SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lieutenant Governor

NEW MEXICO ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau
1190 South St. Francis Drive (87505)
P.O. Box 5469, Santa Fe, New Mexico 87502-5469
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CERTIFIED MAIL – RETURN RECEIPT REQUESTE

February 2, 2018

Jeff Smith, Chief Operating Officer
New Mexico Copper Corporation
4253 Montgomery Blvd. NE
Suite 130
Albuquerque, NM 87109

RE: Draft Discharge Permit, DP-1840, Copper Flat Mine

Dear Mr. Smith:

Notice is hereby given pursuant to Subsection H of 20.6.2.3108 NMAC that Ground Water Discharge Permit 1840 (DP-1840) for the Copper Flat Mine has been proposed for approval (copy enclosed). The New Mexico Environment Department (NMED) Ground Water Quality Bureau (GWQB) will publish notice of the availability of the draft Discharge Permit in the near future and will forward a copy of the notice to you. The Application for DP-1840 was deemed technically complete on February 1, 2018.

Prior to making a final ruling on the proposed Discharge Permit, NMED will allow 30 days from the date the public notice is published, during which time written comments can be submitted or a public hearing requested. Comments and/or hearing requests may be submitted by any interested person, including the Discharge Permit applicant. Written comments or hearing requests must be submitted to the GWQB at the address above and shall set forth the reasons why a hearing is requested. A hearing will be held only if hearing requests are received from the public or the Discharge Permit applicant during the 30-day comment period and NMED determines there is substantial public interest regarding the proposed Discharge Permit. Hearings are presided over by the NMED Secretary or a hearing officer appointed by the Secretary.

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NMED has imposed additional conditions on DP-1840 that are not requirements of the Copper Mine Rule (20.6.7 NMAC). Pursuant to Subsection I of 20.6.7.10 NMAC, NMED is providing the following written explanations of the reasons for the additional conditions.

1. Condition C100.A

   The reason for this condition is to require that the permittee submit a comprehensive set of as-built plans and specifications for constructed mine units authorized by this Discharge Permit.

2. Condition C100.B

   The reason for this condition is to ensure that design, construction and location of all mine units follows Copper Mine Rule requirements and the Discharge Plan.

3. Condition C101.B

   The reason for this condition is to ensure construction of mine units occurs in a predictable and sequential manner.

4. Condition C101.C

   The reason for this condition is to ensure all containment systems are in place prior to operation of discharging mine units.

5. Condition C103.F

   The reason for this condition is to ensure Existing Waste Rock Stockpile 2A is located entirely within the projected Open Pit Surface Drainage Area (OPSDA).

6. Condition C108.A

   The reason for this condition is to ensure that the permittee does not discharge water for dust suppression that may exceed ground water quality standards set forth in Section 20.6.2.3103 NMAC on areas outside the projected OPSDA.

7. Condition C111.B

   The reason for this condition is to clarify sampling and analytical requirements.

8. Condition C111.E

   The reason for this condition is to require implementation of monitoring and reporting requirements prior to discharge.

9. Condition C112.E

   The reason for this condition is to authorize NMED to require submittal of contingency plans and schedules should an unforeseen circumstance occur that may have the potential to impact ground water quality.

10. Condition C113.G

    The reason for this condition is to require that the permittee reclaim two historic waste rock stockpiles at the mine facility prior to the start-up of operations.

11. Condition C113.H

    The reason for this condition is to require that the permittee reclaim the out slopes of historic waste rock stockpiles facing Grayback Arroyo prior to the start-up of operations.

12. Condition C114.B

    The reason for this condition is to require that the permittee submit a workplan to address any ongoing sources of surface or ground water impacts to Grayback Arroyo pursuant to Sections 20.6.2.4000 NMAC through 20.6.2.4115 NMAC.

13. Condition C114.C

    The reason for this condition is to require that the permittee install additional monitoring wells to provide information regarding the horizontal and vertical extent, and magnitude of ground water contamination as required pursuant to Sections 20.6.2.4000 NMAC through 20.6.2.4115 NMAC.

14. Condition C114.D

    The reason for this condition is to require that the permittee collect additional surface and ground water information to provide information regarding the horizontal and vertical extent, and magnitude of ground water contamination as required pursuant to Sections 20.6.2.4000 NMAC through 4115 NMAC.

15. Condition D105.A

    The reason for Condition D105.A is to ensure that the permittee submits proper notification prior to destruction or removal of any monitoring wells required under DP-1840.

16. Condition D105.B

    The reason for Condition D105.B is to ensure that the permittee submits consistent information in support of requests to plug and abandon monitoring wells.

17. Condition D106.A

    The reason for Condition D106.A is to ensure that the permittee submits consistent and accurate location information in the event that an unauthorized discharge occurs.

18. Condition D106.B

    The reason for Condition D106.B is to ensure that the permittee properly notifies NMED in the event of an unauthorized discharge so that a determination of applicable reporting requirements can be made pursuant to 20.6.7 NMAC.

19. Condition D107.D

    The reason for this condition is to assert NMED authority to require that the permittee amend or modify DP-1840 should NMED determine that the requirements of 20.6.2 NMAC are being or may be violated or the standards of Section 20.6.2.3103 NMAC are being or may be violated.

Please review the enclosed draft Discharge Permit carefully for accuracy and completeness to ensure you understand what the permit requires. Please be aware that the proposed Discharge Permit may contain conditions that require the permittee to implement operational, monitoring or closure actions by a specific deadline.

The Water Quality Control Commission (WQCC) Regulations, 20.6.2 NMAC and 20.6.7 NMAC, are available online at *https://www.env.nm.gov/gwb/NMED-GWQB-Regulations.htm.*

Any comments relating to this draft Discharge Permit can be sent to me at the address on the header of this letter or by email to brad.reid@state.nm.us. If written comments or a written request for a hearing are not received during the public comment period, the draft Discharge Permit will become final. Thank you for your cooperation during the review process.

Sincerely,

Brad Reid

Brad Reid
Mining Environmental Compliance Section
Ground Water Quality Bureau
New Mexico Environment Department

Enclosures: Draft Discharge Permit, DP-1840
Ground Water Discharge Permit Monitoring Well Construction and Abandonment Conditions, Revision 1.1, March 2011

Cc**:** Jeff Smith, Chief Operating Officer, NMCC (signed copy: jsmith@themacresourcesgroup.com)
Katie Emmer, Permitting & Environmental Compliance Manager, NMCC (signed copy: kemmer@themacresourcesgroup.com)
Andrew Knight, Assistant General Counsel, NMED (signed copy: andrew.knight@state.nm.us)
Kurt Vollbrecht, Program Manager, MECS (signed copy: kurt.vollbrecht@state.nm.us)
Juan Velasquez, NMCC permitting consultant (signed copy: jvelasquez@vemsinc.com)
David Ennis, MMD (signed copy: david.ennis@state.nm.us)

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GROUND WATER QUALITY BUREAU (GWQB) DISCHARGE PERMIT NEW COPPER MINE FACILITY Issued under 20.6.2 and 20.6.7 NMAC

<u>Return Receipt Requested</u>
<u>Certified Mail Receipt Number</u>: 7005 1820 0001 5766 0796

Mine Facility Name:	Copper Flat Mine
GWQB Discharge Permit Number:	DP-1840
GWQB TEMPO AI Number:	1535
Permittee Name/Responsible Party:	New Mexico Copper Corporation
Mailing Address:	4253 Montgomery Blvd. NE, Suite 130 Albuquerque, NM 87109
Mine Facility Contact:	Jeff Smith; (575) 912-5386
Mine Facility Location:	85 Copper Rock Road Hillsboro, NM 88042
County:	Sierra County
Permitting Action:	New
Effective Date:	XXXX XX, 2018
Expiration Date:	XXXX XX, 2018
NMED Permit Contact:	Brad Reid; (505) 827-2963
E-mail Address:	brad.reid@state.nm.us

Bruce Yurdin
Division Director
Water Protection Division

Date

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TABLE OF CONTENTS

Part A GENERAL INFORMATION 1
A100 Introduction 1
A101 Applicable Regulations 1
A102 Permit Duration 2
A103 Terms of Permit Issuance 2
Part B FACILITY SPECIFIC INFORMATION 2
B100 History and Facility Description 2
B101 Permitting History 4
B102 Facility Location, Ground Water and Process Water Characteristics 4
B103 Authorized Mine Units 5
B104 Authorized Discharges 13
Part C FACILITY SPECIFIC REQUIREMENTS 14
C100 Practice of Engineering 14
C101 Construction Schedule and Progress Reports 14
C102 Copper Flat Open Pit 14
C103 Waste Rock Stockpiles 15
C104 Impoundments 15
C105 Copper Crushing, Milling, Concentrator, and Tailings Storage Facility Units 16
C106 Sumps, Tanks, Pipelines and Other Containment Systems 17
C107 Stormwater Management 17
C108 Dust Suppression 17
C109 Domestic Wastewater Treatment Facility 18
C110 Flow Measurement 18
C111 Monitoring and Reporting 18
C112 Contingency Plan 22
C113 Closure Plan 23
C114 Abatement Plan 24
C115 Financial Assurance 26
Part D GENERAL CONDITIONS 26
D100 Enforcement 26
D101 General Inspection and Entry Requirements 27
D102 General Engineering, Operational and Setback Requirements 27
D103 General Record Keeping and Reporting Requirements 27
D104 General Sampling and Analytical Methods 28
D105 Monitoring Well Abandonment 28
D106 Reporting Requirements for Unauthorized Discharges 29
D107 Modifications and Amendments 29
D108 Compliance with Other Laws 30

LIST OF TABLES AND FIGURES

Table 1 – Copper Flat Development Sequence and Schedule 31
Table 2 – Monitoring and Reporting Summary for DP-1840 32
Figure 1 – Authorized Mine Unit Footprints 34
Figure 2 – Ground and Surface Water Sampling Locations 35
Figure 3 – Flow Meter and Process Water Sampling Locations 36

Part A GENERAL INFORMATION

A100 Introduction

A. The New Mexico Environment Department (NMED) issues this Ground Water Discharge Permit, DP-1840 (Discharge Permit) to the New Mexico Copper Corporation (permittee) pursuant to the New Mexico Water Quality Act (WQA), NMSA 1978, §§ 74-6-1 through 74-6-17, and the New Mexico Water Quality Control Commission (WQCC) Regulations, 20.6.2 and 20.6.7 NMAC. NMED is issuing this Discharge Permit to control the discharge of water contaminants from the Copper Flat Mine facility for the protection of ground water and those segments of surface water gaining from ground water inflow, for present and potential future use as domestic and agricultural water supply and other uses, and to protect public health.

B. Pursuant to this Discharge Permit, the permittee is authorized to discharge a maximum of 25,264,000 gallons per day (gpd) of mine tailings, process water, impacted stormwater, and domestic wastewater to a lined tailing impoundment. In addition, this Discharge Permit regulates discharges from other mine units including waste rock stockpiles, ore stockpiles, mineral processing units, process water impoundments, an open pit, sumps, tanks, pipelines, and other areas within the permit area. The discharge may move directly or indirectly into ground water of the State of New Mexico which has an existing concentration of 10,000 milligrams per liter (mg/L) or less of total dissolved solids (TDS) within the meaning of Section 20.6.2.3104 and Subsection A of 20.6.2.3101 NMAC. The discharge may contain water contaminants or toxic pollutants elevated above the standards of Section 20.6.2.3103 NMAC.

C. The permittee is authorized to discharge water contaminants pursuant to this Discharge Permit which contains conditions authorized or specified by Part 20.6.7 NMAC (Copper Mine Rule) on condition that the permittee complies with the Copper Mine Rule and this Discharge Permit, which are enforceable by NMED.

A101 Applicable Regulations

A. The permittee is discharging from a facility that meets the definition of a "new copper mine facility" as defined in Paragraph (39) of Section 20.6.7.7.B NMAC. Sections 20.6.2.3000 through 20.6.2.3114 NMAC and Part 20.6.7 NMAC apply to discharges specific to copper mine facilities and their operations.

B. The discharges from the mine units regulated pursuant to this Discharge Permit are not subject to any of the exemptions of Section 20.6.2.3105 NMAC.

C. Ground water quality as observed in monitoring wells required by C111.G and C114.C of this Discharge Permit is subject to the criteria of Sections 20.6.2.3101 and 20.6.2.3103 NMAC except as excluded pursuant to Subsection D of 20.6.7.24 NMAC.

A102 Permit Duration

A. Pursuant to the WQA 74-6-5(I) and Subsection H of 20.6.2.3109 NMAC, the term of this Discharge Permit is seven years from the effective date (effective DATE) or five years from the date the discharge commences, whichever occurs first.

B. If the permittee submits an application for renewal in accordance with Subsection F of 20.6.2.3106 NMAC, then the existing discharge permit shall not expire until the application for renewal has been approved or disapproved.

A103 Terms of Permit Issuance

A. **Permit Fees -** The permittee shall remit an annual permit fee payment equal to the applicable permit fee, based on mine size as listed in Subsection A of 20.6.7.9 NMAC on August 1 of each year until termination of all discharge permits related to the Copper Flat Mine facility. [20.6.7.9.A NMAC]

B. **Transfer of Discharge Permit -** Prior to the transfer of any ownership, control, or possession of this permitted facility or any portion thereof, the permittee shall notify the proposed transferee in writing of the existence of this Discharge Permit and include a copy of this Discharge Permit with the notice. The permittee shall deliver or send by certified mail to NMED a copy of the notification and proof that such notification has been received by the proposed transferee. [20.6.7.38 NMAC and 20.6.2.3111 NMAC]

C. **Permit Renewal -** To renew this Discharge Permit, the permittee shall submit an application and associated fees for renewal at least 270 days prior to the expiration date of this Discharge Permit (by DATE) in accordance with Sections 20.6.7.9, 20.6.7.10, and 20.6.7.11 NMAC.

D. **Additional Conditions -** In addition to the requirements of 20.6.7 NMAC, the permittee shall comply with the following additional conditions as authorized by Subsection I of 20.6.7.10 NMAC pursuant to WQA 74-6-5: Condition C100.A, Condition C100.B, Condition C101.B, Condition C101.C, Condition C103.F, Condition C108.A, Condition C111.B, Condition C111.E, Condition C112.E, Condition C113.G, Condition C113.H, Condition C114.B, Condition C114.C, Condition C114.D, Condition D105.A, Condition D105.B, Condition D106.A, Condition D106.B, Condition D107.D.

Part B FACILITY SPECIFIC INFORMATION

B100 History and Facility Description

A. The Copper Flat Mine is an open pit copper mine facility owned by the New Mexico Copper Corporation situated within a mine permit area boundary of approximately 2,190 acres. The Copper Flat Mine will consist of an open pit, waste rock stockpiles, stormwater impoundments and collection systems, a Process Facility Area consisting of a concentrator and associated mineral processing units, a lined tailing impoundment, and associated infrastructure. The mine project will disturb approximately 1,290 acres of which approximately 910 acres were previously disturbed from historic mining operations at the site. The mine is regulated pursuant to this Discharge Permit and an abatement plan.

B. The historic Copper Flat Mine operation included several waste rock stockpiles, an open pit, a tailings storage facility, mineral processing facilities, impoundments, and associated infrastructure. The mine was operated for commercial production in 1982 for approximately three and a half months. Approximately three million tons of overburden (i.e., open pit pre-stripping) and 1.2 million tons of ore were mined resulting in an open pit encompassing eighty acres of disturbance including a five-acre water body. The bottom level of the pit currently sits at 5,400 feet above mean sea level (amsl). No mining has occurred at the open pit since 1982.

C. New Mexico Copper Corporation will construct and operate the Copper Flat Mine and concentrator using conventional copper and molybdenum sulfide flotation circuits and a gravity gold recovery circuit with a maximum throughput of 38,000 dry tons per day of ore, generating up to 25,264,000 gpd of tailings slurry. Over an estimated eleven-year operational period, the permittee intends to mine the copper-rich ore body and process approximately 125 million tons of ore at the Process Facility Area, and place 33 million tons of waste rock on three delineated waste rock stockpiles peripheral to the open pit.

D. Ore mined from the Copper Flat Open Pit will be crushed, milled, and concentrated using conventional milling and concentration processes. The copper and molybdenum concentrates produced at the Process Facility Area will be packaged for off-site transport and additional processing. The tailings, a by-product from the flotation process, will be conveyed via a tailing pipeline to a cyclone classification plant (Cyclone Plant) and then discharged at the Tailings Storage Facility (TSF).

E. A synthetically lined TSF will be constructed in the same location as the historic facility. Tailings slurry (i.e., process water and flotation tailings) containing approximately 29% solids will be gravity conveyed from the Concentrator through the Cyclone Plant to separate the tailings into coarse and fine fractions. The coarse fraction tailings sand cyclone underflow will be deposited at the tailing dam and the fine fraction tailings slime cyclone overflow will be discharged to the interior of the TSF. The TSF will extend approximately 1,000 feet to the east of the former starter dam (the tailings expansion area). A centerline construction method using the cyclone-processed tailings sand for tailings dam construction will be utilized. A starter dam will be constructed using borrow material to provide initial storage capacity and to provide a location for initial discharge of tailings. The use of sand tailings for dam construction are such that the Cyclone Plant will be operated to produce the construction material.

F. Water collected inside the projected Open Pit Surface Drainage Area (OPSDA; as defined in Section 20.6.7.7 NMAC) at the open pit sump will be utilized for dust suppression during operations on haul roads, working areas, and waste rock stockpiles within the projected OPSDA. Water sources that do not exceed ground water quality standards set forth in Section 20.6.2.3103 NMAC will be used for dust suppression outside the projected OPSDA.

G. The pit area will be dewatered to facilitate mining below the water table. The existing diversion structure will be maintained during operations to convey non-impacted stormwater flows generated in Grayback Arroyo around the perimeter of the open pit. Pit water will primarily be used for dust suppression, or re-used in the process water circuit.

H. After the cessation of mining, the pit will be rapidly re-filled with fresh water to the modeled static water table, forming a pit water body. Waste rock stockpiles, the TSF, and other impacted areas will be covered with an engineered soil cover system and revegetated in accordance with the approved Closure/Closeout Plan.

B101 Permitting History

A. The Discharge Plan for DP-1840 includes application materials submitted by the permittee to NMED dated December 11, 2015, Revision 1 of the Discharge Permit Application dated August 2017 ("Revised Application"), and materials contained in the DP-1840 administrative record prior to issuance of this Discharge Permit.

B102 Facility Location, Ground Water and Process Water Characteristics

A. Copper Flat Mine is located at 85 Copper Rock Road approximately 5 miles NE of Hillsboro, in Sections 30 and 31, T15S, R6W, Sections 25, 26, 35, and 36, T15S, R7W, and Section 6, T16S, R6W, Sierra County.

B. Ground water beneath the mine units regulated pursuant to DP-1840 is at a depth ranging from approximately 7 to 156 feet with a pre-discharge TDS concentration ranging from approximately 317 to 868 milligrams per liter.

C. The Copper Flat Open Pit walls, the waste rock stockpiles, the TSF and other disturbed areas at the mine facility may contain sulfide minerals which, when oxidized, generate acidic solutions. These acidic solutions react with in situ minerals to produce acid rock drainage (ARD) that typically contains TDS, sulfate, and certain metals in concentrations that exceed the water quality standards of Section 20.6.2.3103 NMAC.

D. Process water and impacted stormwater discharges regulated pursuant to DP-1840, including ARD, are typically outside the acceptable range for pH and contain TDS, sulfate, and certain metals in concentrations that exceed the water quality standards of Section 20.6.2.3103 NMAC.

B103 Authorized Mine Units

The permittee is authorized to manage the discharge of water contaminants through operation of the following mine units pursuant to this Discharge Permit. This Discharge Permit contains requirements associated with the following mine units as identified in the Revised Application and the administrative record as of the effective date of this Discharge Permit. Mine units listed below meet the definition of "new" mine units pursuant to the Copper Mine Rule, unless otherwise noted, and will meet applicable Copper Mine Rule design and construction requirements.

A. **Open Pit**

1. The permitted open pit operational area will encompass approximately 161 acres at full build out, and will reach an approximate base elevation of 4,650 amsl. The diameter of the open pit will be approximately 2,800 feet, and the open pit depth will reach approximately 850 to 900 feet below the original pre-mining surface. The existing diversion of Grayback Arroyo will route stormwater around the open pit during operations and at closure. Approximately thirty-nine acre-feet per year (24 gallons per minute, gpm) of groundwater seepage and sixty-eight acre-feet per year (42 gpm) of stormwater entering the pit will be returned to the process water circuit or used for dust suppression using one or more pit dewatering sumps.

B. **Waste Rock Stockpiles**

1. Waste Rock Stockpile 1 (WRSP-1) **-** WRSP-1 will be located inside the projected OPSDA northeast of the open pit, and will have an estimated footprint of approximately 40 acres upon build out. Approximately 3.16 million tons of material will be stockpiled within the permitted footprint during the operational phase of the mine. Berms and drain ditches will be constructed around the waste rock stockpile to prevent run-on and to control run-off.

2. Waste Rock Stockpile 2 (WRSP-2) **-** WRSP-2 will be located outside the projected OPSDA east of the open pit and Animas Peak, and will have an estimated footprint of approximately 49 acres upon build out. Approximately 8.64 million tons of material will be stockpiled within the permitted footprint during the operational phase of the mine. Berms and drain ditches will be constructed around the waste rock stockpile to prevent run-on and to control run-off.

3. Waste Rock Stockpile 3 (WRSP-3) **-** WRSP-3 will be located outside the projected OPSDA east of the open pit and Animas Peak, and will have an estimated footprint of approximately 122 acres upon build out. Approximately 32.89 million tons of material will be stockpiled within the permitted footprint during the operational phase of the mine. Berms and drain ditches will be constructed around the waste rock stockpile to prevent run-on and to control run-off. An open channel stormwater conveyance structure will be cut into the underlying bedrock at the toe of the stockpile to collect seepage and impacted stormwater generated

from WRSP-3.

4. Existing Waste Rock Stockpile 1 (EWRSP-1) - EWRSP-1, located inside the projected OPSDA, is an historic waste rock stockpile located at the western edge of the mine facility boundary and contains approximately 512,000 tons of waste rock. The current footprint of the stockpile is approximately 16 acres. This stockpile will be reclaimed during the mine start-up phase.

5. Existing Waste Rock Stockpile 2A (EWRSP-2A) - EWRSP-2A is an historic waste rock stockpile located at the north side of the open pit. A portion of EWRSP-2A is located outside the projected OPSDA. This portion will be relocated onto the portion of EWRSP-2A that is inside the projected OPSDA during the mine start-up phase and prior to construction of WRSP-1. EWSRP-2A will be sequentially covered during the operational phase of the mine from construction of WRSP-1 (i.e., EWRSP-2A will become part of WRSP-1).

6. Existing Waste Rock Stockpile 2B - EWRSP-2B, located inside the projected OPSDA, is an historic waste rock stockpile located at the north side of the open pit immediately west of the toe of EWRSP-2A. EWRSP-2B will be reclaimed during the mine start-up phase. The current combined footprint of EWRSP-2A and EWRSP-2B covers a footprint of 21 acres and contains approximately 913,000 tons of waste rock.

7. Existing Waste Rock Stockpile 3 (EWRSP-3) - EWRSP-3, located outside the projected OPSDA, is an historic waste rock stockpile located north of the Concentrator in the ore processing area. It contains approximately 523,000 tons of waste rock and ore. The current footprint of the stockpile is approximately 20 acres. Ore from this stockpile will be processed during the start-up phase of the concentrator. In addition, EWRSP-3 will be used during mine operations to temporarily store ore during upset conditions (i.e., when the Primary Crusher is not working).

8. Existing Waste Rock Stockpile 4 (EWRSP-4) - EWRSP-4, located inside the projected OPSDA, is an historic waste rock stockpile located southeast of the pit containing approximately 1.2 million tons of waste rock. The current footprint of the stockpile is approximately 23 acres. The southern slopes of the stockpile facing Grayback Arroyo will be reclaimed during the mine start-up phase, and the top surface will be filled and graded to a 1% slope and used for an equipment laydown yard during operations. Stormwater generated from the top surface will discharge to the open pit.

C. **Conditionally Exempt Facilities**

1. Growth Media Stockpiles - Three growth media stockpiles will be constructed at the mine facility to store reclamation cover material. Growth Media Stockpile 1 will be constructed southwest of the TSF and will have an estimated footprint of approximately 30 acres upon

build out. Growth Media Stockpile 2 will be constructed northeast of the TSF and will have an estimated footprint of approximately 32 acres upon build out. Growth Media Stockpile 3 will be constructed southeast of WRSP-3 and will have an estimated footprint of approximately 14 acres upon build out. The stockpiles are authorized for storage of reclamation cover material on condition that the permittee adheres to the approved material characterization and handling plan to ensure the conditionally exempt status as stockpiles that do not generate water contaminants.

2. Mill Site Claims and Electrical Substation - Nine total existing and/or proposed mill site claims and one electrical substation located off-site will contribute to the project. Each mill site claim is five acres in size and the electrical substation will be located on a thirty-acre parcel of land. The mill site claims will be utilized for other water-related infrastructure uses such as staging and storage areas for booster tanks, pumps and electrical equipment, maintenance, and monitoring. The mill site claims and electrical substation are authorized for use on condition that the permittee adheres to the approved material characterization and handling plan to ensure the conditionally exempt status as areas that do not generate water contaminants.

D. **Copper Crushing, Milling, Concentrator, and Tailings Storage Facility**

1. Process Facility Area - The Process Facility Area, located outside the projected OPSDA southeast of the open pit, is where crushing and grinding, milling, flotation, concentrating, drying and packaging of ore will occur. In addition, administration, parking and other ancillary support facilities (e.g., Assay Laboratory) will be located here. Impacted stormwater generated in the Process Facility Area will be directed to open channel conveyances that convey to Impacted Stormwater Impoundment A.

    a. Primary Crusher - Ore from the open pit will be fed to the Primary Crusher for the first stage of crushing. Run-of-the-mine ore rock will be crushed to a size of eight-inch diameter and less. The gyratory crusher will be located below ground level on reinforced concrete with concrete sumps. The sumps will pump water for re-use in the ore processing circuit.

    b. Coarse Ore Stockpile - The Coarse Ore Stockpile will be located between the Primary Crusher and the Concentrator in the Process Facility area. Crushed ore rock from the Primary Crusher will be temporarily stored at the Coarse Ore Stockpile until it is fed into the Reclaim Tunnel beneath the stockpile and onto a conveyor system which will transport ore to the Semi-Autogenous Grinding (SAG) Mill and grinding circuit. The Coarse Ore Stockpile will have a capacity of 75,000 tons and will have a footprint of approximately 2 acres.

    c. Concentrator - The Concentrator is designed to process 1,600 tons of ore per hour, or 38,000 tons per day. It will consist of several copper and molybdenum rougher/scavenger flotation cells, copper and molybdenum flotation and scavenger cells, concentrate tanks, thickeners, filters, a copper concentrate load-out area, a molybdenum packaging area, and associated infrastructure. The Concentrator is designed and will be constructed to prevent discharges from leaving the facility using concrete floors and numerous sumps, pumps, and concrete berms within the building.

d. Mill **-** The Mill is located inside the Concentrator building and will consist of one SAG Mill, one ball mill, a pebble crusher, and associated conveyance systems and separators.

2. Tailings Storage Facility (TSF) **-** The lined TSF will be located outside the projected OPSDA and built progressively out in a five-phase process. It is designed to accommodate the volume of tailings generated during the life of the mine. The liner will consist of an 80-millimeter (mil) high-density polyethylene (HPDE) liner placed on a twelve-inch thick liner bedding fill sub base. In Phase 1, the liner bedding fill will consist of a minimum of 12 inches of historic tailings recovered from the north cell of the old starter dam. After Phase 1, liner bedding fill will consist of a twelve-inch layer of crushed and screened native material, or selected local soil. TSF drainage will be collected using an underdrain collection system that incorporates two underdrains that will convey solutions to the TSF Underdrain Collection Pond. Drainage from the TSF impoundment interior will be collected in a continuous underdrain system (impoundment underdrain) constructed over the geomembrane liner. A separate blanket drain system will underlie the tailings dam (dam underdrain). The impoundment underdrain system will be equipped with a shutoff valve at its inlet during the initial years of operation to ensure two feet of freeboard is maintained in the Underdrain Collection Pond. When the valve is closed, the TSF supernatant pool will be used for storage until the TSF underdrain collection pond is pumped down. The TSF pool, located in the interior of the TSF, will be equipped with four floating-barge pumps with a maximum design capacity of 12,978 gpm. The pumps will convey TSF supernatant process water to the Process Water Reservoir through the 36-inch diameter HDPE water reclaim process water pipeline. Tailing slurry, which is gravity conveyed from the Concentrator, will pass through the Cyclone Plant prior to discharge to the TSF. The Cyclone Plant will separate the tailing slurry into a coarse and fine fraction; the coarse fraction will be used to construct the tailing dam and the fine fraction will be conveyed into the TSF pool.

E. **Domestic Wastewater Treatment Facility**

1. A package treatment plant sized to treat up to 10,000 gallons of day of domestic wastewater will be constructed on a pre-existing slab located near the main gate and outside the projected OPSDA. The plant will be constructed and operated to treat wastewater to a secondary effluent quality. Treated effluent will be pumped via pipeline to the TSF facility for re-use as process water.

F. **Impoundments**

1. Process Water Reservoir (PWR) **-** The Process Water Reservoir will be located east of the concentrator and outside the projected OPSDA. It will have a footprint of approximately

2 acres and a storage capacity of 5,433,472 gallons while maintaining two feet of freeboard. It is sized to retain twelve hours of inflow at 7,200 gpm and a 100-year return interval storm event while maintaining two feet of freeboard. The pond will be double-synthetically lined (60-mil each or equivalent) using HDPE or equivalent material, and equipped with a leak detection/collection system. It is designed to meet the requirements of Paragraphs (1), (2), (3), (6), and (7) of 20.6.7.17.D NMAC. The PWR will receive process water from the Underdrain Collection Pond at the TSF, impacted stormwater from the three impacted stormwater impoundments, and freshwater from the off-site well field for use as process water in the Concentrator. The PWR will pump process water to the Process Water Tank for use in the Process Facility Area. Pumps will be sized to deliver 24,300,000 gpd (16,875 gpm) of process water to the Concentrator. In the event of upset conditions, the PWR overflow weir conveys solutions directly into the lined tailings trench/pipeline corridor which discharges to the TSF.

2. TSF Underdrain Collection Pond (UCP) **-** The UCP will be located outside the projected OPSDA at the southeastern toe of the TSF. It will have a footprint of approximately 8 acres and storage capacity of 12,240,000 gallons while maintaining two feet of freeboard. It is sized to retain twenty-four hours of underdrain flow at a maximum flow rate, and runoff from the downstream face of the TSF during a 100-year return interval storm event. The pond will be double-synthetically lined (60-mil each or equivalent) using HDPE or equivalent material, and equipped with a leak detection/collection system. It is designed to meet the requirements of Paragraphs (1), (2), (3), (6), and (7) of 20.6.7.17.D NMAC. The pond will receive approximately 448 gpm of tailing underflow, tailings dam face seepage, and impacted stormwater under standard operating conditions. Collected solutions will be returned to the process water re-use circuit via the 4,000 gpm pond reclaim pump system (one operating pump and one spare submersible turbine pump mounted in a concrete sump) and the underdrain collection process water pipeline. The underdrain collection process water pipeline will be placed along the upstream side (i.e., inside the TSF toe berm) of the toe berm and above the geomembrane liner during all buildout phases of the TSF. Perimeter collection trenches situated on the bermed upstream side of the TSF liner will capture and contain impacted stormwater from the face of the TSF and convey solutions to the Underdrain Collection Pond.

3. Surge Pond **-**The Surge Pond will be located outside the projected OPSDA at the northwest margin (i.e., upstream side) of the TSF and is associated with the Cyclone Plant. It will have a footprint of approximately 6.4 acres and storage capacity of 1,610,000 gallons while maintaining two feet of freeboard. The 60-mil HDPE (or equivalent) lined impoundment is designed to meet the requirements of Paragraphs (1), (2), (4), (6), and (7) of 20.6.7.17.D NMAC. The purpose of the Surge Pond is to contain discharges (tailings, process, and reclaim water) from various processing locations under upset conditions, due to a pipe failure, or shutdown of the Cyclone Plant. Upset flows from the Cyclone Plant will discharge by gravity to the Surge Pond within a secondary containment ditch lined with a

minimum 60-mil HDPE geomembrane liner placed over 6 inches of liner bedding fill. Dedicated pumps will convey solutions from the Surge Pond to the TSF. The surge pond will be empty under normal operating conditions.

4. Impacted Stormwater Impoundments **-** Three stormwater impoundments will be utilized to capture precipitation and stormwater runoff from areas impacted by mining activities including mining, hauling, waste rock stockpiling, mineral processing, and shipping and receiving of goods and products. The 60-mil HDPE (or equivalent) lined impoundments are designed to meet the requirements of Paragraphs (1), (2), (4), (6), and (7) of 20.6.7.17.D NMAC. Each stormwater impoundment is designed to receive the volume of stormwater generated from a 100-year return interval storm event while maintaining two feet of freeboard. The stormwater impoundments will typically be empty and will be pumped as low as practicable within 30 days of storm events pursuant to Paragraph (4) of 20.6.7.17.D NMAC. Collected solutions from Impacted Stormwater Impoundment B and Impacted Stormwater Impoundment C will be pumped to Impacted Stormwater Impoundment A, and solutions from Impacted Stormwater Impoundment A will be pumped to the PWR using temporary pumps. Sheet flow generated during storm events will be conveyed to the stormwater impoundments via open channel conveyances capable of handling a 100-year return interval storm event while maintaining six inches of freeboard.

   a. Impacted Stormwater Impoundment A (SW-A) **-** As shown in Figure 11J-3 of the Revised Application, SW-A will be located outside the projected OPSDA east of the Process Water Reservoir and at the southwest toe of WRSP-3. It will have a footprint of approximately 2 acres and storage capacity of 7,306,971 gallons while maintaining two feet of freeboard. Impacted Stormwater Impoundment A will capture and manage impacted stormwater from the approximately 91.06-acre catchment area in Watershed A which includes the Process Facility Area.

   b. Impacted Stormwater Impoundment B (SW-B) **-** As shown in Figure 11J-3 of the Revised Application, SW-B will be located inside the projected OPSDA at the southern toe of WRSP-1 and southwest corner of Watershed B. It will have a footprint of approximately 2 acres and storage capacity of 5,513,140 gallons while maintaining two feet of freeboard. Stormwater Impoundment B will capture and manage impacted stormwater generated from the approximately 98.52-acre catchment area in Watershed B, which includes WRSP-1. Overflow from the impoundment will discharge under a haul road via a culvert and then flow into the open pit.

   Impacted Stormwater Impoundment C (SW-C) **-** As shown in Figure 11J-3 of the Revised Application, SW-C will be located outside the projected OPSDA at the eastern toe of WRSP-3 and eastern edge of Watershed C. SW-C will have a footprint of approximately 7 acres and storage capacity of 10,513,140 gallons while maintaining two feet of freeboard. Stormwater Impoundment C will capture and manage impacted stormwater from the approximately 315.76-acre catchment area in Watershed C which contains WRSP-2 and WRSP-3.

G. **Sumps, Tanks, Pipelines and Other Containment Systems**

1. Tanks **-** Forty-eight above ground tanks will be used at the mine site; most will be located outside the projected OPSDA at the Process Facility Area. Appendix C of the Revised Application describes all tanks, sumps, and designed containments for each. Tanks are designed and will be constructed in accordance with Subsections A and B of 20.6.7.23 NMAC, unless otherwise noted.

    a. Concentrator Area **-** Thirty tanks will be located inside the Concentrator including (number of tanks in parenthesis): Grinding Area (1), Copper Floatation Area (1), Copper Regrind Area (1), Molybdenum Floatation Area (3), Copper-Molybdenum Thickening Area (4), Copper Thickening Area (6), Wheel Wash Area (1), Lime Reagent Area (2), Diesel Reagent Area (1), General Reagent Area (7), and Sodium Hydrosulfide Reagent Area (3).

    b. Truck Shop Tank Farm **-** Seven tanks will be located in the Truck Shop Tank Farm area to store various oil and fluid to support the vehicle fleet.

    c. Fuel Station Area **-** Five tanks will be located in the Fuel Station Area to be utilized for fueling needs.

    d. Miscellaneous Locations **-** Three tanks will be incorporated into the domestic wastewater treatment facility, one tank will be used at the Assay Lab for chemical waste, and one 170,000-gallon tank will be used for Process Water Storage and delivery. The Process Water Storage Tank will be situated in a bermed area that will be underlain by a HDPE synthetic liner.

2. Sumps and Containment Areas **-** Twenty-two sumps and/or containment areas will be constructed to capture and contain process water, impacted stormwater, and other solutions in the event there is a release from the primary containment structures in the Process Facility Area.

3. Copper Flat Open Pit dewatering system **-** The Copper Flat Open Pit dewatering system will utilize one or more dewatering sumps and associated pipelines located in the pit to dewater the open pit. A portable booster tank(s) will be incorporated, as necessary, as the pit is deepened.

4. Pipelines **-** Pipelines serving the DP-1840 mine units consist of HDPE and range in size from 6 inches or less in diameter up to 36 inches in diameter. The pipelines are described in Table 11J-3, and Figures 11J-20A and 11J-20B of the Revised Application. All pipelines are designed and will be constructed in accordance with Subsections A and B of 20.6.7.23 NMAC. The Concentrator Whole Tailings Transport pipeline and UCP return pipeline will be placed within lined and bermed channels when located outside building areas.

H. **Truck and Equipment Washing Units**

1. A Truck and Equipment Washing Unit (Truck Wash) will be located outside the projected OPSDA along a haul road between the mine and the Truck Shop south of the Concentrator. It will consist of a concrete pad for vehicle and equipment washing. The pad will be sloped to drain into a 50,000-gallon concrete settling basin for separation of water, solids, oil and grease. Oil and grease will be skimmed and properly disposed of offsite. Solids removed from the bottom of the settling basin will disposed of at the TSF or stored on a concrete pad next to the wash unit for eventual disposal at the TSF. All wash water will be reused at the Truck Wash. The Truck Wash is designed in accordance with Section 20.6.7.26 NMAC.

2. A wheel wash tank and pump and associated concrete containment area will be located adjacent to the Concentrator. It will be used to remove and contain concentrate from truck wheels prior to the trucks travelling onto site roads. Solutions collected in the wheel wash sump will be returned to the Copper Thickener feed box via a dedicated pump equipped with automatic start/stop control.

I. **Dust Suppression -** Dust suppression trucks will utilize water from the open pit sump and/or stand pipes located inside the projected OPSDA for dust suppression within the projected OPSDA. Stand pipes used to deliver water to trucks for dust suppression outside the projected OPSDA will utilize water sources that meet ground water quality standards set forth in Section 20.6.2.3103 NMAC.

J. **Flow Measurement**

1. The permittee will utilize flow meters to measure regulated discharge volumes pursuant to this discharge permit and as required by the Copper Mine Rule. Flow meter locations utilized by DP-1840 are shown in Figures 11J-20A and 11J-20B of the Revised Application. In addition, Figure 3 located on Page 36 of this Discharge Permit, shows a schematic diagram of flow meter locations used for discharge volume reporting pursuant to DP-1840.

K. **Meteorological Station**

1. The mine facility will utilize one Meteorological Station, located at the east central portion of the mine facility permit boundary, to measure meteorological data in accordance with the meteorological plan submitted with the Revised Application. The location is shown on Figure 11W-1 of the Revised Application.

B104 Authorized Discharges

The permittee is authorized to operate the following mine units in accordance with all applicable system design and operational constraints as described in this Discharge Permit, and the Discharge Plan. [20.6.2.3109 NMAC]

A. The permittee is authorized to discharge a maximum of 25,246,000 gpd of tailing slurry from the Concentrator to the Cyclone Plant and then the TSF via gravity through the Concentrator Whole Tailings Transport pipeline.

B. The permittee is authorized to pump a maximum of 21,236,000 gpd of process water from the TSF Water Reclaim System, which includes combined flows from the UCP and TSF supernatant pool, to the PWR.

C. The permittee is authorized to discharge a maximum of 24,300,000 gpd of process water from the PWR to the Concentrator.

D. The permittee is authorized to place waste rock from the Copper Flat Open Pit within the permitted footprints of WRSP-1, WRSP-2, and WRSP-3 and discharge water contaminants originating from placed materials.

E. The permittee is authorized to store crushed ore at the Crushed Ore Stockpile.

F. During upset conditions, the permittee is authorized to temporarily stage ore within the permitted footprint of EWRSP-3, and discharge water contaminants originating from placed materials.

G. The permittee is authorized to operate SW-A, SW-B, and SW-C to collect impacted stormwater.

H. The permittee is authorized the operate all sumps, tanks, pipelines and other containment systems described in B103.G.

I. The permittee is authorized to operate the Truck and Equipment Wash units.

J. The permittee is authorized to discharge a maximum of 10,000 gpd of treated effluent from the domestic wastewater treatment and disposal facility to the TSF.

K. The permittee is authorized to discharge an annual average of approximately 96,000 gpd of process water from the Copper Flat Open Pit sump(s) and dewatering system for use as dust suppression water within the OPSDA or for reuse in the process water circuit.

L. This Discharge Permit authorizes only those discharges specified herein. Any unauthorized discharges such as spills or leaks must be reported to NMED and remediated as required by Section 20.6.2.1203 NMAC, and any additional requirements listed in this Discharge Permit.

M. The permittee shall provide written notice to NMED of the commencement, or recommencement of operations in accordance with Subsection C of 20.6.7.18 NMAC.

Part C FACILITY SPECIFIC REQUIREMENTS

The permittee shall conduct the requirements set forth below in accordance with the WQCC Regulations of Subsection C of 20.6.2.3106 NMAC and Section 20.6.2.3107 NMAC to ensure compliance with 20.6.2 NMAC, and in accordance with applicable requirements of Part 20.6.7 NMAC.

C100 Practice of Engineering

A. Within 120 days of completion of construction of any mine unit authorized for construction and discharge as listed in B103, the permittee shall submit complete as-built drawings and/or a construction certification report pursuant to Paragraph (2) of 20.6.7.18.B NMAC.

B. Design, construction and location of all mine units shall be in accordance with applicable Copper Mine Rule requirements and the Discharge Plan.

C101 Construction Schedule and Progress Reports

A. Pursuant to Subparagraph (a) of 20.6.7.18.C(1), the permittee shall provide NMED with written notice a minimum of 30 days before commencing construction of mine units covered by this Discharge Permit. A summary of construction activities completed shall be submitted in accordance with Subsection B of 20.6.7.29 NMAC.

B. The permittee shall adhere to the sequencing schedule outlined in Table 2-1 of Revision 1 of the Updated Mine Operation Reclamation Plan (MORP) dated July 2017 and titled, "Copper Flat Development Sequence and Schedule," and as shown on Table 1 located on Page 31 of this Discharge Permit. NMED shall be notified prior to any deviations from the sequencing schedule.

C. All containment systems, seepage, and stormwater collection units shall be in place prior to operation of any discharging mine unit.

C102 Copper Flat Open Pit

A. The Copper Flat Open Pit shall be operated in accordance with the applicable requirements of Section 20.6.7.24 NMAC.

B. Pursuant to Subsection A of 20.6.7.24 NMAC, expansion of the Copper Flat Open Pit shall not exceed the area shown on Figure 1 located on Page 34 of this Discharge Permit. The permittee must obtain a permit modification or amendment prior to expanding the Copper Flat Open Pit beyond the area shown on Figure 1 of this Discharge Permit.

C. Pursuant to Subsection C of 20.6.7.24 NMAC, fluids generated within the open pit shall be managed according to the requirements of the Mine Operation Water Management Plan required in C111.I.

C103 Waste Rock Stockpiles

A. Waste rock shall be handled and characterized in accordance with applicable requirements of Subsection A of 20.6.7.21 NMAC, and the NMED-approved material characterization and handling plans summarized and referenced in the Revised Application.

B. Design, construction and location of the waste rock stockpiles shall be in accordance with the Discharge Plan, and applicable requirements of Subsections B and C of 20.6.7.21 NMAC.

C. The permittee shall comply with applicable operational requirements listed in Paragraphs (2) through (8) of 20.6.7.21.D NMAC including the requirement to place waste rock on waste rock stockpiles to plan for closure to the extent practicable, and be in accordance with the operating plan required in C111.J (Sections 20.6.7.18, 20.6.7.21 and 20.6.7.33 NMAC).

D. Pursuant to Paragraph (1) of 20.6.7.21.D NMAC and Paragraph (1) of 20.6.7.21.B NMAC, the waste rock stockpiles described in B103.B shall not exceed the footprint, configuration, and location shown in Figure 1 of this Discharge Permit. The permittee may only expand the permitted footprint for the purpose of facility closure, or through an NMED-approved permit amendment or modification to DP-1840.

E. Pursuant to Paragraph (c) of 20.6.7.21.A(2) and as outlined in the material handling plan in the Revised Application, the permittee shall place a minimum of 10 feet of not potentially acid generating (NPAG) waste rock material above and below any areas where acid generating or potentially acid generating (PAG) waste rock will be placed.

F. As outlined in the Revised Application, the portion of EWRSP-2A located outside the projected OPSDA shall be relocated onto the portion of EWRSP-2A that is located inside the projected OPSDA, during the mine start-up phase and prior to construction of WRSP-1.

C104 Impoundments

A. Design, construction and location of all impoundments shall be in accordance with the Discharge Plan, and applicable requirements of Subsection D of 20.6.7.17 NMAC.

B. Operation of all impoundments shall be in accordance with the applicable requirements of Subsection F of 20.6.7.18 NMAC.

C. Pursuant to Subsection B of 20.6.7.18 NMAC, the permittee shall submit a construction certification report within 120 days of construction completion of all impoundments that require a liner system.

D. In accordance with Subparagraph (c) of 20.6.7.17.D(2) NMAC, water levels in the PWR and UCP shall be maintained to provide capacity to convey maximum design process flow plus stormwater runoff from the reservoir catchment area while maintaining two-feet of freeboard.

E. In accordance with Subparagraph (e) of 20.6.7.17.D(2) NMAC, water levels in the SW-A, SW-B, and SW-C shall be maintained to provide capacity for a 100-year return interval storm event while preserving two-feet of freeboard under standard operating conditions and after storm events.

C105 Copper Crushing, Milling, Concentrator, and Tailings Storage Facility Units

A. Design, construction, and location of all crushing, milling, concentrating, and tailings storage facility units shall be in accordance with the Discharge Plan, and applicable requirements of Subsections A and B of 20.6.7.22 NMAC.

B. Operation of all crushing, milling, concentrating, and tailings storage facility units shall be in accordance with the Discharge Plan and applicable requirements of Subsection C of 20.6.7.22 NMAC.

C. Tailings Storage Facility

1. Deposition of tailings shall be in accordance with the operating plan required in C111.K.

2. Prior to discharging to the TSF, the permittee shall ensure that berms and/or the dam structure of the TSF will have the capacity for such discharges while maintaining appropriate safety measures in accordance with the regulations of the Dam Safety Bureau of the Office of the State Engineer and Paragraph (d) of 20.6.7.17.C(1) NMAC.

3. Pursuant to Subparagraph (4) of 20.6.22.A NMAC and Subsection B of 20.6.7.18 NMAC, the permittee shall submit a construction certification report within 120 days of TSF liner system installation.

4. Pursuant to Subparagraph (a) of 20.6.7.22.C(1) NMAC, the TSF shall not exceed the footprint (564 acres) or location and configuration as shown in Drawing 12 in Appendix J of the document titled *Feasibility Level Design, 30,000 TPD Tailings Storage Facility and Tailings Distribution and Water Reclaim Systems Copper Flat Project Sierra County, New Mexico Golder Associates Inc., Revised, November 2016* (i.e., Appendix A the Revised Application) and as shown on Figure 1 of this Discharge Permit. The permittee may only expand the permitted footprint for the purpose of facility closure, or through an NMED-approved permit amendment or modification to DP-1840.

C106 Sumps, Tanks, Pipelines and Other Containment Systems

A. Design, construction and location of all pipelines, tanks, and sumps shall be in accordance with the Discharge Plan, and applicable requirements of Subsections A and B of 20.6.7.23 NMAC.

B. Operation of all pipelines, tanks, and sumps shall be in accordance with the applicable requirements of Subsection C of 20.6.7.23 NMAC.

C. Detailed and complete construction plans and specifications and supporting design calculations for any proposed or required tanks, pipelines, sumps, or other containment systems, including any replacements thereof, shall be submitted to NMED pursuant to Paragraph (2) of 20.6.7.17.C NMAC and Section 20.6.2.23 NMAC, and D107 of this Discharge Permit. This requirement does not apply to portable or temporary tanks, pipelines, sumps, or other containment systems that are subject to periodic relocation during mining operations.

D. Pursuant to Subsection J of 20.6.7.33 NMAC, upon discontinuing the operation of, or before moving tanks, pipelines, sumps, or other containment systems, all liquids shall be released to a location specifically authorized in the discharge permit, an alternate location subject to NMED approval, or otherwise properly contained, transferred, or disposed of in a manner that does not result in discharge to non-authorized areas.

C107 Stormwater Management

A. Stormwater shall be managed in accordance with the applicable requirements of Paragraph (4) of 20.6.7.17.C NMAC, and in accordance with the Stormwater Management Plan included in the Revised Application.

B. To ensure compliance with Subparagraphs (e) and (f) of 20.6.7.17.D(2) NMAC, the permittee shall inspect all stormwater impoundments, conveyance channels and collection ponds on a monthly basis and after precipitation events that exceed one inch for evidence of stormwater accumulations that exceed design capacities. To properly manage stormwater, the permittee shall ensure that the pumping capacity is adequate to maintain storage capacity in all stormwater impoundments.

C. Open channel conveyance structures, including those located at the base of WRSP-1, WRSP-2, and WRSP-3, shall be designed and operated to meet the requirements of Subparagraph (f) of 20.6.7.17.D(2).

C108 Dust Suppression

A. Dust suppression on areas outside the OPSDA shall be conducted using water sources that do not exceed ground water quality standards set forth in Section 20.6.2.3103 NMAC.

B. If at some time in the future the permittee wishes to use an alternate source of dust suppression water or change the location in which discharges of water for dust suppression have been approved, the permittee shall notify NMED for approval in accordance with D107 prior to the proposed change.

C109 Domestic Wastewater Treatment Facility

A. The permittee shall utilize operators, certified by the State of New Mexico at the appropriate level, to operate the wastewater collection, treatment, and disposal system. The operations and maintenance of all or any part of the wastewater system shall be performed by, or under the direct supervision of, a certified operator. [Subsection C of 20.6.2.3109 NMAC, 20.7.4 NMAC]

C110 Flow Measurement

A. Pursuant to Paragraph (2) of 20.6.7.18.E NMAC, the permittee shall visually inspect all flow meters on a monthly basis for evidence of malfunction and repair or replace malfunctioning flow meters within 30 days of or as soon as practicable following discovery.

C111 Monitoring and Reporting

A. Pursuant to applicable requirements in Sections 20.6.7.28 and 20.6.7.29 NMAC, the permittee shall collect, preserve, transport, and analyze all ground water, process water, tailings slurry, impacted stormwater, seep, spring, and surface water samples from the facility in accordance with Table 2 located on Page 32 of this Discharge Permit, and any additional requirements listed in this Discharge Permit. Table 2 of this Discharge Permit provides a summary the monitoring and reporting requirements. Figures 2 and 3, located on Pages 35-36 of this Discharge Permit, designate sampling locations.

B. Samples of pit sump water, stormwater, PLS, seeps, and process water shall be analyzed for total and dissolved concentrations in accordance with Table 2 of this Discharge Permit. Samples of ground water and springs shall be analyzed for dissolved concentrations in accordance with Table 2 of this Discharge Permit.

C. The permittee shall submit monitoring reports to NMED on a semi-annual basis that contain all quarterly monitoring data and information collected pursuant to the requirements of this Discharge Permit, and applicable requirements of Section 20.6.7.29 NMAC. Semi-annual reports are due by February 28 and August 31 of each year. Data required to be submitted annually shall be submitted in the monitoring report due by February 28 of each year.

D. Pursuant to Subsection L of 20.6.7.28 NMAC, the permittee shall submit to NMED ground water elevation contour map(s) on a semi-annual basis and a map showing the extent of the OPSDA on an annual basis. The ground water elevation contour map(s) shall be of an appropriate scale to show ground water elevation contours for the Copper Flat Mine; the contour maps shall include land surface topographic contours with appropriate contour intervals, and shall include the monitoring wells that the ground water data is based on. The maps shall be submitted in the semi-annual monitoring reports in the format specified by Subsection C of 20.6.7.29 NMAC.

E. Implementation of all monitoring and reporting requirements listed in this Discharge Permit shall commence 180 days before emplacement of ore, waste rock, or discharge of tailings at an individual waste rock stockpile or tailings impoundment to allow for sampling and reporting prior to discharge, except as required under abatement pursuant to C114.C and C114.D.

F. Requests to change monitoring and reporting requirements may require an amendment or modification to this Discharge Permit as required by the secretary. [20.6.2.7 NMAC]

G. **Ground Water**

1. Pursuant to Subsection B of 20.6.7.28 NMAC the permittee shall monitor ground water quality as close as practicable around the perimeter and downgradient of each open pit, waste rock stockpile, tailings impoundment, process water impoundment, and impacted stormwater impoundment."

2. Pursuant to Paragraph (1) of 20.6.7.28.B NMAC, the existing monitoring wells listed in Table 2 of this Discharge Permit, except GWQ-1 and GWQ-8 as discussed in C111.G.4 below, have been deemed appropriate by NMED for continued use as ground water monitoring wells under this Discharge Permit. These ground water monitoring wells, installed prior to the effective date of the Copper Mine Rule, have been identified to be constructed in accordance with the Copper Mine Rule.

3. Pursuant to Subsection G of 20.6.7.28 NMAC, the permittee shall sample and analyze ground water quarterly from all monitoring wells in accordance with Table 2 of this Discharge Permit, and applicable requirements of Subsection F of 20.6.7.28 NMAC. Analytical results shall be submitted in the semi-annual monitoring reports in the format specified by Subsection C of 20.6.7.29 NMAC.

4. Monitoring Wells GWQ-1 and GWQ-8 are not constructed in accordance with Section 20.6.7.28 NMAC; however, these wells are authorized for incorporation into the monitoring network to provide contextual ground water information for this Discharge Permit.

5. Pursuant to Paragraph (a) of 20.6.7.28(2) NMAC, the permittee shall install all proposed monitoring wells at least 180 days before emplacement of ore, waste rock, or discharge of tailings or other contaminants at an individual waste rock stockpile or tailings impoundment to allow sampling prior to discharge, except as required under abatement pursuant to C114.C and C114.D.

a. The permittee shall provide NMED with a definitive installation schedule as project approval dates become more certain.

b. All proposed monitoring wells shall be installed in accordance with Subsections B, C, D and E of 20.6.7.28 NMAC. Within 15 days of completion of each new monitoring well the permittee shall provide NMED with depth-to-water measurements and water quality field parameter data. Pending ground water conditions in the newly installed monitoring wells, additional requirements may be necessary. The permittee shall notify NMED in writing a minimum of one week prior to the start of installation of the monitoring wells. Upon completion of the installation of the monitoring wells, the permittee shall submit to NMED a monitoring well completion report for all newly-installed monitoring wells in accordance with the applicable requirements of Subsection K of 20.6.7.28 NMAC.

6. The permittee is authorized to plug and abandon Monitoring Wells GWQ-11, GWQ94-13, GWQ94-16, GWQ94-17, GWQ94-18, GWQ94-19, GWQ94-20, IW-1, IW-2, IW-3, NP-2, NP-3, NP-5, GWQ11-25A and GWQ11-25B, which will be buried during construction of the TSF and enlargement of the open pit (GWQ11-25A, and GWQ11-25B).

   a. Monitoring wells shall be plugged and abandoned in accordance with the attachment titled, *Ground Water Discharge Permit Monitoring Well Construction and Abandonment Conditions*, Revision 1.1, March 2011, and all applicable local, state, and federal regulations, including 19.27.4 NMAC.

   b. The permittee shall submit documentation describing the well abandonment procedures in accordance with the attachment titled, *Ground Water Discharge Permit Monitoring Well Construction and Abandonment Conditions*, Revision 1.1, March 2011. The well abandonment documentation shall be submitted to NMED with the next semi-annual monitoring report for this Discharge Permit upon completion of abandonment procedures.

   c. Pursuant to Subsection B of 20.6.7.30 NMAC, NMED may require replacement monitoring wells.

7. The permittee shall include Monitoring Wells NP-1, NP-4, GWQ-10, GWQ94-21A, GWQ94-21B, GWQ94-14, GWQ94-15, GWQ11-25A, and GWQ11-25B in the monitoring plan until expansion of the TSF requires plugging and abandonment of these wells.

8. The permittee shall submit a request in accordance with D105 prior to plugging and abandonment of any monitoring well.

H. **Surface Water**

1. The permittee shall analyze surface water collected from five surface water auto-sampling ports (SWQ-1 through SWQ-5) located in Grayback Arroyo in accordance with the applicable requirements of the Revised Application and Subsection N of 20.6.7.28 NMAC. The surface water collection ports shall be checked after each precipitation event of 0.5 inch or greater at the Copper Flat Mine. If sufficient water is present, a sample shall be

collected and analyzed. The permittee shall attempt to collect samples from the collection ports as soon as practicable after the precipitation event. No more than one surface water sample per port may be collected in a 24-hour period, and no more than two surface water samples per port are required to be collected per quarter. Samples shall be analyzed for total and dissolved concentrations of the analytes listed on Table 2 of this Discharge Permit. Analytical results shall be submitted in the semi-annual monitoring reports in the format specified by Subsection C of 20.6.7.29 NMAC.

2. The permittee shall sample and analyze surface water collected quarterly from any seeps or springs, if encountered, outside the OPSDA in accordance with the schedule listed in Table 2 of this Discharge Permit, and applicable requirements of Subsection N of 20.6.7.28 NMAC. Analytical results shall be submitted in the semi-annual monitoring reports in the format specified by Subsection C of 20.6.7.29 NMAC.

I. **Copper Flat Open Pit**

1. Pursuant to Subsection C of 20.6.7.24 NMAC, the permittee shall submit on a semi-annual basis a mine operation water management report summarizing pit dewatering activities and management of water generated and collected from within the perimeter of the open pit. The report shall also include an updated mine operation water management plan discussing changes to water management in the open pit for the upcoming six months. The report shall be submitted in the semi-annual monitoring reports.

J. **Waste Rock Stockpiles**

1. Pursuant to Paragraph (7) of 20.6.7.21.D NMAC, the permittee shall submit on an annual basis an operating plan that describes the sequencing of waste rock deposition on the waste rock stockpiles and describes the operation of any applicable systems utilized to contain or transport process water or impacted stormwater from the waste rock stockpiles. The operating plan shall be submitted with the monitoring report due by February 28 of each year.

K. **Copper Crushing, Milling, Concentrator, and Tailings Storage Facility Units**

1. Pursuant to Subparagraph (j) of 20.6.7.22.C(1) NMAC, the permittee shall submit on an annual basis an operating plan that describes the sequencing of tailings deposition on the TSF and describes the operation of any applicable systems utilized to contain or transport process water and measures taken to manage the surface impoundment area to maintain adequate freeboard.

L. **Discharge Volumes**

1. The permittee shall measure and report discharge volumes for process water, liner solution collection systems, tailings and impacted stormwater discharges in accordance with

Subsections B, E, and F of 20.6.7.29 NMAC and the flow metering plan submitted with the Revised Application. Flow meter locations used for monitoring and reporting are schematically displayed on Figure 3 of this Discharge Permit. Discharge volume reporting shall be submitted in the semi-annual monitoring reports in the format specified by Subsection C of 20.6.7.29 NMAC. In addition to applicable discharge volume reporting required by Subsections B, E, and F of 20.6.7.29 NMAC, additional discharge volume reporting for the following shall be measured and reported:

a. The daily volume and source of water used for dust suppression.

M. **Flow Measurement Report**

1. Pursuant to Subparagraph (a) of 20.6.7.18.E.2 NMAC, the permittee shall submit a report of repaired or replaced flow meters in the semi-annual monitoring reports that include a description of any flow meter malfunctions with a statement verifying the repair and description of calibration of the flow meter pursuant to Paragraph (3) of 20.6.7.18.E NMAC.

N. **Impoundment Leak Detection/Collection System Report**

1. Pursuant to Subparagraph (b) of 20.6.7.18.F.2 NMAC, the permittee shall submit a report of repaired or replaced leak detection/collection system components in the semi-annual monitoring reports.

O. **Meteorological Data**

1. Meteorological data shall be measured and reported as stipulated in the Meteorological Plan submitted with the Revised Application. Pursuant to Subsection G of 20.6.7.29 NMAC, tabulated data shall be submitted to NMED in the monitoring report due by February 28 of each year.

C112 Contingency Plan

A. The permittee shall comply with all applicable contingency requirements and submit to NMED all applicable information or documentation specified in Subsections A through J of 20.6.7.30 NMAC.

B. Pursuant to Subsection G of 20.6.7.30 NMAC, discharges of process water, impacted stormwater, or seepage that exceed the standards of Section 20.6.2.3103 NMAC to unauthorized areas must be reported under Section 20.6.2.1203 NMAC.

C. Pursuant to Subsection K of 20.6.7.30 NMAC, the permittee shall submit to NMED for approval an Interim Emergency Water Management Plan within 180 days of the effective date of this Discharge Permit (by DATE).

D. Pursuant to Subsection I of 20.6.7.30 NMAC, the permittee shall notify NMED of any significant erosion or condition that may compromise conveyance structures utilized in DP-1840.

E. If NMED or the permittee identifies any other failures of the discharge plan or system not specifically noted in this permit, NMED may require the permittee to develop and submit contingency plans and schedules for NMED approval to address such failures. [20.6.2.3107.A.10 NMAC]

C113 Closure Plan

A. Closure of all mine units associated with this Discharge Permit shall be performed in accordance with the requirements of Sections 20.6.7.33 and 20.6.7.34 NMAC, the Closure/Closeout Plan contained in the Revised Application, this Discharge Permit as applicable, and the final Closure/Closeout Plan approved by the New Mexico Mining and Minerals Division pursuant to the New Mexico Mining Act.

B. Pursuant to Paragraph (4) of 20.6.7.33.F NMAC and Subsection F of 20.6.7.34 NMAC, the permittee shall submit for NMED approval sixty days prior to construction, a Construction Quality Assurance/Construction Quality Control (CQA/CQC) plan for any mine units regulated pursuant to DP-1840 where cover is applied under an approved Closure/Closeout Plan.

C. For each mine unit closed, the closure period shall cease, and the post-closure period shall commence following NMED approval of a final CQA/CQC report that is in accordance with Subsection G of 20.6.7.34 NMAC.

D. The permittee shall provide a workplan and an implementation schedule, as a component of the Test Plot Program, for NMED approval within 90 days of the effective date of this permit (by DATE) to perform soil water characteristic curve laboratory analysis on the proposed reclamation cover material (RCM). The workplan shall be designed to verify Copper Mine Rule water holding capacity requirements pursuant to Subsection F of 20.6.7.33 NMAC. Based on the results of developed soil water characteristic curves, the permittee will be required to implement an appropriate material handling plan at closure to ensure the emplaced cover material textural characteristics achieves the water holding capacity required pursuant to Section 20.6.7.33 NMAC. Final RCM approval is subject to a demonstration that Copper Mine Rule requirements will be met, and concurrence from the New Mexico Mining and Minerals Division that requirements of the Mining Act will be met.

E. To demonstrate that the proposed RCM material will be capable of sustaining plant growth without continuous augmentation and have erosion resistant capabilities as required pursuant to Subsection F of 20.6.7.33 NMAC, the permittee shall conduct a RCM Test Plot Program. The RCM Test Plot Program shall be conducted in accordance with all approved work plans, and applicable New Mexico Mining and Minerals Division requirements.

F. In accordance with Subsection H of 20.6.7.33 NMAC, the permittee shall manage all process water at closure pursuant to the water management plan described in the Revised Application.

G. Closure of EWRSP-1 and EWRSP-2B shall be completed during the mine start-up phase in accordance with the requirements of Sections 20.6.7.33 and 20.6.7.34 NMAC, the Revised Application and this Discharge Permit, as applicable.

H. The southern slopes of EWRSP-4 facing Grayback Arroyo shall be reclaimed during the mine start-up phase, and the top surface shall be filled and graded to a 1% slope in accordance with the requirements of Sections 20.6.7.33 and 20.6.7.34 NMAC, the Revised Application and this Discharge Permit, as applicable.

I. **Post-Closure Conditions**

1. Post-closure requirements shall be performed in accordance with the applicable requirements of Section 20.6.7.35 NMAC, and in accordance with the Closure/Closeout Plan and associated materials submitted as part of this Discharge Permit. Pursuant to Subsection D of 20.6.7.35 NMAC, the permittee shall submit to NMED semi-annual reports pursuant to the schedule in Subsection A of 20.6.7.29 NMAC that include, but are not limited to, a description and the results of post-closure monitoring, any work completed during the preceding semi-annual period, any maintenance and repair work conducted for any closure unit, status of post-closure activities, and semi-annual potentiometric maps.

2. Pursuant to Subsection E of 20.6.7.35 NMAC, the contingency requirements of Section 20.6.7.30 NMAC apply to any deficiencies discovered during post-closure monitoring and inspections, including, but not limited to, the requirements for possible corrective action plans, abatement plans, monitoring well replacement, reporting and correction of unauthorized discharges, and significant erosion of, or ponding of water on, a cover system.

C114 Abatement Plan

A. The permittee has been required to submit to NMED for approval a proposed abatement plan for the Copper Flat Mine. All abatement plans and activities shall be performed in accordance with Sections 20.6.2.4000 through 4115 NMAC and Paragraphs (3) and (4) of 20.6.7.30.A NMAC.

B. Within 180 days of the date of this Discharge Permit (by DATE), the permittee shall submit a workplan to evaluate any potential ongoing sources of surface or ground water impacts to Grayback Arroyo and connected aquifers. The workplan shall include a schedule and any corrective action measures, if necessary, to address any currently known source areas of impacts to Grayback Arroyo and connected aquifers pursuant to Sections 20.6.2.4000 NMAC through 4115 NMAC.

C. **Additional Monitoring Wells**

1. In addition to the monitoring wells already proposed in the Revised Application, the permittee shall install two additional monitoring wells to evaluate current ground water conditions proximal to the open pit and historic waste rock stockpiles. One monitoring well shall be located to the northeast side of the open pit at the intersection of ground water contour interval 5450 feet and the OPSDA (PGWQ-21) as shown on Figure 2 of this Discharge Permit, and a second monitoring well shall be located southwest of the open pit near the intersection of ground water contour interval 5480 feet and the OPSDA between GWQ-11-24B and GWQ11-26 (PGWQ-22).

2. Pursuant to Subsection A of 20.6.7.28 NMAC, the permittee shall submit a map identifying the proposed locations and provide construction details for the monitoring wells for NMED approval a minimum of 30 days prior to installation. The proposal shall consider the necessity of a nested pair monitoring well(s) to evaluate ground water conditions in different water bearing units or to account for ground water decline due to pit dewatering.

3. Within 180 days of the date of this Discharge Permit (by DATE), the permittee shall install monitoring wells PGWQ-1, PGWQ-5, PGWQ-13, PGWQ-20, PGWQ-21, and PGWQ-22 to provide additional information regarding the horizontal and vertical extent and magnitude of ground water contamination as required pursuant to Sections 20.6.2.4000 NMAC through 20.6.2.4115 NMAC.

4. Installation of the monitoring wells shall be in accordance with Subsections B, C, D and E of 20.6.7.28 NMAC.

5. The permittee shall notify NMED in writing a minimum of one week prior to the start of installation of the monitoring wells required in C114.C.3. Upon completion of the installation of the monitoring wells, the permittee shall submit to NMED monitoring well completion reports for the newly-installed monitoring wells in accordance with the applicable requirements of Subsection K of 20.6.7.28 NMAC.

D. **Additional Stage 1 Abatement Plan Ground and Surface Water Quality Information**

1. The permittee shall collect an additional four quarters of ground and surface water data from the monitoring wells required in C114.C.3, and the previously approved Stage 1 Abatement Plan sampling locations shown in Table 2 of the document entitled, "Results from First Year of Stage 1 Abatement Investigation at the Copper Flat Mine Site Near Hillsboro, New Mexico," dated May 2014.

2. The initial abatement sampling event shall commence following completion of installation of monitoring wells required in C114.C.3. Analytical results shall be submitted semi-annually in the format specified by Subsection C of 20.6.7.29 NMAC.

C115 Financial Assurance

A. The permittee shall maintain joint financial assurance with NMED and the Mining and Minerals Division of the New Mexico Energy, Minerals and Natural Resources Department to cover costs associated with closure and post-closure activities approved under this Discharge Permit. [20.6.2.3107 NMAC]

Part D GENERAL CONDITIONS

NMED has reviewed the Discharge Plan for the proposed discharge permit and has determined that the provisions of the Copper Mine Rule and applicable ground water quality standards will be met in accordance with this Discharge Permit. General conditions pursuant to 20.6.2 NMAC and 20.6.7 NMAC are listed below.

D100 Enforcement

A. Any violation of the requirements and conditions of this Discharge Permit, including any failure to allow NMED staff to enter and inspect records or facilities, or any refusal or failure to provide NMED with records or information, may subject the permittee to a civil enforcement action pursuant to the NMSA 1978, Section 74-6-10(A) and (B). Such action may include a compliance order requiring compliance immediately or in a specified time, assessing a civil penalty, modifying or terminating the discharge permit, or any combination of the foregoing; or an action in district court seeking injunctive relief, civil penalties, or both. Pursuant to the NMSA 1978, Section 74-6-10(C) and 74-6-10.1, civil penalties of up to $15,000 per day of noncompliance may be assessed for each violation of the NMSA 1978, Section 74-6-5, the WQCC Regulations, or this Discharge Permit, and civil penalties of up to $10,000 per day of noncompliance may be assessed for each violation of any other provision of the WQA, or any regulation, standard, or order adopted pursuant to such other provision. In any action to enforce this Discharge Permit, the permittee waives any objection to the admissibility as evidence of any data generated pursuant to this Discharge Permit. The permittee does not waive any argument as to the weight such evidence should be given. [74-6-10 WQA, 74-6-10.1 WQA]

B. Pursuant to the NMSA 1978, Section 74-6-10.2(A-F), criminal penalties may be assessed for any person who knowingly violates or knowingly causes or allows another person to:

1. Make any false material statement, representation, certification or omission of material fact in an application, record, report, plan or other document filed, submitted or required to be maintained under the WQA;
2. Falsify, tamper with or render inaccurate any monitoring device, method or record required to be maintained under the WQA; or
3. Fail to monitor, sample or report as required by a permit issued pursuant to a state or federal law or regulation.

D101 General Inspection and Entry Requirements

A. Nothing in this Discharge Permit shall be construed as limiting in any way the inspection and entry authority of NMED under the WQA, the WQCC Regulations, or any other applicable law or regulation. [20.6.2.3107 NMAC, 74-6-9(B) & (E) WQA]

B. The permittee shall allow the Secretary or an authorized representative, upon the presentation of credentials, to [20.6.2.3107.D NMAC, 74-6-9(B) & (E) WQA]:

1. Enter at regular business hours or at other reasonable times upon the permittee's premises or other location where records must be kept under the conditions of this Discharge Permit, or under any federal or WQCC regulation.
2. Inspect and copy, during regular business hours or at other reasonable times, any records required to be kept under the conditions of this Discharge Permit, or under any federal or WQCC regulation.
3. Inspect, at regular business hours or at other reasonable times, any facility, equipment (including monitoring and control equipment or treatment works), practices or operations regulated or required under this Discharge Permit, or under any federal or WQCC regulation.
4. Sample or monitor, at reasonable times for the purpose of assuring compliance with this Discharge Permit or as otherwise authorized by the WQA, any effluent, water contaminant, or receiving water at any location before or after discharge.

D102 General Engineering, Operational and Setback Requirements

A. Mine units shall be designed in accordance with the applicable requirements of Section 20.6.7.17 NMAC.

B. Mine units shall be operated in accordance with the applicable requirements of Section 20.6.7.18 NMAC.

C. The permittee shall meet all applicable setback requirements pursuant to Section 20.6.7.19 NMAC.

D103 General Record Keeping and Reporting Requirements

A. The permittee shall retain written records at the copper mine facility as required pursuant to Section 20.6.7.37 NMAC.

B. The permittee shall furnish to NMED, within a reasonable time, any documents or other information which it may request to determine whether cause exists for modifying, terminating and/or renewing this Discharge Permit or to determine compliance with this Discharge Permit.

The permittee shall also furnish to NMED, upon request, copies of documents required to be kept by this Discharge Permit. [20.6.2.3107.D NMAC, 74-6-9 (B) & (E) WQA]

D104 General Sampling and Analytical Methods

A. Unless otherwise approved in writing by NMED, the permittee shall conduct sampling and analysis in accordance with the most recent edition of the following documents [Subsection B of 20.6.2.3107 NMAC]:

1. American Public Health Association, Standard Methods for the Examination of Water and Wastewater (18^{th}, 19^{th}, or current)
2. U.S. Environmental Protection Agency, Methods for Chemical Analysis of Water and Waste
3. U.S. Geological Survey, Techniques for Water Resources Investigations of the U.S. Geological Survey
4. American Society for Testing and Materials, Annual Book of ASTM Standards, Part 31. Water
5. U.S. Geological Survey, et al., National Handbook of Recommended Methods for Water Data Acquisition
6. Federal Register, latest methods published for monitoring pursuant to Resource Conservation and Recovery Act regulations
7. Methods of Soil Analysis: Part 1. Physical and Mineralogical Methods; Part 2. Microbiological and Biochemical Properties; Part 3. Chemical Methods, American Society of Agronomy

D105 Monitoring Well Abandonment

A. The permittee shall submit a written request for NMED approval to amend or modify this Discharge Permit at least 30 days prior to the anticipated destruction or removal of any monitoring wells required under this Discharge Permit. Monitoring well plugging and abandonment shall be completed in accordance with the *Ground Water Discharge Permit Monitoring Well Construction and Abandonment Conditions,* Revision 1.1, March 2011, or according to regulations issued by the Office of the State Engineer in 19.27.7 NMAC, unless an alternate method is approved by NMED. [20.6.2.3107 NMAC]

B. The request required in D105.A shall include the following information:

1. A scaled map showing the location of the monitoring well(s) and the mine units it is intended to monitor;
2. The purpose for plugging and abandoning the monitoring well(s);

3. Details, if available, on the monitoring well(s) including depth-to-water elevation, top-of-casing elevation, construction and lithologic logs;
4. Recent ground water analytical results from a minimum of the most recent eight sampling events from the monitoring well(s);
5. Proposed replacement well(s), if applicable, and;
6. Same details, as applicable, as provided in D105.B.1, D105.B.3, and D105.B.4 are required for the proposed replacement monitoring well(s). New replacement wells require monitoring well completion reports pursuant to Subsection K of 20.6.7.28 NMAC.

D106 Reporting Requirements for Unauthorized Discharges

A. In the event of a spill or release that is not authorized under this Discharge Permit, the permittee shall initiate the notifications and corrective actions as required in 20.6.2.1203 NMAC. The permittee shall take immediate corrective action to contain and remove or mitigate any damage caused by the discharge. Within 24 hours after discovery of the discharge, the permittee shall verbally notify NMED and provide the information required by Paragraph (1) of 20.6.2.1203.A NMAC, and to determine applicable monitoring and reporting requirements pursuant to Paragraphs (2) and (3) of 20.6.7.29.B NMAC. Within 7 days of discovering of a discharge reportable under 20.6.2.1203 NMAC, the permittee shall submit a written report to NMED verifying the oral notification and providing any additional information or changes. The permittee shall submit a corrective action report within 15 days after discovery of the discharge. [20.6.2.1203 NMAC]

B. As part of the 24-hour spill notification requirements, the permittee shall submit a figure to NMED that clearly displays the location (or locations) of the spill and identifies nearby mine units and/or location information in latitude/longitude coordinates in decimal degrees (XX.XXXXXX and –XXX.XXXXXX, respectively), using a specified datum of WGS 84. Submittal of location information in Universal Transverse Mercator (UTM) format is also acceptable.

D107 Modifications and Amendments

A. In the event the permittee proposes a change to the facility or the facility's discharge that would result in a change in the volume discharged; the location of the discharge; or the amount or character of water contaminants received, treated, or discharged by the facility, the permittee shall notify and obtain approval from NMED prior to implementing such changes. Such changes may require modification or amendment of this Discharge Permit, including payment of applicable fees as specified in Section 20.6.7.9 NMAC. [20.6.2.3107.C NMAC, 20.6.2.3109.E NMAC, 20.6.7.7.B(19) NMAC, 20.6.7.14 NMAC]

B. For any proposed change that would meet the definition of a discharge permit modification as specified in Paragraph P of 20.6.2.7 NMAC, the permittee shall submit for NMED approval an application for modification of this Discharge Permit pursuant to Sections 20.6.7.10 and 20.6.7.11 NMAC. Plans and specifications shall be included in the application, as applicable, pursuant to Section 20.6.7.17 NMAC.

C. For any proposed change that meets the definition of a discharge permit amendment as specified in Paragraph 19 of 20.6.7.7.B NMAC, the permittee shall submit to NMED a request for an amendment to this Discharge Permit pursuant to Section 20.6.7.14 NMAC. Plans and specifications shall be included in the request, as applicable, pursuant to Section 20.6.7.17 NMAC.

D. Pursuant to Section 20.6.2.3109 NMAC, NMED reserves the right to require a discharge permit modification in the event NMED determines that the requirements of 20.6.2 NMAC are being or may be violated, or the standards of Section 20.6.2.3103 NMAC are being or may be violated. This may include a determination that structural controls and/or management practices approved under this Discharge Permit are not protective of groundwater quality, and that more stringent requirements are needed to protect groundwater quality. The permittee may be required to abate water pollution.

D108 Compliance with Other Laws

A. Nothing in this Discharge Permit shall be construed in any way as relieving the permittee of the obligation to comply with all applicable federal, state, and local laws, regulations, permits or orders. [20.6.2 NMAC, 20.6.7.8(D) NMAC]

Table 1 – Copper Flat Development Sequence and Schedule

Project Build Out Sequence					Project Reclamation Sequence	
		Disturbed Acres				
Year	Project Activity	Facility	Cumulative	19.10.1602.D(15)(c) Reference	Year	Reclamation Activity
	Mobilize Construction	0.00	0.00	Other Facility or Structures (c)xiii		
	Plant Site Grading	84.41	84.41	Other Facility or Structures (c)xiii		
	TSF Phase 1	451.50	535.91	Tailings Storage Facility (c)vii		
	Top Dressing Stockpile 1	29.33	565.24	Topsoil & Topdressing Stockpiles (c)xi		
	Construct Mill	8.51	573.75	Mills (c)viii		
	Construct Ancillary Facilities	8.89	582.64	Other Facility or Structures (c)xiii		
	Storage Areas	3.22	585.86	Storage Areas (c)x		
1	EWRSP 1	15.34	601.20	Waste Rock Stockpiles (c)xii	1	
	EWRSP 2A	8.33	609.53	Waste Rock Stockpiles (c)xii		
	EWRSP 2B	12.73	622.26	Waste Rock Stockpiles (c)xii		
	EWRSP 3	19.54	641.80	Waste Rock Stockpiles (c)xii		
	EWRSP 4	18.10	659.90	Waste Rock Stockpiles (c)xii		
	Mine Haul Roads	5.97	665.87	Waste Rock Stockpiles (c)xii		
	Impoundments : TSF; Proc; SW A	12.92	678.79	Impoundments (c)ii		
	Collection Ditches: SW A	1.38	680.17	Impoundments (c)ii		
	Top Dressing Stockpile 2	31.55	711.72	Topsoil & Topdressing Stockpiles (c)xi		
	Top Dressing Stockpile 3	3.53	715.25	Topsoil & Topdressing Stockpiles (c)xi		
	Construct Ancillary Facilities	21.10	736.35	Other Facility or Structures (c)xiii		
	Open Pit	82.66	819.01	Open Pit (c)vi		
	WRSP 1	3.97	822.98	Waste Rock Stockpiles (c)xii		Reclaim EWRSP 1
2	WRSP 2	2.44	825.42	Waste Rock Stockpiles (c)xii	2	Reclaim EWRSP 2A
	WRSP 3	6.07	831.49	Waste Rock Stockpiles (c)xii		Reclaim EWRSP 2B
	Mine Haul Roads	11.03	842.52	Waste Rock Stockpiles (c)xii		
	EWRSP 4	4.52	847.04	Waste Rock Stockpiles (c)xii		
	Ore Stockpile	2.07	849.11	Ore Stockpiles (c)i		
	Impoundments : Surge; SW B; SW C	8.99	858.10	Impoundments (c)ii		
	Collection Ditches: SW B; SW C	4.42	862.52	Impoundments (c)ii		
	Top Dressing Stockpile 3	10.58	873.10	Topsoil & Topdressing Stockpiles (c)xi		
	Open Pit	66.13	939.23	Open Pit (c)vi		
3	WRSP 1	27.80	967.03	Waste Rock Stockpiles (c)xii	3	
	WRSP 2	4.88	971.91	Waste Rock Stockpiles (c)xii		
	WRSP 3	18.20	990.11	Waste Rock Stockpiles (c)xii		
	TSF Phase 2	28.22	1,018.33	Tailings Storage Facility (c)vii		
	WRSP 1	7.94	1,026.27	Waste Rock Stockpiles (c)xii		
4	WRSP 2	19.51	1,045.78	Waste Rock Stockpiles (c)xii	4	
	WRSP 3	18.20	1,063.98	Waste Rock Stockpiles (c)xii		
	TSF Phase 3	28.22	1,092.20	Tailings Storage Facility (c)vii		
	Open Pit	8.27	1,100.47	Open Pit (c)vi		
5	WRSP 2	14.63	1,115.10	Waste Rock Stockpiles (c)xii	5	
	WRSP 3	18.20	1,133.30	Waste Rock Stockpiles (c)xii		
	TSF Phase 4	28.22	1,161.52	Tailings Storage Facility (c)vii		
	Open Pit (buildout complete)	8.27	1,169.79	Open Pit (c)vi		
6	WRSP 1	0.00	1,169.79	Waste Rock Stockpiles (c)xii	6	
	WRSP 2	4.88	1,174.67	Waste Rock Stockpiles (c)xii		
	WRSP 3	18.20	1,192.87	Waste Rock Stockpiles (c)xii		
	WRSP 2, 3	2.44	1,195.31	Waste Rock Stockpiles (c)xii		
7	WRSP 3	18.20	1,213.51	Waste Rock Stockpiles (c)xii	7	
	TSF Phase 5 (buildout complete)	28.22	1,241.73	Tailings Storage Facility (c)vii		
8	WRSP 3	18.20	1,259.93	Waste Rock Stockpiles (c)xii	8	
9 - 11	WRSP 3 (buildout complete)	6.07	1,266.00	Waste Rock Stockpiles (c)xii	10 - 11	WRSP 3 Contour
12					12	WRSP 3 Contour, TSF Draindown - Active Evaporation
13					13	Pit Rapid Fill, WRSP 2-Upper Lift Contour, WRSP 1-Contour, TSF Draindown - Active Evaporation
14	Mining and Processing Ends				14	Rapid Fill, WRSP-2 Upper Lift Contour, WRSP 1 - Contour, Fill & Contour, WRSP 3, 2, 1, EWRSP 4 Cover & Seed, TSF Draindown - Active Evaporation
15					15	Process Area Demo, Fill & Contour, WRSP 3, 2, 1, EWRSP 3 & 4 Contour, Cover & Seed, Pit Area Contour, TSF Contour, Draindown - Active Evaporation
16					16	Process Area Fill & Contour, WRSP 3, , 2, 1, EWRSP 3 & 4 Contour, Cover, Seed, TSF Contour, Draindown - Active Evaporation
17					17	TSF Contour, Draindown - Active Evaporation
18	Evaporation Pond Construction (Project Buildout Complete)	24.05	1,290.05	Impoundments (c)ii	18	TSF Contour & Cover, Draindown - Active Evaporation, Passive Evaporation
19					19	TSF Contour, Cover, Draindown - Passive Evaporation
20 - 21					20 - 21	TSF Contour, Cover, Seed, Draindown - Passive Evaporation
22 - 38					22 - 38	TSF Draindown - Passive Evaporation
39					39	TSF Evaporation Pond Fill, Cover & Seed

Table 2 – Monitoring and Reporting Summary for DP-1840

Monitoring Report Schedule of Submittal (Subsection A of 20.6.7.29 NMAC)

1	January 1 - June 30 (Q1 and Q2 sampling quarters) – Semi-annual report due by August 31 of each year
2	July 1 - December 31 (Q3 and Q4 sampling quarters) – Semi-annual report due by February 28 of each year
3	Annual reports due by February 28 of each year

Reporting Summary

Annual Reporting Frequency	**Number of Sites**	**Description**
2	Not Applicable	Monitoring reports – All applicable requirements of Subsections A through H of 20.6.7.29 NMAC.
2	Not Applicable	Additional Discharge Volume reporting listed in C111.L
2	1	Mine facility ground water elevation contour map
1	1	OPSDA Map

Monitoring Schedule

Area	**Identification Number**	**Sampling**					**Notes**
		type	**Q1**	**Q2**	**Q3**	**Q4**	
Open Pit	GWQ96-22A	mw	A-F,W	A-E,W	A-E,W	A-E,W	
	GWQ96-22B	mw	A-F,W	A-E,W	A-E,W	A-E,W	
	GWQ11-26	mw	A-F,W	A-E,W	A-E,W	A-E,W	
	GWQ96-23A	mw	A-F,W	A-E,W	A-E,W	A-E,W	
	GWQ96-23B	mw	A-F,W	A-E,W	A-E,W	A-E,W	
	GWQ11-24A	mw	A-F,W	A-E,W	A-E,W	A-E,W	
	GWQ11-24A	mw	A-F,W	A-E,W	A-E,W	A-E,W	
	PGWQ-1	Pmw	A-F,W	A-E,W	A-E,W	A-E,W	
	PGWQ-2	Pmw	A-F,W	A-E,W	A-E,W	A-E,W	
	PGWQ-21	Pmw	A-F,W	A-E,W	A-E,W	A-E,W	
	PGWQ-22	Pmw	A-F,W	A-E,W	A-E,W	A-E,W	
TSF	GWQ-1	mw & p	A-F,W	A-E,W	A-E,W	A-E,W	
	GWQ-8	mw & p	A-F,W	A-E,W	A-E,W	A-E,W	
	GWQ-10	mw	A-F,W	A-E,W	A-E,W	A-E,W	
	GWQ-12	mw	A-F,W	A-E,W	A-E,W	A-E,W	
	NP-1	mw	A-F,W	A-E,W	A-E,W	A-E,W	
	NP-4	mw	A-F,W	A-E,W	A-E,W	A-E,W	
	GWQ94-14	mw	A-F,W	A-E,W	A-E,W	A-E,W	
	GWQ94-15	mw	A-F,W	A-E,W	A-E,W	A-E,W	
	GWQ94-21A	mw	A-F,W	A-E,W	A-E,W	A-E,W	
	GWQ94-21B	mw	A-F,W	A-E,W	A-E,W	A-E,W	
	GWQ13-28	mw	A-F,W	A-E,W	A-E,W	A-E,W	
	PGWQ-14	Pmw	A-F,W	A-E,W	A-E,W	A-E,W	
	PGWQ-15	Pmw	A-F,W	A-E,W	A-E,W	A-E,W	
	PGWQ-16	Pmw	A-F,W	A-E,W	A-E,W	A-E,W	
	PGWQ-18	Pmw	A-F,W	A-E,W	A-E,W	A-E,W	
	PGWQ-19	Pmw	A-F,W	A-E,W	A-E,W	A-E,W	
TSF/UCP	PGWQ-17	Pmw	A-F,W	A-E,W	A-E,W	A-E,W	
TSF/WRSP-2 &-3	PGWQ-13	Pmw	A-F,W	A-E,W	A-E,W	A-E,W	
Surge Pond	GWQ-5R	mw	A-F,W	A-E,W	A-E,W	A-E,W	
	PGWQ-9	Pmw	A-F,W	A-E,W	A-E,W	A-E,W	
WRSP-2 &-3	PGWQ-3	Pmw	A-F,W	A-E,W	A-E,W	A-E,W	
	PGWQ-4	Pmw	A-F,W	A-E,W	A-E,W	A-E,W	
	PGWQ-5	Pmw	A-F,W	A-E,W	A-E,W	A-E,W	
	PGWQ-8	Pmw	A-F,W	A-E,W	A-E,W	A-E,W	

	PGWQ-20	Pmw	A-F,W	A-E,W	A-E,W	A-E,W	
SW-C/ WRSP-2 & WRSP-3	PGWQ-6	Pmw	A-F,W	A-E,W	A-E,W	A-E,W	
	PGWQ-7	Pmw	A-F,W	A-E,W	A-E,W	A-E,W	
SW-A	PGWQ-10	Pmw	A-F,W	A-E,W	A-E,W	A-E,W	
PWR	PGWQ-11	Pmw	A-F,W	A-E,W	A-E,W	A-E,W	
SW-A/PWR	PGWQ-12	Pmw	A-F,W	A-E,W	A-E,W	A-E,W	
Grayback Arroyo^	SWQ-1	sw	A-F,W	A-E,W	A-E,W	A-E,W	Tot. + Diss
	SWQ-2	sw	A-F,W	A-E,W	A-E,W	A-E,W	Tot. + Diss
	SWQ-3	sw	A-F,W	A-E,W	A-E,W	A-E,W	Tot. + Diss
	SWQ-4	sw	A-F,W	A-E,W	A-E,W	A-E,W	Tot. + Diss
	SWQ-5	sw	A-F,W	A-E,W	A-E,W	A-E,W	Tot. + Diss
Impoundments	SW-A(M/S-9)	sw	A-F,W	A-E,W	A-E,W	A-E,W	Tot. + Diss
	SW-B (M/S-10)	sw	A-F,W	A-E,W	A-E,W	A-E,W	Tot. + Diss
	SW-C (M/S-11)	sw	A-F,W	A-E,W	A-E,W	A-E,W	Tot. + Diss
	PWR (M/S-8)	sw	A-F,W	A-E,W	A-E,W	A-E,W	Tot. + Diss
	Surge Pond (M/S-14)	sw	A-F,W	A-E,W	A-E,W	A-E,W	Tot. + Diss
	UCP (M/S-6)	sw	A-F,W	A-E,W	A-E,W	A-E,W	Tot. + Diss
	TSF (M/S-4)	sw	A-F,W	A-E,W	A-E,W	A-E,W	Tot. + Diss
Mine Pit Water	Dewatering Sump	sw	A-F,W	A-E,W	A-E,W	A-E,W	Tot. + Diss
Seeps/Springs	Outside OPSDA only	spg/ sp	A-F,W	A-E,W	A-E,W	A-E,W	If encountered
Flow Meters/Discharge Volume Reporting	M/S-1 through M/S-17		C.111.L &M	C.111.L &M	C.111.L &M	C.111.L &M	See Figure 3

Sampling Analytical Suites (mg/L, unless noted otherwise):

A = Field Parameters: Temperature (°C), pH, specific conductance (μS/cm)

B = General Chemistry and Inorganic Parameters: alkalinity-bicarbonate (alk-HCO_3), alkalinity-carbonate (alk-CO_3), alkalinity-total (alk-Tot), calcium (Ca), chloride (Cl), cyanide (CN), fluoride (F), magnesium (Mg), potassium (K), sodium (Na), sulfate (SO_4), and total dissolved solids (TDS)

C = Metal Parameters: aluminum (Al), arsenic (As), barium (Ba), beryllium (Be), boron (B), cadmiun (Cd), chromiun (Cr), cobalt (Co), copper (Cu), iron (Fe), lead (Pb), manganese (Mn), molybdenum (Mo), nickel (Ni), selenium (Se), silver (Ag), total mercury (Hg), uranium (U) and zinc (Zn).

D = Nutrients: Total Kjeldahl nitrogen (TKN), and Nitrate-Nitrogen (NO_3-N)

E = Radioactivity: Combined Radium-226 and Radium-228 (pCi/L)

F = Organic Parameters: Total Petroleum Hydrocarbons (TPH), benzene, polychlorinated biphenyls (PCBs), toluene, carbon tetrachloride, 1,2-dichloroethane (EDC), 1,1-dichloroethlyene (1,1-DCE), 1,1,2,2-tetrachloroethylene (PCE), 1,1,2-trichloroethylene (TCE), ethylbenzene, total xylenes , methylene chloride, chloroform, 1,1-dichloroethane, ethylene dibromide (EDB), 1,1,1-trichloroethane, 1,1,2-trichloroethane, 1,1,2,2-tetrachloroethane, vinyl chloride, PAHs: total naphthalene plus monomethylnaphthalenes, benzo-a-pyrene

Measurements

W = Depth-to-water measurement to the nearest 0.01 foot

^ = See C111.H

Explanation to Abbreviations and Symbols

mw = monitoring well Pmw = proposed monitoring well sw = surface water p = production well spg = spring sp = seep Tnk = tank	WRP = Waste Rock Stockpile PWR = Process Water Reservoir UCP = Underdrain Collection Pond SW = Impacted Stormwater Impoundment Tot. + Diss = Total and Dissolved Concentrations M/S-# = Measuring/Sampling Point	Sampling Quarter: Q1 = Jan-Mar Q2 = Apr-Jun Q3 = Jul-Sep Q4 = Oct-Dec

Figure 1 – Authorized Mine Unit Footprints

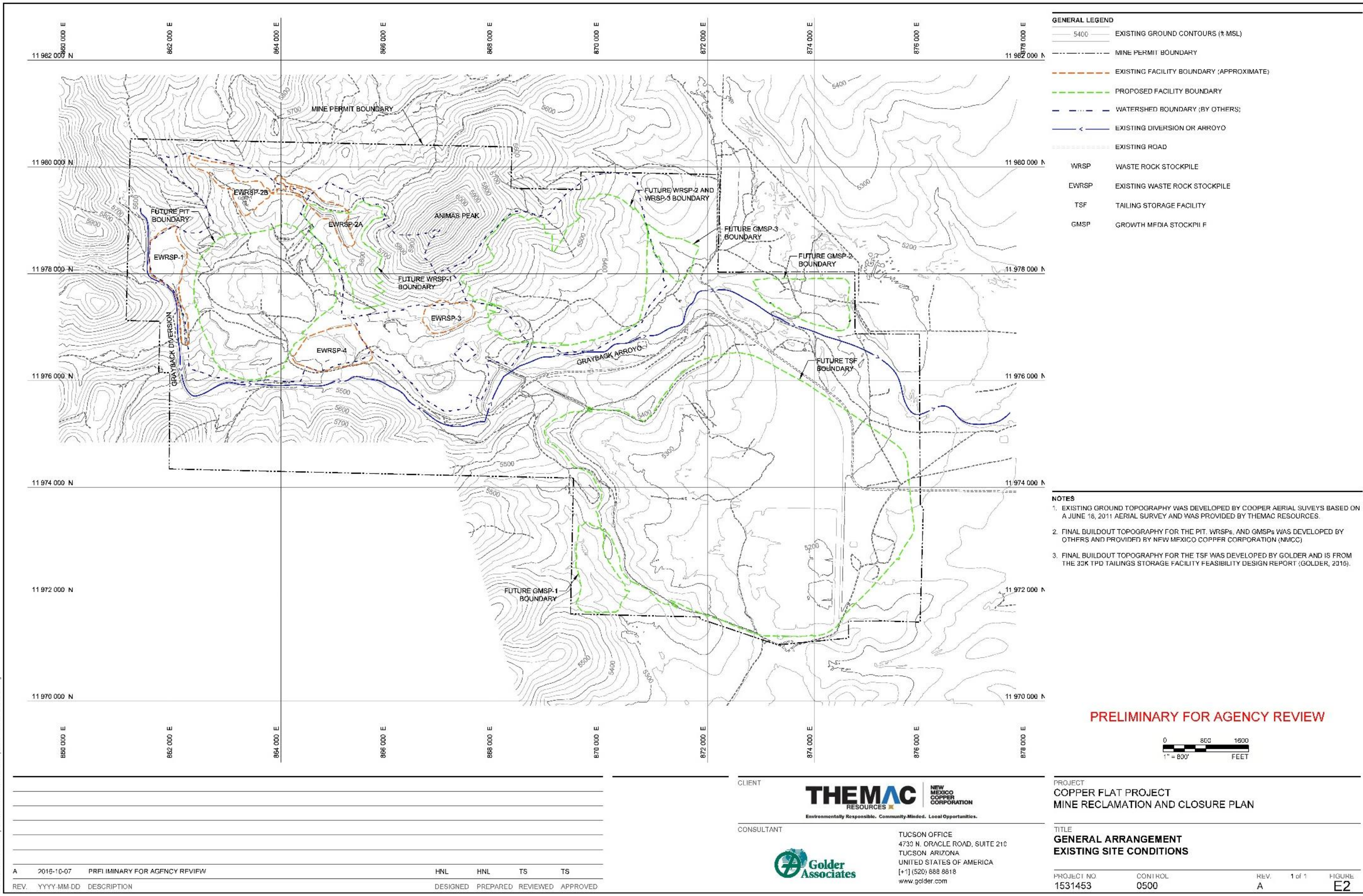


Figure 2 – Ground and Surface Water Sampling Locations

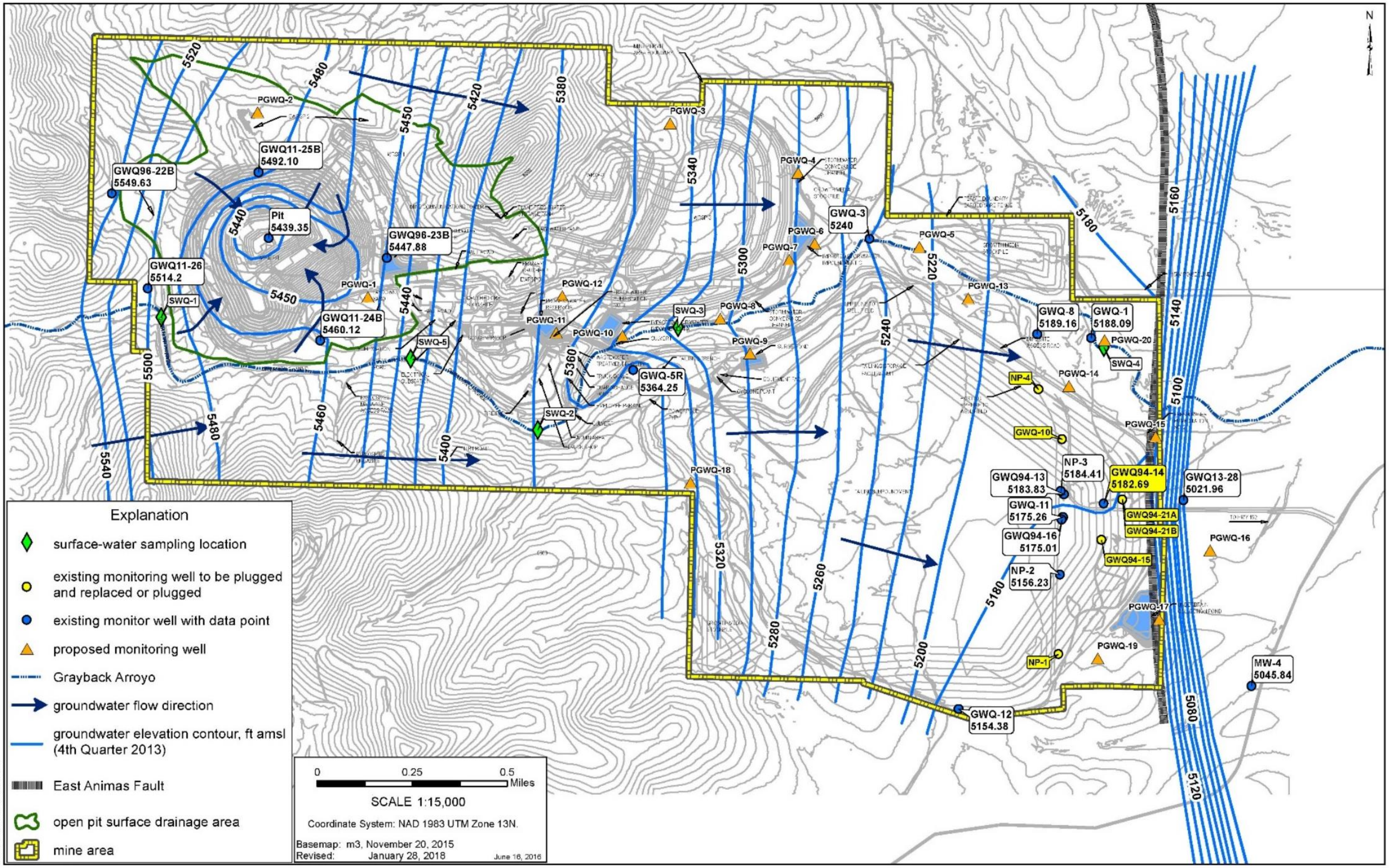
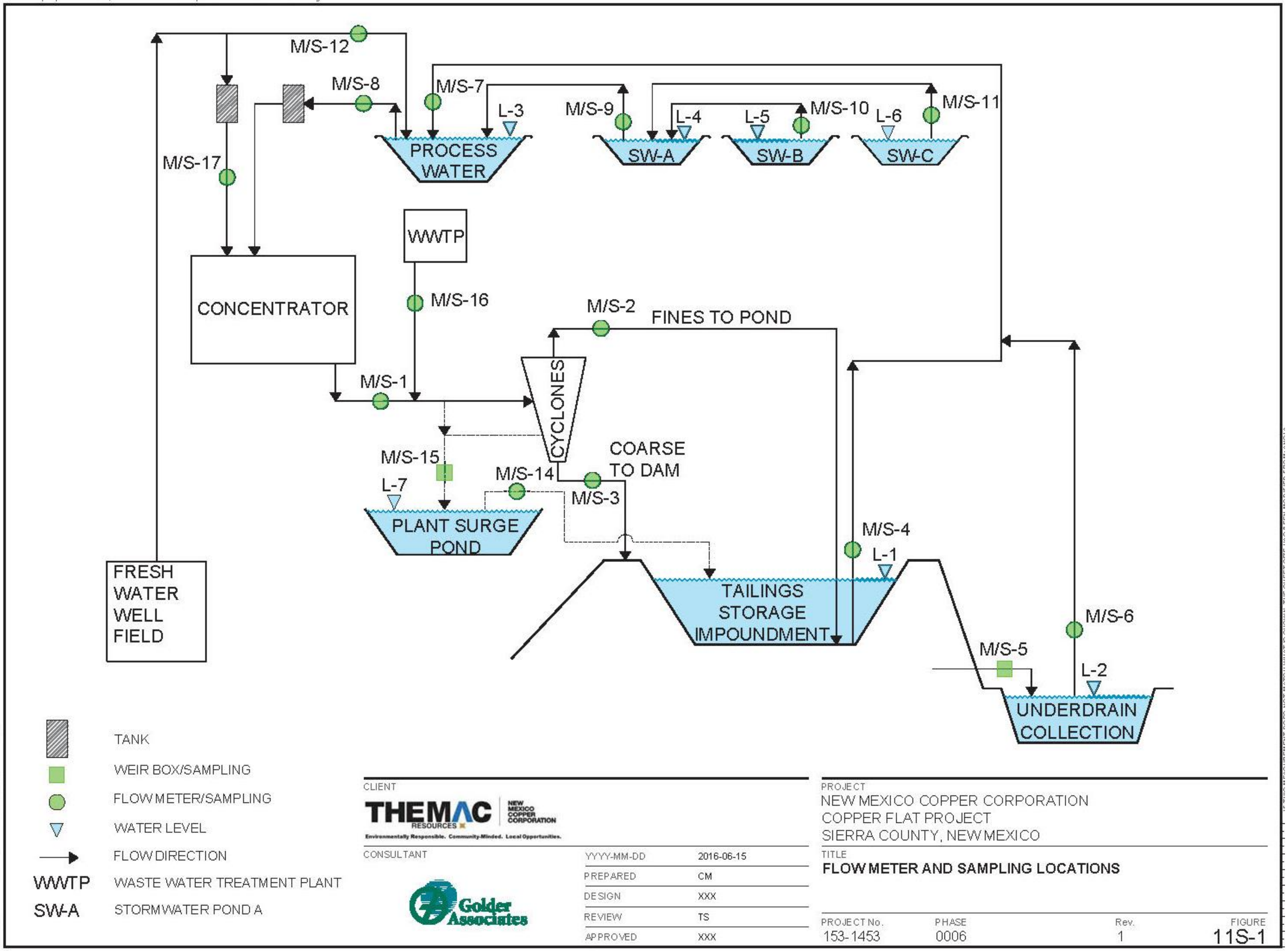


Figure 3 – Flow Meter and Process Water Sampling Locations



Ground Water Discharge Permit Monitoring Well Construction and Abandonment Conditions

These conditions identify construction and abandonment requirements for installation of water table monitoring wells under ground water Discharge Permits issued by the NMED's Ground Water Quality Bureau (GWQB). Proposed locations of monitoring wells required under Discharge Permits and requests to use alternate installation and/or construction methods for water table monitoring wells shall be submitted to the GWQB for approval prior to drilling and construction.

General Drilling Specifications:

1. All well drilling activities shall be performed by an individual with a current and valid well driller license issued by the State of New Mexico in accordance with 19.27.4 NMAC.
2. Drilling methods that allow for accurate determinations of water table locations shall be employed. All drill bits, drill rods, and down-hole tools shall be thoroughly cleaned immediately prior to the start of drilling. The borehole diameter shall be drilled a minimum of 4 inches larger than the casing diameter to allow for the emplacement of sand and sealant.
3. After completion, the well shall be allowed to stabilize for a minimum of 12 hours before development is initiated.
4. The well shall be developed so that formation water flows freely through the screen and is not turbid, and all sediment and drilling disturbances are removed from the well.

Well Specifications (see attached monitoring well schematic):

5. Schedule 40 (or heavier) polyvinyl chloride (PVC) pipe, stainless steel pipe, carbon steel pipe, or pipe of an alternate appropriate material that has been approved for use by NMED shall be used as casing. The casing shall have an inside diameter not less than 2 inches. The casing material selected for use shall be compatible with the anticipated chemistry of the ground water and appropriate for the contaminants of interest at the facility. The casing material and thickness selected for use shall have sufficient collapse strength to withstand the pressure exerted by grouts used as annular seals and thermal properties sufficient to withstand the heat generated by the hydration of cement-based grouts. Casing sections shall be joined using welded, threaded, or mechanically locking joints; the method selected shall provide sufficient joint strength for the specific well installation. The casing shall extend from the top of the screen to at least one foot above ground surface. The top of the casing shall be fitted with a removable cap, and the exposed casing shall be protected by a locking steel well shroud. The shroud shall be large enough in diameter to allow easy access for removal of the cap. Alternatively, monitoring wells may be completed below grade. In this case, the casing shall extend from the top of the screen to 6 to 12 inches below the ground surface; the monitoring wells shall be sealed with locking, expandable well plugs; a flush-mount, watertight well vault that is rated to withstand traffic loads shall be emplaced around the wellhead; and the cover shall be secured with at least one bolt. The vault cover shall indicate that the wellhead of a monitoring well is contained within the vault.
6. A 20-foot section (maximum) of continuous-slot, machine slotted, or other manufactured PVC or stainless steel well screen or well screen of an alternate appropriate material that has been approved for use by NMED shall be installed across the water table. Screens created by cutting slots into solid casing with saws or other tools shall not be used. The screen material selected for use shall be compatible with the anticipated chemistry of the ground water and appropriate for the contaminants of interest at the facility. Screen sections shall be joined using welded, threaded, or mechanically locking joints; the method selected shall provide sufficient joint strength for the specific well installation and shall not introduce constituents that may reasonably be considered contaminants of interest at the facility. A cap shall be attached to the bottom of the well screen; sumps (i.e., casing attached to the bottom of a well screen) shall not be installed. The bottom of the screen shall be installed no more than 15 feet below the water table; the top of the well screen shall be positioned not

less than 5 feet above the water table. The well screen slots shall be appropriately sized for the formation materials and shall be selected to retain 90 percent of the filter pack.

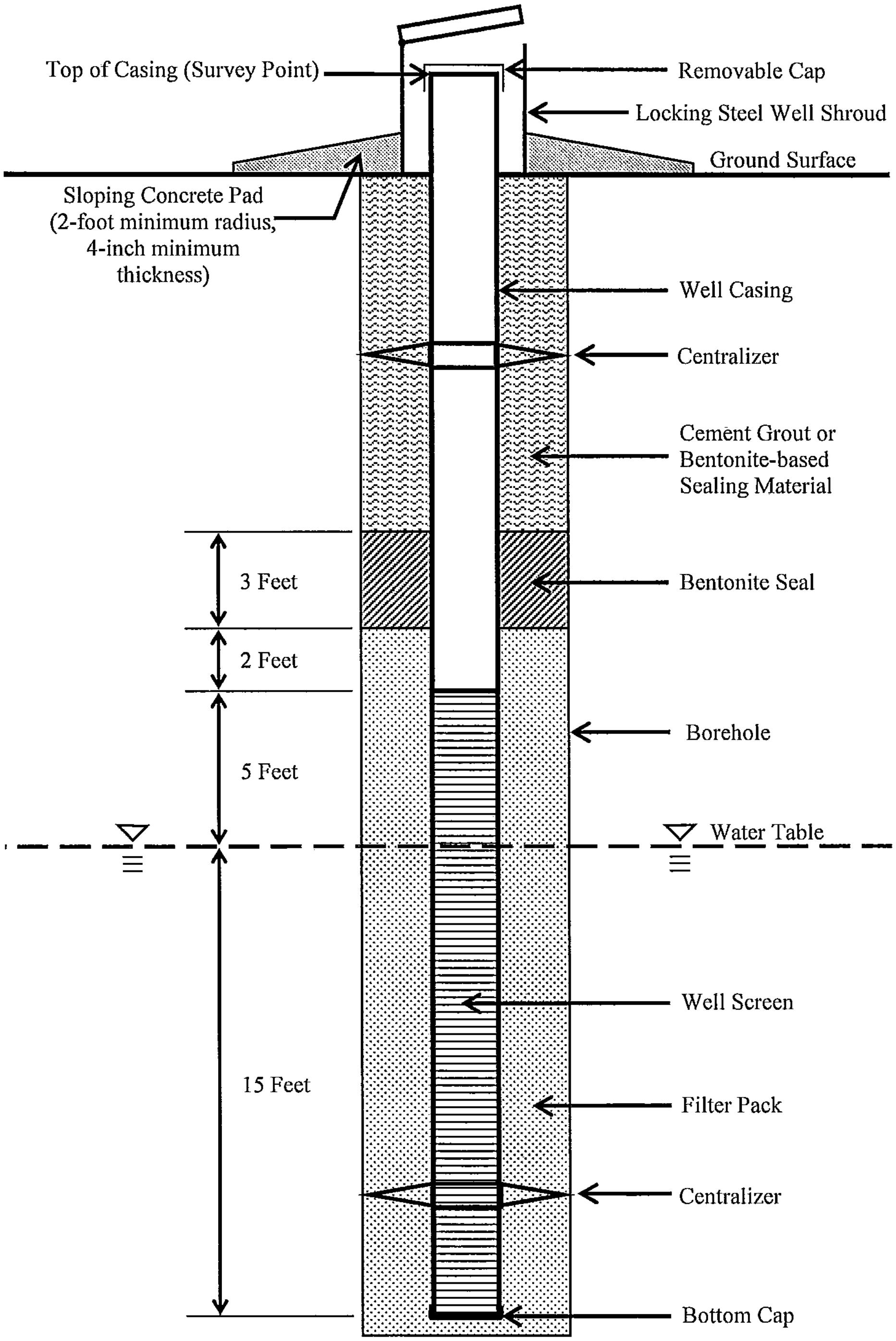
7. Casing and well screen shall be centered in the borehole by placing centralizers near the top and bottom of the well screen.
8. A filter pack shall be installed around the screen by filling the annular space from the bottom of the screen to 2 feet above the top of the screen with clean silica sand. The filter pack shall be properly sized to prevent fine particles in the formation from entering the well. For wells deeper than 30 feet, the sand shall be emplaced by a tremmie pipe. The well shall be surged or bailed to settle the filter pack and additional sand added, if necessary, before the bentonite seal is emplaced.
9. A bentonite seal shall be constructed immediately above the filter pack by emplacing bentonite chips or pellets (3/8-inch in size or smaller) in a manner that prevents bridging of the chips/pellets in the annular space. The bentonite seal shall be 3 feet in thickness and hydrated with clean water. Adequate time shall be allowed for expansion of the bentonite seal before installation of the annular space seal.
10. The annular space above the bentonite seal shall be sealed with cement grout or a bentonite-based sealing material acceptable to the State Engineer pursuant to 19.27.4 NMAC. A tremmie pipe shall be used when placing sealing materials at depths greater than 20 feet below the ground surface. Annular space seals shall extend from the top of the bentonite seal to the ground surface (for wells completed above grade) or to a level 3 to 6 inches below the top of casing (for wells completed below grade).
11. A concrete pad (2-foot minimum radius, 4-inch minimum thickness) shall be poured around the shroud or well vault and wellhead. The concrete and surrounding soil shall be sloped to direct rainfall and runoff away from the wellhead.

Abandonment:

12. Approval for abandonment of monitoring wells used for ground water monitoring in accordance with Discharge Permit requirements shall be obtained from NMED prior to abandonment.
13. Well abandonment shall be accomplished by removing the well casing and placing neat cement grout, bentonite-based plugging material, or other sealing material approved by the State Engineer for wells that encounter water pursuant to 19.27.4 NMAC from the bottom of the borehole to the ground surface using a tremmie pipe. If the casing cannot be removed, neat cement grout, bentonite-based plugging material, or other sealing material approved by the State Engineer shall be placed in the well using a tremmie pipe from the bottom of the well to the ground surface.
14. After abandonment, written notification describing the well abandonment shall be submitted to the NMED. Written notification of well abandonment shall consist of a copy of the well plugging record submitted to the State Engineer in accordance with 19.27.4 NMAC, or alternate documentation containing the information to be provided in a well plugging record required by the State Engineer as specified in 19.27.4 NMAC.

Deviation from Monitoring Well Construction and Abandonment Requirements: Requests to construct water table monitoring wells or other types of monitoring wells for ground water monitoring under ground water Discharge Permits in a manner that deviates from these requirements shall be submitted in writing to the GWQB. Each request shall state the rationale for the proposed deviation from these requirements and provide detailed evidence supporting the request. The GWQB will approve or deny requests to deviate from these requirements in writing.

MONITORING WELL SCHEMATIC
(Not to Scale)



Reid, Brad, NMENV

From: ConnNMex@windstream.net
Sent: Saturday, February 03, 2018 5:16 PM
To: Reid, Brad, NMENV
Subject: Public Hearing

Brad Reid, Writing to request a public hearing for DP 1840. We are residences if Hillsboro in Sierra County, NM.
We are deeply concerned about issues pertaining to uses of water that could pollute, extract large quantities that may endanger future use of clean available supply.

Would like to informed of any hearing scheduled on DP 1840.

Thank you.

Richard & Gloria Spellman
Hillsboro, NM

Email = ConnNMex@windstream.net

Reid, Brad, NMENV

From: Stan Brodsky <stanandrob@windstream.net>
Sent: Saturday, February 03, 2018 4:05 PM
To: Reid, Brad, NMENV
Subject: Copper Flat Mine - DP 1840

I feel that the request for this Discharge Permit needs to be looked at very closely and evaluated with a lot of scrutiny. Discharging 25 million gallons of mine wastewater per day seems like it could very easily and quickly impact the environment enormously. For this reason, I'd like to request a public hearing on this request so that everyone who could be impacted, should this request be approved, understands what the possible impacts could be.

Personally, I have been somewhat involved in the NMCC request to re-open the mine for over a year now. I am very suspect of both the effects on current residents due to the quantity of water usage, as well as the environmental impacts of the wastewater from the mining operation. I feel that everyone who could be impacted by the wastewater needs to have a chance to both ask questions about this plan and to clearly understand the potential impact to the neighboring environment if this request is approved.

Thank you.

Stanley Brodsky
39 Tulpia Trl
Hillsboro, NM 88042

Reid, Brad, NMENV

From: Max Yeh <maxyeh@windstream.net>
Sent: Monday, February 05, 2018 1:52 PM
To: Reid, Brad, NMENV
Subject: DP 1840 Coppr Flat Mine

Hi, Brad,

I did a quick read of permit you did for Copper Flat Mine, and I am impressed with the ways in which you used what the statutes gave you to protect groundwater. A very good job.

That being said, I still have some issues with the risks the mine's operation puts us in, and to air those issues, I am requesting a public hearing on the permit. The mine's pollution is a major problem for those living downstream of the mine, and may even be a serious risk for those of us living slightly upstream of it. Given the gravity of the public health issue, I think a public hearing is in order.

Can you give me an idea of how the hearing process works? Are people requesting a hearing charged for the cost of the hearing? Will we be required to be represented by a lawyer? Are comments submitted orally sufficient (because of the presence of a court reporter) or do written comments have to be submitted?

Thanks.

Max Yeh

Reid, Brad, NMENV

From: Reid, Brad, NMENV
Sent: Monday, February 05, 2018 12:03 PM
To: 'Jeffrey Smith'
Subject: RE: Draft Discharge Permit, DP-1840, Copper Flat Mine

Hi Jeff,

NMCC has no obligations with respect to PN2 – NMED has already published it in two papers:

- Sierra County Herald on 1/31/18 (http://www.heraldpub.com/classifieds.pdf)
- ABQ Journal on 2/2/18

The public comment period ends at 5 pm on March 5, 2018. Let me know if you have other questions or concerns. Thanks, Brad

---

Brad Reid, Geologist
Mining Environmental Compliance Section / PO Box 5469 / Santa Fe, NM / 87502
(505) 827-2963 / brad.reid@state.nm.us

From: Jeffrey Smith [mailto:jsmith@themacresourcesgroup.com]
Sent: Monday, February 05, 2018 11:17 AM
To: Reid, Brad, NMENV <brad.reid@state.nm.us>
Subject: RE: Draft Discharge Permit, DP-1840, Copper Flat Mine

Hi Brad,

Can you provide me information regarding plan for public notice? Where and when will you publish? Anything needed from NMCC?
Thanks.

Jeff

From: Reid, Brad, NMENV [mailto:brad.reid@state.nm.us]
Sent: Friday, February 02, 2018 4:06 PM
To: Jeffrey Smith; Katie Emmer; Juan Velasquez (jvelasquez@vemsinc.com); Vollbrecht, Kurt, NMENV; Knight, Andrew, NMENV; Ennis, David, EMNRD
Subject: RE: Draft Discharge Permit, DP-1840, Copper Flat Mine

Apologies,

There is a minor typographical error with the version I just sent. Please disregard the version I sent at 3:55 pm, and use the attached version instead. Thanks, Brad

---

From: Reid, Brad, NMENV
Sent: Friday, February 02, 2018 3:55 PM
To: Jeffrey Smith (jsmith@themacresourcesgroup.com) <jsmith@themacresourcesgroup.com>; Katie Emmer <kemmer@themacresourcesgroup.com>; Juan Velasquez (jvelasquez@vemsinc.com) <jvelasquez@vemsinc.com>; Vollbrecht, Kurt, NMENV <kurt.vollbrecht@state.nm.us>; Knight, Andrew, NMENV <Andrew.Knight@state.nm.us>;

Ennis, David, EMNRD <David.Ennis@state.nm.us>
Subject: Draft Discharge Permit, DP-1840, Copper Flat Mine

Greetings,

Attached is the letter titled, "Draft Discharge Permit, DP-1840, Copper Flat Mine," dated February 2, 2018. A hard copy to Mr. Jeff Smith will follow in the mail. Please give me a call if you have any questions or concerns. Thanks, Brad

Brad Reid, Geologist
Mining Environmental Compliance Section
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 5469
Santa Fe, NM 87502
Phone: 505.827.2963; Fax: 505.827.2965

Sierra Cty Herald
1/31/18

FOR RENT

Rachel's Rentals
575-740-0012

Mobile Home Spaces Available:
3000 E Third St. $229 per month includes water sewer and trash.
1413 Platinum: 2BD/1BA $550 a month tenant pays gas only.
1519 Broadway: 2BD 1BA mobile home $400 a month plus gas and electric.
860 W. 6th: Studio Apartment $425 a month includes utilities.
43 Boat Dock B: 2BD/1BA Large living area, walk to the lake. $500 a month plus utilities.
510 Lincoln #1: 2BD/1BA $500 includes utilities.
904 Date: Large Commercial building with mobile home. Call for more information.
600 S. Foch #4: Studio Apartment. $400 includes utilities.
302 Ivy Apt. B: Furnished 1 BD 1BA $650 includes utilities.
595 Main St: 1BD/1BA Jetted tub, walk to downtown. $450 tenant pays electric only.

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Susan Kulak
(928) 200-8534
***

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EMPLOYMENT

JOB ADVERTISMENT
The Board of Directors for the Sierra Joint Office on Aging is accepting applications for a full time Finance Director.
The Finance Director Position oversees funding and programs under Title III, Title XX and the Volunteer Programs for Sierra County Seniors. Maintains financial records, prepare and submit all taxes and other assessments in a timely manner, post, reconcile and maintain records of all accounts, also including payroll, accounts receivable and payable, banking. Excellent managerial and communication skills are paramount. Must enjoy working with the senior population. Finance Director works under the direction and answers to the Executive Director of the SJOA. Salary commensurate with education and experience. **Application may be obtained at SJOA offices at 360 W. 4th St. Truth or Consequences or requested by phone or email. Phone # 575-894-6641. jmcclintock@seniorcenter - sjoa.org**

RIVERBEND HOT SPRINGS
Taking applications for house keeping and front desk. Apply in person at 100 Austin St. in T or C.

JOB ADVERTISEMENT
The Board of Directors for the **Sierra Joint Office on Aging** is accepting applications for a **full time Executive Director.**
The Executive Director oversees funding and programs under Title III, Title XX and the Volunteer Programs for Sierra County Seniors. Must be able to respond to RFP's and understand financial data, Capital Outlay, Human Resources and information technology systems. Excellent managerial and communication skills are paramount. Must enjoy working with the senior population. Executive Director works under the direction and answers to the Board of Directors for SJOA, a 501C3. Salary commensurate with education and experience. **Application may be obtained at SJOA offices at 360 W. 4th St. Truth or Consequences or requested by phone or email. Phone # 575-894-6641 or email jmcclintock@seniorcenter-sjoa.org**
Closing date for applications is February 2nd 2018

Big Food Express
Seeking part-time help. Tasks include serving, bussing & cleaning. Must have a reliable transportation, be over 18 & available weekdays. Apply in person at Big Food Express 212 Warm Springs Blvd. Elephant Butte.

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***

LEGAL NOTICE

New Mexico Environment Department - Ground Water Quality Bureau
Conforme a 20.6.2.3108.H NMAC, por el presente se notifica que se ha/n propuesto la/s siguiente/s solicitud/es de Permiso de Descarga en Aguas Subterraneas para su aprobacion. Para pedir mas informacion, obtener una copia de un proyecto de permiso o pedir que se le incluya en la lista de correo para instalaciones especificas, sirvase comunicarse con la Oficina para el Control de la Calidad de las Aguas Subterraneas de Santa Fe al (505) 827-2900. Los proyectos de permisos pueden examinarse en linea en: https://www.env.nm.gov/gwb/NMED-GWQB-PublicNotice.htm
New Mexico Copper Corporation, por medio de su Director de Operaciones, Jeff Smith, de la mina Copper Flat Mine, permiso DP-1840, propone descargar hasta 25,264,000 galones por dia de relaves de la mina, aguas de proceso, aguas pluviales afectadas y aguas residuales domesticas en una presa de relaves revestida. Otras unidades reguladas de la mina incluyen unidades para el procesamiento de acumulaciones de rocas residuales, menas y minerales, presas para aguas de proceso y una fosa abierta. Los contaminantes potenciales de este tipo de descarga incluyen sulfatos, nitratos, solidos disueltos totales y metales. Las instalaciones se encuentran en 85 Copper Rock Road, aproximadamente a 5 millas al NE de Hillsboro, en las Secciones 30 y 31, T15S, R06W, en las Secciones 25, 26, 35 y 36, T15S, R07W, y en la Seccion 6, T16S, R06W, en el condado de Sierra. El agua subterranea en ese sitio se encuentra a una profundidad de aproximadamente 7 a 156 pies, y tiene una concentracion de solidos disueltos totales de aproximadamente 317 a 868 miligramos por litro.
Ademas de los requisitos de 20.6.7 NMAC, el permiso DP-1840 contiene condiciones adicionales con las que el permisionario debe cumplir segun lo autorizado por la Subseccion I de 20.6.7.10 NMAC. El NMED ha proporcionado al solicitante una explicacion escrita de esas condiciones adicionales y porporcionara la justificacion a las partes interesadas si lo solicitan. NMED permiso contacto: Brad Reid a Brad.Reid@state.nm.us o 505-827-2963.
Antes de tomar una decision acerca de cualquier Permiso de Descarga propuesto o de su modificacion, el Departamento del Medio Ambiente de Nuevo Mexico (NMED por su sigla en ingles) permitira que se presenten comentarios por escrito y/o solicitudes de audiencia publica relativa al Permiso de Descarga dentro de los treinta dias posteriores a la fecha de publicacion de este aviso. Cualquier parte interesada, incluido el solicitante, podra presentar comentarios y solicitar una audiencia. Las solicitudes de audiencia publica deben presentarse por escrito a indicar los motivos por los que se deberia celebrar la audiencia. Se celebrara una audiencia si el NMED determina que hay considerable interes publico. Los comentarios y pedidos de audiencia deben enviarse a la Oficina para el Control de la Calidad de las Aguas Subterraneas: Ground Water Quality Bureau, PO Box 5469, Santa Fe, NM 87502-5469.
El Departamento del Medio Ambiente de Nuevo Mexico (NMED, por su sigla en ingles) no discrimina por motivos de raza, color, origen nacional, discapacidad, edad o sexo en la administracion de sus programas o actividades, segun lo exigido por las leyes y los reglamentos correspondientes. El NMED es responsable de la coordinacion de esfuerzos para el cumplimiento de las reglas y la recepcion de indagaciones relativas a los requisitos de no discriminacion implementados por 40 C.F.R. Parte 7, que incluye el Titulo VI de la Ley de Derechos Civiles de 1964, como fuera enmendado, la Seccion 504 de la Ley de Rehabilitacion de 1973; la Ley de Discriminacion por Edad de 1975; el Titulo IX de las Enmiendas de Educacion de 1972; y la Seccion 13 de las Enmiendas a la Ley Federal de Control de la Contaminacion del Agua de 1972. Si tiene preguntas sobre este aviso o sobre cualquier programa de no discriminacion, norma o procedimiento de NMED, puede comunicarse con la Coordinadora de No Discriminacion. Kristine Pintado, Non-Discrimination Coordinator, New Mexico Environment Department, 1190 St. Francis Dr., Suite N4050, P.O. Box 5469, Santa Fe, NM 87502. (505) 827-2855, nd.coordinator@state.nm.us. Si piensa que ha sido discriminado con respecto a un programa o actividad de NMED, puede comunicarse con la Coordinadora de No Discriminacion antes indicada o visitar nuestro sitio web en https://www.env.nm.gov/non-employee-discrimination-complaint-page/ para saber como y donde presentar una queja por discriminacion.
Pub: The Herald
Red:NMED / GWQB
January 31, 2018
This legal is posted at www.publicnoticeads.com
***

YARD SALE DIRECTORY

****CLIP 'N GO!!** DIRECTORY**
*****January 31, 2018*****
T or C
February 3, 8:30AM-?
920 Camino De Mesa
***
February 10, 1:00PM-5:00PM, **February 11,** 10:00AM-1:00PM 618 Poplar St.
***
February 1,2,3 9:00AM-5:00PM, 805 Camino De Mesa
***
February 2,3,4 8:00AM-2:00PM 525 Wyona
***
THE HERALD
(575)894-2143
to find out how you can be included in this directory!!

LEGAL NOTICE

New Mexico Environment Department - Ground Water Quality Bureau
Notice is hereby given pursuant to 20.6.2.3108.G NMAC, the following Groundwater Discharge Permit applications have been proposed for approval. To request additional information or to obtain a copy of a draft permit, contact the Ground Water Quality Bureau in Santa Fe at (505) 827-2900. Draft permits may also be viewed on-line at https://www.env.nm.gov/gwb/NMED-GWQB-PublicNotice.htm
DP-1840, Copper Flat Mine, Jeff Smith, Chief Operating Officer, New Mexico Copper Corporation, proposes to discharge up to 25,264,000 gallons per day of mine tailings, process water, impacted stormwater, and domestic wastewater to a lined tailing impoundment. Additional regulated mine units include waste rock stockpiles, ore stockpiles, mineral processing units, process water impoundments, and an open pit. Potential contaminants from this type of discharge include sulfate, nitrate, total dissolved solids, and metals. The facility is located at 85 Copper Rock Road approximately 5 miles NE of Hillsboro, in Sections 30 and 31, T15S, R06W, Sections 25, 26, 35, and 36, T15S, R07W, and Section 6, T16S, R06W, Sierra County. Groundwater beneath the site is at a depth of approximately of approximately 7 to 156 feet and has a total dissolved solids concentration of approximately 317 to 868 milligrams per liter.
In addition to the requirements of 20.6.7 NMAC, DP-1840 contains additional conditions that the permittee shall comply with as authorized by Subsection I of 20.6.7.10 NMAC. NMED has provided written explanation for those additional conditions to the applicant, and will provide the justification to interested parties upon request. NMED permit contact: Brad Reid at Brad.Reid@state.nm.us or 505-827-2963
Prior to ruling on any proposed Discharge Permit or its modification, the New Mexico Environment Department, (NMED) will allow thirty days after the date of publication of this notice to receive written comments and during which a public hearing may be requested by any interested person, including the applicant. Requests for public hearing shall be in writing and shall set forth the reasons why the hearing should be held. A hearing will be held if NMED determines that there is substantial public interest. Comments for requests for hearing should be submitted to the Ground Water Quality Bureau at PO Box 5469, Santa Fe, NM 87502-5469.
NMED does not discriminate on the basis of race, color, national origin, disability, age or sex in the administration of its programs or activities, as required by applicable laws and regulations. NMED is responsible for coordination of compliance efforts and receipt of inquiries concerning non-discrimination requirements implemented by 40 C.F.R. Part 7, including Title VI of the Civil Rights Act of 1964, as amended; Section 504 of the Rehabilitation Act of 1973, the Age Discrimination Act of 1975, Title IX of the Education Amendments of 1972, and Section 13 of the Federal Water Pollution Control Act Amendments of 1972. If you have any questions about this notice or any of NMED's non- discrimination programs, policies or procedures, you may contact: Kristine Pintado, Non-Discrimination Coordinator, New Mexico Environment Department, 1190 St. Francis Dr., Suite N4050, P.O. Box 5469, Santa Fe, NM 87502, (505) 827-2855, n d . c o o r d i n a t o r @state.nm.us. If you believe that you have been discriminated against with respect to a NMED program or activity, you may contact the Non-Discrimination Coordinator identified above or visit our website at https://www.env.nm.gov/non-employee-discrimination-complaint-page/ to learn how and where to file a complaint of discrimination.
Pub: The Herald
Req: NMED / GWQB
January 31, 2018
This legal is posted at www.publicnoticeads.com
***

LEGAL NOTICE

LEGAL NOTICE
STATE OF NEW MEXICO
SEVENTH JUDICIAL
DISTRICT COURT
COUNTY OF SIERRA
NO: D-721-PB-2018-00003
JUDGE:
Honorable Matthew G. Reynolds
IN THE MATTER OF THE ESTATE OF
JOE C. TORRES,
Deceased.
NOTICE TO CREDITORS
NOTICE IS HEREBY GIVEN that the undersigned has been appointed personal representative of this estate. All persons having claims against this estate are required to present their claims within four months after the date of the first publication of the Notice or the claims will be forever barred. Claims must be presented either to the undersigned personal representative c/o **MARK A. FILOSA,** Post Office Drawer 391, Truth or Consequences, New Mexico, or filed with the District Court, 311 N. Date Street, Truth or Consequences, NM 87901/
DATED: January 4, 2018
/s/DENISE MARIE TORRES
Personal Representative

333 S. Campo St.
Las Cruces, NM 88001
Filed 7th JUDICIAL
DISTRICT COURT
SIERRA COUNTY NM 1/25/18
MARY MORA
CLERK OF COURT
/S/ Lindsey Huston
Pub: The Herald
Req: Filosa Law Firm
January 31, 2018
February 07, 14, 2018
This legal is posted at www.publicnoticeads.com
***

LEGAL NOTICE

LEGAL NOTICE
STATE OF NEW MEXICO
SEVENTH JUDICIAL
DISTRICT COURT
COUNTY OF SIERRA
NO: D-721-PB-2018-00002
JUDGE:
Honorable Shannon Murdock
IN THE MATTER OF THE ESTATE OF
JOANN THOMPSON,
Deceased.
NOTICE TO CREDITORS
NOTICE IS HEREBY GIVEN that the undersigned has been appointed personal representative of this estate. All persons having claims against this estate are required to present their claims within four months after the date of the first publication of the Notice or the claims will be forever barred. Claims must be presented either to the undersigned personal representative c/o **MARK A. FILOSA,** Post Office Drawer 391, Truth or Consequences, New Mexico, or filed with the District Court, 311 N. Date Street, Truth or Consequences, NM 87901/
DATED: January 4, 2018
/s/DEBRA S. MORROW
Personal Representative
P.O. Box 241
Cedar Crest, NM 87008
Filed 7th JUDICIAL
DISTRICT COURT
SIERRA COUNTY NM 1/25/18
MARY MORA
CLERK OF COURT
/S/ Lindsey Huston
Pub: The Herald
Req: Filosa Law Firm
January 31, 2018
February 07, 14, 2018
This legal is posted at www.publicnoticeads.com
***

LEGAL NOTICE

PUBLIC AUCTION
FRED GIBSON
@BUTTE PROPANE
N. HWY 181, LOTS 3
T OR C, NM 87901
04/07/2018 10:00 AM
1998 HARLEY DAVIDSON FLSTC
VIN#
1HD1BJL41WY059828
ABANDON VEHILCE LEIN
AMOUNT OWED- $5,000
Pub: The Herald
Req: Alamo MVD
January 31, 2018
February 07, 2018
This legal is posted at www.publicnoticeads.com

EXPERIENCED Ranch Worker(X3) Temp: 2/26/18 - 12/18/18 Valley Spring, TX. All work, not limited to horses, cattle, livestk. incl. hvy. Lifting & loading, stall cleaning. Work in all weather. Mach., fence, water line/pump installtn& repair, road work. **MUST** have exp. & correctly shoe horses, break colts, repair tack. Absences/lack of perf. not tolerated.$11.87/hr + rm, kit.fac., transport to store, tools, sup/equip. less state& fed. req'ddedctn. NO family/pet housing.DOL 3/4 guarantee. Transport & subsistence costs to worksite pd. upon 50% contract completn. Report/send resume to local SWA. Job **#TX3538798** Reliance Realty/Magill Peak Ranch

17417

Albuquerque Journal

Published in the Albuquerque Journal on Friday February 02, 2018

New Mexico Environment Department Ground Water Quality Bureau Notice is hereby given pursuant to 20.6.2.3108.G NMAC, the following Groundwater Discharge Permit applications have been proposed for approval. To request additional information or to obtain a copy of a draft permit, contact the Ground Water Quality Bureau in Santa Fe at (505) 827-2900. Draft permits may also be viewed on-line at https://www.env.nm.gov/gwb/NMED-GWQB-PublicNotice.htm DP-1529, Mesa Ingredients Clovis Plant: Mesa Ingredients Corporation proposes to renew the Discharge Permit for the discharge of up to 840 gallons per day (gpd) of domestic wastewater to a septic/leachfield system, and up to 7,000 gpd of boiler blow down water to a 2.61-acre land application area for dust control and irrigation. Potential contaminants associated with this type of discharge include nitrogen compounds and other contaminants. The facility is located at 340 Curry Road K, approximately 6 miles south of Clovis, in Section 13, T01N, R35E, Curry County. Groundwater beneath the site is at a depth of approximately 269 feet and had a pre-discharge total dissolved solids concentration of approximately 280 milligrams per liter. NMED permit contact: Jason Herman at Jason.Herman@state.nm.us or 505-827-2713. DP-1762, Johnny's Septage Disposal Facility: Danny Suggs, Owner, proposes to renew and modify the Discharge Permit for the discharge of up to 20,000 gallons per day (gpd), on a monthly average, of domestic septage to two synthetically lined impoundment systems, in parallel, for disposal by evaporation. The modification consists of an increase in the daily discharge volume, on a monthly average, from 10,000 to 20,000 gpd. Potential contaminants associated with this type of discharge include nitrogen compounds. The facility is located on County Road B-059 approximately 2.75 miles from Las Alturas Road, approximately four miles northeast of Mesquite, in Section 21, T24S, R03E, Doa Ana County. Groundwater most likely to be affected is at a depth greater than 430 feet and has a total dissolved solids concentration of approximately 1,700 milligrams per liter. NMED permit contact: Gerald Knutson at Gerald.Knutson@state.nm.us or 505-827-2996. DP-1806, Town and Country Mobile Home Park: Leake Investments, LLC proposes to discharge up to 9,999 gallons per day of domestic wastewater to 12 septic tank/leachfield systems. Potential contaminants associated with this type of discharge include nitrogen compounds. The facility is located at 1716 N. Canal St. in Carlsbad, in Section 30, T21S, R27E, Eddy County. Groundwater beneath the site is at a depth of approximately 29 feet and had a pre-discharge total dissolved solids concentration of approximately 1600 milligrams per liter. NMED permit contact: Jason Herman at Jason.Herman@state.nm.us or 505-827-2713. DP-777, Lee Ranch Mine: Lee Ranch Coal Company proposes to renew the Discharge Permit for the discharge of up to 50,000 gallons per day (gpd) of industrial wastewater from the truck wash facility. This water is treated using an oil/water separator and discharged to an impoundment (SP-1). Separately, up to 5,000 gpd of domestic wastewater from administrative buildings and employee change rooms is treated in a mechanical package plant, disinfected and discharged to a clay-lined impoundment (Evap-2) for disposal by evaporation. Potential contaminants associated with these types of discharge include nitrogen compounds, metals, and organic compounds. The facility is located approximately 35 miles north of Grants, in Section 34, T15N, R08W, McKinley County. Groundwater most likely to be affected is at a depth of approximately 100 feet and has a total dissolved solids concentration of approximately 1,460 milligrams per liter. NMED permit contact: Jason Herman at Jason.Herman@state.nm.us or 505-827-2713. DP-441, Gallina Schools: Jemez Mountain Public School District proposes to renew the Discharge Permit for the discharge of up to 15,000 gallons per day of domestic wastewater to a 7,400-gallon septic tank followed by a synthetically lined impoundment for disposal by evaporation. Wastewater from the facility kitchen passes through a grease interceptor prior to discharging to the septic tank-impoundment system. Potential contaminants associated with this type of discharge include nitrogen compounds. The facility is located on NM HWY 96 at Gallina, in Section 10, T23N, R01E, Rio Arriba County. Groundwater beneath the site is at a depth of approximately 25 feet and had a pre-discharge total dissolved solids concentration of approximately 830 milligrams per liter. NMED permit contact: Sara Arthur at

17418

Sara.Arthur@state.nm.us or 505-827-9669. DP-914, Victoria Douglass Disposal Site (formerly Korcz Sanitation): Victoria Douglass, Owner, proposes to renew the Discharge Permit for the discharge of up to 550 gallons per day (gpd) of domestic septage and portable toilet waste into three settling tanks, followed by land application on two two-acre disposal cells on a rotational basis. Potential contaminants associated with this type of discharge include nitrogen compounds. The facility is located at 917 Hwy 595, approximately two miles south of Lindrith, in Section 28, T24N, R02W, Rio Arriba County. Groundwater beneath the site is at a depth of approximately 300 feet and had a pre-discharge total dissolved solids concentration of approximately 700 milligrams per liter. NMED permit contact: Andrew Romero at AndrewC.Romero@state.nm.us or 505-827-0076. DP-175, Wagon Wheel Mobile Home Park: Wagon Wheel Country Court, LLC proposes to renew the Discharge Permit for the discharge of up to 15,300 gallons per day of domestic wastewater to four synthetically lined impoundments for disposal by evaporation. Potential contaminants associated with this type of discharge include nitrogen compounds. The facility is located at 25 Road 5387, approximately 5 miles southwest of Bloomfield, in Section 26, T29N, R12W, San Juan County. Groundwater beneath the site is at a depth of approximately 22 feet and has a total dissolved solids concentration of approximately 1,780 milligrams per liter. NMED permit contact: Gerald Knutson at Gerald.Knutson@state.nm.us or 505-827-2996. DP-458, Lakeview Heights: Rosa Joint Venture proposes to renew the Discharge Permit for the discharge of up to 8,000 gallons per day of domestic wastewater to a clay-lined impoundment system for disposal by evaporation. Potential contaminants associated with this type of discharge include nitrogen compounds. The facility is located near the terminus of an oil field road that intersects with CR 4029 prior to the subdivision, approximately 38 miles northeast of Aztec, in Section 8, T32N, R06W, San Juan County. Groundwater most likely to be affected is at a depth of approximately 165 feet and has a total dissolved solids concentration of approximately 266 milligrams per liter. NMED permit contact: Gerald Knutson at Gerald.Knutson@state.nm.us or 505-827-2996. DP-1843, San Juan Generating Station Shumway Arroyo Groundwater Recovery System: Public Service Company of New Mexico proposes to discharge up to 200,000 gallons per day of groundwater recovered from the water-bearing alluvium of the Shumway Arroyo to either the synthetically lined San Juan Generating Station South Evaporation Pond system for disposal by evaporation or to the cement-lined Process Pond #1 for reuse within the generating station. Potential contaminants associated with this type of discharge include nitrogen compounds, metals, and total dissolved solids (TDS). The facility is located on County Road 6800, approximately 3.5 miles northwest of Waterflow, in Sections 19 and 32, T30N, R15W, San Juan County. Groundwater most likely to be affected by this discharge occurs in saturated alluvium along the Westwater Arroyo at depths between 10 and 40 feet with pre-discharge TDS concentrations ranging from 4,000 to 13,000 milligrams per liter. NMED permit contact: Pam Homer at Pamela.Homer2@state.nm.us or 505-827-0018. DP-1576, Cerrito Pelado Scoria Mine: Pavestone Company proposes to renew the Discharge Permit for the discharge of up to 40,000 gallons per day of reclaimed domestic wastewater for dust suppression on traffic areas, stockpiles, and process crushing and screening equipment at the mine site, and on haul roads to the mine site. Reclaimed wastewater is transported by tanker truck from the City of Santa Fe Wastewater Treatment Facility, which is regulated under a separate Discharge Permit, DP-289. Potential contaminants associated with this type of discharge include nitrogen compounds. The facility is located approximately four miles northwest of the Santa Fe Airport, Santa Fe, in the Cieneguilla Land Grant, projected in Sections 6, 7, 8, and 9, T16N, R08E; in Section 1, T16N, R07N; and in Section 36, T17N, R07E, Santa Fe County. Groundwater most likely to be affected is at a depth of approximately 85 feet and has a total dissolved solids concentration of approximately 260 milligrams per liter. NMED permit contact: Pam Homer at Pamela.Homer2@state.nm.us or 505-827-0018. DP-1840, Copper Flat Mine, Jeff Smith, Chief Operating Officer, New Mexico Copper Corporation, proposes to discharge up to 25,264,000 gallons per day of mine tailings, process water, impacted stormwater, and domestic wastewater to a lined tailing impoundment. Additional regulated mine units include waste rock stockpiles, ore stockpiles, mineral processing units, process water impoundments, and an open pit. Potential contaminants from this type of discharge include sulfate, nitrate, total dissolved solids, and metals. The facility is located at 85 Copper Rock Road approximately 5 miles NE of Hillsboro, in Sections 30 and 31, T15S, R06W, Sections 25, 26, 35, and 36, T15S, R07W, and Section 6, T16S, R06W, Sierra County. Groundwater beneath the site is at a depth of approximately of approximately 7 to 156 feet and has a total dissolved solids concentration of approximately 317 to 868 milligrams per liter. In addition to the requirements of 20.6.7 NMAC, DP-1840 contains additional conditions that the permittee shall comply with as authorized by Subsection I of 20.6.7.10 NMAC. NMED has provided written explanation for those additional conditions to the applicant, and will provide the justification to interested parties upon request. NMED permit contact: Brad Reid at Brad.Reid@state.nm.us or 505-827-2963. DP-278, BNSF Railway Company - Belen Railyard: Burlington Northern Santa Fe Railway Company proposes to renew the Discharge Permit for the discharge of up to 8,250 gallons per day of industrial wastewater and stormwater to an on-site treatment and disposal system consisting of four oil/water separators, three sludge drying beds, and two synthetically lined evaporation impoundments. Potential contaminants associated with this type of discharge include organic compounds. The facility is located at 106 North First Street, Belen, in Sections 18 and 19, T05N, R02E, Valencia County. Ground water beneath the site is at a depth of approximately four feet and has a total dissolved solids concentration of approximately 560 milligrams per liter. NMED permit contact: Kellie Jones at Kellie.Jones@state.nm.us or 505-827-2949. Prior to ruling on any proposed Discharge Permit or its modification, the New Mexico Environment Department, (NMED) will allow thirty days after the date of publication of this notice to receive written comments and during which a public hearing may be requested by any interested person, including the applicant. Requests for public hearing shall be in writing and shall set forth the reasons why the hearing should be held. A hearing will be held if NMED determines that there is substantial public interest. Comments for requests for hearing should be submitted to the Ground Water Quality Bureau at PO Box 5469, Santa Fe, NM 87502-5469. NMED does not discriminate on the basis of race, color, national origin, disability, age or sex in the administration of its programs or activities, as required by applicable laws and regulations. NMED is responsible for coordination of compliance efforts and receipt of inquiries concerning non-discrimination requirements implemented by 40 C.F.R. Part 7, including Title VI of the Civil Rights Act of 1964, as amended; Section 504 of the Rehabilitation Act of 1973; the Age Discrimination Act of 1975, Title IX of the Education Amendments of 1972, and Section 13 of the Federal Water Pollution Control Act Amendments of 1972. If you have any questions about this notice or any of NMED's non- discrimination programs, policies or procedures, you may contact: Kristine Pintado, Non-Discrimination Coordinator, New Mexico Environment Department, 1190 St. Francis Dr., Suite N4050, P.O. Box 5469, Santa Fe, NM 87502, (505) 827-2855, nd.coordinator@state.nm.us. If you believe that you have been discriminated against with respect to a NMED program or activity, you may contact the Non-Discrimination Coordinator identified above or visit our website at https://www.env.nm.gov/non-employee-discrimination-complaint-page/ to learn how and where to file a complaint of discrimination. Journal: February 2, 2018

From: Ennis, David, EMNRD
To: Lewellin, Jeffrey, NMENV
Cc: Vollbrecht, Kurt, NMENV; Reid, Brad, NMENV; Dail, Bryan, NMENV; Longmire, Patrick, NMENV
Subject: RE: Copper Flat Addendum Report Review -Request for Extension to Provide NMED Comments
Date: Tuesday, February 06, 2018 2:19:00 PM

The requested time extension until March 12, 2018 is approved.

Thanks,
DJ

From: Lewellin, Jeffrey, NMENV
Sent: Tuesday, February 6, 2018 10:36 AM
To: Ennis, David, EMNRD <David.Ennis@state.nm.us>
Cc: Vollbrecht, Kurt, NMENV <kurt.vollbrecht@state.nm.us>; Reid, Brad, NMENV <brad.reid@state.nm.us>; Dail, Bryan, NMENV <Bryan.Dail@state.nm.us>; Longmire, Patrick, NMENV <Patrick.Longmire@state.nm.us>
Subject: Copper Flat Addendum Report Review -Request for Extension to Provide NMED Comments

DJ – We are requesting a second 30 day extension until March 12, 2018 to provide NMED comments related to the two reports submitted as addendum to the Copper Flat permit application. Please let me know if the extension is granted. Thanks, Jeff

Jeff Lewellin, Mining Act Team Leader
Mining Environmental Compliance Section
Ground Water Quality Bureau
New Mexico Environment Department
(505) 827-1049

Reid, Brad, NMENV

From:	A M <amandamunro31@gmail.com>
Sent:	Wednesday, February 07, 2018 9:43 PM
To:	Reid, Brad, NMENV
Subject:	Request for Public Hearing

Hello Mr. Reid,
Given the scale of this mine's discharge (25 million gallons per day including potential contaminants such as metals...which indicates to me a potential for bioaccumulation in the ecosystem), it seems clear that as a community we should have a public hearing on this issue. This mine could have a huge effect on the surrounding community, both human and non-human - and it seems to me that a public hearing should be required. I formally request that there be a public hearing for DP 1840.
Best regards,
Amanda Munro

Reid, Brad, NMENV

From:	Nichole Trushell <ntrushell@gmail.com>
Sent:	Wednesday, February 07, 2018 2:42 PM
To:	Reid, Brad, NMENV
Cc:	steve Morgan
Subject:	DP 1840

Dear Mr. Reid;

I am writing to ask and have assurance from you that that there will be a public hearing for DP 1840 — related to the Copper Flat Mine. It is critical to hold this hearing as this potential water use is an issue that is critical to our very dry region's water availability and potentially to the riparian ecosystems nearby that may depend on this water. We need a broad discussion to also address the potential for pollution, to assure public understanding, and so that all of us who live locally feel we have a voice in such an enormous decision that has very complex consequences for the region.

Thank you,

Nichole Trushell M.S.
Steve Morgan LA
123 North Street
Kingston, NM 88042

SUSANA MARTINEZ
Governor
JOHN A. SANCHEZ
Lt. Governor

NEW MEXICO
ENVIRONMENT DEPARTMENT

Harold Runnels Building
1190 Saint Francis Drive (87505)
PO Box 5469, Santa Fe, NM 87502-5469
Phone (505) 827-2990 Fax (505) 827-1628
www.env.nm.gov

BUTCH TONGATE
Cabinet Secretary
J.C. BORREGO
Deputy Secretary

February 7, 2018

VIA E-MAIL

Jaimie Park
jpark@nmelc.org

Re: Request to Inspect Public Records

Dear Ms. Park:

On February 6, 2018, this office received your request for public information. You request information pertaining to: Entire Discharge Permit 1840 file for the proposed Copper Flat Copper Mine. (See attached request).

I forwarded your request to the bureau on February 6, 2018. The bureau will respond by February 20, 2018.

Should you have any questions, please contact the Ground Water Quality Bureau at (505) 827-2919.

Sincerely,

Melissa Y. Mascareñas

Melissa Y. Mascareñas
New Mexico Environment Department
Department Public Records Custodian

cc: Andrew Knight, Assistant General Counsel
Michelle Hunter, Chief, Ground Water Quality Bureau

NEW MEXICO ENVIRONMENT DEPARTMENT
INSPECTION OF PUBLIC RECORD REQUEST FORM

Please fill out the following information:

1. Date: February 6, 2018

2. Requestor's Name: Jaimie Park, New Mexico Environmental Law Center

3. Requestor's Address: 1405 Luisa Street, Suite 5, Santa Fe, NM 87505

4. Phone No.: (505) 989-9022

5. Email: **jpark@nmelc.org**

6. Company Being Represented: New Mexico Environmental Law Center

7. Address: 1405 Luisa Street, Suite 5, Santa Fe, NM 87505

8. Document or File being requested to be reviewed or copied (please describe the records in sufficient detail to enable Department personnel to reasonably identify & locate the records:

I request that you inform me what documents are available within the scope of this request and when I can inspect those documents. I also request that you not make any copies without first informing me of the number of copies and the cost for the copying that are involved. Finally, I request that if you determine that any documents or portions of documents are exempt from disclosure you inform me of that and provide me with citations to the provisions in the Inspection of Public Records Act that indicate that the documents or portions of documents are exempt from disclosure, describe the type of document being withheld, and identify who sent the document being withheld and who received the document being withheld.

Records being requested:

1. The entire Discharge Permit 1840 file.

For purposes of this request, the term "document" means any record in written, graphic, photographic, or other form kept or memorialized on paper, microfilm, microfiche, or electronic media; and includes each non-identical original or copy of a draft or final record, whether the original or copy is not identical because of notes on the original or copy or otherwise.

For purposes of this request, the term "pertaining to" means addressing, concerning, focusing on, mentioning, relating to, or relevant to in any manner.

Revised 6/14/12

Reid, Brad, NMENV

From:	Jan Richmond <canoelakealgonquin@hotmail.com>
Sent:	Saturday, February 10, 2018 7:48 AM
To:	Reid, Brad, NMENV
Subject:	Cooper Flat Mine

Hello Brad
As a property owner with a well having a domestic and agricultural water right in Hillsboro NM, I have grave concerns about the pulling out that much ground water. I have even worse concerns over the treatment and discharge of the water when they are finished with it. I suspect with Caballo and The Rio Grand being down stream of it could effect millions of water users in the future.
I understand employment is very important, but water is life.
Please forward me any information you can so I can better grasp this issue.
Thanks
Jan Richmond
Sent from my iPhone

Reid, Brad, NMENV

From: Jaimie Park <jpark@nmelc.org>
Sent: Tuesday, February 13, 2018 11:19 AM
To: Reid, Brad, NMENV
Cc: Knight, Andrew, NMENV
Subject: Request to Extend Comment Period for Draft DP-1840
Attachments: TRP and Pitchfork Ranch Request to Extend Comment Period DP 1840.pdf

Importance: High

Dear Mr. Reid,

Please find attached a request from Turner Ranch Properties and the Hillsboro Pitchfork Ranch to extend the current comment period deadline for draft DP-1840. Please let me know when you are available to discuss this request.

Kind Regards,

Jaimie Park

NEW MEXICO ENVIRONMENTAL LAW CENTER

Brad Reid, Permit Lead
Copper Flat Copper Mine Discharge Permit 1840
New Mexico Environment Department
Ground Water Quality Bureau
1190 South St. Francis Drive
Santa Fe, NM 87505

VIA CERTIFIED MAIL, RETURN RECEIPT REQUESTED and ELECTRONIC MAIL

February 12, 2018

RE: Copper Flat Copper Mine; Draft Discharge Permit 1840 Public Comment Period Extension Request

Dear Mr. Reid:

On behalf of Turner Ranch Properties, L.P. ("TRP") and the Hillsboro Pitchfork Ranch, LLC ("Pitchfork Ranch"), the New Mexico Environmental Law Center ("NMELC") submits the following request for an extension of the public comment period on the proposed Copper Flat Copper Mine's draft Discharge Permit 1840 ("DP 1840"). The New Mexico Water Quality Act and its implementing regulations allow NMED to provide a public comment period on a draft discharge permit beyond thirty days. NMSA 1978, Section 74-6-5; Section 20.6.7.10.H NMAC; Section 20.6.2.3108 NMAC. Therefore, for the reasons discussed below, NMED should extend the current public comment period by an additional sixty days, to and including May 4, 2018.

Introduction

TRP is the owner of the Ladder Ranch located adjacent to the Copper Flat Copper Mine in Sierra County, New Mexico. The Ladder Ranch covers 156,439 acres or 245 square miles and contains a wide array of wildlife diversity and mix of ecosystems, ranging from desert grasslands to pine forests in the foothills of the Black Range (Gila Mountains). Four tributaries of the Rio

Grande River – the Las Animas, Seco, Palomas and Cuchillo streams -- are located on the Ladder Ranch. These streams support abundant flora, including sycamores and cottonwoods, and fauna such as Chiricahua leopard frogs and sensitive Rio Grande cutthroat trout, which are being restored to the streams.

The Hillsboro Pitchfork Ranch is a fourth generation family-owned cattle ranch located adjacent to the proposed Copper Flat Copper Mine. The ranch was established in 1906 and continues to operate as a family-owned cattle ranch. In addition, the ranch has partnered with the New Mexico Department of Game and Fish ("NMDG&F") to improve mule deer habitat on the ranch property and has been recognized by NMDG&F as one of few ranches in New Mexico to make meaningful improvement to mule deer habitat.

TRP and the Pitchfork Ranch are extremely concerned about the proposed Copper Flat Copper Mine's impacts on ground and surface water. Hydrologic effects of the proposed reestablished Copper Flat Copper Mine include the lowering of the water table associated with dewatering and post-closure evaporation of the open pit, and the mine production wells, which may affect the Ladder Ranch's water rights and conservation programs that rely on perennial surface water flow, as well as its ranching and ecotourism activities.

The hydrologic effects of the proposed Copper Flat Copper Mine may also affect the Pitchfork Ranch's water rights, as well as the ranch's cattle operations and mule deer habitat restoration efforts that rely on perennial surface water flow. TRP and the Pitchfork Ranch are also concerned about the migration of contaminants from mining operations into ground and surface water, and the associated impacts such contamination would have on their ranches.

I. NMED Has Unreasonably Delayed Public Access to the Draft DP-1840 Application and Supporting Technical Documents.

NMED provided notice of its approval of the draft DP-1840 on the evening of February 2, 2018. A hyperlink to the draft DP-1840 was provided in the electronic notice. However, the draft DP-1840 application and supporting technical documents were not provided in the public notice. In fact, NMED only provides public access of draft discharge permit applications and supporting technical documents when an Inspection of Public Records Act ("IPRA") request is submitted.

NMELC submitted an IPRA request on February 6, 2018 for the draft DP-1840 file, which includes the application and supporting technical documents necessary for review of the draft DP-1840. Typically, under IPRA, a state agency is to provide the requested documents within three business days of an IPRA request. NMSA 1978, Section 14-2-8. However, in this matter, NMED will not even respond to NMELC's request until February 20, 2018 - twelve days before the public comment period deadline. NMED IPRA Response Letter, dated February 7, 2018, attached as Exhibit A. It is unclear whether NMED will make the draft DP-1840 file available to the public on that date.

NMED is well aware that the proposed Copper Flat Copper Mine is a highly controversial project here in New Mexico. NMED is a cooperating agency in the Bureau of Land Management's ("BLM") environmental impact statement ("EIS") process. In fact, NMED representatives, including yourself, attended the BLM's public meetings held in Hillsboro and Truth or Consequences on the draft environmental impact statement, bearing witness to the overwhelming opposition to this proposed project. In light of NMED's involvement in the EIS process, NMED should have anticipated that the public would request access to the draft DP-1840 file in order to review and challenge the draft DP-1840.

Given NMED's unreasonable delay in providing public access to the draft DP-1840's application and supporting technical documents, and the subsequent reduction in time to review and comment on the draft DP-1840, NMED should extend the public comment period by an additional sixty days, to and including May 4, 2018.

II. TRP's and the Pitchfork Ranch's Experts Are Not Available to Review and Comment on the Draft DP-1840 until mid-March 2018, After the Current Public Comment Deadline Expires.

TRP has been utilizing mining engineer expert, Jim Kuipers, and hydrogeologist, Tom Meyers, since the BLM issued public notice of the proposed Copper Flat Copper Mine draft EIS nearly three years ago. Mr. Kuipers and Mr. Meyers provided extensive comments on the Copper Flat Copper Mine Draft EIS and are therefore essential to TRP's review of the draft DP-1840. Both Mr. Kuipers and Mr. Meyers are unavailable to review the draft DP-1840 during the current thirty-day public comment period and will not be available until mid-March. Therefore, TRP requests that NMED extend the severely limited public comment period by an additional sixty days, to and including May 4, 2018.

Conclusion

For the above discussed reasons, NMED should grant this request for an extension of the draft DP-1840 public comment period deadline by an additional sixty days, to and including May 4, 2018, for good cause.

Thank you for your prompt attention to this matter, and please do not hesitate to contact me if you have any questions or need additional information.

Regards,

Jaimie Park
Staff Attorney
NMELC

SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lt. Governor

NEW MEXICO
ENVIRONMENT DEPARTMENT

Harold Runnels Building
1190 Saint Francis Drive (87505)
PO Box 5469, Santa Fe, NM 87502-5469
Phone (505) 827-2990 Fax (505) 827-1628
www.env.nm.gov

BUTCH TONGATE
Cabinet Secretary

J.C. BORREGO
Deputy Secretary

February 7, 2018

VIA E-MAIL

Jaimie Park
jpark@nmelc.org

Re: Request to Inspect Public Records

Dear Ms. Park:

On February 6, 2018, this office received your request for public information. You request information pertaining to: Entire Discharge Permit 1840 file for the proposed Copper Flat Copper Mine. (See attached request).

I forwarded your request to the bureau on February 6, 2018. The bureau will respond by February 20, 2018.

Should you have any questions, please contact the Ground Water Quality Bureau at (505) 827-2919.

Sincerely,

Melissa Y. Mascareñas

Melissa Y. Mascareñas
New Mexico Environment Department
Department Public Records Custodian

cc: Andrew Knight, Assistant General Counsel
Michelle Hunter, Chief, Ground Water Quality Bureau

EXHIBIT
tabbies
A

Reid, Brad, NMENV

From:	rachel.conn@gmail.com on behalf of Rachel Conn <rconn@amigosbravos.org>
Sent:	Tuesday, February 13, 2018 2:55 PM
To:	Reid, Brad, NMENV
Subject:	Comment Period Extension Request - DP 1840
Attachments:	180212.copperflat.extension.request.pdf

Dear Mr. Reid,

Please find attached Amigos Bravos' request for an extension of the comment period for DP-1840.

Thank you,
Rachel Conn

--
Rachel Conn
Projects Director
Amigos Bravos
575-758-3874
P.O. Box 238
Taos, NM 87571

AMIGOS BRAVOS

Because Water Matters

Brad Reid
New Mexico Environment Department
Ground Water Quality Bureau
1190 South St. Francis Drive
Santa Fe, NM 87505

February 12, 2018

RE: Comment Period Extension Request for DP 1840

Dear Mr. Reid:

Amigos Bravos, a statewide New Mexico water conservation organization dedicated to protecting and restoring the waters of New Mexico, submits the following request for an extension of the public comment period on the proposed Copper Flat Copper Mine's draft Discharge Permit 1840 ("DP 1840"). On behalf of our 2,000 members we respectively request an extension of 60 days past the current deadline of March 5, 2018. This additional time is necessary for community members to review and submit comments on the draft DP-1840, pursuant to 20.6.7.10.H NMAC and 20.6.2.3108 NMAC.

Formed in 1988, Amigos Bravos is a statewide water conservation organization guided by social justice principles and dedicated to preserving and restoring the ecological and cultural integrity of New Mexico's water and the communities that depend on it. Amigos Bravos has been active in mining issues since our founding and was a party in the hearings on the Copper Rule.

The current thirty-day public comment period on draft DP-1840 severely limits public participation in the discharge permit process. The draft DP and its supporting documents are highly technical and represent many pages of dense material to review. Thirty days is not enough time for the public to adequately review materials let alone draft meaningful comments on the draft permit.

Public participation in the discharge permit process furthers the New Mexico Water Quality Act's purpose of protecting ground water by providing formulation of better permits, assurance of reasonable costs, public acceptance and support, and resolution of controversies over the permit's substantive measures. Public participation simply results in better agency decisions and we therefore urge you to extend the comment period to ensure that the public is given a chance to review and comment upon the draft permit.

In summary, to allow for meaningful, informed public participation in the draft DP-1840, NMED should extend the public comment period by an additional sixty (60) days to May 4, 2018.

Sincerely,

Rachel Conn

Rachel Conn
Projects Director, Amigos Bravos
rconn@amigosbravos.org
575.770.8327

From:	Janet Correll <janet@h2o-legal.com>
Sent:	Wednesday, February 14, 2018 2:08 PM
To:	Reid, Brad, NMENV
Cc:	Samantha Barncastle; Stephanie Russo; Gary Esslinger
Subject:	Request for 60 Day Extension of Comment Period for DP-1840
Attachments:	Request to NMED for Ext. of Comment Period.Signed.2.14.2018.pdf

Mr. Reid, attached you will find a letter from attorney Samantha Barncastle regarding the above referenced matter. Thank you for your consideration of this request for an extension of time. Please respond at your earliest convenience.

Janet L. Correll, Paralegal for Samantha R. Barncastle
Barncastle Law Firm
P.O. Box 1556
Las Cruces, NM 88004
Ph: 575-636-2377

BARNCASTLE LAW FIRM, LLC

1100 South Main, Ste. 20
Las Cruces, NM 88005

P.O. Box 1556
Las Cruces, NM 88004

Phone: (575) 636-2377
Fax: (575) 636-2688

February 14, 2018

Brad Reid
New Mexico Environment Department
P.O. Box 5469
Santa Fe, NM 87502-5469

Via Email to: Brad.Reid@state.nm.us

Re: Request for 60 Day Extension of Public Comment Period for DP-1840.

Dear Mr. Reid,

I am writing to respectfully request a 60 day extension of time for the public comment period for Copper Flat Mine, proposed GWQB Discharge Permit Number DP-1840. The comment deadline for DP-1840 is 5:00 p.m. MST, March 5, 2018. I am requesting that this deadline be extended, as I am concurrently submitting an Inspection of Public Records Act (IPRA) request to the New Mexico Environment Department regarding DP-1840. I do not expect that I will receive a response to the IPRA request from NMED until approximately fifteen days from today's date, or sometime around March 2, 2018. At that point, and given the magnitude of the issues to be addressed in this project, I do not believe I will have adequate time to review the requested documents and formulate my comments regarding DP-1840 before the deadline of March 5. I believe an additional 60 days will provide a fair opportunity to obtain and review the documents and information I need to provide comments regarding DP-1840.

Thank you for your consideration of this request. Please do not hesitate to contact me directly should you have questions.

Sincerely,

BARNCASTLE LAW FIRM

By ______________________
Samantha R. Barncastle

xc: Client
SRB/sab

Reid, Brad, NMENV

From: Majure, Allison, NMENV
Sent: Wednesday, February 14, 2018 10:37 AM
To: Knight, Andrew, NMENV; Reid, Brad, NMENV
Cc: Hower, Jennifer, NMENV
Subject: FW: Copper Flat discharge permit

FYI ...

Best,
Allison

Allison Scott Majure
NMED | 505.231.8800

From: Majure, Allison, NMENV
Sent: Wednesday, February 14, 2018 10:36 AM
To: Laura Paskus <laura.paskus@gmail.com>
Subject: RE: Copper Flat discharge permit

Thanks Laura. Will send the doc this morning; it's been busy here!

Best,
Allison

Allison Scott Majure
NMED | 505.231.8800

From: Laura Paskus [mailto:laura.paskus@gmail.com]
Sent: Wednesday, February 14, 2018 10:32 AM
To: Majure, Allison, NMENV <Allison.Majure@state.nm.us>; Knight, Andrew, NMENV <Andrew.Knight@state.nm.us>; Reid, Brad, NMENV <brad.reid@state.nm.us>
Subject: Re: Copper Flat discharge permit

hi everyone,

Just checking in on this written explanation re: NMCC.

thanks,
Laura

On Mon, Feb 12, 2018 at 12:23 PM, Laura Paskus <laura.paskus@gmail.com> wrote:

> hi Allison, Brad, and Andrew,
>
> Would love to talk to someone about the discharge permit. Is Brad available Tuesday afternoon or anytime Wednesday for a call? Or Andrew?
>
> Also, in the public notice (dated Feb. 2), it says:

In addition to the requirements of 20.6.7 NMAC, DP-1840 contains additional conditions that the permittee shall comply with as authorized by Subsection I of 20.6.7.10 NMAC. NMED has provided written explanation for those additional conditions to the applicant, and will provide the justification to interested parties upon request.

Can you email me that explanation?

Thanks!

--
Laura Paskus
505.217.5136

Environment Reporter, ***NM Political Report***
Correspondent, New Mexico In Focus (KNME-TV), "Our Land: New Mexico's Environmental Past, Present and Future"

--
Laura Paskus
505.217.5136

Environment Reporter, ***NM Political Report***
Correspondent, New Mexico In Focus (KNME-TV), "Our Land: New Mexico's Environmental Past, Present and Future"

P.O. Box 102
ARREY NM 87930
2/9/18

Ground Water Quality Bureau
1190 S. St. Francis Dr.
P.O. Box 5469 Santa Fe N.M. 87502

GROUND WATER
FEB 14 2018
BUREAU

Reg. Discharge Permits for approval

Lochlin Farrell,

Dear Sir,

We should like a public hearing held on D.P. 1840. At that time a more in-depth study and erudition of proposal D.P 1840 be available.

Yours Sincerely

John & Agnes McGarvie.

John & Agnes McGarvie

17449

Reid, Brad, NMENV

From:	Reid, Brad, NMENV
Sent:	Thursday, February 15, 2018 4:14 PM
To:	rachel.conn@gmail.com; rconn@amigosbravos.org
Cc:	Yurdin, Bruce, NMENV; Knight, Andrew, NMENV; Vollbrecht, Kurt, NMENV
Subject:	60-day extension request for public comments, DP-1840

Hi Rachel,

This e-mail is to notify you that we have received the request to extend the public comment period concerning the draft Ground Water Discharge Permit (DP-1840) for Copper Flat Mine. NMED will grant this request and is in the process of issuing a second PN2 that will reflect a May 4, 2018 deadline to submit public comments. Thanks, Brad

---

Brad Reid, Geologist
Mining Environmental Compliance Section / PO Box 5469 / Santa Fe, NM / 87502
(505) 827-2963 / brad.reid@state.nm.us

Reid, Brad, NMENV

From:	Reid, Brad, NMENV
Sent:	Thursday, February 15, 2018 4:12 PM
To:	'Janet Correll'
Cc:	Samantha Barncastle; Stephanie Russo; Gary Esslinger; Vollbrecht, Kurt, NMENV; Yurdin, Bruce, NMENV; Knight, Andrew, NMENV
Subject:	RE: Request for 60 Day Extension of Comment Period for DP-1840

Hi Janet,

This e-mail is to notify you that we have received the request to extend the public comment period concerning the draft Ground Water Discharge Permit (DP-1840) for Copper Flat Mine. NMED will grant this request and is in the process of issuing a second PN2 that will reflect a May 4, 2018 deadline to submit public comments. Thanks, Brad

---

Brad Reid, Geologist
Mining Environmental Compliance Section / PO Box 5469 / Santa Fe, NM / 87502
(505) 827-2963 / brad.reid@state.nm.us

From: Janet Correll [mailto:janet@h2o-legal.com]
Sent: Wednesday, February 14, 2018 2:08 PM
To: Reid, Brad, NMENV <brad.reid@state.nm.us>
Cc: Samantha Barncastle <samantha@h2o-legal.com>; Stephanie Russo <Stephanie@h2o-legal.com>; Gary Esslinger <gesslinger@ebid-nm.org>
Subject: Request for 60 Day Extension of Comment Period for DP-1840

Mr. Reid, attached you will find a letter from attorney Samantha Barncastle regarding the above referenced matter. Thank you for your consideration of this request for an extension of time. Please respond at your earliest convenience.

Janet L. Correll, Paralegal for Samantha R. Barncastle
Barncastle Law Firm
P.O. Box 1556
Las Cruces, NM 88004
Ph: 575-636-2377

Reid, Brad, NMENV

From:	Reid, Brad, NMENV
Sent:	Thursday, February 15, 2018 4:08 PM
To:	Jaimie Park
Cc:	Knight, Andrew, NMENV; Vollbrecht, Kurt, NMENV; Yurdin, Bruce, NMENV
Subject:	60-day extension request for public comments, DP-1840

Hi Jamie,

This e-mail is to notify you that we have received your request to extend the public comment period concerning the draft Ground Water Discharge Permit (DP-1840) for Copper Flat Mine. NMED will grant this request and is in the process of issuing a second PN2 that will reflect a May 4, 2018 deadline to submit public comments. Thanks, Brad

---

Brad Reid, Geologist
Mining Environmental Compliance Section / PO Box 5469 / Santa Fe, NM / 87502
(505) 827-2963 / brad.reid@state.nm.us

Reid, Brad, NMENV

From: Reid, Brad, NMENV
Sent: Thursday, February 15, 2018 4:25 PM
To: Jeffrey Smith (jsmith@themacresourcesgroup.com)
Cc: Juan Velasquez (jvelasquez@vemsinc.com); Katie Emmer; Vollbrecht, Kurt, NMENV; Knight, Andrew, NMENV; Ennis, David, EMNRD
Subject: Draft DP-1840 Comment Period

Hi Jeff,

Due to several requests we have received to extend the public comment period, NMED will be issuing a second PN2 that will reflect a new deadline of May 4, 2018.

Brad Reid, Geologist
Mining Environmental Compliance Section / PO Box 5469 / Santa Fe, NM / 87502
(505) 827-2963 / brad.reid@state.nm.us

SUSANA MARTINEZ
Governor
JOHN A. SANCHEZ
Lt. Governor

NEW MEXICO ENVIRONMENT DEPARTMENT

Harold Runnels Building
1190 Saint Francis Drive (87505)
PO Box 5469, Santa Fe, NM 87502-5469
Phone (505) 827-2990 Fax (505) 827-1628
www.env.nm.gov

BUTCH TONGATE
Cabinet Secretary
J.C. BORREGO
Deputy Secretary

February 15, 2018

VIA E-MAIL

Samantha Barncastle
Samantha@h2o-legal.com

Re: Request to Inspect Public Records

Dear Ms. Barncastle:

On February 14, 2018, this office received your request for public information. You request information pertaining to: Copper Flat Copper Mine. (See attached request).

I forwarded your request to the bureaus on February 15, 2018. The bureaus will respond by February 27, 2018.

Should you have any questions, please contact the Ground Water Quality Bureau at (505) 827-2919 and the Surface Water Quality Bureau at (505) 827-2819.

Sincerely,

Melissa Y. Mascareñas

Melissa Y. Mascareñas
New Mexico Environment Department
Department Public Records Custodian

cc: Andrew Knight, Assistant General Counsel
Michelle Hunter, Chief, Ground Water Quality Bureau
Shelly Lemon, Chief, Surface Water Quality Bureau

NEW MEXICO ENVIRONMENT DEPARTMENT
INSPECTION OF PUBLIC RECORD REQUEST FORM

Please fill out the following information:

1. Date: 2/14/2018
2. Requestor's Name: Samantha R. Barncastle, Esq., Barncastle Law Firm
3. Requestor's Address: P.O. Box 1556, Las Cruces, NM 88004
4. Phone No.: (575) 636-2377
5. Email: **Samantha@h2o-legal.com**
6. Company Being Represented: Elephant Butte Irrigation District
7. Address: 530 S. Melendres St., Las Cruces, NM 88005
8. Document or File being requested to be reviewed or copied (please describe the records in sufficient detail to enable Department personnel to reasonably identify & locate the records:

   Any and all documentation in NMED's possession, or to which it has access, regarding Copper Flat Mine's proposed DP#1840, including but not limited to:

   a. The original application for groundwater discharge permit submitted by Copper Flat Mine, together with all documentation attached thereto, and any and all amended applications and supplemental documentation submitted by the applicant after submission of the original application;

   b. All written communications sent by and between NMED and any representatives or consultants of the Copper Flat Mine regarding the application and proposed DP-1840.

   c. All written inter-agency and intra-agency communications and memoranda regarding the Copper Flat Mine application and proposed DP-1840.

   d. As stated in the notice Public Notice regarding DP-1840, in addition to the requirements of 20.6.7 NMAC, DP-1840 contains additional conditions that the permittee shall comply with as authorized by Subsection I of 20.6.7.10 NMAC. NMED has provided written explanation for those additional conditions to the applicant and will provide the justification to interested parties upon request. I hereby request copies of those additional conditions and the justification for same.

   e. Any and all other written communications or documentation related to the proposed Copper Flat Mine not otherwise covered by the above request.

9. NMED Bureau where Document/File can be found (if known): Ground Water Quality Bureau

Signature [Samantha R. Barncastle]

The cost for copying by NMED is as indicated on Attachment A. Please send this request to:

Melissa Y. Mascareñas
Inspection of Public Records Officer
1190 St. Francis Drive, Ste. N-4050
Santa Fe, New Mexico 87505
fax: (505) 827-1628 or
email: melissa.mascarenas@state.nm.us

NEW MEXICO ENVIRONMENT DEPARTMENT
INSPECTION OF PUBLIC RECORD REQUEST FORM

Please fill out the following information:

1. Date: 16 February 2018
2. Requestor's Name: Katie Emmer
3. Requestor's Address: 4253 Montgomery Blvd, NE, Suite 130
   Albuquerque, NM 87109
4. Phone No.: (505)400-7925
5. Email: **kemmer@themacresourcesgroup.com**
6. Company Being Represented: New Mexico Copper Corporation
7. Address: See above

8. Document or File being requested to be reviewed or copied (please describe the records in sufficient detail to enable Department personnel to reasonably identify & locate the records:

   Public comments made requesting an extension on the public comment period for the Draft Discharge Permit 1840 for Copper Flat - Brad Reid Permit Lead, to include comments from ELC, EBID, Amigos Bravos, and any other requests for an extension of the public comment period. Thank you for your time and assistance.

9. NMED Bureau where Document/File can be found (if known): GWQB

Katie Emmer
Signature

The cost for copying by NMED is as indicated on Attachment A. Please send this request to:

Melissa Y. Mascareñas
Inspection of Public Records Officer
1190 St. Francis Drive, Ste. N-4050
Santa Fe, New Mexico 87505
fax: (505) 827-1628 or
email: melissa.mascarenas@state.nm.us

Revised 6/14/12

SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lt. Governor

NEW MEXICO ENVIRONMENT DEPARTMENT

Harold Runnels Building
1190 Saint Francis Drive (87505)
PO Box 5469, Santa Fe, NM 87502-5469
Phone (505) 827-2990 Fax (505) 827-1628
www.env.nm.gov

BUTCH TONGATE
Cabinet Secretary

J.C. BORREGO
Deputy Secretary

February 16, 2018

VIA E-MAIL

Katie Emmer
kemmer@themacresourcesgroup.com

Re: Request to Inspect Public Records

Dear Ms. Emmer:

On February 16, 2018, this office received your request for public information. You request information pertaining to: Copper Flat Copper Mine. (See attached request).

I forwarded your request to the bureaus on February 16, 2018. The bureaus will respond by March 1, 2018.

Should you have any questions, please contact the Ground Water Quality Bureau at (505) 827-2919 and the Surface Water Quality Bureau at (505) 827-2819.

Sincerely,

Melissa Y. Mascareñas

Melissa Y. Mascareñas
New Mexico Environment Department
Department Public Records Custodian

cc: Andrew Knight, Assistant General Counsel
Michelle Hunter, Chief, Ground Water Quality Bureau
Shelly Lemon, Chief, Surface Water Quality Bureau

Reid, Brad, NMENV

From:	Val Hildreth-Werker <werks@zianet.com>
Sent:	Monday, February 19, 2018 8:55 AM
To:	Reid, Brad, NMENV
Cc:	Val Hildreth-Werker
Subject:	DP 1840
Importance:	High

Good Morning Brad,

Please schedule public hearings for DP 1840. The vital consequences for residents of Hillsboro and surrounding areas are numerous and complex. The expertise of the people and the lifestyles that are most effected by these proposed discharge permits needs to be voiced and respected.

Sincerely,

Val Hildreth-Werker & Jim C. Werker
NSS Conservation Division Chiefs
PO Box 207
Hillsboro, NM 88042
jimwerker@zianet.com
werks@zianet.com

Reid, Brad, NMENV

From: Reid, Brad, NMENV
Sent: Wednesday, February 21, 2018 4:53 PM
To: 'drenos@milagroherbs.com'
Subject: RE: permit

Hi Tomas,

You can submit comments concerning the draft Discharge Permit (DP-1840) to me via e-mail or standard mail at the following address:

Brad Reid, Geologist
New Mexico Environment Department
P.O. Box 5469
Santa Fe, NM 87502

Please note that NMED is going to extend the public comment period to May 4, 2018. You should receive notice of that change very soon. Thanks, Brad

---

From: drenos@milagroherbs.com [mailto:drenos@milagroherbs.com]
Sent: Saturday, February 17, 2018 2:43 PM
To: Reid, Brad, NMENV <brad.reid@state.nm.us>
Subject: permit

Hello,

Please inform me how to file a letter of protest for the Copper Flat Mine discharge permit

Thank you

Tomas Enos

From: Reid, Brad, NMENV
Sent: Wednesday, February 21, 2018 5:08 PM
To: 'Robin Tuttle'
Subject: RE: Request for Public Hearing on DP-1840
Attachments: 2018-02-02 DP-1840 DraftDP.pdf

Robin,

Please see pages 2-4 of the attached document which provides a written explanation for the additional conditions. Thanks, Brad

Brad Reid, Geologist
Mining Environmental Compliance Section / PO Box 5469 / Santa Fe, NM / 87502
(505) 827-2963 / brad.reid@state.nm.us

From: Robin Tuttle [mailto:robltut@yahoo.com]
Sent: Friday, February 16, 2018 12:02 PM
To: Reid, Brad, NMENV <brad.reid@state.nm.us>
Subject: Request for Public Hearing on DP-1840

Mr. Reid,

As a resident of the Hillsboro area most immediately impacted by the issuance of a wastewater discharge permit to the Copper Flat Mine (DP-1840), I request that the Ground Water Quality Bureau hold a public hearing on all elements of the proposed permit, i.e.,

The discharge of up to 25,264,000 gallons per day of mine tailings, process water, impacted stormwater, and domestic wastewater to a lined tailing impoundment.

Additional regulated mine units including waste rock stockpiles, ore stockpiles, mineral processing units, process water impoundments, and an open pit.

Potential contaminants from this type of discharge including sulfate, nitrate, total dissolved solids, and metals.

The facility is located at 85 Copper Rock Road approximately 5 miles NE of Hillsboro, in Sections 30 and 31, T15S, R06W, Sections 25, 26, 35, and 36, T15S, R07W, and Section 6, T16S, R06W, Sierra County.

Groundwater beneath the site is at a depth of approximately of approximately 7 to 156 feet and has a total dissolved solids concentration of approximately 317 to 868 milligrams per liter.

In addition to the requirements of 20.6.7 NMAC, DP-1840 contains additional conditions that the permittee shall comply with as authorized by Subsection I of 20.6.7.10 NMAC. NMED has provided written explanation for those additional conditions to the applicant, and will provide the justification to interested parties upon request.

I would also appreciate copies of the additional conditions NMED proposes to impose on the Copper Flat Mine and the written justification for the additional conditions as noted in the highlighted text.

With thanks,

Robin Tuttle
42 Cochise Trail
Hillsboro, NM 88042

575-895-5187

Reid, Brad, NMENV

From: Reid, Brad, NMENV
Sent: Wednesday, February 21, 2018 5:17 PM
To: 'Jaimie Park'; Knight, Andrew, NMENV
Subject: RE: Are you able to provide the following before Feb. 20th pursuant to my IPRA for DP-1840?
Attachments: 2018-02-02 DP-1840 DraftDP.pdf

See pages 2-4 of the attached document for an answer to highlighted request below. Brad

---

From: Jaimie Park [mailto:jpark@nmelc.org]
Sent: Thursday, February 15, 2018 12:43 PM
To: Reid, Brad, NMENV <brad.reid@state.nm.us>; Knight, Andrew, NMENV <Andrew.Knight@state.nm.us>
Subject: Are you able to provide the following before Feb. 20th pursuant to my IPRA for DP-1840?

1. October 14, 2016 NMCC letter to NMED regarding revised MORP to be submitted
2. July 17, 2017 response to NMED RAI (is this a supplement to NMCC's April 14, 2017 response to NMED's February 14, 2017 RAI?)
3. NMED submitted another RAI after the July 17, 2017 NMCC response
4. All NMED RAIs issued after receiving NMCC's October 13, 2017 response, up to when NMED determined that the application was technically complete and put out PN2 for approving the draft DP

I'd also like NMED's rationale for additional conditions that go beyond requirements of the Copper Rule that have been included in the draft DP-1840.

I believe you can get me these things before Feb. 20th.

Regards,

Jaimie Park

Reid, Brad, NMENV

From:	Jaimie Park <jpark@nmelc.org>
Sent:	Wednesday, February 21, 2018 2:19 PM
To:	Knight, Andrew, NMENV; Reid, Brad, NMENV
Subject:	RE: IPRA Request for Copper Flat Mine DP-1840 Entire File

Andrew, thank you very much for these. So it seems that NMCC submitted a number of "inserts" for the revised June 21, 2016 application – and that the revised June 21, 2016 DP application is also comprised of "inserts" for the revised December 2015 application. Does NMED have an electronic version of the final application with all of these inserts put in? All of these supplemental inserts and revisions to the revised December 2015 and revised June 21, 2016 applications can be confusing to follow and NMCC should be required to submit a clean final application. I hope NMED required that of them. A lay person would not be able to follow the many subsequent revisions to the revised December 2015 and revised June 21, 2016 DP applications and have a clear understanding of what final information the draft DP is actually based upon.

Regards,

Jaimie Park

From: Knight, Andrew, NMENV [mailto:Andrew.Knight@state.nm.us]
Sent: Wednesday, February 21, 2018 12:56 PM
To: Jaimie Park <jpark@nmelc.org>
Subject: IPRA Request for Copper Flat Mine DP-1840 Entire File

Ms. Park,
Here are electronic copies of documents you requested in four specific categories, with explanations below.

1. October 14, 2016 NMCC letter to NMED regarding revised MORP to be submitted

Attached

2. July 17, 2017 response to NMED RAI.

Attached

3. NMED submitted another RAI after the July 17, 2017 NMCC response

Meeting notes from 2017-10-03 are attached. This is the only document responsive to this request.

4. All NMED RAIs issued after receiving NMCC's October 13, 2017 response, up to when NMED determined that the application was technically complete and put out PN2 for approving the draft DP

No documents exist responsive to this request.

Andrew P. Knight
Assistant General Counsel
New Mexico Environment Department
Office: (505) 222-9540
Cell: (505) 907-8836

17473

Reid, Brad, NMENV

From:	Reid, Brad, NMENV
Sent:	Thursday, February 22, 2018 8:33 AM
To:	'GRIP'
Cc:	Vollbrecht, Kurt, NMENV; Knight, Andrew, NMENV; Yurdin, Bruce, NMENV
Subject:	RE: Request for extension of time to file public comments on DP-1840

Hi Allyson,

This e-mail is to notify you that we have received the request to extend the public comment period concerning the draft Ground Water Discharge Permit (DP-1840) for Copper Flat Mine. NMED will grant this request and is in the process of issuing a second PN2 that will reflect a May 4, 2018 deadline to submit public comments. Thanks, Brad

---

Brad Reid, Geologist
Mining Environmental Compliance Section / PO Box 5469 / Santa Fe, NM / 87502
(505) 827-2963 / brad.reid@state.nm.us

From: GRIP [mailto:grip@gilaresources.info]
Sent: Wednesday, February 21, 2018 6:05 PM
To: Reid, Brad, NMENV <brad.reid@state.nm.us>
Subject: Request for extension of time to file public comments on DP-1840

Good afternoon, Brad:

Please find attached a request for an extension of time to file our public comments on DP-1840.

Thanks for your consideration.
Allyson

Allyson Siwik, Executive Director
Gila Resources Information Project
305A N. Cooper St.
Silver City, NM 88061
575.538.8078 office/fax
www.gilaresources.info

Gila Resources Information Project
Promoting Healthy Communities by Protecting Our Environment Since 1998

February 21, 2018

Brad Reid
New Mexico Environment Department
Ground Water Quality Bureau/Mining Environmental Compliance Section
1190 South St. Francis Drive
Santa Fe, NM 87505
Via email to: brad.reid@state.nm.us

RE: Request for Extension of Time to File Public Comments on Copper Flat Copper Mine Draft Discharge Permit 1840

Dear Brad:

The Gila Resources Information Project (GRIP) submits the following request for an extension of the public comment period on the proposed Copper Flat Copper Mine's draft Discharge Permit 1840 ("DP 1840"). The current deadline is March 5, 2018. GRIP requests an additional sixty (60) days from the March 5, 2018 deadline for community members to review and submit comments on the draft DP-1840, pursuant to 20.6.7.10.H NMAC and 20.6.2.3108 NMAC. We are requesting an extension to May 4, 2018.

GRIP was founded in 1998 and has worked on mining issues for 20 years. Our mission is to promote community health by protecting the environment and natural resources in southwestern New Mexico. GRIP's role in the community has been to facilitate informed public participation in natural resource use decisions that will have profound and long-lasting impacts on the region's environmental and economic health. Acknowledging that copper is important to our economy and modern lives, we advocate for responsible mining that complies with regulations that protect our surface and groundwater, air quality, land, and environment.

Since its creation, GRIP has been actively involved in copper mining issues in southwest New Mexico. GRIP has participated in proceedings related to operational discharge permits, discharge permits for closure, variance proceedings, reclamation permitting, mine reclamation financial assurance, federal NEPA processes, and other permitting activities associated with hardrock mines. GRIP is a partner in the New Mexico Mining Act Network that serves mining-impacted communities across the state in Mining Act proceedings and related environmental permitting decisions.

GRIP communicates regularly with its nearly 1000 supporters who are citizens that care about environmental protection in southwest New Mexico and statewide and want environmental safeguards in place at Freeport- McMoRan's three Grant County mines and other mines in southwest New Mexico and around the state.

Because we have members that live in the vicinity of the proposed mine, GRIP submitted to the Bureau of Land Management scoping comments and public comments on the draft Environmental Impact Statement on the Copper Flat Mine. GRIP will provide public comments on DP-1840.

GRIP believes that the current 30-day public comment period severely limits the public's ability to review and comment on the draft DP-1840. Currently, GRIP and its mining engineering consultant are engaged in preparing for a public hearing on the Cobre Continental Mine DP-181. We will need additional time to review the extensive documentation on this permit application and prepare our comments on DP-1840. We therefore request a 60-day extension of time to file public comments on DP-1840.

Thank you for your consideration of our request.

Sincerely,

Allyson S. Siwik

Allyson Siwik
Executive Director

FORM B
Exempt Records Review Form

FILE REVIEW COMPLETED THROUGH THIS PAGE
AND/OR THROUGH DATE OF REVIEW
FOR RECORDS EXEMPT FROM PUBLIC DISCLOSURE

(Select appropriate statement)

✓ NO EXEMPT MATERIALS IDENTIFIED

____ EXEMPT MATERIALS REMOVED

File reviewed by: B. Reid

Date of review: 2/21/18

FORM C

Ground Water Quality Bureau
INSPECTION OF PUBLIC RECORDS REVIEW DOCUMENTATION

Files provided for inspection or private copy:

Entire DP-1840 File (7 blue folders, numerous binders and reports)

On-site Inspection (if applicable):

Date: 2/22/18 Time: 9:30 am —

Reviewer Name: Jaimie Park Phone #: 505-989-3769

Signature: Jaimie Park

Off-Site copying (if applicable):

Fill out Inspection of Public Records Act Private Copy Facility Authorization Form.

Post-Review:

All documents returned? Yes No

Documents returned in good condition? Yes No

GWQB Staff member: ______________________

Date: ______________

Reid, Brad, NMENV

From:	Jaimie Park <jpark@nmelc.org>
Sent:	Thursday, February 22, 2018 2:34 PM
To:	Reid, Brad, NMENV; Knight, Andrew, NMENV
Subject:	FW: IPRA Request for Copper Flat Mine DP-1840 Entire File
Attachments:	2016-10-14 NMED MORP letter.pdf; 2017-07-17 NMCC Response to MMD Comments.pdf; 2017-10-03 Meeting Notes.pdf

Brad and Andrew,

Please see the below email where Andrew addressed my more specific requests for documents. Again, my Feb. 6th IPRA request is for the entire file, but when agencies tell me they need to take more time to provide the entire file, I've been asked to provide a list of specific documents I would like now, that are able to be provided right away because they're in electronic form, instead of having to wait until the entire file is ready to be provided in electronic form in order to get specific documents. So I did that in this matter.

Andrew helpfully responded to the specific documents I identified and if you look at his response to #3, Andrew has also interpreted IPRA in a broad manner because he provided Brad's memo which contained a request for additional information and did not limit my request to only formal RAI letters issued.

If you look at item #4 I requested all NMED RAIs after NMED received NMCC's October 13, 2017 response. This request, interpreted broadly, includes NMED RAIs in all forms (formal letters, memo notes, etc.) AS WELL AS the responses to any NMED RAIs. So, pursuant to item #4, NMED would provide me with all NMCC correspondence after October 13, 2017 – that would include the NMCC memo on the ore grade and it would include NMCC's January 25, 2018 submittal regarding private waters exemption for the pit water body.

I believe we reached consensus on what my IPRA request entails: the entire DP-1840 file; but in the meantime, while NMED is working on digitizing the entire file, there are recently submitted documents that are in electronic format that can be provided. And I'm trying to fill in the gaps between the June 21, 2016 "revised application" up through February 2, 2018, when NMED put out public notice that the draft DP is approvable.

Thank you for your time today and with providing me the "Revised I" August 2017 application today. If you have any further questions regarding my IPRA requests, please let me know. Also, if you could provide me with a date by which the entire file will be digitized, that would be appreciated. Depending upon that date, the client may not authorize having a copier service copy the entire file at this time.

Regards,

Jaimie Park

From: Knight, Andrew, NMENV [mailto:Andrew.Knight@state.nm.us]
Sent: Wednesday, February 21, 2018 12:56 PM
To: Jaimie Park <jpark@nmelc.org>
Subject: IPRA Request for Copper Flat Mine DP-1840 Entire File

Ms. Park,
Here are electronic copies of documents you requested in four specific categories, with explanations below.

1. October 14, 2016 NMCC letter to NMED regarding revised MORP to be submitted

Attached

2. July 17, 2017 response to NMED RAI.

Attached

3. NMED submitted another RAI after the July 17, 2017 NMCC response

Meeting notes from 2017-10-03 are attached. This is the only document responsive to this request.

4. All NMED RAIs issued after receiving NMCC's October 13, 2017 response, up to when NMED determined that the application was technically complete and put out PN2 for approving the draft DP

No documents exist responsive to this request.

Andrew P. Knight
Assistant General Counsel
New Mexico Environment Department
Office: (505) 222-9540
Cell: (505) 907-8836

Reid, Brad, NMENV

From: CHUCK BARRETT <elrojo2u@gmail.com>
Sent: Thursday, February 22, 2018 5:25 PM
To: Reid, Brad, NMENV
Cc: Melody Sears
Subject: wastewater discharge permit to the Copper Flat Mine (DP-1840

Dear Mr. Reid,

With this email I hereby request a public hearing on the application for a discharge permit by the Copper Flat Mine, Dp 1840. As a resident of Hillsboro I feel it would have a definite impact on my community. Furthermore there are serious environmental legal and regulatory issues involved regardless of community proximity.

Thank you for including this request into the record and for honoring it.

Sincerely,
Charles Barrett
PO Box 431, Hillsboro, 88042
575-895-5457

Reid, Brad, NMENV

From:	Farrell, Lochlin, NMENV
Sent:	Friday, February 23, 2018 5:07 PM
To:	herald@torcherald.com
Cc:	Reid, Brad, NMENV; Vollbrecht, Kurt, NMENV
Subject:	NMED Ground Water Quality Bureau - Legal Ads - Public Notice
Attachments:	20170302 PN2 Newspaper Spanish.doc; 20170302 PN2 Newspaper.doc

To whom it may concern (Legal Ad Dept.),

Please publish the attached Public Notice in the legal section of The Herald on or before **Friday (3/2/18),** (1 time only).

Please provide a quote, ad number, and a proof for review.

Please send invoices for the **Ground Water Quality Bureau** to:
GWQB.Invoices@state.nm.us
Please provide the ad number on the invoice to help us process the invoice.

[redacted]

Please send affidavit to:
STATE OF NEW MEXICO
NMED / Ground Water Quality Bureau
Harold Runnels Building, N2250
1190 St. Francis Drive / PO Box 5469
Santa Fe, NM 87502-5469

Thank you,

Lochlin Farrell
Data Steward
Ground Water Quality Bureau
New Mexico Environment Department
D:505.827.2905 F:505.827.2965
lochlin.farrell@state.nm.us

Notice is hereby given pursuant to 20.6.2.3108.H NMAC, the following Groundwater Discharge Permit applications have been proposed for approval. To request additional information or to obtain a copy of a draft permit, contact the Ground Water Quality Bureau in Santa Fe at (505) 827-2900. Draft permits may also be viewed on-line at **https://www.env.nm.gov/gwb/NMED-GWQB-PublicNotice.htm**

NOTE – If viewing by WEB - Click on facility name to review a copy of the draft permit.

DP #	Facility/Applicant	Closest City	County	Notice	NMED Permit Contact
1840	Copper Flat Mine Jeff Smith Chief Operating Officer New Mexico Copper Corporation 4253 Montgomery Blvd. NE Suite 130 Albuquerque, NM 87109	Hillsboro	Sierra	DP-1840, Copper Flat Mine, Jeff Smith, Chief Operating Officer, New Mexico Copper Corporation, proposes to discharge up to 25,264,000 gallons per day of mine tailings, process water, impacted stormwater, and domestic wastewater to a lined tailing impoundment. Additional regulated mine units include waste rock stockpiles, ore stockpiles, mineral processing units, process water impoundments, and an open pit. Potential contaminants from this type of discharge include sulfate, nitrate, total dissolved solids, and metals. The facility is located at 85 Copper Rock Road approximately 5 miles NE of Hillsboro, in Sections 30 and 31, T15S, R06W, Sections 25, 26, 35, and 36, T15S, R07W, and Section 6, T16S, R06W, Sierra County. Groundwater beneath the site is at a depth of approximately 7 to 156 feet and has a total dissolved solids concentration of approximately 317 to 868 milligrams per liter. In addition to the requirements of 20.6.7 NMAC, DP-1840 contains additional conditions that the permittee shall comply with as authorized by Subsection I of 20.6.7.10 NMAC. NMED has provided written explanation for those additional conditions to the applicant, and will provide the justification to interested parties upon request. The NMED initially provided notice that this Discharge Permit application was proposed for approval on or before February 2, 2018. By this notice, NMED is extending the period to receive written comments and during which time a public hearing may be requested by 60 days.	Brad Reid Brad.Reid@state.nm.us 505-827-2963 Comments for DP-1840 accepted until 11:59 p.m., May 5, 2018

Prior to ruling on any proposed Discharge Permit or its modification, the New Mexico Environment Department (NMED) will allow sixty days after the date of publication of this notice to receive written comments and during which time a public hearing may be requested by any interested person, including the applicant. Requests for public hearing shall be in writing and shall set forth the reasons why a hearing should be held. A hearing will be held if NMED determines that there is substantial public interest. Comments or requests for hearing should be submitted to the Ground Water Quality Bureau at PO Box 5469, Santa Fe, NM 87502-5469.

NMED does not discriminate on the basis of race, color, national origin, disability, age or sex in the administration of its programs or activities, as required by applicable laws and regulations. NMED is responsible for coordination of compliance efforts and receipt of inquiries concerning non-discrimination requirements implemented by 40 C.F.R. Part 7, including Title VI of the Civil Rights Act of 1964, as amended; Section 504 of the Rehabilitation Act of 1973; the Age Discrimination Act of 1975, Title IX of the Education Amendments of 1972, and Section 13 of the Federal Water Pollution Control Act Amendments of 1972. If you have any questions about this notice or any of NMED's non- discrimination programs, policies or procedures, you may contact: Kristine Pintado, Non-Discrimination Coordinator, New Mexico Environment Department, 1190 St. Francis Dr., Suite N4050, P.O. Box 5469, Santa Fe, NM 87502, (505) 827-2855, nd.coordinator@state.nm.us. If you believe that you have been discriminated against with respect to a NMED program or activity, you may contact the Non-Discrimination Coordinator identified above or visit our website at https://www.env.nm.gov/non-employee-discrimination-complaint-page/ to learn how and where to file a complaint of discrimination.

To view this and other public notices issued by the Ground Water Quality Bureau on-line, go to:
https://www.env.nm.gov/gwb/NMED-GWQB-PublicNotice.htm

Departamento del Medio Ambiente de Nuevo México – Oficina para el Control de la Calidad de las Aguas Subterráneas

Conforme a 20.6.2.3108.H NMAC, por el presente se notifica que se ha/n propuesto la/s siguiente/s solicitud/es de Permiso de Descarga en Aguas Subterráneas para su aprobación. Para pedir más información, obtener una copia de un proyecto de permiso o pedir que se le incluya en la lista de correo para instalaciones específicas, sírvase comunicarse con la Oficina para el Control de la Calidad de las Aguas Subterráneas de Santa Fe al (505) 827-2900. Los proyectos de permisos pueden examinarse en línea en: https://www.env.nm.gov/gwb/NMED-GWQB-PublicNotice.htm

New Mexico Copper Corporation, por medio de su Director de Operaciones, Jeff Smith, de la mina Copper Flat Mine, permiso DP-1840, propone descargar hasta 25,264,000 galones por día de relaves de la mina, aguas de proceso, aguas pluviales afectadas y aguas residuales domésticas en una presa de relaves revestida. Otras unidades reguladas de la mina incluyen unidades para el procesamiento de acumulaciones de rocas residuales, menas y minerales, presas para aguas de proceso y una fosa abierta. Los contaminantes potenciales de este tipo de descarga incluyen sulfatos, nitratos, sólidos disueltos totales y metales. Las instalaciones se encuentran en 85 Copper Rock Road, aproximadamente a 5 millas al NE de Hillsboro, en las Secciones 30 y 31, T15S, R06W, en las Secciones 25, 26, 35 y 36, T15S, R07W, y en la Sección 6, T16S, R06W, en el condado de Sierra. El agua subterránea en ese sitio se encuentra a una profundidad de aproximadamente 7 a 156 pies, y tiene una concentración de sólidos disueltos totales de aproximadamente 317 a 868 miligramos por litro.

Además de los requisitos de 20.6.7 NMAC, el permiso DP-1840 contiene condiciones adicionales con las que el permisionario debe cumplir según lo autorizado por la Subsección I de 20.6.7.10 NMAC. El NMED ha proporcionado al solicitante una explicación escrita de esas condiciones adicionales y proporcionará la justificación a las partes interesadas si lo solicitan.

El NMED emitió inicialmente un aviso para informar que esta solicitud de Permiso de Descarga se propuso para su aprobación el 2 de febrero de 2018 o antes de esa fecha. Mediante este aviso, el NMED prolonga por 60 días el período para recibir comentarios escritos, y durante ese período, se podrá solicitar una audiencia pública. Contacto para el permiso del NMED: Brad Reid a brad.reid@state.nm.us o (505) 827-2963.

Antes de tomar una decisión acerca de cualquier Permiso de Descarga propuesto o de su modificación, el Departamento del Medio Ambiente de Nuevo México (NMED por su sigla en inglés) permitirá que se presenten comentarios por escrito y/o solicitudes de audiencia pública relativa al Permiso de Descarga dentro de sesenta días posteriores a la fecha de publicación de este aviso. Cualquier parte interesada, incluido el solicitante, podrá presentar comentarios y solicitar una audiencia. Las solicitudes de audiencia pública deben presentarse por escrito e indicar los motivos por los que se debería celebrar la audiencia. Se celebrará una audiencia si el NMED determina que hay considerable interés público. Los comentarios y pedidos de audiencia deben enviarse a la Oficina para el Control de la Calidad de las Aguas Subterráneas: Ground Water Quality Bureau, PO Box 5469, Santa Fe, NM 87502-5469.

El Departamento del Medio Ambiente de Nuevo México (NMED, por su sigla en inglés) no discrimina por motivos de raza, color, origen nacional, discapacidad, edad o sexo en la administración de sus programas o actividades, según lo exigido por las leyes y los reglamentos correspondientes. El NMED es responsable de la coordinación de esfuerzos para el cumplimiento de las reglas y la recepción de indagaciones relativas a los requisitos de no discriminación implementados por 40 C.F.R. Parte 7, que incluye el Título VI de la Ley de Derechos Civiles de 1964, como fuera enmendado; la Sección 504 de la Ley de Rehabilitación de 1973; la Ley de Discriminación por Edad de 1975; el Título IX de las Enmiendas de Educación de 1972; y la Sección 13 de las Enmiendas a la Ley Federal de Control de la Contaminación del Agua de 1972. Si tiene preguntas sobre este aviso o sobre cualquier programa de no discriminación, norma o procedimiento de NMED, puede comunicarse con la Coordinadora de No Discriminación: Kristine Pintado, Non-Discrimination Coordinator, New Mexico Environment Department, 1190 St. Francis Dr., Suite N4050, P.O. Box 5469, Santa Fe, NM 87502, (505) 827-2855, nd.coordinator@state.nm.us. Si piensa que ha sido discriminado con respecto a un programa o actividad de NMED, puede comunicarse con la Coordinadora de No Discriminación antes indicada o visitar nuestro sitio web en https://www.env.nm.gov/non-employee-discrimination-complaint-page/ para saber cómo y dónde presentar una queja por discriminación.

New Mexico Environment Department – Ground Water Quality Bureau

Notice is hereby given pursuant to 20.6.2.3108.H NMAC, the following Groundwater Discharge Permit application(s) have been proposed for approval. To request additional information, to obtain a copy of a draft permit, or to request to be placed on the facility-specific mailing list, contact the Ground Water Quality Bureau in Santa Fe at (505) 827-2900. Draft permits may be viewed on-line at https://www.env.nm.gov/gwb/NMED-GWQB-PublicNotice.htm

DP-1840, Copper Flat Mine, Jeff Smith, Chief Operating Officer, New Mexico Copper Corporation, proposes to discharge up to 25,264,000 gallons per day of mine tailings, process water, impacted stormwater, and domestic wastewater to a lined tailing impoundment. Additional regulated mine units include waste rock stockpiles, ore stockpiles, mineral processing units, process water impoundments, and an open pit. Potential contaminants from this type of discharge include sulfate, nitrate, total dissolved solids, and metals. The facility is located at 85 Copper Rock Road approximately 5 miles NE of Hillsboro, in Sections 30 and 31, T15S, R06W, Sections 25, 26, 35, and 36, T15S, R07W, and Section 6, T16S, R06W, Sierra County. Groundwater beneath the site is at a depth of approximately 7 to 156 feet and has a total dissolved solids concentration of approximately 317 to 868 milligrams per liter.

In addition to the requirements of 20.6.7 NMAC, DP-1840 contains additional conditions that the permittee shall comply with as authorized by Subsection I of 20.6.7.10 NMAC. NMED has provided written explanation for those additional conditions to the applicant, and will provide the justification to interested parties upon request.

The NMED initially provided notice that this Discharge Permit application was proposed for approval on or before February 2, 2018. By this notice, NMED is extending the period to receive written comments and during which time a public hearing may be requested by 60 days. NMED permit contact: Brad Reid at brad.reid@state.nm.us or (505) 827-2963.

Prior to ruling on any proposed Discharge Permit or its modification, the New Mexico Environment Department (NMED) will allow for the receipt of written comments and/or a request for a public hearing regarding the Discharge Permit for up to sixty days after the date of publication of this notice. This submittal of comments and request for a hearing may come from any interested party including the applicant. Requests for public hearing shall be in writing and shall set forth the reasons why the hearing should be held. A hearing will be held if NMED determines that there is substantial public interest. Comments or requests for hearing should be submitted to the Ground Water Quality Bureau at PO Box 5469, Santa Fe, NM 87502-5469.

NMED does not discriminate on the basis of race, color, national origin, disability, age or sex in the administration of its programs or activities, as required by applicable laws and regulations. NMED is responsible for coordination of compliance efforts and receipt of inquiries concerning non-discrimination requirements implemented by 40 C.F.R. Part 7, including Title VI of the Civil Rights Act of 1964, as amended; Section 504 of the Rehabilitation Act of 1973; the Age Discrimination Act of 1975, Title IX of the Education Amendments of 1972, and Section 13 of the Federal Water Pollution Control Act Amendments of 1972. If you have any questions about this notice or any of NMED's non- discrimination programs, policies or procedures, you may contact: Kristine Pintado, Non-Discrimination Coordinator, New Mexico Environment Department, 1190 St. Francis Dr., Suite N4050, P.O. Box 5469, Santa Fe, NM 87502, (505) 827-2855, nd.coordinator@state.nm.us. If you believe that you have been discriminated against with respect to a NMED program or activity, you may contact the Non-Discrimination Coordinator identified above or visit our website at https://www.env.nm.gov/non-employee-discrimination-complaint-page/ to learn how and where to file a complaint of discrimination.

NEW MEXICO
ENVIRONMENT DEPARTMENT

SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lt. Governor

Harold Runnels Building
1190 Saint Francis Drive (87505)
PO Box 5469, Santa Fe, NM 87502-5469
Phone (505) 827-2990 Fax (505) 827-1628
www.env.nm.gov

BUTCH TONGATE
Cabinet Secretary

J.C. BORREGO
Deputy Secretary

February 26, 2018

VIA E-MAIL

Jaimie Park
jpark@nmelc.org

Re: Request to Inspect Public Records

Dear Ms. Park:

On February 26, 2018, this office received your request for public information. You request information pertaining to: Letter/ communication to Gold Express Corporation in 1992 Copper Flat Copper Mine. (See attached request).

I forwarded your request to the bureaus on February 26, 2018. The bureaus will respond by March 12, 2018.

Should you have any questions, please contact the Ground Water Quality Bureau at (505) 827-2919 and the Surface Water Quality Bureau at (505) 827-2819.

Sincerely,

Melissa Y. Mascareñas

Melissa Y. Mascareñas
New Mexico Environment Department
Department Public Records Custodian

cc: Andrew Knight, Assistant General Counsel
Michelle Hunter, Chief, Ground Water Quality Bureau
Shelly Lemon, Chief, Surface Water Quality Bureau

NEW MEXICO ENVIRONMENT DEPARTMENT
INSPECTION OF PUBLIC RECORD REQUEST FORM

Please fill out the following information:

1. Date: February 26, 2018

2. Requestor's Name: Jaimie Park, New Mexico Environmental Law Center

3. Requestor's Address: 1405 Luisa Street, Suite 5, Santa Fe, NM 87505

4. Phone No.: (505) 989-9022

5. Email: **jpark@nmelc.org**

6. Company Being Represented: New Mexico Environmental Law Center

7. Address: 1405 Luisa Street, Suite 5, Santa Fe, NM 87505

8. Document or File being requested to be reviewed or copied (please describe the records in sufficient detail to enable Department personnel to reasonably identify & locate the records:

I request that you inform me what documents are available within the scope of this request and when I can inspect those documents. I also request that you not make any copies without first informing me of the number of copies and the cost for the copying that are involved. Finally, I request that if you determine that any documents or portions of documents are exempt from disclosure you inform me of that and provide me with citations to the provisions in the Inspection of Public Records Act that indicate that the documents or portions of documents are exempt from disclosure, describe the type of document being withheld, and identify who sent the document being withheld and who received the document being withheld.

Records being requested:

1. Letter/communication to Gold Express Corporation in 1992 whereby action on Gold Express Corporation's discharge permit application for the Copper Flat Copper Mine was suspended pending development and evaluation of an environment impact statement by the Bureau of Land Management.

For purposes of this request, the term "document" means any record in written, graphic, photographic, or other form kept or memorialized on paper, microfilm, microfiche, or electronic media; and includes each non-identical original or copy of a draft or final record, whether the original or copy is not identical because of notes on the original or copy or otherwise.

NEW MEXICO ENVIRONMENT DEPARTMENT
INSPECTION OF PUBLIC RECORD REQUEST FORM

Please fill out the following information:

1. Date: February 27, 2018

2. Requestor's Name: Jaimie Park, New Mexico Environmental Law Center

3. Requestor's Address: 1405 Luisa Street, Suite 5, Santa Fe, NM 87505

4. Phone No.: (505) 989-9022

5. Email: **jpark@nmelc.org**

6. Company Being Represented: New Mexico Environmental Law Center

7. Address: 1405 Luisa Street, Suite 5, Santa Fe, NM 87505

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I request that you inform me what documents are available within the scope of this request and when I can inspect those documents. I also request that you not make any copies without first informing me of the number of copies and the cost for the copying that are involved. Finally, I request that if you determine that any documents or portions of documents are exempt from disclosure you inform me of that and provide me with citations to the provisions in the Inspection of Public Records Act that indicate that the documents or portions of documents are exempt from disclosure, describe the type of document being withheld, and identify who sent the document being withheld and who received the document being withheld.

Records being requested:

1. New Mexico Copper Corporation's Stormwater Pollution Prevention Plan (SWPP) for the proposed Copper Flat Copper Mine;
2. All supporting references identified on pages 178-179 of NMCC's "Revision I, August 2017" discharge permit application, attached as Exhibit A of this request.

For purposes of this request, the term "document" means any record in written, graphic, photographic, or other form kept or memorialized on paper, microfilm, microfiche, or electronic media; and includes each

REFERENCES

Beaumont, E. B., 2011, unpublished aerial photograph lineament analysis of the East Animas Fault Trend.

Harrison, R. W., Lozinsky, R. P., Eggleston, T. L., and McIntosh, W. C., 1993, Geologic Map of the Truth or Consequences 30X60 Minute Quadrangle (1:100,000 scale): New MexicoBureau of Mines and Mineral Resources, Open File Report 390.

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Intera, Discharge Permit Application for the Copper Flat Mine, March 31, 2011, (Intera 2011).

Intera et al., Baseline Data Characterization Report for Copper Flat Mine, Sierra County, New Mexico, June 2012 (Intera 2012).

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John Shomaker and Associates, Amendment to the Stage I Abatement Plan Proposal for the Copper Flat Mine, October, 14, 2011, (JSAI 2011).

John Shomaker and Associates, Conceptual Model off Groundwater Flow in the Animas and Palomas Basin, Copper Flat Project, Sierra County, New Mexico, May, 2012 (JSAI 2012).

John Shomaker and Associates, Model of Groundwater Flow in the Animas Uplift and Palomas Basin, Copper Flat Project, Sierra County, New Mexico, August 22, 2013, (JSAI 2013).

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John Shomaker and Associates (JSAI), Results From First Year of Stage 1 Abatement Investigation at the Copper Flat Mine Site Near Hillsboro, New Mexico, May 2014 (JSAI 2104b).

John Shomaker and Associates, Model of Groundwater Flow in the Animas Uplift and Palomas Basin, Copper Flat Project, Sierra County, New Mexico, August 22, 2014 (JSAI 2014c).

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Kelley, R, Seager, W. R., Clemons, and Hawley, J. W., 1979, unpublished geology map of the Skute Stone Arroyo 7.5 minute Quadrangle near Hillsboro, New Mexico.

Koning, D. J., Jochems, A. P., and Cikoski, C.T. 2015, Geologic map of the Skute Stone Arroyo 7.5-Minute Quadrangle, Sierra County, New Mexico: New Mexico Bureau of Geology and Mineral Resources Open-File Geologic Map 252, June, 2015.

New Mexico Environment Department letter to NMCC, "Comment Resolution Response: Geochemical Characterization Report, Geochemical Modeling of the Pit Lake and associated documents for the Copper Flat Project, Copper Flat Mine, DP-1", February 23, 2015 (NMED 2015).

New Mexico Copper Corporation, Copper Flat Mine Plan of Operations, December 2010 and Revisions (NMCC 2010).

New Mexico Copper Corporation, Mine Operations and Reclamation Plan, Copper Flat Project, July 2012 (NMCC 2012).

Sargent, Hauskins, and Beckwith (SHB), Tailings Dam and Disposal Area, Quintana Mineral Corporation, Copper Flat Project, Gold Dust, New Mexico, October 1980 (SHB 1980).

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Seager, W. R., Clemons, R. E., Hawley, J. W., and Kelley, R. E., 1982, Geology of northwest part of Las Cruces 1x2 sheet (Scale 1:125,000), New Mexico: New Mexico Bureau of Mines & Mineral Resources Geologic Map 53.

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SRK Consulting U.S. Inc., Humidity Cell Termination Report for the Copper Flat Project, New Mexico, February, 2014 (SRK 2014).

Reid, Brad, NMENV

From:	Vollbrecht, Kurt, NMENV
Sent:	Tuesday, February 27, 2018 5:33 PM
To:	Lemon, Shelly, NMENV; Reid, Brad, NMENV
Cc:	Hunter, Michelle, NMENV; Knight, Andrew, NMENV; Holcomb, Sarah, NMENV
Subject:	RE: IPRA Request DP-1840

There is no requirement under the DP for a SWPPP. Their stormwater impoundments are regulated under the copper rule for protection of groundwater quality though.

Kurt Vollbrecht, Program Manager
Mining Environmental Compliance Section
Ground Water Quality Bureau
New Mexico Environment Department
(505) 827-0195

From: Lemon, Shelly, NMENV
Sent: Tuesday, February 27, 2018 2:58 PM
To: Vollbrecht, Kurt, NMENV <kurt.vollbrecht@state.nm.us>; Reid, Brad, NMENV <brad.reid@state.nm.us>
Cc: Hunter, Michelle, NMENV <Michelle.Hunter@state.nm.us>; Knight, Andrew, NMENV <Andrew.Knight@state.nm.us>; Holcomb, Sarah, NMENV <sarah.holcomb@state.nm.us>
Subject: FW: IPRA Request DP-1840

Hello,

The only thing that might be relevant to SWQB is item #1 of this request:

New Mexico Copper Corporation's Stormwater Pollution Prevention Plan (SWPPP) for the proposed Copper Flat Copper Mine.

SWPPPs are a requirement of NPDES permits, but there is no NPDES permit for Copper Flat Mine. In order for a construction, industrial or municipal project site to remain in compliance with the Clean Water Act's NPDES permitting program, a Stormwater Pollution Prevention Plan or Stormwater Management Plan, which details the site's stormwater management initiatives, must be developed and maintained throughout the duration of the project. A SWPPP must be prepared before submitting the NOI for permit coverage (Multi Sector General Permit).

Is a SWPPP required for the DP?

Andrew: do you want me to write up a SWQB response to SWPPP request?

Thanks,
Shelly

From: Mascarenas, Melissa, NMENV
Sent: Tuesday, February 27, 2018 2:00 PM
To: Knight, Andrew, NMENV <Andrew.Knight@state.nm.us>; Hunter, Michelle, NMENV <Michelle.Hunter@state.nm.us>; Lemon, Shelly, NMENV <Shelly.Lemon@state.nm.us>
Subject: IPRA Request DP-1840

Reid, Brad, NMENV

From: Melody Sears <melody21@windstream.net>
Sent: Thursday, March 01, 2018 2:34 PM
To: Reid, Brad, NMENV
Subject: RE: NMCC wastewater discharge permit

Dear Mr. Reid,

I would like to request a public hearing on the application for a discharge permit by the Copper Flat Mine, Dp 1840. The issues involved seem complicated to me and I think warrant a public hearing. I am a Hillsboro resident living less than 5 miles away and a previous board member of Hillsboro Mutual Domestic Water Consumers Association, so ensuring clean, unpolluted water sources for this community is paramount for me.

Thank you for your attention to this request.

Sincerely,
Melody Sears
PO Box 431, Hillsboro, 88042
575-895-5457

Reid, Brad, NMENV

From: Stan Brodsky <stanandrob@windstream.net>
Sent: Friday, March 02, 2018 12:46 PM
To: Reid, Brad, NMENV
Subject: Copper Flat Mine

I would like there to be a public hearing on the discharge permit for Copper Flat Mine (DP 1840).

Thanks

Stanley Brodsky
39 Tulpia Trl
Hillsboro, NM 88042

From:	candi Browne <candilight4u@gmail.com>
Sent:	Friday, March 02, 2018 12:46 PM
To:	Reid, Brad, NMENV
Subject:	Requesting a hearing on the discharge permit for Copper Flat Mine (DP 1840)

2 March 2018
Requesting for a Public Hearing
THEMAC/ NEW MEXICO COPPER CORP
COPPER FLAT MINE -
Discharge Permit - DP 1840

Hello Brad-
This is my official request to have a Public Hearing on the Copper Flat Mine (DP 1840) Discharge Permit.
You may recall that I sent in my questions and concerns to you about THEMAC/NM Copper Corp's discharge plan.

My focus was on the LINER, its production, it's quality, the expertise of the company making &/ or installing it. The complexity of all these areas. The complexity of maintaining the integrity of the liner as it is installed, used and for all the years into perpetuity as it continues to be the fragile barrier between the toxic material it contains & our fragile environment and our depleted water sources.

For all of these reasons I feel that a Public Hearing must be allowed to give concerned people a chance to share their concerns & have a chance to make these concerns public knowledge in the format of a public meeting.

Please share my request for a Public Hearing with whatever people and NM State Departments need to receive this request.

Thank you, Brad for your work and your concern for our environment.
candi

Candace Browne
P.O. Box 3642
Truth or Consequences
NM 87901
575-89404495
candilight4u@gmail.com

Reid, Brad, NMENV

From: Harley Shaw <hgshaw4@gmail.com>
Sent: Friday, March 02, 2018 2:06 PM
To: Reid, Brad, NMENV
Subject: Hearing, discharge permit

I would like to request that a public hearing be made regarding the Copper Flat Mine discharge permit. I feel strongly that this process

represents, once more, big business running over small local concerns and ignoring people on the land.

Harley Shaw
Hillsboro, NM.

Reid, Brad, NMENV

From: Nolan Winkler <nolanwinkler@windstream.net>
Sent: Friday, March 02, 2018 3:53 PM
To: Reid, Brad, NMENV
Subject: Copper Flat Mine (DP 1840)

Please add our names to the list for a public hearing on this very important issue.
We are Hillsboro residents.

A sincere thank you,
R.Wm. and Nolan Winkler
Hillsboro, NM

Reid, Brad, NMENV

From: jimandteresa1@windstream.net
Sent: Friday, March 02, 2018 5:16 PM
To: Reid, Brad, NMENV
Subject: copper flat mine

We would like to request hearing.Oppose mine.Thank you James and Teresa Harthun

Reid, Brad, NMENV

From:	John Cornell <jcls1010@gmail.com>
Sent:	Friday, March 02, 2018 12:32 PM
To:	Reid, Brad, NMENV
Subject:	Copper Flat Mine

Mr Reid,

My wife and I are part of the NMCC opponents and would like to request a hearing on the discharge permit for the Copper Flat Mine (DP1840) .

Thanks for your consideration,

John & Cindy Cornell

John Cornell
100 Juh Trail, Hillsboro, NM 88042
575-895-5090
575-740-1759 Cell
jcls1010@gmail.com

Reid, Brad, NMENV

From: swbirding@gmail.com on behalf of Bob Barnes <rabarnes@blackrange.org>
Sent: Saturday, March 03, 2018 10:24 AM
To: Reid, Brad, NMENV
Subject: Groundwater Discharge Permit Application Proposed for Approval - DP-1840

I would very much like to see a public meeting(s) on this issue, given the significance it has for our community and the surrounding area.

Bob Barnes
Lately of Hillsboro, New Mexico
www.rabarnes.org
www.bobbarnes.us
www.blackrange.org
www.blackrange2.org
www.blackrange3.org

Reid, Brad, NMENV

From: LeRoy Henderson <elhleroy@yahoo.com>
Sent: Saturday, March 03, 2018 11:02 AM
To: Reid, Brad, NMENV
Subject: DP 1840

Based on what I heard at the 2-20-18, Sierra County Commission Work Shop, where THEMAC, dba NMCC, gave a presentation similar to all previous public pleas for support from local governments, I believe a public hearing on this permit request is essential. I worked at Copper Flat for 6 months doing a remodel, reclaiming exploratory drill sites, building fences, talking with their geologists daily, and combing through old documents from Quintana Minerals, which I turned over to THEMAC, but seem to have been destroyed by them. I am very concerned that NMCC has made false claims, and it is imperative that the public who are knowledgeable of the mine, be allowed to hear some of the claims and comment publicly as to their veracity. It is also important that residents of Dona Ana County and Mesilla Valley farmers, be apprised of THEMAC's intentions. Anything downstream of the mine will be affected in one way or another and at differing levels. Hearings must be done in Dona Ana and Texas should be noticed of these plans.
Respectfully submitted,

Le Roy Henderson
HC 30 Box 46
Cuchillo, NM 87901-9604
575-743-2571

17512

From:	Ennis, David, EMNRD
To:	Lewellin, Jeffrey, NMENV
Cc:	Vollbrecht, Kurt, NMENV; Reid, Brad, NMENV; Dail, Bryan, NMENV; Longmire, Patrick, NMENV; Lemon, Shelly, NMENV
Subject:	RE: Copper Flat Addendum Report Review -Request for Extension to Provide NMED Comments
Date:	Friday, March 09, 2018 11:37:52 AM

NMED's request for an extension of time until March 19, 2018 is approved.

Thanks,
DJ

From: Lewellin, Jeffrey, NMENV
Sent: Thursday, March 8, 2018 12:31 PM
To: Ennis, David, EMNRD <David.Ennis@state.nm.us>
Cc: Vollbrecht, Kurt, NMENV <kurt.vollbrecht@state.nm.us>; Reid, Brad, NMENV <brad.reid@state.nm.us>; Dail, Bryan, NMENV <Bryan.Dail@state.nm.us>; Longmire, Patrick, NMENV <Patrick.Longmire@state.nm.us>; Lemon, Shelly, NMENV <Shelly.Lemon@state.nm.us>
Subject: RE: Copper Flat Addendum Report Review -Request for Extension to Provide NMED Comments

DJ – NMED is hereby requesting an extension to provide comments on the above referenced request until COB, March 19, 2018. Please let me know if the extension is granted. Thanks, Jeff

Jeff Lewellin, Mining Act Team Leader
Mining Environmental Compliance Section
Ground Water Quality Bureau
New Mexico Environment Department
(505) 827-1049

From: Lewellin, Jeffrey, NMENV
Sent: Tuesday, February 06, 2018 10:36 AM
To: Ennis, David, EMNRD <David.Ennis@state.nm.us>
Cc: Vollbrecht, Kurt, NMENV <kurt.vollbrecht@state.nm.us>; Reid, Brad, NMENV <brad.reid@state.nm.us>; Dail, Bryan, NMENV <Bryan.Dail@state.nm.us>; Longmire, Patrick, NMENV <Patrick.Longmire@state.nm.us>
Subject: Copper Flat Addendum Report Review -Request for Extension to Provide NMED Comments

DJ – We are requesting a second 30 day extension until March 12, 2018 to provide NMED comments related to the two reports submitted as addendum to the Copper Flat permit application. Please let me know if the extension is granted. Thanks, Jeff

Jeff Lewellin, Mining Act Team Leader
Mining Environmental Compliance Section
Ground Water Quality Bureau
New Mexico Environment Department

Reid, Brad, NMENV

From:	Bill Lindenau and Véronique De Jaegher <bindivis@icloud.com>
Sent:	Sunday, March 18, 2018 1:36 PM
To:	Reid, Brad, NMENV
Subject:	Copper flat Mine permit DP 1840

This project will impact greatly the water quality of all people downstream. Therefore a public hearing is really necessary.
Please make sure people can state their opinion and ask questions.
Thank you. Sincerely Bill Lindenau and Veronique De Jaegher

Reid, Brad, NMENV

From: DA Hayes <dmdhayes@gmail.com>
Sent: Tuesday, March 20, 2018 8:01 AM
To: Reid, Brad, NMENV
Subject: Permit #DP1840

Dear Mr. Reid:
I am writing as a resident of Seirra County to request a public hearing on the above stated permit #DP1840.
It is urgently important on such a matter to allow the populace to have it's input.
Thank you,
D. A. Hayes
Truth or Consequences, NM

Susana Martinez
Governor

Ken McQueen
Cabinet Secretary

Matthias Sayer
Deputy Cabinet Secretary

Fernando Martinez, Director
Mining and Minerals Division

March 22, 2018

Ms. Katie Emmer
New Mexico Copper Corporation
4253 Montgomery Blvd NE, Suite 130
Albuquerque, NM 87109

RE: Technical Comments on Baseline Data Reports for Copper Flat Mine, Sierra County, New Mexico, Permit Tracking Number SI027RN:

- ***Predictive Geochemical Modeling of Pit Lake Water Quality at the Copper Flat Project*, December 2017;**
- ***Probable Hydrologic Consequences of the Copper Flat Project*, December 12, 2017.**

The Mining and Minerals Division ("MMD") has received and reviewed two baseline data reports submitted as part of the Permit Application Package for the Copper Flat Mine. The two reports submitted on behalf of New Mexico Copper Corporation ("NMCC") are: *Predictive Geochemical Modeling of Pit Lake Water Quality at the Copper Flat Project, New Mexico*, prepared by SRK Consulting, December 2017; and *Probable Hydrologic Consequences of the Copper Flat Project, Sierra County, New Mexico*, prepared by John Shomaker & Associates ("JSAI"), December 12, 2017.

In accordance with 19.10.6.605 NMAC, MMD provided these documents to, and requested comments from, the New Mexico Environment Department, New Mexico Office of the State Engineer, Bureau of Land Management, and New Mexico Department of Game and Fish. After review, MMD has the following comments to be addressed in writing:

General Comments:

1. The two reports *Predictive Geochemical Modeling of Pit Lake Water Quality at the Copper Flat Project* and *Probable Hydrologic Consequences of the Copper Flat Project* provide good, technical analyses of what may happen to water quality and quantity during and after mining on the permit and affected areas. The operational and reclamation plans will need to incorporate surface and groundwater monitoring to verify the predicted direction of the models. Monitoring will be a future permit condition.

2. Please provide a detailed executive summary using these two reports addressing the probable hydrologic consequences of the operation on both the permit and affected areas. Specifically, please explain how the performance and reclamation standard, addressed in 19.10.6.603.C(4) NMAC (Hydrologic Balance), is achieved. Please explain how the reclamation shall result in a hydrologic balance similar to pre-mining conditions and how this will be verified at the end of reclamation.

Technical Comments on *Probable Hydrologic Consequences of the Copper Flat Project, JSAI, December 12, 2017*

3. Figure 3.1: The 1 foot contour in this figure shows an abrupt turn to the east on the north side of Percha Creek. This figure is similar to Figure 3-19b in the Draft Environmental Impact Statement ("DEIS"; November 2015), which appears to show that this portion of the contour is controlled by negligible predicted drawdown in well LRG-10948, as shown in Figure A14 of the JSAI Report. However, LRG-10948 is listed in the Baseline Data Report ("BDR"; June 2012 by Intera) as a Percha Creek alluvial well (see Section 8.2.4.3.3 of the BDR) whereas Figure 3.1 represents projected groundwater drawdown in the Santa Fe Group ("SFG") aquifer. If LRG-10948 is an alluvial creek well, the predicted 1 foot contour would likely continue in the SFG south across Percha Creek. Please comment on whether LRG-10948 is modeled as an alluvial creek well or as a SFG well and any changes this may make on the predicted drawdown within the SFG at the end-of-mining.

4. The drawdown contour intervals of Figure 3.12 versus Figure A1 are different. Please include an approximate 1 foot drawdown contour on Figure A1 to allow for comparison of the end-of-mining drawdown versus the anticipated effects 100-years after mining.

5. Figure A1 appears to show propagation of the pit cone of depression within the crystalline aquifer post-mining. At about 40 to 50 years post-mining, the propagation of the cone of depression seems to diminish (i.e. see Figure A23, projected water levels at Ready Pay well). Please comment on this apparent propagation including how the water levels are projected to stabilize over time.

6. There appears to be an area of groundwater drawdown overlap in Grayback/Greenhorn arroyos between the crystalline aquifer and the SFG aquifer immediately east of the permit area (e.g. between the eastern edge of the permit area and monitoring well MW-8). Figure 3.1 shows approximately 10 feet of drawdown in the SFG in this area at the end-of-mining and Figure A1 shows up to 20 feet of drawdown in the crystalline aquifer 100-years after mining. Please comment on whether there are any anticipated cumulative effects of groundwater drawdown in this area.

7. Figure 3.14 of the report indicates that the pit lake surface will stabilize at the ~4,897 foot elevation and remain there for a number of years. What is the probability that it will remain at this level; either drop below or go above? What are the environmental circumstances that would allow the level to decrease or increase beyond the ~4,897 foot level? What might be the impacts on water quality or quantity?

Technical Comments on *Predictive Geochemical Modeling of Pit Lake Water Quality at the Copper Flat Project, New Mexico, SRK Consulting, December 2017*

8. Section 3.1.8 and Figure 3-1 indicate that the pit bottom will be covered with a suitable reclamation material before pit flooding occurs, however the October 13, 2017, amendment to the Mining Operation and Reclamation Plan ("MORP") submitted by NMCC does not propose to place reclamation materials below the waterline of the future pit lake. As stated in Section 6.2, the covered and submerged portions of pit reclamation are excluded from the surface area available (Table 6-1) for leaching, and therefore the pit lake modeling results presented in Section 6.6. It is MMD's opinion that any pit surface area exposed before submerging will likely be available to leaching. NMCC should plan to cover as much of the pit surface area as possible after mining to limit the amount of leaching, even those areas to be submerged. This would assist with reclamation prior to inundation of the pit using the rapid refill proposal. Please address.

9. Please utilize the calibrated PHREEQC model to predict the pit lake chemistry for the small pit lake that currently exists at the Copper Flat site. The model for the existing pit lake should utilize the same time steps used in the future pit lake model. Please provide comments/discussion on the results and compare them to the model results for the future pit lake.

10. Figures 5-1 and 6-1 show different rates of evaporation, direct precipitation, pit wall run-on etc., and a different final pit lake elevation. Please explain the differences between the values presented in these two figures.

11. Agency comments are attached and shall be addressed in writing.

Please provide responses to these comments within 60-days of receipt of this letter. If you have any questions or wish to discuss any of these comments, please contact me at (505) 476-3434 or by email at david.ennis@state.nm.us.

Sincerely,

David J. ("DJ") Ennis, P.G.
Reclamation Specialist/Permit Lead

Attached: Agency comments

cc: Holland Shepherd, Mining Act Program Manager
Brad Reid, NMED Permit Lead

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER
CONCHA ORTIZ Y PINO BUILDING, 130 SOUTH CAPITOL, SANTA FE, NM 87501
TELEPHONE: (505) 827-6091 FAX: (505) 827-3806

TOM BLAINE, P.E.
STATE ENGINEER

Mailing Address:
P.O. Box 25102
Santa Fe, NM 87504-5102

January 12, 2018

David J. Ennis, P.G.
Permit Lead
Mining Act Reclamation Program
1220 South St. Francis Drive
Santa Fe, NM 87505

Re: Response on probable hydrologic consequences, Copper Flat Mine, Sierra County, New Mexico, Permit Tracking No. SI027RN

Dear Mr. Ennis,

I have reviewed the December 12, 2017 report "Probable Hydrologic Consequences of the Copper Flat Project Sierra County New Mexico," authored by John Shomaker & Associates (JSAI). I do not have any objections to the report technical content.

The report addresses and adheres to a concern made by myself for the Hydrology bureau at the Office of the State Engineer (OSE) when reviewing the EIS model. I agree with JSAI on the methodology on the treatment of mine pumping impacts on the general head boundary on the northern portion of the Palomas Graben and how those impacts relate to impacts on the Rio Grande.

Other calculations in the JSAI report that are outside of the numerical model such as potential tailings liner leakage and the estimation of potential land subsidence look reasonable.

In any kind of modeling as new information becomes available, the modeling can change. At present, this is the best available tool in the determination of mine impacts.

Sincerely,

Eric Keyes
Hydrologist
NMOSE Hydrology Bureau
505-476-0322

GOVERNOR
Susana Martinez

DIRECTOR AND SECRETARY
TO THE COMMISSION
Alexandra Sandoval

DEPUTY DIRECTOR
Donald L. Jaramillo

STATE OF NEW MEXICO
DEPARTMENT OF GAME & FISH

One Wildlife Way, Santa Fe, NM 87507

Post Office Box 25112, Santa Fe, NM 87504

Tel: (505) 476-8000 | Fax: (505) 476-8123

For information call: (888) 248-6866

www.wildlife.state.nm.us

17 January 2018

David J. (DJ) Ennis, P.G., Permit Lead
Mining Act Reclamation Program
Mining and Minerals Division (MMD)
1220 South St. Francis Drive
Santa Fe, NM 87505

RE: Predictive Geochemical Modeling of Pit Lake Water Quality, Copper Flat Mine, Permit No. SI027RN; NMDGF No. 18208

Dear Mr. Ennis,

The New Mexico Department of Game and Fish (Department) has reviewed the document referenced above. New Mexico Copper Corporation (NMCC) submitted a report, prepared by SRK Consulting, which provides a predictive geochemical model that assesses future water quality in the Copper Flat Mine project pit lake, and compares the projections to the water quality in the existing pit lake. The work was undertaken to demonstrate compliance with New Mexico Mining Act regulations.

The modeling report concludes that "…changes to the hydrologic balance of the future pit water body that will form post-mining will be nil or minimal and the water quality will be very similar to that of the existing pit lake." The Department believes that the geological and hydrological complexities and inherent uncertainties make accurately predicting future pit lake water quality difficult. We believe that some type of mitigation strategy should be in place and implemented if pit lake water quality degrades to the point where it becomes hazardous to wildlife. The modeling effort was limited to projecting pit lake water quality for 100 years. However, the pit lake will persist "in perpetuity", and the time span over which the water quality can deviate from pre-mining conditions can be on the order of hundreds to thousands of years.

The Department also questions the predicted rate of evaporation that will concentrate chloride, sulfate, total dissolved solids (TDS) and trace elements in the pit lake over time, and may eventually lead to water quality conditions that are deleterious to wildlife. The current model appears to rely on historic climate data to predict the rate of evapoconcentration. The modeling should consider projected future climate regimes that would provide a plausible range of possible pit lake water quality outcomes. A hotter and drier climate for this region could result in substantially higher rates of evapoconcentration.

The proposed rapid fill reclamation scenario uses clean water from the production wells to achieve higher initial water quality of the pit lake. This approach informed the Department's previous comments to MMD regarding pit reclamation in the Mining Operations and Reclamation Plan to improve the value of the pit lake area for wildlife habitat. These recommendations involved modifications to the high wall to create ledges and cavities, and modifications to the Expanded 4900 Catch Bench to create a shallow littoral zone for aquatic plants. Because the pit lake is anticipated to exist in perpetuity and accurately predicting water quality and associated hazards to wildlife for that duration is questionable, the Department no longer supports creating features that may attract wildlife to the pit lake. Alternatively, we suggest installing clean water sources, such as impermeable rainwater catchment drinkers, that would attract wildlife away from the pit lake area. The Department also recommends additional modifications to the pit shell area that are designed to mitigate the impacts of periodic acid wall seep events on the pit lake.

Thank you for the opportunity to review and comment on the proposed project. If you have any questions, please contact Ron Kellermueller Mining and Energy Habitat Specialist, at (505) 476-8159 or ronald.kellermueller@state.nm.us.

Sincerely,

Matt Wunder

Matt Wunder, Ph.D.
Chief, Ecological and Environmental Planning Division

cc: USFWS NMES Field Office

STATE OF NEW MEXICO
DEPARTMENT OF GAME & FISH

One Wildlife Way, Santa Fe, NM 87507

Post Office Box 25112, Santa Fe, NM 87504

Tel: (505) 476-8000 | Fax: (505) 476-8123

For information call: (888) 248-6866

www.wildlife.state.nm.us

19 January 2018

David J. (DJ) Ennis, P.G., Permit Lead
Mining Act Reclamation Program
Mining and Minerals Division (MMD)
1220 South St. Francis Drive
Santa Fe, NM 87505

RE: Probable Hydrologic Consequences of the Copper Flat Project, Sierra County, New Mexico, Permit No. SI027RN; NMDGF No. 18207

Dear Mr. Ennis,

The New Mexico Department of Game and Fish (Department) has reviewed the report referenced above. New Mexico Copper Corporation submitted a report prepared by John Shomaker & Associates, Inc. (JSAI) that presents the probable hydrologic consequences for the Copper Flat Mine project.

The Department's primary concern remains the reaches of perennial flow and riparian habitat along Las Animas and Percha Creeks. These areas may be affected by the cone of depression caused by the pumping of production wells in the Santa Fe Group (SFG) aquifer.

The Department is particularly concerned about the riparian habitat along Las Animas Creek. This habitat is located less than one mile north of the production wells and supports the northernmost riparian forest dominated by Arizona sycamore (*Platanus wrightii*) trees. The JSAI report states on page 20 that:

> the increased transmissivity of the SFG results in water levels dropping below the bottom of the alluvium, forming a hydraulic disconnection between the SFG aquifer and the alluvial groundwater system. As a result, water flows from the alluvium to the SFG, through low-permeability clay beds, only by gravity; pumping from the SFG does not increase the flow or change water levels in the alluvium."

The JSAI report projects "non-measureable small changes in surface flow and riparian evapotranspiration" based on the presence of the low-permeability clay beds that minimize effects to shallow groundwater. It is unclear to the Department whether these changes are considered to be non-measureable relative to a range of normal or average flows, or whether withdrawals would create disproportionately greater reductions in surface water levels during low-flow periods.

The Department remains dubious that the report's findings of limited hydraulic connection between the SFG and the alluvial groundwater system provide sufficient security and mitigation to preclude impacts to wildlife and wildlife habitats from drawdown of groundwater levels. The Department requests clarification of what contingencies, if any, would be in place if the hydraulic connectivity between the SFG and the alluvial groundwater system proves to be greater than predicted, and results in adverse impacts to perennial flow and riparian habitat along lower Animas Creek.

Thank you for the opportunity to review and comment on the proposed project. If you have any questions, please contact Ron Kellermueller, Mining and Energy Habitat Specialist, at (505) 476-8159 or ronald.kellermueller@state.nm.us.

Sincerely,

Matt Wunder, Ph.D.
Chief, Ecological and Environmental Planning Division

cc: USFWS NMES Field Office

NEW MEXICO
ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau
1190 South St. Francis Drive (87505)
P.O. Box 5469, Santa Fe, New Mexico 87502-5469
Phone (505) 827-2900 Fax (505) 827-2965
www.env.nm.gov

SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lieutenant Governor

BUTCH TONGATE
Cabinet Secretary

J.C. BORREGO
Deputy Secretary

MEMORANDUM

DATE: March 16, 2018

TO**:** Holland Shepherd, Program Manager, Mining Act Reclamation Program

FROM: Brad Reid, Mining Environmental Compliance Section
Bryan Dail, Ph.D., Surface Water Quality Bureau
Patrick Longmire, Ph.D., Principal Aqueous Geochemist, Ground Water Quality Bureau
Joe Marcoline, PhD., Mining Environmental Compliance Section, Ground Water Quality Bureau

THROUGH: Jeff Lewellin, Mining Act Team Leader, Mining Environmental Compliance Section

RE: NMED Comments for the Copper Flat Mine Permit Application, Applicant Submission of Two Technical Reports for NMED Review, Sierra County, MMD Permit No. SI027RN

The New Mexico Environment Department (NMED) received correspondence from the Mining and Minerals Division (MMD) on December 14, 2017 requesting that NMED review and provide comments on the above referenced MMD reports associated with the permitting action. In accordance with § 19.10.6.605.C NMAC NMED has 30 days to provide comment. Subsequent to the original deadline to provide comments, NMED requested and was granted an extension from MMD until March 19, 2018. NMED comments are set forth below.

Background

On December 13, 2017, New Mexico Copper Corporation (Applicant) for the Copper Flat Mine submitted two documents as addendum to MMD Permit No. SI027RN. The titles of the two documents submitted are as follows: *Probable Hydrologic Consequences of the Copper Flat Project, Sierra County, New Mexico* by John Shoemaker & Associates, Inc., December 2017; and, *Predictive Geochemical Modeling of Pit Lake Water Quality, Copper Flat Project, New Mexico* by SRK Consulting, December 11, 2017.

NMED Recommendations to MMD Associated with Review of the Predictive Geochemical Modeling and Hydrologic Consequence Models

NMED reviewed the report *Predictive Geochemical Modeling of Pit Lake Water Quality* prepared by SRK Consulting (U.S.), Inc. for THEMAC Resources Group Ltd. SRK Consulting Inc., utilized the computer program PHREEQC developed by the US Geological Survey (USGS) to model different water-rock interactions. These interactions include groundwater and pit lake/wall rock mixing, precipitation/dissolution and adsorption desorption processes expected to occur at Copper Flat. Overall, the PHREEQC simulations are reasonable and applicable to post-mining, aqueous geochemical conditions expected to be encountered after cessation of mining operations at the Copper Flat site. A significant amount of site-specific water chemistry and mineralogical data and experimental results obtained from leachate testing have been conducted that are used as inputs to PHREEQC simulations for Copper Flat. These data and information provide relevance and meaningful input parameters for modeling complex geochemical interactions currently taking place at the site and those that are hypothesized or predicted to take place in the future.

NMED independently ran all PHREEQC simulations using input files provided in the report by SRK Consulting Inc., and evaluated and verified different output files serving as the primary source of material described in the text and shown in various figures in the SRK report.

NMED has the following comments and recommendations regarding PHREEQC modeling performed by SRK Inc. for the Copper Flat site. The comments are not specific action items, whereas the recommendations require additional geochemical modeling, investigation, and analysis.

Surface Water Quality Bureau Comments

Probable Hydrologic Consequences of the Copper Flat Project, New Mexico evaluated the hydrologic consequences related to the development of the Copper Flat Project, including reduced flows to artesian wells and springs, and reduced discharge to shallow aquifers along Animas Creek and Percha Creek. The consequences were evaluated using a numerical model developed from the United States Geological Survey (USGS) groundwater-flow modeling code MODFLOW. The model is well calibrated, reproduces measured data, and demonstrates an evaporative sink for the open pit lake, such that the pit lake waters are not mixing with subsurface waters. However, the SWQB has the following comments and concerns:

The SWQB urges demonstration that sufficient and robust monitoring plans are in place that assure the pit lake remains an evaporative sink under future climatic conditions to confirm model predictions and ultimately protect surface and ground waters.

The SWQB has concerns regarding the potential hydrologic consequences to perennial flows in Las Animas Creek and Percha Creek. Surface water in the Chihuahuan Desert, and the semi-arid southwestern United States in general, is a vital resource for numerous species including humans. The report indicates that, “effects on shallow groundwater (riparian) systems along Las Animas

Creek and Percha Creek are projected to be minimal, with a maximum of less than 2 ft of groundwater-level change on Percha Creek, less than 1 ft of groundwater-level change on Animas, and non-measurable small changes in surface flow and riparian evapotranspiration." The SWQB is concerned with the "non-measurable small changes in surface flow." Non-measurable can be significant when one is talking about creeks that are less than a foot deep. Given the current low baseflow conditions in Las Animas Creek and Percha Creek, any reduction or drawdown in the shallow groundwater that feeds them would likely reduce surface flows and potentially eliminate surface waters and aquatic habitat in certain reaches that are currently wet, which would cause additional stress and impairment to the aquatic community.

Mining Environmental Compliance Section Comments

1. During the review, an emphasis was placed on the end of mining drawdown in the bedrock aquifer around the open pit, i.e., the cone of depression, the evaluation of the extent to which the open pit will form an evaporative sink in the future, and on the potential for discharges from the tailing and waste rock stockpiles.

2. MECS concurs with conclusion by Copper Flat that the post-mining open pit will result in a perpetual evaporative sink and has confidence in the prediction. MECS will require monitoring of water levels in wells surrounding the open pit during and following mining to ensure that the predictions are correct.

3. MECS concurs with Copper Flat that the impact to groundwater chemistry should be minimal, and that net-percolation from the tailing areas is not expected, however, questions the interpretations of infiltration into the cover system, the properties of the cover materials and waste rock and ultimately the net-percolation from the waste rock storage areas. A detailed comment is included in the Specific Comments.

4. MECS also reviewed the modeling and predictions regarding the water-level drawdown in the SFG aquifer as well as the evaluation of the discharge to the Rio Grande. Considering the overall conceptual model, the conventional mathematic modeling approach, the ability to re-calibrate the model following the initiation of mining, and the long-term nature of the predictions, MECS concurs with the model and predictions to date. Since the predictions are extended out to a date exceeding the capability of our current understanding of the system, and past the capabilities of a predictive model, it is recommended that a re-calibration and evaluation of the system occur at a regular interval as impacts in wells are observed following the initiation of mining.

Specific Comments:

1. Copper Flat should revise the documents with the correct spelling of the word "tailing". The words tailing and tailings are often misused, even within the industry. For example, a facility has tailings in their ponds if the milled ore was from multiple sources, facilities, ore types or operations. A facility has tailing in their impoundments if the source was from one operation, unit or era of mining. In New Mexico examples would be the Deming Tailings Facility which had multiple sources or ore and the Molycorp Tailing Facility which only received tailing from the Questa Mine. While this comment has no effect on the modeling or operation, for the sake

of being correct, Copper Flat should refer to the proposed facility as a tailing facility that contains tailing from the new mining operation.

2. MECS requests that Copper Flat clarify the language regarding the water balance to differentiate between surface infiltration and net-percolation. Water that infiltrates into the cover or waste material has the potential to evaporate, be transpired, remain in storage or percolate down past the influence of evaporation and transpiration (net-percolation). To predict the water and gas flux to and from the atmosphere, this distinction in both a conceptual and a physical model must be considered.

3. MECS agrees that the impact to groundwater chemistry is likely to be minimal in part due to precipitation patterns, the low permeability of the underlying andesite, and the geochemical characteristics of the waste rock. MECS disagrees with the conclusion that net-percolation to groundwater from the waste rock storage areas is not expected. The evaluation presented is rudimentary at best and not appropriate for an evaluation of water and evaporative flux within a waste rock cover system and waste rock stockpile. In addition, the numbers are inconsistent with predictions from other mine sites with similar rainfall and evaporative regimes.

Specifically, the evaluation results in precise numbers without an error evaluation and without any supporting science. The evaluation does not include waste or cover material property information other than a number for the field capacity of the waste rock and an associated reference. The referenced document (JSAI, 2011) does not discuss or present the field capacity or have a discussion of the material properties of the waste rock. The evaluation does not rely on an industry standard Richards Equation based approach, nor does it account for redistribution or preferential flow and is not able to describe water or gas flow in an unsaturated material. The evaluation does not couple gas and water flux and has no mechanism to evaluate actual evaporation based on the soil potential and humidity of the pore gas. While potentially insignificant in this semi-arid climate, the evaluation does not have a realistic mechanism of representing transpiration from plants.

The draft DP-1840 requires groundwater monitoring, implementation of a material handling plan to limit production of acid rock drainage, construction of seepage interceptor systems at the toe of the waste rock stockpile, and development of soil water characteristic curves for reclamation cover material. If necessary, based on the information acquired during initial phases of mining MECS may require a more rigorous quantitative evaluation of the potential for impacts to groundwater from the waste rock.

NMED Comments and Recommendations for Additional PHREEQC Modeling and Report Revision

1. The updated model runs now assume two possible scenarios to pit infilling after mine closure. Scenario 1 is the unreclaimed fill scenario wherein the pit mine is allowed to re-fill naturally from area ground water seeps exposed during mining. Scenario 2 is amending the natural infilling with “good quality” ground water from supply wells used during mining. The latter scenario is predicted to reduce groundwater contact with oxidizable pit wall minerals, thus reducing mobilization of metals and acid generating reactions. However, during a presentation of the updated and refined pit lake model, it appeared that part of the improvement to water

quality under the reclaimed "rapid fill" scenario might be allotted to vegetative (or other) reclamation techniques to the pit void and haul road that would be under water in the refilled pit. It is unclear to the SWQB whether these terrestrial reclamation practices would enhance pit water if inundated by pit infilling, whether natural or rapid. A model run that only allows for terrestrial reclamation practices that improve water quality (above the predicted water line of the future pit lake) for both scenario 1 and 2 closure plans would be appropriate to make a valid comparison of the two possible closure plans.

2. Groundwater chemistry and hydrologic monitoring of the aquifer after open-pit mining has been terminated should be conducted to confirm the geochemical simulations quantified by PHREEQC. Groundwater monitoring at Copper Flat, however, is essential under current and future conditions. Additional simulations using PHREEQC are warranted in the future during mining operations, especially if site-specific changes in water chemistry, mineralogy, groundwater flow regime, and climatic conditions take place and vary from predicted conditions. No geochemical model or simulations are entirely perfect and uncertainties exist, especially for predicting future aqueous compositions, mineralogical assemblages, and other water-rock interactions occurring at mine sites.

3. Weaknesses or experimental gaps in thermodynamic data (MINTEQV4), serving as the basis for calculating aqueous speciation, mineral-solution equilibrium, and adsorption, are adequately presented in the SRK Inc. report. This discussion is important to provide to the reader because geochemical modeling contains varying uncertainties and multiple hypotheses can be tested by performing numerous simulations with different constraints placed on the "modeled system".

4. The post mining, rapid-pit fill is an optimal remediation strategy to significantly decrease acid rock processes by neutralizing acidic conditions in the pit lake during filling and steady-state conditions anticipated to occur in the long-term (100 years after post-mining operations). Groundwater pumped from two water supply wells has a sufficiently high total carbonate alkalinity (average value of 111 mgCaCO3/L, Appendix E) to maintain circumneutral pH conditions in the future pit lake at Copper Flat. The average pH of the two groundwater samples is 8.03. Higher bicarbonate alkalinity values (259 mgCaCO3/L, 316 mg/L of HCO3) are reported for the other water supply wells.

5. NMED agrees with the previous revisions to the water balance calculations provided by John Shoemaker & Associates, Inc. (JSAI), as evapo-concentration is the primary process controlling solute concentrations that influence mineral equilibrium and adsorption processes at the site. The new water balance calculations provided by JSAI improved model calibration for PHREEQC simulations under existing pit-lake conditions.

6. Figure 6-18 presents a trilinear or Piper diagram for both existing measured pit lake chemistry and future chemistry of the larger pit lake, suggesting that the future pit lake will be more uniform in major ion composition. This figure most likely assumes that the future pit lake is homogeneous in chemical composition in lateral and vertical dimensions, but it may change as a function of evapo-concentration of solutes under heterogeneous conditions. Monitoring of the future pit lake should confirm its major ion and trace metal composition as functions of depth and surface location.

7. Table 4-3. shows that mean concentrations of numerous measured solutes differ from those determined from PHREEQC simulations, however, they are generally within the range of measured solute concentrations. This suggests that the PHREEQC simulations are approximate for existing pit lake chemistry and model calibration is not perfect for antimony, arsenic, barium, boron, cadmium, chloride, fluoride, iron, lead, and molybdenum. A more detailed discussion needs to be provided in the text explaining discrepancies in solute concentrations that are controlled by a combination of adsorption/desorption and mineral precipitation/dissolution processes.

8. Average solute concentrations obtained from humidity cell tests (HCT) were used as input to the PHREEQC simulations. Use of maximum values of solute concentrations, however, would provide the most conservative or worst-case scenarios of the modeled geochemical processes quantified by PHREEQC and would capture or reduce uncertainty in the simulations. Additional PHREEQC simulations using maximum solute concentrations obtained from HCT should be performed by SRK Inc to more accurately bound model uncertainties in the future (100 years post-mining activities).

9. Suggested revision 2 also has relevance to Figures 5-6 through 5-16. These figures should be separated apart from each other, one set showing existing (measured) concentrations versus modeled concentrations and another set for post-closure conditions of the larger pit lake that will be present at Copper Flat. This is a scaling issue with the smaller existing pit lake and the much larger future pit lake that is part of the PHREEQC simulations. A more detailed geochemical discussion is warranted for Figures 5-6 through 5-16 evaluating mineral precipitation/dissolution (major cations and bicarbonate) and solute adsorption/desorption (arsenic and other oxyanions and cations). Time series plots for the existing pit lake show large variations in total dissolved solids (TDS) and major cations and anions, which support further refinement or calibration of existing and future conditions using PHREEQC.

10. Charge balance errors of zero were achieved for the different simulated aqueous solutions by stipulating that sodium was added to achieve perfect electroneutrality (zero percent charge balance error) by presence of excess anions such as chloride, sulfate, and total carbonate alkalinity. A discussion on this stipulation should be added to the report. Addition of sodium will influence mineral saturation index calculations by causing a positive bias in saturation indices values for sodium-rich silicates, carbonates, and sulfates.

11. Surface complexation modeling using PHREEQC was performed by SRK, Inc., including the adsorbent, ferrihydrite (general formula of FeOOH) to quantify removal of major cations and anions and trace elements from solution. What specific surface area value of ferrihydrite was used during the PHREEQC simulations? The default surface area for ferrihydrite is 600 m^2/g. If this surface area value was not used in the PHREEQC simulations, justification for the alternate value should be provided.

12. Table 3-2 in the report provides a list of equilibrated phases included in the pit lake geochemical simulations. Observed phases include alunite, barite, brochantite, calcite, ferrihydrite, fluorite, gypsum, mirabilite, and NiCO3. Numerous other minerals were included in the PHREEQC simulations that did not reach equilibrium conditions because different

solutions are undersaturated with respect to the phases. Additional PHREEQC simulations should be performed only using the observed phases. Many of the phases hypothesized to occur at Copper Flat have no influence on water chemistry because there is no mass of these minerals precipitated from solution, as shown in PHREEQC output. Precipitation of the additional minerals is negligible at Copper Flat. The additional minerals that are not observed at the site should to be removed from input files and new PHREEQC simulations should to be conducted by SRK, Inc.

13. Phosphorus-bearing and silica phases were included in the PHREEQC simulations. However, PO4 and silica were not analyzed in the water samples. Phosphorus-bearing and silica phases should not be included in the PHREEQC simulations.

14. A discussion on the geochemical evolution of observed and modeled compositions of the present and future pit lakes, shown in Figure 6-17 in terms of pH and Cu + Cd + Co + Pb + Ni + Zn, would be useful to the reader.

NMED Summary Comment

NMED has no additional comments at this time.

If you have any questions regarding the above comments, please contact Jeff Lewellin at (505) 827-1049.

cc: Bruce Yurdin, Division Director, NMED-WPD
Shelly Lemon, Bureau Chief, SWQB
Liz Bisbey-Kuehn, Bureau Chief, AQB
Fernando Martinez, Division Director, EMNRD-MMD
DJ Ennis, Copper Flat Mine, Lead Staff, EMNRD-MMD
Kurt Vollbrecht, Program Manager, MECS

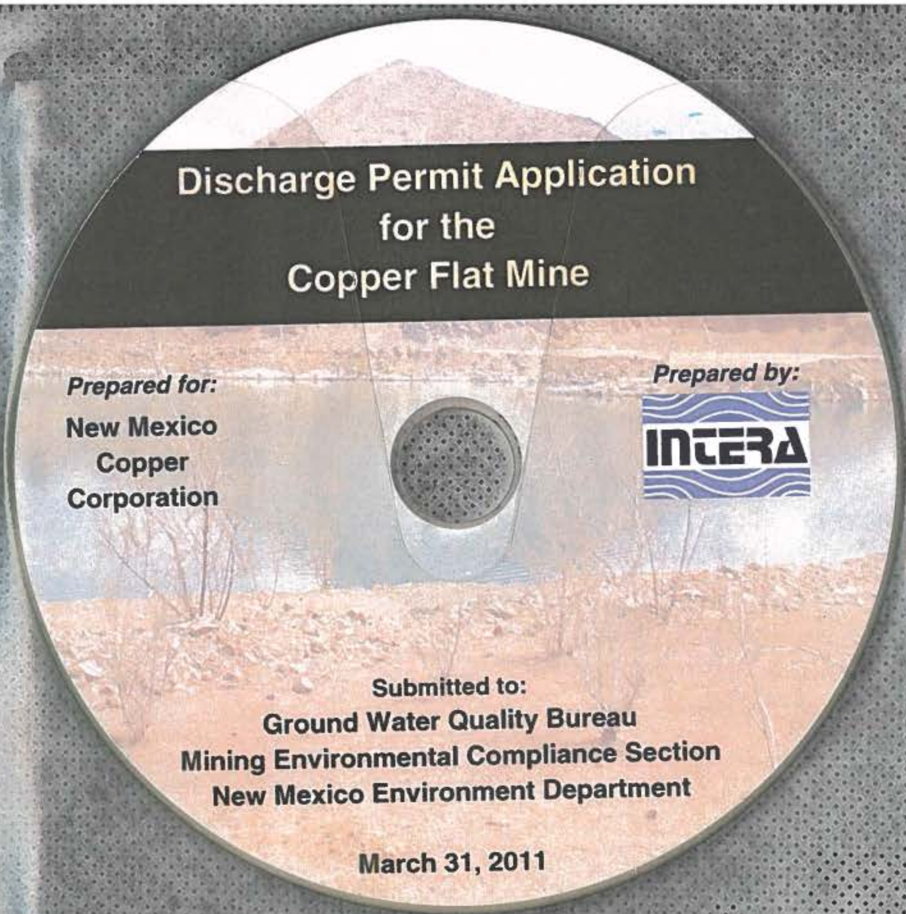
Reid, Brad, NMENV

From:	Peter Van Metre <pcvanmet@gmail.com>
Sent:	Tuesday, March 27, 2018 12:00 PM
To:	Reid, Brad, NMENV
Subject:	Request for a hearing on DP 1840, Copper Flat Mine

Dear Mr Reid,

I am writing to request that a hearing be held on the matter of permit request DP 1840, the Copper Flat Mine. We own a home in Kingston, NM, just to the west of the mine. We are concerned that this large of a project in such an arid region poses risks to the water resources of SW New Mexico, both on the use side and on the discharge and potential contamination side.

Sincerely,
Peter Van Metre
35 Kingston Main Street,
Hillsboro, NM 88042



CDs/DVDs in DP-1840 file as of 3/28/18

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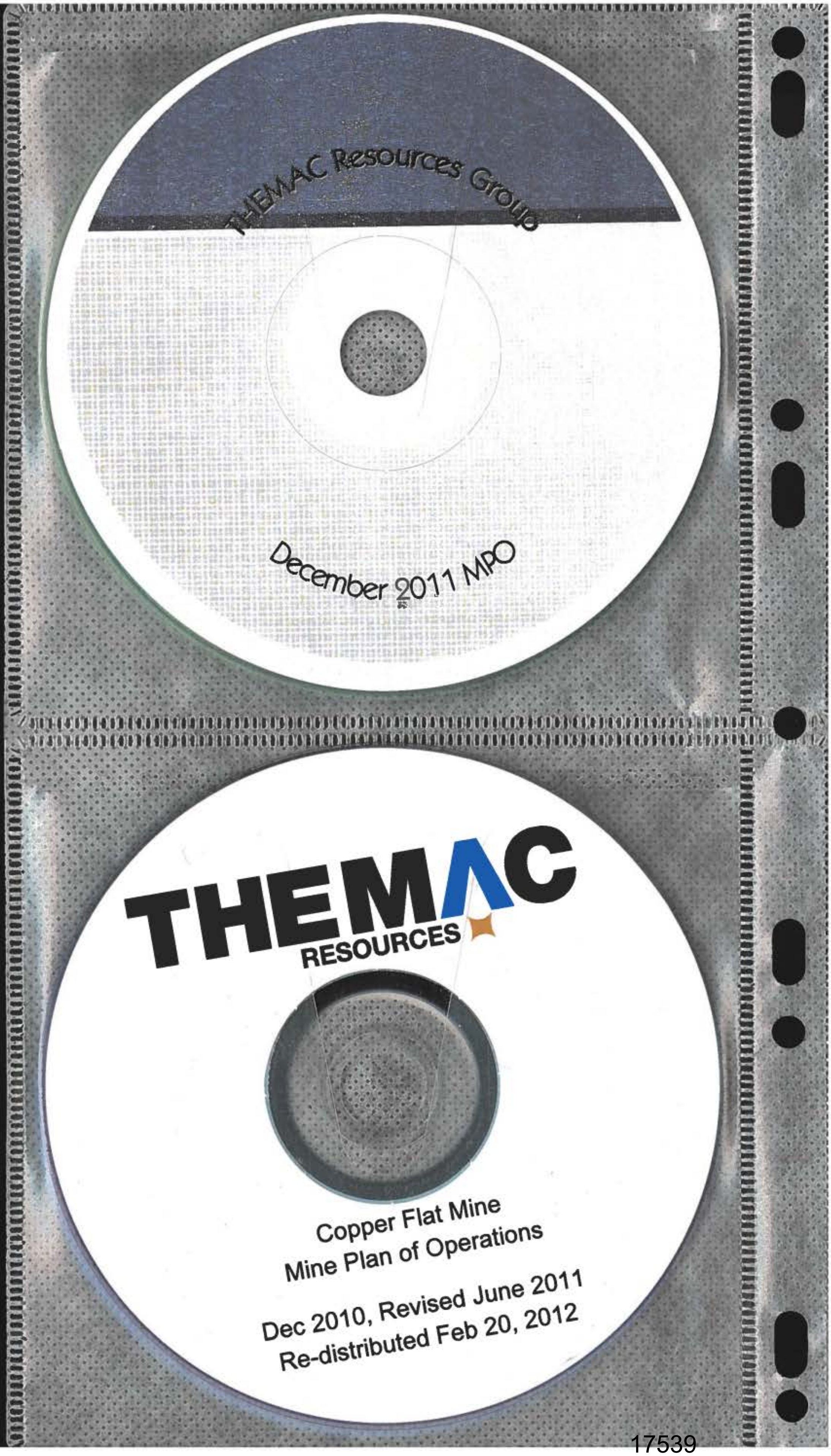
THEMAC Resources Group
December 2011 MPO
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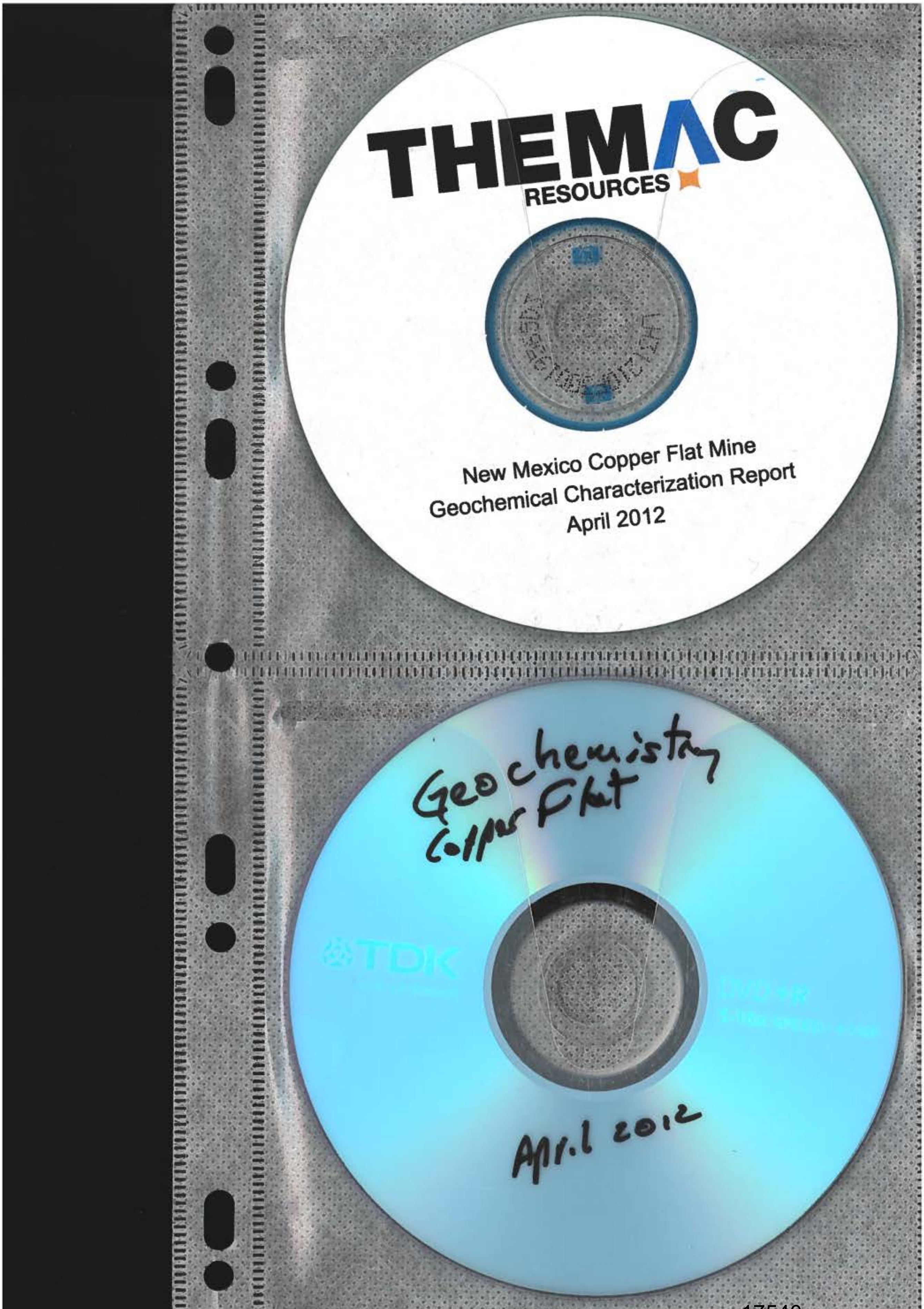
RESOURCES
Copper Flat Mine
Mine Plan of Operations
Dec 2010, Revised June 2011
Re-distributed Feb 20, 2012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New Mexico Copper Flat Mine
Geochemical Characterization Report
April 2012
Geochemistry
Copper Flat
TDK
April 2012

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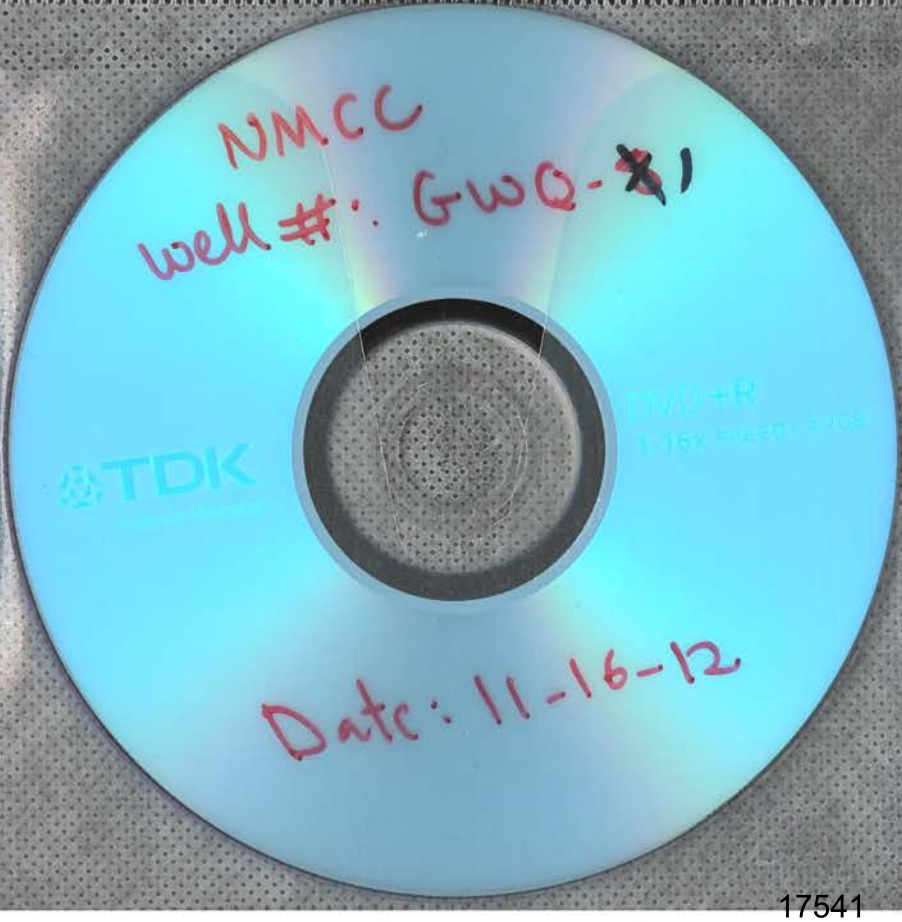
Copper Flat Mine
Permit Application Package
July 18, 2012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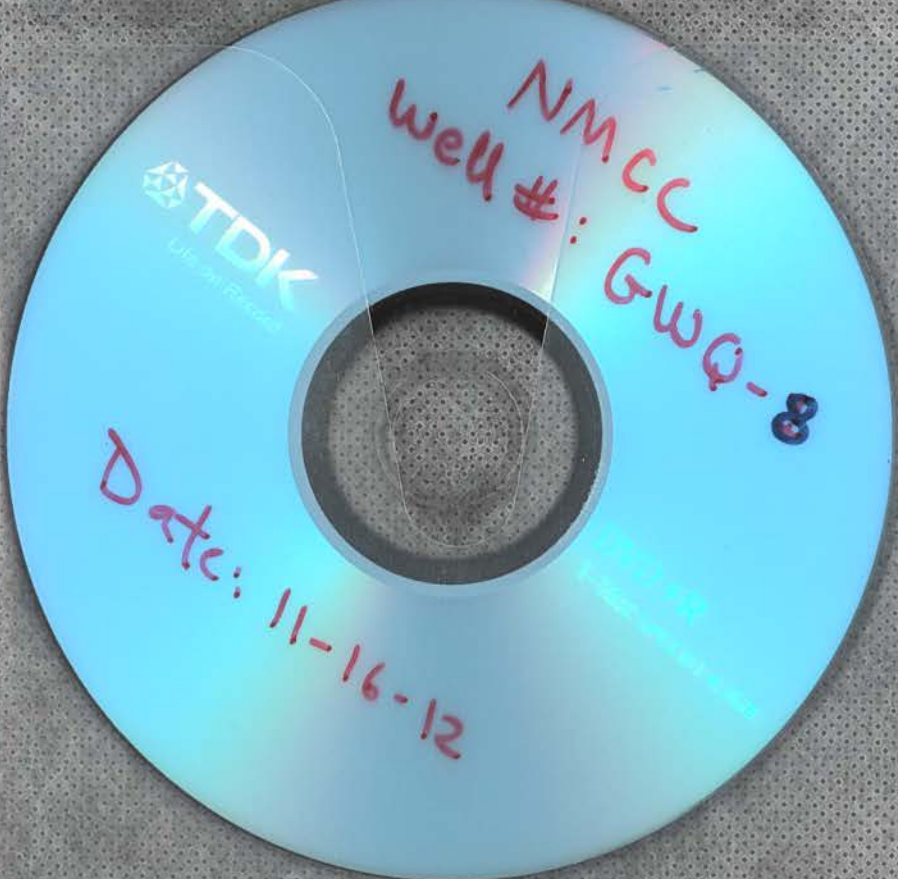
TDK
DVD+R
Date: 11-16-12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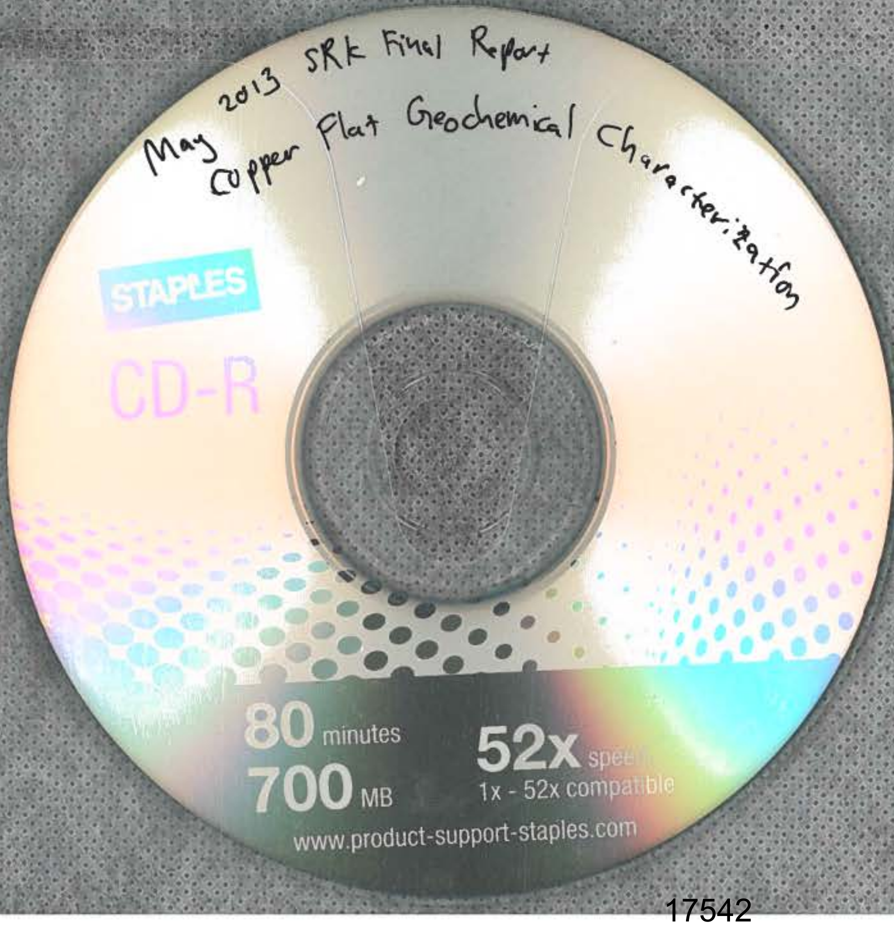
TDK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NMED GWQB
6/13/13

Copper Flat Project,
New Mexico

Electronic files produced by SRK Consulting (U.S.) Inc., 5250 Neil Road, Suite 300, Reno, Nevada 89502-6568 · (775)828-6800

Geochemical Characterization
Report
May 2013

STATUS REPORT FOR
STAGE 1 ABATEMENT AT THE
COPPER FLAT MINE STATE
NEAR HILLSBORO, NEW MEXICO

prepared for

New Mexico
Copper Corporation

June 28, 2013
Adobe pdf of
complete report

JOHN SHOMAKER & ASSOCIATES, INC.
Water-Resource and Environmental Consultants
2611 Broadbent Parkway NE
Albuquerque, New Mexico 87107
505-345-3407
www.shomaker.com

THEMAC
RESOURCES

Baseline Data Report Amendment
Copper Flat Mine, Sierra County,
New Mexico

July 2013

NMED GWQB
10/2/13

**MODEL OF GROUNDWATER FLOW
IN THE ANIMAS UPLIFT
AND PALOMAS BASIN,
COPPER FLAT PROJECT,
SIERRA COUNTY, NEW MEXICO**

prepared for
New Mexico
Copper Corporation

August 22, 2013
Adobe pdf of
complete report
with model files

JOHN SHOMAKER & ASSOCIATES, INC.
Water-Resource and Environmental Consultants
2611 Broadbent Parkway NE
Albuquerque, New Mexico 87107
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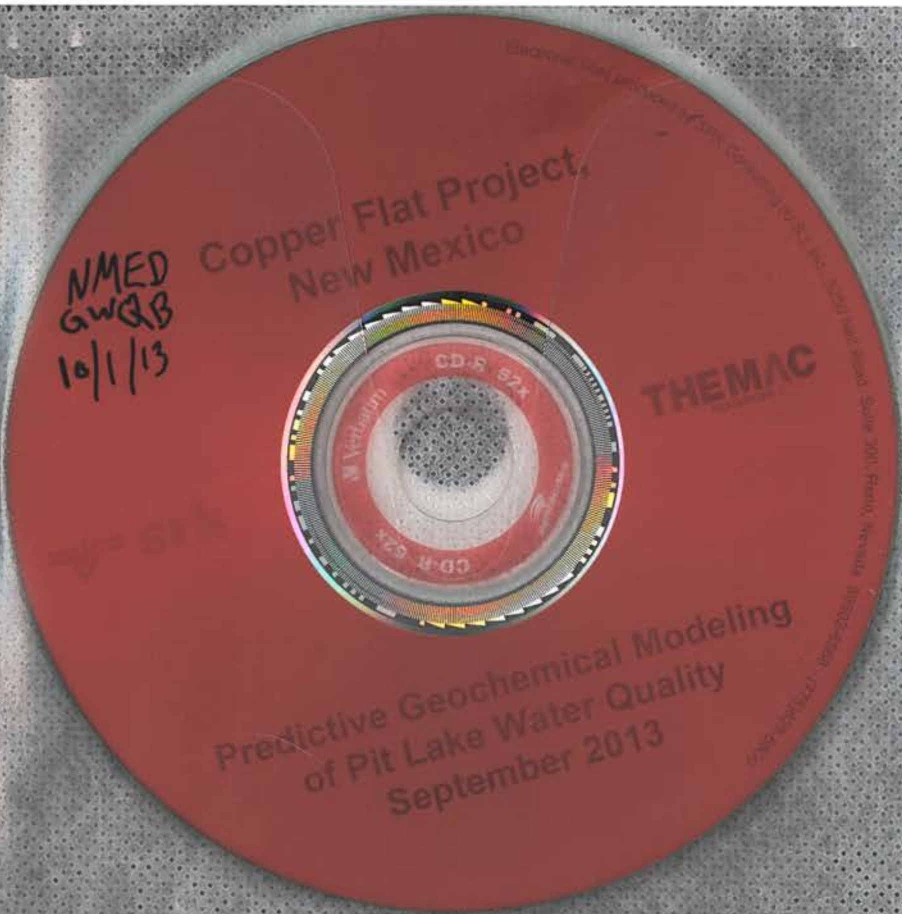
Copper Flat Project,
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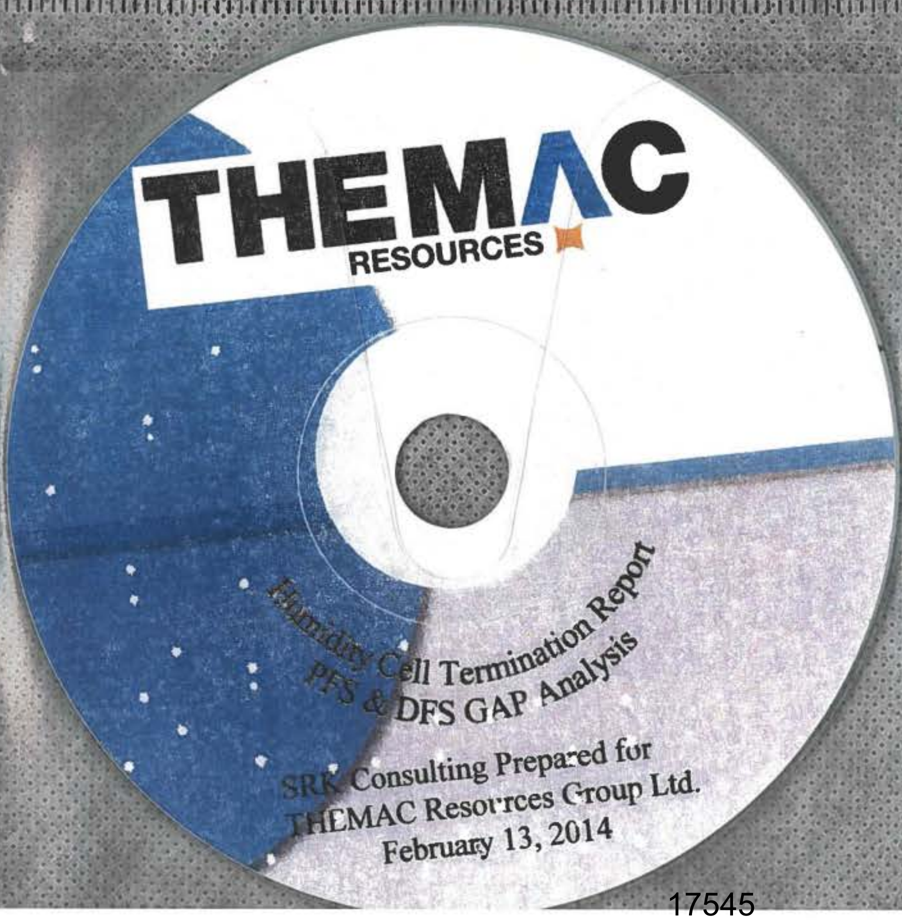
CD-R 52x
Verbatim
Predictive Geochemical Modeling
of Pit Lake Water Quality
September 2013


THEMAC
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Humidity Cell Termination Report
PFS & DFS GAP Analysis
SRK Consulting Prepared for
THEMAC Resorrces Group Ltd.
February 13, 2014

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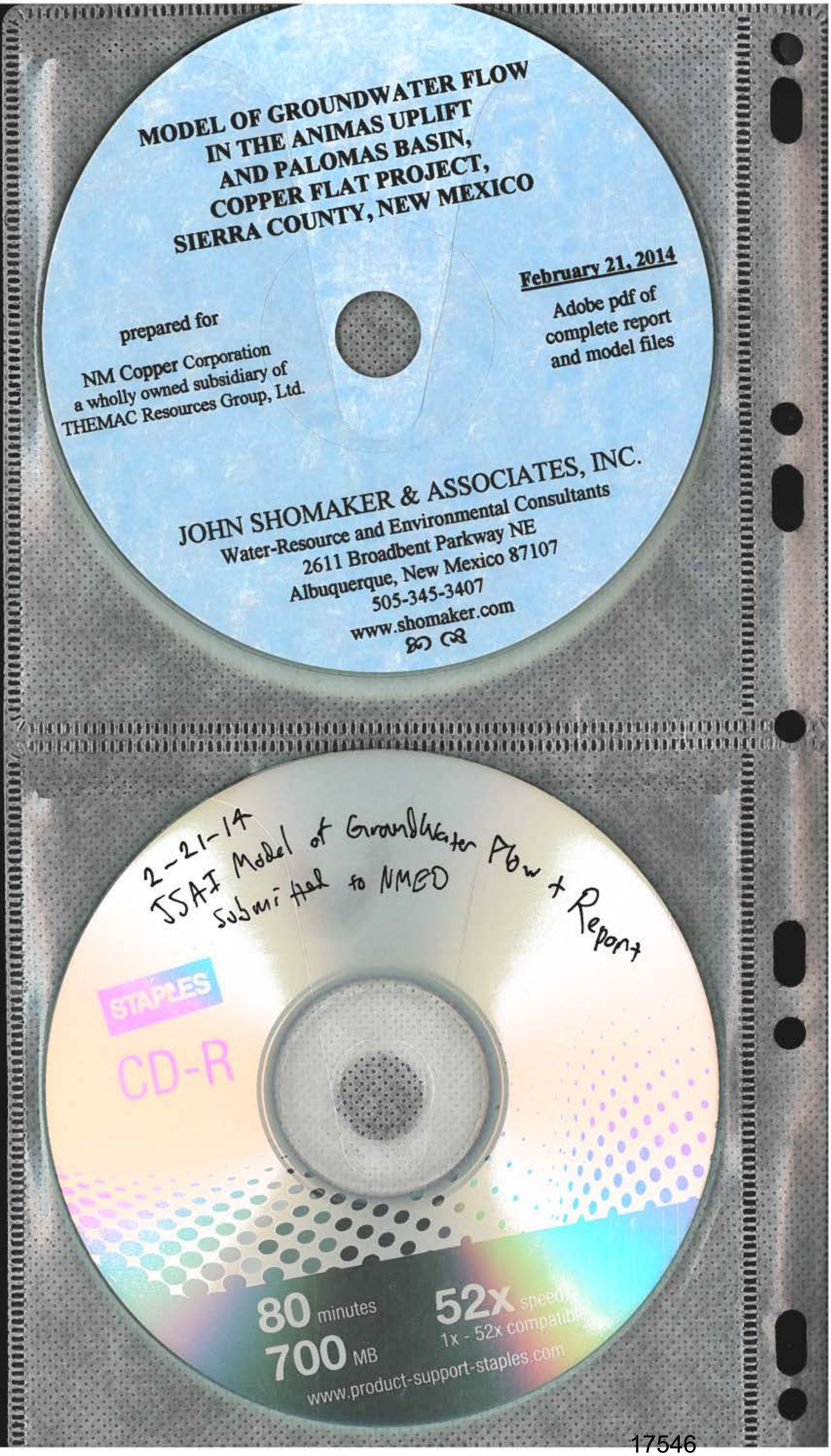
MODEL OF GROUNDWATER FLOW
IN THE ANIMAS UPLIFT
AND PALOMAS BASIN,
COPPER FLAT PROJECT,
SIERRA COUNTY, NEW MEXICO
February 21, 2014
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complete report
and model files
prepared for
NM Copper Corporation
a wholly owned subsidiary of
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Water-Resource and Environmental Consultants
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RESULTS FROM FIRST YEAR OF STAGE 1 ABATEMENT INVESTIGATION AT THE COPPER FLAT MINE SITE NEAR HILLSBORO, NEW MEXICO

prepared for

NM Copper Corporation
a wholly owned subsidiary of
THEMAC Resources Group, Ltd

May 2014

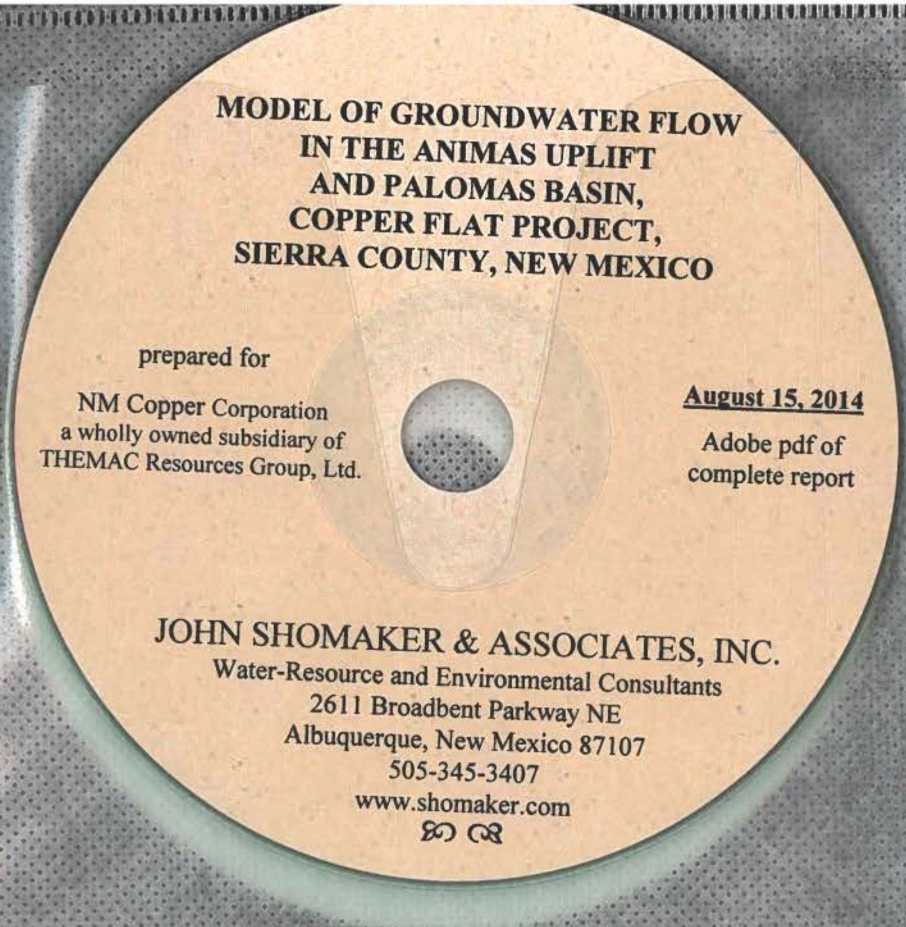
Adobe pdf of
complete report

JOHN SHOMAKER & ASSOCIATES, INC.
Water-Resource and Environmental Consultants
2611 Broadbent Parkway NE
Albuquerque, New Mexico 87107

THEMAC RESOURCES GROUP

July 28, 2014

NMCC Response to NMED Comments to the September 2013 Flat Pit Geochemical Modeling Report


MODEL OF GROUNDWATER FLOW
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COPPER FLAT PROJECT,
SIERRA COUNTY, NEW MEXICO
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a wholly owned subsidiary of
THEMAC Resources Group, Ltd.
August 15, 2014
Adobe pdf of
complete report
JOHN SHOMAKER & ASSOCIATES, INC.
Water-Resource and Environmental Consultants
2611 Broadbent Parkway NE
Albuquerque, New Mexico 87107
505-345-3407
www.shomaker.com


Proposed Copper Flat
Copper Mine
Internal Draft Environmental
Impact Statement
BLM
May 4, 2015

Copper Flat Mine
Discharge Permit Application
Pursuant to
20.6.7 NMAC

Prepared for:
New Mexico Environment Department
Ground Water Quality Bureau

And

New Mexico Copper Corporation

THEMAC RESOURCES

Prepared by:
Velasquez Environmental Management Services, Inc.

VEMS

December, 2015

Copper Flat Mine
Discharge Permit Application
Pursuant to
20.6.7 NMAC

Prepared for:
New Mexico Environment Department
Ground Water Quality Bureau

And

New Mexico Copper Corporation

THEMAC RESOURCES

Prepared by:
Velasquez Environmental Management Services, Inc.

VEMS

December, 2015

Copper Flat Mine
Discharge Permit Application
DP-1840

Prepared for:

New Mexico Environment Department
Ground Water Quality Bureau

And

New Mexico Copper Corporation

THEMAC RESOURCES

Prepared by:

Velasquez Environmental Management Services, Inc.

VEMS

Response to NMED March 2016 RFI's
Revision Documents
June 2016

New Mexico Copper Corporation
Copper Flat Mine
New Mine Permit No. SI027RN
Updated MORP

Prepared for:

New Mexico Mining & Minerals Division

And

New Mexico Copper Corporation

THEMAC RESOURCES

Prepared by:

Velasquez Environmental Management Services, Inc.

VEMS

OCT 14 2016

October, 2016

New Mexico Copper Corporation
Copper Flat Mine
New Mine Permit No. SI027RN
Updated MORP

Prepared for:

New Mexico Mining & Minerals Division

And

New Mexico Copper Corporation

THEMAC RESOURCES

Prepared by:

Velasquez Environmental Management Services, Inc.

VEMS

RECEIVED

OCT 14 2016

Water Quality Bureau

October, 2016

New Mexico Copper Corporation
Copper Flat Mine
New Mine Permit No. SI027RN
Updated MORP

Prepared for:

New Mexico Mining & Minerals Division

And

New Mexico Copper Corporation

THEMAC RESOURCES

Prepared by:

Velasquez Environmental Management Services, Inc.

VEMS

October, 2016

Revision 1
July, 2017

Submitted on 11/15/16

THEMAC RESOURCES | NEW MEXICO COPPER CORPORATION

2010 - 2013 Groundwater Sample
Laboratory Reports
(NMED Comment 16)

Copper Flat Mine
Discharge Permit Application
DP-1840

Prepared for:
New Mexico Environment Department
Ground Water Quality Bureau

And

New Mexico Copper Corporation

THEMAC RESOURCES

Prepared by:
Velasquez Environmental Management Services, Inc.

VEMS

Revision 1
August, 2017

17552

New Mexico Copper Corporation
Copper Flat Mine
New Mine Permit No. SI027RN
Updated MORP

Prepared for:

New Mexico Mining & Minerals Division

And

New Mexico Copper Corporation

THEMAC RESOURCES

Prepared by:

Velasquez Environmental Management Services, Inc.

VEMS

October, 2016

Revision 1
July, 2017

Reid, Brad, NMENV

From: Reid, Brad, NMENV
Sent: Thursday, March 29, 2018 10:54 AM
To: Vollbrecht, Kurt, NMENV
Subject: DP-1840 Hearing Requests tally

Kurt,

There have been 22 hearing requests since PN2 was issued on February 2, 2018. PN2 was re-issued on March 2, 2018. The second public comment period ends 11:59 PM on May 5.

Date	Hearing Requests	Time Extension Requests	Letter of protest/object to DP/other comment
3/27/2018	1		
3/20/2018	1		
3/18/2018	1		
3/5/2018	**1st Public Comment Period Ends**		
3/3/2018	2		
3/2/2018	**PN2 Reissued for DP-1840 (5/5/18 = new deadline)**		
3/2/2018	6		
3/1/2018	1		
2/22/2018	1		
2/21/2018		1	
2/19/2018	1		
2/16/2018	1		
2/14/2018	1	1	
2/13/2018		2	
2/10/2018			1
2/9/2018	1		
2/7/2018	2		
2/5/2018	1		
2/3/2018	2		
2/2/2018	**PN2 issued for draft DP-1840**		
5/25/2016			1
TOTALS	**22**	**4**	**2**

Brad Reid, Geologist
Mining Environmental Compliance Section
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 5469

SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lieutenant Governor

NEW MEXICO
ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau
1190 South St. Francis Drive (87505)
P.O. Box 5469, Santa Fe, New Mexico 87502-5469
Phone (505) 827-2900 Fax (505) 827-2965
www.env.nm.gov

BUTCH TONGATE
Cabinet Secretary

J.C. BORREGO
Deputy Secretary

MEMORANDUM
ATTORNEY CLIENT PRIVILEGE

To: Butch Tongate, Cabinet Secretary, NMED

Through: Bruce Yurdin, Director, Water Protection Division
Andrew Knight, Assistant General Counsel

From: Kurt Vollbrecht, Manager, Mining ~~Environmental~~ Compliance Section KV

Subject: Request for Hearing Determination for the Draft Discharge Permit, DP-1840, Copper Flat Mine

Date: March 29, 2018

The Mining Environmental Compliance Section ("MECS") respectfully requests a hearing determination in the matter of a draft groundwater discharge permit addressing an application from New Mexico Copper Corporation ("Applicant") for groundwater discharges associated with the Applicant's proposed Copper Flat Mine. The Applicant proposes to discharge tailing slurry and other mine water discharges associated with open pit mining and milling operations in Sierra County, New Mexico.

Section 20.6.2.3108.K NMAC states that "a public hearing shall be held if the secretary determines there is substantial public interest." MECS believes that substantial public interest exists in this matter and that therefore a public hearing is warranted.

The significance of public interest is based on the following:

- Interest is from a significant portion of the potentially affected population. The Public Notice for the Copper Flat Mine draft discharge permit, DP-1840 was issued on February 2, 2018. Within a matter of weeks NMED received four requests for an extension of the public comment period, and to date has received 22 requests for hearing even though the public comment period has been extended until May 5, 2018. The Copper Flat Mine has been the subject of numerous Inspection of Public Records requests during the past several years, indicating significant public interest in the application process. Interest has come from numerous residents living within close proximity to the proposed Copper Flat Mine, as well as several organizations including the Elephant Butte Irrigation District; the New Mexico Environmental Law Center representing Turner Ranch Properties, owner of the Ladder Ranch which is located adjacent to the proposed Copper Flat Mine, and the Hillsboro Pitchfork Ranch; and non-governmental organizations including Amigos Bravos and Gila Resources Information Project.

Hearing Request Determination:

The request for hearing on the Draft Discharge Permit DP-1840

_____ Denied

✓ Approved

Butch Tongate

Butch Tongate, Secretary
New Mexico Environment Department

Date: 3/30/18

Reid, Brad, NMENV

From:	Keeven, Leighandra <lkeeven@blm.gov>
Sent:	Wednesday, April 04, 2018 10:30 AM
To:	Reid, Brad, NMENV; Dail, Bryan, NMENV; Kellermueller, Ronald, DGF
Subject:	Re: Copper Flat Administrative Final EIS for Review
Attachments:	Viewing Secured BLM Documents.pdf

Hi All,

Sorry about the delay in getting you more information on how to review the EIS. Attached is instructions on how to view the EIS from your computer. If this doesn't work for you we can make available a copy at the BLM Sante Fe Office for your review.

The URL is: https://www.nm.blm.gov/copysafe/docs/copperFlat/copperFlatFEIS.html

(NOTE, this URL will only work in the ArtistScope browser)

Login ID: [redacted]
PW: [redacted]

Since I got this to you so late, what kind of review time do you need?

Regards,

Leighandra Keeven
Geologist
Bureau of Land Management
Las Cruces District Office
(575) 525-4337

On Mon, Mar 26, 2018 at 10:58 AM, Keeven, Leighandra <lkeeven@blm.gov> wrote:

> Hi All,
>
> The Copper Flat Mine Administrative Final EIS is available for review. Are any of you interested in reviewing the EIS? If so please let me know so we can figure out the best way for you all to complete your review. The review time frame for this is 2 weeks.
>
> If you have any questions on the project in general please let me know.
>
> Regards,
>
> Leighandra Keeven
> Geologist
> Bureau of Land Management
> Las Cruces District Office
> (575) 525-4337

Memorandum of Meeting or Phone Conversation

☑ Telephone ☐ Meeting	**Time:** 10:30 am	**Date:** 04-05-18	

Individuals Involved

Brad Reid, GWQB-MECS	☑ called	Maggie Karlin, interested party re: Copper Flat Mine.

Subject:
Returned Maggie's 3/23/18 call

Discussion:

NMED staff called back Maggie Karlin to update permit status for DP-1840. She is interested in having a public meeting or hearing for Copper Flat, DP-1840. I informed her that a recommendation for a hearing has been approved by the NMED Secretary and that a date for the hearing is currently being determined.

Conclusions:

Distribution: DP-1840 folder

Initialed BR

Reid, Brad, NMENV

From:	Vollbrecht, Kurt, NMENV
Sent:	Friday, April 06, 2018 10:29 AM
To:	Reid, Brad, NMENV; Knight, Andrew, NMENV
Subject:	FW: Copper Flat TSF design report
Attachments:	1.31.18 permit to alter or repair copper flat tailings dam.pdf

Kurt Vollbrecht, Program Manager
Mining Environmental Compliance Section
Ground Water Quality Bureau
New Mexico Environment Department
(505) 827-0195

From: Jim Kuipers [mailto:jkuipers@kuipersassoc.com]
Sent: Friday, April 6, 2018 10:25 AM
To: Vollbrecht, Kurt, NMENV <kurt.vollbrecht@state.nm.us>
Cc: Shepherd, Holland, EMNRD <holland.shepherd@state.nm.us>
Subject: RE: Copper Flat TSF design report

Kurt/Holland,

The more I look, to my chagrin, they probably don't have to meet the OSE requirements until before construction, and not as part of the Copper Rule application. Also, they have an existing permit with conditions that would require them to do certain things before they restart (see attached). Appreciate the thought and energy you both put into things so just wanted to let you know before you went to far on your end looking into this.

Jim K

From: Vollbrecht, Kurt, NMENV <kurt.vollbrecht@state.nm.us>
Sent: Friday, April 06, 2018 10:09 AM
To: Jim Kuipers <jkuipers@kuipersassoc.com>
Cc: Shepherd, Holland, EMNRD <holland.shepherd@state.nm.us>
Subject: RE: Copper Flat TSF design report

Thanks Jim. We'll take a look.

Kurt Vollbrecht, Program Manager
Mining Environmental Compliance Section
Ground Water Quality Bureau
New Mexico Environment Department
(505) 827-0195

From: Jim Kuipers [mailto:jkuipers@kuipersassoc.com]
Sent: Thursday, April 5, 2018 4:58 PM
To: Vollbrecht, Kurt, NMENV <kurt.vollbrecht@state.nm.us>
Cc: Shepherd, Holland, EMNRD <holland.shepherd@state.nm.us>
Subject: RE: Copper Flat TSF design report

Just talked with Charles Thompson at OSE and THEMAC has apparently not submitted anything related to the TSF other than for maintenance. He did mention they reviewed the EIS but didn't recall they had much in the way of comments.

I'm trying to see how THEMAC would "submit documentation of compliance with the requirements of the dam safety bureau of the state engineer pursuant to Section 72-5-32 NMSA 1978" as per 20.6.7.17 C.1.d" without having even submitted an application, much less an approvable application (e.g. technically complete) without a complete application to OSE. Is the process that they can submit the application after the NMED and MMD permits as long as its before construction? Seems like we are going to end up with two different permitted TSF plans – one based on a feasibility study level design for ED/MMD purposes and another based later on OSE requirements. Sorry if I'm confused but according to the beginning of "C. Engineering plans and specifications requirements. The following engineering plans and specifications and associated requirements shall be submitted to the department for approval with an application for a new, renewed or modified discharge permit, as applicable." I don't want to put anyone on the spot but it seems like a real disconnect has occurred and this should have been identified and corrected in the technical review process.

Jim K

From: Vollbrecht, Kurt, NMENV <kurt.vollbrecht@state.nm.us>
Sent: Thursday, April 05, 2018 3:21 PM
To: Jim Kuipers <jkuipers@kuipersassoc.com>
Subject: RE: Copper Flat TSF design report

Ok. thanks for the clarification.

Kurt Vollbrecht, Program Manager
Mining Environmental Compliance Section
Ground Water Quality Bureau
New Mexico Environment Department
(505) 827-0195

From: Jim Kuipers [mailto:jkuipers@kuipersassoc.com]
Sent: Thursday, April 5, 2018 12:58 PM
To: Vollbrecht, Kurt, NMENV <kurt.vollbrecht@state.nm.us>
Subject: Copper Flat TSF design report

Kurt,

They did submit in their MMD/ED application materials. The mystery is why they haven't submitted to OSE.

JimK

James (Jim) R. Kuipers, P.E.
Consulting Engineer
Kuipers & Associates LLC
PO Box 145 (mailing)
2601 Steel Creek Rd (shipping)
Wisdom MT 59761
406-689-3464
jkuipers@kuipersassoc.com

TOM BLAINE, P.E.
STATE ENGINEER

DAM SAFETY BUREAU
CONCHA ORTIZ Y PINO BLDG
P.O. BOX 25102
SANTA FE, NEW MEXICO 87504
(505) 827-6122
(505) 476-0220 FAX
NM.DamSafety@state.nm.us

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER
Santa Fe
January 31, 2018

Mr. Jeff Smith
Chief Operating Officer
New Mexico Copper Corporation (a subsidiary of TheMac Resources)
4253 Montgomery Blvd. NE, Suite 130
Albuquerque, New Mexico 87109

RE: Permit to Alter or Repair Copper Flat Tailings Dam, Sierra County, OSE File No. D-564

Dear Mr. Smith:

The Office of the State Engineer, Dam Safety Bureau (OSE-DSB) has completed the review of the design documentation for the proposed breach of the splitter dike in the reservoir of the Copper Flat Tailings Dam. Review of the design for the breach found errors that would need to be corrected for a more permanent structure. Because the design is temporary and is conservative the design documentation is accepted for filing. Additional comments for future use are included in the enclosed memo.

Enclosed is your copy of the approved Permit to Alter or Repair a Dam and Reservoir as it relates to the construction of the proposed breach of the splitter dike at Copper Flat Tailings Dam with enclosed conditions of approval. As noted in the conditions of approval for the permit, Copper Flat Tailings Dam shall be operated in accordance with the conditions of the maintenance Waiver Extension issued by the OSE-DSB.

If further discussion would be helpful, please contact Bud Brock, P.E. at (505) 383-4137 or me at (505) 383-4134.

Sincerely,

Charles N. Thompson

Charles N. Thompson, P.E.
Dam Safety Bureau Chief

bb:CNT

cc: Doug Rappuhn, OSE Hydrologist
Mr. Kurt Vollbrecht, NMENV (kurt.vollbrecht@state.nm.us)
Mr. David (DJ) Ennis, MMD (david.ennis@state.nm.us)

Enclosures

Conditions of Approval
Application for Permit to Alter or Repair
Copper Flat Tailings Dam

This application is approved as follows:

Permit No.:	D-564
Purpose of Use:	Tailings Storage
Place of Use:	Dam is located in the NW ¼ of the SW ¼, Section 31, T 15 S, R 6 W, N.M.P.M. in Sierra County.
Amount of Water:	No appropriation of water is authorized under this permit.

Construction Conditions:

1. The Office of the State Engineer, Dam Safety Bureau shall be given a minimum of 14 days notice prior to initiating construction on Copper Flat Tailings Dam.

2. Construction shall be in accordance with the accepted construction drawings. Any proposed modifications to the accepted construction drawings and/or other design changes must be submitted in writing for review and approval by the New Mexico Office of the State Engineer, Dam Safety Bureau ***prior*** to undertaking the modifications.

3. Within sixty (60) days of completion of construction associated with the breach of the splitter dike, New Mexico Copper Corporation shall submit documentation as listed below to the New Mexico Office of the State Engineer, Dam Safety Bureau.

   a. A Construction Completion Report which shall contain:

      i) a summary of activity including descriptions of problems and how they were resolved;

      ii) captioned and dated construction photographs of key features pertinent to the breach of the splitter dike.

   b. Record construction drawings in hard (paper) and electronic (pdf) formats.

4. If construction is not completed by May 31, 2018 the owner must apply for an extension of time to perform the construction activities related to breaching the splitter dike. The application for an extension of time and fee must be received by April 30, 2018. If updated design documentation is required to ensure the design complies with the current regulations for dams (19.25.12 NMAC) then plan review fees are required. Failure to request an extension of time will result in a cancellation of the permit.

Conditions of Approval
Application for Permit to Alter or Repair
Copper Flat Tailings Dam

Operation Conditions:

1. The owner shall act in accordance with the conditions of the Maintenance Waiver Extension. Significant changes to the operation and maintenance of the dam requires prior approval from the State Engineer. Failure to comply with the conditions of the Maintenance Waiver Extension resulting in an unsafe condition may result in an order to reclaim the dam.

2. Changes, alterations, or modifications, not specifically identified in the conditions of the Maintenance Waiver Extension require State Engineer approval prior to making the change.

3. The owner shall provide access to the Office of the State Engineer personnel for periodic dam safety inspections. Failure to comply with State Engineer safety orders may result in an order to reclaim the dam.

4. A change of ownership requires notification to the Office of the State Engineer on a form prescribed and provided by the State Engineer.

5. The owner shall comply with the New Mexico Office of the State Engineer rules and regulations for dams.

Witness my hand and seal this 31st day of January 2018.

Tom Blaine, P.E.
State Engineer

Charles N Thompson

By:
Charles N. Thompson, P.E.
Dam Safety Bureau Chief

bb

NEW MEXICO OFFICE OF THE STATE ENGINEER
APPLICATION FOR PERMIT TO ALTER OR REPAIR A DAM AND RESERVOIR

1. OWNER INFORMATION:

I, Jeffrey Smith of New Mexico Copper Corporation

County of Bernalillo, State of New Mexico, owner of Copper Flat Tailings Dam, hereby make application for the approval of plans and specifications for the repair of Copper Flat Tailings Dam or reservoir.

If the owner is a corporation, give name and address of president and secretary:

Jeffrey Smith, Chief Operating Officer
4253 Montgomery Blvd. NE, Suite 130
Albuquerque, NM 87109

2. LOCATION:

A. NE¼ NW¼ SW¼ Section: 31 Township: 15S Range: 6W N.M.P.M. in Sierra County.

or X = ______feet, Y = ____ feet, N.M. State Plane Coordinate System ___ Zone Datum of_____in the _____ Grant.

B. Latitude in decimal degrees: 32.9576°
Longitude in decimal degrees: -107.4976°

3. HAZARD POTENTIAL CLASSIFICATION: Significant

4. DESCRIPTION OF PROPOSED WORK:

A. Type of dam: Earth embankment with internal splitter dike to separate the reservoir into northern and southern cells

B. Description of work contemplated (Use extra sheets or exhibits if necessary.)

Excavate storm water channel through internal splitter dike to allow storm water to flow from northern to southern cells during a flood event. Design details provided in attached technical memo by Golder Associates.

OSE Permit Number: D-564

NEW MEXICO OFFICE OF THE STATE ENGINEER
APPLICATION FOR PERMIT
TO ALTER OR REPAIR A DAM AND RESERVOIR

5. DESCRIPTION OF DEFICIENCIES OF DAM WITH DESIGN REQUIREMENTS FOR DAMS (19.25.12. 11 NMAC):

Mine tailings deposited in the northern cell have reduced the water holding capacity of the north cell, which may lead to overtopping of the front embankment during a flood event.

6. Work is commenced by estimate Q1 2018 (dependent on OSE approval) and to be completed by 3 months after OSE approval (estimate Q2 2018)

7. Engineer: Golder Associates **8.** Contractor: New Mexico Copper Corp. Self-Perform

9. ACKNOWLEDGEMENT FOR THE DAM OWNER:

I, Jeffrey Smith affirm that the foregoing statements are true to the best of my knowledge and belief. I fully understand the repair and alteration related to this dam and the responsibility and liability related to dam ownership.

Signed: J Smith Date: Dec 12, 2017

Subscribed and sworn to before me this 12th day of December, 2017

Notary Public: Katharyn Emmer

My commission expires: 14 March 2020

OFFICIAL SEAL
Katharyn Emmer
NOTARY PUBLIC
STATE OF NEW MEXICO
My Commission Expires: 14 March 2020

(SEAL)

INSTRUCTIONS

Use this form if the properties of the dam or appurtenant structures *will not* change as a result of the alteration or repair. This form shall be filed with original signatures and accompanied by construction drawings, specifications, design report, etc. and filing fee of $25.00 for the application and plan review fee of $2.00 per $1000 of construction cost for dam and appurtenances. Owners repairing a dam to address a dam safety deficiency may request a waiver of the plan review fee. This form and supporting documentation shall be delivered to the attention of the OSE Dam Safety Bureau, P.O. Box 25102, Santa Fe, New Mexico.

Hit "F1" key for additional instructions for each cell. Cell sizes are limited.

Office of the State Engineer Dam File Number required.
Section 1 Name and address of the representative of the owner making the application. Private owners must enter their name. Public or corporate owners must enter the name of the official authorized to make the application. Name of dam must also be entered.
Section 2 Location of dam is required.
Section 3 Hazard potential classification is required. Refer to 19.25.12.10 NMAC.
Section 4 Items A and B are required.
Section 5 Describe the dam deficiency as it relates to the design requirements in 19.25.12.11 NMAC
Section 6 Dates of estimated start and completion of work are required.
Section 7 Name of Design Engineer.
Section 8 Name of Contractor selected.
Section 9 Dam Owner's printed name and notarized signature are required.

MEMORANDUM
OFFICE OF THE STATE ENGINEER
Dam Safety Bureau

DATE: January 18, 2018

TO: Charles N. Thompson, P.E., Chief, Dam Safety Bureau CNT

FROM: Bud Brock, P.E., Dam Safety Engineer

SUBJECT: Review of the Copper Flat Tailings Storage Facility, Splitter Dike Breach Application Documents, Sierra County, OSE File No. D-564

I have reviewed the Splitter Dike Breach Application Documents consisting of a cover letter by New Mexico Copper Corporation (NMCC) dated December 12, 2017; an Application for Permit to Alter or Repair a Dam and Reservoir dated December 12, 2017; a check for $45.00; and the *Copper Flat Tailings Storage Facility, Internal Dike Breach Design Technical Memorandum* (Tech Memo) prepared by Golder Associates, dated December 11, 2017. The Splitter Dike Breach Application Documents were hand delivered to the Office of the State Engineer, Dam Safety Bureau (OSE-DSB) on December 14, 2017. The submittal is in response to a requirement in the maintenance waiver extension conditions transmitted to NMCC in a letter dated September 18, 2017 that the design for the breach of the splitter dike be submitted to the OSE-DSB before December 31, 2017. The cover letter signed by Jeff Smith, COO, NMCC explains the purpose of the submittal and the fee breakdown consisting $25 for the application filing fee and $20 for the plan review fee. This is the first submittal of the Splitter Dike Breach Application Documents.

No comments were generated by a review of the Application for Permit to Alter or Repair a Dam and Reservoir.

The review of the Tech Memo discovered a few errors in the calculations. For example, in Step 2.2 of determining the rainfall values for the Local PMP event, the 1-hour rainfall value of 11.75 was increased by 1.0% due to incorrectly interpreting Figure 14.3 from HMR 55A. The 1-hour rainfall value should have been multiplied by 1 (100%) which would result in no increase in the 1-hour rainfall value. This error results in a slightly conservative analysis as it slightly increases the rainfall values used in the analysis. Another error discovered is in the calculation of the basin lag time (Lg) for subbasin South Cell. The incorrect conversion factor was used when converting the length of the longest watercourse (L) and length of the longest watercourse to the basin centroid (Lca) for the South Cell subbasin. The lengths in feet of L = 4895 ft and Lca = 1800 ft should have been divided by 5280 ft/mi to get the lengths in miles of L = 0.927 mi and Lca = 0.341 mi. The values in the first table in Attachment 2-2 for L and Lca are 3.0416 mi and 1.1185 mi, respectively. This results in the lag time for South Cell subbasin being calculated as 0.64 hour, but it should be 0.29 hour, or slightly less than half the value used. This will measurably reduce the peak flow from the South Cell subbasin. However, the flow from the South Cell subbasin does not pass through the proposed breach so it will have no affect on the breach design. Also, no information, electronic or hard copy, was provided on the calculations for the Southwest Desert S-Graph. Other minor errors in the calculations will have no affect or an insignificant affect on the design. As the errors will have no affect on the design or are conservative in nature, no revisions are required for this submittal. However, the hydrologic results of the Tech Memo are not of sufficient quality to be used for any other purposes other than the design of the breach in the splitter dike.

It should be noted that no electronic data, such as the Excel spreadsheets, HMS model, pdf of the report, etc. were submitted with the Splitter Dike Breach Application Documents. Submittal of electronic documents is a requirement of all submittals. In addition, all submittals are required to be bound in a three ring binder (preferred) or comb bound. Loose submittals are not allowed. These and other requirements are detailed in the OSE-DSB white paper *Technical Reports for Dams*, January 5, 2012, which is available on the OSE-DSB website. The Owner and Engineer need to keep these in mind for any future submittals.

As the errors in the Tech Memo will have no significant affect on the design of the breach in the splitter dike, I recommend the Splitter Dike Breach Application Documents be accepted for filing and the Permit to Alter or Repair a Dam and Reservoir be issued for the purposes of breaching the splitter dike at the Copper Flat Tailings Storage Facility.

Bud Brock, P.E.
OSE Dam Safety Bureau

bb

Review of these documents is only for completeness and general compliance with state regulations; the feasibility or cost effectiveness of the project has not been evaluated. Any OSE approval shall not be interpreted or construed as any warranty or guarantee. Approval of the documents does not relieve the owner or engineer of legal responsibilities for the overall integrity of the project, adequacy of the design, or full compliance with applicable regulations. The Office of the State Engineer is not responsible for increased costs resulting from defects in the plans, design drawings, specifications, engineering studies, or other contract documents. Continued compliance with State regulations will require that the facility be properly constructed, operated, and maintained.

From:	Katie Emmer <kemmer@themacresourcesgroup.com>
Sent:	Friday, April 06, 2018 10:02 AM
To:	Mascarenas, Melissa, NMENV
Cc:	Reid, Brad, NMENV
Subject:	Information Request
Attachments:	InformationRequest_6April2018.pdf

Greetings Ms. Mascareñas,

Attached please find an Information Request. If you have any questions or need anything further, please let me know.

Best regards,

Katie Emmer | Permitting & Environmental Compliance Manager

M: +1 505.400.7925| **F:** +1 505.881.4616
A: 4253 Montgomery Blvd. NE, Suite 130, Albuquerque, NM 87109
W: themacresourcesgroup.com | **E:** kemmer@themacresourcesgroup.com

THEMAC RESOURCES | NEW MEXICO COPPER CORPORATION

NEW MEXICO ENVIRONMENT DEPARTMENT
INSPECTION OF PUBLIC RECORD REQUEST FORM

Please fill out the following information:

1. Date: 6 April 2018
2. Requestor's Name: Katie Emmer
3. Requestor's Address: 4253 Montgomery Blvd, NE, Suite 130
   Albuquerque, NM 87109
4. Phone No.: (505)400-7925
5. Email: **kemmer@themacresourcesgroup.com**
6. Company Being Represented: New Mexico Copper Corporation
7. Address: See above
8. Document or File being requested to be reviewed or copied (please describe the records in sufficient detail to enable Department personnel to reasonably identify & locate the records:

   Requesting letter from ELC or Jim Kaipers regarding NMCC's Discharge Permit Application and compliance with NMAC 20.6.7.17. Also requesting any recent correspondence from ELC or consultants in ELC's employ regarding the NMCC Discharge Permit Application or upcoming public hearing, if NMED has received such correspondence.

9. NMED Bureau where Document/File can be found (if known): GWQB

Katie Emmer
Signature

The cost for copying by NMED is as indicated on Attachment A. Please send this request to:

Melissa Y. Mascareñas
Inspection of Public Records Officer
1190 St. Francis Drive, Ste. N-4050
Santa Fe, New Mexico 87505
fax: (505) 827-1628 or
email: melissa.mascarenas@state.nm.us

Revised 6/14/12

Reid, Brad, NMENV

From: Dail, Bryan, NMENV
Sent: Wednesday, April 11, 2018 10:24 AM
To: Reid, Brad, NMENV
Cc: Fullam, Jennifer, NMENV
Subject: RE: BLM EIS

Good morning.

We did two things last week, Jenn asked BLM if we could get an extension (should have talked with you) and the 16th is our deadline, I believe...my own deadline is yesterday/today (on new edits) (not much extra time, I know!).

I inquired to IT about d/l-ing ArtistScope and they (CL) refused me in so many words, so I arranged to view it last Friday at the BLM in Albuquerque (they would have made arrangements in SF as well, but as I was to be down there...).

It is still available to us in ABQ if needed. I am in SF today. My contact with the BLM (other than Leighandra) for viewing is Kirstin Long, kmlong@blm.gov (505)761-8797.

This afternoon should be fine.

From: Reid, Brad, NMENV
Sent: Wednesday, April 11, 2018 10:12 AM
To: Dail, Bryan, NMENV <Bryan.Dail@state.nm.us>
Subject: RE: BLM EIS

Were you able to view it? I tried looking at it yesterday using that ArtistScope, and it said the document was expired.

I'm working on a letter this morning but should have a little time this afternoon. Are you in SF or ABQ? Brad

---

From: Dail, Bryan, NMENV
Sent: Wednesday, April 11, 2018 10:01 AM
To: Reid, Brad, NMENV <brad.reid@state.nm.us>
Subject: BLM EIS

Hello Brad:

Would you be able to carve out thirty minutes today to discuss some of my responses to BLM regarding the EIS?

I am largely open.

-B

Reid, Brad, NMENV

From:	Fullam, Jennifer, NMENV
Sent:	Tuesday, April 17, 2018 4:38 PM
To:	Keeven, Leighandra; Knight, Andrew, NMENV; Vollbrecht, Kurt, NMENV; Reid, Brad, NMENV; Barrios, Kristopher, NMENV; Fullam, Jennifer, NMENV; Dail, Bryan, NMENV; Shepherd, Holland, EMNRD; Ennis, David, EMNRD; Kellermueller, Ronald, DGF
Cc:	Lemon, Shelly, NMENV
Subject:	Comments to Copper Flat Administrative Final Environmental Impact Statement
Attachments:	Letter to BLM regarding comments to Copper Flat EIS 20180417 Signed.pdf

Good afternoon,

Attached is the Surface Water Quality Bureau's comments to the Copper Flat Mine Administrative Final EIS. We appreciate having the opportunity to provide comment.

Please consider this your copy as a hard copy will not be provided with exception of the recipient (Leighandra Keeven, BLM).

Thank you.

Jennifer Fullam
Standards, Planning & Reporting Team Leader
Surface Water Quality Bureau
New Mexico Environment Department
1190 S. St. Francis Dr.
Santa Fe, NM 87505
Phone: 505.827.2637

NEW MEXICO
ENVIRONMENT DEPARTMENT

SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lt. Governor

Harold Runnels Building
1190 South St. Francis Drive (87505)
P.O. Box 5469, Santa Fe, NM 87502-5469
Phone (505) 827-0187 Fax (505) 827-0160
www.env.nm.gov

BUTCH TONGATE
Cabinet Secretary

J. C. BORREGO
Deputy Secretary

April 17, 2018

Leighandra Keeven, Geologist
Bureau of Land Management
Las Cruces District Office
1800 Marquess Street
Las Cruces, NM 88005

Subject: Copper Flat Administrative Final Environmental Impact Statement

Dear Miss Keeven:

The Surface Water Quality Bureau ("SWQB") of the New Mexico Environment Department ("NMED") appreciates the opportunity to provide review and comment on the above-titled document. Through a memorandum of understanding between NMED and the Bureau of Land Management ("BLM"), NMED is listed as a cooperating agency on this Administrative Final Environmental Impact Statement ("EIS") for the Copper Flat Mine ("CFM") and therefore provides the following comments:

1) The SWQB concurs that proper storage (minimizing run off to surface waters) of overburden, waste rock piles, and low-grade ore during and after mine life are crucial to protecting surface water quality. Since much of these matrices are to be on BLM lands and since the mine could be subject to unexpected closures, it is important that these storage facilities are developed at the start of CFM life to protect surface water quality according to 20.6.4.6 and 20.6.4.7 S(5) New Mexico Administrative Code ("NMAC").

2) Section 2-6 states the Greyback Arroyo, the watercourse altered through previous mining operations by Quintana Resources, is not to be altered further excepting remediation of existing waste rock piles and roads that need removal at mine closure. CFM operations should provide a demonstration of protections afforded to surface waters in Greyback during mine life. Section 2.1.15.10, the "Interim Management Plan" and section 2.1.15.13 indicate measures to isolate waste rock leachates during unplanned or temporary closures. These measures need to include (or emphasize) consideration of any water/stormwater discharges to Greyback Arroyo.

3) In section 2.1.11 of the EIS, fencing and other exclusions of livestock and wildlife are discussed and may preclude some wildlife uses at the pit lake. However, these measures would likely not exclude waterfowl and other avian species; smaller vertebrate species, such as amphibians, reptiles and mammals; and insects. Potential barriers to avians are noted but not with detail about which methodologies would be employed, or the extent to which these structures would be maintained, and for how long, after mine closure.

4) The BLM has determined that the current and future mine pit lake will be wholly on patented mine claims, and thus private land. Pages 2-46 and 2-47 state that "because the mine pit lake is privately owned...and a hydrologic sink, [CFM pit lake] water is neither a water of the state, nor a water of the U.S. and would not be required to meet state surface water quality standards [20.6.4 NMAC]". It is also stated that the pit lake water quality, since it is not a water of the state, would meet permit conditions imposed by New Mexico Mining and Mineral Division ("MMD"), based on 19.10.6.603 NMAC, which states the water quality will be similar to what existed prior to the start of mining operations. In accordance with 20.6.4.7 S(5) NMAC, a "...water of the state does not include private waters that do not combine with other surface or subsurface water...". The determination that the pit lake will respond as a hydrologic sink through variable site conditions over time is subject to continued monitoring and verification. The SWQB feels it premature to assert jurisdiction of the waters within the mine pit lake until such a time to which the New Mexico Environment Department has been provided sufficient information to support adetermination. The SWQB requests language reflecting conditions for both scenarios; that in which the water is deemed to be private and does not combine with other surface or subsurface water, and that in which it does.

5) More detail is needed regarding the existing waste rock pile "west of the pit" [pg. 2-46] which is to be "reclaimed such that the western portion of the pit perimeter would be graded to drain away from the pit into a proposed toe channel that drains to Greyback Arroyo diversion". Pending specifics for reclamation of the waste rock pile such as the use of native soil for capping, run-off and leachate from the reclaimed areas pose a direct threat to the surface water quality of Greyback Arroyo, which is protected under the State's Standards for Interstate and Intrastate Surface Waters. The SWQB requests the EIS address how the reclamation plans to address protections of the water quality of Greyback Arroyo.

6) The EIS states that "during operations...NMCC would periodically update geochemical and hydrologic prediction models to incorporate new information to minimize impacts to wildlife". Further, that the protection and other mitigation to protect birds may include investigations of other measures "to the extent practicable". SWQB would like to clarify that incorporation of new information into the models would then lead to on-the-ground actions to minimize impacts to wildlife. Also, the SWQB would like to see the EIS address actions proposed to eliminate or severely reduce expcsure to wildlife from stormwater leachates collected from low-grade reactive ore.

7) Section 3.4, "Water Quality" [pg. 3-21] states that characterization of the affected environment for water quality is pertinent for several reasons and that defining baseline water quality will be essential for assessing whether post-mine water quality has been degraded. While the SWQB recognizes this element is required in accordance with 19.10.6.603 NMAC, it does not supersede the water quality standards afforded to any water of the state, such as Greyback Arroyo. The EIS acknowledges this but notes that surface water in Greyback Arroyo is subject to ephemeral water quality standards. As an unclassified water of the state, the intermittent water quality standards under 20.6.4.98 NMAC apply to Greyback Arroyo until a hydrology protocol ("HP") survey and a Use Attainability Analysis ("UAA") are conducted and approved by the WQCC and EPA in accordance 20.6.4.15 NMAC. The SWQB requests language be changed to accurately reflect the current protections afforded to Greyback Arroyo as intermittent.

8) The SWQB requests that the environmental and ecological impacts to nearby watersheds associated with draw down during mine operation and post-closure rapid fill of the pit be addressed; specifically, those within the Percha and Animas creeks.

Again, thank you for this opportunity to comment on the BLM's Administrative Final EIS for the Copper Flat Mine. If you have any questions, please contact me by email at shelly.lemon@state.nm.us, or Bryan Dail by email at bryan.dail@state.nm.us.

Sincerely,

Shelly Lemon

Shelly Lemon, Chief
Surface Water Quality Bureau
New Mexico Environment Department

Cc: Andrew Knight, Office of General Counsel, NMED (via email)
Kurt Vollbrecht, Program Manager, Ground Water Quality Bureau (via email)
Brad Reid, Environmental Scientist, Ground Water Quality Bureau (via email)
Kris Barrios, Monitoring, Assessment and Standards Section Program Manager, SWQB (via email)
Jennifer Fullam, Standards, Planning & Reporting Team Leader, SWQB (via email)
Bryan Dail PhD., Environmental Scientist (via email)
Holland Shepherd, ENMRD (via email holland.shepherd@state.nm.us)
David Ennis, ENMRD (via email David.Ennis@state.nm.us)
Ronald Kellermueller, DGF (via email Ronald.Kellermueller@state.nm.us)

Reid, Brad, NMENV

From:	Lemon, Shelly, NMENV
Sent:	Thursday, April 26, 2018 11:32 AM
To:	Keeven, Leighandra; Knight, Andrew, NMENV; Vollbrecht, Kurt, NMENV; Reid, Brad, NMENV; Barrios, Kristopher, NMENV; Fullam, Jennifer, NMENV; Dail, Bryan, NMENV; Shepherd, Holland, EMNRD; Ennis, David, EMNRD; Kellermueller, Ronald, DGF
Subject:	RE: Comments to Copper Flat Administrative Final Environmental Impact Statement
Attachments:	Letter to BLM - clarifications to Copper Flat EIS comments 20180426.pdf

Good morning,

Attached are some clarifications regarding the Surface Water Quality Bureau's comments to the Copper Flat Mine Administrative Final EIS sent April 17, 2018.

Please consider this your copy as a hard copy will not be provided with exception of the recipient (Leighandra Keeven, BLM).

Regards,
Shelly Lemon

Shelly Lemon
NMED - Surface Water Quality Bureau
Bureau Chief
1190 S. St. Francis Dr.
Santa Fe, NM 87505
(505) 827-2819

From: Fullam, Jennifer, NMENV
Sent: Tuesday, April 17, 2018 4:38 PM
To: Keeven, Leighandra <lkeeven@blm.gov>; Knight, Andrew, NMENV <Andrew.Knight@state.nm.us>; Vollbrecht, Kurt, NMENV <kurt.vollbrecht@state.nm.us>; Reid, Brad, NMENV <brad.reid@state.nm.us>; Barrios, Kristopher, NMENV <Kristopher.Barrios@state.nm.us>; Fullam, Jennifer, NMENV <Jennifer.Fullam@state.nm.us>; Dail, Bryan, NMENV <Bryan.Dail@state.nm.us>; Shepherd, Holland, EMNRD <holland.shepherd@state.nm.us>; Ennis, David, EMNRD <David.Ennis@state.nm.us>; Kellermueller, Ronald, DGF <Ronald.Kellermueller@state.nm.us>
Cc: Lemon, Shelly, NMENV <Shelly.Lemon@state.nm.us>
Subject: Comments to Copper Flat Administrative Final Environmental Impact Statement

Good afternoon,

Attached is the Surface Water Quality Bureau's comments to the Copper Flat Mine Administrative Final EIS. We appreciate having the opportunity to provide comment.

Please consider this your copy as a hard copy will not be provided with exception of the recipient (Leighandra Keeven, BLM).

Thank you.

Jennifer Fullam
Standards, Planning & Reporting Team Leader
Surface Water Quality Bureau

NEW MEXICO
ENVIRONMENT DEPARTMENT

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BUTCH TONGATE
Cabinet Secretary

J. C. BORREGO
Deputy Secretary

April 26, 2018

Leighandra Keeven, Geologist
Bureau of Land Management
Las Cruces District Office
1800 Marquess Street
Las Cruces, NM 88005

Subject: Copper Flat Administrative Final Environmental Impact Statement

Dear Ms. Keeven:

Through a memorandum of understanding between the New Mexico Environment Department ("NMED") and the Bureau of Land Management ("BLM"), NMED is listed as a cooperating agency on this Administrative Final Environmental Impact Statement ("EIS") for the Copper Flat Mine ("CFM"). Therefore, the Surface Water Quality Bureau ("SWQB") of the NMED provided comments dated April 17, 2018 on the above-titled document. The SWQB would like to provide the following clarifying points regarding comment #4 and a surface waters of the state determination.

4) In accordance with 20.6.4.7 S(5) NMAC, a "...water of the state does not include private waters that do not combine with other surface or subsurface water...". A property plat for the pit area was completed and sealed by a registered land surveyor, recorded with Sierra County, and submitted to BLM for review. The survey and plat confirm that the current and future mine pit lake is entirely on patented mine claims, and thus private lands. Furthermore, probable hydrologic consequences related to the development of the Copper Flat Project have been evaluated using a numerical model developed from the United States Geological Survey ("USGS") groundwater-flow modeling code MODFLOW. The model was calibrated and verified, and the results demonstrate an evaporative sink for the future open pit lake, such that the pit lake waters will not mix with subsurface waters.

   Pursuant to 19.10.6.606 NMAC of the New Mexico Mining Act, no Mining Act permit shall be issued until the Secretary of the Environment Department has provided a written determination stating that the applicant has demonstrated that the activities to be permitted or authorized will be expected to achieve compliance with all applicable air, water quality, and other environmental standards if carried out as described in the permit application. The land survey and hydrologic model are the key components to the determination of applicable surface water quality standards. However, a determination by SWQB on the status of the pit lake as a water of the state and applicability of surface water quality standards has not yet been made, even though there is sufficient information, because it is not the appropriate time in the process to issue a written determination by the NMED Secretary.

The SWQB also would like to provide the following clarifying points regarding comment #6 and actions to eliminate or reduce exposure of wildlife to stormwater.

6) The National Pollutant Discharge Elimination System ("NPDES") program regulates stormwater discharges from eleven categories of industrial activity. Category three (iii) is related to coal and mineral mining. Permit coverage is required of all phases of mining operations, whether active or inactive, as long as there is exposure to significant materials. Common requirements for coverage under an industrial stormwater permit include a stormwater pollution prevention plan (SWPPP). The SWPPP is a written assessment of potential sources of pollutants in stormwater runoff and control measures that are implemented to minimize the discharge of pollutants in runoff from the site.

   The SWQB acknowledges that compliance with a SWPPP that meets the requirements of the stormwater permit is generally assumed to be protective of surface water quality.

Again, thank you for the opportunity to review and comment on the BLM's Administrative Final EIS for the Copper Flat Mine. If you have any questions, please contact me by email at shelly.lemon@state.nm.us, or Bryan Dail by email at bryan.dail@state.nm.us.

Sincerely,

Shelly Lemon

Shelly Lemon, Chief
Surface Water Quality Bureau
New Mexico Environment Department

Cc: Andrew Knight, Office of General Counsel, NMED (via email)
Kurt Vollbrecht, Program Manager, Ground Water Quality Bureau (via email)
Brad Reid, Environmental Scientist, Ground Water Quality Bureau (via email)
Kris Barrios, Program Manager, SWQB (via email)
Jennifer Fullam, Standards, Planning & Reporting Team Leader, SWQB (via email)
Bryan Dail PhD., Environmental Scientist, SWQB (via email)
Holland Shepherd, ENMRD (via email holland.shepherd@state.nm.us)
David Ennis, ENMRD (via email David.Ennis@state.nm.us)
Ronald Kellermueller, DGF (via email Ronald.Kellermueller@state.nm.us)

From: Pat Gordon <pgordon@eplawyers.com>
Sent: Thursday, April 26, 2018 1:01 PM
To: Reid, Brad, NMENV
Subject: FW: New Mexico Copper Corporation (NMCC) - Discharge Permit
Attachments: Tom Blaine - Application for Permit to Appropriate NMCC - Notice of Viol....pdf

Dear Mr. Reid:

I am the Rio Grande Compact Commissioner for the State of Texas. Attached is a letter delivered to Tom Blaine.

I want to reach out and put you on notice regarding Texas's concern and objection to the Copper Flat Mine, especially regarding its impacts relating to the quantity and quality of water in the Rio Grande and Caballo Reservoir, which is water delivered by New Mexico to Texas under the Rio Grande Compact. We believe the draft EIS issued by the BLM has errors and fails to address Compact issues which will damage Texas. Texas also has concerns with NMCC mitigating damages caused by its operations to the Rio Grande and waters in Caballo Reservoir with a lease of San Juan Chama water. Texas will raise further objections if discharge permits are considered. We believe any discharge will have an adverse impact on waters delivered to Texas.

If you have questions, you can contact me at the address below.

Sincerely,

Pat Gordon
Rio Grande Compact Commissioner

Pat Gordon | Partner
4695 North Mesa Street | El Paso, TX 79912
T (915) 545-1133 | **F** (915) 545-4433 | **E** pgordon@eplawyers.com
GORDON DAVIS JOHNSON & SHANE P.C.
EPLAWYERS.COM DISCLAIMER

RIO GRANDE COMPACT COMMISSION

PATRICK R. GORDON
TEXAS COMMISSIONER

401 E. FRANKLIN AVE., STE 560
EL PASO, TEXAS 79901-1212
TELEPHONE: (915) 834-7075
FAX : (915) 834-7080

April 12, 2018

VIA ELECTRONIC MAIL AND
FIRST CLASS MAIL

Mr. Tom Blaine
New Mexico Compact Commissioner
Office of the State Engineer
P.O. Box 25102
Santa Fe, New Mexico 87102

Re: Application for Permit to Appropriate – New Mexico Copper Corporation ("NMCC") – Notice of Violation of Rio Grande Compact

Dear Commissioner Blaine:

Texas has recently been informed that an Application for Permit to Appropriate 5,234 acre feet of water (the "Application") by NMCC is in the process of being approved by New Mexico. The Application states that this water is needed by NMCC for the operation of a mine ("Mine") located close to the Rio Grande and Caballo Reservoir.

The Draft Environmental Impact Statement ("DEIS") for the Mine and the Hydrology Report prepared by John Shomaker & Associates, Inc. dated December 2017 reflect that the Mine will have a direct, large in magnitude, and long term impact on Compact water delivered by New Mexico to Texas in the Rio Grande and stored in Caballo Reservoir. The New Mexico Interstate Stream Commission ("NMISC") confirms this in a letter dated February 26, 2016, objecting to the DEIS. I wanted to put you on notice of Texas's concerns.

New Mexico is a party to the Rio Grande Compact, see Act of May 31, 1939, ch. 155, 53 Stat. 785 (the "Compact"), along with the States of Texas and Colorado. The Compact apportions the waters of the Rio Grande between the States of Colorado, New Mexico and Texas. The Compact also provides for the delivery of water to Mexico under a 1906 Treaty. New Mexico delivers Texas's apportioned water under the Compact in Elephant Butte Reservoir. At such time, the water belongs to Texas and is only available for use by Texas and certain contract and treaty parties in New Mexico, Texas and Mexico. New Mexico is prohibited from diverting or using Texas's water.

Texas is aware of NMCC's attempts to acquire rights to water that would purportedly offset the impacts to the Rio Grande and Caballo Reservoir. The fifteen year lease that NMCC has with the Jicarilla Apache Nation for San Juan Chama water that New Mexico may require as some type of offset for the diversion of Texas's Compact water would not come close to remedying the immediate and long term depletions to the Rio Grande and Caballo Reservoir caused by the Mine. In fact, NMCC states in the Application that it needs this water to operate the Mine. The DEIS states that the impacts to the Rio Grande and Caballo Reservoir will last over 100 years. A "so called" fifteen year offset that New Mexico calculates in its sole discretion does not remedy the harm to Texas that will be caused by the approval of the Application, even assuming as stated by the NMISC that such offset was in "real-time."

As you are aware, Texas sued New Mexico in the United States Supreme Court, see Texas v. New Mexico, Original No. 141. This case is currently before the Court and is moving forward toward trial and resolution, following the Court's denial of New Mexico's motion to dismiss. Discovery will commence soon.

The NMCC proposed actions and the granting of water rights by your office will directly and adversely impact Texas. New Mexico's approval of this action, as well as granting permits for other actions (such as the Gillis pump immediately below the Caballo Reservoir), are violations of the Compact. These ongoing violations reinforce Texas's action in the United States Supreme Court and add to its recoverable damages against New Mexico.

Sincerely,

Pat Gordon

Pat Gordon,
Texas Commissioner

cc: Kevin Rein, Colorado Compact Commissioner
Hal Simpson, Federal Chairman, Rio Grande Compact Commission

17591

Reid, Brad, NMENV

From:	Janet Correll <janet@h2o-legal.com>
Sent:	Thursday, April 26, 2018 3:00 PM
To:	Reid, Brad, NMENV
Cc:	Samantha Barncastle; Esslinger, Gary
Subject:	Request for Additional 60 Day Extension of Comment Period for DP-1840 (Copper Flat Mine)
Attachments:	2nd Req. to NMED for 60 Day Ext. of Comment Period Re Copper Flat Mine.Signed.4.26.2018.pdf

Dear Mr. Reid, attached you will find a letter from attorney Samantha Barncastle regarding the above matter. Please let us hear from you at your earliest convenience. Thank you.

Janet L. Correll, Paralegal for Samantha R. Barncastle
Barncastle Law Firm
P.O. Box 1556
Las Cruces, NM 88004
Ph: 575-636-2377

BARNCASTLE LAW FIRM, LLC

1100 South Main, Ste. 20
Las Cruces, NM 88005

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Las Cruces, NM 88004

Phone: (575) 636-2377
Fax: (575) 636-2688

April 26, 2018

Brad Reid
New Mexico Environment Department
P.O. Box 5469
Santa Fe, NM 87502-5469

Via Email to: Brad.Reid@state.nm.us

Re: Request for Additional 60 Day Extension of Public Comment Period for DP-1840.

Dear Mr. Reid,

As I believe you are aware, I am general counsel for the Elephant Butte Irrigation District. On February 14, 2018, I submitted to you a request for an extension of time for the public comment period for the Copper Flat Mine, proposed GWQB Discharge Permit Number DP-1840. That initial request was granted, and the comment period was extended to May 4, 2018.

Also on February 14, 2018, I submitted an IPRA Request to the New Mexico Environment Department (NMED) regarding DP-1840, and received NMED's response to that request a couple of weeks ago at the beginning of April. The response received from the NMED is quite massive and consists of thousands of pages of documents. Compounding the normal difficulties associated with review of such a large document production is the fact that the documents are not organized or indexed at all, and our experts are having to expend a great deal of time in order to first sort and organize all of the documents received. Our preliminary review has quickly led us to believe that there is a great deal more to this situation than we expected and that we may even be missing documents that should have been produced, but that we cannot find even though we are aware of their existence. We are respectfully requesting an additional 60 day extension of time in which to submit our comments. We believe an additional 60 days will provide a more fair opportunity for us to review the documents and information received, determine whether additional documents need to be requested, and prepare/submit our comments regarding DP-1840.

We would appreciate your every consideration to this request, and would ask that you respond via email at your earliest convenience due to the obvious time constraints involved. Please also feel free to contact me directly if you have any questions or concerns regarding this request.

Sincerely,

BARNCASTLE LAW FIRM

By ______________________
Samantha R. Barncastle

xc: Client
SRB/jlc

Reid, Brad, NMENV

From:	Katie Emmer <kemmer@themacresourcesgroup.com>
Sent:	Friday, April 27, 2018 3:33 PM
To:	Reid, Brad, NMENV
Subject:	NMCC - 5 maps
Attachments:	CopperFlat_5Maps_JSAI_Jan2018.pdf

Hi Brad,

Here are the five maps you asked for over the phone yesterday. To the best of my memory, we submitted a hard copy of these in person in January 2018 because understood you believed they would be nice to see. I can't find any record of NMCC submitting them electronically pervious to today, perhaps because we understood these to be an informal request. Anyway, that's my best memory and I hope this is helpful. Let me know if you need anything else.

Best regards,

Katie Emmer | Permitting & Environmental Compliance Manager

M: +1 505.400.7925| **F:** +1 505.881.4616
A: 4253 Montgomery Blvd. NE, Suite 130, Albuquerque, NM 87109
W: themacresourcesgroup.com | **E:** kemmer@themacresourcesgroup.com

THE MAC RESOURCES | NEW MEXICO COPPER CORPORATION

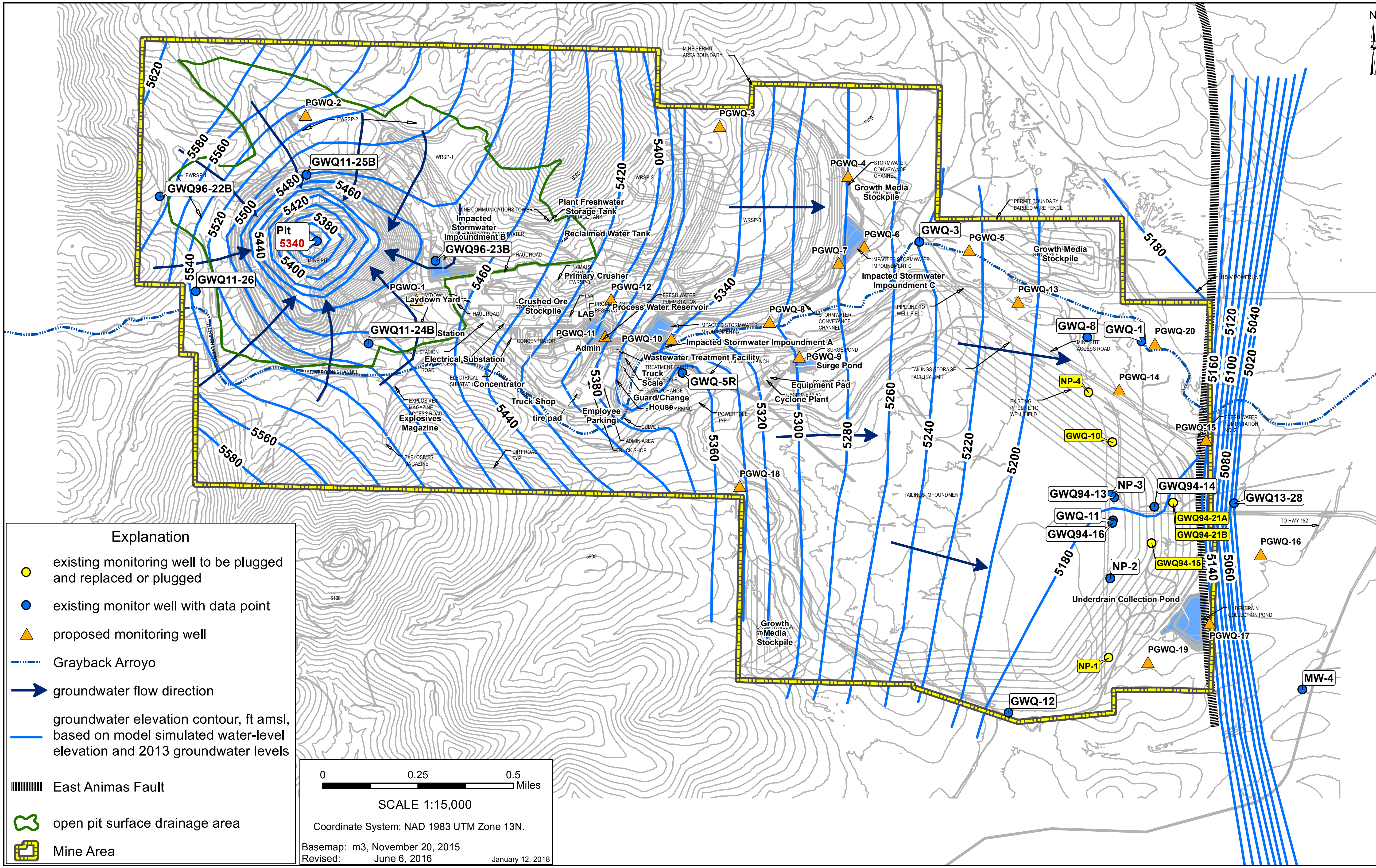

Figure 2a. Groundwater flow direction projected after 1 year of mine operation.

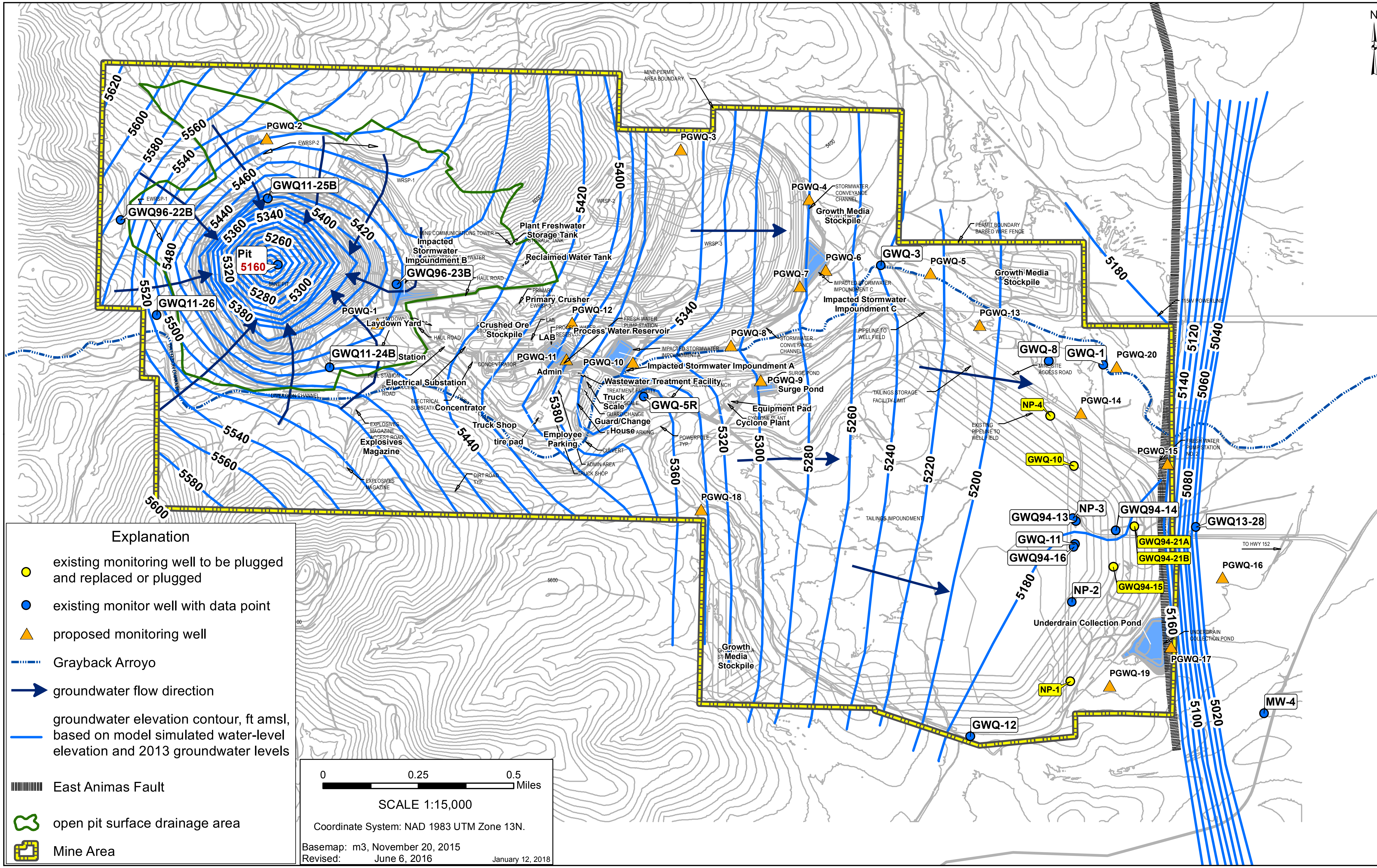

Figure 2b. Groundwater flow direction projected after 2 years of mine operation.

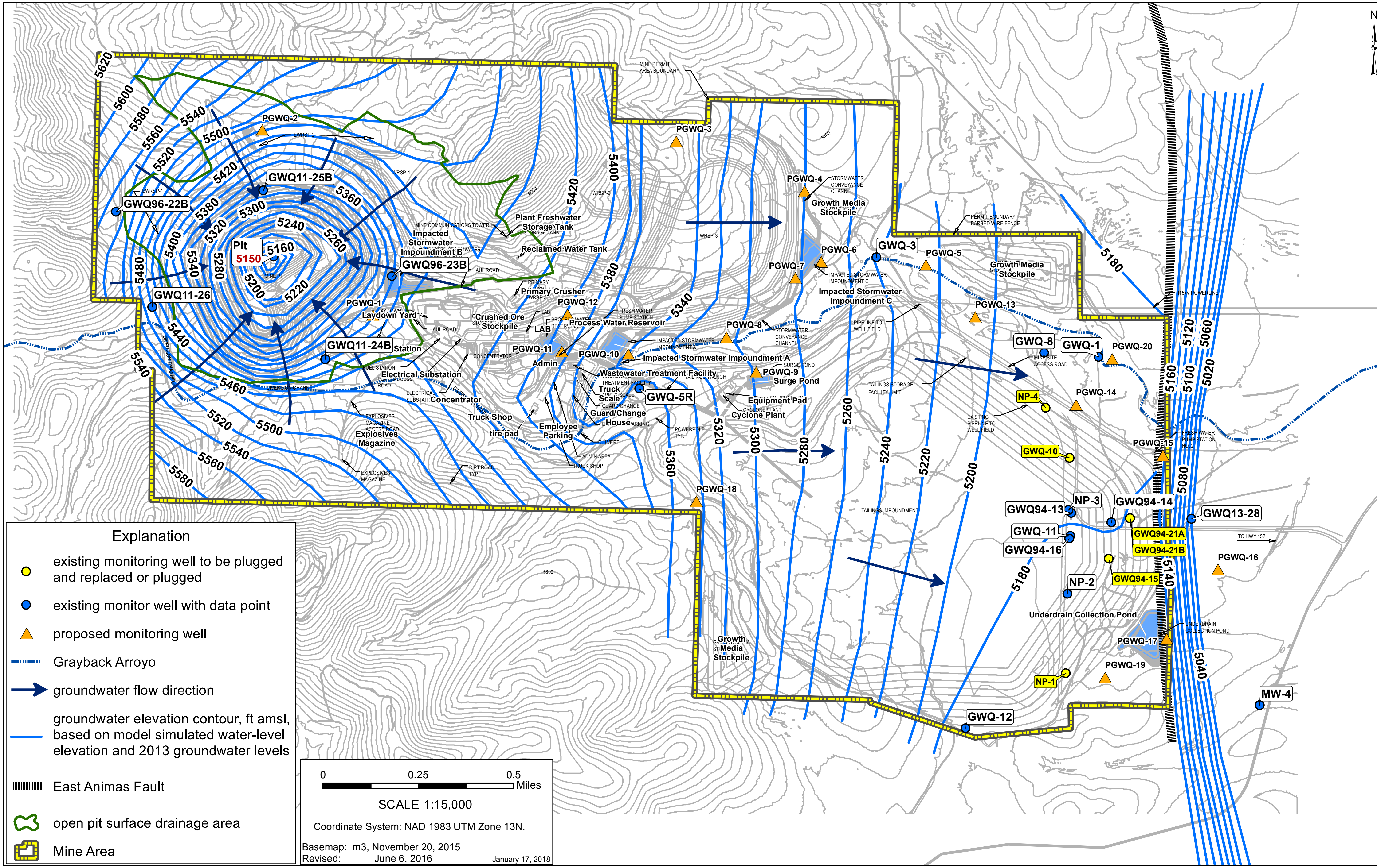

Figure 2c. Groundwater flow direction projected after 3 years of mine operation.

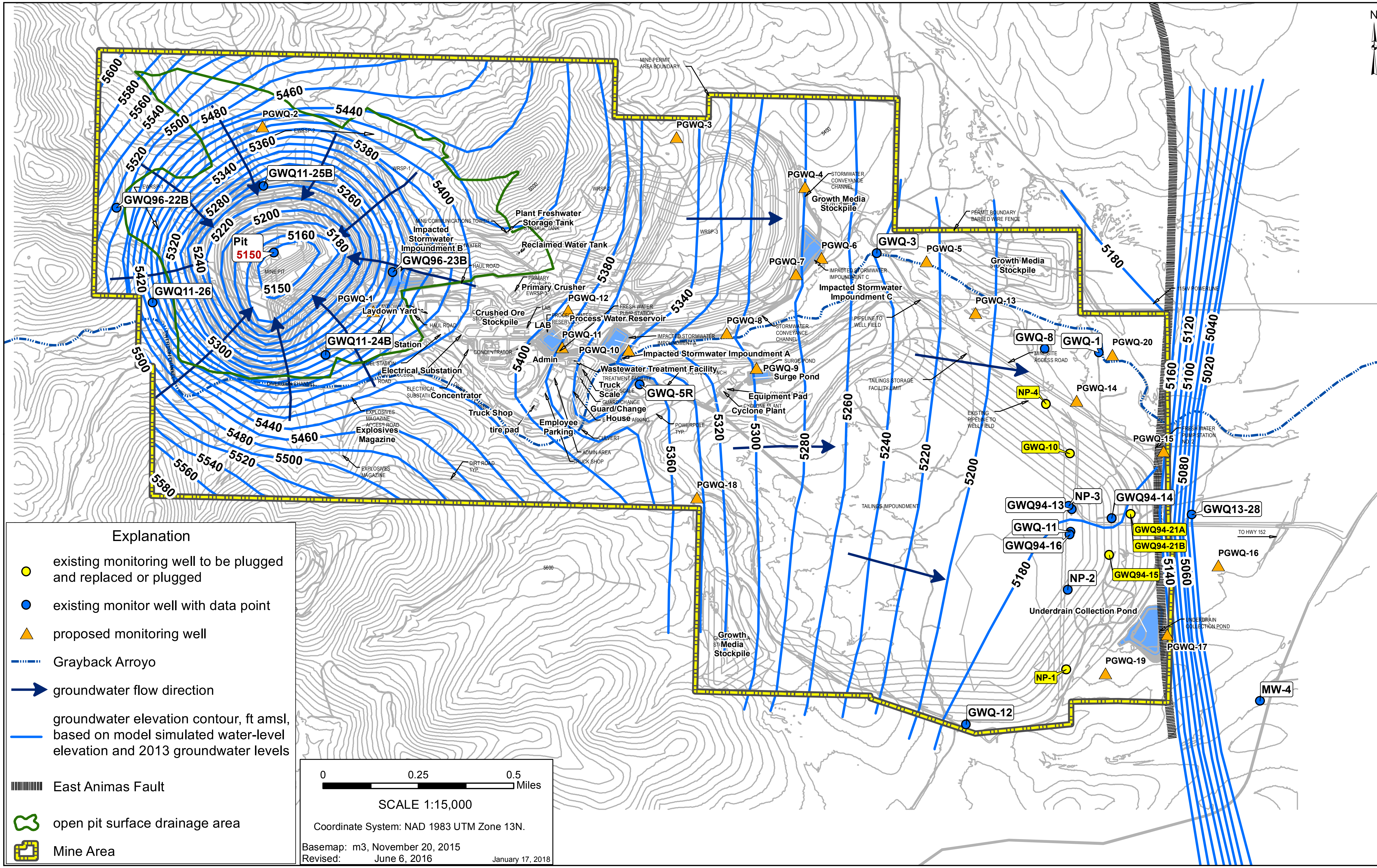

Figure 2d. Groundwater flow direction projected after 4 years of mine operation.

JOHN SHOMAKER & ASSOCIATES, INC.

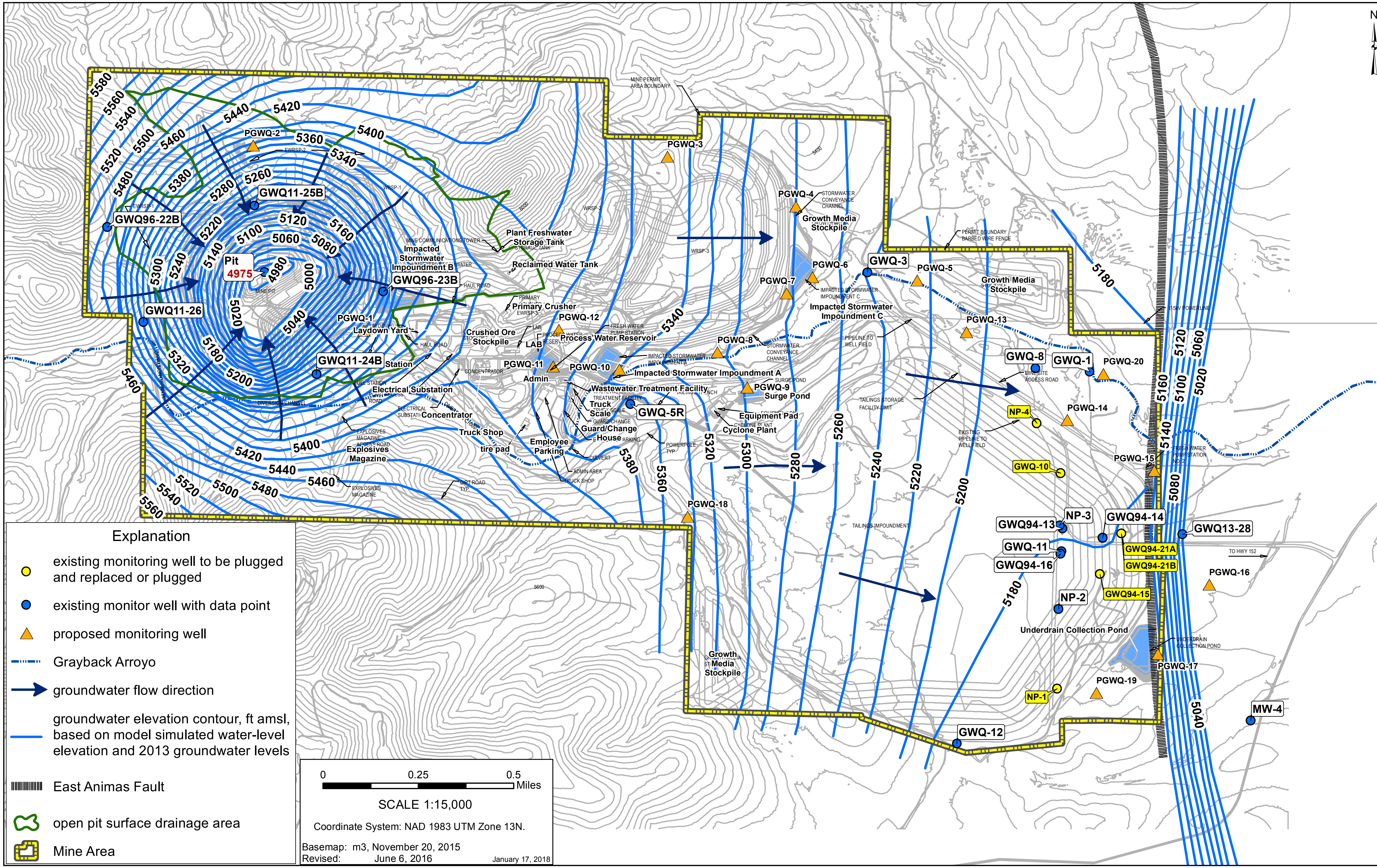

Figure 2e. Groundwater flow direction projected after 5 years of mine operation.

JOHN SHOMAKER & ASSOCIATES, INC.

Reid, Brad, NMENV

From:	Joanne Ferrary <rjferrary53@gmail.com>
Sent:	Saturday, April 28, 2018 12:09 PM
To:	Reid, Brad, NMENV
Subject:	Copper Flat DP Flyer (042718).docx
Attachments:	Copper Flat DP Flyer (042718).docx; ATT00001.txt

Please do not approve the Copper Flat Mine. It's use of valuable water resources and also ground water contamination is not worth the risk to Southern NM!

Thank you,
Representative Joanne Ferrary

Copper Flat Mine in Hillsboro Threatens the Economy and Environment of Sierra County and Southern New Mexico!

Tell the State to Deny the Draft Discharge Permit for the Mine!

An Australian mining company wants to reopen the old Copper Flat Mine in Hillsboro. If the Mine gets permits from the federal and state governments, it will threaten the economy, water, air, and wildlife of Sierra County and beyond.

The New Mexico Environment Department (NMED) has issued a draft Discharge Permit that would allow the Mine to pollute groundwater and surface water in the area.

Please send in comments to the NMED by May 5th.
Tell the Environment Department to **DENY** the Draft Permit.
Send comments to Brad.Reid@state.nm.us

The Mine poses a hazard to public health and an undue risk to property:

- Contaminants discharged from the Mine ***could reach the Rio Grande***.
- Contaminants discharged from the Mine ***could leak into groundwater***.
- The Mine's proposed groundwater ***monitoring well network will not detect contamination*** moving from the Mine's pit lake, waste rock stock piles, or tailings storage facility.

The Mine has lots of other problems:

- There will be ***heavy vehicles and equipment operating 24 hours per day, 365 days per year***. This will cause noise and light pollution that will disturb neighbors, businesses, wildlife and our precious night sky.
- ***The mine will pump over 6,000 acre feet per year of water (almost 2 billion gallons)***, threatening water supplies in Hillsboro, neighboring ranches, and downstream users along the Rio Grande.
- ***The mine will dump over 100 million tons of polluted waste [100 billion gallons] into a 500-acre pond just over 11 miles west of Caballo Reservoir***. Tailings ponds are well known to be unstable. A collapse of this pond could devastate landowners to the east, Caballo Reservoir, and the Rio Grande.
- ***The mine will NOT provide local jobs***! A water use agreement with the Jicarilla Apache Nation in northern New Mexico requires the Mine to hire Jicarilla Apache Tribal citizens – not locals!

From: Jane Holland <iloveujane@gmail.com>
Sent: Sunday, April 29, 2018 6:39 AM
To: Reid, Brad, NMENV
Subject: please deny the draft discharge permit for the Australian mining company

An Australian mining company wants to reopen the old Copper Flat Mine in Hillsboro.
If the Mine gets permits from the federal and state governments, it will threaten the economy, water, air, and wildlife of Sierra County and beyond.

Please do not allow this to happen and veto the opening of this mine. Our citizens and our earth will suffer greatly if this is allowed. Thank you for your heart felt vote against this mine. Sincerely, J Holland, 865 W 7th Ave, T or C, NM 87901

From: Stan Brodsky <stanandrob@windstream.net>
Sent: Sunday, April 29, 2018 2:10 PM
To: Reid, Brad, NMENV
Subject: Copper Flat Mine - Discharge permit

Mr. Reid –

I live in Hillsboro, and for several years now I have heard about this project, and I feel it is the wrong thing for this state, Sierra County, and Hillsboro for many reasons, which you've probably already heard. My #1 concern is the availability of water to the residents of Hillsboro. I understand that it is expected that the mine use about 6,000 acre-feet of water per year. My calculations tell me that, conservatively, that is enough water for about 10,000 families. Wells are already starting to dry up around here (Berrenda Ranch. So from a water usage standpoint, re-opening the mine could have disastrous effects on the population of Hillsboro and probably Sierra County. I understand now that Themac is applying for a Discharge Permit. Well, my #2 problem is with the planned discharge of water that the mine has used in its operations, which will contaminate groundwater, making the water unusable for drinking, either by humans or agricultural growth. My #3 problem relates to what will happen to state route 152, in terms of damage from many very heavy trucks, and traffic, both from a perspective of damage to the road as well as traffic cause by the trucks as well as the people working at the mine. There are more concerns, but those are my top 3.

I urge you to deny the Discharge permit, or at least to carefully do the research to make certain we won't run out of water and that the discharge will not contaminate ground water.

Thank you.

Stanley Brodsky
39 Tulpia Trl
Hillsboro, NM 88042

stanandrob@windstream.net

575-895-5551

Reid, Brad, NMENV

From:	rspeakes@valornet.com
Sent:	Monday, April 30, 2018 10:53 AM
To:	Reid, Brad, NMENV
Subject:	Deny the Draft Discharge Permit for the Mine

Please deny the draft discharge permit for the copper mine in Sierra County New Mexico! This area is fragile and lacks enough water to spare for this water thirsty industry. We in this area love the beauty of the land its water. Please act to preserve our water here!

Thanks, Rebecca Speakes

575-894-0410

Reid, Brad, NMENV

From:	Janet Correll <janet@h2o-legal.com>
Sent:	Tuesday, May 01, 2018 2:08 PM
To:	Reid, Brad, NMENV
Cc:	Samantha Barncastle; Esslinger, Gary
Subject:	EBID Request for Additional 60 Day Extension of Comment Period for DP-1840 (Copper Flat Mine)
Attachments:	2nd Req. to NMED for 60 Day Ext. of Comment Period Re Copper Flat Mine.Signed.4.26.2018.pdf

Dear Mr. Reid,

I emailed a letter request from attorney Samantha Barncastle to you last Thursday, April 26th regarding the above matter. I received a notification that you did in fact receive that email, however we have not yet received a response to the request for an additional 60 day extension of time in which to submit comments regarding the Copper Flat Mine DP-1840. May we please have your response? We would appreciate hearing from you as soon as possible, given the looming May 4th deadline. I have attached Ms. Barncastle's April 26th correspondence again for your ready reference. Please advise. Thank you.

Janet L. Correll, Paralegal for Samantha R. Barncastle
Barncastle Law Firm
P.O. Box 1556
Las Cruces, NM 88004
Ph: 575-636-2377

BARNCASTLE LAW FIRM, LLC

1100 South Main, Ste. 20
Las Cruces, NM 88005

P.O. Box 1556
Las Cruces, NM 88004

Phone: (575) 636-2377
Fax: (575) 636-2688

April 26, 2018

Brad Reid
New Mexico Environment Department
P.O. Box 5469
Santa Fe, NM 87502-5469

Via Email to: Brad.Reid@state.nm.us

Re: Request for Additional 60 Day Extension of Public Comment Period for DP-1840.

Dear Mr. Reid,

As I believe you are aware, I am general counsel for the Elephant Butte Irrigation District. On February 14, 2018, I submitted to you a request for an extension of time for the public comment period for the Copper Flat Mine, proposed GWQB Discharge Permit Number DP-1840. That initial request was granted, and the comment period was extended to May 4, 2018.

Also on February 14, 2018, I submitted an IPRA Request to the New Mexico Environment Department (NMED) regarding DP-1840, and received NMED's response to that request a couple of weeks ago at the beginning of April. The response received from the NMED is quite massive and consists of thousands of pages of documents. Compounding the normal difficulties associated with review of such a large document production is the fact that the documents are not organized or indexed at all, and our experts are having to expend a great deal of time in order to first sort and organize all of the documents received. Our preliminary review has quickly led us to believe that there is a great deal more to this situation than we expected and that we may even be missing documents that should have been produced, but that we cannot find even though we are aware of their existence. We are respectfully requesting an additional 60 day extension of time in which to submit our comments. We believe an additional 60 days will provide a more fair opportunity for us to review the documents and information received, determine whether additional documents need to be requested, and prepare/submit our comments regarding DP-1840.

We would appreciate your every consideration to this request, and would ask that you respond via email at your earliest convenience due to the obvious time constraints involved. Please also feel free to contact me directly if you have any questions or concerns regarding this request.

Sincerely,

BARNCASTLE LAW FIRM

By ______________________
Samantha R. Barncastle

xc: Client
SRB/jlc

Reid, Brad, NMENV

From: Debora Nicoll <4ncx123@gmail.com>
Sent: Wednesday, May 02, 2018 4:57 AM
To: Reid, Brad, NMENV
Subject: Deny Discharge Permit of Copper Flat Mine

This mine has too many potential disasters to the environment and economy of Sierra County and points downstream to allow it to be reopened. Water is the most valuable resource we have here. Not only will the mine use excessive amounts of this resource but it will also threaten the quality of water. Please deny the discharge permit.

Thanks
Deb Nicoll
88042

Reid, Brad, NMENV

From: Jaimie Park <jpark@nmelc.org>
Sent: Wednesday, May 02, 2018 10:35 AM
To: Knight, Andrew, NMENV
Cc: Reid, Brad, NMENV
Subject: Issue with the Copper Flat DP-1840 AR

Importance: High

Hey, Andrew. So I'm working on our comments on the draft DP for Copper Flat and I've identified a lot records that have been withheld from the AR provided to the public. Of particular significance is NMCC's request to NMED regarding the pit lake being administered as a private water not being included in the AR. I also can't find NMELC's request that NMED continue to administer the pit lake as a surface water of the state. And I also can't find all of the cooperating agency meeting notes in the AR. I'm concerned that the public is being deprived of due process because NMED has provided an incomplete AR. The incomplete AR provided is also cause for concern that NMELC hasn't been provided all responsive documents to our IPRA requests submitted over the past few years.

In light of the incomplete AR provided to the public and the resulting deprivation of due process, NMELC is requesting that the May 5th deadline to submit comments is extended an additional 90 days. It is clear that NMED needs additional time to put together and provide the public with a complete AR for DP-1840. Additionally, given the historical connection with DP-01, NMED should digitize that file and make it available to the public online as well.

Please let me know if you have time to discuss this request today.

Regards,

Jaimie Park

Reid, Brad, NMENV

From: Ann Bean <shamanbean@gmail.com>
Sent: Wednesday, May 02, 2018 11:41 AM
To: Reid, Brad, NMENV
Subject: Copper Flats Mine Hillsboro, NM

You know we have the Jets constantly polluting our skies with their chem trails.
We no longer have the nice clear blue skies, that NM was known for.

Now you are going to permit more polluting of our land and water.
You all need to stop this. We need to conserve our land and water for all life.

This mine venture doesn't provide needed employment for local residents.
You all are a disgrace to all the American Citizens.

Ann Bean
PO Box 182
Hillsboro, NM 88042

Reid, Brad, NMENV

From:	Katie Emmer <kemmer@themacresourcesgroup.com>
Sent:	Thursday, May 03, 2018 8:41 AM
To:	Mascarenas, Melissa, NMENV
Cc:	Reid, Brad, NMENV
Subject:	NMCC IPRA 3May2018
Attachments:	NMCC_3May2018_IPRA.pdf

Good morning Ms. Mascareñas,

Attached please find an IPRA from NMCC for correspondence regarding Copper Flat's draft Discharge Permit 1840. If you have any questions or need anything further from me, please let me know.

Best regards,

Katie Emmer | Permitting & Environmental Compliance Manager

M: +1 505.400.7925| **F:** +1 505.881.4616
A: 4253 Montgomery Blvd. NE, Suite 130, Albuquerque, NM 87109
W: themacresourcesgroup.com | **E:** kemmer@themacresourcesgroup.com

THEMAC RESOURCES | NEW MEXICO COPPER CORPORATION

NEW MEXICO ENVIRONMENT DEPARTMENT
INSPECTION OF PUBLIC RECORD REQUEST FORM

Please fill out the following information:

1. Date: 3 May 2018
2. Requestor's Name: Katie Emmer
3. Requestor's Address: 4253 Montgomery Blvd, NE, Suite 130
   Albuquerque, NM 87109
4. Phone No.: (505) 400-7925
5. Email: **kemmer@themacresourcesgroup.com**
6. Company Being Represented: New Mexico Copper Corporation
7. Address: See above
8. Document or File being requested to be reviewed or copied (please describe the records in sufficient detail to enable Department personnel to reasonably identify & locate the records:

   EBID attorney request for additional time beyond 4 May 2018 for public comment on DP-1840

   & NMED response to this request.
9. NMED Bureau where Document/File can be found (if known): GWQB

Katie Emmer
Signature

The cost for copying by NMED is as indicated on Attachment A. Please send this request to:

Melissa Y. Mascareñas
Inspection of Public Records Officer
1190 St. Francis Drive, Ste. N-4050
Santa Fe, New Mexico 87505
fax: (505) 827-1628 or
email: melissa.mascarenas@state.nm.us

Revised 6/14/12

Reid, Brad, NMENV

From:	Nolan Winkler <nolanwinkler@windstream.net>
Sent:	Thursday, May 03, 2018 10:23 AM
To:	Reid, Brad, NMENV
Subject:	Copper Flat mine discharge permit

As a long time resident of Hillsboro, NM, I strongly request that this discharge permit is denied!
It's not JUST about water (but for me, it is)...

- Contaminants discharged from the Mine could reach the Rio Grande.
- • Contaminants discharged from the Mine could leak into groundwater.
- • The Mine's proposed groundwater monitoring well network will not detect contamination moving from the Mine's pit lake, waste rock stock piles, or tailings storage facility.

I'm sure you are aware of the many problems with this discharge permit and am counting on the State of New Mexico to put the priority on the citizens and environment of our state, not the reopening of this mine which will NOT give many local jobs...will NOT be here for the long term and WILL pollute the ground water and possibly the Rio Grande which is nearby.

A sincere thank you for your time and consideration,

Nolan Winkler, Hillsboro, New Mexico

Reid, Brad, NMENV

From: Ted Caluwe <patchnball17@windstream.net>
Sent: Thursday, May 03, 2018 10:45 AM
To: Reid, Brad, NMENV
Subject: Copper Flats Draft Permit

Dear Mr. Reid,

I strongly urge you to DENY the draft permit for the Copper flats mine operation in Sierra County near Hillsboro. The mine operation will have severe and dire consequences for the entire County and Southern New Mexico.

Despite their denial, the basin from which the huge amount of water will be drawn is NOT A CLOSED SYSTEM. There are crevasses and cracks underground that allow water to flow from one system into another, therefore, as the draw down takes place in one system, the other system's water will flow to fill in the vacuum. This will effect ALL THE WELLS in the Hillsboro, Caballo, Animas, Palomas areas. Such a huge draw down could cause the wells to dry up completely, leaving the entire area without water for residences, livestock and farming.

Additionally, the pollutants from the mine will result in pollution entering the water tables and eventually polluting the Rio Grande all the way down stream.

It would take many, many years for the entire area to recover from the extreme devastation caused by the limited number of years the mine could operate.

Additionally, the highways are not equipped for the heavy truck traffic and would require constant maintenance for a long period of time.

Again, please DENY the permit for Copper Flats mine to operate.

Thank you,

Linda Seebach
10634 Hiway 152
Hillsboro, NM 88042
575-895-5154

17626

Reid, Brad, NMENV

From:	Katie Emmer <kemmer@themacresourcesgroup.com>
Sent:	Thursday, May 03, 2018 10:53 AM
To:	Reid, Brad, NMENV; Vollbrecht, Kurt, NMENV
Cc:	Ennis, David, EMNRD; Jeffrey Smith; Juan Velasquez; Stuart R. Butzier (sbutzier@modrall.com)
Subject:	NMCC Comments on Draft DP-1840
Attachments:	NMCC_transmit_CommentsDP-1840_3May2018.pdf; DraftDP-1840_NMCC_tracked_changesMay2018.pdf; DraftDP-1840_NMCC_CommentExplanations3May2018.pdf

Greetings,

This email transmits NMCC's submission of comments regarding Draft DP-1840 within NMED's comment period. NMCC appreciates the opportunity to provide comments on NMED's proposed Draft DP-1840.

Attached please find:

1. NMCC transmittal letter for NMCC Comments on DP-1840, May 3, 2018
2. Draft DP-1840 with NMCC proposed changes tracked
3. Comments and Explanations on NMCC proposed changes to DP-1840

For your convenience, a hard copy of these comments follows via the mail. We hope this method of transmitting comments is clear and easy to follow. Thank you again for your time and consideration.

Best regards,

Katie Emmer | Permitting & Environmental Compliance Manager

M: +1 505.400.7925| **F:** +1 505.881.4616
A: 4253 Montgomery Blvd. NE, Suite 130, Albuquerque, NM 87109
W: themacresourcesgroup.com | **E:** kemmer@themacresourcesgroup.com

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Reid, Brad, NMENV

From: kristin boren <kreneeboren@gmail.com>
Sent: Thursday, May 03, 2018 11:39 AM
To: Reid, Brad, NMENV
Subject: Deny draft permit for Copper Flats Mine

I am writing to you as a business and land owner in Hillsboro, NM. I am the owner of Hillsboro RV Village in Hillsboro, NM. We are a 14 site full Hook-up park located on Mattie Ave. In the short term, the Copper Flat mine would economically boost business at the park. However, I am asking you to deny the draft permit due to the numerous long term effects of the mine to the community of Hillsboro.
The pollution of clean space, night time sky, water and ground would be irreparable. The devastation to our water table which provides and supports the community would be forever altered.
We are a wonderful community filled with people who protect our land and support each other. Please do not allow the greed of on outside company destroy the life we have here.

I can be reached at (57)5 642 4871 if you have any questions.

Kristin Boren
Hillsboro RV Village

Reid, Brad, NMENV

From: Jaimie Park <jpark@nmelc.org>
Sent: Thursday, May 03, 2018 11:49 AM
To: Mascarenas, Melissa, NMENV
Cc: Knight, Andrew, NMENV; Reid, Brad, NMENV
Subject: IPRA Request Pertaining to DP-1840
Attachments: 5.3.18 IPRA Request.pdf

Dear Ms. Mascarenas,

Please find attached our IPRA request.

Regards,

Jaimie Park

NEW MEXICO ENVIRONMENT DEPARTMENT
INSPECTION OF PUBLIC RECORD REQUEST FORM

Please fill out the following information:

1. Date: May 3, 2018

2. Requestor's Name: Jaimie Park, New Mexico Environmental Law Center

3. Requestor's Address: 1405 Luisa Street, Suite 5, Santa Fe, NM 87505

4. Phone No.: (505) 989-9022

5. Email: **jpark@nmelc.org**

6. Company Being Represented: New Mexico Environmental Law Center

7. Address: 1405 Luisa Street, Suite 5, Santa Fe, NM 87505

8. Document or File being requested to be reviewed or copied (please describe the records in sufficient detail to enable Department personnel to reasonably identify & locate the records:

I request that you inform me what documents are available within the scope of this request and when I can inspect those documents. I also request that you not make any copies without first informing me of the number of copies and the cost for the copying that are involved. Finally, I request that if you determine that any documents or portions of documents are exempt from disclosure you inform me of that and provide me with citations to the provisions in the Inspection of Public Records Act that indicate that the documents or portions of documents are exempt from disclosure, describe the type of document being withheld, and identify who sent the document being withheld and who received the document being withheld.

Records being requested:

1. All requests to extend the Copper Flat Copper Mine Draft Discharge Permit, DP-1840, comment period deadline;

2. All NMED communications and responses pertaining to all requests to extend the Copper Flat Copper Mine Draft Discharge Permit, DP-1840, comment period deadline;

3. All requests to hold a public hearing on the Copper Flat Copper Mine Draft Discharge Permit, DP-1840;

4. All NMED communications and responses pertaining to all requests to hold a public hearing on the Copper Flat Copper Mine Draft Discharge Permit, DP-1840;

5. All NMED documents pertaining to the determination to hold a public hearing on the Copper Flat Copper Mine Draft Discharge Permit, DP-1840;

6. All communications with New Mexico Copper Corporation/THEMAC regarding extension of the public comment period on DP-1840 and the holding of a public hearing on DP-1840;

7. All documents pertaining to the May 5th public comment period deadline for DP-1840;

8. All documents pertaining to the holding of a public hearing on DP-1840.

For purposes of this request, the term "document" means any record in written, graphic, photographic, or other form kept or memorialized on paper, microfilm, microfiche, or electronic media; and includes each non-identical original or copy of a draft or final record, whether the original or copy is not identical because of notes on the original or copy or otherwise.

For purposes of this request, the term "pertaining to" means addressing, concerning, focusing on, mentioning, relating to, or relevant to in any manner.

For purposes of this request, "existing uses" means "a use actually attained in a surface water of the state on or after November 28, 1975, whether or not it is a designated use". Section 20.6.4.7.E(3) NMAC.

9. NMED Bureau where Document/File can be found (if known): Surface Water Quality Bureau, Ground Water Quality Bureau

/s/
Signature

The cost for copying by NMED is as indicated on Attachment A. Please send this request to:

Melissa Y. Mascareñas
Inspection of Public Records Officer
1190 St. Francis Drive, Ste. N-4050
Santa Fe, New Mexico 87505
fax: (505) 827-1628 or
email: melissa.mascarenas@state.nm.us

Reid, Brad, NMENV

From: Jaimie Park <jpark@nmelc.org>
Sent: Thursday, May 03, 2018 12:24 PM
To: Knight, Andrew, NMENV
Cc: Reid, Brad, NMENV
Subject: Disc Received

Importance: High

Andrew, our office received the "new" DP-1840 administrative record this morning. Upon a cursory review of the disc, NMED has failed to identify which documents were missing and thus added to the AR. NMED has also continued to fail to provide an index for this highly technical, voluminous AR. Due to these reasons it will take substantial time to review the "new" AR to determine what new information has been provided. Again, providing this "new" AR less than two days before the deadline to submit public comments is a denial of due process. NMELC therefore requests, again, that NMED extend the public comment period deadline to a minimum of 90 days so that NMED can identify all of the missing documents that have just been added to the record and can provide an index. It appears that hundreds of pages have been added.

Regards,

Jaimie

Reid, Brad, NMENV

From:	Jaimie Park <jpark@nmelc.org>
Sent:	Thursday, May 03, 2018 12:39 PM
To:	Mascarenas, Melissa, NMENV
Cc:	Knight, Andrew, NMENV; Reid, Brad, NMENV
Subject:	IPRA Request II
Attachments:	5.3.18 IPRA Request II.pdf

Dear Ms. Mascarenas,

Please find attached our second IPRA request submitted today pertaining to the Copper Flat Copper Mine.

Regards,

Jaimie Park

NEW MEXICO ENVIRONMENT DEPARTMENT
INSPECTION OF PUBLIC RECORD REQUEST FORM

Please fill out the following information:

1. Date: May 3, 2018

2. Requestor's Name: Jaimie Park, New Mexico Environmental Law Center

3. Requestor's Address: 1405 Luisa Street, Suite 5, Santa Fe, NM 87505

4. Phone No.: (505) 989-9022

5. Email: **jpark@nmelc.org**

6. Company Being Represented: New Mexico Environmental Law Center

7. Address: 1405 Luisa Street, Suite 5, Santa Fe, NM 87505

8. Document or File being requested to be reviewed or copied (please describe the records in sufficient detail to enable Department personnel to reasonably identify & locate the records:

I request that you inform me what documents are available within the scope of this request and when I can inspect those documents. I also request that you not make any copies without first informing me of the number of copies and the cost for the copying that are involved. Finally, I request that if you determine that any documents or portions of documents are exempt from disclosure you inform me of that and provide me with citations to the provisions in the Inspection of Public Records Act that indicate that the documents or portions of documents are exempt from disclosure, describe the type of document being withheld, and identify who sent the document being withheld and who received the document being withheld.

Records being requested:

All documents pertaining to the administrative Final EIS for the Copper Flat Copper Mine. This document was provided to NMED by BLM end of April 2018 and is therefore in the custody of MMD. This document is not exempt from disclosure under the attorney-client privilege.

For purposes of this request, the term "document" means any record in written, graphic, photographic, or other form kept or memorialized on paper, microfilm, microfiche, or electronic media; and includes each non-identical original or copy of a draft or final record, whether the original or copy is not identical because of notes on the original or copy or otherwise.

For purposes of this request, the term "pertaining to" means addressing, concerning, focusing on, mentioning, relating to, or relevant to in any manner.

For purposes of this request, "existing uses" means "a use actually attained in a surface water of the state on or after November 28, 1975, whether or not it is a designated use". Section 20.6.4.7.E(3) NMAC.

9. NMED Bureau where Document/File can be found (if known): Surface Water Quality Bureau, Ground Water Quality Bureau

/s/
Signature

The cost for copying by NMED is as indicated on Attachment A. Please send this request to:

Melissa Y. Mascareñas
Inspection of Public Records Officer
1190 St. Francis Drive, Ste. N-4050
Santa Fe, New Mexico 87505
fax: (505) 827-1628 or
email: melissa.mascarenas@state.nm.us

Revised 6/14/12

From:	Katie Emmer <kemmer@themacresourcesgroup.com>
Sent:	Thursday, May 03, 2018 10:53 AM
To:	Reid, Brad, NMENV; Vollbrecht, Kurt, NMENV
Cc:	Ennis, David, EMNRD; Jeffrey Smith; Juan Velasquez; Stuart R. Butzier (sbutzier@modrall.com)
Subject:	NMCC Comments on Draft DP-1840
Attachments:	NMCC_transmit_CommentsDP-1840_3May2018.pdf; DraftDP-1840 _NMCC_tracked_changesMay2018.pdf; DraftDP-1840 _NMCC_CommentExplanations3May2018.pdf

Greetings,

This email transmits NMCC's submission of comments regarding Draft DP-1840 within NMED's comment period. NMCC appreciates the opportunity to provide comments on NMED's proposed Draft DP-1840.

Attached please find:

1. NMCC transmittal letter for NMCC Comments on DP-1840, May 3, 2018
2. Draft DP-1840 with NMCC proposed changes tracked
3. Comments and Explanations on NMCC proposed changes to DP-1840

For your convenience, a hard copy of these comments follows via the mail. We hope this method of transmitting comments is clear and easy to follow. Thank you again for your time and consideration.

Best regards,

Katie Emmer | Permitting & Environmental Compliance Manager

M: +1 505.400.7925| **F:** +1 505.881.4616
A: 4253 Montgomery Blvd. NE, Suite 130, Albuquerque, NM 87109
W: themacresourcesgroup.com | **E:** kemmer@themacresourcesgroup.com

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Reid, Brad, NMENV

From: Don & Mary <cardynavery@gmail.com>
Sent: Thursday, May 03, 2018 3:21 PM
To: Reid, Brad, NMENV
Subject: Copper Flat Mine draft discharge permit

I am writing to oppose any further permitting for the Copper Flat Mine. We are already stressing the state's most valuable resource, clean water, and are in a fight with Texas for this precious commodity. Allowing the potential for irreversibly contaminating this resource for mining a relatively common commodity is illogical and unethical.

Don Avery & Mary Cardyn
Hillsboro, NM

Reid, Brad, NMENV

From: Claudia Edwards <clfed@hotmail.com>
Sent: Thursday, May 03, 2018 4:43 PM
To: Reid, Brad, NMENV
Subject: DENY draft permit for Copper Flat Mine, Hillsboro, Sierra Co. NM

Copper Flat Mine in Hillsboro Threatens the Economy and Environment
of Sierra County and Southern New Mexico - precisely what I thought your office was supposed to protect us from!

Why would you allow a (nonetheless) foreign owned mining company to reopen the old Copper Flat Mine in Hillsboro when giving them permits from the federal and state governments will threaten the economy, water, air, and
wildlife of Sierra County and beyond?

How can you permit them to ruin this pristine land by polluting ground water and surface water in our area? Most of us here rely on our own wells for water!

The Mine poses a hazard to public health and an undue risk to property:
• Contaminants discharged from the Mine could reach the Rio Grande.
• Contaminants discharged from the Mine could leak into groundwater.
• The Mine's proposed groundwater monitoring well network will not detect contamination moving from the Mine's pit lake, waste rock stock piles, or tailings storage facility.
The Mine has lots of other problems:
• There will be heavy vehicles and equipment operating 24 hours per day, 365 days per year. This will cause noise and light pollution that will disturb neighbors, businesses, wildlife and our precious night sky.
• The mine will pump over 6,000 acre feet per year of water (almost 2 billion gallons), threatening water supplies in Hillsboro, neighboring ranches, and downstream users along the Rio Grande.
• The mine will dump over 100 million tons of polluted waste [100 billion gallons] into a 500-acre pond just over 11 miles west of Caballo Reservoir. Tailings ponds are well known to be unstable. A collapse of this pond could devastate landowners to the east, Caballo Reservoir, and the Rio Grande.
• The mine will NOT provide local jobs! A water use agreement with the Jicarilla Apache Nation in northern New Mexico requires the Mine to hire Jicarilla Apache Tribal citizens – not locals!

With all if this in mind, just who stands to benefit from this mining activity? Is the state getting a substantial pay off? As New Mexicans you cannot conscionably permit this activity! I pray you will deny the permit and serve the constituents of New Mexico!

Sincerely,

Claudia Edwards
Hillsboro, NM

Get Outlook for Android

Reid, Brad, NMENV

From: Melody <melody21@windstream.net>
Sent: Thursday, May 03, 2018 5:25 PM
To: Reid, Brad, NMENV
Subject: Addendum to previous comments

I apologize but I failed to add the following to my previous comments submitted to your office:

Deny the draft discharge permit for NM Copper Company's Copper Flat Mine.

Thank you,
Melody Sears
Hillsboro NM

Sent from my iPad

From:	Robin Tuttle <robltut@yahoo.com>
Sent:	Thursday, May 03, 2018 6:11 PM
To:	Reid, Brad, NMENV
Subject:	Comments on DP-1840
Attachments:	Reid.docx

Mr. Reid,

The New Mexico Environment Department (NMED) has issued a draft discharge permit (DP-1840) for the Copper Flat Mine in Hillsboro, New Mexico. The permit authorizes the mine operator, New Mexico Copper Corporation (NMCC), to discharge 22.3 million gallons per day of tailings, mining impacted and domestic wastewater that could contain contaminants and toxics pollutants above state standards.

I urge NMED to deny a final discharge permit for this project for the reasons discussed as follows.

In the Middle Rio Grande south of Socorro, about 17 miles of the river are currently dry, at a time of year when the channel should be full of snowmelt and spring flows. Water managers anticipate the drying will expand north, reaching Albuquerque this summer

The Texas commissioner on the Rio Grande Compact Commission, Patrick Gordon, recently wrote to New Mexico State Engineer Tom Blaine (April 2018) warning that approving NMCC's plan to pump more than a billion gallons of groundwater each year from near Hillsboro, N.M. could put New Mexico at risk for even greater damages if Texas prevails in its case on the Rio Grande.

Specifically, Gordon wrote that approving the plan would violate the Rio Grande Compact of 1938 and reinforce Texas's action in the United States Supreme Court, adding to its recoverable damages against New Mexico.

Gordon also noted that the proposed 15-year agreement between NMCC and the Jicarilla Apache Nation leasing San Juan-Chama water from the Jicarillas would not be used at the mine, but would replace water lost to the Rio Grande due to groundwater pumping.

In a 2016 letter to the U.S. Bureau of Land Management (BLM), which was studying potential impacts from the mine's reopening, the New Mexico Interstate Stream Commission noted that BLM had not adequately considered the impacts on New Mexico's ability to meet its Rio Grande water delivery requirements to Texas.

BLM now appears to share these concerns. In its 2017 environmental impact statement addressing NMCC's proposed mining, the agency noted that predicted reductions in groundwater will have a "more notable effect on the Rio Grande, reducing surface water flows and potentially the amount of water stored behind the Caballo Reservoir."

Caballo Reservoir is just downstream from the Elephant Butte Reservoir; the two store water for downstream users in New Mexico and Texas. The Elephant Butte Irrigation District and the New Mexico Pecan Growers have opposed the project, commenting that pumping groundwater for the mine could affect the water rights of its members.

As a resident of the Hillsboro area, I will be particularly affected by the proposed mining. These are my specific concerns about the draft discharge permit:

The Mine poses a hazard to public health and an undue risk to property:

- Contaminants discharged from the Mine ***could reach the Rio Grande***.

- Contaminants discharged from the Mine ***could leak into groundwater***.

- The Mine's proposed groundwater ***monitoring well network will not detect contamination*** moving from the Mine's pit lake, waste rock stock piles, or tailings storage facility.

The Mine has lots of other problems:

- There will be ***heavy vehicles and equipment operating 24 hours per day, 365 days per year***. This will cause noise and light pollution that will disturb neighbors, businesses, wildlife and our precious night sky.

- ***The mine will pump over 6,000 acre feet per year of water (almost 2 billion gallons)***, threatening water supplies in Hillsboro, neighboring ranches, and downstream users along the Rio Grande.

- ***The mine will dump over 100 million tons of polluted waste [100 billion gallons] into a 500-acre pond just over 11 miles west of Caballo Reservoir***. Tailings ponds are well known to be unstable. A collapse of this pond could devastate landowners to the east, Caballo Reservoir, and the Rio Grande.

- ***The mine will not provide local jobs.*** NMCC's proposed water use agreement with the Jicarilla Apache Nation in northern New Mexico requires the mine to hire Jicarilla tribal citizens, not locals!

The New Mexico Environment Department should deny the discharge permit DP-1840 because the mine poses a hazard to public health, an undue risk to property and public safety, and will impact the area's future water security and quality of life.

Thank you for your consideration of my comments (also attached as Reid.docx).

Robin Tuttle

42 Cochise Trail
Hillsboro, New Mexico

Reid, Brad, NMENV

From: Bill Bussmann <bussmann@zianet.com>
Sent: Thursday, May 03, 2018 6:40 PM
To: Reid, Brad, NMENV
Subject: Re: Copper Flat Mine Discharge Permit

As a nearby neighbor of the proposed mine who deeply cares about Animas Creek's water quality and quantity, I ask that you deny issuance of discharge permit DP-1840 for the Copper Flat Mine in Hillsboro, NM.

The Copper Flat Mine poses a hazard to public health and an undue risk to property, because contaminants discharged from the mine could leak into groundwater, contaminating area water supplies and eventually reach the Rio Grande, causing exceedances of stream standards.

Groundwater withdrawals of the magnitude of 6,000 acre-feet a year threaten Animas Creek's flow. I'm sure you are aware that the last potential operator's hydrologist, Adrian Brown, had indicated that pumping from the production wellfield would illegally take 10% off the top of Animas creek riparian streamflow. The current australian owner has a hydrostitute who claims there will be no effect on Animas Creek.
Baloney! Any bonding that the state can come up with will be woefully inadequate to address problems after the London based playboy is long gone.

Finally, I am concerned about the other issues related to opening the Copper Flat Mine that are not covered by any regulatory framework. Heavy vehicles and equipment operating 24 hours per day, 365 days per year will cause noise and light pollution that will disturb neighbors, businesses, wildlife and our precious night sky.

Highway 152 sustained more surface damage in the 12 months of mine construction and operation in 1981-1982 than in the entire 36 years since, yet the potential taxes they pay the state and county will not begin to cover the $15 million dollars required to rebuild the highway from I-25 to the mine after it is destroyed.

Based on the reasons outlined above, I respectfully request that the New Mexico Environment Department deny the discharge permit DP-1840.

Thank you for your consideration of my comments.

Bill Bussmann

hc31 box89

Caballo NM 87931

Reid, Brad, NMENV

From: lglova15588 <lglova15588@gmail.com>
Sent: Thursday, May 03, 2018 6:48 PM
To: Reid, Brad, NMENV
Subject: Copper Flat Mine

Stop this!!!! We are a drought state. Why would anyone in their right mind allow this. We give to Texas we give to Mexico we need we need. What about the people who live here? The farmers? Hello??? What kind of idiot would allow this. STOP THIS MADDNESS!!!!!
Linda Glova
I am directly affected just an fyi.

Sent from my Verizon Wireless 4G LTE smartphone

Reid, Brad, NMENV

From: David Soules <davidsoules@comcast.net>
Sent: Thursday, May 03, 2018 8:56 PM
To: Reid, Brad, NMENV
Subject: copper flats mine

Dear Mr. Reid:

My wife and I are property owners in Sierra County, near Hillsboro. It is our understanding that you have issued a draft discharge permit for the Copper Flats mine, and that the mine will consume large amounts of water. We are opposed to the mine for numerous reasons.

We bought our property near Hillsboro to get away from the city. To enjoy the peace and quiet and wildlife in the country. This mine will disrupt all of that. The heavy trucks, water consumption, contamination of the water supply, and disturbance to the peace and tranquility of the area all major concerns to us.

Please note our strong opposition to this mining operation. I encourage you to not issue a permit for this mine.

Thank you for your consideration,
David & Nancy Soules

Reid, Brad, NMENV

From: owen <owen@zianet.com>
Sent: Thursday, May 03, 2018 11:46 PM
To: Reid, Brad, NMENV
Cc: Susan Binneweg; Larry & Debbie Brooks; Tom Lander; tommylschlaefli@gmail.com; Ruth Ford; Jack Stewart; Mark Bennett; Linda King
Subject: Draft discharge permit for Copper Flat Mine

Dear Brad Reid,
Please deny Copper Flat Mine's request.

The negative impact on our communities would be too great to justify their request.

Thank you.

Owen R. Jones
118 Kingston Main St.
Hillsboro, NM 88042

SUSANA MARTINEZ
Governor
JOHN A. SANCHEZ
Lt. Governor

NEW MEXICO
ENVIRONMENT DEPARTMENT

Harold Runnels Building
1190 Saint Francis Drive (87505)
PO Box 5469, Santa Fe, NM 87502-5469
Phone (505) 827-2990 Fax (505) 827-1628
www.env.nm.gov

BUTCH TONGATE
Cabinet Secretary
J.C. BORREGO
Deputy Secretary

May 4, 2018

VIA E-MAIL

Jaimie Park
jpark@nmelc.org

Re: Request to Inspect Public Records

Dear Ms. Park:

On May 3, 2018, this office received your request for public information. You request information pertaining to: Copper Flat Copper Mine. (See attached request).

I forwarded your request to the bureaus on May 4, 2018. The bureaus will respond by May 17, 2018.

Should you have any questions, please contact the Ground Water Quality Bureau at (505) 827-2919 and the Surface Water Quality Bureau at (505) 827-2819.

Sincerely,

Melissa Y. Mascareñas
Melissa Y. Mascareñas
New Mexico Environment Department
Department Public Records Custodian

cc: Andrew Knight, Assistant General Counsel
Michelle Hunter, Chief, Ground Water Quality Bureau
Shelly Lemon, Chief, Surface Water Quality Bureau

NEW MEXICO ENVIRONMENT DEPARTMENT
INSPECTION OF PUBLIC RECORD REQUEST FORM

Please fill out the following information:

1. Date: May 3, 2018

2. Requestor's Name: Jaimie Park, New Mexico Environmental Law Center

3. Requestor's Address: 1405 Luisa Street, Suite 5, Santa Fe, NM 87505

4. Phone No.: (505) 989-9022

5. Email: **jpark@nmelc.org**

6. Company Being Represented: New Mexico Environmental Law Center

7. Address: 1405 Luisa Street, Suite 5, Santa Fe, NM 87505

8. Document or File being requested to be reviewed or copied (please describe the records in sufficient detail to enable Department personnel to reasonably identify & locate the records:

I request that you inform me what documents are available within the scope of this request and when I can inspect those documents. I also request that you not make any copies without first informing me of the number of copies and the cost for the copying that are involved. Finally, I request that if you determine that any documents or portions of documents are exempt from disclosure you inform me of that and provide me with citations to the provisions in the Inspection of Public Records Act that indicate that the documents or portions of documents are exempt from disclosure, describe the type of document being withheld, and identify who sent the document being withheld and who received the document being withheld.

Records being requested:

1. All requests to extend the Copper Flat Copper Mine Draft Discharge Permit, DP-1840, comment period deadline;

2. All NMED communications and responses pertaining to all requests to extend the Copper Flat Copper Mine Draft Discharge Permit, DP-1840, comment period deadline;

3. All requests to hold a public hearing on the Copper Flat Copper Mine Draft Discharge Permit, DP-1840;

4. All NMED communications and responses pertaining to all requests to hold a public hearing on the Copper Flat Copper Mine Draft Discharge Permit, DP-1840;

5. All NMED documents pertaining to the determination to hold a public hearing on the Copper Flat Copper Mine Draft Discharge Permit, DP-1840;

6. All communications with New Mexico Copper Corporation/THEMAC regarding extension of the public comment period on DP-1840 and the holding of a public hearing on DP-1840;

7. All documents pertaining to the May 5th public comment period deadline for DP-1840;

8. All documents pertaining to the holding of a public hearing on DP-1840.

For purposes of this request, the term "document" means any record in written, graphic, photographic, or other form kept or memorialized on paper, microfilm, microfiche, or electronic media; and includes each non-identical original or copy of a draft or final record, whether the original or copy is not identical because of notes on the original or copy or otherwise.

For purposes of this request, the term "pertaining to" means addressing, concerning, focusing on, mentioning, relating to, or relevant to in any manner.

For purposes of this request, "existing uses" means "a use actually attained in a surface water of the state on or after November 28, 1975, whether or not it is a designated use". Section 20.6.4.7.E(3) NMAC.

9. NMED Bureau where Document/File can be found (if known): Surface Water Quality Bureau, Ground Water Quality Bureau

/s/
Signature

The cost for copying by NMED is as indicated on Attachment A. Please send this request to:

Melissa Y. Mascareñas
Inspection of Public Records Officer
1190 St. Francis Drive, Ste. N-4050
Santa Fe, New Mexico 87505
fax: (505) 827-1628 or
email: melissa.mascarenas@state.nm.us

NEW MEXICO ENVIRONMENT DEPARTMENT
INSPECTION OF PUBLIC RECORD REQUEST FORM

Please fill out the following information:

1. Date: 3 May 2018

2. Requestor's Name: Katie Emmer

3. Requestor's Address: 4253 Montgomery Blvd, NE, Suite 130
Albuquerque, NM 87109

4. Phone No.: (505) 400-7925

5. Email: **kemmer@themacresourcesgroup.com**

6. Company Being Represented: New Mexico Copper Corporation

7. Address: See above

8. Document or File being requested to be reviewed or copied (please describe the records in sufficient detail to enable Department personnel to reasonably identify & locate the records:

EBID attorney request for additional time beyond 4 May 2018 for public comment on DP-1840

& NMED response to this request.

9. NMED Bureau where Document/File can be found (if known): GWQB

Katie Emmer
Signature

The cost for copying by NMED is as indicated on Attachment A. Please send this request to:

Melissa Y. Mascareñas
Inspection of Public Records Officer
1190 St. Francis Drive, Ste. N-4050
Santa Fe, New Mexico 87505
fax: (505) 827-1628 or
email: melissa.mascarenas@state.nm.us

17667

Reid, Brad, NMENV

From: The Barbershop Cafe <barbershopcafe@yahoo.com>
Sent: Friday, May 04, 2018 8:39 AM
To: Reid, Brad, NMENV
Subject: Mine support from a Water Operator
Attachments: Copper Flat DP Flyer (042718).pdf

Brad,
I live in Hillsboro and offer my SUPPORT for this project. We need jobs and the income in this depressed area that the mine will provide. I am one of the certified Water Operators (#18905) for the Hillsboro Water Association and personally feel that our water source would not be in jeopardy as most people think as the static level of our wells run around 30 feet from the surface, with our well depth near 300 feet.

I think the attached flyer that has been distributed is misleading and one sided.
Steve Detloff
575-895-9212

Copper Flat Mine in Hillsboro Threatens the Economy and Environment of Sierra County and Southern New Mexico!

Tell the State to Deny the Draft Discharge Permit for the Mine!

An Australian mining company wants to reopen the old Copper Flat Mine in Hillsboro.
If the Mine gets permits from the federal and state governments, it will threaten the economy, water, air, and wildlife of Sierra County and beyond.

The New Mexico Environment Department (NMED) has issued a draft Discharge Permit that would allow the Mine to pollute groundwater and surface water in the area.

Please send in comments to the NMED by <u>May 5th.</u>
Tell the Environment Department to **<u>DENY</u>** the Draft Permit.
Send comments to <u>Brad.Reid@state.nm.us</u>

The Mine poses a hazard to public health and an undue risk to property:

- Contaminants discharged from the Mine ***could reach the Rio Grande***.
- Contaminants discharged from the Mine ***could leak into groundwater***.
- The Mine's proposed groundwater ***monitoring well network will not detect contamination*** moving from the Mine's pit lake, waste rock stock piles, or tailings storage facility.

The Mine has lots of other problems:

- There will be ***heavy vehicles and equipment operating 24 hours per day, 365 days per year***. This will cause noise and light pollution that will disturb neighbors, businesses, wildlife and our precious night sky.
- ***The mine will pump over 6,000 acre feet <u>per year</u> of water (almost 2 billion gallons)***, threatening water supplies in Hillsboro, neighboring ranches, and downstream users along the Rio Grande.
- ***The mine will dump <u>over 100 million tons</u> of polluted waste [100 billion gallons] into a 500-acre pond just over 11 miles west of Caballo Reservoir***. Tailings ponds are well known to be unstable. A collapse of this pond could devastate landowners to the east, Caballo Reservoir, and the Rio Grande.
- ***The mine will NOT provide local jobs***! A water use agreement with the Jicarilla Apache Nation in northern New Mexico requires the Mine to hire Jicarilla Apache Tribal citizens – not locals!

Reid, Brad, NMENV

From: Reid, Brad, NMENV
Sent: Friday, May 04, 2018 10:17 AM
To: 'Stan Brodsky'
Subject: RE: Copper Flat Mine

Hi Stan,

I am happy to discuss the Copper Flat Mine draft ground water discharge permit (DP-1840) with you. I have received your previous correspondence regarding the mine, and have filed it in the DP-1840 permit file. A hearing has been granted for the draft DP-1840; however, a hearing date has not yet been finalized. DP-1840 addresses protection of ground water quality, but it does not address your concerns related to water quantity, traffic, and roads.

Please give me a call if you would like to discuss these issues further. Thanks, Brad.

Brad Reid, Geologist
Mining Environmental Compliance Section / PO Box 5469 / Santa Fe, NM / 87502
(505) 827-2963 / brad.reid@state.nm.us

From: Stan Brodsky [mailto:stanandrob@windstream.net]
Sent: Thursday, May 03, 2018 2:41 PM
To: Reid, Brad, NMENV <brad.reid@state.nm.us>
Subject: Copper Flat Mine

I live in Hillsboro and have gotten a wealth of knowledge over the past 1-2 years about the re-opening of the Copper Flat Mine. As far as I know, no one has responded to questions many of us in Hillsboro have asked over the past 2 years. These questions include:

1. Can there be a hearing relative to the Discharge Permit?

2. Some of us get our water from wells. Most family's use about half an acre-foot of water per year. If the mine is going to use 3,000 acre-feet per year, that would be roughly the consumption of 6,000 families. Hillsboro has a population of maybe about 130 people, which we can say would be about the number of people in 65 families. We have had wells go dry from time to time over the last 5-8 years. The opening of the mine seems like it could result in MANY wells going dry in Sierra County. Has there been any study done to determine the effects on existing wells when the mine re-opens?

3. Has anyone determined what the effect will be as to traffic on route 152?

4. Has there been any study done of how the roads will be affected (routes 152 and 27) due to constant travelling by many heavy trucks?

I am afraid of how the re-opening of the mine will impact my life here and my neighbors' lives. Can we be assured of several basic things:

1. we will have enough water to live
2. will the wastewater contaminate our land

17671

3. will the roads (152 and 27) be damaged to the point that they cannot safely be driven on by cars

Thanks for your consideration.

Stan Brodsky
39 Tulpia Trl
Hillsboro, NM 88042

stanandrob@windstream.net

Reid, Brad, NMENV

From:	Jaimie Park <peimiaj@gmail.com>
Sent:	Friday, May 04, 2018 10:26 AM
To:	Knight, Andrew, NMENV; Reid, Brad, NMENV
Subject:	RE: Need to Hand Deliver Copper Flat DP-1840 Comments Today

Andrew, Brad Reid is the designated NMED point person for DP-1840 comments. I am entitled to contact him on ALL matters pertaining to DP-1840. Perhaps NMED should put out in its public notice that Ms. Park and NMELC and her clients specifically are not allowed to contact THE DESIGNATED NMED POINT PERSON for DP-1840.

Your behavior is out of line and unprofessional.

Regards,

Jaimie Park

From: Knight, Andrew, NMENV <Andrew.Knight@state.nm.us>
Sent: Friday, May 04, 2018 10:01 AM
To: Jaimie Park <jpark@nmelc.org>
Subject: RE: Need to Hand Deliver Copper Flat DP-1840 Comments Today

Also, I reiterate my request that you refrain from contacting my clients directly, and ask that all communications regarding pending matters go through me. Again, thanks.

Andrew P. Knight
Assistant General Counsel
New Mexico Environment Department
Office: (505) 222-9540
Cell: (505) 907-8836

From: Jaimie Park [mailto:jpark@nmelc.org]
Sent: Friday, May 04, 2018 9:51 AM
To: Reid, Brad, NMENV <brad.reid@state.nm.us>
Cc: Knight, Andrew, NMENV <Andrew.Knight@state.nm.us>
Subject: Need to Hand Deliver Copper Flat DP-1840 Comments Today
Importance: High

Good morning, Brad. We need to hand deliver our comments on DP-1840 today as they are too voluminous to send via email. Is it possible for you or someone else to come down and meet me at the security desk and accept our comments for filing after lunch today? We would also need proof of receipt. I think stamping a copy of our comments with a "received on May 4, 2018" stamp will be sufficient.

If you're unavailable, perhaps the receptionist in your department could do it? Please advise.

Regards,

Jaimie Park

Reid, Brad, NMENV

From: ConnNMex@windstream.net
Sent: Friday, May 04, 2018 11:56 AM
To: Reid, Brad, NMENV
Subject: Hillsboro Resident

Brad, When is our County and State Governments going to wake up to the real losses this mining process is going to bring.
They seem to see nothing but the, what they see as "big $$$". Last I looked the NMCC was owed by a company out of country,
waiting to load up and haul off the goodies to Canada and/or points west, leave a hole in the area and miss use water that
they have don't have right to.

It seems we're being written off as a bunch of trouble makers.
Election time is coming around again.

Richard Spellman
Hillsboro 575-895-5244.
Past board member of the HIllsboro Domestic Water 14 years.
Active volunteer member of our fire department, 18 years.

Reid, Brad, NMENV

From: Mark Kashmar <markkashmar@yahoo.com>
Sent: Friday, May 04, 2018 1:25 PM
To: Reid, Brad, NMENV
Subject: Copper Flat Mine Draft Discharge Permit

Dear Mr. Reid,
As a resident of Caballo, NM, I am writing to ask for a denial of the discharge permit for the Copper Flat mine.

I am concerned that operation mine will be an environmental pollutant in a number of ways and as such has the potential for having a negative impact on nearby residents' lives.

There appears to be no benefit to be gained from the reopening of the mine by any group other than the Australian company that has applied for the permit. I ask you to please use your influence to deny the issuance of the discharge permit.

Sincerely,
Mark Kashmar

Reid, Brad, NMENV

From: Robert Brooks <desertlb@mac.com>
Sent: Friday, May 04, 2018 4:16 PM
To: Reid, Brad, NMENV
Subject: Copper Flats Mine

Dear Brad Reid,
Please deny Copper Flat Mine's request. Clean water is our most precious resource for us and future generations. The negative impact on our communities and environment would be too great to justify their request.

Thank you.

Larry Brooks
24 North St-Kingston
Hillsboro, NM 88042
Sent from my iPhone

RECEIVED
MAY 04 2018
NM Environment Department
Office of the Secretary

STATE OF NEW MEXICO
BEFORE THE NEW MEXICO ENVIRONMENT DEPARTMENT

IN THE MATTER OF THE	)	
PROPOSED COPPER	)	
FLAT COPPER MINE	)	**No. ______**
DRAFT DISCHARGE	)	
PERMIT, DP-1840	)	

NOTICE OF APPEARANCE

COMES NOW, the New Mexico Environmental Law Center, and hereby enters its appearance in the above-referenced matter on behalf of Turner Ranch Properties, LP ("TRP" and Hillsoboro Pitchfork Ranch ("Pitchfork Ranch").

DATED this 4th day of May, 2018.

Submitted by,

NEW MEXICO ENVIRONMENTAL
LAW CENTER
Jaimie Park
Douglas Meiklejohn
Eric Jantz
Jonathan Block
1405 Luisa St., Suite 5
Santa Fe, NM 87505
(505) 989-9022
Attorneys

Note: Exhibits ~~[illegible]~~ in a separate binder

COMMENTS ON THE COPPER FLAT COPPER MINE DRAFT DISCHARGE PERMIT, DP-1840

PREPARED BY THE NEW MEXICO ENVIRONMENTAL LAW CENTER ("NMELC") ON BEHALF OF TURNER RANCH PROPERTIES, L.P. ("TRP") AND HILLSBORO PITCHFORK RANCH ("PITCHFORK RANCH")

May 4, 2018

TABLE OF CONTENTS

Introduction..1

Executive Summary...3

Detailed Comments...5

I. The Environment Department's Consideration of the Draft Discharge Permit is Premature...5

A. The Environment Department Has Previously Suspended Action on Discharge Permits for Copper Flat Copper Mine Pending Development and Evaluation of Environmental Impact Statements Demanded by the United States Bureau of Land Management..................................5

B. The Environment Department Should Apply Longstanding Policy Regarding Mine Discharge Permits and Suspend Action on the Draft Discharge Permit...7

II. The Draft Discharge Permit Poses a Hazard to Public Health and Undue Risk to Property...9

A. The Draft Discharge Permit, On Its Face, Poses a Hazard to Public Health and Undue Risk to Property...11

1. The Use of Andesite Bedrock As a Waste Rock Stockpile Liner Poses a Hazard to Public Health and Undue Risk to Property............11

2. Contaminants Discharged From the Mine's Waste Rock Stockpiles and Tailings Storage Facility Could Reach Surface Water Near the Mine, Including the Rio Grande, Posing a Hazard to Public Health and Undue Risk to Property...12

3. Tailings Run-Off From the Tailings Storage Facility and Waste Rock Stockpiles Collected in Unlined Ditches Could Seep into Groundwater, Posing a Hazard to Public Health and Undue Risk to Property...14

4. The Draft Discharge Permit's Proposed Groundwater Monitoring Well Network is Grossly Insufficient to Detect Migration of Contaminants, Posing a Hazard to Public Health and Undue Risk to Property..15

B. In the Alternative, if the Environment Department Does Not Determine that the Draft Discharge Permit, On Its Face, Poses a Hazard to Public Health and Undue Risk to Property, the Draft Discharge Permit's Deficiencies Substantially Undermine the Hazard to Public Health/Undue Risk to Property Determination and Therefore the Draft Discharge Permit Must Be Denied..16

1. The Draft Discharge Permit Significantly Underestimates the Maximum Daily Discharge Volume, Substantially Undermining the Required Determination Regarding Whether the Permit Poses a Hazard to Public Health and Undue Risk to Property....................................16

2. The Draft Discharge Permit Grossly Underestimates the Amount of Fresh Groundwater Necessary for Start-Up Operations, Substantially Undermining the Required Determination Regarding Whether the Permit Poses a Hazard to Public Health and Undue Risk to Property...18

3. The Draft Discharge Permit Is Based on the Erroneous Assumption that the Mine's Open Pit Will be a Hydrologic Evaporative Sink at all Times, Substantially Undermining the Required Determination Regarding Whether the Permit Poses a Hazard to Public Health and Undue Risk to Property..19

4. The Environment Department Cannot Determine Whether the Permit Poses a Hazard to Public Health and Undue Risk to Property Without Required Tailings Dam Safety Information and Analyses...22

III. The Draft Discharge Permit is Technically Incomplete...............24

A. NMCC's MORP, the Critical Document for the Draft Discharge Permit, Has Yet to be Finalized or Approved and is Still Undergoing Revision..24

B. The Draft Discharge Permit is Not Based Upon a Finalized Probable Hydrologic Consequences Report and a Finalized Predictive Geochemical Modeling of the Pit Lake Report..........................30

IV. The Draft Discharge Permit is Arbitrarily Based on New Information Not Provided in the Draft Discharge Permit Application Documents and Indicates that NMCC May Have Made False Material Statements, Representations, Certifications or Omissions of Material Fact...34

A. The Draft Discharge Permit is Arbitrarily Based on New Information Not Provided by NMCC's August 2017 Revised Discharge Permit Application, July 2017 Revised MORP, and the Draft EIS...34

B. In the Alternative, the Draft Discharge Permit Indicates that NMCC May Have Made False Material Statements, Representations, Certifications or Omissions of Material Fact........................39

V. The Draft Discharge Permit's Use of Discharge Permit Amendments Violates the New Mexico Water Quality Act..........................39

A. Use of Discharge Permit Amendments in Lieu of Discharge Permit Modifications Unlawfully Eliminates Public Notice, Comment and Opportunity for a Public Hearing on Significant Permit Condition Changes...41

B. Allowing "Amendment" of Significant Permit Conditions After a Permit's Effective Date Undermines Both the Purpose of Permit Conditions and Public Participation in the Permit Process............42

C. The Use of Discharge Permit Amendments Violates the Water Quality Act...43

D. In the Alternative, the Draft Discharge Permit Conditions Identified as "Subject to Change Via Discharge Permit Amendment" Must Actually Be Subject to Change Via Discharge Permit Modification...45

Conclusion...46

EXHIBITS

Exhibit A, Copper Flat Extradited Inter Se Decision

Exhibit B, Alta Gold Co. Letter to NMED, dated August 19, 1994

Exhibit C, NMED Letter to Alta Gold Co., dated September 30, 1994

Exhibit D, TRP's Second Request for Supplemental Draft EIS to BLM, dated January 5, 2018

Exhibit E, TRP Request for Supplemental Draft EIS to BLM, dated April 7, 2017

Exhibit F, Tom Myers, PhD, Hydrologic Consultant's Technical Memorandum: Review of the Draft Discharge Permit and Application, Copper Flat Copper Mine

Exhibit G, Jim Kuipers, P.E., Kuipers and Associates LLC's Technical Comments on Copper Flat Mine Draft Discharge Permit

Exhibit H, MMD's Comments on the Draft EIS to BLM, dated March 4, 2016

Exhibit I, TRP's Request to NMED to Continue Administering the Copper Flat Copper Mine Pit Lake as a Surface Water of the State, dated July 3, 2017

Exhibit J, TRP's Comments on the Draft EIS to BLM, dated April 4, 2016

Exhibit K, New Mexico Interstate Stream Commission's Comments on the Draft EIS to BLM, dated February 26, 2016

Exhibit L, BLM Briefing Memorandum Regarding Copper Flat Copper Mine Draft EIS, dated November 30, 2017

Exhibit M, THEMAC Letter to NMED Regarding Copper Flat Copper Mine's Pit Lake, dated August 5, 2016

Exhibit N, TRP's and Pitchfork Ranch's Request to MMD Regarding Copper Flat Copper Mine's New Application Permit and the Copper Flat Extradited Inter Se Decision, dated February 27, 2018

Exhibit O, NMED emails with NMELC, dated November 9, 2017

Exhibit P, NMED Comments on Copper Flat Copper Mine's Two Hydrologic Reports Submitted to MMD, dated March 16, 2018

Exhibit Q, MMD Comments on Copper Flat Copper Mine's Two Hydrologic Reports Submitted to MMD, dated March 22, 2018

Exhibit R, NM Game & Fish Department Comments on Copper Flat Copper Mine's Two Hydrologic Reports Submitted to MMD, dated January 17, 2018

Exhibit S, NMED Comments on the Copper Flat Administrative Final EIS, dated April 17, 2018

Exhibit T, NMED Comments on the Copper Flat Administrative Final EIS, dated April 26, 2018

NEW MEXICO
ENVIRONMENTAL LAW CENTER

Comments and Request for Public Hearing on Draft Discharge Permit for Proposed Copper Flat Copper Mine, DP-1840

Introduction

The New Mexico Environmental Law Center ("Environmental Law Center"), on behalf of Turner Ranch Properties, L.P. ("TRP") and Hillsboro Pitchfork Ranch, LLC ("Pitchfork Ranch"), submits the following comments on the draft discharge permit for the proposed Copper Flat Copper Mine ("Mine"), DP-1840 ("Draft Discharge Permit"), pursuant to 20.6.7.10.H NMAC and 20.6.2.3108.K NMAC. The Environment Department must stay all action on the Draft Discharge Permit for the reasons discussed below. In the alternative, the Environment Department must grant TRP's and Pitchfork Ranch's request that a public hearing be held on the Draft Discharge Permit[1], and must ultimately deny the Draft Discharge Permit.

TRP is the owner of the Ladder Ranch ("Ladder Ranch," "Ladder" or "Ranch") located adjacent to the Mine in Sierra County, New Mexico. The Ladder Ranch covers 156,439 acres or 245 square miles and contains an extraordinarily diverse range of wildlife and mix of ecosystems, from desert grasslands to pine forests in the foothills of the Black Range. Four tributaries of the Rio Grande – the Las Animas, Seco, Palomas and Cuchillo streams – are located on the Ladder Ranch. These streams support abundant flora, including sycamores and cottonwoods, and fauna such as Chiricahua leopard frogs and sensitive Rio Grande cutthroat trout, which are in the process of being restored to these areas.

---

[1] TRP's and Pitchfork Ranch's comments set forth the reasons why a public hearing should be held on the Draft Discharge Permit and demonstrate that there is substantial public interest in DP-1840. Section 20.6.2.3108.K NMAC; Communities for Clean Water v. New Mexico Water Quality Control Commission, 2017 N.M. App. LEXIS 115; In re Rhino Envtl. Servs., 2005-NMSC-024, P 23, 138 N.M. 133, 139, 117 P.3d 939, 945.

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The Ranch's riparian areas contribute significantly to biological diversity within New Mexico. The most pronounced and unusual communities on the Ranch are those dominated by Arizona sycamore, along the broadest flood plains of Las Animas Creek. Arizona sycamore are not known to occur anywhere else in the Rio Grande watershed, or further east of the Continental Divide. These riparian communities have high priority for conservation since throughout most of the Southwest they are in decline, due to drastic changes in hydrological conditions (such as large flood-control dams and climate change). The continued diversity of the riparian vegetation communities on Ladder is dependent on management practices that favor natural flooding, reliable stream flows on or near the surface, and protection of the uplands from erosion. Many wildlife species are totally dependent upon these riparian communities, which serve as wildlife sanctuaries within an arid landscape.

The Pitchfork Ranch is a fourth-generation family-owned cattle ranch located adjacent to the Mine. The ranch was established in 1906 and continues to operate as a family-owned cattle ranch. In addition, the ranch has partnered with the New Mexico Department of Game and Fish ("NM Game & Fish") to improve mule deer habitat on the ranch property and has been recognized by NM Game & Fish as one of the few ranches in New Mexico to make meaningful improvement to mule deer habitat.

TRP and Pitchfork Ranch are both extremely concerned about the Mine's impacts on ground and surface water. Hydrologic effects include the lowering of the water table associated with dewatering, post-closure evaporation of the open pit, and the Mine production wells. The Mine's hydrologic effects may negatively impact the Ladder Ranch's water resources and conservation programs that rely on perennial surface water flow, as well as its ranching and ecotourism activities, resulting in an undue risk to property. The Mine's hydrologic effects may also harm the Pitchfork Ranch's water resources, as well as the ranch's cattle operations and mule deer habitat restoration efforts that rely on perennial surface water flow, resulting in undue risk to property.[2]

TRP and Pitchfork Ranch are also concerned about the migration of contaminants from mining operations into ground and surface water, and the associated impacts such contamination would have on their ranches, resulting in a hazard to public health and undue risk to property.

Executive Summary

The following comments demonstrate that the New Mexico Environment Department's ("Environment Department" or "NMED") consideration of the Draft Discharge Permit is premature at this time and therefore the Environment Department must stay all action on the Draft Discharge Permit.

In the alternative, the Environment Department must deny the Draft Discharge Permit because it poses a hazard to public health and undue risk to property for the following reasons:

- The andesite bedrock beneath the proposed waste rock stockpiles is not an impermeable liner and therefore will not completely prevent all leaks to groundwater, thereby posing a hazard to public health and undue risk to property;
- The applicant's water balance calculations reveal a huge error regarding initial startup water and free tails water. Because of this error, the DP Application grossly underestimates the amount of fresh water the applicant will pump at the beginning of the project. This, therefore, violates the Copper Rule's requirement that the applicant submit an accurate water management plan. This factor is also key to the Secretary's

[2] The Pitchfork Ranch is not alone in its concern regarding the Mine's impacts to mule deer in the Mine impact area. NM Game & Fish advised the Bureau of Land Management that, "Mule deer populations have been on the decline over the past several decades, and this area is considered to be vital habitat for mule deer in New Mexico. Department biologists have been working with landowners for approximately six years to improve habitat. Mule deer rely upon multiple springs in the area and could be in jeopardy..." NM Game & Fish comments on the Copper Flat Copper Mine Draft Environmental Impact Statement, page 2 (April 4, 2016).

determination whether the Draft Discharge Permit poses a hazard to public health or undue risk to property;

- Contaminants discharged from the Mine's waste rock stockpiles and tailings storage facility ("TSF") pursuant to the Draft Discharge Permit could reach surface water near the Mine, including the Rio Grande, thereby posing a hazard to public health and undue risk to property;
- Tailings run-off collected in unlined ditches could seep into groundwater, thereby posing a hazard to public health and undue risk to property;
- The proposed groundwater monitoring well network is grossly insufficient to detect contamination moving from the Mine's pit lake, waste rock stockpiles or TSF. Even with contaminant dispersion, entire contaminant plumes could escape the Mine site undetected, thereby posing a hazard to public health and undue risk to property.

Specific to Ladder Ranch, the Draft Discharge Permit poses a hazard to public health and undue risk to property for the following reasons:

- The Greyback Arroyo lies just south of the Ranch property line, so any Mine-impacted surface water/stormwater flow that could jump the banks or cause changes in the arroyo plan could negatively impact the Ranch through contamination of springs. Potential contamination resulting from the Mine's discharges thereby poses a hazard to public health and undue risk to property;
- Contaminants discharged from the Mine's waste rock stock piles and TSF pursuant to the Draft Discharge Permit could reach springs on the Ranch. Wells and springs on the Ranch could become contaminated by the Mine's discharges that exceed water quality standards set forth in Section 20.6.2.3103 NMAC, thereby posing a hazard to public health and undue risk to property; and
- The proposed groundwater monitoring well network is grossly insufficient to detect contamination moving from the Mine site onto the Ranch. The monitoring wells are spaced too widely and contaminant plumes could slip through undetected, thereby posing a hazard to public health and undue risk to property on the Ranch.

The Environment Department must also deny the Draft Discharge Permit because it is technically incomplete and fails to demonstrate compliance with the New Mexico Office of the State Engineer-Dam Safety Bureau ("OSE-DSB") rules and regulations for the proposed tailings dam. The Draft Discharge Permit's conditions also violate the New Mexico Water Quality Act and its implementing regulations, as well as the New Mexico Mining Act and its implementing regulations.

Section I of these comments demonstrates why action on the Draft Discharge Permit is premature at this time, and therefore all permit action must be stayed. In the alternative, Section II demonstrates how the Draft Discharge Permit poses a hazard to public health and undue risk to property, and therefore the permit must be denied. Section III demonstrates how the Draft Discharge Permit is technically complete, and therefore the permit must be denied. Section IV demonstrates how the Draft Discharge Permit is arbitrarily based on new information not provided by the applicant and that the applicant may have made false material statements, representations, certifications or omissions of material fact, and therefore the permit must be denied. Section V demonstrates how the Draft Discharge Permit's use of "amendments" violates the Water Quality Act, and therefore the permit must be denied.

Detailed Comments

I. The Environment Department's Consideration of the Draft Discharge Permit is Premature.

A. The Environment Department Has Previously Suspended Action on Discharge Permits for the Copper Flat Copper Mine Pending Development and Evaluation of Environmental Impact Statements Demanded by the United States Bureau of Land Management.

The New Mexico Copper Corporation ("NMCC") is not the first operator of the proposed Mine, and the Draft Discharge Permit is not the first discharge permit for this Mine. In fact, the Mine produced minerals for three months in 1982 under the operation of Quintana Minerals and pursuant to the first ever discharge permit issued in New Mexico, DP-01. *Copper Flat Expedited Inter Se Decision*, page 13 (December 28, 2017). *See* attached Exhibit A. However, operations ceased in July 1982. *Id.* at page 18.

Eight years later, after the Mine infrastructure was stripped and sold off and the Mine's water rights were sold, Gold Express acquired the Mine (*Id.* at page 39) and submitted a proposed plan of operations to the United States Bureau of Land Management ("BLM") on January 31, 1991. *Id.* at page 40. Gold Express also submitted a discharge permit renewal application for the Mine to the Environment Department on July 7, 1992. *See* attached Exhibit B. In 1992, the Environment Department suspended action on the discharge permit application "pending development and evaluation of an environmental impact statement demanded by BLM." Environment Department Letter to Alta Gold Co., (September 30, 1994). *See* attached Exhibit C.

Environment Department Secretary Judith Espinosa stated the following, in pertinent part, regarding the Department's decision to stay action on the discharge permit application: "I view it as reasonable for the Ground Water Bureau not to have acted on this discharge plan application in what **would have amounted to an advisory capacity, or in advance of necessity**." *Id.* (emphasis added).

Alta Gold acquired the Mine in 1994 (*Copper Flat Expedited Inter Se Decision*, page 40) and became the new applicant for the discharge permit renewal initially submitted by Gold Express. Alta Gold requested that its application be processed and approved. *See* attached Exhibit B. The Environment Department continued to suspend action on the discharge permit application until completion of the environmental impact statement ("EIS") process.[3] *See* attached Exhibit C. Therefore, it has been longstanding Environment Department policy to stay action on discharge permit applications while the EIS process is pending.

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[3] Before the BLM's final EIS could be released to the public, Alta Gold Co. went bankrupt, terminating all pending permit activities. *Copper Flat Expedited Inter Se Decision*, Exhibit A, page 42.

B. The Environment Department Should Apply Longstanding Policy Regarding Mine Discharge Permits and Suspend Action on the Draft Discharge Permit.

When NMCC submitted its discharge permit application in 2011 it did so as a discharge permit renewal and modification application for DP-01. *See* NMCC's March 31, 2011 discharge permit renewal and modification application *and* NMCC's December 9, 2015 revision of its discharge permit renewal and modification application. It took the Environment Department over five years to determine that NMCC had incorrectly submitted a discharge permit renewal and modification application and that NMCC was required to submit a new discharge permit application because the Mine is a "new mine" under the New Mexico Mining Act ("Mining Act"). Environment Department Request for Additional Information Letter to NMCC (September 19, 2016). The Environment Department is now handling NMCC's application as a new discharge permit application for a new mine pursuant to the Copper Rule, 20.6.7 NMAC.

BLM has demanded an EIS for the Mine since the decades-dormant mine is technically a "new mine." BLM released the Draft EIS in November 2015 and has yet to issue a Final EIS and Record of Decision. Therefore, the EIS process is still pending for the Mine. In fact, there are multiple requests for BLM to conduct a Supplemental Draft EIS, for a multitude of reasons[4], which are currently pending and may result in the issuance of a Supplemental Draft EIS.

[4] TRP has requested BLM issue a Supplemental Draft EIS in light of the recent *Copper Flat Extradited Inter Se Decision*. *See* attached Exhibit D. The Draft EIS clearly fails to analyze the environmental impacts of any water leases NMCC may enter into for securing water necessary for ore processing and proposed reclamation measures and makes clear that the Mine's water accounting for start-up water is incorrect and that the Mine's proposed reclamation measure of rapid-fill of the pit post-closure is technically infeasible. TRP has also submitted additional requests for a Supplemental Draft EIS based upon substantial information coming to light after the close of the Draft EIS comment period pertaining to BLM's Biological Assessment and the Mine's impacts on two Endangered Species Act candidate species of fish, the Rio Grande Chub and Rio Grande Sucker; to NMCC's water lease with the Jicarilla Apache Nation; and to the Environment Department's potential classification of the Mine's current and future expanded pit

NMCC's discharge permit application relies extensively upon the Draft EIS and is supported by documents submitted in the EIS process. For example, NMCC's Mining Operations Reclamation Plan ("MORP"), submitted to BLM as part of the EIS process, is the foundation for all of the Mine's pending permits with BLM, the Environment Department, the New Mexico Mining and Minerals Division ("MMD"), and the New Mexico Office of the State Engineer ("OSE"). Furthermore, the Environment Department has stated to MMD that the MORP and its associated operational, monitoring and closure plans "are **critical to development of the draft Ground Water Discharge Permit**." Environment Department Comments on NMCC's October 14, 2016 Revised MORP, page 2 (January 6, 2017) (emphasis added).

Additionally, NMED recently submitted comments on BLM's Administrative Final EIS. NMED has requested BLM to:

- Address environmental and ecological impacts to nearby watersheds associated with draw down during mine operation and post-closure rapid fill of the pit; specifically, those within the Percha and Animas creeks;
- Provide more detail regarding the existing waste rock pile "west of the pit" which is to be "reclaimed such that the western portion of the pit perimeter would be graded to drain away from the pit into a proposed toe channel that drains to Greyback Arroyo diversion";
- Provide more detail on potential barriers to avians for the Mine's pit;
- Address how the Mine's reclamation plans will address protections of the water quality of Greyback Arroyo; and
- Address actions proposed to eliminate or severely reduce exposure to wildlife from stormwater leachates collected from low-grade reactive ore.

Exhibit S, pages 2-3.

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lake as a "private water" of the State, not subject to either ground or surface water regulations, thereby allowing NMCC to leave behind a toxic body of water in perpetuity. *See* attached Exhibit E.

As was the case with Gold Express's discharge permit application for the Mine in the 1990s, the current EIS process is still pending and the Environment Department itself has requested a number of additional analyses and revisions to the Administrative Final EIS. Accordingly, any action taken by the Environment Department on the Draft Discharge Permit before conclusion of the EIS process is premature and clearly amounts to actions taken in "an advisory capacity or in advance of necessity." The Environment Department must therefore suspend its consideration of the Draft Discharge Permit pursuant to its longstanding policy.

In the alternative, if the Environment Department does not following longstanding department policy and stay all action on the Draft Discharge Permit, the Environment Department must deny the Draft Discharge Permit for the following reasons.

II. The Draft Discharge Permit Poses a Hazard to Public Health and Undue Risk to Property.

The Environment Department must deny a discharge permit application when it poses either a hazard to public health or undue risk to property. Section 20.6.7.10.J NMAC. The Water Quality Act's implementing regulations provide the following, in pertinent part:

> 'hazard to public health' exists when water which is used or is reasonably expected to be used in the future as a human drinking water supply exceeds at the time and place of such use, one or more of the numerical standards of Subsection A of 20.6.2.3103 NMAC, or the naturally occurring concentrations, whichever is higher, or if any toxic pollutant affecting human health is present in the water...

Section 20.6.2.7.AA NMAC.

It would appear that the hazard to public health analysis is limited to whether water which is used or is reasonably expected to be used in the future as a human drinking water supply exceeds 3103 standards. However, the New Mexico Supreme Court has made clear that the Environment Department "cannot ignore concerns that relate to environmental protection simply because they are not mentioned in a technical regulation. The Department has a duty to interpret its regulations liberally in order to realize the purposes of the Acts." In re Rhino Envtl. Servs.,2005-NMSC-024, P 34, 138 N.M. at 41 (citing to Atlixco Coalition v. Maggiore, 1998-NMCA-134, P 15, 125 N.M. 786).

The purpose of the New Mexico Water Quality Act ("Act" or "WQA") is to prevent and abate water pollution. Bokum Res. Corp. v. N.M. Water Quality Control Comm'n, 1979-NMSC-090, ¶ 59, 93 N.M. 546. Furthermore, the New Mexico Constitution declares that "water and other natural resources of this state" are "of **fundamental importance to the public interest, health, safety and the general welfare**." N.M. Const. art. XX, § 21 (emphasis added). Public water in New Mexico is held in trust by the State for the benefit of the public, not mining companies. New Mexico v. G.E., 467 F.3d 1223, 1243 (10th Cir. 2006). The pollution of public water in New Mexico is also a criminal public nuisance. NMSA 1978, §30-8-2 (1993).

The great public importance of water, as evidenced at all levels of New Mexico law, led the New Mexico Supreme Court, in Kaiser Steel Corp. v. W. S. Ranch Co., to declare:

> Our entire state has only enough water to supply its most urgent needs. **Water conservation and preservation is of utmost importance.** Its utilization for maximum benefits is a requirement second to none, not only for progress, but for survival.

1970-NMSC-043,¶ 15, 81 N.M. 414, 417 (emphasis added); *see also, e.g.,* NMSA 1978, § 74-1-12(A) (1999) (describing water as "the state's most precious resource").

The Environment Department must therefore consider whether contaminant migration from the Mine's discharges will pose a hazard to public health and undue risk to property, as well as whether groundwater pumping that would occur pursuant to the Draft Discharge Permit will pose a hazard to public health and undue risk to property. Rhino makes clear that the

Environment Department must consider all issues relating to environmental protection when making the required public hazard/undue risk to property analysis.

Additionally, the undue risk to property analysis includes not only the risk of groundwater and surface water contamination from the Mine's discharges, but also includes unreasonable and unnecessary risks related to *all* mining operations resulting from issuance of DP-1840. The Environment Department must therefore consider undue risks of groundwater and surface water reduction resulting from the Mine's operations pursuant to DP-1840 to property, and all associated undue risks to Ladder Ranch's wildlife, endangered species restoration efforts, and ecotourism enterprise. Rhino, 2005-NMSC-024.

A. The Draft Discharge Permit, On its Face, Poses a Hazard to Public Health and Undue Risk to Property.

According to hydrogeologist, Tom Myers, and mining engineer, Jim Kuipers, the Draft Discharge Permit poses a hazard to public health and undue risk to property for the following reasons.[5]

1. The Use of Andesite Bedrock as a Waste Rock Stockpile Liner Poses a Hazard to Public Health and Undue Risk to Property.

The Copper Rule requires that Section 20.6.2.3103's groundwater standards ("3103 standards") be met outside the area of open hydrologic containment. GRIP v. New Mexico Water Quality Control Commission, 2018 N.M. LEXIS 22. Therefore, a copper mine must take measures to prevent discharges from mining units located outside the area of open hydrologic containment from contaminating groundwater in exceedance of 3103 standards. *Id.* This is typically done through the use of engineered systems, primarily synthetic liners. NMCC claims

[5] For a detailed discussion of how the Draft Discharge Permit poses a hazard to public health and undue risk to property, see attached Exhibits F and G.

that the andesite bedrock underneath proposed waste rock stockpiles outside the area of open hydrologic containment is an impermeable liner that can substitute for an engineered geomembrane liner. However, according to hydrogeologist Tom Myers, andesite bedrock is not similar to a synthetic liner because the conductivity is too high, it is fractured, and the waste rock would actually cause water to reach soil much more uniformly. *See* Exhibit F, pages 5-8. The Draft Discharge Permit's assumption of andesite impermeability is therefore incorrect, posing a hazard to public health and undue risk to property.

TRP's Ladder Ranch lies east and north of the proposed Mine. Groundwater flows west to east through the Mine site and onto the Ranch. Contaminant plumes would disperse laterally, so most contaminants discharged from the Mine would flow through or under the Ranch. Specifically, contaminants discharged from the Mine's waste rock stockpiles pursuant to the Draft Discharge Permit could reach springs on Ladder Ranch. Wells and springs on the Ranch could become contaminated by discharges that exceed 3103 standards, negatively impacting the Ranch's water resources and conservation programs, as well as its ranching and ecotourism activities, which rely on clean perennial surface water. *Id.* at page 2.

The Draft Discharge Permit therefore poses a hazard to public health and undue risk to property and must be denied. Section 20.6.7.10.J NMAC.

2. *Contaminants Discharged From the Mine's Waste Rock Stockpiles and TSF Could Reach Surface Water Near the Mine, Including the Rio Grande, Posing a Hazard to Public Health and Undue Risk to Property.*

The Copper Rule requires applicants to analyze potential pathways for contaminant migration to surface water and the identification of surface waters that are gaining because of inflow of groundwater that may be affected by contaminants. Sections 20.6.7.11.P(4) and (5) NMAC. NMCC has acknowledged that the Mine's production pumping of its four groundwater wells and subsequent consumptive use would affect flows in the Rio Grande (DEIS 4-8), therefore it follows that groundwater pathways from the Mine site to the river could contain contaminants. Exhibit F, page 13.

Specifically, contaminants escaping from the Mine's waste rock stockpiles and TSF could reach surface water near the Mine site, including the Rio Grande. *Id.* The potential for surface water contamination from the Mine's contaminant discharges would be even greater during closure because pumping of the four groundwater production wells that might capture contaminants during operations would not occur. *Id.* According to hydrogeologist Tom Myers, the risk of contaminant migration to surface waters such as the Rio Grande would remain over the long-term, thus posing a hazard to public health and undue risk to property. *Id.*

As previously discussed, groundwater flows from west to east through the Mine site and underneath TRP's Ladder Ranch. Pathways emanating from any point on the Mine site could cross the Ranch property as they flow eastward to the Rio Grande or its tributaries. Contaminants follow those pathways, and a plume would develop around the flow paths, meaning that dispersion to the north from the flow path would penetrate far into groundwater within the Ranch's property. Wells and springs on the Ranch could become contaminated by the Mine's waste rock stockpiles and TSF discharges, negatively impacting the Ranch's water resources and conservation programs, as well as its ranching and ecotourism activities, which rely on clean perennial surface water. *Id.* The Draft Discharge Permit therefore poses a hazard to public health and undue risk to property and must be denied. Section 20.6.7.10.J NMAC.

Additionally, NMCC's Discharge Permit Application fails to analyze pathways for contaminant migration, as required by the Copper Rule. The Discharge Permit Application specifically fails to consider the pathway contaminants would follow from the Mine's waste rock stockpiles, the TSF, or escaped contaminants from the pit to surface water - whether Percha Creek, Las Animas Creek, Greyback Arroyo, or the Rio Grande - and the effect to off-site properties such as Ladder Ranch. The Environment Department must therefore deny the Draft Discharge Permit. Section 20.6.7.10.J NMAC.

3. Tailings Run-Off From the TSF and Waste Rock Stockpiles Collected in Unlined Ditches Could Seep into Groundwater, Posing a Hazard to Public Health and Undue Risk to Property.

Diverting stormwater away from the Mine's tailings impoundment, surge pond, underdrain collection pond, and process water reservoir is a method used for minimizing the potential for groundwater pollution. Exhibit F, page 14. However, the Draft Discharge Permit Application proposes to collect stormwater run-off through the Mine site, in particular outside the area of open hydrologic containment, with **unlined** ditches which would then report to a lined conveyance ditch at the toe of the tailings dam. *Id.* (emphasis added). According to hydrogeologist Tom Myers, the "biggest threat to groundwater from runoff at the tailings impoundment is runoff leaking from the unlined ditches into and through the embankment and into the ground near the base of the TSF. These ditches would collect water and form a source for seepage into the embankment." *Id.*

The Draft Discharge Permit Application also proposes to divert stormwater run-off away from the waste rock stockpiles (*Id.*), utilizing a nearly forty (40) year old diversion structure remaining at the Mine site since the 1982 three-month operation. The collection ditches for run-off diverted from the waster rock stockpiles would also be **unlined ditches**. Hydrogeologist Tom Myers has concluded, "As with the tailings, these unlined collection ditches would concentrate run-off, creating sources of seepage that would percolate through the waste rock to the ground surface, eventually entering groundwater. Because the collection ditches are not lined…seepage would occur through the bottom of the ditches. This additional seepage would add to the direct seepage through the waste rock stockpiles." *Id.*

The use of unlined collection ditches to divert stormwater run-off from the TSF and the waste rock stockpiles thereby poses a hazard to public health and undue risk to property. Wells and springs on TRP's Ladder Ranch could become contaminated by discharges from the unlined collection ditches, negatively impacting the Ranch's water resources and conservation programs, as well as its ranching and ecotourism activities, which rely on clean perennial surface water. *Id.*

The Draft Discharge Permit therefore poses a hazard to public health and undue risk to property and must be denied. Section 20.6.7.10.J NMAC.

4. The Draft Discharge Permit's Proposed Groundwater Monitoring Well Network is Grossly Insufficient to Detect Migration of Contaminants, Posing a Hazard to Public Health and Undue Risk to Property.

The Copper Rule provides that, "Monitoring wells shall be located…to detect an exceedance(s) or a trend toward exceedance(s) of the applicable standards at the earliest possible occurrence, so that investigation of the extent of contamination and actions to address the source of contamination may be implemented as soon as possible." Section 20.6.7.28.B NMAC. Upon review of the Draft Discharge Permit's proposed groundwater monitoring well network, Hydrogeologist Tom Myers has concluded that, "[t]he monitoring wells are spaced too widely to even detect contaminant plumes emanating from the sources (such as the TSF, pit, and waste rock stockpiles). Even with dispersion, the wide spacing would allow plumes to slip between monitoring wells undetected." Exhibit F, page 15.

The Draft Discharge Permit therefore violates the Copper Rule, poses a hazard to public health and undue risk to property, and must be denied.

B. In the Alternative, if the Environment Department Does Not Determine that the Draft Discharge Permit, On Its Face, Poses a Hazard to Public Health and Undue Risk to Property, the Draft Discharge Permit's Deficiencies Substantially Undermine the Hazard to Public Health/Undue Risk to Property Determination and Therefore the Draft Discharge Permit Must be Denied.

1. The Draft Discharge Permit Significantly Underestimates the Maximum Daily Discharge Volume, Substantially Undermining the Required Determination Regarding Whether the Permit Poses a Hazard to Public Health and/or Undue Risk to Property.

The Copper Rule requires a discharge permit applicant to calculate the maximum daily discharge volume, as this factor substantially impacts the required determination regarding whether a discharge permit poses a hazard to public health and/or undue risk to property. Section 20.6.7.11.H NMAC. The Draft Discharge Permit and Application significantly underestimate the Mine's maximum daily discharge volume in the following ways.

First, neither the DP Application nor the Draft Discharge Permit include leakage estimates from the TSF and its underdrain collection system and pond in the maximum daily discharge volume calculation.[6] Exhibit G, pages 3-6; Exhibit F, page 4. Under the Copper Rule, maximum daily discharge volume is "the total daily volume of *process water*...or tailings...authorized for discharge." Section 20.6.7.7.B(35) NMAC (emphasis added). Process water includes any water within the mine site that has contaminants exceeding 3103 standards, including leachate from waste rock or tailings impoundments. Section 20.6.7.7.B(50) NMAC. Therefore, potential discharges from the TSF and its underdrain collection system and pond must be included in the maximum daily discharge volume calculation.

[6] It is also standard industry practice to include a TSF liner seepage analysis as part of any TSF design report required by the Copper Rule. Exhibit G, page 6. NMCC failed to include this analysis in its TSF Report.

The DP Application relies upon a tailings underdrain collection system and pond to minimize leakage of contaminants to groundwater. Even though the proposed tailings liner would be comprised of eighty (80) millimeter high-density polyethylene and twelve (12) inch liner bedding material, and the underdrain collection pond would be a double-lined sixty (60) millimeter high-density polyethylene liner, the efficacy of the liners directly impacts the maximum daily discharge volume of the proposed Mine. *Id.*

According to hydrogeologist Tom Myers, "Even well-installed liners have pinhole leaks that allow leakage to enter the groundwater beneath the facility," and,"Liners with merely good installation can have leakage rates six times higher than liners with excellent installation for the same head over the liner." *Id.*; *see also* Exhibit G, 5-6. The Draft Discharge Permit's maximum daily discharge volume is therefore significantly underestimated, substantially undermining the required determination regarding whether the permit poses a hazard to public health and/or undue risk to property.[7]

Second, the DP Application and Draft Discharge Permit fail to estimate the amount of discharge that would occur from the unlined collection ditches that would be used for stormwater run-off diversion. Exhibit F at page 14. This too results in a significantly underestimated maximum daily discharge volume.

[7] The failure to analyze TSF liner seepage does not merely result in a significant underestimation of the Mine's maximum daily discharge volume. It also results in both NMCC's and the Environment Department's failure to address an almost certain unauthorized discharge. Exhibit G, page 6. Unauthorized discharges violate the Water Quality Act and its implementing regulations, including the Copper Rule, and may result in either modification or termination of a discharge permit. NMSA 1978, Section 74-6-5(M).

Accordingly, the Environment Department cannot make an adequate assessment regarding the Draft Discharge Permit's hazard to public health/undue risk to property without an accurate maximum daily discharge volume. The DP Application must therefore be denied.

2. *The Draft Discharge Permit Grossly Underestimates the Amount of Fresh Groundwater Necessary for Start-Up Operations, Substantially Undermining the Required Determination Regarding Whether the Permit Poses a Hazard to Public Health and/or Undue Risk to Property.*

The Copper Rule requires applicants to provide an accurate Mine Water Management Plan, as a Mine's water balance directly impacts the Mine's potential hydrologic effects and, thereby, the determination regarding whether a discharge permit poses a hazard to public health and/or undue risk to property. Section 20.6.7.11.H(2) NMAC. NMCC's DP Application, however, fails to provide an accurate Mine Water Management Plan for the following reasons.

First, NMCC's water balance calculations do not account for fresh groundwater that would initially be added to the ore processing system, otherwise known as start-up water. Exhibit F, page 9. The DP Application claims that the source water for the majority of water necessary for ore-processing will be "water reclaimed from the TSF"- or "recycled water." However, according to hydrogeologist Tom Myers, "Until the water balance reaches steady state, the amount of recycled water presented in Table 3 of the water balance is underestimated and the make-up water must be much higher than predicted. In other words, the applicant will have to pump much more groundwater than acknowledged in the water balance just to commence the mine processing." *Id.* at page 10.

Because there is initially no source of reclaimed TSF water at the start of operations, and the fact that it could takes years to achieve a steady state that would provide NMCC's claimed 9,708 gallons per minute of recycled TSF water, the Mine's water balance calculations are grossly inaccurate. *Id.* at page 9.

Second, NMCC's water balance calculations also ignore the tailings water that would remain in the saturated portions of the tails, otherwise known as free tails water. *Id.* Water that remains in the tailings or evaporates cannot be reclaimed or reused. *Id.* This failure to include free tails water in NMCC's water balance calculations also results in a grossly inaccurate Mine Water Management Plan.

It is clear that the Mine's impacts to groundwater from pumping its groundwater production wells have not been estimated at all and the actual impacts to groundwater-related resources have been grossly underestimated. Without this required analysis, the Environment Department cannot accurately and definitively rule out whether the Draft Discharge Permit will pose a hazard to public health and undue risk to property due to substantially lowered groundwater tables and associated lowering of hydrologically connected surface water, such as the Rio Grande and its tributaries. *Id.* at page 10. The Environment Department must therefore deny the Draft Discharge Permit.

3. *The Draft Discharge Permit is Based on the Erroneous Assumption that the Mine's Open Pit Will be a Hydrologic Evaporative Sink at All Times, Substantially Undermining the Required Determination Regarding Whether the Permit Poses a Hazard to Public Health and/or Undue Risk to Property.*

The Copper Rule provides significantly different post-closure requirements for open pits depending on whether the open pit is a hydrologic evaporative sink or a flow-through pit. If the Environment Department determines that an open pit is an evaporative hydrologic sink, then 3103 ground water quality standards do not apply within the area of open hydrologic containment. Section 20.6.7.33.D(1) NMAC. In contrast, if the Environment Department determines that an open pit is a flow-through pit, the open pit water quality must meet 3103 standards or the open pit must be pumped in order to maintain an area of open pit hydrologic containment. Section 20.6.7.33.D(2) NMAC.

The Third Judicial District Court's *Copper Flat Extradited Inter Se Decision* recently held that the Mine's pit lake is hydrologically connected to groundwater, therefore the pit cannot be a hydrologic evaporative sink that does not mingle with groundwater. Exhibit A, page 61. However, the Draft Discharge Permit is based on the erroneous assumption that the Mine's pit will be a hydrologic evaporative sink at all times and that the Copper Rule's post-closure requirements for flow-through pits are not applicable. The Draft Discharge Permit's erroneous assumption that toxic pit lake water will not mingle with groundwater substantially undermines the required determination regarding whether the permit poses a hazard to public health and/or undue risk to property.

Furthermore, MMD has also concluded that, "[I]t seems likely that the water placed in the pit [from rapid-fill post-closure] **will leak back into the surrounding aquifer**." MMD Comments on the Copper Flat Copper Mine Draft EIS (March 4, 2016) (emphasis added). *See* attached Exhibit H.

TRP's expert has also demonstrated to the Environment Department that the Mine's open pit will not be an evaporative hydrologic sink at all times. On July 3, 2017, TRP requested that NMED's Surface Water Quality Bureau ("SWQB") continue regulating the Mine's pit lake as a surface water of the State, subject to the ground water quality standards of Section 20.6.2.3103 NMAC and the Copper Rule's requirements found at Section 20.6.7.33.D(2) NMAC. *See* attached Exhibit I; *see* also Exhibit F, pages 10-13.

In TRP's request, hydrogeologist Tom Myers provided the Environment Department with a technical memo concluding that "pit lake water would enter the surrounding formations as groundwater" due to rapid-fill of the pit post-closure, thus becoming a flow-through pit for an unknown period of time. Exhibit I's Exhibit C, page 8. Accordingly, the open pit is clearly subject to Section 20.6.2.3103 NMAC water quality standards and the Copper Rule's flow-through pit requirements.

Finally, the SWQB recently submitted comments to BLM on the Copper Flat Administrative Final EIS. The SWQB has advised the following, in pertinent part:

> The determination that the pit lake will respond as a hydrologic sink through variable site conditions over time is subject to continued monitoring and verification. The SWQB feels it premature to assert jurisdiction of waters within the mine pit lake **until such a time to which the New Mexico Environment Department has been provided sufficient information to support a determination.** The SWQB requests language reflecting conditions for both scenarios; that in which the water is deemed to be private and does not combine with other surface or subsurface water, and that in which it does.

Exhibit S, page 2 (emphasis added).[8] Accordingly, NMED concedes that the department does not have sufficient information to determine whether the Mine's pit lake will be a hydrologic evaporative sink at all times. The Environment Department therefore must deny the Draft Discharge Permit.[9]

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[8] SWQB then submitted a second comment letter to BLM on the Copper Flat Administrative Final EIS stating that "there is sufficient information" to make a determination regarding whether the Mine's pit lake will be a hydrologic evaporative sink at all times, but that "it is not the appropriate time in the process to issue a written determination by the NMED Secretary." Exhibit T, page 2. It is unclear what new information came to light since April 17, 2018 that now provides the SWQB with "sufficient information" to make a determination regarding the Mine's pit lake being a hydrologic evaporative sink. Furthermore, the appropriate time for such a determination is now and not after the close of the public comment period on the Draft Discharge Permit.

[9] The Copper Rule expressly states that, "Compliance with these rules does not relieve an applicant or permittee of a copper mine facility from complying with the Mining Act rules in Title 19, Chapter 10 NMAC under the authority of the mining and minerals division." Section 20.6.7.6 NMAC. The Copper Rule also provides that, "Compliance with commission rules including the requirements of 20.6.7 NMAC does not relieve a copper mine facility owner, operator or permittee from complying with the requirements of other applicable local, state and federal regulations or laws." Section 20.6.7.8 NMAC.

4. The Environment Department Cannot Determine Whether the Permit Poses a Hazard to Public Health and/or Undue Risk to Property Without Required Tailings Dam Safety Information and Analyses.

The Copper Rule requires applicants or permittees proposing or required to construct a tailings dam to submit "documentation of compliance with the requirements of the dam safety bureau of the state engineer pursuant to Section 72-5-32 NMSA 1978, and rules promulgated under that authority, unless exempt by law from such requirements" (Section 20.6.7.17.C(1)(d)) to the department for approval "**with an application** for a new, renewed or modified discharge permit." Section 20.6.7.17.C NMAC (emphasis added). This is mostly likely because tailings dam failures pose a significant hazard to public health and undue risk to property, and an approved OSE-DSB permit is the only definitive means of demonstrating compliance with OSE-DSB's requirements and rules.

The Draft Discharge Permit Application fails to demonstrate compliance with OSE-DSB rules and regulations for the following reasons. First, NMCC has failed to submit and obtain OSE-DSB permit approval for its proposed tailings dam.[10] As previously discussed, the Copper Flat Copper Mine only operated for a little over three months in 1982. The previous owners left in place the Mine's 3.5 months of tailings production. The tailings dam was placed under a State

The Mining Act's regulations require the mine to "achieve a self-sustaining ecosystem appropriate for the life zone of the surrounding areas following closure," Section 19.10.6.603 NMAC, and for a new mining operation to be "designed to meet without perpetual care all applicable environmental requirements of the Act." Section 19.10.6.603.H NMAC. A discharge permit that allows perpetual pump and treat of the open pit will result in violation of Section 20.6.7.6 NMAC and Section 19.10.6.603.H NMAC. Therefore the Draft Discharge Permit must be denied.

[10] NMCC's failure to submit documentation of compliance with OSE-DSB rules and regulations for the proposed TSF dam also demonstrates that the Discharge Permit Application is technically incomplete, a further violation of the Copper Rule and grounds for denying the Draft Discharge Permit.

Engineer Order, dated April 19, 1983 and amended on April 18, 1985 ("1985 Order"), requiring the Mine operators to submit annual monitoring data to OSE-DSB and to perform routine maintenance. Exhibit G, page 7.

However, NMCC obtained a waiver from OSE-DSB in 2012 and has alarmingly not been required to perform routine maintenance and monitoring pursuant to the 1985 Order, on the grounds that NMCC is in the process of obtaining a new mining permit.[11] In fact, the last report received by the OSE-DSB on the Mine's existing tailings dam was in 1986, over thirty (30) years ago. Exhibit G, page 7.

Second, even though the Discharge Permit Application includes a TSF Report, this report has not been reviewed or approved by the OSE-DSB and fails to provide the following required information:

- The Mine's maximum daily discharge volume and annual volume of tailings as design factors;
- TSF topography, geology and footprint adequate to assess the geologic setting and corresponding risks related to the foundation and seismic risk; and
- TSF hazard classification, design storm requirements, and free board requirements.

Exhibit G, pages 10-13; Section 20.6.7.17.C(1)(d) NMAC; Section 20.6.7.22.C(1) NMAC.

[11] NMCC first requested a waiver from routine maintenance and monitoring of the existing tailings dam in 2012. OSE-DSB approved the waiver. NMCC requested that the waiver be extended to June 30, 2017. NMCC Letter to OSE-DSB, dated April 20, 2014. The waiver extension was approved. OSE-DSB Letter to NMCC, dated April 30, 2014. The waiver expired on June 30, 2017. Nearly thirty (30) days after the waiver expired, NMCC submitted a request to extend the waiver. NMCC Letter to OSE-DSB, dated July 21, 2017. Even though the waiver had expired on June 30, 2017, OSE-DSB granted NMCC's request to extend the waiver through June 30, 2020. OSE-DSB Letter to NMCC, dated September 18, 2017. It is most likely that this waiver extension is unlawful and subject to legal challenge.

Accordingly, the TSF Report clearly does not comply with OSE-DSB rules and regulations and cannot be used to satisfy Section 20.6.7.17.C(1)(d)'s requirement. Only an approved OSE-DSB permit for the proposed tailings dam can satisfy the Copper Rule's Section 20.6.7.17.C(1)(d). For these reasons, the Environment Department must therefore deny the Draft Discharge Permit.

Furthermore, without an approved OSE-DSB permit, the Environment Department cannot determine whether the proposed tailings dam poses a hazard to public health and/or undue risk to property. The Environment Department must therefore deny the Draft Discharge Permit.

III. The Draft Discharge Permit Is Technically Incomplete.

A. NMCC's MORP, the Critical Document for the Draft Discharge Permit, Has Yet to be Finalized or Approved and is Still Undergoing Revision.

As discussed above, the Environment Department takes the position that the MORP and its associated operational, monitoring and closure plans "are **critical to development of the draft Ground Water Discharge Permit**." Environment Department Comments on NMCC's October 14, 2016 Revised MORP, page 2 (January 6, 2017) (emphasis added). TRP and Pitchfork Ranch are also in agreement that these documents are critical to drafting a lawful, effective discharge permit. Sections 20.6.7.11 - 37 NMAC. However, confusingly, the Environment Department proceeded to draft a discharge permit and determine that the Draft Discharge Permit is approvable without having these critical documents finalized and approved by both BLM and MMD.[12] These critical documents were first submitted to BLM and state agencies in 2010. They were revised in July 2012, again in October 2016, and again in July

[12] The Draft Discharge Permit concedes that the Closure/Closeout Plan relied upon is not yet finalized by MMD. Draft Discharge Permit, page 23, paragraph C113.A.

2017.[13] Neither BLM nor MMD has approved a final MORP and associated operational, monitoring and closure plans. These critical documents are still undergoing revision at this time.

In fact, the recently issued Third Judicial District Court's *Copper Flat Expedited Inter Se Decision* demonstrates that the last iteration of the MORP and associated operational and closure plans are based on outdated and incorrect information regarding the Mine's sole fresh water supply source required for both mining operations and reclamation.

The *Copper Flat Expedited Inter Se Proceeding* to determine water rights claimed by NMCC, the proponent of the proposed Copper Flat Copper Mine, and William Frost and Harris Gray, legal owners of the water rights to be used by NMCC, came before the Third Judicial District Court in January 2014. A ten (10) day trial was held on March 14 through 18, 2016 and June 27 through July 1, 2016.

After trial on the issues and after considering the parties' proposed findings of fact and conclusions of law, the Court concluded the following on December 28, 2017:

1) Any inchoate water rights are extinguished;
2) The combined amount of the water element for LRG-4652, LRG-4652-S, LRG-4652-S-2, and LRG-4652-S-3 **is 861.84 acre-feet per year** ("afy");
3) LRG-4652, LRG-4652-S, LRG-4652-S-2, and LRG-4652-S-3 have an additional, combined stock right;
4) LRG-4652-S-8 has a stock right; and
5) The amount of the water element for the open pit, LRG-4652-17 is 34.45 afy.

[13] NMED has also misrepresented the chronology of and metamorphosis of NMCC's discharge permit application by stating that the first discharge permit application submitted was on December 11, 2015. The first discharge permit application was actually submitted on March 31, 2011. The application was then revised on December 9, 2015, and again on June 21, 2016, again on July 17, 2017, and again in August 2017. It is concerning that NMED clearly does not have a basic understanding of the procedural history of this discharge permit application. Draft Discharge Permit, page 4, paragraph A.

Third Judicial District Copper Flat Expedited Inter Se Proceeding Decision, page 3 (December 28, 2017) (emphasis added); *See* attached Exhibit A.

The *Inter Se Decision* held that NMCC has a water right of only 861.84 acre-feet of water per year in its four groundwater production wells. However, NMCC has summarized its Mine Operation Water Management Plan as follows: 15,504 acre feet of "recycled" water will be used per year; 5,738 acre feet of "non-recycled" water will be used per year; with a total of 21,242 acre feet of water being used per year for ore processing.[14] August 2017 Revised DP Application, Table 11J-2, page 74. NMCC fails to account for the 4,876 acre feet of "non-recycled" water necessary for ore processing, hereby violating Section 20.6.7.11.H(2) NMAC. The Environment Department must therefore deny the Draft Discharge Permit.

NMCC also fails to properly account for start-up water needed for ore processing, thereby violating Section 20.6.7.11.H(2) NMAC. At the commencement of mining there are no tailings, so there is no tailings reclaim water; initial water must be obtained from freshwater sources. TRP has previously advised BLM that it will take the Mine at least five years to reach a recycling capacity of 9,096 af/y at a seventy-five percent recycling efficiency. TRP Comments on the Draft EIS, page 5, attached as Exhibit J; *See also* New Mexico Interstate Stream Commission Comments on the Draft EIS, page 5, attached as Exhibit K. Accordingly, the Environment Department must therefore deny the Draft Discharge Permit.

Furthermore, NMCC's revised MORP and associated Closure Plan state that the Mine will use 2,202 acre-feet of water from its four groundwater production wells to rapid-fill the pit over a six-month period. The recent *Inter Se Decision* makes clear that the Mine's MORP and

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[14] This summarized Mine Operation Management Plan contradicts the water balance summarized in the Draft EIS: "Alternative 2 (30,000 tpd) uses 22,210 af/y, recycling 15,504 af/y and obtaining from freshwater sources 6,105 af/y." Draft EIS Figure 2014.

associated plans are based upon outdated and incorrect water accounting, thereby violating Section 20.6.7.11.H(2) NMAC. The Environment Department must therefore deny the Draft Discharge Permit. *See* TRP's and Pitchfork Ranch's February 27, 2018 Request to MMD (attached as Exhibit L).

The *Inter Se Decision* also demonstrates that NMCC's proposed open pit reclamation measure of rapid-fill is currently technically infeasible. However, the Environment Department includes the technically infeasible reclamation measure as a condition of the permit. Draft Discharge Permit, page 4, paragraph H. Due to the technical infeasibility of pit rapid-fill, it is unknown what reclamation measures will be required for the pit in the final approved Closure/Closeout Plan. TRP and Pitchfork Ranch have therefore requested MMD to require further revisions of the MORP to: 1) properly account for an annual 5,243.1 acre-foot water deficit in the Mine's sole freshwater supply source needed for mining operations and reclamation, and 2) identify a technically feasible open pit reclamation measure. *See* TRP's and Pitchfork Ranch's February 27, 2018 Request to MMD (attached as Exhibit L). The Environment Department must therefore deny the Draft Discharge Permit.

Another issue with the Environment Department's reliance on an outdated MORP is that the Draft Discharge Permit mistakenly assumes the July 2017 MORP's proposed reclamation measures will actually be implemented and that the July 2017 MORP will not undergo any further revisions. For example, the Draft Discharge Permit assumes that not only will the open pit be reclaimed using rapid-fill, but that the open pit will be reclaimed to provide wildlife habitat in line with pre-mining standards. Draft Discharge Permit, page 4, paragraph H; page 23, paragraph A; page 24, paragraph 1. However, through documents obtained from BLM via a

Freedom of Information Act ("FOIA") request, it is clear NMCC will not be reclaiming the open pit area to meet pre-mining conditions for wildlife habitat.

The BLM has recently determined the following in regard to the Mine's open pit:

> The EIS (affected environment section and wildlife impacts section) has been revised to better describe the pit lake with respect to wildlife and habitat. As described in the EIS, water in the existing pit is high in cadmium, copper, manganese, and selenium. The revision will articulate that the pit lake is not now a water of the State, nor will it be post-mining, and therefore it is not and will not be subject to surface water quality standards applicable to waters of the State. The water quality standard that would apply is a mining permit condition from MMD that post-mining pit lake water quality would be similar to pre-mining pit lake water quality. This discussion will be carried forward through the wildlife sections to better articulate that **the current pit lake does not provide habitat and the post mining pit will not provide habitat**.

November 2017 BLM "Briefing Memorandum" Supporting Document. (Attached as Exhibit M) (emphasis added).

BLM's recent determination that the open pit area was never wildlife habitat and never will be post-closure directly contradicts NMCC's statement that:

> At the completion of mining activities, the site will be restored to conditions and standards that meet approved post-mining land uses. These uses will include native plant communities similar to surrounding undisturbed areas **for wildlife habitat**, and grazing land potentially suitable for livestock. **Once reclamation is successfully completed, wildlife populations would be expected to return to existing (i.e. pre-mining operation) levels** (BLM DEIS Nov. 2015, p. 3-137 and 138).

NMCC's July 2017 Revised MORP, page 2-54 (emphasis added).

NMCC's July 2017 Revised MORP expressly states that its "Reclamation and Closure Plan is designed to re-establish grazing in the area and allow for long-term use of the reclaimed areas by wildlife known to historically use the area," *Id.* at page 2-62, and "…**the pit lake that will form over time upon mine closure will provide enhanced avian wildlife habitat and a water source for transient wildlife**." *Id.* at page 2-63 (emphasis added). Most importantly, NMCC has declared in its July 2017 Revised MORP, which the Environment Department has deemed critical to the Draft Discharge Permit, that "the company is **committed to a reclamation and closure plan that re-establishes grazing and wildlife habitat land use of the site at closure**." *Id.* (emphasis added).

Furthermore, NMCC has requested NMED to administer the current and future expanded pit lake as a "private water of the State," thereby being exempt from both ground and surface water quality standards.[15] If NMED regulates the pit lake as a private water, NMCC will leave behind a substantial body of toxic water without reclaiming to pre-mining standards for wildlife, grazing, and warmwater aquatic life habitat.[16]

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[15] This request letter has unlawfully been omitted from the DP-1840 Administrative Record provided to the public on March 21, 2018 by the Environment Department. It is attached as Exhibit N to these comments. TRP's request to the Environment Department to continue to administer the Mine's current and future expanded pit lake as a surface water of the State has also been unlawfully omitted from the DP-1840 Administrative Record. It is attached as Exhibit I of these comments. NMELC has advised NMED that a number of documents are missing from the March 21, 2018 Administrative Record. NMED sent NMELC a "corrected" Administrative Record disc dated May 2, 2018 that was received on May 3, 2018 – less than two days before the public comment period deadline. NMED failed to identify hundreds of records added to the "corrected" Administrative Record and has not provided an index. NMELC advised NMED that due process is being denied by the Department's refusal to provide a correct, complete Administrative Record for DP-1840 and refusal to extend the public comment period so that interested parties could continue to identify missing documents and review the May 2, 2018 Administrative Record. TRP and Pitchfork Ranch therefore reserve the right to submit additional comments and raise additional concerns based on the May 2, 2018 Administrative Record, and to supplement the Administrative Record with additional documents.

[16] The Copper Rule expressly states that, "Compliance with these rules does not relieve an applicant or permittee of a copper mine facility from complying with the Mining Act rules in Title 19, Chapter 10 NMAC under the authority of the mining and minerals division." Section 20.6.7.6 NMAC. The Copper Rule also provides that, "Compliance with commission rules including the requirements of 20.6.7 NMAC does not relieve a copper mine facility owner, operator or permittee from complying with the requirements of other applicable local, state and federal regulations or laws." Section 20.6.7.8 NMAC. The Mining Act's regulations require the mine to "achieve a self-sustaining ecosystem appropriate for the life zone of the surrounding areas following closure," Section 19.10.6.603 NMAC, and for a new mining operation to be "designed to meet without perpetual care all applicable environmental requirements of the Act." Section 19.10.6.603.H NMAC. Accordingly, classification of the Mine's pit lake as a private water will violate the Mining Act's requirements for new mines.

It is clear that the Draft Discharge Permit is based upon an incomplete description of proposed mining operations and reclamation measures, resulting in a draft permit comprised of outdated, technically incomplete, and contradictory information. Currently, based on the most recent discharge permit application (August 2017) and supporting documents (which include the July 2017 revised MORP and associated operational, monitoring and closure plans), the public could only conclude that the Draft Discharge Permit requires the Mine to reclaim the open pit area to pre-mining standards for wildlife, grazing, and warmwater aquatic life habitat. That conclusion, based on the above discussed documents, is incorrect.

Finally, without an approved MORP and associated operational, monitoring and closure plans in place, the Environment Department cannot adequately assess whether the Mine's discharge permit complies with the Copper Rule and other applicable law, such as the Mining Act. Section 20.6.7.6 NMAC; Section 20.6.7.10.J NMAC; Sections 20.6.7.11 - .37 NMAC. For these reasons, the Environment Department must deny the Draft Discharge Permit.

B. The Draft Discharge Permit is Not Based Upon a Finalized Probable Hydrologic Consequences Report and a Finalized Predictive Geochemical Modeling of the Pit Lake Report.

The Copper Rule requires discharge permit applicants to provide hydrologic information and a hydrologic conceptual model for a copper mine. Sections 20.6.7.11.K(3) and 20.6.7.11.P NMAC. This information is another critical component of a discharge permit and assists the Environment Department in its evaluation of whether the discharge permit poses a hazard to public health and/or undue risk to property. A discharge permit cannot be granted if it poses a hazard to public health and/or undue risk to property. Section 20.6.7.10.J NMAC. NMCC submitted to the Environment Department and MMD two hydrologic reports in December 2017 in support of its discharge permit application and mining permit application.

The first report submitted was NMCC's "Probable Hydrologic Consequences" Report ("PHC Report"). The objective of this report is to "develop a determination of the probable hydrologic consequences of the operation and reclamation on both the permit and affected areas with respect to the hydrologic regime, quantity and quality of surface and groundwater systems that may be affected by the proposed operations." NMCC's PHC Report, page ii (December 2017).

The second report submitted was NMCC's "Predictive Geochemical Monitoring of Pit Lake Water Quality" Report ("PGM Report"). The objective of this report is to "provide an analysis that demonstrates that future pit lake water quality results in a water body with similar chemistry to that of pre-mining conditions upon implementation of the reclamation actions proposed by NMCC in its MORP and Reclamation Plan." Copper Corporation's PGM Report, page ii.

However, it is clear that the Environment Department did not base the Draft Discharge Permit on information provided in these two December 2017 hydrologic reports for the following reasons. First, the Environment Department began drafting the Draft Discharge Permit well before it even made a technical completeness determination. *See* attached Exhibit O. Second, the Environment Department made its technical completeness finding for the discharge permit application on February 1, 2018 without having reviewed these two hydrologic reports. *See* attached Environment Department Comments on these two hydrologic reports provided to MMD, Exhibit P. Third, the Environment Department did not complete its review of these two hydrologic reports until March 16, 2018 – forty-two (42) days **after** it determined the Draft Discharge Permit approvable. *Id.*

Furthermore, based on the Environment Department's comments submitted to MMD on these two hydrologic reports, as well as the comments of MMD and NM Game & Fish, further revisions to these hydrologic reports and the underlying hydrologic model are required. *Id.*; *see also* MMD and NM Game & Fish comments on the hydrologic reports, attached as Exhibit Q and R, respectively. In fact, NMCC has until May 22, 2018 to respond in writing to MMD's, the Environment Department's, and NM Game and Fish's comments on the two hydrologic reports.

The Environment Department expressed the following concerns regarding NMCC's two hydrologic reports:

- The SWQB [Surface Water Quality Bureau] has concerns regarding the potential hydrologic consequences to perennial flows in Las Animas Creek and Percha Creek;

- MECS [Mining Environmental Compliance Section] ...questions the interpretations of infiltration into the [tailing area] cover system, the properties of the cover materials and waste rock and ultimately the net-percolation from the waste rock storage areas; and

- MECS disagrees with the conclusion that net-percolation to groundwater from the waste rock storage areas is not expected. The evaluation presented is rudimentary at best and not appropriate for an evaluation of water and evaporative flux within a waste rock cover system and waste rock stockpile. In addition, the numbers are inconsistent with predictions from other mine sites with similar rainfall and evaporative regimes.

Exhibit Q, pages 3-4. Based upon these concerns, the Environment Department has recommended NMCC conduct a number of model revisions. *Id.* at pages 4-7.

Additionally, NM Game & Fish advised MMD the following, in pertinent part:

> The modeling effort was limited to projecting pit lake water quality for 100 years. However, **the pit lake will persist 'in perpetuity'**...

and,

> The current model appears to **rely on historic climate data** to predict the rate of evapoconcentration [of the pit lake]. The modeling should consider projected future climate regimes that would provide a plausible range of possible pit lake water quality outcomes.

Exhibit R (emphasis added).

Finally, MMD also has a number of concerns with NMCC's two hydrologic reports and is requiring NMCC to make a number of revisions addressing probable hydrologic consequences such as achieving pre-mining hydrologic balance, predicted drawdown within the Santa Fe Group at the end of mining, anticipated cumulative effects of groundwater drawdown in Grayback/Greenhorn arroyos, pit lake surface elevation and stabilization post-mining, and pit lake chemistry for the existing pit lake. Exhibit Q.

NMCC's hydrologic reports are now undergoing state agency requested revisions based upon the above discussed concerns. It is unclear when these hydrologic reports will be finalized and approved.

Accordingly, the procedural timeline for the Draft Discharge Permit clearly demonstrates that the Environment Department, at the least, drafted a discharge permit based on outdated, technically incomplete information, and, at the most, speedily and hastily determined that an unlawful draft discharge permit is approvable despite the fact that NMCC has yet to address concerns raised by the Environment Department itself. Because the critical hydrologic components of the discharge permit application have yet to be finalized, the Environment Department must deny the Draft Discharge Permit.

IV. The Draft Discharge Permit is Arbitrarily Based on New Information Not Provided in the Draft Discharge Permit Application Documents. In the Alternative, the Draft Discharge Permit Indicates that NMCC May Have Made False Material Statements, Representations, Certifications or Omissions of Material Fact.

A. The Draft Discharge Permit is Arbitrarily Based on New Information Not Provided by NMCC's August 2017 Revised Discharge Permit Application, July 2017 Revised MORP, and the Draft EIS.

As previously discussed, the Mine's MORP and associated operational, monitoring and closure plans are critical to the Draft Discharge Permit's development. NMCC has stated that its July 2017 Revised MORP and associated plans are "consistent with information contained in NMCC's Discharge Permit application," and information contained in the Draft EIS, "in particular, with regard to Alternative 2 as described in the DEIS." NMCC's July 2017 Revised MORP, page 1-1. However, the Draft Discharge Permit, which is based upon the July 2017 Revised MORP and associated plans – which in turn are based upon the Draft EIS's Alternative 2 – contains numerous inconsistencies regarding the Mine's history and facility description, as well as the Mine's proposed operations.

First and foremost is the proposed daily production rate in the Draft Discharge Permit. The Draft Discharge Permit states that the daily production rate for the Mine will be 38,000 tons per day ("TPD"). Draft Discharge Permit, page 3, paragraph C. However, the August 2017 Revised Discharge Permit Application, upon which the Draft Discharge Permit is also based, states that the Mine's daily production rate will be, at the most, 30,000 TPD. August 2017 Revised Discharge Permit Application, page 1.[17] The July 2017 Revised MORP states that the daily production rate will be "approximately 25.5 to 29.6 thousand TPD." July 2017 Revised

[17] The August 2017 Revised Discharge Permit Application also states that the daily production rate will be 32,000 TPD. August 2017 Revised DP Application, page 41. It does not, however, state that the daily production rate will be 38,000 TPD.

MORP, page 2-1. Alternative 2 in the Draft EIS also states that the production rate will be 30,000 TPD for the Mine. DEIS ES-4.

This inconsistency demonstrates that the Draft Discharge Permit is arbitrarily based on new information not provided by NMCC in its DP Application, MORP and associated plans, and the BLM's Draft EIS. It is unclear why the Environment Department has arbitrarily increased the Mine's daily production rate by nearly thirty (30) percent for purposes of a discharge permit. It is, however, clear that all of the models, analyses, and reports relied upon by the Draft Discharge Permit are not based upon this increased daily production rate.

A nearly thirty (30) percent increase in the Mine's daily production rate clearly impacts whether the Mine will pose a hazard to public health and/or undue risk to property. The Environment Department cannot make this required public hazard/undue risk to property determination without analyzing the Mine's impacts pursuant to this increased daily production rate. Section 20.6.7.10.J NMAC. The Environment Department must therefore deny the Draft Discharge Permit.

Other inconsistencies in the Draft Discharge Permit relate to the Mine's water management plan, area of disturbance, the amount of ore to be processed and the amount of waste rock to be produced, the size of the existing pit lake, and the depth of the future expanded pit lake. All of these factors influence the Mine's impact to ground and surface water quality and whether the Mine will pose a hazard to public health and undue risk to property. Section 20.6.7.10.J NMAC.

As previously discussed, NMCC's summary of its Mine Operation Management Plan in its Revised August 2017 DP Application states that the Mine will use 5,738 af/y of fresh groundwater for ore processing. Revised August 2017 DP Application, Table 11J-2, page 74. In contrast, the Draft EIS states that 6,105 af/y of fresh groundwater will be needed for ore processing. NMCC fails to account for the 367 ac/f of fresh groundwater necessary for operations. Additionally, the water balance provided in the Draft EIS is for a *maximum* of 30,000 TPD - not the 38,000 TPD rate provided in the Draft Discharge Permit. A nearly thirty (30) percent increase in the Mine's daily production rate would result in a corresponding thirty (30) percent increase in water consumption necessary for ore processing.

The increase in ore production and its corresponding increase in fresh water consumption directly affect whether the Mine will pose a hazard to public health and/or undue risk to property in the following ways. First, the increase in ore production results in increased amounts of waste rock, thereby resulting in an increased risk of waste rock run-off, leaching and seepage into groundwater, in turn resulting in an increased risk of groundwater and surface water contamination. Second, the increased consumption of fresh groundwater for the increased ore production could result in further lowering the groundwater table and hydrologically connected surface water flows of the Rio Grande, thereby posing a hazard to public health and undue risk to property. The Environment Department therefore cannot make the required public hazard/undue risk to property determination without analyzing the Mine's impacts pursuant to this increased daily production rate, and therefore must deny the Draft Discharge Permit. Section 20.6.7.10.J NMAC.

The Draft Discharge Permit also states that the project will disturb approximately 1,290 acres, of which approximately 910 acres were previously disturbed from historic mining operations at the site. Draft Discharge Permit, page 3, paragraph A. In the Draft EIS, the proposed action (17,500 tpd) identifies a total of 1,586 acres of disturbance within the Mine area and 97.2 acres outside the Mine area for ancillary facilities (DEIS 2-5, Table 2-1, Table 2-2); for

Alternative 1 (25,000 tpd) it identifies a total of 1,401 acres of disturbance within the Mine area (DEIS 2-59, Table 2-16); for Alternative 2 (30,000 tpd and BLM's preferred alternative) it identifies a total of 1,444 acres of disturbance within the Mine area) (DEIS 2-73, Table 2-24). An increase in the Mine's area of disturbance will naturally result in an increased risk to ground and surface waters, as well as to wildlife and grazing habitat. Without an accurate accounting of the Mine's area of disturbance, the Environment Department cannot make the required public hazard/undue risk to property determination and therefore must deny the Draft Discharge Permit. Section 20.6.7.10.J NMAC.

Also of concern is the Draft Discharge Permit's statement that "over an estimated eleven-year operational period, the permittee intends to mine the copper-rich ore body and process approximately **125 million tons of ore** at the Process Facility Area, and place **33 million tons of waste rock** on three delineated waste rock stockpiles peripheral to the open pit". Draft Discharge Permit, 3, paragraph C (emphasis added). This contradicts the July 2017 Revised MORP, which states that NMCC will mine approximately **113 million tons of ore and 45 million tons of waste rock** during the operating life of the Mine (158 million tons). July 2017 Revised MORP, page 2-1.

Though the total of processed ore and waste rock is the same, 158 million tons, it appears that the Environment Department has reduced the amount of waste rock by 12 million tons and has increased the amount of ore to be processed by 12 million tons. It is unclear how the Environment Department was able to reach this conclusion, given the very low grade of the ore to be processed. Without an accurate accounting of waste rock to be produced by the Mine's operations, the Environment Department cannot make the required public hazard/undue risk to property determination and therefore must deny the Draft Discharge Permit. Section 20.6.7.10.J NMAC.

Additionally, according to the Draft Discharge Permit, the current pit encompasses "eighty acres of disturbance including a five-acre water body." Draft Discharge Permit, page 3, paragraph B. However, this contradicts information in the DEIS stating that the current pit encompasses "102 acres" of disturbance. DEIS 2-6. The size of the current and future expanded pit lake is directly related to its impact to wildlife, grazing and warmwater aquatic life, thereby affecting the determination regarding whether the Draft Discharge Permit poses a hazard to public health and/or undue risk to property. Without an accurate accounting of the pit lake's current and future expanded size, the Environment Department cannot make the required public hazard/undue risk to property determination and therefore must deny the Draft Discharge Permit. Section 20.6.7.10.J NMAC.

Finally, the July 2017 Revised MORP, which the Environment Department has identified as critical to the Draft Discharge Permit, purportedly contains information consistent with that provided in the Draft EIS. However, when it comes to information regarding the depth of the future expanded pit lake, the July 2017 Revised MORP provides a depth of "approximately 850 to 900 feet," (July 2017 Revised MORP, page 2-7), whereas the Draft EIS provides a depth of "approximately 1,000 feet." DEIS, page 2-73, 2-74. The depth to groundwater ratio directly affects whether the Mine's Draft Discharge Permit will pose a hazard to public health and/or undue risk to property. Without an accurate accounting of the Mine's pit depth, the Environment Department cannot make the required public hazard/undue risk to property determination and therefore must deny the Draft Discharge Permit. Section 20.6.7.10.J NMAC.

In conclusion, the Draft Discharge Permit, on its face, is arbitrarily based upon information not provided by NMCC for key mining units and operations and contains numerous inconsistencies, rendering determination of hazard to public health and/or undue risk to property impossible. The Environment Department must therefore deny the Draft Discharge Permit.

B. In the Alternative, the Draft Discharge Permit Indicates that NMCC May Have Made False Material Statements, Representations, Certifications or Omissions of Material Fact.

Information pertaining to the Mine's units and operations must be consistent with NMCC's Discharge Permit Application and the BLM's Draft EIS. In the alternative, if NMED determines that the Draft Discharge Permit is not arbitrarily based on new information not provided by NMCC, the above-discussed inconsistencies indicate that NMCC may be making false material statements, representations, certifications or omissions of material facts in its discharge permit application, its MORP and associated operational, monitoring and closure plans, and in the Draft EIS, which is of grave concern to both TRP and Pitchfork Ranch. Any false material statements, representations, certifications or omissions of material fact made by NMCC are direct violations of the Water Quality Act. NMSA 1978, Section 74-6-10.2.A(2).

The Environment Department must therefore deny NMCC's application for a discharge permit pursuant to the Water Quality Act. Section 74-6-5.E(4)(a),(b).

V. The Draft Discharge Permit's Use of Discharge Permit Amendments Violates the New Mexico Water Quality Act.

The Draft Discharge Permit is replete with the use of discharge permit amendments for making future significant changes to the permit - after the permit's effective date - without public notice, comment or opportunity for a public hearing. A discharge permit amendment is defined under the Copper Rule as:

> [a] minor modification of a discharge permit that does not result in a significant change in the location of a discharge, an increase in daily discharge volume of greater than 10% of the original daily discharge volume approved in an existing discharge permit for an individual discharge location, a significant increase in the concentration of water contaminants discharged, or introduction of a new water contaminant discharged.

Section 20.6.7.7.B(19) NMAC.

The Environment Department is authorizing the use of discharge permit amendments for the following future significant changes to the Draft Discharge Permit, *after* the permit's effective date: 1) expansion of the TSF beyond the permitted footprint of the TSF (Draft Discharge Permit, page 16, paragraph C.4); 2) changing the location of discharges of contaminated, untreated water for dust suppression (*Id.* at page 18, paragraph C108.B); 3) changing monitoring and reporting requirements (*Id.* at page 19, paragraph C111.F); and 4) abandonment of required monitoring wells (*Id.* at page 20, paragraph 8).

The use of discharge permit amendments throughout the Draft Discharge Permit is of great concern to TRP and Pitchfork Ranch for several reasons. First, the use of amendments unlawfully eliminates public notice, comment and opportunity for a public hearing on significant changes to a permit. Second, allowing substantial permit conditions to be amended after the permit's effective date undermines both the purpose of permit conditions and public participation in the permit process. Third, the use of discharge permit amendments is unlawful under the Water Quality Act. Finally, the permit conditions identified in the Draft Discharge Permit that "could be changed via an amendment" constitute significant changes to the permit that would result from a change in the location of a discharge, a significant increase in the quantity of the discharge, and from a significant change in the quality of the permitted discharge that are required to be administered as permit modifications.

A. Use of Discharge Permit Amendments in Lieu of Discharge Permit Modifications Unlawfully Eliminates Public Notice, Comment and Opportunity for a Public Hearing on Significant Permit Condition Changes.

The Water Quality Act expressly states that, "No ruling shall be made on any application for a permit without opportunity for a public hearing..." Section 74-6-5(G). Therefore, decisions regarding applications for a new discharge permit or for modification of an existing discharge permit cannot be made without an opportunity for a public hearing. *Id.* It is clear that the Environment Department's substantial reliance upon discharge permit amendments – which are not subject to public notice, comment or opportunity for a public hearing – for significant changes to DP-1840 after the permit's effective date is a means of circumventing the Water Quality Act's public participation requirements.

The Environment Department's attempts at circumventing the Water Quality Act's public participation requirements become even more apparent when the Draft Discharge Permit states that significant changes to permit conditions – that would certainly result from a change in location of a discharge, increase in quantity or change in quality of a discharge and thus satisfying the current regulatory definition for discharge permit modification which are subject to public notice, comment and opportunity for a public hearing – are to be unlawfully administered as amendments. Section 20.6.2.7.P NMAC.

New Mexico Courts have made clear that the Environment Department's repeated attempts to circumvent and chill public participation in the discharge permit process are unlawful. Communities for Clean Water v. New Mexico Water Quality Control Commission, 2017 N.M. App. LEXIS 115; In re Rhino Envtl. Servs., 2005-NMSC-024, P 23, 138 N.M. 133, 139, 117 P.3d 939, 945. The Draft Discharge Permit's violation of the Water Quality Act's public participation provisions requires the Environment Department to deny NMCC's permit application pursuant to Section 74-6-5.E(2).

B. Allowing "Amendment" of Significant Permit Conditions After a Permit's Effective Date Undermines Both the Purpose of Permit Conditions and Public Participation in the Permit Process.

A key distinction between a discharge permit amendment and a discharge permit modification is that amendments are not subject to public notice, comment and opportunity for a public hearing. Section 20.6.7.14.C NMAC. In contrast, discharge permit modifications, whether initiated by NMED or by the permittee, are subject to public notice, comment and opportunity for a public hearing. Section 20.6.2.3108 NMAC; NMSA 1978, Section 74-6-5(G). The Environment Department's substantial reliance on amendments to change significant permit conditions after DP-1840's effective date is extremely concerning for the following reasons.

First, the public has no guarantee that the proposed permit conditions of the Draft Discharge Permit will remain in effect for the entire term of the discharge permit, or for even one day after DP-1840's effective date.

Second, the public would not even know whether significant permit conditions pertaining to the TSF footprint, changes in location of discharges, changes to the boundaries of the monitoring well network, changes to monitoring and reporting requirements and abandonment of required monitoring wells are made because the public would receive no notice, opportunity to comment, or opportunity to request a public hearing on such changes.

Third, the use of amendments to change vital permit conditions that help prevent or mitigate ground water pollution clearly undermines the purpose of permit conditions initially imposed and that were subject to robust public review, comment and opportunity for a public hearing. If the Environment Department and the permittee can, behind closed doors, undo any or all permit conditions of DP-1840 that the public sought to impose through public review, comment and hearings on the initial permit after the permit's effective date – all of the permit conditions would be rendered meaningless.

C. The Use of Discharge Permit Amendments Violates the Water Quality Act.

The Water Quality Act ("Act") expressly authorizes the Environment Department to perform the following actions: deny a permit, terminate a permit, *modify* a permit, or grant a permit subject to a condition. *See* NMSA 1978, Sections 74-6-5(M), (N) (emphasis added). The Act provides the following criteria for when a permit may be modified:

> A permit may be terminated or *modified* by the constituent agency that issued the permit prior to its date of expiration *for any of the following causes*:
>
> 1) Violation of any condition of the permit;
> 2) Obtaining the permit by misrepresentation or failure to disclose fully all relevant facts;
> 3) Violation of any provisions of the WQA or any applicable regulations, standard of performance or water quality standards;
> 4) Violation of any applicable state or federal effluent regulations or limitations; or
> 5) Change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge

Section 74-6-5(M) (emphasis added). The Act therefore provides a definition for permit modification as follows:

> *A permit modification results from* the violation of any condition of the permit, from obtaining the permit by misrepresentation or failure to disclose fully all relevant facts; from violation of any provisions of the WQA or any applicable regulations, standard of performance or water quality standards; from violation of any applicable state or federal effluent regulations or limitations; or from a change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge.

The Legislature expressly provided the criteria for when the Environment Department may modify a permit, whether the Environment Department determines to modify a permit on its own or whether a permitted facility submits an application for permit modification. *Id.* Thus, if a permittee requests a change to a permit condition because a violation will occur or is occurring, the request must be administered as a modification. *Id.* If the Environment Department determines that a change to a permit condition is necessary because a violation will occur or is occurring, then it must be administered as a modification.[18] *Id.*

Furthermore, "Where authority is given to do a particular thing and the mode of doing it is prescribed, it is limited to be done in that mode; all other modes are excluded. This is a part of the so-called doctrine of expressio unius est exclusio alterius [the express mention of one thing excludes all others]". Fancher v. Bd. of Comm'rs, 1921-NMSC-039, ¶ 11; 28 N.M. 179, 188. The Legislature expressly gave the Environment Department the authority to *modify* a permit under the prescribed mode provided in Section 74-6-5(M). The Environment Department is limited to modifying a permit pursuant to the prescribed mode in Section 74-6-5(M). All other modes the Water Quality Control Commission ("Commission") has provided through regulation, such as through the current regulatory definition for discharge permit modification found at Section 20.6.2.7.P NMAC, are unlawful.

Therefore, any and all changes to a permit condition for DP-1840 must be processed as a discharge permit modification, subject to public notice, comment and opportunity for a public hearing. Section 20.6.2.3108. NMAC. The Draft Discharge Permit's violation of the Water

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[18] For example, the Draft Discharge Permit includes a condition to "install two additional monitoring wells to evaluate current ground water conditions proximal to the open pit and historic waste rock stockpiles." Draft Discharge Permit, page 25, paragraph C.1. After the effective date of the permit, NMCC may decide that it does not want to comply with this condition. Non-compliance would result in violation of this permit condition. Therefore, Section's 74-6-5(M)'s criteria for when a permit may be modified requires NMCC to submit a discharge permit modification application to change this permit condition. If NMED determined that removal of this condition would be warranted, then NMED would have to administer such removal as a permit modification pursuant to Section 74-6-5(M).

Quality Act's criteria for when a permit may be modified requires the Environment Department to deny NMCC's permit application pursuant to Section 74-6-5.E(2).

Finally, the recent New Mexico Supreme Court decision in GRIP v. New Mexico Water Quality Control Commission, 2018 N.M. LEXIS 22, did not address the Copper Rule's use of discharge permit amendments under the Water Quality Act or whether the Copper Rule *as applied* violated the Water Quality Act. The Environment Department cannot justify its unlawful use of discharge permit amendments with the recent Supreme Court's Copper Rule decision. *Id.*

D. In the Alternative, the Draft Discharge Permit Conditions Identified as "Subject to Change Via Discharge Permit Amendment" Must Actually Be Subject to Change Via Discharge Permit Modification.

In the alternative, if the New Mexico Courts were to conclude that Section 74-6-5(M) does not provide the sole criteria for when a permit may be modified and that the current regulatory definition for discharge permit modification found at Section 20.6.2.7.P NMAC and the Copper Rule's current regulatory definition for discharge permit amendment found at Section 20.6.7.7.B(19) NMAC are lawful under the Water Quality Act, then the Draft Discharge Permit conditions identified as "subject to change via discharge permit amendment" must actually be subject to change via discharge permit modification for the following reasons.

First, each of the permit conditions identified in the Draft Discharge Permit as being "subject to change via discharge permit amendment" constitute significant changes to the permit "that would result from a change in the location of a discharge, a significant increase in the quantity of the discharge, and from a significant change in the quality of the permitted discharge," thereby satisfying the regulatory definition of discharge permit modification. Section 20.6.2.7.P NMAC.

To increase the TSF beyond the permitted footprint would certainly result in a change in the location of a discharge, and likely result in a significant increase in the quantity of the discharge. Additionally, changing the location of discharges of contaminated, untreated water for dust suppression would clearly result in a change in the location of a discharge. Accordingly, the Environment Department must therefore deny the Draft Discharge Permit.

Second, the regulatory definition of discharge permit modification allows the Environment Department Secretary discretion in requiring permit condition changes that may not result in changes to discharge location, quantity and quality to be processed as modifications pursuant to Section 20.6.2.7.P NMAC's "or as required by the secretary" language. Changes to significant discharge permit components, such as the location of the monitoring well network, monitoring and reporting requirements, and abandonment of required monitoring wells, warrant being processed as a modification subject to public notice, comment and opportunity for a public hearing. All of these permit components impact the permittee's and the Environment Department's ability to monitor and prevent contamination of ground and surface waters. The Environment Department must therefore deny the Draft Discharge Permit.

Conclusion

The above discussed comments demonstrate that the Environment Department's consideration of the Draft Discharge Permit is premature at this time and all permit action must be stayed. In the alternative, TRP's and Pitchfork Ranch's comments demonstrate why the Environment Department must deny the Draft Discharge Permit.

The Environment Department must deny the Draft Discharge Permit because it poses a hazard to public health and undue risk to property for the following reasons:

- The andesite bedrock beneath the proposed waste rock stockpiles is not an impermeable liner and therefore will not completely prevent all leaks to groundwater, thereby posing a hazard to public health and undue risk to property;

- The applicant's water balance calculations reveal a huge error regarding initial startup water and free tails water. Because of this error, the DP Application grossly underestimates the amount of fresh water the applicant will pump at the beginning of the project. This, therefore, violates the Copper Rule's requirement that the applicant submit an accurate water management plan. This factor is also key to the Secretary's determination whether the Draft Permit poses a hazard to public health and undue risk to property;

- Contaminants discharged from the Mine's waste rock stockpiles and TSF pursuant to the Draft Permit could reach surface water near the Mine, including the Rio Grande, thereby posing a hazard to public health and undue risk to property;

- Tailings run-off collected in unlined ditches could seep into groundwater, posing a hazard to public health and undue risk to property; and

- The proposed groundwater monitoring well network is grossly insufficient to detect contamination moving from the Mine's pit lake, waste rock stockpiles or TSF. Even with contaminant dispersion, entire contaminant plumes could escape the Mine site undetected, thereby posing a hazard to public health and undue risk to property.

Specific to Ladder Ranch, the Draft Discharge Permit poses a hazard to public health and undue risk to property for the following reasons:

- The Greyback Arroyo lies just south of the Ranch property line, so any Mine-impacted surface water/stormwater flow that could jump the banks or cause changes in the arroyo plan could negatively impact the Ranch through contamination of springs. Potential contamination resulting from the Mine's discharges poses a hazard to public health and undue risk to property;

- Contaminants discharged from the Mine's waste rock stock piles and TSF pursuant to the Draft Permit could reach springs on the Ranch. Wells and springs on the Ranch could become contaminated by the Mine's discharges that exceed water quality standards set forth in Section 20.6.2.3103 NMAC, posing a hazard to public health and undue risk to property; and

- The proposed groundwater monitoring well network is grossly insufficient to detect contamination moving from the Mine site onto the Ranch. The monitoring wells are spaced too widely and contaminant plumes could slip through undetected, thereby posing a hazard to public health and undue risk to property on the Ranch.

The Environment Department must also deny the Draft Discharge Permit because it is technically incomplete and fails to demonstrate compliance with OSE-DSB rules and regulations for the proposed tailings dam. The Draft Discharge Permit's conditions also violate the New Mexico Water Quality Act and its implementing regulations, as well as the New Mexico Mining Act (and its implementing regulations.

Dated: May 4, 2018

Submitted by:

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STATE OF NEW MEXICO
COUNTY OF DOÑA ANA
THIRD JUDICIAL DISTRICT COURT

FILED
2017 DEC 28 PM 4:27
DISTRICT COURT
DOÑA ANA COUNTY, NM

STATE OF NEW MEXICO, *ex rel.*,
OFFICE OF THE STATE ENGINEER
Plaintiff

vs.

ELEPHANT BUTTE IRRIGATION DISTRICT, *et al.*,
Defendants.

Copper Flat Expedited *Inter Se*

CV-96-888
James J. Wechsler
Judge Pro Tempore

Lower Rio Grande Adjudication

Outlying Areas Section

Subfile No. LRO-28-008-9009
Case No. 307-OA-9703126
New Mexico Copper Corporation

Subfile No. LRO-28-008-9010
Case No. 307-OA-9702236
William Frost

Case No. 307-OA-9702237
Harris Gray

FINDINGS OF FACT AND CONCLUSIONS OF LAW

INTRODUCTION

This matter came before the Court pursuant to a joint motion, filed January 14, 2014, requesting that the Court designate a stream system issue and expedited *inter se* proceeding to determine water rights claimed by New Mexico Copper Corporation (NMCC) and William Frost and Harris Gray.[1] After responses and

[1] Joint Motion for Designation of Stream System Issue and Expedited *Inter Se* of Water Rights Claimed by New Mexico Copper Corporation, et al., Under Subfile Numbers LRO-28-008-9010 and LRO-28-008-9009 (filed 1/14/14). Parties filing the joint motion were: Charles Barrett, Melody Sears, R. William and Nolan Winkler, Robin Tuttle, Robert Shipley, Jim Groton, John and Agnes McGarvey,

EXHIBIT
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replies were filed,[2] the Court held a hearing on the joint motion on September 17, 2014. On September 26, 2014, the Court entered an order designating the water rights claims of NMCC and Frost and Gray as an expedited *inter se* proceeding, pursuant to Rule 1-071.2(B) NMRA.[3]

A ten-day trial was held on March 14 through 18, 2016 and June 27 through July 1, 2016. After trial on the issues and after considering the parties' proposed findings of fact and conclusions of law, the Court CONCLUDES that (1) any

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John and Cindy Cornell, Stanley and Joyce Brodsky, Arlene Lynch, Turner Ranch Properties, L.P., New Mexico Pecan Growers, and Hillsboro Mutual Domestic Water Consumers' Association.

(Titles to documents in the footnotes are taken from the website for LRO-28-008-9009/9010; Rights of NM Copper, Gray and Frost - https://lrgadjudication.nmcourts.gov/lro-28-008-9009-9010-rights-of-nm-copper-gray-and-frost.aspx, last visited November 2, 2017).

[2] Response to Joint Motion for Designation of Stream System Issue and Expedited *Inter Se* of Water Rights Claimed by New Mexico Copper Corporation, et al., Under Subfile Numbers LRO-28-008-9010 and LRO-28-008-9009 (filed 2/3/14); State of New Mexico's Response to Motion to Set Stream System Issue on Right of New Mexico Copper, et al., and Reply to Response of New Mexico Copper, et al. (filed 2/19/14); Joint Movants' Reply to New Mexico Copper's Response to Joint Motion for Designation of Stream System Issue and Expedited *Inter Se* of Water Rights Claimed by New Mexico Copper Corporation, et al., Under Subfile Numbers LRO-28-008-9010 and LRO-28-008-9009 (filed 2/28/14); and Reply to the SNM's Response to the Joint Motion for Designation of Stream System Issue and Expedited *Inter Se* of Water Rights Claimed by New Mexico Copper Corporation, et al., Under Subfile Numbers LRO-28-008-9010 and LRO-28-008-9009 (filed 4/14/14).

[3] Order Designating Expedited *Inter Se* Proceeding (entered 9/26/14).

inchoate water rights are extinguished, (2) the combined amount of the water element for LRG-4652, LRG-4652-S, LRG-4652-S-2, and LRG-4652-S-3 is 861.84 acre-feet per year (*afy*); (3) LRG-4652, LRG-4652-S, LRG-4652-S-2, and LRG-4652-S-3 have an additional, combined stock right; (4) LRG-4652-S-8 has a stock right; and (5) the amount of the water element for the open pit, LRG-4652-17, is 34.45 *afy*.[4]

NATURE OF THIS PROCEEDING AND PROCEDURAL HISTORY

This is an expedited *inter se* proceeding under Rule 1-071.2 NMRA to determine the amount-of-water element for a number of points of diversion associated with the Copper Flat mine (Copper Flat),[5] located near the community of Hillsboro in Sierra County, New Mexico. The following is a brief description of this proceeding.

The Court commenced this proceeding on September 26, 2014 with its Order Designating Expedited *Inter Se* Proceeding. NMCC and Frost and Gray jointly filed a statement of claims on November 24, 2014.[6] The State of New

[4] Points of diversion will be referred to by the number assigned by the Office of the State Engineer (e.g., LRG-4652, etc.).

[5] For the sake of convenience, the mine and the property on which the mine is located will be referred to throughout as "Copper Flat," regardless of who owned the mine and its associated claims.

[6] Statement of Claims Under Subfile Numbers LRO-28-008-9009 and LRO-28-008-9010 (by NM Copper, Harris Gray and William J. Frost) (filed 11/24/14).

Mexico *ex rel.* Office of the State Engineer filed a disclosure describing the State's offer of judgment with regard to the Frost and Gray claims on December 2, 2014.[7]

On November 4, 2015, Turner Ranch Properties, L.P. (TRP) and the State each filed a motion for partial summary judgment concerning the Frost and Gray claims, and the State and Charles P. Barrett, et al. (the Hillsboro Claimants)[8] filed

[7] State's Disclosure of Offers of Judgment (filed 12/2/14).

[8] The Hillsboro Claimants are comprised of the following: Charles P. Barnett, Stanley and Joyce Brodsky, John and Cindy Cornell, Jim Goton, Arlene Lynch, Agnes and John McGarvie, Melody K. Sears, Robert Shipley, Robin Tuttle, R. William and Nolan Winkler, and the Hillsboro Mutual Domestic Water Consumers Association.

joinders in support of TRP's motion.[9] After responses in opposition,[10] the State withdrew its motion for partial summary judgment.[11] Replies were filed.[12]

On November 16, 2016, NMCC and Frost and Gray filed a motion to dismiss TRP and the Hillsboro Claimants for lack of standing.[13] The State, TRP, and the Hillsboro Claimants filed respective responses in opposition to the motion

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[9] Turner Ranch Properties, L.P.'s Motion for Partial Summary Judgment and Memorandum in Support as to Claims of Gray and Frost Under Subfile No. LRO-28-008-9010 (filed 11/4/15); Hillsboro Claimants' Joinder in the Turner Ranch Properties, L.P.'s Motion for Partial Summary Judgment and Memorandum in Support as to Claims of Gray and Frost Under Subfile No. LRO-28-008-9010 (filed 11/9/15); SNM's Motion for Partial Summary Judgment, Joinder in Support of Partial Summary Judgment Motion of Turner Ranch Properties, and Memorandum in Support (filed 11-16-15).

[10] New Mexico Copper Corporation's, Harris Gray's and William Frost's Response to Turner Ranch Properties, L.P.'s Motion for Partial Summary Judgment as to Claims of Gray and Frost Under Subfile No. LRO-28-008-9010 (filed 11/19/15); NM Copper Corporation's, Harris Gray's and William Frost's Response to the Joinder by Hillsboro Defendants in Turner Ranch Properties, LP's Motion for Partial Summary Judgment as to Claims of Gray and Frost Under Subfile No. LRO-28-008-9010 (filed 11/23/15).

[11] SNM's Withdrawal of Partial Summary Judgment Motion (filed 11/24/15).

[12] Reply to NMCC's Opposition to Partial Summary Judgment (filed by Hillsboro Claimants 12/8/15); Turner Ranch Properties, L.P's Reply to NM Copper Corporation's, Harris Gray's and William Frost's Response to its Motion for Partial Summary Judgment as to Claims of Gray and Frost Under Subfile No. LRO-28-008-9010 (filed 12/8/15).

[13] New Mexico Copper Corporation's, Harris Gray's and William Frost's Motion to Dismiss Defendants from this Expedited *Inter Se* Proceeding for Lack of Standing (filed 11/16/15).

to dismiss.[14] NMCC and Frost and Gray filed replies.[15] The Court heard oral argument on all dispositive motions on January 7, 2016 and denied both TRP's motion for partial summary judgment and NMCC and Frost and Gray's motion to dismiss.[16]

The Court set the trial for March 14, 2016.[17] After five days of trial, the Court and the parties agreed that additional days were required, and an additional five days of trial began on June 27, 2016.[18] At the Court's request, the parties

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[14] Turner Ranch Response in Opposition to NM Copper, Gray and Frost's Motion to Dismiss Defendants from this Expedited *Inter Se* Proceeding for Lack of Standing or, Alternatively, Request for Stay of Proceedings (filed 12/1/15); Response in Opposition to Motion to Dismiss; 12-1-15 (Charles P. Barrett, Melody K. Sears, R. Wm. and Nolan Winkler, Robin Tuttle, Robert Shipley, Jim Goton, John and Agnes McGarvie, John and Cindy Cornell, Stanley and Joyce Brodsky, Arlene Lynch and the Hillsboro Mutual Domestic Water Consumers Association ("Hillsboro Claimants" or "Hillsboro") Responding to the New Mexico Copper Company, William J. Frost and Harris Gray's ("NMCC's") Motion to Dismiss) (filed 12/1/16); SNM's Response in Opposition to the Motion of the Copper Flat Claimants to Dismiss Participating Parties from this Expedited *Inter Se* Proceeding for Lack of Standing (filed 12/4/15).

[15] William Frost's, Harris Gray's and New Mexico Copper Corporation's Consolidated Reply Brief in Support of Motion to Dismiss (filed 12/23/15).

[16] Order Denying Motion for Partial Summary Judgment (entered 1/15/16); Memorandum Order Denying Motion to Dismiss for Lack of Standing (entered 1/15/16).

[17] Notice of Trial (entered 2-17-16).

[18] Notice of Continuation of Trial (entered 5/16/16).

submitted proposed findings of fact and conclusions of law, written closing arguments, and post-trial briefs on January 26, 2017.[19]

With this background, the Court enters the following findings of fact and conclusions of law.

FINDINGS OF FACT

PARTIES

1. NMCC was incorporated in New Mexico in 2009, with its principal place of business in New Mexico. NMCC is a wholly-owned subsidiary of THEMAC Resources, a Canadian company that is publically traded on the Toronto Stock Exchange. THEMAC Resources was formed for the purpose of developing natural resource projects. Copper Flat is its primary asset. [1 Tr. 74:3-75:14; TRP-213 at 19][20]

2. Frost and Gray are residents of New Mexico and are co-owners of water rights described in the files of the New Mexico Office of the State Engineer (OSE)

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[19] NM Copper Corporation's, William Frost's and Harris Gray's Closing Arguments (filed 1/26/17); NM Copper Corporation's and William Frost's and Harris Gray's Requested Findings of Fact and Conclusions of Law (filed 1/26/17); Hillsboro's Additional Closing Argument, Post-Trial Brief, Requested Findings of Fact and Conclusions of Law (filed 1/26/17); Turner Ranch Properties, L.P.s Post-Trial Brief (filed 1/26/17); Turner Ranch Properties, L.P.s Proposed Findings of Fact and Conclusions of Law (filed 1/26/17); State of New Mexico's Proposed Findings of Fact, Conclusions of Law, and Post-Trial Brief (filed 1/26/17).

[20] Page numbers for exhibits refer to the page number of the PDF versions, not the page number within the actual exhibits.

with the following well numbers: LRG-4652 (production well 1 or PW-1); LRG-4652-S (production well 2 or PW-2); LRG-4652-S-2 (production well-3 or PW-3), LRG-4652-S-3 (production well-4 or PW-4), LRG-4652-S-11, LRG-4652-S-12, LRG-4652-S-13, LRG-4652-S-14, LRG-4652-S-15, and LRG-4652-S-16. [TRP-114]

3. The Hillsboro Claimants are water rights claimants with claims located in the Outlying Areas Section of the Lower Rio Grande Basin, an administrative area established by the OSE. [HILLS-002; HILLS-003; HILLS-004; HILLS-005; HILLS-006; HILLS-007a; HILLS-007b; HILLS-008; HILLS-009; HILLS-010; HILLS-011; HILLS-012a; HILLS-012b]

4. TRP is a water rights claimant with claims located in the Outlying Areas Section of the Lower Rio Grande Basin. TRP purchased Ladder Ranch in 1992 and is the current owner of the ranch, which is adjacent to, and shares a boundary with, Copper Flat. TRP owns groundwater rights used for wildlife and livestock purposes. [8 Tr. 184:17-196:1, 206:18-207:20; TRP-217; TRP-135;TRP-228]

THE COPPER FLAT MINE

5. Copper Flat is a mineral deposit located near the town of Hillsboro, in the Hillsboro Mining District, Sierra County, New Mexico. Copper Flat contains copper, silver, gold, and molybdenum minerals that are capable of being developed

under the Mining Law of 1872, 30 U.S.C. §§ 22-24, 26-30, 33-35, 37, 39-43, 47 (1872). [TRP-213 at 20-23]

6. Copper Flat is located in the Outlying Areas Section of the Lower Rio Grande Basin. The OSE has assigned to NMCC Subfile No. LRO-28-008-9009. [7 Tr. 151:17-154:3; TRP-163]

WATER RIGHTS AND CLAIMS AT ISSUE

7. The trial in this matter focused on two disputes concerning the amount-of-water element of the four production wells drilled at Copper Flat beginning in 1975: (1) the amount of water put to beneficial use by Copper Flat Partnership (CFP) in 1982, and (2) whether Frost and Gray and NMCC met their burden to prove continuing diligent development of water rights, on their part and on the part of their predecessors in interest, according to CFP's original, pre-basin plan, under the standards set forth in *State ex rel. S. E. Reynolds v. Mendenhall*, 1961-NMSC-083, 68 N.M. 467, 362 P.2d 998.

8. NMCC and Frost and Gray are requesting the Court to determine that:

a. a vested water right in the amount of 1,963 *afy* exists for use at Copper Flat; and

b. an inchoate water right not exceeding 7,481 *afy* exists for use at Copper Flat. [NMCC Brief at 119]

9. The State is requesting the Court to determine that:

a. a vested water right of 861.84 *afy* exists in the production wells;

b. a vested water right of 34.45 *afy* exists in LRG-4652-S-17;

c. a vested water right of 3 *afy* exists for livestock and domestic use; and

d. all other water rights claims were either forfeited, abandoned, or otherwise not valid under the law. [State Brief at 21, 36]

10. TRP is requesting the Court to determine that:

a. a vested water right of 34.45 *afy* exists in LRG-4652-S-17; and

b. all other water rights claims were either forfeited, abandoned, or otherwise not valid under the law. [Turner Brief 58-60]

11. The Hillsboro Claimants are requesting the Court to determine that all water rights and claims in this proceeding were abandoned. [Hillsboro Brief at 43]

IDENTIFICATION OF POINTS OF DIVERSION AT ISSUE

12. The following eighteen wells and one open pit are at issue in this proceeding:

a. Four production wells: LRG-4652 (PW-1), LRG-4652-S (PW-2), LRG-4652-S-2 (PW-3), and LRG-4652-S-3 (PW-4) (the four production wells). [NMCC-037; NMCC-038; NMCC-039; NMCC-040]

b. Seven miscellaneous wells: LRG-4652-S-4, LRG-4652-S-5, LRG-4652-S-6, LRG-4652-S-7, and LRG-4652-S-8; LRG-4652-S-9; and LRG-4652-S-10 (the miscellaneous wells). [NMCC-041; NMCC-042; NMCC-043; NMCC-044; NMCC-045 NMCC-046; NMCC-047]

c. Six monitoring wells: LRG-4652-S-11, LRG-4652-S-12, LRG-4652-S-13, LRG-4652-S-14, LRG-4652-S-15, and LRG-4652-S-16 (the monitoring wells). [NMCC-048; NMCC-049; NMCC-050; NMCC-051; NMCC-052; NMCC-053]

d. LRG-4652-S-17 (the open pit), which collected water and is not a well. [NMCC-054]

e. LRG-4654, (the "Dolores well"), a six-inch casing installed in the Old El Oro mineshaft. [NMCC-055]

ACQUISITION OF COPPER FLAT BY INSPIRATION AND LEASE BY QUINTANA MINERALS

13. Inspiration Development (Inspiration), a mining company based in Arizona, acquired Copper Flat in 1967 and conducted further investigation of the site's mineral reserves. By 1973, Inspiration conducted a feasibility study and developed a plan for an open pit mine. Inspiration drilled two wells seeking an adequate water supply for a mill. [9 Tr. 59:18-25; NMCC-001; NMCC-086 at 1]

14. On July 15, 1974, Quintana Minerals Corporation (Quintana) leased Copper Flat from Inspiration and undertook a program of exploration to estimate ore reserves. Quintana's investigation continued through 1976 at a cost of $3.32 million. Quintana expanded the Copper Flat project to 12,000 acres of private, state, and federal lands. Quintana suspended its work at Copper Flat in late-1976 due to the low price of copper. [NMCC-005 at 1; NMCC-028; NMCC-030 at 1-2; TRP-006]

15. As of September 1978, Quintana intended to mill about 15,000 tons of ore per day. [NMCC-004 at 35; TRP-003 at 2, 14]

16. In 1979, Quintana resumed work at Copper Flat. [NMCC-028]

17. As of January 1980, Quintana estimated that the project would cost $75 million. [NMCC-030 at 10]

18. Quintana could not put the mining project into production due to the low price of copper, an inability to successfully negotiate a smelter contract, and difficulties with obtaining the necessary permits to operate the mine. [NMCC-005 at 1]

THE COPPER FLAT PARTNERSHIP AND THE OPERATION OF THE COPPER FLAT MINE

The Creation of the Copper Flat Partnership

19. In September 1979, Quintana and Phibro, Inc., a Delaware corporation, signed a letter of intent to form a partnership to develop a mining operation at Copper Flat. [NMCC-030 at 9; TRP-004]

20. Quintana and Phibro jointly renewed efforts to develop Copper Flat in June 1980 under the name Copper Flat Partnership (CFP) with Quintana having a separate role as the operator and managing agent of the mine and mill. [9 Tr. 129:13-24; NMCC-006 at 3; NMCC-037; NMCC-038; NMCC-039; NMCC-040; NMCC-041; NMCC-042; NMCC-043; NMCC-044; NMCC-045; NMCC-046; NMCC-047; NMCC-048; NMCC-049; NMCC-050; NMCC-051; NMCC-052; NMCC-053; NMCC-054; NMCC-055; TRP-008]

21. CFP leased Copper Flat from Inspiration. The lease consisted of twenty-three patented mining claims totaling 430 acres, 294 unpatented mining claims, and 160 unpatented millsites. [NMCC-072]

   a. A patented mining claim is a claim owned by the holder of the patent. [NMCC-149 at 26:21-22]

   b. An unpatented mining claim is a claim that is leased for a fee. [NMCC-149 at 26:22-25]

22. By July 1980, Quintana had invested over $7 million in the project. [NMCC-030 at 10-11]

23. CFP's plan was to develop a mining operation at Copper Flat.

Financing by the Canadian Imperial Bank of Commerce

24. CFP arranged financing for the Copper Flat project in the amount of $75 million with the Canadian Imperial Bank of Commerce (CIBC), based in Toronto, Canada. CFP signed a promissory note in favor of CIBC. [NMCC-143]

25. On June 11, 1980, CFP and CIBC executed a deed of trust, with CFP as the borrower/debtor, CIBC as the creditor/lender, and the First National Bank of Albuquerque as the trustee. Under the deed of trust, CIBC agreed to lend CFP $75 million in exchange for a promissory note, a security interest in all current and future property and mining interests, and a conveyance of legal title of the property to First National Bank of Albuquerque as trustee. The deed of trust conveyed title to all current and future real property to the trustee to be held for the benefit of CIBC. The deed of trust was to be delivered to CIBC in the event of CFP's default. [*Id.*]

WELLS DRILLED AT COPPER FLAT

Wells Drilled by Quintana

26. In December 1975 and January 1976, Quintana drilled three production wells, PW-1, PW-2, and PW-3, at Copper Flat in order to assure an adequate water supply for the project. [NMCC-037; NMCC-038; NMCC-039]

27. Between December 1974 and August 1975, Quintana drilled the six monitoring wells for exploration and monitoring of groundwater quality. [NMCC-48; NMCC-49; NMCC-50; NMCC-51; NMCC-52; NMCC-53]

The Production Well Drilled by CFP

28. CFP drilled a fourth production well, PW-4, around September 1980. [NMCC-030 at 12-13]

Miscellaneous Wells

29. From 1931 to 1972, the seven miscellaneous wells were drilled. Five of these wells were drilled in 1931 and 1932 for placer mining that had largely terminated by 1943. Two of these wells (LRG-4652-S-9 and LRG-4652-S-10) were drilled in 1971 and 1972 in search of an adequate supply for mining at Copper Flat. [NMCC-041; NMCC-042; NMCC-043; NMCC-044, NMCC-045; NMCC-046, NMCC-047]

Other Points of Diversion

30. The open pit (LRG-4652-S-17) was in use during mining operations at Copper Flat and intermittently after.

31. In 1932, the "Dolores" Well (LRG-4654) was developed by installing a six-inch casing in the Old El Oro mineshaft. [NMCC-055]

CONSTRUCTION OF CFP'S COPPER FLAT OPERATION

32. Site testing and preconstruction activities began at Copper Flat in 1976. CFP began construction in July 1980. [NMCC-030 at 11]

33. CFP undertook the following construction activities:

a. installation of a water pipeline from the well field and the water distribution infrastructure in the fall of 1980; [NMCC-030 at 13-14]

b. installation of six 30,000-gallon-water storage tanks and a 150,000 gallon fire/potable tank in March 1981; [NMCC-030 at 14]

c. employment of a 350 KW electrical generator to power a pump on PW-1 for construction purposes and installation of permanent electric power in October 1981; [*Id.*]

d. installation of a twenty-inch freshwater delivery pipe in September 1980; [*Id.* at 14] and

e. connection of the production wells to the twenty-inch delivery pipe and permanent electrical power by November 1980. [*Id.* at 14]

34. CFP planned to mill 15,000 tons per day of ore. [TRP-003 at 2]

COPPER PRODUCTION AT COPPER FLAT

35. In March 1982, CFP began producing copper concentrate. It took about seven years to get the project into operation. [10 Tr. 43:23-44:5; NMCC-030 at 16]

36. During the months of April, May, and June 1982, CFP processed an average of 14,908, 15,981, and 14,014 tons per day, respectively, of copper ore. [NMCC-30 at 17]

37. At the beginning of operations from March to July 1982, CFP employed about 250 people at Copper Flat. [NMCC-065 at 5]

Water Use at Copper Flat During Mining Operations

38. Water from the production wells and other wells was used during the construction process. However, no records of the amount of water pumped were kept until March 1982, when measuring instrumentation was installed on the production wells. [NMCC-019; and NMCC-028; NMCC-030 at 14]

39. In 1982, CFP put 861.84 *afy* of water to beneficial use from the production wells for mining, milling, reclamation, dust control, wash water, and employee consumptive and sanitary use. [7 Tr. 158:22-160:19; STATE-025]

40. During the period the mill was in operation, CFP used water from the open pit for dust control. [2 Tr. 14:3-10; NMCC-030 at 1]

41. As late as November 1983, CFP used water from various wells at Copper Flat for maintaining equipment, human consumption, sanitary uses, fire protection, and cleanup. [NMCC-019]

Copper Prices During Mining Operations at Copper Flat

42. When CFP began construction on the processing equipment in 1980, the global price of copper was $ 0.953 per pound. [NMCC-030 at 16]

43. When CFP began production in March 1982, the global price of copper was $ 0.623 per pound. [*Id.*]

44. During the time in which CFP operated Copper Flat, CFP calculated that the price of copper at which Copper Flat would break even was $ 0.90 per pound. [2 Tr. 21:22-22:2]

End of Mining Operations at Copper Flat

45. CFP ceased mining operations at Copper Flat in July 1982. On June 30, 1982, the price of copper was $ 0.642 per pound. [2 Tr. 133:5-8]

46. CFP kept forty-three employees on at Copper Flat until the end of 1982. By February 1983, nineteen employees remained, including a small security and maintenance crew and others engaged in claim assessment, environmental

monitoring and testing, basic engineering, accounting, and secretarial work. [NMCC-30 at 18-19]

47. When CFP ceased operations at Copper Flat in June 1982, CFP hoped and expected that the mine would reopen if (1) an investor could be identified that would fund a potential resumption of operations, and (2) the global price of copper would increase such that a resumption of operations was feasible. [1 Tr. 190:17-191:10]

48. It is common practice in the copper mining industry to cease operations of a mine when the global price of copper drops such that continued operation is no longer feasible. The degree to which operations are terminated varies, ranging from a temporary cessation of operations in which the mine's infrastructure remains in place ready to resume when copper prices recover, to permanent abandonment of a mine with no intent to resume. [2 Tr. 160:5-161:6]

49. Between July 1982 and the end of 1983, CFP hosted three or four potential investors or purchasers at Copper Flat. Ultimately, these efforts were not successful. [1 Tr. 191:11-192:11; NMCC-30 at 18-19; NMCC-032 at 18-19]

CFP'S DECLARATIONS OF WATER RIGHTS

50. After CFP ceased operations at Copper Flat, it was aware of its legal counsel's belief that the water rights, if perfected, could possibly be worth millions of dollars. [TRP-028 at 4]

51. On September 17, 1982, approximately two months after the Copper Flat mine ceased operations, the State Engineer declared the Lower Rio Grande Underground Water Basin (the LRG basin). The mine and associated wells were located within the LRG basin.

52. In response to the declaration of the LRG basin, and on advice of legal counsel, CFP began gathering the necessary information to file a Declaration of Underground Water Right for each of the eighteen wells and the open pit. [2 Tr. 138:6-23; TRP-028]

a. On September 7, 1983, CFP's consulting geologist provided draft declarations based on the assumption that all water uses at Copper Flat would require 2,160 *afy* from the production wells with supplemental water, if needed, from the monitoring and miscellaneous wells and the open pit. [STATE-104 at 1]

b. An engineer employed by CFP performed an alternative calculation, finding that 6,462 *afy* was required for all water use at the mine. [NMCC-032 at 7]

c. After revision for the alternative calculation, the declarations (the 1984 declarations) were filed on February 17, 1984. [NMCC-037; NMCC-038; NMCC-039; NMCC-040; NMCC-041; NMCC-042; NMCC-043; NMCC-044: NMCC-045; NMCC-046; NMCC-047;

NMCC-048; NMCC-049; NMCC-050; NMCC-051; NMCC-052; NMCC-053; NMCC-055]

53. In the 1984 declarations, CFP declared that 278,385,500 gallons of water (854.33 *afy*) were used for mining in 1982 and that it had the right to use 6,462 *afy* at Copper Flat. [NMCC-037 at 1, 3]

54. For the 1984 declarations, CFP calculated the amount of water used during operations using power consumption and known pumping volumes per kilowatt hour. [NMCC-032 at 1]

THE OSE'S SEPTEMBER 1984 FIELD CHECK

55. The OSE conducted a field check on September 13, 1984 (the 1984 field check) to verify the claims documented in the 1984 declarations. During the 1984 field check, the OSE found that the production wells were equipped and in operation to provide water for mine construction, employee consumption, equipment maintenance and operations, sanitary purposes, fire protection, and maintenance of water levels in shotcrete reservoirs. [NMCC-120 at 9-10; STATE-005 at 1; TRP-055 at 1]

56. During the 1984 field check, the OSE found that of the thirteen miscellaneous wells and monitoring wells, nine were not equipped or in use (LRG-4652-S-4, LRG-4652-S-5, LRG-4652-S-7, LRG-4652-S-10, LRG-4652-S-11, LRG-4652-S-13, LRG-4652-S-14, LRG-4652-S-15, LRG-4652-S-16), three were

equipped and in use (LRG-4652-S-6 for placer mining, LRG-4652-S-8 for domestic and livestock, and LRG-4652-S-12 for livestock), and one was equipped but not in use (LRG-4652-S-9). The open pit (LRG-4652-S-17) was not in use. [NMCC-120 at 9-10; STATE-005 at 2; TRP-055 at 2]

DEFAULT OF CFP AND THE ROLE OF CIBC

57. By March 1984, CFP had defaulted on its loan from CIBC. [NMCC-056; NMCC-143 at 22-24, 28; TRP-052]

58. On March 31, 1984, Quintana relinquished its management responsibilities for Copper Flat, and effective April 1, 1984, CFP assumed direct control over Copper Flat. [TRP-053]

59. By sometime in 1985, CIBC exerted more control over the Copper Flat project, with CFP acting as CIBC's representative with regard to the management and eventual closure and liquidation of Copper Flat. [2 Tr. 137:15-23; NMCC-066; TRP-067, TRP-071, TRP-072 at 1-2; TRP-103]

CIBC's Consideration of Selling the Water Rights

60. By April 1985, CIBC sought advice of counsel concerning the sale of the water rights associated with Copper Flat. CIBC was advised that it was "virtually certain" that any potential buyers would require the ability to transfer the point of diversion and place and type of use of the water rights. [NMCC-056]

Plans to Liquidate the Copper Flat Assets

61. By April 1985, CIBC was planning the sale of the mining and milling equipment at Copper Flat. [NMCC-057]

62. By April 1985, CIBC and CFP were exploring options for reclamation efforts at the Copper Flat site. Milton W. Hood, a consultant advising CIBC, recommended two options for reclamation of the site: (1) total stripping and sale of assets from the site and return of leases to Inspiration, or (2) sale of the buildings and equipment and capping the wells, but leaving in place water lines, water tanks, and foundations for "'possible' future rebuilding." [NMCC-057]

63. On May 7, 1985, Hood proposed two alternatives to CFP for reclamation of the mine after the equipment was "dismantled and sold." The first proposed that CFP leave the foundations, tunnels, and tailings systems intact for possible reuse of the mine. The second proposed a "complete abandonment of the property," requiring burying of the foundations, capping of dumps and tailings, and terracing of roads, yards and other areas showing erosion. [TRP-061 at 1-2]

64. In his May 7, 1985 letter, Hood opined that "[t]he water rights could be the most valuable of the assets if they could be severed from the property." Hood recommended that CFP hire an agent to "search for possible buyers" of the water rights. [*Id.* at 2]

65. A May 21, 1985 interoffice correspondence discussed preliminary plans for abandonment of Copper Flat. The author, P. A. Weyler, mill supervisor, noted that, with regard to the proposed plans, "[m]ost of the following refers to complete abandonment of the property." This preliminary plan of complete abandonment included using dirt and rock "to cover the SAG mill and ball mill foundations." [TRP-063 at 1-2]

66. On June 25, 1985, F. W. Knackstedt, resident manager at Copper Flat, outlined two reclamation alternatives for CIBC to consider. The alternatives were based on meetings CFP had with the BLM and ESCON, Inc., an Arizona contractor that prepared for CFP a budget estimate for reclamation. "Plan A" consisted of removing mining equipment and fencing the area. "Plan B" was much more detailed and was referred to as "Complete Abandonment." Under Plan B, complete abandonment consisted of, among other things, destroying all buildings; covering the crusher shaft to ground level and covering the crusher's foundations; covering both ends of the reclaim tunnel; filling completely the tailings thickener, reclaim water storage area, and gatehouse area with demolition refuse; filling the decant reservoir and tail dam seepage collection pond to ground level; covering the pump station foundation with alluvium; and covering all concrete slabs with nine inches of top soil. In its budget proposal for complete abandonment, ESCON noted that it did not include

> removing any underground buried items such as pipe, conduit and septic tanks. Also we have not planned on removing any concrete foundations or concrete slabs on grade.

[TRP-064; TRP-066]

67. On August 2, 1985, Knackstedt informed the BLM that CFP was considering the two reclamation scenarios developed by ESCON and provided a description of both alternatives that was virtually identical to the ESCON proposals. He stated that CFP had no definite plans to abandon Copper Flat at that time. [TRP-069]

68. On November 26, 1985, the BLM sent a letter informing CFP that the two alternatives detailed in Knackstedt's August 2, 1985 letter would be considered by the BLM at the appropriate time. The BLM informed CFP that stabilization measures were required at Copper Flat to control erosion on the site. [TRP-080]

69. Sometime in 1985, CIBC undertook efforts to market the Copper Flat water rights in the amount of 6,462 *afy* to the City of Las Cruces. Las Cruces declined to purchase the right. [2 Tr. 97:4-98:15]

70. By September 25, 1986, CFP entered into discussions with a private contractor to salvage the water pipeline and electrical lines. During this time, CFP also discussed with Phelps-Dodge Corporation the purchase of Copper Flat. These discussions did not result in the salvaging of material or in a sale of the site. [NMCC-070]

71. Upon liquidation of the mine's assets, CFP and CIBC did not intend for the water rights to be used exclusively for mining.

Sale and Removal of the Copper Flat Assets

72. As of April 11, 1986, CIBC had sold all removable physical assets of Copper Flat to OK Tedi Mining Ltd. (OK Tedi), a company headquartered in Papua, New Guinea. CIBC retained all "land holdings, permits, rights-of-way, roads, and water rights." [NMCC-067]

73. OK Tedi intended to remove all the buildings and equipment from Copper Flat down to the concrete foundations by December 31, 1986. [*Id.*]

74. All buildings and mining equipment were removed from Copper Flat in accordance with OK Tedi's plans.

ABANDONMENT OF COPPER FLAT

"Mothballing" a Mining Operation

75. "Mothballing" is a phrase used in the mining industry to describe a type of mine closure in which the mine is intended to be reopened at some point in the future. Typically, a mine is "mothballed" when conditions for mining are unfavorable, such as low copper prices. When a mine is "mothballed," the workforce is reduced to a small maintenance crew, the mill is cleaned, and the mill bearings are protected and maintained. In some cases, the mill may be operated periodically to protect the bearings from damage. The idea behind "mothballing" is

to keep the mine in such a state that it can returned to operation quickly after favorable conditions for mining return. [9 Tr. 70:3-71:6]

76. In the copper mining industry, when the global price of copper declines, it is not uncommon for mining operations to be "mothballed." [*Id.*]

77. In New Mexico, it is common practice for mining operators to respond to low copper prices by "mothballing" their operations and putting their infrastructure on standby status. According to Jim Kuipers, a professional engineer, mines may remain "mothballed" for to up five years. [TRP-224 at 17-18]

78. Copper Flat was not "mothballed." CFP closed the mine and terminated operations at Copper Flat.

Reclamation Plans for Copper Flat

79. On April 18, 1986, CFP informed the BLM about "developments regarding the abandonment of the mine" and subsequent reclamation. [NMCC-068]

80. On October 7, 1986, a memorandum was circulated within CFP concerning "Abandonment of Copper Flat," which outlined estimates of alluvium and other materials needed to accomplish reclamation tasks. This outline was virtually identical to the description of "Complete Abandonment" in the ESCON recommendations of June 1985. [TRP-064; TRP-097]

81. On October 9, 1986, a delegation from the BLM met with CFP to assist in "identifying final reclamation requirements for the abandonment of the Copper

Flat mine and mill." At the meeting, CFP informed the BLM that final reclamation efforts would begin early in 1987 [NMCC-071]

82. At the October 9, 1986 meeting, CFP and the BLM established requirements for final reclamation of the Copper Flat site that were virtually identical to the "final reclamation" plan proposed by ESCON: covering tunnels and filling shafts and reservoirs with earth and stone; contouring, grading, and performing re-vegetation of the site to minimize erosion; covering the concrete foundations with alluvium; erecting safety fences; and capping the production wells. [NMCC-071 at 1-3]

83. In the Mine Data Retrieval System maintained by the federal Mining Safety and Health Administration, the status of Copper Flat, identified as Mine ID No. 2901520, is shown as "Abandoned." [TRP-005]

84. In a 1978 environmental assessment of Copper Flat, the BLM defined "abandonment" as "[a] period after the termination of normal mining operations which results in a termination of economically-oriented activities at the site." The BLM presumed that after the termination of mining operations a "close out workforce" would remain on-site to complete the abandonment process. [NMCC-004 at 54, 122]

The Termination of CFP's Lease

85. In January 1986, CIBC informed Inspiration that CIBC was going to remove all structures from the mine and undertake reclamation efforts to the "satisfaction of the governing agencies involved." CIBC offered to leave the office/lab building on the site for Inspiration's use, but Inspiration declined because it had "no immediate use" for the buildings and did not want the liability and maintenance costs associated with keeping the building on site. [NMCC-066]

86. On December 31, 1986, CFP cancelled its lease interest in the Copper Flat property, and the property reverted to Inspiration. [NMCC-072]

87. The four production wells and the six monitoring wells were located on land acquired entirely by Quintana and did not revert to Inspiration. [NMCC-062]

88. In February 1987, CFP informed the New Mexico Environmental Improvement Division that "the Copper Flat property is [p]ermanently [c]losed and will not be restarted." [HILLS-023]

89. By February 5, 1987, CFP's reclamation efforts with regard to BLM lands at Copper Flat were completed. [*Id.*]

Infrastructure Left in Place at Copper Flat

90. In late 1986, CIBC and CFP considered an offer to purchase the Copper Flat water pipeline, subject only to BLM approval of the sale. The BLM would not approve the sale on the grounds that digging up the pipeline would cause "undue

and unnecessary degradation" of the BLM lands within Copper Flat. [HILLS-018; HILLS-028; TRP-103]

91. It is typical industry practice to leave underground pipelines and electrical power lines in place as part of the reclamation process. Upon the initial installation of underground appurtenances, reclamation activities such as covering with soil and vegetation take place soon after the installation, and removal would only serve to further disturb the area. [9 Tr. 215:13-216:11]

92. Kuipers testified that over the course of his career he had reviewed "literally hundreds of reclamation and closure plans" and that the burial of foundations was "entirely consistent with abandonment of a site and doing final reclamation and closure." He further testified that "as long as [the foundations] were covered [and] there was vegetation growing over the top of them, BLM accepted that as meeting the final reclamation requirements." [9 Tr. 213:12-214:5]

93. Kuipers also testified that, in his experience, he had never encountered a mine operator that buried foundations in order to preserve them for future use. Kuipers explained that if reuse of the foundations was the goal, there would be evidence of an attempt to protect the foundations and equipment-mounting hardware and that he saw no evidence of such steps taken at Copper Flat. [9 Tr. 214:6-215:12]

94. Only .75 miles of the 2.5 mile access road were on BLM land. The remaining 1.75 miles of the access road were on private land, which did not require reclamation. [NMCC-004 at 23]

95. Roads on BLM lands are commonly left in place after a mine closure because they allow public access to publically-owned lands. [Tr. 9 218:12-20; Tr. 10 138:15-140:5]

96. Wells drilled on BLM land during mining activities are often left in place for other uses after mining activities cease. [9 Tr. 218:21-220:1]

97. The majority of CFP's tailings pond and dam was located on privately-owned land over which BLM had no authority to require reclamation. [9 Tr. 184:11-187:1; TRP-104]

98. The OSE had permitting authority over the tailings pond. [TRP-101; TRP-106; TRP-108]

99. Around the beginning of 1987, the OSE had discussed reclamation of the tailings dam with the BLM. The BLM informed the OSE that the BLM had considered requiring CFP to breach the dam for the sake of safety. The OSE replied that the OSE had determined that breach was not necessary since the dam was in safe condition and would not need maintenance for many years. [TRP-109]

CFP'S TERMINATION OF MINING OPERATIONS AT COPPER FLAT

100. CFP abandoned its mining operations at Copper Flat.

101. When CFP abandoned mining operations at Copper Flat, it abandoned its plans to develop a mine at Copper Flat.

CFP's TRANSFER APPLICATION

102. CFP filed with the OSE an Application for Permit to Change Location of Wells and Place and Purpose of Use of Underground Waters, dated February 28, 1986 (CFP's transfer application). In CFP's transfer application, CFP explained that it had entered into "an agreement with the State of New Mexico Office of the Commissioner of Public Lands" to transfer its rights to "wells located on State lands located in the general vicinity of Las Cruces, Dona Ana County, New Mexico," approximately fifty to sixty miles south of Copper Flat. CFP sought to transfer 6,462 *afy* to "private or public utilities" for "recreational, aesthetic, industrial, manufacturing, utility, municipal, residential, subdivision, construction, stock-raising, and mining" purposes. [NMCC-065 at 1-2, 5, 20-21; TRP-082]

103. In CFP's transfer application, CFP stated that the Copper Flat project was forced to cease operations due to an "industry wide and worldwide depression in mineral prices generally and copper prices in particular" and that "at this time there is no reasonable likelihood that the operation can be made economic presently or that it will be economic in the near future." CFP concluded that "the valuable water

resource that Copper Flat has developed . . . cannot be economically be used at Copper Flat." [NMCC-065 at 5]

104. Notice of CFP's transfer application was published in the *Las Cruces Bulletin* on May 7, 14, and 21, 1986. [TRP-083 at 22]

105. Elephant Butte Irrigation District (EBID), Strahmann Farms, Inc., County of Doña Ana, City of El Paso, Texas, and Afton Sod Farm protested CFP's transfer application. [TRP-094 at 1-2]

106. EBID, Doña Ana County, and Strahmann Farms each argued in their protests that the transfer of the inchoate right would be contrary to New Mexico law. [TRP-094 at 6, 9, and 12]

WILLIAM FROST, HARRIS GRAY, AND THE COPPER FLAT WATER RIGHTS

107. Frost, of Las Cruces, New Mexico, is a former real estate agent who practiced primarily in Las Cruces and Silver City, New Mexico, in the years between 1973 and 2010. Frost had been involved in the transfer of other water rights and developed an understanding of the monetary value of water rights in New Mexico. [2 Tr. 96:5-25; 99:6-11]

108. Gray, of Silver City, New Mexico, is a retired Certified Public Accountant, who practiced accounting in Silver City for forty-three years. Gray's clients were primarily farmers and ranchers who owned water rights, and Gray was familiar with the monetary value of water rights. [5 Tr. 116:14-25-118:5]

109. Neither Frost nor Gray ever worked in the mining industry in any capacity. [2 Tr. 202:23-203:6; 5 Tr. 142:24-143:12]

Purchase of the Water Rights

110. Sometime in 1985, an attorney, J. W. Woodbury, informed Frost that the Copper Flat water rights were being marketed and asked Frost if he would approach the City of Las Cruces to ascertain whether it would be interested in purchasing the rights. Frost presented the proposal to Las Cruces, but it declined. At this time, Frost was not aware of who owned the water rights. [2 Tr. 97:8-98:8]

111. Between 1985 and 1986, Frost became aware that the Copper Flat assets were being liquidated. He understood that any such water rights would be a valuable financial investment. [*Id.* at 98:11-15; 98:25-99:17]

112. After January 1, 1986, Frost suggested to Gray that Gray consider purchasing the Copper Flat water rights as an investment. Frost informed Gray that the amount of water associated with the rights was significant and that there was a possibility of obtaining the rights for $20,000. [2 Tr. 99:18-23, 100:7-11; 5 Tr. 117:4-16]

113. Gray thought that if he could purchase the Copper Flat water rights, he could lease them back to copper mining operations at Copper Flat. He decided to purchase the rights and asked Frost to make inquiries to that end. [2 Tr. 100:14-16; 5 Tr. 118:6-16]

114. By verbal agreement, Frost and Gray became partners in the venture to purchase the Copper Flat water rights. Under the partnership agreement, Gray would put up the investment capital and Frost would undertake efforts to market the rights. [5 Tr. 118:21-25]

115. Frost began making inquiries with regard to purchasing the Copper Flat water rights. He made a verbal offer to CIBC on Gray's behalf to purchase the rights and received a verbal acceptance. [2 Tr. 100:18-101:18]

116. On March 26, 1987, Frost made a written offer to CIBC of $20,000 for "all water right assets of Copper Flat Partnership." [NMCC-073]

117. Gray received a quitclaim deed and a bill of sale for the water rights from CFP. Gray specifically acknowledged that CFP made no representations or warranties concerning the water rights. [2 Tr. 101:20-102:4; NMCC-074; NMCC-075]

118. The quitclaim deed transferred "title, if any, in and to inchoate and beneficially used water rights of approximately 6,462 acre-feet" associated with the four production wells and six monitoring wells. [NMCC-074]

119. On March 31, 1987, Gray filed with the OSE a Change of Ownership of Water Right for the four production wells and the six monitoring wells, in the amount of 6,462 *afy*. [TRP-114]

120. Gray was put on notice that the water rights were subject to CFP's transfer application, and, on April 1, 1987, Gray requested that the OSE withdraw the application. [5 Tr. 145:20-147:7; TRP-113]

121. Frost and Gray purchased the water rights for investment purposes. [2 Tr. 202:23-203:6; 5 Tr. 142:24-143:12]

Frost and Gray's Application to Transfer Water Rights to Ladder Ranch

122. After the transaction was complete in 1987, Frost and Gray believed that the best return on their investment would be to keep the water rights associated with Copper Flat, in the hope that the mine would be put back into operation and that the rights could be leased to a mine operator. [2 Tr. 103:11-13; 5 Tr. 119:12-15]

123. Because of a concern that they could lose their water rights through non-use, Frost and Gray entered into an agreement with Gerald Lyda to transfer the water rights to Lyda's Ladder Ranch and change the type of use to agriculture, build a dam, and create a farm. [2 Tr. 104:1-17; 5 Tr. 119:16-120:4]

124. On September 2, 1988, Gray filed with the OSE an Application to Change Point of Diversion and Place and/or Purpose of Use from Ground Water to Surface Water (the Gray transfer application). The Gray transfer application requested that the claimed 6,462 *afy* of water rights be transferred to Ladder Ranch for "recreation & irrigation" uses. It listed the new point of diversion as "Seco Creek," from which surface water would be impounded behind an "earthen dam, 65 feet in

height, 365 feet at the base." The application indicated that Gray intended that the wells at Copper Flat would be plugged following the transfer. [NMCC-078]

125. On February 10, 1989, Frost and Gray and Gerald Lyda reduced to writing their agreement to develop Ladder Ranch. As part of the agreement, on the condition that the parties meet their obligations and that the OSE approve the transfer, Frost and Gray agreed to convey to Lyda an "undivided one-half (½) interest in all the water rights transferred." Frost and Gray also reserved the right to sell their half of the water rights to "whomever they wish." While Frost and Gray had hoped that the filing of the transfer application might attract the attention of mining interests, they fully intended to follow through on their obligations under this agreement. [2 Tr. 210:22-211:5; NMCC-082]

126. As of September 1988, Frost and Gray were not aware of any competing claims to the water rights.

FROST AND GRAY'S CONFLICT WITH HYDRO RESOURCES

127. On August 24, 1987, Hydro Resources Corporation acquired an option from Inspiration to acquire Inspiration's interest in Copper Flat. [NNCC-086]

128. On November 16, 1989, Inspiration conveyed by quitclaim deed to Hydro Resources, "all the right, title and interest . . . in those patented and unpatented mining claims" along with any appurtenances to Copper Flat. Water rights were not included in the quitclaim deed. [TRP-123]

129. On September 23, 1988, Hydro Resources filed an objection and protest to the Gray transfer application. Hydro Resources objected on the grounds that (1) the transfer of inchoate water rights was contrary to New Mexico law, and (2) the Gray transfer application constituted an application to make an inter-basin transfer that Hydro Resources opposed. [NMCC-079]

130. On July 5, 1989, Frost and Gray filed with the OSE a motion to strike Hydro Resources' objection and protest on the grounds that (1) Hydro Resources' stated grounds were not cognizable under New Mexico law, and (2) Hydro Resources had no standing to file an objection or protest because it made no showing of owning a relevant water right. [TRP-122]

131. On July 25, 1989, Cobb Resources, Inc., which controlled Hydro Resources, entered into an agreement to sell Copper Flat to the Copper Flat Mining Company (CFMC), based in Denver, Colorado. CFMC planned to develop Copper Flat with prospective partners. [NMCC-086 at 1]

132. Hydro Resources filed a response to Frost and Gray's motion to strike, arguing that Inspiration was the actual owner of the water rights and therefore Frost and Gray had no lawful interest to transfer. [NMCC-083]

133. On January 5, 1990, CFMC filed with the OSE an application for Change of Ownership of Water Right from CFP to CFMC. In the application, CFMC set forth the theory that upon the termination of CFP's lease of Copper Flat, the water rights

associated with the mine were "tied to the mining enterprise and reverted to Inspiration and . . . [are] now owned by CFMC." [NMCC-084 at 1, 4]

134. On January 9, 1990, the OSE informed CFMC of the pending Gray transfer application for Ladder Ranch. CMFC's legal counsel informed CMFC about Frost and Gray's ownership claim. Legal counsel advised CFMC to proceed due to "the extraordinary amount of water involved and the extreme value of the rights," if CFMC were to prevail in its challenge. [NMCC-084 at 54; NMCC-085 at 6]

135. CFMC's application for a Change of Ownership of Water Right conflicted with the Gray application for change of ownership filed on April 3, 1987. This conflict created a question as to the title of Frost and Gray's water rights.

GOLD EXPRESS CORPORATION'S ACQUISITION OF COPPER FLAT

136. Gold Express Corporation purchased the mining claims from CFMC on April 11, 1990. [*Hydro Resources Corp. v. Gray*, 2007-NMSC-067, ¶ 8, 143 NM 142, 173 P.3d 749]

137. During discussions concerning the possible lease by Gold Express of the water rights, Frost and Gray learned that Gold Express claimed an ownership interest in the water rights and that CFMC had filed a change of ownership form with the OSE. [2 Tr. 111:1-113:19]

138. In April 1990, Gold Express acquired title to Copper Flat. [NMCC-089 at 7; NMCC-094 at 14]

139. On January 4, 1991, Gold Express and Frost and Gray agreed to settle their dispute over the use and ownership of the water rights. The agreement stated in part that (1) Frost and Gray would withdraw the Gray transfer application and not interfere with Gold Express' use at Copper Flat of the beneficially used and inchoate water rights, (2) Frost and Gray would receive 20,000 shares of Gold Express stock, and (3) Frost and Gray would receive annual payments of $50,000 to $100,000 for Gold Express' use of the water rights. [NMCC-087]

140. On January 7, 1991, pursuant to the agreement with Gold Express, Gray notified the OSE that he wished to withdraw the Gray transfer application. [NMCC-088]

141. On January 31, 1991, Gold Express submitted to the BLM a proposed plan of operations for Copper Flat. Gold Express proposed to "rebuild the entire Copper Flat mining facility as it existed in 1986." [NMCC-089 at 7]

142. Gold Express did not put water to beneficial use at Copper Flat.

ALTA GOLD'S ACQUISITION OF COPPER FLAT

143. By September 31, 1993, Alta Gold Corporation, a publically-traded company that engaged in gold, silver, lead, and zinc mining, had acquired an option to purchase Copper Flat from Gold Express. It exercised the option in 1994. [NMCC-106; NMCC-097; NMCC-149 at 21:7-9, 21-25]

144. On November 24, 1993, Gold Express quitclaimed to Alta Gold its right, title, and interest, "if any," to the 6,462 *afy* of water rights that Gold Express acquired from CFMC in May 1990. [NMCC-108 at 7, 12]

145. On May 3, 1994, Frost and Gray entered into an agreement with Alta Gold that Alta Gold would succeed to Gold Express' rights and obligations under the January 4, 1991 agreement between Frost and Gray and Gold Express. [NMCC-104]

146. Alta Gold had hoped to reopen Copper Flat for a cost of $35 million. The footprint of Alta Gold's proposed operations at Copper Flat was very similar to CFP's, and Alta Gold intended to recover and reuse the salvageable infrastructure remaining from CFP's operations. [NMCC-149 at 44:3-17, 70:4-10, 181:18-182:23, 184:1-14]

147. Between February 1996 and 1999, Alta Gold waited for the BLM to issue the final Environmental Impact Statement. During this period, Alta Gold made efforts to purchase a SAG mill and have it moved to Copper Flat and to lease trucks in order to begin operations. [NMCC-149 at 88:15-90:8]

148. From 1991 to 1999, Gold Express and Alta Gold paid Frost and Gray a total of $400,000 for Frost and Gray's consent to use the water rights. [5 Tr. 179:2-5; NMCC-104]

Alta Gold's Bankruptcy and Claim to the Water Rights

149. In 1999, Alta Gold filed for bankruptcy in the United States Bankruptcy Court for the District of Nevada (the bankruptcy court). Alta Gold claimed ownership of the water rights in its bankruptcy filings. [2 Tr. 118:20-119:11; NMCC-149 at 87:3-88:10]

150. Alta Gold's assets, including those associated with Copper Flat, were liquidated in an auction ordered by the bankruptcy court. [NMCC-139 at 1-3; NMCC-149 at 191:23-192:6]

151. Frost and Gray hired legal counsel licensed in Nevada to represent their interest in Alta Gold's bankruptcy. The bankruptcy court recognized Frost and Gray's ownership of the water rights. [2 Tr. 119:12-120:4; 5 Tr. 126:22-127:3]

152. On December 21, 2000, the bankruptcy court ordered Alta Gold to execute a quitclaim deed for its claims to the water rights to Frost and Gray. [NMCC-113]

153. Ultimately, Alta Gold did not follow through on the permitting process for Copper Flat and did not reopen the mine because it filed for bankruptcy in 1999. [NMCC-0149 at 86:1-87:3]

154. Alta Gold did not put water to beneficial use at Copper Flat.

THE LOWER RIO GRANDE HYDROGRAPHIC SURVEY

155. The OSE completed the Lower Rio Grande Basin Hydrographic Survey in December 2000. In the hydrographic survey, the OSE found that the following

wells had no right of use, stating, "[w]ells were originally declared as mining wells, but only limited stock use found": LRG-4652-S-3; LRG-4652-S-4; LRG-4652-S-5; LRG-4652-S-6; LRG-4652-S-7; LRG-4652-S-8; LRG-4652-S-9; LRG-4652-S-10; LRG-4652-S-11; LRG-4652-S-12; LRG-4652-S-13; and LRG-4652-S-15. [TRP-163 at 21]

156. The other wells at issue in this case were not located by the OSE. [*Id.*]

157. The hydrographic survey indicated "no right" for Subfile No. LRO-28-008-9009, the subfile number then assigned by the OSE to Alta Gold and currently assigned to NMCC. [7 Tr. 151:17-154:3; TRP-163 at 21]

HYDRO RESOURCES LITIGATION

158. On January 8, 2001, Hydro Resources filed suit in New Mexico's Seventh Judicial District Court against Frost and Gray seeking a declaratory judgment to quiet title to the water rights. Hydro Resources contended that the water rights were appurtenant to the mining claims developed for Copper Flat. Litigation between Hydro Resources and Frost and Gray proceeded in district court, the New Mexico Court of Appeals, and the New Mexico Supreme Court for nearly seven years between January 2001 and November 2007. [2 Tr. 120:20-122:8, 214:7-215:2; *Hydro Resources Corp. v. Gray*, 2007-NMSC-067, ¶ 10; *Hydro Resources Corp. v. Gray*, 2006-NMCA-108, ¶ 1, 140 N.M. 363, 142 P.3d 951]

159. On November 9, 2007, the New Mexico Supreme Court recognized Frost and Gray's title to the water rights, holding that since "water rights are not considered appurtenant to land under a lease," 2007-NMSC-067, ¶ 1, title to the Frost and Gray rights did not pass to Hydro Resources with the conveyance of title to the mining claims.

160. On January 22, 2008, the Seventh Judicial District Court entered a quiet title decree to the water rights in favor of Frost and Gray. [NMCC-114]

FROST AND GRAY'S RESUMPTION OF MARKETING THE WATER RIGHTS

161. When litigation between Hydro Resources and Frost and Gray was completed, Frost and Gray resumed marketing the water rights with a preference for leasing the rights to a mining interest. [2 Tr. 195:1-17, 231:7-13; TRP-179; TRP-181]

162. Over time, Frost and Gray have been paid approximately $1.5 million for the use of the water rights. [2 Tr. 235:5-7]

ABSENCE OF MINING ACTIVITY AT COPPER FLAT, 1990-2008

163. Max Yeh, a resident of Hillsboro, New Mexico, made between five and seven personal visits to the Copper Flat site over the course of ten to fifteen years beginning in the early-1990s. He often hiked to the top of the hills overlooking the mine. On none of these occasions did Yeh see any mining operations or personnel at Copper Flat. Yeh testified that there were no signs of the former buildings, other

than the imprints; that the open pit was ringed with lightish-yellow crystals; and that the dam was overgrown with brush, weeds, and small shrubs. [Max Yeh Tr. 30:8-19, 34:4-35:1, 36:1-37:9]

164. In a field report dated April 17, 2008, OSE staff reported that it had

> [f]ound all wells, none of which are in current use. None of them are equipped and have locked covers on each of them. All but two had concrete pads with the casing right in the middle. The other two had metal covers over with locks on them and no concrete pads.

The OSE staff described the location of the wells as

> Large open ranch land. There are currently large native brush and cactus over the entire area. There were rough roads leading to some of the wells, however we had to really hunt down to find.

[STATE-008]

NMCC'S PURCHASE OF COPPER FLAT

165. On July 23, 2009, NMCC entered into an option agreement with Hydro Resources to purchase Copper Flat and the associated mineral claims. [NMCC-116]

166. On September 9, 2010, Frost and Gray entered into an option agreement with NMCC for the sale of the declared water rights. At the time of trial, there remained conditions precedent to the transfer of ownership of the rights to NMCC. [2 Tr. 24:11-21, 124:20-125:25; NMCC-117]

167. On September 27, 2010, Frost and Gray filed an Amended Declaration of Ownership of Underground Water Right (2010 amended declaration) for the

production wells, claiming that 1,267 *afy* had been placed to beneficial use at the mine, rather than the 854.333 *afy* claimed in the 1984 declarations. [NMCC-118 at 1-4]

NMCC's Application to Repair and Deepen Wells

168. On February 28, 2012, NMCC filed an Application for Permit to Repair and/or Deepen Well for the four production wells and five supplemental wells (LRG-4652-S-4, LRG-4652-S-5, LRG-4652-S-6, LRG-4652-S-7, and LRG-4652-S-8). [STATE-017 at 1-3]

169. On May 5, 2012, OSE employees, Cheryl Thacker and Craig Cathey, conducted a field check of Copper Flat. Thacker and Cathey found that the four production wells were not equipped or operational and that the well casings were capped with an access point for well-monitoring purposes. [STATE-001 at 9]

170. On August 2, 2012, Thacker, an OSE Lower Rio Grande Basin supervisor, summarized in a memorandum her analysis and evaluation of NMCC's application to repair and deepen wells. Thacker recommended that:

a. the water rights associated with LRG-4652 be limited to 888.783 *afy*, "reflecting the largest amount of water diverted and consumed in any one year" at Copper Flat; and
b. the OSE consider CFP's pre-basin claim of 6,462 *afy* as "entirely inchoate" and "relinquished when thirty-seven years elapsed

> without the resumption of mining operations or construction of a copper concentrator."

[STATE-001 at 15]

171. On August 16, 2012, the OSE approved in part, and denied in part, the application. The request to deepen and repair the wells was approved for the four production wells and six of the miscellaneous wells (LRG-4652-S-4, LRG-4652-S-5, LRG-4652-S-6, LRG-4652-S-7, LRG-4652-S-8, and LRG-4652-S-10). The conditions of approval limited the total diversion for the four production wells and the thirteen supplemental wells to 888.783 *afy* for mining, milling, reclamation, dust control, wash water, and domestic and sanitary uses. The conditions of approval required that all the wells be equipped with measuring technology approved by the OSE. The OSE denied the pre-basin claim of 6,462 *afy* as "entirely inchoate" and "at no time been put to beneficial use." NMCC aggrieved the OSE's partial approval, and the matter is pending and currently stayed. [STATE-017 at 4-7]

THE POINTS OF DIVERSION

The Four Production Wells

172. LRG-4652, LRG-4652-S; LRG-4652-S-2; and LRG-4652-S-3:

a. LRG-4652 and LRG-4652-S were drilled in December 1975, LRG-4652-S-2 was drilled in January 1976, and LRG-4652-S-3 was drilled in 1980. [NMCC-037; NMCC-038; NMCC039; NMCC-040]

b. The 1984 declarations for the four production wells declared an estimated future use from a combination of these wells of 6,462 *afy* and declared that the amount of water put to beneficial use was 278,385,500 gallons (854.33 *afy*). [*Id.*]

c. The 1984 field check found that the wells were supplying water "for maintaining the equipment, human consumption, sanitary purposes, fire protection, and cleanup." [TRP-055]

d. The 2000 hydrographic survey found that LRG-4652-S-3 was utilized only for "limited stock use." [STATE-007 at 21; TRP-163 at 21]

e. The 2010 amended declaration claimed that 1,227 *afy* was put to beneficial use, rather than the 854.333 *afy* declared in 1984. [NMCC-118 at 10]

f. During an April 2008 field visit, the OSE found that all four production wells were not equipped, not in use, and closed with a locked cover. [STATE-008]

g. On March 14, 2011, a private consulting firm conducted a field visit (the 2011 field visit) to assess the status of the four production wells and the seven miscellaneous wells. A report (the 2011 report) summarizing the findings of the field visit states that the production wells were not equipped and that the wellhead on each well was capped with a welded steel plate that would require a cutting torch to remove. On each of the four wells, there was a steel pipe secured with a padlock that allowed the measuring of water levels. Access to the wells was hindered by overgrowth of brush. Photographs of the production wells show that the caps and pipes on each well were rusted and apparently not in use for an extended period of time. [TRP-195 at 1-5]

h. During a May 2012 field check, the OSE found that all four production wells were not equipped, not operable, capped, and locked. [STATE-018 at 10-12]

i. The OSE determined in August 2012 that the 6,462 *afy* inchoate claim had never been put to beneficial use. [*Id.* at 16]

j. In July 2014, the OSE offered to recognize Frost and Gray's vested right of 861.84 *afy* in the four production wells and six monitoring wells. The OSE calculated the amount using metered and estimated amounts actually used by the wells in 1982. [7 Tr. 159:19-160:19; STATE-011; STATE-025]

k. 861.84 *afy* is the total amount of water put to beneficial use from the productions wells.

l. No water has been put to beneficial use from LRG-4562, LRG-4562-S, and LRG-4562-S-2 since December 31, 1984.

m. No water has been put to beneficial use from LRG-4562-S-3 since December 31, 2000.

The Miscellaneous Wells

173. LRG-4652-S-4:

a. LRG-4652-S-4 was drilled in 1931 for placer mining and used for that purpose until 1943. The well was used only for watering livestock from 1943 to 1980. [NMCC-041]

b. The 1984 field check found that LRG-4652-S-4 was not equipped or in use. [7 Tr. 32:20-24; 8 Tr. 92:25-94:11; STATE-044; TRP-055]

c. The 2011 field visit found that LRG-4562-S-4 was equipped with a windmill with the blades missing. Access to the wellhead was somewhat blocked by brush in which an animal was nesting. Next to the well was a corroded stock tank with holes in it. Photographs show that the well was apparently not in use for an extended period of time. [TRP-195 at 10]

d. No credible evidence was introduced at trial excusing nonuse of water for mining purposes from LRG-4652-S-4 from 1943 to 1980, a period of approximately thirty-seven years.

e. Water from LRG-4652-S-4 was not put to beneficial use after December 31, 1980.

174. LRG-4652-S-5:

a. LRG-4652-S-5 was drilled in 1931 for placer mining and used for that purpose until 1943. The well was not used from 1943 to 1982. For about seven months, the well was again used for placer mining from September 1, 1982 to April 20, 1983. [NMCC-042]

b. The 1984 field check found that LRG-4652-S-5 was not equipped and not in use. [STATE-005 at 2]

c. The 2011 field visit found that LRG-4562-S-5 was unequipped, uncovered, and contained rocks inside the well. The roads to the well site were in poor condition and in need of repair. The 2011 report suggested that, if the well could not be cleaned out, it might be simply filled, capped, and abandoned. Photographs show that the well was obscured by overgrowth of brush and apparently not in use for an extended period of time. [TRP-195 at 11]

d. No credible evidence was introduced at trial excusing nonuse of water for mining purposes from LRG-4652-S-5 from 1943 to 1982, a period of approximately thirty-nine years.

e. Water from LRG-4652-S-5 has not been put to beneficial use after December 31, 1983.

175. LRG-4652-S-6

a. LRG-4652-S-6 was drilled in 1931 for placer mining and used for that purpose until 1943. The well was not used from 1943 to 1963. The well was used for placer mining again from 1963 to 1964, was not in use from 1964 to 1975, and was again used for placer mining from 1975 to 1984. [NMCC-43]

b. The 1984 field check found that LRG-4652-S-6 was equipped and in use for placer mining. [STATE-005 at 2]

c. The 2011 field visit found that LRG-4562-S-6 was unequipped, uncovered, contained rocks, and had a bee hive inside the well. The road to the well site was in poor condition and in need of repair. Photographs show that the well was obscured by an overgrowth of grass, that the cap was almost entirely rusted away, and that the well was apparently not in use for an extended period of time. [TRP-195 at 12]

d. No credible evidence was introduced at trial excusing nonuse of water for mining purposes from LRG-4652-S-6 from 1943 to 1963, a period of approximately twenty years.

e. Water from LRG-4652-S-6 has not been put to beneficial use after December 31, 1986. [Tr. 7 176:15-23]

176. LRG-4652-S-7

a. LRG-4652-S-7 was drilled in 1932 for placer mining and used for that purpose until 1943. The well was next used to water stock from 1943 to 1975 and was used for domestic purposes from 1975 to 1980. [NMCC-44]

b. The 1984 field check found that LRG-4652-S-7 was not equipped and not in use. [STATE-005 at 2]

c. The 2011 field visit found that LRG-4562-S-7 was unequipped and covered by a sheet of rubber and a rusted steel plate, both unsecured. The well was surrounded by grass and branches. Photographs show that the well was apparently not in use for an extended period of time. [TRP-195 at 7]

d. No credible evidence was introduced at trial excusing nonuse of water for mining purposes from LRG-4652-S-7 from 1943 to 1980, a period of approximately thirty-seven years.

e. Water from LRG-4652-S-7 has not been put to beneficial use after December 31, 1980.

177. LRG-4652-S-8

a. LRG-4652-S-8 was drilled in 1932 for placer mining and used for that purpose until 1943. The well was next used to water stock and for domestic purposes from 1943 to 1984 and has a perfected pre-basin water right of 3 *afy* for domestic and stock watering purposes. [7 Tr. 178:18-179:1-7; NMCC-45]

b. The 1984 field check found that LRG-4652-S-8 was equipped and in use for domestic and livestock purposes. [STATE-005 at 2]

c. The 2011 field visit found that LRG-4562-S-8 was equipped with a submersible pump and was providing non-potable water for the NMCC office. Photographs show that the metal plate covering the well was rusted and that the well appears to have been rehabilitated. [7 Tr. 178:18-180:24; TRP-195 at 6]

178. LRG-4652-S-9

a. LRG-4652-S-9 was drilled in 1971 to explore for adequate water for Copper Flat, and it cannot be determined if the well was used between 1972 and 1974. From 1974 to 1978, the well was in use for unknown purposes. From 1978 to 1980, there was little or no use of the well. The well pumped approximately 22,922,500 gallons of water (70.35 *afy*) for a construction project from October 1980 to March 1982. [NMCC-46]

b. The 1984 field check found that LRG-4652-S-9 was equipped but not in use. [STATE-005 at 2]

c. The 2011 field visit found that LRG-4562-S-9 was equipped with a pump and 30 hp motor dating back to March 2010 and located inside an aluminum shed. Photographs of the wellhead show the cap and pipes and shed frame to be rusted. The well appears to have been rehabilitated. [TRP-195 at 8]

d. No credible evidence was introduced at trial excusing nonuse of water from LRG-4652-S-9 from December 31, 1982 to at least March 2010, a period of over twenty-seven years.

e. Water from LRG-4652-S-9 was not been put to beneficial from December 31, 1982 to March 31, 2010.

179. LRG-4652-S-10

a. LRG-4652-S-10 was drilled in 1972 to explore for adequate water for Copper Flat, and it cannot be determined if the well was used between 1972 and 1974. From 1974 to 1978, the well was used for placer mining. From 1978 to 1980, there was little or no use of the well. The well pumped approximately 18,000,000 gallons of water (55.24 *afy*) for a construction project from October 1980 to March 1982. [NMCC-47]

b. The 1984 field check found that LRG-4652-S-10 was not equipped and not in use. [STATE-005 at 2]

c. The 2011 field visit found that LRG-4562-S-10 was unequipped and covered by a sheet of rubber and a piece of plywood held in place by a rock. The eastern side of the well was partially covered by a shrub. Photographs show that the well was apparently not in use for an extended period of time. [TRP-195 at 7]

d. No credible evidence was introduced at trial excusing nonuse of water from LRG-4652-S-10 from December 31, 1982 to June 2016, a period of over thirty-three years.

e. Water from LRG-4652-S-10 has not been put to beneficial use after December 31, 1982.

The Monitoring Wells

180. LRG-4652-S-11

a. LRG-4652-S-11 was drilled in December 1974, with a capacity of 20 *gpm*, with 32 *afy* available for "standby use for mining, milling, and reclamation purposes, to supplement supply" from the production wells. [NMCC-048]

b. The 1984 field check found that LRG-4652-S-11 was not equipped and not in use. [STATE-005 at 2]

c. Water from LRG-4652-S-11 has never been put to beneficial use.

181. LRG-4652-S-12

a. LRG-4652-S-12 was drilled in April 1975, with a capacity of 106 *gpm*, equipped with a cylinder pump powered by a windmill. The 1984 declaration claimed 171 *afy* available for "standby use for mining, milling, and reclamation purposes, to supplement supply" from the production wells, and 3 *afy* "since 1982 for stock watering." [NMCC-49]

b. The 1984 field check found that LRG-4652-S-12 was equipped and in use. [STATE-005 at 2]

c. As of June 2016, LRG-4652-S-12 was in use for stock watering under a separate permit, independent of this proceeding. [7 Tr. 187:12-24-188:2]

d. No credible evidence was introduced at trial excusing nonuse of water from LRG-4652-S-12 for mining purposes from December 31, 1982 to June 2016, a period of over thirty-three years.

e. Water from LRG-4652-S-12 has not been put to beneficial use for mining purposes after December 31, 1982.

182. LRG-4652-S-13

a. LRG-4652-S-13 was drilled on May 12, 1975, with a capacity of 97 *gpm*. The 1984 declaration claimed 156 *afy* available for "standby use for mining, milling, and reclamation purposes, to supplement supply" from the production wells. [NMCC-050]

b. The 1984 field check found that LRG-4652-S-13 was not equipped and not in use. [STATE-005 at 2]

c. As of June 2016, LRG-4652-S-13 was in use for stock watering under a separate permit, independent of this proceeding. [7 Tr. 188:5-17]

d. No credible evidence was introduced at trial excusing nonuse of water from LRG-4652-S-13 for mining purposes from December 31, 1975 to June 2016, a period of over forty years.

e. Water from LRG-4652-S-13 has not been put to beneficial use for mining purposes after December 31, 1975.

183. LRG-4652-S-14

a. LRG-4652-S-14 was drilled on August 22, 1975, with a capacity of 262 *gpm*. The 1984 declaration claimed 423 *afy* available for "standby use for mining, milling, and reclamation purposes, to supplement supply" from the production wells. [NMCC-51]

b. The 1984 field check found that LRG-4652-S-14 was not equipped and not in use. [STATE-005 at 2]

c. No credible evidence was introduced at trial excusing nonuse of water from LRG-4652-S-14 for mining purposes from December 31, 1975 to June 2016, a period of over forty years.

d. Water from LRG-4652-S-14 has not been put to beneficial use for mining purposes after December 31, 1975.

184. LRG-4652-S-15

a. LRG-4652-S-15 was drilled on September 22, 1975, with a capacity of 208 *gpm*. The 1984 declaration claimed 336 *afy* available for "standby use for mining, milling, and reclamation purposes, to supplement supply" from the production wells. [NMCC-52]

b. The 1984 field check found that LRG-4652-S-15 was not equipped and not in use. [STATE-005 at 2]

c. No credible evidence was introduced at trial excusing nonuse of water from LRG-4652-S-15 for mining purposes from December 31, 1975 to June 2016, a period of over forty years.

d. Water from LRG-4652-S-15 has not been put to beneficial use for mining purposes after December 31, 1975.

185. LRG-4652-S-16

a. LRG-4652-S-16 was drilled on October 31, 1975, with a capacity of 110 *gpm*. The 1984 declaration claimed 177 *afy* available for "standby use for mining, milling, and reclamation purposes, to supplement supply" from the production wells. [NMCC-53]

b. The 1984 field check found that LRG-4652-S-16 was not equipped and not in use. [STATE-005 at 2]

c. No credible evidence was introduced at trial excusing nonuse of water from LRG-4652-S-16 for mining purposes from December 31, 1975 to June 2016, a period of over forty years.

d. Water from LRG-4652-S-16 not has been put to beneficial use for mining purposes after December 31, 1975.

The Open Pit and the Dolores Well

186. LRG-4652-S-17, the open pit

a. LRG-4652-S-17 was declared separately as a point of diversion, not as a well, and with no associated drill rig or well casing. The 1984 declaration estimated that 75 *gpm* could be removed, but no pump was installed. 120 *afy* was declared available for "dust control" and "reclamation," but no information was included concerning the calculation of this amount. [7 Tr. 26:12-19; NMCC-054]

b. LRG-4652-S-17 is hydrologically connected to groundwater and evaporates at an amount of 34.45 *afy*. [STATE-001 at 12]

187. LRG-4654, the Dolores well

a. LRG-4654 was drilled in 1932 for mining purposes and was used in that capacity from 1932 to 1934. The well was used intermittently for mining between 1932 and 1981. [NMCC-055]

b. No evidence was introduced at trial excusing nonuse of water from LRG-4654 from December 31, 1981 to June 2016, a period of over thirty-four years.

c. Water from LRG-4654 has not been put to beneficial use for mining purposes after December 31, 1981.

RECENT ACTIVITIES AT COPPER FLAT

188. No mining company has operated a copper mine at Copper Flat since July 1982. [State-033 at 5-16]

189. No water from the production wells has been put to beneficial use for mining since the acquisition of water rights by Frost and Gray. [5 Tr. 138:14-22]

CONCLUSIONS OF LAW

1. This Court has jurisdiction over the parties and the subject matter of this proceeding. N.M. Const. art. VI, § 13.

2. The Hillsboro Claimants have standing to participate in this proceeding. NMSA 1978, § 72-4-17 (1965); Rule 1-071.2(B), (C).

3. Turner Ranch Properties has standing to participate in this proceeding. *Id*

4. As water rights claimants, NMCC and Frost and Gray must prove each element of their respective water rights by a preponderance of the evidence.

NEW MEXICO WATER LAW

5. Unappropriated surface water and groundwater belong to the people of New Mexico and are subject to beneficial use in accordance with New Mexico law. N.M. Const. art. XVI, § 2; NMSA 1978, § 72-12-1 (2003); NMSA 1978, § 72-12-

18 (1983). *See City of Albuquerque v. Reynolds*, 1962-NMSC-173, ¶ 28, 71 N.M. 428; 379 P.2d 73 (holding that the substantive law relating to the appropriation of surface waters is the same as that relating to groundwater)(internal citations omitted).

6. "Beneficial use is the basis, the measure and the limit of the right to the use of water." N.M. Const. art. XVI, § 3; § 72-12-18.

INCHOATE RIGHTS AND THE *MENDENHALL* RULE

7. Under *State ex rel. Reynolds v. Mendenhall*, 1961-NMSC-083, ¶ 29; 68 N.M. 467; 362 P.2d 998, an appropriator who develops groundwater resources prior to the declaration of an underground basin by the state engineer, continues to diligently develop the water after the declaration of the basin, and places it to beneficial use within a reasonable time may acquire a valid water right to the water put to beneficial use.

8. In order to benefit from the rule set forth in *Mendenhall,* appropriators must "(1) legally commence drilling their well prior to declaration of the basin; (2) proceed diligently to develop the water pursuant to a plan; and (3) apply the water to beneficial use." *State ex rel. Reynolds v. Rio Rancho Estates, Inc.*, 1981-NMSC-017, ¶ 13, 95 N.M. 560, 624 P.2d 502.

9. For the purposes of this case, "inchoate rights" are incomplete water rights that had not vested at the time the OSE declared the basin because, although the

appropriator had begun development of the rights, the water had not been put to beneficial use.

10. For purposes of the *Mendenhall* rule, diligence in developing water requires that the developer take reasonable efforts in pursuit of a pre-basin plan.

11. The requirement to show diligence is not met by attempts to develop water for projects different from the developer's pre-basin plan.

12. In accordance with New Mexico law, the OSE declared the Lower Rio Grande Underground Water Basin on September 11, 1980. NMSA 1978, § 72-2-8 (1967); 19.27.48 NMAC.

INCHOATE WATER RIGHT CLAIMS

13. The claims to inchoate water rights in this proceeding are connected to the mining operations at Copper Flat because of the *Mendenhall* requirement that a developer of such a water right proceed with diligence to develop the right pursuant to a plan.

14. CFP did not meet the *Mendenhall* requirements because it did not diligently develop water in accordance with its pre-basin plan.

15. Specifically, CFP did not diligently pursue the development of inchoate water rights because it terminated mining operations at Copper Flat and, with CIBC, sold and moved the mining equipment and sold the water rights used for mining operations at Copper Flat.

16. CIBC, to the extent that it was a successor of CFP's interest in Copper Flat, did not diligently pursue the development of inchoate water rights because it sold and moved the mining equipment and sold the water rights used for mining operations at Copper Flat.

17. CFP's and CIBC's actions described in conclusion nos. 15 and 16 are inconsistent with CFP's pre-basin plan under *Mendenhall.*

18. CFP's filing of the transfer application of February 28, 1986 was inconsistent with its pre-basin plan and inconsistent with a diligent effort to pursue the pre-basin plan under *Mendenhall.*

19. The sale of the water rights to Frost and Gray was inconsistent with a diligent effort in pursuit of CFP's pre-basin plan because the sale severed the water rights from the mining operations.

20. CFP's and CIBC's actions extinguished any inchoate water rights under *Mendenhall.*

21. Alternatively, Frost and Gray did not meet the *Mendenhall* requirements because they did not diligently develop water in accordance with CFP's pre-basin plan.

22. Frost and Gray's actions in filing the transfer application of September 2, 1988 and in pursuing a plan to transfer the inchoate water rights to Ladder Ranch for agricultural purposes were inconsistent with CFP's pre-basin plan.

23. Frost and Gray's failure to diligently develop water in accordance with CFP's pre-basin plan extinguished under *Mendenhall* any inchoate rights they may have owned.

24. Efforts by subsequent entities seeking to restart mining operations at Copper Flat did not constitute diligence for purposes of the *Mendenhall* rule.

25. NMCC and Frost and Gray have failed to meet their respective burdens of proof to establish compliance with the requirements of the *Mendenhall* rule.

26. There are no continuing claims to inchoate water rights in this proceeding.

FORFEITURE AND ABANDONMENT OF WATER RIGHTS

Forfeiture

27. When a party entitled to appropriate groundwater failed to apply the water to beneficial use for a period of four or more years prior to June 1, 1965, the water right is forfeited. The forfeiture occurs by operation of law, and the holder of the forfeited right is not entitled to notice or a period to cure the nonuse. NMSA 1978 § 72-12-8(A) (2002); NMSA 1978, § 72-5-28(A) (2002).

28. A person is not entitled to receive more water than is necessary for the person's actual use. *State ex rel. Erickson v. McLean*, 1957-NMSC-012, ¶ 20, 62 N.M. 264, 308 P.2d 383.

29. As a matter of public policy, New Mexico law provides that "municipalities, counties, school districts, state universities, member-owned

community water systems, special water users' associations and public utilities supplying water to municipalities or counties" have up to forty years to develop a water use plan. NMSA 1978, § 72-1-9 (2006).

30. An appropriator may be exempt from the requirements of beneficial use "either by an extension of time or other statutory exemption," which stops the running of the four-year forfeiture period. § 72-12-8(E).

31. Any period of nonuse of a groundwater right by a municipality or county for the purpose of implementing water development or conservation plans is not included when computing the forty-year forfeiture period. § 72-12-8(F).

32. New mining operations are not included in the statutory forty-year planning exemptions; therefore the forfeiture exemptions do not apply to NMCC. *See* NMSA 1978, § 69-36-3(I) (1993) (defining, under the New Mexico Mining Act, a "new mining operation" as a mining operation developed after the 1993 effective date of the act); § 72-1-9 (establishing a forty-year planning period for municipalities and other entities), § 72-12-8(E), (F) (creating exemptions from the computation of the statutory forfeiture period).

33. Individual ownership of water rights is not included in the statutory forty-year planning exemptions; therefore the forfeiture exemptions do not apply to Frost and Gray. § 72-12-8(E), (F).

Abandonment

34. Water rights can be lost by abandonment through nonuse. *See State ex rel. Reynolds v. South Springs Co.*, 1969-NMSC-023, ¶ 9, 80 N.M. 144, 452 P.2d 478 ("[A]bandonment is the relinquishment of the [water] right by the owner with the intention to forsake and desert it[.]" (internal quotation marks and citation omitted)).

35. Nonuse of water alone is not sufficient to establish abandonment of a water right, "[b]ut where by clear and convincing evidence it is shown that for an unreasonable time available water has not been used, an intention to abandon may be inferred in the absence of proof of some fact or condition excusing such nonuse." *Id.* ¶ 22 (quoting *Commonwealth Irrigation Co. v. Rio Grande Canal Water Users' Ass'n*, 45 P.2d 622, 623 (Colo. 1935)).

The Burden of Proof in Abandonment Proceedings

36. The proponent of an abandonment claim has the burden of proving an intent to abandon by clear and convincing evidence. *See Id.*; *State ex rel. Office of State Eng'r v. Elephant Butte Irrigation Dist.*, 2012-NMCA-090, ¶ 23, 287 P.3d 324 (noting that nothing indicated that the special master did not apply the correct standard of proof of clear and convincing evidence to an abandonment claim when required to do so).

37. "[A]fter a long period of nonuse, the burden of proof [of abandonment] shifts to the holder of the right to show the reasons for the nonuse." *Id.* ¶ 24 (internal quotation marks and citation omitted).

38. An owner of a valid water right can overcome allegations of common law abandonment "after a protracted period of nonuse by establishing the absence of intent to abandon the water right." *Id.*

FROST AND GRAY'S RIGHTS IN THE PRODUCTION WELLS

39. Water from the production wells has not been put to beneficial use for an unreasonable amount of time.

40. However, the successive efforts of CFP and Frost and Gray to put water from the production wells to beneficial use demonstrate that neither CFP nor Frost and Gray intended to abandon the vested water rights associated with the production wells.

41. Frost and Gray's litigation to protect their interests demonstrates that they did not intend to abandon the vested water rights.

42. The economic, financial, and logistical difficulties of CFP and the legal challenges of Frost and Gray excuse the long period of nonuse of the vested water rights.

43. As the proponents of abandonment, the Hillsboro Claimants and TRP did not meet their burden to prove by clear and convincing evidence that either CFP or Frost and Gray abandoned the water right associated with the production wells.

44. The amount-of-water element for LRG-4652, LRG-4652-S, LRG-4652-S-2, and LRG-4652-S-3 is 861.84 *afy*, which may be diverted from any combination of these four wells.

45. LRG-4652, LRG-4652-S, LRG-4652-S-2, and LRG-4652-S-3 have an additional water right for stock use, which may be diverted from any combination of these four wells.

46. Frost and Gray are co-owners of a vested water right in the amount of 861.84 *afy* from LRG-4652, LRG-4652-S, LRG-4652-S-2, and LRG-4652-S-3.

RIGHTS IN THE MISCELLANEOUS WELLS

47. As the proponents of abandonment, the State, TRP, and the Hillsboro Claimants have established abandonment by clear and convincing evidence in LRG-4652-S-4, LRG-4652-S-7, LRG-4652-S-9, and LRG-4652-S-10.

48. As the proponents of abandonment, the State, TRP, and the Hillsboro Claimants failed to establish abandonment by clear and convincing evidence in LRG-4652-S-8.

49. The water right to LRG-4652-S-4 for mining use was forfeited by operation of law no later than January 1, 1948.

50. The stock right to LRG-4652-S-4 was abandoned.

51. All water rights to LRG-4652-S-5 were forfeited by operation of law no later than January 1, 1948.

52. All water rights to LRG-4652-S-6 were forfeited by operation of law no later than January 1, 1948.

53. The water right to LRG-4652-S-7 for mining use was forfeited by operation of law no later than January 1, 1948.

54. The stock right to LRG-4652-S-7 was abandoned.

55. The water right to LRG-4652-S-8 for mining use was forfeited by operation of law no later than January 1, 1948.

56. LRG-4652-S-8 has a water right for stock use.

57. The water right to LRG-4652-S-9 for mining use was abandoned.

58. The water right to LRG-4652-S-10 for mining use was abandoned.

RIGHTS IN THE MONITORING WELLS

59. As the proponents of abandonment, the State, TRP, and the Hillsboro Claimants have established abandonment by clear and convincing evidence in LRG-4652-S-11, LRG-4652-S-12, LRG-4652-S-13, LRG-4652-S-14, LRG-4652-S-15, and LRG-4652-S-16.

60. The water right to LRG-4652-S-11 for mining use was abandoned.

61. The water right to LRG-4652-S-12 for mining use was abandoned.

62. The water right to LRG-4652-S-13 for mining use was abandoned.

63. The water right to LRG-4652-S-14 for mining use was abandoned.

64. The water right to LRG-4652-S-15 for mining use was abandoned.

65. The water right to LRG-4652-S-16 for mining use was abandoned.

The Open Pit

66. The amount-of-water element of the water right for the open pit, LRG-4652-17, is 34.45 *afy*.

The Dolores Well

67. As the proponents of abandonment, the State, TRP, and the Hillsboro Claimants have established abandonment in LRG-4654 by clear and convincing evidence.

68. The water right to the Dolores well, LRG-4654, for mining use was abandoned.

James J. Wechsler

James J. Wechsler
Judge Pro Tempore

CERTIFICATE OF MAILING

I hereby certify that I have caused to be mailed and/or emailed a true and correct copy of the foregoing instrument to the following counsel and/or parties of record on the above file stamped date.

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August 19, 1994

Judith M. Espinosa
Secretary
New Mexico Environment Department
P.O. Box 26110
Santa Fe, New Mexico 87502

Re: Copper Flat Project / Ground Water Discharge Plan No. DP-1

Dear Ms. Espinosa:

I represent Alta Gold Co. which recently acquired the Copper Flat Project located in Sierra County from Gold Express Corporation. The Copper Flat Project was previously mined by owners prior to Gold Express, but has not operated since 1982. Alta Gold plans to develop the Copper Flat Project as a copper mine. The purpose of this letter is to request that you address an issue concerning the ground water discharge plan for the Project.

The New Mexico Ground Water Section initially issued a Ground Water Discharge Plan for the Project in 1977. The Plan was subsequently amended after the Project ceased operation. Gold Express acquired the Project in 1990 and planned to reactivate the mine. On July 7, 1992, it submitted an application to the Ground Water Section to renew and amend the Plan.

Prior to acquiring the Project, Alta Gold interviewed Marcy Leavitt, Chuck Thomas and Alan Jager of the Ground Water Section who represented that the Ground Water Section had not acted on Gold Express's application because BLM was requiring the Project to prepare an Environmental Impact Statement ("EIS"), which would hold up development of the Project. Chuck Thomas indicated in November, 1993 that the Ground Water Section was processing the application, that it needed certain additional information from Gold Express and that the application could be processed within approximately three months.

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Alta Gold is in the process of preparing the additional information requested by the Ground Water Section and would like the Ground Water Section to process the application within the next few months.

Representatives of Alta Gold met with Dale Doremus, Clint Marshall and Rip Harwood of the Ground Water Section on August 10, 1994 to discuss the outstanding application. Ms. Doremus and Mr. Marshall indicated in the meeting that they recommend that Alta Gold submit a new application for amending and renewing the Plan, as a replacement for Gold Express's application, so that the application is a stand alone document, without referencing prior applications and Plans. They also recommended that the application be subject to public comment again because the application has been inactive for more than six months. Alta Gold objects to both recommendations. Gold Express has already submitted an application that was initially approved by the Ground Water Section and Alta Gold has no need to make any substantive changes to the application. Preparation of a new application would be an additional cost to Alta Gold for which it had not planned and would further delay the process. Alta Gold also objects to republishing the application for the following reasons:

1. The application submitted on July 7, 1992 by Gold Express covers the exact operation contemplated by Alta Gold. The Ground Water Section published a notice of the application in August, 1992 and received no public comments. The contemplated operation has not changed since that time and the public has already had the opportunity to submit comments.

2. It is my understanding that the application was tabled by the Ground Water Section because the EIS process was delaying the project. The delay was not due to inaction on the part of Gold Express.

3. The New Mexico Regulations do not require that a ground water discharge plan application be republished. See Section 3-108.

4. When Alta Gold inquired about the status of the application prior to acquiring the Project, the Ground Water Section indicated that the application was being processed and did not indicate that a public notice would be required again. Alta Gold relied on these representations when it acquired the Project.

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Ms. Doremus suggested that I present Alta Gold's position to you in a letter and request that you address these issues.

Please telephone me if you have any questions or would like any additional information.

Very truly yours,

PARSONS BEHLE & LATIMER

Lucy Jenkins

Lucy B. Jenkins

LBJ:jdg
cc: Dale Doremus
Clint Marshall
Robert Prescott

126303

State of New Mexico
ENVIRONMENT DEPARTMENT
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BRUCE KING
GOVERNOR

JUDITH M. ESPINOSA
SECRETARY

RON CURRY
DEPUTY SECRETARY

Clint

RECEIVED
SEP 30 1994
GROUND WATER BUREAU

September 30, 1994

Lucy B. Jenkins, Esq.
Parsons Behle & Latimer
P.O. Box 45898
Salt Lake City, Utah 84145-0898

Re: **DP-1 renewal for Copper Flats Mine**

Dear Ms. Jenkins:

This is in response to your letter of August 19, 1994. I understand that the Groundwater Bureau suspended action on a permit application submitted by Gold Express Corporation in 1992 pending development and evaluation of an environmental impact statement demanded by BLM. I view it as reasonable for the Ground Water Bureau not to have acted on this discharge plan application in what would have amounted to an advisory capacity, or in advance of necessity. In addition, I gather from your letter that at some time during this period, Gold Express sold the mining interest at issue to your client, Alta Gold.

The Water Quality Control Commission Regulations require public notice of the filing of a proposed discharge plan, or modification or renewal of an existing plan. Given the amount of time that has elapsed since Gold Express' 1992 application, and the change in ownership of the mine, I feel it is mandatory that the Department reissue public notice. However, even if renewed issuance of public notice of this application is discretionary and not mandatory under the circumstances, I elect to exercise my discretion in favor of renotifying the public of Alta Gold's renewed interest in a discharge plan application of a predecessor company. The Water Quality Act places special emphasis on ensuring public input into permitting decisions. In my view, the public has a right to know that a new company is proposing to operate under DP-1, even if no material changes are proposed to the plan itself.

EXHIBIT
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Lucy B. Jenkins, Esq.
September 30, 1994
Page 2

I thank you for working with us to afford an efficient public hearing and input from New Mexico citizens.

Sincerely,

JUDITH M. ESPINOSA
Secretary

NEW MEXICO
ENVIRONMENTAL LAW CENTER

Amy Leuders
New Mexico State Director
U.S. Bureau of Land Management
301 Dinosaur Trail
Santa Fe, NM 87508

VIA CERTIFIED MAIL, RETURN RECEIPT REQUESTED and ELECTRONIC MAIL

April 7, 2017

RE: Supplemental Draft Environmental Impact Statement for the proposed Copper Flat Copper Mine Project

Dear Ms. Leuders:

On behalf of Turner Ranch Properties, L.P. ("TRP"), the New Mexico Environmental Law Center ("NMELC") requests that the Bureau of Land Management ("BLM") publish and circulate for public review and comment a Supplemental Draft Environmental Impact Statement ("SDEIS" or "Supplemental DEIS") for the proposed Copper Flat Copper Mine project ("Project").

TRP's April 4, 2016 comments on the Draft Environmental Impact Statement ("DEIS") for the Project outlined many of the DEIS's substantial defects that must be corrected in a Supplemental DEIS. The DEIS inadequately analyzed the Project's potential impacts to the adjacent Ladder Ranch and other affected areas. Important alternatives were improperly excluded from detailed analysis and many critical assumptions, especially relating to water quality and quantity, were based on insufficient data. The DEIS also failed to adequately address whether the New Mexico Copper Corporation's ("NMCC") Mine Plan of Operations ("MPO"), including the reclamation scheme, would prevent unnecessary or undue degradation of federal land. BLM, under its own regulations, has a legal duty to affirmatively answer this question or require substantial revisions to the MPO.

Additionally, substantial new information associated with the Project has come to light since the DEIS public comment period ended. First, BLM completed a Biological Assessment ("BA") of the Project. This BA should have been provided with the DEIS for public review and comment. Second, information

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has come to light regarding a February 10, 2016 water lease between NMCC and the Jicarilla Apache Nation. Neither the water lease nor its environmental and socioeconomic impacts were disclosed or analyzed in the DEIS. Third, the New Mexico Environment Department ("NMED") is currently evaluating whether the Project's current and future expanded pit lake is a "private water of the State" and not subject to ground water or surface water standards. This information was neither disclosed nor analyzed in the DEIS.

This significant new information bearing on the proposed action and its impacts is relevant to environmental concerns and was not considered in the DEIS, thereby triggering NEPA's supplemental EIS requirement. *Norton v. S. Utah Wilderness Alliance*, 542 U.S. 55, 72 (2004); 40 C.F.R. § 1502.9(c)(1); *See also*, BLM "National Environmental Policy Act Handbook", pages 29-30 (January 30, 2008). BLM must conduct a supplemental DEIS and provide the public and other agencies an opportunity to review and comment on the analysis of the new information. 40 C.F.R. § 1502.9(c)(4).

I. Legal Requirements for a Supplemental Environmental Impact Statement.

When an agency publishes a draft EIS, it "must fulfill and satisfy to the fullest extent possible the requirements established for final statements in section 102(2)(C) of the Act." 40 CFR § 1502.9(a). "If a draft statement is so inadequate as to preclude meaningful analysis, the agency *shall* prepare and circulate a revised draft of the appropriate portion." *Id.* (emphasis added). Additionally, an agency must "not act on incomplete information, only to regret its decision after it is too late to correct." *Marsh v. Oregon Natural Res. Council*, 490 U.S. 360, 371 (1989).

NEPA also requires a supplement to an EIS when significant new information or changes in a project implicate significant changes in the environmental analysis. NEPA regulations require that:

> (1) [Agencies]...[s]hall prepare supplements to either draft or final environmental impact statements if: (i) The agency makes substantial changes in the proposed action that are relevant to environmental concerns; or (ii) *There are significant new circumstances* or information relevant to environmental concerns and bearing on the proposed action or its impacts.

(2) [Agencies] may also prepare supplements when the agency determines that the purposes of the Act will be furthered by doing so.

40 C.F.R. § 1502.9(c) (emphasis added); *See also*, BLM "National Environmental Policy Act Handbook", pages 29-30 (January 30, 2008); *Friends of Marolt Park v. United States DOT*, 382 F.3d 1088, 1097 (10th Cir. 2004). The use of the word "shall" is mandatory; it creates a duty on the part of the agency to prepare a supplemental EIS if substantial changes are made or if there is significant new information relevant to environmental concerns. *Marsh v. Oregon Natural Res. Council*, 490 U.S. 360, 372 (1989) (recognizing the duty where there are significant new circumstances or information).

II. BLM Must Prepare a Supplemental DEIS for the Project.

A. Significant New Information Relevant to Environmental Concerns and Bearing on the Project and its Effects Has Come to Light Since the Close of the DEIS Public Comment Period.

1. The BLM has since completed its biological assessment for the Project and the need for "Service-approved surveys" for fish and endangered species has been identified.

Nearly four months after the DEIS was released for public comment, BLM provided a biological assessment ("BA") of the Project's impacts to the U.S. Fish and Wildlife Service ("FWS") for Section 7 consultation under the Endangered Species Act ("ESA") (16 U.S.C. 1531 et seq.). FWS Memorandum, "Endangered Species Act Section 7 Consultation on the Proposed Copper Flat Mine Project", page 1(July 6, 2016). *See* attached Exhibit A. The purpose of a BA is to evaluate the potential effects of the Project on listed and proposed species and designated and proposed critical habitat, and to determine whether any such species or habitat are likely to be adversely affected by the Project. The failure to include this BA in the DEIS for public review and comment clearly violates NEPA and requires the BLM to prepare a supplemental DEIS. 40 C.F.R. § 1502.25.[1]

The FWS has identified the need for fish surveys to be conducted and for BLM to analyze the Project's impacts to candidate fish species:

[1] TRP raised this issue in its submitted comments on the DEIS. See I.J.4(b), page 50, TRP Comments on DEIS for Proposed Copper Flat Copper Mine Project (April 4, 2016).

We completed 90-day findings on the Rio Grande chub (*Gila pandora*) and Rio Grande sucker (*Catostomus plebeius*) in 2016 (Service 2016). We are presently conducting a 12-month finding that may lead to these species being listed. These species are found in small streams, such as Las Animas and Percha creeks. As such, we recommend you provide an assessment of the potential effects of Project activities on these species.

FWS Memorandum, "Endangered Species Act Section 7 Consultation on the Proposed Copper Flat Mine Project", page 1-3 (July 6, 2016). FWS also advised BLM to conduct "Service-approved surveys" for federally listed species, including the Chiricahua leopard frog, southwestern willow flycatcher, and yellow-billed cuckoo. *Id.* at page 2.

The DEIS neither identifies nor analyzes "Service-approved surveys" for fish and for federally listed species and the Project's impacts to fish and federally listed species, in violation of NEPA. The significant new information provided by the BLM's BA and the FWS's response to the BA are relevant to environmental concerns and bear on the Project and its effects, thereby triggering NEPA's supplemental DEIS requirement. BLM cannot adequately analyze the Project's impacts to wildlife and endangered species and cannot adequately analyze mitigation measures for such impacts without completing and analyzing Service-approved surveys for fish and endangered species. Therefore, BLM must now supplement the DEIS with the Service-approved surveys for fish and endangered species in the Project's action area, and with the required analyses of the Project's impacts on fish and endangered species. 40 C.F.R. § 1502.9(c).

2. The DEIS neither identifies nor analyzes the impacts of the "Water Supply Agreement Between the Jicarilla Apache Nation and the New Mexico Copper Corporation, Inc."

The applicant in this matter, New Mexico Copper Corporation ("NMCC"), entered into a draft water lease with the Jicarilla Apache Nation on July 14, 2015 for the proposed Project – four months before BLM released the DEIS for public review and comment. The water lease was approved by the U.S. Bureau of Reclamation on February 10, 2016, nearly a month before the close of the DEIS public review and comment period. The water lease was not disclosed to the public and was obtained by NMELC through a Freedom of Information Act request submitted to the U.S. Bureau of Reclamation. *See* attached Exhibit B.

The finalized water lease is "intended to meet water requirements imposed on NM Copper by the New Mexico state engineer" and to "offset pumping from wells owned by NMCC" for a term of fifteen (15) years after commencement of mining operations. Water Supply Agreement Between the Jicarilla Apache Nation and New Mexico Copper Corporation, Inc., paragraph 2.1, page 3; appendix (February 10, 2016) ("Agreement"). The Agreement is for up to 3,000 acre feet of water per year. *Id.* at paragraph 4.1, page 4.

The DEIS neither identifies nor analyzes the impacts of this Agreement. DEIS 4-8. This Agreement pertains to San Juan-Chama surface water owned by the Jicarilla Apache Nation and involves the release of water through the El Vado and Abiquiu Dams to the Rio Grande. Agreement at paragraph 4.4, page 5. The water source is not a "native water source" for the Rio Grande and is over 300 miles away from the Project site. This significant new information is relevant to environmental concerns and bear on the Project and its effects, thereby triggering NEPA's supplemental DEIS requirement. BLM cannot adequately analyze the Project's impacts to the Rio Grande and cannot adequately analyze mitigation measures for such impacts without considering this water lease.

Furthermore, this Agreement contains a Tribal employment preference for the Project that was neither identified nor analyzed in the DEIS's socioeconomic impacts analysis. The Agreement provides that, "It is the intent of NM Copper to build a core group of skilled labor candidates through job placement and training assistance to eligible enrolled members of the Nation" and that NMCC "shall reasonably consult with the Nation to give preference in employment to members of the Nation and to maximize utilization of tribal members in all available employment opportunities." *Id.* at paragraph 21.0, page 20. However, the DEIS's socioeconomic analysis is based upon the presumption that the Project's estimated 3,440 direct jobs will go to current local residents of Sierra County, not Jicarilla Apache Nation tribal members residing 300 miles away from the Project site. DEIS at 3-269.

This significant new information is relevant to socioeconomic concerns and bear on the Project and its effects, thereby triggering NEPA's supplemental DEIS requirement. BLM cannot adequately analyze the Project's socioeconomic impacts to Sierra County, New Mexico and cannot adequately analyze mitigation measures for such impacts without considering this Tribal employment preference.

3. The New Mexico Environment Department is currently evaluating whether the Project's pit lake is a "private water of the State" and not subject to ground water or surface water standards.

The Project's DEIS states that future water quality standards for the Project's pit lake may be modified using two approaches, "[a] use attainability analysis or site-specific water quality standards. A use attainability analysis is being conducted to evaluate if the pit lake was capable of attaining a designated use such as warmwater aquatic life based on physical, chemical, biological, or other factors." DEIS 3-33. This statement is factually incorrect for two reasons.

First, NMCC has not completed a use attainability analysis for the Project's pit lake. In fact, NMCC has requested the New Mexico Environment Department ("NMED") to either 1) not require a use attainability analysis or 2) defer the completion of a use attainability analysis until after closure of mining activities. Copper Flat Copper Mine Cooperating Agency Meeting Notes, page 4 (April 28, 2016).[2] *See* attached Exhibit C.. Second, NMCC is now claiming that the Project's pit lake is a "private water of the State" and not subject to ground water and surface water quality standards. NMCC Letter, "Copper flat Current and Proposed Future Pit Water Body in Sierra County, New Mexico" (August 5, 2016). *See* attached Exhibit D.

NMED is now evaluating whether the Project's pit lake is a "private water of the State" and has advised NMCC that if BLM "concurs that the water body is entirely on private lands" that NMED will find that the pit lake is not subject to ground water or surface water quality standards. NMED Letter, "Current and Proposed Pit Water Body, Copper Flat Mine, New Mexico Copper Corporation, Sierra County, New Mexico", page 2 (October 21, 2016). *See* attached Exhibit E. This significant new information is relevant to environmental concerns and bear on the Project and its effects, thereby triggering NEPA's supplemental DEIS requirement.

The DEIS failed to analyze the Mine's impacts under this scenario. If NMED finds that the Project's pit lake is not subject to water quality standards, NMCC will never have to clean up this toxic body of water. The public must be

[2] NMCC legal counsel asked NMED attorney Andrew Knight, "Could we skip doing the UAA today?" And, "One thought is if we can push the UAA decision to the end of mine life..."

given the opportunity to review and comment on the possibility that the Project's pit lake may never be cleaned up.

B. The Issuance of a Final EIS with a Public Comment Period, In Lieu of a Supplemental DEIS, Will Violate NEPA.

Issuance of a Final EIS ("FEIS") with a public comment period, in lieu of a Supplemental DEIS, would not satisfy the requirements and purpose of NEPA. NEPA was enacted to "insure that environmental information is available to public officials and citizens before decisions are made and before actions are taken." 40 CFR § 1500.1(b) (emphasis added). It is essential that that environmental information is high quality and based upon "accurate scientific analysis, expert agency comments and public scrutiny." *Id.* Allowing public comment only after the BLM has made a decision, i.e., issued a FEIS, undermines this critical aspect of the NEPA process.

Furthermore, part of the NEPA process includes the public's opportunity to understand the agency's response to these comments. Even with a comment period, a FEIS will not allow informed public scrutiny of and input into the decision making process before a "decision is made and before actions are taken." *Id.*

III. Conclusion.

For these reasons, a Supplemental DEIS is required to address substantial deficiencies in the DEIS, as well as significant new information that has come to light since the close of the DEIS comment period. In such circumstances, NEPA regulations require the issuance of a Supplemental DEIS. *Norton v. S. Utah Wilderness Alliance*, 542 U.S. 55, 72 (2004). Issuing a Supplemental DEIS will also further the intent and purposes of NEPA, which is to ensure that high quality, accurate environmental information is available to public officials and citizens before actions are taken. *Marsh v. Oregon Natural Res. Council*, 490 U.S. 360, 371 (1989).

Thank you for taking these concerns into consideration. We look forward to your prompt response.

Regards,

Jaimie Park, Staff Attorney
New Mexico Environmental Law Center

Cc: Doug Haywood, Project Lead
Copper Flat Copper Mine Project
BLM Las Cruces District Office

United States Department of the Interior

FISH AND WILDLIFE SERVICE

New Mexico Ecological Services Field Office
2105 Osuna Road NE
Albuquerque, New Mexico 87113
Telephone 505-346-2525 Fax 505-346-2542
www.fws.gov/southwest/es/newmexico/

July 6, 2016

Consultation Number 02ENNM00-2016-I-0487

Memorandum

To: District Manager, Las Cruces District Office, Bureau of Land Management, Las Cruces, New Mexico

From: Field Supervisor, U.S. Fish and Wildlife Service, New Mexico Ecological Services Field Office, Albuquerque, New Mexico WALLY MURPHY Digitally signed by WALLY MURPHY Date: 2016.07.07 12:53:18 -06'00'

Subject: Endangered Species Act Section 7 Consultation on the Proposed Copper Flat Mine Project

Thank you for providing the Copper Flat Mine Project (Project) biological assessment (BA) for consultation under section 7 of the Endangered Species Act of 1973 as amended (16 USC 1531 et seq.) that the U.S. Fish and Wildlife Service (Service) received on March 17, 2016. We are requesting further information on the following issues to help complete our assessment and consultation.

We are most concerned with impacts in the Las Animas and Percha Creek drainages where there are important fish and wildlife resources. It was unclear to us where groundwater withdrawal will affect surface water flows and riparian habitat in these two drainages. It is hard to translate the zones from the cross sectional view in BA Figure 3-3 to the plan view in Figure 3-2. It seems clear on BA page 69 that different zones will have different impacts from groundwater drawdown. A map in plan view identifying the zones and what resources (species, surface water, and riparian habitat) are found there and potential impacts would help with our analysis. We would like to know what areas in each drainage might have no or reduced surface flow and what areas might have a decline in riparian vegetation due to Project impacts.

Both inches of drawdown and acre-feet per year were used as the measures of groundwater depletion. Can these be translated in changes in flow (cubic feet per second) or surface water area that would be easier to relate to species impacts?

EXHIBIT
A

On BA page 69 the groundwater depletion is compared to the vegetation evapotranspiration. The vegetation evapotranspiration rate makes a big difference on the calculated amount of drawdown. We would like to know how the evapotranspiration number calculated.

Areas where there may be no or reduced surface flow or a decline in riparian vegetation due to Project activities may have adverse impacts to federally listed species, including Chiricahua leopard frog (*Lithobates chiricahuensis*), southwestern willow flycatcher (*Empidonax traillii extimus*), and yellow-billed cuckoo (*Coccyzus americanus*). In these areas we recommend Service-approved surveys be conducted to determine if occupied. Since no standard surveys were conducted it is difficult to evaluate the impacts to these species. If the areas cannot be surveyed they may be assumed occupied. If assumed occupied how much area would potentially be impacted by the Project. How will these impacts be compensated for?

On BA page 69 groundwater modeling is done to model what the direct drawdown would be "after mining ceases." We believe the impact would be greatest during mining when there is active pumping. What is the expected groundwater drawdown level during projected maximum water use and how will this affect surface flows and riparian vegetation in Las Animas and Percha Creeks?

Stock ponds have proven to support Chiricahua leopard frog in other areas (Sredl and Saylor 1998). Presuming artesian well fed irrigation ponds are compromised for frogs does not seem substantiated. It seems just as likely that isolated ponds might provide refugia for Chiricahua leopard frogs. Please provide a map of the pond locations that will be affected. Have the landowner(s) of these ponds been contacted for permission to determine Chiricahua leopard frog status? If the ponds cannot be surveyed they may be assumed occupied. If assumed occupied how much area would potentially be impacted by the Project. How will these impacts be compensated for?

On BA page 70 it is inferred that if groundwater depletion caused a decline the water levels in these ponds the landowners would pump more water to maintain the pond water level. The landowners may not have the necessary water rights to pump more water. Does the Project have senior water rights that would allow impacts to these ponds?

On BA page 74 you determined that water pumping from the deep aquifer by the Project would substantively reduce groundwater discharge to Caballo Reservoir and the Rio Grande decreasing surface water quantities there but we found no estimate of what the depletion would be. This depletion to surface water storage would likely to need a permit from the State Engineer. Does the Project have senior water rights that allow it to deplete these water resources? Is there a permit for this depletion?

You determined on BA page 71 that the reduced groundwater flows to the Caballo Reservoir may adversely affect flycatchers nesting in the vicinity. Can you be more specific about where "the vicinity" is?

It is our understanding that the primary control on the water level of Caballo Reservoir is water releases from Elephant Butte Reservoir and the stored water's primary function is to provide water delivery to Mexico and irrigation operations. How would these functions be affected by the Project? On BA page 80 you indicated that the cumulative magnitude of the effect can only be determined through a comprehensive mid-basin study of Caballo Reservoir and the Rio Grande. This study seems essential to evaluating the impacts to flycatchers and cuckoos along the Rio Grande.

Discharge from and habitat management at Caballo Reservoir is controlled by the Bureau of Reclamation (2002). As such, effects at the Reservoir and downstream would be a function of the water operations schedule rather than strictly the water level in Caballo Reservoir. The United States International Boundary and Water Commission (USIBWC) manages river habitat below Caballo Reservoir through the Rio Grande Canalization Project (USIBWC 2004). We would like a more detailed explanation of the mechanism by which southwestern willow flycatchers would be impacted on the Rio Grande from the Project groundwater depletion given the other operational aspects of the system.

We completed 90-day findings on the Rio Grande chub (*Gila pandora*) and Rio Grande sucker (*Catostomus plebeius*) in 2016 (Service 2016). We are presently conducting a 12-month finding that may lead to these species being listed. These species are found in small streams, such as Las Animas and Percha Creeks. As such, we recommend you provide an assessment of the potential effects of Project activities on these species.

In addition, Las Animas Creek supports the only population of Rio Grande cutthroat trout (*Oncorhynchus clarkii virginalis*) in the Caballo geographic management unit. This species was not listed because multiple agencies including BLM developed a conservation strategy that was deemed sufficient to avoid listing at the time (Rio Grande Cutthroat Trout Range-wide Conservation Team 2013). Further loss of Rio Grande cutthroat trout populations would likely trigger listing review. As such, we recommend you evaluate the project impacts on this population.

In reviewing the impacts of groundwater depletion the following references cited in the BA would be helpful in our assessment?

ABC (Adrian Brown Consultants). 1996. Appendix F of Copper Flat project hydrology impact evaluation report, surface water characterization. Prepared for S. Steffen Robertson and Kristen, Report 1356A/960909. September 9, 1996.

INTERA. 2012. Baseline characterization data report for Copper Flat Mine Sierra County, New Mexico. Prepared for New Mexico Copper Corporation. Submitted to Mining and Minerals Division of New Mexico Energy, Minerals and Natural Resources Department.

Jones, M.A., J.W. Shomaker, and S. Finch Jr. 2012. Conceptual Model of Groundwater Flow in the Animas Uplift and Palomas Basin, Copper Flat Project, Sierra County, New Mexico. Prepared for New Mexico Copper Corporation.

Jones, M.A., J.W. Shomaker, and S. Finch Jr. 2013. Model of Groundwater Flow in the Animas Uplift and Palomas Basin, Copper Flat Project, Sierra County, New Mexico. Prepared for New Mexico Copper Corporation. August 22, 2013.

Please feel free to contact George Dennis (505-761-4754, george_dennis@fws.gov) of my staff if you have any questions about the issues we have raised.

cc:
Director, New Mexico Department of Game and Fish, Santa Fe, New Mexico (electronic copy)
Director, New Mexico Energy, Minerals, and Natural Resources Department, Forestry Division, Santa Fe, New Mexico (electronic copy)

Literature Cited

Bureau of Reclamation. 2002. Elephant Butte and Caballo Reservoirs Resource Management Plan. Final Environmental Impact Statement. U.S. Department of the Interior, Bureau of Reclamation, Albuquerque Area Office Albuquerque, New Mexico.

Rio Grande Cutthroat Trout Range-wide Conservation Team. 2013. Rio Grande Cutthroat Trout Conservation Strategy. https://www.fws.gov/southwest/es/newmexico/documents/RGCT_conservation_strategy_final_12-10-13.pdf, accessed July 6, 2016.

Sredl, M.J., and L.S. Saylor. 1998. Conservation and management zones and the role of earthern cattle tanks in conserving Arizona leopard frogs on large landscapes. Pages 211-225 in Proceedings of symposium on environmental, economic, and legal issues related to rangeland water developments. Tempe, Arizona. http://www.law.asu.edu/LinkClick.aspx?fileticket=7EhpeG9Q0N4%3d&tabid=2047 , accessed July 6, 2016.

U.S. Fish and Wildlife Service (Service). 2016. Endangered and threatened wildlife and plants; 90-Day findings on 29 petitions. Federal Register 81:14,058-14,072.

United States International Boundary and Water Commission (USIBWC). 2004. River management alternatives for the Rio Grande Canalization Project. Biological Assessment. http://www.ibwc.state.gov/Files/RGCP_BA_final.pdf, accessed July 6, 2016.

Haas, Amy, OSE

From:	Schmidt, Rolf I., OSE
Sent:	Wednesday, May 18, 2016 11:00 AM
To:	Lindeen, Christopher, OSE; Romero, John, OSE; Longworth, John W., OSE; Shaw, Chris, OSE; Haas, Amy, OSE; Shafike, Nabil G., OSE
Subject:	Fwd: Scanned from a Xerox Multifunction Printer
Attachments:	Scanned from a Xerox Multifunction Printer.pdf

Fyi, here's the contract Chuck gave us between Jicarilla and NM Copper for SJCP water.

Sent from my Verizon Wireless 4G LTE DROID

-------- Original Message --------
Subject: Scanned from a Xerox Multifunction Printer
From: lap.xerox7970@state.nm.us
To: "Schmidt, Rolf I., OSE" <rolf.schmidt@state.nm.us>
CC:

Please open the attached document. It was scanned and sent to you using a Xerox Multifunction Printer.

Sent by: Guest [lap.xerox7970@state.nm.us]
Attachment File Type: pdf, Multi-Page

Multifunction Printer Location:
Device Name: Legalxerox7970

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EXHIBIT
B

Johnson
Barnhouse
& Keegan LLP
Attorneys at Law

ncuylear@indiancountrylaw.com
505.842-6123 ext. 107

VIA ELECTRONIC MAIL AND FIRST CLASS MAIL US POSTAL SERVICE

March 18, 2016

Charles T. DuMars, Esq.
Law & Resource Planning Associates, P.C.
201 Third Street NW, Suite 1750
Albuquerque, NM 87125
Email: ctd@lrpa-usa.com

Re: Approval of a Third-Party Water Lease Agreement between the Jicarilla Apache Nation and New Mexico Copper Corporation, Inc., San Juan-Chama Project, New Mexico

Dear Mr. DuMars:

Enclosed please find a copy of the Regional Director's memorandum of approval dated February 10, 2016, and an original third-party agreement between the Jicarilla Apache Nation (Nation) and New Mexico Copper Corporation, Inc. to lease 3000 acre-feet of SJ-CP water, commencing on the date of the agreement.

Please do not hesitate to call if you have questions.

Sincerely,

Natasha

Natasha D. Cuylear

CC: Darryl Vigil (via e-mail)
W/o enclosure

BUR United States Department of the Interior

ALB. AREA OFFICE RECEIVED

2016 FEB 16 PM 8:12

BUREAU OF RECLAMATION
Upper Colorado Regional Office
125 South State Street, Room 8100
Salt Lake City, UT 84138-1102

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FEB 16 '16

Class			Action
Prj			
Cntr #			
Fldr #			
Date	Initial	To	
2/16/16		430	
		420	

IN REPLY REFER TO:
UC-446
WTR-4.00

FEB 10 2016

ORIGINAL

MEMORANDUM

To: Area Manager
Attention: ALB-442 (YMcKenna)

From: Brent Rhees
Regional Director

Subject: Approval of a Third-Party Water Lease Agreement between the Jicarilla Apache Nation and New Mexico Copper Corporation, Inc., San Juan-Chama Project, New Mexico

We are transmitting three originals of the subject third-party agreement for the annual delivery of 3,000 acre-feet from the San Juan-Chama Project water supply allocated to the Jicarilla Apache Nation with Reclamation's approval. We note however that the Nation may also need to obtain approvals/permits from other federal and state agencies for the proposed use of this water. Compliance of this third-party agreement with the National Environmental Policy Act of 1969 has been documented through ALB-CE-15-063.

The water lease agreement has been reviewed by the Regional Solicitor for legal adequacy and approved by the Upper Colorado Regional Office on behalf of the United States. Please distribute the agreement originals to the proper individuals with a copy to the State Engineer of New Mexico. If you have any further questions, please contact Mr. Michael Loring at 801-524-3691.

Attachment (3 originals)

WATER SUPPLY AGREEMENT BETWEEN THE JICARILLA APACHE NATION AND NEW MEXICO COPPER CORPORATION, INC.

THIS AGREEMENT (the "Agreement") effective May 12, 2015, is between the JICARILLA APACHE NATION (the "Nation") and New Mexico Copper Corporation, Inc. ("NM Copper"). The Nation and NM Copper are collectively referred to as the "Parties" and individually as "Party."

EXPLANATORY RECITALS

NM Copper is in need of a water supply and water is available on a temporary basis from the Nation's San Juan-Chama water supply, and

The Nation is the owner of certain water rights pursuant to the Jicarilla Apache Tribal Water Rights Settlement Act of October 23, 1992, 106 Stat. 2237 (the "Settlement Act"), and the Act of June 13, 1962, 76 Stat. 96 (the "NIIP/San Juan-Chama Act"), and

The Nation has the right to deplete up to 6,500 acre feet per year from the San Juan-Chama Project pursuant to the Settlement Act and paragraph 4(d) of the Contract between the Nation and the United States of America dated December 8, 1992 (the "Federal Contract" attached as Exhibit A), and

The Nation has the right to market such water pursuant to the Settlement Act and the Federal Contract, and

The Nation desires to subcontract under the Federal Contract to market water to NM Copper, and NM Copper desires to purchase such water supply under the terms and conditions of this Agreement,

ACCORDINGLY, in consideration of the mutual covenants in this Agreement, the Parties agree as follows:

ARTICLE 1
GENERAL DEFINITIONS

1.1 "Nation" means the Jicarilla Apache Nation. The Nation is a federally recognized Indian tribe organized under the Indian Reorganization Act.

1.2 "Project" means the San Juan-Chama Project created by the diversion of San Juan basin water into the Rio Grande basin with terminus storage at Heron Dam as authorized by the Act of Congress of June 13, 1962.

1.3 "Heron Dam" means the delivery point for the Nation's San Juan-Chama water supply as it is defined in the Federal Contract and delivered by the United States Bureau of Reclamation ("USBR").

1.4 "Notice" is proper notice provided pursuant to Article 13 of this Agreement.

1.5 "NEPA" means the National Environment Policy Act. 42 U.S.C. §§4321 et seq.

1.6 "ESA" means the Endangered Species Act. 16 U.S.C. §§1531 et seq.

1.9 "USBR" means the United States Bureau of Reclamation.

1.10 "NM Copper" means New Mexico Copper Corporation, Inc., its successors or assigns.

1.11 "State Engineer Approved" means a final order of the New Mexico State Engineer approving the use of water leased under the contract to offset effects of pumping on the Rio Grande.

1.12 "Secretary" means the Secretary of the United States Department of Interior.

1.13 "Commencement of mining operations" means the date on which mined rock is first fed to the mine primary crusher in order to build the ore stockpile ahead of the concentrator.

1.14 "Federal Contract" means the contract between the Nation and the United States dated December 8, 1992 that was authorized and adopted by Congress in the

Jicarilla Apache Tribe Water Rights Settlement Act of October 23, 1992, 106 Stat. 2237.

1.16 "Sublease" means any agreement, contract, subcontract, sublease, or arrangement of any kind made by NM Copper to deliver or make available for delivery to a third party all or a portion of the water made available for delivery to NM Copper under this Agreement.

1.17 "Subleasing" means any agreeing, contracting, subcontracting, subleasing, or arranging of any kind by NM Copper to deliver or make available for delivery to a third party all or a portion of the water made available for delivery to NM Copper under this Agreement.

1.18 A "Right of First Refusal" means the right of NM Copper to be given notice of a potential third party contract, the terms of that contract, and the right to match the price term and thereby keep this Agreement in full force and effect.

ARTICLE 2
CONTRACT CONDITIONS

2.1 This Lease is intended to meet water requirements imposed on NM Copper by the New Mexico State Engineer. If the New Mexico State Engineer directs that a lesser amount of Leased Rights than 3,000 acre feet per annum shall be allowed or required that quantity shall be the amount acquired under this Lease.

2.2 Compliance by the Nation with Article 11.6 is a Condition Precedent. If the New Mexico State Engineer determines that no offsetting water is required for NM Copper to pump water from its wells for this project, this contract will terminate, and neither party shall have any further obligation hereunder.

ARTICLE 3
TERM OF AGREEMENT

3.1 The term of this Agreement shall be from the date on which all necessary approvals are received to fifteen (15) years after commencement of mining operations, unless earlier terminated pursuant to the provisions of Article 19. The Parties may begin at the end of the twelfth year to develop new terms and conditions mutually agreeable to both Parties for any additional renewal period after the expiration of the fifteen year term of this Agreement.

ARTICLE 4
WATER AVAILABILITY

4.1 The Nation shall deliver to NM Copper, through USBR pursuant to the Federal Contract, up to 3,000 acre-feet of water per year beginning on the date of commencement of mining operations and continuing from the first date of delivery and at such times during the term of this agreement as best suits NM Copper's needs until fully delivered but no later than December 31st of each year for the term of this agreement. NM Copper shall give the Nation six months prior Notice of the date on which it will commence mining operations. NM Copper shall pay the Nation for the water as provided in Articles 6 and 7. Provided, however, that should, because of market conditions or unforeseen circumstances, NM Copper not require the full amount under this Agreement, the amount delivered shall be reduced to actual demand, but in no case shall payment under this Agreement fall below $50,000.00.

4.2 NM Copper shall be responsible for the operation, maintenance, and replacement costs of the San Juan - Chama project that the Federal Bureau of Reclamation bills the Nation per acre foot/year (for municipal and industrial uses) payable annually through the term of this contract to the Federal Bureau of Reclamation associated with the quantity of water leased. These charges will be in addition to lease rates set forth in Article 7.

4.3 NM Copper shall have no holdover storage rights in Heron Reservoir from year to year, and NM Copper does hereby relinquish claim to any annual water supply to which it is entitled hereunder, but has not utilized beginning with the commencement of mining operations and for the term of this Agreement. Any water subject to delivery hereunder not called for by the end of each calendar year shall become integrated with the water supply for all purposes of the Heron Reservoir at that time.

4.4 Subject to the water shortage constraints described under Article 9, obtaining the appropriate permit from the New Mexico State Engineer ("State Engineer"), and compliance with any applicable laws and regulations, NM Copper may, in its sole discretion, determine the timing and manner in which water is diverted provided that there are no operational constraints in the routing of releases through El Vado and Abiquiu dams as determined by Reclamation or the Corps of Engineers.

ARTICLE 5
WATER USE

5.1 The water provided hereunder shall be used by NM Copper, and NM Copper shall prepare and furnish such reports on water use and related data as required by the Nation and USBR.

5.2 In the event that NM Copper cannot take full delivery of water supplied under this Agreement for its purposes, then NM Copper may sublease water to third parties only when the terms and conditions of any sublease agreement are approved in writing in advance by the Nation, which approval shall not be unreasonably withheld. NM Copper shall provide ninety (90) days written Notice to the Nation of any proposed Sublease, regardless of duration. Such Notice shall include a copy of the proposed Sublease. NM Copper is prohibited from Subleasing for a term longer than one (1) year any water supplied under this Agreement to third parties unless specifically authorized by the Nation in writing prior to execution of the Sublease. If water is subleased for a price per acre foot that is greater than that NM Copper pays to the Nation for that same water, the Parties shall share equally in the amount of the exceedance. Any Sublease may also require approval by the USBR. Every Sublease shall incorporate and be subject to the terms and conditions of this Agreement and the Federal Contract.

5.3 In the event that NM Copper does not want to sublease any water of which it cannot take delivery from the Nation, nothing in this paragraph shall preclude NM Copper from relinquishing any undelivered amounts to the Nation for use by the Nation in the manner it chooses.

ARTICLE 6
PAYMENT FOR LOST OPPORUNITY

6.1 As compensation to the Nation for its lost opportunity to market its water prior to delivery to NM Copper, NM Copper shall pay the Nation an annual payment in the amount of $50,000.00 (payable in two (2) equal installments of $25,000.00) for the year(s) preceding actual delivery of water subject to this Agreement. For purposes of this section a year is defined as beginning January 1st and ending December 31st.

17835

6.2 The initial payment shall be made within thirty (30) days after the approval of this Agreement by the Secretary. In the event approval of the Secretary occurs prior to January 1st, the initial payment shall be prorated accordingly. Succeeding annual payments shall be made on January 1st and July 1st of each year.

6.3 The succeeding annual payments shall be adjusted for inflation and market value increases as provided for in subsection 6.4 herein.

6.4 Beginning in the second year of this Agreement and every year thereafter, the annual payments shall be adjusted for inflation. The price adjustment will be indexed to the Consumer Price Index (CPI-U Western Region) for the 12 months preceding the annual lease term or three and one/half percent (3.5%), whichever is the greater number.

6.5 Payments under Section 6 shall end upon actual delivery of water to NM Copper.

ARTICLE 7
PAYMENT FOR WATER DELIVERED

7.1 Beginning on the commencement of mining operations, NM Copper agrees to pay in advance on a semi-annual basis for 3,000 acre-feet of water, whether or not NM Copper actually takes and uses such water. The rate charged in year one (the year of commencement of mining operations) for this contract for water is $125.00 per acre-foot per year. Payment due for year one (the year of commencement of mining operations) shall be prorated according to the date of first delivery. The amount due in each subsequent year of the contract shall be adjusted for inflation as provided in Section 6.4. The appropriate amount due for each year subsequent to the first year of delivery shall be paid in advance, on a semi-annual basis, the first payment due no later than January 31st of the year the water is delivered. The payment will be made after both parties have signed this Agreement, approval of this Agreement by USBR, and issuance of the appropriate permit by the State Engineer.

7.2 The payment described in this Article and in Article 6, along with the operation and maintenance costs as set forth in Article 4.2, represents the total consideration due for the water purchased under this Agreement. Each Party shall bear its own administrative costs.

7.3 If NM Copper pays in advance for water supplied under the requirements of Article 7.1 and water purchased under the terms of this Agreement is not delivered to NM Copper due to circumstances beyond the control of either party, then a full refund less expenses incurred by the Nation will be made on an acre-foot basis for all water not delivered from Heron Dam and Reservoir by December 31st of the year for which water is not delivered.

ARTICLE 8
MEASUREMENT AND RESPONSIBILITY FOR DISTRIBUTION

8.1 The water furnished under this Agreement shall be supplied and delivered by the Nation, through USBR pursuant to the Federal Contract, to NM Copper which agrees to make arrangements for storage, diversion and conveyance of such water to places of use at NM Copper's own expense. Further, NM Copper shall bear all post – delivery water losses, including but not limited to consumptive losses, conveyance losses and channel losses.

8.2 NM Copper will be responsible for the measurement of water diverted from Heron Dam and Reservoir under this Agreement. Beginning in the year following the first delivery of water and for the duration of this Agreement, records of the previous year's diversion and associated accounting by NM Copper or others will be provided to the Nation and USBR no later than January 31 of the following year.

8.3 The Nation shall not be responsible for the storage, diversions, control, carriage, handling, use, disposal, or distribution of water taken by NM Copper hereunder, and NM Copper shall hold the Nation harmless on account of damage or claim of damage of any nature arising out of or connected with the storage, diversion, control, carriage, handling, use, disposal, or distribution of such water.

ARTICLE 9
WATER SHORTAGES AND LIMITATIONS

9.1 The delivery of water during any calendar year is conditioned upon and subject to the following:

9.1.1 Any shortages to the San Juan-Chama Project supply that are determined to exist by the Secretary for any reason will be shared among Project beneficiaries only pursuant to all Project authorizations, the Federal Contract and any other applicable laws. In no event shall any liability accrue against the United States, the Nation or any officers, agents, or employees of either for any damage, direct or indirect, arising from a shortage for any causes.

9.1.2 If shortages are declared by the Secretary such that the Nation cannot supply and deliver through USBR pursuant to the Federal Contract in accordance with Article 4.1 of this Agreement all the water contracted for from the San Juan-Chama Project supply, NM Copper's payment will be reduced in proportion to the amount of water not supplied, or credited against the following year's payment or refunded.

9.1.3 This Agreement and all water delivered pursuant hereto shall be subject to and controlled by the Colorado River Compact, the Boulder Canyon Project Act, the Boulder Canyon Project Adjustment Act, the Upper Colorado River Basin Compact, the Mexican Water Treaty of February 3, 1944, the Colorado River Storage Project Act, the NIIP/San Juan-Chama Act, the Colorado River Basin Project Act and other applicable federal law. In the event deliveries to NM Copper are required to be curtailed under and by reason of any of the provisions of the foregoing, NM Copper agrees to a reduction of the amount of water delivered hereunder as the Secretary determines necessary to comply with said acts. In that event, NM Copper's Contract Rate payment to the Nation will be reduced in proportion to the amount of water not supplied.

ARTICLE 10
PAYMENT CONDITIONED UPON DELIVERY

10.1 NM Copper's obligation to pay the Nation is conditioned upon the delivery of the water at the outlet works of Heron Dam and Reservoir, all as provided for in this Agreement.

10.2 Subject to the Nation's ability to supply and deliver, through USBR pursuant to the Federal Contract, the water contracted for from San Juan-Chama Project supply or otherwise as provided in this Agreement, NM Copper shall take all the water ordered, or shall pay for the water as if taken.

ARTICLE 11
OTHER PROVISIONS

11.1 This Agreement incorporates by reference the Federal Contract, a true and correct copy of which is attached as Exhibit "A".

11.2 This Agreement is subject to the requirements of NEPA and ESA. The Parties understand that USBR will conduct a review in compliance with NEPA.

11.3 This Agreement is subject to the approval of the Secretary or his designee pursuant to the Federal Contract.

11.4 Notwithstanding the provisions of Article 17, if a Party is in default, which default continues for more than thirty (30) days after Notice, the Parties may seek to remedy the default under the Dispute Resolution provisions of this Agreement (Article 18).

11.5 This Agreement is dependent upon the issuance of a diversion permit for the contracted water from the State Engineer that is final and not appealable. Any payments made pursuant to Article 7 are subject to refund as provided in Article 7.3 if the diversion permit is not issued or if the decision to grant the permit is reversed. In that event, all payment obligations will cease and this Agreement will terminate as of the date of a final denial of a diversion permit by the State Engineer.

11.6 The Nation shall obtain all requisite approvals under the Federal Contract.

11.7 The Nation shall comply with all requirements of the Federal Contract related to this Agreement.

11.8 The Parties shall cooperate in all required approval processes.

11.9 Andrew Maloney, Chief Executive Officer of THEMAC Resources, represents and warrants that he has the authority to enter into this agreement and that upon his signature hereon, this Agreement is a binding obligation of NM Copper.

11.10 Both Parties are relying on the advice of their own technical and legal experts in entering into the Agreement and there are no warranties or representations by either Party other than those expressly contained herein. Any ambiguities herein shall not be construed in favor of or against either Party as the drafter hereof.

11.11 Nothing in this Agreement shall be construed to obligate the Nation to construct, install, operate or maintain pumps, pipelines, storage tanks, distribution lines, or other facilities required to take, convey or distribute water made available under this Agreement.

11.12 NM Copper agrees to cooperate with the Nation in its general activities to put its settlement rights to beneficial use within the Rio Chama and Rio Grande basins. NM Copper further agrees to not take legal action in the form of inter se or the filing of formal protests against the Nation regarding water rights filings in the Upper Chama adjudication or future transfers and diversions of the Nation's native Rio Grande rights or its San Juan-Chama water for the duration of this Agreement or amendments thereto.

ARTICLE 12
NOTICES

12.1 Any Notice, demand, or request authorized by this Agreement shall be deemed to have been given if mailed (return receipt requested), hand delivered, or faxed as follows:

To: New Mexico Copper Corporation, Inc.

Jeffrey Smith
Chief Operating Officer
New Mexico Copper Corp.
2424 Louisiana Blvd. NE Suite 301
Albuquerque, NM 87110

(505) 382 5770
(505) 881-4616

To Nation:

President
Jicarilla Apache Nation
P.O. Box 507
Dulce, NM 87528
Facsimile number 575-759-4487

With a copy to:

Jenny Dumas, Esq.
Natasha D. Cuylear, Esq.
Johnson Barnhouse & Keegan LLP
7424 4th Street NW
Los Ranchos de Albuquerque
New Mexico 87107
Facsimile number 505-842-6124

To USBR:

Regional Director
Upper Colorado Region
Attn: UC-400
125 South State Street
Room 6107
Salt Lake City, Utah 84138-1102
Facsimile number 801-524-5499

All Notices and demands given or required to be given by a Party to the other Party shall be deemed to have been properly given if and when delivered in person, sent by facsimile (with verification of receipt) or three (3) business days after having been deposited with the U.S. Postal Service and sent by registered or certified mail, postage prepaid.

In the event either party delivers a Notice by facsimile, as set forth above, such Party agrees to deposit the originals of the Notice in a Post Office, or mail depository maintained by the U.S. Postal Service, postage prepaid, and addressed as set forth above. Such deposit in the U.S. Mail shall not affect the deemed delivery of the Notice by facsimile, provided that the procedures set above are fully complied with.

12.2 The designation of the addressee or the address may be changed by Notice given in the same manner as provided above in Article 12.1.

ARTICLE 13
ASSIGNMENT

13.1 The provisions of this Agreement shall apply to and bind the successors and assigns of the Parties, but no assignment of this Agreement or of any right or interest hereunder shall be valid until approved in writing by the other Party and the Secretary or designee, which consent shall not be unreasonably withheld.

ARTICLE 14
WATER AND AIR POLLUTION CONTROL AND WATER CONSERVATION

14.1 NM Copper shall comply with all applicable water and air pollution control laws now or hereafter in force, and shall be responsible for obtaining all required licenses and permits.

ARTICLE 15
EQUAL OPPORTUNITY AND RELATED LAWS

15.1 NM Copper or its assignee will not discriminate against any employee or applicant for employment because of race, color, religion, sex or national origin. NM Copper will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to race, color, religion, sex or national origin. Such action shall include, but not be limited to, the following: Employment, upgrading, demotion or transfer, recruitment or recruitment advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training, including apprenticeship.

15.2 NM Copper will, in all solicitations or advertisements for employees placed by or on behalf of the subcontractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex or national origin.

15.3 The Nation will take such action with respect to any subcontractor as the USBR may direct as a means of enforcing such provisions, including sanctions for noncompliance; provided however, if the Nation becomes involved in, or is threatened with, litigation with a subcontractor as a result of such direction, the Nation may request the United States to enter into such litigation to protect the interest of the United States.

15.4 Nothing in paragraphs 15.1 through 15.3, above, shall be read as prohibiting the Nation from requiring that subcontractors give preferential employment to members of the Jicarilla Apache Nation.

ARTICLE 16
HOLD HARMLESS

16.1 In the event that any action taken by any administrative entity or judicial forum curtails, diminishes or eliminates the San Juan-Chama water supply to which the Nation is otherwise entitled, and results in the curtailment, diminishment or elimination of deliveries to NM Copper under this Agreement the Agreement will terminate and NM Copper will hold the Nation harmless and will not seek to enforce the terms and conditions of this Agreement except for NM Copper's right to a refund or reimbursement as described in Articles 7 and 9 above.

ARTICLE 17
FORCE MAJEURE

17.1 Neither Party shall be considered to be in default in respect to any obligation hereunder, if delays in or failure of performance shall be due to Uncontrollable Forces. "Uncontrollable Forces" shall mean any cause beyond the control of the Party affected and not due to its fault or negligence, including, but not limited to, acts of God, flood, earthquake, storm, fire, lightning, epidemic, war, riot, civil disturbance, sabotage, strikes or other labor disturbances, or restraint by court or public authority, any of which such Party could not reasonably have been expected to avoid, and which by the exercise of due diligence it is unable to overcome. Neither Party shall, however, be relieved of liability for failure of performance if such failure is due to removable or remediable causes which it fails to remove or remedy with reasonable dispatch. Nothing contained herein, however, shall be construed to require either Party to prevent or settle a strike or other labor disturbance against its will. The Party whose performance hereunder is so affected shall immediately notify the other Party of all pertinent facts and take all reasonable steps to promptly and diligently prevent such causes if feasible to do so, or to minimize or eliminate the effect thereof without delay.

ARTICLE 18
DISPUTE RESOLUTION

18.1 Disputes shall first be discussed and resolved by representatives of each Party having the authority, through appropriate corporate or tribal resolution, if necessary, to bind the Party that they represent. Such representatives shall use their best efforts to amicably and promptly resolve the dispute. Pending resolution of any dispute, the Parties shall continue to perform their obligations hereunder. If the Parties are unable to resolve any dispute within fifteen (15) calendar days of the occurrence of the event or circumstances giving rise to the dispute, either Party may give written notice to the other Party that the dispute is to be submitted to binding arbitration. Such notice shall name a proposed arbitrator. In the event that the other Party does not agree to the proposed arbitrator, it shall submit the name of its proposed arbitrator, within ten (10) calendar days of said notice, and if that person is not acceptable to the Party giving the original notice, the arbitrators proposed by each Party shall, within five (5) days, select a third arbitrator. The person selected to be an arbitrator must be licensed to practice law in the United States and have experience in Indian and water law.

18.2 The arbitration provisions herein shall constitute the sole and exclusive procedural remedy to any dispute or controversy arising out of this Agreement and shall be binding on the Parties. All reasonable fees and costs incurred by the arbitrators shall be split equally by the Parties and each Party shall be responsible for payment of its own attorney's fees, preparation fees, witness and expert fees, and other costs.

18.2.1 An arbitration hearing shall be held at the Jicarilla Apache Nation's judicial complex in Dulce, NM within thirty (30) days of the appointment of the last arbitrator. At the hearing, each Party may submit statements of fact or memoranda of law as desired and the arbitrator(s) shall allow each Party to present its case, evidence and witnesses, if any, in the presence of both Parties. The arbitrator(s) shall render their decision promptly after the hearing.

18.2.2 The prevailing Party shall be entitled to confirmation of any award of the arbitrator(s) and to judgment thereon. For purposes of confirmation of any award of the arbitrator(s), the Parties hereby consent to jurisdiction in the Jicarilla Apache Nation's Tribal Court. The Nation waives its sovereign immunity solely for the purpose of the obligations of this Article, including but not limited to the entry and enforcement of the arbitration award. This waiver of immunity is not intended, nor shall it be construed to, (a) waive the Nation's sovereign immunity for any other purpose, or (b) extend to the benefit of any person other than Parties to this Agreement or their successors or assigns. This waiver of immunity from suit shall not be construed as an admission of liability by the Nation as to any claim for damages or as an agreement or willingness to pay any amount as damages absent an arbitration determination of liability, and the Nation shall have the right to defend any such claim fully on the merits.

18.2.3 This Agreement shall be governed by and construed in accordance with the laws of the Jicarilla Apache Nation as applicable, and as codified in the Jicarilla Apache Nation Code (2007) with specific reference to Title 21: Water Code.

ARTICLE 19
RELINQUISHMENT AND EARLY TERMINATION

19.1 NM Copper may elect to permanently relinquish a portion of the water to be made available for delivery under this Agreement and may be excused from performance of the corresponding portion of its obligation to pay for water, or may terminate this Agreement prior to the expiration date, provided that such election may be exercised by NM Copper only upon satisfaction of the following conditions:

19.1.1 NM Copper shall provide the Nation twelve (12) months advance written Notice of its intent to terminate this Agreement or to relinquish a portion of the water to be made available for delivery under this Agreement. Such Notice shall specify whether it is a Notice of termination or relinquishment, and if for relinquishment, the amount of relinquishment in AFY.

19.2 The Nation, in the event of extraordinary circumstances, at its sole discretion may be excused from performance of the corresponding portion of its obligation to deliver water, or may terminate this Agreement prior to the expiration date, provided that such election may be exercised by the Nation only by providing NM Copper twelve (12) months advance Notice of its intent to terminate this Agreement and provided that NM Copper shall be given a right of first refusal if the purpose of the cancellation is to contract with a third party.

19.3 If NM Copper is more than sixty (60) days delinquent in a payment under this Agreement, the Nation shall provide NM Copper thirty (30) days notice of its intent to terminate. If NM Copper fails within thirty (30) days after notice to cure such delinquency or fails to invoke the Dispute Resolution provisions of Article 18 of this Agreement, the Nation may, in its sole discretion, terminate this Agreement. A partial payment shall be deemed to be a delinquent payment for this purpose unless the parties mutually agree in writing to a schedule for partial payments and the partial payment is made pursuant to the terms of that agreement and all terms of this Agreement. This right of termination is without prejudice to any other right or remedy to which the Nation is entitled in the event of a breach by NM Copper.

ARTICLE 20
AMENDMENTS

20.1 This Agreement may be amended only by written instrument executed by the Parties with the same formalities and requisite approvals as this Agreement.

ARTICLE 21
POLICY STATEMENT ON INDIAN PREFERENCE

21.0 As an employer, the Nation seeks to employ individuals who possess the skills, abilities, and background to meet the employment needs of the tribe. As a sovereign Indian tribe and a unique cultural group, the Nation promotes preference for qualified Indian individuals in employment. Accordingly, the Nation has established Title 23 in the Jicarilla Apache Nation Code for hiring employees to provide services that meet the needs of the Nation's people. NM Copper hereby supports and endorses the policy of the Nation and shall reasonably consult with the Nation to give preference in employment to members of the Nation and to maximize utilization of tribal members in all available employment opportunities. It is the intent of NM Copper to build a core group of skilled labor candidates through job placement and training assistance to eligible enrolled members of the Nation.

IN WITNESS WHEREOF, the Parties have caused this Agreement to be duly executed by their duly authorized representatives having the specific authority to execute this Agreement as of the date set forth below.

NEW MEXICO COPPER CORPORATION, INC.:

By: ____________________
Jeffrey Smith
Chief Operating Officer
Date: July 14, 2015

THE JICARILLA APACHE NATION

By: ____________________
Ty Vicenti
President
Date:

Resolution No. 2015-R-228-05

APPROVED AS REQUIRED BY THE FEDERAL CONTRACT:

UNITED STATES BUREAU OF RECLAMATION, AS THE DULY AUTHORIZED DELEGATEE OF THE SECRETARY OF THE DEPARTMENT OF THE INTERIOR OF THE UNITED STATES

By:
Printed Name:
Title: Regional Director
Date:

By: Christopher B Rich
Printed Name:
Title: for Regional Solicitor
Date:

APPENDIX

Explanation of Purposes of Use and Location for Use of San Juan / Chama Surface Water Leased from the Jicarilla Apache Nation

Pursuant to the Lease Agreement entered into between the Jicarilla Apache Nation and New Mexico Copper Corporation for lease of San Juan / Chama surface water, dated May 1, 2015, the following explains the anticipated purposes and locations of use of the water:

All water under the Contract; all water will be released into the Rio Grande to offset pumping from wells owned by New Mexico Copper Corporation, specifically wells designated by the New Mexico State Engineer as file numbers LRG-4652 through LRG-4652-S-17 and LRG-4654. All this water will be consumed from within the Rio Grande at the locations* described below within the State of New Mexico:

Caballo Reservoir

Township	Range	Section(s)
16S	4W	6, 7, 18, 19
16S	5W	1, 12, 13, 24
15S	4W	31, 30
15S	5W	25, 36

Caballo Reservoir Dam

Township	Range	Section(s)
16S	4W	S½ 19

Rio Grande Below Caballo Reservoir Dam

Township	Range	Section(s)
16S	4W	30, 31

* Locations based on PLSS system for State of New Mexico, New Mexico Principal Meridian.

Notes – Meeting of Surface Water Quality Bureau (SWQB) and New Mexico Copper Corporation (NMCC) on 28 April 2016

In Attendance

Name	Organization	Initials
James Hogan	NMED – SWQB	JH
Shelly Lemon	NMED – SWQB	SL
Andrew Knight	NMED – SWQB	AK
Bryan Dail	NMED – SWQB	BD
Kris Pintado	NMED – SWQB	KP
Brad Reid	NMED – GWQB	BR
Jeff Smith	NMCC	JS
Katie Emmer	NMCC	KE
Stuart Butzier	Modrall Sperling	SB
Christina Sheehan	Modrall Sperling	CS

Next Meeting: 23 May, 2pm at SWQB

Action Items

- NMED will consider and research the interpretations discussed regarding whether the Copper Flat Pit meets or is excluded from the definition of a surface water of the state and provide feedback on their position in the next scheduled meeting.
- NMCC will continue to work on the geochemical model and reclamation strategies that might improve future pit water quality, the economic impact of limiting mining to keep pit water on private lands, and the possibility of a Use Attainability Analysis (UAA).

Meeting Discussion

JH: Provided an overview of status based on KE's email and our previous conversations. There currently is a pit water body that the ACOE has determined is not jurisdictional "Waters of the United States" under the Clean Water Act. However, because the current pit water exceeds some NM surface water quality standards (for Cu, Zn, Cd, others), we've discussed that NMCC could do a UAA to change water quality standards- either modify or remove the aquatic life standard. During mining, the water will be pumped out of the pit. We've discussed that groundwater coming into the pit could be used in process per NMCC's Discharge Plan (DP) and within NMCC's water rights. Post mining, water will collect in the pit and the question will be does the future water meet the applicable water quality standards under a closure scenario.

JS- Confirmed JH's schematic overview: Copper Flat has a pit water body now, when mined it will be dewatered, and when the mine closes the water will return to the pit. Discussed background on where we've been and why we are here. JS has been with NMCC for about 2.5 years. Copper Flat was mined briefly in 1982 and had to be shut down due to copper prices. The plans for the proposed mine now being considered are similar to what Quintana put in place then. In 2013 NMCC did a project feasibility study, with engineering and economic analysis, and after that NMCC has had to focus most of its

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attention on the NEPA process and getting BLM what they needed. NMCC has a small staff and with some considerable effort it did get the DEIS issued last year. In 2015, in addition to working on responding to requests for information from the BLM, NMCC shifted focus to the DP Application, and that was submitted in December of 2015. The DP is in review, and NMCC is in the process of responding to comments from NMED. Now NMCC is shifting its focus to the mine permit needed from MMD. This is why we are here today, we are shifting our focus to the regulatory issues we need to work through for that permit, and we want to clarify a few things and make sure we are all on the same page.

SB- Modrall has been asked to review things for NMCC, and has taken a step back to look at how the pit is understood in relation to the Water Quality Control Commission's (WQCC) definition of "surface waters of the state." NMCC wishes to explore that issue, discuss whether a possible UAA will be necessary, and come to an understanding of how the Determination the NMED needs to make under the Mining Act for the state mining permit to be issued under the Mining Act by the Mining and Minerals Division (MMD). Under that permitting process, the Post Mining Land Use (PMLU) will be wildlife at the pit. The pit will not be backfilled at the end of mining. It will be there. The pit is a unique situation. NMCC does not want active treatment at the end of mining. Cunningham Hill is perhaps a similar situation, but was already in play by 2010 when the surface water standards were changed.

JH- The Cunningham Hill permit was already in place and SWQB did not change the standards that apply to it at that time.

SB- Because the pit water situation at Copper Flat is fairly unique, how SWQB interprets the Copper Flat pit will not be hugely precedent setting. We view the Copper Flat pit as distinct from other sites where water will be in mine pits. Tyrone/Chino will have long term treatment, so they are exempt. The Cunningham pit is not subject to aquatic life or primary contact standards. Up to this point apparently NMED has been thinking that the water at Copper Flat probably is a "lake." Our interpretation is that it's not a lake and will not collect surface waters of the state. The definition draws distinctions between natural features and manmade bodies. Because the pit will be a hydrologic sink, it will not combine with surface or ground waters under the language of the surface waters of the state definition.

JH- So what about a manmade body, such as damming the Rio Grande and creating Elephant Butte?

SB- In that case you are impounding a water of the US, and the same water would be surface water of the state.

CS- That is expressly contemplated in the definition of a surface water of the state, it's a manmade body in a tributary.

JH- So what if you have a closed basin, such as Mimbres, and there's a stock pond there, is that a surface water of the state? It's in a stream channel, but we know the Army Corps of Engineers is not involved...

SB- Yes, that impounds surface waters of the state, it's created in a tributary, a stream that is a surface water of the state and once you impound that water, it's included.

KE- I'd note here that Grayback arroyo does not connect to the pit water body; this was one of the features that made ACOE comfortable to make their jurisdictional determination that the pit water is not a Water of the United States.

JS- I was part of making the diversion back in the 80s at Copper Flat. We diverted Grayback so that it goes around the pit.

BD- The water in the pit comes from groundwater coming into the ore body that is exposed.

SB- Correct. So you aren't impounding a surface water of the state. There will be water falling on the pit walls during precipitation events, but no tributary flowing in. We don't expect a solution today; we just want to talk through a list of things for you to think about, and for us to think about.

AK – I followed this case from the side lines when Kay Bonsa was assigned to this project. I have been willing to revisit her conclusions if it ever was assigned to me, and now it is. I think this will turn on how we've interpreted the definition in the past and in other similar places. I need to dive deeply into this topic and do some research. Kay didn't do much mining; she worked on waters of the US, dairy. On its face, the interpretation you are presenting is plausible and will require a lot of research on my part to see what kind of context we have.

SB – Under Part 6 of the Mining Act there is a stringent (some would say onerous) permitting process that MMD administers and requires a NMED determination that the plan will meet all standards. NMCC is of course concerned about wildlife. There is a provision in Part 6 that addresses wildlife, and so there will be consideration of protecting wildlife. Even if SWQB concludes the pit water is not surface waters of the state, NMED will have an opportunity to comment on the application, and MMD may confer with NMED about protections for wildlife. Wildlife protection issues will be addressed through the mining program administered by MMD.

JH- So if MMD came to us, we would say (in this scenario), it's not a surface water of the state, no standards apply, but MMD may ask what is needed to protect wildlife and we could advise on what is appropriate.

SB- NMED could urge MMD to consider its standards relating to wildlife protection.

JH- So Andrew, would you want anything further from Stuart on this, a memo or any rendering of opinion?

AK- (No.) I have enough to get started.

SB – We are happy to field any questions. So after that question of the definition of a surface water of the state, which is our first layer that we'd like you to consider, there is a second layer of interpretation SWQB could consider, that of private waters. Most of the water body at the end of mine life will be on patented mining claims, which is to say they are on private lands. Most of the surface expression of the pit water falls on patented land; only a small sliver expresses on unpatented claims, which are not fee lands. If you assume for the discussion that the pit water is disqualified for a private water when it expresses beyond the boundary of patented lands, what if the future water body were to be entirely confined to private land? We are interested in NMED's view of this alteration, if NMCC decided to make it, would cause you to conclude the water is private.

JH – If you can figure out a way to avoid that issue, the private waters exclusion is clear. We would entertain that.

SB – We understand the reasoning that if part is not on private land, there's access. But to be clear, our first layer interpretation is our first choice: the pit water is a unique water body and does not meet the definition of a surface water of the state, so it is not even necessary to consider the private waters exception.

SB – So on a third level, and only if the SWQB decides the pit water meets the definition of a surface water of the state and is not within the private waters exception, we have the issue of the tricky UAA process. The UAA purpose is to try to scale back some normal fishable/swimmable standards based on attainability. You've indicated NMCC may need to do a UAA on current water, how do you transpose that to future water?

JH – It all comes down to the future pit water body. The water in the current pit does not meet standards. If future water meets standards at the end, then fine. If you can't meet standards in the future, do the UAA on the present water body and if the standards are modified or removed, that same change (in standards applied) would ultimately apply to the future pit.

SB – We wanted to explore this idea of doing a UAA on the current water. The current water doesn't tell you much about the water in the future pit. The company expects to mine out most of the sulfides in the pit and will take reclamation steps to limit the amount of water that comes in contact with sulfides. They are still in the process of undertaking that planning and analysis. Based on no reclamation, the pit will maybe not meet the standard for Se. But we are optimistic that modeling can show standards will be met. Could we skip doing the UAA today? Give MMD a plan, we think we will meet but if we can't, then at that point we would do a UAA. Is that a way to avoid problems now? Allow NMED to say that we will meet in the future, but still provide cover if we don't.

JH – Right now, you can't meet standards. There are some constituents that the model shows as high where the current data from the actual pit water it's lower. The model isn't able to accurately predict exactly what is in the pit, some things are high, some are low. Perhaps you can show that the model is conservative and use it. What I hear you saying is we will look at the future water body and see if we can meet those standards, perhaps do more future measures, remove sources of constituents. If you can show that you will be able to meet standards and have confidence in the reasoning, then yes (NMED can offer the determination). If however based on your analysis you believe you can't meet a, b, c, that will kick us back to the UAA.

SB – We are wondering about timing. We think we will meet standards, but if we don't, perhaps a UAA in the future.

BR – So you would monitor the pit way into the future? Such that perhaps you find 50 years after closure that it's not meeting standards and do something then? Will that be considered perpetual care?

SB – No, I had only contemplated running a new model at the end of mine life, allowing us to re-assess at closure with more information about the pit walls, etc. One thought is if we can push the UAA decision to the end of mine life, perhaps we could set up a process where NMED can today say it's ok if you go through this process.

JH – I'm not sure we could.

AK- For us to make a determination, if you can show you will meet standards, fine. But if the model shows you won't meet standards, we can't make that certification.

SB – My hypothetical does imagine showing that water will meet standards. Maybe you stop there.

JH – Maybe more can be done to avoid exposure to rocks that will contribute constituents to the water body.

SB- If NMCC can produce a model that shows compliance with standards in the future, maybe the determination on surface waters of the state can be punted.

AK- Strictly speaking a determination letter does not go into that. It states the standards, if apply, will be met.

JH – The report we've seen on the geochemical model for the pit does show some discrepancy between the existing pit and what the model shows. For example Vanadium – the model shows it higher than the current water in the pit. Se, for another example, is higher in the predicted model than the existing water. Arsenic is high in the current water but lower in the model.

KE – Yes, trying to calibrate to an existing pit has been both a blessing and a difficulty. There are some things the model is good at modeling, others that it doesn't do as well at.

BR – So was Kay looking at Copper Flat?

AK – She was also tasked with looking at Little Rock.

BR – But that's a water of the US, a water of the state. Little Rock is a closed basin.

JH – It's a water of the state if we don't buy SB's argument.

AK and SB – Discussed the possibility of appeals and how the issues might play out in that context.

AK – It certainly would be easier if you meet standards.

KE- I just want to note that meeting the wildlife standard is hard but meeting the warm water aquatic life standard is really a problem.

AK – I know it's easy for me to say, but I think the UAA is very doable. I know it's hard to put in all that effort and just see what happens.

JH – The UAA says we can't achieve this use for these reasons.

KE – I'm concerned that if we do a UAA on the current pit, which isn't reclaimed, and show that we can't attain the standards, people will complain that once the pit is reclaimed we should be able to meet standards.

AK- People will have that criticism.

KP – We were aimed at the use because the aquatic life standard is so difficult.

SB- The current conditions don't reflect the future conditions.

JH- You do a UAA because in the future you don't believe you will meet standards.

KE- We can't meet aquatic life. There will be no mining if we are required to meet warm water aquatic life standards.

SB- Is it possible to do a UAA on a future pit?

JH – We can only apply a UAA to what exists today.

BR- So could you do a UAA if there was not water body today?

JH- No. I don't know what we would do in that scenario.

SB- So, if the pit water is interpreted as a surface water of the state, you'd have to go through the UAA before NMED would issue a determination?

AK & JH- Yes.

SB – I think this first layer interpretation I have laid out is defensible and avoids the uncertainties associated with trying to do a UAA under the circumstances presented here.

AK – I think it will be challenged, so we have to be sure.

SL – The UAA may not be too long. It just has to go to the commission, it's a hearing. The UAA process doesn't necessary mean years.

JH – We've done a UAA hearing that took an hour. Once you have the analysis done the hearing can go fast.

SB, AK and CS – Further discussed the possibility of an appeal. AK – I think I can get this interpretation issue reviewed in 2 weeks; that should be enough to find and look at what's out there.

Discussion of next steps- NMED will shoot for having their internal review done by 20 May. Group agrees to meet again to discuss further on 23 May at 2pm. Meanwhile NMCC will continue assessing pit issues.

Close. Thank you for your time.

Doc # 2704671

THEMAC RESOURCES | NEW MEXICO COPPER CORPORATION

August 5, 2016

AUG 09 2016

James Hogan, Bureau Chief
Surface Water Quality Bureau
New Mexico Environment Department
1190 St. Francis Dr.
P.O. Box 5469
Santa Fe, New Mexico 87502

RE: Copper Flat Current and Proposed Future Pit Water Body in Sierra County, New Mexico

Dear Dr. Hogan,

The purpose of this letter is to inform the New Mexico Environment Department ("NMED") about the unique aspects of the current and future proposed Copper Flat pit water body and to request NMED's guidance regarding the water that collects in it both under current circumstances and in the future as proposed following mining. As you may know, New Mexico Copper Corporation (NMCC), a wholly owned subsidiary of THEMAC Resources Group, Ltd., acquired the Copper Flat property in 2011. NMCC has been engaged in a lengthy effort to obtain the permits necessary to operate its proposed Copper Flat mine. As we have discussed in previous meetings, clarification of what, if any, water quality standards administered by NMED currently apply or will apply to the current and future proposed pit water body at Copper Flat is critical to NMCC's permitting efforts that are being pursued with multiple state and federal agencies.

As we have discussed, NMCC has obtained a determination from the United States Army Corps of Engineers (USACE) that the existing open pit water body is not a water of the United States. However, there is a separate question whether the current and future open pit water body is or will be considered a surface water of the state (as defined by 20.6.4.7(S)(5) NMAC). As defined in 20.6.4.7(S)(5), surface waters of the state does not include private waters. Pursuant to the definition of private waters, private waters include certain waters that do not combine with other surface or subsurface water or any water under tribal regulatory jurisdiction pursuant to Section 518 of the Clean Water Act.

Based on our review of the regulations, we believe that limiting the expression of water in the pit to privately held lands owned by NMCC satisfies New Mexico's private waters exemption from surface water standards due to the specific characteristics of the water body, both under current circumstances and in the future following mining.

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The current Copper Flat pit water body is unique in its physical setting and location. It is entirely confined to private lands in the form of mining claims for which patents were issued long ago by the United States. Likewise, with proposed engineering controls, following dewatering of the pit to allow mining, the Copper Flat pit water body that eventually develops again will be entirely confined to private, patented lands after proposed mining is completed. The current and future water body otherwise includes the following attributes:

1. The pit is and will remain isolated from any surface waters of the state, and no surface waters of the state will report to the pit.

2. The pit is and will remain an evaporative sink and thus, as has been noted in our meetings, does not mix with groundwater.

3. The pit is and will remain completely confined within private land (i.e., the patented mining claims held by NMCC).

4. Grayback Arroyo was diverted around what was to become the pit area by Quintana Minerals prior to that unrelated company's development, construction and operation of the mine in 1980. This decades-old diversion was in place when NMCC acquired the property. This diversion will remain permanently in place during mining and then after mining and reclamation is complete. No water from Grayback Arroyo has reported, or will report, to the pit in its current or expected future configuration.

5. The Army Corps of Engineers completed a jurisdictional determination on the pit in 2014 and determined that water in the pit does not comprise jurisdictional "waters of the United States" for purposes of the federal Clean Water Act.

Based on professional surveys commissioned by NMCC, the current pit water expresses completely within patented mining claims that are private land. Based on conceptual engineering, we know that the future pit water body could also be limited to expressing exclusively on private land. As we recently presented to you and other representatives of NMED, NMCC could design the mine pit such that sufficient benching is left so that the accumulated pit water remains within the boundaries of private land at all times. Alternatively, NMCC could design the pit to use mined rock in a manner that would confine the pit water surface entirely to private land upon closure and reclamation of the mine. We are confident that the future proposed Copper Flat pit water body could be designed in one of these two ways to retain all the physical attributes listed above.

If the current and future expression of the pit water body at Copper Flat is confined to private land only, and has and retains all of the unique physical attributes listed above, would NMED agree that the water body is and will be private waters and thus exempt from definition as surface waters of the state and not subject to water quality standards administered by NMED?

We appreciate the time you have taken to discuss this matter with us, and your consideration of this crucial element of the Copper Flat permit planning process. If you would like to discuss this further, please do not hesitate to contact us.

Best regards,
New Mexieo Copper Corporation

Jeff Smith
Chief Operating Officer

cc: Mr. Andrew Knight

bcc: Katie Emmer
Stuart Butzier
Christina Sheehan

NEW MEXICO
ENVIRONMENT DEPARTMENT

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SUSANA MARTINEZ
Governor
JOHN A. SANCHEZ
Lt. Governor

BUTCH TONGATE
Cabinet Secretary - Designate
J.C. BORREGO
Acting Deputy Secretary

October 21, 2016

Mr. Jeff Smith
Chief Operating Officer
New Mexico Copper Corporation
4253 Montgomery Blvd NE, Suite 130
Albuquerque, NM 87109

Re: Current and Proposed Pit Water Body, Copper Flat Mine, New Mexico Copper Corporation, Sierra County, New Mexico

Mr. Smith,

This letter responds to your communication of August 5, 2016, regarding the applicable surface water quality standards for the water body located at the Copper Flat Mine site. Specifically, your letter requests clarification on whether the pit lake (a.k.a. "water body") would be considered a "surface water of the state" as defined in the New Mexico Administrative Code at 20.6.4.7(S)(5) NMAC, and if any surface water quality standards would apply to the current or future water body.

The water body in question is located in an artificially constructed pit in Sierra County, and was originally created as the result of copper mining activity that occurred decades ago. New Mexico Copper Corporation (NMCC) contends that a survey indicates the water body is located entirely on privately held lands owned by NMCC in the form of patented mining claims. Currently, only stormwater from rainfall events ("overland flow") flows into this pit. No other surface waters flow into this pit. Greyback Arroyo, which originally flowed through the location of the current water body, was diverted around the area that was to become the pit before mining operations began.

We understand from your letter that the United States Army Corp of Engineers (USACE) has issued a determination[1] that the water body in question is not a water of the United States, as that term is defined in federal codes and statutes. Further, a groundwater flow model report[2] submitted by your company to the Department with the ground water discharge permit

[1] Approved Jurisdictional Determination – Action No. SPA-2014-00364-LCO
[2] Jones MA, Shomaker JW & ST Finch, Jr. (2014). Model of groundwater flow in the Animas uplift and Palomas basin, Copper Flat Project, Sierra County, New Mexico.

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application contains hydrologic modeling showing that the water body does not combine with other surface or subsurface waters. The modeling shows that the water body is an evaporative sink, meaning that ground water within a certain radius will flow exclusively toward the pit, where it will be evaporated along with any stormwater that enters the pit. Additional hydrologic modeling also demonstrates that at the end of mining, the pit will remain an evaporative sink.

Provided that the land surveys and modeling are accurate, the current water body would meet the exception in 20.6.4.7(S)(5) that excludes "private waters that do not combine with other surface or subsurface water, or any other water under tribal jurisdiction pursuant to Section 518 of the Clean Water Act." 20.6.4.7(S)(5) NMAC. In other words, if NMCC limits the surface expression of this water body exclusively to private lands and continues to do so, then the water body will continue to meet this exception, and would therefore not be subject to the state's surface water quality standards found at 20.6.4 NMAC and administered by the New Mexico Environment Department.

The Department requests that you work with the Bureau of Land Management (BLM) to verify and document that the land surveys are indeed accurate, and BLM concurs that the water body is entirely on private lands. If it is found that the current and/or proposed future water body is not entirely on private lands, the water body would be considered a "surface water of the state" subject to the surface water quality standards codified in 20.6.4 NMAC.

Sincerely,

Shelly Lemon

Shelly Lemon, Acting Chief
Surface Water Quality Bureau

NEW MEXICO
ENVIRONMENTAL LAW CENTER

Mr. Doug Haywood
Project Lead Copper Flat Copper Mine
BLM Las Cruces District Office

VIA ELECTRONIC MAIL

January 5, 2018

RE: Second Request for Supplemental Draft Environmental Impact Statement for the Proposed Copper Flat Copper Mine Project

Dear Mr. Haywood:

On behalf of Turner Ranch Properties, L.P. ("TRP"), the New Mexico Environmental Law Center ("NMELC") submits a second request for the Bureau of Land Management ("BLM") to publish and circulate for public review and comment a Supplemental Draft Environmental Impact Statement ("SDEIS" or "Supplemental DEIS") for the proposed Copper Flat Copper Mine project ("Project"). Significant new information associated with the Project has come to light through the issuance of the Third Judicial District Court's *Copper Flat Expedited Inter Se Proceeding Decision*. *See* attached Exhibit A.

This significant new information bearing on the proposed action and its impacts is relevant to environmental concerns and was not considered in the draft environmental impact statement ("DEIS"), thereby triggering NEPA's supplemental EIS requirement. *Norton v. S. Utah Wilderness Alliance*, 542 U.S. 55, 72 (2004); 40 CFR § 1502.9(c)(1); *see also*, BLM "National Environmental Policy Act Handbook," pages 29-30 (January 30, 2008). BLM must conduct a supplemental DEIS and provide the public and other agencies an opportunity to review and comment on the analysis of the new information. 40 CFR § 1502.9(c)(4).

I. Legal Requirements for a Supplemental Environmental Impact Statement.

When an agency publishes a draft EIS, it "must fulfill and satisfy to the fullest extent possible the requirements established for final statements in section 102(2)(C) of the Act." 40 CFR § 1502.9(a). "If a draft statement is so inadequate as to preclude meaningful analysis, the agency *shall* prepare and circulate a

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revised draft of the appropriate portion." *Id.* (emphasis added). Additionally, an agency must "not act on incomplete information, only to regret its decision after it is too late to correct." *Marsh v. Oregon Natural Res. Council*, 490 U.S. 360, 371 (1989).

NEPA also requires a supplement to an EIS when significant new information or changes in a project implicate significant changes in the environmental analysis. NEPA regulations require that:

> (1) [Agencies]...[s]hall prepare supplements to either draft or final environmental impact statements if: (i) The agency makes substantial changes in the proposed action that are relevant to environmental concerns; or (ii) *There are significant new circumstances or information* relevant to environmental concerns and bearing on the proposed action or its impacts.
>
> (2) [Agencies] may also prepare supplements when the agency determines that the purposes of the Act will be furthered by doing so.

40 C.F.R. § 1502.9(c) (emphasis added); *see also*, BLM "National Environmental Policy Act Handbook", pages 29-30 (January 30, 2008); *Friends of Marolt Park v. United States DOT*, 382 F.3d 1088, 1097 (10th Cir. 2004). The use of the word "shall" is mandatory; it creates a duty on the part of the agency to prepare a supplemental EIS if substantial changes are made or if there is significant new information relevant to environmental concerns. *Marsh v. Oregon Natural Res. Council*, 490 U.S. 360, 372 (1989) (recognizing the duty where there are significant new circumstances or information).

II. BLM Must Prepare a Supplemental DEIS for the Project.

A. Significant New Information Relevant to Environmental Concerns and Bearing on the Project and Its Effects Has Come to Light Through the Issuance of the Third Judicial District Court's *Copper Flat Expedited Inter Se Proceeding Decision*.

1. Background and the *Copper Flat Expedited Inter Se Proceeding Decision.*

The *Copper Flat Expedited Inter Se Proceeding* to determine water rights claimed by the New Mexico Copper Corporation ("NMCC"), the proponent of the proposed Copper Flat Copper Mine project, and William Frost and Harris Gray, legal owners of the water rights to be used by NMCC, came before the

Third Judicial District Court in January 2014. A ten (10) day trial was held on March 14 through 18, 2016 and June 27 through July 1, 2016. After trial on the issues and after considering the parties' proposed findings of fact and conclusions of law, the Court concluded the following on December 28, 2017:

1) Any inchoate water rights are extinguished;
2) The combined amount of the water element for LRG-4652, LRG-4652-S, LRG-4652-S-2, and LRG-4652-S-3 **is 861.84 acre-feet per year** ("afy");
3) LRG-4652, LRG-4652-S, LRG-4652-S-2, and LRG-4652-S-3 have an additional, combined stock right;
4) LRG-4652-S-8 has a stock right; and
5) The amount of the water element for the open pit, LRG-4652-17 is 34.45 afy.

Third Judicial District Copper Flat Expedited Inter Se Proceeding Decision, page 3 (December 28, 2017) (emphasis added); *See* attached Exhibit A.

2. The *Copper Flat Expedited Inter Se Proceeding Decision's* Impact On the Proposed Action and Environmental Concerns.

As previously stated, BLM must "not act on incomplete information, only to regret its decision after it is too late to correct." *Marsh v. Oregon Natural Res. Council, supra.* The DEIS must also "fulfill and satisfy to the fullest extent possible the requirements established for final statements in section 102(2)(C) of the Act [NEPA]." 40 CFR § 1502.9(a). The recent *Copper Flat Expedited Inter Se Proceeding Decision* clearly establishes that the BLM has been acting on incomplete information and that the DEIS does not fulfill and satisfy to the fullest extent possible the requirements of NEPA.

The DEIS for the Copper Flat Project was released for public review and comment in late November 2015. It stated, in pertinent part, that "Water is essential to mining" and that "Water is a limited resource in New Mexico." DEIS, page 2-25 (November 2015). The DEIS also identified the water supply for the proposed Project, which would be composed "of two distinct types of water classifications: process water and fresh water." *Id.* at 2-26. Under the Proposed Action, the DEIS claims that "Seventy-two percent of the water supply for the Copper Flat Mine would be process water" and that "Twenty-eight percent of the water supply for the Copper Flat Mine would be fresh water." *Id.* Finally, the DEIS provided that NMCC's four groundwater production wells "would be sourced for freshwater." *Id.* at 2-29.

Under the Proposed Action, the Project would need a minimum of 3,802 afy of fresh groundwater pumped from its four groundwater production wells. DEIS Figure 2-6. Under the Alternative 1 action, the Project would need a minimum of 5,290 afy of fresh groundwater pumped from its four groundwater production wells. DEIS Figure 2-10. Finally, under the Alternative 2 action, which is BLM's Preferred Action, the Project would need a minimum of 6,105 afy of fresh groundwater pumped from its four groundwater production wells.

The recent *Copper Flat Expedited Inter Se Proceeding Decision* indicates that NMCC only has a water right to 861.84 afy for its four groundwater production wells. Therefore, it is clear that NMCC does not have the ability to operate the mine, under any action alternative, based on the water right of its four groundwater production wells. The DEIS did not address the fact that NMCC does not have the claimed water right in its four groundwater production wells identified by the DEIS as the source of fresh groundwater necessary to operate the mine.

The DEIS also failed to address the fact that NMCC does not have the claimed water right in its four groundwater production wells necessary to prevent unnecessary or undue degradation of federal land. BLM, under its own regulations, has a legal duty to analyze whether NMCC's Mine Plan of Operations ("MPO") and associated reclamation scheme would prevent unnecessary or undue degradation of federal land. 43 CFR § 3809. Specifically, the DEIS states that the Project's open pit would be reclaimed by "Rapid fill" of the pit "by pumping the mine production wells at approximately 3,000 gpm [gallons per minute] for about 7 months. Water would be pumped into the bottom of the pit via a temporary HDPE pipe laid along the haul road. The total pumped volume would be about 2,800 AF [acre fee]." DEIS 2-44.

However, with the recent *Copper Flat Expedited Inter Se Proceeding Decision* it is now known that NMCC only has a water right to 861.84 afy in its four groundwater production wells identified by the DEIS as the source of fresh water necessary for reclamation of the open pit.

The DEIS, therefore, failed to account for the 1,938.16 acre feet deficit in the water necessary for reclamation of the open pit via rapid fill. Furthermore, given the deficit in NMCC's claimed water rights in its four groundwater production wells, it is no longer feasible for open pit reclamation to occur via rapid fill. BLM must now issue a supplemental DEIS which analyzes the reclamation action of backfilling the open pit and other alternatives.

This significant new information regarding NMCC's insufficient water rights in the four groundwater production wells identified by the DEIS as the Project's fresh water supply source clearly impacts the Project and associated environmental considerations. Therefore, the *Copper Flat Expedited Inter Se Proceeding Decision* triggers NEPA's supplemental DEIS requirement.

B. The Issuance of a Final EIS with a Public Comment Period, In Lieu of a Supplemental DEIS, Will Violate NEPA.

Issuance of a Final EIS ("FEIS") with a public comment period, in lieu of a Supplemental DEIS, would not satisfy the requirements and purpose of NEPA. NEPA was enacted to "insure that environmental information is available to public officials and citizens *before* decisions are made and *before* actions are taken." 40 CFR § 1500.1(b) (emphasis added). It is essential that that environmental information is high quality and based upon "accurate scientific analysis, expert agency comments and public scrutiny." *Id.* Allowing public comment only *after* the BLM has made a decision, i.e., issued a FEIS, undermines this critical aspect of the NEPA process. Furthermore, part of the NEPA process includes the public's opportunity to understand the agency's response to these comments. Even with a comment period, a FEIS will not allow informed public scrutiny of and input into the decision making process before a "decision is made and before actions are taken." *Id.*

III. Conclusion.

For these reasons, a Supplemental DEIS is required to address this significant new information that has come to light since the close of the DEIS comment period. In such circumstances, NEPA regulations require the issuance of a Supplemental DEIS. *Norton v. S. Utah Wilderness Alliance*, 542 U.S. 55, 72 (2004). Issuing a Supplemental DEIS will also further the intent and purposes of NEPA, which is to ensure that high quality, accurate environmental information is available to public officials and citizens before actions are taken. *Marsh v. Oregon Natural Res. Council*, 490 U.S. 360, 371 (1989).

Thank you for taking these concerns into consideration. We look forward to your prompt response.

Regards,

/s/

Jaimie Park, Staff Attorney
New Mexico Environmental Law Center

STATE OF NEW MEXICO
COUNTY OF DOÑA ANA
THIRD JUDICIAL DISTRICT COURT

FILED
2017 DEC 28 PM 4:27
DISTRICT COURT
DOÑA ANA COUNTY, NM

STATE OF NEW MEXICO, *ex rel.*,
OFFICE OF THE STATE ENGINEER
Plaintiff

vs.

ELEPHANT BUTTE IRRIGATION DISTRICT, *et al.*,
Defendants.

Copper Flat Expedited *Inter Se*

CV-96-888
James J. Wechsler
Judge Pro Tempore

Lower Rio Grande Adjudication

Outlying Areas Section

Subfile No. LRO-28-008-9009
Case No. 307-OA-9703126
New Mexico Copper Corporation

Subfile No. LRO-28-008-9010
Case No. 307-OA-9702236
William Frost

Case No. 307-OA-9702237
Harris Gray

FINDINGS OF FACT AND CONCLUSIONS OF LAW

INTRODUCTION

This matter came before the Court pursuant to a joint motion, filed January 14, 2014, requesting that the Court designate a stream system issue and expedited *inter se* proceeding to determine water rights claimed by New Mexico Copper Corporation (NMCC) and William Frost and Harris Gray.[1] After responses and

[1] Joint Motion for Designation of Stream System Issue and Expedited *Inter Se* of Water Rights Claimed by New Mexico Copper Corporation, et al., Under Subfile Numbers LRO-28-008-9010 and LRO-28-008-9009 (filed 1/14/14). Parties filing the joint motion were: Charles Barrett, Melody Sears, R. William and Nolan Winkler, Robin Tuttle, Robert Shipley, Jim Groton, John and Agnes McGarvey,

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replies were filed,[2] the Court held a hearing on the joint motion on September 17, 2014. On September 26, 2014, the Court entered an order designating the water rights claims of NMCC and Frost and Gray as an expedited *inter se* proceeding, pursuant to Rule 1-071.2(B) NMRA.[3]

A ten-day trial was held on March 14 through 18, 2016 and June 27 through July 1, 2016. After trial on the issues and after considering the parties' proposed findings of fact and conclusions of law, the Court CONCLUDES that (1) any

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John and Cindy Cornell, Stanley and Joyce Brodsky, Arlene Lynch, Turner Ranch Properties, L.P., New Mexico Pecan Growers, and Hillsboro Mutual Domestic Water Consumers' Association.

(Titles to documents in the footnotes are taken from the website for LRO-28-008-9009/9010; Rights of NM Copper, Gray and Frost - https://lrgadjudication.nmcourts.gov/lro-28-008-9009-9010-rights-of-nm-copper-gray-and-frost.aspx, last visited November 2, 2017).

[2] Response to Joint Motion for Designation of Stream System Issue and Expedited *Inter Se* of Water Rights Claimed by New Mexico Copper Corporation, et al., Under Subfile Numbers LRO-28-008-9010 and LRO-28-008-9009 (filed 2/3/14); State of New Mexico's Response to Motion to Set Stream System Issue on Right of New Mexico Copper, et al., and Reply to Response of New Mexico Copper, et al. (filed 2/19/14); Joint Movants' Reply to New Mexico Copper's Response to Joint Motion for Designation of Stream System Issue and Expedited *Inter Se* of Water Rights Claimed by New Mexico Copper Corporation, et al., Under Subfile Numbers LRO-28-008-9010 and LRO-28-008-9009 (filed 2/28/14); and Reply to the SNM's Response to the Joint Motion for Designation of Stream System Issue and Expedited *Inter Se* of Water Rights Claimed by New Mexico Copper Corporation, et al., Under Subfile Numbers LRO-28-008-9010 and LRO-28-008-9009 (filed 4/14/14).

[3] Order Designating Expedited *Inter Se* Proceeding (entered 9/26/14).

inchoate water rights are extinguished, (2) the combined amount of the water element for LRG-4652, LRG-4652-S, LRG-4652-S-2, and LRG-4652-S-3 is 861.84 acre-feet per year (*afy*); (3) LRG-4652, LRG-4652-S, LRG-4652-S-2, and LRG-4652-S-3 have an additional, combined stock right; (4) LRG-4652-S-8 has a stock right; and (5) the amount of the water element for the open pit, LRG-4652-17, is 34.45 *afy*.[4]

NATURE OF THIS PROCEEDING AND PROCEDURAL HISTORY

This is an expedited *inter se* proceeding under Rule 1-071.2 NMRA to determine the amount-of-water element for a number of points of diversion associated with the Copper Flat mine (Copper Flat),[5] located near the community of Hillsboro in Sierra County, New Mexico. The following is a brief description of this proceeding.

The Court commenced this proceeding on September 26, 2014 with its Order Designating Expedited *Inter Se* Proceeding. NMCC and Frost and Gray jointly filed a statement of claims on November 24, 2014.[6] The State of New

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[4] Points of diversion will be referred to by the number assigned by the Office of the State Engineer (e.g., LRG-4652, etc.).

[5] For the sake of convenience, the mine and the property on which the mine is located will be referred to throughout as "Copper Flat," regardless of who owned the mine and its associated claims.

[6] Statement of Claims Under Subfile Numbers LRO-28-008-9009 and LRO-28-008-9010 (by NM Copper, Harris Gray and William J. Frost) (filed 11/24/14).

Mexico *ex rel.* Office of the State Engineer filed a disclosure describing the State's offer of judgment with regard to the Frost and Gray claims on December 2, 2014.[7]

On November 4, 2015, Turner Ranch Properties, L.P. (TRP) and the State each filed a motion for partial summary judgment concerning the Frost and Gray claims, and the State and Charles P. Barrett, et al. (the Hillsboro Claimants)[8] filed

[7] State's Disclosure of Offers of Judgment (filed 12/2/14).

[8] The Hillsboro Claimants are comprised of the following: Charles P. Barnett, Stanley and Joyce Brodsky, John and Cindy Cornell, Jim Goton, Arlene Lynch, Agnes and John McGarvie, Melody K. Sears, Robert Shipley, Robin Tuttle, R. William and Nolan Winkler, and the Hillsboro Mutual Domestic Water Consumers Association.

joinders in support of TRP's motion.[9] After responses in opposition,[10] the State withdrew its motion for partial summary judgment.[11] Replies were filed.[12]

On November 16, 2016, NMCC and Frost and Gray filed a motion to dismiss TRP and the Hillsboro Claimants for lack of standing.[13] The State, TRP, and the Hillsboro Claimants filed respective responses in opposition to the motion

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[9] Turner Ranch Properties, L.P.'s Motion for Partial Summary Judgment and Memorandum in Support as to Claims of Gray and Frost Under Subfile No. LRO-28-008-9010 (filed 11/4/15); Hillsboro Claimants' Joinder in the Turner Ranch Properties, L.P.'s Motion for Partial Summary Judgment and Memorandum in Support as to Claims of Gray and Frost Under Subfile No. LRO-28-008-9010 (filed 11/9/15); SNM's Motion for Partial Summary Judgment, Joinder in Support of Partial Summary Judgment Motion of Turner Ranch Properties, and Memorandum in Support (filed 11-16-15).

[10] New Mexico Copper Corporation's, Harris Gray's and William Frost's Response to Turner Ranch Properties, L.P.'s Motion for Partial Summary Judgment as to Claims of Gray and Frost Under Subfile No. LRO-28-008-9010 (filed 11/19/15); NM Copper Corporation's, Harris Gray's and William Frost's Response to the Joinder by Hillsboro Defendants in Turner Ranch Properties, LP's Motion for Partial Summary Judgment as to Claims of Gray and Frost Under Subfile No. LRO-28-008-9010 (filed 11/23/15).

[11] SNM's Withdrawal of Partial Summary Judgment Motion (filed 11/24/15).

[12] Reply to NMCC's Opposition to Partial Summary Judgment (filed by Hillsboro Claimants 12/8/15); Turner Ranch Properties, L.P's Reply to NM Copper Corporation's, Harris Gray's and William Frost's Response to its Motion for Partial Summary Judgment as to Claims of Gray and Frost Under Subfile No. LRO-28-008-9010 (filed 12/8/15).

[13] New Mexico Copper Corporation's, Harris Gray's and William Frost's Motion to Dismiss Defendants from this Expedited *Inter Se* Proceeding for Lack of Standing (filed 11/16/15).

to dismiss.[14] NMCC and Frost and Gray filed replies.[15] The Court heard oral argument on all dispositive motions on January 7, 2016 and denied both TRP's motion for partial summary judgment and NMCC and Frost and Gray's motion to dismiss.[16]

The Court set the trial for March 14, 2016.[17] After five days of trial, the Court and the parties agreed that additional days were required, and an additional five days of trial began on June 27, 2016.[18] At the Court's request, the parties

[14] Turner Ranch Response in Opposition to NM Copper, Gray and Frost's Motion to Dismiss Defendants from this Expedited *Inter Se* Proceeding for Lack of Standing or, Alternatively, Request for Stay of Proceedings (filed 12/1/15); Response in Opposition to Motion to Dismiss; 12-1-15 (Charles P. Barrett, Melody K. Sears, R. Wm. and Nolan Winkler, Robin Tuttle, Robert Shipley, Jim Goton, John and Agnes McGarvie, John and Cindy Cornell, Stanley and Joyce Brodsky, Arlene Lynch and the Hillsboro Mutual Domestic Water Consumers Association ("Hillsboro Claimants" or "Hillsboro") Responding to the New Mexico Copper Company, William J. Frost and Harris Gray's ("NMCC's") Motion to Dismiss) (filed 12/1/16); SNM's Response in Opposition to the Motion of the Copper Flat Claimants to Dismiss Participating Parties from this Expedited *Inter Se* Proceeding for Lack of Standing (filed 12/4/15).

[15] William Frost's, Harris Gray's and New Mexico Copper Corporation's Consolidated Reply Brief in Support of Motion to Dismiss (filed 12/23/15).

[16] Order Denying Motion for Partial Summary Judgment (entered 1/15/16); Memorandum Order Denying Motion to Dismiss for Lack of Standing (entered 1/15/16).

[17] Notice of Trial (entered 2-17-16).

[18] Notice of Continuation of Trial (entered 5/16/16).

submitted proposed findings of fact and conclusions of law, written closing arguments, and post-trial briefs on January 26, 2017.[19]

With this background, the Court enters the following findings of fact and conclusions of law.

FINDINGS OF FACT

PARTIES

1. NMCC was incorporated in New Mexico in 2009, with its principal place of business in New Mexico. NMCC is a wholly-owned subsidiary of THEMAC Resources, a Canadian company that is publically traded on the Toronto Stock Exchange. THEMAC Resources was formed for the purpose of developing natural resource projects. Copper Flat is its primary asset. [1 Tr. 74:3-75:14; TRP-213 at 19][20]

2. Frost and Gray are residents of New Mexico and are co-owners of water rights described in the files of the New Mexico Office of the State Engineer (OSE)

[19] NM Copper Corporation's, William Frost's and Harris Gray's Closing Arguments (filed 1/26/17); NM Copper Corporation's and William Frost's and Harris Gray's Requested Findings of Fact and Conclusions of Law (filed 1/26/17); Hillsboro's Additional Closing Argument, Post-Trial Brief, Requested Findings of Fact and Conclusions of Law (filed 1/26/17); Turner Ranch Properties, L.P.s Post-Trial Brief (filed 1/26/17); Turner Ranch Properties, L.P.s Proposed Findings of Fact and Conclusions of Law (filed 1/26/17); State of New Mexico's Proposed Findings of Fact, Conclusions of Law, and Post-Trial Brief (filed 1/26/17).

[20] Page numbers for exhibits refer to the page number of the PDF versions, not the page number within the actual exhibits.

with the following well numbers: LRG-4652 (production well 1 or PW-1); LRG-4652-S (production well 2 or PW-2); LRG-4652-S-2 (production well-3 or PW-3), LRG-4652-S-3 (production well-4 or PW-4), LRG-4652-S-11, LRG-4652-S-12, LRG-4652-S-13, LRG-4652-S-14, LRG-4652-S-15, and LRG-4652-S-16. [TRP-114]

3. The Hillsboro Claimants are water rights claimants with claims located in the Outlying Areas Section of the Lower Rio Grande Basin, an administrative area established by the OSE. [HILLS-002; HILLS-003; HILLS-004; HILLS-005; HILLS-006; HILLS-007a; HILLS-007b; HILLS-008; HILLS-009; HILLS-010; HILLS-011; HILLS-012a; HILLS-012b]

4. TRP is a water rights claimant with claims located in the Outlying Areas Section of the Lower Rio Grande Basin. TRP purchased Ladder Ranch in 1992 and is the current owner of the ranch, which is adjacent to, and shares a boundary with, Copper Flat. TRP owns groundwater rights used for wildlife and livestock purposes. [8 Tr. 184:17-196:1, 206:18-207:20; TRP-217; TRP-135;TRP-228]

THE COPPER FLAT MINE

5. Copper Flat is a mineral deposit located near the town of Hillsboro, in the Hillsboro Mining District, Sierra County, New Mexico. Copper Flat contains copper, silver, gold, and molybdenum minerals that are capable of being developed

under the Mining Law of 1872, 30 U.S.C. §§ 22-24, 26-30, 33-35, 37, 39-43, 47 (1872). [TRP-213 at 20-23]

6. Copper Flat is located in the Outlying Areas Section of the Lower Rio Grande Basin. The OSE has assigned to NMCC Subfile No. LRO-28-008-9009. [7 Tr. 151:17-154:3; TRP-163]

WATER RIGHTS AND CLAIMS AT ISSUE

7. The trial in this matter focused on two disputes concerning the amount-of-water element of the four production wells drilled at Copper Flat beginning in 1975: (1) the amount of water put to beneficial use by Copper Flat Partnership (CFP) in 1982, and (2) whether Frost and Gray and NMCC met their burden to prove continuing diligent development of water rights, on their part and on the part of their predecessors in interest, according to CFP's original, pre-basin plan, under the standards set forth in *State ex rel. S. E. Reynolds v. Mendenhall*, 1961-NMSC-083, 68 N.M. 467, 362 P.2d 998.

8. NMCC and Frost and Gray are requesting the Court to determine that:

a. a vested water right in the amount of 1,963 *afy* exists for use at Copper Flat; and

b. an inchoate water right not exceeding 7,481 *afy* exists for use at Copper Flat. [NMCC Brief at 119]

9. The State is requesting the Court to determine that:

a. a vested water right of 861.84 *afy* exists in the production wells;

b. a vested water right of 34.45 *afy* exists in LRG-4652-S-17;

c. a vested water right of 3 *afy* exists for livestock and domestic use; and

d. all other water rights claims were either forfeited, abandoned, or otherwise not valid under the law. [State Brief at 21, 36]

10. TRP is requesting the Court to determine that:

a. a vested water right of 34.45 *afy* exists in LRG-4652-S-17; and

b. all other water rights claims were either forfeited, abandoned, or otherwise not valid under the law. [Turner Brief 58-60]

11. The Hillsboro Claimants are requesting the Court to determine that all water rights and claims in this proceeding were abandoned. [Hillsboro Brief at 43]

IDENTIFICATION OF POINTS OF DIVERSION AT ISSUE

12. The following eighteen wells and one open pit are at issue in this proceeding:

a. Four production wells: LRG-4652 (PW-1), LRG-4652-S (PW-2), LRG-4652-S-2 (PW-3), and LRG-4652-S-3 (PW-4) (the four production wells). [NMCC-037; NMCC-038; NMCC-039; NMCC-040]

b. Seven miscellaneous wells: LRG-4652-S-4, LRG-4652-S-5, LRG-4652-S-6, LRG-4652-S-7, and LRG-4652-S-8; LRG-4652-S-9; and LRG-4652-S-10 (the miscellaneous wells). [NMCC-041; NMCC-042; NMCC-043; NMCC-044; NMCC-045 NMCC-046; NMCC-047]

c. Six monitoring wells: LRG-4652-S-11, LRG-4652-S-12, LRG-4652-S-13, LRG-4652-S-14, LRG-4652-S-15, and LRG-4652-S-16 (the monitoring wells). [NMCC-048; NMCC-049; NMCC-050; NMCC-051; NMCC-052; NMCC-053]

d. LRG-4652-S-17 (the open pit), which collected water and is not a well. [NMCC-054]

e. LRG-4654, (the "Dolores well"), a six-inch casing installed in the Old El Oro mineshaft. [NMCC-055]

ACQUISITION OF COPPER FLAT BY INSPIRATION AND LEASE BY QUINTANA MINERALS

13. Inspiration Development (Inspiration), a mining company based in Arizona, acquired Copper Flat in 1967 and conducted further investigation of the site's mineral reserves. By 1973, Inspiration conducted a feasibility study and developed a plan for an open pit mine. Inspiration drilled two wells seeking an adequate water supply for a mill. [9 Tr. 59:18-25; NMCC-001; NMCC-086 at 1]

14. On July 15, 1974, Quintana Minerals Corporation (Quintana) leased Copper Flat from Inspiration and undertook a program of exploration to estimate ore reserves. Quintana's investigation continued through 1976 at a cost of $3.32 million. Quintana expanded the Copper Flat project to 12,000 acres of private, state, and federal lands. Quintana suspended its work at Copper Flat in late-1976 due to the low price of copper. [NMCC-005 at 1; NMCC-028; NMCC-030 at 1-2; TRP-006]

15. As of September 1978, Quintana intended to mill about 15,000 tons of ore per day. [NMCC-004 at 35; TRP-003 at 2, 14]

16. In 1979, Quintana resumed work at Copper Flat. [NMCC-028]

17. As of January 1980, Quintana estimated that the project would cost $75 million. [NMCC-030 at 10]

18. Quintana could not put the mining project into production due to the low price of copper, an inability to successfully negotiate a smelter contract, and difficulties with obtaining the necessary permits to operate the mine. [NMCC-005 at 1]

THE COPPER FLAT PARTNERSHIP AND THE OPERATION OF THE COPPER FLAT MINE

The Creation of the Copper Flat Partnership

19. In September 1979, Quintana and Phibro, Inc., a Delaware corporation, signed a letter of intent to form a partnership to develop a mining operation at Copper Flat. [NMCC-030 at 9; TRP-004]

20. Quintana and Phibro jointly renewed efforts to develop Copper Flat in June 1980 under the name Copper Flat Partnership (CFP) with Quintana having a separate role as the operator and managing agent of the mine and mill. [9 Tr. 129:13-24; NMCC-006 at 3; NMCC-037; NMCC-038; NMCC-039; NMCC-040; NMCC-041; NMCC-042; NMCC-043; NMCC-044; NMCC-045; NMCC-046; NMCC-047; NMCC-048; NMCC-049; NMCC-050; NMCC-051; NMCC-052; NMCC-053; NMCC-054; NMCC-055; TRP-008]

21. CFP leased Copper Flat from Inspiration. The lease consisted of twenty-three patented mining claims totaling 430 acres, 294 unpatented mining claims, and 160 unpatented millsites. [NMCC-072]

   a. A patented mining claim is a claim owned by the holder of the patent. [NMCC-149 at 26:21-22]

   b. An unpatented mining claim is a claim that is leased for a fee. [NMCC-149 at 26:22-25]

22. By July 1980, Quintana had invested over $7 million in the project. [NMCC-030 at 10-11]

23. CFP's plan was to develop a mining operation at Copper Flat.

Financing by the Canadian Imperial Bank of Commerce

24. CFP arranged financing for the Copper Flat project in the amount of $75 million with the Canadian Imperial Bank of Commerce (CIBC), based in Toronto, Canada. CFP signed a promissory note in favor of CIBC. [NMCC-143]

25. On June 11, 1980, CFP and CIBC executed a deed of trust, with CFP as the borrower/debtor, CIBC as the creditor/lender, and the First National Bank of Albuquerque as the trustee. Under the deed of trust, CIBC agreed to lend CFP $75 million in exchange for a promissory note, a security interest in all current and future property and mining interests, and a conveyance of legal title of the property to First National Bank of Albuquerque as trustee. The deed of trust conveyed title to all current and future real property to the trustee to be held for the benefit of CIBC. The deed of trust was to be delivered to CIBC in the event of CFP's default. [*Id.*]

WELLS DRILLED AT COPPER FLAT

Wells Drilled by Quintana

26. In December 1975 and January 1976, Quintana drilled three production wells, PW-1, PW-2, and PW-3, at Copper Flat in order to assure an adequate water supply for the project. [NMCC-037; NMCC-038; NMCC-039]

27. Between December 1974 and August 1975, Quintana drilled the six monitoring wells for exploration and monitoring of groundwater quality. [NMCC-48; NMCC-49; NMCC-50; NMCC-51; NMCC-52; NMCC-53]

The Production Well Drilled by CFP

28. CFP drilled a fourth production well, PW-4, around September 1980. [NMCC-030 at 12-13]

Miscellaneous Wells

29. From 1931 to 1972, the seven miscellaneous wells were drilled. Five of these wells were drilled in 1931 and 1932 for placer mining that had largely terminated by 1943. Two of these wells (LRG-4652-S-9 and LRG-4652-S-10) were drilled in 1971 and 1972 in search of an adequate supply for mining at Copper Flat. [NMCC-041; NMCC-042; NMCC-043; NMCC-044, NMCC-045; NMCC-046, NMCC-047]

Other Points of Diversion

30. The open pit (LRG-4652-S-17) was in use during mining operations at Copper Flat and intermittently after.

31. In 1932, the "Dolores" Well (LRG-4654) was developed by installing a six-inch casing in the Old El Oro mineshaft. [NMCC-055]

CONSTRUCTION OF CFP'S COPPER FLAT OPERATION

32. Site testing and preconstruction activities began at Copper Flat in 1976. CFP began construction in July 1980. [NMCC-030 at 11]

33. CFP undertook the following construction activities:

a. installation of a water pipeline from the well field and the water distribution infrastructure in the fall of 1980; [NMCC-030 at 13-14]

b. installation of six 30,000-gallon-water storage tanks and a 150,000 gallon fire/potable tank in March 1981; [NMCC-030 at 14]

c. employment of a 350 KW electrical generator to power a pump on PW-1 for construction purposes and installation of permanent electric power in October 1981; [*Id.*]

d. installation of a twenty-inch freshwater delivery pipe in September 1980; [*Id.* at 14] and

e. connection of the production wells to the twenty-inch delivery pipe and permanent electrical power by November 1980. [*Id.* at 14]

34. CFP planned to mill 15,000 tons per day of ore. [TRP-003 at 2]

COPPER PRODUCTION AT COPPER FLAT

35. In March 1982, CFP began producing copper concentrate. It took about seven years to get the project into operation. [10 Tr. 43:23-44:5; NMCC-030 at 16]

36. During the months of April, May, and June 1982, CFP processed an average of 14,908, 15,981, and 14,014 tons per day, respectively, of copper ore. [NMCC-30 at 17]

37. At the beginning of operations from March to July 1982, CFP employed about 250 people at Copper Flat. [NMCC-065 at 5]

Water Use at Copper Flat During Mining Operations

38. Water from the production wells and other wells was used during the construction process. However, no records of the amount of water pumped were kept until March 1982, when measuring instrumentation was installed on the production wells. [NMCC-019; and NMCC-028; NMCC-030 at 14]

39. In 1982, CFP put 861.84 *afy* of water to beneficial use from the production wells for mining, milling, reclamation, dust control, wash water, and employee consumptive and sanitary use. [7 Tr. 158:22-160:19; STATE-025]

40. During the period the mill was in operation, CFP used water from the open pit for dust control. [2 Tr. 14:3-10; NMCC-030 at 1]

41. As late as November 1983, CFP used water from various wells at Copper Flat for maintaining equipment, human consumption, sanitary uses, fire protection, and cleanup. [NMCC-019]

Copper Prices During Mining Operations at Copper Flat

42. When CFP began construction on the processing equipment in 1980, the global price of copper was $ 0.953 per pound. [NMCC-030 at 16]

43. When CFP began production in March 1982, the global price of copper was $ 0.623 per pound. [*Id.*]

44. During the time in which CFP operated Copper Flat, CFP calculated that the price of copper at which Copper Flat would break even was $ 0.90 per pound. [2 Tr. 21:22-22:2]

End of Mining Operations at Copper Flat

45. CFP ceased mining operations at Copper Flat in July 1982. On June 30, 1982, the price of copper was $ 0.642 per pound. [2 Tr. 133:5-8]

46. CFP kept forty-three employees on at Copper Flat until the end of 1982. By February 1983, nineteen employees remained, including a small security and maintenance crew and others engaged in claim assessment, environmental

monitoring and testing, basic engineering, accounting, and secretarial work. [NMCC-30 at 18-19]

47. When CFP ceased operations at Copper Flat in June 1982, CFP hoped and expected that the mine would reopen if (1) an investor could be identified that would fund a potential resumption of operations, and (2) the global price of copper would increase such that a resumption of operations was feasible. [1 Tr. 190:17-191:10]

48. It is common practice in the copper mining industry to cease operations of a mine when the global price of copper drops such that continued operation is no longer feasible. The degree to which operations are terminated varies, ranging from a temporary cessation of operations in which the mine's infrastructure remains in place ready to resume when copper prices recover, to permanent abandonment of a mine with no intent to resume. [2 Tr. 160:5-161:6]

49. Between July 1982 and the end of 1983, CFP hosted three or four potential investors or purchasers at Copper Flat. Ultimately, these efforts were not successful. [1 Tr. 191:11-192:11; NMCC-30 at 18-19; NMCC-032 at 18-19]

CFP'S DECLARATIONS OF WATER RIGHTS

50. After CFP ceased operations at Copper Flat, it was aware of its legal counsel's belief that the water rights, if perfected, could possibly be worth millions of dollars. [TRP-028 at 4]

51. On September 17, 1982, approximately two months after the Copper Flat mine ceased operations, the State Engineer declared the Lower Rio Grande Underground Water Basin (the LRG basin). The mine and associated wells were located within the LRG basin.

52. In response to the declaration of the LRG basin, and on advice of legal counsel, CFP began gathering the necessary information to file a Declaration of Underground Water Right for each of the eighteen wells and the open pit. [2 Tr. 138:6-23; TRP-028]

a. On September 7, 1983, CFP's consulting geologist provided draft declarations based on the assumption that all water uses at Copper Flat would require 2,160 *afy* from the production wells with supplemental water, if needed, from the monitoring and miscellaneous wells and the open pit. [STATE-104 at 1]

b. An engineer employed by CFP performed an alternative calculation, finding that 6,462 *afy* was required for all water use at the mine. [NMCC-032 at 7]

c. After revision for the alternative calculation, the declarations (the 1984 declarations) were filed on February 17, 1984. [NMCC-037; NMCC-038; NMCC-039; NMCC-040; NMCC-041; NMCC-042; NMCC-043; NMCC-044: NMCC-045; NMCC-046; NMCC-047;

NMCC-048; NMCC-049; NMCC-050; NMCC-051; NMCC-052; NMCC-053; NMCC-055]

53. In the 1984 declarations, CFP declared that 278,385,500 gallons of water (854.33 *afy*) were used for mining in 1982 and that it had the right to use 6,462 *afy* at Copper Flat. [NMCC-037 at 1, 3]

54. For the 1984 declarations, CFP calculated the amount of water used during operations using power consumption and known pumping volumes per kilowatt hour. [NMCC-032 at 1]

THE OSE'S SEPTEMBER 1984 FIELD CHECK

55. The OSE conducted a field check on September 13, 1984 (the 1984 field check) to verify the claims documented in the 1984 declarations. During the 1984 field check, the OSE found that the production wells were equipped and in operation to provide water for mine construction, employee consumption, equipment maintenance and operations, sanitary purposes, fire protection, and maintenance of water levels in shotcrete reservoirs. [NMCC-120 at 9-10; STATE-005 at 1; TRP-055 at 1]

56. During the 1984 field check, the OSE found that of the thirteen miscellaneous wells and monitoring wells, nine were not equipped or in use (LRG-4652-S-4, LRG-4652-S-5, LRG-4652-S-7, LRG-4652-S-10, LRG-4652-S-11, LRG-4652-S-13, LRG-4652-S-14, LRG-4652-S-15, LRG-4652-S-16), three were

equipped and in use (LRG-4652-S-6 for placer mining, LRG-4652-S-8 for domestic and livestock, and LRG-4652-S-12 for livestock), and one was equipped but not in use (LRG-4652-S-9). The open pit (LRG-4652-S-17) was not in use. [NMCC-120 at 9-10; STATE-005 at 2; TRP-055 at 2]

DEFAULT OF CFP AND THE ROLE OF CIBC

57. By March 1984, CFP had defaulted on its loan from CIBC. [NMCC-056; NMCC-143 at 22-24, 28; TRP-052]

58. On March 31, 1984, Quintana relinquished its management responsibilities for Copper Flat, and effective April 1, 1984, CFP assumed direct control over Copper Flat. [TRP-053]

59. By sometime in 1985, CIBC exerted more control over the Copper Flat project, with CFP acting as CIBC's representative with regard to the management and eventual closure and liquidation of Copper Flat. [2 Tr. 137:15-23; NMCC-066; TRP-067, TRP-071, TRP-072 at 1-2; TRP-103]

CIBC's Consideration of Selling the Water Rights

60. By April 1985, CIBC sought advice of counsel concerning the sale of the water rights associated with Copper Flat. CIBC was advised that it was "virtually certain" that any potential buyers would require the ability to transfer the point of diversion and place and type of use of the water rights. [NMCC-056]

Plans to Liquidate the Copper Flat Assets

61. By April 1985, CIBC was planning the sale of the mining and milling equipment at Copper Flat. [NMCC-057]

62. By April 1985, CIBC and CFP were exploring options for reclamation efforts at the Copper Flat site. Milton W. Hood, a consultant advising CIBC, recommended two options for reclamation of the site: (1) total stripping and sale of assets from the site and return of leases to Inspiration, or (2) sale of the buildings and equipment and capping the wells, but leaving in place water lines, water tanks, and foundations for "'possible' future rebuilding." [NMCC-057]

63. On May 7, 1985, Hood proposed two alternatives to CFP for reclamation of the mine after the equipment was "dismantled and sold." The first proposed that CFP leave the foundations, tunnels, and tailings systems intact for possible reuse of the mine. The second proposed a "complete abandonment of the property," requiring burying of the foundations, capping of dumps and tailings, and terracing of roads, yards and other areas showing erosion. [TRP-061 at 1-2]

64. In his May 7, 1985 letter, Hood opined that "[t]he water rights could be the most valuable of the assets if they could be severed from the property." Hood recommended that CFP hire an agent to "search for possible buyers" of the water rights. [*Id.* at 2]

65. A May 21, 1985 interoffice correspondence discussed preliminary plans for abandonment of Copper Flat. The author, P. A. Weyler, mill supervisor, noted that, with regard to the proposed plans, "[m]ost of the following refers to complete abandonment of the property." This preliminary plan of complete abandonment included using dirt and rock "to cover the SAG mill and ball mill foundations." [TRP-063 at 1-2]

66. On June 25, 1985, F. W. Knackstedt, resident manager at Copper Flat, outlined two reclamation alternatives for CIBC to consider. The alternatives were based on meetings CFP had with the BLM and ESCON, Inc., an Arizona contractor that prepared for CFP a budget estimate for reclamation. "Plan A" consisted of removing mining equipment and fencing the area. "Plan B" was much more detailed and was referred to as "Complete Abandonment." Under Plan B, complete abandonment consisted of, among other things, destroying all buildings; covering the crusher shaft to ground level and covering the crusher's foundations; covering both ends of the reclaim tunnel; filling completely the tailings thickener, reclaim water storage area, and gatehouse area with demolition refuse; filling the decant reservoir and tail dam seepage collection pond to ground level; covering the pump station foundation with alluvium; and covering all concrete slabs with nine inches of top soil. In its budget proposal for complete abandonment, ESCON noted that it did not include

> removing any underground buried items such as pipe, conduit and septic tanks. Also we have not planned on removing any concrete foundations or concrete slabs on grade.

[TRP-064; TRP-066]

67. On August 2, 1985, Knackstedt informed the BLM that CFP was considering the two reclamation scenarios developed by ESCON and provided a description of both alternatives that was virtually identical to the ESCON proposals. He stated that CFP had no definite plans to abandon Copper Flat at that time. [TRP-069]

68. On November 26, 1985, the BLM sent a letter informing CFP that the two alternatives detailed in Knackstedt's August 2, 1985 letter would be considered by the BLM at the appropriate time. The BLM informed CFP that stabilization measures were required at Copper Flat to control erosion on the site. [TRP-080]

69. Sometime in 1985, CIBC undertook efforts to market the Copper Flat water rights in the amount of 6,462 *afy* to the City of Las Cruces. Las Cruces declined to purchase the right. [2 Tr. 97:4-98:15]

70. By September 25, 1986, CFP entered into discussions with a private contractor to salvage the water pipeline and electrical lines. During this time, CFP also discussed with Phelps-Dodge Corporation the purchase of Copper Flat. These discussions did not result in the salvaging of material or in a sale of the site. [NMCC-070]

71. Upon liquidation of the mine's assets, CFP and CIBC did not intend for the water rights to be used exclusively for mining.

Sale and Removal of the Copper Flat Assets

72. As of April 11, 1986, CIBC had sold all removable physical assets of Copper Flat to OK Tedi Mining Ltd. (OK Tedi), a company headquartered in Papua, New Guinea. CIBC retained all "land holdings, permits, rights-of-way, roads, and water rights." [NMCC-067]

73. OK Tedi intended to remove all the buildings and equipment from Copper Flat down to the concrete foundations by December 31, 1986. [*Id.*]

74. All buildings and mining equipment were removed from Copper Flat in accordance with OK Tedi's plans.

ABANDONMENT OF COPPER FLAT

"Mothballing" a Mining Operation

75. "Mothballing" is a phrase used in the mining industry to describe a type of mine closure in which the mine is intended to be reopened at some point in the future. Typically, a mine is "mothballed" when conditions for mining are unfavorable, such as low copper prices. When a mine is "mothballed," the workforce is reduced to a small maintenance crew, the mill is cleaned, and the mill bearings are protected and maintained. In some cases, the mill may be operated periodically to protect the bearings from damage. The idea behind "mothballing" is

to keep the mine in such a state that it can returned to operation quickly after favorable conditions for mining return. [9 Tr. 70:3-71:6]

76. In the copper mining industry, when the global price of copper declines, it is not uncommon for mining operations to be "mothballed." [*Id.*]

77. In New Mexico, it is common practice for mining operators to respond to low copper prices by "mothballing" their operations and putting their infrastructure on standby status. According to Jim Kuipers, a professional engineer, mines may remain "mothballed" for to up five years. [TRP-224 at 17-18]

78. Copper Flat was not "mothballed." CFP closed the mine and terminated operations at Copper Flat.

Reclamation Plans for Copper Flat

79. On April 18, 1986, CFP informed the BLM about "developments regarding the abandonment of the mine" and subsequent reclamation. [NMCC-068]

80. On October 7, 1986, a memorandum was circulated within CFP concerning "Abandonment of Copper Flat," which outlined estimates of alluvium and other materials needed to accomplish reclamation tasks. This outline was virtually identical to the description of "Complete Abandonment" in the ESCON recommendations of June 1985. [TRP-064; TRP-097]

81. On October 9, 1986, a delegation from the BLM met with CFP to assist in "identifying final reclamation requirements for the abandonment of the Copper

Flat mine and mill." At the meeting, CFP informed the BLM that final reclamation efforts would begin early in 1987 [NMCC-071]

82. At the October 9, 1986 meeting, CFP and the BLM established requirements for final reclamation of the Copper Flat site that were virtually identical to the "final reclamation" plan proposed by ESCON: covering tunnels and filling shafts and reservoirs with earth and stone; contouring, grading, and performing re-vegetation of the site to minimize erosion; covering the concrete foundations with alluvium; erecting safety fences; and capping the production wells. [NMCC-071 at 1-3]

83. In the Mine Data Retrieval System maintained by the federal Mining Safety and Health Administration, the status of Copper Flat, identified as Mine ID No. 2901520, is shown as "Abandoned." [TRP-005]

84. In a 1978 environmental assessment of Copper Flat, the BLM defined "abandonment" as "[a] period after the termination of normal mining operations which results in a termination of economically-oriented activities at the site." The BLM presumed that after the termination of mining operations a "close out workforce" would remain on-site to complete the abandonment process. [NMCC-004 at 54, 122]

The Termination of CFP's Lease

85. In January 1986, CIBC informed Inspiration that CIBC was going to remove all structures from the mine and undertake reclamation efforts to the "satisfaction of the governing agencies involved." CIBC offered to leave the office/lab building on the site for Inspiration's use, but Inspiration declined because it had "no immediate use" for the buildings and did not want the liability and maintenance costs associated with keeping the building on site. [NMCC-066]

86. On December 31, 1986, CFP cancelled its lease interest in the Copper Flat property, and the property reverted to Inspiration. [NMCC-072]

87. The four production wells and the six monitoring wells were located on land acquired entirely by Quintana and did not revert to Inspiration. [NMCC-062]

88. In February 1987, CFP informed the New Mexico Environmental Improvement Division that "the Copper Flat property is [p]ermanently [c]losed and will not be restarted." [HILLS-023]

89. By February 5, 1987, CFP's reclamation efforts with regard to BLM lands at Copper Flat were completed. [*Id.*]

Infrastructure Left in Place at Copper Flat

90. In late 1986, CIBC and CFP considered an offer to purchase the Copper Flat water pipeline, subject only to BLM approval of the sale. The BLM would not approve the sale on the grounds that digging up the pipeline would cause "undue

and unnecessary degradation" of the BLM lands within Copper Flat. [HILLS-018; HILLS-028; TRP-103]

91. It is typical industry practice to leave underground pipelines and electrical power lines in place as part of the reclamation process. Upon the initial installation of underground appurtenances, reclamation activities such as covering with soil and vegetation take place soon after the installation, and removal would only serve to further disturb the area. [9 Tr. 215:13-216:11]

92. Kuipers testified that over the course of his career he had reviewed "literally hundreds of reclamation and closure plans" and that the burial of foundations was "entirely consistent with abandonment of a site and doing final reclamation and closure." He further testified that "as long as [the foundations] were covered [and] there was vegetation growing over the top of them, BLM accepted that as meeting the final reclamation requirements." [9 Tr. 213:12-214:5]

93. Kuipers also testified that, in his experience, he had never encountered a mine operator that buried foundations in order to preserve them for future use. Kuipers explained that if reuse of the foundations was the goal, there would be evidence of an attempt to protect the foundations and equipment-mounting hardware and that he saw no evidence of such steps taken at Copper Flat. [9 Tr. 214:6-215:12]

94. Only .75 miles of the 2.5 mile access road were on BLM land. The remaining 1.75 miles of the access road were on private land, which did not require reclamation. [NMCC-004 at 23]

95. Roads on BLM lands are commonly left in place after a mine closure because they allow public access to publically-owned lands. [Tr. 9 218:12-20; Tr. 10 138:15-140:5]

96. Wells drilled on BLM land during mining activities are often left in place for other uses after mining activities cease. [9 Tr. 218:21-220:1]

97. The majority of CFP's tailings pond and dam was located on privately-owned land over which BLM had no authority to require reclamation. [9 Tr. 184:11-187:1; TRP-104]

98. The OSE had permitting authority over the tailings pond. [TRP-101; TRP-106; TRP-108]

99. Around the beginning of 1987, the OSE had discussed reclamation of the tailings dam with the BLM. The BLM informed the OSE that the BLM had considered requiring CFP to breach the dam for the sake of safety. The OSE replied that the OSE had determined that breach was not necessary since the dam was in safe condition and would not need maintenance for many years. [TRP-109]

CFP'S TERMINATION OF MINING OPERATIONS AT COPPER FLAT

100. CFP abandoned its mining operations at Copper Flat.

101. When CFP abandoned mining operations at Copper Flat, it abandoned its plans to develop a mine at Copper Flat.

CFP's TRANSFER APPLICATION

102. CFP filed with the OSE an Application for Permit to Change Location of Wells and Place and Purpose of Use of Underground Waters, dated February 28, 1986 (CFP's transfer application). In CFP's transfer application, CFP explained that it had entered into "an agreement with the State of New Mexico Office of the Commissioner of Public Lands" to transfer its rights to "wells located on State lands located in the general vicinity of Las Cruces, Dona Ana County, New Mexico," approximately fifty to sixty miles south of Copper Flat. CFP sought to transfer 6,462 *afy* to "private or public utilities" for "recreational, aesthetic, industrial, manufacturing, utility, municipal, residential, subdivision, construction, stock-raising, and mining" purposes. [NMCC-065 at 1-2, 5, 20-21; TRP-082]

103. In CFP's transfer application, CFP stated that the Copper Flat project was forced to cease operations due to an "industry wide and worldwide depression in mineral prices generally and copper prices in particular" and that "at this time there is no reasonable likelihood that the operation can be made economic presently or that it will be economic in the near future." CFP concluded that "the valuable water

resource that Copper Flat has developed . . . cannot be economically be used at Copper Flat." [NMCC-065 at 5]

104. Notice of CFP's transfer application was published in the *Las Cruces Bulletin* on May 7, 14, and 21, 1986. [TRP-083 at 22]

105. Elephant Butte Irrigation District (EBID), Strahmann Farms, Inc., County of Doña Ana, City of El Paso, Texas, and Afton Sod Farm protested CFP's transfer application. [TRP-094 at 1-2]

106. EBID, Doña Ana County, and Strahmann Farms each argued in their protests that the transfer of the inchoate right would be contrary to New Mexico law. [TRP-094 at 6, 9, and 12]

WILLIAM FROST, HARRIS GRAY, AND THE COPPER FLAT WATER RIGHTS

107. Frost, of Las Cruces, New Mexico, is a former real estate agent who practiced primarily in Las Cruces and Silver City, New Mexico, in the years between 1973 and 2010. Frost had been involved in the transfer of other water rights and developed an understanding of the monetary value of water rights in New Mexico. [2 Tr. 96:5-25; 99:6-11]

108. Gray, of Silver City, New Mexico, is a retired Certified Public Accountant, who practiced accounting in Silver City for forty-three years. Gray's clients were primarily farmers and ranchers who owned water rights, and Gray was familiar with the monetary value of water rights. [5 Tr. 116:14-25-118:5]

109. Neither Frost nor Gray ever worked in the mining industry in any capacity. [2 Tr. 202:23-203:6; 5 Tr. 142:24-143:12]

Purchase of the Water Rights

110. Sometime in 1985, an attorney, J. W. Woodbury, informed Frost that the Copper Flat water rights were being marketed and asked Frost if he would approach the City of Las Cruces to ascertain whether it would be interested in purchasing the rights. Frost presented the proposal to Las Cruces, but it declined. At this time, Frost was not aware of who owned the water rights. [2 Tr. 97:8-98:8]

111. Between 1985 and 1986, Frost became aware that the Copper Flat assets were being liquidated. He understood that any such water rights would be a valuable financial investment. [*Id.* at 98:11-15; 98:25-99:17]

112. After January 1, 1986, Frost suggested to Gray that Gray consider purchasing the Copper Flat water rights as an investment. Frost informed Gray that the amount of water associated with the rights was significant and that there was a possibility of obtaining the rights for $20,000. [2 Tr. 99:18-23, 100:7-11; 5 Tr. 117:4-16]

113. Gray thought that if he could purchase the Copper Flat water rights, he could lease them back to copper mining operations at Copper Flat. He decided to purchase the rights and asked Frost to make inquiries to that end. [2 Tr. 100:14-16; 5 Tr. 118:6-16]

114. By verbal agreement, Frost and Gray became partners in the venture to purchase the Copper Flat water rights. Under the partnership agreement, Gray would put up the investment capital and Frost would undertake efforts to market the rights. [5 Tr. 118:21-25]

115. Frost began making inquiries with regard to purchasing the Copper Flat water rights. He made a verbal offer to CIBC on Gray's behalf to purchase the rights and received a verbal acceptance. [2 Tr. 100:18-101:18]

116. On March 26, 1987, Frost made a written offer to CIBC of $20,000 for "all water right assets of Copper Flat Partnership." [NMCC-073]

117. Gray received a quitclaim deed and a bill of sale for the water rights from CFP. Gray specifically acknowledged that CFP made no representations or warranties concerning the water rights. [2 Tr. 101:20-102:4; NMCC-074; NMCC-075]

118. The quitclaim deed transferred "title, if any, in and to inchoate and beneficially used water rights of approximately 6,462 acre-feet" associated with the four production wells and six monitoring wells. [NMCC-074]

119. On March 31, 1987, Gray filed with the OSE a Change of Ownership of Water Right for the four production wells and the six monitoring wells, in the amount of 6,462 *afy*. [TRP-114]

120. Gray was put on notice that the water rights were subject to CFP's transfer application, and, on April 1, 1987, Gray requested that the OSE withdraw the application. [5 Tr. 145:20-147:7; TRP-113]

121. Frost and Gray purchased the water rights for investment purposes. [2 Tr. 202:23-203:6; 5 Tr. 142:24-143:12]

Frost and Gray's Application to Transfer Water Rights to Ladder Ranch

122. After the transaction was complete in 1987, Frost and Gray believed that the best return on their investment would be to keep the water rights associated with Copper Flat, in the hope that the mine would be put back into operation and that the rights could be leased to a mine operator. [2 Tr. 103:11-13; 5 Tr. 119:12-15]

123. Because of a concern that they could lose their water rights through non-use, Frost and Gray entered into an agreement with Gerald Lyda to transfer the water rights to Lyda's Ladder Ranch and change the type of use to agriculture, build a dam, and create a farm. [2 Tr. 104:1-17; 5 Tr. 119:16-120:4]

124. On September 2, 1988, Gray filed with the OSE an Application to Change Point of Diversion and Place and/or Purpose of Use from Ground Water to Surface Water (the Gray transfer application). The Gray transfer application requested that the claimed 6,462 *afy* of water rights be transferred to Ladder Ranch for "recreation & irrigation" uses. It listed the new point of diversion as "Seco Creek," from which surface water would be impounded behind an "earthen dam, 65 feet in

height, 365 feet at the base." The application indicated that Gray intended that the wells at Copper Flat would be plugged following the transfer. [NMCC-078]

125. On February 10, 1989, Frost and Gray and Gerald Lyda reduced to writing their agreement to develop Ladder Ranch. As part of the agreement, on the condition that the parties meet their obligations and that the OSE approve the transfer, Frost and Gray agreed to convey to Lyda an "undivided one-half (½) interest in all the water rights transferred." Frost and Gray also reserved the right to sell their half of the water rights to "whomever they wish." While Frost and Gray had hoped that the filing of the transfer application might attract the attention of mining interests, they fully intended to follow through on their obligations under this agreement. [2 Tr. 210:22-211:5; NMCC-082]

126. As of September 1988, Frost and Gray were not aware of any competing claims to the water rights.

FROST AND GRAY'S CONFLICT WITH HYDRO RESOURCES

127. On August 24, 1987, Hydro Resources Corporation acquired an option from Inspiration to acquire Inspiration's interest in Copper Flat. [NNCC-086]

128. On November 16, 1989, Inspiration conveyed by quitclaim deed to Hydro Resources, "all the right, title and interest . . . in those patented and unpatented mining claims" along with any appurtenances to Copper Flat. Water rights were not included in the quitclaim deed. [TRP-123]

129. On September 23, 1988, Hydro Resources filed an objection and protest to the Gray transfer application. Hydro Resources objected on the grounds that (1) the transfer of inchoate water rights was contrary to New Mexico law, and (2) the Gray transfer application constituted an application to make an inter-basin transfer that Hydro Resources opposed. [NMCC-079]

130. On July 5, 1989, Frost and Gray filed with the OSE a motion to strike Hydro Resources' objection and protest on the grounds that (1) Hydro Resources' stated grounds were not cognizable under New Mexico law, and (2) Hydro Resources had no standing to file an objection or protest because it made no showing of owning a relevant water right. [TRP-122]

131. On July 25, 1989, Cobb Resources, Inc., which controlled Hydro Resources, entered into an agreement to sell Copper Flat to the Copper Flat Mining Company (CFMC), based in Denver, Colorado. CFMC planned to develop Copper Flat with prospective partners. [NMCC-086 at 1]

132. Hydro Resources filed a response to Frost and Gray's motion to strike, arguing that Inspiration was the actual owner of the water rights and therefore Frost and Gray had no lawful interest to transfer. [NMCC-083]

133. On January 5, 1990, CFMC filed with the OSE an application for Change of Ownership of Water Right from CFP to CFMC. In the application, CFMC set forth the theory that upon the termination of CFP's lease of Copper Flat, the water rights

associated with the mine were "tied to the mining enterprise and reverted to Inspiration and . . . [are] now owned by CFMC." [NMCC-084 at 1, 4]

134. On January 9, 1990, the OSE informed CFMC of the pending Gray transfer application for Ladder Ranch. CMFC's legal counsel informed CMFC about Frost and Gray's ownership claim. Legal counsel advised CFMC to proceed due to "the extraordinary amount of water involved and the extreme value of the rights," if CFMC were to prevail in its challenge. [NMCC-084 at 54; NMCC-085 at 6]

135. CFMC's application for a Change of Ownership of Water Right conflicted with the Gray application for change of ownership filed on April 3, 1987. This conflict created a question as to the title of Frost and Gray's water rights.

GOLD EXPRESS CORPORATION'S ACQUISITION OF COPPER FLAT

136. Gold Express Corporation purchased the mining claims from CFMC on April 11, 1990. [*Hydro Resources Corp. v. Gray*, 2007-NMSC-067, ¶ 8, 143 NM 142, 173 P.3d 749]

137. During discussions concerning the possible lease by Gold Express of the water rights, Frost and Gray learned that Gold Express claimed an ownership interest in the water rights and that CFMC had filed a change of ownership form with the OSE. [2 Tr. 111:1-113:19]

138. In April 1990, Gold Express acquired title to Copper Flat. [NMCC-089 at 7; NMCC-094 at 14]

139. On January 4, 1991, Gold Express and Frost and Gray agreed to settle their dispute over the use and ownership of the water rights. The agreement stated in part that (1) Frost and Gray would withdraw the Gray transfer application and not interfere with Gold Express' use at Copper Flat of the beneficially used and inchoate water rights, (2) Frost and Gray would receive 20,000 shares of Gold Express stock, and (3) Frost and Gray would receive annual payments of $50,000 to $100,000 for Gold Express' use of the water rights. [NMCC-087]

140. On January 7, 1991, pursuant to the agreement with Gold Express, Gray notified the OSE that he wished to withdraw the Gray transfer application. [NMCC-088]

141. On January 31, 1991, Gold Express submitted to the BLM a proposed plan of operations for Copper Flat. Gold Express proposed to "rebuild the entire Copper Flat mining facility as it existed in 1986." [NMCC-089 at 7]

142. Gold Express did not put water to beneficial use at Copper Flat.

ALTA GOLD'S ACQUISITION OF COPPER FLAT

143. By September 31, 1993, Alta Gold Corporation, a publically-traded company that engaged in gold, silver, lead, and zinc mining, had acquired an option to purchase Copper Flat from Gold Express. It exercised the option in 1994. [NMCC-106; NMCC-097; NMCC-149 at 21:7-9, 21-25]

144. On November 24, 1993, Gold Express quitclaimed to Alta Gold its right, title, and interest, "if any," to the 6,462 *afy* of water rights that Gold Express acquired from CFMC in May 1990. [NMCC-108 at 7, 12]

145. On May 3, 1994, Frost and Gray entered into an agreement with Alta Gold that Alta Gold would succeed to Gold Express' rights and obligations under the January 4, 1991 agreement between Frost and Gray and Gold Express. [NMCC-104]

146. Alta Gold had hoped to reopen Copper Flat for a cost of $35 million. The footprint of Alta Gold's proposed operations at Copper Flat was very similar to CFP's, and Alta Gold intended to recover and reuse the salvageable infrastructure remaining from CFP's operations. [NMCC-149 at 44:3-17, 70:4-10, 181:18-182:23, 184:1-14]

147. Between February 1996 and 1999, Alta Gold waited for the BLM to issue the final Environmental Impact Statement. During this period, Alta Gold made efforts to purchase a SAG mill and have it moved to Copper Flat and to lease trucks in order to begin operations. [NMCC-149 at 88:15-90:8]

148. From 1991 to 1999, Gold Express and Alta Gold paid Frost and Gray a total of $400,000 for Frost and Gray's consent to use the water rights. [5 Tr. 179:2-5; NMCC-104]

Alta Gold's Bankruptcy and Claim to the Water Rights

149. In 1999, Alta Gold filed for bankruptcy in the United States Bankruptcy Court for the District of Nevada (the bankruptcy court). Alta Gold claimed ownership of the water rights in its bankruptcy filings. [2 Tr. 118:20-119:11; NMCC-149 at 87:3-88:10]

150. Alta Gold's assets, including those associated with Copper Flat, were liquidated in an auction ordered by the bankruptcy court. [NMCC-139 at 1-3; NMCC-149 at 191:23-192:6]

151. Frost and Gray hired legal counsel licensed in Nevada to represent their interest in Alta Gold's bankruptcy. The bankruptcy court recognized Frost and Gray's ownership of the water rights. [2 Tr. 119:12-120:4; 5 Tr. 126:22-127:3]

152. On December 21, 2000, the bankruptcy court ordered Alta Gold to execute a quitclaim deed for its claims to the water rights to Frost and Gray. [NMCC-113]

153. Ultimately, Alta Gold did not follow through on the permitting process for Copper Flat and did not reopen the mine because it filed for bankruptcy in 1999. [NMCC-0149 at 86:1-87:3]

154. Alta Gold did not put water to beneficial use at Copper Flat.

THE LOWER RIO GRANDE HYDROGRAPHIC SURVEY

155. The OSE completed the Lower Rio Grande Basin Hydrographic Survey in December 2000. In the hydrographic survey, the OSE found that the following

wells had no right of use, stating, "[w]ells were originally declared as mining wells, but only limited stock use found": LRG-4652-S-3; LRG-4652-S-4; LRG-4652-S-5; LRG-4652-S-6; LRG-4652-S-7; LRG-4652-S-8; LRG-4652-S-9; LRG-4652-S-10; LRG-4652-S-11; LRG-4652-S-12; LRG-4652-S-13; and LRG-4652-S-15. [TRP-163 at 21]

156. The other wells at issue in this case were not located by the OSE. [*Id.*]

157. The hydrographic survey indicated "no right" for Subfile No. LRO-28-008-9009, the subfile number then assigned by the OSE to Alta Gold and currently assigned to NMCC. [7 Tr. 151:17-154:3; TRP-163 at 21]

HYDRO RESOURCES LITIGATION

158. On January 8, 2001, Hydro Resources filed suit in New Mexico's Seventh Judicial District Court against Frost and Gray seeking a declaratory judgment to quiet title to the water rights. Hydro Resources contended that the water rights were appurtenant to the mining claims developed for Copper Flat. Litigation between Hydro Resources and Frost and Gray proceeded in district court, the New Mexico Court of Appeals, and the New Mexico Supreme Court for nearly seven years between January 2001 and November 2007. [2 Tr. 120:20-122:8, 214:7-215:2; *Hydro Resources Corp. v. Gray*, 2007-NMSC-067, ¶ 10; *Hydro Resources Corp. v. Gray,* 2006-NMCA-108, ¶ 1, 140 N.M. 363, 142 P.3d 951]

159. On November 9, 2007, the New Mexico Supreme Court recognized Frost and Gray's title to the water rights, holding that since "water rights are not considered appurtenant to land under a lease," 2007-NMSC-067, ¶ 1, title to the Frost and Gray rights did not pass to Hydro Resources with the conveyance of title to the mining claims.

160. On January 22, 2008, the Seventh Judicial District Court entered a quiet title decree to the water rights in favor of Frost and Gray. [NMCC-114]

FROST AND GRAY'S RESUMPTION OF MARKETING THE WATER RIGHTS

161. When litigation between Hydro Resources and Frost and Gray was completed, Frost and Gray resumed marketing the water rights with a preference for leasing the rights to a mining interest. [2 Tr. 195:1-17, 231:7-13; TRP-179; TRP-181]

162. Over time, Frost and Gray have been paid approximately $1.5 million for the use of the water rights. [2 Tr. 235:5-7]

ABSENCE OF MINING ACTIVITY AT COPPER FLAT, 1990-2008

163. Max Yeh, a resident of Hillsboro, New Mexico, made between five and seven personal visits to the Copper Flat site over the course of ten to fifteen years beginning in the early-1990s. He often hiked to the top of the hills overlooking the mine. On none of these occasions did Yeh see any mining operations or personnel at Copper Flat. Yeh testified that there were no signs of the former buildings, other

than the imprints; that the open pit was ringed with lightish-yellow crystals; and that the dam was overgrown with brush, weeds, and small shrubs. [Max Yeh Tr. 30:8-19, 34:4-35:1, 36:1-37:9]

164. In a field report dated April 17, 2008, OSE staff reported that it had

> [f]ound all wells, none of which are in current use. None of them are equipped and have locked covers on each of them. All but two had concrete pads with the casing right in the middle. The other two had metal covers over with locks on them and no concrete pads.

The OSE staff described the location of the wells as

> Large open ranch land. There are currently large native brush and cactus over the entire area. There were rough roads leading to some of the wells, however we had to really hunt down to find.

[STATE-008]

NMCC'S PURCHASE OF COPPER FLAT

165. On July 23, 2009, NMCC entered into an option agreement with Hydro Resources to purchase Copper Flat and the associated mineral claims. [NMCC-116]

166. On September 9, 2010, Frost and Gray entered into an option agreement with NMCC for the sale of the declared water rights. At the time of trial, there remained conditions precedent to the transfer of ownership of the rights to NMCC. [2 Tr. 24:11-21, 124:20-125:25; NMCC-117]

167. On September 27, 2010, Frost and Gray filed an Amended Declaration of Ownership of Underground Water Right (2010 amended declaration) for the

production wells, claiming that 1,267 *afy* had been placed to beneficial use at the mine, rather than the 854.333 *afy* claimed in the 1984 declarations. [NMCC-118 at 1-4]

NMCC's Application to Repair and Deepen Wells

168. On February 28, 2012, NMCC filed an Application for Permit to Repair and/or Deepen Well for the four production wells and five supplemental wells (LRG-4652-S-4, LRG-4652-S-5, LRG-4652-S-6, LRG-4652-S-7, and LRG-4652-S-8). [STATE-017 at 1-3]

169. On May 5, 2012, OSE employees, Cheryl Thacker and Craig Cathey, conducted a field check of Copper Flat. Thacker and Cathey found that the four production wells were not equipped or operational and that the well casings were capped with an access point for well-monitoring purposes. [STATE-001 at 9]

170. On August 2, 2012, Thacker, an OSE Lower Rio Grande Basin supervisor, summarized in a memorandum her analysis and evaluation of NMCC's application to repair and deepen wells. Thacker recommended that:

a. the water rights associated with LRG-4652 be limited to 888.783 *afy*, "reflecting the largest amount of water diverted and consumed in any one year" at Copper Flat; and

b. the OSE consider CFP's pre-basin claim of 6,462 *afy* as "entirely inchoate" and "relinquished when thirty-seven years elapsed

> without the resumption of mining operations or construction of a copper concentrator."

[STATE-001 at 15]

171. On August 16, 2012, the OSE approved in part, and denied in part, the application. The request to deepen and repair the wells was approved for the four production wells and six of the miscellaneous wells (LRG-4652-S-4, LRG-4652-S-5, LRG-4652-S-6, LRG-4652-S-7, LRG-4652-S-8, and LRG-4652-S-10). The conditions of approval limited the total diversion for the four production wells and the thirteen supplemental wells to 888.783 *afy* for mining, milling, reclamation, dust control, wash water, and domestic and sanitary uses. The conditions of approval required that all the wells be equipped with measuring technology approved by the OSE. The OSE denied the pre-basin claim of 6,462 *afy* as "entirely inchoate" and "at no time been put to beneficial use." NMCC aggrieved the OSE's partial approval, and the matter is pending and currently stayed. [STATE-017 at 4-7]

THE POINTS OF DIVERSION

The Four Production Wells

172. LRG-4652, LRG-4652-S; LRG-4652-S-2; and LRG-4652-S-3:

a. LRG-4652 and LRG-4652-S were drilled in December 1975, LRG-4652-S-2 was drilled in January 1976, and LRG-4652-S-3 was drilled in 1980. [NMCC-037; NMCC-038; NMCC039; NMCC-040]

b. The 1984 declarations for the four production wells declared an estimated future use from a combination of these wells of 6,462 *afy* and declared that the amount of water put to beneficial use was 278,385,500 gallons (854.33 *afy*). [*Id.*]

c. The 1984 field check found that the wells were supplying water "for maintaining the equipment, human consumption, sanitary purposes, fire protection, and cleanup." [TRP-055]

d. The 2000 hydrographic survey found that LRG-4652-S-3 was utilized only for "limited stock use." [STATE-007 at 21; TRP-163 at 21]

e. The 2010 amended declaration claimed that 1,227 *afy* was put to beneficial use, rather than the 854.333 *afy* declared in 1984. [NMCC-118 at 10]

f. During an April 2008 field visit, the OSE found that all four production wells were not equipped, not in use, and closed with a locked cover. [STATE-008]

g. On March 14, 2011, a private consulting firm conducted a field visit (the 2011 field visit) to assess the status of the four production wells and the seven miscellaneous wells. A report (the 2011 report) summarizing the findings of the field visit states that the production wells were not equipped and that the wellhead on each well was capped with a welded steel plate that would require a cutting torch to remove. On each of the four wells, there was a steel pipe secured with a padlock that allowed the measuring of water levels. Access to the wells was hindered by overgrowth of brush. Photographs of the production wells show that the caps and pipes on each well were rusted and apparently not in use for an extended period of time. [TRP-195 at 1-5]

h. During a May 2012 field check, the OSE found that all four production wells were not equipped, not operable, capped, and locked. [STATE-018 at 10-12]

i. The OSE determined in August 2012 that the 6,462 *afy* inchoate claim had never been put to beneficial use. [*Id.* at 16]

j. In July 2014, the OSE offered to recognize Frost and Gray's vested right of 861.84 *afy* in the four production wells and six monitoring wells. The OSE calculated the amount using metered and estimated amounts actually used by the wells in 1982. [7 Tr. 159:19-160:19; STATE-011; STATE-025]

k. 861.84 *afy* is the total amount of water put to beneficial use from the productions wells.

l. No water has been put to beneficial use from LRG-4562, LRG-4562-S, and LRG-4562-S-2 since December 31, 1984.

m. No water has been put to beneficial use from LRG-4562-S-3 since December 31, 2000.

The Miscellaneous Wells

173. LRG-4652-S-4:

a. LRG-4652-S-4 was drilled in 1931 for placer mining and used for that purpose until 1943. The well was used only for watering livestock from 1943 to 1980. [NMCC-041]

b. The 1984 field check found that LRG-4652-S-4 was not equipped or in use. [7 Tr. 32:20-24; 8 Tr. 92:25-94:11; STATE-044; TRP-055]

c. The 2011 field visit found that LRG-4562-S-4 was equipped with a windmill with the blades missing. Access to the wellhead was somewhat blocked by brush in which an animal was nesting. Next to the well was a corroded stock tank with holes in it. Photographs show that the well was apparently not in use for an extended period of time. [TRP-195 at 10]

d. No credible evidence was introduced at trial excusing nonuse of water for mining purposes from LRG-4652-S-4 from 1943 to 1980, a period of approximately thirty-seven years.

e. Water from LRG-4652-S-4 was not put to beneficial use after December 31, 1980.

174. LRG-4652-S-5:

a. LRG-4652-S-5 was drilled in 1931 for placer mining and used for that purpose until 1943. The well was not used from 1943 to 1982. For about seven months, the well was again used for placer mining from September 1, 1982 to April 20, 1983. [NMCC-042]

b. The 1984 field check found that LRG-4652-S-5 was not equipped and not in use. [STATE-005 at 2]

c. The 2011 field visit found that LRG-4562-S-5 was unequipped, uncovered, and contained rocks inside the well. The roads to the well site were in poor condition and in need of repair. The 2011 report suggested that, if the well could not be cleaned out, it might be simply filled, capped, and abandoned. Photographs show that the well was obscured by overgrowth of brush and apparently not in use for an extended period of time. [TRP-195 at 11]

d. No credible evidence was introduced at trial excusing nonuse of water for mining purposes from LRG-4652-S-5 from 1943 to 1982, a period of approximately thirty-nine years.

e. Water from LRG-4652-S-5 has not been put to beneficial use after December 31, 1983.

175. LRG-4652-S-6

a. LRG-4652-S-6 was drilled in 1931 for placer mining and used for that purpose until 1943. The well was not used from 1943 to 1963. The well was used for placer mining again from 1963 to 1964, was not in use from 1964 to 1975, and was again used for placer mining from 1975 to 1984. [NMCC-43]

b. The 1984 field check found that LRG-4652-S-6 was equipped and in use for placer mining. [STATE-005 at 2]

c. The 2011 field visit found that LRG-4562-S-6 was unequipped, uncovered, contained rocks, and had a bee hive inside the well. The road to the well site was in poor condition and in need of repair. Photographs show that the well was obscured by an overgrowth of grass, that the cap was almost entirely rusted away, and that the well was apparently not in use for an extended period of time. [TRP-195 at 12]

d. No credible evidence was introduced at trial excusing nonuse of water for mining purposes from LRG-4652-S-6 from 1943 to 1963, a period of approximately twenty years.

e. Water from LRG-4652-S-6 has not been put to beneficial use after December 31, 1986. [Tr. 7 176:15-23]

176. LRG-4652-S-7

a. LRG-4652-S-7 was drilled in 1932 for placer mining and used for that purpose until 1943. The well was next used to water stock from 1943 to 1975 and was used for domestic purposes from 1975 to 1980. [NMCC-44]

b. The 1984 field check found that LRG-4652-S-7 was not equipped and not in use. [STATE-005 at 2]

c. The 2011 field visit found that LRG-4562-S-7 was unequipped and covered by a sheet of rubber and a rusted steel plate, both unsecured. The well was surrounded by grass and branches. Photographs show that the well was apparently not in use for an extended period of time. [TRP-195 at 7]

d. No credible evidence was introduced at trial excusing nonuse of water for mining purposes from LRG-4652-S-7 from 1943 to 1980, a period of approximately thirty-seven years.

e. Water from LRG-4652-S-7 has not been put to beneficial use after December 31, 1980.

177. LRG-4652-S-8

a. LRG-4652-S-8 was drilled in 1932 for placer mining and used for that purpose until 1943. The well was next used to water stock and for domestic purposes from 1943 to 1984 and has a perfected pre-basin water right of 3 *afy* for domestic and stock watering purposes. [7 Tr. 178:18-179:1-7; NMCC-45]

b. The 1984 field check found that LRG-4652-S-8 was equipped and in use for domestic and livestock purposes. [STATE-005 at 2]

c. The 2011 field visit found that LRG-4562-S-8 was equipped with a submersible pump and was providing non-potable water for the NMCC office. Photographs show that the metal plate covering the well was rusted and that the well appears to have been rehabilitated. [7 Tr. 178:18-180:24; TRP-195 at 6]

178. LRG-4652-S-9

a. LRG-4652-S-9 was drilled in 1971 to explore for adequate water for Copper Flat, and it cannot be determined if the well was used between 1972 and 1974. From 1974 to 1978, the well was in use for unknown purposes. From 1978 to 1980, there was little or no use of the well. The well pumped approximately 22,922,500 gallons of water (70.35 *afy*) for a construction project from October 1980 to March 1982. [NMCC-46]

b. The 1984 field check found that LRG-4652-S-9 was equipped but not in use. [STATE-005 at 2]

c. The 2011 field visit found that LRG-4562-S-9 was equipped with a pump and 30 hp motor dating back to March 2010 and located inside an aluminum shed. Photographs of the wellhead show the cap and pipes and shed frame to be rusted. The well appears to have been rehabilitated. [TRP-195 at 8]

d. No credible evidence was introduced at trial excusing nonuse of water from LRG-4652-S-9 from December 31, 1982 to at least March 2010, a period of over twenty-seven years.

e. Water from LRG-4652-S-9 was not been put to beneficial from December 31, 1982 to March 31, 2010.

179. LRG-4652-S-10

a. LRG-4652-S-10 was drilled in 1972 to explore for adequate water for Copper Flat, and it cannot be determined if the well was used between 1972 and 1974. From 1974 to 1978, the well was used for placer mining. From 1978 to 1980, there was little or no use of the well. The well pumped approximately 18,000,000 gallons of water (55.24 *afy*) for a construction project from October 1980 to March 1982. [NMCC-47]

b. The 1984 field check found that LRG-4652-S-10 was not equipped and not in use. [STATE-005 at 2]

c. The 2011 field visit found that LRG-4562-S-10 was unequipped and covered by a sheet of rubber and a piece of plywood held in place by a rock. The eastern side of the well was partially covered by a shrub. Photographs show that the well was apparently not in use for an extended period of time. [TRP-195 at 7]

d. No credible evidence was introduced at trial excusing nonuse of water from LRG-4652-S-10 from December 31, 1982 to June 2016, a period of over thirty-three years.

e. Water from LRG-4652-S-10 has not been put to beneficial use after December 31, 1982.

The Monitoring Wells

180. LRG-4652-S-11

a. LRG-4652-S-11 was drilled in December 1974, with a capacity of 20 *gpm*, with 32 *afy* available for "standby use for mining, milling, and reclamation purposes, to supplement supply" from the production wells. [NMCC-048]

b. The 1984 field check found that LRG-4652-S-11 was not equipped and not in use. [STATE-005 at 2]

c. Water from LRG-4652-S-11 has never been put to beneficial use.

181. LRG-4652-S-12

a. LRG-4652-S-12 was drilled in April 1975, with a capacity of 106 *gpm*, equipped with a cylinder pump powered by a windmill. The 1984 declaration claimed 171 *afy* available for "standby use for mining, milling, and reclamation purposes, to supplement supply" from the production wells, and 3 *afy* "since 1982 for stock watering." [NMCC-49]

b. The 1984 field check found that LRG-4652-S-12 was equipped and in use. [STATE-005 at 2]

c. As of June 2016, LRG-4652-S-12 was in use for stock watering under a separate permit, independent of this proceeding. [7 Tr. 187:12-24-188:2]

d. No credible evidence was introduced at trial excusing nonuse of water from LRG-4652-S-12 for mining purposes from December 31, 1982 to June 2016, a period of over thirty-three years.

e. Water from LRG-4652-S-12 has not been put to beneficial use for mining purposes after December 31, 1982.

182. LRG-4652-S-13

a. LRG-4652-S-13 was drilled on May 12, 1975, with a capacity of 97 *gpm*. The 1984 declaration claimed 156 *afy* available for "standby use for mining, milling, and reclamation purposes, to supplement supply" from the production wells. [NMCC-050]

b. The 1984 field check found that LRG-4652-S-13 was not equipped and not in use. [STATE-005 at 2]

c. As of June 2016, LRG-4652-S-13 was in use for stock watering under a separate permit, independent of this proceeding. [7 Tr. 188:5-17]

d. No credible evidence was introduced at trial excusing nonuse of water from LRG-4652-S-13 for mining purposes from December 31, 1975 to June 2016, a period of over forty years.

e. Water from LRG-4652-S-13 has not been put to beneficial use for mining purposes after December 31, 1975.

183. LRG-4652-S-14

a. LRG-4652-S-14 was drilled on August 22, 1975, with a capacity of 262 *gpm*. The 1984 declaration claimed 423 *afy* available for "standby use for mining, milling, and reclamation purposes, to supplement supply" from the production wells. [NMCC-51]

b. The 1984 field check found that LRG-4652-S-14 was not equipped and not in use. [STATE-005 at 2]

c. No credible evidence was introduced at trial excusing nonuse of water from LRG-4652-S-14 for mining purposes from December 31, 1975 to June 2016, a period of over forty years.

d. Water from LRG-4652-S-14 has not been put to beneficial use for mining purposes after December 31, 1975.

184. LRG-4652-S-15

a. LRG-4652-S-15 was drilled on September 22, 1975, with a capacity of 208 *gpm*. The 1984 declaration claimed 336 *afy* available for "standby use for mining, milling, and reclamation purposes, to supplement supply" from the production wells. [NMCC-52]

b. The 1984 field check found that LRG-4652-S-15 was not equipped and not in use. [STATE-005 at 2]

c. No credible evidence was introduced at trial excusing nonuse of water from LRG-4652-S-15 for mining purposes from December 31, 1975 to June 2016, a period of over forty years.

d. Water from LRG-4652-S-15 has not been put to beneficial use for mining purposes after December 31, 1975.

185. LRG-4652-S-16

a. LRG-4652-S-16 was drilled on October 31, 1975, with a capacity of 110 *gpm*. The 1984 declaration claimed 177 *afy* available for "standby use for mining, milling, and reclamation purposes, to supplement supply" from the production wells. [NMCC-53]

b. The 1984 field check found that LRG-4652-S-16 was not equipped and not in use. [STATE-005 at 2]

c. No credible evidence was introduced at trial excusing nonuse of water from LRG-4652-S-16 for mining purposes from December 31, 1975 to June 2016, a period of over forty years.

d. Water from LRG-4652-S-16 not has been put to beneficial use for mining purposes after December 31, 1975.

The Open Pit and the Dolores Well

186. LRG-4652-S-17, the open pit

a. LRG-4652-S-17 was declared separately as a point of diversion, not as a well, and with no associated drill rig or well casing. The 1984 declaration estimated that 75 *gpm* could be removed, but no pump was installed. 120 *afy* was declared available for "dust control" and "reclamation," but no information was included concerning the calculation of this amount. [7 Tr. 26:12-19; NMCC-054]

b. LRG-4652-S-17 is hydrologically connected to groundwater and evaporates at an amount of 34.45 *afy*. [STATE-001 at 12]

187. LRG-4654, the Dolores well

a. LRG-4654 was drilled in 1932 for mining purposes and was used in that capacity from 1932 to 1934. The well was used intermittently for mining between 1932 and 1981. [NMCC-055]

b. No evidence was introduced at trial excusing nonuse of water from LRG-4654 from December 31, 1981 to June 2016, a period of over thirty-four years.

c. Water from LRG-4654 has not been put to beneficial use for mining purposes after December 31, 1981.

RECENT ACTIVITIES AT COPPER FLAT

188. No mining company has operated a copper mine at Copper Flat since July 1982. [State-033 at 5-16]

189. No water from the production wells has been put to beneficial use for mining since the acquisition of water rights by Frost and Gray. [5 Tr. 138:14-22]

CONCLUSIONS OF LAW

1. This Court has jurisdiction over the parties and the subject matter of this proceeding. N.M. Const. art. VI, § 13.

2. The Hillsboro Claimants have standing to participate in this proceeding. NMSA 1978, § 72-4-17 (1965); Rule 1-071.2(B), (C).

3. Turner Ranch Properties has standing to participate in this proceeding. *Id*

4. As water rights claimants, NMCC and Frost and Gray must prove each element of their respective water rights by a preponderance of the evidence.

NEW MEXICO WATER LAW

5. Unappropriated surface water and groundwater belong to the people of New Mexico and are subject to beneficial use in accordance with New Mexico law. N.M. Const. art. XVI, § 2; NMSA 1978, § 72-12-1 (2003); NMSA 1978, § 72-12-

18 (1983). *See City of Albuquerque v. Reynolds*, 1962-NMSC-173, ¶ 28, 71 N.M. 428; 379 P.2d 73 (holding that the substantive law relating to the appropriation of surface waters is the same as that relating to groundwater)(internal citations omitted).

6. "Beneficial use is the basis, the measure and the limit of the right to the use of water." N.M. Const. art. XVI, § 3; § 72-12-18.

INCHOATE RIGHTS AND THE *MENDENHALL* RULE

7. Under *State ex rel. Reynolds v. Mendenhall*, 1961-NMSC-083, ¶ 29; 68 N.M. 467; 362 P.2d 998, an appropriator who develops groundwater resources prior to the declaration of an underground basin by the state engineer, continues to diligently develop the water after the declaration of the basin, and places it to beneficial use within a reasonable time may acquire a valid water right to the water put to beneficial use.

8. In order to benefit from the rule set forth in *Mendenhall,* appropriators must "(1) legally commence drilling their well prior to declaration of the basin; (2) proceed diligently to develop the water pursuant to a plan; and (3) apply the water to beneficial use." *State ex rel. Reynolds v. Rio Rancho Estates, Inc.*, 1981-NMSC-017, ¶ 13, 95 N.M. 560, 624 P.2d 502.

9. For the purposes of this case, "inchoate rights" are incomplete water rights that had not vested at the time the OSE declared the basin because, although the

appropriator had begun development of the rights, the water had not been put to beneficial use.

10. For purposes of the *Mendenhall* rule, diligence in developing water requires that the developer take reasonable efforts in pursuit of a pre-basin plan.

11. The requirement to show diligence is not met by attempts to develop water for projects different from the developer's pre-basin plan.

12. In accordance with New Mexico law, the OSE declared the Lower Rio Grande Underground Water Basin on September 11, 1980. NMSA 1978, § 72-2-8 (1967); 19.27.48 NMAC.

INCHOATE WATER RIGHT CLAIMS

13. The claims to inchoate water rights in this proceeding are connected to the mining operations at Copper Flat because of the *Mendenhall* requirement that a developer of such a water right proceed with diligence to develop the right pursuant to a plan.

14. CFP did not meet the *Mendenhall* requirements because it did not diligently develop water in accordance with its pre-basin plan.

15. Specifically, CFP did not diligently pursue the development of inchoate water rights because it terminated mining operations at Copper Flat and, with CIBC, sold and moved the mining equipment and sold the water rights used for mining operations at Copper Flat.

16. CIBC, to the extent that it was a successor of CFP's interest in Copper Flat, did not diligently pursue the development of inchoate water rights because it sold and moved the mining equipment and sold the water rights used for mining operations at Copper Flat.

17. CFP's and CIBC's actions described in conclusion nos. 15 and 16 are inconsistent with CFP's pre-basin plan under *Mendenhall.*

18. CFP's filing of the transfer application of February 28, 1986 was inconsistent with its pre-basin plan and inconsistent with a diligent effort to pursue the pre-basin plan under *Mendenhall.*

19. The sale of the water rights to Frost and Gray was inconsistent with a diligent effort in pursuit of CFP's pre-basin plan because the sale severed the water rights from the mining operations.

20. CFP's and CIBC's actions extinguished any inchoate water rights under *Mendenhall.*

21. Alternatively, Frost and Gray did not meet the *Mendenhall* requirements because they did not diligently develop water in accordance with CFP's pre-basin plan.

22. Frost and Gray's actions in filing the transfer application of September 2, 1988 and in pursuing a plan to transfer the inchoate water rights to Ladder Ranch for agricultural purposes were inconsistent with CFP's pre-basin plan.

23. Frost and Gray's failure to diligently develop water in accordance with CFP's pre-basin plan extinguished under *Mendenhall* any inchoate rights they may have owned.

24. Efforts by subsequent entities seeking to restart mining operations at Copper Flat did not constitute diligence for purposes of the *Mendenhall* rule.

25. NMCC and Frost and Gray have failed to meet their respective burdens of proof to establish compliance with the requirements of the *Mendenhall* rule.

26. There are no continuing claims to inchoate water rights in this proceeding.

FORFEITURE AND ABANDONMENT OF WATER RIGHTS

Forfeiture

27. When a party entitled to appropriate groundwater failed to apply the water to beneficial use for a period of four or more years prior to June 1, 1965, the water right is forfeited. The forfeiture occurs by operation of law, and the holder of the forfeited right is not entitled to notice or a period to cure the nonuse. NMSA 1978 § 72-12-8(A) (2002); NMSA 1978, § 72-5-28(A) (2002).

28. A person is not entitled to receive more water than is necessary for the person's actual use. *State ex rel. Erickson v. McLean*, 1957-NMSC-012, ¶ 20, 62 N.M. 264, 308 P.2d 383.

29. As a matter of public policy, New Mexico law provides that "municipalities, counties, school districts, state universities, member-owned

community water systems, special water users' associations and public utilities supplying water to municipalities or counties" have up to forty years to develop a water use plan. NMSA 1978, § 72-1-9 (2006).

30. An appropriator may be exempt from the requirements of beneficial use "either by an extension of time or other statutory exemption," which stops the running of the four-year forfeiture period. § 72-12-8(E).

31. Any period of nonuse of a groundwater right by a municipality or county for the purpose of implementing water development or conservation plans is not included when computing the forty-year forfeiture period. § 72-12-8(F).

32. New mining operations are not included in the statutory forty-year planning exemptions; therefore the forfeiture exemptions do not apply to NMCC. *See* NMSA 1978, § 69-36-3(I) (1993) (defining, under the New Mexico Mining Act, a "new mining operation" as a mining operation developed after the 1993 effective date of the act); § 72-1-9 (establishing a forty-year planning period for municipalities and other entities), § 72-12-8(E), (F) (creating exemptions from the computation of the statutory forfeiture period).

33. Individual ownership of water rights is not included in the statutory forty-year planning exemptions; therefore the forfeiture exemptions do not apply to Frost and Gray. § 72-12-8(E), (F).

Abandonment

34. Water rights can be lost by abandonment through nonuse. *See State ex rel. Reynolds v. South Springs Co.*, 1969-NMSC-023, ¶ 9, 80 N.M. 144, 452 P.2d 478 ("[A]bandonment is the relinquishment of the [water] right by the owner with the intention to forsake and desert it[.]" (internal quotation marks and citation omitted)).

35. Nonuse of water alone is not sufficient to establish abandonment of a water right, "[b]ut where by clear and convincing evidence it is shown that for an unreasonable time available water has not been used, an intention to abandon may be inferred in the absence of proof of some fact or condition excusing such nonuse." *Id.* ¶ 22 (quoting *Commonwealth Irrigation Co. v. Rio Grande Canal Water Users' Ass'n*, 45 P.2d 622, 623 (Colo. 1935)).

The Burden of Proof in Abandonment Proceedings

36. The proponent of an abandonment claim has the burden of proving an intent to abandon by clear and convincing evidence. *See Id.*; *State ex rel. Office of State Eng'r v. Elephant Butte Irrigation Dist.*, 2012-NMCA-090, ¶ 23, 287 P.3d 324 (noting that nothing indicated that the special master did not apply the correct standard of proof of clear and convincing evidence to an abandonment claim when required to do so).

37. "[A]fter a long period of nonuse, the burden of proof [of abandonment] shifts to the holder of the right to show the reasons for the nonuse." *Id.* ¶ 24 (internal quotation marks and citation omitted).

38. An owner of a valid water right can overcome allegations of common law abandonment "after a protracted period of nonuse by establishing the absence of intent to abandon the water right." *Id.*

FROST AND GRAY'S RIGHTS IN THE PRODUCTION WELLS

39. Water from the production wells has not been put to beneficial use for an unreasonable amount of time.

40. However, the successive efforts of CFP and Frost and Gray to put water from the production wells to beneficial use demonstrate that neither CFP nor Frost and Gray intended to abandon the vested water rights associated with the production wells.

41. Frost and Gray's litigation to protect their interests demonstrates that they did not intend to abandon the vested water rights.

42. The economic, financial, and logistical difficulties of CFP and the legal challenges of Frost and Gray excuse the long period of nonuse of the vested water rights.

43. As the proponents of abandonment, the Hillsboro Claimants and TRP did not meet their burden to prove by clear and convincing evidence that either CFP or Frost and Gray abandoned the water right associated with the production wells.

44. The amount-of-water element for LRG-4652, LRG-4652-S, LRG-4652-S-2, and LRG-4652-S-3 is 861.84 *afy*, which may be diverted from any combination of these four wells.

45. LRG-4652, LRG-4652-S, LRG-4652-S-2, and LRG-4652-S-3 have an additional water right for stock use, which may be diverted from any combination of these four wells.

46. Frost and Gray are co-owners of a vested water right in the amount of 861.84 *afy* from LRG-4652, LRG-4652-S, LRG-4652-S-2, and LRG-4652-S-3.

RIGHTS IN THE MISCELLANEOUS WELLS

47. As the proponents of abandonment, the State, TRP, and the Hillsboro Claimants have established abandonment by clear and convincing evidence in LRG-4652-S-4, LRG-4652-S-7, LRG-4652-S-9, and LRG-4652-S-10.

48. As the proponents of abandonment, the State, TRP, and the Hillsboro Claimants failed to establish abandonment by clear and convincing evidence in LRG-4652-S-8.

49. The water right to LRG-4652-S-4 for mining use was forfeited by operation of law no later than January 1, 1948.

50. The stock right to LRG-4652-S-4 was abandoned.

51. All water rights to LRG-4652-S-5 were forfeited by operation of law no later than January 1, 1948.

52. All water rights to LRG-4652-S-6 were forfeited by operation of law no later than January 1, 1948.

53. The water right to LRG-4652-S-7 for mining use was forfeited by operation of law no later than January 1, 1948.

54. The stock right to LRG-4652-S-7 was abandoned.

55. The water right to LRG-4652-S-8 for mining use was forfeited by operation of law no later than January 1, 1948.

56. LRG-4652-S-8 has a water right for stock use.

57. The water right to LRG-4652-S-9 for mining use was abandoned.

58. The water right to LRG-4652-S-10 for mining use was abandoned.

RIGHTS IN THE MONITORING WELLS

59. As the proponents of abandonment, the State, TRP, and the Hillsboro Claimants have established abandonment by clear and convincing evidence in LRG-4652-S-11, LRG-4652-S-12, LRG-4652-S-13, LRG-4652-S-14, LRG-4652-S-15, and LRG-4652-S-16.

60. The water right to LRG-4652-S-11 for mining use was abandoned.

61. The water right to LRG-4652-S-12 for mining use was abandoned.

62. The water right to LRG-4652-S-13 for mining use was abandoned.

63. The water right to LRG-4652-S-14 for mining use was abandoned.

64. The water right to LRG-4652-S-15 for mining use was abandoned.

65. The water right to LRG-4652-S-16 for mining use was abandoned.

The Open Pit

66. The amount-of-water element of the water right for the open pit, LRG-4652-17, is 34.45 *afy*.

The Dolores Well

67. As the proponents of abandonment, the State, TRP, and the Hillsboro Claimants have established abandonment in LRG-4654 by clear and convincing evidence.

68. The water right to the Dolores well, LRG-4654, for mining use was abandoned.

James J. Wechsler

James J. Wechsler
Judge Pro Tempore

CERTIFICATE OF MAILING

I hereby certify that I have caused to be mailed and/or emailed a true and correct copy of the foregoing instrument to the following counsel and/or parties of record on the above file stamped date.

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TECHNICAL MEMORANDUM: REVIEW OF THE DRAFT DISCHARGE PERMIT AND APPLICATION, COPPER FLAT COPPER MINE

Sierra County NM

May 1, 2018

Prepared for: Turner Ranch Properties, LP, and New Mexico Environmental Law Center

Prepared by: Tom Myers, PhD, Hydrologic Consultant, Reno NV

1.0 Executive Summary

New Mexico Copper Corporation (NMCC) has submitted an application for a discharge permit (Velasquez 2017, hereinafter DP Application) for the proposed Copper Flat Copper Mine (CFCM or Mine) to the New Mexico Environment Department (NMED). NMED has prepared Draft Discharge Permit DP-1840 for the Copper Flat Mine (hereinafter Draft Permit) and transmitted it to NMCC on February 2, 2018.

This technical memorandum reviews the DP Application, Appendices, associated documents and Draft Permit, with an emphasis on the following factors:

- The efficacy of liners under the tailings impoundments and various ponds
- The use of the andesite under the waste rock as a natural liner
- Tailings and process water management, including water balance and the residence time of water in the tailings
- Discharges from the pit lake to the surrounding groundwater
- Contaminant transport pathways to surface water and through the Ladder Ranch
- Stormwater diversions around waste and tailings
- The monitoring well system

The focus is on impacts to Turner Ranch Properties, LP's Ladder Ranch (Ladder Ranch or Ranch), which is shown in Figure 1, and how the permit violates the Copper Rule (NMAC 20.6.7).

Upon my review, the Draft Permit violates the Copper Rule in the following ways:

- The Draft Permit's maximum daily discharge volume is inadequate because it fails to include estimates of leakage from either the tailings storage facility (TSF) or underdrain pond, as described within these comments. The Draft Permit therefore violates the Copper Rule's requirement that applicants determine the maximum daily discharge volume. It also indicates that the discharge quantity identified in the Draft Permit is significantly underestimated. This factor is key to the Secretary's determination whether the Draft Permit poses a hazard to public health or undue risk to property.

EXHIBIT

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- The andesite bedrock beneath the proposed waste rock stockpiles is not an impermeable liner and therefore will not completely prevent all leaks to groundwater, thereby posing a hazard to public health and undue risk to property.

- The applicant's water balance calculations reveal a huge error regarding initial startup water and free tails water. Because of this error, the DP Application grossly underestimates the amount of fresh water the applicant will pump at the beginning of the project. This, therefore, violates the Copper Rule's requirement that the applicant submit an accurate water management plan. This factor is also key to the Secretary's determination whether the Draft Permit poses a hazard to public health or undue risk to property.

- The applicant failed to adequately analyze whether the Mine's open pit will be a hydrologic evaporative sink at all times, in violation of the Copper Rule's Section 20.6.7.33.D NMAC.

- Contaminants discharged from the Mine's waste rock stockpiles and TSF pursuant to the Draft Permit could reach surface water near the Mine, including the Rio Grande. This poses a hazard to public health and undue risk to property.

- Tailings run-off collected in unlined ditches could seep into groundwater, posing a hazard to public health and undue risk to property.

- The proposed groundwater monitoring well network is grossly insufficient to detect contamination moving from the Mine's pit lake, waste rock stockpiles or TSF. Even with contaminant dispersion, entire contaminant plumes could escape the Mine site undetected, thereby posing a hazard to public health and undue risk to property.

1.1 Impacts to Ladder Ranch

Ladder Ranch lies east and north of the proposed Mine, as shown in Figure 1. As will be discussed below in the memorandum, the groundwater flows west to east through the Mine site and onto the Ranch. Contaminant plumes would disperse laterally, so most contaminants released from the Mine would flow through or under the Ladder Ranch. Upon my review, the Draft Permit violates the Copper Rule on the Ranch in the following ways:

- The Greyback Arroyo lies just south of the Ranch property line, so any Mine-impacted surface water/stormwater flow that could jump the banks or cause changes in the arroyo plan could negatively impact the Ranch through contamination of springs. Potential contamination resulting from the Mine's discharges poses a hazard to public health and undue risk to property.

- Contaminants discharged from the Mine's waste rock stock piles and TSF pursuant to the Draft Permit could reach springs on the Ranch. Wells and springs on the Ranch could become contaminated by the Mine's discharges that exceed water quality standards set forth in Section 20.6.2.3103 NMAC, posing a hazard to public health and undue risk to property.

- The proposed groundwater monitoring well network is grossly insufficient to detect contamination moving from the Mine site onto the Ranch. The monitoring wells are spaced too widely and contaminant plumes could slip through undetected, thereby posing a hazard to public health and undue risk to property on the Ranch.

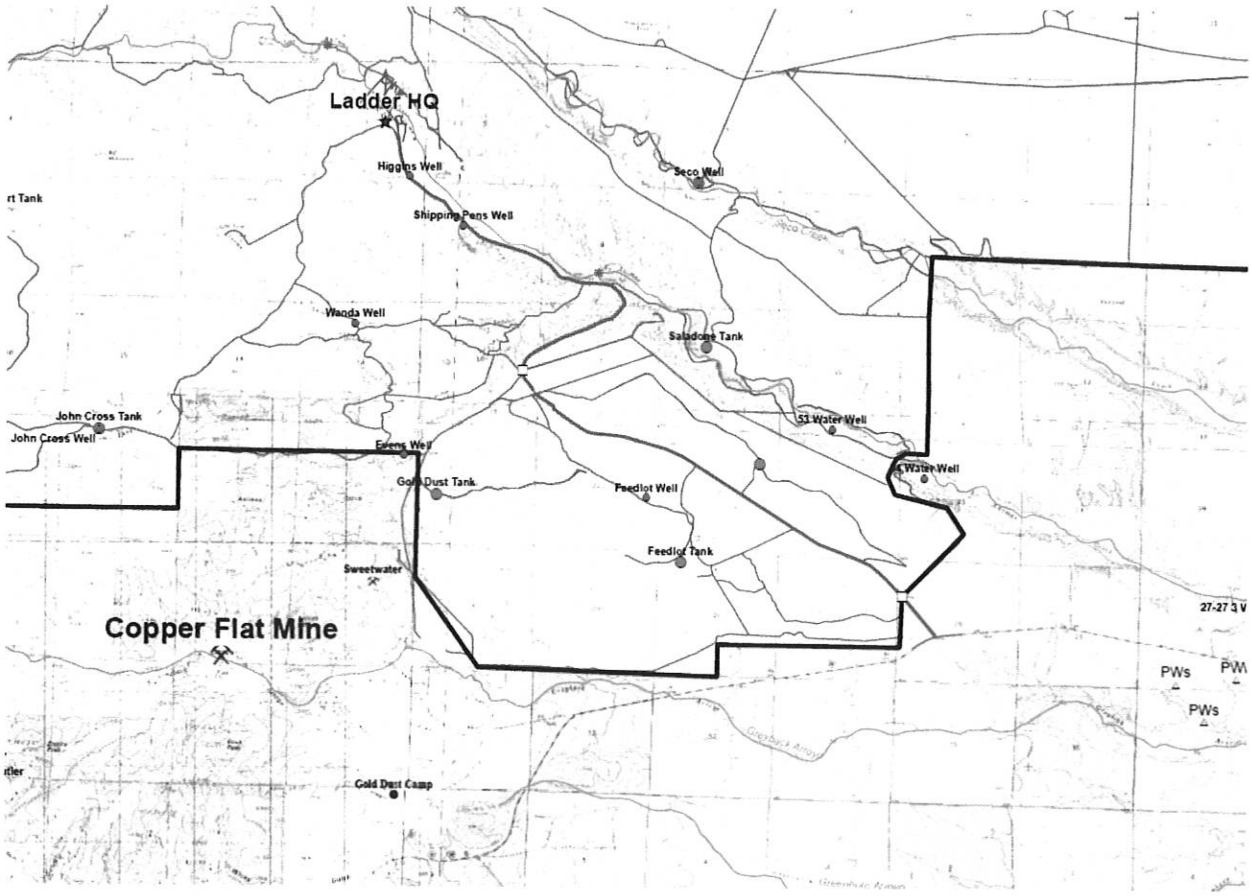

Figure 1: Map showing the Ladder Ranch, north of the dark property line, and the general location of the Copper Flat Mine.

2.0 Tailings Impoundment and Water Management Liners

The TSF would be constructed on the east portion of the Mine project site, downhill from and outside of the surface drainage area of the open pit and outside of the drawdown cone that will be caused by the pit dewatering (Jones and Finch 2017).

The TSF would ultimately contain 113 million tons of tailings waste from a facility producing ore at the rate of either 30,000 dry tons per day (tpd) (DP Application, p 1), 32,000 tpd (DP Application, p 41), or 38,000 tpd (Draft Permit, p 3). The maximum rate of slurry applied to the TSF would be 25,264,000 gallons per day (Draft Permit, p 3). The TSF would have an underdrain collection system, underdrain collection pond, and a water reclaim system (DP Application, p. 40). Much of the tailings water as

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captured in the underdrain or decanted from the surface would be reused for processing and dust suppression. Although the DP Application relies on the tailings underdrain to minimize leakage (Id.), the tailings underdrain would allow water to drain from the tailings and flow through the underdrain so that there would be a head of water on the underlying liner. Water would collect in depressions or sumps, which potentially would become a leakage source if the liner is not perfect as discussed below.

NMCC proposes as the primary means of protecting groundwater the use of engineered systems, primarily meaning liners under the TSF and various ponds. The proposed tailings liner would be 80 millimeter (mil) high-density polyethylene and 12-inch liner bedding material beneath the underdrain system and the underdrain collection pond would be a double-lined 60 mil HDPE liner (DP Application, p 41). However, the efficacy of the liners directly impacts the maximum daily discharge volume of the proposed Mine in the following way.

A leak is a discharge from the facility, according to Section 20.6.7.7.B(18) NMAC, and the Copper Rule specifies that the "maximum daily discharge volume" is the "total daily volume of *process water* ... or tailings ... authorized for discharge ..." (Section 20.6.7.7.B(35) NMAC, emphasis added). Process water includes any water within the copper mine facility that has contaminants exceeding standards specified in the Copper Rule, including leachate from waste rock or tailings impoundments (Section 20.6.7.7.B(50) NMAC). The Copper Rule requires that a DP Application determine the maximum daily discharge volume (Section 20.6.7.11.H.(1) and H.(3) NMAC) and that the Discharge Permit specify the discharge quantity.

However, DP Application section 20.6.7.11.H does not include estimates of leakage from either the TSF or the underdrain pond (DP Application, p 29). As noted, the DP Application and the Draft Permit simply assume that the engineering will completely protect groundwater. This is demonstrably not true (Beck et al 2009, Breitenbach and Smith 2006, Giraud and Bonaparte 1989). Even well-installed liners have pinhole leaks that allow leakage to enter the groundwater beneath the facility (the reference manual for the popular computer program for calculating flow through landfills (Schroeder et al 1994) provides estimates for the number of leaks in liners). Beck et al (2006) refers to geomembrane liners as causing "leakage avoided", meaning that improving the liner system simply avoids leakage, or reduces it, and that even in cases of excellent liner installation a liner still has leaks. Beck et al also provide data showing that liners with merely good installation can have leakage rates six times higher than liners with excellent installation for the same head over the liner.

Neither the DP Application nor the Draft Permit includes leakage estimates and therefore do not fulfill the Copper Rule's requirement that discharge quantities be estimated. NMED should therefore revise the Draft Permit to accurately reflect the maximum daily discharge volume.

The Ranch lies east and north of the proposed Mine, as shown in Figure 1. Groundwater flows west to east through the Mine site, and a contaminant leak from the TSF would disperse laterally - possibly resulting in contaminants reaching groundwater underneath the Ranch property. Additionally, wells and springs on the Ranch could become contaminated by discharges that exceed water quality standards set forth in Section 20.6.2.3103 NMAC. This potential contamination poses both a hazard to public health and an undue risk to property. Accordingly, approval of the draft permit, as written, would violate Section 20.6.7.10.J NMAC.

3.0 The Use of Andesite Bedrock Under the Waste Rock as a "Natural Liner"

NMCC claims the andesite bedrock underneath the proposed waste rock stockpiles[1] is an impermeable[2] liner that can substitute for an engineered geomembrane liner. It provides two arguments that the conductivity[3] (K) of the andesite is very low (Jones et al 2014, p 23). The first argument is that dewatering rates during the Mine's brief operations in 1982 and the evaporation rates from the existing pit lakes indicate there is very little groundwater inflow (through andesite) to the pit. The second argument is that Jones et al's completed pressure-injection tests demonstrate a low K. Neither of these arguments supports considering andesite as a substitute for a properly-installed impermeable liner. Additionally, while the numerical model simulated very little recharge into the andesite, this is not evidence of low permeability andesite because many things other than the formation K control recharge rates, including potentially fallacious modeling assumptions. The following paragraphs expand these three points.

3.1 Dewatering the Pit and Pit Lake Evaporation

The pumping rate for dewatering the pit while being mined in 1982 ranges from 22 to 50 gpm (Jones et al 2014, p 23). The pit lake which formed post-1982 has evaporated from between 16 and 45 gpm from a surface area which varied from 5 to 14 acres (Jones et al 2014, p 42). This rate reflects not only the transmissivity[4] of the formation connected to and providing water to the pit, but also the amount of recharge[5] reaching the pit. Due to faults limiting the area that may directly drain to the pit, the recharge may be limited by a small contributing area and by the precipitation.

Faults bound the andesite volcano which contains the ore body (Jones et al 2014, Figure 4.2 and 4.3). Recharge within these faults likely is the source of most of the flow into the pit, because the faults may be flow barriers[6]. Jones et al indicates that most groundwater in the Animas Graben[7] uphill from the Mine site either discharges to the surface in Warm Springs, uphill from the Animas Uplift[8], or it flows north or south to Percha Creek or Las Animas Creek (Jones et al 2014, p 24). Based on these observations, the groundwater entering the pit or pit lake must originate as recharge within the volcano fault system. Jones et al does not provide an estimate of the area of andesite within the volcano, but scaling from the map suggests it is about three miles square, or 5760 acres. Spreading the dewatering

[1] Waste rock is rock that does not contain enough ore to process and stockpiles are where the waste is stored.
[2] Impermeable means that the formation is impervious to water flowing through it. In reality, nothing is truly impervious but rather it would allow only small amounts of water to enter.
[3] Conductivity is a measure of the ease with which water will flow through a formation.
[4] Transmissivity is a measure of the ease with which water will flow through an aquifer, and is the product of the conductivity and the thickness of the aquifer.
[5] Recharge is water that flows through the soil to reach the groundwater table.
[6] A flow barrier is a formation that prevents flow.
[7] A graben is a geologic formation that has been downthrust due to faulting.
[8] An uplift is a geologic formation that has been thrust upward due to faulting.

rate of 22 to 50 gpm over the area would yield from 0.07 to 0.17 in/y. However, there are indications there is much more groundwater in the volcano.

One indication is that there is no step drop[9] in the groundwater table at the point where the volcano meets the Palomas Basin east of the pit (Jones et al 2014, Figure 4.2). If the fault was a significant flow barrier, the water table would drop. This observation suggests that flow leaves the volcano area and there is more recharge than indicated by the pit dewatering rates.

A second indication is that the pit lake forms only a small drawdown cone[10] that could capture recharge from only a small portion of the andesite. This can be seen in the existing conditions groundwater contours (Jones et al 2014, Figure 5.21), which show flow arrows passing the capture zone of the pit and in the steady state[11] contours from the model calibration (Jones et al 2014, Figure 6.11). The simulated steady state 50-foot contours (Id.) show a small crenulation[12] at the pit indicating the pit captures some flow. The mapped pit lake contours indicate the drawdown is only about 25 feet (Jones et al 2014, Figure 5.21).

A third indication is the two springs shown within the crystalline bedrock surrounding the proposed pit (Jones et al 2014, Figure 4.4). Jones et al does not provide a flow estimate or even discuss them, but they clearly represent another discharge point for recharge occurring within the volcano.

3.2 Pressure Injection Test

The pressure injection test yielded K estimates in three boreholes, with three different levels in two of the boreholes. Jones et al (2011 Table 1) summarized the K estimates, ranging from effectively zero in one well that had some fracture-sealing issues to 0.14 ft/d, including 0.02, 0.085, 0.081 and 0.074 ft/d for various well levels. These estimates are mid-range, as shown in Freeze and Cherry (1979) Table 2.2, with the values being equivalent to those for silty sand or silt loess, or sandstone. The range includes fractured igneous and metamorphic rocks. Truly impermeable rocks, such as unfractured metamorphic rocks, have a K five orders of magnitude lower than the andesite being proposed as a liner herein.

The zones tested for permeability also were at least 64 feet below ground surface, with all but one exceeding 100 feet below ground surface (bgs). It is not known whether these levels were below the water table, since Jones et al provided no well log for them. Although the highest observed K is at the deepest range for borehole GWQ 11-24, the typical trend is for higher K to occur nearer the surface due to weathering which causes rock to fracture.

The other issue not considered when using the pressure injection tests to justify considering the andesite impermeable is scale – the waste rock will cover multiple acres whereas these tests are

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[9] A step drop is a point at which the water table changes steeply.

[10] Drawdown is the distance that the water table changes due to pumping or dewatering, and a cone is how the water table experiencing drawdown appears in three dimensions.

[11] Steady state is a condition when the inflow to a groundwater system equals the outflow, with there being no change in groundwater storage.

[12] A crenulation in a water table contour is where the contour line has a sharp bend due to a small trough in the water table.

relevant to only small volumes of the aquifer. Conductivity expressed over a large area is an average for that area, including fractures and unfractured media between the fractures. Most infiltration would occur through fractures, even though the fractures probably represent a small fraction of the andesite. If the waste rock covers fracture zones, it is likely that the seepage that makes it through the waste to the ground surface will flow across the ground surface and contact fracture zones. Seepage should not be considered as an average over the area of the waste rock stockpile, but as significant plumes of moisture entering the ground beneath the stockpile. It is therefore likely that K at the surface is even higher, contradicting the argument that andesite bedrock is sufficiently impermeable to serve as a liner.

3.3 Groundwater Model Recharge in to the Andesite

The groundwater model steady state calibration (Jones et al 2014, section 6.3) balances recharge with discharge to surrounding streams. The pinkish area in Figure 2 is the andesite and has recharge equal to 0.14 in/y; the area east of that is the Natomas basin which has no recharge. The rate corroborates the rate estimated above for offsetting the dewatering and evaporation rates. Because groundwater discharges other than to the pit lake, such as to springs, streams, and the Rio Grande downgradient from the Mine area, the calibrated recharge rate is clearly too low.

Simulated recharge is of meteoric water, rainfall and snowmelt, which occurs intermittently during specific events. Although the MODFLOW modeling is an empirical estimate and not a simulation of the physical process, it still represents a process that occurs only when water is available. Only 0.14 in/y is available because during the short-term events the water availability overwhelms the capacity of the ground surface to allow it to percolate so that that much of it runs off. A waste rock stockpile, prior to reclamation, would allow much of the meteoric water to enter and pass to the ground surface (the andesite) uniformly so that it would not runoff and would have full opportunity to enter the ground surface. The effective rate that water would reach the ground surface would exceed 0.14 in/y by many times and would do so much more uniformly with opportunities for seepage to enter the andesite lasting for much of the year.

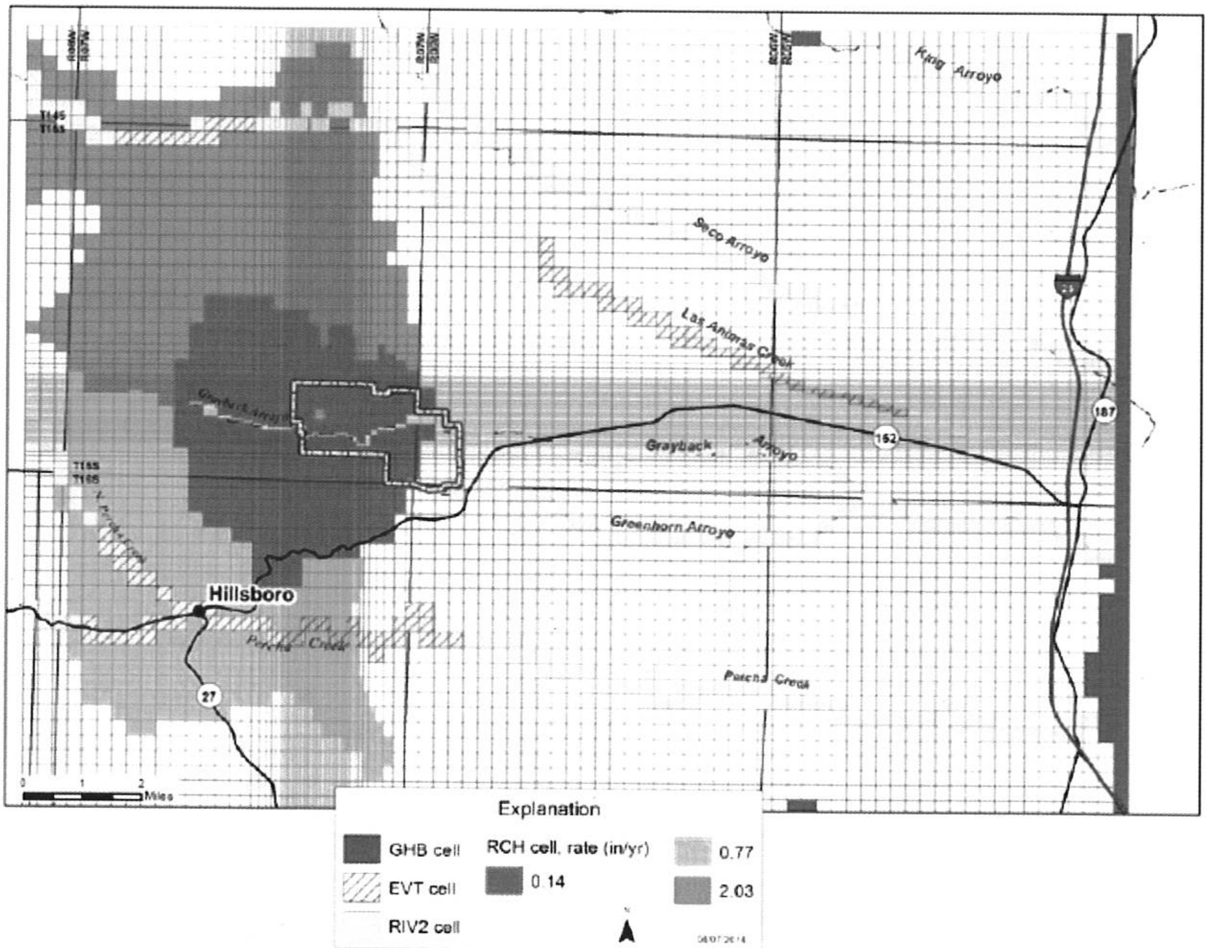

Figure 6.6. Natural boundary conditions.

Figure 2: Figure 6.6 from Jones et al (2014).

It is very likely that waste rock would cause more meteoric water to enter the ground. Andesite is not similar to a liner, because the average K is too high, it is fractured, and the waste rock would cause the water to reach the soil much more uniformly than it would without the waste rock. The DP Application (p 65) is not accurate where it states the permeability of the andesite is less than 10^{-6} cm/s; all of the estimates in Jones et al (2014) Table 5.2 exceed 10^{-5} cm/s. Therefore, Jones et al's modeling yielded conductivity values that contradict the andesite impermeability assumption in the DP Application.

4.0 Tailings and Process Water Management

NMCC summarizes the water balances for the mineral processing activities by stating that 13,000 gpm of water is necessary to operate the facility, 9200 gpm of which will originate from the TSF and 3800 gpm would be make-up water that is freshly pumped groundwater which supplements the other sources of water. The TSF water would be water pumped from the surface of the tails with a barge pump having a maximum capacity of 9200 gpm, and pumped from an underdrain collection pond at a design capacity up to 4000 gpm (DP Application p 73). NMCC would also use captured site stormwater, which NMCC describes as water that replaces water that would otherwise be pumped make-up water. DP Application Table 11J-2 shows total ore processing water totaling 21,242 af/y, with 15,504 and 5738 af/y being recycled and non-recycled water, respectively. If the facilities operated as proposed and the various pond liners do not leak, the primary lost water would be 4973 af/y that remains entrained[13] in the tailings and 752 af/y lost to evaporation (from the tails and various ponds). DP Application Appendix A describes the processing facilities in which Appendix G tabulates detailed water balance calculations (hereinafter, water balance refers to Appendix G of DP Application Appendix A).

The water balance tables show that average reclaim water (recycled water) is drainage from underflow tailings, and free water from the cyclone overflow slimes and cyclone overflow beach. The beach is the dry part of the tailings impoundment surface which NMCC estimates at about ¾ of the total impoundment; for example, the water balance shows after one month the pond and beach areas are 1,742,400 and 6,740,054 ft^2, respectively. Also, tailings discharge is 29.1% solids, and NMCC describes the cyclone feed as 31,992 tpd which requires 77,946 tpd of water, or 12,978 gpm (Table 2 of the water balance).

The water balance includes monthly volumes of water inflows, such as water inflow for the first month being 579,339,937 gallons of tailings water, 3,066,903 gallons of direct precipitation and 271,525 gallons of run-on. Of this, water losses include 135,827,440 gallons being entrained, and three evaporation fluxes[14]. The tailings water includes the majority, 433,345,798 gallons, being reclaimed from the TSF.

The water balance calculations reveal huge error – the table assumes steady state conditions and ignores the tailings water that remains in the saturated portion of the tails. Entrained water is that which wets the tailings, but water in the tailings pore spaces[15] will drain from the tailings. The underdrain captures this flow (or leaks it). The error is that the water balance calculations do not account for the free water that remains within the tailings, but rather shows a steady state condition, with all of the tailings water not entrained or evaporated being reclaimed. Water that remains in the tailings or evaporates cannot be reclaimed or reused.

The water balance also does not account for the water that initially would be added to the ore processing system[16]. Most of the 9708 gpm of "Water reclaimed from TSF" (Id.) for the first month, and certainly portions of the reclaim water for subsequent months, have not yet been added to the ore-processing and tailings circuit. The make-up water for the first month is 3270 gpm, but because there is initially no source of the reclaimed water, the first month, and many subsequent months or even years, would likely require additional make-up water. Steady state conditions would occur once the water recycled from the TSF reaches its full possible rate. Until the water balance reaches steady state, the

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[13] Entrained water is water that goes to wetting the tailings and is not free to drain to the underdrain.
[14] Evaporation flux is the rate that water evaporates.
[15] Tailings pore spaces are the open volumes between tailings particle, or volume of tailings occupied by air or water.
[16] In this review, ore processing system includes processing, the discharge of tailings to the TSF, and the various features for recycling water, including the underdrain and the recant.

amount of recycled water presented in Table 3 of the water balance is underestimated and the make-up water must be much higher than predicted. In other words, the applicant will have to pump much more groundwater than acknowledged in the water balance just to commence the mine processing.

The DP Application description of the water balance, as presented in the water balance table of Appendix G of the DP Application, violates the Copper Rule requirement that an accurate water management plan be presented. Specifically, it violates Section 20.6.7.11.H(2) NMAC because the "identification of all sources of process water and tailings" is wrong. The Mine's DP Application clearly fails to account for initial start-up water and it fails to account for free tails water.

The Mine's impacts to groundwater from the pumping of the required amounts of groundwater for operations clearly have not been estimated at all and the actual impacts to groundwater-related resources have been grossly underestimated. Without this required analysis, the Secretary cannot accurately and definitively rule out whether the Draft Permit will pose a hazard to public health or an undue risk to property due to substantially lowered groundwater tables and associated lowering of hydrologically connected surface water. NMED must therefore require NMCC to revise its water balance calculations and associated water management plans.

5.0 Pit Lake Discharge to Surrounding Groundwater

If the pit lake is a flow through pit[17] after closure, the pit lake water quality must meet groundwater standards (Section 20.6.7.33.D(2) NMAC). If the pit lake is a hydrologic evaporative sink[18], the groundwater standards would not apply (Section 20.6.7.33.D(1) NMAC). The DP Application (p 165) states the final steady state water surface would be about 4895 ft above mean sea level (amsl). NMCC would do a rapid refill by adding about 2200 acre-feet to the pit within six months after closure. NMCC claims that groundwater downhill of the pit would be 5100 ft amsl, which is higher than the full pit lake level, and that would prevent pit lake water from escaping the zone around the pit and mixing with groundwater (Jones and Finch 2017).

The basis for NMCC's claim is the modeling of dewatering and pit lake development (Jones et al 2014, Jones and Finch 2017). The modeling relies on calibrated aquifer parameters[19], as shown in Jones et al (2014) Table 6.1. The andesite formation is the primary formation in the Animas Volcano zone of the Animas Uplift (Jones et al 2014, Figure 4.3), although quartz monzonite surrounds the pit and controls the hydraulics of flow around the pit (Jones et al 2014, Figure 4.3, Figure 6.3). Parameters for the andesite and quartz monzonite are the same throughout the model, so treating them as separate has no effect on the model results. The andesite and quartz monzonite are referred to as the pit formations hereinafter whenever both are implied.

[17] A flow through pit is one in which groundwater enters the pit and then discharges from the pit.
[18] A hydrologic evaporative sink means that evaporation from the pit exceeds precipitation so that groundwater drains to the pit.
[19] Aquifer parameters are properties that define the aquifer and control how groundwater flows through it, including conductivity, transmissivity, and porosity. Transmissivity is the product of conductivity and thickness.

The modeling treats the pit formations as a homogeneous formation, with K equal to 0.002, 0.001, and 0.001 ft/d for layers 2, 3, and 4, respectively. Vertical anisotropy[20] is 0.01 for all three layers, which means that the vertical K is 1/100th of the K specified above. Layers 2, 3, and 4 are 1000, 2000, and 3000 feet thick, respectively. Simulations of pit dewatering and pit lake development all occur within layer 2 because it is 1000-feet thick and therefore encompasses the entire profile of the pit, which means dewatering is simulated as being drawn from one homogeneous formation. Modeling the pit formations in this way assures that the drawdown cone near the pit is very steep and does not expand from the pit quickly. Thus, at the end of mining, the simulated volume of unsaturated pit formation[21] between the pit wall and the saturated zone, or drawn-down water table, is small (Figure 3). As NMCC rapid fills the pit, water from the pit lake would enter that unsaturated formation. As shown on Figure 3, NMCC's simulated water table encircles the pit and prevents water from escaping. However, this simulated water table is inaccurate for various reasons discussed below, including the calibrated K being far too low and because the modeling ignores potential fracture zones.

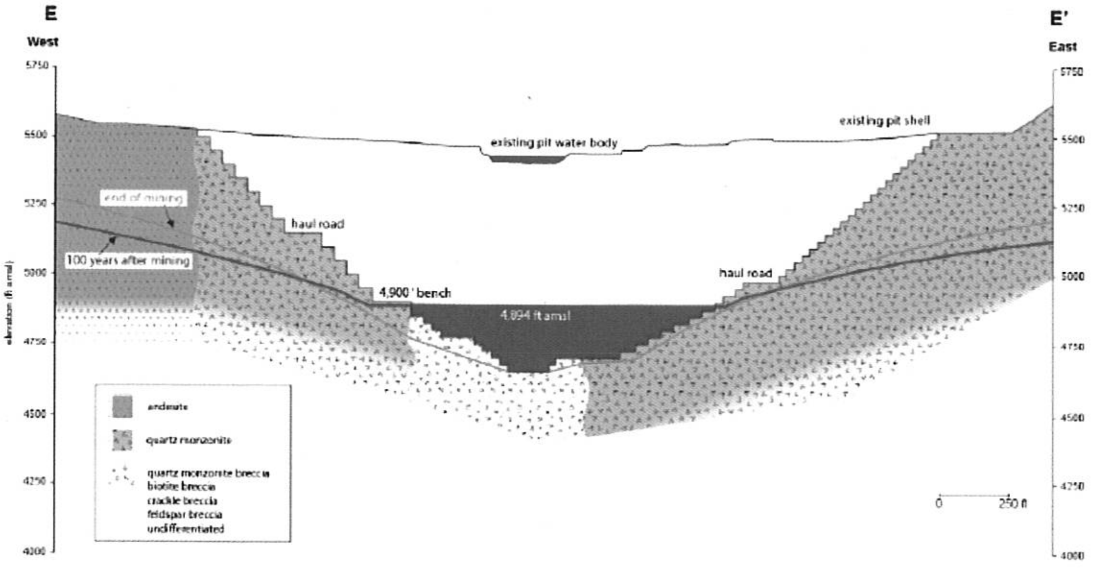

Figure 3.16. West-to-east hydrogeologic cross-section E-E' showing water-level profile across existing pit and proposed open pit after rapid fill.

Figure 3: Figure 3.16 from Jones and Finch (2017) showing the water table near pit at the end of mining and 100 years after the end of mining.

The first reason the simulated water table is inaccurate is that the calibrated andesite K is two orders of magnitude less than the measured values. Therefore, the water table drawdown forms a steep cone near the pit, as shown in NMCC's modeled results in Figure 3. If the K was higher, as measured, there

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[20] Anisotropy is a ratio of hydraulic conductivity values in different direction. If vertical conductivity is less than horizontal conductivity, the vertical anisotropy would be greater than 1.0 (Kh/Kv is vertical anisotropy).

[21] The unsaturated pit formation is the geologic formation surrounding an open pit than has been drained of groundwater. As the pit lake forms after mine dewatering ceases, groundwater will reenter some of the unsaturated pit formation.

would be much additional aquifer volume between the pit and the drawn-down water table. Additionally, the model parameterization ignores the results of the pressure injection tests, in that the testing found that K at depth was greater than in shallow areas, but the parameterization assumed the highest layer had the highest K. There is no basis for the Jones et al (2014) assumption of decreasing K at depth because they conducted no analyses of permeability at levels lower than 250 feet bgs.

The second reason the simulated water table is inaccurate is the failure to consider fractures. Layering in bedrock means the model could miss pathways in the bedrock that would connect the forming pit lake to the aquifer beyond the groundwater divide. By assuming a homogenous 1000-foot thick formation, Jones et al (2014) essentially ignored fracture zones in the model. However, the variability of K found in the pressure injection tests demonstrates that fractures are likely. These tests showed that K varied over an order of magnitude over just 150 feet. More and longer samples would undoubtedly reveal zones with even higher permeability. These pathways could allow contaminants to escape the drawdown cone so that most of the formation drains away from the pit rather than towards it. NMCC has presented no evidence that indicates there are no significant fracture pathways that would cause contaminants to escape the pit.

The third reason the simulated water table is inaccurate is the drawdown cone generated by dewatering in a formation with higher K would be much more spread out, and flatter, than the one shown in Figure 3. Drawdown caused by dewatering in a sloped groundwater table, west to east as occurs pre-mining at the Mine, forms a groundwater divide[22] east of the pit. This "capture zone" defines an area from which water will be drawn to the pit, or pit lake. The elevation of the groundwater divide depends on the K of the formation in which it is calculated, the recharge entering the formation near the pit, and the steepness of the original water surface through the pit. The groundwater divide in a more conductive pit formation would occur further downgradient from the pit and therefore would be lower because the pre-mining water table would be lower. The groundwater divide would also be lower if the pre-mining groundwater table was steeper. Higher recharge would increase the water flowing to the pit and needing to be dewatered, so for a given K it would raise the groundwater divide because a higher gradient would be required to cause the water to flow toward the pit.

The fourth reason the simulated water table is inaccurate is that fracture zones in the pit formations would cause the groundwater table near the pit to be irregular, and the divide could form further from the pit and at a lower elevation in a high K fracture zone. The groundwater divide in these zones would possibly be lower than the final pit lake elevation estimated by NMCC based on a homogeneous pit formation, so these zones provide possible pathways for water to escape the forming pit lake to reach downgradient groundwater.

NMCC has clearly not analyzed this potential nor presented evidence to support its assumption of no fracture zones. Analysis could be accomplished within the model by increasing the K by two orders of magnitude to reflect the measured values, and by creating potential zones with even higher K. However, due to the lack of mapping of these zones, they could be tested only theoretically.

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[22] A high point, or ridge, in a groundwater table.

Finally, Finch and Jones (2017) presented an analysis of how much rainfall would be necessary to cause the pit lake to rise high enough to escape their estimated 5100 ft groundwater divide. Rather than considering the rapid refill which could cause the pit lake to rise above the surrounding groundwater, they estimated it would require a 250-inch rainstorm to fill the pit lake to a level above surrounding groundwater (Finch and Jones 2017). The amount is ludicrous in an area with less than 20 inches of annual rainfall.

Without evidence or modeling as evidence, NMED must assume that pit lake water could escape the pit and contaminate surrounding groundwater during the proposed filling operations. NMED, however, could minimize potential contamination of groundwater from pit lake discharges by properly administering the pit lake as a flow-through pit during the rapid fill and until the groundwater level has recovered to make the pit lake a sink. The pit lake during rapid refill must be subject to water quality standards found at Section 20.6.2.3103 NMAC. NMED should therefore revise the Draft Permit to require that Section 20.6.2.3103 NMAC standards be met at the pit lake during refill operations, in accordance with Section 20.6.7.33.D(2) NMAC.

6.0 Groundwater Contaminants Reaching Surface Water

Contaminants escaping the waste rock/tailings facilities could reach surface water near the Mine site, including the Rio Grande. NMCC acknowledges that its production pumping and subsequent consumptive use could affect flows in the Rio Grande, so it follows that groundwater pathways from the Mine site to the river could contain contaminants. The potential of surface water contamination from the Mine's contaminated discharges would be even greater during closure because production pumping that might capture contaminants during operations will not be operating. Even though it is unlikely that contaminants would reach the production wells within the Mine's operation phase due to slow transport time, the risk of contaminants reaching the river remains over the long-term. Therefore, the Draft Permit as written poses a hazard to public health and undue risk to property from migrating contaminants reaching the Rio Grande and negatively impacting the river's water quality and ecosystem.

Additionally, as previously discussed, the Ranch lies east and north of the proposed Mine, as shown in Figure 1. Groundwater flows west to east through the Mine site, so pathways emanating from any point on the Mine site could cross the Ranch property as they flow eastward to the river or tributaries. Contaminants follow those pathways, and a plume would develop around the flow paths, meaning that dispersion to the north from the flow path would penetrate far into groundwater within the Ranch property. Wells and springs on the Ranch could become contaminated by the Mine's discharges, posing both a hazard to public health and an undue risk to property. Accordingly, approval of the Draft Permit, as written, would violate Section 20.6.7.10.J NMAC.

Failure to discuss these pathways also violates Sections 20.6.7.11.P(4) and (5) NMAC, which require the identification of potential pathways for migration of contaminants to surface water and the identification of surface waters that are gaining because of inflow of groundwater that may be affected by contaminants. The DP Application (p 153, 154) attempts to address potential pathways but mostly implies the liners or covers would prevent contaminants from entering the groundwater. The DP

Application fails by not considering the pathway that contaminants would follow from waste rock stockpiles, the tailings impoundment, or escaped contaminants from the pit to surface water, whether Percha Creek, Las Animas Creek, Greyback Arroyo, or the Rio Grande, and the effect to offsite properties including the Ranch. This pathway mapping should also be used to site additional groundwater monitoring locations to monitor if leaks are occurring.

NMCC could use its model to track pathways from the sources (TSF, waste rock stockpiles, pit) to their eventual sinks (the feature into which the contaminant would discharge). This could be accomplished with particle tracking using the existing model, although it would include the biases toward low K in the bedrock discussed above. Using reasonable seepage rates, the model could also be used to track contaminants and estimate contaminant plumes. It could also estimate relative contaminant concentrations for discharges into the rivers. NMED must therefore require NMCC to modify its model to adequately track contaminant pathways in order to satisfy Sections 20.6.7.11.P(4) and (5) NMAC.

7.0 Stormwater Diversions and Prevention of Infiltration to the Tailings and Waste rock.

Diverting stormwater away from the tailings impoundment, surge pond, underdrain collection pond, and process water reservoir is a method used for minimizing the potential for groundwater pollution that would occur if stormwater contacted these materials and seeped into the ground (DP Application, p 42). The tailings impoundment would mostly be protected from runoff through the Mine site from above by the routing of the Greyback Arroyo through the Mine site (DP Application, p 100). Runoff from the tailings dam would be collected in ditches which report to a lined conveyance ditch at the toe of the dam. The biggest threat to groundwater from runoff at the tailings impoundment is runoff leaking from the unlined ditches into and through the embankment and into the ground near the base of the TSF. These ditches would collect water and form a source for seepage into the embankment.

The DP Application also claims that run-off would be diverted away from waste rock stockpiles to minimize contact with waste rock through the use of unlined collection ditches. However, the figures are not sufficiently detailed to assess whether the proposed diversion would be successful. As with the tailings, these unlined collection ditches would concentrate run-off, creating sources of seepage that would percolate through the waste rock to the ground surface, eventually entering groundwater. Because the collection ditches are not lined (see cross-section C and D, Figures 9 and 11, DP Application Appendix B), seepage would occur through the bottom of the ditches. This additional seepage would add to the direct seepage through the waste rock stockpiles.

The DP Application and Draft Permit therefore fail to protect groundwater from the seepage of stormwater into the base of the tailings and waste rock stockpiles. They also fail to estimate the amount of discharge that would occur, in violation of the Copper Rule. It is clear, on the face of the DP Application and associated Draft Permit, that seepage from unlined stormwater collection ditches will pose a hazard to public health and undue risk to property by contaminating groundwater.

Again, Ladder Ranch lies east and north of the proposed Mine, as shown in Figure 1. Groundwater flows west to east through the Mine site, so most contaminants released from the Mine pursuant to the Draft Permit would flow through or under the Ranch. This includes seepage from unlined stormwater collection ditches. Wells and springs on the Ranch could therefore become contaminated by the Mine's discharges from unlined stormwater collection ditches. This potential contamination poses both a hazard to public health and an undue risk to property. Accordingly, approval of the Draft Permit, as written, would violate Section 20.6.7.10.J NMAC.

8.0 Groundwater Monitoring Well Network

The groundwater monitoring well network, described in DP Application Appendix E, is grossly insufficient to detect contamination moving from the forming pit lake, waste rock stockpiles or TSF, thereby resulting in a hazard to public health and undue risk to property. It does not meet the requirements for monitoring specified in the Copper Rule.

> A permittee shall monitor ground water quality as close as practicable around the perimeter and downgradient of each open pit, leach stockpile, waste rock stockpile, tailings impoundment, process water impoundment, and impacted stormwater impoundment The department may require additional wells around the perimeter of mine units that are underlain by areas where ground water flow directions are uncertain, including fracture flow systems, and around copper mine units that have the potential to cause ground water mounding. The department may require additional monitoring wells at any other unit of a copper mine facility that has the potential to cause an exceedance of applicable standards as additional permit conditions in accordance with Subsection I of 20.6.7.10 NMAC. **Monitoring wells shall be located pursuant to this section to detect an exceedance(s) or a trend towards exceedance(s) of the applicable standards at the earliest possible occurrence, so that investigation of the extent of contamination and actions to address the source of contamination may be implemented as soon as possible.** (NMAC 20.6.7.28.B, emphasis added)

As will be described, the monitoring wells are spaced too widely to even detect contaminant plumes emanating from the sources (such as the TSF, pit, and waste rock stock piles). Even with dispersion, the wide spacing would allow plumes to slip between monitoring wells undetected. NMED clearly has authority under the Copper Rule to require a greater and more appropriate number of monitoring wells at Copper Flat than the inadequate number the Draft Permit is proposing. Section 20.6.7.28.B NMAC. The following paragraphs will discuss monitoring at the waste rock stockpiles (WRSP) 2 & 3, the TSF, ponds, and the open pit and how NMCC's proposal is inadequate to detect contaminant migration.

8.1 Waste Rock Stock Piles

NMCC proposes four new monitoring wells around the perimeter of WRSP3 (#2 is upgradient from #3). Proposed wells PGWQ-4, PGWQ-7, PGWQ-8, and PGWQ-12 are located on the perimeter and spaced at from 1000 to 2000 feet, based on scaling from Figure 4 in Appendix E. PGWQ-12 is south of WRSP2. These four wells would only detect contaminants if there is a leak directly upgradient from them because a leak anywhere would slip between the wells undetected due to the well spacing. PGWQ-5, PGWQ-13, and PGWQ-20 will be additional monitoring wells farther down-gradient of the waste rock (Appendix E, p 13) along the runoff channel conveying upgradient water through the site. The water is probably not Mine-impacted, so percolating runoff would dilute any contaminants in these wells, rendering the wells much less useful for monitoring purposes. Also, PGWQ-13 and -20 are just north of the TSF, and any contaminant found there would have an indeterminate source – the waste rock, the TSF, or impacted storm water.

8.2 Tailings Storage Facility

There are essentially just four monitoring wells proposed for near the perimeter of the TSF – PGWQ-14, -15, -16, and -19 (Appendix E, p 14). All are replacement wells for existing monitoring wells that will be buried by the expanding TSF (Id.). The existing wells will be the monitoring wells initially. The new proposed wells are spaced at what scales at greater than 2000 feet. As for the waste rock stockpiles, these wells will detect contaminant only if their source is just upstream from the well.

8.3 Monitoring Wells Downgradient from Ponds

The DP Applications indicates there are additional monitoring wells proposed downgradient from different ponds, such as PGWQ-17 downgradient from the underdrain collection pond (Appendix E, Figure 4) or PGWQ-6 downgradient from a Mine-impacted stormwater impoundment[23]. The source of contaminants reaching these wells could be difficult to discern because of multiple sources upgradient from them. Monitoring wells downgradient from stormwater impoundments should be sampled during the normal sampling times and after each large storm event during which the impoundment filled with water. This would help detect changes due to stormwater seeping through the pond. NMED should revise the Draft Permit accordingly.

8.4 Addition of Monitoring Wells Around the Waste Rock Stockpiles and Tailings Storage Facility

NMCC should propose additional monitoring wells for the waste rock and tailings based on potential plume dispersion from leaks in the facilities, pursuant to its authority under Section 20.6.7.28.B NMAC. The spacing should be set so the chance that a plume could slip between the monitoring wells is small. This would be accomplished by using a detailed numerical transport model for the site. The regional model of Jones et al (2014) may not be detailed enough, but it could form the basis for a telescoped model grid[24] around the sources. The transport model should use reasonable dispersion parameters to simulate the growth of the plume. The maximum spacing between monitoring wells should be a little less than the width of the simulated plume, to be conservative. Without this type of modeling, the placement of the wells is simply random guesswork and there can be no confidence that groundwater contamination would be found, potentially resulting in a hazard to public health and undue risk to property.

8.5 Open Pit

The monitoring well network around the pit also appears to be grossly inadequate. NMCC proposed to use three existing monitoring wells upgradient of the pit and six monitoring wells, four existing and two new, around the pit perimeter. The wells appear to be designed more to monitor water level than to

[23] A mine-impacted stormwater impoundment is one which contains stormwater that has contacted mine disturbed rock or soil.

[24] A telescoped model grid is one where the model is made much more detailed around a specific area.

monitor potential leaks. Appendix E Table 3 does not show the elevation of the screens, but some of the depths appear to not be deep enough to sample the water at the full depth of the pit. The monitoring well network must be designed to detect whether groundwater flows from the pit into surrounding groundwater.

NMED should use its authority under the Copper Rule to require additional monitoring around the Mine facilities, based on adequate modeling of how plumes would develop from different portions of the Mine as described above in section 8.4. NMED should require an inner and outer perimeter of monitoring wells that will sample the water table when the pit is at full drawdown. The focus should be on the east side of the pit, with about six monitoring wells on an inner perimeter and six on an outer perimeter. This would detect irregularities in the water table that would allow pit lake water mixing with groundwater.

9.0 Conclusion

The DP Application submitted by NMCC for a discharge permit for the proposed Copper Flat Copper Mine Draft Discharge Permit, DP-1840, is insufficient and the Draft Permit poses a hazard to public health and undue risk to property on the Ranch. The Draft Permit violates the Copper Rule in the following ways:

- The Draft Permit's maximum daily discharge volume is incorrect because it does not include estimates of leakage from either the TSF or Underdrain Pond. This violates the Copper Rule's requirement that applicants determine the maximum daily discharge volume. The discharge quantity identified in the Draft Permit is significantly underestimated. This factor is key to the Secretary's determination whether the Draft Permit poses a hazard to public health or undue risk to property.

- The andesite bedrock beneath the proposed waste rock stock piles does not substitute as an impermeable liner and therefore will not completely prevent all leaks to groundwater, thereby posing a hazard to public health and undue risk to property.

- The applicant's water balance calculations include a huge error regarding initial startup water and free tails water. Because of this error, the DP Application grossly underestimates the amount of fresh water the applicant will pump during the commencement and initial months of the project. This therefore violates the Copper Rule's requirement that the applicant submit an accurate water management plan. This factor is key to the Secretary's determination whether the Draft Permit poses a hazard to public health or undue risk to property.

- The applicant failed to adequately analyze whether the Mine's open pit will be a hydrologic evaporative sink at all times, in violation of the Copper Rule's Section 20.6.7.33.D NMAC.

- Contaminants discharged from the Mine's waste rock stock piles and TSF pursuant to the Draft Permit could reach surface water near the Mine, including the Rio Grande. This poses a hazard to public health and undue risk to property.

- Tailings run-off collected in unlined ditches could seep into groundwater, posing a hazard to public health and undue risk to property.

- The proposed groundwater monitoring well network is grossly insufficient to detect contamination moving from the Mine's pit lake, waste rock stock piles or TSF. Even with contaminant dispersion, entire contaminant plumes could escape the Mine Site undetected, posing a hazard to public health and undue risk to property.

Ladder Ranch lies east and north, partly downgradient, of the proposed Copper Flat Mine. Due to dispersion of the contaminants, many leaks emanating from the proposed Mine would flow through or under the Ranch. Upon my review, the Draft Permit violates the Copper Rule on the Ranch in the following ways:

- The Greyback Arroyo lies just south of the Ranch property line, so any Mine-impacted surface water/stormwater flow that could jump the banks or cause changes in the arroyo plan could negatively impact the Ranch through contamination of springs. Potential contamination resulting from the Mine's discharges poses a hazard to public health and undue risk to property.

- Contaminants discharged from the Mine's waste rock stock piles and TSF pursuant to the Draft Permit could reach springs on the Ranch. Wells and springs on the Ranch could become contaminated by the Mine's discharges that exceed water quality standards set forth in Section 20.6.2.3103 NMAC, posing a hazard to public health and undue risk to property.

- The proposed groundwater monitoring well network is grossly insufficient to detect contamination moving from the Mine site onto the Ranch. The monitoring wells are spaced too widely and contaminant plumes could slip through undetected, thereby posing a hazard to public health and undue risk to property on the Ranch.

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Copper Flat Mine Draft Discharge Permit 1840 Technical Comments

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Prepared For: Turner Ranch Properties, LP and New Mexico Environmental Law Center

May 1, 2018

The following comments are provided regarding technical and administrative completeness of the Copper Flat Mine Draft Discharge Permit 1840 (Draft Permit) application, draft permit requirements and conditions, as well as compliance with the technical requirements of New Mexico Copper Rule, 20.6.7 NMAC. These comments are based upon more than 35 years of professional experience in the mining environmental field, as well as significant involvement in both the technical and administrative group efforts in the development of the New Mexico Copper Rule. The comments provided are limited to the proposed Tailings Storage Facility (TSF) that would be located outside of the open pit stormwater capture area (OPSCA).

1 Summary

The risk for groundwater impacts to occur from tailings storage facilities such as that proposed for the Copper Flat Project is well demonstrated and acknowledged. Despite engineered features intended to result in zero discharge of tailings process and seepage water, experience has shown that without exception some level of discharge will occur. Therefore, it is accepted engineering practice to consider and address the potential for unintended or accidental discharges. Typically, the risk to groundwater occurs from unintended and/or untreated discharges that are not captured, such as leakage and/or seepage through a liner. Additionally, in the event of an accidental discharge of tailings resulting from a ruptured pipeline or a catastrophic failure of a TSF, in turn resulting in the release of fluids and deposition of uncontained tailings, impacts to groundwater have the potential to occur. Our comments address the potential from both such occurrences that can result in unaccounted and/or unintended discharges from engineered facilities such as TSFs to groundwater. Our conclusions are summarized as follows:

- Neither the permit application materials or the Draft Permit identify or address TSF liner "seepage" that would be expected to occur from the lined TSF and therefore have not addressed an almost certain "unauthorized discharge." The New Mexico Environment Department (NMED) must require the applicant, New Mexico Copper Corporation (NMCC), to revise the application to identify and include seepage in terms of both liner permeability and potential defects; to conduct an aquifer evaluation to determine the nature and extent of impact to groundwater from TSF seepage; and to propose additional mitigation measures such as a groundwater interception system, as required by the Copper Rule.

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- The TSF was essentially abandoned in the early 1980s and the subsequent owners, including NMCC, have failed to conduct the required monitoring and maintenance. They have further failed to address potential hazards associated with the existing TSF in a timely manner. Given the track record of the project and NMCC, together with the as yet to be filed New Mexico Office of the State Engineer's Dam Safety Bureau (OSE-DSB) application and the potential for the TSF to result in groundwater impacts resulting from a catastrophic failure, the NMED must 1) require NMCC to submit documentation that its proposed TSF complies with OSE-DSB requirements, and 2) delay all discharge permit action until OSE-DSB completes and approves a Dam Permit for the Mine.

- The NMED must require NMCC to provide the basis for the information contained in Part A of the Draft Permit and ensure it is consistent with Part B of same and revise the Draft Permit accordingly. As explicitly required by the Copper Rule, the Copper Flat TSF Report must be revised to include the maximum daily discharge volume and annual volume of tailings as design factors. The Draft Permit must also provide the basis for the maximum discharge figure used which, in addition to the volume of tailings, also includes, impacted stormwater and domestic water (according to the description of process water). The Draft Permit must also identify the annual volume of tailings to be deposited in Part A of the Draft Permit, and the individual basis for the process water, impacted stormwater, and domestic water in Part B of the Draft Permit.

- The Copper Flat TSF Report must be revised to identify the TSF footprint and/or the Draft Permit must identify the source of the information for the footprint. NMCC, OSE-DSB, as well as NMED and the Mining and Minerals Division of the Department of Natural Resources (MMD), should be advised that the information provided does not meet the current standard of care based on industry guidance for geological assessment, including for seismic design as noted. NMED should therefore require NMCC to utilize a 1-in-10,000-year return maximum credible earthquake (MCE) for its seismic analysis and revise the Draft Permit application accordingly.

- While NMED correctly defers to OSE-DSB with respect to stability and associated stormwater control requirements, OSE-DSB regulatory requirements should be provided in the Draft Permit and made a condition of same. Both NMED and MMD must require NMCC to provide the results of a hazard classification and dam breach and flood routing analysis. The analysis would show the distribution of tailings in the event of a catastrophic discharge and whether the TSF poses a hazard to public health or undue risk to property from potential groundwater and surface water impacts resulting from a catastrophic release of tailings and process water. The analysis is also necessary in determining potential impacts in MMD's environmental impact analysis. Additionally, this analysis would ensure the public's right to know what personal risk the discharge permit, mining permit, and dam safety permit, in the event of a catastrophic TSF failure, would entail.

2 TSF Seepage

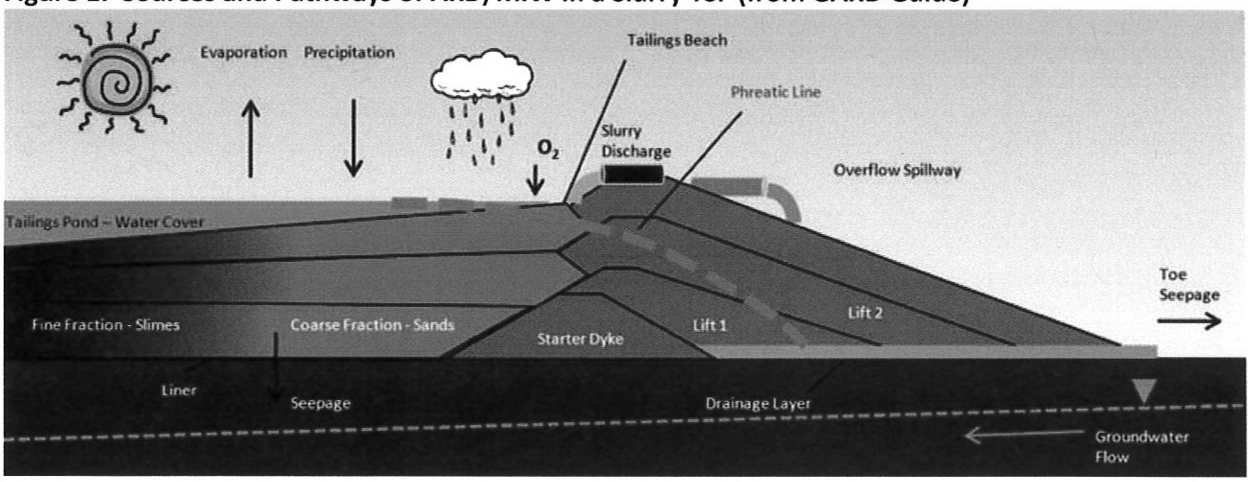
As noted by the mining industry-produced and accepted Global Acid Rock Drainage (GARD) Guide[1], tailings from hardrock mining activities are a primary source of acid rock drainage (ARD) leading to mining influenced water (MIW). As the GARD Guide notes, "Discharges associated with tailings facilities include runoff and seepage for all disposal methods. Runoff and seepage quality are a function of tailings composition, reactivity, and contact time."

According to the Draft Permit:

> "B100 History and Facility Description, E. A synthetically lined TSF will be constructed in the same location as the historic facility. Tailings slurry (i.e., process water and flotation tailings) containing approximately 29% solids will be gravity conveyed from the Concentrator through the Cyclone Plant to separate the tailings into coarse and fine fractions. The coarse fraction tailings sand cyclone underflow will be deposited at the tailing dam and the fine fraction tailings slime cyclone overflow will be discharged to the interior of the TSF. The TSF will extend approximately 1,000 feet to the east of the former starter dam (the tailings expansion area). A centerline construction method using the cyclone-processed tailings sand for tailings dam construction will be utilized. A starter dam will be constructed using borrow material to provide initial storage capacity and to provide a location for initial discharge of tailings. The use of sand tailings for dam construction are such that the Cyclone Plant will be operated to produce the construction material."

Figure 1 shows the flow paths and geochemical reactions occurring in a subaqueous TSF using a centerline construction method like that proposed for the Copper Flat TSF.

Figure 1. Sources and Pathways of ARD/MIW in a Slurry TSF (from GARD Guide)



The GARD Guide describes the source characterization and potential for discharges from TSFs as follows:

> "A dam is first constructed to impound the tailings and supernatant. For stability reasons, tailings dam embankments are commonly designed to be unsaturated and well drained so if

[1] The International Network for Acid Prevention (INAP), 2009. Global Acid Rock Drainage Guide (GARD Guide).http://www.gardguide.com/

17963

they are constructed with sulphide-bearing waste rock or tailings, the tailings dam embankments may be particularly prone to ARD generation. Precipitation onto the surface of the facility contacts the tailings beaches (tailings exposed to atmospheric oxygen), the dam, or falls directly on the tailings pond. During large storm events, discharge through an overflow drain or discharge down the face of the dam may occur. This water may be captured for treatment. Infiltration through the tailings enters into the subsurface or is captured in a seepage collection system. The seepage rate is a function of the permeability of the underlying natural or engineered materials and the infiltration rate through the tailings. During operations, ARD is not normally a concern (except with extremely reactive tailings) because most mill circuits add lime to the tailings. Also, during subaqueous disposal, fresh tailings added to the beaches maintain a relatively high water content for a time. Active management of the tailings pond supernatant (e.g., addition of lime) can be conducted to prevent low pH conditions and mobilization of metals. During post closure, remedial measures that have been designed from the outset are implemented to prevent ARD and improve seepage quality."

The New Mexico Copper Rule addresses TSF seepage and groundwater, as well as various mitigation approaches, as shown in Table 1 attached to these comments. The sequential approach described in the rule assumes that the design process starts with minimal seepage containment such as construction of headwalls, impoundments and diversion structures (NMAC 20.6.7.22 (4)(b). Then, based upon potential groundwater impacts (NMAC 20.6.7.22 (4)(c)), an aquifer evaluation is performed (NMAC 20.6.7.22 (4)(d)(vii). If the design report indicates impacts to groundwater an interceptor system for containment is to be proposed (NMAC 20.6.7.22 (4)(d)(viii)). If the department determines that the proposed seepage collection and interceptor systems evaluated in the previous steps are not capable of meeting groundwater standards, then the department can require additional controls, which may include, but are not limited to, a liner system (NMAC 20.6.7.22 (4)(e)).

The approach taken by NMCC is reflected in the report titled "Feasibility Level Design, 30,000 TPD Tailings Storage Facility" by Golder Associates dated November 30, 2015 and revised June 2016 (Copper Flat TSF Report). The approach has in essence been to skip the steps in NMAC 20.6.7.22 (4)(b)-(d) and propose additional controls in the form of a liner system in the initial application. The liner system proposed by NMCC is described in the Draft Permit as follows:

"B103 Authorized Mine Units. D. Copper Crushing, Milling, Concentrator, and Tailings Storage Facility. 2. Tailings Storage Facility (TSF) - The lined TSF will be located outside the projected OPSDA and built progressively out in a five-phase process. It is designed to accommodate the volume of tailings generated during the life of the mine. The liner will consist of an 80-millimeter (mil) high-density polyethylene (HPDE) liner placed on a twelve-inch thick liner bedding fill sub base. In Phase 1, the liner bedding fill will consist of a minimum of 12 inches of historic tailings recovered from the north cell of the old starter dam. After Phase 1, liner bedding fill will consist of a twelve-inch layer of crushed and screened native material, or selected local soil. TSF drainage will be collected using an underdrain collection system that incorporates two underdrains that will convey solutions to the TSF Underdrain Collection Pond. Drainage from the TSF impoundment interior will be collected in a continuous underdrain system (impoundment underdrain) constructed over the geomembrane liner. A separate blanket drain system will underlie the tailings dam (dam underdrain). The impoundment underdrain system will be equipped with a shutoff valve at its inlet during the initial years of operation to ensure two feet of freeboard is maintained in the Underdrain Collection Pond. When the valve is closed, the TSF supernatant pool will be used for storage until the TSF underdrain collection pond is pumped down. The TSF pool, located in the interior of the TSF, will be equipped with four floating-barge pumps with a maximum design capacity of 12,978 gpm. The pumps will convey TSF supernatant process water to the Process Water Reservoir through the 36-inch diameter HDPE water reclaim process water pipeline. Tailing slurry, which is gravity conveyed from the Concentrator, will pass through the Cyclone Plant prior to discharge to the TSF. The Cyclone Plant will separate the tailing slurry into a coarse and fine fraction; the coarse fraction will be used to construct the tailing dam and the fine fraction will be conveyed into the TSF pool."

The New Mexico Copper Rule does not identify specific requirements for TSF liner systems. However, it does have specific requirements for leach stockpiles (NMAC 20.6.7.20) that includes a solution collection system designed to prevent the buildup of head and transmit process fluids out of the pile, a soil liner consisting of a minimum of 12 inches of soil that has a minimum re-compacted in-place coefficient of permeability of $1x10^{-6}$ cm/sec, and a synthetic liner for a leach stockpile shall provide the same or greater level of containment, including permeability, as a 60 mil HDPE geomembrane liner system.

While generally consistent with industry practice, the Copper Flat TSF Report addresses the tailings seepage that will report to the underdrain on top of the liner but does not address seepage through the TSF liner itself. In its technical review, the NMED apparently did not identify the need to include seepage through the liner as a potential discharge. Accordingly, the Draft Permit does not recognize TSF liner seepage in Section B104.

Liners are a recognized means of source control and most state and federal regulations require that the standard of containment is at least equivalent to a constructed liner of 12-18 inches thickness of clay, with a permeability of 10^{-6}cm/s, similar to that required by the New Mexico Copper Rule. However, the fact that all liners leak has been long acknowledged by the U.S. Environmental Protection Agency (EPA) since the 1990s, as well as by industry. For that reason, it is standard practice to recognize both seepage resulting from permeation, but also from liner defects.

Synthetic membranes with low permeation rates such as high-density polyethylene (HDPE) may, under ideal conditions, have hydraulic conductivities as low as 2×10^{-15} m/s, (Giroud and Bonaparte, 1989[2]). However, permeation leakage rates are estimated to be several orders of magnitude less than the rates resulting from geomembrane defects and represent an insignificant component of the total estimated potential leakage.

Seepage from TSF due to geomembrane defects is dependent on the following:

- The area covered by tailings (i.e. the seepage area).
- The pore pressure conditions within the tailings mass and the basin underdrain system.
- The thickness and permeability of the tailings stored within the TSF.
- The permeability of the constructed basin liner and embankment.
- The permeability of the materials underlying the basin liner.
- The hydraulic head within the basin underdrain system over the base of the TSF.

[2] Giroud, J.P. and Bonaparte, R., 1989. *Leakage Through Liners Constructed with Geomembranes – Part II. Composite Liners.* Geotextiles and Geomembranes. Vol. 8 No. 1, 71-111. Great Britain.

The leakage rate through a section of a composite liner system with a single defect in the geomembrane per acre can be evaluated using the following formula presented by Bonaparte (1989):

$$Q = 0.21a^{0.1} h^{0.9} ks^{0.74} A$$

Where:

Q = Steady state leakage through one hole in the geomembrane (m3/s)
a = Area of the hole (m2)
h = Hydraulic head over the section (m)
ks = Hydraulic conductivity of the material underlying the geomembrane (m/s)
A = Geomembrane section area (acres)

This formula is based on "good contact" between the geomembrane and the underlying soil. This is a reasonable assumption for these analyses due to the surcharge pressures applied by the overlying tailings mass. Leakage through a synthetic liner depends on the number and size of defects and the permeability of the subgrade. The hydraulic head acting along the base of the liner is reduced by the underdrainage system but because it is not eliminated, seepage will be expected to occur. For that reason, it is standard practice to include a liner seepage analysis as part of any TSF design report.

Conclusions and Recommendations

The Copper Rule (Section 20.6.7.7.B(51) NMAC) defines "seepage" as "leachate that is discharged from a waste rock stockpile or tailing impoundment and emerges above or at the ground surface or that is present in the vadose zone and may be captured prior to entering ground water." An "unauthorized discharge" "means a release of process water, tailings, leachate or seepage from individual copper mine facility components, impacted stormwater or other substances containing water contaminants not approved by a discharge permit" pursuant to Section 20.6.7.7.B(61) NMAC. Neither the permit application materials or the Draft Permit identify or address TSF seepage that would still be expected to occur from the lined TSF and therefore have not addressed an almost certain "unauthorized discharge." The NMED should have identified this deficiency in its technical completeness review. The NMED must require NMCC to revise the Copper Flat TSF Report to recognize and perform a seepage estimate consistent with current industry practice, which would include a sensitivity analysis given the inherent uncertainty in this type of estimate. The NMED must also require NMCC to perform and submit an aquifer evaluation to determine the nature and extent of impacts to groundwater from TSF seepage, as required by the Copper Rule. Finally, if warranted, the NMED should require NMCC to propose additional mitigation measures, such as a groundwater interceptor system. The draft permit should then be revised accordingly to account for the TSF seepage.

3 TSF Catastrophic Failures

The recent Mount Polley and Samarco/Fundão tailings dam failures highlight the potential for catastrophic failures associated with TSFs, such as that proposed for the Copper Flat Project, and are summarized in Appendix A of these comments. The failures were not the result of a single isolated action or event, but rather resulted from a series of actions any of which by themselves would not result in a catastrophic failure, but as a sequence of events leading to those failures. Also inherent in both catastrophes was a failure to connect hydrologic, stability and operational considerations. For this reason, these comments on the Copper Flat Project Draft Permit focus on the level of interaction between New Mexico regulators required during the design and permitting processes to ensure that there is not undue risk to public health, property or the environment from a catastrophic failure. Given that in New Mexico three separate agencies (NMED, MMD, OSE-DSB) have individual responsibility for various aspects of TSF design, permitting, operations, reclamation and closure there is a greater likelihood for requirements and/or oversight by one agency to inadvertently or unintentionally impact the requirements and/or oversight by the other agencies. This can lead to a greater risk of a catastrophic event unless this potential is clearly acknowledged and a significantly high level of coordination is undertaken by the agencies.

The New Mexico Copper Rule addresses TSF safety in Section 20.6.7.17.C.(1)(d) which requires "An applicant or permittee proposing or required to construct a tailings impoundment shall submit documentation of compliance with the requirements of the dam safety bureau of the state engineer pursuant to Section 72-5-32 NMSA 1978, and rules promulgated under that authority, unless exempt by law from such requirements."

3.1 Applicable New Mexico Office of State Engineer Regulations for TSFs

The OSE-DSB has primary responsibility for the safety of TSFs in New Mexico during the construction and operations phase of the TSF life-cycle. According to the Copper Rule's Section 20.6.7.17.C(1)(d) NMAC, "An applicant or permittee proposing or required to construct a tailings impoundment shall submit documentation of compliance with the requirements of the dam safety bureau of the state engineer pursuant to Section 72-5-32 NMSA 1978, and rules promulgated under that authority, unless exempt by law from such requirements."

Historic records indicate that the Copper Flat Partnership, and its mine owner, Quintana Minerals Corporation, quit operating the mine after less than four months, and subsequently the mine equipment and other liquid assets went into receivership in the 1980s. According to the 2013 Feasibility Study[3], in "mid-March 1982 after a $112 million capital investment, the Copper Flat open pit copper mine began full production at a rated capacity 15,000 tpd, a waste to ore ratio of 1.8:1, and a cut-off grade of 0.25 percent copper. After just 3.5 months of production, the mine shut down on June 30, 1982, due to low copper prices ($0.70/lb) and high interest rates on the CIBC loan." The "Copper Flat mine passed its project stabilization with CIBC during this initial mining period before going into receivership. By late 1985, the surface facilities equipment was sold to the Ok Tedi mine in Papua New Guinea, and the site was reclaimed by CIBC as formally approved by state and federal requirements. The structural foundations, power lines, water wells, and inground infrastructure were left in-place."

The Copper Flat TSF containing 3.5 months of tailings production was also left in place. As noted in a recent communication from the OSE-DSB to NMCC dated September 18, 2017 and attached as Appendix B to these comments, "The dam is currently under a State Engineer Order, dated April 19, 1983 and amended on April 18, 1985, requiring the condition of the dam and monitoring data be reported to the OSE-DSB by March 10 of each year. The last report received by the OSE-DSB was January 31, 1986 (underline added)." At the request of NMCC in 2012 a waiver was granted for performing routine maintenance and monitoring. According to the letter from the OSE-DSB, "The waiver was granted as a mining permit is being sought to reopen the mine which will include removing the existing tailings dam and constructing a new tailings dam approximately 1,000 feet downstream of the existing dam." A recent search of the OSE-DSB files for the Copper Flat Mine revealed that no application for the proposed new TSF had been submitted as of April 1, 2018.

[3] 2013 Feasibility Study. Form 43-101F1 Technical Report, Feasibility Study, Copper Flat Project, New Mexico, USA, M3 for THEMAC Resources, November 21, 2013.

Conclusions and Recommendations

The TSF was essentially abandoned in the early 1980s and the subsequent owners, including NMCC, have failed to conduct the required monitoring and maintenance. NMCC has further failed to address potential hazards associated with the TSF in a timely manner. Given the track record of the project and NMCC, together with the potential impacts to groundwater from a catastrophic event that can only be assessed by OSE-DSB requirements, the NMED must 1) require NMCC to submit documentation that its proposed TSF complies with OSE-DSB requirements, and 2) delay all discharge permit action until OSE-DSB completes and approves a Dam Permit for the Mine.

3.2 Copper Rule Requirements and OSE-DSB Requirements

The discharge permit requirements for Copper Mines pertaining to TSFs are provided in NMAC 20.6.7.22 REQUIREMENTS FOR COPPER CRUSHING, MILLING, CONCENTRATOR, SMELTING AND TAILINGS IMPOUNDMENT UNITS, which includes Section A.4 addressing engineering design requirements for new TSFs. The requirements are shown in Table 1 attached to these comments.

The OSE-DSB requirements for TSF safety as addressed by NMAC 19.25.12 DAM DESIGN, CONSTRUCTION AND DAM SAFETY are also identified in Table 1.

As part of their permit application package to NMED, NMCC submitted the previously discussed Copper Flat TSF Report by Golder. Agency review comments on the application materials do not indicate the submittal has been reviewed by the OSE-DSB. As will be discussed further in the following comments, various aspects of NMED's Copper Rule for Discharge Permits and OSE-DSB requirements overlap or otherwise have common implications that either should result in significant comment from OSE-DSB or would result from submittal of the same document directly to OSE-DSB. In a similar fashion, these overlaps highlight why it is highly risky to permit the TSF under NMED regulations without consideration of OSE-DSB requirements.

3.2.1 Tailings Discharge Description

As shown in Table 1 attached to these comments, the Copper Rule requires that NMCC provide the "annual volumes and daily maximum design rates of tailings deposited in the impoundment." Also, as indicated current OSE-DSB requirements are for dam safety in general and non-specific for mine tailings other than for closure. Most existing U.S. regulations and guidance for dam safety is similarly intended for water storage dams and not mine tailings storage facilities. Aspects in which mining TSFs are different from water storage dams include:

- TSFs are constructed, operated and closed by mine owners focused on extraction for a profit and not necessarily for public benefit or on TSF safety.
- TSFs are designed to retain solids (that may or may not be contaminated) and/or process solutions (that may or may not be contaminated).
- TSFs can contain large quantities of fluids and solids that if released can cause significant environmental damage and result in loss of human life.
- TSFs are built during the development and operation of mines and remain as part of the landscape becoming a permanent feature that must perform as designed after closure of the mine indefinitely (e.g. in perpetuity).

- TSFs, if they contain contaminated substances (fluids and/or solids), have no minimum size where the consequences of failure would be generally acceptable.
- Many TSFs are built in stages over the mine life, rather than built in a single stage prior to decommissioning.
- The condition of TSFs is continually changing so safety must be continually re-evaluated rendering TSF management more onerous. A steady-state condition is only achieved some time after the mine operations cease.
- TSF decommissioning cannot be accomplished by breaching and removal but instead typically requires a transition period and long-term monitoring and maintenance.
- TSFs are not generally viewed as an asset but instead as a liability and thus may warrant a lower standard of care from their owners.
- TSF owners typically rely on consultants rather than in-house expertise leading to the potential for poor communication and lack of project continuity.

Water storage dam safety principles are applicable to TSFs. However, because of the important differences, design reports typically reference both U.S. federal and state regulations in addition to guidance documents such as the Canadian Dam Association's Technical Bulletin: Application of Dam Safety Guidelines to Mining Dams.[4] The Copper Flat TSF Report does not reference the CDA Technical Bulleting on Mining Dams.

As indicated in Table 1 attached to these comments, the Copper Flat TSF Report (p. 19) provides the required information in the TSF design factors in terms of tailings specific gravity, tailings solids content and production rate, to calculate the daily maximum design rate and annual volume of tailings.

According to "Part A GENERAL INFORMATION A100 Introduction B. Pursuant to this Discharge Permit, the permittee is authorized to discharge a maximum of 25,264,000 gallons per day (gpd) of mine tailings, process water, impacted stormwater, and domestic wastewater to a lined tailing impoundment." The DP does not identify how the maximum discharge rate is calculated. The DP also does not identify the annual volume of tailings. B104 Authorized Discharges indicates "A. The permittee is authorized to discharge a maximum of 25,246,000 gpd of tailing slurry from the Concentrator to the Cyclone Plant and then the TSF via gravity through the Concentrator Whole Tailings Transport pipeline" and according to "J. The permittee is authorized to discharge a maximum of 10,000 gpd of treated effluent from the domestic wastewater treatment and disposal facility to the TSF." The permit does not identify the discharge of impacted stormwater, but by calculation it would appear to be 10,000 gpd. The permit should provide the basis for the information contained in Part A and it should be consistent with Part B.

According to B104 Authorized Discharges "A. The permittee is authorized to discharge a maximum of 25,246,000 gpd of tailing slurry from the Concentrator to the Cyclone Plant and then the TSF via gravity through the Concentrator Whole Tailings Transport pipeline." However, this description is incorrect. As noted by the Golder Report, "The tailings delivery and distribution system design consists of pipeline system that delivers whole tailings from the processing plant to the tailings storage facility. Whole tailings will be separated into fine material and sand material in the cyclone plant. The sand fraction will be transported to the TSF and used for dam construction while fine material will be deposited into the TSF."

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[4] CDA. 2014. *Technical Bulletin: Application of Dam Safety Guidelines to Mining Dams.* www.cda.ca

Conclusions and Recommendations

The NMED must require NMCC to provide the basis for the information contained in Part A and ensure it is consistent with Part B and revise the Draft Permit accordingly. As explicitly required by the Copper Rule, the Copper Flat TSF Report must be revised to include the maximum daily discharge and annual volume of tailings as design factors. The Draft Permit must also provide the basis for the maximum discharge figure used which, in addition to the volume of tailings, also includes, impacted stormwater and domestic water (according to the description process water). The Draft Permit must also identify the annual volume of tailings to be deposited in Part A and the individual basis for the process water, impacted stormwater, and domestic water in Part B.

The following revision must also be made to B104 Authorized Discharges: A. The permittee is authorized to discharge a maximum of 25,246,000 gpd of tailing slurry from the Concentrator *to the TSF via gravity through the Concentrator Whole Tailings Transport pipeline* to the Cyclone Plant *and then the sand fraction will be transported to the TSF and used for dam construction while fine material will be deposited into* the TSF ~~via gravity through the Concentrator Whole Tailings Transport pipeline~~."

3.2.2 Topography, geology, footprint

The NMED Copper Rule requires that a description be provided of the TSF topography, geology and footprint. However, as previously discussed, OSE-DSB requirements are significantly more detailed and require a geological assessment for all dams classified as high or significant hazard potential. The geological assessment may be a stand-alone document or part of the geotechnical investigation or seismic study. The geological assessment is required to address a number of factors as noted in Table 1 attached to these comments: regional geologic setting; local and site geology; geologic suitability of the dam foundation; slide potential of the reservoir rim and abutment areas; and seismic history and potential.

The Copper Flat TSF Report provides a brief description of the site topography (p.4) and a more detailed description of the TSF Area Subsurface Conditions (p. 5-6), consisting of a description of the geology and observations from the site geotechnical program. However, the report does not identify the size of the TSF footprint other than to suggest "At final build-out with an impoundment floor area of 321 acres, total drainage collected in the impoundment underdrain will be on the order of 66 gallons per minute (gpm)." The report also includes information on site investigations (Section 3), including information on foundation materials.

The Seismic Design Criteria (p. 41) are also discussed in the report. The report identifies the requirements of the OSE-DSB as the basis for the seismic criteria: "The NMDSB requires that structures such as the Copper Flat TSF be designed to withstand the seismic loading from the Maximum Design Earthquake (MDE) with a 2 percent probability of exceedance in 50 years (approximately 2,475-year return frequency). The peak ground acceleration (PGA) for the Copper Flat property was obtained using the US Seismic "Design Maps" Web Application developed by the United States Geological Survey (USGS) Geologic Hazards Science Center (USGS, 2011). Considering the 2009 National Earthquake Hazards Reduction Program provisions for a Site Class C and a site location of 32.96° North latitude and 107.5° West longitude, the resulting PGA for the 2,475-year return MDE is approximately 0.13 times gravitational acceleration (0.13g)."

Although the Copper Flat TSF Report identifies the OSE-DSB requirements it is clear the contents of the report would not meet those requirements. Based on our review and a comparison to the current standard of care based on industry practice for TSFs, the information provided in the report is not adequate to assess the geologic setting or corresponding risks related to the foundation or seismic risk.

Though OSE-DSB's regulations are more stringent than NMED's, this particular regulation is not consistent with current dam safety and TSF standard of care such as that contained in CDA 2014 or Montana's SB 409. MCA 82-4-376. Tailings storage facility (2)(i) requires "for a new tailings storage facility, an analysis showing that the seismic response of the tailings storage facility does not result in the uncontrolled release of impounded materials or other undesirable consequences when subject to the ground motion associated with the 1-in-10,000-year event, or the maximum credible earthquake, whichever is larger."

The use of a 2,475-year return is significantly less conservative than that required by Montana and other current guidance for TSFs and presents a significant risk of underestimating both the probability and magnitude of a catastrophic failure associated with a TSF embankment failure. Based on our experience we would expect that a more conservative risk assessment would result in a significantly higher gravitational acceleration of approximately 0.25g or greater as compared to the current 0.13g value used in the assessment contained in the Copper Flat TSF Report.

Conclusions and Recommendations

Though the DP application briefly addresses topography and geology of the TSF, the draft DP is silent on those subjects.

According to the Draft Permit, "C105 Copper Crushing, Milling, Concentrator, and Tailings Storage Facility Units C. Tailings Storage Facility 4. Pursuant to Subparagraph (a) of 20.6.7.22.C(1) NMAC, the TSF shall not exceed the footprint (564 acres) or location and configuration as shown in Drawing 12 in Appendix J of the document titled Feasibility Level Design, 30,000 TPD Tailings Storage Facility and Tailings Distribution and Water Reclaim Systems Copper Flat Project Sierra County, New Mexico Golder Associates Inc., Revised, November 2016 (i.e., Appendix A the Revised Application) and as shown on Figure 1 of this Discharge Permit." The Copper Flat TSF Report must be revised to identify the size of the TSF footprint (as noted, 321 acres is the size of the "impoundment area" identified in the TSF Report) and/or the DP should identify the source of the information for the footprint.

NMCC, OSE-DSB, as well as NMED and MMD, should be advised that the information provided does not meet the current standard of care based on industry guidance for geological assessment, including for seismic design as noted. NMED should therefore require NMCC to utilize a 1-in-10,000-year return MBE for its seismic analysis and revise its DP application accordingly.

3.2.3 Stormwater

As shown in Table 1 of these comments, the Copper Rule requires that stormwater run-on be diverted and/or contained to minimize contact between stormwater run-on and the tailing material. The Copper Rule also requires NMCC to disclose and consider the amount, intensity, duration and frequency of precipitation; watershed characteristics including the area, topography, geomorphology, soils and vegetation of the watershed; and run-off characteristics of the watershed including the peak rate, volumes and time distribution of run-off events. While no specific stormwater criteria are provided under the Copper Rule for TSFs, the general engineering requirements for impoundments are for a "100-year return interval storm event" while maintaining "two feet of freeboard" and "peak flow from a 100-year return interval storm event" while maintaining at least "six inches of freeboard" for conveyances.

Also shown in Table 1 of these comments are the OSE-DSB requirements for stormwater that include: Hydrologic analysis, Spillway design flood, Incremental damage assessment, Spillway capacity, Spillway design, Outlet works capacity, Outlet works design and Freeboard. The OSE-DSB requirements are based on Section 19.25.12.10 NMAC (Hazard Potential Classification), which is a rating for a dam based on the potential consequences of failure. "No allowances for evacuation or other emergency actions by the population are to be considered" and "the hazard potential classification is not a reflection of the condition of the dam." The classification is based on the following definitions:

> **A. Low hazard potential**: Dams assigned the low hazard potential classification are those dams where failure or misoperation results in no probable loss of life and low economic or environmental losses. Losses are principally limited to the dam owner's property.
>
> **B. Significant hazard potential**: Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in populated areas with significant infrastructure.
>
> **C. High hazard potential**: Dams assigned the high hazard potential classification are those dams where failure or misoperation will probably cause loss of human life.

The classification is based on a dam breach and flood routing analysis that includes a table of results for the flood routing for the sunny day failure, and the failure and no failure scenarios for multiple flood events, up to and including, the spillway design flood as defined in Subparagraph (a) through (d) of Paragraph (3) of Subsection C of 19.25.12.11 NMAC; the table of results for all critical locations downstream shall include the depth of flow in feet, velocity of flow in feet per second, rate of flow in cubic feet per second and the incremental impacts; and dam failure inundation maps downstream of the dam for the sunny day failure and failure during the spillway design flood event showing the depth of flow in feet, average velocity in feet per second and rate of flow in cubic feet per second at critical locations downstream. The spillway design flood requirements for Dams classified as large, with a significant hazard potential rating shall have spillways designed to pass a flood resulting from 75 percent of the probable maximum precipitation and Dams classified as high hazard potential, regardless of size, shall have spillways designed to pass a flood resulting from the probable maximum precipitation.

According to the Copper Flat TSF Report (p. 41), the proposed TSF "can be classified as having a significant hazard potential." The report provides no basis for this assessment, such as a classification evaluation including dam breach and flood routing analysis. However, even though the report suggests a significant hazard potential, it uses the design event for a high hazard potential (p. 33): "the TSF will be required to contain inflows and direct precipitation associated with the 72-hour PMP of 26 inches. Diversion ditches constructed for impoundment run-on control have been sized to carry the peak discharge associated with the prescribed PMP event using a rainfall intensity versus time distribution defined in Hydrometeorological Report 55A (US Department of Commerce, 1998)."

Conclusions and Recommendations

The Draft Permit does not identify the hazard classification or design storm requirements for the TSF or any suggestion of the freeboard requirements. According to C105 Copper Crushing, Milling, Concentrator, and Tailings Storage Facility Units C. Tailings Storage Facility 2, "Prior to discharging to the TSF, the permittee shall ensure that berms and/or the dam structure of the TSF will have the capacity for such discharges while maintaining appropriate safety measures in accordance with the regulations of the Dam Safety Bureau of the Office of the State Engineer and Paragraph (d) of 20.6.7.17.C(1) NMAC."

While NMED correctly defers to OSE-DSB with respect to stability and associated stormwater control requirements, OSE-DSB regulatory requirements should be provided in the Draft Permit and made a condition of the permit. Both NMED and MMD must require NMCC to provide the results of a hazard classification and dam breach and flood routing analysis for the following reasons. First, the analysis would show the distribution of tailings in the event of a catastrophic discharge and whether the TSF poses a hazard to public health or undue risk to property from potential groundwater and surface water impacts resulting from a catastrophic release of tailings and process water. Second, the analysis is also necessary in determining potential impacts in MMD's environmental impact analysis. Additionally, this analysis would ensure the public's right to know what personal risk the discharge permit, mining permit and OSE-DSB permit, would entail.

Table 1. Comparison of NM Copper Rule, OSE-DSB Requirements and NMCC Submittal

Description	NMAC 20.6.7.22 GENERAL ENGINEERING AND SURVEYING REQUIREMENTS (4) New tailings impoundments	NMAC 19.25.12 DAM DESIGN, CONSTRUCTION AND DAM SAFETY 19.25.12.11 DESIGN OF A DAM C. Design report:	NMCC Feasibility Study
Tailings discharge description	(d) (i) The annual volumes and daily maximum design rates of tailings or other discharge approved by the department to be deposited in the impoundment.		Varies, Net tailings to the TSF from 9,182 to 10,704 kilotons per year (25,156 to 29,326 tons per day). Tailings S.G 2.64. 29.2 percent solids by weight. (p. 19)
Topography, geology, footprint	(d) (ii) The topography of the site where the impoundment will be located. (iii) The geology of the site. (iv) The design footprint of the tailing impoundment.	(9) Geological assessment. A geological assessment of the dam and reservoir site is required for all dams classified as high or significant hazard potential. The geological assessment may be included in the geotechnical investigation or seismic study, or may be submitted as a separate document. The geological assessment shall address regional geologic setting; local and site geology; geologic suitability of the dam foundation; slide potential of the reservoir rim and abutment areas; and seismic history and potential.	Section 2.0 Site Description At final build-out with an impoundment floor area of 321 acres, total drainage collected in the impoundment underdrain will be on the order of 66 gallons per minute (gpm). (p. 24)
Stormwater	(4) Impacted stormwater management plans and specifications. An applicant shall submit stormwater management plans and specifications to limit run-on of stormwater and manage impacted stormwater in a manner which prevents water pollution that may cause an exceedance of the applicable standards. The plans and specifications shall be submitted with an application for a new or renewed discharge permit, or as	(1) Hazard potential classification (2) Hydrologic analysis (3) Spillway design flood. (4) Incremental damage assessment. (5) Spillway capacity. (6) Spillway design (7) Outlet works capacity. (8) Outlet works design (15) Freeboard	The TSF will be required to contain inflows and direct precipitation associated with the 72-hour PMP of 26 inches. Diversion ditches constructed for impoundment runon control have been sized to carry the peak discharge associated with the prescribed PMP event using a rainfall intensity versus time distribution defined in Hydrometeorological Report 55A (US Department of Commerce, 1998). (p. 33)

17974

	applicable with an application for a modified discharge permit, and shall include the following information. (a) A scaled map of the copper mine facility showing: (i) the property boundaries of the copper mine facility and the mining areas; (ii) all existing and proposed structures; (iii) existing and proposed final ground surface contours outside of the open pit surface drainage area at appropriate vertical intervals; and (iv) existing and proposed stormwater containment and conveyance structures, including construction materials, size, type, slope, capacity and inlet and invert elevation (or minimum and maximum slopes) of the structures, as applicable. (b) A description of existing surface water drainage conditions. (c) A description of the proposed post-development surface water drainage conditions. (d) Supplemental information supporting the stormwater management plan including the following information: (i) hydrologic and hydraulic calculations for design storm events; (ii) hydraulic calculations demonstrating the capacity of existing and proposed stormwater impoundments; (iii) hydraulic calculations demonstrating the capacity of existing and proposed conveyance channels to divert stormwater or contain and transport runoff to stormwater impoundment(s); and (iv) a list of tools and references used to		

17975

	develop the hydrologic and hydraulic calculations such as computer software, documents, circulars, and manuals. (e) A plan to manage impacted stormwater, and to divert run-on of non-impacted stormwater where practicable. The plan shall include, as necessary, design, construction, and installation of stormwater run-on and run-off diversion structures, collection of impacted stormwater, and a description of existing surface water drainage conditions. The plan shall consider: (i) the amount, intensity, duration and frequency of precipitation; (ii) watershed characteristics including the size, topography, soils and vegetation of the watershed; and (iii) runoff characteristics including the peak rate, volumes and time distribution of runoff events.		
Seepage	(b) Seepage from the sides of a tailing impoundment shall be captured and contained through the construction of headwalls, impoundments and diversion structures as applicable. (d) (v) The design of tailing seepage collection systems, to be proposed based on consideration of site-specific conditions.	(11) Seepage and internal drainage. (16) Erosion protection.	*The TSF report does not provide an estimate of seepage from the impoundment. The TSF report addresses seepage from the tailings into the TSF underdrain that lies above the liner, but otherwise appears to assume that no additional seepage will occur through the liner.*
Groundwater	(c) Ground water impacted by the tailing impoundment in excess of applicable standards shall be captured and contained through the construction of interceptor systems designed in accordance with Subparagraph (d) of Paragraph (4) of Subsection A of 20.6.7.22 NMAC.		*Report assumes no groundwater discharge.*

17976

	(d) (vii) An aquifer evaluation to determine the potential nature and extent of impacts on ground water from the tailings impoundment based on the proposed tailings impoundment design. The aquifer evaluation shall include a complete description of aquifer characteristics and hydrogeologic controls on movement of tailing drainage and ground water impacted by the tailings impoundment. (viii) A design report for a proposed interceptor system for containment and capture of ground water impacted by the tailings impoundment based on the aquifer evaluation required in Subparagraph (d) of Paragraph (4) of Subsection A of this section. The design report shall include, at a minimum construction drawings and interceptor system performance information, recommended equipment including pumps and meters, recommended pump settings and pumping rates, methods for data collection, and a demonstration that the permittee has adequate water rights to operate the system as designed. The design report shall include a demonstration that interceptor system design will capture ground water impacted by the tailings impoundment such that applicable standards will not be exceeded at monitoring well locations specified by 20.6.7.28 NMAC. The interceptor system shall be designed to maximize capture of impacted ground water and minimize the extent of ground water impacted by the tailings		

	impoundment.		
Additional Controls/Liners	(e) If the department determines that the proposed tailings impoundment, seepage collection and interceptor systems when constructed and operated in accordance with the design plan specified in this paragraph would cause ground water to exceed applicable standards at monitoring well locations specified by 20.6.7.28 NMAC, the department shall require additional controls, which may include but are not limited to, a liner system as additional conditions in accordance with Subsection I of 20.6.7.10 NMAC.	17) Geotextile design	
Stability/Safety	(d) Dam safety. An applicant or permittee proposing or required to construct a tailings impoundment shall submit documentation of compliance with the requirements of the dam safety bureau of the state engineer pursuant to Section 72-5-32 NMSA 1978, and rules promulgated under that authority, unless exempt by law from such requirements.[5]	(1) Hazard potential classification (2) Hydrologic analysis (3) Spillway design flood. (4) Incremental damage assessment. (5) Spillway capacity. (6) Spillway design (7) Outlet works capacity. (8) Outlet works design (9) Geological assessment (10) Geotechnical investigation. (11) Seepage and internal drainage. (12) Stability analysis. (13) Seismic design and analysis (14) Dam geometry. (15) Freeboard (16) Erosion protection. (17) Geotextile design	

[5] NMAC 20.6.7.33 CLOSURE REQUIREMENTS FOR COPPER MINE FACILITIES B. Slope stability. At closure, tailing impoundment(s) not regulated by the office of the state engineer, leach stockpile(s) or waste rock stockpile(s) shall be constructed to promote the long-term stability of the structure. Closure of all critical structures at a copper mine facility shall be designed for a long-term static factor of safety of 1.5 or greater and non-critical structures shall be designed for a long-term static factor of safety of 1.3 or greater. The units being closed shall also be designed for a factor of safety of 1.1 or greater under pseudostatic analysis. A stability analysis shall be conducted for the unit and shall include evaluation for static and seismic induced liquefaction.

		(18) Structural design. (19) Utilities design (20) Miscellaneous design I. Operation and maintenance manual: An operation and maintenance manual is required for dams classified as high or significant hazard potential. The operation and maintenance manual identifies activity necessary to address the continued safe operation, maintenance and overall performance of the dam. Any restrictions imposed by the design shall be addressed in the operation and maintenance manual. The operation and maintenance manual shall conform to the requirements set forth in 19.25.12.17 NMAC. J. Emergency action plan: An emergency action plan is required for dams classified as high or significant hazard potential. The emergency action plan identifies potential emergency conditions at a dam and specifies preplanned actions to be followed to minimize property damage and loss of life. The emergency action plan shall conform to the requirements set forth in 19.25.12.18 NMAC.	

Appendix A

TSF FAILURE CASE STUDIES

This appendix summarizes the causes of two recent TSF catastrophic failures (Mount Polley and Fundão). As both of these recent significant TSF failures demonstrate, minimization and/or prevention of catastrophic consequences requires detailed and strict attention to not only design, but also other factors such as operations. The following summarizes the causes and recommendations as reported by Independent Engineering Review Panels that were explicitly formed to investigate each failure.

Mount Polley, British Columbia, Canada

In August 2014, the Mount Polley Mine tailings facility breached, resulting in a catastrophic release of tailings that was previously considered unlikely due to the circumstances of it occurring in what is touted as one of the more progressively regulated jurisdictions (British Columbia) at a mine operated by a rising and supposedly highly capable Canadian based mining company (Imperial Metals) and designed and inspected by leading engineering firms (Knight Piésold and AMEC). Additionally, the failure was not triggered by seismic or hydrologic events, but instead occurred as a nearly instantaneous event under "Sunny Day" conditions. The event resulted in a loss of about 17 million cubic meters of water and 8 million cubic meters of tailings/materials which were deposited in a drainage basin including two lakes downstream of the TSF, but fortunately did not result in loss of human life. The event was considered by the industry and associated engineering consultants as a highly significant event.

The Mount Polley Independent Expert Engineering Investigation and Review Panel (Panel), consisting of three leading experts in the geotechnical stability of mine tailings facilities, was convened by the BC Government to investigate the cause of the failure and to address the minimization and elimination of the risk of similar failures from tailings facilities. The Panel Report[6] was issued in January 2015. The following was excerpted from the report.

Failure Cause

The Panel made the following conclusions as to the failure mechanisms involved in the Mount Polley TSF failure:

- The breach of the TSF perimeter embankment was caused by shear failure of dam foundation materials when the loading imposed by the dam exceeded the capacity of these materials to sustain it. The failure occurred rapidly and without precursors. They also concluded that the dominant contribution to the failure resided in the design. The design did not take into account the complexity of the sub-glacial and pre-glacial geological environment associated with the Perimeter Embankment foundation. As a result, foundation investigations and associated site characterization failed to identify a continuous glaciolacustrine layer in the vicinity of the breach and to recognize that it was susceptible to undrained failure when subject to the stresses associated with the embankment.

[6] Morgenstern, N.R., S.G. Vick, and Dirk Van Zyl. 2015. *Independent Expert Engineering Investigation and Review Panel, Report on Mount Polley Tailings Storage Facility Breach.* Province of British Columbia. January 30. https://www.mountpolleyreviewpanel.ca/final-report

- The specifics of the failure were triggered by the construction of the downstream rockfill zone at a steep slope of 1.3 horizontal to 1.0 vertical. This was justified by design analyses without questioning its reasonableness. Had the downstream slope in recent years been flattened to 2.0 horizontal to 1.0 vertical, as proposed in the original design, failure would have been avoided. The slope was on the way to being flattened to meet its ultimate design criteria at the time of the incident.
- A lack of foresight in planning for dam raising contributed to the failure. Successfully executing the raising plan required intimate coordination of impoundment water-level projections, production and transport of mine waste for raising, and seasonal constraints on construction. This made the tailings dam contingent at the same time on the water balance, the Mine plan, and the weather. But instead of projecting these interactions into the future, they were evaluated a year at a time, with dam raising often bordering on ad hoc and only responding to events as they occurred. The effects were twofold: a near overtopping failure in May of 2014, and restrictions on mine waste availability that produced the over-steepened slopes and deferred buttress expansion.
- The Observational Method was adopted as a design philosophy, but misapplied. For reasons not unrelated to planning shortcomings, instrumentation was relied upon to substitute for definitive input parameters and design projections. But the Mount Polley dam was ill-suited to this approach, for both practical and strategic reasons. The steep slopes and constant construction activity on the Perimeter Embankment prevented installation of instruments at optimal locations. More importantly, the instrumentation program was incapable of detecting critical conditions because, once again, the critical materials and their critical mode of undrained behavior were not recognized.
- High impoundment water levels were a major cause of chronic problems in maintaining a tailings beach around the perimeter of the dam. At the breach section, water was in direct contact with the upstream zone of tailings fill when failure occurred. This increased the piezometric level in the upstream zone above what it would have been had a wide tailings beach been present. The Panel's analyses show that this had some influence on dam stability, although it was not the dominant factor.
    - The high water level was the final link in the chain of failure events. Immediately before the failure, the water was about 2.3 m below the dam core. The Panel's excavation of the failure surface showed that the crest dropped at least 3.3 m, which allowed overflow to begin and breaching to initiate. Had the water level been even a meter lower and the tailings beach commensurately wider, this last link might have held until dawn the next morning, allowing timely intervention and potentially turning a fatal condition into something survivable.
    - Finally, the quantity of water had a great deal to do with the quantity of tailings released after the breach developed. It was water erosion that transported the bulk of the tailings, and these fluvial processes ended when the supply of water was exhausted. Had there been less water to sustain them, the proportion of the tailings released from the TSF would have been less than the one-third that was actually lost.

Recommendations

The Panel included recommendations that are grouped into the following seven areas and discussed in the sections below:

1. Implement Best Available Practices (BAP) and Best Available Technologies (BAT) using a phased approach,

2. Improve corporate governance,
3. Expand corporate design commitments,
4. Enhance validation of safety and regulation of all phases of a TSF,
5. Strengthen current regulatory operations,
6. Improve professional practice, and
7. Improve dam safety guidelines

Implement Best Available Practices (BAP) and Best Available Technologies (BAT) using a phased approach. The Panel recommended using Best Available Practices (BAP) to address existing TSFs and recommended using Best Available Technology (BAT). They further recommended applying BAT principles to closure of active impoundments to eliminate risk. The Panel identified the three principles of BAT, as: no surface water; unsaturated conditions, and; achieve dilatant conditions by compaction. The Panel further identified backfilling of mined out pits or underground workings as being the most direct method, but otherwise identified "filtered tailings" technology as the primary BAT. In doing so, the Panel suggested that "There are no overriding technical impediments to more widespread adoption of filtered tailings technology" and "While economic factors cannot be neglected, neither can they continue to pre-empt best technology."

Improve corporate governance. The Panel recommended that corporations operating TSFs should be required to be a member of the Mining Association of Canada (MAC) or be obliged to commit to an equivalent program for tailings management, including the audit function. The MAC, in response to issues presented by TSFs worldwide owned by Canadian based corporations, developed guidelines for tailings management that are considered worldwide as best management practice (BMP). This includes: A Guide to the Management of Tailings Facilities; Developing an Operation, Maintenance and Surveillance Manual for Tailings and Water Management Facilities, and; A Guide to the Audit and Assessment of Tailings Facility Management.

Expand corporate design commitments. The Panel recommended that new TSFs "should be based on a bankable feasibility study and consider all technical, environmental, social and economic aspects of the project in sufficient detail to support an investment decision" and should contain a failure modes and effects analysis, cost/benefit analysis of BAT tailings and closure options with the caveat the cost/benefit should not super-cede safety considerations, and detailed and declared Quantitative Performance Objectives (QPOs).

Enhance validation of safety and regulation of all phases of a TSF. The Panel recommended that Independent Expert Review Panels (IERPs) be utilized together with QPOs to improve safety and regulation of all phases of TSFs.

Strengthen current regulatory operations. The Panel recommended that inspections be performed at all existing TSFs to ascertain whether they may be a risk and require appropriate actions due to specific failure modes: filter adequacy; water balance adequacy; undrained shear failure of silt and clay foundations.

Improve professional practice. The Panel encouraged the Association of Professional Engineers and Geoscientists of BC to develop guidelines that would lead to improved site characterization for tailings dams with respect to the geological, geomorphological, hydrogeological and possibly seismotectonic characteristics.

Improve dam safety guidelines. The Panel, recognizing limitations of current Canadian Dam Association guidelines, recommended that dam safety guidance be developed specific to the conditions encountered with TSFs in BC and incorporated as a statutory requirement.

Fundão, Brazil

The Fundão dam began operating in 2008 and was designed to contain a total of 79.6 million cubic meters of fine tailings (mud) and 32 million cubic meters of sandy tailings during what was supposed to be a 25-year lifespan. In November 2015, Fundão contained 56.4 million cubic meters of iron ore tailings deposited in merely seven years of operation and was undergoing further expansion. On 05 November 2015 a total collapse of the dam took place and about43 million m3of tailings (80% of the total contained volume) were released, generating mud waves 10 m high, killing 19 people, and causing damage to downstream water courses 548 km downstream and beyond (Carmo et al. 2017).

The investigation of the Fundão Tailings Dam failure was commissioned by BHP Billiton Brasil Ltda., Vale S.A. and Samarco Mineração S.A. The firm of Cleary Gottlieb Steen & Hamilton LLP (CGSH) was engaged to conduct the Investigation with the assistance of a panel of experts. The Fundão Tailings Dam Review Panel (Panel) included four members, all specialist geotechnical engineers in water and tailings dams: Norbert R. Morgenstern (Chair), Steven G. Vick, Cássio B. Viotti, and Bryan D. Watts. The Panel Report[7] was issued in August 2016. The following was excerpted from the report.

Failure Cause

The Panel made the following conclusions as to the failure mechanisms involved in the Fundão TSF failure:

- The original design concept for the Fundão Dam employed an unsaturated sand zone to support the weak slimes zone. Unsaturated sand is not amenable to liquefaction and hence the original design was robust in this regard. However, difficulties were encountered in executing the design and a modified design was put forward and adopted. As part of this modification, a change in the design concept was also adopted and saturated conditions were permitted to develop in the sand.
- The flowslide required three conditions to develop: (1) saturation of the sand; (2) loose uncompacted sand; and (3) a trigger mechanism. Depositing sand tailings by hydraulic means resulted in loose conditions. The growth in the saturated conditions is well-documented. Hence, all the conditions prevailed for liquefaction to develop resulting in a flowslide, provided it was triggered.
- Eyewitness accounts revealed that the flowslide initiated on the left abutment, where the dam had been set back from its former alignment. Studies of the depositional history associated with the growth of the Fundão Dam revealed that slimes encroached into the area preserved for sand deposition alone. The design incorporated a 200-meter zone separating the two deposits but historical information reveals that slimes had encroached into the area on a number of occasions. The presence of slimes introduces a barrier to downward drainage and a zone of

[7] Morgenstern, N.R., S.G. Vick, C.B. Viotti, B.D. Watts. 2016. *Fundão Tailings Dam Review Panel Report on the Immediate Causes of the Failure of the Fundão Dam*. August 25, 2016. http://fundaoinvestigation.com/the-panel-report/

potential weakness that might affect stability. Deposition in the area of the right abutment was almost slimes free.

- The setback was implemented to accommodate repairs to a deficient conduit at the base of the impoundment as well as the construction of additional horizontal blanket drains to facilitate subsequent dike-raising. This change in geometry resulted in substantial embankment loading over slimes-rich deposits. This distinguishes the left abutment area from the right and accounts for the location of flowslide initiation.
- The Panel concluded that lateral extrusion initiated the failure. The lateral extrusion mechanism develops as the dam increases in height, loading the slimes-rich zone vertically which tends to extrude or spread laterally, rather like squeezing toothpaste from a tube. This results in stress changes in the overlying sands which reduce their confinement, leading to collapse.
    - This mechanism for collapse was modelled by tests in the laboratory and by computational modeling that predicted to an acceptable degree that collapse should have occurred about the time that the dam was raised to the height that was attained on November 5, 2015.
- The role of the earthquakes that occurred just prior to collapse was also investigated quantitatively. Calculations with recommended design motions reveal that about 5 mm of displacement may have been induced in the slimes. Given the proximity of the dam to collapse due to prior construction loading, this likely accelerated the failure process that was already well-advanced.

BISON CONNECT

LCDO_Comments, BLM_NM <blm_nm_lcdo_comments@blm.gov>

FW: DEIS Comments - Copper Flat

1 message

Shepherd, Holland, EMNRD <holland.shepherd@state.nm.us> Fri, Mar 4, 2016 at 2:27 PM
To: "BLM_NM_LCDO_Comments@blm.gov" <BLM_NM_LCDO_Comments@blm.gov>
Cc: "Ennis, David, EMNRD" <David.Ennis@state.nm.us>, "Ohori, David, EMNRD" <david.ohori@state.nm.us>

These comments are from the:

NM Mining and Minerals Division

1220 South Saint Francis Drive

Santa Fe, NM 87505

505/476-3400

Holland Shepherd

Program Manager

Mining Act Reclamation Program

Mining and Minerals Division

505/476-3437

From: Ennis, David, EMNRD
Sent: Wednesday, March 02, 2016 3:45 PM
To: Shepherd, Holland, EMNRD; Ohori, David, EMNRD
Subject: DEIS Comments - Copper Flat

Once you've reviewed these comments, please forward the Word document with your changes to:

BLM_NM_LCDO_Comments@blm.gov

Comments are due on Friday March 4.

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Copper Flat DEIS Comments:

- Section 2.1.4.1 Reclamation Material: this section seems out of place as a heading under Waste Rock Disposal Facility. This section would seem better located under Section 2.1.8 Growth Media, Section 2.1.9 Borrow Areas or 2.1.15.9 Plant Growth Media and Cover Materials.

- p. 2-23, Table 2-5: A reference/citation of where this data was obtained should be provided because this table shows a substantial increase in the available reclamation material compared to the estimates provided in the report by Stetson Engineers, Inc. entitled "Order 1 Soil Survey of Permit Area" dated September 14, 2011 (provided by THEMAC as appendix 6-A to the Baseline Data Report).

- p. 2-24, Table 2-7: This table for the estimated number of employees needed in year 1 of the Proposed Action is the same as Table 2-18 for year 1 of Alternative 1. It seems likely to this reader that the estimated number of employees needed for Alternative 1 (an accelerated rate of mining) would require additional employees compared to the Proposed Action.

- p. 2-40, Table 2-12: top dressing cover requirements. This table ties to Section 2.1.15.9, Page 2-39, of the DEIS which states:

  "...poor development of topsoil (top dressing) at the site would require the evaluation of alternative sources and types of materials for use as reclamation cover. The estimated volumes of salvageable cover material available in areas to be newly disturbed or re-disturbed by the project are shown in Table 2-5, above."

  - Table 2-12 states the volume of top dressing cover needed, but Table 2-5 and Section 2.1.15.9 don't provide enough information to determine if the volume of required top dressing is available on site.

  - Table 2-12 does not provide the assumed thickness of top dressing required. Page 2-37 under the heading of Acid Rock Drainage, provides a total thickness of up to 36" of cover materials, but Table 2-12 doesn't describe what portion of the 36" is top dressing. Granted, this could be back-calculated from the information provided, but it shouldn't be necessary for the reader to do this.

- p. 2-87, Section 2.4: The last sentence of this section states that "the mine area would be reclaimed according to BLM standards, and to NMED [emphasis added] requirements, pertaining to disturbances associated with site exploration. "MMD" should be substituted for NMED; NMED does not typically regulate exploration disturbance, but MMD does.

- p. 3-25, Table 3-9: the superscripts of 1 and 2 and not explained in the notes at the bottom of the table.

- p. 3-34 through 3-36, rapid infilling of the pit: natural infilling of the pit to its natural static water level is anticipated to take a period of decades to centuries (page 3-34, 3rd paragraph and page 3-35, 1st paragraph). Since natural infilling is so slow, and rapid infilling with fresh water from the production wells is anticipated to take 6 months to a year (page 3-34, 3rd paragraph), it seems likely that the water placed in the pit will leak back into the surrounding andesite aquifer; the pit water level will have a higher head than the water level in the andesite aquifer. It seems likely that the water level in the pit will therefore progressively go down due to evapotranspiration and until equilibrium with the surrounding static water level is reached. This scenario isn't described in the DEIS nor whether NMCC will continue to introduce water to the pit until static water level equilibrium is reached. The DEIS isn't clear as to whether the use of this "make-up" water is accounted for in the DEIS alternatives.

- p. 3-128, Table 3-25: Bendire's Thrasher does not have a dot indicating that it is a either a recorded species or a species likely to occur in proper habitat.

- p. 3-180, Figure 3-29: There is something fragmented about this photo – it looks like two images partially superimposed on each other.

- p. 3-180, Figures 3-30, 3-31, and 3-32: These photos are pixelated and should be clear for the Final EIS.

NEW MEXICO
ENVIRONMENTAL LAW CENTER

July 3, 2017

Shelly Lemon, Bureau Chief
Surface Water Quality Bureau
New Mexico Environment Department
1190 St. Francis Dr.
P.O. Box 5469
Santa Fe, NM 87502

RE: Copper Flat Copper Mine Current and Proposed Future Pit Lake in Sierra County, New Mexico

Dear Mrs. Lemon:

The New Mexico Environmental Law Center ("NMELC") represents Turner Ranch Properties, L.P. ("TRP"), owner of the Ladder Ranch ("Ranch") in Hillsboro, New Mexico. The Ranch is located adjacent to the Copper Flat Copper Mine site ("Mine"), which the New Mexico Copper Corporation ("NMCC") has proposed to reopen. As part of the proposed reopening process, NMCC has requested that the New Mexico Environment Department ("NMED") regulate the Mine's current and potentially future expanded pit lake ("Pit Lake") as a "private water of the State," thereby exempting it from New Mexico's water quality protection regulations. NMCC Letter to Surface Water Quality Bureau (August 9, 2016). On behalf of TRP, NMELC hereby requests that NMED continue to regulate the Pit Lake as a surface water of the State, subject to New Mexico's water quality protection regulations.

The Pit Lake cannot satisfy New Mexico's private waters exemption for the following two reasons: first, the Pit Lake is partially located on public lands; and second, the Pit Lake will not remain an evaporative sink during post-closure operations and will combine with groundwater. Therefore, NMED must continue to regulate this toxic body of water as a surface

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water of the State, subject to water quality protection regulations, and must require NMCC to complete its Use Attainability Analysis ("UAA") for the Pit Lake.

I. Surface Waters of the State and the Private Waters Exemption.

New Mexico has historically treated pit lakes, which are water bodies within artificially constructed pits created as a result of copper mining activity, as surface waters of the state subject to New Mexico's surface water quality standards. 20.6.4 NMAC. Flow-through pit lakes that recharge the groundwater must also meet groundwater standards. *Id.* Until pit lakes are reclaimed to meet water quality standards they pose a grave threat to wildlife.[1] NMCC has requested NMED find that the Mine's Pit Lake is not a surface water of the State, but rather a "private water of the State" not subject to either State surface or groundwater quality protection standards.

The "private waters exemption" is found at 20.6.4.7(5) NMAC. It states, in pertinent part:

> Surface waters of the state does not include private waters that do not combine with other surface or subsurface water or any water under tribal regulatory jurisdiction pursuant to Section 518 of the Clean Water Act.

Id.

A two-part test is used in determining whether a pit lake satisfies the private waters exemption. The first part of the test is whether the pit lake is solely on private lands. The pit lake cannot be situated "wholly or partly within or bordering upon the state." *Id.* The second part of the test is whether the pit lake will combine with either surface or subsurface water or any

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[1] The U.S. Fish and Wildlife Service determined that the 3,000 to 4,000 snow geese that perished in the Berkley Pit in Montana in December 2016 died due to heavy metals and sulfuric acid exposure. http://mtstandard.com/natural-resources/superfund/metals-acid-in-berkeley-pit-water-killed-geese-report-confirms/article_0d30c9c3-ae67-56cf-9314-bb1685a1a42d.html. Last visited on June 26, 2017.

water under tribal regulatory jurisdiction. *Id.* The Pit Lake, both in its current and potential future expanded states, does not satisfy this two-part test for the reasons discussed below.

II. The Pit Lake is Situated on Both Public and Private Lands.

The Pit Lake is situated on both public and private lands. The Bureau of Land Management ("BLM") "manages surface ownership of 56 percent of the Copper Flat site and 44 percent is privately owned." Draft Environmental Impact Statement, page 1-1; *see also* Figure 1-1 (Source: BLM 2015) (November 2015). Specifically, "10 percent of the open pit would be located on public land subject to mining claims controlled by NMCC ...." *Id.* at 2-2 (citing to THEMAC 2011). This comports with the previous Mine owner's assertion regarding location of the Pit Lake. *See* Draft Environmental Impact Statement, page 2-5 (1996) ("10 percent of the open pit would be on public land"); *see also* Figure 2-1, attached as Exhibit A (Date: NOV/17/1995; ACAD FILE: 12-476\401\BASE).

Moreover, legal counsel for NMCC conceded to NMED that a portion of the Pit Lake is situated on public lands. Mine Cooperating Agency Meeting Notes, page 3 (April 28, 2016).[2] Therefore, the Pit Lake fails to satisfy the private water exemption's requirement that the surface water be situated wholly on private land.

III. The Pit Lake Will Not Remain an Evaporative Sink at the End of Mining.

NMCC's inadequate hydrologic modeling fails to show that the Pit Lake will not remain a hydrologic evaporative sink at all times during post-closure operations.[3] The Pit Lake will

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[2] Attached as Exhibit B.

[3] NMED responded to NMCC's August 5, 2016 request letter on October 21, 2016. Acting Surface Water Quality Bureau Chief, Shelly Lemon, stated in response:

[A] groundwater flow model report submitted by your company to the Department with the ground water discharge permit application contains hydrologic modeling showing that the water body does not combine with other surface or subsurface waters. The modeling shows that the water body is an evaporative sink, meaning that ground water combine with subsurface waters during and after rapid fill of the pit after mining operations cease. Back in April 2016, NMELC provided extensive comments on the BLM's Draft Environmental Impact Statement ("DEIS") released in November 2015, with particular emphasis on the DEIS's failure to fully ascertain hydrologic baseline conditions and the resultant conceptual flow model errors and numerical flow model errors and biases relied upon in the DEIS.[4] In light of these substantial hydrologic modeling errors, NMED should not presume NMCC's groundwater flow model is scientifically valid.

NMELC requests that NMED take into consideration a recent technical memorandum prepared by its Hydrologic Consultant, Dr. Tom Myers, addressing the Pit Lake.[5] In his technical memorandum, Myers concludes that "pit lake water would enter the surrounding formations as groundwater" due to rapid fill of the pit after mining operations cease. Dr. Tom Myers Technical Memorandum, "Description of Pit Lake Formation, Copper Flat", page 8 (June 25, 2017) ("Myers Technical Memo").

Myers has estimated that the Pit Lake surface "would be about 600 feet below the rim of the pit" at the end of mining operations. Myers Technical Memo, page 2. The DEIS states that the Proposed Action and Alternatives 2 and 3 include a "rapid fill" of the pit to limit the exposure of sulfide in the wall rock to oxidation and to stabilize pit water quality after mining operations cease. DEIS, page 2-44 (November 2015). The plan would "bring pit water to a

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within a certain radius will flow exclusively toward the pit, where it will evaporated along with any stormwater that enters the pit. Additional hydrologic modeling demonstrates that at the end of mining, the pit will remain an evaporative sink.

NMED Response Letter to NMCC, pages 1-2 (October 21, 2016). NMED fails to cite to additional hydrologic modeling demonstrating that at the end of mining the pit lake will remain an evaporative sink.

[4] *See* NMELC's comments on the DEIS, pages 2-3, 6-7, 20-26, 45-48, 54-57 (April 4, 2016).

[5] Myers' Technical Memo has been attached as Exhibit C.

steady-state water level elevation in less than a year through the addition of groundwater from the mine production wells, rather than the many years it would take for the pit water elevation to rise to this level if it were to refill naturally." *Id.* About 2800 acre feet of water would be pumped into the pit within seven months at 3,000 gallons per minute. *Id.* The DEIS claims that this would "create a steady state condition for the hydraulic sink in the near term rather than waiting for the natural refilling of the pit." *Id.* Myers estimates that natural refill of the pit would take between 35-100 years. Myers Technical Memo, page 3.

Rapid filling the pit after the end of mining operations will cause Pit Lake water to combine with groundwater for the following reason:

> Rapid refilling of the pit would occur at a rate as much as 60 times that of the natural inflow rate. This would cause the pit lake level to rise much faster than it would solely on groundwater inflow and runoff. It would also rise faster than the groundwater table around the pit would rise naturally because natural groundwater level rise depends on the rate that groundwater can flow toward the pit, and that is very limited by the low conductivity in most of the bedrock. *Because the rising pit lake levels would be higher than the surrounding groundwater, it would cause the water table to slope from the pit lake into the surrounding formations, opposite from its share during natural refill. Water would enter the formations from the rising pit lake.*

Id. at page 7 (emphasis added). It is unclear for how long Pit Lake water will enter surrounding formations and combine with groundwater. Therefore, the Pit Lake fails to satisfy the private waters exemption's requirement that it not combine with surface or subsurface water.

IV. NMED Must Require NMCC to Complete Its Use Attainability Analysis of the Pit Lake.

The New Mexico Mining Act requires that new mines be designed "to meet without perpetual care all applicable environmental requirements imposed by the New Mexico Mining Act and regulations adopted pursuant to that act and other laws following closure." NMSA 1978, Section 69-36-12.B(4). This statutory requirement is implemented through Section 10.19.6.606.B(3) NMAC, which states that no permit shall be issued until:

> The Secretary of the Environment Department has provided a written determination stating that the permit applicant has demonstrated that the activities to be permitted or authorized will be expected to achieve compliance with all applicable air, water quality and other environmental standards if carried out as described in the permit application. This determination shall address applicable standards for air, surface water and ground water protection enforced by the Environment Department, or for which the Environment Department is otherwise responsible.

Id. In order for NMED to make a determination regarding whether NMCC will meet surface water and ground water protection standards after mining operations cease, a Use Attainability Analysis ("UAA") is required.

There are two main reasons why a UAA is needed. First, the Pit Lake is a surface water of the State, specifically it is a perennial unclassified water. Section 20.6.4.99 NMAC. Perennial unclassified waters have the following designated uses: "warm water aquatic life, livestock watering, wildlife habitat and primary contact." The designated use determines the water quality standards NMCC is required to meet. Section 20.6.4.900 NMAC. NMCC has conceded to NMED that it cannot meet standards for warm water aquatic life. Mine Cooperating Agency Meeting Notes, page 6 (April 28, 2016) ("We can't meet aquatic life. There will be no mining if we are required to meet warm water aquatic life standards".)

Second, NMED has determined that the proposed Mine cannot meet standards after mining operations cease based on NMCC's groundwater flow model. *Id.* at page 4 (James Hogan, Acting Bureau Chief of the Surface Water Quality Bureau, advised NMCC, "Right now, you can't meet standards."). Because the current Pit Lake does not currently meet standards[6] and NMCC's modeling demonstrates that the future expanded Pit Lake will not meet standards, a UAA is required.

[6] *See* DEIS, pages 3-21, 3-22; *See also* NMCC's Stage 1 Abatement Plan for the current pit lake.

A UAA "is a scientific study conducted for the purpose of assessing the factors affecting the attainment of a use," Section 20.6.4.15.A NMAC, and "shall assess the physical, chemical, biological, economic or other factors affecting the attainment of a use." *Id.* at -B. The New Mexico Water Quality Control Commission ("WQCC") may, upon request by NMCC, remove a designated use "only if a use attainability analysis demonstrates that attaining the use is not feasible." *Id.* at –A(1). Therefore, if NMCC wants to avoid meeting standards for the designated use of warm water aquatic life because it has conceded that it cannot meet this standard at the Pit Lake, then NMCC must complete a UAA in order to request that the WQCC remove this designated use and thereby remove the associated requirement of meeting those particular water quality standards. Until a UAA is completed and the WQCC has ruled on a request to remove the designated use of warm water aquatic life from the Pit Lake, NMED cannot certify to MMD that the Mine will meet the applicable water quality standards upon mine closure.

Additionally, the DEIS stated that a "use attainability analysis is being conducted to evaluate if the pit lake was capable of attaining a designated use such as warm water aquatic life based on physical, chemical, biological, or other factors." DEIS 3-33. This statement is factually incorrect for two reasons. First, NMCC has not completed a use attainability analysis for the Mine's Pit Lake. In fact, NMCC has requested that NMED either 1) not require a UAA or 2) defer the completion of a UAA until after closure of mining activities. Mine Cooperating Agency Meeting Notes, page 4 (April 28, 2016). Second, NMCC is now claiming that the Pit Lake is a "private water of the State" and not subject to State groundwater and surface water quality standards, therefore a UAA is no longer required.

V. Conclusion.

For the above stated reasons, NMED must continue to regulate the Pit Lake as a surface water of the State subject to water quality protection regulations and must therefore require NMCC to complete its UAA for the Pit Lake.

Regards,

Jaimie Park

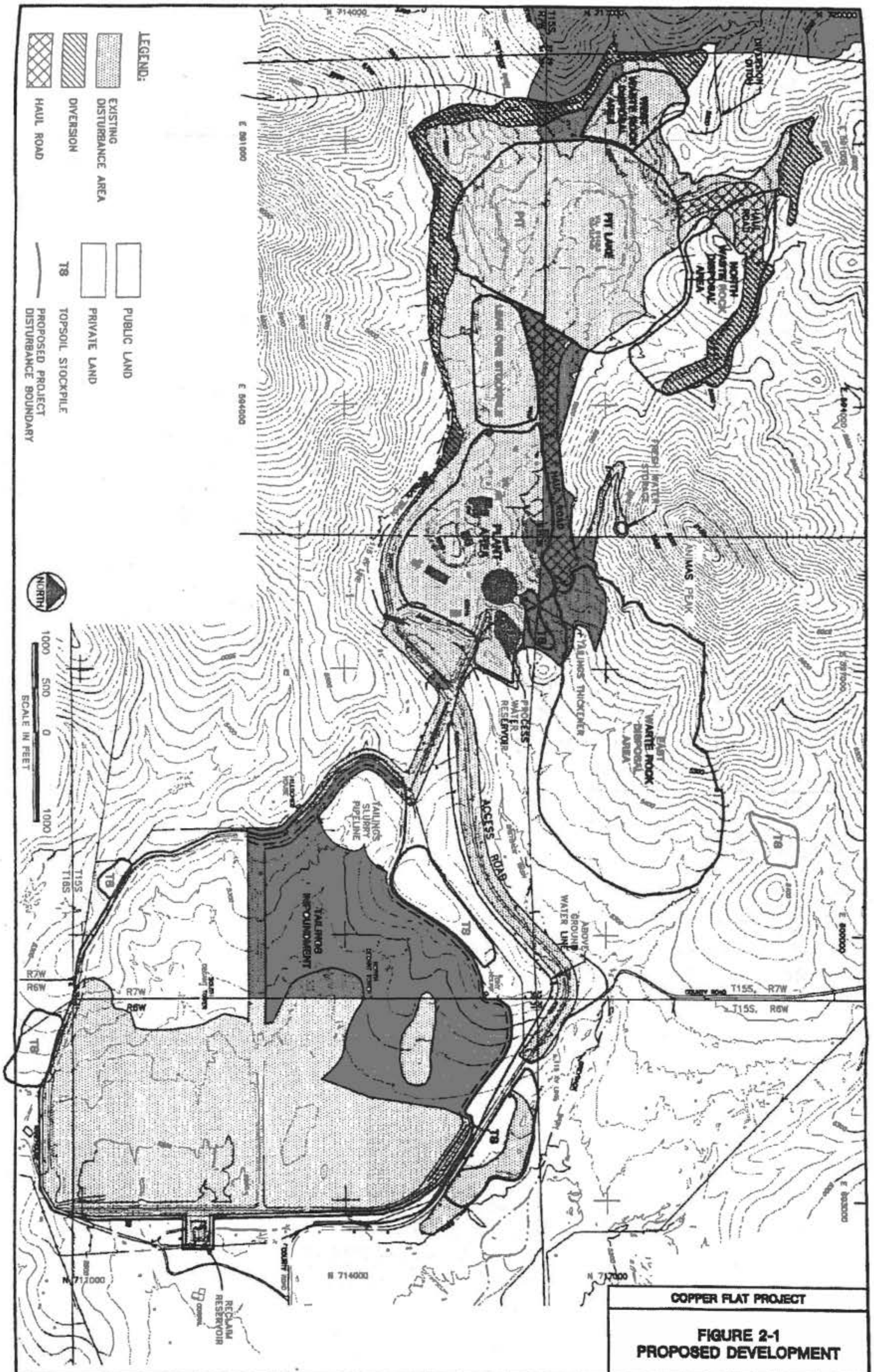
Jaimie Park, Staff Attorney
New Mexico Environmental Law Center

Cc:

Andrew Knight, Assistant General Counsel
New Mexico Environment Department

Doug Haywood, Project Lead
Copper Flat Copper Mine Project
BLM Las Cruces District Office

Holland Shepherd, Program Manager
New Mexico Mining and Minerals Division,
Mining Act Reclamation Program



COPPER FLAT PROJECT

FIGURE 2-1
PROPOSED DEVELOPMENT

DATE: NOV/17/1995 ACAD FILE: 12-476\401\BASE

EXHIBIT A

EXHIBIT
B

Notes – Meeting of Surface Water Quality Bureau (SWQB) and New Mexico Copper Corporation (NMCC) on 28 April 2016

In Attendance

Name	Organization	Initials
James Hogan	NMED – SWQB	JH
Shelly Lemon	NMED – SWQB	SL
Andrew Knight	NMED – SWQB	AK
Bryan Dail	NMED – SWQB	BD
Kris Pintado	NMED – SWQB	KP
Brad Reid	NMED – GWQB	BR
Jeff Smith	NMCC	JS
Katie Emmer	NMCC	KE
Stuart Butzier	Modrall Sperling	SB
Christina Sheehan	Modrall Sperling	CS

Next Meeting: 23 May, 2pm at SWQB

Action Items

- NMED will consider and research the interpretations discussed regarding whether the Copper Flat Pit meets or is excluded from the definition of a surface water of the state and provide feedback on their position in the next scheduled meeting.
- NMCC will continue to work on the geochemical model and reclamation strategies that might improve future pit water quality, the economic impact of limiting mining to keep pit water on private lands, and the possibility of a Use Attainability Analysis (UAA).

Meeting Discussion

JH: Provided an overview of status based on KE's email and our previous conversations. There currently is a pit water body that the ACOE has determined is not jurisdictional "Waters of the United States" under the Clean Water Act. However, because the current pit water exceeds some NM surface water quality standards (for Cu, Zn, Cd, others), we've discussed that NMCC could do a UAA to change water quality standards- either modify or remove the aquatic life standard. During mining, the water will be pumped out of the pit. We've discussed that groundwater coming into the pit could be used in process per NMCC's Discharge Plan (DP) and within NMCC's water rights. Post mining, water will collect in the pit and the question will be does the future water meet the applicable water quality standards under a closure scenario.

JS- Confirmed JH's schematic overview: Copper Flat has a pit water body now, when mined it will be dewatered, and when the mine closes the water will return to the pit. Discussed background on where we've been and why we are here. JS has been with NMCC for about 2.5 years. Copper Flat was mined briefly in 1982 and had to be shut down due to copper prices. The plans for the proposed mine now being considered are similar to what Quintana put in place then. In 2013 NMCC did a project feasibility study, with engineering and economic analysis, and after that NMCC has had to focus most of its attention on the NEPA process and getting BLM what they needed. NMCC has a small staff and with some considerable effort it did get the DEIS issued last year. In 2015, in addition to working on responding to requests for information from the BLM, NMCC shifted focus to the DP Application, and that was submitted in December of 2015. The DP is in review, and NMCC is in the process of responding to comments from NMED. Now NMCC is shifting its focus to the mine permit needed from MMD. This is why we are here today, we are shifting our focus to the regulatory issues we need to work through for that permit, and we want to clarify a few things and make sure we are all on the same page.

SB- Modrall has been asked to review things for NMCC, and has taken a step back to look at how the pit is understood in relation to the Water Quality Control Commission's (WQCC) definition of "surface waters of the state." NMCC wishes to explore that issue, discuss whether a possible UAA will be necessary, and come to an understanding of how the Determination the NMED needs to make under the Mining Act for the state mining permit to be issued under the Mining Act by the Mining and Minerals Division (MMD). Under that permitting process, the Post Mining Land Use (PMLU) will be wildlife at the pit. The pit will not be backfilled at the end of mining. It will be there. The pit is a unique situation. NMCC does not want active treatment at the end of mining. Cunningham Hill is perhaps a similar situation, but was already in play by 2010 when the surface water standards were changed.

JH- The Cunningham Hill permit was already in place and SWQB did not change the standards that apply to it at that time.

SB- Because the pit water situation at Copper Flat is fairly unique, how SWQB interprets the Copper Flat pit will not be hugely precedent setting. We view the Copper Flat pit as distinct from other sites where water will be in mine pits. Tyrone/Chino will have long term treatment, so they are exempt. The Cunningham pit is not subject to aquatic life or primary contact standards. Up to this point apparently NMED has been thinking that the water at Copper Flat probably is a "lake." Our interpretation is that it's not a lake and will not collect surface waters of the state. The definition draws distinctions between natural features and manmade bodies. Because the pit will be a hydrologic sink, it will not combine with surface or ground waters under the language of the surface waters of the state definition.

JH- So what about a manmade body, such as damming the Rio Grande and creating Elephant Butte?

SB- In that case you are impounding a water of the US, and the same water would be surface water of the state.

CS- That is expressly contemplated in the definition of a surface water of the state, it's a manmade body in a tributary.

JH- So what if you have a closed basin, such as Mimbres, and there's a stock pond there, is that a surface water of the state? It's in a stream channel, but we know the Army Corps of Engineers is not involved...

SB- Yes, that impounds surface waters of the state, it's created in a tributary, a stream that is a surface water of the state and once you impound that water, it's included.

KE- I'd note here that Grayback arroyo does not connect to the pit water body; this was one of the features that made ACOE comfortable to make their jurisdictional determination that the pit water is not a Water of the United States.

JS- I was part of making the diversion back in the 80s at Copper Flat. We diverted Grayback so that it goes around the pit.

BD- The water in the pit comes from groundwater coming into the ore body that is exposed.

SB- Correct. So you aren't impounding a surface water of the state. There will be water falling on the pit walls during precipitation events, but no tributary flowing in. We don't expect a solution today; we just want to talk through a list of things for you to think about, and for us to think about.

AK – I followed this case from the side lines when Kay Bonsa was assigned to this project. I have been willing to revisit her conclusions if it ever was assigned to me, and now it is. I think this will turn on how we've interpreted the definition in the past and in other similar places. I need to dive deeply into this topic and do some research. Kay didn't do much mining; she worked on waters of the US, dairy. On its face, the interpretation you are presenting is plausible and will require a lot of research on my part to see what kind of context we have.

SB – Under Part 6 of the Mining Act there is a stringent (some would say onerous) permitting process that MMD administers and requires a NMED determination that the plan will meet all standards. NMCC is of course concerned about wildlife. There is a provision in Part 6 that addresses wildlife, and so there will be consideration of protecting wildlife. Even if SWQB concludes the pit water is not surface waters of the state, NMED will have an opportunity to comment on the application, and MMD may confer with NMED about protections for wildlife. Wildlife protection issues will be addressed through the mining program administered by MMD.

JH- So if MMD came to us, we would say (in this scenario), it's not a surface water of the state, no standards apply, but MMD may ask what is needed to protect wildlife and we could advise on what is appropriate.

SB- NMED could urge MMD to consider its standards relating to wildlife protection.

JH- So Andrew, would you want anything further from Stuart on this, a memo or any rendering of opinion?

AK- (No.) I have enough to get started.

SB – We are happy to field any questions. So after that question of the definition of a surface water of the state, which is our first layer that we'd like you to consider, there is a second layer of interpretation SWQB could consider, that of private waters. Most of the water body at the end of mine life will be on patented mining claims, which is to say they are on private lands. Most of the surface expression of the pit water falls on patented land; only a small sliver expresses on unpatented claims, which are not fee lands. If you assume for the discussion that the pit water is disqualified for a private water when it expresses beyond the boundary of patented lands, what if the future water body were to be entirely confined to private land? We are interested in NMED's view of this alteration, if NMCC decided to make it, would cause you to conclude the water is private.

JH – If you can figure out a way to avoid that issue, the private waters exclusion is clear. We would entertain that.

SB – We understand the reasoning that if part is not on private land, there's access. But to be clear, our first layer interpretation is our first choice: the pit water is a unique water body and does not meet the definition of a surface water of the state, so it is not even necessary to consider the private waters exception.

SB – So on a third level, and only if the SWQB decides the pit water meets the definition of a surface water of the state and is not within the private waters exception, we have the issue of the tricky UAA process. The UAA purpose is to try to scale back some normal fishable/swimmable standards based on attainability. You've indicated NMCC may need to do a UAA on current water, how do you transpose that to future water?

JH – It all comes down to the future pit water body. The water in the current pit does not meet standards. If future water meets standards at the end, then fine. If you can't meet standards in the future, do the UAA on the present water body and if the standards are modified or removed, that same change (in standards applied) would ultimately apply to the future pit.

SB – We wanted to explore this idea of doing a UAA on the current water. The current water doesn't tell you much about the water in the future pit. The company expects to mine out most of the sulfides in the pit and will take reclamation steps to limit the amount of water that comes in contact with sulfides. They are still in the process of undertaking that planning and analysis. Based on no reclamation, the pit will maybe not meet the standard for Se. But we are optimistic that modeling can show standards will be met. Could we skip doing the UAA today? Give MMD a plan, we think we will meet but if we can't, then at that point we would do a UAA. Is that a way to avoid problems now? Allow NMED to say that we will meet in the future, but still provide cover if we don't.

JH – Right now, you can't meet standards. There are some constituents that the model shows as high where the current data from the actual pit water it's lower. The model isn't able to accurately predict exactly what is in the pit, some things are high, some are low. Perhaps you can show that the model is conservative and use it. What I hear you saying is we will look at the future water body and see if we can meet those standards, perhaps do more future measures, remove sources of constituents. If you can show that you will be able to meet standards and have confidence in the reasoning, then yes (NMED can offer the determination). If however based on your analysis you believe you can't meet a, b, c, that will kick us back to the UAA.

SB – We are wondering about timing. We think we will meet standards, but if we don't, perhaps a UAA in the future.

BR – So you would monitor the pit way into the future? Such that perhaps you find 50 years after closure that it's not meeting standards and do something then? Will that be considered perpetual care?

SB – No, I had only contemplated running a new model at the end of mine life, allowing us to re-assess at closure with more information about the pit walls, etc. One thought is if we can push the UAA decision to the end of mine life, perhaps we could set up a process where NMED can today say it's ok if you go through this process.

JH – I'm not sure we could.

AK- For us to make a determination, if you can show you will meet standards, fine. But if the model shows you won't meet standards, we can't make that certification.

SB – My hypothetical does imagine showing that water will meet standards. Maybe you stop there.

JH – Maybe more can be done to avoid exposure to rocks that will contribute constituents to the water body.

SB- If NMCC can produce a model that shows compliance with standards in the future, maybe the determination on surface waters of the state can be punted.

AK- Strictly speaking a determination letter does not go into that. It states the standards, if apply, will be met.

JH – The report we've seen on the geochemical model for the pit does show some discrepancy between the existing pit and what the model shows. For example Vanadium – the model shows it higher than the current water in the pit. Se, for another example, is higher in the predicted model than the existing water. Arsenic is high in the current water but lower in the model.

KE – Yes, trying to calibrate to an existing pit has been both a blessing and a difficulty. There are some things the model is good at modeling, others that it doesn't do as well at.

BR – So was Kay looking at Copper Flat?

AK – She was also tasked with looking at Little Rock.

BR – But that's a water of the US, a water of the state. Little Rock is a closed basin.

JH – It's a water of the state if we don't buy SB's argument.

AK and SB – Discussed the possibility of appeals and how the issues might play out in that context.

AK – It certainly would be easier if you meet standards.

KE- I just want to note that meeting the wildlife standard is hard but meeting the warm water aquatic life standard is really a problem.

AK – I know it's easy for me to say, but I think the UAA is very doable. I know it's hard to put in all that effort and just see what happens.

JH – The UAA says we can't achieve this use for these reasons.

KE – I'm concerned that if we do a UAA on the current pit, which isn't reclaimed, and show that we can't attain the standards, people will complain that once the pit is reclaimed we should be able to meet standards.

AK- People will have that criticism.

KP – We were aimed at the use because the aquatic life standard is so difficult.

SB- The current conditions don't reflect the future conditions.

JH- You do a UAA because in the future you don't believe you will meet standards.

KE- We can't meet aquatic life. There will be no mining if we are required to meet warm water aquatic life standards.

SB- Is it possible to do a UAA on a future pit?

JH – We can only apply a UAA to what exists today.

BR- So could you do a UAA if there was not water body today?

JH- No. I don't know what we would do in that scenario.

SB- So, if the pit water is interpreted as a surface water of the state, you'd have to go through the UAA before NMED would issue a determination?

AK & JH- Yes.

SB – I think this first layer interpretation I have laid out is defensible and avoids the uncertainties associated with trying to do a UAA under the circumstances presented here.

AK – I think it will be challenged, so we have to be sure.

SL – The UAA may not be too long. It just has to go to the commission, it's a hearing. The UAA process doesn't necessary mean years.

JH – We've done a UAA hearing that took an hour. Once you have the analysis done the hearing can go fast.

SB, AK and CS – Further discussed the possibility of an appeal. AK – I think I can get this interpretation issue reviewed in 2 weeks; that should be enough to find and look at what's out there.

Discussion of next steps- NMED will shoot for having their internal review done by 20 May. Group agrees to meet again to discuss further on 23 May at 2pm. Meanwhile NMCC will continue assessing pit issues.

Close. Thank you for your time.

Doc # 2704671

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EXHIBIT
C

Technical Memorandum

RE: DESCRIPTION OF PIT LAKE FORMATION, COPPER FLAT Sierra County NM

June 25, 2017

Prepared for: Turner Ranch Properties, L.P. ("TRP"), owner of the Ladder Ranch, and the New Mexico Environmental Law Center ("NMELC")

Prepared by: Tom Myers, PhD, Hydrologic Consultant, Reno NV

Introduction

The Copper Flat project would reestablish an open pit mine (proposed action) in foothills near Hillsboro NM between Las Animas and Percha Creeks. Myers (2016) reviewed the Draft Environmental Impact Statement (DEIS) prepared for the project.

The original mine operated for a few months in 1982. When it closed, it left an open pit which has formed a small pit lake. The existing pit lake is a terminal lake with a historical water level ranging between 5435 and 5450 ft amsl, and a water surface area between 5 and 14 acres (Jones et al 2014, p 42). The evaporation rate is 64.6 in/y so the evaporation has varied from 16 to 45 gpm. The bottom of the existing pit is about 5400 ft amsl and the current water level is about 5439 ft amsl (Jones et al 2014, p 24). The pre-mining groundwater level had been about 5450 ft amsl (Id.) so evaporation in the existing pit maintains about an 11-foot drawdown over pre-mine groundwater levels. To keep the pit dry in 1982, the pumping rate was about 22 gpm with some increases to 50 gpm due to precipitation.

Evaporation is the only outflow from a terminal pit lake that has reached steady state conditions, such as the existing pit lake. Steady state means that the pit lake water level is relatively constant from year to year, with changes occurring seasonally and due to long-term wet or dry periods. Groundwater contours around the pit lake form a cone with the pit at its center so that groundwater flows toward the lake from all directions (Figure 1). The groundwater contour plotting assumes the observed water levels are representative for the entire aquifer thickness that could drain toward the lake. It assumes there are no geologic layers that have substantially different water levels not accounted for in the contour plotting and through which water could escape from the pit.

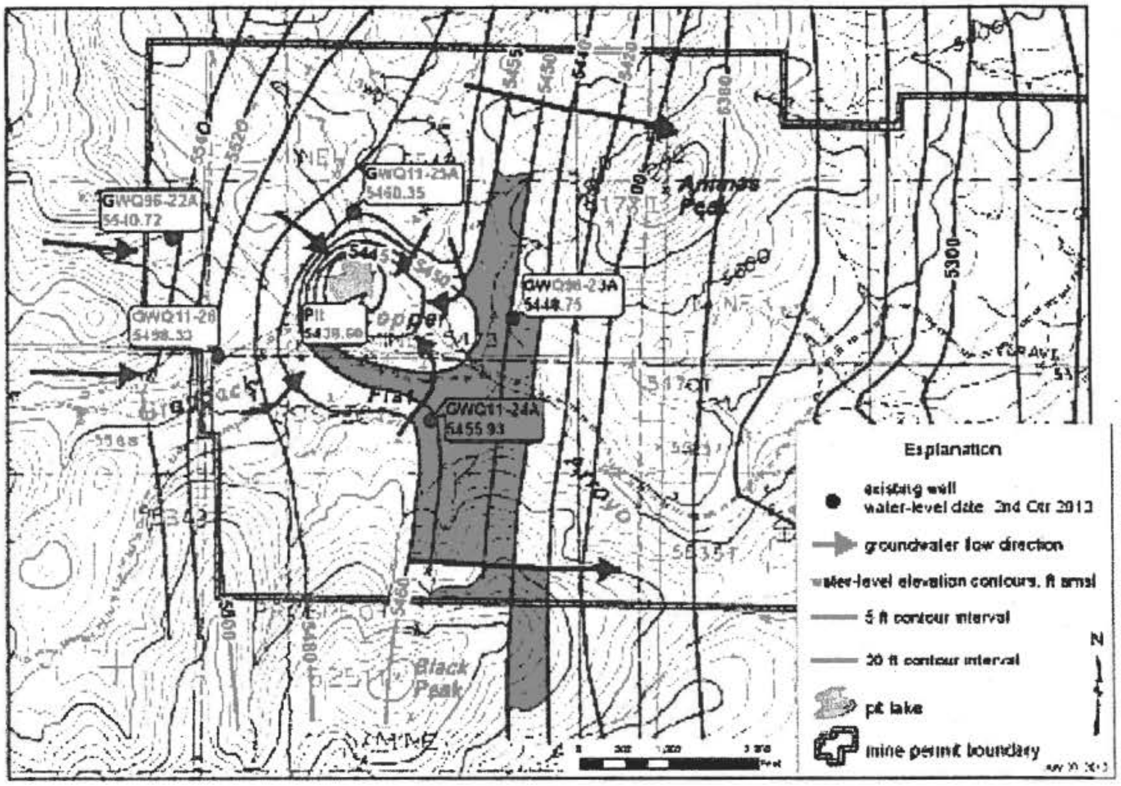


Figure 5.21. Measured pit-area groundwater levels.

Figure 1: Snapshot of Figure 5.21 from Jones et al (2014) showing groundwater contours around the existing pit lake at Copper Flat.

Proposed Action and Pit Lake

The proposed pit would average about 780 feet deep with a maximum depth of about 900 feet from its highest point (DEIS, p 2-6). During mining operations, the pit would be kept dry by pumping water ponded in a sump at the bottom of the pit. At the end of mining, model-simulated groundwater contour maps for all mining alternatives show drawdown at the center of the cone centered on the pit would exceed 700 feet (Jones 2015).

The proposed action and both alternatives would allow a pit lake to form at the proposed Copper Flat Pit during closure. The closure pit lake water level has been estimated to be about 4900 ft amsl once the pit lake water balance reaches steady state (DEIS, p 2-43). Assuming the closure pit lake level is accurate, the pit lake surface would be about 600 feet below the rim of the pit (based on ground contours on Figure 1) and drawdown of the closure pit lake level from the pre-mining water level would be 550 feet. The pit lake would be lower than the groundwater table all around the pit which would render the long-term steady state pit lake a hydrologic sink. Outflow would equal pit lake evaporation. The difference in groundwater inflow rates to the pit during operations and closure does not vary substantially among alternatives. The groundwater flow rate to the pit three months and 100 years after the end of mining for the proposed action would be 21 and 28 gpm, respectively. For alternative 2, the similar rates are 33 and 30 gpm (Jones 2015).

Neither the DEIS nor Jones (2015) estimate the time until the pit lake naturally recovers. Jones (2015) runs the model for 100 years after the mine closes and the changed flows generally return to a steady state value in times ranging from 60 to 100 years, although Jones' graphs do not include pit lake inflow. Considering the inflow rate changed no more than 33% between the end of mining and 100 years later, as discussed in the previous paragraph, it is likely that the simulated pit lake at least has approached steady state within 100 years and probably substantially sooner.

Rapid Fill of the Pit

The proposed action and alternatives all include a "Rapid Fill" of the pit to limit the exposure of sulfide in the wall rock to oxidation and stabilize pit water quality (DEIS, p 2-44). The plan would "bring pit water to a steady-state water level elevation in less than a year through the addition of groundwater from the mine production wells, rather than the many years it would take for the pit water elevation to rise to this level if it were to refill naturally" (Id.). About 2800 af of water would be pumped into the pit within seven months at 3000 gpm (Id.). The DEIS claims this would "create a steady state condition for the hydraulic sink in the near term rather than waiting for the natural refilling of the pit" (Id.).

The pit would therefore fill at the rate of about 3000 gpm and be at its projected steady state level within seven months rather than in many years. The pit lake would have risen approximately 230 feet from the empty pit, which averages 780-feet deep. The refill rate if allowed to fill naturally would be between 23 and 33 gpm plus some occasional runoff into the pit. Pumping it full would refill the pit at about 60 times its natural refill rate, assuming that with runoff the average is 50 gpm. That ratio would establish the natural refill time at 35 years.

At mine closure, the groundwater table would intersect the bottom of the pit because dewatering the pit would have lowered the water table that far. That would result in the 550-foot drawdown noted above, although there may be seeps of perched water entering the pit from up along the pit walls. If allowed to refill naturally, groundwater would continue to discharge into the pit at rates noted above and accumulate on the pit floor and form a lake. The groundwater table would rise as the pit lake fills.

The natural groundwater inflow rate depends on the rate groundwater in the surrounding rock flows to the pit. Darcy's Law controls the flow rate which can be estimated as the product of hydraulic gradient, the rock conductivity (K), and the cross-sectional area through which the flow enters the pit.

The gradient is the slope of the water table which is sloping toward the pit. The water table is curved so the gradient changes all along the water table, with it generally being flatter with distance from the pit. The flow rate toward the pit is the same however because as the water table becomes flatter the cross-sectional area becomes larger. Cross-sectional area is the aquifer area through which the groundwater flows toward the pit, including area beneath the pit as some water will enter through the bottom.

Hydraulic conductivity is a measure of the ease with which water flows through a material, usually measured as a velocity at a unit gradient, or feet/day (ft/d). The proposed pit would be constructed in andesite separated from undifferentiated bedrock north and south (Figure 2).

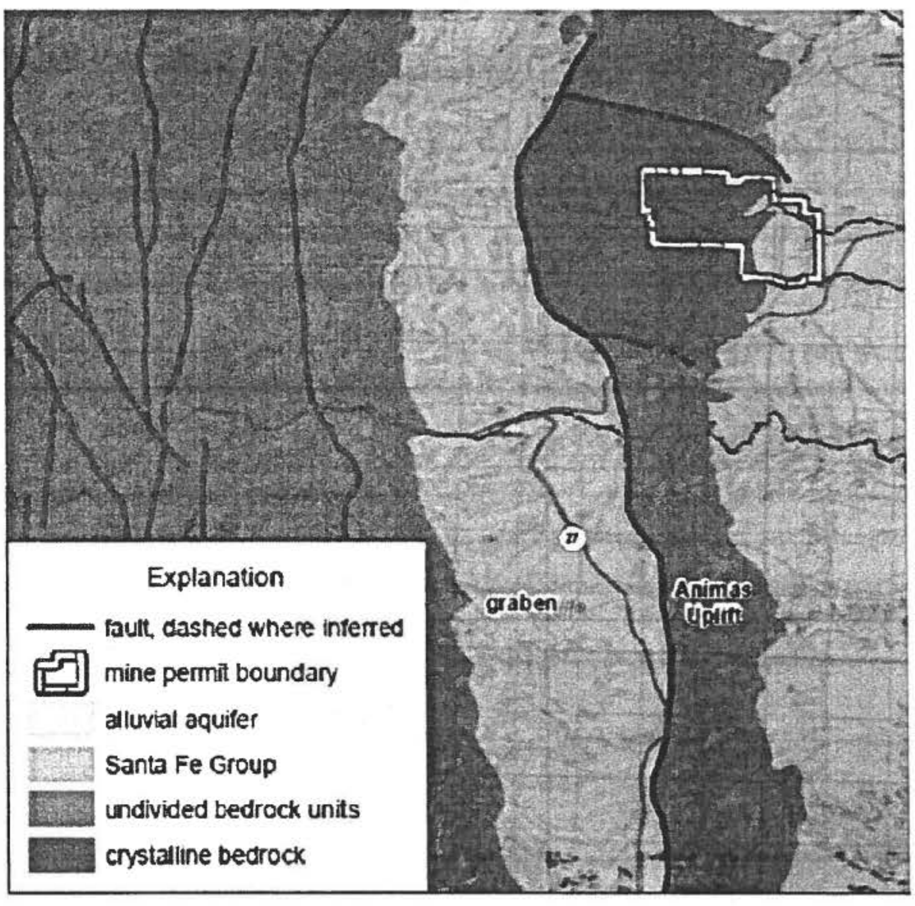


Figure 2: Snapshot of a portion of Figure 1-6 (SRK 2013) showing the aquifer zones near the proposed Copper Flat pit.

The local geology at the pit is primarily monzonite (Figure 3). The monzonite is a small pillar containing the ore intruded into the andesite (Figure 4). Much of the monzonite would be excavated to construct the pit, although the pit walls would slope into andesite which would therefore be most of the pit wall material (Figure 5).

SRK (2013) indicated the K of the andesite is just 0.003 ft/d but that in the monzonite nearest the proposed pit (Figure 2), K is about 0.1 ft/d. Pressure injection tests pit show K increasing with depth (Jones et al 2014, p 43), countering the conception that K should decrease with depth due to decreased weathering and the closing of fractures (Jones et al 2014, p 23). For depths of 100-147, 150-197, and 204-251 ft bgs, K was 0.02, 0.085, and 0.14 ft/d, respectively in one well and for approximately the same depth intervals conductivity was ~0, 0.081, and 0.074 ft/d for another well (Id.). These observations suggest that near the pit, the ore body has increased K with depth. This could be due to fracturing related to mineral intrusion.

The groundwater model calibrated the quartz monzonite and andesite around the pit (Figure 3) for model layers 2 through 4 at 0.002 in layer 2 and 0.001 ft/d in both layers 3 and 4 (Jones et al 2014, Table 6.1). The saturated thickness for these layers at the pit was 1000, 2000, and 3000 feet, respectively (Id.), so model layer 2 simulates the entire pit lake. The storage coefficient in that layer for both formations is 0.1%, a very high value meaning that more water is released for each unit of drawdown. The NMCC model therefore simulates pit refill with groundwater entering from one formation with no differing conductivity.

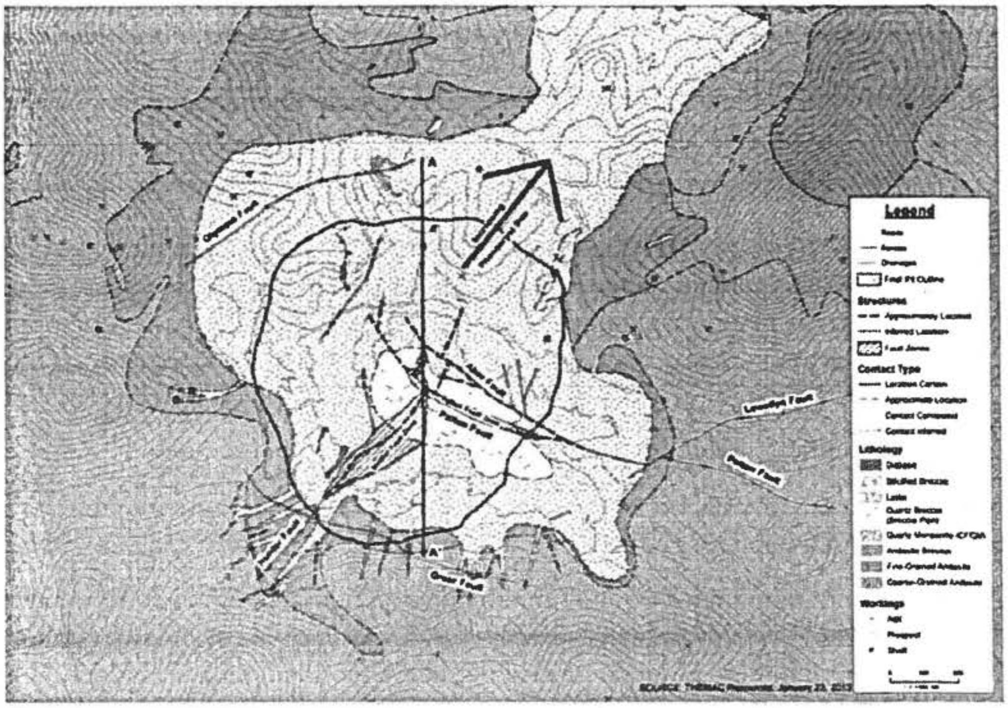
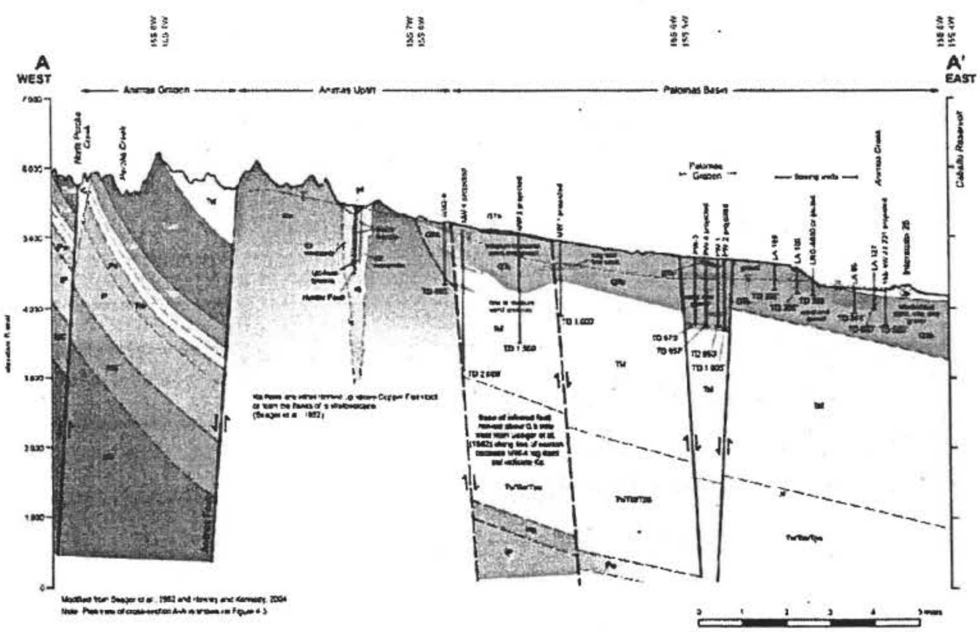


Figure 1-4: Detailed Geologic Map of the Copper Flat Orebody (THEMAC, 2013)

Figure 3: Snapshot of Figure 1-4 (SRK, 2013) showing a detailed geologic map of the Copper Flat proposed pit and the outline of the proposed pit.



- ***Figure 4: Snapshot of a portion of Figure 4-2 (Jones et al 2014) showing geologic cross-section from west to east through the proposed pit.***

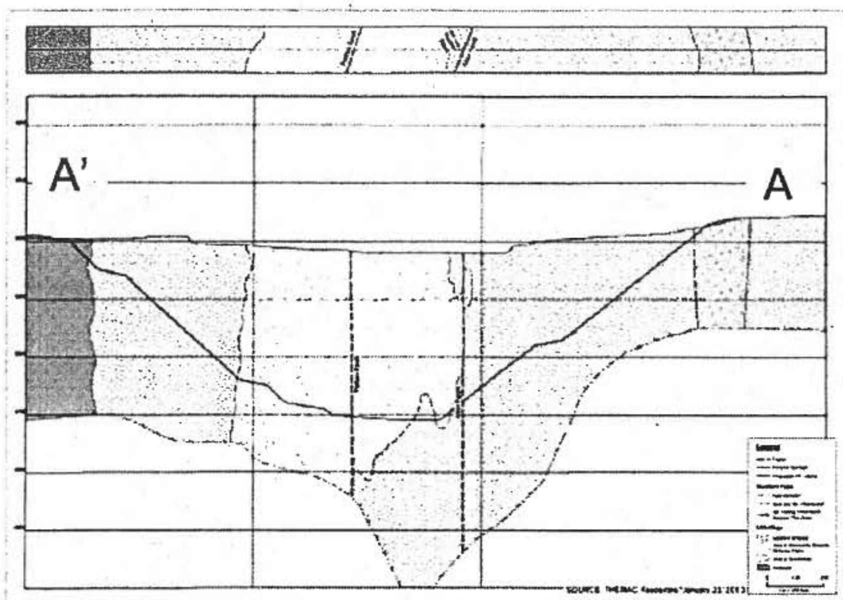


Figure 1-5: Geologic Cross Section through the Copper Flat Orebody (THEMAC, 2013)

Figure 5: Snapshot of Figure 1-5 (SRK 2013) showing a north-south geologic cross-section through the proposed Copper Flat pit.

Comparison of Rapid Fill and Natural Fill

Low conductivity near the pit causes the drawdown cone to be steep near the pit. During natural refill, the pit would continue to resemble a drain for the groundwater flowing toward the pit because the pit lake would not recover rapidly. The effective controlling downgradient groundwater level would be the pit lake water level.

Rapid refilling of the pit would occur at a rate as much as 60 times that of the natural inflow rate. This would cause the pit lake level to rise much faster than it would solely on groundwater inflow and runoff. It would also rise faster than the groundwater table around the pit would rise naturally because natural groundwater level rise depends on the rate that groundwater can flow toward the pit, and that is very limited by the low conductivity in most of the bedrock. Because the rising pit lake levels would be higher than the surrounding groundwater, it would cause the water table to slope from the pit lake into the surrounding formations, opposite from its shape during natural refill. Water would enter the formations from the rising pit lake. The water table that was sloping toward the pit would resemble a U for a time period as the water level in both the pit lake and away from the pit lake in the wall would be higher than the water table closer to the pit. The water table in this low point in the U would rise as groundwater flows toward this point from both sides.

The summary is that pit lake water would enter the surrounding formations as groundwater. Until the nadir in the U rises so that the gradient away from the pit becomes horizontal, the lake will not be a hydrologic sink and pit lake waters will be mixing with groundwater in formations around the pit.

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NEW MEXICO
ENVIRONMENTAL LAW CENTER

April 4, 2016

Doug Haywood, Project Lead
BLM Las Cruces District Office
1800 Marquess Street
Las Cruces, NM 88005

RE: Comments of Turner Ranch Properties, L.P. on the Draft Environmental Impact Statement for the Copper Flat Copper Mine

Dear Mr. Haywood:

Please accept these comments on the Draft Environmental Impact Statement ("DEIS") for New Mexico Copper Corporation's ("NMCC") proposed Copper Flat Copper Mine ("Mine" or "Project"). These comments have been prepared by the New Mexico Environmental Law Center ("NMELC") on behalf of Turner Ranch Properties, L.P. ("TRP"), owner of the Ladder Ranch ("Ladder" or "Ranch"), located adjacent to the Mine.

Ladder is an historic livestock ranch which originated in the 1890s. Throughout its existence, cattle, horses and sheep were the main economic drivers of the Ranch. Since 1992, Ladder has been owned and operated by TRP. The primary sources of income are bison production and sales, and commercial hunting, with eco-tourism emerging as a very important economic component of the Ranch's operation. Recently, TRP's ownership has launched "Ted Turner Expeditions," an affiliated enterprise focusing on eco-tourism on Ladder and affiliated ranches. In addition to these commercial activities, great emphasis has also been placed on the restoration of native wildlife species and the protection and management of State and Federally listed species (threatened, endangered and experimental populations), and to protect the area's night sky.

The Ranch is also an important contributor to the local economy. Ninety-five (95) percent of Ladder's employees are from Sierra County, New Mexico. This includes full-time, part-time, and seasonal employment. The Ranch and its employees contribute to the local economy by buying goods and services that sustain those families and Ranch functions. Groceries, fuel, electricity, building and maintenance materials, and independent contractors from Sierra County are all critical for efficient operation of the Ranch.

Ladder is deeply concerned about the Mine's adverse impacts to the environment (air quality, water quantity and quality, wildlife, and threatened and endangered species), the night sky and recreation. This concern is based on the Mine's proximity to the Ranch boundaries and the Mine's potentially damaging impacts on surrounding land. To the north, northwest and northeast the Ranch is the closest landowner to the Mine.

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EXHIBIT
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Ladder contains four tributaries of the Rio Grande River – the Las Animas, Seco, Palomas and Cuchillo streams. These streams support abundant flora, including ancient sycamores and cottonwoods, and fauna such as threatened Chiricahua leopard frogs and threatened Yellow-Billed Cuckoos, and sensitive Rio Grande cutthroat trout, which it is hoped will be soon restored to the streams. Undoubtedly, Ladder's most distinguishing characteristics are its incredibly diverse wildlife (bison, elk, deer, antelope, mountain lions, bears, a captive population of endangered Mexican Grey Wolves) and its breathtaking mix of ecosystems, ranging from desert grasslands to pine forests in the foothills of the Black Range (Gila Mountains).

The DEIS is grossly defective in a number of ways. It inadequately analyzes the potential impacts of the Mine to Ladder and the surrounding area. Important alternatives have been improperly excluded from detailed analysis and many critical assumptions – especially relating to water quality and quantity – are based on insufficient data. BLM has also failed to adequately address whether NMCC's Mine Plan of Operation ("MPO"), including the reclamation scheme, will prevent unnecessary or undue degradation of federal land. BLM, under its own regulations, has a legal duty to affirmatively answer this question or require substantial revisions to the MPO.

Because of these reasons, we urge BLM to prepare and submit for public review a revised Draft EIS and not simply proceed to issue a Final EIS. At a minimum, a supplemental DEIS must be published for public comment to meet the National Environmental Policy Act's legal requirements. As mandated by the regulations governing environmental impact statements, "The draft statement [EIS] must fulfill and satisfy to the fullest extent possible the requirements established for final statements." 40 C.F.R. § 1502.9(a).

Thank you for your consideration of these comments.

Sincerely,

Jaimie Park,
NMELC Attorney

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COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE COPPER FLAT COPPER MINE

PREPARED BY THE NEW MEXICO ENVIRONMENTAL LAW CENTER ("NMELC") ON BEHALF OF TURNER RANCH PROPERTIES, L.P. ("TRP")

APRIL 4, 2016

TABLE OF CONTENTS

EXECUTIVE SUMMARY 1

DETAILED COMMENTS 2

I. The DEIS Violates the National Environmental Policy Act 2

A. The DEIS Fails to Fully Ascertain Baseline Conditions 2

1. Water Quality & Quantity 3

2. Wildlife and Federally-Listed Species 5

B. The DEIS Relies Upon Inadequate and Biased Groundwater Models 6

1. Conceptual Flow Model Errors 6

2. Numerical Flow Model Errors and Biases 7

C. The DEIS Fails to Adequately Review Reasonable Alternatives 11

D. The DEIS Fails to Adequately Analyze the "No Action" Alternative 14

E. The DEIS Fails to Analyze Different Management Scenarios For Each Action Alternative 15

F. The DEIS Fails to Identify Care and Maintenance Procedures for Each Action Alternative 16

G. The DEIS Fails to Fully Analyze the Mine's Direct and Indirect Impacts 16

1. The DEIS Fails to Take a Hard Look at the Mine's Impacts to Air Quality 17

2. The DEIS Fails to Take a Hard Look at the Mine's Impacts to Climate Change and Sustainability 18

3. The DEIS Fails to Take a Hard Look at the Mine's Impacts to Water Quantity & Quality 20

a. The Mine's Impacts to Water Quantity 20

i. The Mine's Production Wells 21

ii. The Mine's Dewatering Wells and Open Pit 22

b. The Mine's Impacts to Water Quality 24

i. The Mine's Waste Rock Dumps 25

ii. The Mine's Tailings Impoundment 26

iii. The Mine's Pit Lake 26

4. The DEIS Fails to Take a Hard Look at Impacts to Wildlife and Federally-Listed Species 28

a. The Mine's Impacts to Wildlife 28

b. The Mine's Impacts to Federally-Listed Species 28

i. Ladder's Endangered Mexican Grey Wolf Reintroduction Project 29

ii. Ladder's Threatened Chiricahua Leopard Frog ("CLF") Recovery Project 29

iii. Ladder's Endangered Bolson Tortoise Reintroduction Project 30

iv. Ladder's Prairie Dog Reintroduction Project 31

5. The DEIS Fails to Take a Hard Look at the Mine's Impacts to Recreation 31

a. Impacts to Ladder Ranch 31

b. Impacts to Sierra County 32

6. The DEIS Fails to Take a Hard Look at the Mine's Impacts to Transportation 34

7. The DEIS Fails to Take a Hard Look at the Mine's Impacts to Noise and Vibration Levels 35

8. The DEIS Fails to Take a Hard Look at the Mine's Impacts to the Night Sky 37

9. The DEIS Fails to Take a Hard Look at the Mine's Impacts to Socioeconomic Issues 38

H. The DEIS Fails to Take a Hard Look at the Mine's Environmental Justice Impacts 41

I. The DEIS Fails to Take a Hard Look at the Mine's Cumulative Impacts 42

J. The DEIS Fails to Fully Evaluate Mitigation Measures 43

1. Mitigation Measures for the Mine's Impacts to Air Quality 44

2. Mitigation Measures for the Mine's Impacts to Climate Change 45

3. Mitigation Measures for the Mine's Impacts to Water Quantity & Quality 45

a. The Mine's Waste Rock Dumps 46

b. The Mine's Tailings Impoundment 47

c. The Mine's Pit Lake Water 48

4. Mitigation Measures for the Mine's Impacts to Wildlife and Federally-Listed Species 50

a. Migratory Birds, Wildlife & Livestock 50

i. Migratory Birds 50

ii. Wildlife and Livestock 50

b. Federally-Listed Species 51

5. Mitigation Measures for the Mine's Impacts to Recreation 51

6. Mitigation Measures for the Mine's Impacts to Transportation 51

7. Mitigation Measures for the Mine's Impacts to Noise and Vibrations Levels 52

8. Mitigation Measures for the Mine's Impacts to the Night Sky 54

9. Mitigation Measures for the Mine's Impacts to Socioeconomic Issues 54

K. The DEIS Fails to Adequately Analyze the Mine's Post-Closure Operations, Maintenance and Monitoring Plans 55

L. The DEIS Fails to Adequately Identify and Analyze NMCC's Financial Resources and Assurance 57

M. BLM Fails to Disclose All Preparers of the DEIS and to Require Disclosure Statements 58

N. The DEIS Fails to Adequately Incorporate by Reference Supporting Documents and to Accurately List Supporting Documents in the References Section 59

II. The DEIS is Based on Incorrect and Unsupportable Assumptions Regarding NMCC's Alleged "Entitlement" to Have the Mine Approved Under the Mining Law 59

III. The DEIS Action Alternatives Violate Other State and Federal Laws 61

A. The DEIS Action Alternatives Violate the Federal Lands Policy Management Act and BLM § 3809 Regulations 61

B. The DEIS Action Alternatives Violate State and Federal Water Quality Laws 61

CONCLUSION 62

EXECUTIVE SUMMARY

The proposed Copper Flat Copper Mine ("Mine" or "Project") will have to comply with a number of state and federal environmental statutes and regulations that regulate air quality, water quality, solid wastes, wildlife and vegetation habitat, cultural and archaeological resources, transportation and noise. First and foremost, the Draft Environmental Impact Statement ("DEIS") for the Mine violates the National Environmental the National Environmental Policy Act ("NEPA") because it:

- Fails to fully ascertain baseline conditions;
- Relies upon a flawed, biased model for groundwater flow that yields significantly erroneous conclusions;
- Fails to adequately analyze all reasonable action alternatives and the No Action alternative;
- Fails to adequately analyze the Mine's direct and indirect impacts to air quality, climate change, water quantity and quality, wildlife and Federally-listed species, recreation, transportation, and economy in Sierra County and at the Ladder Ranch ("Ladder" or "Ranch");
- Failure to adequately analyze Environmental Justice issues in Sierra County;
- Fails to adequately analyze cumulative, subsequent and related impacts on Sierra County and the Ladder Ranch;
- Fails to adequately analyze the Mine's mitigation measures and their effectiveness;
- Fails to adequately analyze New Mexico Copper Company's ("NMCC") financial resources and assurance – and therefore fails to adequately address bonding requirements; and
- Fails to disclose all DEIS preparers and to properly reference all supporting documents.

Second, the DEIS makes incorrect and unsupportable assumptions regarding the 1872 Mining Act. Third, the stated action alternatives in the DEIS would violate federal and state water quality standards. Finally, the DEIS violates the Federal Lands Policy Management Act and Bureau of Land Management ("BLM") §3809 regulations because all action alternatives will result in unnecessary or undue degradation of federal lands.

These violations of NEPA and Council on Environmental Quality ("CEQ") standards and state and federal law must be corrected either through a revised draft EIS or a supplementation of the DEIS. However, Ladder contends that even when these issues have been fully addressed the

BLM must conclude that the Mine cannot be conducted without unnecessary and undue degradation to the environment and, therefore, cannot be approved.

DETAILED COMMENTS

The following are detailed comments on how the DEIS violates several federal and state laws. First, the DEIS violates NEPA. Second, the DEIS is based upon incorrect and unsupportable assumptions regarding NMCC's alleged "entitlement" to have the Mine approved under the 1872 Mining Law. Third, all action alternatives violate federal and state water quality standards. Fourth, all action alternatives violate the Federal Lands Policy Management Act ("FLPMA") and BLM §3809 regulations because each will result in unnecessary or undue degradation of federal lands. For these reasons BLM must either revise or supplement the DEIS, and ultimately cannot approve the Mine.

I. The DEIS Violates the National Environmental Policy Act.

A. The DEIS Fails to Fully Ascertain Baseline Conditions.

Under NEPA, an agency must "describe the environment of the areas to be affected or created by the alternatives under consideration." 40 C.F.R. §1502.15. "Without establishing the baseline conditions...there is simply no way to determine what effect the [action] will have on the environment, and, consequently, no way to comply with NEPA." *Half Moon Bay Fisherman's Mktg. Ass'n v. Carlucci*, 857 F.2d 505, 510 (9th Cir. 1988). "In analyzing the affected environment, NEPA requires the agency to set forth the baseline conditions." *Western Watersheds Project v. BLM*, 552 F. Supp. 2d 1113, 1126 (D. Nev. 2008).

The lack of an adequate baseline analysis fatally undermines an EIS. "[O]nce a project begins, the pre-project environment becomes a thing of the past and evaluation of the project's effect becomes simply impossible." *Northern Plains v. Surf. Transp. Brd.*, 668 F.3d 1067, 1083 (9th Cir. 2011). "[W]ithout [baseline] data an agency cannot carefully consider information about significant environment impacts. Thus, the agency fail[s] to consider an important aspect of the problem, resulting in an arbitrary and capricious decision." *Id.* at 1085.

Baseline data that provides the basis for BLM's environmental analysis must be provided before a proposed action is approved, not afterward. *Id.* at 1083 (internal citations omitted) (concluding that an agency's "plans to conduct surveys and studies as part of its post-approval mitigation measures," in the absence of baseline data, indicate failure to take the requisite "hard look" at environmental impacts). NEPA also requires agencies to disclose that information is incomplete or unavailable. 40 C.F.R. 1502.22(b). Agencies must obtain incomplete or unavailable information "if the overall costs of doing so are not exorbitant." *Id.*

Throughout the DEIS it fails to contain the required detailed analysis of all baseline conditions, and also fails to disclose that information is incomplete or unavailable. The following are two examples of how the DEIS relies upon inadequate data.

1. Water Quality & Quantity

Baseline hydrologic data is used to develop a conceptual flow model and to calibrate a numerical groundwater flow model. It includes surface water flow rates and chemistry, groundwater levels and chemistry, and aquifer property tests. The DEIS fails to contain complete hydrologic baseline data. According to hydrologist Tom Myers this is troubling because all DEIS action alternatives will cause a substantial drawdown of groundwater and significant depletions in flow to the Rio Grande and tributaries within the Mine area.[1]

The DEIS refers to the study INTERA (2012) for baseline hydrology information pertaining to groundwater monitoring wells (DEIS 3-21), pit lake water levels and inflow (*Id.* at 3-52), environmental characteristics of waste rock (*Id.* at 3-37), spring flow *(Id.* at 3-52), and the existing sulphate plume downgradient of the Mine's tailings (*Id.* at 3-30). However, the DEIS fails entirely to include:

- Data pertaining to fractures and other hydrogeologic characteristics of andesite rock in the Mine pit area deeper than 400 feet, although the pit will be at least 900 feet deep;
- Data for predicted rates of seepage and future contaminant plumes from waste rock;
- Data fully characterizing the existing sulphate plume;
- Information regarding the location for land application disposal ("LAD") of excess water from tailings, and soil sampling data;
- Groundwater level observations on the Ladder;
- Adequate stream flow measurements for Las Animas Creek; and
- Data pertaining to impairment of existing wells from the Mine.

BLM may not circumvent NEPA's requirement that this data be provided in a DEIS by stating that cooperating agencies, such as the New Mexico Office of the State Engineer, will provide such information at a later time. 42 U.S.C. § 4332(D); 40 C.F.R. Part 1501.6(b)(1) ("The lead agency shall request the participation of each cooperating agency in the NEPA process at the earliest possible time."). Furthermore, it is evident that there are not enough monitoring wells, especially at depth, to allow an estimation of parameters for the model around the Mine pit or to support conceptual flow modeling around the Mine's production wells. The

[1] Comments pertaining to the groundwater models relied upon in the DEIS and to the Mine's impacts on water quantity and quality were prepared by hydrologist Tom Myers, on behalf of TRP and NMELC. *See* attached Exhibit A.

surface water sampling is also insufficient because it was completed too infrequently and for too short a time period.

The following actions are necessary for completing hydrologic baseline data:

- Surface water flow data should be collected, at a minimum, monthly for two years. The measurements should be correlated to a nearby gage station for record extension purposes.

- Additional flow data should be collected to supplement the Greenhorn Arroyo water quality data. A seepage study should be performed to determine the source of any surface water.

- Near-pit monitoring wells should be placed at least to the maximum depth of the pit.

- Complete a water balance of the Santa Fe aquifer, including flow to the wells and flow to the river, to estimate the recharge. If the estimated recharge is unrealistically high, INTERA should identify areas further upstream that would be necessary to provide the recharge.

- Complete a groundwater balance for the Palomas graben[2] ("graben") and Animas uplift areas to assess whether springs are a significant part of the water balance.

- Consider geochemistry and isotopes in the springs in Las Animas Creek to determine whether flow actually diverts in a west-to-east gradient.

- Estimate hydrologic properties for a regional-scale; small-scale estimates yield conductivity values that are much too low for regional flow analysis.

- Fully characterize the existing sulphate plume at the Mine's tailings to determine whether the plume extends beyond a fault.

Additionally, though the DEIS states that all action alternatives will "reduce groundwater discharge to Caballo Reservoir and the Rio Grande, decreasing surface water quantities there," (DEIS 4-8), baseline data has not been gathered and an analysis has not been conducted. The DEIS provides that the "cumulative magnitude of the effect can only be determined through a comprehensive mid-basin study of Caballo Reservoir and the Rio Grande." *Id.*

Finally, we agree with the New Mexico Interstate Stream Commission ("ISC") comment that the DEIS fails to account for startup water necessary for the Mine's operations under all action alternatives. ISC Comments on Copper Flat DEIS, p. 5 (February 26, 2016). The

[2] Graben: A geologic formation which has been lowered relative to the surrounding formation, and is usually bounded by normal faults.

Proposed Action anticipates using 13,370 acre feet of water per year ("af/y"), recycling 9,096 af/y and obtaining from freshwater sources 3,802 af/y. DEIS Figure 2-6. Alternative 1 uses 18,674 af/y, recycling 12,845 af/y and obtaining from freshwater sources 5,290 af/y. DEIS Figure 2-10. Alternative 2 uses 22,210 af/y, recycling 15,504 af/y and obtaining from freshwater sources 6,105 af/y. DEIS Figure 2-14. The recycling is reuse of water from the Mine's tailings; the DEIS figures refer to it as "water reclaimed from TSF." For each action alternative, the recycling water is about 2.5 times the freshwater source. It is unclear if the current tailings facility contains water from previous operations sufficient for the Mine's startup water needs.

At the commencement of mining there are no tailings, so there is no tailings reclaim water; initial water must be obtained from freshwater sources. The DEIS water accounting in Figures 2-6, -10, and -14 does not account for the initial water. This represents a major error in the water accounting for the Mine. We agree with the ISC that "it will take the mine about 5 years to reach a recycling capacity of 9,096 acre-feet at a 75 percent recycling efficiency." ISC Comments on Copper Flat DEIS, p. 5 (February 26, 2016). Therefore, BLM must either revise or supplement the DEIS with an adequate accounting of startup water necessary for mining operations.

2. Wildlife and Federally-Listed Species

The DEIS also relies upon incomplete or no baseline data for biological resources at and near the Mine site. For example, the DEIS fails to include recent data provided by NMCC to the New Mexico Mining and Minerals Division ("MMD") regarding the Mine's wildlife and vegetation impacts. In July 2015, NMCC submitted to MMD a "Baseline Data Addendum, Biological and Paleontology Resource Surveys on Nine Mill Sites and Two Substation Alternatives, Copper Flat Mine, Sierra County, New Mexico, Permit Tracking No. S1027RN ("BDR Addendum").[3] MMD and the New Mexico Department of Game and Fish ("NMDG&F"), both cooperating state agencies in the preparation of the DEIS, have determined that the BDR Addendum is incomplete.[4]

We also agree with EPA's comment that the "DEIS does not contain a final determination on the environmental consequences of the alternatives" to wildlife and Federally-listed species, and that the "U.S. Fish and Wildlife Service (USFWS) and New Mexico Department of Game and Fish (NMDGF) were contacted for consultation, but there is no concurrence from USFWS and NMDGF on any conclusion reached in the DEIS." EPA Comments on the Copper Flat DEIS, p. 3 (March 4, 2016). Additionally, the DEIS also fails to

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[3] http://www.emnrd.state.nm.us/mmd/MARP/documents/2015-07-28_BDRAddendum-BioandPaleoReportofMillSiteClaims_CopperFlatMine_SI027RN.pdf. Last visited on February 26, 2016.

[4] http://www.emnrd.state.nm.us/mmd/MARP/documents/2016-01-05BaselineDataRptAddendum3-BiologicalandPaleontologyResourceSurveysonMillSiteClaims_.pdf. Last visited on February 26, 2016.

identify the Mine's impacts to Ladder's bison herd and captive endangered Mexican Grey Wolves.

In summary, the DEIS relies upon incomplete or no baseline data throughout, and fails to disclose that data is incomplete or unavailable. Inadequate baseline data leads to erroneous impacts and mitigation analyses. BLM must either revise or supplement the DEIS with complete baseline data.

B. The DEIS Relies Upon Inadequate and Biased Groundwater Models.

As discussed above, the hydrologic baseline data report (INTERA 2012) presents insufficient data to develop the modeling used for assessing the Mine's impacts. The DEIS's impacts analysis for surface and groundwater resources relies upon two models: the conceptual flow model ("CFM") and the numerical flow model ("NFM"). There are significant errors in the conceptual flow model and biases in the numerical flow model. These lead to erroneous impacts and mitigation analyses.

1. Conceptual Flow Model Errors

A conceptual flow model ("CFM") is a qualitative description of groundwater flow sources and sinks, and the flow paths through aquifers. A CFM describes geology, material properties, and geologic structures that affect groundwater flow. A CFM also estimates groundwater recharge and discharge, to the extent possible. The CFM relies upon testing conducted by INTERA (2012) for the estimation of material properties. According to hydrologist Tom Myers, there are six significant errors in the CFM which cause the numerical flow model to underestimate the amount of water the Mine will consume and how that consumption will affect water resources on and near the Ranch:[5]

- The CFM does not consider the source of water drawn to the pumping wells from the north. This water is probably an additional loss to the Rio Grande.
- The CFM describes the graben incorrectly, with inappropriate values for transmissivity[6], vertical anisotropy[7], and fault conductance[8]. The values used in the modeling are not supported by data. In fact, the anisotropy and transmissivity are not supported by the

[5] Tom Myers, Hydrologic Consultant, "Technical Memorandum: Review of the Draft Environmental Impact Statement, Copper Flat," p. 5 (March 30, 2016).

[6] "Transmissivity" is the product of conductivity and the saturated thickness of the aquifer. It is an expression of the ease with which groundwater can flow through the entire aquifer.

[7] "Vertical anisotropy" is the ratio of vertical conductivity to horizontal conductivity, since vertical conductivity is usually much less than horizontal conductivity.

[8] "Fault conductance" is the ease with which groundwater flows perpendicularly through a fault. It is a function of the conductivity and thickness of the fault.

lithology[9] of the pumping wells. These errors cause the model to underestimate drawdown in Las Animas Creek, particularly near and on Ladder.

- The recharge rates and location for distributed recharge are not well supported. The CFM ignores distributed recharge into the Santa Fe formation east of the Mine.

- The CFM does not include an estimate for discharge to the Rio Grande, to Las Animas Creek or Percha Creek, to the flowing wells, or to evapotranspiration[10] ("ET") along the streams.

- The transmissivity of the andesite near the pit is not justified to be as low as calibrated. This inappropriately prevents the pit dewatering drawdown from extending northward to Ladder.

These errors result in an inaccurate water balance estimate, i.e., water that is consumed for mining versus water provided by natural processes such as precipitation and runoff. Rather than estimate recharge with an inaccurate method, the CFM should include an estimate of steady state discharge to the streams, to the Rio Grande, and to evapotranspiration. The CFM should then set recharge equal to discharge. Using estimated parameters of the geology and soils in the Mine's watersheds, the CFM should establish in general the locations for distributed recharge in the watershed. If the geology is too impervious for all of the recharge, there will be runoff to stream bottoms and the CFM should estimate recharge through the stream bottoms. These estimates must be supplemented with streamflow measurements to identify recharging reaches.

There are also serious conceptual errors in the description of the graben from which the Mine's production wells withdraw water. There can be no confidence in the CFM without data describing the conductance of the faults, the transmissivity of the aquifer within the graben, or the source of water in the graben. There is also no data to support the CFM's suggestion that clay layers prevent the pumping from drawing water from Las Animas Creek. Because the CFM has significant basic conceptual problems, there can be no confidence in the predictions resulting from the numerical flow model.

2. <u>Numerical Flow Model Errors and Biases</u>

The Mine site and its production wells site are numerically modeled using a version of the USGS code MODFLOW by Jones et al. (2014, 2013). It is a "version" of MODFLOW because it consists of proprietary alterations to the code. The numerical model leads to erroneous impacts predictions for the following reasons: 1) it implements the substantially

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[9] "Lithology" is a description of characteristics of the geologic formations, rock or fill, through a vertical section of the ground.

[10] "Evapotranspiration" is the combination of evaporation and transpiration, or evaporation through plant leaves.

flawed CFM; 2) it utilizes methods which decrease the accuracy of simulations; 3) its inaccurate model structure minimizes the Mine's impacts; and 4) its calibration relies on baseline data insufficient to accurately calibrate the model in a steady state mode.[11]

There are many biases in the numerical model which minimize the Mine's impacts:

- The failure to adequately identify the regional hydrogeologic properties of the andesite, where the Mine pit is located. This causes the model to underestimate the drawdown effects in the area, particularly on Ladder.
- The production wells are located in the Palomas graben, a north-south trending feature between two faults, for which the model assumes the transmissivity as being unjustifiably high and the western fault conductivity unjustifiably low.
- The use of an inappropriate boundary condition which adds water to the north end of the graben in a way that will provide much of the production pumping water.[12]
- The failure to consider vertical gradients over large aquifer thicknesses due to inadequate vertical discretization of the model, especially in layer 2, the uppermost layer. This results in failing to consider flow losses to evapotranspiration or to the streams (Las Animas Creek, Percha Creek).
- Vertical discretization[13] near the pit is nonexistent, with a 1000-foot layer of thickness. This renders the calculations of dewatering inaccurate and makes it impossible to estimate the source of groundwater flowing into the pit. Any pit lake modeling based on this would be inaccurate and would also most likely underestimate the toxicity of the pit lake.

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[11] Tom Myers, Hydrologic Consultant, "Technical Memorandum: Review of the Draft Environmental Impact Statement, Copper Flat," p. 31-53 (March 30, 2016).

[12] We agree with the New Mexico Interstate Stream Commission's ("ISC") comment that:

> The model also assumes that there is Paleo-channel that results in an additional source of water to the model area from north to south. However, the predominant groundwater flow direction is from west to east toward the Rio Grande and Caballo Reservoir. This assumed boundary in the model adds additional water to the system that may not exist. A sensitivity analysis was done on this boundary and concluded that inclusion of this boundary does impact the measured surface flow of the Rio Grande. See Draft EIS page 3-71. However, despite this finding, the BLM decided to keep this boundary in the model that was used in the evaluation of the proposed action. The ISC suggests examining this sensitivity analysis again to determine how to better handle this assumption in the model."

ISC Comments on Copper Flat DEIS, p. 5-6 (February 26, 2016).

[13] "Vertical discretization" is the vertical thickness of groundwater model layers.

- The vertical anisotropy (the ratio of vertical to horizontal conductivity) as specified by Jones et al. (2014, Table 6.1) is highly suspect and likely biases model results.

- The model sets vertical conductivity[14] in the Santa Fe Group much too high, minimizing the effects of pumping on nearby artesian wells.

- The simulation of faults as flow barriers when there is no data to support they are barriers. This minimizes the Mine's impacts to Las Animas Creek and other surface waters.

- The failure to consider recharge in the Santa Fe Group. This skews the model calibration toward estimating higher conductivity values because water would have further to flow from the recharge source to a discharge point. This also causes the model to minimize the Mine's impacts Las Animas Creek and other surface waters.

The result of these biases is that the model erroneously predicts that most of the production pumping drawdown would extend eastward toward the Rio Grande, hence the Mine's predicted impacts are in that direction. However, if one removes these biases from the model, the Mine's impacts would actually extend in a different direction. For example, without the extra water entering the graben from the north (due to the model's inappropriate boundary condition and inaccurate characterization of the fault just west of the graben being highly impervious), production pumping drawdown would actually extend to the west and north of the Mine, affecting Las Animas Creek far further upstream than currently predicted.

For the reasons discussed above, BLM must either revise or supplement the DEIS with complete hydrologic baseline data and remove errors and biases in the groundwater models so that adequate impacts and mitigation analyses can be conducted. The following are necessary changes to the numerical model that would lead to adequate impacts and mitigation analyses:[15]

- Layer 2 should be split into at least three layers. Except in the streams, layer 2 is the uppermost layer and simulates the Santa Fe aquifer. Additional layers would allow better simulation of vertical flow and gradient, changing conductivity with depth, and provide a better match to screened intervals for the monitoring wells. Unfortunately, the new layers 3 and 4 would have no wells for calibration in the graben and near the pit, hence additional monitoring wells are needed in conjunction with this.

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[14] "Vertical conductivity" is conductivity in a vertical direction.

[15] Tom Myers, Hydrologic Consultant, "Technical Memorandum: Review of the Draft Environmental Impact Statement, Copper Flat," p. 52-53 (March 30, 2016).

- Horizontal discretization[16] should be improved around the production wells to improve the calculation of well drawdown. Discretization at the wells should be the same as at the pit.

- If justified in the CFM, the general head boundary[17] allowing flow north to south through the model domain[18] should be widened to include all of the northern and southern boundaries of the model. The current location, which is only in the graben, biases the model results by providing water to the portion of the model from which pumping occurs.

- The boundary for the Rio Grande River should be in all layers that intersect the depth of the reservoir, rather than in only layer 1 (which forces water upward into the river).

- Stream recharge should be simulated in a transient, not a steady state mode, because recharge will occur as slugs, not as a long-term steady state flow.

- The recommended data collection for parameterizing the faults and transmissivity of the graben must be collected and implemented to obtain improved modeling of the pumping from the graben.

- Vertical anisotropy should be better simulated with values of 0.01 to 0.001 rather than the values used in the model, including in the graben (which based on well logs should be 0.1 to 0.01).

- Existing tailings seepage should be better estimated by calibrating with the wells near the impoundment. The seepage includes both meteoric water draining through the facility and draindown.

In sum, the groundwater models upon which the DEIS relies to evaluate water impacts make every assumption designed to minimize impacts from the Mine, and exclude any assumption that would more realistically reflect the Mine's actual water impacts. NEPA specifically prohibits an agency from disclosing and considering only the impacts from a project that favor the project's applicant. 40 C.F.R. Part § 1502.2(f)(g).

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[16] "Horizontal discretization" is the size of groundwater model cells.

[17] "General head boundary" is a head-controlled flow boundary in a groundwater model. This means that the groundwater head is specified for the boundary, and flow into or from the model domain is controlled by the hydraulic gradient between the head in the boundary and in the surrounding model domain and the conductance of the boundary.

[18] "Model domain" is the portion of an aquifer that is considered in a groundwater model.

C. The DEIS Fails to Adequately Review Reasonable Alternatives.

The DEIS also fails to fully review reasonable alternatives to the activities at the Mine, and related milling and transportation activities. NEPA requires the agency to "study, develop, and describe appropriate alternatives to recommend courses of action in any proposal that involves unresolved conflicts concerning alternative uses of available resources." 42 U.S.C. §4332(E); 40 C.F.R. §1502.14. BLM must "rigorously explore and objectively evaluate all reasonable alternatives to a proposed action, in order to compare the environmental impacts of all available courses of action. For those alternatives eliminated from detailed study, the EIS must briefly discuss the reasons for their elimination." *N.M. ex rel. Richardson v. BLM*, 565 F.3d 683, 703 (10th Cir. 2009); 40 C.F.R. §§1502.14. *See also*, *City of Tenakee Springs v. Clough*, 915 F.2d 1308, 110 (9th Cir. 1990).

Indeed, NEPA's implementing regulations recognize that the consideration of alternatives is "the heart of the environmental impact statement." 40 C.F.R. §1502.14; *Greater Yellowstone Coal. v. Flowers*, 359 F.3d 1257, 1277 (10th Cir. 2004); *Utah Envtl. Cong. v. Bosworth*, 439 F.3d 1184, 1195 (10th Cir. 2006); *Alaska Wilderness Recreation and Tourism Ass'n v. Morrison*, 67 F.3d 723, 729 (9th Cir. 1995). *Dine Citizens Against Ruining Our Environment v. Klein*, 747 F. Supp. 2d 1234, 1254 (D. Colo. 2010).

The DEIS analyzes three action alternatives, the first being NMCC's Proposed Action. The Proposed Action would have a throughput of 17,500 tons per day ("tpd"),[19] whereas Alternative 1 would have a 25,000 tpd throughput, and Alternative 2 would have a 30,000 tpd throughput. BLM has selected Alternative 2 as the "Preferred Alternative." According to Mining Engineer Jim Kuipers,[20] all three action alternatives are clearly economic driven alternatives intended to be "more efficient."[21] The DEIS fails to analyze additional reasonable alternatives that avoid unnecessary and undue degradation of federal land. DEIS 2-71.

Furthermore, the DEIS inadequately represents NMCC's Proposed Action. In 2013, NMCC conducted a Definitive Feasibility Study ("DFS") based upon a 30,000 tpd production rate.[22] NMCC failed to amend its mining plan of operations ("MPO") to reflect this new

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[19] The Proposed Action's throughput would be an increase from the previous 15,000 tpd throughput of the Quintana operation.

[20] Jim Kuipers is a mining engineer with more than 30 years of experience in mining and environmental process engineering design, management of mining operations, compliance with mining regulatory requirements, remediation of mining waste, reclamation and closure of mining operations, and financial assurances for mining operations. Mr. Kuipers has worked as a technical expert on mining and environmental issues for industry, public interest groups, and tribal, local, state and federal governmental entities. Mr. Kuipers has worked on several projects governed by the New Mexico Mining Act.

[21] *See* Jim Kuipers, Mining Engineer, "Technical Review of Copper Flat DEIS," p. 2 (March 31, 2016), attached as Exhibit B.

[22] NMCC, "Definitive Feasibility Study," p. 23 (November 21, 2013).

increased throughput, and the DEIS fails to present a Proposed Action consistent with NMCC's DFS and permit applications submitted to the New Mexico Environment Department ("NMED") and the New Mexico Mining and Minerals Division ("MMD").[23]

NMCC's Proposed Action also relies on economic data that is unreasonable and unjustified.[24] NMCC's DFS is based upon a "long-term" copper price of $3.00 per pound and a daily production rate of 30,000 tpd, with an expected 20 percent internal rate of return.[25] At current copper prices of $2.01 - $2.28 per pound[26] it is likely that the NMCC's Proposed Action will result in a very low or negative rate of return. Given the nature of metals prices, an internal rate of return of 40 percent might be considered as the required rate of return to attract knowledgeable investors.[27] The copper price trend overall has continued a significant downtrend from almost $4.50 per pound in 2011 to current prices of approximately 50 percent that value. The economic analysis relied upon in the DEIS fails to take into consideration such information, therefore the analysis is unreasonable.

Additionally, the DEIS fails to consider an action alternative with increased waste rock storage and zero processing of low-grade ore.[28] According to expert Jim Kuipers, the DEIS description of the Mine's ore and waste production (DEIS 3-37) indicates that the DEIS fails to address alternatives involving a lower than expected copper price and a higher than expected waste to ore ratio. The DEIS states that "Low-grade copper ore would likely be processed at the end of the mine life," (DEIS 2-6), yet provides no supporting documentation for this statement.

Significantly lower copper prices (such as the current price of copper) results in an increase in waste rock storage area requirements and no processing of low-grade ore. Based on the history of copper mines in New Mexico and elsewhere, it is more likely that low-grade copper ore will not be processed except during times of exceptionally high copper prices or as an adjunct process to other processing operations. There is no assurance that the low-grade ore will be processed at any time during or at the end of the Mine's life. For the DEIS to consider it

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23 NMCC also recently submitted a revised discharge permit application with NMED on December 8, 2015, stating its daily production rate will be 30,000 tpd. NMCC has also submitted an application with MMD stating its daily production rate will be 25,000 tpd. NMCC's representations to NMED and MMD regarding its daily production rate and NMCC's Proposed Action submitted to BLM for the DEIS are significantly different.

24 *See* Jim Kuipers, Mining Engineer, "Technical Review of Copper Flat DEIS," p. 3 (March 31, 2016).

25 NMCC, "Definitive Feasibility Study," p. 23, p. 34 (November 21, 2013).

26 *See* Jim Kuipers, Mining Engineer, "Technical Review of Copper Flat DEIS," p. 3 (March 31, 2016).

27 *Id.*

28 *Id.* at 5.

"likely" is unreasonable and unwarranted. Therefore, BLM must either revise or supplement the DEIS with an adequate ore and waste production alternatives analysis.

Lastly, the DEIS fails to consider a reasonable action alternative that utilizes the following mitigation measures:[29]

- The use of a pit sump pump to prevent a pit lake;
- Partial or complete pit backfilling of the pit to prevent long-term pit lake water quality issues;
- Alternative tailings facility locations and methods, such as dry stack tailings (also known as filtered tailings) disposal and the depyritization method to reduce tailings acid generation;
- Alternative waste rock dump locations and configurations, and waste rock liners to collect any seepage; and
- Alternative reclamation and closure measures that utilize more advanced designs to address acid generation potential and metals leaching, such as engineered covers for waste rock and tailings.

According to hydrologist Tom Myers, backfilling the pit is the only mitigation measure that would prevent long-term pit lake water quality problems and will lessen the impacts of developing a pit lake on the groundwater balance in the area.[30] It also allows the drawdown cone, i.e., depleted groundwater levels, around the pit to recover. However, the DEIS does not disclose the obvious advantages of doing this. DEIS Chapter 2 mentions twice there is no plan to backfill the pit without considering it as an alternative. Backfilling would cost more, but the environmental benefits would outweigh those costs. BLM must either revise or supplement the DEIS to consider the following with regard to pit backfill:[31]

- The open pit lake will likely evaporate water in perpetuity, creating a long-term groundwater deficit and causing a drawdown cone that extends to the Ladder and to Hillsboro. Backfilling the pit would eliminate that evaporation.
- Water that flows to the pit from surrounding groundwater and surface water intercepted by the pit will likely be lost simply to fill the pit lake. Backfill would eliminate this loss.

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[29] *See* Jim Kuipers, Mining Engineer, "Technical Review of Copper Flat DEIS," p. 4 (March 31, 2016).

[30] Tom Myers, Hydrologic Consultant, "Technical Memorandum: Review of the Draft Environmental Impact Statement, Copper Flat," p. 18-19 (March 30, 2016).

[31] *Id.*

- Backfilling the pit would lessen pit lake water quality problems. Though oxidation of the rock eventually backfilled into the pit could cause groundwater problems, this would be mitigated by mixing neutralizing material into the backfill.

- To mitigate the Mine's water quality and quantity impacts, the open pit should be backfilled with waste rock pulled from the pit, to at least the level to which groundwater would recover. Reclamation bonding should include the cost of backfill.

D. The DEIS Fails to Adequately Analyze the "No Action" Alternative.

NEPA requires that BLM include the alternative of "No Action." 40 C.F.R. Part § 1502.14(d). The DEIS "No Action" alternative analysis is woefully inadequate. The analysis is predicated on the premise that the "No Action" alternative requires no real analysis, and consists of repeated statements that "nothing will happen" were the "No Action" alternative to be selected. The requirement for the "No Action" alternative exists as a mechanism for comparing the environmental and related social and economic effects of the action alternatives. "Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations," Federal Register Vol. 46, No. 55, March 1981, Question 3, "No Action Alternative." Just as the impacts of the three action alternatives are analyzed over a range of 11 to 16 years of the Mine's operations, so too must the "No Action" alternative be analyzed. Furthermore, the period after Mine closure needs to be carefully and fully analyzed, particularly because the Mine represents an irreversible commitment of resources.

The DEIS fails to recognize that substantial change will continue to occur on other public lands and private lands surrounding the Mine. Changes in land use patterns will occur, including but not limited to residential uses, commercial uses, ranching, recreation, and conservation. Moreover, patterns in resource use will also change, most notably the use of increasingly scarce water resources.

The "No Action" alternative does not consist of a baseline suspending all change in Sierra County and Southwestern New Mexico for the duration of the Mine. To realistically project conditions in the affected area under the "No Action" alternative requires BLM to evaluate the aggregate of local government plans, policies, population projections, capital improvement programs, and conservation programs, along with other plans for other relevant federal, state and local agencies.

An especially troubling aspect of the "No Action" alternative analysis is its assertion that:

> Current regulations for environmental protection during mining, reclamation of disturbed areas, and post-closure site management are more stringent than the regulations that applied in the 1980s during the Quintana mining operations at the site. The beneficial effects that would occur under the Proposed Action and action alternatives would not occur under the No Action Alternative.

DEIS 3-49.

The DEIS also incorrectly states, "No additional mining, mitigation of existing water quality issues, or reclamation of the mine would occur." *Id.* In fact, NMCC has submitted to the New Mexico Environment Department ("NMED") a Stage 1 Abatement Plan ("Plan"), under the New Mexico Water Quality Act ("WQA"), to address current water contamination at the Mine. The Plan went into effect early 2012. Significant cleanup of the sulphate plumes under and adjacent to the tailings storage facility has occurred under this Plan.[32] Therefore, the DEIS errs in asserting that the only way reclamation of the Mine's current contamination will occur is to permit the Mine to resume operations. This assertion is another example of how BLM is making unreasonable and unfounded assumptions that favor NMCC and the Preferred Alternative, in violation of NEPA. 40 C.F.R. Part § 1502.2(f)(g).

Lastly, NMCC, as the owner and operator of the Mine, currently has reclamation obligations under the WQA. These obligations do not disappear if the Mine is not approved by BLM. BLM must either revise or supplement the DEIS with an analysis which acknowledges that reclamation must occur at the Mine in any event, and to describe what that reclamation would be.

E. The DEIS Fails to Analyze Different Management Scenarios For Each Action Alternative.

BLM fails to identify the regulatory environment under different management scenarios as an issue for analysis, in violation of NEPA. 40 CFR Part § 1501.7. The environmental effects of unplanned occurrences, such as acid mine drainage, accidental leaks and spills, and failure of design features, can be greatly reduced if there is a monitoring program in place to detect and respond to these situations earlier rather than later. As such, the DEIS should compare the following factors under different management scenarios: number of agency inspections, the thoroughness of these inspections, the ability to review the adequacy of the reclamation bond and adjust it as needed, the frequency of bonding review, bonding amounts, the past history of bonding increases, the past history of calculating the correct bond, the amount of potential fines for violations, and the ability to require and manage a fund for long term water treatment.

The frequency and duration of monitoring and number of annual agency inspections have real impacts on detection and response. Ladder recommends that the level of monitoring and inspection increase for all action alternatives. Ladder also strongly recommends that unannounced site visits be offered to the public upon request. Such site visits are extremely helpful in informing the public about actual conditions on site. BLM must either revise or supplement the DEIS with an adequate analysis of management scenarios for each action alternative.

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[32] The NMCC Stage 1 Abatement Plan is not referenced in the DEIS. However, a 2013 Status Update Report on the Stage 1 Abatement Plan is listed in the "References" section, yet is not cited to in the DEIS. *See also*, Tom Myers, PhD, Hydrologic Consultant, "Technical Memorandum: Review of the Draft Environmental Impact Statement, Copper Flat," p. 7 (March 30, 2016).

F. The DEIS Fails to Identify Care and Maintenance Procedures for Each Action Alternative.

In the event of a temporary, short-term halt to mining or suspension of production, "care and maintenance" procedures need to be detailed for each action alternative. Under the New Mexico Mining Act ("NMMA"), mines may apply for a standby permit for a period of five years at a time, with an overall 20 year limit. 19.10.7.701.J NMAC. This temporary suspension does not fit the category of daily operations or the category of reclamation and closure. Major pieces of infrastructure need to be retained and maintained for future start up, but daily procedures such as water use for milling and dust control may be discontinued.

As such, the DEIS needs to describe how water balance will be affected; how capture, treatment and disposal of water will be affected; how the formation of a pit lake will be mitigated; and what level of work force is needed to assist in site management. This "Twilight Zone" of mine management leaves many uncertainties that are best addressed in advance of the actual event. Because different alternatives may have different ways of managing water balance or treatment, care and maintenance procedures should be detailed for each alternative.

The DEIS discusses NMCC's "interim management plan" for its Proposed Action at 2-42, stating that, "NMCC has prepared the following interim management plan to manage the mine area during periods of temporary closure (including periods of seasonal closure, if necessary) to prevent unnecessary or undue degradation." This plan includes:

> "[M]easures to stabilize excavations and workings; measures to isolate and control toxic or deleterious materials; provisions for the storage or removal of equipment, supplies, and structures; measures to maintain the mine area in a safe and clean condition; and plans for monitoring site conditions during periods of non-operation."

DEIS 2-42. However, the DEIS fails to reasonably discuss these measures and to evaluate their effectiveness. The DEIS also fails to adequately analyze other reasonable measures. For these reasons, BLM must either revise or supplement the DEIS with an adequate analysis of NMCC's interim management plan under all three action alternatives.

G. The DEIS Fails to Fully Analyze the Mine's Direct and Indirect Impacts.

An EIS must consider "any adverse environmental effects.".42 U.S.C. § 4332(2)(C)(iii); 40 C.F.R. Part § 1502.16. This review cannot be superficial—agencies must "take a 'hard look' at the environmental consequences of proposed actions utilizing public comment and the best available scientific information." *Biodiversity Conservation Alliance v. Jiron*, 762 F.3d 1036, 1051 (10th Cir. 2014). The "hard look" standard ensures the "agency did a careful job at fact gathering and otherwise supporting its position." *Id.*; *New Mexico ex rel. Richardson, 565 F.3d at 704* (quotations omitted).

"Any adverse environmental effects" are all direct, indirect, and cumulative environmental impacts of the proposed action. 40 C.F.R. §§1502.16; 1508.8; 1508.25(c). Impacts that must be analyzed include "effects on natural resources and on the components, structures, and functioning of affected ecosystems," as well as "aesthetic, historic, cultural, economic, social or health [effects]." Direct effects are caused by the action and occur at the same time and place as the proposed project. 40 C.F.R. §1508.8(a). Indirect effects are caused by the action and are later in time or father removed in distance, but are still reasonably foreseeable. 40 C.F.R. §1508.8(b).

As demonstrated above on pages 2-6 of these comments, the DEIS relies upon incomplete baseline data and biased models, which in turn preclude BLM from adequately analyzing the Mine's direct and indirect impacts on air quality, climate change, groundwater and surface water resources, wildlife and threatened and endangered species, recreation and tourism, transportation, and socioeconomic conditions.

1. <u>The DEIS Fails to Take a Hard Look at the Mine's Impacts to Air Quality.</u>

Ladder is located three miles downwind from the Mine,[33] and is very concerned about the Mine's air quality impacts on its wildlife, bison herd, staff and ecotourism guests. The Mine will produce significant amounts of fugitive dust emissions; heavy vehicle emissions; particulate emissions from soil stripping, blasting, construction, use of haul roads, crushing activities, materials storage and handling; and wind erosion from stockpiles. DEIS 3-6.

The DEIS fails to adequately analyze these impacts. General statements such as, "The overall air quality in the vicinity of the mine is good," and, "A review of the results of recent NATA [National Air Toxics Assessment] documents show that cancer, neurological, and respiratory risks in the mine area are well below national levels," are made without citation to any supporting documents. Furthermore, on December 17, 2015, EPA released the most recent update to the National Air Toxics Assessment (NATA).[34] The DEIS was released to the public on November 23, 2015. It clearly did not review "the results of recent NATA documents."

For example, the DEIS states that NMCÇ "operated an ambient particulate monitoring program...at the mine." DEIS 3-3. Two particulate samplers were used at the Mine, and "collected 58 samples between October 1, 2010 and September 30, 2011." *Id.* The DEIS fails to cite with particularity information in this study. Also, this study is not included in the appendices of the DEIS, nor is it listed under the "References" section; therefore, the data relied upon is not readily available to the public, in violation of NEPA. 40 C.F.R. Parts §§§ 1502.18, -.21 and -.24.

The DEIS also states that, "A detailed breakdown of mine operational emissions is in Appendix B." DEIS 3-6. Appendix B consists of the following documents:

- "Table B-1. Uncontrolled Emissions for 25,000 tpd Operating Scenario" (Source: NMED 2014);

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[33] Prevailing winds are from the southwest.

[34] http://www.epa.gov/national-air-toxics-assessment. Last accessed on March 1, 2016.

- "Table B-2. Controlled Emissions for 25,000 tpd Operating Scenario" (Source: NMED 2014);

- "Dispersion Model Report For THEMAC RESOURCES NEW MEXICO COPPER CORPORATION'S COPPER FLAT COPPER MINE NSR PERMIT APPLICATION" (Prepared by Paul Wade, Class One Technical Services, Inc., dated February 22, 2013); and

- "New Mexico Environment Department New Source Review Permit" (June 25, 2013).

These documents pertain to emissions for mining operations with a 25,000 tpd production rate, which is Alternative 1. Tables B-1 and B-2 are templates prepared by NMED, which provide estimates of emissions for mining operations. These tables do not represent actual emissions of the Mine.

The DEIS also refers to a dispersion model report, stating that, "Modeling was completed using as many receptor locations to ensure that the maximum estimated impacts are identified." DEIS B-19. However, this report fails to identify the "many receptor locations." It is unclear whether the dispersion model identifies Ladder as a receptor location for the Mine's air quality impacts. *Id.*

The documents in the DEIS appendices do not provide a detailed breakdown of emissions rates for either the Proposed Action or the Preferred Alternative. The DEIS must provide a detailed breakdown of emissions rates for all alternatives under NEPA. BLM must therefore either revise or supplement the DEIS to provide this information and to adequately analyze the Mine's air quality impacts under all action alternatives.

2. <u>The DEIS Fails to Take a Hard Look at the Mine's Impacts to Climate Change and Sustainability.</u>

The U.S. Department of Interior's Bureau of Reclamation has recently warned that "Within New Mexico, and in the Rio Grande Basin generally, climate change is anticipated to have profound effects on flood risks, water supply, ecosystem health, land cover, and other areas of national concern."[35] Although the DEIS provides a brief discussion of climate change and states that the Mine's climate change impacts would be "short-term to medium-term minor adverse effects" (DEIS 3-15 through 3-17), it fails to provide any supporting documentation or to adequately analyze such impacts, in violation of NEPA. 40 C.F.R. Parts §§1502.16 and .23.

For example, the "Regulatory Requirements Related to Climate Change and Sustainability" section fails to identify and take into consideration the Executive Order issued by President Obama on March 19, 2015 (Executive Order Planning for Federal Sustainability in the Next Decade). DEIS 3-15. This Executive Order commits federal agencies to cutting

[35] U.S. Department of the Interior, Bureau of Reclamation, SECURE Water Act Report: Reclamation Climate Change and Water 2016, p. 7-19 (March 2016).

greenhouse gas (GHG) emissions forty (40) percent over the next decade from 2008 levels -- saving taxpayers up to $18 billion in avoided energy costs -- and increase the share of electricity the Federal Government consumes from renewable sources to thirty (30) percent. No analysis of the Mine's green house gas ("GHG") emissions has been completed. We agree with the EPA that BLM should estimate the Mine's GHG emissions under all alternatives with the tools provided by CEQ for estimating and quantifying GHG emissions. EPA Copper Flat DEIS Comments, p. 2 (March 4, 2016).[36]

Additionally, the DEIS fails to analyze emissions from off-site operations of the Mine. For example, under NMCC's Proposed Action:

> Copper concentrate would be hauled by 25-ton capacity highway trucks towing 10-ton trailers to I-25 and then to a nearby railhead in southern New Mexico, and then transported by rail to a smelter in North America or to port facilities for shipping to Asia or Europe. Molybdenum concentrate and any other mineral would be filtered, dried, and packaged on-site and then transported to an off-site refinery by truck.

DEIS 2-33. The DEIS fails to provide any information regarding off-site smelters in North America that the copper concentrate may be transported to, and regarding off-site refineries the molybdenum concentrate may be transported to. Without knowing these potential smelter and refinery locations it is impossible to adequately analyze the Mine's indirect emissions and climate change impacts.

The DEIS refers to Table 3-4 for the total direct and indirect emissions associated with each of the action alternatives. DEIS 3-17. However, Table 3-4 fails to separate out the Mine's "direct" and "indirect" emissions. Table 3-4 is titled "Estimated Operational Emissions." *Id.* It appears that Table 3-4 does not specifically identify the Mine's indirect emissions from copper and molybdenum concentrates being transported off-site by truck, rail, and ship to ports in Mexico and Europe.

The DEIS also fails to analyze environmental impacts of an off-site substation that will be constructed on a "30-acre State Trust land south of NM-152 and east of the production wells" to supply additional power needed under an accelerated production rate. DEIS 2-81. There is no analysis of the effects (direct, indirect and cumulative) from using energy generated off-site, in violation of NEPA. 40 C.F.R. Part § 1502.16. Under Alternative 2, the Project's total power demand will be 241.49 gigawatt hours a year ("GWh/year"). DEIS 2-82. Such a huge energy demand will tax and possibly exceed the current regional electrical generating capacity, resulting in the likely need to go farther afield to acquire operating energy.

The DEIS's inadequate climate change analysis is particularly disturbing given that recent warming in the Southwest is one of the most rapid in the Nation. The average temperature in the Rio Grande Basin is projected to increase by roughly 5 to 6 degrees Fahrenheit during the

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[36] Example tools can be found on CEQ's NEPA.gov website at https:..ceq.doc.gov/current_developments/GHG_accounting_methods_7Jan2015.html.

21st century.[37] The U.S. Department of the Interior is well aware that the Rio Grande Basin and the Southwest has experienced periods of unusually severe drought (e.g. a five decade mega drought) and findings suggest that similar severe drought conditions should be anticipated in an even warmer and drier future.[38] The Bureau of Reclamation has asserted that "mean-annual precipitation is projected to decrease" during the 21st century and "low-flow periods in the Rio Grande are projected to become more frequent due to climate change."[39] Until the climate dynamics of such mega droughts are fully understood, plans involving water management should be designed to accommodate a fifty (50) year mega drought.

Climate change is a reasonably foreseeable issue that should be analyzed in an integral way and included in the DEIS when assessing potential impacts to soils, water quality and quantity, and biological resources. BLM guidance, CEQ guidance, and several Executive Orders require that a complete, adequate climate change analysis occur. BLM must therefore either revise or supplement the DEIS to address these impacts.

3. The DEIS Fails to Take a Hard Look at the Mine's Impacts to Water Quantity & Quality.

As discussed above on pages 4-6 of these comments, the DEIS is based upon incomplete hydrologic baseline data. This leads to errors in the conceptual flow model and to biases in the numerical flow model. The CFM and numerical model ultimately fail to adequately identify the Mine's impacts. However, even the flawed DEIS concludes that the Mine will have significant impacts to water resources.

a. The Mine's Impacts to Water Quantity.

The Mine's greatest impact to water quantity will be the substantial reduction of groundwater levels, which will result in significant surface water depletions to the Rio Grande, Caballo Reservoir, Las Animas Creek, and Percha Creek.

The Mine's impacts to water resources under all action alternatives include the following:[40]

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[37] U.S. Department of the Interior, Bureau of Reclamation, SECURE Water Act Report: Reclamation Climate Change and Water 2016, p. 7-5 (March 2016). *See also* Karl, T.R., J.M. Melillo, and T.C. Peterson (eds.). 2009. Global Climate Change Impacts in the United States. Cambridge University Press.

[38] *Id.* at 7-5 through 7-6. *See also* Cody Routson. 2011. Second Century Southwest Megadrought. Accessed at http://www.southwestclimatechange.org/blog/13285. Last visited on February 19, 2016.

[39] *Id.* at 7-6.

[40] Tom Myers, Hydrologic Consultant, "Technical Memorandum: Review of the Draft Environmental Impact Statement, Copper Flat," p. 7 (March 30, 2016).

- The Mine's production pumping will cause drawdown in the Palomas Basin and decrease flows to the Rio Grande River, Las Animas Creek, and Percha Creek, as well as to springs in the area.

- The Mine's dewatering and pit lake will deplete groundwater resources and cause a drawdown ("pit lake cone of depression" or "drawdown cone"), thereby decreasing discharges to springs and streams, both in Percha Creek and Las Animas Creek. The drawdown would affect springs and wells on Ladder.

- Leaks from the Mine's waste rock and tailings would reach groundwater and flow eastward toward productive aquifers.

- The Mine's future pit lake would have significant water quality issues, based on the acid-producing properties of the rock surrounding the pit.

The Mine's impacts to water quantity can be divided between the impacts of the Mine's production wells and the Mine's dewatering wells and open pit.

i. The Mine's Production Wells.

In general, the Mine's production wells will pump a very substantial amount of water with potential for significant harm. The predicted impacts of this pumping have been minimized due to the errors and biases in the models relied upon in the DEIS.[41] Impacts of the Mine's production well pumping would likely extend to Las Animas Creek, Percha Creek, and Caballo Reservoir.

Impacts to Ladder Ranch.

The DEIS fails to adequately analyze the Mine's direct impacts to Ladder due to the Mine's production pumping wells. The Mine's impacts to water quantity on Ladder will be the following:[42]

- If biases in the DEIS model are removed, then simulated production pumping drawdown of at least one foot would extend west and north of the Mine, affecting Las Animas Creek further upstream (on Ladder property) than currently predicted. This would affect springs along the stream course and decrease the perennial flows. Drawdown would also reach Seco Creek on Ladder.

[41] *See* pages 7-11 of these comments for a detailed discussion on how errors and biases in the groundwater models minimize the Mine's impacts to water quantity and quality.

[42] Tom Myers, Hydrologic Consultant, "Technical Memorandum: Review of the Draft Environmental Impact Statement, Copper Flat," p. 4 (March 30, 2016).

- If biases in the DEIS model are removed, simulated production pumping drawdown would exceed twenty (20) feet at Ladder's southern boundary.

Impacts to the Rio Grande and Caballo Reservoir.

The DEIS also fails to adequately analyze the Mine's direct impacts to the Rio Grande and Caballo Reservoir due to the Mine's production pumping wells. As discussed on page 5 of these comments, the DEIS admits that the "cumulative magnitude of the effect [from the Mine's production pumping wells] can only be determined through a comprehensive mid-basin study of Caballo Reservoir and the Rio Grande." DEIS 4-8. This study has not yet been conducted, therefore the public is unable to comment on the findings of such a study. However, the estimated depletions to the Rio Grande provided in the DEIS are considerable. Under NMCC's Proposed Action, 17% of the flow from the project area watersheds to the Rio Grande would be lost. Under Alternative 2, BLM's Preferred Alternative, that loss increases to 25%.[43] The impact from these losses to groundwater discharge would be alarmingly apparent during periods of drought. Surface water depletions to the Rio Grande would have serious consequences for Sierra County and New Mexico.[44]

ii. The Mine's Dewatering Wells and Open Pit.

Impacts to Ladder Ranch.

The Mine's direct impacts to Ladder, due to mine dewatering and pit lake formation, include the following:[45]

- At the end of Mining operations, according to the DEIS modeling, drawdown of up to one foot would reach the John Cross Well on Ladder, and drawdown of ten (10) feet would reach Ladder's property line just north of the Mine.

- At the end of Mining, if the DEIS model is properly simulated with more fractures and higher conductivity of the andesite at the Mine pit, the drawdown would extend further into Ladder (and possibly for at least another mile beyond Ladder). It is very likely that the drawdown would be up to fifty (50) feet at Ladder's southern boundary.

- At the end of Mining operations a pit lake will form. It will most likely take a century or more to reach its full size. Drawdown around the pit lake will continue to expand even longer, reaching Las Animas Creek on Ladder after a few decades. Drawdown from the

[43] *Id.* at 4.

[44] Reductions in surface water flows and levels will have serious impacts on Sierra County's economy and on New Mexico's ability to satisfy its obligations under the Rio Grande Compact.

[45] *Id.* at 3.

pit would cause Las Animas Creek, Warm Spring, and Myers Animas Spring to lose much or all of their flow.

During Mining operations, to keep the Mine's pit dry, NMCC proposes to pump water from locations close to the pit to dewater the entire area. These dewatering wells and the pit itself would have serious long-term effects on water availability in the regional aquifer and in surface water. The DEIS fails to adequately address whether the Mine's production pumping will "impair existing wells." DEIS 3-76. It simply states that the New Mexico Office of the State Engineer ("OSE") will determine such impairment. This is a clear violation of NEPA. 40 C.F.R. Part § 1501.6. BLM must either revise or supplement the DEIS with the required impairment analysis.

Additionally, as stated above, after the Mine ceases to operate a small pit lake will form and evaporate water in perpetuity. This evaporation would cause the pit to hydraulically resemble a large diameter well, in perpetuity. Though the DEIS discloses the total evaporation of the pit lake under the Proposed Action, it fails to disclose the total evaporation under the Preferred Alternative. This is significant because pit lake evaporation is a permanent loss of flow to the Rio Grande. Pit lake evaporation will be a permanent loss of approximately 100 af/y from the water budget of the Mine-area watershed's drainage to the Rio Grande.[46]

BLM must either revise or supplement the DEIS to estimate the long-term pit lake evaporation loss for all action alternatives and estimate the time for these losses to reach the Rio Grande. This can be accomplished by running the numerical model in transient mode[47] into the future, until conditions approach steady state[48]. The model should also be run in a steady state mode with the pit lake to estimate the steady state evaporation.

The DEIS concludes that drawdown of groundwater levels at wells near the Mine pit would be over 200 feet after 100 years. Continued drawdown at the Mine pit would be much greater. Water levels would recover very slowly to a point where the evaporation from the pit lake equals the inflowing groundwater, precipitation and runoff and the drawdown cone would continue to expand. However, the DEIS fails to adequately analyze the ultimate extent of the pit's cone of depression. BLM must either revise or supplement the DEIS to adequately estimate this impact. This can be done by running the numerical model with the pit lake simulated in steady state, as recommended above for estimating the steady state pit lake evaporation rate.

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[46] *Id.*

[47] "Transient mode" is a model simulation in which conditions change with time, usually including a change in pumping or other stresses with time.

[48] "Steady state mode" is a model simulation in which all inflows and outflows are constant, with no changes in groundwater levels.

The DEIS also fails to disclose all affected springs within the predicted one foot drawdown (of groundwater levels) from the Mine pit. It avoids doing so by claiming that springs along the alluvial valley will not be affected, because they are "perched discharges."[49] DEIS 3-82. The DEIS offers no evidence to support this assertion.

Impacts to the Rio Grande and Caballo Reservoir.

As stated above, the most substantial impact on the Rio Grande and Caballo Reservoir would be the loss of water due to the Mine's production wells and to evaporation from the permanent pit lake. However, the zone of influence of the pit dewatering wells and the Mine pit after mining ceases can contribute to robbing groundwater flow from the Rio Grande and Caballo Reservoir.

In summary, the water quantity impacts of the Mine will likely be very substantial. In light of the errors and biases in the groundwater models relied upon in the DEIS (and the associated minimization and uncertainty of impacts), BLM must ensure that this analysis is expanded to address the potential range of impacts. A worst case scenario should be presented in detail in either a revised or supplemental DEIS. BLM must also assure itself that NMCC has sufficient water rights to operate this Mine, given the massive quantities of water involved for both operations and mitigation.

b. The Mine's Impacts to Water Quality.

The Mine would pose serious threats to water quality in the surrounding area. Several aspects of the Mine would affect water quality, such as the construction and reclamation of waste rock dumps, expansion of the pit and dewatering, expansion and reclamation of the tailings impoundment, non-point source pollution from disturbed area runoff, and spills of hazardous materials. DEIS 3-36, -37. The major threat would be the tailings impoundment, with the waste rock piles and the open pit also potentially contributing to water quality impairment.

Additionally, the "Copper Rule" (20.6.7 NMAC) promulgated by the New Mexico Environment Department ("NMED") currently exempts groundwater beneath existing and future copper mines from compliance with New Mexico's "3103" water quality standards.[50] The Copper Rule allows the open pits, waste rock piles, leach piles, tailings, and other mine units at copper mines to release hazardous contaminants directly into the environment and to pollute groundwater above 3103 Standards. The DEIS makes no mention of this rule and its application to this Mine.

[49] "Perched discharge" is a charge from a spring associated with a perched aquifer. A perched aquifer is a (usually) small aquifer not connected to the deeper regional aquifer.

[50] The numeric water quality standards codified at 20.6.2.3101 NMAC are commonly referred to as "3103 standards."

Hundreds of millions of tons of broken, crushed and finely ground mineralized rock are present within the massive leach ore, waste rock, and tailings piles found at open pit copper mines in New Mexico. These piles are capable of generating and releasing acid rock drainage ("ARD") into the environment for hundreds of years. ARD, along with the acidic solution used to leach copper from ore, has already contaminated approximately 20,000 acres of groundwater pollution at Freeport-McMoran's three existing mines in Grant County, New Mexico. After active mining ceases, the ore, waste rock, and tailings piles continue to generate ARD and pollute groundwater, which continues to move and spread in response to pressure gradients. Accordingly, the pump-and-treat remedial systems (prescribed by the Copper Rule) at a given copper mine must be operated continuously, in perpetuity, in order to prevent the permitted pollution from spreading offsite.

The following paragraphs discuss water quality impacts by Mine feature. The DEIS claims there is very little difference in impacts among the action alternatives because Project features (such as pit lake, waste rock dumps, tailings impoundment) vary minimally in size. However, the pit lake will be larger under the Preferred Alternative than under NMCC's Proposed Action and Alternative 1. Therefore, the DEIS fails to adequately analyze the difference in pit lake water quality due to size differences among the action alternatives, as discussed below.

i. The Mine's Waste Rock Dumps.

Waste rock dumps are pollution sources due to precipitation or runoff leaching through them. Their capacity for pollution depends on the reactivity[51] of the rock and whether the rock is sufficiently covered. The DEIS describes the waste rock only in general terms, acknowledging that some will have the potential to generate acid mine drainage ("AMD"). DEIS Table 3-12. The DEIS states that both waste rock and low-grade ore have the potential to generate "deleterious leachate if sufficient percolation of water through the rock piles occurs." DEIS 3-41. However, it fails to disclose the amount of transitional or sulfide waste rock or ore. This is problematic because some ore could be temporarily stored on the ground surface prior to processing.[52] The DEIS also implies that the Mine will rely on the dry climate to prevent AMD from reaching ground or surface water, (DEIS 3-39), and fails to disclose how NMCC will accomplish cover requirements.

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[51] "Reactivity" of rocks is the tendency for rock to undergo geochemical changes with time, due to changing conditions in the ground.

[52] Tom Myers, Hydrologic Consultant, "Technical Memorandum: Review of the Draft Environmental Impact Statement, Copper Flat," p. 15 (March 30, 2016).

BLM must either revise or supplement the DEIS to analyze the following: reactive rock amounts potentially causing pollution on the Mine site; substantial precipitation events beyond low-frequency high rainfall events occurring in the summer; seepage from the waste rock dumps; cover requirements; and mitigation measures addressing waste rock and potential leaching of contaminants.

ii. The Mine's Tailings Impoundment.

The existing tailings impoundment has impacted downgradient groundwater since it was constructed in the early 1980s.[53] The DEIS claims that constructing a new impoundment on top of the existing impoundment would improve existing water quality because it will have a geomembrane liner, which will prevent seepage of new tailings water and prevent future seepage from the existing tailings.[54] DEIS 3-45. For this reason, the DEIS claims that all action alternatives will "result in an improvement of water quality as compared to the No Action alternative." *Id.*

This ignores the fact that NMCC has been implementing an abatement plan since 2012, remediating existing groundwater. It also fails to acknowledge that if BLM does not permit the Mine, NMCC will be required to undertake reclamation activities under NMMA, including tailings remediation. It is extremely inappropriate for the DEIS to suggest that an action alternative is necessary to remediate an existing sulfate/TDS plume, and demonstrates BLM's bias for the Preferred Alternative in violation of NEPA. 40 C.F.R. Part § 1502.2(f),(g).

iii. The Mine's Pit Lake.

The DEIS indicates that the existing pit lake has exceedances of "applicable surface water quality standards for aluminum, *cadmium, copper*, lead, manganese, selenium, and zinc in at least one of the baseline water quality samples." DEIS 3-21 (emphases show constituents with exceedances in all samples). Exceedances are based on the "designated uses of warmwater aquatic life, livestock watering, or wildlife habitat." *Id.* Total dissolved solids ("TDS") and sulfate also have very high and increasing concentrations with time since the initial pit lake formed in the early 1980s. DEIS 3-22.

The DEIS also predicts that a pit lake will re-form after mining ceases under all action alternatives. Inflow to the pit lake will be groundwater, precipitation, and surface runoff. There is little difference among alternatives for inflow. Being terminal,[55] with a significant amount of

[53] *Id.* at 16.

[54] Mining Engineer Jim Kuipers also notes that the DEIS fails to adequately analyze the high rate of rise for the Mine's tailings storage facility. This is significant because the "rate of rise" is often times cited as a potential adverse factor relative to failures in mine tailings facility design and operation. *See* Jim Kuipers, "Technical Review of Copper Flat DEIS," p. 6-7 (March 31, 2016).

[55] "Terminal" means groundwater flow enters as a liquid and can leave only as a gas by evaporation.

reactive rock surrounding the pit, the future water quality would be at least as bad as the existing pit lake, and with evapoconcentration[56] (due to being a terminal lake) some concentrations will be worse than existing concentrations.[57] DEIS 3-31.

The DEIS downplays the importance of detailed water quality predictions for the pit lake because of "pertinent uncertainties." DEIS 3-31. Thus, the DEIS relies on both a predictive model and the existing pit lake only to inform its discussion of future pit lake water quality. A "predictive geochemical model is useful to understand the general water quality that may be present decades or centuries in the future, but the model predictions are only estimates and the *level of uncertainty in the model predictions cannot be fully quantified*." DEIS 3-32 (emphasis added). The DEIS notes the modeling predicts future water quality would be near-neutral pH, high TDS, calcium sulfate water, with exceedances of the current water quality standards for copper, lead, manganese, selenium, and zinc. *Id.*

The DEIS also discusses that future water quality standards for the pit lake may be different than at present, either by changing the designated use through a "use attainability analysis" (DEIS 3-33), or by completing site-specific standards, which appears to simply set standards based on what can live in the future poor quality water. *Id.*

Lastly, the DEIS fails to present groundwater modeling results to determine what would happen if the pit lake is pumped full prior to groundwater recovery. BLM must either revise or supplement the DEIS to include a "use attainability analysis" and data regarding pit lake water migration.

In summary, BLM must either revise or supplement the DEIS with the following information to comply with NEPA:

- The DEIS must disclose the amount of transitional or sulfide waste rock or ore and how it will be stored during mining operations;
- The DEIS must disclose how NMCC will accomplish cover requirements for the waste rock and tailings impoundment;
- The DEIS must disclose that NMCC has been undertaking remediation measures for existing groundwater contamination at the Mine site and will continue to do so if BLM does not permit the Mine;

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[56] "Evapoconcentration" is the concentration of salts or metals in a water body due to evaporation. This is primarily a problem in terminal pit lakes into which groundwater flows, but only exits by evaporation. Salts and metals remain in solution when evaporation occurs.

[57] Tom Myers, Hydrologic Consultant, "Technical Memorandum: Review of the Draft Environmental Impact Statement, Copper Flat," p. 17 (March 30, 2016).

- The DEIS must disclose what the water quality standards for the pit will be after Mining operations cease; and

- The DEIS must disclose an analysis of the Mine's pit stability and groundwater modeling results to estimate the potential for pit lake water to enter the groundwater.

4. The DEIS Fails to Take a Hard Look at Impacts to Wildlife and Federally-Listed Species.

The DEIS fails to adequately analyze the Mine's impacts to wildlife and federally-listed species for two reasons. First, the DEIS relies upon incomplete baseline data for biological resources at and near the Mine site.[58] Second, the DEIS fails to identify and analyze the Mine's impacts to Ladder's bison herd and captive endangered Mexican Grey Wolves, and other wildlife species found on the Ranch.

a. The Mine's Impacts to Wildlife.

Ladder's riparian areas contribute significantly to biological diversity within New Mexico. The most pronounced and unusual communities on the Ranch are those dominated by Arizona sycamore, along the broadest flood plains of Las Animas Creek. Arizona sycamores are not known to occur anywhere else in the Rio Grande watershed, or further east of the Continental Divide. These riparian communities have high priority for conservation since throughout most of the Southwest they are in decline, due to drastic changes in hydrological conditions (such as large flood-control dams and climate change). The continued diversity of the riparian vegetation communities on Ladder is dependent on management practices that favor natural flooding, reliable stream flows on or near the surface, and protection of the uplands from erosion. Many wildlife species are totally dependent on these riparian communities, which serve as wildlife sanctuaries within an arid landscape.

The DEIS admits that due to pumping of the Mine's production wells and dewatering of the Mine's pit significant impacts will occur to local streams, springs, and seeps. These impacts will result in significant degradation to, and maybe even elimination of, wildlife and riparian habitat dependent upon these and other waters.

b. The Mine's Impacts to Federally-Listed Species.

As previously discussed, Ladder is engaged in numerous wildlife and federally-listed species reintroduction and restoration projects. Ladder has also recently launched its ecotourism initiative through Ted Turner Expeditions, which educates the public about the importance of such species and restoration and reintroduction efforts. Ladder has the following concerns regarding the Mine's impacts to its reintroduction and restoration projects:

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[58] *See* pages 6-7 of these comments.

i. Ladder's Endangered Mexican Grey Wolf Reintroduction Project.

Located within 3.5 miles of the Mine is a United States Fish and Wildlife Service ("USFWS") holding facility for the Endangered Mexican Grey Wolf. Ladder has been a partner with USFWS in endangered Mexican grey wolf restoration efforts since 1997. Since then, over 100 wolves have been housed in the Ladder Ranch Wolf Management Facility ("LRWMF"). Turner Endangered Species Fund ("TESF") is the cooperating entity with USFWS. TESF currently holds a permit from USFWS and New Mexico Game and Fish ("NMGDF") through 2016. It is anticipated that the program will continue and that the LRWMF will continue to be an important transitioning facility for the recovery of this endangered species. Blasting from the Mine could adversely affect the behavior of the captive wolves being held prior to their release in the wild.[59]

ii. Ladder's Threatened Chiricahua Leopard Frog ("CLF") Recovery Project.

Ladder has worked in partnership with USFWS and the NMDGF to conserve the threatened CLFs on the Ranch since 2001. CLFs are listed as "threatened" under the federal Endangered Species Act ("ESA") and as a "species of greatest conservation concern" by NMDGF. The conservation value of the Ranch's 155,000+ acres of diverse habitat in New Mexico cannot be overstated. As home to the last large CLF population in New Mexico, the Ranch plays a crucial role in the survival of this species. CLF occur in four drainages on the Ranch: Las Animas, Seco, Las Palomas, and Cuchillo creeks. The Ladder also houses an outdoor breeding facility and several steel rim refugia tanks that serve as temporary holding facilities for small, putatively unique populations that are at high risk of extirpation in the wild and serve a crucial role in CLF recovery.[60]

<u>Dust-abatement</u>.

Dust-abatement (especially with any chemicals) caused by the Mine will likely have a major impact on water quality, in turn affecting Ladder's breeding facility and refugia tanks. Water is relatively stagnant at these sites and an increase in chemicals in the area will likely change the pH in the water. Water with pH less than 6.0 may inhibit reproduction, and acidic waters with a pH of less than 5.5 are likely fatal to most CLFs (USFWS 2007: 25); whereas pH above 10 is also likely detrimental. Copper has been found to be acutely toxic to CLFs.

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[59] *See* Turner Endangered Species Fund website at http://tesf.org/project/mexican-wolf-recovery/ for more information about Ladder's endangered Mexican grey wolf reintroduction project.

[60] Comments pertaining to the Mine's impacts to CLFs were prepared by Ladder Ranch Staff Biologist, Cassidi Cooibos, on behalf of TRP and NMELC. *See also* Turner Endangered Species Fund website at http://tesf.org/project/chiricahua-leopard-frog/ for more information about Ladder's threatened CLF recovery project.

Groundwater pumping.

As stated above, the Mine's extraction of ground water may reduce the extent or permanence of nearby surface waters, thereby eliminating habitat for any frogs present, resulting in forced dispersal, increased exposure to predators, or desiccation. A reduction in permanency will also result in changes to other components, such as aquatic vegetation and invertebrates, leading to a reduction in food resources to larval and adult frogs.

Noise and Vibrations.

The Mine's noise may disrupt male vocalizations in some manner, and thus may affect aspects of mating and reproduction. Vocalizations by male frogs are species-specific and are assumed to serve as conspecific[61] mate attractants that permit females to reduce the likelihood of error in mate choice where other similar ranid species are present. Frost and Bagnara 1977. Anthropogenic noise, especially during the night or at dusk when CLFs primarily vocalize, may impact calling behavior. The vibrations may also disturb CLFs in Cave Creek, which could cause forced dispersal from the area or change breeding habitats.

Vegetation Removal.

The Mine's activities that degrade riparian zones are likely to have significant impacts to water permanency in lotic systems and their associated backwater pools. The removal of upland vegetative ground cover may also induce erosion and sedimentation reaching aquatic sites. Neary et al. (2005). The deposition of sediments, as previously discussed, may fill in Ladder's pools and tanks, thus reducing the permanence of those sites and their use for breeding. Parker 2006. Increased turbidity and accumulated fine particulates may reduce primary productivity of vegetated sites, resulting in altered availability of foods for larva and adults. Sedimentation may also alter aquatic or semi-aquatic vegetation in and around aquatic sites, thus reducing feeding and cover (e.g., egg-laying, escape) habitats for CLFs. Pilliod et al. 2003. Pulses of sediments may also smother eggs.

iii. Ladder's Endangered Bolson Tortoise Reintroduction Project.

Ladder's endangered bolson tortoise reintroduction project is located within 2.5 miles of the Mine. Bolson tortoises, the largest and rarest of the five North American tortoise species, is listed as endangered under the ESA and as "vulnerable" on the International Union for Conservation of Nature ("IUCN") Red List. The objective of this project is to release juvenile bolson tortoises on Ladder (as well as the Armendaris Ranch), which is the northern tip of the tortoise's prehistoric range, to establish wild populations. Effects of mining activity, particularly vibrations from blasting, are unknown, but could cause the collapse of burrows and alter behavior patterns.[62]

[61] Conspecific: of the same species.

[62] *See* Turner Endangered Species Fund website at http://tesf.org/project/bolson-tortoise-recovery/ for more information on Ladder's endangered bolson tortoise reintroduction project.

iv. Ladder's Prairie Dog Reintroduction Project.

The black-tailed prairie dog has been a candidate species for listing under the ESA. Prairie dogs are a keystone species whose presence on the landscape has a profound positive effect on biodiversity. Ladder has been restoring black-tailed prairie dog colonies within two miles of the Mine. Effects on these colonies from blasting and other mining operations are unknown, but could cause the collapse of burrows and alter behavior patterns.[63]

For the reasons discussed above, the DEIS's analysis of the Mine's wildlife and threatened and endangered species impacts is woefully inadequate. BLM must either revise or supplement the DEIS with complete baseline data which address Ladder's concerns.

5. <u>The DEIS Fails to Take a Hard Look at the Mine's Impacts to Recreation.</u>

The Mine will have significant impacts to air quality, water quality and quantity, and visual resources - which in turn will negatively affect recreation at Ladder and in Sierra County. The DEIS fails to take a hard look at the Mine's recreation impacts for three reasons: 1) it fails to identify Ladder,[64] Caballo Lake State Park and Percha Dam State Park as key recreational sites in Sierra County (DEIS 3-194); 2) it fails to adequately analyze the Mine's impacts on water levels at Caballo Reservoir and Elephant Butte Lake; and 3) it fails to adequately analyze streamflow reduction impacts to Las Animas and Cave creeks.

a. Impacts to Ladder Ranch.

Of primary concern is the DEIS's failure to adequately analyze the Mine's impacts on water use and the subsequent impact to recreation at Ladder. Ladder offers the following recreational opportunities: hunting, guided hiking and mountain biking, bird watching, wildlife and bison viewing, and astronomy events. Anticipated future recreational activities on the Ranch include guided horseback riding and camping.[65]

The DEIS states that, "The Proposed Action…is predicted to slightly reduce streamflows in both Las Animas Creek and Percha Creek and reduce groundwater discharge to Caballo Reservoir and the Rio Grande. However, recreational impacts in Caballo Reservoir and the Rio Grande are expected to be minor and temporary to medium-term, where recreational use is concerned." DEIS 3-201. The DEIS then fails to cite to any supporting documents.

One of Ladder's greatest concerns is that a 700-900 foot deep pit, and associated pit dewatering, will cause a cone of depression that could devastate portions of these creeks forever.

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[63] *See* Turner Endangered Species Fund website at http://tesf.org/project/prairie-dogs/ for more information on Ladder's black-tailed prairie dog reintroduction project.

[64] *See* http://tedturnerexpeditions.com/properties/ladder-ranch/ for more information on Ladder's many recreational opportunities, which include hunting and ecotourism.

[65] *See* attached Exhibit G for more information on recreational tour offerings at Ladder Ranch.

Ladder is extremely concerned about the Mine's reduction in streamflows in Las Animas Creek and Cave Creek, and how this will impact Ladder's wildlife restoration projects and ecotourism programs.[66] It has been estimated that roughly eighty (80) percent of all the wildlife on Ladder depend on these creeks for survival.[67] They are important migration routes for birds, as well as nesting grounds for rare species. Ladder will be conducting surveys this summer for endangered Willow Flycatchers and threatened Yellow-billed Cuckoos on Las Animas Creek.

Las Animas creek is one of the crown jewels for biodiversity in New Mexico and the Southwest. Any draw down of water from the Mine's production pumping, dewatering wells and pit lake will likely affect these creeks and riparian corridors, and the unique species that rely on them. A drop in ground water can also eliminate certain vegetation and trees, particularly ancient sycamores, upon which many species, particularly birds, depend.

Even a one-foot drop can be disastrous. Specifically, this can affect a suite of neoptropical birds that breed on Ladder, including tanagers, oriels, blackhawks, and zone tails. Until a few years ago, Ladder had bald eagles nesting along the Las Animas creek. Although now abandoned, the nest can still be reused. This can be seen at the Armendaris Ranch, a nearby ranch owned by a TRP affiliate, where bald eagles are again using a nest that had been abandoned for many years.

b. Impacts to Sierra County.

The Mine's reduction of groundwater discharge to Caballo reservoir and the Rio Grande pose serious threats to recreation in Sierra County. The New Mexico Tourism Department has stated:

> State park visits decreased by 20.5% from 2010 to 2013. State park visitation is highly sensitive to drought and water levels as most visits to New Mexico's state parks are associated with warm weather water recreation. Visitation has suffered over the last few years, almost entirely due to long term drought that has resulted in low water levels low enough to interfere with recreation activities (such as boating, camping, fishing and swimming), combined with occasional park closures due to wildlife hazards."

New Mexico Tourism Department 2014 Annual Report, p. 14.

The Mine will further lower water levels at Caballo Lake State Park, and thus potentially interfere with recreational activities at these sites. Any reduction of capacity at Caballo can in turn result in the forced release of water from Elephant Butte Lake upstream, which will result in further negative impacts on recreational activities conducted there. Taken together, this reduction of flow caused by the Mine will have more than a "minor" adverse impact on Sierra County. Though tourism levels decreased during 2010-2013, New Mexico began to see a

[66] *See* http://theladderranch.com/wp-content/themes/bones-ttx/library/docs/TTX-Ladder-sample-itinerary.pdf.

[67] *See* attached Exhibit C for a list of all wildlife species on Ladder Ranch.

significant increase in visitation and tourism spending in 2014. New Mexico Tourism Department 2015 Annual Report, p. 5-6. "Tourism employment has been one of the best performing sectors in the New Mexico economy." *Id.* at 7. New Mexico is also currently benefitting from a substantial tourism-generated taxes increase. *Id.* at 9.

Elephant Butte and Caballo are two of the most visited state parks in New Mexico. New Mexico Tourism Department Fiscal Year 2011 3rd Quarter Report, p. 8. These parks are major economic drivers of Sierra County. The U.S. Department of Interior's Bureau of Reclamation recently stated that "...reservoir evaporation at Elephant Butte Reservoir, the reservoir with the highest evaporative losses in the Upper Rio Grande Basin, is projected to increase by up to 10 percent."[68] Additionally, the Upper Rio Grande Impact Assessment has identified a number of water-dependent recreational activities that are expected to be negatively affected by climatic changes that reduce water supply in the basin for recreational uses. These activities include fishing and flat-water boating and camping at Elephant Butte and Caballo Reservoirs.[69] The Mine's contribution to the lowering of water levels at these parks will substantially interfere with recreation activities, resulting in a significant reduction of income and tax revenue generated from these activities.[70]

The DEIS also fails to adequately analyze the benefits to recreation under the "No Action" alternative. The DEIS states that, "Local employment and economic revenue would not increase as a result of this [no action] alternative. Existing uses such as grazing and recreation would continue at current levels," (DEIS 2-87) without any citation to supporting documents. The DEIS must state what the current level for recreation is and acknowledge that New Mexico is currently experiencing substantial growth in recreation and tourism.[71]

Economic contributions from recreational fishing alone constitute a significant economic driver for Sierra County. The American Sportfishing Association released a report on the economic contributions of recreational fishing in 2015 stating that New Mexico's Congressional District #2 (which includes Sierra County) generated 1,599 jobs; $12,286,252 in state and local

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68 U.S. Department of the Interior, Bureau of Reclamation, SECURE Water Act Report: Reclamation Climate Change and Water 2016, p. 7-7 (March 2016).

69 U.S. Department of the Interior, Bureau of Reclamation, SECURE Water Act Report: Reclamation Climate Change and Water 2016, p. 7-9 (March 2016).

70 According to a study by Texas A&M University, the economic contribution from wildlife watchers in the Rio Grande Valley is estimated to be approximately $463 million per year. U.S. Department of the Interior, Bureau of Reclamation, SECURE Water Act Report: Reclamation Climate Change and Water 2016, p. 7-11 (March 2016). Though a similar study has not been conducted for the entire Rio Grande Basin, this study provides a reasonable estimate of income derived from recreational wildlife watchers in the Rio Grande Basin.

71 *See* https://outdoorindustry.org/images/ore_reports/NM-newmexico-outdoorrecreationeconomy-oia.pdf. "Every year, Americans spend $646 billion on outdoor recreation."

tax revenues; $129,423,004 in retail sales, with a total multiplier effect of $180,584,884.[72] Based on this report and forecasts of the New Mexico Tourism Department, local employment and revenue will continue to increase as a result of the No Action alternative.

For the above stated reasons, BLM must either revise or supplement the DEIS with documentation supporting its claim that no benefits to recreation (such as continued growth in visitation, employment, income and tax revenue for Sierra County) will occur, and to fully analyze the Mine's recreation impacts to Ladder and Sierra County.

6. The DEIS Fails to Take a Hard Look at the Mine's Impacts to Transportation.

The Mine will rely heavily on NM-152 and I-25 for mining operations. Thorough analysis of transportation impacts to NM-152 is vital because it is an important rural connector serving the Truth or Consequences, Caballo, Elephant Butte, Hillsboro, Kingston, and Silver City region. More important, NM-152 is a part of two scenic byways: the Lake Valley Backcountry Byway and the Geronimo Trail National Scenic Byway. Ladder is also located along NM-152, three miles from the entrance to the proposed Mine. Traffic congestion, increased travel time, and reduced safety caused by the Project would negatively impact the Ranch and these scenic byways.

The DEIS's transportation impacts analysis is inadequate for four reasons. First, the DEIS fails to evaluate the current capacity of NM-152 and I-25 to serve the Mine's traffic demand and volume. NM-152 is a chipseal route and is not designed for a specific load carrying capacity. An assessment of NM-152's current capacity for withstanding increased heavy truck traffic under all three action alternatives, along with a cost analysis for road improvements and maintenance, must be completed in the DEIS. Second, the analysis is erroneously based on assumptions and not actual baseline data. DEIS 3-218.

Third, the DEIS fails to identify and evaluate the following transportation impacts:

- Impacts to wildlife and Federally listed species existing within and nearby the minesite;

- Impacts to the scenic byways and other recreational and cultural resources; and

- Impacts to Ladder and other land uses along NM-152, such as reduced property values.

Finally, the DEIS fails to identify studies conducted and relied upon in support of its assertion that transportation impacts to recreation along the two scenic byways would be "minor" and "would occasionally reduce the standard pace of scenic driving along the overlap of the byways." This statement contradicts Table ES-3 "Summary of Impacts," in which the DEIS

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[72] American Sportfishing Association, Economic Contributions of Recreational Fishing: U.S. Congressional Districts, p. 18 (October 2015).

concludes that the Mine's impacts to transportation and traffic will be "significant" under all three action alternatives. DEIS ES-9. Therefore, BLM must either revise or supplement the DEIS with an adequate transportation impacts analysis.

7. <u>The DEIS Fails to Take a Hard Look at the Mine's Impacts to Noise and Vibration Levels.</u>

Noise impacts associated with the Mine can be divided into four distinct phases: 1) pre-mining, which consists primarily of enlarging the existing pit and constructing mining facilities; 2) active mining, which consists primarily of operation of the mine; 3) final reclamation and closure of the mine; and 4) post-closure activities. The analysis of the Mine's noise and vibration impacts is grossly inadequate for several reasons. First, it is based on misstatements of law and facts. Second, it fails to disclose and make readily available to the public the study relied upon in the DEIS. Third, it fails to identify and analyze several factors.

The DEIS only identifies the federal Noise Control Act of 1972 as governing law regarding noise and vibrations and claims that "Neither the State of New Mexico nor Sierra County have noise ordinances." DEIS 3-225. This is incorrect, and for this reason alone the BLM must either revise or supplement the DEIS with a noise and vibrations impacts analysis governed by all applicable federal and state laws and guidance policies.

The following are federal and state laws and guidance policies which the DEIS must include in its analysis:

- Office of Surface Mining blasting performance standards (30 C.F.R. §816.67);
- Federal Highway Administration regulations for noise evaluation (23 C.F.R. §772) and FHWA's Highway Traffic Noise: Analysis and Abatement Guidance (June 2010);
- New Mexico Department of Transportation's Infrastructure Design Directive IDD-2011-02: Procedures for Abatement of Highway Traffic Noise and Construction Noise (April 2011) (provides procedures for noise studies and noise abatement measures);
- 1980 Federal Interagency Committee on Urban Noise Report (U.S. Department of Housing and Urban Development, Federal Transit Administration and Federal Aviation Administration use the metric within this report to establish impacts; This metric serves as guidance for BLM); and
- U.S. Department of Housing and Urban Development noise guidelines (This serves as guidance for BLM).

New Mexico also has a number of noise-related statutes, though none specifically regulating copper mines. However, such statutes provide guidance and must be considered in the DEIS to render an adequate noise impacts analysis.[73]

The DEIS also claims that, "There are no nearby noise-sensitive receptors (churches, schools, hospitals, or residences) in the immediate vicinity of the proposed Copper Flat Copper project." DEIS 3-226. This is inaccurate. Ladder is within the immediate vicinity of the Mine. Ladder is not only a residence for the ownership representatives and staff of the Ranch, it is a commercial bison operation, ecotourism destination, and site of numerous endangered and threatened species restoration projects.

Additionally, Ladder Headquarters is comprised of historic buildings constructed in the early 1900s from rock and mortar. Several miles of water pipelines, five wells and four cement-base steel rimmed water storage units are also located within two to three miles of the Mine. All of these structures will be subjected to noise and continuous vibrations from blasting on a daily basis, suffering unknown damage to structural integrity.

Individuals living within two to four miles of the Tyrone Mine in Grant County have advised Ladder that they experience significant adverse impacts from the Tyrone Mine. These include noise from mining operations, truck and equipment traffic, and blasting. They also include vibrations from blasting, which have caused structural damage to buildings on residential property near the mine.[74]

Finally, it is unclear what factors are considered in the study relied upon by the DEIS and what the study's spatial and temporal parameters are.[75] It is necessary for BLM to include the following factors in its analysis:[76]

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[73] *See, e.g.*, NMSA 1978, §3-18-17 (Nuisances and offenses…noises); §66-3-843 (Horns and warning devices); §66-3-844 (Mufflers; prevention of noise); §66-3-1010.3 (Operation and equipment); §66-12-10 (Muffling devices); §73-25-2 ("The purpose of the Regional Transit District Act is to …reduce noise and air pollution produced by motor vehicles.").

[74] Richard Martin resides 3.5 miles from the Tyrone Mine. Adverse impacts from the Tyrone Mine experienced on Mr. Martin's property include noise from dumping, dozers filling trucks, clanking of trucks/equipment, and traffic; vibrations from blasting occurring during the day, during the lunch hour. Ed Spencer resides two miles from the Tyrone Mine. Adverse impacts experienced on Mr. Spencer's property include noise from constant mining activities, the use of fire cannons to scare away birds from settling into the pits and ponds at the mine; and vibrations from blasting have caused cracks in the walls of several buildings on his property.

[75] The DEIS states that "Existing noise levels (DNL and Leq) were estimated for the areas associated with the proposed Copper Flat project using the techniques specified in the *American National Standard Quantities and Procedures for Description and Measurement of Environmental Sound Part 3: Short-term Measurements with an Observer Present* (ANSI 2013). DEIS at 3-226. Not only is ANSI not listed under the "References" section of the DEIS, it is not included in the DEIS appendices. Even more concerning, the study itself is not listed under "References" section or included in the DEIS appendices. These documents must be made readily available to the public under NEPA and CEQ guidelines. The BLM must either revise or supplement the DEIS with these documents so that the public may submit informed comments on the adequacy of the DEIS's noise and vibrations impacts analysis.

- Evaluation of Sound Characteristics:
    - Ambient noise level;
    - Future noise level;
    - Increase in Sound Pressure Level ("SPL");
    - Sharp and Starling Noise;
    - Frequency and Tone;
    - Percentile of Sound Levels; and
    - Expression of Overall Sound.

- Receptor Locations (Ladder Ranch, Scenic Byways); and

- Thresholds for Significant SPL Increase.

It is also necessary for BLM to conduct noise monitoring at a currently active open-pit copper mine to establish complete baseline data.[77] For the reasons stated above, BLM must either revise or supplement the DEIS with an adequate noise and vibrations impacts analysis.

8. The DEIS Fails to Take a Hard Look at the Mine's Impacts to the Night Sky.

The DEIS states that under all action alternatives the proposed Mine will operate 24 hours a day, 365 days a year. DEIS 2-6. This indicates that the Mine will utilize extensive artificial lighting. The Mine will have significant impacts on the night sky and astronomy interests at Ladder and in Sierra County, yet the DEIS fails to identify and adequately analyze this impact.

In 1999, New Mexico enacted the Night Sky Protection Act (NMSA 1978, §§74-12-1 through 74-12-10) ("Act"). The purpose of this Act is to "regulate outdoor night lighting fixtures to preserve and enhance the state's dark sky while promoting safety, conserving energy and preserving the environment for astronomy." *Id.* One of the first of its kind in the United States, the Night Sky Protection Act makes dark skies a priority in New Mexico for the health of its people, wildlife, and economy.

Sierra County recognizes the economic importance of protecting dark skies. "Thanks to New Mexico's efforts to minimize light pollution, the whole state offers great views of the night

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[76] Ladder recommends the DEIS include guidance from the New York State Department of Environmental Conservation Program Policy: *Assessing and Mitigating Noise Impacts* (October 6, 2000). http://www.dec.ny.gov/docs/permits_ej_operations_pdf/noise2000.pdf. Last visited March 1, 2016.

[77] The noise and vibrations impacts analysis relied upon in the EIS for the proposed Rosemont Copper Mine in Arizona was based not only on noise monitoring studies conducted in the vicinity of the project area, but also on noise monitoring at a currently active open-pit copper mine with similar terrain for comparative analysis with the project area. http://www.rosemonteis.us/final-eis. Last visited March 1, 2016.

skies, and Sierra County's sparse population (just 3 people per square mile, largest town population = 6000) maximizes this advantage!"[78]

An important component of the recreational experience at Ladder and in Sierra County is night sky viewing. The cloudless night skies, minimal atmospheric pollution, and low humidity of the Southwest provide ideal conditions for this activity. Dark skies are a prerequisite to any star gazing activities. These activities will be significantly impacted by light pollution from the Mine, adversely affecting Ladder's ecotourism programs. Specifically, increased light and air particulates from Mine-related facilities, equipment, vehicles, and processes may diminish dark skies. The increased sky glow will reduce the visibility of all celestial objects, particularly the faint ones.

The DEIS briefly discusses artificial night lighting in the context of environmental effects on wildlife (DEIS 3-137), however, it fails to discuss impacts on threatened and endangered species, people, and the night sky. This is problematic for three reasons: 1) New Mexico's Night Sky Protection Act has been governing law since 1999; 2) both the Federal Public Lands Management Act ("FPLMA") and BLM's §3809 standard ("undue, unnecessary degradation standard) require BLM to prevent such degradation to night skies; and 3) artificial night lighting impacts cannot be isolated to wildlife; it also impacts people and the night sky.

The recent EIS for the proposed Rosemont Copper Mine in Arizona contains a light impacts analysis and is instructive in this case.[79] Rosemont Copper, owner and operator of the proposed mine, prepared a "Lighting Plan," gathered baseline data for adequate analysis of light impacts,[80] and had a "Light Pollution Mitigation Recommendation Report" prepared by Monrad Engineering, Inc.[81] Each of these documents was relied upon in that EIS process. Therefore, BLM must either revise or supplement the DEIS to adequately analyze the Mine's light pollution impacts to threatened and endangered species, people and the night sky.

9. The DEIS Fails to Take a Hard Look at the Mine's Impacts to Socioeconomic Issues.

"NEPA requires an EIS to disclose the significant health, socioeconomic, and cumulative consequences of the environmental impact of a proposed action." *Balt. Gas & Elec. Co. v. NRDC*, 462 U.S. 87, 106-107 (1983) (citing Metropolitan *Edison Co. v. People Against Nuclear Energy*, 460 U.S. 766 (1983); *Kleppe v. Sierra Club*, 427 U.S. at 410; 40 C.F.R. §§1508.7, -.8. The DEIS fails to rely on a quantitative analysis of public costs to Sierra County and the State.

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[78] Sierra County Recreation and Tourism, http://www.sierracountynewmexico.info/recreation/stargazing/.

[79] EIS materials can be accessed at http://www.rosemonteis.us/final-eis. Last visited March 1, 2016.

[80] "Sky Brightness and Light at Night: Santa Rita Mountains, Arizona, Airborne and Ground-based Reference Data Collection," prepared by STEM Laboratory, Inc. (December 2011) (Referenced as: STEM TechRep-11-1201).

[81] "Rosemont Copper Project Light Pollution Mitigation Recommendation Report," prepared by Monrad Engineering, Inc. (January 24, 2012).

Contrary to its assertions that the Mine will have a positive impact to Sierra County, the DEIS fails to take a hard look at the following:[82]

- The instability of the Mine's production, employment and payroll;[83]
- The impact of ongoing labor-displacing technological change that constantly reduces the workforce required for any level of Mine production;
- The fact that Mine employees are very mobile, commuting long distance to work while maintaining their residences outside of the area immediately impacted by the mining and milling. This causes a significant amount of the Mine's payroll to "leak" out of the region immediately around the Mine;
- The fact that mines, ultimately, always deplete their economically viable ore deposits and shut down. The average life of a metal mine has declined significantly in recent decades. The Copper Flat Project is an example of this reduced mine life. The DEIS states the life of the project ranges from 11-16 years;
- The fact that mining is land intensive and as a result can have nearly permanent impacts on the natural environment. Environmental degradation can significantly reduce the attractiveness of a mining area as a place to live, work, and raise a family;
- The costs to state infrastructure and resources. The DEIS fails to analyze the costs of road, bridge and other infrastructure maintenance and repair associated with this increase in truck traffic;
- The costs associated with the damage to water resources.[84] In an arid state where water is likely to become even scarcer due to the effects of global climate change, the economic

[82] Comments pertaining to the Mine's socioeconomic impacts were prepared by Phil Musser, retired Economic Developer, on behalf of NMCC. For a detailed discussion of the DEIS's inadequate socioeconomic impacts analysis see Phil Musser, Economic Developer, "Comments on Socioeconomic Analysis Relied Upon By the DEIS of Copper Flat Copper Mine," (February 16, 2016), attached as Exhibit D.

[83] The Mine was formerly owned and operated by Quintana Minerals, Inc. (1977-1982) and only operated for 3.5 months. Gold Express Corporation then owned the Mine (1991-1993), but did not engage in mining operations. Alta Gold Company then became the Mine's owners (1994-1999) and attempted to renew mining operations, but filed for bankruptcy before BLM could issue a Final Environmental Impact Statement. Consider also that the Tyrone Mine in Grant County recently reduced its mining operations by 50%, resulting in a significant layoff of mine workers. http://www.grantcountybeat.com/news/news-articles/23804-freeport-mcmoran-to-implement-layoffs-at-tyrone-mine. Last visited February 26, 2016.

[84] *See* page 43 of these comments for a discussion on the Mine's impacts to New Mexico's obligations under the Rio Grande Compact. The State of Texas has sued New Mexico for alleged violation of the Compact, seeking upwards of $1 billion in damages.

value of water will increase, both in terms of its value as a commodity and its value as an economic driver. The DEIS fails entirely to quantify and analyze the costs associated with the Mine's water use;

- The economic impacts and legal implications of a new source of surface water depletion to the Rio Grande Project. The United States and Texas have initiated litigation against New Mexico in the U.S. Supreme Court, alleging that New Mexico is permitting illegal and excessive groundwater pumping that is affecting the water supply of the Rio Grande Project. Texas is claiming that New Mexico has been under-delivering surface water to Texas, in violation of the Rio Grande Compact. Texas is claiming damages in excess of $1 billion dollars; and

- The social impacts of increased crime, drug abuse, prostitution, infectious diseases, including sexually transmitted diseases, and domestic violence associated with boom and bust extractive economies.[85] These impacts will certainly impose increased costs on local law enforcement, jails, court systems and medical care facilities.

Additionally, the socioeconomic analysis relied upon in the DEIS is fundamentally biased toward the Mine due to the following:[86]

- It ignores the economic role that the landscape amenities of Sierra County and Southwestern New Mexico play in supporting local economic wellbeing and vitality;

- It treats landscape amenities and their degradation as primarily cultural, social or aesthetic problems with no significant economic implications;

- It relies uncritically on economic impact modeling funded by NMCC;

- It exaggerates economic impacts of the construction phase of the Mine;

- It exaggerates local economic impacts of the Mine by exaggerating indirect impacts for Sierra County by assuming that most of the supplies needed to operate the Mine will be produced by and purchased from local business firms;

- It states that closure of the Mine is not anticipated.[87] Current copper prices have been hovering around $2 a pound.[88] Throughout the history of copper mining in

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[85] *See*, e.g., Kuyek, Joan and Coumans, Catherine, "No Rock Unturned: Revitalizing the Economies of Mining Dependent Communities" (2003).

[86] *See, e.g.*, Power, Thomas Michael and Power, Donovan S., "The Economic Impacts of Renewed Copper Mining in the Western Upper Peninsula of Michigan" (2013); http://www.savethewatersedge.com/the-economic-impacts-of.html (last visited February 17, 2016).

New Mexico and the United States copper mine production and employment have fluctuated substantially over periods as short as ten years or less. The DEIS fails to consider one of the primary economic costs associated with metal mining - the instability and disruption it brings to local employment and payroll. The net result, again, is to exaggerate the local economic benefits by assuming they will be more stable than can reasonably be expected;

- The DEIS grossly understates the size of the visitor economy that can be negatively impacted by the Mine; and
- The DEIS confidently predicts the level of copper production and its impacts on employment and payroll 11-16 years into the future in its positive economic impacts analysis. Hence, the BLM is willing to speculate on the positive impacts of the Mine, but dismisses the potential negative impacts because they might be speculative or difficult to predict or quantify. This clearly represents a bias that emphasizes positive economic impacts while dismissing negative economic impacts.

For the above listed reasons, BLM must either revise or supplement the DEIS with an adequate socioeconomic impacts analysis.

H. The DEIS Fails to Take a Hard Look at the Mine's Environmental Justice Impacts.

We agree with the EPA's comment that the DEIS fails to provide meaningful consideration of the Mine's environmental justice impacts on the people of Sierra County, a recognized environmental justice community. EPA Comments on Copper Flat DEIS, p. 1 (March 4, 2016). Though Table ES-3 "Summary of Impacts" identifies environmental justice impacts as significant under Alternatives 1 and 2, "it does not appear that BLM took the necessary measures to identify each EJ community nor identify the impact totality as required by Executive Order 12898." *Id.* The DEIS has failed to provide the public with any supporting documentation that adequately supports its environmental justice analysis.

Therefore, BLM must either revise or supplement the DEIS with an analysis that identifies each environmental justice community within, near and adjacent to the proposed Project boundaries, pursuant to Executive Order 12898.

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[87] According to Mining Engineer Jim Kuipers, "It is very likely that the Copper Flat Mine is not economically viable for long-term production (11 to 16 years) or even short-term production given the current price of copper." Jim Kuipers, "Technical Review of Copper Flat DEIS," p. 3 (March 31, 2016).

[88] http://www.nasdaq.com/markets/copper.aspx. Last visited March 1, 2016.

I. The DEIS Fails to Take a Hard Look at the Mine's Cumulative Impacts.

NEPA requires that BLM fully consider all direct, indirect, and cumulative environmental impacts of the proposed action. 40 C.F.R. §§1502.16; 1508.8; 1508.25(c); *Utahns v. United States DOT*, 305 F.3d 1152, 1172 (10th Cir. 2002). Cumulative impacts are:

> The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.
>
> 40 C.F.R. §1508.7. *Id.* at 1172-73.

In a cumulative impact analysis, an agency must take a "hard look" at all actions…[A]nalysis of cumulative impacts "must give a sufficiently detailed catalogue of past, present, and future projects, and provide adequate analysis about how these projects and differences between the projects, are thought to have impacted the environment." *Te-Moak Tribe v. U.S. Dep't of Interior*, 608 F.3d 592, 603 (9th Cir. 2010).

BLM fails to adequately analyze cumulative impacts (including related and consequentional actions) throughout the DEIS. First, the DEIS fails to identify all projects in the region and to reasonably discuss the actual impacts from these projects. The DEIS merely lists some nearby projects, notes that they will result in cumulative impacts along with the Mine to various resources (e.g. air, water, wildlife), and provides a cursory mention of impacts. Second, the DEIS fails to provide the "quantified assessment" of the impacts from these activities, as required by NEPA.

For example, the DEIS fails to identify the Mine's cumulative impacts to the administration of the Rio Grande Compact ("Compact") and to the Compact states of New Mexico, Colorado, and Texas.[89] The DEIS acknowledges that all action alternatives will impact water storage in Caballo Reservoir, therefore affecting the amount of "usable water in project storage."[90] We agree with the New Mexico Interstate Stream Commission's ("ISC") comment that "…if the impact on the Rio Grande and Caballo Reservoir is not offset on a real-time basis, there will be an impact on the amount of water in the Reservoir, thereby reducing Usable Water in Project Storage." ISC's Comments on Copper Flat DEIS, p. 2 (February 26, 2016).

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[89] This issue also falls under the DEIS's socioeconomic impacts analysis, as discussed on page 40 of these comments.

[90] "Usable Water in Project Storage" is defined by the Rio Grande Compact as "all water, exclusive of credit water, which is in project storage and which is available for release in accordance with irrigation demands, including deliveries to Mexico." See Act of May 31, 1939, ch. 155, 53 Stat. 785. The water stored in Caballo Reservoir is Usable Water in Rio Grande Project Storage.

In 2013 the State of Texas initiated a lawsuit against New Mexico for violation of the Compact. *See Texas v. New Mexico and Colorado*, Original No. 141. The U.S. Supreme Court cleared the way last year for Texas to proceed with its lawsuit. Texas is alleging that New Mexico has violated and continues to violate the Compact by allowing illegal and unauthorized diversions and use of water apportioned to Texas. Texas is charging that groundwater pumping in New Mexico is tapping the shallow aquifer, causing water tables to drop and preventing water from draining back into the river. The suit alleges river levels are now lower than normal due to such action, preventing Texas from receiving its full share of water as required by the Compact.[91]

The U.S. Department of Interior's Bureau of Reclamation recently warned that "The project water supply imbalances will greatly reduce the reliability of deliveries to all users who depend on Rio Grande water. In the Upper Rio Grande, supplies over the course of the 21st century are projected to decrease by about one-fourth in the Colorado portion of the basin, and by about one-third in the New Mexico portion."[92] The Mine's impacts to groundwater and surface water must be analyzed in the context of the Rio Grande Compact. Therefore, BLM must either revise or supplement the DEIS with an analysis addressing the Mine's cumulative impacts to the administration of the Compact.

Other striking examples of the DEIS's failure to adequately analyze the Mine's cumulative, related and consequential impacts include, but are not limited to: (1) the Mine's need for new high voltage lines to be brought up from Caballo dam to meet its energy needs; and (2) the Mine's immediate and long-term impacts upon existing public road infrastructure (secondary roads, primary roads and interstate highways) already in need of repairs, maintenance and upgrading. BLM must either revise or supplement the DEIS with an adequate analysis of these cumulative, related and consequential impacts.

J. The DEIS Fails to Fully Evaluate Mitigation Measures.

BLM is required to "discuss possible mitigation measures in defining the scope of the EIS, 40 CFR §1508.25(b) (1987), in discussing alternatives to the proposed action, §1502.14(f), and consequences of that action, § 1502.16(h), and in explaining its ultimate decision, §1505.2(c). It is not enough to merely list possible mitigation measures." *San Juan Citizens Alliance v. Stiles*, 654 F.3d 1038, 1053-54 (10th cir. 2011) (citing to *Colorado Envtl. Coal. v. Dombeck*, 185 F.3d 1162, 1173 (10th Cir. 1999)). "Detailed quantitative assessments of possible mitigation measures are generally necessary when a federal agency prepares an EIS to assess the impacts of a relatively contained, site-specific proposal." *Id.*

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[91] http://southwestfarmpress.com/water-shortage/new-mexico-attorney-general-wants-money-fight-texas-suit. Last accessed on February 28, 2016.

[92] U.S. Department of the Interior, Bureau of Reclamation, SECURE Water Act Report: Reclamation Climate Change and Water 2016, p. 7-8 (March 2016).

NEPA regulations define "mitigation" as a way to avoid, minimize, rectify, or compensate for the impact of a potentially harmful action. 40 C.F.R. §§1508.20(a)-(e). The omission of a reasonably complete discussion of possible mitigation measures will undermine the 'action-forcing' function of NEPA. Without such a discussion, neither the agency nor other interested groups and individuals can properly evaluate the severity of the adverse effects.

> An essential component of a reasonably complete mitigation discussion is an assessment of whether the proposed mitigation measures can be effective. The Supreme Court has required a mitigation discussion precisely for the purpose of evaluating whether anticipated environmental impacts can be avoided. A mitigation discussion without at least some evaluation of effectiveness is useless in making that determination.

South Fork Band Council v. Dept. of Interior, 588 F.3d 718, 727 (9th Cir. 2009) (rejecting EIS for failure to conduct adequate review of mitigation and mitigation effectiveness) (internal citations omitted). *See also*, *Wyoming Outdoor Council v. U.S. Army Corps of Eng'rs*, 351 F. Supp. 2d 1232, 1238 (D. Wyo. 2005).

As just one example of the DEIS's failure to adequately evaluate mitigation measures, the DEIS admits that "...the likelihood and severity of possible effects to Federally-listed species are being evaluated, and any measures necessary to mitigate adverse effects are being determined, through consultation with the USFWS in compliance with Section 7 requirements of the Endangered Species Act." DEIS 3-160.[93] This admits that the analysis has not yet been conducted – despite NEPA's requirement that all mitigation analysis must be included in the Draft EIS.

The following are additional examples of the DEIS's failure to adequately analyze mitigation measures for the Mine's impacts to air quality, climate change, water quantity and quality, wildlife and federally-listed species, recreation, transportation, the night sky, and socioeconomic matters.

1. <u>Mitigation Measures for the Mine's Impacts to Air Quality.</u>

The DEIS fails to adequately analyze mitigation measures for the Mine's impacts to air quality on Ladder and surrounding areas. Again, Ladder is three miles from the Mine, downwind and with prevailing winds from the southwest. For an adequate analysis to occur, Ladder must be identified as a receptor location for a dispersion model relied upon by the DEIS. Therefore, BLM must either revise or supplement the DEIS to include an adequate analysis of mitigation measures and their effectiveness for impacts to air quality on Ladder Ranch.

[93] *See also* pages 6-7 of these comments for a discussion of how the DEIS relies upon incomplete baseline data for biological resources.

2. Mitigation Measures for the Mine's Impacts to Climate Change.

The DEIS fails to identify and analyze the effectiveness of mitigation measures for the Mine's climate change impacts. Page 2-25 of the DEIS states, "NMCC is analyzing the viability of solar power generation to partially offset the mine's energy demand along with other energy and water conservation measures," indicating that this study has yet to be completed. The BLM must either revise or supplement the DEIS with this analysis.

We also agree with the EPA's recommendation of the following mitigation measures for BLM's consideration:

- Use conveyors rather than haul trucks where possible, e.g., for transporting ore to processing areas and the heap leach facility;
- Incorporate alternative energy components into the project such as on-site distributed generation systems, solar thermal hot water heating, etc.;
- Incorporate recovery and reuse, leak detection, pollution control devices, maintenance of equipment, product substitution and reduction in quantity used or generated;
- Include use of alternative transportation fuels, electric vehicles, etc., during construction and operation if applicable; and
- Commit to using high efficiency diesel particulate filters on new and existing diesel engines to provide nearly 99.9% reductions of black carbon emissions.

EPA Comments on Copper Flat DEIS, p. 2-3 (March 4, 2016). Additionally, we also recommend that BLM utilize the National Climate Assessment ("NCA") to identify and analyze climate change mitigation measures based on how future climate scenarios may impact the Mine.[94]

3. Mitigation Measures for the Mine's Impacts to Water Quantity & Quality.

As previously discussed on pages 21-29 of these comments, the Mine's impacts to water quantity and quality will be substantial. Ladder is in close proximity to the Mine and will directly experience such impacts. The DEIS fails to provide any mitigation measures for the Mine's drawdown of groundwater levels and reduction of surface water discharges to the Rio Grande and its tributaries. The mitigation analysis for the Mine's impacts to water quality is also woefully inadequate.

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[94] The NCA was released by the U.S. Global Change Resource Program (http://nca2014.globalchange.gov/) and "contains scenarios for regions and sectors, including energy and transportation. Using NCA or other peer reviewed climate scenarios to inform alternatives analysis and possible changes to the proposal can improve resilience and preparedness for climate change." EPA Comments on Copper Flat DEIS, p. 3 (March 4, 2016).

As previously mentioned, New Mexico's Copper Rule currently allows pollution above water quality standards within: (1) the "area of open pit hydrologic containment," within which liners and monitoring of tailings, waste rock and impoundment are not required; and (2) outside the area of open pit hydrologic containment if the operator installs interceptor systems downgradient from waste rock and tailings piles. Because of the permanent nature of ARD, once the pollution is allowed it may persist and have to be contained hydraulically for 100s of years, or in perpetuity. This means that the pit dewatering could extend much longer than the time necessary to extract the ore, and that pump-and-treat remediation measures could extend into perpetuity.

The following comments on mitigation measures for specific Mine features were prepared by hydrologist Tom Myers, and mining engineer Jim Kuipers on behalf of TRP and NMELC.[95]

a. The Mine's Waste Rock Dumps.

The Mine's waste rock dumps are pollution sources due to precipitation or runoff leaching through them.[96] The DEIS fails to adequately analyze mitigation measures for the impacts of waste rock dumps. It merely states that the dry climate would prevent acid mine drainage from reaching ground or surface water. DEIS 3-39. Therefore, BLM must either revise or supplement the DEIS with an analysis of cover requirements and mitigation measures, and to address the following:

- Why alternative cover designs, such as an engineered cover with geomembrane and capillary break resulting in zero infiltration, were not chosen as a mitigation for acid rock drainage;
- The extent to which the proposed design will limit infiltration of water and oxygen based on results at other similar mine sites in New Mexico, such as the Chino and Tyrone Mines; and
- Why a geomembrane liner or similar system to college and manage seepage under the waste rock was not considered as the best practice to protect groundwater and long-term public liability.[97]

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[95] Tom Myers, Hydrologic Consultant, "Technical Memorandum: Review of the Draft Environmental Impact Statement, Copper Flat," p. 15-19 (March 30, 2016) and Jim Kuipers, Mining Engineer, "Technical Review of Copper Flat DEIS," p. 7-20 (March 31, 2016).

[96] *Id.* at 15.

[97] Jim Kuipers, Mining Engineer, "Technical Review of Copper Flat DEIS," p. 8-9 (March 31, 2016).

b. The Mine's Tailings Impoundment.

Though the DEIS recognizes there will be years of water management at the new tailings upon closure (DEIS 3-45), it fails to discuss how the tailings impoundment would be closed. However, it does specify that the tailings water would be disposed of by land application disposal ("LAD"). The DEIS errs by not discussing the plans for LAD. The DEIS neither discloses where the LAD site would be, nor presents data regarding the ability of the soils to accept the excess tailings water. Rather, the DEIS states that NMCC "would provide detailed chemical analyses of the water and an assessment of potential effects to vegetation or soils to the BLM. If the seepage water has the potential to adversely affect vegetation or soils, the proponent would propose an alternative management approach to the BLM for approval." *Id.*

BLM is allowing NMCC to create a potential pollution hazard, the tailings impoundment, without a plan for closing that hazard.[98] BLM must either revise or supplement the DEIS with plans for constructing an LAD site, including soils and vegetation analyses appropriate to the plan.

We also agree with the EPA in that "an analysis of the proposed [TSF] liner's long-term effectiveness and long-term compatibility with the tailings material be provided" by BLM. EPA Comments on the DEIS for Copper Flat, p. 5 (March 4, 2016). Additionally, a revised or supplemental DEIS should include information on how the proposed liner design will conform with New Mexico law (20.6.7.22(4) NMAC) and address why the proposed liner was chosen over a less leak-prone design, such as a double liner with a leak collection and recovery system.[99]

Lastly, the DEIS fails to discuss the most current standards relative to reduction of catastrophic risks from TSF dam collapse, which have been summarized in the findings of the Mt. Polley Mine Expert Panel.[100] Therefore, BLM must either revise or supplement the DEIS with the following:

- A probabilistic and deterministic seismic evaluation for the area.
- A dam breach analysis, a failure modes and effects analysis or other appropriate detailed risk assessment, and an observational method plan addressing residual risk.
- A description of the chemical and physical properties of the materials and process solutions to be stored in the TSF.

[98] Tom Myers, Hydrologic Consultant, "Technical Memorandum: Review of the Draft Environmental Impact Statement, Copper Flat," p. 16 (March 30, 2016).

[99] Jim Kuipers, Mining Engineer, "Technical Review of Copper Flat DEIS," p. 8 (March 31, 2016).

[100] The full report, appendices and background material are available at https://www.mountpolleyreviewpanel.ca/

- A list of the assumptions used during the analysis and design of the facility and a description justifying the validity of each assumption.

- A description of proposed risk management measures for each facility life-cycle stage, including construction, operation and closure.

- A detailed description of how water, seepage, and process solutions are to be routed or managed during construction, operation and closure.

- A detailed description of storm water controls, including diversions, storage, freeboard, and how extreme storm events will be managed.

- A flood event design criterion less than the probable maximum flood but greater than the 1-in-500 year, 24-hour event.

- Utilization of an Independent Review Panel to ensure the TSF design plans satisfy best available technology ("BAT").[101]

c. *The Mine's Pit Lake Water.*

The DEIS also states that future water quality standards for the pit lake may be different than at present, either by changing the designated use through a "use attainability analysis" (DEIS 3-33), or by completing site-specific standards, which appear to simply set standards based on what can live in the future poor quality water. *Id.* Additionally, the DEIS suggests that there is uncertainty regarding federal jurisdiction over pit lake water quality because the Clean Water Act does not specifically address pit lakes. This perceived uncertainty does not allow BLM to avoid a mitigation measures analysis. The DEIS merely recommends that:

- NMCC plans to meet requirements in the future by creating a preliminary pit lake water quality management plan as part of the mine plan of operations (MPO) that would meet applicable standards for 30 years after completion of reclamation. The DEIS states this while also acknowledging that it does not know what those standards would be.

- NMCC update the pit lake water quality management plan at least 1 year prior to Mine closure, to outline reclamation, water quality management, and monitoring that would "facilitate compliance with applicable water quality standards during the post-mining monitoring period." DEIS 3-34.

- NMCC provide a cost estimate for implementation of the plan for BLM review and approval. The DEIS does not specify when this is to occur, but the implication is it would be part of the updated MPO.

[101] Jim Kuipers, Mining Engineer, "Technical Review of Copper Flat DEIS," p. 8-9 (March 31, 2016).

- NMCC "provide a trust fund or other long-term funding mechanism" to implement the water quality management plan for 30 years.

BLM is essentially allowing NMCC to develop mitigation measures for pit lake water quality just one year before closure (avoiding public review). Regardless of the uncertainties inherent with pit lake water quality predictions, BLM must require plans and bonding for mitigation *before* approving any mining at the site.

Additionally, the DEIS is incorrect in stating that rapidly pumping the pit lake full would create a steady state hydraulic sink.[102] DEIS 3-34. The lake will initially be higher than surrounding groundwater, which will cause pit lake water to flow from the pit into the surrounding groundwater. Seepage discharge from the rapidly formed pit lake can degrade the surrounding groundwater. The DEIS fails to present groundwater modeling results to estimate the potential for pit lake water to enter the groundwater.

The groundwater model assumes a 1000-ft thick model layer near the pit, which does not allow predictions of inflow from areas with different reactivity. BLM must acknowledge that any such prediction is highly dependent on near-pit conductivity and recharge estimates, and can be quite inaccurate. Therefore, BLM must either revise or supplement the DEIS with groundwater modeling results addressing this issue.

Backfilling the pit is the only mitigation that will prevent long-term pit lake water quality problems and allow the drawdown cone around the pit to recover. However, the DEIS fails to disclose backfilling's obvious advantages. DEIS Chapter 2 mentions twice there is no plan to backfill the pit, and fails to consider it under any of the action alternatives. Backfilling would cost more, but the environmental benefits could make the plan worthwhile. BLM must either revise or supplement the DEIS to analyze this mitigation measure.[103]

Lastly, we are in agreement with EPA's assessment that the 30-year time period for post-mining compliance with water quality standards for the pit lake and for the funding mechanism for implementation of the pit lake water quality management plan is inadequate. See EPA's Comments on DEIS for Copper Flat, p. 7 (March 4, 2016). As EPA has stated, "The 30-year time period is inadequate because (1) it may take decades or even centuries for some environmental impacts (acid rock drainage from sulphate rock) to occur to the surface water and ground water resources at this site, and (2) mitigation efforts to maintain compliance with New Mexico surface water quality standards for the designated future uses of the pit lake will likely be needed for similar time frames and possibly in perpetuity." *Id.* We also recommend that "BLM require the MPO to include post-mining monitoring and implementation of the pit lake water quality management plan for a minimum of 100 years." *Id.*

[102] Tom Myers, Hydrologic Consultant. "Technical Memorandum: Review of the Draft Environmental Impact Statement, Copper Flat," p. 17-18 (March 30, 2016).

[103] *See also* pages 14-15 of these comments.

4. Mitigation Measures for the Mine's Impacts to Wildlife and Federally-Listed Species.

The DEIS's mitigation measures analysis for the Mine's impacts to wildlife, Ladder's captive endangered Mexican Grey Wolf population, and federally-listed species is woefully inadequate for the following reasons.

a. Migratory Birds, Wildlife and Livestock.

i. Migratory Birds.

Ladder Ranch, less than two miles from the Mine, provides habitat for 28 migratory bird species protected by the Migratory Bird Treaty Act ("MBTA").[104] Also, as previously discussed, the Mine's pit lake and process ponds will exceed water quality standards and most likely be toxic to birds and wildlife. In addressing the Mine's impacts to migratory birds, the DEIS merely provides that "NMCC would investigate and utilize other mitigation actions, such as exclusionary devices. These devices include, but are not necessarily limited to, bird balls and netting to minimize the potential for avian wildlife contacting process pond waters that contain elevated chemical constituents in excess of ecological risk levels." DEIS 3-139. There is no discussion of the MBTA, or how these mitigation measures will be implemented and how effective these measures will be.

The MBTA declares it a misdemeanor to pursue, hunt, *take*, capture, or kill birds protected by several international treaties. 16 U.S.C.S. § 703 (emphasis added). Violations of the MBTA are strict liability crimes. *United States v. Apollo Energies, Inc.*, 611 F.3d 679 (10th Cir. 2010). However, defendants must "proximately cause" the MBTA violation to be found guilty. *Id.* at 689 (internal citations omitted). Liability attaches under the MBTA where the injury to migratory birds "might be reasonably anticipated or foreseen as a natural consequence of the wrongful act." *Id.*

NMCC has admitted that it anticipates or foresees migratory birds contacting "process pond waters that contain elevated chemical constituents in excess of ecological risk levels" (DEIS 3-139), which is likely to result in a "taking" under the MBTA if adequate mitigation measures are not conducted by NMCC. Lastly, the DEIS also fails to identify mitigation measures for the Mine's impacts on the night sky, particularly measures pertaining to migratory birds relying on dark skies for navigation.

ii. Wildlife and Livestock.

In addressing the Mine's impacts to livestock, the DEIS simply states that, "NMCC would construct BLM-approved wire fencing to prevent livestock from entering the pit, WRDFs, and TSF. Fences of appropriate height would be constructed around water and solution ponds to keep out *larger wildlife such as deer and antelope*." DEIS 2-32 (emphasis added). This fails to

[104] *See* attached Exhibit C and 50 C.F.R. 10.13.

address preventing bison from entering the pit, WRDFs, and TSF. As previously stated, Ladder is engaged in bison production and sales, which is the Ranch's primary source of income.

b. *Federally-Listed Species*

The DEIS admits that a mitigation measures analysis for impacts to federally-listed (threatened or endangered) species has not yet been completed. DEIS 3-160. This is a clear violation of NEPA's requirements. 40 C.F.R. Part § 1502.25. BLM may not complete this analysis after the issuance of a DEIS. Therefore, BLM must either revise or supplement the DEIS with this required analysis.

5. Mitigation Measures for the Mine's Impacts to Recreation.

The DEIS fails to analyze water use, noise and vibrations, transportation and night sky impacts to recreational users and wildlife – all of which impact recreation.[105] Without an adequate analysis of the Mine's direct and indirect recreation impacts there cannot be an adequate mitigation measures analysis. BLM must therefore either revise or supplement the DEIS with this required analysis.

6. Mitigation Measures for the Mine's Impacts to Transportation.

We agree with EPA's conclusion that "it is unclear how the transportation and traffic impacts will be addressed." EPA Comments on Copper Flat DEIS, p. 3 (March 4, 2016). The DEIS clearly fails to adequately identify and analyze mitigation measures for the Mine's transportation impacts. It merely states, "No mitigation measures for transportation and traffic beyond regulatory requirements described in the Proposed Action have been identified for any alternative." DEIS 3-224.

Additionally, under Section 2.1.13, the transportation of hazardous materials is identified:

> Hazardous materials required for operation of the Copper Flat project include gasoline, diesel fuel, propane, other petroleum products, explosives, solvents for degreasing of machinery and equipment, and laboratory chemicals. These materials would be purchased from various vendors and brought to the site by truck. NMCC would ensure that the Hillsboro volunteer fire department and the Sierra County fire district are aware of the nature of the materials routinely being transported to the site, and that they have appropriate response training in the event of a spill or other accident involving hazardous materials.

DEIS 2-34.

The DEIS fails to discuss NMCC's obligations or ability to finance such mitigation. NMCC should be required to pay for all transportation mitigation measures required by NMDOT

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[105] *See also* pages 32-35 of these comments.

in connection with NM-152, as well as mitigation measures for other Sierra County and New Mexico state roads.[106] We agree with EPA that clarification is needed for "how the transportation and traffic impacts will be addressed" and to "identify any committed mitigation." EPA Comments on Copper Flat DEIS, p. 3 (March 4, 2016). BLM must therefore either revise or supplement the DEIS with this information.

7. <u>Mitigation Measures for the Mine's Impacts to Noise and Vibrations Levels.</u>

Both New Mexico and Federal policy make clear that when traffic noise impacts occur, noise abatement must be considered and implemented if found to be feasible and reasonable. The DEIS states, "Due to the remote location and the overall minor impacts, no mitigation would be required. Although the overall effects would be less than significant, the following BMPs [best management practices] are proposed to minimize the potential for blasting noise and vibration impacts." DEIS 3-234. This fails to identify mitigation measures for noise from vehicles and mining equipment and operations not involving explosive devices. BLM must therefore either revise or supplement the DEIS.

BLM should analyze the following necessary mitigation measures:[107]

- Reduce noise frequency and impulse noise at the source of generation by:
    - Replacing back-up beepers on machinery with strobe lights (subject to other requirements, e.g., OSHA and Mine Safety and Health Administration, as applicable). This eliminates the most annoying impulse beeping;
    - Using appropriate mufflers to reduce the frequency of sound on machinery that pulses, such as diesel engines and compressed air machinery;
    - Changing equipment: using electric motors instead of compressed air driven machinery; using low speed fans in place of high speed fans;
    - Modifying machinery to reduce noise by using plastic liners, flexible noise control covers, and dampening plates and pads on large sheet metal surfaces;

[106] The DEIS also fails to identify the transportation routes to be used by the Mine in transporting hazardous materials.

[107] Ladder recommends the DEIS consider guidance from the New York State Department of Environmental Conservation Program Policy: *Assessing and Mitigating Noise Impacts* (October 6, 2000). http://www.dec.ny.gov/docs/permits_ej_operations_pdf/noise2000.pdf. Last visited March 1, 2016.

- Reduce noise duration by:

    - o Limiting the number of days of operation, restricting the hours of operation and specifying the time of day and hours of access and egress can abate noise impacts;

    - o Limiting noisier operations to normal work day hours may reduce or eliminate complains, though it does not reduce the sound pressure level;

- Reduce noise sound pressure levels by:

    - o Increasing the setback distance of the Mine's ancillary facilities from noise and vibrations receptors;

    - o Moving processing equipment during operation further from receptors (particularly the Ladder Ranch);

    - o Substituting quieter equipment (example – replacing compressed air fan with an electric fan could result in a 20 dB reduction of noise level);

    - o Using mufflers selected to match the type of equipment and air or gas flow on mechanical equipment;
    - o Ensuring that equipment is regularly maintained;

    - o Enclosing processing equipment in buildings (example – enclosing noisy equipment could result in an 8-10 decibel ("dB") noise level reduction, a 9 inch brick wall can reduce sound pressure level by 45-50 dB);

    - o Erecting sound barriers such as screens or berms around the noise generating equipment or near the point of reception;

    - o Phasing operations to preserve natural barriers as long as possible;
    - o Altering the direction, size, proximity of expanding operations particularly in relation to the Ladder Ranch); and

    - o Designing enclosed facilities to prevent or minimize sound pressure level increases above ambient levels. This would require a noise analysis and building designed by a qualified engineer that includes adequate ventilation with noise abatement systems on the ventilation system.

8. Mitigation Measures for the Mine's Impacts to the Night Sky.

The DEIS fails to identify and analyze mitigation measures for the Mine's impacts to the night sky. BLM must therefore either revise or supplement the DEIS. BLM should include in its analysis the following necessary mitigation measures: [108]

- Employ 21st century light sources (light emitting diodes or LED, induction, organic LED, and plasma) and on-demand lighting and adaptive lighting;

- Employ very well shielded and aimed light sources;

- Employ spectral control eliminating aqua, blue and violet emissions to preserve conditions that are more favorable to astronomical observations;

- Use the smallest necessary light source ("lumen package");

- Address the environmental concerns of native flora and fauna; and

- Use solid-state lighting for vehicular-mounted task lighting.

9. Mitigation Measures for the Mine's Impacts to Socioeconomic Issues.

The DEIS fails to adequately analyze mitigation measures for the Mine's socioeconomic impacts. Of primary concern, the DEIS fails to address the economic impacts from the Mine's reduction of the overall surface water supply available to Ladder and Sierra County residents and recreationists. It also fails to address the Mine's economic impacts to nearby irrigated lands. Such lands will dry up as the Mine attempts to provide replacement water to offset its impacts to area water resources, resulting in substantial economic losses. Lastly, the DEIS also fails to address the economic impacts to New Mexico and its obligations under the Rio Grande Compact with Texas.[109] BLM must therefore either revise or supplement the DEIS with mitigation measures for these impacts.

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[108] These mitigation measures recommendations are derived from Rosemont Copper's "Light Pollution Mitigation Recommendation Report." This report has been viewed as a "good compromise" between industry and individuals and groups concerned with dark sky preservation. See footnote 47. "Scott Kardel, managing director of the International Dark-Sky Association, said the plan Monrad proposed appeared to be a good compromise." http://www.insidetucsonbusiness.com/news/rosemont-mine-lighting-plan-seeks-to-minimize-impact-on-night/article_176d6d8e-81ce-11e2-9282-001a4bcf887a.html. Last visited on March 1, 2016.

[109] *See also* pages 40 and 43 of these comments.

K. The DEIS Fails to Adequately Analyze the Mine's Post-Closure Operations, Maintenance and Monitoring Plans.

The DEIS fails to adequately analyze the Mine's post-closure operations, maintenance and monitoring plans for two reasons. First, the DEIS fails to include information required under BLM's § 3809 regulations. Second, the DEIS claims that the Mine, post-closure, will not require perpetual care.

In addressing the Mine's post-closure monitoring, the DEIS states that "The BLM and State agencies would set post-closure monitoring requirements at mine closure," and, "Sampling of the water in the pit after mine closure would continue for a period that is established by consultation with the NMED to determine any changes in pit water quality." DEIS 2-38. Such statements do not satisfy the requirements of NEPA. Additionally, the DEIS fails to provide the following information required under BLM § 3809 regulations:[110]

- The reclamation plan must include all reclamation, closure, and post-reclamation requirements needed to meet the performance standards described at 43 CFR 3809.420. (BLM § 3809 Handbook, p. 3-7)
- Detailed plans for water treatment that will be conducted during mine operations, or will continue post-reclamation, must be provided. This includes information on treatment methods, system design, outfalls, rates, treatment threshold, and the expected duration of treatment. Other Federal or state permits that may be needed for the operation of the treatment system must be identified. (*Id.* at 4-16)

- Post-Closure Management Plans...Sometimes reclamation-related activities must continue long after the majority of reclamation work has been completed. Fencing may need to be maintained, signs replaced, water treatment systems operated or maintained, reclaimed slopes repaired, etc. The duration of such activity may be months, years, decades, or in the case of water treatment, the end date may be indefinite. The reclamation plan must clearly identify these post-closure activities and the operator's commitment to performing the required work over the necessary time period. (*Id.* at 4-24)

- Evaluate the Plan of Operations and any alternatives on their inherent merits assuming full implementation, including all operation, mitigation, monitoring, reclamation, closure, and post-reclamation actions. (*Id.* at 4-40)

- Post-reclamation runoff or run-on control structures must be incorporated by the operator into the overall reclamation plan and built to accommodate flows from the design storm event. Inadequate consideration of the runoff area(s), control designs, or improper runoff management procedures, can cause cascading downgradient reclamation failures that may seriously affect the overall reclamation success. (*Id.* at 5-11)

[110] *See* Jim Kuipers, Mining Engineer, "Technical Review of Copper Flat DEIS," p. 17-18 (March 31, 2016).

- Reclamation Plan. Any post-reclamation obligations covered by the long-term funding mechanism must be described in the approved Plan of Operations. If the District/Field Manager determines the operator is responsible for post-reclamation obligations not described in the original reclamation plan, the manager will direct the operator to submit a modification to the Plan of Operations covering those obligations. The manager must review and approve the Plan of Operations to ensure all reclamation and closure obligations and corrective actions are adequately addressed. (*Id.* at 6-33)

BLM must therefore either revise or supplement the DEIS to include the above referenced information required under § 3809 regulations. Additionally, the post-closure monitoring period of 12 years (for all three action alternatives; *See* DEIS 2-5, 2-59, and 2-73) should be lengthened. Twelve years may be appropriate for revegetation activities, but it is not appropriate or consistent with either BLM or New Mexico's Copper Rule for post-closure monitoring.[111] As stated on page 50 of these comments, we agree with the EPA that "BLM require [NMCC's] MPO to include post-mining monitoring and implementation of the pit lake water quality management plan for a minimum of 100 years." EPA's Comments on DEIS for Copper Flat, p. 7 (March 4, 2016).

Second, the DEIS states, "The project is designed to meet, without perpetual care, all applicable Federal and State environmental requirements following closure." DEIS 2-34. This statement contradicts not only the experience at other major mines in New Mexico and elsewhere, but also contradicts BLM's experience and subsequent guidance developed in geographic areas such as Nevada (where modern mining is more common and the effects more well established).[112] For example, management of mine-influenced water associated with the existing Chino, Tyrone, Cobre, and Little Rock copper mines in New Mexico is predicted to require perpetual care.[113]

As noted by BLM's § 3809 Handbook:

> The reclamation plan may be the most important component of the Plan of Operations for the long-term mitigation of impacts and achievement of sustainable development levels or objectives. The reclamation plan serves as the basic construction plan for calculating the reclamation cost and financial guarantee amount, so detail is important."

(4-19).

Therefore, the DEIS should be revised or supplemented to provide additional discussion of how the site-specific characteristics of this Mine contradict both BLM guidance and

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[111] Jim Kuipers, Mining Engineer, "Technical Review of Copper Flat DEIS," p. 18-19 (March 31, 2016).

[112] *Id.* at 11.

[113] *See* Chino, Tyrone and Cobre Closure Closeout Plans submitted to MMD and NMED.

management experience at similar projects in New Mexico where perpetual care is assumed to be required, such as at the Chino and Tyrone Mines. The DEIS should not contain or be based upon unjustified speculation as to the success of the Mine, particularly where it is in direct contradiction to the overwhelming evidence that suggests long-term monitoring, maintenance and operations are required to assure protection of the land and water resources. Not one mine in New Mexico has been successfully closed and reclaimed.[114]

Lastly, though the DEIS states that NMCC will utilize liners for tailings seepages instead of using seepage containment wells, there is currently no legal requirement for NMCC to do so. New Mexico's Copper Rule does not require the use of liners for tailings within the Mine's boundaries. In the event that NMCC revises its MPO, stating it will not utilize liners for tailings seepages but will use seepage containment wells, then BLM must supplement the DEIS with this new closure plan.

L. The DEIS Fails to Adequately Identify and Analyze NMCC's Financial Resources and Assurance.

Under 43 C.F.R. §3809.500, BLM requires mine operators to provide a financial guarantee before beginning operations under an approved Notice or Plan. The bond amount must cover the estimated cost to contract a third party to reclaim the mine's operations. The NMMA also requires the provision of a financial guarantee. 19.10.12 NMAC. If the operator of a mine provides evidence of an acceptable state approved financial guarantee under the New Mexico Mining Act that covers the same operations, the mining operator will not be required to provide a separate financial guarantee.

In exercising its authority under 43 C.F.R. §3809.500, BLM must also comply with its NEPA mandate by disclosing and analyzing the amount, scope and form of financial assurance to make certain that such a critical issue is subjected to public review and comment. Such disclosure is consistent with CEQ guidance, which states that all relevant, reasonable mitigation measures that could improve the project are to be identified in an EIS; and, to ensure that environmental effects of a proposed action are fairly assessed, the probability of the mitigation measures being implemented should also be discussed.[115] More recent CEQ guidance concerning mitigation views a discussion of funding as critical to ensuring informed decision making, and suggests that agencies should not commit to mitigation measures if it is not reasonable to foresee the availability of sufficient resources to ensure the performance of the mitigation.[116]

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114 Jim Kuipers, Mining Engineer, "Technical Review of Copper Flat DEIS," p. 11 (March 31, 2016).

115 CEQ, "Memorandum for Federal NEPA Liaisons, Federal, State and Local Officials and Other Persons Involved in the NEPA Process", Question 19b, March 16, 1981.

116 CEQ, "Appropriate Use of Mitigation and Monitoring and Clarifying the Appropriate Use of Mitigated Findings of No Significant Impact", 76 Fed. Reg. 3843, 3848-3849 (Jan. 21, 2011).

The DEIS is grossly inadequate because it does not disclose any detail about how BLM will ensure that funds will be available as long as they are needed to implement NMCC's closure and post-closure obligations.[117] We are in agreement with the EPA's comment that, "The availability of adequate resources to ensure effective reclamation, closure and post-closure management is a critical factor in determining the significance of [the Mine's] potential impacts." EPA's Comments on Copper Flat DEIS, p. 2 (March 4, 2016).

We recommend that BLM determine the appropriate level of funding for the reclamation/closure bond and the proposed long-term funding mechanism for the Mine, and analyze the adequacy of the funding amount and mechanism, including associated uncertainties to ensure that sufficient funds would be available for as long as needed. This information should be made available to the public for review in either a revised DEIS or a supplemental DEIS, in accordance with NEPA and CEQ's NEPA Implementation Regulations.

M. BLM Fails to Disclose All Preparers of the DEIS and to Require Disclosure Statements.

40 C.F.R. §1506.5 permits the BLM to prepare directly, or indirectly through a contractor selected by the lead agency, an environmental impact statement. Additionally, "Contractors shall execute a disclosure statement prepared by the lead agency, or where appropriate the cooperating agency, specifying that they have no financial or other interest in the outcome of the project." *Id.* The DEIS also "shall list the names, together with their qualifications (expertise, experience, professional disciplines), of the persons who were primarily responsible for preparing the environmental impact statement or significant background papers." 40 C.F.R. Part § 1502.17. Though Table 5-1 on page 5-6 of the DEIS shows a "List of Preparers" it fails to provide their qualifications.

On February 3, 2016, an NMELC attorney requested information from Doug Haywood, Project Lead for the Mine, regarding preparation of the DEIS. Mr. Haywood stated, "The original company that was hired to assist us with the EIS was Mangi, which is now Solv. I have attached their disclosure statement for you." *See* attached Exhibit E . The disclosure statement is dated November 16, 2011, and states that:

> Mangi Environmental Group, Inc. is to be engaged, via a third party contract arrangement with New Mexico Copper Corporation (NMCC), to assist the Bureau of Land Management and the State of New Mexico in the preparation of an Environmental Impact Statement and an Environmental Evaluation concerning the proposed Copper Flat Mine.

See attached Exhibit F. The disclosure statement is signed by James I. Mangi, PhD, President.

It is unclear exactly how and when Mangi Environmental Group, Inc. became Solv. Mr. Haywood provided no such explanation, and Solv's website fails to convey it originated as Mangi Environmental Group, Inc. Solv's founders are Tom Grome and Purvagna Amin. Their biographies on Solv's website do not mention any employment at Mangi Environmental Group,

[117] Jim Kuipers, Mining Engineer, "Technical Review of Copper Flat DEIS," p. 19 (March 31, 2016).

Inc.[118] Solv's website also does not disclose the company's past and current contracts. Thus, there is no way for the public to ascertain whether a conflict of interest exists between Solv and NMCC.

BLM has failed to publically disclose that Mangi Environmental Group, Inc. were preparers of the DEIS.[119] BLM also failed to procure the required disclosure statement from Solv. The public is therefore unable to determine whether there exists a conflict of interest between Solv and NMCC. BLM must either revise or supplement the DEIS with this information and identify which work product of Mangi Environmental Group, Inc. was incorporated into the DEIS.

N. The DEIS Fails to Adequately Incorporate by Reference Supporting Documents and to Accurately List Supporting Documents in the References Section.

Throughout the body of the DEIS there are various reports and papers referenced as supporting documents, but the DEIS fails to provide citations to specific text or information. There is also a "References" section, consisting of documents not cited to in the body of the DEIS. It is unclear what information in these documents is relied upon. The DEIS must explain to the public precisely what information is being "incorporated by reference," 40 C.F.R. §1502.21, and must accurately list supporting documents relied upon in the references section. *Id.* at -.18. This deficiencies need to be addressed in a revised or supplemental DEIS.

II. The DEIS is Based on Incorrect and Unsupportable Assumptions Regarding NMCC's Alleged "Entitlement" to Have the Mine Approved Under the Mining Law.

"The need for the BLM to authorize this project is established under the General Mining Law of 1872…persons are entitled to reasonable access to explore for and develop mineral deposits on public domain land." DEIS ES-3. The DEIS is therefore based on BLM's belief that, due to NMCC's filing of mining claims (26 patented mining claims and 231 unpatented mining claims [202 lode claims and 29 placer claims], 9 unpatented mill sites), BLM cannot prohibit mining or deny mineral operations under the Mining Law. The DEIS fails to provide verification that all of NMCC's mining claims are valid claims. It is unclear what evidence BLM is relying upon and whether BLM conducted such an inquiry.

Under NMCC's Proposed Action, the Mine would disturb "approximately 745 acres of unpatented mining claims on public land and 841 acres of private land controlled by NMCC." DEIS 2-2. Additionally, "Portions of the waste rock disposal areas, as well as the crushing facility and the mill facility, would be located on public land subject to unpatented mining claims controlled by NMCC. Approximately 28 percent of the TSF [tailings storage facility] and 10

118 http://www.solvllc.com/about-us.php. Last visited February 19, 2016.

119 BLM, through Project Lead Doug Haywood, failed to clarify how long Mangi Environmental Group, Inc. worked on the DEIS and which of its work product was included in the DEIS.

percent of the open pit would be located on public land subject to mining claims controlled by NMCC." *Id.*

The filing of NMCC's lode claims does not preclude BLM from choosing the "No-Action" alternative, nor does it restrict its approval and review authority over the Mine. The DEIS's review, and the BLM's selection of Alternative 2 as its "Preferred Alternative," are based on the overriding assumption that NMCC has statutory rights to use all of the public lands at the Mine site under the 1872 Mining Law. However, where Project lands have not been verified to contain, or do not contain, such rights, BLM's more discretionary multiple-use authorities apply. *See Mineral Policy Center v. Norton*, 292 F.Supp.2d 30, 46-51 (D.D.C. 2003). BLM's Preferred Alternative violates provisions of FLPMA and the Multiple Use Sustained Yield Act, laws mandating that agencies manage, or at least consider managing, these lands for non-mineral uses – something which the BLM fails to do or consider.

Under the Mining Law, in order to be valid, mining claims must contain the "discovery of a valuable mineral deposit." 30 U.S.C. §22.[120] Based on the record in this matter, the lands to be covered by the large ancillary waste and processing facilities do not contain the requisite valuable and locatable mineral deposits. It defies common sense for BLM to assume that NMCC would permanently bury "valuable mineral deposits" with 100.8 million tons of contaminated tailings and 38.4 million tons of waste rock over 16 years. *Id.* at 2-5. Indeed, it is very likely that these lands do not contain sufficient mineralization to qualify as "valuable mineral deposits" and are in fact simple "common varieties" of rock and sand covering the non-mineralized portions of the Mine site.

At a minimum, BLM should inquire as to whether the vast majority of the Mine lands contain "common varieties" or "valuable mineral deposits." BLM regulations contemplate an investigation into whether the lands covered by proposed plans of operation contain the requisite locatable minerals instead of common varieties. Under 43 C.F.R. §3809.101(a), except for casual use operations, claimants "must not initiate operations for minerals that may be 'common variety' minerals...until BLM has prepared a mineral examination report." The DEIS fails to cite to such a report.

The evidence in the record shows that the lands proposed for the waste dumping, tailings, and other non-extractive uses do not contain the requisite valuable minerals, and may indeed be "common variety" minerals, therefore BLM's assumptions of "rights" or an "entitlement" under the Mining Law are erroneous. BLM's assumption regarding such "rights" and "entitlement"

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[120] The Supreme Court has endorsed at least two tests for determining whether a claim qualifies as a "valuable mineral deposit." Under the "marketability" test, it must be shown that the mineral can be "extracted, removed and marketed at a profit." *United States v. Coleman*, 390 U.S. 599, 600 (1968). According to the "prudent-person" test, "the discovered deposits must be of such a character that a person of ordinary prudence would be justified in the further expenditure of his labors and means, with a reasonable prospect of success, in developing a valuable mine." *Id.* at 602. The Court has held that profitability is "an important consideration in applying the prudent-man test and the marketability test," and notes that "...the prudent-man test and the marketability test are not distinct standards, but are complementary in that the latter is a refinement of the former." *Id.* at 602-603.

should be investigated and supported by detailed factual evidence (such as the inclusion of a mineral examination report) in a revised or supplemental DEIS.

III. The DEIS Action Alternatives Violate Other State and Federal Laws.

A. The DEIS Action Alternatives Violate the Federal Lands Policy Management Act and BLM § 3809 Regulations.

FLPMA requires BLM to "take any action necessary to prevent unnecessary or undue degradation of the lands." 43 U.S.C. § 1732(b). This is known as the "prevent UUD" standard. This duty to "prevent undue degradation" is the "heart of FLPMA [that] amends and supercedes the Mining Law." *Mineral Policy Center v. Norton*, 292 F.Supp. 2d 30, 42 (U.S. Dist. D.C. 2003). BLM cannot approve a mining project that will cause UUD. 43 C.F.R. § 3809.411(d)(3)(iii). "FLPMA's requirement that the Secretary prevent UUD supplements requirements imposed by other federal laws and by state law." *Center for Biological Diversity v. Dept. of Interior*, 623 F.3d 633, 644 (9th Cir. 2010).

In addition, BLM must ensure that all operations comply with the Performance Standards found at §3809.420. *See* 43 C.F.R. §3809.5 (definition of UUD, specifying that failing to comply with the Performance Standards set forth at §3809.420 constitutes UUD). One of the most important Performance Standards requires BLM to ensure that all operations comply with all environmental protection standards, including air and water quality standards. *See, e.g.*, 43 C.F.R. §3809.5 (definition of UUD includes "fail[ure] to comply with one or more of the following:...Federal and state laws related to environmental protection."); §3809.420(b)(5) (listing Performance Standards that must be met, including the requirement that "All operators shall comply with Federal and state water quality standards..."); §3809.420(b)(4) ("All operators shall comply with applicable Federal and state air quality standards, including the Clean Air Act.").

As detailed in pages 25-29 of these comments, the Mine pit lake is predicted to violate federal and state water quality standards (with no mitigation proposed or required). According to BLM policy, failure to avoid significant impacts and failure to require mitigation that would reduce adverse Project impacts constitute UUD. "Mitigation measures fall squarely within the actions the Secretary can direct to prevent unnecessary or undue degradation of the public lands. *An impact that can be mitigated, but is not, is clearly unnecessary*." 65 Fed. Reg. 69998, 70052 (Nov. 21, 2000) (preamble to BLM's 43 C.F.R. Part § 3809 mining regulations) (emphasis added). Additionally, as discussed on pages 46-50 of these comments, the DEIS's mitigation analysis fails to include the required analysis of the effectiveness of each measure, thus failing to meet BLM's duties under NEPA as well as FLPMA.

B. The DEIS Action Alternatives Violate State and Federal Water Quality Laws.

The DEIS fails to ensure that all requirements of the federal Clean Water Act have been met. Under the Clean Water Act ("CWA") Section 313, agencies cannot approve any activity that may result in a violation of a federal[121] or state water quality standards or water quality protection requirements, including a state's antidegradation policy. 33 U.S.C. §1323(a). Judicial review of this requirement is available under the federal Administrative Procedure Act. *Oregon Natural Resources Council v. United States Forest Service*, 834 F.2d 852 (9th Cir. 1987).

"A water quality standard defines the water quality goals of a water body, or portion thereof, by designating the use or uses to be made of the water and by setting criteria necessary to protect the uses." 40 C.F.R. §131.2. The minimal designated use for a water body is the "fishable/swimmable" designation which "provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water." 33 U.S.C. §1251(a)(2).

> The text [of the CWA] makes it plain that water quality standards contain two components. We think the language of §303 is most naturally read to require that a project be consistent with both components, namely, the designated uses *and* the water quality criteria. Accordingly, under the literal terms of the statute, a project that does not comply with a designated use of the water does not comply with the applicable water quality standards.

PUD No. 1 of Jefferson County v. Washington Department of Ecology, 511 U.S. 700, 714-15 (1994) (italics emphasis in original). Thus, the CWA prohibits any activity that will not fully protect all of the designated uses for that water body.

Again, as detailed in pages 25-29 of these comments, the Mine's pit lake is predicted to violate federal and state water quality standards (with no mitigation proposed or required). The DEIS fails to adequately analyze the Mine's impacts to water resources at the Mine site and surrounding areas. It also fails to adequately analyze mitigation measures for such impacts (*See* pages 46-50 of these comments). The DEIS merely states that there is uncertainty regarding federal jurisdiction over pit lake water quality. DEIS 3-33. Under NEPA, jurisdiction is irrelevant to identifying reasonable action alternatives and considering impacts. 40 C.F.R. Part 1502.14(c). BLM must either revise or supplement the DEIS with the required analyses and a determination whether pit lake water quality will violate the CWA.

CONCLUSION

In summary, the Copper Flat Copper Mine DEIS violates numerous state and federal laws. First, it violates NEPA for the overwhelmingly persuasive reasons discussed at pages 3-59 of these comments. Second, the DEIS makes incorrect and unsupportable assumptions regarding the 1872 Mining Act. Third, the stated action alternatives in the DEIS violate federal and state water quality standards. Finally (and ultimately), the DEIS violates the Federal Lands Policy Management Act and BLM §3809 regulations because all action alternatives will result in unnecessary or undue degradation of federal lands.

[121] Water quality standards include the protection of beneficial uses under both the CWA and EPA regulations.

BLM, therefore, must either revise or supplement the DEIS to correct these violations of NEPA and CEQ standards, and state and federal law. However, Ladder contends that when these issues have been fully addressed BLM must conclude that the proposed Mine cannot be conducted without unnecessary and undue degradation to the environment and, therefore, cannot be approved.

Table 2 – Listed Species

Species	Scientific Name	Type	Federal	State	TESF	TNC	IUCN	NatureServe NHNM
Allen's big-eared bat	*Idionycteris phyllotis*	Mammal		SGCN				G4/S3
Apache skipper	*Hesperia woodgatei*	Insect		SGCN				G3G4/SNR
a terrestrial snail	*Ashmunella tetrodon fragilis*	Mollusc						G3T1/S1
Arizona gray squirrel	*Sciurus arizonensis*	Mammal		SGCN		ECO		G4/S2
Arizona toad	*Anaxyrus microscaphus*	Amphibian						G3G4/S2?
arroyo darner	*Rhionaeschna dugesi*	Insect		SGCN				
bald eagle	*Haliaeetus leucocephalus*	Bird	BCC	LT/SGCN		ECO		G5/S1B
band-tailed pigeon	*Patagioenas fasciata*	Bird		SGCN		ECO		G4/S3B
banded rock rattlesnake	*Crotalus lepidus klauberi*	Reptile		SGCN				G5T5/S2
Bell's vireo	*Vireo bellii*	Bird	BCC	LT; SGCN		ECO	NT	G5/S2B
big free-tailed bat	*Nyctinomops macrotis*	Mammal						G5/S3
black bear	*Ursus americanus*	Mammal		SGCN				
black-chinned sparrow	*Spizella atrogularis*	Bird	BCC					
black-tailed prairie dog	*Cynomys ludovicianus*	Mammal		SGCN	TESF	ECO		G4/S2
black-throated gray warbler	*Setophaga nigrescens*	Bird		SGCN				
bleached skimmer	*Libellula composita*	Insect		SGCN				G3G4/SNR
Bolson's tortoise	*Gopherus flavomarginatus*	Reptile	LE		TESF	ECO	E	G5/S1

EXHIBIT C

tabbles

Species	Scientific Name	Type	Federal	State	TESF	TNC	IUCN	NatureServe NHNM
burrowing owl	*Athene cunicularia*	Bird	BCC	SGCN		ECO		G4T4/S3
cactus wren	*Campylorhyncus brunneicapillus*	Bird	BCC					
Cassus roadside-skipper	*Amblyscirtes cassus*	Insect		SGCN				
chestnut-collared longspur	*Calcarius ornatus*	Bird	BCC				NT	G5/S3N
Chiricahua leopard frog	*Lithobates chiricahuensis*	Amphibian	LT	SGCN	TESF	ECO	V	G2G3/S1
Cockerell holospira	*Holospira cockerelli*	Mollusc		SGCN		ECO		G1/S1
collared lizard	*Crotaphytus collaris*	Reptile		SGCN				
common black hawk	*Buteogallus anthracinus*	Bird	BCC	LT; SGCN				G4G5/S2B
Coue's white-tailed deer	*Odocoileus virginianus*	Mammal		SGCN				
desert box turtle	*Terrapene ornate luteola*	Reptile		SGCN			NT	
desert massasauga	*Sistrurus catenatus*	Reptile		SGCN				G3G4/T3T4Q/SNR
deva skipper	*Atrytonopsis deva*	Insect		SGCN				G3G5/SNR
elf owl	*Micrathene whitneyi*	Bird	BCC	SGCN				G5/S3B
ferruginous hawk	*Buteo regalis*	Bird	BCC	SGCN				G4/S2B
flammulated owl	*Psiloscops flammeolous*	Bird	BCC	SGCN		ECO		G4/S3B
four-spotted skipperling	*Piruna polingii*	Insect		SGCN				G3/SNR
golden eagle	*Aquila chrysaetos*	Bird	BCC	SGCN				G5/S3B
Grace's warbler	*Setophaga graciae*	Bird	BCC	SGCN		ECO		G5S3B
grasshopper sparrow	*Ammodramus savannarum*	Bird		SGCN				G5/S3B

Species	Scientific Name	Type	Federal	State	TESF	TNC	IUCN	NatureServe NHNM
gray vireo	*Vireo vicinior*	Bird	BCC	LT; SGCN		ECO		G4/S3N
giant helloborine	*Epipactis gigantea*	Plant						G4/S2?
Hermosa mountain snail	*Oreohelix metcalfei hermosensis*	Mollusc						G2T1T1/SNR
hooded oriole	*Icterus cucullatus*	Bird		SGCN				G5/S3N
hooded skunk	*Mephitis macroura*	Mammal						G5/S2
juniper titmouse	*Baeodophus ridgwayi*	Bird		SGCN				
large roadside-skipper	*Amblyscirtes exoteria*	Insect		SGCN				
lark bunting	*Calamospiza melanocorys*	Bird	BCC					G5/S3B
loggerhead shrike	*Lanius ludovicianus*	Bird	BCC	SGCN				G4/S3B
Madrean alligator lizard	*Elgaria kingii*	Reptile		SGCN				
McCown's longspur	*Phynchophanes mccownii*	Bird	BCC					G4/S3N
Metcalfe's tick-trefoil	*Desmodium metcalfei*	Plant						G3G4/S3?
Mexican spotted owl	*Stix occidentalis lucidua*	Bird	LT	SGCN		ECO		
Mexican wolf	*Canis lupus baileyi*	Mammal	LE	LE; SGCN	TESF	ECO		G4G5/T1/S1
Montezuma quail	*Cyrtonyx montezumae*	Bird		SGCN				G4G5/S3B
mourning dove	*Zenaida macroura*	Bird		SGCN				
mule deer	*Odocoileus hemionus*	Mammal		SGCN				
Mule Moutain brickell -bush	*Brickellia squamulosa*	Plant						G3G4/S3?
New Mexican milk snake	*Lampropeltis triangulum*	Reptile		SGCN				

Species	Scientific Name	Type	Federal	State	TESF	TNC	IUCN	NatureServe NHNM
	celaenops							
northern goshawk	*Accipiter gentilis*	Bird		SGCN		ECO		G5/S2B
northern harrier	*Circus cyaneus*	Bird		SGCN				G5/S2B
peregrine falcon	*Falco peregrinus*	Bird	BCC	LT		ECO		G4T4/S2B
plains leopard fro	*Lithobates blairi*	Amphibian		SGCN				
pinyon jay	*Gymnorhinus cyanocephalus*	Bird		SGCN				G5/S2S3
Rio Grande cutthroat trout	*Oncorhynchus clarki virginalis*	Fish		SGCN	TESF	ECO		G4T3/S2
Rio Grande chub	*Gila Pandora*	Fish		SGCN	TESF	ECO		G3/S3
Rio Grande sucker	*Catostomus plebeius*	Fish		SGCN	TESF	ECO		G3G4/S2
scaled quail	*Callipepla squamata*	Bird		SGCN				G5/S3B
slaty roadside-skipper	*Amblyscirtes nereus*	Insect		SGCN				
spotted bat	*Euderma maculatum*	Mammal		SGCN				G4/S3
Texas roadside-skipper	*Amblyscirtes texanae*	Insect		SGCN				G3G4/SNR
tiger salamander	*Ambystoma tigrinum*	Amphibian		SGCN				
Townsend's big-eared bat	*Corynorhinus townsendii*	Mammal				ECO		G4T4/S3
Virginia's warbler	*Oreothlypis virginiae*	Bird	BCC					G5/S3B
western diamond-backed rattlesnake	*Crotalus atrox*	Reptile		SGCN				
western painted turtle	*Chrysemys picta bellii*	Reptile		SGCN				
western red bat	*Lasiurus blossevillii*	Mammal		SGCN				G5/S3
white-nosed coati	*Nasua narica*	Mammal		SGCN				G5/S2

Species	Scientific Name	Type	Federal	State	TESF	TNC	IUCN	NatureServe NHNM
western yellow-billed cuckoo	*Coccygus americanus*	Bird	LT, BCC	SGCN		ECO		G5T3Q/S3B
yellow-faced pocket gopher	*Cratogemys castanops*	Mammal				ECO		G5/S3
zone-tailed hawk	*Buteo albonotatus*	Bird						G4/S3B

Key:
BCC – Bird of Conservation Concern (USFWS)
E – Endangered (IUCN)
ECO – Ecoregional Plan Conservation Target (TNC, WWF, other)
IUCN – International Union for the Conservation of Nature
LE – Listed Endangered (by a federal or state agency)
LT – Listed Threatened (by a federal or state agency)
NHNM – Natural Heritage New Mexico (University of New Mexico)
SGCN – Species of Greatest Conservation Need
TESF – Turner Endangered Species Fund
TNC – The Nature Conservancy
V – Vulnerable (IUCN)

Superior Economic Development Services
404 Sibley Avenue, Houghton, MI 49931
Tel: 906-370-6817; e-mail: pmusser306@gmail.com

MEMORANDUM

To: Jaimie Park, NMELC

FROM: Phil Musser

RE: Comments on Socioeconomic Analysis Relied Upon By the DEIS of Copper Flat Copper Mine

DATE: February 16, 2016

My Background

Back in 1985 I was hired as the regional economic developer in the Western Upper Peninsula of Michigan, a geographically isolated region with a population of 47,000. This region experienced the closure of a copper mine in 1969 that laid off hundreds of workers. The copper mine had been the lifeblood of the community, being the major employer, the primary purchaser of local goods and services, and a contributor to many community organizations. By 1985, the regional economy had suffered a long downturn. Many manufacturing and service businesses that once served the mine had closed, and many retail businesses either closed or were in a difficult economic condition. The only industries left in the region were logging and tourism.

My task was to rebuild the region's economy. Because of few resources and little possibility of attracting outside employers, I developed what later became known as an "economic gardening strategy." This strategy was later popularized by an economic development group in Littleton, Colorado, and championed by the Edward Lowe Foundation and many states and communities throughout the U.S. An economic gardening strategy involves providing customized business assistance to local entrepreneurs with potential for starting new businesses, that is, growing your own businesses. These businesses have roots in the community, can be started by low and moderate income residents, and are often smaller businesses which provide economic diversification.

Over a period of 20 years, this strategy revitalized the local economy through the start up of many manufacturing, high tech and service companies in the community. Tourism continued to also be a mainstay of the regional economy, as did logging (though to a lesser extent). The rebuilding was made easier by the fact that "boom and bust" copper mining did not resume in the community; thus allowing the region to focus on building a diversified economy based on many small and medium-sized businesses which have continued to grow.

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Critique of the DEIS's Socioeconomic Study

The socioeconomic study for Sierra County has a number of deficiencies. Specifically, it erroneously assumes that:

- **Copper mining will continue uninterrupted, albeit at different levels, over the 11-16 year life of the mine.**

However, mining is contingent upon copper prices and, in reviewing copper prices over the past decades, it is difficult to find an 11-year period when copper prices stayed above what is commonly considered to be break-even prices.[1] The current situation with the nearby Tyrone Mine that has recently laid off over 200 employees due to low copper prices is just such an example. This downsizing will likely continue to haunt that regional economy for many years to come.

- **The majority of wages and benefits paid to mining employees will stay in Sierra County.**

While the study correctly observes that there will be leakage of miners' incomes as wages are sent back to family members not living in Sierra County, it fails to mention that a significant share of income for mine employees with both locally relocated and distant families is spent purchasing goods and services on the internet. A report by Forrester Research Inc. states that e-retail spending will increase by 62% from 2011 to 2016, and that each customer is projected to spend $1,738 in 2016 since many consumers prefer e-commerce to shopping at local bricks-and-mortar stores. Further, most small town businesses do not advertise on the internet nor are set up to allow on-line purchases. Small town goods and services businesses often cannot compete with either larger bricks-and-mortar stores in their community, which send their profits out of the area, or with on-line stores. These dynamics severely constrain wage spending and growth of Sierra County's economy.[2]

[1] 3.22.1.4.3: Royalties – the first paragraph of page 3-2444 indicates royalty payments above and below $2 per pound of copper. However, it fails to mention what price of copper is necessary for the mine to even operate. That is, there is no real sensitivity analysis offered based on a break-even price for copper.

[2] 3.22.1.3 Earnings: the discussion of leakage, while correctly observing that workers who do not live where the work occurs will spend elsewhere, forgets to mention that in addition a significant share of worker wages gets spent on internet purchases. Together, this is significant leakage that diminishes the wage figures claimed to benefit Sierra County.

- **A significant number of jobs for miners and other employees will be held by Sierra County residents.[3]**

To the contrary, current mining technology requires education and skills that most Sierra County residents do not possess.[4] The study observes that Sierra County has an older population, with double the number of persons 65 and older than the state as a whole. A story *Undermining the West*, an article about a proposed Arizona copper mine in an area called Oak Flat, appeared in the February 8, 2016 issue of *High Country News*. The article included a quote from a former mayor of Superior, Arizona who is also a former miner:

> *Former mayor (Roy) Chavez has spent a good deal of energy and time since the old mines closed trying to build a new economy for Superior, one based on tourism, amenities and the like, and he worries that an enormous mine would scuttle those plans. Besides, he predicts that the nature of modern mining means that few locals will be hired. 'Without a college degree,' Chavez says, 'you don't stand a chance.'*

As the study observes, "About 78.1 percent of the total population in the Hillsboro CDP has less than a ninth-grade education," and, "Additionally, 30.6 percent of Sierra County's population is over the age of 65, an above-average concentration."[5]

- **New mining jobs in Sierra County will be a positive economic development.**

However, the study ignores the following:

- When mining operations are first announced and then commence, many local businesses take out bank or government guaranteed loans (SBA 7a loans) in order to expand or update their businesses in anticipation of increased customers and revenues. Local governments also expend funds for new and updated infrastructure.[6] Real Estate developers build new

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[3] 3.22.1.2.3: Unemployment rates: Sierra County's unemployment rate is significantly lower than the state as a whole. This means two things, first that fewer qualified workers are available for the proposed mine and, secondly, that Sierra County's economy has begun to rebound without mining jobs.

[4] 3.22.1.5.3.2 Continuing Education: The fact that 78.1 percent of Hillsboro CDP have less than a ninth-grade education would suggest that, even with continuing education, few Hillsboro residents would be eligible for mining jobs, particularly during the operating phase.

[5] Table 3-54: Cites a lower population of people between the ages of 19 and 44 than the state as a whole, and a significantly higher percentage of older adults than the state as a whole. This is a recipe for very few local hires in the copper mining industry which is constantly increasingly the level of technology and, correspondingly, the level of education and skills required of its workforce.

[6] 3.22.1.5 Community Services: this section fails to mention that an increase of both firefighters and police would be necessary during mine operations. Further, many communities are having difficulty recruiting volunteer firefighters, and hiring/retaining of law enforcement personnel depends on continued mine operations during the mine period. Given the volatility of copper prices, this would cause hiring/retention issues.

homes. A layoff or cessation of mining operations leaves these businesses with unpayable debt, and wreaks a heavy financial toll on local government and school budgets.

- Mine closures happen quickly with little notice to employees who have financial obligations they suddenly cannot meet if laid off or if working hours are reduced.[7]

- A mining operation tends to dominate the local economy. Businesses start to focus their products and services to the mining operation and to mine employees; local governments become dependent upon increased tax revenues and larger budgets; and local organizations and non-profits become dependent upon contributions from the mining company. This tends to preempt other community economic development initiatives that otherwise would have happened, preventing growth and diversification of the local economy. When a mine closes or downsizes, this produces a negative financial domino effect throughout the community. This causes businesses to "pull in," and for now-unemployed workers to move elsewhere. Financial institutions also become less willing to finance local business and entrepreneurs. In Michigan, it took us many years to convince local lenders to begin providing business loans to local businesses and entrepreneurs again, a dynamic that severely constrained economic development.

- Mining and tourism are incompatible economic drivers. The study observes that one of Sierra County's main economic drivers is tourism. Specifically, it states "Over the past few decades, the social environment of the surrounding communities has been in transition from traditional extractive associations with natural resources...to more recreation- and tourism-based economies and lifestyles." Mining facilities increase truck traffic, dust and particulates, and decrease water quantity and quality, as well as visual resources.[8] Tourists in Sierra County are most interested in beautiful vistas and outdoor recreation, and communities like Sierra County promote an image of offering these amenities. Mining activity can actually decrease tourism activity while it is operating, and long after mining operations have ceased. During the period 2001-2010, the study observes that no compensation of employees in Sierra County came from mining.[9] Given that Sierra County's

[7] DEIS 3-260, first and second paragraphs: The assumption of 127 employees on average per year neglects the likelihood that the mine will have vastly different employment levels over the life of the mine, resulting in economic "boom and bust" for Sierra County. It also neglects the possibility of the mine shutting down in the event of low copper prices. Further, it bases its assumptions on 70 percent local employment which, as previously stated, is likely unrealistic.

[8] 3.22.2 Environmental Effects: The study promotes the positive economic impacts of the mine, but fails to discuss the longer-term negative impacts to the economy from mine closure, that is, the "boom-and-bust" nature of mining operations and the fact that most mining communities are worse off economically than communities with no mining history. Again, only positive "ripple" effects are considered.

[9] 3.22.1.3.1 Per Capita Personal Income (PCPI): The fact that Sierra County's PCPI grew so rapidly from 2001-2010 again likely shows its economy is gathering strength based upon other than mining employment (Table 3-62 shows no mining employment from 2001-2010) as evidenced by "the ongoing revival of downtown Truth and Consequences." The reference to this being caused in part by an aging resident population neglects to mention the increase in transfer payments to an **increasing** aging population including pension and social security payments adding to income. Transfer payments are an important component of local spendable income and a boost to local retail and other establishments.

Per Capita Personal Income increased 63.2% in this 10 year period, the County is certainly doing something right economically.[10] It would be disappointing if relatively short-term mining disrupted the sectors that are doing well, particularly the tourism sector.[11]

[10] 3.22.1.2.2 Employment: Since employment increased during the period 2000-2010, this indicates that Sierra County has had positive results in rebuilding their economy based on other than mining employment.

[11] It takes many years, even decades, for a community to establish itself as a recreation and tourism destination and as a place for retirees to relocate to. That is, a community must take a long-term view when executing an economic development strategy. The proposed mining project is a short-term economic event that is not in conformity with Sierra County's longer-term and recently successful recreation and tourism strategy as indicated by PCPI and other statistics. It is unfortunate that lower income communities feel it necessary to welcome short-term economic impacts that are not in its longer-term interest.

Jaimie Park

From: Haywood, Doug [dhaywood@blm.gov]
Sent: Thursday, February 04, 2016 8:26 AM
To: Jaimie Park
Subject: Re: Question Regarding Contractor Who Prepared DEIS for Copper Flat
Attachments: Mangi Environmental Group disclosure for Copper Flat 11-16-11.pdf

Jaimie,

The original company that was hired to assist up with the EIS was Mangi, which in now Solv. I have attached their disclosure statement for you. Let me know if you need anything else. On another note we are getting close to having all of your other FOIA done.

Thanks,

On Wed, Feb 3, 2016 at 11:26 AM, Jaimie Park <jpark@nmelc.org> wrote:

Good afternoon, Doug. I wanted to confirm that the contractor who prepared the DEIS is Solv, correct? Do you happen to have on hand the contractor's disclosure statement indicating that Solv has no financial or other interest in the project? I will submit a FOIA for that shortly, but wanted to ask you first. Take care.

Kind Regards,

Jaimie Park

Staff Attorney

New Mexico Environmental Law Center

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EXHIBIT

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Douglas Haywood
Lands/Minerals Supervisor
575-525-4498

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703 760 4801 Fax 703 760 4899
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MANGI ENVIRONMENTAL GROUP

Viet Nam Veteran Owned

16 Nov 2011

Mangi Environmental Group, Inc. is to be engaged, via a third party contract arrangement with New Mexico Copper Corporation (NMCC), to assist the Bureau of Land Management and the State of New Mexico in the preparation of an Environmental Impact Statement and an Environmental Evaluation concerning the proposed Copper Flat Mine.

This is to certify that Mangi Environmental Group, Inc. has no financial interest in the mine, or the outcome of the EIS/EE decision process. Our only business relationship with NMCC is in regard to the preparation of the EIS/EE and associated documentation. Moreover, Mangi Environmental has no interests in any other project or effort that would create a conflict of interest, impairing our ability to conduct the EIS/EE effort in a thoroughly objective manner.

J. I. Mangi

JAMES I. MANGI, PhD
President

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TED TURNER
EXPEDITIONS™

TOUR OFFERINGS

ABOUT TED TURNER EXPEDITIONS

Ted Turner Expeditions is rooted in two million acres of wild, private North American landscape acquired by Ted Turner as a pioneering investment in balancing conservation and economic sustainability. The restoration of habitats, conservation of threatened and imperiled species, and increase of biodiversity are the cornerstones of Ted's vision. His vast, pristine, working landscapes and their ground-breaking conservation practices give voice to the visionary in all of us.

ABOUT OUR TOURS

Ted Turner Expeditions' eco-conscious journeys are individually crafted and tailored to their specific locales; these unique adventures are intended to deliver an insightful and restorative experience, while also providing extraordinary guest service. Each well-appointed property reflects its surrounding geography and its area's rich history. Ted Turner Expeditions is committed to making a difference by inspiring individual action to preserve the wonder of nature.

All tours begin and end at Sierra Grande Lodge and Spa, where a Ted Turner Expeditions guide will escort you to and from the properties and be your host on the tours.

We offer private and group (max 4 guests) touring opportunities! Pricing for private and group tours vary. Please contact the front desk of Sierra Grande Lodge & Spa for more information, or to inquire about booking.

We look forward to hosting you on the ranches!

Front Desk: 575-894-6976
TTX Representative: 1-877-288-7637
www.tedturnerexpeditions.com

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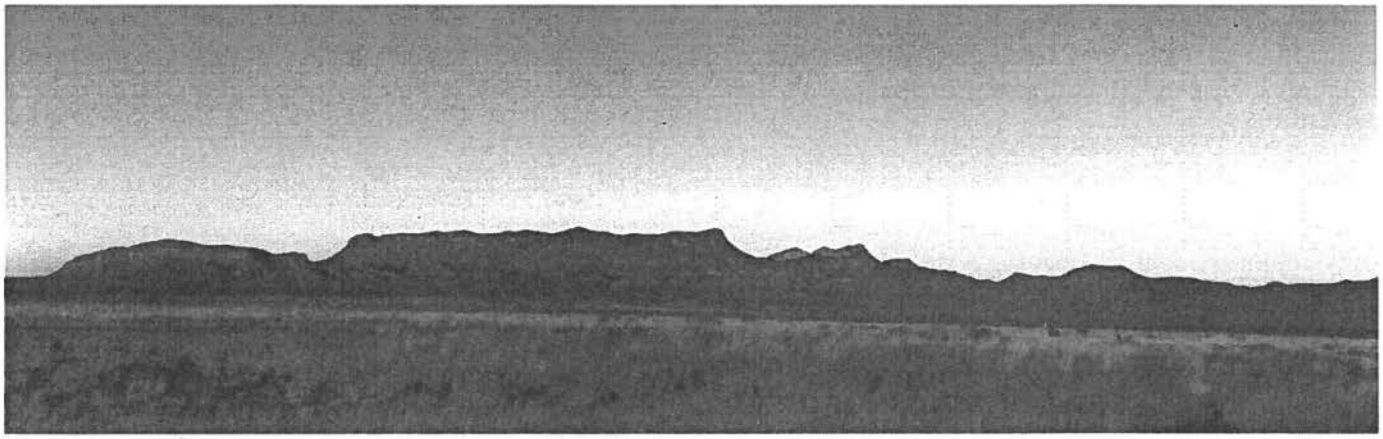
ARMENDARIS RANCH



FRA CRISTOBAL SUMMIT OVERLOOK MOTOR TOUR | FROM $150 PER GUEST*

Easy fitness level

Experience dramatic, panoramic views of Ted Turner's 362,885-acre Armendaris Ranch on a compelling, guided driving tour to the summit overlook of the picturesque Fra Cristobal Range. Your excursion on the Armendaris provides you with a highly unique experience complete with stunning, desert landscapes and abundant animal and plant species.

At the summit, lofty views of Elephant Butte Reservoir and the Rio Grande corridor await - the prized pinnacle of this exceptional five-hour tour.

Your guide will be your escort to the top of the range.

FRA CRISTOBAL SUMMIT TREK & GEOCACHE | FROM $200 PER GUEST*

Moderate fitness level

Summit your own private mountain range, the Fra Cristobals, and experience dramatic, panoramic views of the 360,000-acre Armendaris Ranch on an all-day adventure guided by a TTX team member.

The cross country passage covers just over three miles of ridge crest terrain with commanding views across the Chihuahuan Desert to the Continental Divide. At the summit, a bird's eye view encompassing over sixty miles in every direction awaits. Stretching out before you will be the Rio Grande Valley, White Sands Missile Range, the Trinity Site, El Camino Real, Elephant Butte Reservoir, the Black Range, Ladder Ranch and the towns of Truth or Consequences and Elephant Butte.

Be among the few to sign the summit register and take part in a unique geocache experience- bring a small trinket for the geocache and plan on taking a small souvenir home left by others who have summited.

This eight-hour tour is a great way to enjoy off-trail hiking and visit the highest point on the Armendaris Ranch, as well as experience the abundant animal and plant species.

TED TURNER
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PALEONTOLOGY PROSPECTING TOUR | FROM $200 PER GUEST*

Easy fitness level

The Armendaris Ranch is home to an impressive cache of Late-Cretaceous Period dinosaur bones, including specimens that are currently on display at the New Mexico Museum of Natural History. There are active paleontology digs underway on the ranch, resulting in the recent excavation of a Sauropod femur.

On this guided fossil "prospecting" tour you will travel on an easy 1.5-mile cross-country hike (requires climbing a gentle hill) in search of undisturbed dinosaur bone fields, learning to differentiate bone fragments from the surrounding rock and possibly help identify the next promising site for further investigation and research. This half day tour is a wonderful way to get out on the Armendaris and share in its rich paleontological legacy.

7TX BUBBLING SPRING MOUNTAIN BIKE TOUR | FROM $200 PER GUEST*

Easy fitness level

Ted Turner Expeditions' 7TX Mountain Biking Area offers experienced and beginner riders an opportunity to peddle for the first time on the Armendaris Ranch. Our Bubbling Spring ride is a gentle 6-mile out-and-back route, with a host of intriguing areas to explore – including Bubbling Spring, a historic well used by the Spanish as they passed through the area and Canon Del Muerto (Canyon of Death) a reference to the frequent attacks by Native Americans in this tight passage. This half day excursion is fun for the novice rider and can be extended into a full day for those looking for more of a challenge. On a one to five scale (five being most difficult), this half day tour is rated "2" for fitness level and ability.

ARMENDARIS HERITAGE & PHOTOGRAPHY TOUR | FROM $200 PER GUEST*

Easy fitness level

Spend the day exploring the undisturbed beauty of the vast Armendaris Ranch grasslands and desert mountain range, in pursuit of the perfect compositions and light on our Heritage and Photography Tour. This majestic landscape has seen the passage of countless Spanish pioneers along the Jornado Del Muerto section of the historic El Camino Real.

Your exclusive photo tour unfolds at your own pace to allow for the study of large scale landscapes and textural desert details. The unmatched long shadows and dramatic light of the southwest winter sunrises or sunsets are the ideal subjects for a photographer's dream. Picturesque stops such as Lava Station, Lava Camp, Casa Grande and the Fra Cristobal Canyons are always guest favorites.

This southwestern safari crossing of open grasslands on the Armendaris Ranch provides extremely unique opportunities to photograph bison and unparalleled wildlife. We look forward to developing an itinerary which best achieves your photographic goals and connects you with the remarkable history of the Armendaris Ranch.

SPELLMEYER CANYON TOUR | FROM $150 PER GUEST*

Moderate Fitness Level

Ted Turner Expeditions leads you back in time on a 5-hour hike in Spellmeyer Canyon.

The pristine nature of Spellmeyer Canyon exemplifies undisturbed beauty – a hallmark of Ted Turner's ranches.

Your guide will help you locate marine fossils from an ancient seabed and navigate the rock scrambles you will encounter on this hike.

This five-hour tour provides a platform to contemplate the ever-changing environment of our home planet.
As with all tours to Ted Turner's ranches, wildlife and Bison encounters are a very real possibility.

CAVE CANYON SCRAMBLE | FROM $200 PER GUEST*

Moderate to Strenuous Fitness Level

Cave Canyon begins with a steep climb through limestone terraces that ascend a picturesque canyon overlooking the eastern grasslands of Ted Turner's Armendaris Ranch. A fortified entrance to a large alcove at the top of the canyon shows evidence of use as an ancient shelter by the region's indigenous people. This tour is perfect for the experienced hiker who is adept at using their hands and feet to climb stair-step ledges, with a modest amount of exposure. A half-day tour, Cave Canyon can be combined with Spellmeyer Canyon to create a full-day adventure with two remarkably diverse and untouched canyon hikes.

TWO HOUR HIDDEN CANYON HIKE | $200 (for up to four guests)

Moderate to Strenuous Fitness Level

A perfect way to sample Ted Turner's Armendaris Ranch, the Hidden Canyon Hike is a brief, 15 minute drive from Sierra Grande Lodge & Spa. On this superb, guided two-hour loop, experience the diversity of terrain and natural beauty that sets the Armendaris apart, including several rock scrambles into pristine canyons and dramatic views of the Chihuahuan desert and the town of Truth or Consequences.

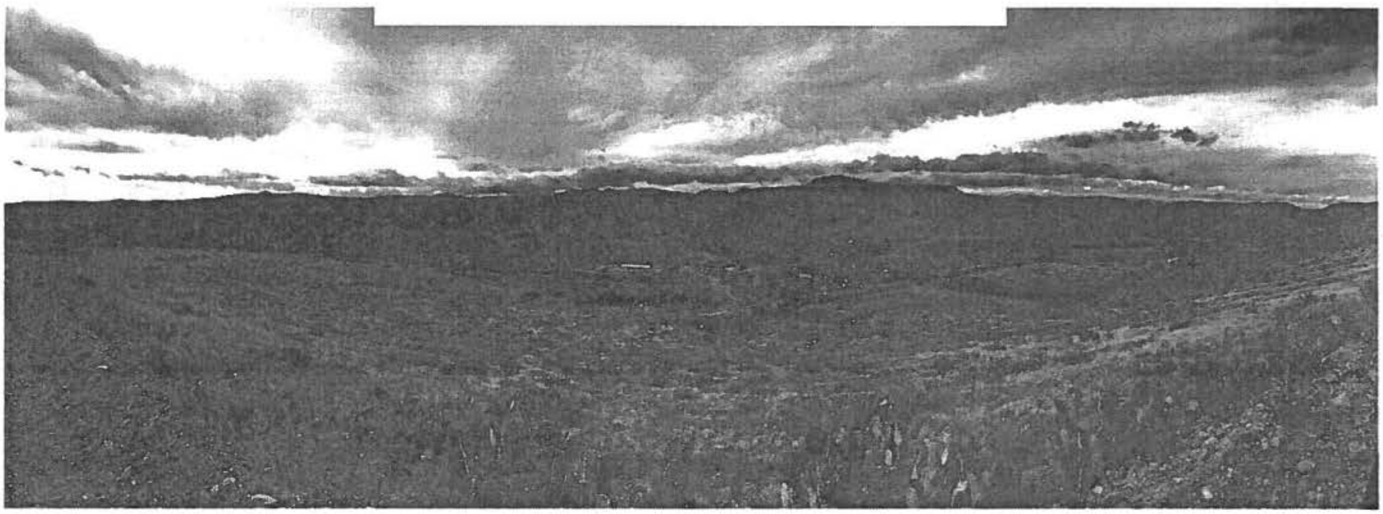
SPACEPORT AMERICA AND ARMENDARIS EXPEDITION | FROM $900 PER GUEST*

Experience a full day of adventure, gazing into the future and discovering the past, while exploring two of New Mexico's inspirational landmarks: Spaceport America and Ted Turner's historic, 363,000-acre Armendaris Ranch.

Our exclusive Spaceport America Immersion Excursion is a behind-the-scenes look at the world's first purpose-built commercial spaceport. Ted Turner Expeditions (TTX) guests receive access to the inner workings of this futuristic facility, including the Spaceport Command Center (SCC), home to Mission Control. Guests have the opportunity to interact with Spaceport America crewmembers while touring the 18,000-acre campus.

TTX guests are then escorted a short distance by vehicle to Ted's Armendaris Ranch for a customized tour. There, guest will have opportunities to encounter 300-million-year-old marine fossils, Cretaceous period dinosaur bone fields, exciting wildlife, commanding views from the summit of the Fra Cristobal Mountains, and other points of interest.
For an additional landing fee, guests with private aircraft can opt to land on Spaceport America's two-mile-long Spaceway.
**Rates: $900 for first guest. $475 each additional guest.*

LADDER RANCH



ANIMAS CREEK / RANCH HERITAGE TOUR | FROM $150 PER GUEST*

Easy Fitness Level

Take a step back in time onto the 156,439-acre Ladder Ranch with our Animas Creek and Ranch Heritage Tour. Experience the beauty of Animas Creek, historic Native American artifacts, ancient petroglyphs, and the photogenic ruins of a turn-of-the-century adobe home.

The pristine nature of the ranch also provides a unique opportunity to photograph the incredible and diverse wildlife from birds to bison that call Ladder Ranch home.

Choose from a three hour, or half-day (five hour) tour. Prices vary depending on length of tour.

LADDER RANCH NATIVE AMERICAN ROCK ART TOUR | FROM $150 PER GUEST*

Easy Fitness Level

The lush and diverse environment of the Ladder Ranch once provided a home to several indigenous cultures. Most prominent, are the ancient remnants of the Mimbres and Apache tribes that can be found throughout the ranch in the form of pictographs and petroglyphs. The tranquil settings of the Native American Rock Art sites on the Ladder Ranch provide an unrivaled opportunity to step back in time and reflect on the former inhabitants of this magnificent landscape on this full day tour.

TED TURNER
EXPEDITIONS.

Both novice and seasoned rock art enthusiasts will enjoy the diversity of the petroglyphs and the unique locations including canyon walls, loose boulders and small outcroppings of rock that provided perfect canvases for the rock art. Your archeological tour will also include a brief stop at Ladder Ranch Headquarters.

LADDER RANCH BIRDING TOUR | FROM $200 PER GUEST*

Easy Fitness Level

Ted Turner's 156,000 acre Ladder Ranch is considered one of the finest birdwatching sanctuaries in North America. The Ladder offers exquisite and diverse habitats, from lush riparian zones to arid, rocky slopes and cliffs; which host a large number of species who migrate through the region and many species who call the ranch home year-round. Its location is a magnet for spring and fall migrations.

One of our seasoned birding guides will be your host for this private tour. Your experience may also include viewing of bison, black bear and coyote; as well as stops at petroglyphs (Rock Art) created by ancient indigenous people. Whether you are a beginner or advanced birder we can create a half or full day tour which will surely add new species to your Life List. Our birding tours are limited to four guests, offering an intimate and low impact birding experience.

LAS PALOMAS NORTH AND SOUTH LOOP TOUR | FROM $200 PER GUEST*

Moderate Fitness Level

Join us for a 5-hour tour of the pristine riparian habitat of Palomas Creek on Ladder Ranch, and experience why we at Ted Turner Expeditions feel that this is the perfect picture of the ecological conservancy that is the foundation of the Turner Ranches.

You'll have the opportunity to hike through scenic rugged back-country that's in a completely unaltered and natural state. The stunning scenery alone is a photographer's dream, and you may even encounter fascinating wildlife along the way including Bison, Elk, Deer, Peccary (Javelina), and a host of other animals that call Ladder Ranch home.

Please note that the hike includes some off-trail sections and requires a moderate fitness level for this five-hour tour. Transportation to the Palomas Creek trailhead is provided.

TED'S VISION QUEST HIKE | FROM $200 PER GUEST*

Moderate Fitness Level

A personal favorite of owner Ted Turner, this 3-hour guided hike leads you along a unique path once used by ancient Native Americans cultures for their sacred vison quest ceremonies. The hike begins close to the Ladder Ranch Headquarters and Ted's private residence, ascending to the top of a bluff overlooking breathtaking views of the riparian area of Animas Creek, Ladder Ranch HQ and the surrounding Chihuahuan desert (an entertaining anecdote about this path is recounted by Ladder Ranch Manager Steve Dobrott, in Ted Turner's 2013 biography, *Last Stand: Ted Turner's Quest to Save a Troubled Planet*; pgs. 35-36). Along the way, your guide will provide you with fascinating information on the desert vegetation, the animals who call Ladder Ranch home and Ted's vision for the Ladder Ranch. *Please note that this hike includes some exposure along ledges and steeper terrain.*

CREST TO CREEK MOUNTAIN BIKE RIDE | FROM $385 PER COUPLE*

Moderate Fitness and Riding Level

This guided, moderately difficult mountain bike ride covers 6.5 miles (10.46 km) of backroads and historic old wagon trails. For this 3-hour tour, you depart from Sierra Grande Lodge & Spa and be transported to the staging area atop a ridge near the Ladder Ranch Headquarters. The first leg of the ride traverses the ridgecrest with incredible 360-degree views of the Chihuahuan desert, Ladder Ranch, Armendaris Ranch, the Black Range of the Gila National Forest, the Caballo Mountains, and much more. After taking in these expansive, stunning views, you then descend off of the ridge into the lush Animas Creek drainage.

Riders will be provided with start-of-the-art, full suspension Santa Cruz "Tall Boy" bikes, helmets and riding gloves. *Please note that as this ride has been classified "moderate" in difficulty, riders should be prepared to utilize some technical skills to negotiate uneven terrain.*

CUSTOM ITINERARY LADDER RANCH DAY TOUR | FROM $150 PER GUEST*

Easy to Moderate Fitness Level

The 156,000-acres of the Ladder Ranch provide endless opportunity to explore and photograph its exquisite wildlife, as well as hike its unbelievably vast terrain while experiencing the Ladder's fascinating history. The Ladder Ranch is a private working bison ranch focusing on habitat conservation and wildlife management. With a diversity of formations and ecosystems including the Chihuahuan Desert, riparian habitats, open grasslands, volcanic cones, Rocky Mountain vegetation, adobe ruins, Apache battle sites and other ancient points of interest; there are endless opportunities for private guided expeditions for a wide range of interests, ability levels and ages.

Your tour can be custom tailored to fit your ultimate Ted Turner Expeditions experience. From searching for bison or the incredibly diverse wildlife on the Ladder (elk, deer, antelope, mountain lions, bears, etc.) to customized motor tours, mountain biking or hiking with your choice to focus on areas of interest such as photography, botany, biodiversity or archeology. The Custom Ladder Ranch Day Tour is the perfect way to relax and allow maximum flexibility in your itinerary to experience all this majestic property has to offer.

Half and full-day touring options are available.

TRUTH OR CONSEQUENCES

HISTORIC DISTRICT WALK | COMPLIMENTARY

Easy Fitness Level

Sierra Grande Lodge & Spa and Ted Turner Expeditions invite you on a complimentary, guided 1.25 mile walk through historical downtown Truth or Consequences.

This enlightening tour lasts approximately 45 minutes and includes several educational stops through Truth or Consequence's vibrant and varied history. Your guide will discuss a range of topics from "how the city got its name," to the history of the hot springs, introduction to the local artist community, Spaceport America and plans for the city's new downtown.

Guests are encouraged to stop and explore the Geronimo Museum along the walk, but please note there is an additional entrance fee.

Check with the front desk at Sierra Grande Lodge & Spa for a tour schedule and departure times.

Sites of interest, particularly for photography and nature enthusiasts, are the desert pathway and the portion of the trail that passes the beautiful Rio Grande. During the tour, your guide will educate you on local botany, geography, geology and human history of the region.

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EXPEDITIONS.

SIERRA GRANDE LODGE & SPA

IN-ROOM BOOKING

BOOKING DETAILS

All tours depart from the Sierra Grande Lodge. Ground transportation, specialized equipment, and professional guide included. Lunch and snacks can be arranged through the Restaurant at Sierra Grande. Trips may be cancelled by TTX due to weather with full refund. Cancellation within 24 hours of departure forfeits full-payment. 48 hour advanced reservations recommended.

- **Private Tours -** Rates are based on a two guest minimum, flexible departure times.
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- **Customized Group Itineraries** - TTX invites groups to experience our private ecotourism venues with themes and activities designed to achieve your retreat objectives. Please contact the Sierra Grande Lodge & Spa to custom your itinerary.
- **Packages** - Check out our special packages for lodging, spa and activities savings.

TOUR RATES

PRIVATE TOURS

	1-2 Guests	Each Additional
Two Hour Tours	$200.00 (1 to 4 guests)	$100.00
Three Hour Tours	$350.00	$100.00
Half Day Tours (Approx. 5 Hours)	$450.00	$125.00
Full Day Tours (Approx. 8 Hours)	$600.00	$150.00
Crest to Creek Mountain Bike Ride	$385.00	$175.00

SCHEDULED GROUP TOURS

	Per Person
Two Hour Tours	$200.00 (1 to 4 guests)

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Three Hour Tours	$150.00
Half Day Tours (Approx. 5 Hours)	$200.00
Full Day Tours (Approx. 8 Hours)	$250.00

NEW MEXICO INTERSTATE STREAM COMMISSION

BATAAN MEMORIAL BUILDING, ROOM 101
POST OFFICE BOX 25102
SANTA FE, NEW MEXICO 87504-5102
(505) 827-6160
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February 26, 2016

Mr. Doug Haywood
BLM Las Cruces District Office
1800 Marquess Street
Las Cruces, NM 88005

Submitted via Email to: BLM_NM_LCDO_Comments@blm.gov

RE: Comments on Draft Environmental Impact Statement for the Copper Flat Mine

Dear Mr. Haywood:

The New Mexico Interstate Stream Commission ("ISC") submits the following comments on the Draft Environmental Impact Statement for the Copper Flat Mine (the "Draft EIS"). Notice of the Draft EIS was published in the Federal Register, Vol. 80, No. 229 on November 30, 2015, and comments are due March 4, 2016. We want to thank the Bureau of Land Management ("BLM") for the opportunity to comment on the Draft EIS.

The ISC is interested in the Draft EIS because of the effects the proposed action, and the proposed alternatives, will have on the Rio Grande and Caballo Reservoir. The ISC is charged with administration of all interstate water compacts for New Mexico, as well as protecting, conserving and developing the waters and stream systems of the State. NMSA 1978, § 72-14-3 (1943). In this role, the ISC examined the Draft EIS to determine whether the BLM has met the requirements of the National Environmental Protection Act, 42 U.S.C. §§ 4321-4370h ("NEPA"). Please note that in addition to the information available on the BLM website, the ISC also reviewed the groundwater flow model files used to complete the Draft EIS. The ISC obtained the model files from the New Mexico Office of the State Engineer, a cooperating agency on the Draft EIS.

Based on our review, the ISC is concerned that the BLM did not adequately examine all the environmental consequences of the proposed action required to make a fully-informed and well-considered decision. Some of the items not covered by the Draft EIS, or addressed inadequately, are substantial and it is doubtful that, if challenged, the Draft EIS would stand up to the "hard look" standard set forth in NEPA jurisprudence. It

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is our hope that these comments will assist the BLM in modifying the Draft EIS to meet the requirements of NEPA.

Impact to Administration of the Rio Grande Compact

First and foremost, the Draft EIS fails to address impacts to the administration of the Rio Grande Compact (the "Compact") and to the Compact states of New Mexico, Colorado, and Texas. Specifically, the proposed action will decrease Usable Water in Project Storage, which is defined by the Compact as "all water, exclusive of credit water, which is in project storage and which is available for release in accordance with irrigation demands, including deliveries to Mexico." *See* Act of May 31, 1939, ch. 155, 53 Stat. 785 (the full text of the Rio Grande Compact). The water stored in Caballo Reservoir is Usable Water in Rio Grande Project Storage.

Usable Water is determined on a daily basis. Unless offset, a decrease in Usable Water in Project Storage will occur as a result of the groundwater pumping conducted to support the mining operations of the proposed action, and proposed alternatives. In total, the production will result in extraction of about 60,000 acre-feet of water from the groundwater system by the end of 15.67 years (pumping duration for the proposed action). Conservatively, for the aquifer to recover to its present condition, all of the pumped water will be captured from surface water that would otherwise have reached the Rio Grande or Caballo Reservoir itself, or from existing springs in the area. Therefore, if the impact on the Rio Grande and Caballo Reservoir is not offset on a real-time basis, there will be an impact on the amount of water in the Reservoir, thereby reducing Usable Water in Project Storage.

More specifically, under the terms of the Compact, if Usable Water in Project Storage is decreased below specified levels, the following impacts will occur:

1. Article VII of the Compact prohibits storage in reservoirs constructed after 1929, upstream of Elephant Butte Reservoir, whenever there is less than 400,000 acre-feet of Usable Water in Project Storage. As noted above, Usable Water is not stored in Elephant Butte alone, but is also stored in Caballo Reservoir. The Draft EIS acknowledges that the proposed action, and proposed alternatives, will impact water storage in Caballo, therefore affecting the amount of Usable Water in Project Storage. Thus, the proposed action and alternatives could have adverse impacts on the timing of Article VII storage restrictions for both New Mexico and Colorado, limiting both states' ability to store water upstream of Elephant Butte. For New Mexico, any reduction in water stored in Caballo Reservoir would have significant impact on the ability of the Middle Rio Grande Valley to store water in El Vado

Reservoir. This storage limitation affects agricultural and municipal uses in the most populous part of the State.

2. Article VIII of the Compact requires New Mexico and Colorado to release their debit water from upstream reservoirs to Elephant Butte Reservoir in order to bring Usable Water in Project Storage to 600,000 acre-feet by March 1st. Any reduction to the amount of water stored in Caballo Reservoir will reduce the amount of Usable Water in Project Storage. Accordingly, such a reduction would have an impact on this upstream debit water release and, consequently, on the amount of water available for use above Elephant Butte.

3. The proposed action may also impact actual or hypothetical spill as defined in Article I of the Compact. Lowering the amount of actual water in storage and Usable Water levels in Project Storage will lessen the likelihood of an actual or hypothetical spill occurring, which have major impacts on both credit and debit accounting for Colorado and New Mexico under the Compact. *See* Article I(p) and I(q) of the Compact.

4. The proposed action could also have adverse impacts on Actual Release from Project Storage. Actual Release is defined in the Compact as "the amount of usable water released in any calendar year from the lowest reservoir comprising project storage." *See* Article 1 of the Compact. If Usable Water amounts are reduced in Caballo Reservoir, the lowest reservoir with Project storage, the volume of water available for irrigators in the Rincon and Mesilla Valleys in New Mexico, as well as for Texas and Mexico farmers, will also be reduced.

Accordingly, the ISC suggests the BLM analyze the impacts of the proposed action and alternatives to Compact administration. Alleged groundwater withdrawal impacts on the surface water in the Lower Rio Grande basin of New Mexico are already the basis for interstate litigation involving the Compact. *See* Texas v. New Mexico and Colorado, Original No. 141. Thus, the Compact is not something that should be ignored in the BLM's analysis of the environmental effects of the proposed action. Also, it is important to note that the Compact cannot be modified to meet the needs of the proposed action. Thus, to remedy these issues, the impacts on the Rio Grande and Caballo Reservoir by the proposed action, or a proposed alternative, will need to be offset on a real-time basis.

<u>The Model Minimizes the Impacts of Groundwater Withdrawals on the Surface Waters of the Rio Grande and Caballo Reservoir</u>

Second, the ISC is concerned about the groundwater flow model used in the Draft EIS. Specifically, the impact on the surface and ground water supplies in the mine area is evaluated using a groundwater flow model that utilizes assumptions not supported by field data, in particular reservoir elevations, and contains conceptual misrepresentations. *See* Sections 3.5 & 3.6 of the Draft EIS. Below is a discussion of these concerns along with suggestions on how to fix the issues.

1. In the Draft EIS, Caballo Reservoir is represented with a head dependent boundary that is fixed at 4200 feet for all time periods: pre-mining, during the mining operations, and post mining. *See* Model Files, New Mexico Office of the State Engineer. Caballo Reservoir elevations are extremely important to the analysis because the elevation of the Reservoir controls groundwater discharge back into the Reservoir, therefore impacting substantially the effects to ground and surface water supplies of the proposed action and alternatives. It is unclear why the Draft EIS used the fixed elevation. The United States Bureau of Reclamation has historical data showing end of month levels of the Reservoir since the date of construction. That data should be used in the model at least up to 2015, and then an estimated annual fluctuation could be used to simulate lake elevation during the mining operations and post-mine time periods.

2. The model assumes all water in the alluvium (model layer 1) is isolated from the Upper Santa Fe group by a confining bed in the entire model area. Furthermore, the model conceptually assumes that there is no horizontal interaction between the Upper Santa Fe group and neighboring alluvium; it only allows vertical interaction through a very low vertical conductance. This assumption results in minimizing (or completely isolating, *see* 3.6.1.4 page 3-63 second paragraph) the pumping impact on the surface water and shallow alluvium in the whole model area. For example, Figure 3.13a in the Draft EIS shows only one foot of drawdown in the lower Percha Creek area after 15.67 years of pumping. This would be remarkable based on the location of the wells and levels of pumping required for the proposed action. To make sure this assumption is valid, and accordingly preserve the model's integrity, the assumption needs to be tested using site specific hydrogeologic data and a sensitivity analysis.

3. The model also assumes that there is Paleo-channel that results in an additional source of water to the model area from north to south. However, the predominant groundwater flow direction is from west to east toward the Rio Grande and Caballo Reservoir. This assumed boundary in the model adds additional water to the system that may not exist. A sensitivity analysis was done

on this boundary and concluded that inclusion of this boundary does impact the measured surface flow of the Rio Grande. *See* Draft EIS page 3-71. However, despite this finding, the BLM decided to keep this boundary in the model that was used in the evaluation of the proposed action. The ISC suggests examining this sensitivity analysis again to determine how to better handle this assumption in the model.

4. The model top layer elevations contain a very steep elevation change in the middle of the model that is not supported by the United States Geological Survey Digital Elevation Model map. The model elevations need to be corrected after review of the map.

5. In the model, the routing of water in Percha Creek is not modeled correctly; it is represented by two reaches while it should have been represented by three reaches. *See* Model Files, New Mexico Office of the State Engineer. The model flow routing in Percha Creek should be corrected.

<u>Certain Elements of the Mine's Water Budget and Associated Supply Are Unclear</u>

Finally, the initial source of the recycling water needed for the proposed action and proposed alternatives is not clearly stated in the Draft EIS (9,096 acre-feet, Table 2-10, Figure 2-6). Does the tailing facility currently contain this full amount of water from previous operations? If not, it will take the mine about 5 years to reach a recycling capacity of 9,096 acre-feet at a 75 percent recycling efficiency. This amount of water, or a lesser amount if part of the 9,096 acre-feet is already available, is not included in the modeling undertaken for the Draft EIS. The BLM should clearly state the source of this water and include any additional water needed in the modeling for the Draft EIS.

<u>Conclusion</u>

For the reasons discussed above, the Draft EIS does not yet meet the requirements of NEPA. It fails to fully examine the environmental consequences of the proposed action by omitting review of its effects on Compact administration, utilizes a model that minimizes the effects of the proposed groundwater withdrawals on the surface water supply, and fails to clearly indicate and model the source of the recycling water. The ISC is hopeful that its feedback will result in BLM's modification of the Draft EIS to address these concerns.

Please contact Kim Bannerman at (505) 827-4004 or kim.bannerman@state.nm.us if you have questions regarding our comments.

Sincerely,

Deborah K Dixon

Deborah K. Dixon, P.E., Director
New Mexico Interstate Stream Commission

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cc: Rolf Schmidt-Petersen, NMISC Rio Grande Bureau Chief
Amy Haas, NMISC General Counsel
Kim Bannerman, NMISC Attorney

BRIEFING MEMORANDUM

DATE: November 30, 2017
FROM: William Childress, BLM Las Cruces District Manager
SUBJECT: Copper Flat Copper Mine Draft Environmental Impact Statement (DEIS)

KEY FACTS

Threatened and Endangered Species
BLM has entered into Section 7 Consultation with US Fish and Wildlife Service under the Endangered Species Act and has prepared a Biological Assessment that evaluates the potential for the Copper Flat Mine project to jeopardize the wolf, frog, and tortoise, as well as migratory birds, including protected species at Ladder Ranch.

Water Issues
Diversion New Mexico Copper Company (NMCC) has committed to offset surface water depletions to ensure other surface water users are not impacted from the mining activities. NMCC has secured surface water rights from an up-stream user that would release water into the Rio Grande for the quantity of surface water depletion identified in the model.
Pit Lake Pit Lake is not now a water of the State, nor will it be post-mining, and therefore it is not and will not be subject to surface water quality standards applicable to waters of the State.

Jobs: The mining activities are anticipated to employ up to 270 employees. The estimated operational life is 16 years.
Stakeholder Positions: The BLM has prepared the DEIS in conjunction with its four Cooperating Agencies, including: the New Mexico (NM) Department of Game and Fish, NM Environment Department, NM Energy Minerals and Natural Resources Department, and the NM Office of the State Engineer. Key issues for the DEIS focused on water, biological resources, traffic, and socio-economic concerns.
Public Lands Affected: Lands managed by the BLM Las Cruces District.

BACKGROUND
In 2012, the New Mexico Copper Corporation submitted a proposed mining plan of operation (MPO) to BLM. The mine would produce copper, gold, silver, and molybdenum. The MPO is based on the plan of operations Quintana Mineral Corporation used. The facilities, disturbance, and operations would be similar to the former operation.
The key issues identified from public scoping for the DEIS focused on water, biological resources, traffic, and socio-economic concerns.
More information: https://eplanning.blm.gov/epl-front-office/eplanning/planAndProjectSite.do?methodName=renderDefaultPlanOrProjectSite&projectId=75353

DISCUSSION
LCDO is recommending to proceed to a Final Environment Impact Statement since the comment responses are within the range of alternatives and scope of analysis. No supplement needed.

NEXT STEPS
Briefing of NM State Director

ATTACHMENT
Map_Copper Flat Mine Area

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Species in the project area that are not listed under ESA, but that are considered at risk in Southwest New Mexico and therefore listed as special status species by the New Mexico Department of Game and Fish (NMDGF), were evaluated in this EIS and mitigation was developed based on correspondence with NMDGF.

The pit lake is not now a water of the State, nor will it be post-mining, and therefore it is not and will not be subject to surface water quality standards applicable to waters of the State. The water quality standard that would apply is a mining permit condition from MMD that post-mining pit lake water quality would be similar to pre-mining pit lake water quality.

As described in the EIS, water in the existing pit is high in cadmium, copper, manganese, and selenium. Table 3-8 of the EIS shows the relevant surface water standards for these four contaminants in waters of the State. Selenium is the only one of these four contaminants with a wildlife standard (<5 ug/L or 5 ppb). The measured level of selenium in the existing pit lake is 35 ug/L or 35 ppb. At the species level, the USEPA has set water quality criteria for aquatic life, but has yet to set criteria for aquatic dependent species such as birds and bats.

The baseline data report for the project, prepared in 2011, identified four species of birds in the pit lake habitat, several species of bats, and riparian vegetation in the fringes of the pit lake consisting of a small cattail marsh (<0.1 ac) and intermittent saltcedar, an invasive species. A 2014 survey of the pit lake concluded that there are no fish, zooplankton. or macroinvertebrates in the existing pit lake.

In the absence of USEPA water quality criteria for selenium applicable to aquatic dependent wildlife and the scarcity of quality food sources (fish, aquatic vegetation, zooplankton, and macroinvertebrates) that would biomagnify to higher levels of selenium, the BLM finds that the potential for bioaccumulation of selenium and selenium poisoning, selenosis, is very low. The presence of insect-eating birds and a relative abundance of bats at the existing pit lake at a point in time 35 years after the lake began refilling and establishing the water quality baseline for the lake, suggests that existing water quality levels in the pit lake are not exclusionary for these species. The pit lake is likely a resting or transitory area for these species rather than a feeding area. The EIS (affected environment section and wildlife impacts section) has been revised to better describe the pit lake with respect to wildlife and habitat.

THEMAC RESOURCES | NEW MEXICO COPPER CORPORATION

August 5, 2016

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James Hogan, Bureau Chief
Surface Water Quality Bureau
New Mexico Environment Department
1190 St. Francis Dr.
P.O. Box 5469
Santa Fe, New Mexico 87502

RE: Copper Flat Current and Proposed Future Pit Water Body in Sierra County, New Mexico

Dear Dr. Hogan,

The purpose of this letter is to inform the New Mexico Environment Department ("NMED") about the unique aspects of the current and future proposed Copper Flat pit water body and to request NMED's guidance regarding the water that collects in it both under current circumstances and in the future as proposed following mining. As you may know, New Mexico Copper Corporation (NMCC), a wholly owned subsidiary of THEMAC Resources Group, Ltd., acquired the Copper Flat property in 2011. NMCC has been engaged in a lengthy effort to obtain the permits necessary to operate its proposed Copper Flat mine. As we have discussed in previous meetings, clarification of what, if any, water quality standards administered by NMED currently apply or will apply to the current and future proposed pit water body at Copper Flat is critical to NMCC's permitting efforts that are being pursued with multiple state and federal agencies.

As we have discussed, NMCC has obtained a determination from the United States Army Corps of Engineers (USACE) that the existing open pit water body is not a water of the United States. However, there is a separate question whether the current and future open pit water body is or will be considered a surface water of the state (as defined by 20.6.4.7(S)(5) NMAC). As defined in 20.6.4.7(S)(5), surface waters of the state does not include private waters. Pursuant to the definition of private waters, private waters include certain waters that do not combine with other surface or subsurface water or any water under tribal regulatory jurisdiction pursuant to Section 518 of the Clean Water Act.

Based on our review of the regulations, we believe that limiting the expression of water in the pit to privately held lands owned by NMCC satisfies New Mexico's private waters exemption from surface water standards due to the specific characteristics of the water body, both under current circumstances and in the future following mining.

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The current Copper Flat pit water body is unique in its physical setting and location. It is entirely confined to private lands in the form of mining claims for which patents were issued long ago by the United States. Likewise, with proposed engineering controls, following dewatering of the pit to allow mining, the Copper Flat pit water body that eventually develops again will be entirely confined to private, patented lands after proposed mining is completed. The current and future water body otherwise includes the following attributes:

1. The pit is and will remain isolated from any surface waters of the state, and no surface waters of the state will report to the pit.

2. The pit is and will remain an evaporative sink and thus, as has been noted in our meetings, does not mix with groundwater.

3. The pit is and will remain completely confined within private land (i.e., the patented mining claims held by NMCC).

4. Grayback Arroyo was diverted around what was to become the pit area by Quintana Minerals prior to that unrelated company's development, construction and operation of the mine in 1980. This decades-old diversion was in place when NMCC acquired the property. This diversion will remain permanently in place during mining and then after mining and reclamation is complete. No water from Grayback Arroyo has reported, or will report, to the pit in its current or expected future configuration.

5. The Army Corps of Engineers completed a jurisdictional determination on the pit in 2014 and determined that water in the pit does not comprise jurisdictional "waters of the United States" for purposes of the federal Clean Water Act.

Based on professional surveys commissioned by NMCC, the current pit water expresses completely within patented mining claims that are private land. Based on conceptual engineering, we know that the future pit water body could also be limited to expressing exclusively on private land. As we recently presented to you and other representatives of NMED, NMCC could design the mine pit such that sufficient benching is left so that the accumulated pit water remains within the boundaries of private land at all times. Alternatively, NMCC could design the pit to use mined rock in a manner that would confine the pit water surface entirely to private land upon closure and reclamation of the mine. We are confident that the future proposed Copper Flat pit water body could be designed in one of these two ways to retain all the physical attributes listed above.

If the current and future expression of the pit water body at Copper Flat is confined to private land only, and has and retains all of the unique physical attributes listed above, would NMED agree that the water body is and will be private waters and thus exempt from definition as surface waters of the state and not subject to water quality standards administered by NMED?

We appreciate the time you have taken to discuss this matter with us, and your consideration of this crucial element of the Copper Flat permit planning process. If you would like to discuss this further, please do not hesitate to contact us.

Best regards,
New Mexico Copper Corporation

Jeff Smith
Chief Operating Officer

cc: Mr. Andrew Knight

bcc: Katie Emmer
Stuart Butzier
Christina Sheehan

February 27, 2018

Fernando Martinez, Director
New Mexico Mining and Minerals Division
Mining and Minerals Division
Wendell Chino Building, Third Floor
1220 South St. Francis Drive
Santa Fe, NM 87505

RE: Permit Application No. SI027RN, Copper Flat Copper Mine and the Third Judicial District Court Opinion Issued in the Copper Flat Inter Se Proceeding.

Dear Director Martinez:

On behalf of Turner Ranch Properties, L.L.P. and the Hillsboro Pitchfork Ranch, the New Mexico Environmental Law Center ("NMELC") requests that the New Mexico Mining and Minerals Division ("MMD") refrain from making a technical completeness determination for New Mexico Copper Corporation's ("NMCC") revised Mining Operations and Reclamation Plan ("MORP") and associated documents for the proposed Copper Flat Copper Mine ("Mine"). NMELC also requests that MMD require NMCC to further revise its MORP and associated documents.

There are two main reasons for this request. First, the recent Third Judicial District Court decision issued in the *Copper Flat Inter Se Proceeding* ("*Inter Se* Decision") demonstrates that the revised MORP and associated "Mine Reclamation and Closure Plan," "Probable Hydrologic Consequences" Report, and the "Predictive Geochemical Modeling of the Pit Lake Water Quality" Report are each based on incorrect information regarding the Mine's sole fresh water supply source that is required for mining operations and reclamation.

Second, the *Inter Se* Decision also demonstrates that reclamation of the Mine, in accordance with NMCC's proposed reclamation plan, is not technically feasible. Therefore,

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MMD is precluded from 1) making a technical completeness determination for NMCC's mining permit application package, and 2) ultimately approving NMCC's mining permit application package pursuant to New Mexico Administrative Code Section 19.10.6.606.B(6).

I. Background of NMCC's Revised MORP and Associated "Mine Reclamation And Closure Plan," "Probable Hydrologic Consequences" Report, and The "Predictive Geochemical Modeling of the Pit Lake Water Quality" Report.

A. NMCC's Revised MORP.

NMCC submitted its initial MORP for the proposed Mine in July 2012. Based on MMD's several requests for additional information, NMCC submitted a revised MORP in October 2016. Appendix E of the revised MORP provides the "Mine Reclamation and Closure Plan." MMD again requested more information from NMCC, resulting in a second revised MORP and "Mine Reclamation and Closure Plan" in July 2017. The objective of a MORP is to evaluate whether a proposed project will comply with the New Mexico Mining Act and its implementing regulations, as well as with other applicable law.

NMCC claims in its revised July 2017 MORP that it "provides the most recent information available" and is "*consistent with the information contained in the Bureau of Land Management's (BLM) draft Environmental Impact Statement (DEIS) published for public comment in November 2015, in particular, with regard to Alternative 2 as described in the DEIS and designated by the BLM as the preferred alternative.*" NMCC Revised MORP, page 1-1 (July 2017) (emphasis added).

The revised MORP, therefore, incorporates by reference the DEIS's identification of the Mine's four groundwater production wells as the sole source of fresh groundwater imperative to mining operations and reclamation, as well as the DEIS's identification of the minimum fresh groundwater amount of 6,105 acre feet per year ("afy") necessary for mining operations. NMCC Revised MORP, page 1-1 (July 2017); DEIS 2-26, 2-29, 2-84 (November 2015).

B. NMCC's "Mine Reclamation and Closure Plan."

NMCC submitted a revised "Mine Reclamation and Closure Plan" ("Closure Plan") in July 2017. The objective of the Closure Plan is to evaluate compliance with the New Mexico Mining Act's implementing regulations.

The Closure Plan states, in pertinent part, the following:

> NMCC will conduct rapid filling of the mine pit with fresh water provided from the off-site well field as the initial step in commencing reclamation/closure. The purpose of rapid filling the pit is to provide a source of good quality water and provide a mechanism by which the mineralized rock walls of the pit will be more quickly submerged under water, thus limiting the potential for mineral oxidation. *Approximately 2,200 acre-feet of water will be required for the rapid fill, which will be completed in approximately 6 months*."

NMCC's Closure Plan, page 16 (July 2017) (emphasis added). The source of the 2,200 acre-feet of water is NMCC's four groundwater production wells. The amount of water necessary for rapid fill of the pit and the duration of rapid fill provided in the Closure Plan contradicts information provided in the DEIS. Specifically, the DEIS states that rapid fill of the pit would require *2,800* acre-feet of water over a duration of seven (7) months. DEIS 2-44, emphasis added. The Closure Plan fails to explain the 600 acre-foot discrepancy.

C. NMCC's "Probable Hydrologic Consequences" Report.

NMCC submitted its "Probable Hydrologic Consequences" Report ("PHC Report") in December 2017. The objective of this report is to "develop a determination of the probable hydrologic consequences of the operation and reclamation on both the permit and affected areas with respect to the hydrologic regime, *quantity* and quality of surface and groundwater systems that may be affected by the proposed operations." NMCC's PHC Report, page ii (December

2017). The New Mexico Mining Act regulations require permit applicants to submit a PHC report. Section 10.10.6.602(13)(g)(v) NMAC.

The PHC Report identifies NMCC's four groundwater production wells as a source of possible hydrologic consequences, NMCC's PHC Report, page ii (December 2017), because the four groundwater production wells will "provide the main water supply for the mine." *Id.* at page 7. The probable hydrologic consequence of pumping these four production wells is groundwater-level drawdown in the Santa Fe Group aquifer. *Id.* at page 11.

Also of interest is the PCH Report's discussion of NMCC's commitment to offsetting the effects of groundwater pumping from its four production wells on the Rio Grande system. *Id.* at pages 16-17. The PCH Report identifies a water lease between NMCC and the Jicarilla Apache Nation for the purpose of offsetting the effects of groundwater pumping on the Rio Grande. Specifically, the PCH Report states, "The Settlement Act [Jicarilla Apache Tribe Water Rights Settlement Act of October 23, 1992] expressly permits trans-basin transfers and the Nation currently has the right to lease 6,500 ac-ft/yr." *Id.* at 16.

However, the Settlement Act does not expressly authorize trans-basin transfers of water, and the lease between NMCC and the Jicarilla Apache is for 3,000 acre-feet of water per year and not 6,500 acre feet. *See* Exhibits A and B, respectively. Therefore, it is unclear whether Jicarilla Apache's water rights in San Juan-Chama Project Water can be utilized for off-setting the effects of groundwater pumping in the lower Rio Grande. It is also unclear whether the NMCC water lease with the Jicarilla Apache for 3,000 acre-feet of water is sufficient to offset the significant impacts of the Mine's groundwater pumping on the Rio Grande.

D. NMCC's "Predictive Geochemical Modeling of Pit Lake Water Quality" Report.

NMCC submitted its "Predictive Geochemical Monitoring of Pit Lake Water Quality" Report ("PGM Report") in December 2017. The objective of this report is to "provide an analysis that demonstrates that future pit lake water quality results in a water body with similar chemistry to that of pre-mining conditions upon implementation of the reclamation actions proposed by NMCC in its MORP and Reclamation Plan." NMCC's PGM Report, page ii. Additionally, the PGM Report states, in pertinent part, the following regarding the geochemical predictions that are the basis of this report:

> *Geochemical predictions were developed for three scenarios*, including: (i) a calibration model for the existing pit lake; (ii) a natural fill model for the future unreclaimed pit; and (iii) *a rapid fill model for the future reclaimed pit*. Rapid fill has been proposed as the water quality component of NMCC's reclamation strategy for the future pit lake. It will include filling the pit with 2,202 acre-feet of good quality water from the production water supply wells during the first six months of groundwater recovery and pit infilling.

Id. at page iii. (Emphasis added).

II. The Third Judicial District Court Decision In The *Copper Flat Inter Se Proceeding*.

The *Copper Flat Expedited Inter Se Proceeding* to determine water rights claimed by NMCC, the proponent of the proposed Copper Flat Copper Mine, and William Frost and Harris Gray, legal owners of the water rights to be used by NMCC, came before the Third Judicial District Court in January 2014. A ten (10) day trial was held on March 14 through 18, 2016 and June 27 through July 1, 2016. After trial on the issues and after considering the parties' proposed findings of fact and conclusions of law, the Court concluded the following on December 28, 2017:

1) Any inchoate water rights are extinguished;
2) The combined amount of the water element for LRG-4652, LRG-4652-S, LRG-4652-S-2, and LRG-4652-S-3 **is 861.84 acre-feet per year** ("afy");

3) LRG-4652, LRG-4652-S, LRG-4652-S-2, and LRG-4652-S-3 have an additional, combined stock right;
4) LRG-4652-S-8 has a stock right; and
5) The amount of the water element for the open pit, LRG-4652-17 is 34.45 afy.

Third Judicial District Copper Flat Expedited Inter Se Proceeding Decision, page 3 (December 28, 2017) (emphasis added); *See* attached Exhibit C.

III. The *Inter Se* Decision Precludes MMD from Determining That NMCC's Revised MORP and Associated Documents Are Technically Complete.

The recently issued *Inter Se* Decision demonstrates that NMCC's revised MORP and associated documents do not provide "the most recent information available" regarding the proposed Mine's sole freshwater supply source imperative to mining operations and reclamation. The Third Judicial District Court held that NMCC only has the right to pump a mere *861.84 acre-feet* of water a year from its four groundwater production wells. *Third Judicial District Copper Flat Expedited Inter Se Proceeding Decision*, page 3 (December 28, 2017) (emphasis added). NMCC's revised MORP states that the Mine will need, at a minimum, *6,105 acre-feet* of fresh groundwater a year in order to operate the Mine. NMCC Revised MORP, page 1-1 (July 2017). NMCC's revised MORP does not account for this annual *5,243.16 acre-feet* of water deficit and clearly relies on incorrect information regarding NMCC's water rights in the four groundwater production wells. *Id.*

NMCC's revised "Mine Reclamation and Closure Plan," "Probable Hydrologic Consequences" Report, and "Predictive Geochemical Modeling of the Pit Lake Water Quality" Report also rely on incorrect information regarding NMCC's water rights in the four groundwater production wells. MMD, therefore, cannot determine that the revised MORP is technically complete.

MMD must require NMCC to revise its MORP and associated documents to properly account for this annual 5,243.16 acre-foot deficit in the mine's sole freshwater supply source imperative to mining operations and reclamation.

IV. In The Alternative, If MMD Determines That NMCC's Mining Permit Application Package Is Technically Complete, MMD Must Find That The Application Is Not Approvable Under The Mining Act And Its Implementing Regulations.

A. The *Inter Se* Decision Demonstrates That Reclamation of the Proposed Mine, In Accordance With NMCC's Proposed Reclamation Plan, Is Not Technically Feasible.

As previously discussed, NMCC's revised MORP and associated Closure Plan and "Predictive Geochemical Modeling of Pit Lake Water Quality" each propose that the Mine's future expanded pit lake will be reclaimed via rapid-fill of the pit. These documents further propose the use of 2,202 acre-feet of water from NMCC's four groundwater production wells over the duration of 6 months to rapid-fill the pit. The recent *Inter Se* Decision makes clear that NMCC does not have sufficient water rights in the four groundwater production wells – the sole source for reclaiming the future expanded pit lake. NMCC fails to account for the 1,340.16 acre-feet deficit imperative to reclamation of the future expanded pit lake.

With water rights of only 861.84 acre-feet of water per year in the four groundwater production wells, it would take NMCC nearly 3 years to fill the expanded pit lake with good quality fresh groundwater from its four production wells – nearly 6 times the duration proposed by NMCC. This slow-fill of the pit would defeat the purpose of rapid-fill, which is to prevent or minimize mineral oxidation of the pit walls.

The *Inter Se* Decision makes clear that the geochemical predictions relied upon in NMCC's "Predictive Geochemical Modeling of the Pit Lake Water Quality" Report are based upon a scenario that is not technically feasible: the rapid-fill of the expanded pit. NMCC's

PGM Report, page iii. MMD must therefore, at a minimum, require NMCC to revise this report based upon technically feasible scenarios. Because rapid-fill of the pit, as proposed by NMCC, is technically infeasible, MMD is precluded from ultimately approving NMCC's mining permit application pursuant to Section 19.10.6.606.B(6) NMAC.

Section 10.10.6.606.B(6) NMAC states, in pertinent part, the following:

> B. No permit shall be issued until the Director finds, in writing, that:
>
> (6) *Reclamation in accordance with the proposed reclamation plan is economically and technically feasible.*

Id. (Emphasis added).

B. MMD Must Request Additional Submittal or Changes To NMCC's Revised MORP and Associated Documents Pursuant To Section 10.10.6.605.D NMAC.

In the alternative, if MMD determines that NMCC's revised MORP and associated documents are technically complete, thereby finding that NMCC's entire mining permit application package is technically complete, MMD cannot find that the application is approvable pursuant to Section 19.10.6.605.E NMAC. This is because the Decision makes clear that NMCC's proposed reclamation plan is not technically feasible. MMD cannot approve NMCC's mining permit application if NMCC's proposed reclamation plan is not technically feasible. Section 19.10.6.606.B(6) NMAC.

When the Director of MMD determines that a mining permit application is not approvable under the Mining Act and its implementing regulations, the Director "shall specify in detail what additional submittal or changes are required." Section 19.10.6.605.E NMAC. Therefore, for the reasons discussed above, MMD must determine that NMCC's mining permit application is not approvable and request additional submittals or changes to NMCC's revised MORP and associated documents.

V. Conclusion

The *Inter Se* Decision demonstrates that NMCC's revised MORP and associated documents rely upon incorrect information regarding the proposed Mine's sole source of fresh groundwater imperative to mining operations and reclamation. The *Inter Se* Decision also demonstrates that NMCC's proposed reclamation plan is not technically feasible. Therefore, MMD must find that NMCC's mining permit application is technically incomplete and ultimately cannot approve such application, pursuant to Section 19.10.6.606.B(6) NMAC and Section 19.10.6.605.E NMAC.

In the alternative, if MMD determines that NMCC's revised MORP and associated documents are technically complete, thereby determining the entire mining permit application technically complete, MMD still cannot approve NMCC's permit application pursuant to the Mining Act's implementing regulations. Section 19.10.6.606.B(6) NMAC and Section 19.10.6.605.E NMAC.

Thank you for taking NMELC's concerns into consideration. We look forward to your prompt response.

Regards,

Jaimie Park, Staff Attorney
NMELC

Cc:
Holland Shepherd, MMD Mining Act Program Manager

Gabriel Wade, MMD Staff Attorney

DJ Ennis, Reclamation Specialist/Permit Lead

EXHIBIT
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Jaimie Park

From: Knight, Andrew, NMENV <Andrew.Knight@state.nm.us>
Sent: Thursday, November 09, 2017 11:55 AM
To: Jaimie Park
Subject: RE: IPRA Request Copper Flat Copper Mine

Yes, the Bureau is in the process of drafting a DP. Obviously, that process cannot be completed until the application is deemed technically complete.

From: Jaimie Park [mailto:jpark@nmelc.org]
Sent: Thursday, November 09, 2017 11:50 AM
To: Knight, Andrew, NMENV <Andrew.Knight@state.nm.us>
Subject: RE: IPRA Request Copper Flat Copper Mine

Thanks for getting back to me so quickly. So NMED is in the process of drafting a DP based on the application and all associated submittals? I'd just like to be clear about the process. I understood that drafting of a DP doesn't begin until after a technical completeness determination. But you're saying that drafting could begin before that? I understand that NMED doesn't have to talk the full amount of time to determine technical completeness. I'm just confused about when drafting of a permit begins. Hopefully you can help clear up my confusion.

Jaimie

From: Knight, Andrew, NMENV [mailto:Andrew.Knight@state.nm.us]
Sent: Thursday, November 09, 2017 11:44 AM
To: Jaimie Park <jpark@nmelc.org>
Subject: RE: IPRA Request Copper Flat Copper Mine

Jamie,
The application has not yet been deemed technically complete. However, I think what NMCC said is accurate, as far as it goes. We are indeed "considering" a draft DP, which will trigger further public notice requirements once it is complete. We have until mid-January to make the determination, but that does not necessarily mean that we will need that full amount of time to do so.

Andrew P. Knight
Assistant General Counsel
New Mexico Environment Department
Office: (505) 222-9540
Cell: (505) 907-8836

From: Jaimie Park [mailto:jpark@nmelc.org]
Sent: Thursday, November 09, 2017 11:33 AM
To: Knight, Andrew, NMENV <Andrew.Knight@state.nm.us>
Subject: RE: IPRA Request Copper Flat Copper Mine

Hey, Andrew. I just received a copy of NMCC's "Management's Discussion & analysis for the year ended June 30, 2017," dated October 30, 2017. I'm attaching it for your review. On page 5, it states that "NMED is now considering a Draft

Discharge Permit, which will trigger further public notice and public comment once it is complete." I'm confused by this statement. NMED has not made a technical completeness determination yet, correct? NMED recently requested additional information and now has until mid-January to make a technical completeness determination, correct? And it's only once that is made that NMED then moves to the next phase and starts drafting a DP, correct? So, is NMCC just clumsily phrasing things here or has NMED recently just made a technical completeness determination? Please let me know if I need to file my monthly IPRA request early.

Also, any information as to when the next cooperating agency meeting will be?

Thanks for any update you can provide. Take care.

Jaimie Park

From: Knight, Andrew, NMENV [mailto:Andrew.Knight@state.nm.us]
Sent: Monday, October 30, 2017 2:40 PM
To: Jaimie Park <jpark@nmelc.org>; Mascarenas, Melissa, NMENV <melissa.mascarenas@state.nm.us>
Subject: RE: IPRA Request Copper Flat Copper Mine

Ms. Park,
This email responds to your IPRA request of October 21, 2017.

1. NMED determination regarding Copper Flat Copper Mine pit lake being a private water, date range July 2017 through date of this request;
Response: No such determination has been made as of October 30, 2017.

2. Bureau of Land Management letter of concurrence for NMED's/Surface Water Quality Bureau's benefit regarding the proposed Copper Flat Copper Mine pit lake and associated patented claims surveys completed and a finding that the pit lake constitutes a "private water" and is not subject to either surface or groundwater quality standards;
Revised 6/14/12

Response: The following four documents were found to be responsive and are attached
1. NMCC letter to SLemon_27Sept2017
2. Copper Flat Boundary Survey Plat, March 2017
3. BLM letter from Ida Viarreal, September 13, 2017
4. BLM Map Township 15 South, Range 7 West

3. New Mexico Copper Corporation submittals to NMED pertaining to its discharge permit application since July 2017;

Response: One document was found to be responsive to this request, and is attached
1. MMD RFAI MORP response

4. New Mexico Copper Corporation submittals to NMED pertaining to the pit lake since July 2017;

Response: One document was found to be responsive to this request, and is attached.
1. NMCC Hydrologic Sink Info

This completes the Department's response to this IPRA request.
Sincerely,

Andrew P. Knight
Assistant General Counsel

New Mexico Environment Department
Office: (505) 222-9540
Cell: (505) 907-8836

From: Jaimie Park [mailto:jpark@nmelc.org]
Sent: Saturday, October 21, 2017 12:16 PM
To: Mascarenas, Melissa, NMENV <melissa.mascarenas@state.nm.us>
Cc: Knight, Andrew, NMENV <Andrew.Knight@state.nm.us>
Subject: IPRA Request Copper Flat Copper Mine

Dear Ms. Mascarenas,

Please find attached an IPRA request pertaining to the Copper Flat Copper Mine's pending discharge permit application.

Kind Regards,

Jaimie Park

SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lieutenant Governor

NEW MEXICO
ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau
1190 South St. Francis Drive (87505)
P.O. Box 5469, Santa Fe, New Mexico 87502-5469
Phone (505) 827-2900 Fax (505) 827-2965
www.env.nm.gov

BUTCH TONGATE
Cabinet Secretary

J.C. BORREGO
Deputy Secretary

MEMORANDUM

DATE: March 16, 2018

TO: Holland Shepherd, Program Manager, Mining Act Reclamation Program

FROM: Brad Reid, Mining Environmental Compliance Section
Bryan Dail, Ph.D., Surface Water Quality Bureau
Patrick Longmire, Ph.D., Principal Aqueous Geochemist, Ground Water Quality Bureau
Joe Marcoline, PhD., Mining Environmental Compliance Section, Ground Water Quality Bureau

THROUGH: Jeff Lewellin, Mining Act Team Leader, Mining Environmental Compliance Section

RE: NMED Comments for the Copper Flat Mine Permit Application, Applicant Submission of Two Technical Reports for NMED Review, Sierra County, MMD Permit No. SI027RN

The New Mexico Environment Department (NMED) received correspondence from the Mining and Minerals Division (MMD) on December 14, 2017 requesting that NMED review and provide comments on the above referenced MMD reports associated with the permitting action. In accordance with § 19.10.6.605.C NMAC NMED has 30 days to provide comment. Subsequent to the original deadline to provide comments, NMED requested and was granted an extension from MMD until March 19, 2018. NMED comments are set forth below.

Background

On December 13, 2017, New Mexico Copper Corporation (Applicant) for the Copper Flat Mine submitted two documents as addendum to MMD Permit No. SI027RN. The titles of the two documents submitted are as follows: *Probable Hydrologic Consequences of the Copper Flat Project, Sierra County, New Mexico* by John Shoemaker & Associates, Inc., December 2017; and, *Predictive Geochemical Modeling of Pit Lake Water Quality, Copper Flat Project, New Mexico* by SRK Consulting, December 11, 2017.

EXHIBIT
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NMED Recommendations to MMD Associated with Review of the Predictive Geochemical Modeling and Hydrologic Consequence Models

NMED reviewed the report *Predictive Geochemical Modeling of Pit Lake Water Quality* prepared by SRK Consulting (U.S.), Inc. for THEMAC Resources Group Ltd. SRK Consulting Inc., utilized the computer program PHREEQC developed by the US Geological Survey (USGS) to model different water-rock interactions. These interactions include groundwater and pit lake/wall rock mixing, precipitation/dissolution and adsorption desorption processes expected to occur at Copper Flat. Overall, the PHREEQC simulations are reasonable and applicable to post-mining, aqueous geochemical conditions expected to be encountered after cessation of mining operations at the Copper Flat site. A significant amount of site-specific water chemistry and mineralogical data and experimental results obtained from leachate testing have been conducted that are used as inputs to PHREEQC simulations for Copper Flat. These data and information provide relevance and meaningful input parameters for modeling complex geochemical interactions currently taking place at the site and those that are hypothesized or predicted to take place in the future.

NMED independently ran all PHREEQC simulations using input files provided in the report by SRK Consulting Inc., and evaluated and verified different output files serving as the primary source of material described in the text and shown in various figures in the SRK report.

NMED has the following comments and recommendations regarding PHREEQC modeling performed by SRK Inc. for the Copper Flat site. The comments are not specific action items, whereas the recommendations require additional geochemical modeling, investigation, and analysis.

Surface Water Quality Bureau Comments

Probable Hydrologic Consequences of the Copper Flat Project, New Mexico evaluated the hydrologic consequences related to the development of the Copper Flat Project, including reduced flows to artesian wells and springs, and reduced discharge to shallow aquifers along Animas Creek and Percha Creek. The consequences were evaluated using a numerical model developed from the United States Geological Survey (USGS) groundwater-flow modeling code MODFLOW. The model is well calibrated, reproduces measured data, and demonstrates an evaporative sink for the open pit lake, such that the pit lake waters are not mixing with subsurface waters. However, the SWQB has the following comments and concerns:

The SWQB urges demonstration that sufficient and robust monitoring plans are in place that assure the pit lake remains an evaporative sink under future climatic conditions to confirm model predictions and ultimately protect surface and ground waters.

The SWQB has concerns regarding the potential hydrologic consequences to perennial flows in Las Animas Creek and Percha Creek. Surface water in the Chihuahuan Desert, and the semi-arid southwestern United States in general, is a vital resource for numerous species including humans. The report indicates that, "effects on shallow groundwater (riparian) systems along Las Animas

Creek and Percha Creek are projected to be minimal, with a maximum of less than 2 ft of groundwater-level change on Percha Creek, less than 1 ft of groundwater-level change on Animas, and non-measurable small changes in surface flow and riparian evapotranspiration." The SWQB is concerned with the "non-measurable small changes in surface flow." Non-measurable can be significant when one is talking about creeks that are less than a foot deep. Given the current low baseflow conditions in Las Animas Creek and Percha Creek, any reduction or drawdown in the shallow groundwater that feeds them would likely reduce surface flows and potentially eliminate surface waters and aquatic habitat in certain reaches that are currently wet, which would cause additional stress and impairment to the aquatic community.

<u>Mining Environmental Compliance Section Comments</u>

1. During the review, an emphasis was placed on the end of mining drawdown in the bedrock aquifer around the open pit, i.e., the cone of depression, the evaluation of the extent to which the open pit will form an evaporative sink in the future, and on the potential for discharges from the tailing and waste rock stockpiles.

2. MECS concurs with conclusion by Copper Flat that the post-mining open pit will result in a perpetual evaporative sink and has confidence in the prediction. MECS will require monitoring of water levels in wells surrounding the open pit during and following mining to ensure that the predictions are correct.

3. MECS concurs with Copper Flat that the impact to groundwater chemistry should be minimal, and that net-percolation from the tailing areas is not expected, however, questions the interpretations of infiltration into the cover system, the properties of the cover materials and waste rock and ultimately the net-percolation from the waste rock storage areas. A detailed comment is included in the Specific Comments.

4. MECS also reviewed the modeling and predictions regarding the water-level drawdown in the SFG aquifer as well as the evaluation of the discharge to the Rio Grande. Considering the overall conceptual model, the conventional mathematic modeling approach, the ability to re-calibrate the model following the initiation of mining, and the long-term nature of the predictions, MECS concurs with the model and predictions to date. Since the predictions are extended out to a date exceeding the capability of our current understanding of the system, and past the capabilities of a predictive model, it is recommended that a re-calibration and evaluation of the system occur at a regular interval as impacts in wells are observed following the initiation of mining.

Specific Comments:

1. Copper Flat should revise the documents with the correct spelling of the word "tailing". The words tailing and tailings are often misused, even within the industry. For example, a facility has tailings in their ponds if the milled ore was from multiple sources, facilities, ore types or operations. A facility has tailing in their impoundments if the source was from one operation, unit or era of mining. In New Mexico examples would be the Deming Tailings Facility which had multiple sources or ore and the Molycorp Tailing Facility which only received tailing from the Questa Mine. While this comment has no effect on the modeling or operation, for the sake

of being correct, Copper Flat should refer to the proposed facility as a tailing facility that contains tailing from the new mining operation.

2. MECS requests that Copper Flat clarify the language regarding the water balance to differentiate between surface infiltration and net-percolation. Water that infiltrates into the cover or waste material has the potential to evaporate, be transpired, remain in storage or percolate down past the influence of evaporation and transpiration (net-percolation). To predict the water and gas flux to and from the atmosphere, this distinction in both a conceptual and a physical model must be considered.

3. MECS agrees that the impact to groundwater chemistry is likely to be minimal in part due to precipitation patterns, the low permeability of the underlying andesite, and the geochemical characteristics of the waste rock. MECS disagrees with the conclusion that net-percolation to groundwater from the waste rock storage areas is not expected. The evaluation presented is rudimentary at best and not appropriate for an evaluation of water and evaporative flux within a waste rock cover system and waste rock stockpile. In addition, the numbers are inconsistent with predictions from other mine sites with similar rainfall and evaporative regimes.

Specifically, the evaluation results in precise numbers without an error evaluation and without any supporting science. The evaluation does not include waste or cover material property information other than a number for the field capacity of the waste rock and an associated reference. The referenced document (JSAI, 2011) does not discuss or present the field capacity or have a discussion of the material properties of the waste rock. The evaluation does not rely on an industry standard Richards Equation based approach, nor does it account for redistribution or preferential flow and is not able to describe water or gas flow in an unsaturated material. The evaluation does not couple gas and water flux and has no mechanism to evaluate actual evaporation based on the soil potential and humidity of the pore gas. While potentially insignificant in this semi-arid climate, the evaluation does not have a realistic mechanism of representing transpiration from plants.

The draft DP-1840 requires groundwater monitoring, implementation of a material handling plan to limit production of acid rock drainage, construction of seepage interceptor systems at the toe of the waste rock stockpile, and development of soil water characteristic curves for reclamation cover material. If necessary, based on the information acquired during initial phases of mining MECS may require a more rigorous quantitative evaluation of the potential for impacts to groundwater from the waste rock.

<u>NMED Comments and Recommendations for Additional PHREEQC Modeling and Report Revision</u>

1. The updated model runs now assume two possible scenarios to pit infilling after mine closure. Scenario 1 is the unreclaimed fill scenario wherein the pit mine is allowed to re-fill naturally from area ground water seeps exposed during mining. Scenario 2 is amending the natural infilling with "good quality" ground water from supply wells used during mining. The latter scenario is predicted to reduce groundwater contact with oxidizable pit wall minerals, thus reducing mobilization of metals and acid generating reactions. However, during a presentation of the updated and refined pit lake model, it appeared that part of the improvement to water

quality under the reclaimed "rapid fill" scenario might be allotted to vegetative (or other) reclamation techniques to the pit void and haul road that would be under water in the refilled pit. It is unclear to the SWQB whether these terrestrial reclamation practices would enhance pit water if inundated by pit infilling, whether natural or rapid. A model run that only allows for terrestrial reclamation practices that improve water quality (above the predicted water line of the future pit lake) for both scenario 1 and 2 closure plans would be appropriate to make a valid comparison of the two possible closure plans.

2. Groundwater chemistry and hydrologic monitoring of the aquifer after open-pit mining has been terminated should be conducted to confirm the geochemical simulations quantified by PHREEQC. Groundwater monitoring at Copper Flat, however, is essential under current and future conditions. Additional simulations using PHREEQC are warranted in the future during mining operations, especially if site-specific changes in water chemistry, mineralogy, groundwater flow regime, and climatic conditions take place and vary from predicted conditions. No geochemical model or simulations are entirely perfect and uncertainties exist, especially for predicting future aqueous compositions, mineralogical assemblages, and other water-rock interactions occurring at mine sites.

3. Weaknesses or experimental gaps in thermodynamic data (MINTEQV4), serving as the basis for calculating aqueous speciation, mineral-solution equilibrium, and adsorption, are adequately presented in the SRK Inc. report. This discussion is important to provide to the reader because geochemical modeling contains varying uncertainties and multiple hypotheses can be tested by performing numerous simulations with different constraints placed on the "modeled system".

4. The post mining, rapid-pit fill is an optimal remediation strategy to significantly decrease acid rock processes by neutralizing acidic conditions in the pit lake during filling and steady-state conditions anticipated to occur in the long-term (100 years after post-mining operations). Groundwater pumped from two water supply wells has a sufficiently high total carbonate alkalinity (average value of 111 mgCaCO3/L, Appendix E) to maintain circumneutral pH conditions in the future pit lake at Copper Flat. The average pH of the two groundwater samples is 8.03. Higher bicarbonate alkalinity values (259 mgCaCO3/L, 316 mg/L of HCO3) are reported for the other water supply wells.

5. NMED agrees with the previous revisions to the water balance calculations provided by John Shoemaker & Associates, Inc. (JSAI), as evapo-concentration is the primary process controlling solute concentrations that influence mineral equilibrium and adsorption processes at the site. The new water balance calculations provided by JSAI improved model calibration for PHREEQC simulations under existing pit-lake conditions.

6. Figure 6-18 presents a trilinear or Piper diagram for both existing measured pit lake chemistry and future chemistry of the larger pit lake, suggesting that the future pit lake will be more uniform in major ion composition. This figure most likely assumes that the future pit lake is homogeneous in chemical composition in lateral and vertical dimensions, but it may change as a function of evapo-concentration of solutes under heterogeneous conditions. Monitoring of the future pit lake should confirm its major ion and trace metal composition as functions of depth and surface location.

7. Table 4-3. shows that mean concentrations of numerous measured solutes differ from those determined from PHREEQC simulations, however, they are generally within the range of measured solute concentrations. This suggests that the PHREEQC simulations are approximate for existing pit lake chemistry and model calibration is not perfect for antimony, arsenic, barium, boron, cadmium, chloride, fluoride, iron, lead, and molybdenum. A more detailed discussion needs to be provided in the text explaining discrepancies in solute concentrations that are controlled by a combination of adsorption/desorption and mineral precipitation/dissolution processes.

8. Average solute concentrations obtained from humidity cell tests (HCT) were used as input to the PHREEQC simulations. Use of maximum values of solute concentrations, however, would provide the most conservative or worst-case scenarios of the modeled geochemical processes quantified by PHREEQC and would capture or reduce uncertainty in the simulations. Additional PHREEQC simulations using maximum solute concentrations obtained from HCT should be performed by SRK Inc to more accurately bound model uncertainties in the future (100 years post-mining activities).

9. Suggested revision 2 also has relevance to Figures 5-6 through 5-16. These figures should be separated apart from each other, one set showing existing (measured) concentrations versus modeled concentrations and another set for post-closure conditions of the larger pit lake that will be present at Copper Flat. This is a scaling issue with the smaller existing pit lake and the much larger future pit lake that is part of the PHREEQC simulations. A more detailed geochemical discussion is warranted for Figures 5-6 through 5-16 evaluating mineral precipitation/dissolution (major cations and bicarbonate) and solute adsorption/desorption (arsenic and other oxyanions and cations). Time series plots for the existing pit lake show large variations in total dissolved solids (TDS) and major cations and anions, which support further refinement or calibration of existing and future conditions using PHREEQC.

10. Charge balance errors of zero were achieved for the different simulated aqueous solutions by stipulating that sodium was added to achieve perfect electroneutrality (zero percent charge balance error) by presence of excess anions such as chloride, sulfate, and total carbonate alkalinity. A discussion on this stipulation should be added to the report. Addition of sodium will influence mineral saturation index calculations by causing a positive bias in saturation indices values for sodium-rich silicates, carbonates, and sulfates.

11. Surface complexation modeling using PHREEQC was performed by SRK, Inc., including the adsorbent, ferrihydrite (general formula of FeOOH) to quantify removal of major cations and anions and trace elements from solution. What specific surface area value of ferrihydrite was used during the PHREEQC simulations? The default surface area for ferrihydrite is 600 m^2/g. If this surface area value was not used in the PHREEQC simulations, justification for the alternate value should be provided.

12. Table 3-2 in the report provides a list of equilibrated phases included in the pit lake geochemical simulations. Observed phases include alunite, barite, brochantite, calcite, ferrihydrite, fluorite, gypsum, mirabilite, and NiCO3. Numerous other minerals were included in the PHREEQC simulations that did not reach equilibrium conditions because different

solutions are undersaturated with respect to the phases. Additional PHREEQC simulations should be performed only using the observed phases. Many of the phases hypothesized to occur at Copper Flat have no influence on water chemistry because there is no mass of these minerals precipitated from solution, as shown in PHREEQC output. Precipitation of the additional minerals is negligible at Copper Flat. The additional minerals that are not observed at the site should to be removed from input files and new PHREEQC simulations should to be conducted by SRK, Inc.

13. Phosphorus-bearing and silica phases were included in the PHREEQC simulations. However, PO4 and silica were not analyzed in the water samples. Phosphorus-bearing and silica phases should not be included in the PHREEQC simulations.

14. A discussion on the geochemical evolution of observed and modeled compositions of the present and future pit lakes, shown in Figure 6-17 in terms of pH and Cu + Cd + Co + Pb + Ni + Zn, would be useful to the reader.

NMED Summary Comment

NMED has no additional comments at this time.

If you have any questions regarding the above comments, please contact Jeff Lewellin at (505) 827-1049.

cc: Bruce Yurdin, Division Director, NMED-WPD
Shelly Lemon, Bureau Chief, SWQB
Liz Bisbey-Kuehn, Bureau Chief, AQB
Fernando Martinez, Division Director, EMNRD-MMD
DJ Ennis, Copper Flat Mine, Lead Staff, EMNRD-MMD
Kurt Vollbrecht, Program Manager, MECS

State of New Mexico
Energy, Minerals and Natural Resources Department

Susana Martinez
Governor

Ken McQueen
Cabinet Secretary

Matthias Sayer
Deputy Cabinet Secretary

Fernando Martinez, Director
Mining and Minerals Division

March 22, 2018

Ms. Katie Emmer
New Mexico Copper Corporation
4253 Montgomery Blvd NE, Suite 130
Albuquerque, NM 87109

RE: Technical Comments on Baseline Data Reports for Copper Flat Mine, Sierra County, New Mexico, Permit Tracking Number SI027RN:

- ***Predictive Geochemical Modeling of Pit Lake Water Quality at the Copper Flat Project*, December 2017;**
- ***Probable Hydrologic Consequences of the Copper Flat Project*, December 12, 2017.**

The Mining and Minerals Division ("MMD") has received and reviewed two baseline data reports submitted as part of the Permit Application Package for the Copper Flat Mine. The two reports submitted on behalf of New Mexico Copper Corporation ("NMCC") are: *Predictive Geochemical Modeling of Pit Lake Water Quality at the Copper Flat Project, New Mexico*, prepared by SRK Consulting, December 2017; and *Probable Hydrologic Consequences of the Copper Flat Project, Sierra County, New Mexico*, prepared by John Shomaker & Associates ("JSAI"), December 12, 2017.

In accordance with 19.10.6.605 NMAC, MMD provided these documents to, and requested comments from, the New Mexico Environment Department, New Mexico Office of the State Engineer, Bureau of Land Management, and New Mexico Department of Game and Fish. After review, MMD has the following comments to be addressed in writing:

General Comments:

1. The two reports *Predictive Geochemical Modeling of Pit Lake Water Quality at the Copper Flat Project* and *Probable Hydrologic Consequences of the Copper Flat Project* provide good, technical analyses of what may happen to water quality and quantity during and after mining on the permit and affected areas. The operational and reclamation plans will need to incorporate surface and groundwater monitoring to verify the predicted direction of the models. Monitoring will be a future permit condition.

2. Please provide a detailed executive summary using these two reports addressing the probable hydrologic consequences of the operation on both the permit and affected areas. Specifically, please explain how the performance and reclamation standard, addressed in 19.10.6.603.C(4) NMAC (Hydrologic Balance), is achieved. Please explain how the reclamation shall result in a hydrologic balance similar to pre-mining conditions and how this will be verified at the end of reclamation.

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Technical Comments on *Probable Hydrologic Consequences of the Copper Flat Project, JSAI, December 12, 2017*

3. Figure 3.1: The 1 foot contour in this figure shows an abrupt turn to the east on the north side of Percha Creek. This figure is similar to Figure 3-19b in the Draft Environmental Impact Statement ("DEIS"; November 2015), which appears to show that this portion of the contour is controlled by negligible predicted drawdown in well LRG-10948, as shown in Figure A14 of the JSAI Report. However, LRG-10948 is listed in the Baseline Data Report ("BDR"; June 2012 by Intera) as a Percha Creek alluvial well (see Section 8.2.4.3.3 of the BDR) whereas Figure 3.1 represents projected groundwater drawdown in the Santa Fe Group ("SFG") aquifer. If LRG-10948 is an alluvial creek well, the predicted 1 foot contour would likely continue in the SFG south across Percha Creek. Please comment on whether LRG-10948 is modeled as an alluvial creek well or as a SFG well and any changes this may make on the predicted drawdown within the SFG at the end-of-mining.

4. The drawdown contour intervals of Figure 3.12 versus Figure A1 are different. Please include an approximate 1 foot drawdown contour on Figure A1 to allow for comparison of the end-of-mining drawdown versus the anticipated effects 100-years after mining.

5. Figure A1 appears to show propagation of the pit cone of depression within the crystalline aquifer post-mining. At about 40 to 50 years post-mining, the propagation of the cone of depression seems to diminish (i.e. see Figure A23, projected water levels at Ready Pay well). Please comment on this apparent propagation including how the water levels are projected to stabilize over time.

6. There appears to be an area of groundwater drawdown overlap in Grayback/Greenhorn arroyos between the crystalline aquifer and the SFG aquifer immediately east of the permit area (e.g. between the eastern edge of the permit area and monitoring well MW-8). Figure 3.1 shows approximately 10 feet of drawdown in the SFG in this area at the end-of-mining and Figure A1 shows up to 20 feet of drawdown in the crystalline aquifer 100-years after mining. Please comment on whether there are any anticipated cumulative effects of groundwater drawdown in this area.

7. Figure 3.14 of the report indicates that the pit lake surface will stabilize at the ~4,897 foot elevation and remain there for a number of years. What is the probability that it will remain at this level; either drop below or go above? What are the environmental circumstances that would allow the level to decrease or increase beyond the ~4,897 foot level? What might be the impacts on water quality or quantity?

Technical Comments on *Predictive Geochemical Modeling of Pit Lake Water Quality at the Copper Flat Project, New Mexico, SRK Consulting, December 2017*

8. Section 3.1.8 and Figure 3-1 indicate that the pit bottom will be covered with a suitable reclamation material before pit flooding occurs, however the October 13, 2017, amendment to the Mining Operation and Reclamation Plan ("MORP") submitted by NMCC does not propose to place reclamation materials below the waterline of the future pit lake. As stated in Section 6.2, the covered and submerged portions of pit reclamation are excluded from the surface area available (Table 6-1) for leaching, and therefore the pit lake modeling results presented in Section 6.6. It is MMD's opinion that any pit surface area exposed before submerging will likely be available to leaching. NMCC should plan to cover as much of the pit surface area as possible after mining to limit the amount of leaching, even those areas to be submerged. This would assist with reclamation prior to inundation of the pit using the rapid refill proposal. Please address.

9. Please utilize the calibrated PHREEQC model to predict the pit lake chemistry for the small pit lake that currently exists at the Copper Flat site. The model for the existing pit lake should utilize the same time steps used in the future pit lake model. Please provide comments/discussion on the results and compare them to the model results for the future pit lake.

10. Figures 5-1 and 6-1 show different rates of evaporation, direct precipitation, pit wall run-on etc., and a different final pit lake elevation. Please explain the differences between the values presented in these two figures.

11. Agency comments are attached and shall be addressed in writing.

Please provide responses to these comments within 60-days of receipt of this letter. If you have any questions or wish to discuss any of these comments, please contact me at (505) 476-3434 or by email at david.ennis@state.nm.us.

Sincerely,

David J. ("DJ") Ennis, P.G.
Reclamation Specialist/Permit Lead

Attached: Agency comments

cc: Holland Shepherd, Mining Act Program Manager
Brad Reid, NMED Permit Lead

GOVERNOR
Susana Martinez

DIRECTOR AND SECRETARY
TO THE COMMISSION
Alexandra Sandoval

DEPUTY DIRECTOR
Donald L. Jaramillo

STATE OF NEW MEXICO
DEPARTMENT OF GAME & FISH

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17 January 2018

David J. (DJ) Ennis, P.G., Permit Lead
Mining Act Reclamation Program
Mining and Minerals Division (MMD)
1220 South St. Francis Drive
Santa Fe, NM 87505

RE: Predictive Geochemical Modeling of Pit Lake Water Quality, Copper Flat Mine, Permit No. SI027RN; NMDGF No. 18208

Dear Mr. Ennis,

The New Mexico Department of Game and Fish (Department) has reviewed the document referenced above. New Mexico Copper Corporation (NMCC) submitted a report, prepared by SRK Consulting, which provides a predictive geochemical model that assesses future water quality in the Copper Flat Mine project pit lake, and compares the projections to the water quality in the existing pit lake. The work was undertaken to demonstrate compliance with New Mexico Mining Act regulations.

The modeling report concludes that "...changes to the hydrologic balance of the future pit water body that will form post-mining will be nil or minimal and the water quality will be very similar to that of the existing pit lake." The Department believes that the geological and hydrological complexities and inherent uncertainties make accurately predicting future pit lake water quality difficult. We believe that some type of mitigation strategy should be in place and implemented if pit lake water quality degrades to the point where it becomes hazardous to wildlife. The modeling effort was limited to projecting pit lake water quality for 100 years. However, the pit lake will persist "in perpetuity", and the time span over which the water quality can deviate from pre-mining conditions can be on the order of hundreds to thousands of years.

The Department also questions the predicted rate of evaporation that will concentrate chloride, sulfate, total dissolved solids (TDS) and trace elements in the pit lake over time, and may eventually lead to water quality conditions that are deleterious to wildlife. The current model appears to rely on historic climate data to predict the rate of evapoconcentration. The modeling should consider projected future climate regimes that would provide a plausible range of possible pit lake water quality outcomes. A hotter and drier climate for this region could result in substantially higher rates of evapoconcentration.

The proposed rapid fill reclamation scenario uses clean water from the production wells to achieve higher initial water quality of the pit lake. This approach informed the Department's previous comments to MMD regarding pit reclamation in the Mining Operations and Reclamation Plan to improve the value of the pit lake area for wildlife habitat. These recommendations involved modifications to the high wall to create ledges and cavities, and modifications to the Expanded 4900 Catch Bench to create a shallow

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littoral zone for aquatic plants. Because the pit lake is anticipated to exist in perpetuity and accurately predicting water quality and associated hazards to wildlife for that duration is questionable, the Department no longer supports creating features that may attract wildlife to the pit lake. Alternatively, we suggest installing clean water sources, such as impermeable rainwater catchment drinkers, that would attract wildlife away from the pit lake area. The Department also recommends additional modifications to the pit shell area that are designed to mitigate the impacts of periodic acid wall seep events on the pit lake.

Thank you for the opportunity to review and comment on the proposed project. If you have any questions, please contact Ron Kellermueller Mining and Energy Habitat Specialist, at (505) 476-8159 or ronald.kellermueller@state.nm.us.

Sincerely,

Matt Wunder, Ph.D.
Chief, Ecological and Environmental Planning Division

cc: USFWS NMES Field Office

GOVERNOR
Susana Martinez

DIRECTOR AND SECRETARY
TO THE COMMISSION
Alexandra Sandoval

DEPUTY DIRECTOR
Donald L. Jaramillo

STATE OF NEW MEXICO
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19 January 2018

David J. (DJ) Ennis, P.G., Permit Lead
Mining Act Reclamation Program
Mining and Minerals Division (MMD)
1220 South St. Francis Drive
Santa Fe, NM 87505

RE: Probable Hydrologic Consequences of the Copper Flat Project, Sierra County, New Mexico, Permit No. SI027RN; NMDGF No. 18207

Dear Mr. Ennis,

The New Mexico Department of Game and Fish (Department) has reviewed the report referenced above. New Mexico Copper Corporation submitted a report prepared by John Shomaker & Associates, Inc. (JSAI) that presents the probable hydrologic consequences for the Copper Flat Mine project.

The Department's primary concern remains the reaches of perennial flow and riparian habitat along Las Animas and Percha Creeks. These areas may be affected by the cone of depression caused by the pumping of production wells in the Santa Fe Group (SFG) aquifer.

The Department is particularly concerned about the riparian habitat along Las Animas Creek. This habitat is located less than one mile north of the production wells and supports the northernmost riparian forest dominated by Arizona sycamore (*Platanus wrightii*) trees. The JSAI report states on page 20 that:

> the increased transmissivity of the SFG results in water levels dropping below the bottom of the alluvium, forming a hydraulic disconnection between the SFG aquifer and the alluvial groundwater system. As a result, water flows from the alluvium to the SFG, through low-permeability clay beds, only by gravity; pumping from the SFG does not increase the flow or change water levels in the alluvium."

The JSAI report projects "non-measureable small changes in surface flow and riparian evapotranspiration" based on the presence of the low-permeability clay beds that minimize effects to shallow groundwater. It is unclear to the Department whether these changes are considered to be non-measureable relative to a range of normal or average flows, or whether withdrawals would create disproportionately greater reductions in surface water levels during low-flow periods.

The Department remains dubious that the report's findings of limited hydraulic connection between the SFG and the alluvial groundwater system provide sufficient security and mitigation to preclude impacts to wildlife and wildlife habitats from drawdown of groundwater levels. The Department requests clarification of what contingencies, if any, would be in place if the hydraulic connectivity between the SFG and the alluvial groundwater system proves to be greater than predicted, and results in adverse impacts to perennial flow and riparian habitat along lower Animas Creek.

Thank you for the opportunity to review and comment on the proposed project. If you have any questions, please contact Ron Kellermueller, Mining and Energy Habitat Specialist, at (505) 476-8159 or ronald.kellermueller@state.nm.us.

Sincerely,

Matt Wunder, Ph.D.
Chief, Ecological and Environmental Planning Division

cc: USFWS NMES Field Office

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SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lt. Governor

BUTCH TONGATE
Cabinet Secretary

J. C. BORREGO
Deputy Secretary

April 17, 2018

Leighandra Keeven, Geologist
Bureau of Land Management
Las Cruces District Office
1800 Marquess Street
Las Cruces, NM 88005

Subject: Copper Flat Administrative Final Environmental Impact Statement

Dear Miss Keeven:

The Surface Water Quality Bureau ("SWQB") of the New Mexico Environment Department ("NMED") appreciates the opportunity to provide review and comment on the above-titled document. Through a memorandum of understanding between NMED and the Bureau of Land Management ("BLM"), NMED is listed as a cooperating agency on this Administrative Final Environmental Impact Statement ("EIS") for the Copper Flat Mine ("CFM") and therefore provides the following comments:

1) The SWQB concurs that proper storage (minimizing run off to surface waters) of overburden, waste rock piles, and low-grade ore during and after mine life are crucial to protecting surface water quality. Since much of these matrices are to be on BLM lands and since the mine could be subject to unexpected closures, it is important that these storage facilities are developed at the start of CFM life to protect surface water quality according to 20.6.4.6 and 20.6.4.7 S(5) New Mexico Administrative Code ("NMAC").

2) Section 2-6 states the Greyback Arroyo, the watercourse altered through previous mining operations by Quintana Resources, is not to be altered further excepting remediation of existing waste rock piles and roads that need removal at mine closure. CFM operations should provide a demonstration of protections afforded to surface waters in Greyback during mine life. Section 2.1.15.10, the "Interim Management Plan" and section 2.1.15.13 indicate measures to isolate waste rock leachates during unplanned or temporary closures. These measures need to include (or emphasize) consideration of any water/stormwater discharges to Greyback Arroyo.

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3) In section 2.1.11 of the EIS, fencing and other exclusions of livestock and wildlife are discussed and may preclude some wildlife uses at the pit lake. However, these measures would likely not exclude waterfowl and other avian species; smaller vertebrate species, such as amphibians, reptiles and mammals; and insects. Potential barriers to avians are noted but not with detail about which methodologies would be employed, or the extent to which these structures would be maintained, and for how long, after mine closure.

4) The BLM has determined that the current and future mine pit lake will be wholly on patented mine claims, and thus private land. Pages 2-46 and 2-47 state that "because the mine pit lake is privately owned…and a hydrologic sink, [CFM pit lake] water is neither a water of the state, nor a water of the U.S. and would not be required to meet state surface water quality standards [20.6.4 NMAC]". It is also stated that the pit lake water quality, since it is not a water of the state, would meet permit conditions imposed by New Mexico Mining and Mineral Division ("MMD"), based on 19.10.6.603 NMAC, which states the water quality will be similar to what existed prior to the start of mining operations. In accordance with 20.6.4.7 S(5) NMAC, a "…water of the state does not include private waters that do not combine with other surface or subsurface water…". The determination that the pit lake will respond as a hydrologic sink through variable site conditions over time is subject to continued monitoring and verification. The SWQB feels it premature to assert jurisdiction of the waters within the mine pit lake until such a time to which the New Mexico Environment Department has been provided sufficient information to support adetermination. The SWQB requests language reflecting conditions for both scenarios; that in which the water is deemed to be private and does not combine with other surface or subsurface water, and that in which it does.

5) More detail is needed regarding the existing waste rock pile "west of the pit" [pg. 2-46] which is to be "reclaimed such that the western portion of the pit perimeter would be graded to drain away from the pit into a proposed toe channel that drains to Greyback Arroyo diversion". Pending specifics for reclamation of the waste rock pile such as the use of native soil for capping, run-off and leachate from the reclaimed areas pose a direct threat to the surface water quality of Greyback Arroyo, which is protected under the State's Standards for Interstate and Intrastate Surface Waters. The SWQB requests the EIS address how the reclamation plans to address protections of the water quality of Greyback Arroyo.

6) The EIS states that "during operations…NMCC would periodically update geochemical and hydrologic prediction models to incorporate new information to minimize impacts to wildlife". Further, that the protection and other mitigation to protect birds may include investigations of other measures "to the extent practicable". SWQB would like to clarify that incorporation of new information into the models would then lead to on-the-ground actions to minimize impacts to wildlife. Also, the SWQB would like to see the EIS address actions proposed to eliminate or severely reduce expcsure to wildlife from stormwater leachates collected from low-grade reactive ore.

7) Section 3.4, "Water Quality" [pg. 3-21] states that characterization of the affected environment for water quality is pertinent for several reasons and that defining baseline water quality will be essential for assessing whether post-mine water quality has been degraded. While the SWQB recognizes this element is required in accordance with 19.10.6.603 NMAC, it does not supersede the water quality standards afforded to any water of the state, such as Greyback Arroyo. The EIS acknowledges this but notes that surface water in Greyback Arroyo is subject to ephemeral water quality standards. As an unclassified water of the state, the intermittent water quality standards under 20.6.4.98 NMAC apply to Greyback Arroyo until a hydrology protocol ("HP") survey and a Use Attainability Analysis ("UAA") are conducted and approved by the WQCC and EPA in accordance 20.6.4.15 NMAC. The SWQB requests language be changed to accurately reflect the current protections afforded to Greyback Arroyo as intermittent.

8) The SWQB requests that the environmental and ecological impacts to nearby watersheds associated with draw down during mine operation and post-closure rapid fill of the pit be addressed; specifically, those within the Percha and Animas creeks.

Again, thank you for this opportunity to comment on the BLM's Administrative Final EIS for the Copper Flat Mine. If you have any questions, please contact me by email at shelly.lemon@state.nm.us, or Bryan Dail by email at bryan.dail@state.nm.us.

Sincerely,

Shelly Lemon

Shelly Lemon, Chief
Surface Water Quality Bureau
New Mexico Environment Department

Cc: Andrew Knight, Office of General Counsel, NMED (via email)
Kurt Vollbrecht, Program Manager, Ground Water Quality Bureau (via email)
Brad Reid, Environmental Scientist, Ground Water Quality Bureau (via email)
Kris Barrios, Monitoring, Assessment and Standards Section Program Manager, SWQB (via email)
Jennifer Fullam, Standards, Planning & Reporting Team Leader, SWQB (via email)
Bryan Dail PhD., Environmental Scientist (via email)
Holland Shepherd, ENMRD (via email holland.shepherd@state.nm.us)
David Ennis, ENMRD (via email David.Ennis@state.nm.us)
Ronald Kellermueller, DGF (via email Ronald.Kellermueller@state.nm.us)

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BUTCH TONGATE
Cabinet Secretary
J. C. BORREGO
Deputy Secretary

April 26, 2018

Leighandra Keeven, Geologist
Bureau of Land Management
Las Cruces District Office
1800 Marquess Street
Las Cruces, NM 88005

Subject: Copper Flat Administrative Final Environmental Impact Statement

Dear Ms. Keeven:

Through a memorandum of understanding between the New Mexico Environment Department ("NMED") and the Bureau of Land Management ("BLM"), NMED is listed as a cooperating agency on this Administrative Final Environmental Impact Statement ("EIS") for the Copper Flat Mine ("CFM"). Therefore, the Surface Water Quality Bureau ("SWQB") of the NMED provided comments dated April 17, 2018 on the above-titled document. The SWQB would like to provide the following clarifying points regarding comment #4 and a surface waters of the state determination.

4) In accordance with 20.6.4.7 S(5) NMAC, a "...water of the state does not include private waters that do not combine with other surface or subsurface water...". A property plat for the pit area was completed and sealed by a registered land surveyor, recorded with Sierra County, and submitted to BLM for review. The survey and plat confirm that the current and future mine pit lake is entirely on patented mine claims, and thus private lands. Furthermore, probable hydrologic consequences related to the development of the Copper Flat Project have been evaluated using a numerical model developed from the United States Geological Survey ("USGS") groundwater-flow modeling code MODFLOW. The model was calibrated and verified, and the results demonstrate an evaporative sink for the future open pit lake, such that the pit lake waters will not mix with subsurface waters.

   Pursuant to 19.10.6.606 NMAC of the New Mexico Mining Act, no Mining Act permit shall be issued until the Secretary of the Environment Department has provided a written determination stating that the applicant has demonstrated that the activities to be permitted or authorized will be expected to achieve compliance with all applicable air, water quality, and other environmental standards if carried out as described in the permit application. The land

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survey and hydrologic model are the key components to the determination of applicable surface water quality standards. However, a determination by SWQB on the status of the pit lake as a water of the state and applicability of surface water quality standards has not yet been made, even though there is sufficient information, because it is not the appropriate time in the process to issue a written determination by the NMED Secretary.

The SWQB also would like to provide the following clarifying points regarding comment #6 and actions to eliminate or reduce exposure of wildlife to stormwater.

6) The National Pollutant Discharge Elimination System ("NPDES") program regulates stormwater discharges from eleven categories of industrial activity. Category three (iii) is related to coal and mineral mining. Permit coverage is required of all phases of mining operations, whether active or inactive, as long as there is exposure to significant materials. Common requirements for coverage under an industrial stormwater permit include a stormwater pollution prevention plan (SWPPP). The SWPPP is a written assessment of potential sources of pollutants in stormwater runoff and control measures that are implemented to minimize the discharge of pollutants in runoff from the site.

   The SWQB acknowledges that compliance with a SWPPP that meets the requirements of the stormwater permit is generally assumed to be protective of surface water quality.

Again, thank you for the opportunity to review and comment on the BLM's Administrative Final EIS for the Copper Flat Mine. If you have any questions, please contact me by email at shelly.lemon@state.nm.us, or Bryan Dail by email at bryan.dail@state.nm.us.

Sincerely,

Shelly Lemon

Shelly Lemon, Chief
Surface Water Quality Bureau
New Mexico Environment Department

Cc: Andrew Knight, Office of General Counsel, NMED (via email)
Kurt Vollbrecht, Program Manager, Ground Water Quality Bureau (via email)
Brad Reid, Environmental Scientist, Ground Water Quality Bureau (via email)
Kris Barrios, Program Manager, SWQB (via email)
Jennifer Fullam, Standards, Planning & Reporting Team Leader, SWQB (via email)
Bryan Dail PhD., Environmental Scientist, SWQB (via email)
Holland Shepherd, ENMRD (via email holland.shepherd@state.nm.us)
David Ennis, ENMRD (via email David.Ennis@state.nm.us)
Ronald Kellermueller, DGF (via email Ronald.Kellermueller@state.nm.us)

Reid, Brad, NMENV

From: Catherine Berger <animascreekcat@gmail.com>
Sent: Friday, May 04, 2018 5:23 PM
To: Reid, Brad, NMENV
Subject: Copper Flat Mine Draft Discharge Permit

I am writing as a concerned citizen and local resident of the area most likely to be impacted by this discharge permit.

New Mexico is the most water challenged state in the United States, and to think that our environmental department doesn't understand the precarious position its decisions may have on the future prosperity of this magical land is profoundly disturbing. Our state's wide open spaces, its unpolluted waters and forever vistas are what will be a calling card for tourists and future residents.

We have a beautiful river that runs 500 miles north to south that could be an amazing asset if managed wisely. I can envision numerous hiking, biking, equestrian trails, parks, waterways, habitats, all that could bring in many millions in tourist dollars. Having these amenities would also encourage future retirees to relocate to our beautiful state.

If your policies allow for this discharge permit, it is one step in a direction that will surely lead to contamination of not only the groundwater, but the Rio Grande itself, irrigation water for Hatch chiles and Mesilla Valley chile and pecan growers. Not only that. but the water use necessary to operate the mine would drain the aquifer in surrounding communities, including those along the Rio Grande.

And this would all be done for a mere twenty years of operation and profit for WHO???

I hope you have a conscience.

Catherine McDonald-Berger
425 Animas Creek Road
Caballo, NM 87931

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BARNCASTLE LAW FIRM, LLC

1100 South Main, Ste. 20
Las Cruces, NM 88005

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RECEIVED
MAY 4 2018
Ground Water Quality Bureau

May 3, 2018

VIA OVERNIGHT DELIVERY

New Mexico Environment Department
Ground Water Quality Bureau
P.O. Box 5469
Santa Fe, NM 87502-5469

Re: **EBID Comments Regarding Copper Flat Mine, Application for DP-1840.**

Dear Sirs,

Please be advised that I am general counsel for the Elephant Butte Irrigation District (EBID). Enclosed you will find EBID's Comments Regarding the Copper Flat Mine, application for proposed Discharge Permit 1840. In addition to being substantive Comments regarding the proposed Permit, please accept these Comments as EBID's statement of interest in this matter. It is our understanding that the pending Application for DP-1840 will ultimately result in a public hearing, and this letter also serves as my entry of appearance on behalf of EBID for purposes of that public hearing.

Sincerely,

BARNCASTLE LAW FIRM

By ______________________
Samantha R. Barncastle

Enclosure
xc: Gary Esslinger, EBID
SRB/jlc

NMED DP-1840 Evaluation

Comments from the Elephant Butte Irrigation District

To the N.M. Environment Department.

"All that glitters is not gold." ***William Shakespeare***
(…or Copper)

EBID

ELEPHANT BUTTE IRRIGATION DISTRICT

Elephant Butte Irrigation District
530 South Melendres St.
Las Cruces, NM 88005

May 4, 2018

The New Mexico Environment Department's consideration of the Draft Groundwater Discharge Permit DP-1840 is premature and the draft permit is technically incomplete. If the permit is issued under the current circumstances, such action will necessarily be arbitrary, capricious, and/or an abuse of agency discretion.

- *Water rights uncertainty positively precludes issuance of the proposed new NMED discharge permit.*

The proposed NMED Groundwater Discharge Permit, DP-1840, identifies up to 25,264,000 gallons per day (28,299 acre-feet per year) of mine tailings and other process wastewater to be discharged to an impoundment at the Copper Flats mine site, and therefore necessarily assumes that NMCC has or will have sufficient water rights to produce this wastewater to begin with.[1] As a matter of fundamental logic, and indeed law, sufficient rights to water are absolutely essential in order for the proposed discharge permit to have any utility whatsoever, yet the proposed discharge permit does not acknowledge, let alone discuss this critical consideration anywhere. This oversight might be less egregious if this were a renewal of an existing discharge permit, but proposed DP-1840 is altogether new.

In fact, as a result of recent judicial determinations (Third Judicial District Court, Doña Ana County, State of New Mexico in *New Mexico ex rel. Office of the State Engineer v. Elephant Butte Irrigation District, et al.*, Case No.s 307-OA-9703126, 307-OA-9702236, and 307-OA-9702237, Dec. 28, 2017), NMCC does not, and nor does its affiliates, have rights to water in amounts even remotely close to sufficient to operate the mine as proposed, or to generate process wastewater in volumes anywhere near what is described in the proposed discharge permit. It is therefore pointless to proceed with the proposed NMED discharge permit in this case at this time. Furthermore, it is impossible to predict when, if ever, proposed DP-1840 may become pertinent.

This is because it is at best uncertain when, if ever, NMCC may secure rights to water sufficient to operate the mine as proposed. The New Mexico Office of the State Engineer (NMOSE), rather than the NMED, has jurisdiction over water rights in this instance, however 'chicken and egg' arguments are untenable here because water rights considerations are such a fundamental consideration in this case, and also because a Memorandum of Understanding, issued years ago by way of legislative direction, instructs the NMED to coordinate permitting activities with the NMOSE. In this case, basic logic dictates that water quality (i.e., discharge permit) considerations are inherently dependent on water quantity (i.e., water rights) considerations, which mandates that water rights issues must FIRST be resolved before the new discharge permit can be entertained. NMCC recently (February, 2018) filed an application with the NMOSE for a large (5,234 acre-feet per year consumptive use), new appropriation of

[1] Whether this quantity of water figure is the actual amount needed for mine production operations is questionable and is unsupported by the materials provided to EBID by NMED. It is expected that more water than is claimed is actually necessary for mine production operations.

groundwater in the area, which is in a basin that is known to be fully-appropriated with no unappropriated water available. To the extent that no unappropriated water is available in this area, which has been well-documented for many years, the NMOSE was/is in error to have even accepted this application to begin with. Similarly, NMED is in error to have entertained the proposed discharge permit unless and until sufficient water rights are secured. It is certain that this application for a new appropriation of water in an area where no unappropriated water is available, which NMED DP-1840 necessarily depends on, will be met with a barrage of legal challenges, likely of an interstate dimension, such as in the context of the ongoing United States Supreme Court Original Action styled Texas and United States v. New Mexico and Colorado, No. 141, and which is likely to protract for years costing New Mexico millions of taxpayer dollars.

- *Available geophysical data to support the groundwater model and the proposed new NMED discharge permit are lacking.*

The Shomaker 2013, 2014 and 2017 reports that describe the development of a groundwater model for the area rely heavily on the existence and extents of the so-called "Palomas Graben", purportedly located several miles east of the NMCC mine site but west of Caballo Reservoir, and situated parallel to the Rio Grande in the area for some unknown distance north to south. The existence of the Palomas Graben and related properties is a critical feature of NMCC's proposed production wells, the groundwater model, and certainly also proposed NMED DP-1840 and the potential for contaminant transport, especially since it is known that a sulfate contaminant plume persists in the area immediately downgradient of the mine, as left over from previous mining activities at the site. The available geophysical data for the area cited by Shomaker, and that proposed NMED DP-1840 assumes to be representative of the area, are constrained almost exclusively to the immediate area of the mine site. The actual extents and related properties of this critical hydrogeological feature are therefore largely unknown, and so it is necessarily uncertain what the likelihood of further migration and/or expansion of the existing contaminant plume further downgradient may be. It is essential that adequate geophysical data that are representative of the area hydrogeology, not just the immediate mine site and attendant features, be gathered and appropriately analyzed well in advance of the proposed NMED discharge permit. The fact is that NMCC has not, and nor has the NMED or anyone else provided any real assurance with convincing, current geophysical evidence that migration of the existing sulfate plume, which may expand to one degree or another if the mine goes into production as proposed, will not eventually make its way to, and contaminate, the major water supply of Caballo Reservoir. Failure to consider the larger area affected is unjustifiable, arbitrary, and capricious.

Similarly, available well and pumping data, and associated aquifer testing results necessary to support a genuinely calibrated regional groundwater flow model in this area are limited almost exclusively to data derived from the NMCC's existing production and monitoring wells maintained by the NMCC in very near proximity to the mine site. Apart from a collection of older, classic hydrogeology studies that reflect efforts back in the late 1970's and early 1980's to map the basic geology of the area, which Shomaker and Associates have referred to in order to generally inform the groundwater model, Shomaker acknowledges that judgment constrained by limited data is the basis for much of the model construction. In other words, the groundwater model is based largely on a collection of estimates of hydrologic properties of the aquifer system in the area to provide further estimates of what hydrologic impacts as a consequence of the mine's groundwater pumping might be. This is not an appropriate substitute for the need for spatially adequate, actual geophysical field data, but at least captures the reality that persistent surface water depletions can be expected in this case for some time beyond 100 years if the mine goes into production as proposed.

- *NMED SWQB approval of a Stormwater Pollution Prevention Plan, in addition to NMOSE Dam Safety Bureau permitting is necessary ahead of issuing the proposed new NMED discharge permit.*

The NMED SWQB has communicated (letter dated January 6, 2017) that it is concerned that mine-impacted stormwater may discharge into Greyback Arroyo, and that the existence of a sulfate plume downgradient of the mine is indication that contaminated stormwater has already, apparently for many years, been discharged into Greyback Arroyo. This acknowledgement of a pre-existing condition by the NMED SWQB is compelling evidence that both surface and groundwater contamination has already occurred, and has gone unabated since at least the last time the Copper Flats mine was operational (approximately 36 years ago). Clearly, an adequate Stormwater Pollution Prevention Plan should have been in place many years ago, and the absence of any such plan, even today, is arbitrary, capricious, and an abuse of discretion. At the very least, an adequate Stormwater Pollution Prevention Plan must first be completed by NMCC and appropriately publicized (subject to outside review and comment) before the proposed new NMED discharge permit proceeds. The more recent existence of an approved USACE NPDES permit for the mine does not obviate this requirement, and it certainly does not excuse the fact that surface and groundwater contamination has been ignored at the Copper Flats mine site for nearly 40 years. To this end, the appropriate, if not the only course of action at this time is that NMCC and/or other responsible parties must be made to first properly and completely remediate the Copper Flats mine site to rectify, at the very least, the existing sulfate plume before any further mining activities are even considered, including the proposed new NMED discharge permit.[2]

Likewise, the TSF design and all diversion plans for existing topographic drainages (which obviously relates to an adequate Stormwater Pollution Prevention Plan that remains nonexistent) must comply with the design and dam safety guidelines and regulations of the NMOSE Dam Safety Bureau, and in fact will require a permit from the NMOSE Dam Safety Bureau. No such permit for the Copper Flats mine TSF from the NMOSE Dam Safety Bureau exists, and nor is there any evidence that NMCC has even filed an application with the NMOSE

[2] An additional discussion on this issue is included below.

Dam Safety Bureau. Once again, NMED is reminded that it cannot abdicate its responsibilities by ignoring its legislative directive through MOU with the NMOSE to synchronize its permitting activities with those of the NMOSE, and once again, a 'chicken and egg' argument is invalid. A permit from the NMOSE Dam Safety Bureau must FIRST be secured, and due process therein honored, before proposed new NMED DP-1840 can be entertained.

The information provided in the documentation available to EBID, including the information collected through NMED's incomplete response to EBID's February 14, 2018 IPRA request, is inadequate to formulate a hydrograph resulting from a Probable Maximum Precipitation (PMP) storm event in the upper watershed. Substantially more information on watershed basin topography, soils and vegetation is required to generate a hydrograph for a PMP storm event. An inundation plan should also be presented to clarify this potential catastrophic event. An Emergency Action Plan (EAP) must be prepared in consultation with the corresponding Emergency Management Agency in Sierra County using the inundation plan developed in this section of the application. The draft EIS fails to provide any of these logical requirements for NMOSE Dam Safety Office approval of the proposed operations.

The NMOSE has responsibility for ensuring the embankment is designed and constructed in accordance with the provisions of NMAC 19.25.12.11, but NMED and NMCC should be familiar with these requirements and should have addressed them prior to considering issuing a discharge permit.

The Copper Flat Copper Mine Draft Environmental Impact Statement (DEIS), section 2.1.3.4 (DEIS pp 2-18 through 2-20), titled "Tailing Storage Facility" mentions that:

> "Based on the rule and regulation of the New Mexico Office of the State Engineer (OSE), the Copper Flat TSF would be classified as a large dam having significant hazard potential" (EIS, p 2-18). And that "All considerations regarding dam design addressed in this section of the document would require approval under a permit granted by the OSE Dam Safety Bureau. As such, the TSF would be designed to contain the equivalent of 100 percent of the probable maximum precipitation (PMP) during operations. A spillway capable of passing 75 percent of the PMP would be required upon closure."

New Mexico Administrative Code, NMAC, Title 19, Chapter 25, Part 12 (19.25.12) addresses the requirement for Dam Design, Construction and Dam Safety. Specifically, 19.25.12.11.C states that:

> 3) " ... for perimeter embankment dams with no spillway and no external drainage area, the dam must be capable of impounding the spillway design flood without failure." and,
>
> (3.c) "Dams classified as large, with a significant hazard potential rating shall have spillways design to pass a flood resulting from 75 percent of the probable maximum precipitation."

EBID agrees that the perimeter embankment must be capable of impounding 100% of the runoff generated by the PMP storm event during operations, and that the spillway design requires passing 75% of the PMP storm event upon closure. EBID also agrees that the 24-hr PMP is in the order of 26-inches in this location (DEIS, p 2-19).

In connection with the discussion regarding NMOSE Dam Safety requirements, it is notable that the tailings pond is designed for a 100-year storm event. The implication is that a storm event larger than the 100-year event would likely cause a failure of the system, creating a catastrophic discharge into Caballo Reservoir. Caballo Reservoir is the release point for Rio Grande Project water to EBID, El Paso County Water Improvement District No. 1 (including the City of El Paso's water supply) and Mexico. The choice of a design event generally considers the consequence of failure. Higher-risk projects have higher design standards. The use of a 100-year design event is clearly inadequate considering the consequences of contaminating Caballo reservoir with mine waste.

A 100-year event is the depth of precipitation with a 1/100 probability of being exceeded in a given year. However, the mine and its after-effects will be perched above Caballo for a long time. Looking at the probability of exceeding the design event over various time spans in the table below, there is a 14 percent chance that the design storm will be exceeded in the roughly 15 year life of the mine, and exceedance is more likely than not over the next century. This design standard is hardly suitable for protecting this key facility in the RGP.

Time span, years	Probability of Exceedance
1	0.01
5	0.05
15	0.14
50	0.39
100	0.63

A further discussion of these issues in the context of the risk posed to life and property is included in Section 20.6.7.10(J) of the NMAC, which necessarily applies to the proposed discharge permit, as discussed below.

- *Completion of the EIS is also necessary ahead of issuing the proposed new NMED discharge permit.*

The EIS process has largely been ignored by the state and federal agencies involved in the permitting process. EBID (and other stakeholders) prepared extensive comments on the DEIS which were summarily ignored. Indeed, the current DEIS is not the first time that the EBID has raised concerns about the Copper Flat project. EBID provided timely, substantive comments to the BLM by way of letter dated April 15, 1996 reflecting a time when Alta Gold Company had proposed to activate the Copper Flat mining facility, some fourteen years after Quintana

Mineral Corporation had completely abandoned the site, and a large sulfate plume that Quintana had created in the groundwater of the area that persists to this day. Among other things, the EBID pointed out then, and again raises the critical issue now that any water rights associated with this site are at best questionable, and again reminds NMED that in the absence of appropriate permits from NMOSE on water rights and dam safety issues, and/or a court order establishing water rights in a sufficient quantity, the proposed permit should not be issued.

The draft permit would create a hazard to public health and undue risk to property (20.6.7.10(J))

- *NMED has improperly failed to consider water rights issues as an undue risk to property, as the detriment to the Rio Grande Project cannot be understated.*

Recognition of water law is crucial to this process, specifically that the 19.26 NMAC and 19.27 NMAC regulations (see the Scope of these regulations) do not authorize the appropriation or use of water gained by the Rio Grande Project (RGP), as that water belongs to users downstream. The Proposed use of groundwater for the Copper Flat Mine will have serious detrimental effects on the water supply of the RGP, a federal Reclamation project that delivers water to EBID, El Paso County Water Improvement District No. 1 (EPCWID) and the country of Mexico. These depletions will reduce, to varying degrees, the water supply available to each of these RGP beneficiaries. Additionally, the discharge permit seems to require the interception of a certain quantity of surface water, which belongs to the Rio Grande Project and which will increase the amount of property interfered with by the proposed permit.

In the December 2017 report by John Shomaker & Associates Inc. (JSAI), groundwater discharge into the Rio Grande above Caballo Dam would be reduced by the mining activity by an estimated 1,089 acre-feet per year. This capture of tributary groundwater that would otherwise flow into Caballo Reservoir and be available for use by RGP beneficiaries reduces the water available for allocation to the two districts and Mexico. Impacts on the Rio Grande below Caballo Dam are slightly smaller, peaking at 983 acre-feet per year.

The 2008 Operating Agreement, implemented to settle litigation in federal district court between the two districts and the United States, determines allocation to the RGP beneficiaries based on usable water in storage in Elephant Butte and Caballo reservoirs and river system performance. The proposed groundwater withdrawals will negatively impact both usable water in storage and river system performance to the detriment of the RGP beneficiaries. The effects upstream of Caballo Dam will be borne by EBID, EPCWID, and potentially Mexico. The impacts on the river below Caballo Dam will be borne solely by EBID.

Usable water in storage is determined by summing the volumes of water in storage in Elephant Butte and Caballo reservoirs, and subtracting Rio Grande Compact credit water and imported San Juan-Chama Project water that may be stored in Elephant Butte Dam. Reducing the inflow of tributary surface water and groundwater into Caballo Reservoir will therefore reduce the allocation to the RGP beneficiaries. Mexico is allocated 60,000 acre-feet per year, except in years of extraordinary drought, when the allocation to Mexico is "diminished in the same proportion as the water delivered to lands under said irrigation system in the United States." (Convention, 1906). In years when Mexico's allocation is not reduced due to drought, the impact of the mining activity on surface water supply would be born entirely by EBID and EPCWID. Extraordinary drought conditions have resulted in a reduction in Mexico's allocation in most years since 2003, and in such years, Mexico will share in the reduced allocation, specifically absorbing 11.35 percent of the reduction in surface water supply. The rest of the reduction would be borne by EBID and EPCWID. Concerns regarding this project and its probable impact on both water allocation and quality have already been raised by the United States International Boundary and Water Commission, the entity responsible for working with its Mexican counterpart to ensure that deliveries to Mexico are accomplished.

Impacts of the mining activity downstream of Caballo Reservoir reduce the ratio of diversions charged to the allocations of surface water to the RGP beneficiaries to the release from Caballo Dam, known as the diversion ratio. Tributary groundwater captured by the mining operation reduces the amount of water available for diversion, thereby lowering the diversion ratio. The 2008 Operating Agreement ensures delivery of water to EPCWID and Mexico based on the amount of release, so any reductions in the amount of divertible water for a given level of Caballo release would be borne solely by EBID.

NMCC proposes to offset its impact on the RGP by leasing non-native water transferred from the Colorado River system to the Rio Grande through the San Juan-Chama Project by leasing water from the Jicarilla Apache Nation. This approach is problematic for a number of reasons:

1. The accounting mechanisms for San Juan-Chama water have never been extended below Elephant Butte Dam. Any use of water below Elephant Butte Dam would be a major change in historical management of the resource. Input and approval from the Rio Grande Compact Commission would likely be required. No process for this new use has been conducted, and the potential impacts are far-reaching.
2. The negative hydrologic impacts of the mining operation on the Rio Grande are not distributed equally among the Project beneficiaries. If leased San Juan-Chama water were placed in Caballo Reservoir to offset the impacts, the effects downstream would still be absorbed by EBID. If more water were added to offset downstream effects, EPCWID and Mexico would be included in its allocation, to the detriment of EBID.
3. The term of the lease is 15 years, and the hydrologic impact of the mining operation will continue for decades. Once the mine is closed and the mining company is gone, no one is likely to ensure continued replacement water.
4. The lease provides easy outs for both NMCC and the Jicarilla Nation. The lease approach appears to be in place for permitting purposes, but once the mine is operating or closed,

it is quite possible that the replacement scheme will be abandoned, and the hydrologic impacts will continue unchecked.

5. The Shomaker report states that:
   "If NMCC, at some point after mine operation ceases and impacts to the river are decreasing, elects to stop leasing water from the Nation to provide for offsets on the river, NMCC will either secure another lease of equally effectual water or secure and permanently retire water rights. NMCC will supply the offset water in the quantity and location sufficient to offset the effects of NMCC pumping, in a manner agreed by NMOSE."

   "Another lease of equally effectual water" is difficult to imagine. The Rio Grande basin is in persistent drought, and the region is shifting into a permanently more arid climate. Assuming more water will be available in the future is simply unrealistic. San Juan-Chama water is fully contracted, and as drought and climate change make it more scarce, the price will skyrocket. The ability to permanently retire sufficient water rights in the Lower Rio Grande administrative basin is nonexistent does nothing to address the hydrologic impacts on the Rio Grande Project.

This irresponsible and cynical effort by the NMOSE to make a new appropriation in a fully appropriated basin under the cover of an ill-conceived plan to offset with imported water is a demonstration of exactly the mind-set and management scheme that led New Mexico to permit non-RGP depletions of RGP water over the past several decades. The lease of San Juan-Chama water from the Jicarilla Apache Nation will not be sustained, as the water is priced well below market value, and the Nation will get a better offer. NMCC has no serious plans to offset its impacts on the RGP in general and EBID in particular. This issue is now in the US Supreme Court, and New Mexico will very likely find out that it is no longer business as usual. NMED's failure to consider the harm this scheme causes to EBID's property rights is a direct violation of 20.6.7.10(J), and is therefore arbitrary, capricious, and an abuse of discretion.

Should they be allowed, the persistence of surface water depletions in this case for some time beyond 100 years is further troubling because post-closure monitoring and maintenance by NMCC is said to only be planned for 12 years after NMCC has exhausted the economic potential of the Copper Flat site. Thereafter, and even to begin with, there is no clear, let alone reasonable, plan for how the impairment of Rio Grande Project water rights is to be addressed, or how the impairment of several flowing springs (of which livestock and wildlife in the area depend on) and a number of artesian wells along Las Animas Creek and Percha Creek will be made whole. There is no indication whatsoever that NMCC is committed to the long-term maintenance of impacts from the proposed mining activity, some of which (such as the impairment of senior water rights) are expected to persist essentially indefinitely. These issues must FIRST be resolved well ahead of the proposed new discharge permit.

Complexities associated with the fully-appropriated condition in NM's Lower Rio Grande basin, however apparently ignored by the NMED where the new discharge permit (and new appropriation of groundwater) is proposed in this case, is evident upon considering that in January 2013, the State of Texas, later joined by the United States, brought suit against the State of NM (and CO) in the US Supreme Court (Original Action No. 141). A central complaint asserted by Texas, and also the United States Department of Justice in this ongoing, massive legal battle is that existing and new depletions of water occurring in NM's Lower Rio Grande basin beyond Rio Grande Project contractual amounts, thereby impairing Rio Grande Project contractual beneficiaries (including the EBID), is a violation of the Rio Grande Compact. The NMED's entertainment of proposed new discharge permit DP-1840, which necessarily relates to NMCC's recent submittal to the NMOSE for a large, new appropriation of water in NM's fully-appropriated Lower Rio Grande basin, has already, unmistakably aggravated existing, very serious interstate tensions in these matters. The State of Texas, through the Texas Rio Grande Compact Commissioner, has raised grave concerns about this project, which NMED and other agencies are seemingly ignoring to the direct detriment to the State of NM. See letter dated April 12, 2018 from the Rio Grande Compact Commissioner for the State of Texas to NM State Engineer Tom Blaine (Compact Commissioner for NM), attached. In this letter, the Compact Commissioner for Texas plainly states that NM's handling of NMCC's interests in water to date is particularly inflammatory, and potentially quite damaging to any hope of productive settlement discussions that are otherwise the subject of US Supreme Court proceedings. Here again, the NMED cannot ignore its legislative directive as evidenced by MOU with the NMOSE years ago to synchronize its permitting activities with those of the NMOSE, and here again, a 'chicken and egg' argument is entirely untenable. The water rights issues in this case must FIRST be resolved. Failure to consider the property rights directly harmed by the proposed discharge permit, and the proposal to outright misappropriate those rights, is again a direct violation of 20.6.7.10(J), and is therefore arbitrary, capricious, and an abuse of discretion.

The predicted surface water depletion rates used in the groundwater model developed by John Shomaker and Associates (JSAI, 2013; 2014; 2017) as part of the underlying effort to support proposed NMED DP-1840 prove that the NMED is aware that impairment to the Rio Grande Project is expected as a result of NMCC's proposed activities, yet NMED remains silent on this critical issue. The NMED is again reminded that it cannot ignore its legislative directive as evidenced by MOU with the NMOSE years ago to coordinate its permitting activities with those of the NMOSE. Assuming that the modeling efforts undertaken by Shomaker and Associates on behalf of NMCC are appropriately conservative, the results reveal that depletions of senior Rio Grande Project surface water rights are expected to persist for some time over 100 years following the closure of the mine. These depletions to the Rio Grande Project directly impair the senior water rights of the EBID members in NM, EPCWID members in Texas, and also flows of the Rio Grande obligated to Mexico as per international convention. Significantly, proposed NMED DP-1840 completely ignores how these depletions and resultant impairment of senior water rights are going to be made whole at any time, let alone assured for the next 100 years and beyond. It is therefore necessary that proposed DP-1840 be postponed indefinitely pending coordination and resolution with the NMOSE, the State of Texas, and related Rio Grande Project contractual interests, including Mexico.

- *The proposed post closure monitoring is insufficient to ensure protection of property rights*

The BLM proposes a 12-year period for post-closure monitoring, care and maintenance (DEIS, p 2-59). EBID considers this period to be inadequate for post-closure operations. A period of at least 100 years would be more adequate for this facility than the proposed short term duration, particularly given that depletions of surface water resources in the neighboring area are expected for over 100 years as a consequence of NMCC's proposed production well pumping.

Further, the HDPE liner in the TSF is expected to perform essentially forever, which is physically not possible. The site reclamation plan calls for placing many tons of tailing material and waste rock into the TSF. The piling of many feet of very different materials will create large differential settling and stresses on the HDPE liner that will likely induce shear or tension ruptures in the lining material, resulting in failure of the liner. There is no long-term monitoring plan to detect such damage, or remediation plan to mitigate it. The NMCC proposal does not consider that the geomembrane will ever fail (DEIS p 2-64), in spite of technical literature to the contrary (Koerner and Hsuan, 2003, Koerner et al., 2011, Peggs, 2010). Groundwater contamination by copper and other metals is likely to occur after HDPE geomembrane rupture because:

a. The proposed tailings dam is not expected to behave as a dry dam (it is not expected to have a regular spillway that should empty the dam within the regulated OSE timeframe), and
b. The liquid wastes within the dam should be driven by hydraulic head into the underlying aquifer.

- *There remain inadequate assurances regarding offsite copper and other inorganics migration to ensure private property rights are protected into the future*

The EBID finds the DEIS, upon which the NMED proposed discharge permit necessarily relies, to be deficient in the lack of explanations on possible contaminant migration routes and environmental impact of these likely contaminant migration events. EBID has identified three potential migration routes for the copper in the TSF that can have considerable impact upon the waters of the Rio Grande. These waters are presently used for both irrigation (EBID, EPCWID, and Mexico) and municipal drinking water use (City of El Paso's surface water treatment plants and LRGPWWA's plant in New Mexico which is under NMED review for construction):

1. Surface water migration into Caballo reservoir;
2. Groundwater contamination and subsurface flow into Caballo Reservoir;
3. Fugitive air emissions of heavy metals from mining operations.

Other state and federal regulatory standards that are more restrictive than the Copper Rule may apply, such as 3103 standards and CERCLA.

- *Given that the existing sulfate plume has clearly migrated, provision for its rectification should be required prior to operating a new facility.*

It is clear from the proposed rule changes to CERCLA, 2017 (i.e., Superfund) that the EPA will take drastic measures against the Hardrock Mining Industry in the United States by requiring that the mining operations are compliant with the CERCLA regulations. The financial responsibility of the proposed amendments to the proposed CERCLA rule will, when made final, increase the likelihood that owners and operators will provide funds necessary to address the CERCLA liabilities at their facilities, thus preventing owners or operators from shifting the burden of cleanup to other parties, including the taxpayer. The copper mining industry is likely to fall under this provision, and closer scrutiny, as example-after-example of abandoned and active mining copper operations are subject to the proposed regulation amendments. Under the rule changes, Retroactive Parties (RPs) may be held liable for acts that happened before Superfund's enactment in 1980; Any one potentially responsible party (PRP) may be held liable for the entire cleanup of the site (when the harm caused by multiple parties cannot be separated). This is potentially the case of the Hardrock Mining Operation at the site. A PRP cannot simply say that it was not negligent or that it was operating according to industry standards. If a PRP sent some amount of the hazardous waste found at the site, that party is liable. Under CERCLA a PRP is potentially liable for government cleanup costs, damages to natural resources, the costs of certain health assessments, and injunctive relief (i.e., performing a cleanup) where a site may present an imminent and substantial endangerment.

NMED should require the complete rectification of the existing sulfate plume before it allows any additional pollution, or at a minimum, should require remediation of the entire volume of contamination following closure of the mining operation. Failure to require remediation of known contamination while simultaneously allowing additional pollution is a dereliction of its duty and is a direct harm to the public interest. Further, the proposed discharge permit conditions fail to require long term responsibility for additional pollution added by NMCC's operation, thus compounding the already existing problem. Additional safeguards should be put in place to ensure the taxpayers are not ultimately on the hook for remediation that should otherwise be handled by NMCC.

- *3103 Standards should apply to all contamination resulting from this project*

Referring to the discussion above regarding the probable failure of HDPE liner in the TSF, and the probable contamination that will occur upon failure of the same, 3103 standards will apply. Even so, the risk to property once a contamination event is detected cannot be understated, and the failure to apply 3103 standards at the outset of this project is an unnecessary and irresponsible risk. Considering that entire communities rely on the water that will ultimately be contaminated, complete remediation to 3103 standards should be required in this instance, even if not otherwise required through the Copper Rule. The safest, most responsible approach to this project, to ensure the continued safety of drinking water and the viability of the entire agriculture community below the proposed project are not jeopardized, would be to require 3103 standards to apply to this particular copper mine. As the courts of New Mexico have recognized, NMED must strike a wise balance among competing interests. That means NMED has a responsibility to balance all of the interests involved, and failure to consider that southern New Mexico, Texas and Mexico rely on a clean water supply that may be damaged by this project is arbitrary, capricious, and an abuse of agency discretion.

EBID has been denied due process by NMED's failure to comply with NM Inspection of Public Records Act, and while these comments are necessarily incomplete as a result of said violation of due process, EBID reserves the right to raise all necessary and proper issues at public hearing on the proposed permit.

On February 14, 2018 EBID sent an Inspection of Public Records Act request to NMED in which all documents, records, and other information related to the proposed permit were requested. The agency failed to provide said documents in a timely fashion, and it was later determined that the agency altogether failed to provide a complete and accurate response to the IPRA request. As a result, EBID is working from an incomplete set of documents which it had only three weeks to review prior to submitting the above comments. Despite the unfairness of the situation, the agency refused to provide an extension of time to allow EBID to receive the remainder of the documents the agency failed to initially provide, and further refused to allow any additional time to review the thousands of pages of documents that were provided. Such a situation creates grave concern, gives the appearance of impropriety, and leads EBID to believe that this process is inherently flawed. NMED's failure to follow the law must be corrected, the documents requested must be provided, and adequate time to review the same must be allowed before pushing for a quick hearing to otherwise avoid further due process failures.

RIO GRANDE COMPACT COMMISSION

PATRICK R. GORDON
TEXAS COMMISSIONER

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April 12, 2018

VIA ELECTRONIC MAIL AND
FIRST CLASS MAIL

Mr. Tom Blaine
New Mexico Compact Commissioner
Office of the State Engineer
P.O. Box 25102
Santa Fe, New Mexico 87102

Re: Application for Permit to Appropriate – New Mexico Copper Corporation ("NMCC") – Notice of Violation of Rio Grande Compact

Dear Commissioner Blaine:

Texas has recently been informed that an Application for Permit to Appropriate 5,234 acre feet of water (the "Application") by NMCC is in the process of being approved by New Mexico. The Application states that this water is needed by NMCC for the operation of a mine ("Mine") located close to the Rio Grande and Caballo Reservoir.

The Draft Environmental Impact Statement ("DEIS") for the Mine and the Hydrology Report prepared by John Shomaker & Associates, Inc. dated December 2017 reflect that the Mine will have a direct, large in magnitude, and long term impact on Compact water delivered by New Mexico to Texas in the Rio Grande and stored in Caballo Reservoir. The New Mexico Interstate Stream Commission ("NMISC") confirms this in a letter dated February 26, 2016, objecting to the DEIS. I wanted to put you on notice of Texas's concerns.

New Mexico is a party to the Rio Grande Compact, see Act of May 31, 1939, ch. 155, 53 Stat. 785 (the "Compact"), along with the States of Texas and Colorado. The Compact apportions the waters of the Rio Grande between the States of Colorado, New Mexico and Texas. The Compact also provides for the delivery of water to Mexico under a 1906 Treaty. New Mexico delivers Texas's apportioned water under the Compact in Elephant Butte Reservoir. At such time, the water belongs to Texas and is only available for use by Texas and certain contract and treaty parties in New Mexico, Texas and Mexico. New Mexico is prohibited from diverting or using Texas's water.

Texas is aware of NMCC's attempts to acquire rights to water that would purportedly offset the impacts to the Rio Grande and Caballo Reservoir. The fifteen year lease that NMCC has with the Jicarilla Apache Nation for San Juan Chama water that New Mexico may require as some type of offset for the diversion of Texas's Compact water would not come close to remedying the immediate and long term depletions to the Rio Grande and Caballo Reservoir caused by the Mine. In fact, NMCC states in the Application that it needs this water to operate the Mine. The DEIS states that the impacts to the Rio Grande and Caballo Reservoir will last over 100 years. A "so called" fifteen year offset that New Mexico calculates in its sole discretion does not remedy the harm to Texas that will be caused by the approval of the Application, even assuming as stated by the NMISC that such offset was in "real-time."

As you are aware, Texas sued New Mexico in the United States Supreme Court, see Texas v. New Mexico, Original No. 141. This case is currently before the Court and is moving forward toward trial and resolution, following the Court's denial of New Mexico's motion to dismiss. Discovery will commence soon.

The NMCC proposed actions and the granting of water rights by your office will directly and adversely impact Texas. New Mexico's approval of this action, as well as granting permits for other actions (such as the Gillis pump immediately below the Caballo Reservoir), are violations of the Compact. These ongoing violations reinforce Texas's action in the United States Supreme Court and add to its recoverable damages against New Mexico.

Sincerely,

Pat Gordon

Pat Gordon,
Texas Commissioner

cc: Kevin Rein, Colorado Compact Commissioner
Hal Simpson, Federal Chairman, Rio Grande Compact Commission

THEMAC RESOURCES | NEW MEXICO COPPER CORPORATION

May 3, 2018

RECEIVED
MAY 4 2018
Ground Water Quality Bureau

Brad Reid
Mining Environmental Compliance Section
Ground Water Quality Bureau
New Mexico Environment Department
1190 South St. Francis Drive
P.O. Box 5469
Santa Fe, NM 87502-5496

RE: Transmittal of New Mexico Copper Corporation's Written Comments on Draft Discharge Permit 1840, for Copper Flat Mine, Sierra County

Dear Mr. Reid,

In your letter dated February 2, 2018, you provided a copy of the New Mexico Environment Department (NMED) Draft Discharge Permit 1840 (DP-1840) for the Copper Flat Mine, proposed for approval. NMED deemed DP-1840 technically complete on February 1, 2018 and allowed time for public review and comment. We have completed our review of Draft DP-1840 and I am providing comments on behalf of New Mexico Copper Corporation (NMCC) for NMED's consideration. We have presented NMCC comments imbedded as track-changes in the Draft DP-1840 for clarity. We are also providing a separate document with our reason and/or explanation for proposed changes to the permit.

We appreciate the time and effort NMED has put into the review of Discharge Permit Application 1840 for Copper Flat Mine. If you have any questions regarding these comments, please contact me or Jeff Smith, our Chief Operating Officer.

Best regards,
New Mexico Copper Corporation

Katie Emmer

Katie Emmer
Permitting & Environmental Compliance Manager

Attachments:

1. NMCC Tracked Changes in NMED letter dated February 2, 2018 and in following Draft Discharge Permit D-1840
2. NMCC Comment Explanations NMED Draft Proposed Discharge Permit DP-1840 Copper Flat Mine, May 3, 2018

CC: David Ennis, Reclamation Specialist and Copper Flat Permit Lead, Mining & Minerals Division (david.ennis@state.nm.us)

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Ground Water Quality Bureau

New Mexico Copper Corporation Comment Explanations
NMED Draft Proposed Discharge Permit DP-1840
Copper Flat Mine
May 3, 2018

The New Mexico Environment Department (NMED) has provided notice to New Mexico Copper Corporation (NMCC) that it has proposed approval of the Ground Water Discharge Permit DP-1840 and provided NMCC with a draft of the permit for review. NMCC has completed its review and has provided comments for NMED's consideration imbedded as track-changes in an accompanying document. NMCC has also provided the following reason and/or explanation for its proposed changes to the permit.

1. **Explanation for Condition C113.G.** The NMED explains that the reason for this condition is to require that NMCC reclaim two historic waste rock stockpiles at the mine facility prior to beginning operations. NMED's explanation requires clarification as the term "beginning operations" is not defined in the Copper Rule. The representations and commitments proposed by NMCC for reclaiming the existing stockpiles EWRSP-1 and EWRSP-2B as well as the language proposed by NMED in Condition C113.G are different than in NMED's explanation.

   NMCC, on page 65 of its Discharge Plan, Rev. 1 of July 2017 in the first sentence of the last paragraph clearly commits that "EWRSP-1 and EWRSP-2B will be reclaimed during the operations phase of the project". In its Closure Plan, also called the Reclamation Plan, in Section 4.0, Reclamation Schedule and Sequence, NMCC commits to reclamation of the EWRSPs during the mine pre-production period, to be completed in year two after NMCC has begun "operation" of its new mine pursuant to a New Mine Permit issued by the New Mexico Mining and Minerals Division (MMD). Condition C113.G of NMED's proposed DP requires that "[C]losure of EWRSP-1 and EWRSP-2B shall be completed during the mine start-up phase…"

   NMCC requests that NMED revise its explanation to delete the phrase "prior to start-up of operations" and replace it with "require that NMCC reclaim EWRSP-1 and EWRSP-2B during the pre-production period of its mining operation."

2. **Explanation for Condition C113.H.** NMCC requests the same revision to this as that which has been requested for C111.G, above.

3. NMCC requests that the contact telephone number for the Mine Facility contact be corrected to (505) 382-5770.

4. **A100B.** The language of A100B is not consistent with that of B100C, which refers only to the 25,264,000 gpd as tailings slurry. As such, NMCC requests that the phrase "tailings slurry, i.e.," be inserted after "per day of" on line 2 of Condition A100B.

5. **A101B.** NMC is concerned that this condition as currently proposed is in conflict with design requirements of the Copper Rule. Certain Impacted Stormwater

Impoundments are required to have a spillway allow for potential discharge in the event of a precipitation event that exceeds design capacity. These discharge points will require an NPDES permit even though they will not discharge under normal conditions. NMCC requests revision of this condition to account for the NPDES requirement.

6. **A102A.** The manner in which this condition is currently written is in conflict with Subsection H of 20.6.2.3.3109(4) NMAC which provides that for new discharges, the term of the discharge permit approval shall commence on the date the discharge begins, but in no event shall the approval term exceed 7 years from the date the permit was issued. NMCC requests that this condition be revised to delete the phrase "whichever comes first" from the condition.

7. **B100A.** NMCC requests that the word "tailing" at page 3, line 2, be changed to "tailings" here and wherever it also used in the document to be consistent with definition number 59, "Tailings" of the Copper Rule.

8. **B100B.** NMCC requests that the phrase "at the open pit" be deleted from the last sentence of this condition to make clear that no mining of any kind has occurred at the site since 1982.

9. **B100E.** NMCC requests that this condition be revised at line 3 to add "a pipeline into" after "through", at line 5 to delete "at" and insert "to construct", and to delete the last sentence of this section in its entirety to provide more clarity.

10. **B100F.** Impacted Stormwater Impoundment B collects water from WRSP-1. WRSP-1 is located in the OPSDA (see page 5, B103B.1 of the draft permit). Water collected in Impacted Stormwater Impoundment B will be pumped to the process water impoundment during normal operating conditions. Only the overflow that would occur in the case of a precipitation event that exceeds the design capacity of the impoundment will be diverted into the pit. Therefore, NMCC requests that the phrase "at the open pit sump" on line 2 be moved to line 1, inserted after "collected" to make it clear that this condition only applies to the pit water and not Impoundment B water pumped to the process water pond.

11. **B100G.** NMCC requests that at line 2, the word "structure" be changed to "structures", as there are more than one diversion structures that will be maintained, i.e., the tributaries at the NW corner of the sit and that at line 3, the phrase "and its tributaries" be inserted after "Grayback Arroyo".

12. **B100H.** NMCC requests that at line 3, the phrase "covered with an engineered soil cover system and revegetated" be deleted and replace with "reclaimed". This makes it clear that the open pit, which is an "impacted area", will not be covered.

13. **B101A.** NMCC requests at line 3, that the phrase "Revised Application" be changed to "DP Application, Rev. 1" to clearly identify this document as the most recent. This

reference nomenclature should be utilized throughout the document instead of "revised application".

14. **B102C.** NMCC requests that the word "may" be inserted at line 2 before "generate" and at line 4 before "exceed".

15. **B103A.1**. NMCC requests that the phrase "during operations" be inserted at the end of the last sentence in this section to provide clarity.

16. **B103.B4.** NMCC requests that at line 3- 512,000 tons be changed to 486,000 tons per Table E2 of the MORP Reclamation Plan.

17. **B103.B6.** NMCC requests that at line 5- 913,000 tons be changed to 760,050 tons per Table E2 of the MORP Reclamation Plan.

18. **B103.B7.** NMCC requests that at line 3- 523,000 tons be changed to 333,300 tons per Table E2 of the MORP Reclamation Plan.

19. **B103.B8.** NMCC requests that at line 3- 1.2 million tons be changed to 1,000,050 tons per Table E2 of the MORP Reclamation Plan.

20. **B103.C2.** NMCC requests that the last sentence of this condition be deleted as NMCC's material characterization and handling plan proposed in the DP is for the waste rock stockpiles.

21. **B103.D.1.b.** NMCC requests the footprint of the Coarse Ore Stockpile be changed to 5 acres to more closely reflect the size of the stockpile operating area.

22. **B103.D.2.** NMCC requests that at line 4, the phrase "(or equivalent)" be inserted after "liner"; at line 19, the phrase "located in the plant area" be inserted after "Process Water Reservoir"; at line 20, the phrase "for use in the process" be inserted after "pipeline"; and beginning at line 20, the last two sentences be moved up to line 5 and inserted after the sentence that ends with "sub-base". These changes will add clarity and are consistent with NMCC's DP application.

23. **B103.F.1.** NMCC requests that at line 2, the phrase "in the plant area" be inserted after "OPSDA", and that at line 3 (carry-over sentence to page 9), 5,433,472 gallons be changed to 5,433,849 gallons per Table E4 of the MORP Reclamation Plan.

24. **B103.F.4.b.** NMCC requests that paragraph 2 of F.4.b be identified as a new paragraph "c" to differentiate between SW-B and SW-C. Also, at line 6, the catchment area should be changed from 315.76 to 198.66 acres as shown on Table 1 of Appendix B of the Discharge Plan.

25. **B104.A.** NMCC requests that at line 1- 25,246,000 gpd be changed to 25,264,000 gpd and the phrase "38,000 tons of tailings per day" be inserted after "tailings slurry" per page 29 of the DP application.

26. **B104.M.** NMCC requests that the phrase "or recommencement" be deleted and that and that the regulatory citation be modified to insert "C.(1)(a & b)". This clarifies the notice requirement that applies to this new mine.

27. **C111.B.** NMCC requests that at line 2 the phrase "total and" be deleted as the ground water regulations require protection of ground water as to the dissolved component of the constituents, not total component.

28. **C.111.G.2 and G.4.** NMCC requests that these two conditions be combined by deleting the phrase beginning on line 2 of G.2 "except GWQ-1 and GWQ-8 as discussed in C111.G.4 below" and inserting the entirety of G.4 at the end of condition G.2 and deleting condition G.4. This change will clarify the monitoring use and ultimate plug and abandon disposition of these wells.

29. **C.111.G.6 and 7.** NMCC requests that these two conditions be combined by revising condition C.111.G.7 by inserting the phrase "and enlargement of the open pit" after "TSF" and moving the entire condition to the end of the first paragraph of condition G.6. This change will clarify the list of wells that NMCC has the approval to plug and abandon per the approved permit after they are no longer part of the Monitoring Plan.

30. **C.111.G.8.** NMCC requests that this condition be revised to insert the phrase "not listed in condition C.111.G.6" at the end of the sentence. This makes it clear that plugging and abandoning the wells listed in condition C.111.G.6 are not amendments or modifications to this approved DP.

31. **C111.K.1.** NMCC requests the this condition be revised to move the phrase "on an annual basis" beginning at the end of line 1 to line 3 after "TSF" to make it clear that that 20.6.7.22.C.(1)(j) requires that an operating plan is required to be submitted and that the plan is required to describe the sequencing of tailings deposition on annual basis rather than requiring that NMCC describe each year how it is planning to sequence deposition of tailings, in effect requiring annual approval of the sequence.

32. **C112.C.** NMCC requests that at line 2, the phrase "within 180 days of the effective date of this Discharge Plan (by DATE)" be deleted and replaced with the phrase "no less than 60 days prior to discharge at a new copper mine facility" as required by 20.6.7.30.K for a new mine.

33. **C113.B.** NMCC requests that at line 2, the phrase "at least" be inserted after "approval".

34. **C114.C.1,2 and 3.** NMCC recommends that the word "Additional" be removed from the title header of these conditions and the these conditions be deleted because the additional wells proposed are redundant to wells already in existence and/or wells already proposed by NMCC and will, therefore, not provide additional information regarding currently known source areas of impacts to Grayback Arroyo and

connected aquifers. The two wells proposed would not provide any information regarding known source areas of impacts to Grayback Arroyo as they would be drilled into the crystalline bedrock aquifer, nor would they provide information regarding connected aquifers as NMED concurs with NMCC that the pit is a hydrologic sink.

35. **C114.D.1.** NMCC requests that this condition be revised to clarify that the samples required are to be analyzed for the constituents of concern identified in the NMED approved Stage 1 Abatement list for the site.

36. **Table 2.** NMCC requests that a notation be added to the table at "Sampling Analytical Suites" analysis of samples to be conducted for dissolved constituents only, unless otherwise required.

37. **Table 2.** NMCC requests the notation that sample suites E and F need be analyzed for once annually.

Figure 1 – NMCC suggests that Figure E3 from the MORP, Appendix E, General Arrangement at Final Build-out should be utilized as a better representation of the authorized mine unit footprints.

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MAY 4 2018

Ground Water Quality Bureau

NEW MEXICO
ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau
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Cabinet Secretary

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Deputy Secretary

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

February 2, 2018

Jeff Smith, Chief Operating Officer
New Mexico Copper Corporation
4253 Montgomery Blvd. NE
Suite 130
Albuquerque, NM 87109

RE: Draft Discharge Permit, DP-1840, Copper Flat Mine

Dear Mr. Smith:

Notice is hereby given pursuant to Subsection H of 20.6.2.3108 NMAC that Ground Water Discharge Permit 1840 (DP-1840) for the Copper Flat Mine has been proposed for approval (copy enclosed). The New Mexico Environment Department (NMED) Ground Water Quality Bureau (GWQB) will publish notice of the availability of the draft Discharge Permit in the near future and will forward a copy of the notice to you. The Application for DP-1840 was deemed technically complete on February 1, 2018.

Prior to making a final ruling on the proposed Discharge Permit, NMED will allow 30 days from the date the public notice is published, during which time written comments can be submitted or a public hearing requested. Comments and/or hearing requests may be submitted by any interested person, including the Discharge Permit applicant. Written comments or hearing requests must be submitted to the GWQB at the address above and shall set forth the reasons why a hearing is requested. A hearing will be held only if hearing requests are received from the public or the Discharge Permit applicant during the 30-day comment period and NMED determines there is substantial public interest regarding the proposed Discharge Permit. Hearings are presided over by the NMED Secretary or a hearing officer appointed by the Secretary.

NMED has imposed additional conditions on DP-1840 that are not requirements of the Copper Mine Rule (20.6.7 NMAC). Pursuant to Subsection I of 20.6.7.10 NMAC, NMED is providing the following written explanations of the reasons for the additional conditions.

1. Condition C100.A

   The reason for this condition is to require that the permittee submit a comprehensive set of as-built plans and specifications for constructed mine units authorized by this Discharge Permit.

2. Condition C100.B

   The reason for this condition is to ensure that design, construction and location of all mine units follows Copper Mine Rule requirements and the Discharge Plan.

3. Condition C101.B

   The reason for this condition is to ensure construction of mine units occurs in a predictable and sequential manner.

4. Condition C101.C

   The reason for this condition is to ensure all containment systems are in place prior to operation of discharging mine units.

5. Condition C103.F

   The reason for this condition is to ensure Existing Waste Rock Stockpile 2A is located entirely within the projected Open Pit Surface Drainage Area (OPSDA).

6. Condition C108.A

   The reason for this condition is to ensure that the permittee does not discharge water for dust suppression that may exceed ground water quality standards set forth in Section 20.6.2.3103 NMAC on areas outside the projected OPSDA.

7. Condition C111.B

   The reason for this condition is to clarify sampling and analytical requirements.

8. Condition C111.EThe reason for this condition is to require implementation of monitoring and reporting requirements prior to discharge.

9. Condition C112.E

The reason for this condition is to authorize NMED to require submittal of contingency plans and schedules should an unforeseen circumstance occur that may have the potential to impact ground water quality.

10. Condition C113.G

The reason for this condition is to require that the permittee reclaim two historic waste rock stockpiles at the mine facility ~~prior to the start-up of operations~~, EWRSP-1 and EWRSP-2B during the preproduction period of its mining operation.

11. Condition C113.H

The reason for this condition is to require that the permittee reclaim the out slopes of historic waste rock stockpiles facing Grayback Arroyo ~~prior to the start-up of operations~~ during the preproduction period of its mining operation..

12. Condition C114.B

The reason for this condition is to require that the permittee submit a workplan to address any ongoing sources of surface or ground water impacts to Grayback Arroyo pursuant to Sections 20.6.2.4000 NMAC through 20.6.2.4115 NMAC.

13. Condition C114.C

The reason for this condition is to require that the permittee install additional monitoring wells to provide information regarding the horizontal and vertical extent, and magnitude of ground water contamination as required pursuant to Sections 20.6.2.4000 NMAC through 20.6.2.4115 NMAC.

14. Condition C114.D

The reason for this condition is to require that the permittee collect additional surface and ground water information to provide information regarding the horizontal and vertical extent, and magnitude of ground water contamination as required pursuant to Sections 20.6.2.4000 NMAC through 4115 NMAC.

15. Condition D105.A

The reason for Condition D105.A is to ensure that the permittee submits proper notification prior to destruction or removal of any monitoring wells required under DP-1840.

16. Condition D105.B

The reason for Condition D105.B is to ensure that the permittee submits consistent information in support of requests to plug and abandon monitoring wells.

17. Condition D106.A

The reason for Condition D106.A is to ensure that the permittee submits consistent and accurate location information in the event that an unauthorized discharge occurs.

18. Condition D106.B

The reason for Condition D106.B is to ensure that the permittee properly notifies NMED in the event of an unauthorized discharge so that a determination of applicable reporting requirements can be made pursuant to 20.6.7 NMAC.

19. Condition D107.D

The reason for this condition is to assert NMED authority to require that the permittee amend or modify DP-1840 should NMED determine that the requirements of 20.6.2 NMAC are being or may be violated or the standards of Section 20.6.2.3103 NMAC are being or may be violated.

Please review the enclosed draft Discharge Permit carefully for accuracy and completeness to ensure you understand what the permit requires. Please be aware that the proposed Discharge Permit may contain conditions that require the permittee to implement operational, monitoring or closure actions by a specific deadline.

The Water Quality Control Commission (WQCC) Regulations, 20.6.2 NMAC and 20.6.7 NMAC, are available online at *https://www.env.nm.gov/gwb/NMED-GWQB-Regulations.htm.*

Any comments relating to this draft Discharge Permit can be sent to me at the address on the header of this letter or by email to brad.reid@state.nm.us. If written comments or a written request for a hearing are not received during the public comment period, the draft Discharge Permit will become final. Thank you for your cooperation during the review process.

Sincerely,
Brad Reid
Mining Environmental Compliance Section
Ground Water Quality Bureau
New Mexico Environment Department

Enclosures: Draft Discharge Permit, DP-1840
Ground Water Discharge Permit Monitoring Well Construction and Abandonment Conditions, Revision 1.1, March 2011

Cc: Jeff Smith, Chief Operating Officer, NMCC (signed copy: jsmith@themacresourcesgroup.com)
Katie Emmer, Permitting & Environmental Compliance Manager, NMCC (signed copy: kemmer@themacresourcesgroup.com)
Andrew Knight, Assistant General Counsel, NMED (signed copy: andrew.knight@state.nm.us)
Kurt Vollbrecht, Program Manager, MECS (signed copy: kurt.vollbrecht@state.nm.us)
Juan Velasquez, NMCC permitting consultant (signed copy: jvelasquez@vemsinc.com)
David Ennis, MMD (signed copy: david.ennis@state.nm.us)

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Governor

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Lieutenant Governor

**NEW MEXICO
ENVIRONMENT DEPARTMENT**

Ground Water Quality Bureau

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BUTCH TONGATE
Cabinet Secretary

J.C. BORREGO
Deputy Secretary

**GROUND WATER QUALITY BUREAU (GWQB)
DISCHARGE PERMIT
NEW COPPER MINE FACILITY
Issued under 20.6.2 and 20.6.7 NMAC**

Return Receipt Requested
Certified Mail Receipt Number: 7005 1820 0001 5766 0796

Mine Facility Name: Copper Flat Mine
GWQB Discharge Permit Number: DP-1840
GWQB TEMPO AI Number: 1535

Permittee Name/Responsible Party: New Mexico Copper Corporation
Mailing Address: 4253 Montgomery Blvd. NE, Suite 130
Albuquerque, NM 87109

Mine Facility Contact: Jeff Smith; ~~(575) 912-5386~~(505) 382-5770
Mine Facility Location: 85 Copper Rock Road
Hillsboro, NM 88042

County: Sierra County

Permitting Action: New
Effective Date: XXXX XX, 2018
Expiration Date: XXXX XX, 2018

NMED Permit Contact: Brad Reid; (505) 827-2963
E-mail Address: brad.reid@state.nm.us

**Bruce Yurdin
Division Director
Water Protection Division**

Date

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TABLE OF CONTENTS

Part A GENERAL INFORMATION 1
- A100 Introduction 1
- A101 Applicable Regulations 1
- A102 Permit Duration 2
- A103 Terms of Permit Issuance 2

Part B FACILITY SPECIFIC INFORMATION 2
- B100 History and Facility Description 2
- B101 Permitting History 4
- B102 Facility Location, Ground Water and Process Water Characteristics 4
- B103 Authorized Mine Units 5
- B104 Authorized Discharges 13

Part C FACILITY SPECIFIC REQUIREMENTS 14
- C100 Practice of Engineering 14
- C101 Construction Schedule and Progress Reports 14
- C102 Copper Flat Open Pit 14
- C103 Waste Rock Stockpiles 15
- C104 Impoundments 15
- C105 Copper Crushing, Milling, Concentrator, and Tailings Storage Facility Units 16
- C106 Sumps, Tanks, Pipelines and Other Containment Systems 17
- C107 Stormwater Management 17
- C108 Dust Suppression 17
- C109 Domestic Wastewater Treatment Facility 18
- C110 Flow Measurement 18
- C111 Monitoring and Reporting 18
- C112 Contingency Plan 22
- C113 Closure Plan 23
- C114 Abatement Plan 24
- C115 Financial Assurance 26

Part D GENERAL CONDITIONS 26
- D100 Enforcement 26
- D101 General Inspection and Entry Requirements 27
- D102 General Engineering, Operational and Setback Requirements 27
- D103 General Record Keeping and Reporting Requirements 27
- D104 General Sampling and Analytical Methods 28
- D105 Monitoring Well Abandonment 28
- D106 Reporting Requirements for Unauthorized Discharges 29
- D107 Modifications and Amendments 29
- D108 Compliance with Other Laws 30

LIST OF TABLES AND FIGURES

Table 1 – Copper Flat Development Sequence and Schedule 31
Table 2 – Monitoring and Reporting Summary for DP-1840 32
Figure 1 – Authorized Mine Unit Footprints 34
Figure 2 – Ground and Surface Water Sampling Locations 35
Figure 3 – Flow Meter and Process Water Sampling Locations 36

Part A GENERAL INFORMATION

A100 Introduction

A. The New Mexico Environment Department (NMED) issues this Ground Water Discharge Permit, DP-1840 (Discharge Permit) to the New Mexico Copper Corporation (permittee) pursuant to the New Mexico Water Quality Act (WQA), NMSA 1978, §§ 74-6-1 through 746-17, and the New Mexico Water Quality Control Commission (WQCC) Regulations, 20.6.2 and 20.6.7 NMAC. NMED is issuing this Discharge Permit to control the discharge of water contaminants from the Copper Flat Mine facility for the protection of ground water and those segments of surface water gaining from ground water inflow, for present and potential future use as domestic and agricultural water supply and other uses, and to protect public health.

B. Pursuant to this Discharge Permit, the permittee is authorized to discharge a maximum of 25,264,000 gallons per day (gpd) of tailings slurry, i.e., mine tailings, process water, impacted stormwater, and domestic wastewater under normal operating conditions to a lined tailing impoundment. In addition, this Discharge Permit regulates discharges from other mine units including waste rock stockpiles, ore stockpiles, mineral processing units, process water impoundments, an open pit, sumps, tanks, pipelines, and other areas within the permit area. The discharge may move directly or indirectly into ground water of the State of New Mexico which has an existing concentration of 10,000 milligrams per liter (mg/L) or less of total dissolved solids (TDS) within the meaning of Section 20.6.2.3104 and Subsection A of 20.6.2.3101 NMAC. The discharge may contain water contaminants or toxic pollutants elevated above the standards of Section 20.6.2.3103 NMAC.

C. The permittee is authorized to discharge water contaminants pursuant to this Discharge Permit which contains conditions authorized or specified by Part 20.6.7 NMAC (Copper Mine Rule) on condition that the permittee complies with the Copper Mine Rule and this Discharge Permit, which are enforceable by NMED.

A101 Applicable Regulations

A. The permittee is discharging from a facility that meets the definition of a "new copper mine facility" as defined in Paragraph (39) of Section 20.6.7.7.B NMAC. Sections 20.6.2.3000 through 20.6.2.3114 NMAC and Part 20.6.7 NMAC apply to discharges specific to copper mine facilities and their operations.

B. The discharges from the mine units regulated pursuant to this Discharge Permit are not subject to any of the exemptions of Section 20.6.2.3105 NMAC.

Comment [V1]: See NMCC comment no. 4

C. Ground water quality as observed in monitoring wells required by C111.G and C114.C of this Discharge Permit is subject to the criteria of Sections 20.6.2.3101 and 20.6.2.3103 NMAC except as excluded pursuant to Subsection D of 20.6.7.24 NMAC.

A102 Permit Duration

A. Pursuant to the WQA 74-6-5(I) and Subsection H of 20.6.2.3109 NMAC, the term of this Discharge Permit is seven years from the effective date (effective DATE) or five years from the date the discharge commences, ~~whichever occurs first~~.

B. If the permittee submits an application for renewal in accordance with Subsection F of 20.6.2.3106 NMAC, then the existing discharge permit shall not expire until the application for renewal has been approved or disapproved.

A103 Terms of Permit Issuance

A. Permit Fees - The permittee shall remit an annual permit fee payment equal to the applicable permit fee, based on mine size as listed in Subsection A of 20.6.7.9 NMAC on August 1 of each year until termination of all discharge permits related to the Copper Flat Mine facility. [20.6.7.9.A NMAC]

B. Transfer of Discharge Permit - Prior to the transfer of any ownership, control, or possession of this permitted facility or any portion thereof, the permittee shall notify the proposed transferee in writing of the existence of this Discharge Permit and include a copy of this Discharge Permit with the notice. The permittee shall deliver or send by certified mail to NMED a copy of the notification and proof that such notification has been received by the proposed transferee. [20.6.7.38 NMAC and 20.6.2.3111 NMAC]

C. Permit Renewal - To renew this Discharge Permit, the permittee shall submit an application and associated fees for renewal at least 270 days prior to the expiration date of this Discharge Permit (by DATE) in accordance with Sections 20.6.7.9, 20.6.7.10, and 20.6.7.11 NMAC.

D. Additional Conditions - In addition to the requirements of 20.6.7 NMAC, the permittee shall comply with the following additional conditions as authorized by Subsection I of 20.6.7.10 NMAC pursuant to WQA 74-6-5: Condition C100.A, Condition C100.B, Condition C101.B, Condition C101.C, Condition C103.F, Condition C108.A, Condition C111.B, Condition C111.E, Condition C112.E, Condition C113.G, Condition C113.H, Condition C114.B, Condition C114.C, Condition C114.D, Condition D105.A, Condition D105.B, Condition D106.A, Condition D106.B, Condition D107.D.

Part B FACILITY SPECIFIC INFORMATION

B100 History and Facility Description

A. The Copper Flat Mine is an open pit copper mine facility owned by the New Mexico Copper Corporation situated within a mine permit area boundary of approximately 2,190 acres. The Copper Flat Mine will consist of an open pit, waste rock stockpiles, stormwater impoundments and collection systems, a Process Facility Area consisting of a concentrator and associated mineral processing units, a lined tailings impoundment, and associated infrastructure. The mine project will disturb approximately 1,290 acres of which approximately 910 acres were previously disturbed from historic mining operations at the site. The mine is regulated pursuant to this Discharge Permit and an abatement plan.

B. The historic Copper Flat Mine operation included several waste rock stockpiles, an open pit, a tailings storage facility, mineral processing facilities, impoundments, and associated infrastructure. The mine was operated for commercial production in 1982 for approximately three and a half months. Approximately three million tons of overburden (i.e., open pit pre-stripping) and 1.2 million tons of ore were mined resulting in an open pit encompassing eighty acres of disturbance including a five-acre water body. The bottom level of the pit currently sits at 5,400 feet above mean sea level (amsl). No mining has occurred ~~at the open pit~~ since 1982.

C. New Mexico Copper Corporation will construct and operate the Copper Flat Mine and concentrator using conventional copper and molybdenum sulfide flotation circuits and a gravity gold recovery circuit with a maximum throughput of 38,000 dry tons per day of ore, generating up to 25,264,000 gpd of tailings slurry. Over an estimated eleven-year operational period, the permittee intends to mine the copper-rich ore body and process approximately 125 million tons of ore at the Process Facility Area, and place 33 million tons of waste rock on three delineated waste rock stockpiles peripheral to the open pit.

D. Ore mined from the Copper Flat Open Pit will be crushed, milled, and concentrated using conventional milling and concentration processes. The copper and molybdenum concentrates produced at the Process Facility Area will be packaged for off-site transport and additional processing. The tailings, a by-product from the flotation process, will be conveyed via a tailing pipeline to a cyclone classification plant (Cyclone Plant) and then discharged at the Tailings Storage Facility (TSF).

E. A synthetically lined TSF will be constructed in the same location as the historic facility. Tailings slurry (i.e., process water and flotation tailings) containing approximately 29% solids will be gravity conveyed from the Concentrator through a pipeline into the Cyclone Plant to separate the tailings into coarse and fine fractions. The coarse fraction tailings sand cyclone underflow will be deposited ~~at~~ to construct the tailing dam and the fine fraction tailings slime cyclone overflow will be discharged to the interior of the TSF. The TSF will extend approximately 1,000 feet to the east of the former starter dam (the tailings expansion area). A centerline construction method using the cyclone-processed tailings sand for tailings dam construction will be utilized. A starter dam will be constructed using borrow material to provide initial storage capacity and to provide a location for initial discharge of tailings. ~~The use of sand tailings for dam construction are such that the Cyclone Plant will be operated to produce the construction material.~~

F. Water collected <u>at the open pit sump </u>inside the projected Open Pit Surface Drainage Area (OPSDA; as defined in Section 20.6.7.7 NMAC) ~~at the open pit sump~~ will be utilized for dust suppression during operations on haul roads, working areas, and waste rock stockpiles within the projected OPSDA. Water sources that do not exceed ground water quality standards set forth in Section 20.6.2.3103 NMAC will be used for dust suppression outside the projected OPSDA.

G. The pit area will be dewatered to facilitate mining below the water table. The existing diversion structures will be maintained during operations to convey non-impacted stormwater flows generated in Grayback Arroyo and its tributaries around the perimeter of the open pit. Pit water will primarily be used for dust suppression, or re-used in the process water circuit.

H. After the cessation of mining, the pit will be rapidly re-filled with fresh water to the modeled static water table, forming a pit water body. Waste rock stockpiles, the TSF, and other impacted areas will be ~~covered with an engineered soil cover system~~reclaimed and revegetated in accordance with the approved Closure/Closeout Plan.

B101 Permitting History

A. The Discharge Plan for DP-1840 includes application materials submitted by the permittee to NMED dated December 11, 2015, Revision 1 of the Discharge Permit Application dated August 2017 ("~~Revised~~DP Application, Rev. 1"), and materials contained in the DP-1840 administrative record prior to issuance of this Discharge Permit.

B102 Facility Location, Ground Water and Process Water Characteristics

A. Copper Flat Mine is located at 85 Copper Rock Road approximately 5 miles NE of Hillsboro, in Sections 30 and 31, T15S, R6W, Sections 25, 26, 35, and 36, T15S, R7W, and Section 6, T16S, R6W, Sierra County.

B. Ground water beneath the mine units regulated pursuant to DP-1840 is at a depth ranging from approximately 7 to 156 feet with a pre-discharge TDS concentration ranging from approximately 317 to 868 milligrams per liter.

C. The Copper Flat Open Pit walls, the waste rock stockpiles, the TSF and other disturbed areas at the mine facility may contain sulfide minerals which, when oxidized, may generate acidic solutions. These acidic solutions react with in situ minerals to produce acid rock drainage (ARD) that typically contains TDS, sulfate, and certain metals in concentrations that may exceed the water quality standards of Section 20.6.2.3103 NMAC.

D. Process water and impacted stormwater discharges regulated pursuant to DP-1840, including ARD, are typically outside the acceptable range for pH and contain TDS, sulfate, and certain metals in concentrations that exceed the water quality standards of Section 20.6.2.3103 NMAC.

B103 Authorized Mine Units

The permittee is authorized to manage the discharge of water contaminants through operation of the following mine units pursuant to this Discharge Permit. This Discharge Permit contains requirements associated with the following mine units as identified in the Revised Application and the administrative record as of the effective date of this Discharge Permit. Mine units listed below meet the definition of "new" mine units pursuant to the Copper Mine Rule, unless otherwise noted, and will meet applicable Copper Mine Rule design and construction requirements.

A. Open Pit

1. The permitted open pit operational area will encompass approximately 161 acres at full build out, and will reach an approximate base elevation of 4,650 amsl. The diameter of the open pit will be approximately 2,800 feet, and the open pit depth will reach approximately 850 to 900 feet below the original pre-mining surface. The existing diversion of Grayback Arroyo will route stormwater around the open pit during operations and at closure. Approximately thirty-nine acre-feet per year (24 gallons per minute, gpm) of groundwater seepage and sixty-eight acre-feet per year (42 gpm) of stormwater entering the pit will be returned to the process water circuit or used for dust suppression using one or more pit dewatering sumps during operations.

B. Waste Rock Stockpiles

1. Waste Rock Stockpile 1 (WRSP-1) - WRSP-1 will be located inside the projected OPSDA northeast of the open pit, and will have an estimated footprint of approximately 40 acres upon build out. Approximately 3.16 million tons of material will be stockpiled within the permitted footprint during the operational phase of the mine. Berms and drain ditches will be constructed around the waste rock stockpile to prevent run-on and to control run-off.

2. Waste Rock Stockpile 2 (WRSP-2) - WRSP-2 will be located outside the projected OPSDA east of the open pit and Animas Peak, and will have an estimated footprint of approximately 49 acres upon build out. Approximately 8.64 million tons of material will be stockpiled within the permitted footprint during the operational phase of the mine. Berms and drain ditches will be constructed around the waste rock stockpile to prevent run-on and to control run-off.

3. Waste Rock Stockpile 3 (WRSP-3) - WRSP-3 will be located outside the projected OPSDA east of the open pit and Animas Peak, and will have an estimated footprint of approximately 122 acres upon build out. Approximately 32.89 million tons of material will be stockpiled within the permitted footprint during the operational phase of the mine. Berms and drain ditches will be constructed around the waste rock stockpile to prevent run-on and to control run-off. An open channel stormwater conveyance structure will be cut into the underlying bedrock at the toe of the stockpile to collect seepage and impacted stormwater generated

from WRSP-3.

4. Existing Waste Rock Stockpile 1 (EWRSP-1) - EWRSP-1, located inside the projected OPSDA, is an historic waste rock stockpile located at the western edge of the mine facility boundary and contains approximately ~~512~~486,000 tons of waste rock. The current footprint of the stockpile is approximately 16 acres. This stockpile will be reclaimed during the mine start-up phase.

5. Existing Waste Rock Stockpile 2A (EWRSP-2A) - EWRSP-2A is an historic waste rock stockpile located at the north side of the open pit. A portion of EWRSP-2A is located outside the projected OPSDA. This portion will be relocated onto the portion of EWRSP-2A that is inside the projected OPSDA during the mine start-up phase and prior to construction of WRSP-1. EWSRP-2A will be sequentially covered during the operational phase of the mine from construction of WRSP-1 (i.e., EWRSP-2A will become part of WRSP-1).

6. Existing Waste Rock Stockpile 2B - EWRSP-2B, located inside the projected OPSDA, is an historic waste rock stockpile located at the north side of the open pit immediately west of the toe of EWRSP-2A. EWRSP-2B will be reclaimed during the mine start-up phase. The current combined footprint of EWRSP-2A and EWRSP-2B covers a footprint of 21 acres and contains approximately ~~913,000~~760,050 tons of waste rock.

7. Existing Waste Rock Stockpile 3 (EWRSP-3) - EWRSP-3, located outside the projected OPSDA, is an historic waste rock stockpile located north of the Concentrator in the ore processing area. It contains approximately ~~523,000~~333,300 tons of waste rock and ore. The current footprint of the stockpile is approximately 20 acres. Ore from this stockpile will be processed during the start-up phase of the concentrator. In addition, EWRSP-3 will be used during mine operations to temporarily store ore during upset conditions (i.e., when the Primary Crusher is not working).

8. Existing Waste Rock Stockpile 4 (EWRSP-4) - EWRSP-4, located inside the projected OPSDA, is an historic waste rock stockpile located southeast of the pit containing approximately 1,000,050~~.2~~ tons of waste rock. The current footprint of the stockpile is approximately 23 acres. The southern slopes of the stockpile facing Grayback Arroyo will be reclaimed during the mine start-up phase, and the top surface will be filled and graded to a 1% slope and used for an equipment laydown yard during operations. Stormwater generated from the top surface will discharge to the open pit.

C. **Conditionally Exempt Facilities**

1. Growth Media Stockpiles - Three growth media stockpiles will be constructed at the mine facility to store reclamation cover material. Growth Media Stockpile 1 will be constructed southwest of the TSF and will have an estimated footprint of approximately 30 acres upon

build out. Growth Media Stockpile 2 will be constructed northeast of the TSF and will have an estimated footprint of approximately 32 acres upon build out. Growth Media Stockpile 3 will be constructed southeast of WRSP-3 and will have an estimated footprint of approximately 14 acres upon build out. ~~The stockpiles are authorized for storage of reclamation cover material on condition that the permittee adheres to the approved material characterization and handling plan to ensure the conditionally exempt status as stockpiles that do not generate water contaminants.~~

2. Mill Site Claims and Electrical Substation - Nine total existing and/or proposed mill site claims and one electrical substation located off-site will contribute to the project. Each mill site claim is five acres in size and the electrical substation will be located on a thirty-acre parcel of land. The mill site claims will be utilized for other water-related infrastructure uses such as staging and storage areas for booster tanks, pumps and electrical equipment, maintenance, and monitoring. The mill site claims and electrical substation are authorized for use on condition that the permittee adheres to the approved material characterization and handling plan to ensure the conditionally exempt status as areas that do not generate water contaminants.

D. Copper Crushing, Milling, Concentrator, and Tailings Storage Facility

1. Process Facility Area - The Process Facility Area, located outside the projected OPSDA southeast of the open pit, is where crushing and grinding, milling, flotation, concentrating, drying and packaging of ore will occur. In addition, administration, parking and other ancillary support facilities (e.g., Assay Laboratory) will be located here. Impacted stormwater generated in the Process Facility Area will be directed to open channel conveyances that convey to Impacted Stormwater Impoundment A.

   a. Primary Crusher - Ore from the open pit will be fed to the Primary Crusher for the first stage of crushing. Run-of-the-mine ore rock will be crushed to a size of eight-inch diameter and less. The gyratory crusher will be located below ground level on reinforced concrete with concrete sumps. The sumps will pump water for re-use in the ore processing circuit.

   b. Coarse Ore Stockpile - The Coarse Ore Stockpile will be located between the Primary Crusher and the Concentrator in the Process Facility area. Crushed ore rock from the Primary Crusher will be temporarily stored at the Coarse Ore Stockpile until it is fed into the Reclaim Tunnel beneath the stockpile and onto a conveyor system which will transport ore to the Semi-Autogenous Grinding (SAG) Mill and grinding circuit. The Coarse Ore Stockpile will have a capacity of 75,000 tons and will have a footprint of approximately 5~~2~~ acres.

   c. Concentrator - The Concentrator is designed to process 1,600 tons of ore per hour, or 38,000 tons per day. It will consist of several copper and molybdenum rougher/scavenger flotation cells, copper and molybdenum flotation and scavenger cells, concentrate tanks, thickeners, filters, a copper concentrate load-out area, a molybdenum packaging area, and associated infrastructure. The Concentrator is designed and will be constructed to prevent discharges from leaving the facility using concrete floors and numerous sumps, pumps, and concrete berms within the building.

d. Mill - The Mill is located inside the Concentrator building and will consist of one SAG Mill, one ball mill, a pebble crusher, and associated conveyance systems and separators.

2. Tailings Storage Facility (TSF) - The lined TSF will be located outside the projected OPSDA and built progressively out in a five-phase process. It is designed to accommodate the volume of tailings generated during the life of the mine. The liner will consist of an 80-millimeter (mil) high-density polyethylene (HPDE) liner, or equivalent, placed on a twelve-inch thick liner bedding fill sub base. **Tailing slurry, which is gravity conveyed from the Concentrator, will pass through the Cyclone Plant prior to discharge to the TSF. The Cyclone Plant will separate the tailing slurry into a coarse and fine fraction; the coarse fraction will be used to construct the tailing dam and the fine fraction will be conveyed into the TSF pool**In Phase 1, the liner bedding fill will consist of a minimum of 12 inches of historic tailings recovered from the north cell of the old starter dam. After Phase 1, liner bedding fill will consist of a twelve-inch layer of crushed and screened native material, or selected local soil. TSF drainage will be collected using an underdrain collection system that incorporates two underdrains that will convey solutions to the TSF Underdrain Collection Pond. Drainage from the TSF impoundment interior will be collected in a continuous underdrain system (impoundment underdrain) constructed over the geomembrane liner. A separate blanket drain system will underlie the tailings dam (dam underdrain). The impoundment underdrain system will be equipped with a shutoff valve at its inlet during the initial years of operation to ensure two feet of freeboard is maintained in the Underdrain Collection Pond. When the valve is closed, the TSF supernatant pool will be used for storage until the TSF underdrain collection pond is pumped down. The TSF pool, located in the interior of the TSF, will be equipped with four floating-barge pumps with a maximum design capacity of 12,978 gpm. The pumps will convey TSF supernatant process water to the Process Water Reservoir located in the Plant Area through the 36-inch diameter HDPE water reclaim process water pipeline for use in the process.~~ Tailing slurry, which is gravity conveyed from the Concentrator, will pass through the Cyclone Plant prior to discharge to the TSF. The Cyclone Plant will separate the tailing slurry into a coarse and fine fraction; the coarse fraction will be used to construct the tailing dam and the fine fraction will be conveyed into the TSF pool~~.

E. Domestic Wastewater Treatment Facility

1. A package treatment plant sized to treat up to 10,000 gallons of day of domestic wastewater will be constructed on a pre-existing slab located near the main gate and outside the projected OPSDA. The plant will be constructed and operated to treat wastewater to a secondary effluent quality. Treated effluent will be pumped via pipeline to the TSF facility for re-use as process water.

F. Impoundments

18194

1. Process Water Reservoir (PWR) - The Process Water Reservoir will be located east of the concentrator and outside the projected OPSDA in the plant area. It will have a footprint of approximately

2 acres and a storage capacity of 5,433,472 gallons while maintaining two feet of freeboard. It is sized to retain twelve hours of inflow at 7,200 gpm and a 100-year return interval storm event while maintaining two feet of freeboard. The pond will be double-synthetically lined (60-mil each or equivalent) using HDPE or equivalent material, and equipped with a leak detection/collection system. It is designed to meet the requirements of Paragraphs (1), (2), (3), (6), and (7) of 20.6.7.17.D NMAC. The PWR will receive process water from the Underdrain Collection Pond at the TSF, impacted stormwater from the three impacted stormwater impoundments, and freshwater from the off-site well field for use as process water in the Concentrator. The PWR will pump process water to the Process Water Tank for use in the Process Facility Area. Pumps will be sized to deliver 24,300,000 gpd (16,875 gpm) of process water to the Concentrator. In the event of upset conditions, the PWR overflow weir conveys solutions directly into the lined tailings trench/pipeline corridor which discharges to the TSF.

2. TSF Underdrain Collection Pond (UCP) - The UCP will be located outside the projected OPSDA at the southeastern toe of the TSF. It will have a footprint of approximately 8 acres and storage capacity of 12,240,000 gallons while maintaining two feet of freeboard. It is sized to retain twenty-four hours of underdrain flow at a maximum flow rate, and runoff from the downstream face of the TSF during a 100-year return interval storm event. The pond will be double-synthetically lined (60-mil each or equivalent) using HDPE or equivalent material, and equipped with a leak detection/collection system. It is designed to meet the requirements of Paragraphs (1), (2), (3), (6), and (7) of 20.6.7.17.D NMAC. The pond will receive approximately 448 gpm of tailing underflow, tailings dam face seepage, and impacted stormwater under standard operating conditions. Collected solutions will be returned to the process water re-use circuit via the 4,000 gpm pond reclaim pump system (one operating pump and one spare submersible turbine pump mounted in a concrete sump) and the underdrain collection process water pipeline. The underdrain collection process water pipeline will be placed along the upstream side (i.e., inside the TSF toe berm) of the toe berm and above the geomembrane liner during all buildout phases of the TSF. Perimeter collection trenches situated on the bermed upstream side of the TSF liner will capture and contain impacted stormwater from the face of the TSF and convey solutions to the Underdrain Collection Pond.

3. Surge Pond -The Surge Pond will be located outside the projected OPSDA at the northwest margin (i.e., upstream side) of the TSF and is associated with the Cyclone Plant. It will have a footprint of approximately 6.4 acres and storage capacity of 1,610,000 gallons while maintaining two feet of freeboard. The 60-mil HDPE (or equivalent) lined impoundment is designed to meet the requirements of Paragraphs (1), (2), (4), (6), and (7) of 20.6.7.17.D NMAC. The purpose of the Surge Pond is to contain discharges (tailings, process, and reclaim water) from various processing locations under upset conditions, due to a pipe failure, or shutdown of the Cyclone Plant. Upset flows from the Cyclone Plant will discharge by gravity to the Surge Pond within a secondary containment ditch lined with a

minimum 60-mil HDPE geomembrane liner placed over 6 inches of liner bedding fill. Dedicated pumps will convey solutions from the Surge Pond to the TSF. The surge pond will be empty under normal operating conditions.

4. Impacted Stormwater Impoundments - Three stormwater impoundments will be utilized to capture precipitation and stormwater runoff from areas impacted by mining activities including mining, hauling, waste rock stockpiling, mineral processing, and shipping and receiving of goods and products. The 60-mil HDPE (or equivalent) lined impoundments are designed to meet the requirements of Paragraphs (1), (2), (4), (6), and (7) of 20.6.7.17.D NMAC. Each stormwater impoundment is designed to receive the volume of stormwater generated from a 100-year return interval storm event while maintaining two feet of freeboard. The stormwater impoundments will typically be empty and will be pumped as low as practicable within 30 days of storm events pursuant to Paragraph (4) of 20.6.7.17.D NMAC. Collected solutions from Impacted Stormwater Impoundment B and Impacted Stormwater Impoundment C will be pumped to Impacted Stormwater Impoundment A, and solutions from Impacted Stormwater Impoundment A will be pumped to the PWR using temporary pumps. Sheet flow generated during storm events will be conveyed to the stormwater impoundments via open channel conveyances capable of handling a 100-year return interval storm event while maintaining six inches of freeboard.

   a. Impacted Stormwater Impoundment A (SW-A) - As shown in Figure 11J-3 of the Revised Application, SW-A will be located outside the projected OPSDA east of the Process Water Reservoir and at the southwest toe of WRSP-3. It will have a footprint of approximately 2 acres and storage capacity of 7,306,971 gallons while maintaining two feet of freeboard. Impacted Stormwater Impoundment A will capture and manage impacted stormwater from the approximately 91.06-acre catchment area in Watershed A which includes the Process Facility Area.

   b. Impacted Stormwater Impoundment B (SW-B) - As shown in Figure 11J-3 of the Revised Application, SW-B will be located inside the projected OPSDA at the southern toe of WRSP-1 and southwest corner of Watershed B. It will have a footprint of approximately 2 acres and storage capacity of 5,513,140 gallons while maintaining two feet of freeboard. Stormwater Impoundment B will capture and manage impacted stormwater generated from the approximately 98.52-acre catchment area in Watershed B, which includes WRSP-1. Overflow from the impoundment will discharge under a haul road via a culvert and then flow into the open pit.

   c. Impacted Stormwater Impoundment C (SW-C) - As shown in Figure 11J-3 of the Revised Application, SW-C will be located outside the projected OPSDA at the eastern toe of WRSP-3 and eastern edge of Watershed C. SW-C will have a footprint of approximately 7 acres and storage capacity of 10,513,140 gallons while maintaining two feet of freeboard. Stormwater Impoundment C will capture and manage impacted stormwater from the approximately ~~315.76~~198.66-acre catchment area in Watershed C which contains WRSP-2 and WRSP-3.

G. **Sumps, Tanks, Pipelines and Other Containment Systems**

1. Tanks - Forty-eight above ground tanks will be used at the mine site; most will be located outside the projected OPSDA at the Process Facility Area. Appendix C of the Revised Application describes all tanks, sumps, and designed containments for each. Tanks are designed and will be constructed in accordance with Subsections A and B of 20.6.7.23 NMAC, unless otherwise noted.

   a. Concentrator Area - Thirty tanks will be located inside the Concentrator including (number of tanks in parenthesis): Grinding Area (1), Copper Floatation Area (1), Copper Regrind Area (1), Molybdenum Floatation Area (3), Copper-Molybdenum Thickening Area (4), Copper Thickening Area (6), Wheel Wash Area (1), Lime Reagent Area (2), Diesel Reagent Area (1), General Reagent Area (7), and Sodium Hydrosulfide Reagent Area (3).

   b. Truck Shop Tank Farm - Seven tanks will be located in the Truck Shop Tank Farm area to store various oil and fluid to support the vehicle fleet.

   c. Fuel Station Area - Five tanks will be located in the Fuel Station Area to be utilized for fueling needs.

   d. Miscellaneous Locations - Three tanks will be incorporated into the domestic wastewater treatment facility, one tank will be used at the Assay Lab for chemical waste, and one 170,000-gallon tank will be used for Process Water Storage and delivery. The Process Water Storage Tank will be situated in a bermed area that will be underlain by a HDPE synthetic liner.

2. Sumps and Containment Areas - Twenty-two sumps and/or containment areas will be constructed to capture and contain process water, impacted stormwater, and other solutions in the event there is a release from the primary containment structures in the Process Facility Area.

3. Copper Flat Open Pit dewatering system - The Copper Flat Open Pit dewatering system will utilize one or more dewatering sumps and associated pipelines located in the pit to dewater the open pit. A portable booster tank(s) will be incorporated, as necessary, as the pit is deepened.

4. Pipelines - Pipelines serving the DP-1840 mine units consist of HDPE and range in size from 6 inches or less in diameter up to 36 inches in diameter. The pipelines are described in Table 11J-3, and Figures 11J-20A and 11J-20B of the Revised Application. All pipelines are designed and will be constructed in accordance with Subsections A and B of 20.6.7.23 NMAC. The Concentrator Whole Tailings Transport pipeline and UCP return pipeline will be placed within lined and bermed channels when located outside building areas.

H. **Truck and Equipment Washing Units**

1. A Truck and Equipment Washing Unit (Truck Wash) will be located outside the projected OPSDA along a haul road between the mine and the Truck Shop south of the Concentrator. It will consist of a concrete pad for vehicle and equipment washing. The pad will be sloped to drain into a 50,000-gallon concrete settling basin for separation of water, solids, oil and grease. Oil and grease will be skimmed and properly disposed of offsite. Solids removed from the bottom of the settling basin will disposed of at the TSF or stored on a concrete pad next to the wash unit for eventual disposal at the TSF. All wash water will be reused at the Truck Wash. The Truck Wash is designed in accordance with Section 20.6.7.26 NMAC.

2. A wheel wash tank and pump and associated concrete containment area will be located adjacent to the Concentrator. It will be used to remove and contain concentrate from truck wheels prior to the trucks travelling onto site roads. Solutions collected in the wheel wash sump will be returned to the Copper Thickener feed box via a dedicated pump equipped with automatic start/stop control.

I. **Dust Suppression -** Dust suppression trucks will utilize water from the open pit sump and/or stand pipes located inside the projected OPSDA for dust suppression within the projected OPSDA. Stand pipes used to deliver water to trucks for dust suppression outside the projected OPSDA will utilize water sources that meet ground water quality standards set forth in Section 20.6.2.3103 NMAC.

J. **Flow Measurement**

1. The permittee will utilize flow meters to measure regulated discharge volumes pursuant to this discharge permit and as required by the Copper Mine Rule. Flow meter locations utilized by DP-1840 are shown in Figures 11J-20A and 11J-20B of the Revised Application. In addition, Figure 3 located on Page 36 of this Discharge Permit, shows a schematic diagram of flow meter locations used for discharge volume reporting pursuant to DP-1840.

K. **Meteorological Station**

1. The mine facility will utilize one Meteorological Station, located at the east central portion of the mine facility permit boundary, to measure meteorological data in accordance with the meteorological plan submitted with the Revised Application. The location is shown on Figure 11W-1 of the Revised Application.

B104 Authorized Discharges

The permittee is authorized to operate the following mine units in accordance with all applicable system design and operational constraints as described in this Discharge Permit, and the Discharge Plan. [20.6.2.3109 NMAC]

A. The permittee is authorized to discharge a maximum of 25,2~~46~~64,000 gpd of tailing slurry, 38,000 tons of tailings per day, from the Concentrator to the Cyclone Plant and then the TSF via gravity through the Concentrator Whole Tailings Transport pipeline.

B. The permittee is authorized to pump a maximum of 21,236,000 gpd of process water from the TSF Water Reclaim System, which includes combined flows from the UCP and TSF supernatant pool, to the PWR.

C. The permittee is authorized to discharge a maximum of 24,300,000 gpd of process water from the PWR to the Concentrator.

D. The permittee is authorized to place waste rock from the Copper Flat Open Pit within the permitted footprints of WRSP-1, WRSP-2, and WRSP-3 and discharge water contaminants originating from placed materials.

E. The permittee is authorized to store crushed ore at the Crushed Ore Stockpile.

F. During upset conditions, the permittee is authorized to temporarily stage ore within the permitted footprint of EWRSP-3, and discharge water contaminants originating from placed materials.

G. The permittee is authorized to operate SW-A, SW-B, and SW-C to collect impacted stormwater.

H. The permittee is authorized the operate all sumps, tanks, pipelines and other containment systems described in B103.G.

I. The permittee is authorized to operate the Truck and Equipment Wash units.

J. The permittee is authorized to discharge a maximum of 10,000 gpd of treated effluent from the domestic wastewater treatment and disposal facility to the TSF.

K. The permittee is authorized to discharge an annual average of approximately 96,000 gpd of process water from the Copper Flat Open Pit sump(s) and dewatering system for use as dust suppression water within the OPSDA or for reuse in the process water circuit.

L. This Discharge Permit authorizes only those discharges specified herein. Any unauthorized discharges such as spills or leaks must be reported to NMED and remediated as required by Section 20.6.2.1203 NMAC, and any additional requirements listed in this Discharge Permit.

M. The permittee shall provide written notice to NMED of the commencement~~, or recommencement~~ of operations in accordance with Subsection C.(1)(a&b) of 20.6.7.18 NMAC.

Part C FACILITY SPECIFIC REQUIREMENTS

The permittee shall conduct the requirements set forth below in accordance with the WQCC Regulations of Subsection C of 20.6.2.3106 NMAC and Section 20.6.2.3107 NMAC to ensure compliance with 20.6.2 NMAC, and in accordance with applicable requirements of Part 20.6.7 NMAC.

C100 Practice of Engineering

A. Within 120 days of completion of construction of any mine unit authorized for construction and discharge as listed in B103, the permittee shall submit complete as-built drawings and/or a construction certification report pursuant to Paragraph (2) of 20.6.7.18.B NMAC.

B. Design, construction and location of all mine units shall be in accordance with applicable Copper Mine Rule requirements and the Discharge Plan.

C101 Construction Schedule and Progress Reports

A. Pursuant to Subparagraph (a) of 20.6.7.18.C(1), the permittee shall provide NMED with written notice a minimum of 30 days before commencing construction of mine units covered by this Discharge Permit. A summary of construction activities completed shall be submitted in accordance with Subsection B of 20.6.7.29 NMAC.

Comment [V2]: This is an incorrect citation.

B. The permittee shall adhere to the sequencing schedule outlined in Table 2-1 of Revision 1 of the Updated Mine Operation Reclamation Plan (MORP) dated July 2017 and titled, "Copper Flat Development Sequence and Schedule," and as shown on Table 1 located on Page 31 of this Discharge Permit. NMED shall be notified prior to any deviations from the sequencing schedule.

C. All containment systems, seepage, and stormwater collection units shall be in place prior to operation of any discharging mine unit.

C102 Copper Flat Open Pit

A. The Copper Flat Open Pit shall be operated in accordance with the applicable requirements of Section 20.6.7.24 NMAC.

B. Pursuant to Subsection A of 20.6.7.24 NMAC, expansion of the Copper Flat Open Pit shall not exceed the area shown on Figure 1 located on Page 34 of this Discharge Permit. The permittee must obtain a permit modification or amendment prior to expanding the Copper Flat Open Pit beyond the area shown on Figure 1 of this Discharge Permit.

C. Pursuant to Subsection C of 20.6.7.24 NMAC, fluids generated within the open pit shall be managed according to the requirements of the Mine Operation Water Management Plan required in C111.I.

C103 Waste Rock Stockpiles

A. Waste rock shall be handled and characterized in accordance with applicable requirements of Subsection A of 20.6.7.21 NMAC, and the NMED-approved material characterization and handling plans summarized and referenced in the Revised Application.

B. Design, construction and location of the waste rock stockpiles shall be in accordance with the Discharge Plan, and applicable requirements of Subsections B and C of 20.6.7.21 NMAC.

C. The permittee shall comply with applicable operational requirements listed in Paragraphs (2) through (8) of 20.6.7.21.D NMAC including the requirement to place waste rock on waste rock stockpiles to plan for closure to the extent practicable, and be in accordance with the operating plan required in C111.J (Sections 20.6.7.18, 20.6.7.21 and 20.6.7.33 NMAC).

D. Pursuant to Paragraph (1) of 20.6.7.21.D NMAC and Paragraph (1) of 20.6.7.21.B NMAC, the waste rock stockpiles described in B103.B shall not exceed the footprint, configuration, and location shown in Figure 1 of this Discharge Permit. The permittee may only expand the permitted footprint for the purpose of facility closure, or through an NMED-approved permit amendment or modification to DP-1840.

E. Pursuant to Paragraph (c) of 20.6.7.21.A(2) and as outlined in the material handling plan in the Revised Application, the permittee shall place a minimum of 10 feet of not potentially acid generating (NPAG) waste rock material above and below any areas where acid generating or potentially acid generating (PAG) waste rock will be placed.

F. As outlined in the Revised Application, the portion of EWRSP-2A located outside the projected OPSDA shall be relocated onto the portion of EWRSP-2A that is located inside the projected OPSDA, during the mine start-up phase and prior to construction of WRSP-1.

C104 Impoundments

A. Design, construction and location of all impoundments shall be in accordance with the Discharge Plan, and applicable requirements of Subsection D of 20.6.7.17 NMAC.

B. Operation of all impoundments shall be in accordance with the applicable requirements of Subsection F of 20.6.7.18 NMAC.

C. Pursuant to Subsection B of 20.6.7.18 NMAC, the permittee shall submit a construction certification report within 120 days of construction completion of all impoundments that require a liner system.

D. In accordance with Subparagraph (c) of 20.6.7.17.D(2) NMAC, water levels in the PWR and UCP shall be maintained to provide capacity to convey maximum design process flow plus stormwater runoff from the reservoir catchment area while maintaining two-feet of freeboard.

E. In accordance with Subparagraph (e) of 20.6.7.17.D(2) NMAC, water levels in the SW-A, SW-B, and SW-C shall be maintained to provide capacity for a 100-year return interval storm event while preserving two-feet of freeboard under standard operating conditions and after storm events.

C105 Copper Crushing, Milling, Concentrator, and Tailings Storage Facility Units

A. Design, construction, and location of all crushing, milling, concentrating, and tailings storage facility units shall be in accordance with the Discharge Plan, and applicable requirements of Subsections A and B of 20.6.7.22 NMAC.

B. Operation of all crushing, milling, concentrating, and tailings storage facility units shall be in accordance with the Discharge Plan and applicable requirements of Subsection C of 20.6.7.22 NMAC.

C. Tailings Storage Facility

1. Deposition of tailings shall be in accordance with the operating plan required in C111.K.

2. Prior to discharging to the TSF, the permittee shall ensure that berms and/or the dam structure of the TSF will have the capacity for such discharges while maintaining appropriate safety measures in accordance with the regulations of the Dam Safety Bureau of the Office of the State Engineer and Paragraph (d) of 20.6.7.17.C(1) NMAC.

3. Pursuant to Subparagraph (4) of 20.6.22.A NMAC and Subsection B of 20.6.7.18 NMAC, the permittee shall submit a construction certification report within 120 days of TSF liner system installation.

4. Pursuant to Subparagraph (a) of 20.6.7.22.C(1) NMAC, the TSF shall not exceed the footprint (564 acres) or location and configuration as shown in Drawing 12 in Appendix J of the document titled *Feasibility Level Design, 30,000 TPD Tailings Storage Facility and Tailings Distribution and Water Reclaim Systems Copper Flat Project Sierra County, New Mexico Golder Associates Inc., Revised, November 2016* (i.e., Appendix A the Revised Application) and as shown on Figure 1 of this Discharge Permit. The permittee may only expand the permitted footprint for the purpose of facility closure, or through an NMED-approved permit amendment or modification to DP-1840.

C106 Sumps, Tanks, Pipelines and Other Containment Systems

A. Design, construction and location of all pipelines, tanks, and sumps shall be in accordance with the Discharge Plan, and applicable requirements of Subsections A and B of 20.6.7.23 NMAC.

B. Operation of all pipelines, tanks, and sumps shall be in accordance with the applicable requirements of Subsection C of 20.6.7.23 NMAC.

C. Detailed and complete construction plans and specifications and supporting design calculations for any proposed or required tanks, pipelines, sumps, or other containment systems, including any replacements thereof, shall be submitted to NMED pursuant to Paragraph (2) of 20.6.7.17.C NMAC and Section 20.6.2.23 NMAC, and D107 of this Discharge Permit. This requirement does not apply to portable or temporary tanks, pipelines, sumps, or other containment systems that are subject to periodic relocation during mining operations.

D. Pursuant to Subsection J of 20.6.7.33 NMAC, upon discontinuing the operation of, or before moving tanks, pipelines, sumps, or other containment systems, all liquids shall be released to a location specifically authorized in the discharge permit, an alternate location subject to NMED approval, or otherwise properly contained, transferred, or disposed of in a manner that does not result in discharge to non-authorized areas.

C107 Stormwater Management

A. Stormwater shall be managed in accordance with the applicable requirements of Paragraph (4) of 20.6.7.17.C NMAC, and in accordance with the Stormwater Management Plan included in the Revised Application.

B. To ensure compliance with Subparagraphs (e) and (f) of 20.6.7.17.D(2) NMAC, the permittee shall inspect all stormwater impoundments, conveyance channels and collection ponds on a monthly basis and after precipitation events that exceed one inch for evidence of stormwater accumulations that exceed design capacities. To properly manage stormwater, the permittee shall ensure that the pumping capacity is adequate to maintain storage capacity in all stormwater impoundments.

C. Open channel conveyance structures, including those located at the base of WRSP-1, WRSP-2, and WRSP-3, shall be designed and operated to meet the requirements of Subparagraph (f) of 20.6.7.17.D(2).

C108 Dust Suppression

A. Dust suppression on areas outside the OPSDA shall be conducted using water sources that do not exceed ground water quality standards set forth in Section 20.6.2.3103 NMAC.

B. If at some time in the future the permittee wishes to use an alternate source of dust suppression water or change the location in which discharges of water for dust suppression have been approved, the permittee shall notify NMED for approval in accordance with D107 prior to the proposed change.

C109 Domestic Wastewater Treatment Facility

A. The permittee shall utilize operators, certified by the State of New Mexico at the appropriate level, to operate the wastewater collection, treatment, and disposal system. The operations and maintenance of all or any part of the wastewater system shall be performed by, or under the direct supervision of, a certified operator. [Subsection C of 20.6.2.3109 NMAC, 20.7.4 NMAC]

C110 Flow Measurement

A. Pursuant to Paragraph (2) of 20.6.7.18.E NMAC, the permittee shall visually inspect all flow meters on a monthly basis for evidence of malfunction and repair or replace malfunctioning flow meters within 30 days of or as soon as practicable following discovery.

C111 Monitoring and Reporting

A. Pursuant to applicable requirements in Sections 20.6.7.28 and 20.6.7.29 NMAC, the permittee shall collect, preserve, transport, and analyze all ground water, process water, tailings slurry, impacted stormwater, seep, spring, and surface water samples from the facility in accordance with Table 2 located on Page 32 of this Discharge Permit, and any additional requirements listed in this Discharge Permit. Table 2 of this Discharge Permit provides a summary the monitoring and reporting requirements. Figures 2 and 3, located on Pages 35-36 of this Discharge Permit, designate sampling locations.

B. Samples of pit sump water, stormwater, PLS, seeps, and process water shall be analyzed for ~~total and~~ dissolved concentrations in accordance with Table 2 of this Discharge Permit. Samples of ground water and springs shall be analyzed for dissolved concentrations in accordance with Table 2 of this Discharge Permit.

C. The permittee shall submit monitoring reports to NMED on a semi-annual basis that contain all quarterly monitoring data and information collected pursuant to the requirements of this Discharge Permit, and applicable requirements of Section 20.6.7.29 NMAC. Semi-annual reports are due by February 28 and August 31 of each year. Data required to be submitted annually shall be submitted in the monitoring report due by February 28 of each year.

D. Pursuant to Subsection L of 20.6.7.28 NMAC, the permittee shall submit to NMED ground water elevation contour map(s) on a semi-annual basis and a map showing the extent of the OPSDA on an annual basis. The ground water elevation contour map(s) shall be of an appropriate scale to show ground water elevation contours for the Copper Flat Mine; the contour maps shall include land surface topographic contours with appropriate contour intervals, and shall include the monitoring wells that the ground water data is based on. The maps shall be submitted in the semi-annual monitoring reports in the format specified by Subsection C of 20.6.7.29 NMAC.

E. Implementation of all monitoring and reporting requirements listed in this Discharge Permit shall commence 180 days before emplacement of ore, waste rock, or discharge of tailings at an individual waste rock stockpile or tailings impoundment to allow for sampling and reporting prior to discharge, except as required under abatement pursuant to C114.C and C114.D.

F. Requests to change monitoring and reporting requirements may require an amendment or modification to this Discharge Permit as required by the secretary. [20.6.2.7 NMAC]

G. Ground Water

1. Pursuant to Subsection B of 20.6.7.28 NMAC the permittee shall monitor ground water quality as close as practicable around the perimeter and downgradient of each open pit, waste rock stockpile, tailings impoundment, process water impoundment, and impacted stormwater impoundment."

2. Pursuant to Paragraph (1) of 20.6.7.28.B NMAC, the existing monitoring wells listed in Table 2 of this Discharge Permit, ~~except GWQ-1 and GWQ-8 as discussed in C111.G.4 below,~~ have been deemed appropriate by NMED for continued use as ground water monitoring wells under this Discharge Permit. These ground water monitoring wells, installed prior to the effective date of the Copper Mine Rule, have been identified to be constructed in accordance with the Copper Mine Rule. Monitoring Wells GWQ-1 and GWQ-8 are not constructed in accordance with Section 20.6.7.28 NMAC; however, these wells are authorized for incorporation into the monitoring network to provide contextual ground water information for this Discharge Permit

0. Pursuant to Subsection G of 20.6.7.28 NMAC, the permittee shall sample and analyze ground water quarterly from all monitoring wells in accordance with Table 2 of this Discharge Permit, and applicable requirements of Subsection F of 20.6.7.28 NMAC. Analytical results shall be submitted in the semi-annual monitoring reports in the format specified by Subsection C of 20.6.7.29 NMAC.

1. ~~Monitoring Wells GWQ-1 and GWQ-8 are not constructed in accordance with Section 20.6.7.28 NMAC; however, these wells are authorized for incorporation into the monitoring network to provide contextual ground water information for this Discharge Permit.~~

2. Pursuant to Paragraph (a) of 20.6.7.28(2) NMAC, the permittee shall install all proposed monitoring wells at least 180 days before emplacement of ore, waste rock, or discharge of tailings or other contaminants at an individual waste rock stockpile or tailings

impoundment to allow sampling prior to discharge, except as required under abatement pursuant to C114.C and C114.D.

a. The permittee shall provide NMED with a definitive installation schedule as project approval dates become more certain.

b. All proposed monitoring wells shall be installed in accordance with Subsections B, C, D and E of 20.6.7.28 NMAC. Within 15 days of completion of each new monitoring well the permittee shall provide NMED with depth-to-water measurements and water quality field parameter data. Pending ground water conditions in the newly installed monitoring wells, additional requirements may be necessary. The permittee shall notify NMED in writing a minimum of one week prior to the start of installation of the monitoring wells. Upon completion of the installation of the monitoring wells, the permittee shall submit to NMED a monitoring well completion report for all newly-installed monitoring wells in accordance with the applicable requirements of Subsection K of 20.6.7.28 NMAC.

7. 6. The permittee is authorized to plug and abandon Monitoring Wells GWQ-11, GWQ94-13, GWQ94-16, GWQ94-17, GWQ94-18, GWQ94-19, GWQ94-20, IW-1, IW-2, IW-3, NP-2, NP-3, NP-5, GWQ11-25A and GWQ11-25B, which will be buried during construction of the TSF and enlargement of the open pit (GWQ11-25A, and GWQ11-25B). The permittee shall include Monitoring Wells NP-1, NP-4, GWQ-10, GWQ94-21A, GWQ94-21B, GWQ94-14, GWQ94-15, GWQ11-25A, and GWQ11-25B in the monitoring plan until expansion of the TSF and enlargement of the open pit requires plugging and abandonment of these wells.

a. Monitoring wells shall be plugged and abandoned in accordance with the attachment titled, *Ground Water Discharge Permit Monitoring Well Construction and Abandonment Conditions*, Revision 1.1, March 2011, and all applicable local, state, and federal regulations, including 19.27.4 NMAC.

b. The permittee shall submit documentation describing the well abandonment procedures in accordance with the attachment titled, *Ground Water Discharge Permit Monitoring Well Construction and Abandonment Conditions*, Revision 1.1, March 2011. The well abandonment documentation shall be submitted to NMED with the next semi-annual monitoring report for this Discharge Permit upon completion of abandonment procedures.

c. Pursuant to Subsection B of 20.6.7.30 NMAC, NMED may require replacement monitoring wells.

~~7. The permittee shall include Monitoring Wells NP-1, NP-4, GWQ-10, GWQ94-21A, GWQ94-21B, GWQ94-14, GWQ94-15, GWQ11-25A, and GWQ11-25B in the monitoring plan until expansion of the TSF requires plugging and abandonment of these wells.~~

8. The permittee shall submit a request in accordance with D105 prior to plugging and abandonment of any monitoring well not listed in condition C.111.G.^.

H. **Surface Water**

1. The permittee shall analyze surface water collected from five surface water auto-sampling ports (SWQ-1 through SWQ-5) located in Grayback Arroyo in accordance with the applicable requirements of the Revised Application and Subsection N of 20.6.7.28 NMAC. The surface water collection ports shall be checked after each precipitation event of 0.5 inch or greater at the Copper Flat Mine. If sufficient water is present, a sample shall be

collected and analyzed. The permittee shall attempt to collect samples from the collection ports as soon as practicable and safe to do so, after the precipitation event. No more than one surface water sample per port may be collected in a 24-hour period, and no more than two surface water samples per port are required to be collected per quarter. Samples shall be analyzed for total and dissolved concentrations of the analytes listed on Table 2 of this Discharge Permit. Analytical results shall be submitted in the semi-annual monitoring reports in the format specified by Subsection C of 20.6.7.29 NMAC.

2. The permittee shall sample and analyze surface water collected quarterly from any seeps or springs, if encountered, outside the OPSDA in accordance with the schedule listed in Table 2 of this Discharge Permit, and applicable requirements of Subsection N of 20.6.7.28 NMAC. Analytical results shall be submitted in the semi-annual monitoring reports in the format specified by Subsection C of 20.6.7.29 NMAC.

I. Copper Flat Open Pit

1. Pursuant to Subsection C of 20.6.7.24 NMAC, the permittee shall submit on a semi-annual basis a mine operation water management report summarizing pit dewatering activities and management of water generated and collected from within the perimeter of the open pit. The report shall also include an updated mine operation water management plan discussing changes to water management in the open pit for the upcoming six months. The report shall be submitted in the semi-annual monitoring reports.

J. Waste Rock Stockpiles

1. Pursuant to Paragraph (7) of 20.6.7.21.D NMAC, the permittee shall submit on an annual basis an operating plan that describes the sequencing of waste rock deposition on the waste rock stockpiles and describes the operation of any applicable systems utilized to contain or transport process water or impacted stormwater from the waste rock stockpiles. The operating plan shall be submitted with the monitoring report due by February 28 of each year.

K. Copper Crushing, Milling, Concentrator, and Tailings Storage Facility Units

1. Pursuant to Subparagraph (j) of 20.6.7.22.C(1) NMAC, the permittee shall submit ~~on an annual basis~~ an operating plan that describes the sequencing of tailings deposition on the TSF on an annual basis and describes the operation of any applicable systems utilized to contain or transport process water and measures taken to manage the surface impoundment area to maintain adequate freeboard.

L. Discharge Volumes

1. The permittee shall measure and report discharge volumes for process water, liner solution collection systems, tailings and impacted stormwater discharges in accordance with

18210

Subsections B, E, and F of 20.6.7.29 NMAC and the flow metering plan submitted with the Revised Application. Flow meter locations used for monitoring and reporting are schematically displayed on Figure 3 of this Discharge Permit. Discharge volume reporting shall be submitted in the semi-annual monitoring reports in the format specified by Subsection C of 20.6.7.29 NMAC. In addition to applicable discharge volume reporting required by Subsections B, E, and F of 20.6.7.29 NMAC, additional discharge volume reporting for the following shall be measured and reported:

a. The daily volume and source of water used for dust suppression.

M. Flow Measurement Report

1. Pursuant to Subparagraph (a) of 20.6.7.18.E.2 NMAC, the permittee shall submit a report of repaired or replaced flow meters in the semi-annual monitoring reports that include a description of any flow meter malfunctions with a statement verifying the repair and description of calibration of the flow meter pursuant to Paragraph (3) of 20.6.7.18.E NMAC.

N. Impoundment Leak Detection/Collection System Report

1. Pursuant to Subparagraph (b) of 20.6.7.18.F.2 NMAC, the permittee shall submit a report of repaired or replaced leak detection/collection system components in the semi-annual monitoring reports.

O. Meteorological Data

1. Meteorological data shall be measured and reported as stipulated in the Meteorological Plan submitted with the Revised Application. Pursuant to Subsection G of 20.6.7.29 NMAC, tabulated data shall be submitted to NMED in the monitoring report due by February 28 of each year.

C112 Contingency Plan

A. The permittee shall comply with all applicable contingency requirements and submit to NMED all applicable information or documentation specified in Subsections A through J of 20.6.7.30 NMAC.

B. Pursuant to Subsection G of 20.6.7.30 NMAC, discharges of process water, impacted stormwater, or seepage that exceed the standards of Section 20.6.2.3103 NMAC to unauthorized areas must be reported under Section 20.6.2.1203 NMAC.

~~C.~~ Pursuant to Subsection K of 20.6.7.30 NMAC, the permittee shall submit to NMED for approval an Interim Emergency Water Management Plan no less than 60 days prior to discharge at a new mine facility.~~within 180 days of the effective date of this Discharge Permit (by DATE).~~

D. Pursuant to Subsection I of 20.6.7.30 NMAC, the permittee shall notify NMED of any significant erosion or condition that may compromise conveyance structures utilized in DP-1840.

E. If NMED or the permittee identifies any other failures of the discharge plan or system not specifically noted in this permit, NMED may require the permittee to develop and submit contingency plans and schedules for NMED approval to address such failures. [20.6.2.3107.A.10 NMAC]

C113 Closure Plan

A. Closure of all mine units associated with this Discharge Permit shall be performed in accordance with the requirements of Sections 20.6.7.33 and 20.6.7.34 NMAC, the Closure/Closeout Plan contained in the Revised Application, this Discharge Permit as applicable, and the final Closure/Closeout Plan approved by the New Mexico Mining and Minerals Division pursuant to the New Mexico Mining Act.

B. Pursuant to Paragraph (4) of 20.6.7.33.F NMAC and Subsection F of 20.6.7.34 NMAC, the permittee shall submit for NMED approval at least sixty days prior to construction, a Construction Quality Assurance/Construction Quality Control (CQA/CQC) plan for any mine units regulated pursuant to DP-1840 where cover is applied under an approved Closure/Closeout Plan.

C. For each mine unit closed, the closure period shall cease, and the post-closure period shall commence following NMED approval of a final CQA/CQC report that is in accordance with Subsection G of 20.6.7.34 NMAC.

D. The permittee shall provide a workplan and an implementation schedule, as a component of the Test Plot Program, for NMED approval within 90 days of the effective date of this permit (by DATE) to perform soil water characteristic curve laboratory analysis on the proposed reclamation cover material (RCM). The workplan shall be designed to verify Copper Mine Rule water holding capacity requirements pursuant to Subsection F of 20.6.7.33 NMAC. Based on the results of developed soil water characteristic curves, the permittee will be required to implement an appropriate material handling plan at closure to ensure the emplaced cover material textural characteristics achieves the water holding capacity required pursuant to Section 20.6.7.33 NMAC. Final RCM approval is subject to a demonstration that Copper Mine Rule requirements will be met, and concurrence from the New Mexico Mining and Minerals Division that requirements of the Mining Act will be met.

E. To demonstrate that the proposed RCM material will be capable of sustaining plant growth without continuous augmentation and have erosion resistant capabilities as required pursuant to Subsection F of 20.6.7.33 NMAC, the permittee shall conduct a RCM Test Plot Program. The RCM Test Plot Program shall be conducted in accordance with all approved work plans, and applicable New Mexico Mining and Minerals Division requirements.

F. In accordance with Subsection H of 20.6.7.33 NMAC, the permittee shall manage all process water at closure pursuant to the water management plan described in the Revised Application.

G. Closure of EWRSP-1 and EWRSP-2B shall be completed during the mine start-up phase in accordance with the requirements of Sections 20.6.7.33 and 20.6.7.34 NMAC, the Revised Application and this Discharge Permit, as applicable.

H. The southern slopes of EWRSP-4 facing Grayback Arroyo shall be reclaimed during the mine start-up phase, and the top surface shall be filled and graded to a 1% slope in accordance with the requirements of Sections 20.6.7.33 and 20.6.7.34 NMAC, the Revised Application and this Discharge Permit, as applicable.

I. Post-Closure Conditions

1. Post-closure requirements shall be performed in accordance with the applicable requirements of Section 20.6.7.35 NMAC, and in accordance with the Closure/Closeout Plan and associated materials submitted as part of this Discharge Permit. Pursuant to Subsection D of 20.6.7.35 NMAC, the permittee shall submit to NMED semi-annual reports pursuant to the schedule in Subsection A of 20.6.7.29 NMAC that include, but are not limited to, a description and the results of post-closure monitoring, any work completed during the preceding semi-annual period, any maintenance and repair work conducted for any closure unit, status of post-closure activities, and semi-annual potentiometric maps.

2. Pursuant to Subsection E of 20.6.7.35 NMAC, the contingency requirements of Section 20.6.7.30 NMAC apply to any deficiencies discovered during post-closure monitoring and inspections, including, but not limited to, the requirements for possible corrective action plans, abatement plans, monitoring well replacement, reporting and correction of unauthorized discharges, and significant erosion of, or ponding of water on, a cover system.

C114 Abatement Plan

A. The permittee has been required to submit to NMED for approval a proposed abatement plan for the Copper Flat Mine. All abatement plans and activities shall be performed in accordance with Sections 20.6.2.4000 through 4115 NMAC and Paragraphs (3) and (4) of 20.6.7.30.A NMAC.

B. Within 180 days of the date of this Discharge Permit (by DATE), the permittee shall submit a work_plan to evaluate any potential ongoing sources of surface or ground water impacts to Grayback Arroyo and connected aquifers. The work_plan shall include a schedule and any corrective action measures, if necessary, to address any currently known source areas of impacts to Grayback Arroyo and connected aquifers pursuant to Sections 20.6.2.4000 NMAC through 4115 NMAC.

C. ~~Additional~~ Monitoring Wells

~~1. In addition to the monitoring wells already proposed in the Revised Application, the permittee shall install two additional monitoring wells to evaluate current ground water conditions proximal to the open pit and historic waste rock stockpiles. One monitoring well shall be located to the northeast side of the open pit at the intersection of ground water contour interval 5450 feet and the OPSDA (PGWQ-21) as shown on Figure 2 of this Discharge Permit, and a second monitoring well shall be located southwest of the open pit near the intersection of ground water contour interval 5480 feet and the OPSDA between GWQ-11-24B and GWQ11-26 (PGWQ-22).~~

~~2. Pursuant to Subsection A of 20.6.7.28 NMAC, the permittee shall submit a map identifying the proposed locations and provide construction details for the monitoring wells for NMED approval a minimum of 30 days prior to installation. The proposal shall consider the necessity of a nested pair monitoring well(s) to evaluate ground water conditions in different water bearing units or to account for ground water decline due to pit dewatering.~~

~~3.~~1. Within 180 days of the date of this Discharge Permit (by DATE), the permittee shall install monitoring wells PGWQ-1, PGWQ-5, PGWQ-13, and PGWQ-20, ~~PGWQ-21, and PGWQ-22~~ to provide additional information regarding the horizontal and vertical extent and magnitude of ground water contamination as required pursuant to Sections 20.6.2.4000 NMAC through 20.6.2.4115 NMAC.

~~4.~~2. Installation of the monitoring wells shall be in accordance with Subsections B, C, D and E of 20.6.7.28 NMAC.

~~5.~~3. The permittee shall notify NMED in writing a minimum of one week prior to the start of installation of the monitoring wells required in C114.C.3. Upon completion of the installation of the monitoring wells, the permittee shall submit to NMED monitoring well completion reports for the newly-installed monitoring wells in accordance with the applicable requirements of Subsection K of 20.6.7.28 NMAC.

D. **Additional Stage 1 Abatement Plan Ground and Surface Water Quality Information**

1. The permittee shall collect and analyze an additional four quarters of ground and surface water samples for the parameters identified in the NMED approved Stage 1 Abatement list for the site~~data~~ from the monitoring wells required in C114.C.3, and the previously approved Stage 1 Abatement Plan sampling locations shown in Table 2 of the document entitled, "Results from First Year of Stage 1 Abatement Investigation at the Copper Flat Mine Site Near Hillsboro, New Mexico," dated May 2014.

2. The initial abatement sampling event shall commence following completion of installation of monitoring wells required in C114.C.3. Analytical results shall be submitted semi-annually in the format specified by Subsection C of 20.6.7.29 NMAC.

C115 Financial Assurance

A. The permittee shall maintain joint financial assurance with NMED and the Mining and Minerals Division of the New Mexico Energy, Minerals and Natural Resources Department to cover costs associated with closure and post-closure activities approved under this Discharge Permit. [20.6.2.3107 NMAC]

Part D GENERAL CONDITIONS

NMED has reviewed the Discharge Plan for the proposed discharge permit and has determined that the provisions of the Copper Mine Rule and applicable ground water quality standards will be met in accordance with this Discharge Permit. General conditions pursuant to 20.6.2 NMAC and 20.6.7 NMAC are listed below.

D100 Enforcement

A. Any violation of the requirements and conditions of this Discharge Permit, including any failure to allow NMED staff to enter and inspect records or facilities, or any refusal or failure to provide NMED with records or information, may subject the permittee to a civil enforcement action pursuant to the NMSA 1978, Section 74-6-10(A) and (B). Such action may include a compliance order requiring compliance immediately or in a specified time, assessing a civil penalty, modifying or terminating the discharge permit, or any combination of the foregoing; or an action in district court seeking injunctive relief, civil penalties, or both. Pursuant to the NMSA 1978, Section 74-6-10(C) and 74-6-10.1, civil penalties of up to $15,000 per day of noncompliance may be assessed for each violation of the NMSA 1978, Section 74-6-5, the WQCC Regulations, or this Discharge Permit, and civil penalties of up to $10,000 per day of noncompliance may be assessed for each violation of any other provision of the WQA, or any regulation, standard, or order adopted pursuant to such other provision. In any action to enforce this Discharge Permit, the permittee waives any objection to the admissibility as evidence of any data generated pursuant to this Discharge Permit. The permittee does not waive any argument as to the weight such evidence should be given. [74-6-10 WQA, 74-6-10.1 WQA]

B. Pursuant to the NMSA 1978, Section 74-6-10.2(A-F), criminal penalties may be assessed for any person who knowingly violates or knowingly causes or allows another person to:

Make any false material statement, representation, certification or omission of material fact in an application, record, report, plan or other document filed, submitted or required
2. to be maintained under the WQA;

Falsify, tamper with or render inaccurate any monitoring device, method or record
3. required to be maintained under the WQA; or

Fail to monitor, sample or report as required by a permit issued pursuant to a state or federal law or regulation.

D101 General Inspection and Entry Requirements

A. Nothing in this Discharge Permit shall be construed as limiting in any way the inspection and entry authority of NMED under the WQA, the WQCC Regulations, or any other applicable law or regulation. [20.6.2.3107 NMAC, 74-6-9(B) & (E) WQA]

B. The permittee shall allow the Secretary or an authorized representative, upon the presentation of credentials, to [20.6.2.3107.D NMAC, 74-6-9(B) & (E) WQA]:

1. Enter at regular business hours or at other reasonable times upon the permittee's premises or other location where records must be kept under the conditions of this Discharge Permit, or under any federal or WQCC regulation.
2. Inspect and copy, during regular business hours or at other reasonable times, any records required to be kept under the conditions of this Discharge Permit, or under any federal or WQCC regulation.
3. Inspect, at regular business hours or at other reasonable times, any facility, equipment (including monitoring and control equipment or treatment works), practices or operations regulated or required under this Discharge Permit, or under any federal or WQCC regulation.
4. Sample or monitor, at reasonable times for the purpose of assuring compliance with this Discharge Permit or as otherwise authorized by the WQA, any effluent, water contaminant, or receiving water at any location before or after discharge.

D102 General Engineering, Operational and Setback Requirements

A. Mine units shall be designed in accordance with the applicable requirements of Section 20.6.7.17 NMAC.

B. Mine units shall be operated in accordance with the applicable requirements of Section 20.6.7.18 NMAC.

C. The permittee shall meet all applicable setback requirements pursuant to Section 20.6.7.19 NMAC.

D103 General Record Keeping and Reporting Requirements

A. The permittee shall retain written records at the copper mine facility as required pursuant to Section 20.6.7.37 NMAC.

B. The permittee shall furnish to NMED, within a reasonable time, any documents or other information which it may request to determine whether cause exists for modifying, terminating and/or renewing this Discharge Permit or to determine compliance with this Discharge Permit.

The permittee shall also furnish to NMED, upon request, copies of documents required to be kept by this Discharge Permit. [20.6.2.3107.D NMAC, 74-6-9 (B) & (E) WQA]

D104 General Sampling and Analytical Methods

A. Unless otherwise approved in writing by NMED, the permittee shall conduct sampling and analysis in accordance with the most recent edition of the following documents [Subsection B of 20.6.2.3107 NMAC]:

American Public Health Association, Standard Methods for the Examination of Water and Wastewater (18th, 19th, or current)

3. U.S. Environmental Protection Agency, Methods for Chemical Analysis of Water and Waste

4. U.S. Geological Survey, Techniques for Water Resources Investigations of the U.S. Geological Survey

5. American Society for Testing and Materials, Annual Book of ASTM Standards, Part 31. Water

6. U.S. Geological Survey, et al., National Handbook of Recommended Methods for Water Data Acquisition

7. Federal Register, latest methods published for monitoring pursuant to Resource Conservation and Recovery Act regulations

Methods of Soil Analysis: Part 1. Physical and Mineralogical Methods; Part 2. Microbiological and Biochemical Properties; Part 3. Chemical Methods, American Society of Agronomy

D105 Monitoring Well Abandonment

A. The permittee shall submit a written request for NMED approval to amend or modify this Discharge Permit at least 30 days prior to the anticipated destruction or removal of any monitoring wells required under this Discharge Permit. Monitoring well plugging and abandonment shall be completed in accordance with the *Ground Water Discharge Permit Monitoring Well Construction and Abandonment Conditions,* Revision 1.1, March 2011, or according to regulations issued by the Office of the State Engineer in 19.27.7 NMAC, unless an alternate method is approved by NMED. [20.6.2.3107 NMAC]

B. The request required in D105.A shall include the following information:

1. A scaled map showing the location of the monitoring well(s) and the mine units it is intended to monitor;
2. The purpose for plugging and abandoning the monitoring well(s);

4. Details, if available, on the monitoring well(s) including depth-to-water elevation, top-of-casing elevation, construction and lithologic logs;

5. Recent ground water analytical results from a minimum of the most recent eight sampling events from the monitoring well(s);

6. Proposed replacement well(s), if applicable, and;

Same details, as applicable, as provided in D105.B.1, D105.B.3, and D105.B.4 are required for the proposed replacement monitoring well(s). New replacement wells require monitoring well completion reports pursuant to Subsection K of 20.6.7.28 NMAC.

D106 Reporting Requirements for Unauthorized Discharges

A. In the event of a spill or release that is not authorized under this Discharge Permit, the permittee shall initiate the notifications and corrective actions as required in 20.6.2.1203 NMAC. The permittee shall take immediate corrective action to contain and remove or mitigate any damage caused by the discharge. Within 24 hours after discovery of the discharge, the permittee shall verbally notify NMED and provide the information required by Paragraph (1) of 20.6.2.1203.A NMAC, and to determine applicable monitoring and reporting requirements pursuant to Paragraphs (2) and (3) of 20.6.7.29.B NMAC. Within 7 days of discovering of a discharge reportable under 20.6.2.1203 NMAC, the permittee shall submit a written report to NMED verifying the oral notification and providing any additional information or changes. The permittee shall submit a corrective action report within 15 days after discovery of the discharge. [20.6.2.1203 NMAC]

B. As part of the 24-hour spill notification requirements, the permittee shall submit a figure to NMED that clearly displays the location (or locations) of the spill and identifies nearby mine units and/or location information in latitude/longitude coordinates in decimal degrees (XX.XXXXXX and –XXX.XXXXXX, respectively), using a specified datum of WGS 84. Submittal of location information in Universal Transverse Mercator (UTM) format is also acceptable.

D107 Modifications and Amendments

A. In the event the permittee proposes a change to the facility or the facility's discharge that would result in a change in the volume discharged; the location of the discharge; or the amount or character of water contaminants received, treated, or discharged by the facility, the permittee shall notify and obtain approval from NMED prior to implementing such changes. Such changes may require modification or amendment of this Discharge Permit, including payment of applicable fees as specified in Section 20.6.7.9 NMAC. [20.6.2.3107.C NMAC, 20.6.2.3109.E NMAC, 20.6.7.7.B(19) NMAC, 20.6.7.14 NMAC]

B. For any proposed change that would meet the definition of a discharge permit modification as specified in Paragraph P of 20.6.2.7 NMAC, the permittee shall submit for NMED approval an application for modification of this Discharge Permit pursuant to Sections 20.6.7.10 and 20.6.7.11 NMAC. Plans and specifications shall be included in the application, as applicable, pursuant to Section 20.6.7.17 NMAC.

C. For any proposed change that meets the definition of a discharge permit amendment as specified in Paragraph 19 of 20.6.7.7.B NMAC, the permittee shall submit to NMED a request for an amendment to this Discharge Permit pursuant to Section 20.6.7.14 NMAC. Plans and specifications shall be included in the request, as applicable, pursuant to Section 20.6.7.17 NMAC.

D. Pursuant to Section 20.6.2.3109 NMAC, NMED reserves the right to require a discharge permit modification in the event NMED determines that the requirements of 20.6.2 NMAC are being or may be violated, or the standards of Section 20.6.2.3103 NMAC are being or may be violated. This may include a determination that structural controls and/or management practices approved under this Discharge Permit are not protective of groundwater quality, and that more stringent requirements are needed to protect groundwater quality. The permittee may be required to abate water pollution.

D108 Compliance with Other Laws

A. Nothing in this Discharge Permit shall be construed in any way as relieving the permittee of the obligation to comply with all applicable federal, state, and local laws, regulations, permits or orders. [20.6.2 NMAC, 20.6.7.8(D) NMAC]

Table 1 – Copper Flat Development Sequence and Schedule

Project Build Out Sequence					Project Reclamation Sequence	
		Disturbed Acres				
Year	Project Activity	Facility	Cumulative	19.10.1602.0(15)(c) Reference	Year	Reclamation Activity
	Mobilize Construction	0.00	0.00	Other Facility or Structures (c)xiii		
	Plant Site Grading	84.41	84.41	Other Facility or Structures (c)xiii		
	TSF Phase 1	451.50	535.91	Tailings Storage Facility (c)vii		
	Top Dressing Stockpile 1	29.33	565.24	Topsoil & Topdressing Stockpiles (c)xi		
	Construct Mill	8.51	573.75	Mills (c)viii		
	Construct Ancillary Facilities	8.89	582.64	Other Facility or Structures (c)xiii		
	Storage Areas	3.22	585.86	Storage Areas (c)x		
1	EWRSP 1	15.34	601.20	Waste Rock Stockpiles (c)xii	1	
	EWRSP 2A	8.33	609.53	Waste Rock Stockpiles (c)xii		
	EWRSP 2B	12.73	622.26	Waste Rock Stockpiles (c)xii		
	EWRSP 3	19.54	641.80	Waste Rock Stockpiles (c)xii		
	EWRSP 4	18.10	659.90	Waste Rock Stockpiles (c)xii		
	Mine Haul Roads	5.97	665.87	Waste Rock Stockpiles (c)xii		
	Impoundments : TSF; Proc; SW A	12.92	678.79	Impoundments (c)ii		
	Collection Ditches: SW A	1.38	680.17	Impoundments (c)ii		
	Top Dressing Stockpile 2	31.55	711.72	Topsoil & Topdressing Stockpiles (c)xi		
	Top Dressing Stockpile 3	3.53	715.25	Topsoil & Topdressing Stockpiles (c)xi		
	Construct Ancillary Facilities	21.10	736.35	Other Facility or Structures (c)xiii		
	Open Pit	82.66	819.01	Open Pit (c)vi		
	WRSP 1	3.97	822.98	Waste Rock Stockpiles (c)xii		Reclaim EWRSP 1
2	WRSP 2	2.44	825.42	Waste Rock Stockpiles (c)xii	2	Reclaim EWRSP 2A
	WRSP 3	6.07	831.49	Waste Rock Stockpiles (c)xii		Reclaim EWRSP 2B
	Mine Haul Roads	11.03	842.52	Waste Rock Stockpiles (c)xii		
	EWRSP 4	4.52	847.04	Waste Rock Stockpiles (c)xii		
	Ore Stockpile	2.07	849.11	Ore Stockpiles (c)i		
	Impoundments : Surge; SW B; SW C	8.99	858.10	Impoundments (c)ii		
	Collection Ditches: SW B; SW C	4.42	862.52	Impoundments (c)ii		
	Top Dressing Stockpile 3	10.58	873.10	Topsoil & Topdressing Stockpiles (c)xi		
	Open Pit	66.13	939.23	Open Pit (c)vi		
	WRSP 1	27.80	967.03	Waste Rock Stockpiles (c)xii		
3	WRSP 2	4.88	971.91	Waste Rock Stockpiles (c)xii	3	
	WRSP 3	18.20	990.11	Waste Rock Stockpiles (c)xii		
	TSF Phase 2	28.22	1,018.33	Tailings Storage Facility (c)vii		
	WRSP 1	7.94	1,026.27	Waste Rock Stockpiles (c)xii		
4	WRSP 2	19.51	1,045.78	Waste Rock Stockpiles (c)xii		
	WRSP 3	18.20	1,063.98	Waste Rock Stockpiles (c)xii	4	
	TSF Phase 3	28.22	1,092.20	Tailings Storage Facility (c)vii		
	Open Pit	8.27	1,100.47	Open Pit (c)vi		
	WRSP 2	14.63	1,115.10	Waste Rock Stockpiles (c)xii		
5	WRSP 3	18.20	1,133.30	Waste Rock Stockpiles (c)xii	5	
	TSF Phase 4	28.22	1,161.52	Tailings Storage Facility (c)vii		
	Open Pit (buildout complete)	8.27	1,169.79	Open Pit (c)vi		
6	WRSP 1	0.00	1,169.79	Waste Rock Stockpiles (c)xii		
	WRSP 2	4.88	1,174.67	Waste Rock Stockpiles (c)xii	6	
	WRSP 3	18.20	1,192.87	Waste Rock Stockpiles (c)xii		
	WRSP 2, 3	2.44	1,195.31	Waste Rock Stockpiles (c)xii		
7	WRSP 3	18.20	1,213.51	Waste Rock Stockpiles (c)xii	7	
	TSF Phase 5 (buildout complete)	28.22	1,241.73	Tailings Storage Facility (c)vii		
8	WRSP 3	18.20	1,259.93	Waste Rock Stockpiles (c)xii	8	
9 - 11	WRSP 3 (buildout complete)	6.07	1,266.00	Waste Rock Stockpiles (c)xii	10- 11	WRSP 3 Contour
12					12	WRSP 3 Contour, TSF Draindown - Active Evaporation
13					13	Pit Rapid Fill, WRSP 2-Upper Lift Contour, WRSP 1- Contour, TSF Draindown - Active Evaporation
14	Mining and Processing Ends				14	Rapid Fill, WRSP-2 Upper Lift Contour, WRSP 1- Contour, Fill & Contour, WRSP 3, 2, 1, EWRSP 4 Cover & Seed, TSF Draindown - Active Evaporation
15					15	Process Area Demo, Fill & Contour, WRSP 3, 2, 1, EWRSP 3 & 4 Contour, Cover & Seed, Pit Area Contour, TSF Contour, Draindown - Active Evaporation
16					16	Process Area Fill & Contour, WRSP 3, 2, 1, EWRSP 3 & 4 Contour, Cover, Seed, TSF Contour, Draindown - Active Evaporation
17					17	TSF Contour, Draindown - Active Evaporation
18	Evaporation Pond Construction (Project Buildout Complete)	24.05	1,290.05	Impoundments (c)ii	18	TSF Contour & Cover, Draindown - Active Evaporation, Passive Evaporation
19					19	TSF Contour, Cover, Draindown - Passive Evaporation
20 - 21					20 - 21	TSF Contour, Cover, Seed, Draindown - Passive Evaporation
22 - 38					22 -38	TSF Draindown - Passive Evaporation
39					39	TSF Evaporation Pond Fill, Cover & Seed

Table 2 Monitoring and Reporting Summary for DP-1840

Monitoring Report Schedule of Submittal (Subsection A of 20.6.7.29 NMAC)

1	January 1 - June 30 (Q1 and Q2 sampling quarters) - Semi-annual report due by August 31 of each year
2	July 1 - December 31 (Q3 and Q4 sampling quarters) - Semi-annual report due by February 28 of each year
3	Annual reports due by February 28 of each year

Reporting Summary

Annual Reporting Frequency	Number of Sites	Description
2	Not Applicable	Monitoring reports – All applicable requirements of Subsections A through H of 20.6.7.29 NMAC.
2	Not Applicable	Additional Discharge Volume reporting listed in C111.L
2	1	Mine facility ground water elevation contour map
1	1	OPSDA Map

Monitoring Schedule

Area	Identification Number	Sampling type	Q1	Q2	Q3	Q4	Notes
Open Pit	GWQ96-22A	mw	A-F,W	A-E,W	A-E,W	A-E,W	
	GWQ96-22B	mw	A-F,W	A-E,W	A-E,W	A-E,W	
	GWQ11-26	mw	A-F,W	A-E,W	A-E,W	A-E,W	
	GWQ96-23A	mw	A-F,W	A-E,W	A-E,W	A-E,W	
	GWQ96-23B	mw	A-F,W	A-E,W	A-E,W	A-E,W	
	GWQ11-24A	mw	A-F,W	A-E,W	A-E,W	A-E,W	
	GWQ11-24A	mw	A-F,W	A-E,W	A-E,W	A-E,W	
	PGWQ-1	Pmw	A-F,W	A-E,W	A-E,W	A-E,W	
	PGWQ-2	Pmw	A-F,W	A-E,W	A-E,W	A-E,W	
	PGWQ-21	Pmw	A-F,W	A-E,W	A-E,W	A-E,W	
	PGWQ-22	Pmw	A-F,W	A-E,W	A-E,W	A-E,W	
TSF	GWQ-1	mw & p	A-F,W	A-E,W	A-E,W	A-E,W	
	GWQ-8	mw & p	A-F,W	A-E,W	A-E,W	A-E,W	
	GWQ-10	mw	A-F,W	A-E,W	A-E,W	A-E,W	
	GWQ-12	mw	A-F,W	A-E,W	A-E,W	A-E,W	
	NP-1	mw	A-F,W	A-E,W	A-E,W	A-E,W	
	NP-4	mw	A-F,W	A-E,W	A-E,W	A-E,W	
	GWQ94-14	mw	A-F,W	A-E,W	A-E,W	A-E,W	
	GWQ94-15	mw	A-F,W	A-E,W	A-E,W	A-E,W	
	GWQ94-21A	mw	A-F,W	A-E,W	A-E,W	A-E,W	
	GWQ94-21B	mw	A-F,W	A-E,W	A-E,W	A-E,W	
	GWQ13-28	mw	A-F,W	A-E,W	A-E,W	A-E,W	
	PGWQ-14	Pmw	A-F,W	A-E,W	A-E,W	A-E,W	
	PGWQ-15	Pmw	A-F,W	A-E,W	A-E,W	A-E,W	
	PGWQ-16	Pmw	A-F,W	A-E,W	A-E,W	A-E,W	
	PGWQ-18	Pmw	A-F,W	A-E,W	A-E,W	A-E,W	
	PGWQ-19	Pmw	A-F,W	A-E,W	A-E,W	A-E,W	
TSF/UCP	PGWQ-17	Pmw	A-F,W	A-E,W	A-E,W	A-E,W	
TSF/WRSP-2 &-3	PGWQ-13	Pmw	A-F,W	A-E,W	A-E,W	A-E,W	
Surge Pond	GWQ-5R	mw	A-F,W	A-E,W	A-E,W	A-E,W	
	PGWQ-9	Pmw	A-F,W	A-E,W	A-E,W	A-E,W	
WRSP-2 &-3	PGWQ-3	Pmw	A-F,W	A-E,W	A-E,W	A-E,W	
	PGWQ-4	Pmw	A-F,W	A-E,W	A-E,W	A-E,W	
	PGWQ-5	Pmw	A-F,W	A-E,W	A-E,W	A-E,W	
	PGWQ-8	Pmw	A-F,W	A-E,W	A-E,W	A-E,W	

	PGWQ-20	Pmw	A-F,W	A-E,W	A-E,W	A-E,W	
SW-C/ WRSP-2 & WRSP-3	PGWQ-6	Pmw	A-F,W	A-E,W	A-E,W	A-E,W	
	PGWQ-7	Pmw	A-F,W	A-E,W	A-E,W	A-E,W	
SW-A	PGWQ-10	Pmw	A-F,W	A-E,W	A-E,W	A-E,W	
PWR	PGWQ-11	Pmw	A-F,W	A-E,W	A-E,W	A-E,W	
SW-A/PWR	PGWQ-12	Pmw	A-F,W	A-E,W	A-E,W	A-E,W	
Grayback Arroyo^	SWQ-1	sw	A-F,W	A-E,W	A-E,W	A-E,W	Tot. + Diss
	SWQ-2	sw	A-F,W	A-E,W	A-E,W	A-E,W	Tot. + Diss
	SWQ-3	sw	A-F,W	A-E,W	A-E,W	A-E,W	Tot. + Diss
	SWQ-4	sw	A-F,W	A-E,W	A-E,W	A-E,W	Tot. + Diss
	SWQ-5	sw	A-F,W	A-E,W	A-E,W	A-E,W	Tot. + Diss
Impoundments	SW-A(M/S-9)	sw	A-F,W	A-E,W	A-E,W	A-E,W	Tot. + Diss
	SW-B (M/S-10)	sw	A-F,W	A-E,W	A-E,W	A-E,W	Tot. + Diss
	SW-C (M/S-11)	sw	A-F,W	A-E,W	A-E,W	A-E,W	Tot. + Diss
	PWR (M/S-8)	sw	A-F,W	A-E,W	A-E,W	A-E,W	Tot. + Diss
	Surge Pond (M/S-14)	sw	A-F,W	A-E,W	A-E,W	A-E,W	Tot. + Diss
	UCP (M/S-6)	sw	A-F,W	A-E,W	A-E,W	A-E,W	Tot. + Diss
	TSF (M/S-4)	sw	A-F,W	A-E,W	A-E,W	A-E,W	Tot. + Diss
Mine Pit Water	Dewatering Sump	sw	A-F,W	A-E,W	A-E,W	A-E,W	Tot. + Diss
Seeps/Springs	Outside OPSDA only	spg / sp	A-F,W	A-E,W	A-E,W	A-E,W	If encountered
Flow Meters/Discharge Volume Reporting	M/S-1 through M/S-17		C.111.L &M	C.111.L &M	C.111.L &M	C.111.L &M	See Figure 3

Sampling Analytical Suites (mg/L, unless noted otherwise)(sample analyzed for dissolved constituents only, unless otherwise required:

Formatted Table

A = Field Parameters: Temperature (°C), pH, specific conductance (µS/cm)

B = General Chemistry and Inorganic Parameters: alkalinity-bicarbonate (alk-HCO_3), alkalinity-carbonate (alk-CO_3), alkalinity-total (alk-Tot), calcium (Ca), chloride (Cl), cyanide (CN), fluoride (F), magnesium (Mg), potassium (K), sodium (Na), sulfate (SO_4), and total dissolved solids (TDS)

C = Metal Parameters: aluminum (Al), arsenic (As), barium (Ba), beryllium (Be), boron (B), cadmiun (Cd), chromiun (Cr), cobalt (Co), copper (Cu), iron (Fe), lead (Pb), manganese (Mn), molybdenum (Mo), nickel (Ni), selenium (Se), silver (Ag), total mercury (Hg), uranium (U) and zinc (Zn).

D = Nutrients: Total Kjeldahl nitrogen (TKN), and Nitrate-Nitrogen (NO_3-N)

E = Radioactivity: Combined Radium-226 and Radium-228 (pCi/L) (1st Qtr. Only)

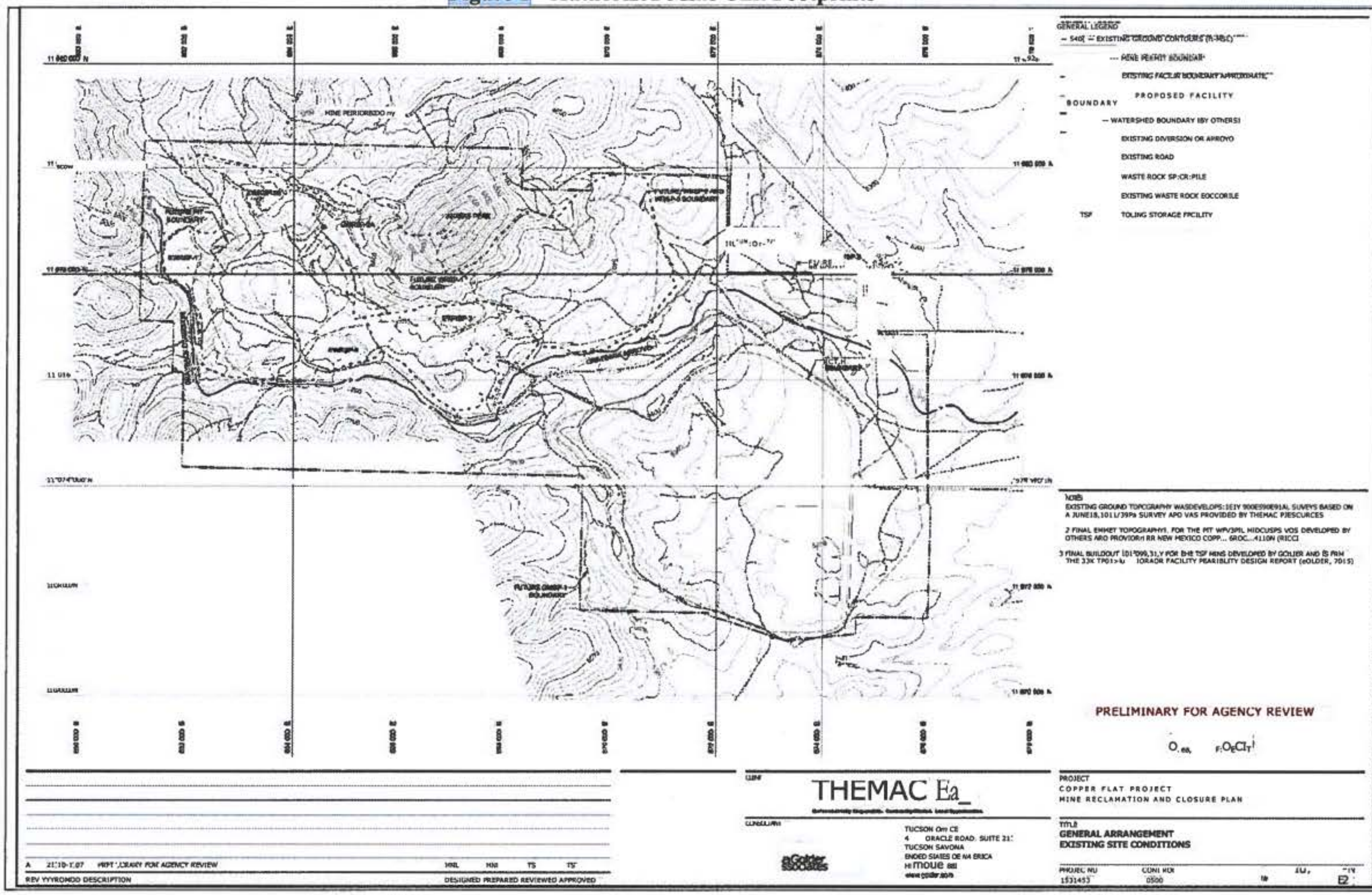
F = (1st Qtr. Only) Organic Parameters: Total Petroleum Hydrocarbons (TPH), benzene, polychlorinated biphenyls carbon tetrachloride, 1,2-dichloroethane (EDC), 1,1 -dichloroethlyene (1,1-DCE), 1,1,2,2-tetrachloroethylene (PCE), 1,1,2-trichloroethylene (TCE), ethylbenzene, total xylenes , methylene chloride, chloroform, 1,1-dichloroethane, ethylene dibromide (EDB), 1,1,1 -trichloroethane, 1,1,2-trichloroethane, 1,1,2,2-tetrachloroethane, vinyl chloride, PAHs: total naphthalene plus monomethylnaphthalenes, benzo-a-pyrene Measurements

W = Depth-to-water measurement to the nearest 0.01 foot
^ = See C111.H

Explanation to Abbreviations and Symbols

mw = monitoring well Pmw = proposed monitoring well sw = surface water p = production well spg = spring sp = seep Tnk = tank	WRP = Waste Rock Stockpile PWR = Process Water Reservoir UCP = Underdrain Collection Pond SW = Impacted Stormwater Impoundment Tot. + Diss = Total and Dissolved Concentrations M/S-# = Measuring/Sampling Point	Sampling Quarter: Q1 = Jan-Mar Q2 = Apr-Jun Q3 = Jul-Sep Q4 = Oct-Dec

Figure 1 – Authorized Mine Unit Footprints



Comment [V3]: Use Figure E3 from the MORP, Appendix E

Figure 2 – Ground and Surface Water Sampling Locations

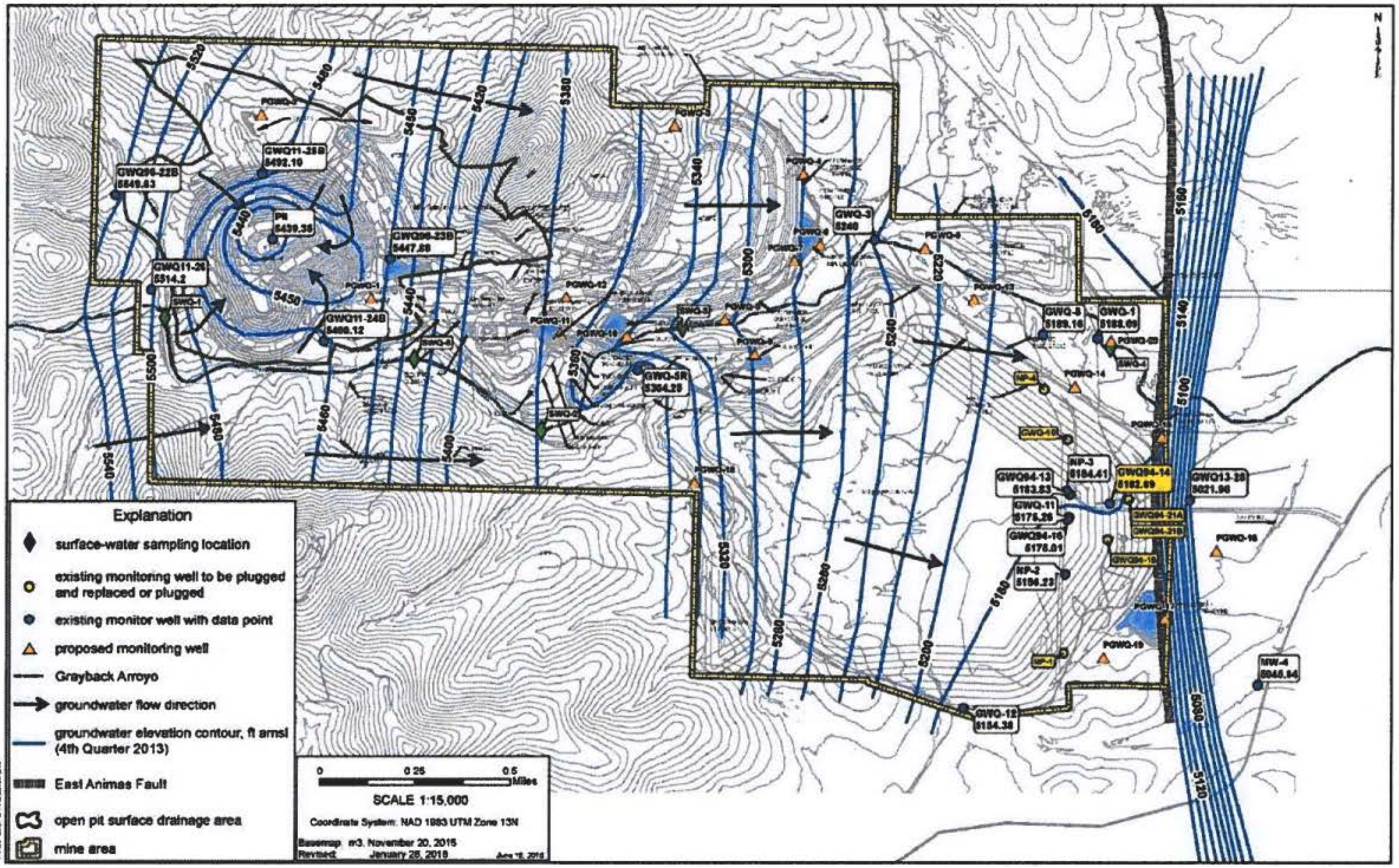
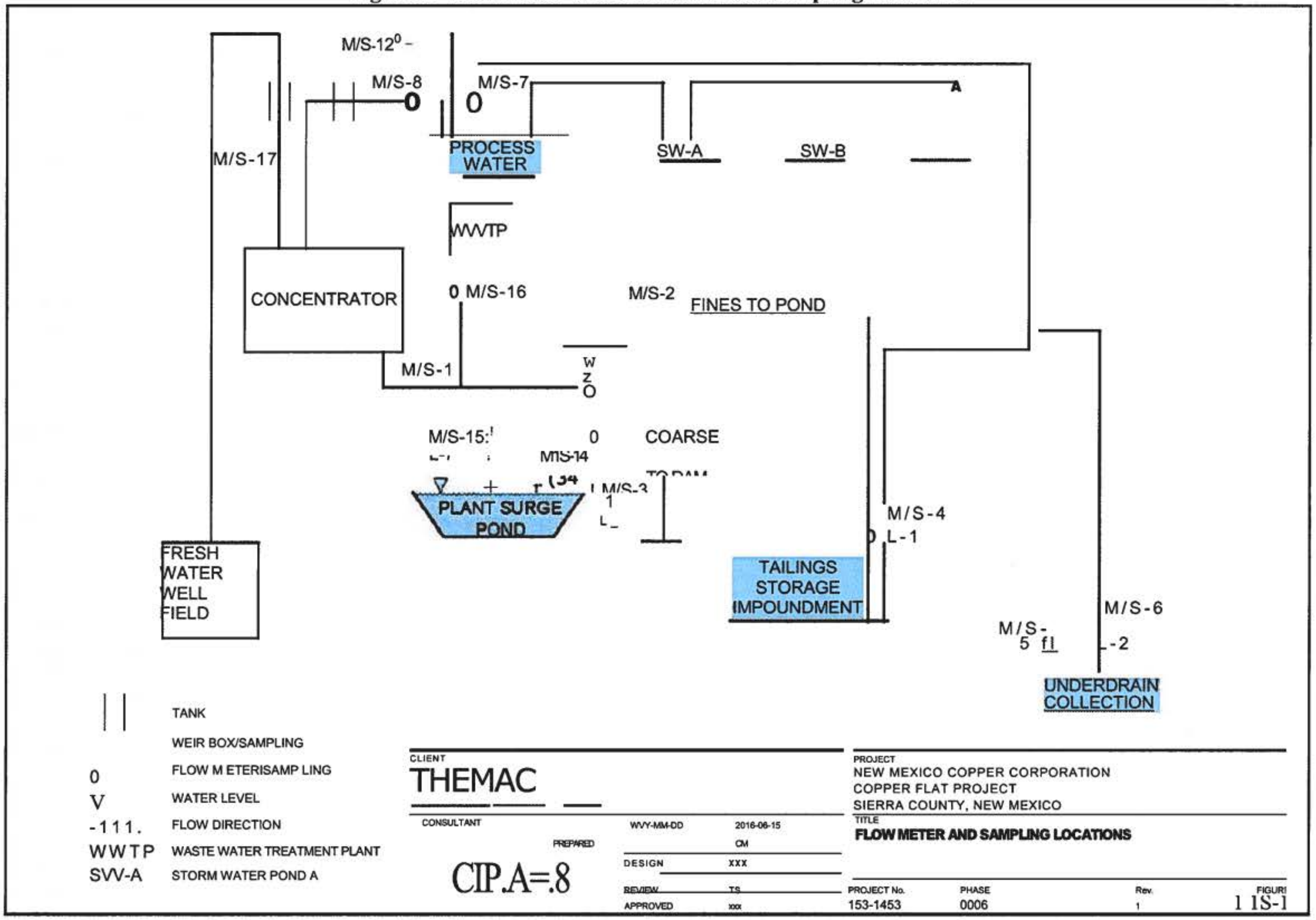


Figure 3 - Flow Meter and Process Water Sampling Locations



Ground Water Discharge Permit Monitoring Well Construction and Abandonment Conditions

These conditions identify construction and abandonment requirements for installation of water table monitoring wells underground water Discharge Permits issued by the NMED's Ground Water Quality Bureau (GWQB). Proposed locations of monitoring wells required under Discharge Permits and requests to use alternate installation and/or construction methods for water table monitoring wells shall be submitted to the GWQB for approval prior to drilling and construction.

General Drilling Specifications:

1. All well drilling activities shall be performed by an individual with a current and valid well driller license issued by the State of New Mexico in accordance with 19.27.4 NMAC.
2. Drilling methods that allow for accurate determinations of water table locations shall be employed. All drill bits, drill rods, and down-hole tools shall be thoroughly cleaned immediately prior to the start of drilling. The borehole diameter shall be drilled a minimum of 4 inches larger than the casing diameter to allow for the emplacement of sand and sealant.
3. After completion, the well shall be allowed to stabilize for a minimum of 12 hours before development is initiated.
4. The well shall be developed so that formation water flows freely through the screen and is not turbid, and all sediment and drilling disturbances are removed from the well.

Well Specifications (see attached monitoring well schematic):

5. Schedule 40 (or heavier) polyvinyl chloride (PVC) pipe, stainless steel pipe, carbon steel pipe, or pipe of an alternate appropriate material that has been approved for use by NMED shall be used as casing. The casing shall have an inside diameter not less than 2 inches. The casing material selected for use shall be compatible with the anticipated chemistry of the ground water and appropriate for the contaminants of interest at the facility. The casing material and thickness selected for use shall have sufficient collapse strength to withstand the pressure exerted by grouts used as annular seals and thermal properties sufficient to withstand the heat generated by the hydration of cement-based grouts. Casing sections shall be joined using welded, threaded, or mechanically locking joints; the method selected shall provide sufficient joint strength for the specific well installation. The casing shall extend from the top of the screen to at least one foot above ground surface. The top of the casing shall be fitted with a removable cap, and the exposed casing shall be protected by a locking steel well shroud. The shroud shall be large enough in diameter to allow easy access for removal of the cap. Alternatively, monitoring wells may be completed below grade. In this case, the casing shall extend from the top of the screen to 6 to 12 inches below the ground surface; the monitoring wells shall be sealed with locking, expandable well plugs; a flush-mount, watertight well vault that is rated to withstand traffic loads shall be emplaced around the wellhead; and the cover shall be secured with at least one bolt. The vault cover shall indicate that the wellhead of a monitoring well is contained within the vault.
6. A 20-foot section (maximum) of continuous-slot, machine slotted, or other manufactured PVC or stainless steel well screen or well screen of an alternate appropriate material that has been approved for use by NMED shall be installed across the water table. Screens created by cutting slots into solid casing with saws or other tools shall not be used. The screen material selected for use shall be compatible with the anticipated chemistry of the ground water and appropriate for the contaminants of interest at the facility. Screen sections shall be joined using welded, threaded, or mechanically locking joints; the method selected shall provide sufficient joint strength for the specific well installation and shall not introduce constituents that may reasonably be considered contaminants of interest at the facility. A cap shall be attached to the bottom of the well screen; sumps (i.e., casing attached to the bottom of a well screen) shall not be installed. The bottom of the screen shall be installed no more than 15 feet below the water table; the top of the well screen shall be positioned not

less than 5 feet above the water table. The well screen slots shall be appropriately sized for the formation materials and shall be selected to retain 90 percent of the filter pack.

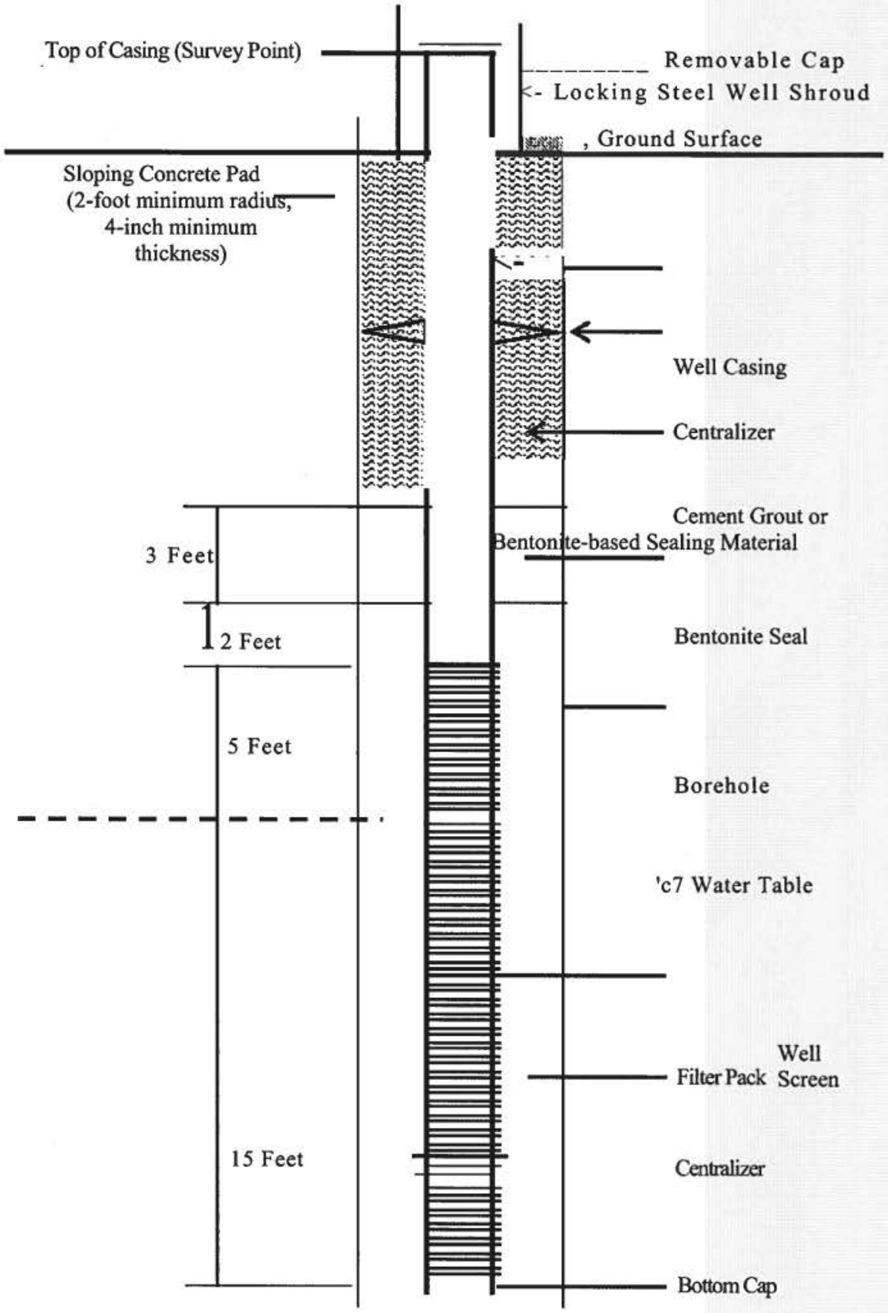
7. Casing and well screen shall be centered in the borehole by placing centralizers near the top and bottom of the well screen.
8. A filter pack shall be installed around the screen by filling the annular space from the bottom of the screen to 2 feet above the top of the screen with clean silica sand. The filter pack shall be properly sized to prevent fine particles in the formation from entering the well. For wells deeper than 30 feet, the sand shall be emplaced by a tremmie pipe. The well shall be surged or bailed to settle the filter pack and additional sand added, if necessary, before the bentonite seal is emplaced.
9. A bentonite seal shall be constructed immediately above the filter pack by emplacing bentonite chips or pellets (3/8-inch in size or smaller) in a manner that prevents bridging of the chips/pellets in the annular space. The bentonite seal shall be 3 feet in thickness and hydrated with clean water. Adequate time shall be allowed for expansion of the bentonite seal before installation of the annular space seal.
10. The annular space above the bentonite seal shall be sealed with cement grout or a bentonite-based sealing material acceptable to the State Engineer pursuant to 19.27.4 NMAC. A tremmie pipe shall be used when placing sealing materials at depths greater than 20 feet below the ground surface. Annular space seals shall extend from the top of the bentonite seal to the ground surface (for wells completed above grade) or to a level 3 to 6 inches below the top of casing (for wells completed below grade).
11. A concrete pad (2-foot minimum radius, 4-inch minimum thickness) shall be poured around the shroud or well vault and wellhead. The concrete and surrounding soil shall be sloped to direct rainfall and runoff away from the wellhead.

Abandonment:

12. Approval for abandonment of monitoring wells used for ground water monitoring in accordance with Discharge Permit requirements shall be obtained from NMED prior to abandonment.
13. Well abandonment shall be accomplished by removing the well casing and placing neat cement grout, bentonite-based plugging material, or other sealing material approved by the State Engineer for wells that encounter water pursuant to 19.27.4 NMAC from the bottom of the borehole to the ground surface using a tremmie pipe. If the casing cannot be removed, neat cement grout, bentonite-based plugging material, or other sealing material approved by the State Engineer shall be placed in the well using a tremmie pipe from the bottom of the well to the ground surface.
14. After abandonment, written notification describing the well abandonment shall be submitted to the NMED. Written notification of well abandonment shall consist of a copy of the well plugging record submitted to the State Engineer in accordance with 19.27.4 NMAC, or alternate documentation containing the information to be provided in a well plugging record required by the State Engineer as specified in 19.27.4 NMAC.

Deviation from Monitoring Well Construction and Abandonment Requirements: Requests to construct water table monitoring wells or other types of monitoring wells for ground water monitoring under ground water Discharge Permits in a manner that deviates from these requirements shall be submitted in writing to the GWQB. Each request shall state the rationale for the proposed deviation from these requirements and provide detailed evidence supporting the request. The GWQB will approve or deny requests to deviate from these requirements in writing.

MONITORING WELL SCHEMATIC (Not to Scale)



Reid, Brad, NMENV

From: John Buchser <jbuchser@comcast.net>
Sent: Saturday, May 05, 2018 9:14 AM
To: Reid, Brad, NMENV
Cc: Blaine, Tom, OSE; Longworth, John W., OSE; hbalderas@nmag.gov; concerns@nmag.gov; regents@nmsu.org
Subject: DP-1840 Copper Flat Mine Discharge Permit
Attachments: Copper Flat Mine groundwater permit May 5 2018.pdf

Mr. Reid,

Please refer to the attached document containing the comments of the Rio Grande Chapter of the Sierra Club on the proposed groundwater permit
DP-1840 for the Copper Flat Mine.

Thank you,

John R. Buchser

Water Issues Chair

Rio Grande Chapter, Sierra Club
369 Montezuma Ave. #575
Santa Fe, NM 87501
jbuchser@comcast.net

May 5, 2018

Brad Reid
Ground Water Quality Bureau
New Mexico Environment Department
1190 South St. Francis Dr.
PO Box 5469
Santa Fe, NM. 87502
Brad.Reid@state.nm.us

Re: DP-1840 Copper Flat Mine Discharge Permit

Dear Mr. Reid:

On the behalf of the 10,000 members of the Rio Grande Chapter of the Sierra Club, I would like to comment on this permit. There are several aspects of this project that are particularly troubling: (a) the applicant, NM Copper Corporation, does not have anywhere near enough water rights to operate the mine, (b) the amount of copper present is unlikely to be financially profitable, and (c) allowing the contaminated water to remain on-site in a lined pit and just evaporate is a terrible waste of the most precious resource New Mexico has. However, as I understand the GWQB regulations under 20.6.2 and 20.6.7 NMAC, you are not allowed to take these important facts into account in consideration for approval of this permit. If in fact I am incorrect, please take these factors into consideration.

The drainage of Copper Flat is to the Rio Grande River and Caballo Reservoir, which subsequently provide a major source of water for many farms. Both surface and subsurface water contributes to the agricultural financial foundation of the lower Rio Grande Valley. Therefore, failures of any of the systems integral to this permit allowing contaminated water to go outside the boundaries of the permit has a very high risk. The maximal financial risk of permit exceedances to NM Copper are only $10,000 per day, which is insufficient to remedy loss of crops downstream.

The evaporation pond is allowed to collect up to 77AF/day of water. Beyond this quantity of water, "impacted stormwater, process water and leachate generated from waste rock stockpiles, mine units including a concentrator and associated mineral processing facilities, impoundments, sumps, tanks, and pipelines, and other areas within the permit area" (page 1 of permit) can potentially leave the 2,190 acres (about 3.4 square miles) of the mine, and thus leave the area regulated by the copper rule and thus fall under normal groundwater regulations. Contamination of groundwater is thus highly probable as follows: the slope immediately to the south of the mine is substantial, allowing surface water to quickly leave the site, and then the slope decreases dramatically, giving an opportunity for this water to saturate the sandy soil and contaminate shallow groundwater.

It is curious that the permittee is planning on operating the mine for 11 years, but the permit is only being granted for 7 years. Is closure immediately required if the permit is initially granted but not renewed?

The latitude/longitude of the corners of the property should be specified in the permit to facilitate the public's understanding of the permitted location (page 4).

What is the total area drained by the Grayback Arroyo upstream of the permitted site? Given that historical 100-year flood intervals have been exceeded multiple times in the last 50 years in this region of NM, if the goal of the permit is to control surface flow impacting disturbed mine areas during such floods, then NMED needs to re-define a 100-year flood in recognition of increasing probability of flooding based on global climate change. Further, either (a) the existing diversion structure preventing the Grayback Arroyo needs to be improved to avoid flooding the mine pit, and/or (b) the permit needs to consider the potential flooding of the pit after the failure of the diversion structure.

On page 19, two existing wells (G.4) are not in compliance with 20.6.7.28 NMAC, are stated as being allowed for context, but the permit does not state in what manner they are out of compliance.

If mining activity begins but then is put on hold or only minimal activity is occurring, at what point do closure activities begin? Is it possible the permittee can request permit renewals every 7 years, indefinitely?

In several locations (for example, pg.9 process water reservoir) double-lined 60-mil (or equivalent) HDPE (or equivalent) is specified as a liner, in other locations 60-mil HDPE (or greater) is specified. Other reservoirs specify equivalents to HDPE but not equivalent to 60-mil. Why this inconsistency? If an 'equivalent' is OK, what physical parameters make an alternative OK?

The maximal mining pit size allowed has fairly steep sides and is quite deep (2800 ft wide by 900 ft deep). If water accumulates in the pit, depending on how much water is present and how long it takes to de-water it, there is potential for contamination of deeper aquifers. The permit does not state how deep other aquifers are, which way they flow, how fast they flow, and how far it is to domestic or livestock wells that could be adversely impacted. This should be stated in the permit, including which monitoring wells will be used to determine water quality problems that will proceed outside the area permitted by the copper rule.

The various pits of standing water will attract birds. This mine is on the edge of the Rio Grande migratory flyway. Birds will spot the bodies of water. They are sufficiently toxic that any birds that land on the water will soon die, and all birds will quickly die if they drink the water. Are there possible conditions that can be added to the permit to minimize the likelihood of this happening? The economic value of bird watching is very important to both Socorro and Sierra Counties.

There are several important points to be made about the sensitivity of the approval of this permit, which would have major financial implications for the State of NM, farming in the Lower Rio Grande, as well as drinking water for downstream users:

1. Elephant Butte Irrigation District has expressed its deep concerns about the Copper Flat Mine and its potential to pollute the surface waters of the Rio Grande upon which the economy and environment of the lower Rio Grande (Doña Ana County, El Paso, Juarez, ...) are utterly dependent. A relatively minor breach of the ponds which polluted the Rio Grande (mainly between Elephant Butte and Caballo Reservoirs) would utterly devastate that region. The Gold King mine incident would seem negligible in comparison.

2. Domestic water users below Caballo (e.g., Las Cruces, Doña Ana County) rely almost exclusively on groundwater pumped from the Mesilla Basin and the recharge of that basin is largely due to "seepage" from the Rio Grande during (increasingly infrequent) irrigation events. Any contamination of the surface waters of the Rio Grande would result in contamination of the groundwaters of the Mesilla Basin - and a major international "incident" since Mexico draws heavily from the lower reaches of the basin - mainly to supply domestic supplies to Juarez. (Note that a 1906 treaty with Mexico also requires provision of Rio Grande surface waters to Mexico.)

3. As all should be aware there is a matter before the Supreme Court (Texas *vs.* New Mexico and Colorado). Basically, Texas is arguing (correctly) that New Mexico has been failing to provide Texas (and Mexico) with its proper share of the Rio Grande Project water following its release from Caballo Reservoir. Texas has notified New Mexico that the Copper Flat water request, if approved at any level, would become one more element in its case against New Mexico. We've been warned.

4. The adjudication process in Doña Ana County is far from complete. Any attempt to claim water rights beyond those already "proven up" will generate decades of litigation that none of us can afford. Indeed, the situation in the Lower Rio Grande Valley is so dire that proven water rights are likely to be called into question. When water "rights" exceed a sustainable supply of wet water, somebody is going to go thirsty. Remember: "Lawyers cannot make water except in piddling amounts."

In conclusion, there are too many unaddressed concerns combined with major risks related to this Discharge Permit that we ask you to not issue this permit. Permitting an activity that threatens human health, the downstream water supply, farming, and tourism, is a major mistake.

Thank you for the opportunity to comment on this permit. The Sierra Club would appreciate your responding in writing to all signatories on these comments prior to issuance of the permit, if in fact that is the action of the New Mexico Environment Department.

Sincerely,

John R. Buchser

Water Issues Chair, Rio Grande Chapter

jbuchser@comcast.net

Howie Dash

Chair, Southern Group, Rio Grande Chapter

howiedash@aol.com

Kurt Anderson

Water Issues Chair, Southern Group, Rio Grande Chapter

kurt@nmsu.edu

cc: NM State Engineer – Tom Blaine - Tom.Blaine@state.nm.us

NM ISC Director – John Longworth - John.Longworth@state.nm.us

NM Attorney General – Hector Balderas - hbalderas@nmag.gov, concerns@nmag.gov

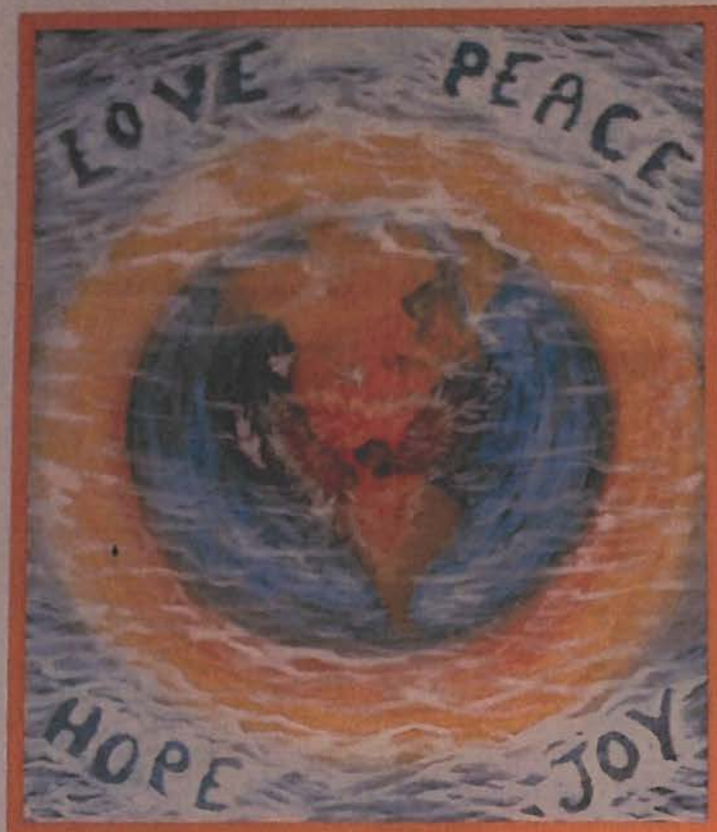
NMSU Regents – regents@nmsu.org

Reid, Brad, NMENV

From:	Denise Boman <dboman13@gmail.com>
Sent:	Saturday, May 05, 2018 1:55 PM
To:	Reid, Brad, NMENV; Denise Boman
Subject:	Copper Flat Mine - Hillsboro, NM - DENY the Draft Discharge Permit for this Mine !!!
Attachments:	0505181323-1.jpg

I am "Unconditionally Opposed" (NO!) to Copper Flat Mine re-opening & polluting our beautiful Lower Rio Grande Valley. Please let me know what else I can do to stop this "take-over" by foreign company (& other similar proposals) of the unique cultural, environmental, geological and spiritual land that is "New Mexico" ... Respectfully, Denise Boman

As one of many "Elder" residents of Truth or Consequences, I am an artist whose past website documented many of my concerns & personal feelings about the present environmental dangers facing the Southwest especially! (I am not up to much "technologic interface" but pls see attachment below & one following...)



Global Heart of Love & Peace
by Dee Boman ©2008

Planet Ocean, adrift in the Cosmic Seas, is anchored by the beating Global Heart. The Love, Peace, Hope & Joy expressed by Earth's inhabitants becomes the world-wide aura protecting precious life on the planet. Sparks of divine magma are to be found in Mother Earth's "hot-spots" around the globe, if we but listen more clearly to her Global Heartbeat...

email Dee at Denise Boman - dboman13@gmail.com

RETURN OF THE FISHES

I Come to the River for Solace
I Come to the River for Care
I Come to the River because ...
My Source, You Are Always Here
Abba-Ama - Aloha
Aho Mitakuye Oyasin
Namaste, Dee

"PROTECT" OUR "RIO GRANDE" "RIO GRANDE VALLEY"

"NO" to Copper Flats Mine

Denise Boman
T or C, NM

From:	Allyson Siwik via ActionNetwork.org <info@actionnetwork.org>
Sent:	Saturday, May 05, 2018 4:18 PM
To:	Reid, Brad, NMENV
Subject:	Brad Reid, New Mexico Environment Department, Deny discharge permit for Copper Flat Mine
Attachments:	deny-discharge-permit-for-copper-flat-mine_signatures_201805051018.pdf

Brad Reid, New Mexico Environment Department,

152 people have signed a petition on Action Network telling you to Deny discharge permit for Copper Flat Mine .

Here is the petition they signed:

> As a member of the public that deeply cares about water quality and the long-term security of New Mexico's water supplies, I ask that you deny issuance of the discharge permit DP-1840 for the Copper Flat Mine in Hillsboro, NM.
>
> • The Copper Flat Mine poses a hazard to public health and an undue risk to property, because contaminants discharged from the mine could leak into groundwater, contaminating area water supplies and eventually reach the Rio Grande, causing exceedences of stream standards.
>
> • Given the mine proposes to use 6,000 acre-feet of water per year, groundwater withdrawals of this magnitude threaten water supplies in Hillsboro, neighboring ranches and downstream users along the Rio Grande.
>
> • I am also concerned that the proposed groundwater monitoring well network is inadequate to detect contamination moving from the mine's pit lake, waste rock stock piles, or tailings storage facility. Without a sufficient monitoring network, it will be impossible to detect and contain pollutants migrating from mine units.
>
> • Because tailings ponds are known to be unstable, I am worried that the 400-acre tailings pond containing 100 million tons of polluted waste could threaten downstream landowners and the Rio Grande.

• Finally, I am concerned about the other issues related to opening the Copper Flat Mine that are not covered by any regulatory framework. Heavy vehicles and equipment operating 24 hours per day, 365 days per year will cause noise and light pollution that will disturb neighbors, businesses, wildlife and our precious night sky.

Based on the reasons outlined above, I respectfully request that the New Mexico Environment Department deny the discharge permit, DP-1840.

Thank you for your consideration of my comments.

You can view each petition signer and the comments they left you in the attached PDF.

Thank you,

Allyson Siwik

Brad Reid, New Mexico Environment Department,

152 people have signed a petition on Action Network telling you to Deny discharge permit for Copper Flat Mine .

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>
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>
> • Finally, I am concerned about the other issues related to opening the Copper Flat Mine that are not covered by any regulatory framework. Heavy vehicles and equipment operating 24 hours per day, 365 days per year will cause noise and light pollution that will disturb neighbors, businesses, wildlife and our precious night sky.
>
> Based on the reasons outlined above, I respectfully request that the New Mexico Environment Department deny the discharge permit, DP-1840.
>
> Thank you for your consideration of my comments.

You can view each petition signer and the comments they left you below.

Thank you,

Allyson Siwik

---

1. Debora Nicoll *(ZIP code: 88042)*

2. Laura Watchempino *(ZIP code: 87034)*
NMED should not disregard the volume of water pumped from the mine, nor the impact of discharging wastewater from the mine in close proximity to Caballo reservoir and the Rio Grande.

The long-term impacts to our state's water security and quality of life are most likely irreversible.

3. Allyson Siwik *(ZIP code: 88061)*

4. Ann Mumford *(ZIP code: 87506-9722)*

5. Jan Peck *(ZIP code: 88061)*

6. Azaima Anderson *(ZIP code: 88061)*

7. Bruce Donnell *(ZIP code: 87506)*

8. Bonne Beavers *(ZIP code: 88041)*

9. Rebecca Summer *(ZIP code: 88061)*
The risks of public health, public safety and property destruction are just too much. Contamination could actually reach the Rio Grande. Stop this insult.

10. Betsy Holdsworth *(ZIP code: 88061)*
To Brad Reid
Please deny the discharge permit DP 1840 to NM Copper Corporation for the Copper Flat Mine. It poses serious public health safety risks due to the discharge 22.3 million gallons of this highly toxic contaminated wastewater. This has been true for the people who live in the vicinity of the Chino Mine where the water is undrinkable. The use of this 6,000 acre feet of water will threaten the water table and water for the all of the people of Hillsboro and local ranches and father down even to the Rio Grande. At this juncture you can stop this...once they are up and running corporation certainly have a history of taking the money and running. Please keep New Mexico pristine and beautiful and healthy above profit. It is the lasting legacy for the furure. Thank you. Betsy Holdsworth

11. Bridget McColville *(ZIP code: 87801)*
Thank you for attending to this crucial issue.

12. Betty Mishuk *(ZIP code: 87931)*
The proposed discharge area is upstream from the Caballo Lake Mutual Domestic Water Association well. The well is located close to the confluence of Percha Creek and the Rio Grand (Caballo Lake). The water association services 50 lot owners. There is no other public water source avaliable to service this community. discharge could contaminate this public water supply.

13. Brwyn Downing *(ZIP code: 87107)*
Don't allow this mining operator to pollute our waters and harm our health and environment. Deny the permit.

14. Betsy Wolf *(ZIP code: 87571)*

15. cANDACE BROWNE *(ZIP code: 87901)*
I believe New Mexico Environment Department should DENY discharge permit DP-1840 for Copper Flat mine project because the mine poses hazards to public health, undue risks to private property and public safety.
Production at this mine site will impact the area's future water security by it's draw-down effect.
The mine will dump 100 million tons of polluted waste into the tailing pond which is just over 11 miles west of Caballo Reservoir. Tailings ponds are KNOWN to be unstable. A breach of this pond could devastate landowners to the east, Caballo Reservoir, and the Rio Grande. The tailings will be there forever while the mine is in production & afterward. A breach can happen at any time. The tailings pond is at a point at the upper end of a watershed that goes right into Caballo Reservoir.
New Mexico Environment Department should deny the discharge permit DP-1840 because the mine poses a hazard to public health, an undue risk to property and public safety, and will impact the area's future water security and quality of life.

16. Carol Sassaman *(ZIP code: 88041)*

17. carolyn morrison *(ZIP code: 88062)*
I am opposed to the draft discharge permit for Copper Flat Mine for a simple reason: there is no effective groundwater monitoring network that will insure that this Copper Flat Mine will not do lasting damage to NM's environment, economy and public health. Until then, NO PERMIT.

18. Catherine Stolzenbach *(ZIP code: 88061)*

19. Cathy Owens *(ZIP code: 88061)*

20. Charris Ford *(ZIP code: 88041)*
It is now and has always been so important to protect our surface water and groundwater for people, plants and animals. We cannot allow mining discharge to pollute our environment.

21. Christine Schwab *(ZIP code: 88042)*
Our town of Hillsboro embodies the best and the historic legacy of NM. We are a small unincorporated, self-governing true community. This mine has never historically provided the jobs they claim. Who will need a job when they are too ill, dead, or can't live in the community because the water is poisoned????

22. Tasha Cooper *(ZIP code: 88061)*

23. Daisy Kates *(ZIP code: 87043)*
Mining or other operations should NEVER put public health at risk or impair drinking water for wildlife. We are in a long-term drought which makes the issue of water even that much more critical.

24. Debra Preusch (*ZIP code: 88053)*

25. Debra Kern (*ZIP code: 34653)*
Please stop mining .. we need to live without what you are trying to make a profit from. We need clean water .

26. deborah brandt (*ZIP code: 88005-2521)*
I do not want mining in my area

27. Deborah Lane (*ZIP code: 86314)*
We need to protect our environment. We always hear about water shortages, this kind of mine like fracking uses and poisons millions of gallons of water.

28. diana ingalls (*ZIP code: 88061)*

29. Diana Lahm (*ZIP code: 87540)*

30. Deb Shatzkin (*ZIP code: 88049)*

31. Dulcie Ford (*ZIP code: 88041)*

32. Diego Perea (*ZIP code: 87505)*

33. John E. Arguello (*ZIP code: 88076)*

34. CAROLBETH ELLIOTT (*ZIP code: 88061)*

35. CHARLES BARRETT (*ZIP code: 88042)*
Mr. Reid:

This permit makes a travesty of environmental protection and constitutes a reversal of your duty as a department. Hiding behind the copper law does not absolve you of common sense or duty to the public welfare. I urge you to deny this permit as a citizen of New Mexico and an affected resident of Hillsboro.

36. Estelle Voeller (*ZIP code: 97501)*

37. Tom Vaughan (*ZIP code: 88061)*
They are going to put 200 BILLION pounds of pollution in a pond that less than 2/3 of a section in size? That boggles the mind - and exceeds credibility!

This surely bodes ill for everyone and everything downhill from the mine, and it also looks like it's going to severely deplete the water resources in the vicinity of the mine itself.

Deny the permit until a reasonable - and enforceable - plan is submitted. This one is preposterous!

38. Jane Foraker-Thompson *(ZIP code: 880 6 1)*

39. Mary Frances Wright *(ZIP code: 95616)*
I love this part of the planet which I consider home. Please protect it.

40. Gregory Carr *(ZIP code: 88021)*
This is an ounce of consideration for short term gain, and a pound of foolishness that can not be undone. Many that decide in favor of this will not live long enough to see the error of their ways.

41. Geri Rhodes *(ZIP code: 87060)*
Protect Hillsboro!

42. Sandra and Glenn Griffin *(ZIP code: 88061)*
Third time is not the charm for re-starting the Copper Flat Mine. Toxic heavy metal pollution is a serious problem from Freeport-McMoran's mines in Grant County. The Copper Flat Mine does not have lined tailings pond or tailings piles.
What is different with this open pit mine?

43. Virginia Lowen *(ZIP code: 87006)*

44. Peter Glaberman *(ZIP code: 48130)*
I am a former Grant Co. resident

45. Jana Gunnell *(ZIP code: 87571)*

46. Shannon Curry *(ZIP code: 88043)*
To: Brad Reid, New Mexico Environment Department
From: [Your Name]

As a member of the public that deeply cares about water quality and the long-term security of New Mexico's water supplies, I ask that you deny issuance of the discharge permit DP-1840 for the Copper Flat Mine in Hillsboro, NM. • The Copper Flat Mine poses a hazard to public health and an undue risk to property, because contaminants discharged from the mine could leak into groundwater, contaminating area water supplies and eventually reach the Rio Grande, causing exceedences of stream standards. • Given the mine proposes to use 6,000 acre-feet of water per year, groundwater withdrawals of this magnitude threaten water supplies in Hillsboro, neighboring ranches and downstream users along the Rio Grande. • I am also concerned that the proposed groundwater monitoring well network is inadequate to detect contamination moving from the mine's pit lake, waste rock stock piles, or tailings storage facility. Without a sufficient monitoring network, it will be impossible to detect and contain pollutants migrating from mine units. • Because tailings ponds are known to be unstable, I am worried that the 400-acre tailings pond containing 100 million tons of polluted waste could threaten downstream landowners and the Rio Grande. • Finally, I am concerned about the other issues related to opening the Copper Flat Mine that are not covered by any regulatory framework. Heavy vehicles and equipment operating 24 hours per day, 365 days per year will cause noise and light pollution that will disturb neighbors, businesses, wildlife and our precious night sky. Based on the reasons outlined above, I respectfully request that the New Mexico Environment Department deny the discharge permit, DP-1840. Thank you for your consideration of my comments.

47. Anne Widmark (*ZIP code: 87501)*

48. Harold Gregory (*ZIP code: 88061)*

49. H. Shoup (*ZIP code: 88061)*
When will folks understand that water is becoming the new gold? And here you are, devastating more water so a corporation can make more profit! Shame!

50. William Lindenau (*ZIP code: 88042)*
please deny the discharge permit for the Copper Flat Mine due to likely contamination of groundwater, the Rio Grande, and Caballo lake. Monitoring wells are inadequate to insure the safe containment of 100 million tons of waste in a 400 acre lake a mere 11 miles from the Rio Grande River.

51. Joyce Carlson-leavitt (*ZIP code: 87107)*

52. Jenny Brady (*ZIP code: 87506)*
New Mexico cannot afford to use water for this purpose. We cannot risk polluting the Rio Grande or other precious water sources. Be responsible to the people and environment you serve not out side interests! Look at the big picture always!

53. James Martin (*ZIP code: 87501)*

54. John Dawe (*ZIP code: 18704)*

55. John and Carolyn Wilson (*ZIP code: 87825)*
In this time of water crisis we should not be permitting operations that profit a few and which have great potential to injure many. No permit for Copper Flat discharge!

56. Judith Truett (*ZIP code: 88039)*
This will contaminate the water supply of Hillsboro. Water is worth more than copper.....water is life.

57. Joseph Zummach (*ZIP code: 88028)*

58. Denise Evans (*ZIP code: 88049)*

59. Kate Brown (*ZIP code: 88041)*
The revised Copper Rules have greatly increased the vulnerability of the groundwater . Please exercise your mandated responsibilities and deny the Copper flat Mine Discharge permit that could contain contaminants and toxics pollutants above state standards

60. Kendra Milligan (*ZIP code: 88061)*

61. Karen Froiland (*ZIP code: 94928)*

62. Kristina Fisher (*ZIP code: 87501-232)*

63. Lee Reynis (*ZIP code: 87114)*

64. John Noel (*ZIP code: 87901)*
Fought and defeated this mine 20 years ago . . . we do not need it!

65. Leslie Larsen (*ZIP code: 87501)*
Do NOT allow poisonous discharge to contaminate our low flow rivers. Every drop of water is needed to sustain life. Make the mine clean the water to drinking level standards. Protecting water is protecting life!

66. lydia dixon (*ZIP code: 87901)*

67. Linda Fair (*ZIP code: 87529)*
Such a very beautiful place, Hillsboro. Don't let a copper mine destroy it.

68. Linda Thompson (*ZIP code: 87529)*

69. Linda Zatopek (*ZIP code: 88061)*

70. Lisa Heenan (*ZIP code: 3550)*

71. Leslie Barclay (*ZIP code: 87505)*
The enormous amount of water that would be used should disqualify this mine before any other consideration was made. We are entering a severe drought and water is all that matters! Without it there is no life!!!

72. Lorraine Schwartz (*ZIP code: 88011)*
This mine would destroy the calm and laid back lifestyle of the area. Tourism, especially for Spaceport America, would be harmed.
Please deny the permit.

73. Laurie Maitre (*ZIP code: 87505)*
Stop discharge that threatens our surface water and Aquifer and threatens the way of life for our agricultural communities. Laurie

74. Laura Ramnarace (*ZIP code: 88062)*

75. Maria Jensen (*ZIP code: 86001)*

76. Lynn Lee (*ZIP code: 87501-2835)*

77. Melissa Amarello (*ZIP code: 88062)*

78. Marc and Susan Severson (*ZIP code: 85710)*
This needs to stop!

79. Marion Newton *(ZIP code: 88041)*

80. Matt Middleton *(ZIP code: 87825)*
With the ongoing water crisis in New Mexico, this is absurd. Please deny the Copper Flat Mine discharge permit.

81. Michael Casaus *(ZIP code: 87107)*

82. Mary Burton Riseley *(ZIP code: 88028)*

83. Mecki Kuppers-Kantor *(ZIP code: 87540)*

84. Megan Hartman *(ZIP code: 04011)*

85. Melody Sears *(ZIP code: 88042)*
The more I hear about this mine the more worried I am that corporate interests (Canadian, not even U.S.) seem to have more importance than those of near residents, downstream water users, and the health of our iconic Rio Grande. We live here—they don't. Do your job NMED and protect New Mexicans and our environment!

86. Marci White *(ZIP code: 30601)*

87. Jane Gillespie *(ZIP code: 88038)*

88. Chelsea *(ZIP code: 88041)*

89. Mary Katherine Ray *(ZIP code: 87943)*
The copper flat mine would use too much water, produce to much toxic pollution and make too little economic sense. Please deny the discharge permit!

90. Mary Morton *(ZIP code: 05859)*

91. Marie Previti *(ZIP code: 87571)*
Protect clean water.

92. Nancy Williamson *(ZIP code: 88041)*

93. Glen DeGarmo *(ZIP code: 87106)*
In cases such as this I always wonder when the health and quality of life of human "people" will be more important to lawmakers, regulators, and local decision makers than the narrow profit goals of big corporations.

Is this another test case? It sounds like it.

94. Deb H Cookingham *(ZIP code: 88061)*

95. Ronald Groves (*ZIP code: 88061)*

96. Pamela Bryant (*ZIP code: 88061)*

97. Ronald Parry (*ZIP code: 88061)*

98. Patrice Mutchnick (*ZIP code: 88061)*
How is it possible that the state of NM could still be permitting toxic discharge into its own waterways? What economic advantage is there to the region to continue to degrade the health and safety of our residents and despoil the environment? Deny this discharge permit and help move NM forward to a clean economy.

99. Barbara Pearlman (*ZIP code: 88042)*
There remains toxicity from the operation years ago. The water table will be affected, this is not about jobs, this is not about a "working" nm. When will be understand the degradation is not reparable. This is a foreign company who will, if approved, hit and run leaving Sierra County with the problem for decades. This mine has never been viable long term, why are we even considering it. The price of copper and the economic stability of the corporation is in constant flux and unstable. I urge non approval for the health and safety of New Mexicans.

100. Catherine Swain (*ZIP code: 88062)*

101. Pamela Conway (*ZIP code: 88038)*

102. Carol Pittman (*ZIP code: 87821)*
I am in complete agreement with the reasons stated in requesting denial of DP-1840. Do we really have that much leeway in times of water scarcity to potentially contaminate the water supply? Making a mistake at this critical time could be very costly.

103. Jeanne Pitts (*ZIP code: 88030)*

104. Tammie Wheeler (*ZIP code: 88022)*
We need to protect our waters and keep corporations from destroying our environment.

105. Pat Wolph (*ZIP code: 88061)*

106. Patricia Taber (*ZIP code: 88061)*
PLEASE DENY this permit! It will cause a hazard to public health, an undue risk to property and public safety, and will impact the area's future water security and quality of life.

107. Rosaruby Glaberman (*ZIP code: 88041)*

108. Rachel Bighley (*ZIP code: 88061)*

109. Richard Ducotey (*ZIP code: 88061-4721)*

110. An anonymous signer *(ZIP code: 87505)*
Water is the critical issue for the future of our state. The permit must be denied.

111. Johnny Reed *(ZIP code: 88041)*

112. Carol Martin *(ZIP code: 88061)*
Do Not let this happen especially right next door to a wildlife refuge.

113. Robert Southworth *(ZIP code: 88061)*

114. Robin Williamson *(ZIP code: 80234)*

115. rick burns *(ZIP code: 87931)*

116. Rhonda Rivera *(ZIP code: 87120)*

117. Linda Pafford *(ZIP code: 88041)*
It seems like putting the cart before the horse to permit the discharge before the water rights are even settled. Beyond that, it is time to require these mines to clean the water they use and reuse it rather than leave it out to evaporate. The technology does exist and though might require additional expense up front but it must start somewhere.

118. Sally Smith *(ZIP code: 88041)*
I have been to this mine site and followed the various proposal.
I have huge concerns about water quality and the long-term security of New Mexico's water supplies, I ask that you deny issuance of the draft discharge permit DP-1840 for the Copper Flat Mine in Hillsboro, NM. • The Copper Flat Mine poses a hazard to public health and an undue risk to property, because contaminants discharged from the mine could leak into groundwater, contaminating area water supplies and eventually reach the Rio Grande, causing exceedences of stream standards. • Given the mine proposes to use 6,000 acre-feet of water per year, groundwater withdrawals of this magnitude threaten water supplies in Hillsboro, neighboring ranches and downstream users along the Rio Grande. • I am also concerned that the proposed groundwater monitoring well network is inadequate to detect contamination moving from the mine's pit lake, waste rock stock piles, or tailings storage facility. Without a sufficient monitoring network, it will be impossible to detect and contain pollutants migrating from mine units. • Because tailings ponds are known to be unstable, I am worried that the 400-acre tailings pond containing 100 million tons of polluted waste [100 billion gallons] could threaten downstream landowners and the Rio Grande. • Finally, I am concerned about the other issues related to opening the Copper Flat Mine that are not covered by any regulatory framework. Heavy vehicles and equipment operating 24 hours per day, 365 days per year will cause noise and light pollution that will disturb neighbors, businesses, wildlife and our precious night sky. Based on the reasons outlined above, I respectfully request that the New Mexico Environment Department deny the discharge permit, DP-1840. Thank you for your consideration of my comments.

119. SARAH BROWN *(ZIP code: 78704-6040)*
This dangerous action will have major negative, spreading, impact on treasured land. Please act to stop it.

120. Satomi Lander (*ZIP code: 88042)*
Please deny discharge permit.
Thank you!

121. Susan Berry (*ZIP code: 88061)*

122. Jene Moseley (*ZIP code: 88061)*
Why does discharging toxic chemicals from a mining operation become more urgent than clean water? I detect a pending lawsuit.

123. Sharon Bookwalter (*ZIP code: 88061)*
"The mine poses a hazard to public health and an undue risk to property and public safety." 'Nuff said.

124. Griff Campbell (*ZIP code: 88061)*
It seems superfluous for me to explain why this discharge permit needs to be rescinded, but in case no one has explained it to you, dumping polluted waste water anywhere is asinine behavior.

125. virginia McCoy (*ZIP code: 88049)*
Unexceptable! this whole mining area is already a disaster!

126. Sierra Wilson (*ZIP code: 86301)*
I urge you to deny the draft discharge permit for the old Copper Flat Mine in Hillsboro! If the mine gets permits from the federal and state governments, it will threaten the economy, water, air, and wildlife of Sierra County and beyond.

127. Heather Karlson (*ZIP code: 87504)*

128. Linda Sperling (*ZIP code: 87502)*
Do not allow New Mexico Copper Corp to poison groundwater - deny their request for a permit.

129. Sara Mawhinney (*ZIP code: 59730)*
"We didn't inherit this planet, we borrow it from our children"-Native American Priverb.

130. Susan Selbin (*ZIP code: 87104)*

I oppose the New Mexico Environment Department's draft discharge permit for the new Copper Flat Mine in Hillsboro, New Mexico. The pollutants are a threat to NM.

The permit authorizes the mine operator, New Mexico Copper Corporation, to discharge 22.3 million gallons per day of tailings, mining impacted and domestic wastewater that could contain contaminants and toxics pollutants above state standards.

The New Mexico Environment Department should deny the discharge permit DP-1840 because the mine poses a hazard to public health, an undue risk to property and public safety, and will impact the area's future water security and quality of life.

Please do the right thing for New Mexicans and New Mexico!

131. John Stocke *(ZIP code: 88041)*
Despite my old business email address I am now a New Mexico resident, where I have had a house for 20+ years.

132. Peter Roche *(ZIP code: 87507-1596)*

133. Susan Morgan *(ZIP code: 87514)*

134. susan schiowitz *(ZIP code: 88061)*
This is not acceptable.

135. Sebastian Stokhof de Jong *(ZIP code: 87505)*
Contaminants discharged from the Mine could reach the Rio Grande.
Contaminants discharged from the Mine could leak into groundwater.
The Mine's proposed groundwater monitoring well network will not detect contamination moving from the Mine's pit lake, waste rock stock piles, or tailings!!!
This puts us all in danger. Please do something!

136. Terry Thompson *(ZIP code: 87529)*

137. Liliana Castillo *(ZIP code: 87507)*

138. Thomas Lander *(ZIP code: 88042)*
Please save the environment and deny the Copper Flat mine discharge permit.

139. Lee Newman *(ZIP code: 87931)*
sierra county future is recreation and agriculture which will last forever and not poison the land

140. Yvette Troy *(ZIP code: 88061)*
Please don't continue to ruin what little is left. You are the custodian of freshwater and have the most influence over this matter. Please do the right thing and confine mining operations to the areas that have already been ruined. As a human race, necessity breeds innovation; if necessary, we will figure out healthier alternatives to exploitation of our natural resources that profit seekers say are so imperative. Please keep this beautiful area in tact, our freshwater clean, our watersheds healthy and in this unique and sensitive area please help us exploit tourism and its long-term sustainable economic viability versus short-term unsustainable natural resource extraction.

141. Ty Smith *(ZIP code: 87942)*
Water comes first.

142. Victoria Linehan *(ZIP code: 88039)*
Deny the draft permit!

143. William Britton *(ZIP code: 87552)*

144. Eleanor Wootten (*ZIP code: 88038)*
Allowing this mine to reopen and discharge waste into the ground that will effect our water is not acceptable. NM is short on water for drinking and behind on what it owes Texas, I do not understand how letting this mine open and discharge polluted water can even be considered.

145. pamela wolfe (*ZIP code: 88061)*
horrific!

Reid, Brad, NMENV

From:	Allyson Siwik <allysonsiwik@gmail.com>
Sent:	Saturday, May 05, 2018 6:28 PM
To:	Reid, Brad, NMENV
Cc:	Vollbrecht, Kurt, NMENV
Subject:	GRIP public comments on Copper Flat DP-1840
Attachments:	GRIP-PublicCommentDP1840-050518.pdf

Good afternoon, Brad:

Please find attached GRIP's comments on the draft DP-1840.

Thanks,
Allyson

Allyson Siwik, Executive Director
Gila Resources Information Project
305A N. Cooper St.
Silver City, NM 88061
575.538.8078 office/fax
www.gilaresources.info

20 Years of Promoting Healthy Communities
by Protecting Our Environment

May 5, 2018

Brad Reid, Permit Lead
New Mexico Environment Department
Ground Water Quality Bureau
1190 South St. Francis Dr.
PO Box 5469 Santa Fe, NM. 87502

Via email: Brad.Reid@state.nm.us

RE: Public Comments on Draft DP-1840 for Copper Flat Mine, Hillsboro, NM

Dear Brad,

The Gila Resources Information Project has the following concerns with the draft discharge permit DP-1840 and believes that the Ground Water Quality Bureau should not approve the permit for the following reasons:

1) **The DP-1840 as currently written violates the Copper Rule.**

- The DP fails to include estimates of seepage from the Tailings Storage Facility (TSF) and the underdrain pond. This significantly underestimates the maximum daily discharge volume.
- The DP has huge errors for initial startup water and free tails water. This means the applicant does not have an accurate water management plan because the water balance calculations are incorrect.

2) **The proposed Copper Flat Mine poses a hazard to public health and an undue risk to property.**

- Contaminants discharged from the mine's waste rock stockpiles and Tailings Storage Facility (TSF) could reach surface water near the mine and could migrate to the Rio Grande.
- Tailings run-off collected in unlined ditches in areas outside of the Open Pit Capture Zone/Open Pit Surface Drainage Area could seep into groundwater and won't be captured/contained.
- The proposed groundwater monitoring well network is not sufficient to detect contamination moving from the Mine's pit lake, waste rock stock piles, or TSF. Large gaps between monitoring wells means that contaminants may

not be detected; contaminants may be detected only after significant volumes of groundwater have been contaminated; and it may not be possible to identify the source of the contaminants. The operator should be required to install a higher density of groundwater quality monitoring wells to be able to better evaluate containment of pollutants at the mine site.

- The rock beneath the proposed waste rock stockpiles is not an impermeable liner as claimed and therefore will not prevent all leaks to groundwater. This is not an adequate alternative containment system to a liner. Either another alternative should be developed or the operator should be required to install a liner system.
- The applicant failed to adequately analyze the mine's open pit. Under some conditions, the pit lake will not always be an evaporative sink. The pit lake will exist in perpetuity and could be a source of groundwater contamination and a continual toxic attractant to birds and wildlife. Pumping and treating should be required.

Thank you for consideration of our comments.

Sincerely,

Ally T. Siwik

Allyson Siwik
Executive Director

Reid, Brad, NMENV

From:	Katie Emmer <kemmer@themacresourcesgroup.com>
Sent:	Tuesday, May 08, 2018 10:38 AM
To:	Mascarenas, Melissa, NMENV
Cc:	Reid, Brad, NMENV
Subject:	NMCC 8May2018 IPRA
Attachments:	NMCC_8May2018_IPRA.pdf

Good morning Ms. Mascareñas,

Attached please find an IPRA from NMCC for comments regarding Copper Flat's draft Discharge Permit 1840. If you have any questions or need anything further from me, please let me know.

Best regards,

Katie Emmer | Permitting & Environmental Compliance Manager

M: +1 505.400.7925| **F:** +1 505.881.4616
A: 4253 Montgomery Blvd. NE, Suite 130, Albuquerque, NM 87109
W: themacresourcesgroup.com | **E:** kemmer@themacresourcesgroup.com

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SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lt. Governor

NEW MEXICO
ENVIRONMENT DEPARTMENT

Harold Runnels Building
1190 Saint Francis Drive (87505)
PO Box 5469, Santa Fe, NM 87502-5469
Phone (505) 827-2990 Fax (505) 827-1628
www.env.nm.gov

BUTCH TONGATE
Cabinet Secretary

J.C. BORREGO
Deputy Secretary

MEMORANDUM

To: Andrew Knight, Office of General Counsel
Michelle Hunter, Chief, Ground Water Quality Bureau
Shelly Lemon, Chief, Surface Water Quality Bureau

From: Melissa Y. Mascareñas, Department Public Records Custodian

Date: May 8, 2018

Subject: Request to Inspect Public Records

We have received a request from **Ms. Katie Emmer** asking for information regarding:

SEE ATTACHED REQUEST

The Inspection of Public Records Act requires a response to a requester of public records within fifteen (15) calendar days from receipt of a request. Please respond to the requestor by no later than **May 22, 2018**.

Your response may take several forms:

a) Provide the requested information; or
b) Notify the requester of a delay; you must give reasons for the delay and the date when the information will be available; or
c) Deny the request or part of it; provide the records that can be released and identify the reason(s) for denial of any records; or
d) Ask for more information or clarification; and
e) Notify the requester of any mailing or photocopy charges.

A copy of my initial response to this request is attached for your records. **Please provide me with a copy of any responses you make to this request and/or notify me when the records have been made available for inspection.**

NEW MEXICO ENVIRONMENT DEPARTMENT
INSPECTION OF PUBLIC RECORD REQUEST FORM

Please fill out the following information:

1. Date: 8 May 2018
2. Requestor's Name: Katie Emmer
3. Requestor's Address: 4253 Montgomery Blvd, NE, Suite 130
Albuquerque, NM 87109
4. Phone No.: (505) 400-7925
5. Email: **kemmer@themacresourcesgroup.com**
6. Company Being Represented: New Mexico Copper Corporation
7. Address: See above
8. Document or File being requested to be reviewed or copied (please describe the records in sufficient detail to enable Department personnel to reasonably identify & locate the records:

Requesting electronic copies of all public comments on DP-1840 received by NMED at the close of the public comment period for this permit

9. NMED Bureau where Document/File can be found (if known): GWQB

Katie Emmer
Signature

The cost for copying by NMED is as indicated on Attachment A. Please send this request to:

Melissa Y. Mascareñas
Inspection of Public Records Officer
1190 St. Francis Drive, Ste. N-4050
Santa Fe, New Mexico 87505
fax: (505) 827-1628 or
email: melissa.mascarenas@state.nm.us

Revised 6/14/12

18261

Robert Shipley
6900 Barber Pl., NE
Albuquerque, NM 87109

May 5, 2018

Brad Reid
NMED GWQB
Harold Runnels Building
1190 Saint Frances Drive
Santa Fe, NM 87502

Dear Mr. Reid:

As you know, The Copper Flats in Hillsboro, NM has applied for and received a draft Discharge Permit that would allow the mine to pollute ground and surface water in the area.

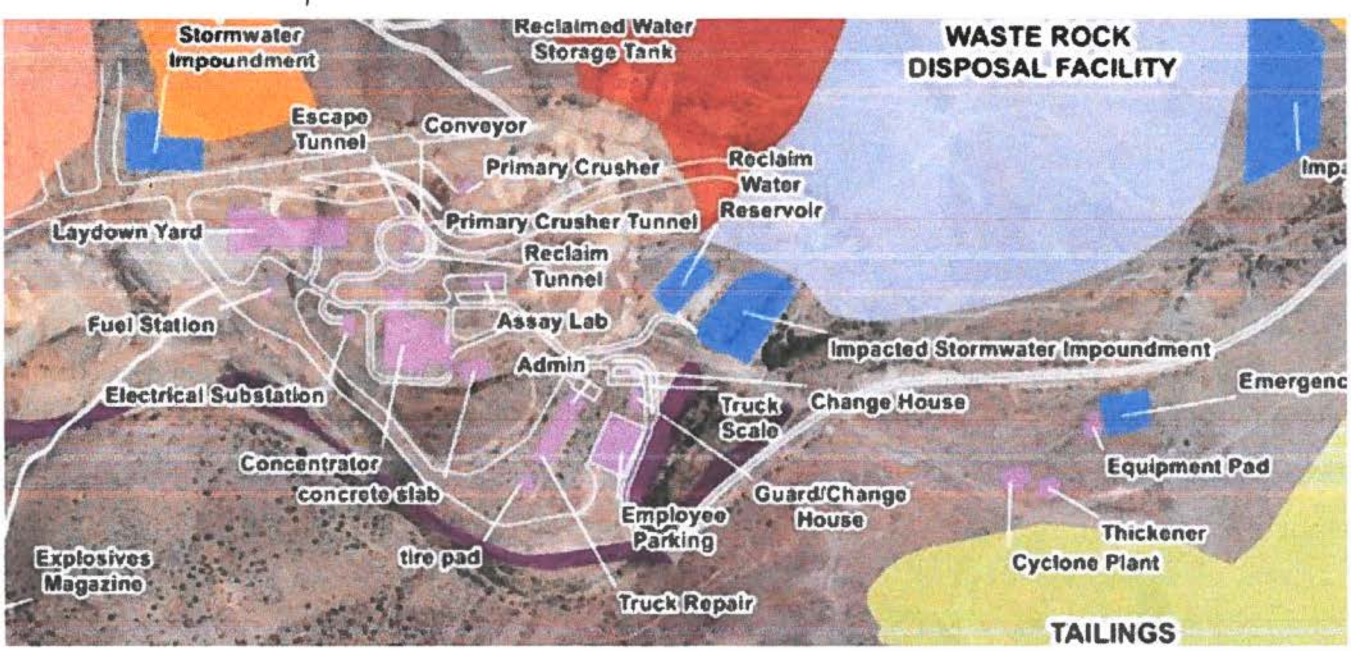
Allowing this permit to enable the mine to begin operation and pollute below and above water resources in the Hillsboro area would have a virtually permanently disastrously impact on all forms of life in Sierra County.

As a property owner in the Sierra (as well as Bernalillo) County I am counting you and your staff to revisit this request. There is no justification to allow the permit to be granted other than to provide a short-term profit for a company that will provide few jobs and a minimum revenue stream to the State. On the other hand, the consequences of operating this mine would have a long-term disastrous impact on ALL forms of life in the area with no virtually no opportunity for mitigation.

So, I'm expecting that you and your staff understand the full spectrum of the Copper Flat mine operation and deny the permit, initially and permanently. If you do not agree with me, in a timely manner please contact me at the above address with solid reasons for granting this permit.

Respectfully,

Robert Shipley



Robert Shipley
6900 Barber Pl., NE
Albuquerque, NM 87109

RECEIVE
MAY 9 2018

May 5, 2018

Kurt Volbrecht
NMED GWQB
Harold Runnels Building
1190 Saint Frances Drive
Santa Fe, NM 87502

Dear Mr. Volbrect:

As you know, The Copper Flats in Hillsboro, NM has applied for and received a draft Discharge Permit that would allow the mine to pollute ground and surface water in the area.

Allowing this permit to enable the mine to begin operation and pollute below and above water resources in the Hillsboro area would have a virtually permanently disastrously impact on all forms of life in Sierra County.

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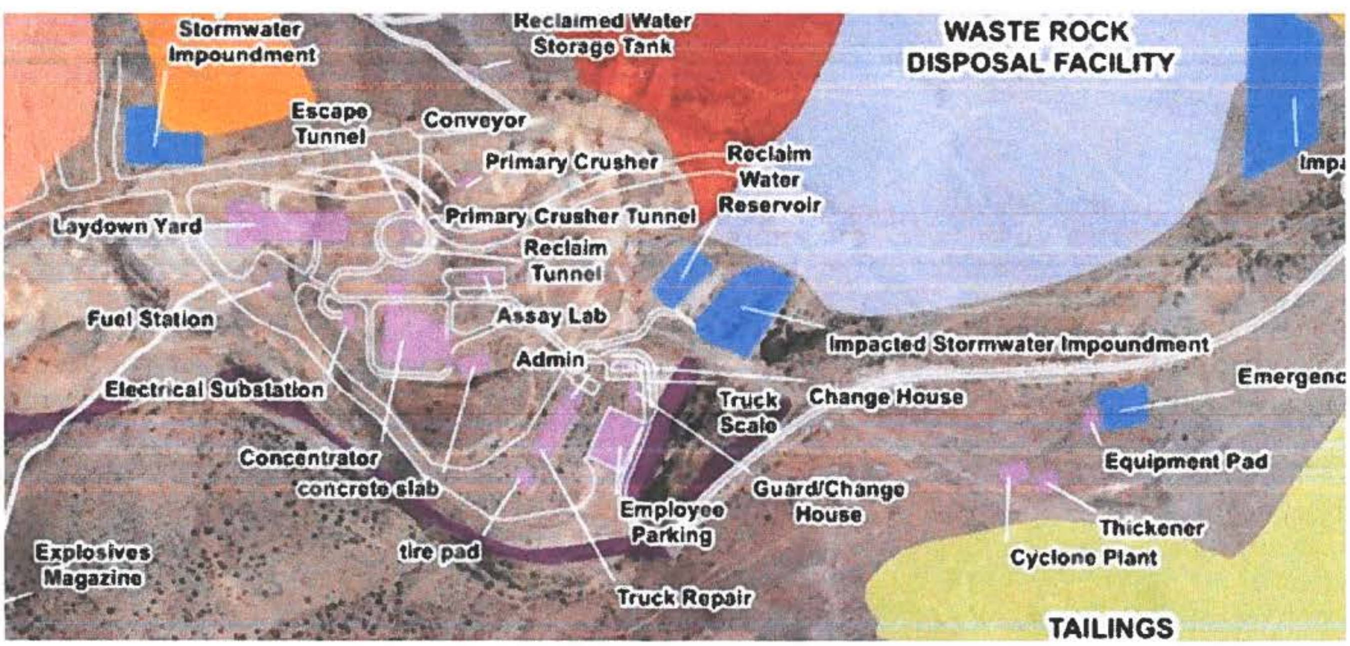
So, I'm expecting that you and your staff understand the full spectrum of the Copper Flat mine operation and deny the permit, initially and permanently. If you do not agree with me, in a timely manner please contact me at the above address with solid reasons for granting this permit.

Respectfully,

Robert Shipley



Reid, Brad, NMENV

From: Knight, Andrew, NMENV
Sent: Friday, May 11, 2018 10:24 AM
To: Reid, Brad, NMENV; Katie Emmer
Subject: RE: NMCC IPRA 3May2018

Katie,
Here is our response:

From: Knight, Andrew, NMENV <Andrew.Knight@state.nm.us>
Sent: Wednesday, May 02, 2018 4:21 PM
To: Samantha Barncastle <samantha@h2o-legal.com>
Subject: RE: EBID Request for Additional 60 Day Extension of Comment Period for DP-1840 (Copper Flat Mine)

Samantha,
The Department will not be extending the comment period for this permit, as a determination has already been made to grant a public hearing in this matter.

Andrew P. Knight
Assistant General Counsel
New Mexico Environment Department
Office: (505) 222-9540
Cell: (505) 907-8836

From: Reid, Brad, NMENV
Sent: Friday, May 11, 2018 10:21 AM
To: Katie Emmer <kemmer@themacresourcesgroup.com>
Cc: Knight, Andrew, NMENV <Andrew.Knight@state.nm.us>
Subject: FW: NMCC IPRA 3May2018

Katie,

Here is the EBID time-extension request. Andrew will forward on the NMED's response to the request. Brad

---

From: Katie Emmer [mailto:kemmer@themacresourcesgroup.com]
Sent: Thursday, May 03, 2018 8:41 AM
To: Mascarenas, Melissa, NMENV <melissa.mascarenas@state.nm.us>
Cc: Reid, Brad, NMENV <brad.reid@state.nm.us>
Subject: NMCC IPRA 3May2018

Good morning Ms. Mascareñas,

Attached please find an IPRA from NMCC for correspondence regarding Copper Flat's draft Discharge Permit 1840. If you have any questions or need anything further from me, please let me know.

Best regards,

Katie Emmer | Permitting & Environmental Compliance Manager

FORM B
Exempt Records Review Form

FILE REVIEW COMPLETED THROUGH THIS PAGE
AND/OR THROUGH DATE OF REVIEW
FOR RECORDS EXEMPT FROM PUBLIC DISCLOSURE

(Select appropriate statement)

✓ NO EXEMPT MATERIALS IDENTIFIED

_____ EXEMPT MATERIALS REMOVED

File reviewed by: B. Reid

Date of review: 5/16/18

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RECEIVED
MAY 22 2018
Ground Water Quality Bureau

May 22, 2018

Mr. David Ennis
Reclamation Specialist/Permit Lead
New Mexico Energy, Minerals and Natural Resources Department
Mining and Minerals Division
1220 South St. Francis Drive
Santa Fe, NM 87505

Re: Response to Agency Comments Received March 22, 2018
New Mexico Copper Corporation
New Mine Permit S10227RN

Dear Mr. Ennis,

New Mexico Copper Corporation (NMCC) hereby responds to Agency comments on the Company's Probable Hydrologic Consequences (PHC) and Pit Lake Geochemistry reports. The Agency comments were provided in a letter from your office dated March 22, 2018.

We have responded to all comments. Our response is provided in hard copy and electronic media format and is organized as follows:

1. A comment and response matrix that sets forth each individual Agency comment with the NMCC response;
2. Revised PHC and Predictive Geochemistry reports reflecting Agency comments, with the location of edits described in the comment and response matrix;
3. A combined executive summary of the PHC and Predictive Geochemistry reports explaining how the Project achieves the performance standards of 19.10.603.C.(4), Hydrologic Balance;
4. NMCC's proposed groundwater drawdown monitoring network and plan to monitor groundwater changes against projections in the PHC; and
5. A list of major permits required for the project.

I trust this response sufficiently addresses your final technical comment and will now allow the MMD to determine that NMCC's Mine Operations and Reclamation Plan is technically approvable. Please do not hesitate to contact me if you require any clarification or additional information.

Sincerely,

J Smith

Jeff Smith
Chief Operating Officer
New Mexico Copper Corporation

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EXECUTIVE SUMMARY
PROBABLE HYDROLOGIC CONSEQUENCES & PREDICTIVE GEOCHEMICAL MODELING OF PIT LAKE WATER QUALITY REPORTS
COPPER FLAT MINE
THEMAC Resources Group Ltd.
May 2018

FINDINGS

Based on the model results presented in *Probable Hydrologic Consequences of the Copper Flat Project Sierra County New Mexico* by JSAI, Inc., December 2017, NMCC's planned operations at Copper Flat will minimize change to the hydrologic balance in the permit area and potentially affected areas. These two reports together provide an analysis of how NMCC's reclamation plan will meet the performance and reclamation standard contained in 19.10.6.603.C.(4), Hydrologic Balance.

As detailed in JSAI's report, groundwater systems at Copper Flat include:

- The regional Santa Fe Group (SFG) aquifer,
- Quaternary-age alluvial aquifers along Animas and Percha Creek,
- The crystalline bedrock of the Animas uplift.

Surface water includes:

- Perennial flow in the Rio Grande and Caballo Reservoir that is supplied in part by discharge from the SFG aquifer.
- An area of perennial flow and riparian vegetation along Animas Creek where the Quaternary-age alluvial aquifer discharges to the surface and an area of perennial flow and riparian vegetation along Percha Creek, atop the crystalline bedrock.
- Springs
- Storm water flows in Grayback Arroyo.

JSAI's report details how the groundwater and surface water in the permit area and potentially affected areas are impacted by the operation of Copper Flat, and shows how mitigation measures and physical properties of the area result in minimal change and meet the standard of similar after mining ceases. Table 1 below presents JSAI's findings of probable effects for groundwater and surface water systems and how the post-mining condition will be similar to pre-mining conditions. Based on the model results presented in *Predictive Geochemical Modeling of Pit Lake Water Quality at the Copper Flat Project, New Mexico* by SRK Consulting,

Table 1		
System Evaluated	**Probable Effect**	**Post-Mining Condition**
Santa Fe Group Aquifer	Water-level drawdown in the SFG aquifer projected to reach a max. of 70' at the well field at the end of mining. (Section 3.1.1 JSAI 2017)	Water levels will recover over a period of about 20-30 years.
Quaternary-age alluvial aquifers along Animas and Percha Creeks	Effects are projected to be minimal, less than 2' of groundwater-level change on Percha, less than 1' of groundwater-level change on Animas. (Section 3.1.7 JSAI 2017)	Water levels will remain similar throughout mine operation and minimal changes to water levels will recover after mining ceases.
Crystalline bedrock of Animas uplift	At the end of mining, drawdown will approach a maximum of about 750' at the bottom of the dewatered pit and drawdown of 1' extends for an approximately 2-mile radius around the pit. (Section 3.2.1 JSAI 2017)	The crystalline bedrock will be similar to pre-mining conditions in that it has not historically been a strong source of groundwater and it will remain thus into the future.
Perennial flow in the Rio Grande and Caballo supplied by SFG	Depletion to the Rio Grande is projected to peak around 2,080 ac-ft/yr at the end of mining. These depletions will be offset by additional water purchased by NMCC and added to the river to result in no net effect to the Rio Grande. (Section 3.1.1 JSAI 2017)	Offsets will be supplied to the Rio Grande to match depletions to flow even as depletions decrease in the years post mining. JSAI projects that depletions will be about 28-ac-ft/yr 100 years after mining. At some point, NMCC may elect to permanently retire water rights to offset depletions to the Rio Grande. (Section 3.1.4 JSAI 2017)
Area of perennial flow along Animas Creek where Quaternary-age alluvial aquifer discharges to the surface and an area of perennial flow and riparian vegetation along Percha Creek, atop the crystalline bedrock.	Peak groundwater drawdown along Animas Creek and most of Percha Creek will be less than 1 ft. A small area of Percha Creek is projected to see drawdown of less 1-2 ft. (Section 3.1.7 JSAI 2017)	Projected effects on evapotranspiration and surface discharge from the shallow aquifers are small and will recover post mining.
Effects on Springs	Springs discharging on the Animas uplift are fed by local perched groundwater systems or precipitation and would not be affected by flow of groundwater toward the open pit. Springs of the Animas Graben are fed by Las Animas and Percha Creek watersheds west of the Animas Uplift and are separate from and will not be directly affected by movement of groundwater toward the open pit. Springs on the east edge of the Animas Uplift could be indirectly affected by the project. (Section 3.2.4 JSAI 2017)	No direct effects to identified springs are predicted to occur as a result of the project because (1) the springs of the Animas Uplift are ephemeral, precipitation-event-fed springs unrelated to the bedrock groundwater system, (2) the springs of the Animas Graben are fed by groundwater from the west and depth, unrelated to groundwater of the Uplift. Small indirect effects may occur, however the end result to the hydrologic balance is expected to be similar.
Storm water flows in Grayback Arroyo.	The Grayback Arroyo diversion would be maintained. (Section 1.1 JSAI 2017)	No change to the Grayback Arroyo will result in similar conditions post mining.

Inc., December 2017, the changes to the hydrologic balance of the future pit water body that will form post- mining will be nil or minimal. Section 4.3.4 of the July 2017 Revised MORP presents further information about how the planned and designed operations of Copper Flat minimize change to the hydrologic balance in the permit area and potentially affected areas. Subsection 19.10.6.603.C.(4) NMAC (Hydrologic Balance) specifically addresses requirements on how hydrologic balance to surface water quality will be achieved. The SRK and JSAI PHC reports address potential water quality and quantity impacts to groundwater from the mine pit, waste rock stockpiles and the tailings storage facility, and potential water quantity impacts to the groundwater and surface water system at the site and potentially affected areas. Subsection 19.10.6.602.D.(13).(g).(v) NMAC requires that the baseline data provided include a determination of the probable hydrologic consequences of the operation and reclamation, on the permit and affected areas with respect to the hydrologic regime, quantity and quality of surface and groundwater systems that may be affected by the proposed operation, including dissolved and suspended solids under seasonal flow. As such, Section 4.3.4 of the July 2017 Revised MORP addresses the surface water component of this requirement.

With respect to groundwater quantity and quality of the hydrologic regime, Subsection 19.10.6.603.C.(4) NMAC requires that operations be planned and conducted to minimize change to the hydrologic balance in both the permit and potentially affected areas and that reclamation result in a hydrologic balance similar to pre-mining conditions unless non-mining impacts have substantially changed the hydrologic balance. Operations at the Copper Flat project are planned and will be conducted such that change to the hydrologic balance in the groundwater regime of the permit at affected areas will be similar to pre-mining conditions. The mine pit has been determined to be a hydrologic sink such that during operations there will be no impact to groundwater as groundwater around the pit will flow to the pit. The waste rock stockpiles will be located on the andesite bedrock, demonstrated to provide a natural impermeable liner, thus preventing net-percolation from the WRSP to groundwater. A liner will be installed at the TSF to prevent percolation of tailings fluids to groundwater during operations. Therefore, during operations there will be no impacts to groundwater quality.

With respect to minimizing impacts to groundwater quantity during operations, the JSAI PHC report demonstrates that water quantity impacts during the 12 years of operations will be localized and minimal. The groundwater flow model projections indicate that existing water rights uses will not be impaired by the Copper Flat operations, as required pursuant to the New Mexico State Engineer requirements for water rights protection.

The mine site will be reclaimed in accordance with the Reclamation Plan presented in Appendix E of the MORP. As described therein, reclamation of the site will ensure that a hydrologic balance similar to pre-mining conditions will prevail. With respect to surface water, quality and quantity, the diversion structures that diverted water around the site will remain after reclamation. On-site reclamation is designed such that the site will be regraded and re-contoured and a 36-inch soil cover will be placed over the TSF, WRSP's and other areas identified in the Reclamation Plan. Other areas of the site, such as haul roads, process areas will receive a 6-inch soil cover, as appropriate. The soil cover areas will be re-vegetated as described in the Reclamation Plan. Mine pit areas identified to receive soil cover, such as the haul roads and perimeter of the mine pit will be re-contoured and reclaimed per the Plan. Upon completion of reclamation all direct precipitation onto the site will be shed off the site through runoff collection channels and swales, routing surface water to Grayback Arroyo. The mine pit will be rapid-filled with fresh water from the Production Wells as described in the Reclamation Plan and the PHC. Surface water in the Open Pit Surface Drainage area will continue to report to the open pit after reclamation. As discussed in detail in the MORP, DP and referenced herein in the SRK and JSAI PHC reports, the mine pit will remain a hydrologic sink after mining and the resulting future pit lake will not significantly change. The resulting surface water hydrologic balance will be similar to that which exists pre-mining.

The groundwater hydrologic regime will also be similar post-mining. As noted above, the existing mine pit is a hydrologic sink and will remain so in the future after reclamation. A 36-inch thick soil cover will be placed over the re-graded and re-contoured WRSP's per the Copper Rule regulatory requirements to eliminate net-percolation through the stockpile, and of course, the andesite formation will provide an additional protective shield to groundwater. Similarly, the TSF will be covered with 36-inches of soil cover in accordance with regulatory requirements. The site will be revegetated as described in detail in the Reclamation Plan. Therefore, the groundwater hydrologic regime will be similar post-mining in compliance with 19.10.6.603.C.(4) NMAC. Monitoring will be conducted after reclamation to provide verification as discussed below.

MONITORING

The Monitoring Plan presented as Appendix E to the Copper Flat Mine Discharge Permit by JSAI Revised, 2016, presents a monitoring well network within the permit area that will be able to verify the effectiveness of mitigation and reclamation efforts. A monitoring network has also been developed to verify the similarity of the hydrologic balance in the potentially affected areas as well and is presented below.

NMCC believes that the groundwater model is conservative and that monitoring will reveal that impacts to groundwater in the potentially affected areas will be less than those projected. NMCC nevertheless commits to providing a groundwater monitoring network to evaluate future impacts to the three groundwater units identified near Copper Flat and its Production Wells. The information obtained through this monitoring network can be used to verify the similarity of the hydrologic balance for MMD, and will be useful to other agencies, such as the Office of the State Engineer (OSE), the Bureau of Land Management (BLM) and United States Fish & Wildlife (USFW).

With assistance from JSAI, NMCC has evaluated the number of wells necessary to monitor the groundwater projections. NMCC has identified 23 monitoring wells at the mine and in the surrounding affected area that will be sufficient to assess and verify projected effects on the Santa Fe Group aquifer (eight wells), the Quaternary-age alluvial aquifers along Animas (four wells) and Percha Creek (three wells) as well as the crystalline bedrock of the Animas uplift (eight wells). Plate 1 presents the locations of these 23 monitoring wells in relation to the mine area and the Production Wells. Some of these wells are part of the Monitoring Plan in Appendix

E of the Discharge Permit, and others are in addition to it. Where necessary, NMCC has obtained permission from private land owners for access to monitor these wells through mine operation and reclamation. Many of these wells have been in place for years and NMCC has background data on water levels and water quality, some are newly identified monitoring locations, and 3 wells will be drilled to replace wells that will be taken out by the planned pit expansion.

These wells are in the three groundwater systems shown in the Copper Flat groundwater model:

Santa Fe Group

Eight Santa Fe Group aquifer wells (all of these have been used historically): MW-5 near the Production Wells, MW-9 and MW-10 north of the Production Wells along Animas Creek, MW-6 west of the wellfield, MW-8, MW-4 and MW-2 near the mine area to the west and southwest of the wellfield, and GWQ11-27 east of the wellfield in the flowing well area along Animas Creek. NMCC has right of way access from BLM (via NMNM 125870) to monitor MW-2, MW-5, MW-6 and MW-8. NMCC owns the land where MW-4 is located. NMCC has permission from the rangeland allotment holders, to monitor MW-6. NMCC owns MW-9 and MW-10 and has permission from the private landowners to access these wells.

Alluvium

Four shallow alluvial wells along Animas Creek (MW-11 has been monitored historically, the remaining wells are new additions): MW-11 north of the wellfield, NMCC owns this well and has permission from the private landowners for access. Also three existing wells owned by private landowners along Animas Creek, one west of MW-11 and another east of MW-11, and a third east of GWQ11-27 near I-25. The private wells will be monitored via transducers that will not interfere with the use of the wells. NMCC has permission from the private landowners to access the wells.

Three existing wells installed by the Bureau of Reclamation (BOR) in the shallow alluvium of Percha Creek are proposed additional monitoring points. BOR has granted NMCC ownership of these wells and NMCC has permission from private landowners for access.

Crystalline Bedrock

There are eight wells proposed for monitoring the crystalline bedrock. Seven wells in the bedrock around the open pit have provided historic data: GWQ-5R, GWQ-6N, GWQ96-22, GWQ96-23, GWQ11-24, GWQ11-25, and GWQ11-26. Of these, two will be destroyed by the expansion of the pit (GWQ11-23 and GWQ11-25). Access to these wells is provided either through NMCC ownership of the well site and well or through an approved access permit with BLM. Three new wells proposed in the New Mexico Copper Discharge Permit application, PGWQ-1, PGWQ-2, and PGWQ-3, will replace two existing wells (GWQ11-23 and GWQ11-25) north and east of the pit that will be taken out during the expansion of the pit through mining operations. These new wells will be installed prior to operation of Copper Flat.

If the Office of the State Engineer (OSE) requires additional monitoring points as conditions of NMCC's water pumping permit, NMCC will incorporate them into the monitoring network. NMCC will comply with all of OSE's directives and conditions regarding groundwater monitoring per its (anticipated) pumping permit. Monitoring and reporting data from the monitoring network will be performed by qualified NMCC personnel staff assigned to the Copper Flat Mine as part of standard procedure during project construction, operation, and reclamation. If NMCC's pumping is found by the OSE to impair private water rights, NMCC will take all appropriate measures, as required.

Similarly, if the groundwater monitoring described herein demonstrates that the impacts of pumping are greater than the model predicted, USFW and BLM have the authority under Section 7 consultation to require additional evaluation and negotiation of monitoring and mitigation measures necessary to protect threatened or endangered species.

JSAI review of the monitoring network and well locations described here has determined that the proposed network is more than adequate to evaluate performance of the NMCC groundwater model and effectively identify changes that may occur in each of the three groundwater systems of interest. Further, monitoring of the shallow alluvial wells will give hydrologists insight into whether surface waters in Las Animas and Percha Creeks might be measurably affected. At this time, the model indicates that impacts to surface waters will be so minor as to not be measurable, but this monitoring network will provide data regarding greater unanticipated effects if they do occur.

Pit Water Quality and Quantity

A property plat for the pit area was completed by a registered land surveyor and provided to NMED in previous correspondence. The survey and plat confirm that the current pit body is entirely on private lands, as shown on the plat. Further, NMCC has proposed a design that will confine the surface of the pit water body in the future pit entirely on private lands. As such, the pit water body is not considered "waters of the state" subject to the New Mexico surface water quality regulations.

Based on the model results presented in *Predictive Geochemical Modeling of Pit Lake Water Quality at the Copper Flat Project, New Mexico* by SRK Consulting, Inc., December 2017, the changes to the hydrologic balance of the future pit water body that will form post- mining will be nil or minimal. The water quality will be very similar to that of the existing pit lake. The existing pit lake at Copper Flat and the future pit water body at Copper Flat are and will be artificial water bodies created as a result of mineral extraction. The post-mining water body will be similar to the existing pit lake and is not expected to be conductive to providing aquatic habitat or supporting fish life. The mine pit reclamation proposed for Copper Flat meets the water quality similarity requirements of 19.10.6.603 NMAC.

Based on the model results presented in *Probable Hydrologic Consequences of the Copper Flat Project Sierra County New Mexico* by JSAI, Inc., December 2017, the pit, which currently is a evaporative hydrologic sink, will remain an evaporative hydrologic sink post-mining.

The projected similarity of water quantity and quality in the pit as well as the continuity of the pit as an evaporative hydrologic sink will be confirmed by post-mining monitoring of the pit as described in the monitoring plan discussed above and in NMCC's Discharge Permit Application.

NMCC Copper Flat Mine

Anticipated Major Permits & Approvals Schedule

May 22, 2018

Permit/Approval	Agency	Anticipated Approval
	Federal	
Final EIS Published (NEPA)	BLM	2018
Record of Decision (ROD) Issued	BLM	2018
Approval of MPO Revised to match ROD	BLM	2019
Programmatic Agreement Signed (Section 106 Consultation on Cultural Resources)	BLM, SHPO	2016
Cultural Resources Treatment Plan (Data Recovery Plan)	BLM, SHPO	2019/2020
Consultation on Threatened & Endangered Species Complete	BLM, USFW	2018
Federal Communicatons Commission License	Federal Communications Commission	2019/2020
Mine Safety and Health Administration Registration	Mine Safety and Health Administration	2019/2020
Explosives Permit	Bureau of Alcohol, Tobacco, and Firearms	2019/2020
404 Permit	Army Corps of Engineers	2018
Multi-Sector General Permit (NPDES)	Environmental Protection Agency (EPA)	2019
Spill Prevention Control & Countermeasures Plan	EPA	2019/2020
	State	
New Mine Permit	NMEMNRD- Mining & Minerals Division (MMD)	2019
Environmental Evaluation	NMEMNRD- Mining & Minerals Division (MMD)	2018
Financial Assurance Estimate	NMEMNRD- Mining & Minerals Division (MMD) - To be Jointly Held by NMED/BLM	2018/2019
Mine Registration	NMEMNRD- Mine Registration	2019/2020
Permit to Construct (air quality)	New Mexico Environment Department (NMED) - Air Qaulity Bureau	2019
Permit to Operate (air quality)		2013
Permit to appropriate water	New Mexico Office of the State Engineer (OSE) - Water Rights Division	2019
Permits for dam construction and operations	NM OSE - Dam Safety Bureau	2019/2020
Groundwater Dischage Permit	NMED Groundwater Quality Bureau	2018
Memorandum of Understanding	New Mexico Deporatment of Transportation	2018
Aboveground petroleum storage tank registration	NMED - Petroleum Storage Tank Bureau	2019/2020
Approval to operate a sanitary landfill	NMED - Solid Waste Bureau	2019/2020
Miscellaneous Construction Permits	Sierra County	2019/2020

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New Mexico Copper Corporation Response to NM MMD's March 22[st], 2018 Technical Comments on Baseline Data Reports for Copper Flat Mine, Sierra County Predictive Geochemistry Modeling of Pit Lake Water Quality at the Copper Flat Project, December 2017 Probable Hydrologic Consequences of the Copper Flat Project, December 12, 2017 Permit Tracking No. SIO27RN May 22, 2018

<table>
<tr><td colspan="4">Agency Review of Updated MORP</td></tr>
<tr><td colspan="3">Reviewer: David (DJ) Ennis, P.G.
Agency: NM Mining and Minerals Division</td><td>Review Date: March 22, 2018</td></tr>
<tr><td>Item #</td><td>Section/Page (or general)</td><td>Topic</td><td>Comment</td></tr>
<tr><td>MMD Comment 1</td><td>General Comment</td><td>Monitoring to verify model predictions</td><td>The two reports, Predictive Geochemistry Modeling of Pit Lake Water quality at the Copper Flat Project and Probable Hydrologic Consequences of the Copper Flat Project provide good, technical analyses of what may happen to water quality and quantity during and after mining on the permit and affected areas. The operational and reclamation plans will need to incorporate surface and groundwater monitoring to verify the predicted direction of the models. Monitoring will be a future permit condition.</td></tr>
<tr><td></td><td>NMCC Response</td><td></td><td>The Monitoring Plan contained in Appendix E of NMCC's Discharge Plan Application which is incorporated into NMCC's Mining Operation and Reclamation Plan meets part of the MMD's request to provide surface and groundwater monitoring to verify predicted direction of the models. In addition, a monitoring plan has been developed to verify the similarity of the hydrologic balance in the potentially affected areas, a copy of which is provided herewith.</td></tr>
<tr><td>MMD Comment 2</td><td>General Comment</td><td>Executive Summary Request</td><td>Please provide a detailed executive summary using these two reports addressing the probable hydrologic consequences of the operation on both the permit and affected areas. Specifically, please explain how the performance and reclamation standard, addressed in 19.10.6.603.C(4) NMAC (Hydrologic Balance), is achieved. Please explain how the reclamation shall result in a hydrologic balance similar to pre-mining conditions and how this will be verified at the end of reclamation.</td></tr>
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Agency Review of Updated MORP

Reviewer: David (DJ) Ennis, P.G. Agency: NM Mining and Minerals Division			Review Date: March 22, 2018
Item #	**Section/Page (or general)**	**Topic**	**Comment**
	NMCC Response		*NMCC has prepared the summary requested by MMD that explains how the performance and reclamation standard of 19.10.6.603.C(4) is achieved, how NMCC's proposed reclamation will result in a hydrologic balance similar to pre-mining conditions and how it will be verified. The requested executive summary is attached herewith. NMCC's attached Monitoring Plan provided in response to Comment 1, above, is also a part of NMCC's response to this comment.*
MMD Comment 3	Figure 3-1	LRG-10948 well	Figure 3.1: The 1 foot contour in this figure shows an abrupt turn to the east on the north side of Percha Creek. This figure is similar to Figure 3-19b in the Draft Environmental Impact Statement ("DEIS", November 2015), which appears to show that this portion of the contour is controlled by negligible predicted drawdown in well LRG-10948, as shown in Figure A14 of the JSAI Report. However, LRG-10948 is listed in the Baseline Data Report ("BDR"; June 2012 by Intera) as a Percha Creek alluvial well (see Section 8.2.4.3.3 of the BDR) whereas Figure 3.1 represents projected groundwater drawdown in the Santa Fe Group ("SFG") aquifer. If LRG-10948 is an alluvial creek well, the predicted 1 foot contour would likely continue in the DFG south across Percha Creek. Please comment on whether LRG-10948 is modeled as an alluvial creek well or as a SFG well and changes this may make on the predicted drawdown within the SFG at the end of mining.
	NMCC Response		*The shape of the 1-foot contour in the Santa Fe Group south and east of the site to Percha Creek shown on Figure 3.1 of the PHC Report and on Figure 3-19b of the DEIS is controlled by the westernmost fault boundary shown on Figure 3.6 of the PHC together with the recharge from Percha Creek. This causes the contour to show up as the abrupt turn by the model. An additional factor is the small (1-foot) magnitude of the drawdown relative to grid spacing of the model. MMD's confusion with respect to this contour is understandable given the manner in which the BDR discusses well LRG-10948 and the Upper Percha well. The issue is further compounded by historic miss-location of well LRG-10948 by INTERA in the BDR and JSAI in subsequent documents since the BDR was issued as result of incorrect location by the NMOSE database. NMCC has confirmed that well LRG-10948 is actually located a number of miles to the west of Hillsboro, NM, as indicated by the attached water rights declaration document. As such, it has not been used in the hydrologic analyses performed by JSAI in the ground water model or the PHC. It is not at the location shown on Figure 8-21 of the BDR, Figure 3-19b of*

Agency Review of Updated MORP

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Item #	**Section/Page (or general)**	**Topic**	**Comment**
	NMCC Response (Cont.)		*the DEIS or Figure A1 of the PHC. As such, Figure A14 is not a hydrograph of LRG-1048. Therefore, Figures A1 and A14 have been removed from the revised PHC so as to prevent future confusion.*
MMD Comment 4	Figure 3.12 vs. Figure A1	Contour Intervals	The drawdown contour intervals of Figure 3.12 versus Figure A1 are different. Please include an approximate 1 foot drawdown contour of Figure A1 to allow for comparison of the end-of-mine drawdown versus the anticipated effects 100-years after mining.
	NMCC Response		*Figure A1 of the PHC Report has been revised to include the 1-foot drawdown contour.*
MMD Comment 5	Figure A1	Cone of Depression	Figure A1 appears to show propagation of the pit cone of depression within the crystalline aquifer post-mining. At about 40 to 50 years post-mining, the propagation of the cone of depression seems to diminish (i.e. see Figure A23, projected water levels at Ready Pay well). Please comment on this apparent propagation including how the water levels are projected to stabilize over time.
	NMCC Response		*Water levels in the bedrock near the pit rapidly equilibrate to the pit water level. The rate of propagation of the drawdown away from the pit is a function of the low permeability of the andesite bedrock. Locations closer to the pit reach equilibrium sooner (see Figure A21) than locations farther from the pit (see Figure A23). By 100 years post-mining, the propagation of drawdown has essentially stopped; the contours in Figure A1 represent the post-mining equilibrium condition. Appendix A of the PHC has been updated to reflect this response.*
MMD Comment 6	Figure 3.1 vs Figure A1	Cumulative effects of groundwater drawdown	There appears to be an area of groundwater drawdown overlap in Grayback/Greenhorn arroyos between the crystalline aquifer and the SFG aquifer immediately east of the permit area (e.g. between the eastern edge of the permit area and monitoring well MW-8). Figure 3.1 shows approximately 10 feet of drawdown in the SFG in this area at the end-of-mining and Figure A1 shows up to 20 feet of drawdown in the crystalline aquifer 100-years after mining. Please comment on whether there are any anticipated cumulative effects of groundwater drawdown in this area.

Agency Review of Updated MORP

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Item #	**Section/Page (or general)**	**Topic**	**Comment**
	NMCC Response		*Drawdown in the bedrock reduces recharge to the SFG aquifer along Grayback Arroyo, as shown on both Figures 3.1 and A1. Figure 3.1 shows the cumulative effect at the end of mining, i.e., in the near-term and Figure A1 shows the long-term post-mining cumulative effect, i.e., 100 years after mining.*
MMD Comment 7	Figure 3.14	Pit Lake water surface stability	Figure 3.14 of the report indicates that the pit lake surface will stabilize at the ~4,897 foot elevation and remain there for a number of years. What is the probability that it will remain at this level; either drop below or go above? What are the environmental circumstances that would allow the level to decrease or increase beyond the ~4,897 foot level? What might be the impacts on water quality or quantity?
	NMCC Response		*The probability that the pit lake water level will remain at this level is very high. Page 28 and Figure 3.14 of the PHC indicate the model simulated average near-term pit water level after rapid-fill and reclamation will be 4,894 ft. amsl and the final long-term water level of 4,897 ft. amsl. The pit lake is expected to average about 22 acres in size. JSAI's Technical Memorandum titled, "Hydrologic Effects of proposed Rapid Fill Reclamation of Copper Flat Open Pit" submitted to NMED on October 13, 2017, indicates "water levels will fluctuate around the mean by a few feet, rising and falling seasonally and with wet and dry climate conditions…" Stormwater runoff is, by far, the largest input to the pit water balance. The largest potential effect on pit water levels would result from environmental circumstances such as a 100 year flood event or the occurrence of a prolonged drought. Probability is an indicator for the likelihood of an event's occurrence. As such, the probability that a 100 year flood will occur in any one year is 1 in a 100 or 1 percent. The historical precipitation record at Hillsboro indicates that a 100-year 24 hours precipitation event is 3.29 inches (JSAI, September 25, 2017 Technical Memorandum regarding OPSDA runoff). Utilizing this data, such an event would generate 36 acre-feet of runoff to the pit. Therefore, there is a 1 percent chance that the pit water level could rise 1.6 ft. in any one year. Conversely, if there was zero runoff for one year, i.e., a worst-case drought in any one year, the water level of the pit lake would decline 2.6 ft. due to evaporation. Therefore, the bracket for maximum short-term potential rise and decline would be 4898.6 ft. to 4891.4 ft. amsl., albeit with a low probability. The impact to water quantity would be very small, a change of less than 3 percent in total volume. Such a change in water quantity would not be expected to result in a significant change in water quality. Section 3.2.2 of the PHC has been updated to reflect this response.*

Agency Review of Updated MORP

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Item #	**Section/Page (or general)**	**Topic**	**Comment**
MMD Comment 8	Section 3.1.8 and Figure 3-1	Placement of reclamation materials below the waterline of the future pit lake	Section 3.1.8 and Figure 3-1 indicate that the pit bottom will covered with a suitable reclamation material before pit flooding occurs, however the October 13, 2017, amendment to Mining Operation and Reclamation Plan (”MORP”) submitted by NMCC does not propose to place reclamation materials below the waterline of the future pit lake. As stated in Section 6.2, the covered and submerged portions of pit reclamation are excluded from the surface area available (Table 6-1) for leaching and therefore the pit lake modeling results present in Section 6.6. It is MMD's opinion that any pit surface area exposed before submerging will lieely be available to leaching. NMCC should plan to cover as much of the pit surface area as possible after mining to limit the amount of leaching, even those areas to be submerged. This would assist with reclamation prior to inundation of the pit using the rapid pit proposal. Please address.
	NMCC Response		*The representations made by NMCC in its October 13, 2017 amendment to the MORP indicating that it does not propose to place reclamation materials below the waterline of the future pit lake are correct. The SRK Report has been revised to reflect this. Because the proposed rapid filling of the pit will occur within 6 months of the end of mining the length of time that the exposed surface area before submerging will be very short and, therefore, not available for leaching. Placing cover in the submerged area will not assist with reclamation prior to inundation as postulated by MMD.*
MMD Comment 9	General	Model Run to predict existing pit lake chemistry over 100 years	Please utilize the calibrated PHREEQC model to predict the pit lake chemistry for the small pit lake that currently exists at the Copper Flat site. The model for the existing pit lake should utilize the same time steps used in the future pit lake model. Please provide comments/discussion on the results and compare them to the model results for the future pit lake.
	NMCC RESPONSE		*Per MMD's request, NMCC will provide the model run for the existing pit lake under separate cover and not incorporated into the SRK report. NMCC believes that the purpose of performing this analysis should be viewed, in effect, as a "no action" alternative analysis. While it may allow some comparison to be made between projected water quality and quantity of the existing pit lake over 100 years and the proposed future pit lake after mining, However, the results of this analysis have little to no bearing on the chemistry predicted for the future pit lake.*

Agency Review of Updated MORP

Reviewer: David (DJ) Ennis, P.G. Agency: NM Mining and Minerals Division			Review Date: March 22, 2018
Item #	**Section/Page (or general)**	**Topic**	**Comment**
MMD Comment 10	Figures 5-1 and 6-1	Conceptual model parameters	Figure 5-1 and 6-1 show different rates of evaporation, direct precipitation, pit wall run-on, etc., and a different final pit lake elevation. Please explain the differences between the values presented in these two figures.
	NMCC Response (Cont.)		*The two figures illustrate the projected pit water balance 100 years post-mining, for the un-reclaimed pit without rapid fill (Figure 5-1) and the reclaimed pit with rapid fill Figure 6-1). The values represented in these figures are averages over the 100-year period and, therefore, represent different ranges of values over time in each scenario. These differences between the two water balances include:* • *Pit lake elevation is eight feet lower in Figure 5-1 than in Figure 6-1 because it takes longer than 100 years to reach the equilibrium stage in the un-reclaimed pit model with natural fill.* • *Direct precipitation is a lower minimum value in Figure 5-1 because in the natural fill case direct precipitation onto the pit water body is very low while the size of the water body is small and increases over time as the lake size increases. This results in a lesser maximum volume than that shown in Figure 6-1 over 100 years. Similarly, direct precipitation has a lower maximum for the natural fill case because the final water level is lower, thus the lake is smaller and direct precipitation on the water surface is less. In Figure 6-1 the direct precipitation values are higher because the pit lake water is fully formed in six months resulting in a larger surface area for direct precipitation and the surface area of the water body is slightly larger at the end of 100 years.* • *Evaporation is lower in Figure 5-1 for the natural fill case because the pit starts out empty (evaporation zero), as compared to Figure 6-1 because the pit water body is filled within six months of end-of mining, and because in the natural case the pit lake has not filled completely in 100 years.* • *The contribution to groundwater inflow is higher in Figure 5-1 for the natural fill case because the pit water level is lower than the rapid fill case.* • *Pit-wall and haul road runoff is different for the two cases because reclamation takes place in the Figure 6-1 case providing more runoff control whereas in the Figure 5-1 case there is a larger pit un-reclaimed catchment area over time due to lower water level and, therefore, more area above the water line contributing to runoff.*

Agency Review of Updated MORP			
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Item #	**Section/Page (or general)**	**Topic**	**Comment**
MMD Comment 11		Other Agency Comments	Agency Comments are attached and shall be addressed in writing.
	NMCC Response		*NMCC's responses to agency comments are included below*
NMOSE Comment 1	General Comment		I (Eric Keyes, OSE Hydrologist) have reviewed the December 12, 2017 report "Probable Hydrologic Consequences of the Copper Flat Project Sierra County New Mexico," authored by John Shomaker & Associates (JSAI). I do not have any objections to the report technical content. The report addresses and adheres to a concern made by myself for the Hydrology bureau at the Office of the State Engineer (OSE) when reviewing the EIS model. I agree with JSAI on the methodology on the treatment of mine pumping impacts on the general head boundary on the northern portion of the Palomas Graben and how those impacts relate to impacts on the Rio Grande. Other calculations in the JSAI report that are outside of the numerical model such as potential tailings liner leakage and the estimation of potential land subsidence look reasonable. In any kind of modeling as new information becomes available, the modeling can change. At present, this is the best available tool in the determination of mine impacts.
	NMCC Response		*New Mexico Copper appreciates the efforts of the OSE in its review of these reports and looks forward to working with the State Engineer as we proceed to permit approval.*
NMDG&F Comment 1	General Comment on SRK Report	Uncertainty of Model Predictions	The modeling report concludes that "…changes to the hydrologic balance of the future pit water body that will form post-mining will be nil or minimal and the water quality will be very similar to that of the existing pit lake". The Department believes that the geological and hydrological complexities and inherent uncertainties make accurately predicting future pit lake water quality difficult. We believe that some type of mitigation strategy should be in place and implemented if pit lake water quality degrades to the point where it becomes hazardous to wildlife. The modeling efforts are limited to projecting pit lake water quality for 100 years. However, the pit lake will persist "in perpetuity", and the time span over which over which the water quality can deviate from pre-mining conditions can be on the order from hundreds to thousands of years.

Agency Review of Updated MORP

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Item #	**Section/Page (or general)**	**Topic**	**Comment**
	NMCC Response		*NMCC acknowledges NMDG&F's recognition of the geological and hydrological complexities and inherent uncertainties of the analyses that it has presented. The Departments' concerns notwithstanding, NMCC is confident of its predictions, in particular with respect to modeling for 100 years. New Mexico's mine reclamation and water quality protection regulations, and the permit approvals obtained therefrom, contain sufficient mitigation strategies to provide the protections conceived within the reasonable timeframe. Specifically, the MMD regulations require that NMCC's reclamation plan be designed to ensure that a self-sustaining ecosystem be established without perpetual care. Please note that the MMD will* *Require that NMCC perform monitoring of site conditions to verify the results of the modeling. The agency may require mitigation action of NMCC should it be determined necessary per regulatory requirements. NMCC's response to MMD Comment no. 1, above, contains NMCC's proposed monitoring program.*
NMDG&F Comment 2	General Comment on SRK Report	Predicted evaporation rates & climate change	The Department also questions the also questions the predicted rate of evaporation that will concentrate chloride, sulfate, total dissolved solids (TDS) and trace elements in the pit lake over time, and may eventually lead to water quality conditions that deleterious to wildlife. The current model appears to rely on historic climate data to predict the rate of evapoconcentration. The modeling should consider projected future climate regimes that would provide a plausible range of possible pit late water quality outcomes. A hotter and drier climate for the region could result in substantially higher rates of evapoconcentration.
	NMCC Response		*See NMCC response to MMD comment No. 1, above. Additionally, NMCC believes that it is inappropriate to take an oversimplified view of postulated effects of global warming, as local climate trends may be complex. The climate models do not provide clarity on predicting local climate conditions, therefore the best scientific method for water models is to rely on the longest period of record from local climate data that provides a reasonable bracket of climate conditions, such as the 1950s drought and the late 1980s wet period. Based on the Hillsboro meteorological data and the Penman Monteith ET0 formula, an increase of 2 degrees Centigrade would result in an annual evaporation increase of 2 inches per year, a minor change. Assumptions regarding the future changes in precipitation are speculative.*

Agency Review of Updated MORP

Reviewer: David (DJ) Ennis, P.G. **Agency:** NM Mining and Minerals Division			**Review Date:** March 22, 2018
Item #	**Section/Page (or general)**	**Topic**	**Comment**
NMDG&F Comment 3 & 4	General Comment on SRK Report	Alternative features to attract wildlife away from the pit lake	The proposed rapid fill reclamation scenario uses clean water from the production wells to achieve higher initial water quality of the pit lake. This approach informed the Department's previous comments to MMD regarding pit reclamation in the Mining Operations and Reclamation Plan to improve the value of the pit lake for wildlife habitat. These recommendations involved modifications to the high wall to create ledges and cavities, and modifications to the Expanded 4900 Catch Basin to create a shallow littoral zone for aquatic plants. Because the pit lake is anticipated to exist in perpetuity and accurately predicting water quality and associated hazards to wildlife for that duration is questionable, the Department no longer supports creating features that may attract wildlife to the pit lake. Alternatively, we suggest installing clean water sources, such as impermeable rainwater catchment drinkers, that would attract wildlife away from the pit lake area. The Department also recommends additional modifications to the pit shell area that are designed to mitigate the impacts of periodic wall seep events on the pit lake.
	NMCC Response		*See NMCC response to MMD comment No. 1, above. Additionally, as indicated in NMCC's previous responses to the Department's comments, NMCC will work with the Department in a reasonable manner to address its concerns, including consideration of developing water retention features such as swales and shallow ponding areas in reclaimed areas away from the future pit lake.*
NMDG&F Comment 5	General Comment on JSAI PHC Report	Effects of pumping on reaches of perennial flow	The Department's primary concern remains the reaches of perennial flow and riparian habitat along Las Animas and Percha Creeks. These areas may be affected by the cone of depression caused by the pumping of production wells in the Santa Fe Group (SFG) aquifer.
	NMCC Response		*See NMCC response to MMD comment No. 1, above. Additionally, the Department's concern notwithstanding, NMCC believes that the analysis presented by NMCC and its hydrology consultants adequately demonstrates that there will be no significant effect on perennial flow and riparian habitat along Las Animas and Percha Creeks.*

Agency Review of Updated MORP

Reviewer: David (DJ) Ennis, P.G. Agency: NM Mining and Minerals Division			Review Date: March 22, 2018
Item #	**Section/Page (or general)**	**Topic**	**Comment**
NMDG&F Comment 6	Page 20 JSAI PHC Report	Riparian habitat for Arizona Sycamore along Las Animas Creek	The Department is particularly concerned about the riparian habitat along Las Animas Creek. This habitat is located less than one mile north of the production wells and supports the northernmost riparian forest dominated by Arizona Sycamore (Platanus wrightii) trees. The JSAI report states on page 20 that: "the increased transmissivity of the SFG results in water levels dropping below the bottom of the alluvium, forming a hydrologic disconnection between the SFG aquifer and the alluvial groundwater system. As a result, water flows from the alluvium to the SFG, through low-permeability clay beds, only by gravity; pumping from the SFG does not increase the flow or change water levels in the alluvium." The JSAI report projects "non-measurable small changes in surface flow and riparian evapotranspiration" based on the presence of the low-permeability clay beds that minimize effects to shallow groundwater. It is unclear to the Department whether these changes are considered to be non-measurable relative to a range of normal or average flows, or whether withdrawals would create disproportionately greater reductions in surface water levels during low-flow periods.
	NMCC Response		*See NMCC response to MMD comment No. 1, above. Additionally, the model does not independently simulate streamflow, but rather includes flow (groundwater inflow and recharge) into the alluvial system and evapotranspiration from the riparian area. This is similar to the description of Las Animas Creek by Davie and Spegiel (1967) in which they stated "the stream plus the adjoining shallow aquifer is called a water course." Most of the temporary reduction in flow into the alluvial system will be manifested as a reduction in evapotranspiration, rather than a reduction in stream flow. The model-simulated changes are non-measurable because they are such a small part of the system water balance, and because they are temporary. Furthermore, the model is conservative by assuming a hydraulic connection between the Las Animas alluvial system and the underlying Santa Fe Group west of MW-11 to the Animas uplift. The model may be overstating the reduction in flow to the alluvial system. The water budget for perennial segments of Las Animas Creek is more significantly influenced by inflow from snowmelt runoff, and infiltration of storm water runoff events than by groundwater inflow from the Santa Fe Group aquifer. Any above-average snowmelt or storm runoff event will mask the model-simulated reduction of inflow from SFG groundwater. Likewise, just one irrigation well pumping from the alluvial aquifer, such as those on Ladder Ranch and other locations along Animas Creek, will obscure smaller potential effects to streamflow.*

Agency Review of Updated MORP

Reviewer: David (DJ) Ennis, P.G. Agency: NM Mining and Minerals Division			Review Date: March 22, 2018
Item #	**Section/Page (or general)**	**Topic**	**Comment**
	NMCC Response (Cont)		*Maximum model simulated change in Las Animas Creek evapotranspiration and flow reduction is 18 ac-ft./yr. (0.025 cf.). Water-level monitoring in the alluvial aquifer has shown seasonal changes of more than 10 ft. (INTERA, 2012), which would make it difficult to identify a smaller effect of less than 1 ft. Detecting the effect would require water-balance measurements to three significant digits. This would be impossible, particularly when the largest stress on the alluvial system (irrigated agriculture) is unmetered and ongoing.*
NMDG&F Comment 7	General Comment on JSAI PHC Report	Report findings re: limited hydraulic connection between SFG & alluvial aquifer	The Department is dubious that the report's findings of limited hydraulic connection between the SFG and the alluvial groundwater system provide sufficient security and mitigation to preclude impacts to wildlife habitats from drawdown of groundwater levels. The Department requests clarification of what contingencies, if any, would be in place if the hydraulic connectivity between the SFG and alluvial groundwater system proves to be greater than predicted, and results in adverse impacts to perennial flow and riparian habitat along the lower Animas Creek.
	NMCC Response		*See NMCC response to MMD comment No. 1, above.*
NMED SWQB Comment 1	PHC General Comment	PHC Report Model	The Probable Hydrologic Consequences of the Copper Flat Project, New Mexico "were evaluated using a numerical model developed from the USGS groundwater-flow modeling code MODFLOW. The model is well calibrated, reproduces measured data, and demonstrates an evaporative sink for the open pit lake, such ate the pit lake water ae not mixing with subsurface waters.
	NMCC Response		*NMCC appreciates NMED's recognition of the modeling efforts of NMCC and its' consultants. We look forward to a positive working relationship with the Department as we proceed to permit approval and operation.*
NMED SWQB Comment 2	PHC General Comment	Monitoring Plan	The SWQB urges demonstration that sufficient and robust monitoring plans are in place that assure the pit lake remains an evaporative sink under future climatic conditions to confirm model predictions and ultimately protect surface and ground waters.
	NMCC Response		*See NMCC response to MMD comment No. 1, above.*

Agency Review of Updated MORP

Reviewer: David (DJ) Ennis, P.G. Agency: NM Mining and Minerals Division	Review Date: March 22, 2018

Item #	Section/Page (or general)	Topic	Comment
NMED SWQB Comment 3	PHC General Comment	Potential hydrologic consequences to perennial flows	The SWQB has concerns regarding the potential hydrologic consequences to perennial flows in Las Animas Creek and Percha Creek. Surface water in the Chihuahuan Desert, and the semi-arid southwestern United States in general, is a vital resource for numerous species including humans. The report indicates that, "effects on shallow groundwater (riparian) systems along Las Animas Creek and Percha Creek are projected to be minimal, with a maximum of less than 2 ft of groundwater-level change on Percha Creek, less than 1 ft of groundwater-level change on Animas, and non-measurable small changes in surface flow and riparian evapotranspiration." The SWQB is concerned with the "non-measurable small changes in surface flow." Non-measurable can be significant when one is talking about creeks that are less than a foot deep. Given the current low baseflow conditions in Las Animas Creek and Percha Creek, any reduction or drawdown in the shallow groundwater that feeds them would likely reduce surface flows and potentially eliminate surface waters and aquatic habitat in certain reaches that are currently wet, which would cause additional stress and impairment to the aquatic community.
	NMCC Response		*See NMCC response to NMDG&F comment No.6, above. Also, note that the model simulated effects on Percha Creek occur on the alluvial system where there is no perennial streamflow, therefore no effect on streamflow. The effect on evapotranspiration is proportionally small and would not be measurable.*
NMED MECS General Comment 1	PHC Comment	Report Emphasis	During the review, an emphasis was placed on the end of mining drawdown in the bedrock aquifer around the open pit, i.e., the cone of depression, the evaluation of the extent to which the open pit will form an evaporative sink in the future, and on the potential for discharges from the tailing and waste rock stockpiles.
	NMCC Response		*No response to this comment is necessary from NMCC*
NMED MECS General Comment 2	PHC Comment	Post-mining open pit hydrologic sink	MECS concurs with the conclusion by Copper Flat that the post-mining open pit will result in a perpetual evaporative sink and has confidence in the prediction. MECS will require monitoring of the water levels in wells surrounding the open pit during and following mining to ensure that the prediction is correct.

Agency Review of Updated MORP

Reviewer: David (DJ) Ennis, P.G. **Agency:** NM Mining and Minerals Division			**Review Date:** March 22, 2018
Item #	**Section/Page (or general)**	**Topic**	**Comment**
	NMCC Response		*NMCC appreciates MECS' concurrence and confidence in NMCC's analysis. Appendix E of NMCC's Discharge Plan application contains the proposed monitoring program required by NMED. In addition, NMCC has provided a proposed monitoring program per MMD reuest (see NMCC response to MMD comment no. 1).*
NMED MECS General Comment 3	PHC Comment	Impacts to groundwater chemistry from infiltration	MECS concurs with Copper Flat that the impact to groundwater chemistry should be minimal, and that net-percolation from the tailing areas is not expected, however questions the interpretations of infiltration into the cover system, the properties of the cover materials and waste rock and ultimately the net-percolation from the waste rock storage areas. A detailed comment is included in the Specific Comments.
	NMCC Response		*NMCC appreciates MECS' concurrence in NMCC's analysis with regard to the TSF. MECS' questions noted in this comment have been evaluated by NMCC and its consultants and offers responses as appropriate below.*
NMED MECS General Comment 4	PHC Comment	Groundwater Model Predictions	MECS also reviewed the modeling and predictions regarding the water-level drawdown in the SFG aquifer as well as the evaluation of the discharge to the Ro Grande. Considering the overall conceptual model, the conventional mathematic modeling approach, the ability to recalibrate the model following the initiation of mining, and the long-term nature of the predictions, MECS concurs with the model and predictions to date, Since the prediction are extended out to a date exceeding the capability of our current understanding of the system, and past capabilities of a predictive model, it is recommended that a re-calibration and evaluation of the system occur at a regular interval as impacts in wells are observed following initiation of mining.
	NMCC Response		*NMCC appreciates MECS' concurrence and confidence in NMCC's groundwater model analysis. NMCC has provided a monitoring plan in response to MMD comments (see NMCC Response to MMD Comment No. 1) which we believe will establish the basis for re-calibration and evaluation of the system per MECS' recommendation.*
NMED MECS Specific Comment 1	PHC Comment	"tailing" vs "tailings"	Copper Flat should revise the documents with the correct spelling of the word "tailing". The words tailing and tailings are often misused, even within the industry. For example, a facility has tailings in their ponds if the milled ore was from multiple sources, facilities, ore types or operations.

Agency Review of Updated MORP				
Reviewer: David (DJ) Ennis, P.G. **Agency:** NM Mining and Minerals Division				**Review Date:** March 22, 2018
Item #	**Section/Page (or general)**	**Topic**	**Comment**	
	NMCC Response		*"Tailings" is a commonly accepted term that has been utilized by the mining industry for many years. NMCC is unaware of the distinction made by the MECS and respectfully chooses to continue to use the term "tailings" in order to avoid confusion.*	
NMED MECS Specific Comment 2	PHC Comment	Surface infiltration vs net-percolation	MECS requests that Copper Flat clarify the language regarding the water balance to differentiate between surface infiltration and net-percolation. Water that infiltrates into the cover or waste material has the potential to evaporate, be transpired, remain in storage or percolate down past the influence of evaporation and transpiration (net-percolation). To predict the water and gas flux to and from the atmosphere, this distinction in both a conceptual and a physical model must be considered.	
	NMCC Response		*The probable hydrologic consequences presented in the PHC for operation and reclamation of the Waste Rock Stockpiles are related to the potential for infiltration through the cover, through the waste rock, and to groundwater. NMCC concurs with MECS' proposition that water that infiltrates into the cover or waste material has the potential to evaporate, be transpired, remain in storage or percolate down past the influence of evaporation and transpiration. That component of "surface infiltration" can be said to be "net percolation". The PHC was prepared with those concepts in mind and were considered in developing the Mine Operations and Reclamation Plan that was also submitted to NMED as a supplement to the Discharge Plan application. Section 3.3.2 of the PHC has been revised where appropriate to add clarity per NMED's comment.*	

Agency Review of Updated MORP

Reviewer: David (DJ) Ennis, P.G. **Agency:** NM Mining and Minerals Division			**Review Date:** March 22, 2018
Item #	**Section/Page (or general)**	**Topic**	**Comment**
NMED MECS Specific Comment 3	PHC Comment	Net-percolation through waste rock to groundwater	MECS agrees that the impact to groundwater chemistry is likely to be minimal in part due to precipitation patterns, the low permeability of the underlying andesite, and the geochemical characteristics of the waste rock. MECS disagrees with the conclusion that net-percolation to groundwater from the waste-rock storage areas is not expected. The evaluation presented is rudimentary at best and not appropriate for an evaluation of water and evaporative flux within a waste rock cover system and waste rock waste rock stockpile. In addition, the numbers are inconsistent with predictions from other mine sites with similar rainfall and evaporative regimes. Specifically, the evaluation results in precise number without an error evaluation and without any supporting science. The evaluation does not include waste or cover material property information other than a number for the field capacity of the waste and associated reference. The references document (JSAI, 2011) does not discuss or present the field capacity or have a discussion of the material properties of the waste rock. The evaluation dos not rely on the an industry standard Richards Equation based approach, not does it account for redistribution or preferential flow and is not able to describe water or gas flow in an unsaturated material. The evaluation does not couple gas and water flux and has no mechanism to evaluate actual evaporation based on the soil potential and humidity of the pore gas. While potentially insignificant in this semi-arid climate, the evaluation does not have a realistic mechanism of representing transpiration from plants. The draft DP-1840 requires groundwater monitoring, implementation of a material handling plan to limit production of acid rock drainage, construction of seepage interceptor systems at the toe of the waste rock stockpile, and development of soil water characteristic curves for reclamation cover material. If necessary, based on the information acquired during initial phases of mining MECS may require a more rigorous quantitative evaluation of the potential for impacts to groundwater from the waste rock.
	NMCC Response		*NMCC appreciates that NMED agrees that the impact to ground water chemistry is likely to be minimal in part due to precipitation patterns, the low permeability of the underlying andesite and geochemical characteristics of the waste rock. NMCC and is consultants have provided significant evidence to that effect in the many documents provided in support of its DP application. MECS' disagreement with the conclusion that net-percolation to ground water from the waste rock is not expected is misplaced considering the data that NMCC has provided previously in this regard as discussed in more detail below. Regarding the concern with the calculation of net percolation through the waste rock storage area (PHC report section 3.3.2;*

Agency Review of Updated MORP

Reviewer: David (DJ) Ennis, P.G. Agency: NM Mining and Minerals Division			Review Date: March 22, 2018
Item #	**Section/Page (or general)**	**Topic**	**Comment**
	NMCC Response (Cont.)		*JSAI, 2017), MECS appears to differentiate its concern in this regard between the potential for net-percolation to reach ground water during the operations phase of the project, i.e., while the WSRP is not covered, and the post-closure phase, after reclamation. Clearly, NMCC's proposed placement of a three foot cover over the WRSP as required by the Copper Rules addresses MECS's regulatory concerns after reclamation. NMED appears to have an incorrect interpretation of the requirements of 20.6.7.21 with regard to a purported requirement of an aquifer evaluation. Subsection 20.6.7.21.B.(1)(d)(vii) of the regulation requires an aquifer evaluation per 20.6.7.B.(1) "unless the applicant or permittee demonstrates through material characterization or implementation of a material handling plan pursuant to subsection (A) the waste rock will not cause an exceedance of applicable standards". The standards are applied at the ground water source they are to protect, in this case, ground water in the andesite. NMCC has demonstrated with its considerable material characterization studies conducted by SRK and has provided a material handling plan as part of its DP application. NMCC has provided ample evidence that net percolation of water through the waste rock material will not result in the water quality standards being exceeded during the operations phase, thus providing the data needed to demonstrate compliance with the regulations. An aquifer evaluation is not required because the requirements of Subsection 20.6.7.A have been met. The PHC was not submitted to NMED for the purpose of meeting Subsection 20.6.7.21.B.(1)(d)(vii) of the Copper Rules. It was submitted to the MMD to complete the requirements of the Mining Act regulations. The PHC analysis is designed to meet the requirements of NMAC 19.10.6.602.(13)(g)(v), of the NM Mining Act regulations that require a PHC as part of its Baseline Data Report. The analysis and conclusions are based on numerous studies and referenced reports such as the Stage 1 Abatement (JSAI, 2013), NMED Discharge Permit Application (THEMAC, 2017), the Groundwater Model, (JSAI, 2014), the BLM Draft Environmental Impact Statement; BLM DEIS, 2015) and others, all referenced in NMCC's Discharge Plan (DP) Application and Mining Operation and Reclamation Plan (MORP submittals to NMED and MMD. As such, there has been an exhaustive analysis of the Copper Flat mine plan with many of the reports building on the next. Therefore, many of the answers to agency comments are embedded in other referenced reports. NMCC believes that references regarding such comments as "[T}he evaluation presented is rudimentary", the evaluation results in precise number without an error evaluation and without any supporting science",*

Agency Review of Updated MORP			
Reviewer: David (DJ) Ennis, P.G. **Agency:** NM Mining and Minerals Division		**Review Date:** March 22, 2018	
Item #	**Section/Page (or general)**	**Topic**	**Comment**
	NMCC Response (Cont.)		*"[T]he evaluation does not rely on an industry standard Richards Equation based approach does not account for redistribution or preferential flow and is not able to describe water or gas flow in an unsaturated material", result from a lack of familiarity with the complete set of the many documents at have been submitted previously. The probable hydrologic consequences presented in the PHC for operation and reclamation of the Waste Rock Stockpile are related to infiltration through the cover, infiltration through the waste rock, and infiltration to groundwater. JSAI has revised Section 3.3.2 of the PHC to further discuss the rationale utilized to assess the potential for net infiltration through the WRSP material, to the andesite and whether or not the potential exists for net percolation to penetrate the andesite and impact ground water beneath the WRSP during the 12 year operation of the mine. NMCC acknowledges the requirements in the draft DP, including groundwater monitoring, implementation of its material handling plan, construction of the interceptor systems at the toe of the WRSP and development of soil/water characteristic curves for reclamation cover material, and is committed to meeting those requirements.*
NMED Additional Comment 1	General	Additional Model runs	The updated model runs now assume two possible scenarios to pit infilling after mine closure. Scenario 1 is the unreclaimed fill scenario wherein the pit mine is allowed to re-fill naturally from area ground water seeps exposed during mining. Scenario 2 is amending the natural infilling with "good quality" ground water from supply wells used during mining. The latter scenario is predicted to reduce groundwater contact with oxidized pit wall minerals, thus reducing mobilization of metals and acid generating reactions. However, during a presentation of the updated and refined pit lake model, It appeared that part of the improvement to water quality under the reclaimed "rapid fill" scenario might be allotted to vegetative (or other) reclamation techniques to the pit void and haul road that would be under water in the refilled pit. It is unclear to the SWQB whether these terrestrial reclamation practices would enhance pit water if inundated by pit infilling, whether natural or rapid. A model run that only allows for terrestrial reclamation practices that improve water quality (above the predicted water line of the future pit lake) for both scenario 1 and 2 would be appropriate to make a valid comparison of the two possible closure plans.

Agency Review of Updated MORP			
Reviewer: David (DJ) Ennis, P.G. **Agency:** NM Mining and Minerals Division		**Review Date:** March 22, 2018	
Item #	**Section/Page (or general)**	**Topic**	**Comment**
	NMCC Response		*MMD's comment no. 8, above, is similar to this NMED comment. As indicated in NMCC's response to MMD comment no. 8, the representations made by NMCC in its October 13, 2017 amendment to the MORP indicating the it does not propose to place reclamation materials below the waterline of the future pit lake is correct. The SRK Report has been corrected to reflect this, including a model run consistent with proposed MORP reclamation.*
NMED Additional Comment 2	General	Monitoring	Groundwater chemistry and hydrologic monitoring of the aquifer after open-pit mining has been terminated should be conducted to confirm the geochemical simulation quantified by PHREEQC. Groundwater monitoring at Copper Flat, however, is essential under current and future conditions. Additional simulations using PHREEQC are warranted in the future during mining operations, especially if changes in water chemistry, mineralogy, groundwater flow regime, and climatic conditions take place and vary from predicted conditions. No geochemical model or simulations are entirely perfect and uncertainties exist, especially for predicting future aqueous compositions, mineralogical assemblages, and other water-rock inteactions occurring at mine sites.
	NMCC Response		*NMCC has prepared a proposed monitoring plan for this purpose (see NMCC's response to MMD comment no. 1, above).*
NMED Additional Comment 3	General SRK Report		Weakness or experimental gaps in thermodynamic data (MINETEQV4), serving as the basis for calculating aqueous speciation, mineral-solution equilibrium, and adsorption, are adequately presented in the SRK Inc. report. This discussion is important to the reader because geochemical modeling contains varying uncertainties and multiple hypotheses can be tested by performing numerous simulations with different constraints placed on the "model system".
	NMCC Response		*NMCC appreciates NMED's acknowledgement of the quality of the SRK Report.*
NMED Additional Comment 4	General PHC Report	Rapid Fill proposal	The post mining, rapid-pit fill is as optimal remediation strategy to significantly decrease acid rock processes by neutralizing acidic conditions in the pit lake during filling and steady-state conditions anticipated to occur in the long-term (100 years after post-mining operations). Groundwater pumping from two water supply wells has a sufficiently high total carbonate alkalinity (average value of 111 mgCaCo3/L, Appendix E) to maintain circumneutral pH conditions in the future pit lake at Copper Flat. The average pH of the two groundwater samples is 8.03. Higher bicarbonate alkalinity values (259 mgCaCo3/L, 316 mg/L, of HCO3) are reported for the other water supply wells.

Reviewer: David (DJ) Ennis, P.G. Agency: NM Mining and Minerals Division			Review Date: March 22, 2018
Item #	**Section/Page (or general)**	**Topic**	**Comment**
	NMCC Response		*NMCC concurs with NMED's conclusion.*
NMED Additional Comment 5	General PHC Report	Water Balance	NMED agrees with the previous revisions to the water balance calculation provided by John Shoemaker & Associates, Inc. (JSAI), as evapo-concentration is the primary process controlling solute concentrations that influence mineral equilibrium and adsorption processes at the site. The new water balance calculations provide by JSAI improved model calibration for PHREEQC simulations under existing pit-lake conditions.
	NMCC Response		*NMCC appreciates NMED's concurrence and recognition of the improvements made.*
NMED Additional Comment 6	Figure 6-18 PHC Report	Monitoring	Figure 6-18 presents a trilinear or Piper diagram for both existing measured pit lake chemistry and future chemistry of the larger pit like, suggesting that the future pit lake will be more uniform in major ion composition. This figure most likely assumes that the future pit lake is homogeneous in chemical composition in lateral and vertical dimensions, but it may change as a function of evapo-concentration of solutes under heterogeneous conditions. Monitoring of the future pit lake should confirm its major ion trace metal composition as functions of depth and surface location.
	NMCC Response		*Section 5.6 of SRK's report discusses the potential for future pit lake stratification. The future pit lake is expected to be well mixed, oxygenated, and not acidic, although seasonal stratification may occur as suggested by Figure 6-18.*
NMED Additional Comment 7	Table 4-3 PHC Report	Discrepancies in solute concentrations	Table 4-3 shows that mean concentrations of numerous measured solutes differ from those determined from PHREEQC simulations, however, they are generally within the range of measured solute concentrations. This suggests that the PHREEQC simulations are approximate for existing pit lake chemistry and model calibration is not perfect for antimony, arsenic, barium, boron, cadmium, chloride, fluoride, iron, lead, and molybdenum. A more detailed discussion need to be provided in the text explaining discrepancies in solute concentrations that are controlled by a combination of adsorption/desorption and mineral precipitation/dissolution processes.
	NMCC Response		*The SRK Report has been revised at Section 4.6 to provide the discussion requested. Some of the limitations in thermodynamic database (which affect mineral precipitation and adsorption processes) are also discussed in Section 3.8, therefore, a cross-reference to this section to direct the reader to this discussion.*

Agency Review of Updated MORP

Reviewer: David (DJ) Ennis, P.G. **Agency:** NM Mining and Minerals Division			**Review Date:** March 22, 2018
Item #	**Section/Page (or general)**	**Topic**	**Comment**
NMED Additional Comment 8	Humidity Cell Data SRK Report	Use of Maximum vs Average Values	Average solute concentrations obtained from humidity cell tests (HCT) were used as input to the PHREEQC simulations. Use of maximum values of solute concentrations, however, would provide the most conservative or worst-case scenarios of the modeled geochemical processes quantified by PHREEQC and would capture or reduce uncertainty in the simulations. Additional PHREEQC simulation using maximum solute concentrations obtained from HCT should be performed by SRK Inc to more accurately bound model uncertainties in the future (100 years post-mining activities).
	NMCC Response		*The use of average solute release rates from the humidity cell test is supported by the calibration model for the existing pit lake (Section 4), which showed that the majority of parameters can be predicted with a good degree of accuracy when average release rates are used. Maximum solute release rates are typically only observed at the start of the humidity cell test during the initial flush (see Figure B-2 of SRK revised report) and are not sustained for a significant period of time. Therefore, using the maximum solute release rates would bias the predictions towards this initial flush, which is not representative of likely longer-term chemistry. Furthermore, the modeling effort was designed to provide the most likely scenario, rather than the upper and lower bound that are not at useful when evaluating potential impacts.*
NMED Additional Comment 9	Figures 5-6 through 5-16	Existing vs. Future concentrations	Suggested revision 2 also has relevance to Figures 5-6 through 5-16. These figures should be separate apart from each other, one set showing existing (measured) concentrations versus modeled concentrations and another set for post-closure conditions of the larger pit lake that will be present at Copper Flat. This is a scaling issue with the smaller existing pit lake and the much larger future pit lake that is part of the PHREEQC simulations. A more detailed geochemical discussion is warranted for Figures 5-6 through 5-16 evaluation mineral precipitation/dissolution (major cations and bicarbonate) and solute adsorption/desorption (arsenic and other oxyanions and cations). Time series plots for the existing pit lake show large variations in total dissolved solids (TDS) and major cations and anions, which support further refinement or calibration of existing and future conditions using PHREEQC.
	NMCC Response		*Figures 5-6 to 5-17 and Figures 6-5 to 6-16 of the SRK report have been revised to show only predicted constituent concentrations in the context of the minimum, maximum, and average measured values in the existing pit lake. Section 5.7 has been revised to provide more detail regarding mineral precipitation/adsorption reactions.*

Agency Review of Updated MORP			
Reviewer: **David (DJ) Ennis, P.G.** **Agency:** **NM Mining and Minerals Division**			**Review Date:** **March 22, 2018**
Item #	**Section/Page (or general)**	**Topic**	**Comment**
NMED Additional Comment 10	SRK Report General	Sodium use to achieve zero percent charge balance error	Charge balance errors of zero were achieved for the different simulated aqueous solutions by stipulating that sodium was added to achieve perfect electroneutrality (zero percent charge balance error) by presence of excess anions such as chloride, sulfate, and total carbonate alkalinity. A discussion on this stipulation should be added to the report. Addition of sodium will influence mineral saturation index calculations by causing a positive bias in saturation indices values foe sodium-rich silicates, carbonates, and sulfates.
	NMCC Response		*Section 5.5.3 of the SRK report has been revised to include the following in response to NMED's comment; "In order to maintain charge balance, the solutions were balanced by adjusting the concentration of a conservative ion (either chloride or sodium) which have a low potential to influence model outcome."*
NMED Additional Comment 11	SRK Report General	Surface area value used for FeOOH	Surface complexation modeling using PHREEQC was performed by SRK, Inc., including the adsorbent, ferrihydrite (general formula of FeOOH) to quantify removal of major cations and anions and trace elements from solution. What specific surface area value of ferrihydrite was used during the PHREEQC simulations? The default surface area for ferrihydrite is 600m^2/g. If this surface area value was not used in the PHREEQC simulations, justification for the alternate value should be provided.
	NMCC Response		*The pit lake simulations used the default surface area of 600 m^2/gram quoted by Dzombak and Morel (1990). However, the number of surface sited is based on an equilibrium definition (i.e., moles of ferrihydrite precipitated during the previous time step). The value of 64200 is calculated based on the surface area (600 m^2/g)multiplied by the molar mass of Fe(OH), (107 moles).*

Agency Review of Updated MORP

Reviewer: David (DJ) Ennis, P.G. **Agency:** NM Mining and Minerals Division			**Review Date:** March 22, 2018
Item #	**Section/Page (or general)**	**Topic**	**Comment**
NMED Additional Comment 12	SRK Report Table 3-2	Observed phases of minerals	Table 3-2 in the report provided a list of equilibrated phases included in the pit lake geochemical simulations. Observed phases included alunite, barite, brochantite, calcite, ferrihydrite, fluoride, gypsum, mirabilite, and NiCO3. Numerous other minerals were included in the PHREEQC simulations that did not reach equilibrium conditions because different solutions are undersaturated with respect to the phases. Additional PHREEQC simulations should be performed only using the observed phases. Many of the phases hypothesized to occur at Copper Flat have no influence on water chemistry because there is no mass of these minerals precipitated from solution, as shown in PHREEQC output. Precipitation of the additional minerals is negligible at Copper Flat. The additional minerals that are not observed at the site should to be removed from the input files and new PHREEQC simulation should to be conducted by SRK, Inc.
	NMCC Response		*Any mineral phases that were not observed in the SRK Copper flat mineralogical studies were removed from the PHREEQC code and the models were re-run. Removal of these phases did not significantly affect the predicted chemistry. There were minor increases in predicted arsenic, cadmium, and lead concentrations, but these increases were not sufficient to change the overall conclusions of the model.*
NMED Additional Comment 13	SRK Report General	Phosphorous and silica phases	Phosphorous-bearing and silica phases were included in the PHREEQC simulations. However, PO4 and silica were not analyzed in the water samples. Phosphorus-bearing and silica phases should not be included in the PHREQC simulations.
	NMCC Response		*Phosphorous and silica-bearing phases have been removed from the PHREEQC simulation and the models have been re-run. Removal of these phases did not affect the predicted chemistry.*
NMED Additional Comment 14	Figure 6-17	Evolutions of observed and modeled compositions	A discussion on the geochemical evolution of observed and modeled compositions of the present and future pits, shown in Figure 6-17 in terms of pH and Cu + Cd + Co + Pb + Ni + Zn would be useful to the reader.

Agency Review of Updated MORP			
Reviewer: **David (DJ) Ennis, P.G.** **Agency:** **NM Mining and Minerals Division**		**Review Date:** **March 22, 2018**	
Item #	**Section/Page (or general)**	**Topic**	**Comment**
	NMCC Response		*Section 6.6 of the SRK report has been revised to include the following; "Ficklin metal concentrations are predicted to evolve and increase over time as a result of evaopconcentration effects. This evolution chemistry is similar to the trends observed in the existing pit lake; however, for the future reclaimed pit lake, water chemistry is predicted to remain in the 'near-neutral, low metal' classification for all model time steps."*
Additional MMD RFI May 2018		Other Permits ID & Schedule	MMD would like for NMCC to provide MMD evidence that all other applicable state and federal permits required to be obtained… have been or will be issued before the activities subject to those permits begin as required 19.10.6.606.B. NMAC
	NMCC Response		*NMCC has provided herewith an updated list of federal and state permits/approvals that will be obtained for the Copper Flat Project. Please note that NMCC provided such a list in its July 18, 2012 PAP (see Section 3.7). Section 19.10.606.B.(2) NMAC requires that the Director find that NMCC has provided evidence that all other applicable state and federal permits required to be obtained either have or will be issued before activities subject to those permits begins. Section 19.10.606.A provides that the Director may issue a permit subject to conditions necessary to meet the requirements of the Act and 19.10 NMAC. As such, NMCC believes that the MMD has the authority to issue NMCC its mine permit conditioned upon obtaining the required permits. There is ample president for this action as state and federal agcncies commonly condition final approval based on obtaining all other required permits.*

Revised May 2018

New Mexico Copper Corporation

PROBABLE HYDROLOGIC CONSEQUENCES OF THE COPPER FLAT PROJECT SIERRA COUNTY NEW MEXICO

JOHN SHOMAKER & ASSOCIATES, INC.
WATER-RESOURCCE AND ENVIRONMENTAL CONSULTANTS
PREPARED BY JSAI

18302

REVISION 1.0

PROBABLE HYDROLOGIC CONSEQUENCES OF THE COPPER FLAT PROJECT, SIERRA COUNTY, NEW MEXICO

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Revised May 22, 2018

PROBABLE HYDROLOGIC CONSEQUENCES OF THE COPPER FLAT PROJECT, SIERRA COUNTY, NEW MEXICO

EXECUTIVE SUMMARY

The proposed Copper Flat Project includes a mine pit, supply wells, tailings facility, and waste rock facilities (Fig. 1.1) located in the Hillsboro Mining District, Sierra County, New Mexico.

Presented in this report is the evaluation of the hydrologic consequences of the proposed operating plan detailed in the New Mexico Copper Corporation (NMCC) Updated Mining Operation and Reclamation Plan for Copper Flat Mine, Rev. 1 (THEMAC, 2017a) and in the New Mexico Copper Corporation Discharge Permit Application, Rev. 1 (THEMAC, 2017b). The operating plan reviewed herein reflects a nominal processing rate of 30,000 tons of ore per day for 11.5 years and aligns with “Alternative 2” in the Copper Flat Draft Environmental Impact Statement (BLM, 2015).

The objective of this report is to develop a determination of the probable hydrologic consequences of the operation and reclamation on both the permit and affected areas with respect to the hydrologic regime, quantity and quality of surface and groundwater systems that may be affected by the proposed operations (NMAC 19.10.6.602.(13)(g)(v)) of the Mining Act regulations.

Groundwater systems include:

- The regional Santa Fe Group (SFG) aquifer.
- Quaternary-age alluvial aquifers along Animas Creek and Percha Creek.
- The crystalline bedrock of the Animas Uplift.

Surface water includes:

- Perennial flow in the Rio Grande and Caballo Reservoir that is supplied in part by discharge from the SFG aquifer.
- An area of perennial flow and riparian vegetation along Animas Creek where the Quaternary-age alluvial aquifer discharges to the surface.
- An area of perennial flow and riparian vegetation along Percha Creek, atop the crystalline bedrock.
- Springs discharging from the crystalline bedrock.
- Storm-water flows in Grayback Arroyo.

“Consequences” considered here are the resulting effects on the hydrologic regime of NMCC’s proposed operation and reclamation including both water use, and surface and groundwater impact mitigation measures.

The sources of possible hydrologic consequences of the Project include:

1. Groundwater withdrawals from the SFG aquifer: The mine water supply will be withdrawn from pumping wells PW-1, PW-2, PW-3, and PW-4. Water level in the SFG aquifer will be lowered around the well field and then gradually recover after mining. Secondary effects evaluated include:
   a. Reduced groundwater discharge to Rio Grande and Caballo Reservoir.
   b. Reduced flow to artesian wells and other effects to local groundwater users.
   c. Potential reduced discharge to shallow aquifers along Animas Creek and Percha Creek, leading to lower alluvial water levels and reduced discharge to the perennial flow and riparian areas along Animas Creek.
   d. Potential ground subsidence.

2. Groundwater withdrawals from the crystalline bedrock associated with the open pit. Water levels in the bedrock around the pit will be permanently lowered, and groundwater will flow to the pit and evaporate. Groundwater flow rates to the pit and the future open pit water level and water balance area assessed. Secondary effects evaluated include:
   a. Potential groundwater discharge from the open pit.
   b. Potential effects on springs discharging from the crystalline bedrock and on the Percha Creek perennial (riparian) area.

3. Potential for groundwater discharge from the tailings storage facility (TSF) and waste rock stockpiles (WRSPs).

The consequences were evaluated using the numerical groundwater flow model (JSAI, 2014) developed for the Copper Flat Project. Effects include the following:

Santa Fe Group (SFG) Aquifer

- Water-level drawdown in the SFG aquifer is projected to reach a maximum of about 70 ft at the well field, at the end of mining. Drawdown will decrease with distance from the well field. Water levels will then recover over a period of about 20 to 30 years.
- Total reductions in discharge to the system from the SFG aquifer are projected to peak at a total of about 3,100 acre-feet per year (ac-ft/yr) shortly after the end of mining, then diminish to near-zero over about 30 years (Fig 3.3; Table 3.1).
- Flow induced from the Palomas Graben north of the study area is projected to reach a maximum of less than 800 ac-ft/yr at the end of mining, which is estimated to result in an additional reduction of discharge to the Rio Grande by a maximum of 275 ac-ft/yr.
- Potential impairment of existing water rights from reduced discharge to flowing wells may occur.
- Effects on shallow groundwater (riparian) systems along Las Animas Creek and Percha Creek are projected to be minimal, with a maximum of less than 2 ft of groundwater-level change on Percha Creek, less than 1 ft of groundwater-level change on Animas, and non-measureable small changes in surface flow and riparian evapotranspiration.
- Depletion to the Rio Grande is projected to peak around 2,080 ac-ft/yr at the end of mining, then reduce to 28 ac-ft/yr 100 years after mining (Fig. 3.3; Table 3.1)

  As required by New Mexico Office of the State Engineer (NMOSE), NMCC will mitigate the effects of pumping of the SFG aquifer by offsetting reductions in discharge to the Rio

Grande by lease or purchase of additional water rights in the amount of the model-simulated reductions to flow.

NMCC will work with the NMOSE to ensure that impairment to existing water rights (including permitted wells) according to NMOSE criteria, by NMCC pumping, will be appropriately mitigated.

- Pumping of the production water-supply wells is not expected to result in measurable ground subsidence. No water-quality effects are expected from pumping the proposed supply wells in the affected area.

Crystalline Bedrock

- At the end of mining, groundwater-level drawdown in the bedrock around the open pit is projected to reach a maximum of about 800 ft at the pit.
- A permanent cone of depression will form around the pit, with maximum drawdown of about 600 ft at the edge of the pit.
- The pit, which currently is an evaporative hydrologic sink, will form an evaporative hydrologic sink again in the future.

After mining, the pit will be filled with fresh water from the production water-supply wells to inundate portion of the pit walls and create a steady-state hydraulic sink with the surrounding groundwater system (rapid fill). The rapid fill will begin immediately after mining and will be completed in approximately 6 months. The rapid fill requires pumping 2,200 ac-ft into the pit and will fill the pit to elevation 4,894 ft amsl. At hydrologic equilibrium, the final pit water level is projected to be about 4,897 ft amsl, about 580 ft below the pit crest at the haul road entrance. The post-mining pit water body that forms after mining from rapid fill remediation will be about 250 ft in depth and have a steady-state surface area of about 22 acres. Steady state groundwater inflow is estimated at 36 ac-ft/yr and captured storm-water runoff is estimated at 57 ac-ft/yr. Pit water evaporation is projected to be about 93 ac-ft/yr. Evaporation will maintain the hydraulic sink in perpetuity.

Long-term, indirect effects to springs discharging in and around the Animas Uplift are projected to be minimal and not measureable. Water quality effects for the open pit water body are addressed in a separate report prepared for the project.

Storm-Water Flows

Storm-water flow through Grayback Arroyo will not be affected. During operations and after reclamation, storm-water flows from Grayback Arroyo will be conveyed around the open pit in existing bypass channel and through the mine area with no expected hydrologic consequences.

TSF and WRSPs

Net percolation to groundwater from the tailings and waste rock storage areas is not expected due to installation of liner under the TSF, placement of WRSPs on low permeability crystalline bedrock, and storm-water controls. Furthermore, proposed reclamation efforts are designed to limit infiltration and be protective of groundwater. In the event of a liner defect, the impact to groundwater chemistry is expected to be minimal and remain localized.

CONTENTS

page

EXECUTIVE SUMMARY ii

1.0 INTRODUCTION 1
1.1 Project Description 2
1.2 Analysis Method 4
1.3 Report Structure 6

2.0 PROJECT WATER DEMAND 7
2.1 Water-Supply Pumping 7
2.2 Open-Pit Dewatering and Refilling 9

3.0 PROBABLE HYDROLOGIC CONSEQUENCES 11
3.1 Groundwater Withdrawals From the SFG Aquifer 11
3.1.1 Regional Groundwater Level Drawdown 11
3.1.2 Effects on Water Balance 13
3.1.3 Flow From North Palomas Graben 15
3.1.4 Operational Plans for No Net Effect on the Rio Grande 16
3.1.5 Other Water Rights 17
3.1.6 Effects of Reduced Flowing Well Pressure 17
3.1.7 Effects on Quaternary-Age Alluvial Aquifers and Animas Creek Perennial Flow and Riparian Zone 20
3.1.8 Ground Subsidence 24
3.2 Groundwater Withdrawals From the Crystalline Bedrock 26
3.2.1 End-of-Mining Groundwater Drawdown 26
3.2.2 Open Pit Water Balance 27
3.2.3 Potential Open Pit Discharge to Groundwater 29
3.2.4 Effects on Springs 30
3.3 Potential Discharge From Tailings Impoundment and Waste Rock Stockpiles 35
3.3.1 Tailings Impoundment 35
3.3.2 Waste Rock Stockpile 36
3.3.2.1 WRSP Hydrologic Setting 37
3.3.2.2 WRSP Operational Conditions 38
3.3.2.3 WRSP Post Reclamation Conditions 40

4.0 CONCLUSIONS 42
4.1 Groundwater Withdrawals From the SFG Aquifer 43
4.2 Groundwater Withdrawals From the Crystalline Bedrock 44
4.3 Potential Groundwater Discharge From Tailings and Waste Rock 44

5.0 REFERENCES 45

TABLES

page

Table 2.1. Projected water-supply pumping 7

Table 2.2. Projected water-supply pumping (acre-feet per year) 8

Table 2.3. Pit dewatering 9

Table 3.1. Summary of results 14

Table 3.2. Parameters for Glover-Balmer solution 15

Table 3.3. Areas and potential evapotranspiration for Animas Creek ponds and fields 18

Table 3.4. Estimated water balance for Animas Creek flowing wells 19

Table 3.5. Projected groundwater-level change (in feet) at spring locations 34

Table 3.6. Potential tailings liner leakage 36

Table 3.7 Summary of input parameters for MACRO5 model of WRSP operational conditions 39

Table 3. 8. Model predicted water balance for WRSP operational period 40

Table 3.9. Sample single-layer waste rock cover properties 41

ILLUSTRATIONS

page

Figure 1.1. Map showing New Mexico Copper Corporation proposed mine facilities, mine area, and the affected area evaluated, Sierra County, New Mexico...... 1

Figure 2.1. Projected pit bottom elevation, groundwater level, and dewatering rate. 10

Figure 2.2. Current pit and final pit elevations and water-surface areas. 10

Figure 3.1. Projected end-of-mining groundwater drawdown in the SFG aquifer............ 12

Figure 3.2. Projected sources of water pumped. 13

Figure 3.3. Projected reductions in discharge. 14

Figure 3.4. Projected effect on Rio Grande of increased flow from north Palomas Graben. 15

Figure 3.5. Projected incremental drawdown due to pumping of flowing wells at current flow rates. 19

Figure 3.6. Geologic map. 21

Figure 3.7. Cross-section C-C'. 22

Figure 3.8. Section C-C', inset area of perched shallow aquifer. 23

Figure 3.9. Projected end-of-mining groundwater drawdown, shallow aquifers. 23

Figure 3.10. Projected maximum drawdown in Santa Fe Group aquifer.......................... 24

Figure 3.11. Projected worst-case potential maximum subsidence................................... 25

Figure 3.12. Projected end-of-mining groundwater drawdown in the crystalline bedrock. 26

Figure 3.13. Ultimate open pit and watershed area. 27

Figure 3.14. Projected open-pit water level (rapid fill in year 1). 29

Figure 3.15. Projected open-pit water balance (rapid fill in year 1). 29

Figure 3.16. West-to-east hydrogeologic cross-section E-E' showing water-level profile across existing pit and proposed open pit after rapid fill. 31

Figure 3.17. Proposed mine facilities and projected post-mining groundwater elevation. 32

Figure 3.18. Locations of springs in and around the Animas Uplift. 33

Figure 3.19. Waste rock stockpile conceptual model. 37

APPENDICES
(follow text)

Appendix A. Projected Groundwater-Level Hydrographs at Selected Locations

Appendix B. Technical Memo Regarding Liner Leakage Rates

PROBABLE HYDROLOGIC CONSEQUENCES OF THE COPPER FLAT PROJECT, SIERRA COUNTY, NEW MEXICO

1.0 INTRODUCTION

This report presents an evaluation of the probable hydrologic consequences of the proposed Copper Flat Project (Project) in Sierra County, New Mexico. Hydrologic consequences refer to any changes, resulting from the Project, to groundwater and surface water systems, including changes to flow, water level, or chemical composition.

The Project is located in the Hillsboro Mining District, shown on Figure 1.1. Effects on both the mine permit area (Fig. 1.1) and the surrounding affected area are evaluated with respect to the hydrologic regime, quantity, and quality of surface and groundwater systems that may be affected by the proposed operations (NMAC 19.10.6.602.(13)(g)(v)).

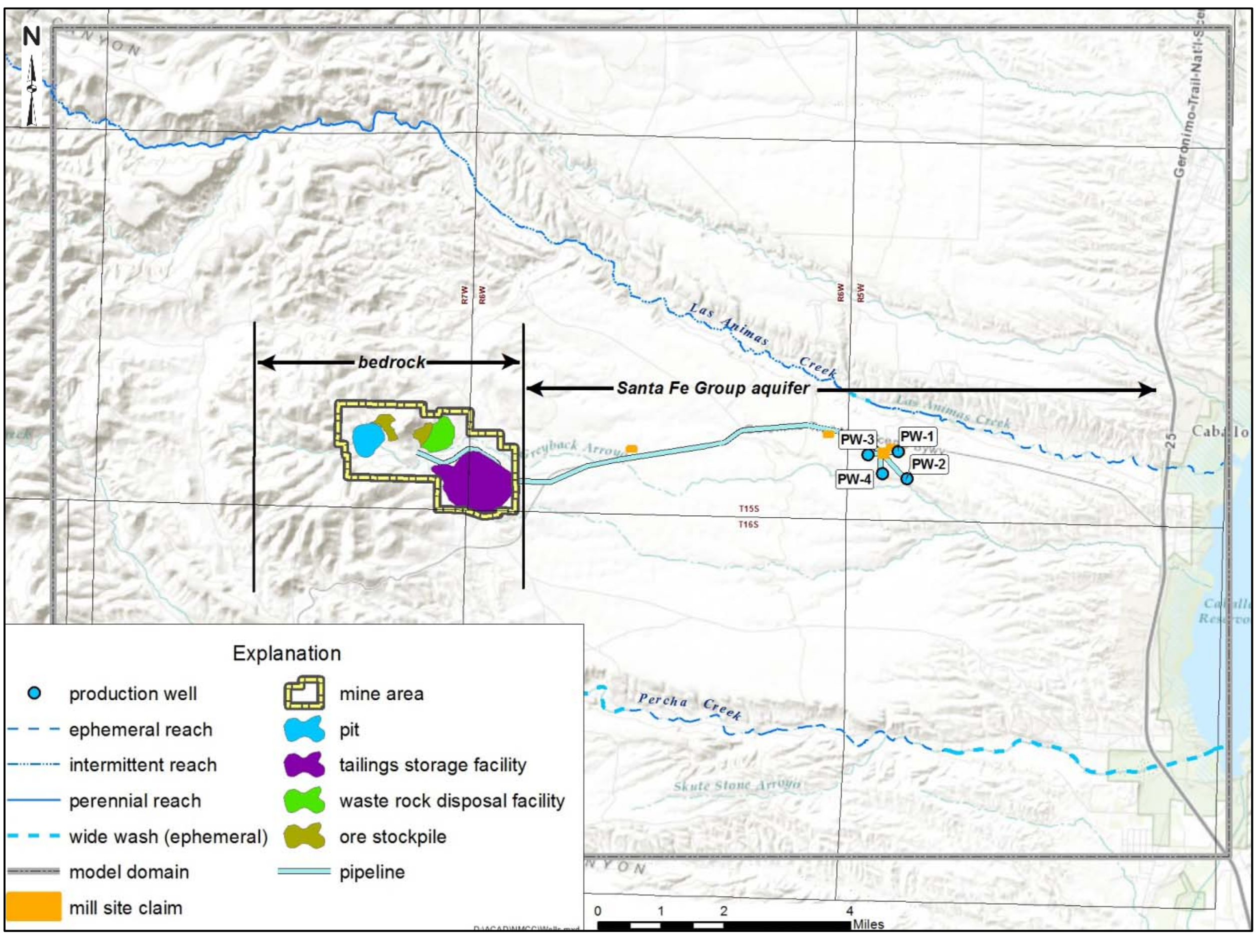

Figure 1.1. Map showing New Mexico Copper Corporation proposed mine facilities, mine area, and the affected area evaluated, Sierra County, New Mexico.

For the analysis of probable hydrologic consequences, the affected area includes the mine permit area containing the open pit and surrounding facilities, located on the andesite and quartz monzonite crystalline bedrock of the Animas Uplift (Fig. 1.1), as well as the affected area including the Santa Fe Group (SFG) aquifer around water supply wells PW-1 through PW-4 and surface and groundwater under Las Animas and Percha Creeks. The area evaluated for potential effects was the “model domain” shown on Figure 1.1.

1.1 Project Description

NMCC proposes to expand the existing open pit, previously developed by Quintana Minerals Corporation (Quintana) during a brief period of operation in 1982.

The existing pit was excavated to about 100 ft below original ground surface, with bottom elevation at about 5,400 feet above mean sea level (ft amsl). A permanent pool of water is present in the existing pit. The current water body has a surface area of about 5 acres, ranges from 10 to 35 ft deep, and contains 60 to 80 ac-ft of water. A diversion channel routes Grayback Arroyo around the pit.

Other facilities from 1982, including processing plant, waste rock storage and tailings storage, have been partially reclaimed. Water-supply wells PW-1, PW-2, PW-3, and PW-4 (Fig. 1.1) have been unused since 1982, except for pumping tests conducted by NMCC in 2012 to 2013.

Features of the Project include (Fig. 1.1) an expanded pit, processing plant, a lined tailings storage facility (TSF), and waste rock stockpiles (WRSPs). The water-supply wells will be re-activated. The Grayback Arroyo diversion would be maintained. Other diversions will route surface runoff around the processing plant and waste rock and tailings storage facilities.

The proposed operating scenario is detailed in NMCC’s Updated Mining Operation and Reclamation Plan for Copper Flat Mine (MORP; THEMAC, 2017a, Rev. 1) and in NMCC’s Discharge Permit Application (DP: THEMAC, 2017b, Rev 1). The planned scenario reflects a processing rate of 30,000 tons of ore per day for 11 to 12 years, and aligns with “Alternative 2” in the Copper Flat Draft Environmental Impact Statement (BLM, 2015). Upon receiving the required permit approvals, the Project will begin site preparation and construction, which will last approximately 2 years.

The operating life (period of mining) of the project is anticipated to be 11 to 12 years as noted in the MORP. NMCC will mine approximately 113 million tons of ore and 45 million tons of waste rock during the operating life of the mine (158 million tons). Depending on operational conditions, the mining operation will supply 8.9 to 10.8 million tons per year of copper ore to the mill for processing.

The pit will be expanded to occupy a footprint of 129 acres, reaching an ultimate bottom elevation of 4,650 ft amsl, about 825 ft below original ground surface. At the end of mining, the pit would be rapid-filled with good quality water from the production wells to the projected long-term stable water level and prevent oxidation of sulfates below the pit lake water line, thus optimizing pit water quality.

The WRSPs will be placed completely on crystalline bedrock, which provides a natural low-permeability liner. During operations, surface-water runoff collection trenches will be constructed, as needed, to collect and route runoff from the WRSPs to storm-water impoundments at the toe. These trenches will be constructed into the andesite bedrock to prevent water from entering the alluvial surface material down-gradient of the WRSPs. After mining ceases, the WRSPs will be reclaimed and covered with a 3-ft-thick engineered layered system of fill materials designed to store precipitation until it evaporates and prevent infiltration into the underlying WRSPs.

The TSF will be placed on an engineered liner system to prevent subsurface infiltration. The lined TSF will include an over-liner drainage system to maximize reclaim of water and minimize pressure on the liner. Underdrains beneath the dam will collect seepage and preserve dam stability. Water will be reclaimed from the surface of the tailings in a supernatant pond. After mining, the facility will be drained down reclaimed and covered with a 3-ft-thick layered system of fill materials to prevent infiltration into the tailings.

Ore will be trucked from the pit to the processing plant for crushing, grinding, and flotation recovery of copper. The mill will process ore at an average rate of 27,890 tons per day over the life of the operation. Milling will also include a molybdenum processing circuit and a gravity gold recovery circuit.

After mining, the site will be closed and reclaimed per an approved Reclamation and Closure Plan. NMCC has prepared a Reclamation and Closure Plan described in the Mine Operation and Reclamation Plan submitted to the Mining and Minerals Division as part of NMCC's Permit Application Package (THEMAC, 2017a; Golder, 2017).

The objective of the Reclamation and Closure Plan is to reclaim and close the facility in a manner protective of groundwater in conformance with the NM Copper Rules, meet the reclamation requirements of the New Mexico Mining Act, and return the mine area to conditions similar to those present before NMCC's re-establishment of the mine. The Reclamation and Closure Plan is designed to re-establish grazing in the area and allow for long-term use of the reclaimed areas by wildlife known to historically use the area without affecting the potential for other uses such as mining and recreation.

1.2 Analysis Method

The model of groundwater flow in the Animas Uplift and the Palomas Basin (JSAI, 2014) was used to project the hydrologic consequences of development of the Copper Flat Project. The numerical model was peer reviewed and adopted by the New Mexico Office of the State Engineer (NMOSE) in its deliberations regarding NMCC water rights declarations, and used for the Copper Flat Draft Environmental Impact Statement (BLM, 2015).

The mine site water balance developed for the proposed Mining Operation and Reclamation Plan (THEMAC, 2017a) was simulated in the numerical model to estimate potential effects on groundwater and surface-water levels and flows for the pre-mining, mining, and post-mining periods.

This analysis meets the requirements of NMAC 19.10.6.602.(13)(g)(v) by evaluating the probable hydrologic consequences of the operation and reclamation on both the permit and affected areas, with respect to the hydrologic regime, quantity, and quality of surface and groundwater systems that may be affected by the proposed operations.

The analysis takes into account both water use by the proposed operation and proposed mitigation strategies to reduce or eliminate the effects of the proposed operation. The "hydrologic regime" is considered to be surface and groundwater systems potentially affected by NMCC's proposed operation and reclamation of Copper Flat.

Surface and groundwater systems in the area include the following.

Groundwater is found in:

- The regional Santa Fe Group (SFG) aquifer.
- Quaternary-age alluvial aquifers along Animas Creek and Percha Creek.
- The crystalline bedrock of the Animas Uplift.

Surface water includes:

- Perennial flow in the Rio Grande and Caballo Reservoir that is supplied in part by discharge from the SFG aquifer.
- An area of perennial flow and riparian vegetation along Animas Creek where the Quaternary-age alluvial aquifer discharges to the surface.
- An area of perennial flow and riparian vegetation along Percha Creek, atop the crystalline bedrock.
- Springs discharging from the crystalline bedrock.
- Storm-water flows in Grayback Arroyo.

"Consequences" considered here are the resulting effects on the hydrologic regime of NMCC's proposed operation and reclamation including both water use, and surface and groundwater impact mitigation measures.

The sources of possible hydrologic consequences of the Project include:

1. Groundwater withdrawals from the SFG aquifer: The mine water supply will be withdrawn from pumping wells PW-1, P W-2, P W-3, and P W-4. Water level in the SFG aquifer will be lowered around the well field and then gradually recover after mining. Secondary effects evaluated include:
   a. Reduced groundwater discharge to Rio Grande and Caballo Reservoir.
   b. Reduced flow to artesian wells and other effects to local groundwater users.
   c. Potential reduced discharge to shallow aquifers along Animas Creek and Percha Creek, leading to lower alluvial water levels and reduced discharge to the perennial flow and riparian areas along Animas Creek.
   d. Potential ground subsidence.

2. Groundwater withdrawals from the crystalline bedrock associated with the open pit. Water levels in the bedrock around the pit will be permanently lowered, and groundwater will flow to the pit and evaporate. Groundwater flow rates to the pit and the future open pit water level and water balance are assessed. Secondary effects evaluated include:
   a. Potential effects on springs discharging from the crystalline bedrock and on the Percha Creek perennial (riparian) area.

3. Potential for groundwater discharge from the WRSPs and TSF.

The consequences were evaluated using the numerical model (JSAI, 2014), which was developed using the United States Geological Survey (USGS) groundwater-flow modeling code MODFLOW (McDonald and Harbaugh, 1988).

Water supply pumping from the SFG aquifer was simulated at rates specified in the mine-site water balance using the MODFLOW module WEL. Pumping was simulated for the pre-mining period of construction, for the period of mining and for post-mining filling of the open pit. The period-of-pumping simulation is followed by simulation of the post-pumping recovery of water levels.

Pit-area dewatering is simulated initially as pumping from the open pit, represented using MODFLOW module LAK2 (JSAI, 2014, appendix D). After the initial dewatering of the existing pit, a set of drain boundary conditions (MODFLOW module DRN) simulate a lowering of groundwater levels as the open pit depth increases. The simulated drain elevations initially represent the extent and elevation of the current pit. The drain elevations are then lowered and new drains are added through the simulation time, to transform the boundary conditions to represent the ultimate pit. The post-mining pit filling and pit water balance is simulated using module LAK2.

Potential for groundwater discharge from the WRSPs and TSF are estimated independently of the numerical model.

1.3 Report Structure

The contents of the report are organized as follows:

Section 1.0 – Describes the Project and analysis methods and outlines the report

Section 2.0 – Projected water demand for mine water supply and rapid-filling in mine area, and estimated open-pit dewatering

Section 3.0 – Probable hydrologic consequences for mine area including the following:

- 3.1 Groundwater withdrawals from the SFG aquifer
  - 3.1.1 Regional groundwater level drawdown
  - 3.1.2 Effects on water balance
  - 3.1.3 Flow from north Palomas Graben
  - 3.1.4 Operational plans for no net effect on the Rio Grande
  - 3.1.5 Other water rights
  - 3.1.6 Effects of reduced flowing well pressure
  - 3.1.7 Effects on Quaternary-age alluvial aquifers and Animas Creek perennial flow and riparian zones
  - 3.1.8 Ground subsidence
- 3.2 Groundwater withdrawals from the crystalline bedrock
  - 3.2.1 End-of-mining groundwater drawdown
  - 3.2.2 Open pit water balance
  - 3.2.3 Potential open pit discharge to groundwater
  - 3.2.4 Effects on springs and on the Percha Creek perennial (riparian) area
- 3.3 Potential groundwater discharge from tailings and waste rock
  - 3.3.1 Tailings infiltration
  - 3.3.2 Waste rock infiltration
  - 3.3.3 Groundwater flow paths and travel times

Section 4.0 – Report conclusions with a summary of results

Section 5.0 – References

Appendix A – Additional results regarding projected groundwater-level hydrographs at different locations

Appendix B – Technical Memorandum regarding the analysis of liner leakage rates

2.0 PROJECT WATER DEMAND

The projected water demand is based on the proposed mine plan for Copper Flat as detailed in the Mining Operation and Reclamation Plan, Rev. 1 (THEMAC, 2017a), which includes a water balance accounting for seasonal effects of climate, recycled process water, makeup water from supply wells, open pit dewatering, and diverted and captured storm-water runoff from the mine area.

The projected monthly water demand was obtained in electronic form (spreadsheet file "Nov 2016 Water Balance Prod Well GPM.xlsx," NMCC personal communication, February 2017). Operational demand increases in summer and decreases in winter, averaging 6,105 acre-feet per year (ac-ft/yr) over the 11.5-year life of the mining operation.

Water will be withdrawn from the SFG aquifer to provide the main water supply for the mine. Water will also be withdrawn from the crystalline bedrock, to dewater the pit. After mining, water will be withdrawn from the SFG aquifer to rapid-fill the open pit.

2.1 Water-Supply Pumping

The estimated rates of groundwater use are summarized on Table 2.1. Project water demand includes the mine construction and start up, 11.5-year mining period, and post-mining reclamation water demand requirements. Pumping for rapid fill reclamation of the open pit will require 2,200 ac-ft over 0.5 year.

Table 2.1. Projected water-supply pumping

component	unit	result
pumping duration (includes construction, operation, reclamation)	years	23.0
average pumping rate over full project duration	gpm	2,180
summer maximum pumping rate	gpm	4,224
winter minimum pumping rate	gpm	3,388
water removed from aquifer over pumping duration	ac-ft	73,856
average annual pumping rate over pumping duration	ac-ft/yr	3,211
maximum annual withdrawal rate	ac-ft/yr	6,095

gpm - gallons per minute ac-ft/yr - acre-feet per year

The Project water use is presented in more detail in Table 2.2, showing year-by-year projections of water needs. The table presents the water balance for the mine operation that has been provided to the U.S. Bureau of Land Management in response to comments on the Draft Environmental Impact Statement, with the exception in listing a smaller volume of water (2,200 ac-ft instead of 2,800 ac-ft) used for post-mining filling of the pit.

Table 2.2. Projected water-supply pumping (acre-feet per year)

year	production wells	operation	construction	startup	rapid fill	reclama-tion
1	132	0	132	0	0	0
2	673	0	233	440	0	0
3	6,081	6,081	0	0	0	0
4	6,087	6,087	0	0	0	0
5	6,071	6,071	0	0	0	0
6	6,088	6,088	0	0	0	0
7	6,078	6,078	0	0	0	0
8	6,086	6,086	0	0	0	0
9	6,090	6,090	0	0	0	0
10	6,095	6,095	0	0	0	0
11	6,095	6,095	0	0	0	0
12	6,090	6,090	0	0	0	0
13	6,093	6,093	0	0	0	0
14	5,472	2,621	0	0	2,200	651
15	321	0	0	0	0	321
16	97	0	0	0	0	97
17	97	0	0	0	0	97
18	50	0	0	0	0	50
19	24	0	0	0	0	24
20	15	0	0	0	0	15
21	10	0	0	0	0	10
22	6	0	0	0	0	6
23	5	0	0	0	0	5
24	0	0	0	0	0	0
25	0	0	0	0	0	0
----	----	----	----	----	----	----
total	73,856	69,575	365	440	2,200	1,276

This smaller post-mining filling of the pit volume is a refinement of the plan that does not measurably change the effects of the Project. The revised pit water balance is reflected in the analysis of pit water (SRK, 2017). Other, smaller adjustments to the estimated water balance may arise as the Project develops, with no measureable change to the effects of the Project.

2.2 Open-Pit Dewatering and Refilling

Pit dewatering is simulated assuming initial pit sump pumping of 100 gallons per minute (gpm), projected to empty the existing pit, with a water volume of about 60 ac-ft (INTERA et al., 2012), in about 4-1/2 months. During operations, groundwater and runoff flowing to the pit will be collected in sumps and pumped out. Projected pit dewatering during mining is summarized in Table 2.3.

Table 2.3. Pit dewatering

pit dewatering duration	years	11.4
average pit dewatering rate	gpm	28
total water withdrawn by pumping over full project duration	ac-ft	499

gpm - gallons per minute ac-ft – acre-feet

The schedule of dewatering is shown on Figure 2.1 including projected pit bottom elevation, pit-area groundwater elevation, and dewatering rates. Long-term total flow is expected to range between about 35 and 65 gpm (56 and 105 ac-ft/yr) with an initial minimum of about 20 gpm (32 ac-ft/yr) and a maximum of about 70 gpm (113 ac-ft/yr), as the pit bottom approaches final elevation of 4,650 ft amsl.

After mining is complete, the pit will be rapid filled to the projected steady-state post-mining equilibrium water level.

Current and projected final pit geometry are summarized on Figure 2.2 showing the water surface area as a function of water level. The existing pit currently has a water surface area of about 5.2 acres. The proposed pit would have water surface area of about 22 acres, with a final water level near 4,897 ft amsl. Rainfall, runoff, and groundwater inflows to the ultimate pit are projected (Section 3.2 below) to be about 100 ac-ft/yr, sufficient to sustain evaporation from a water surface of about 22 acres.

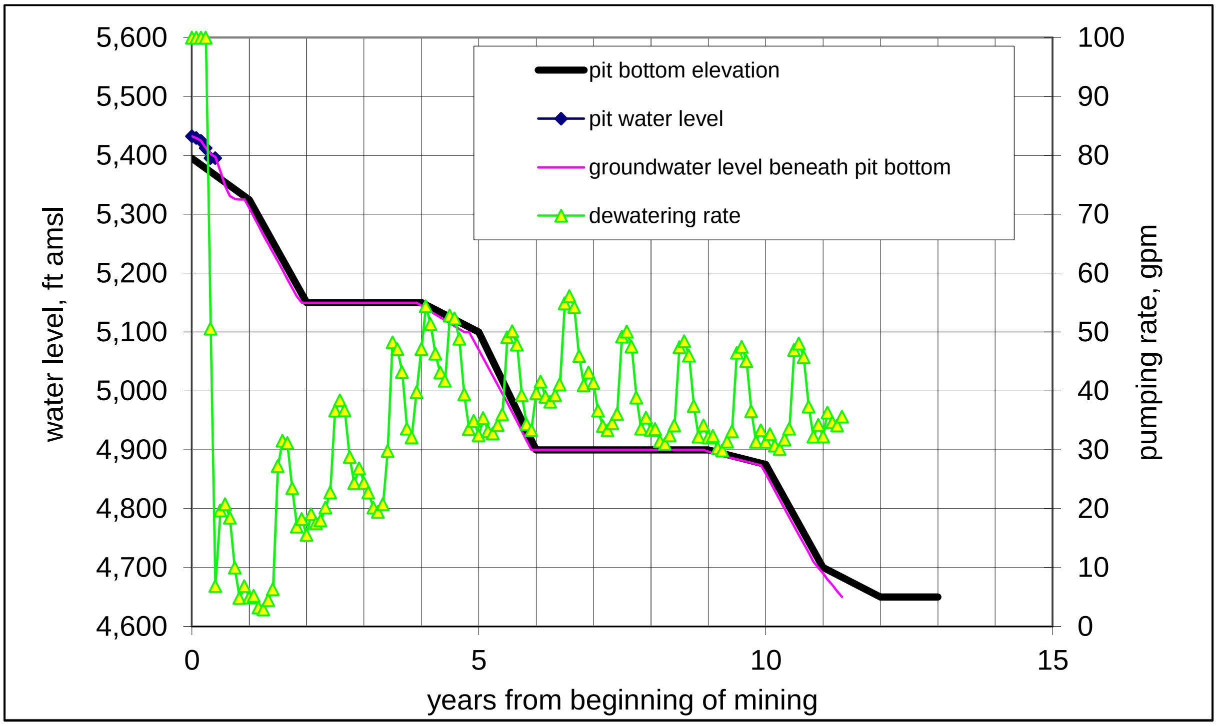

Figure 2.1. Projected pit bottom elevation, groundwater level, and dewatering rate.

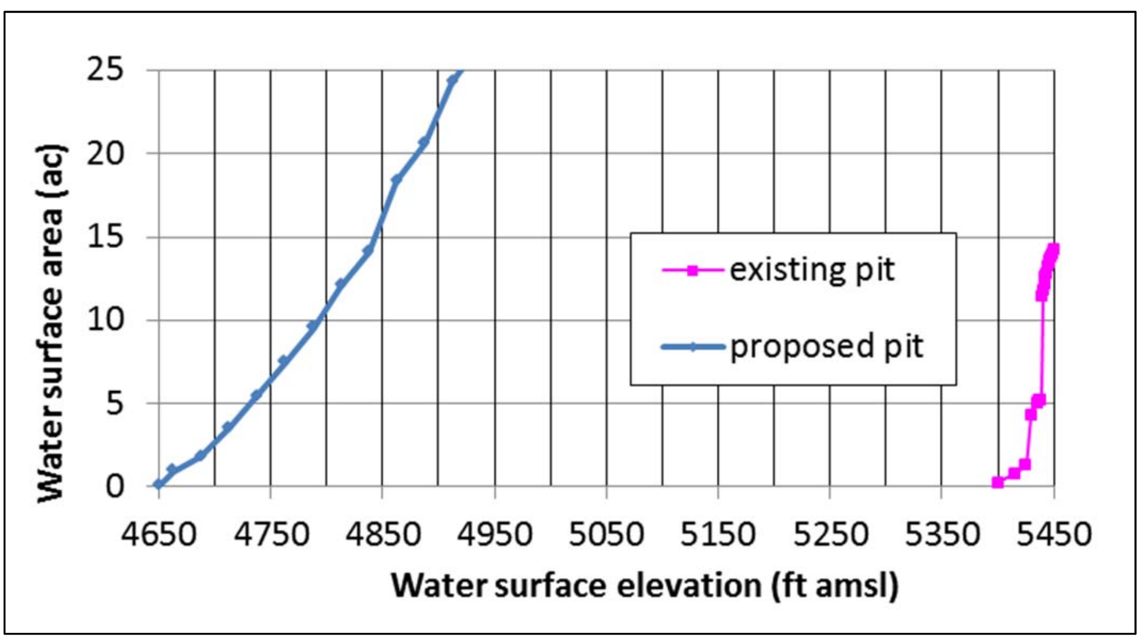

Figure 2.2. Current pit and final pit elevations and water-surface areas.

3.0 PROBABLE HYDROLOGIC CONSEQUENCES

Probable hydrologic consequences are related to the direct hydrologic consequences of the Project:

1. Groundwater withdrawal from the SFG aquifer for mine water supply.
2. Groundwater withdrawal from the crystalline bedrock around the open pit.
3. Potential for infiltration of water from the TSF and WRSPs to groundwater systems.

3.1 Groundwater Withdrawals From the SFG Aquifer

The most direct consequence of groundwater withdrawal from the SFG aquifer will be groundwater-level drawdown in the aquifer (Sec. 3.1.1). This will in turn result in changes to the aquifer water balance (Sec. 3.1.2), including increased inflow from the north Palomas Graben (Sec. 3.1.3), reduced discharge to the Rio Grande and Caballo Reservoir, reduced discharge to flowing wells, and reduced discharge to the Quaternary-age alluvial aquifers.

The consequences of reduced discharge to the Rio Grande and Caballo are discussed in Section 3.1.4. Potential consequences to other groundwater rights are discussed in Section 3.1.5, with the consequences of reduced discharge to flowing wells discussed in Section 3.1.6.

The potential consequences of reduced discharge to Quaternary-age alluvial aquifers, including reduced discharge to the perennial and riparian zone along Animas Creek, are discussed in Section 3.1.7.

Potential land subsidence, another possible consequence of groundwater drawdown, is discussed in Section 3.1.8.

3.1.1 Regional Groundwater Level Drawdown

Contours of projected groundwater-level drawdown at the end of mining in the SFG aquifer around the water-supply wells are shown on Figure 3.1. After the end of mining, water levels in the SFG aquifer will gradually recover to pre-mining levels over about 20 to 30 years.

The groundwater-level drawdown over time will in turn cause reduced discharge from the SFG aquifer to the Rio Grande and Caballo, and reduced discharge to other related hydrogeologic systems.

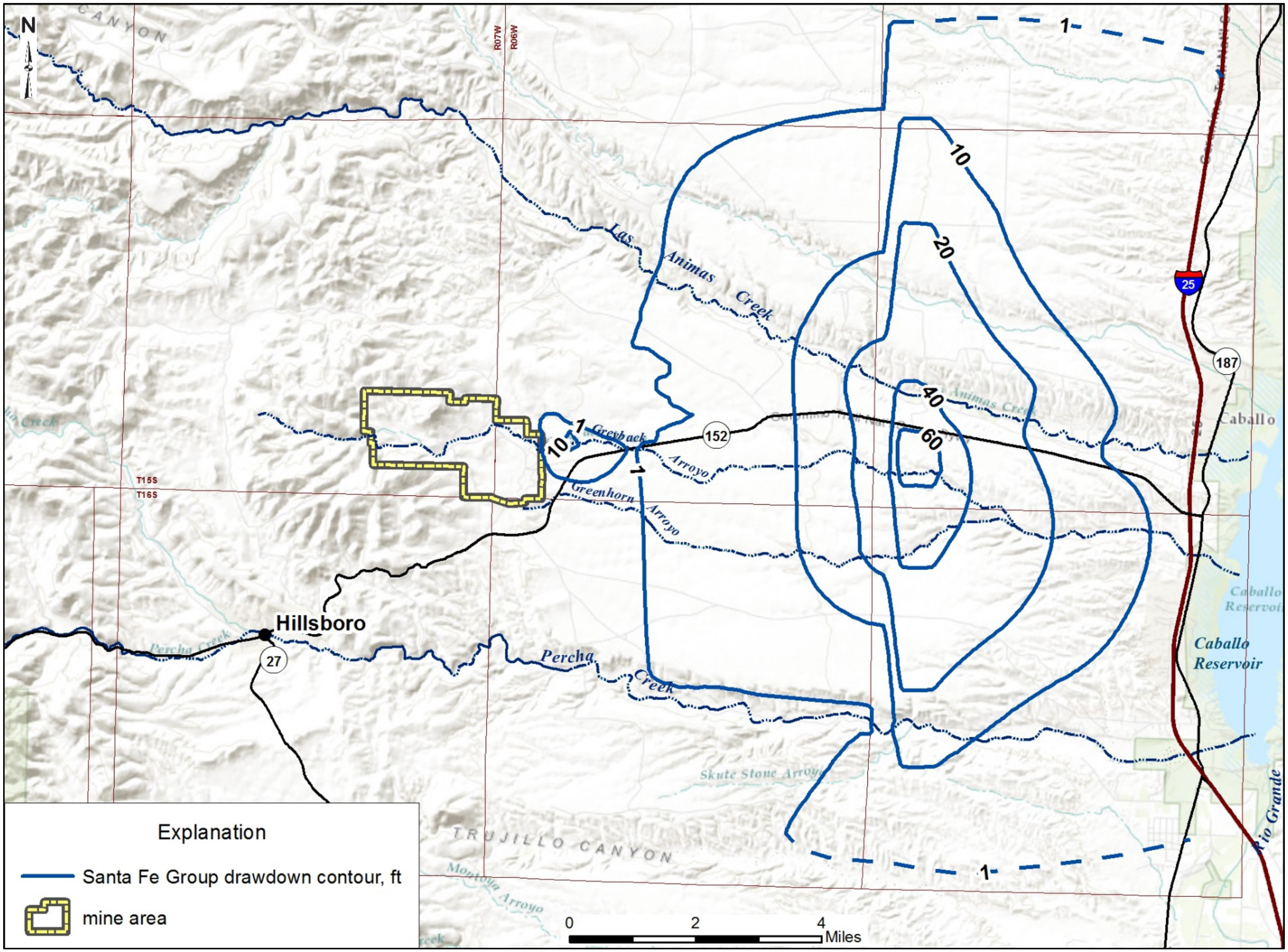

Figure 3.1. Projected end-of-mining groundwater drawdown in the SFG aquifer.

3.1.2 Effects on Water Balance

The groundwater pumped is initially removed from aquifer storage. Over time, more water is provided by increased inflow from the Palomas Graben north of the study area and by reduced discharge out of the study area. The sources of the water pumped are shown on Figure 3.2.

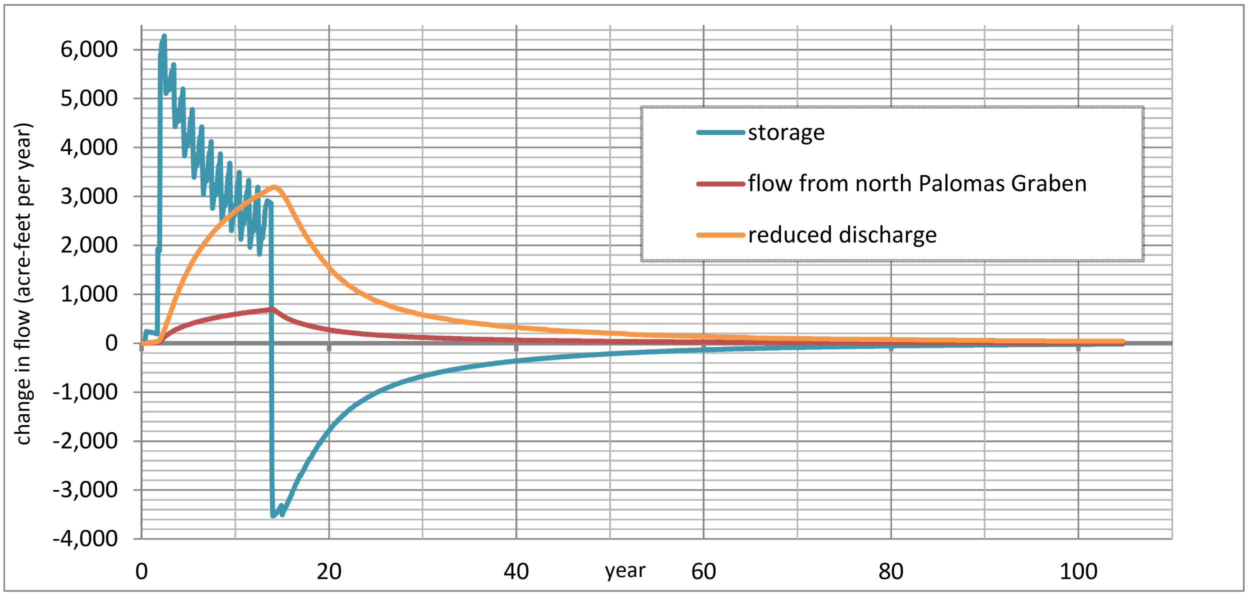

Figure 3.2. Projected sources of water pumped.

The hydrologic effect of additional inflow from the north Palomas Graben on the Rio Grande is estimated in Section 3.1.3.

The reductions in discharge are presented in detail on Figure 3.3, and include components of (1) reduced discharge to the Rio Grande both above and below Caballo Reservoir, (2) reduced discharge to flowing wells, and (3) reduced discharge to Quaternary-age alluvial aquifers and the Animas Creek perennial (riparian) zone.

The effects of reduced discharge to Caballo Reservoir and the Rio Grande are discussed in Section 3.1.4. The potential effects on other groundwater rights are discussed in Section 3.1.5. The potential hydrologic effects of reduced discharge to flowing wells are discussed in Section 3.1.6.

The potential hydrologic effects of reduced discharge to Quaternary-age alluvial aquifers and the Animas Creek perennial (riparian) zone are discussed in Section 3.1.7.

The projected water balance changes are summarized in Table 3.1.

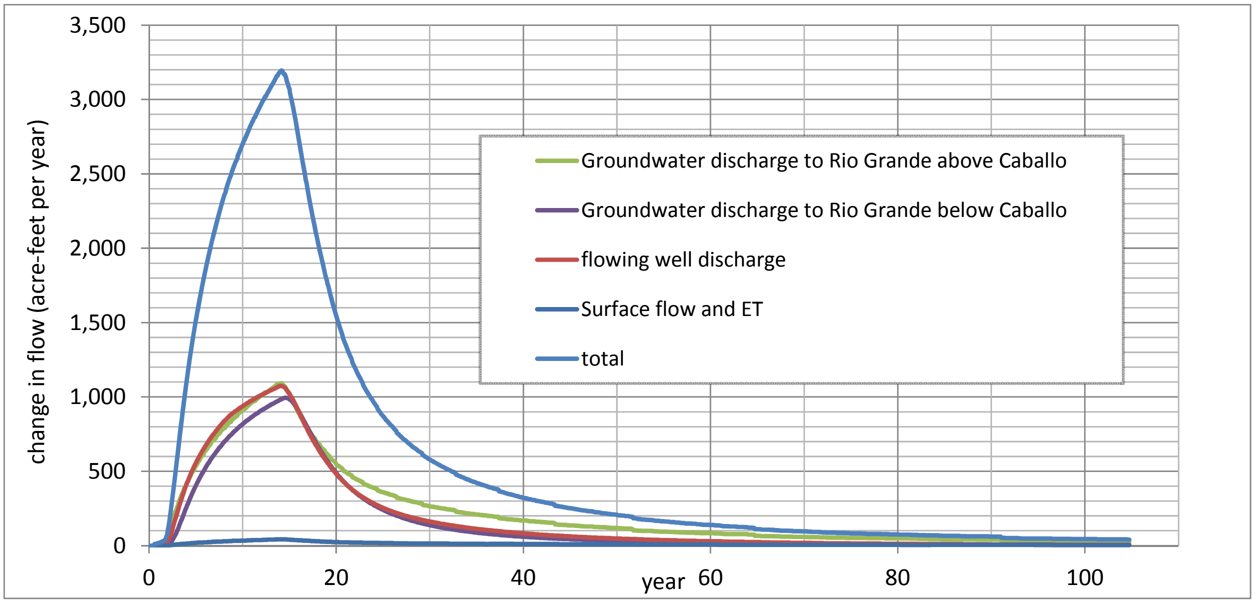

Figure 3.3. Projected reductions in discharge.

Table 3.1. Summary of results

change in flow, acre-feet/year		
parameter	**rate 3 months after pit filling**	**rate 100 yrs after mining**
storage	-3,525	-12
groundwater discharge to Rio Grande above Caballo Dam	1,089	25
groundwater discharge to Rio Grande below Caballo Dam	983	3
discharge from flowing wells	1,075	5
Animas Creek evapotranspiration and flow reduction	18	0
Percha Creek evapotranspiration and flow reduction	25	2
flow to open pit	28	29
inflow from graben north of study area	686	3

cumulated change in volume, acre-feet	
parameter	**volume change 3 months after pit filling**
storage	42,813
Rio Grande above Caballo Dam	8,878
Rio Grande below Caballo Dam	7,504
flowing wells	9,007
Animas Creek flow and evapotranspiration	147
Percha Creek flow and evapotranspiration	180
flow to open pit	-467
inflow from graben north of study area	5,924
total	**73,987**

3.1.3 Flow From North Palomas Graben

Induced groundwater flow from the Palomas Graben (Fig. 3.2) north of the study area would result in reduced discharge to the Rio Grande, beyond the reductions shown in Figure 3.3.

Based on discussions with the NMOSE, the effect of increased flow from north of the study area on the Rio Grande is estimated here using an analytical solution (Glover and Balmer, 1954; Theis, 1941) for the effect on streamflow of pumping a well.

The solution applied here simulates an impermeable barrier west of the Palomas Graben, reflecting the fault barrier and lack of aquifer transmissivity west of the graben.

A computer program employed by NMOSE (E. Keyes, personal communication, 2015) was used to compute the effect on the Rio Grande from removal of (the numerical model-computed) water from the graben, using assumptions listed in Table 3.2.

Table 3.2. Parameters for Glover-Balmer solution

transmissivity (ft^2/day)	3,700
storage coefficient (percent)	10
distance from well to river (miles)	6
distance from well to barrier (mile)	1

Results are shown on Figure 3.4 for a scenario pumping a constant 6,100 ac-ft/yr for 12 years. The computed effect on the Rio Grande would be added to the "Rio Grande above Caballo" effect shown on Figure 3.3.

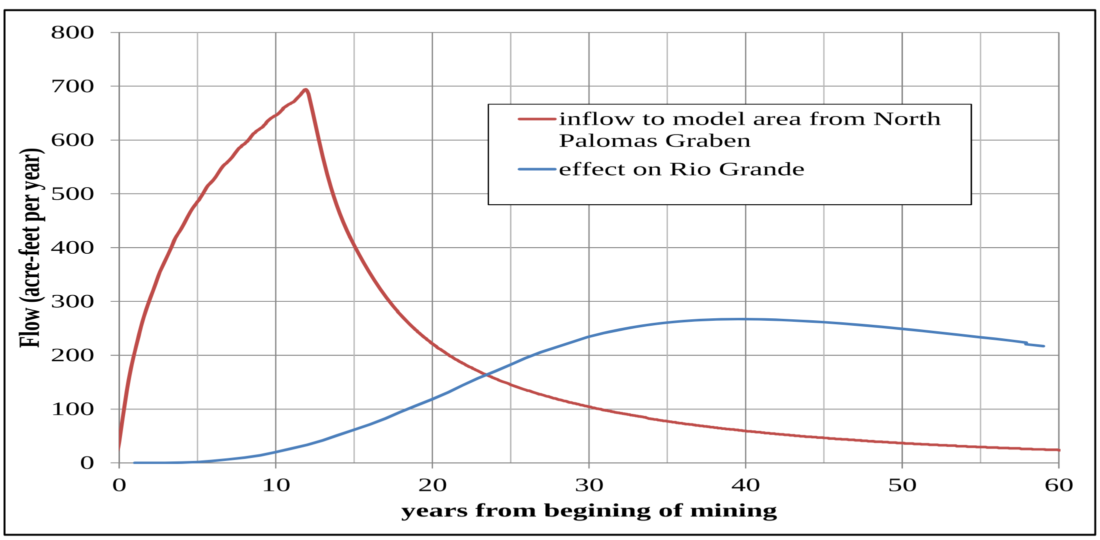

Figure 3.4. Projected effect on Rio Grande of increased flow from north Palomas Graben.

3.1.4 Operational Plans for No Net Effect on the Rio Grande

NMCC has committed to offset the effects of reduced discharge to the Rio Grande system (Figs. 3.3 and 3.4) during and after the operation of the Copper Flat Mine to ensure no net reduction in flows of the Rio Grande, in a manner approved by the NMOSE.

NMCC has procured a lease for water from the Jicarilla Apace Nation (Nation) that has been approved by the United States Secretary of the Interior.

The Nation is the owner of water rights through a water rights settlement agreement authorized and adopted by the United States Congress and the State of New Mexico in the Jicarilla Apache Tribe Water Rights Settlement Act of October 23, 1992 (Settlement Act).

The Settlement Act expressly permits trans-basin transfers and the Nation currently has the right to lease 6,500 ac-ft/yr. The Jicarilla lease water is diverted from three tributaries in Colorado, diverted through the San Juan Chama project tunnels and is stored in Heron Reservoir in northern New Mexico.

The water purchased by NMCC for offset purposes will travel down the Chama River and into the Rio Grande in the same manner that other Jicarilla-leased water is allowed with the approval of the Secretary of Interior and NMOSE.

Flow of Jicarilla lease water arriving at Caballo Reservoir will be computed based on agreed-upon evaporation and conveyance losses between Heron Reservoir and Caballo Dam. NMCC will provide sufficient water arriving at Caballo Dam to offset the groundwater-flow model-computed effects (Figs. 3.3 and 3.4) both above and below Caballo Dam.

The Jicarilla lease has been executed by NMCC and the Nation, and the agreement has been reviewed and approved by the United States Bureau of Reclamation action with the full authority of the United States Secretary of Interior. The lease specifically allows water to be utilized at the locations where NMCC pumping effects on the Rio Grande are predicted to take place.

All that remains to allow the diversion of Jicarilla lease water is NMOSE approval of the NMCC plan to use wells LRG-4652 through LRG-4652-S-3 (PW-1 through PW-4), which is pending an on-going proceeding and negotiation. NMCC is working with NMOSE to incorporate into the permit all monitoring, offsets, and replacement requirements deemed necessary to avoid impairment to other water users and impacts to the Rio Grande.

When the permit is issued, the conditions of approval will include an express condition by NMOSE, that the pumping effect on the Rio Grande will be offset by the water purchased under the lease from the Nation. The permit will address the length of time offsets and monitoring are necessary to protect the Rio Grande and existing water users after mine operations cease.

If NMCC, at some point after mine operation ceases and impacts to the river are decreasing, elects to stop leasing water from the Nation to provide for offsets on the river, NMCC will either secure another lease of equally effectual water or secure and permanently retire water rights. NMCC will supply the offset water in the quantity and location sufficient to offset the effects of NMCC pumping, in a manner agreed by NMOSE.

In the case of the permanent retirement of water rights, the offset would continue to have a positive effect on the Rio Grande even after the NMCC effect ceases. In any case, NMCC will take steps to ensure that no net reduction of flow to the Rio Grande occurs.

3.1.5 Other Water Rights

The SFG aquifer will have a limited area of significant drawdown, which may directly affect a small number of private wells. During the operation of its production wells, NMCC will work with NMOSE to ensure that impairment to existing water rights, according to NMOSE criteria, shown to be caused by NMCC pumping, will be mitigated, as appropriate, so that there is no net loss of available water to the existing water right.

Flowing wells along the eastern ends of Animas Creek and Percha Creek will experience a reduction in artesian pressure and reduced flow, as described in Section 3.1.6.

Groundwater model projections indicate that private wells in the shallow aquifer along Animas Creek and Percha Creek will not be affected by the pumping of the NMCC production wells, as described in Section 3.1.7.

3.1.6 Effects of Reduced Flowing Well Pressure

The model estimates a peak reduction in discharge to flowing wells of 1,054 ac-ft/yr, out of a pre-mining discharge of 2,030 ac-ft/yr (Table 3.1). The effect builds gradually from zero, to a maximum of 1,054 ac-ft/yr shortly after the end of mining, then gradually diminishes to near-zero over 30 years (Fig. 3.3). The possible consequences of reduced discharge to flowing wells are discussed below.

The flowing wells are located in the lower (eastern) section of the study area, upstream of Caballo Reservoir. Most of the wells are located along Animas Creek, with the remainder along Percha Creek. Estimated pre-mining discharge to flowing wells of 2,030 ac-ft/yr consists of 1,750 ac-ft/yr of discharge to Animas Creek wells and 280 ac-ft/yr to wells along Percha Creek.

In general, discharge from the flowing wells is used to fill unlined ponds, which in turn serve as reservoirs for irrigation systems. Most wells are allowed to flow continually, maintaining permanent ponds; these are visible in Google Earth images taken both inside and outside the irrigation season.

The discharge from flowing wells to ponds can evaporate from the pond, infiltrate into the shallow groundwater system or be pumped to irrigate fields. Water applied to the fields may be discharged as evapotranspiration or infiltrate to the shallow groundwater system.

Discharge from the flowing wells does not contribute significantly to streamflow, as there are no perennial stream sections in the artesian zone of the lower Animas and Percha Creek basins (INTERA et al., 2012). Flowing well discharge instead contributes to the shallow groundwater systems along Animas Creek and Percha Creek.

The pond and field areas along Animas Creek were estimated based on Google Earth, at 3.9 and 125.8 acres, respectively. By comparison, the 1966 hydrographic survey indicates 8.4 acres of pond and 191.2 acres of field. The estimated discharge from flowing wells is larger than would be required to irrigate the areas indicated. Pond and field areas are listed in Table 3.3, along with the maximum rate of evaporation and evapotranspiration (JSAI, 2014, section 2.4) that could occur from the given areas.

Table 3.3. Areas and potential evapotranspiration for Animas Creek ponds and fields

	area (acres)	maximum ET (in./yr)	ET (ac-ft/yr)
ponds	3.9	65	21
fields	125.8	65	681
total	**130**		**703**

ac-ft/yr - acre-feet per year

As indicated in Table 3.3, the maximum evaporation and evapotranspiration that could occur from the given areas of pond and field is 703 ac-ft/yr. This implies that most of the 1,750 ac-ft/yr of flowing well discharge along Animas Creek infiltrates to the shallow aquifer, either from the fields or through the ponds.

Current water balance for Animas Creek flowing wells was estimated assuming (1) typical application of irrigation water, with 70-percent evapotranspiration of the water applied and 30-percent infiltration to the shallow groundwater system, and (2) infiltration of any remaining flowing well discharge through the ponds. Results are presented in Table 3.4.

Some wells with reduced artesian pressure may be pumped in order to maintain water supply. Model-projected additional drawdown at the end of mining, due to pumping flowing wells at pre-mining rates, is shown on Figure 3.5. Incremental drawdown reaches a maximum of less than 10 ft in the lower reach of Animas Creek basin.

Table 3.4. Estimated water balance for Animas Creek flowing wells

flowing well discharge	1,750
evapotranspiration (ET)	703
infiltration (fields)	301
infiltration (ponds)	746
Total (ac-ft/yr)	**1,750**

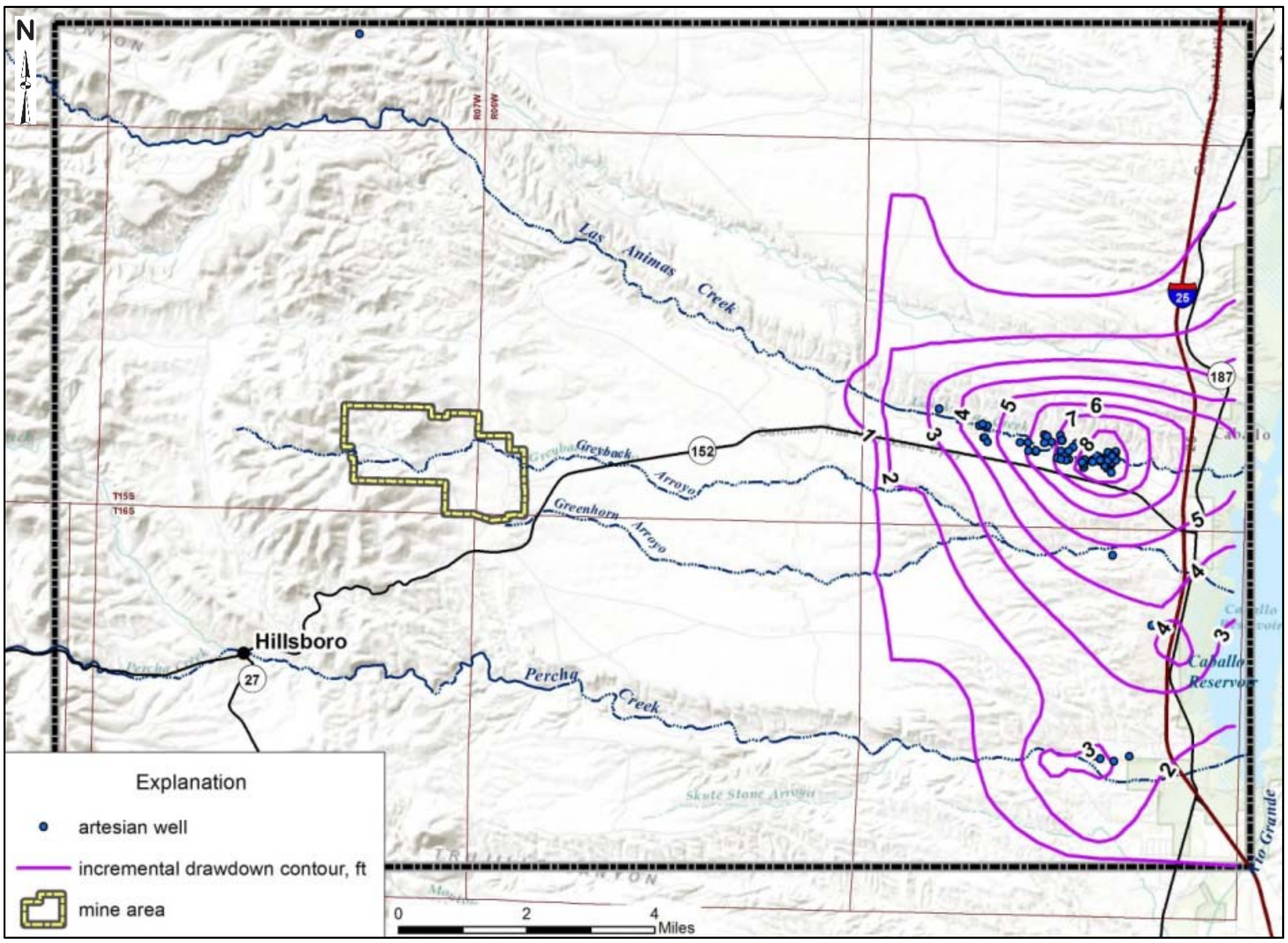

Figure 3.5. Projected incremental drawdown due to pumping of flowing wells at current flow rates.

3.1.7 Effects on Quaternary-Age Alluvial Aquifers and Animas Creek Perennial Flow and Riparian Zone

The shallow groundwater and riparian systems along Animas Creek and Percha Creek overlie the SFG sediments. Geology of the study area is shown on Figure 3.6, showing faulting within the SFG. An important fault-bounded feature is the Palomas Graben, in which the Copper Flat water-supply wells are completed.

West of the graben, the SFG sediments are thinner and less permeable, and do not yield substantial flow to wells. Within and east of the graben, the SFG forms an aquifer capable of yielding substantial flow. The hydrologic relationship of the shallow alluvial systems to the SFG is illustrated in cross-section C-C' (Fig. 3.7) along Animas Creek.

West of the graben, the low transmissivity of the SFG results in elevated water levels reaching the level of the shallow alluvium. Flow between the SFG and the alluvium is limited by low transmissivity and the small water-level gradient between the two.

Near the graben, the increased transmissivity of the SFG results in water levels dropping below the bottom of the alluvium, forming a hydraulic disconnection between the SFG aquifer and the alluvial groundwater system (Fig. 3.8). As a result, water flows from the alluvium to the SFG, through low-permeability clay beds, only by gravity; pumping from the SFG does not increase the flow or change water levels in the alluvium.

East of the graben, water flows down-dip along the permeable SFG beds. In the lower part of the basin, water level in the SFG pressurizes the confining clay beds from below. Water discharges from the SFG to the alluvium and to Caballo reservoir by flowing slowly across the resistant clay beds, or by discharging to flowing wells.

As a result, groundwater-level changes in the shallow alluvium, due to pumping in the SFG, will be highly attenuated. The main area of groundwater drawdown in the SFG (Fig. 3.1) will be in the graben, where the alluvium is disconnected from the SFG (Fig. 3.7).

Away from the graben, SFG drawdown will be smaller, and the connection to the alluvium is limited by low-permeability clay beds (Fig. 3.8).

A contour map of projected groundwater-level drawdown within Quaternary-age alluvial aquifers at the end of mining is shown on Figure 3.9. The figure indicates that peak groundwater-level drawdown along Animas Creek and most of Percha Creek will be less than 1 ft. Drawdown in a small area along lower Percha Creek is projected to be greater than 1 ft and less than 2 ft. The projected effects on evapotranspiration and surface discharge from the shallow aquifers are correspondingly small (Table 3.1). After mining ends water levels will slowly recover to pre-mining levels.

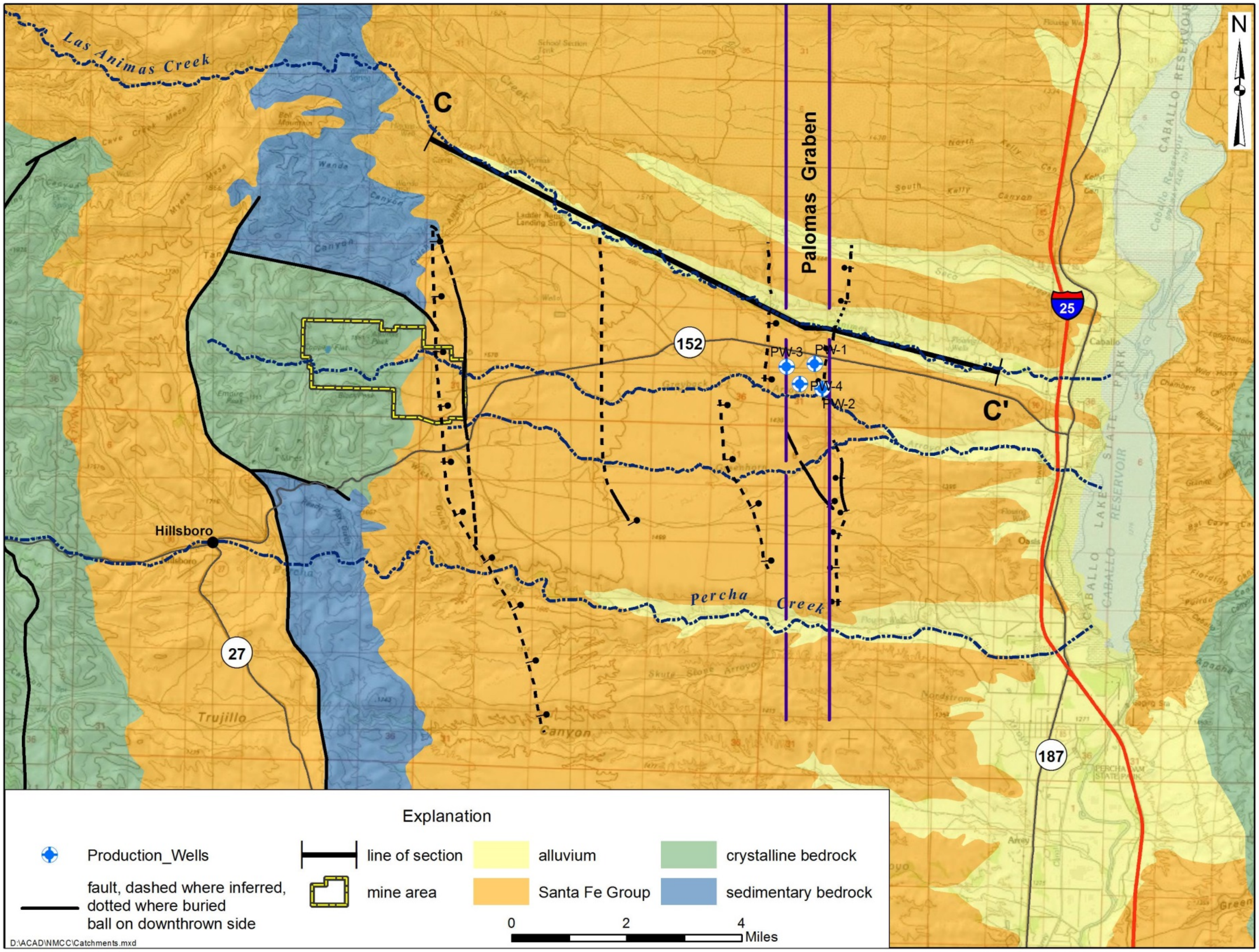

Figure 3.6. Geologic map.

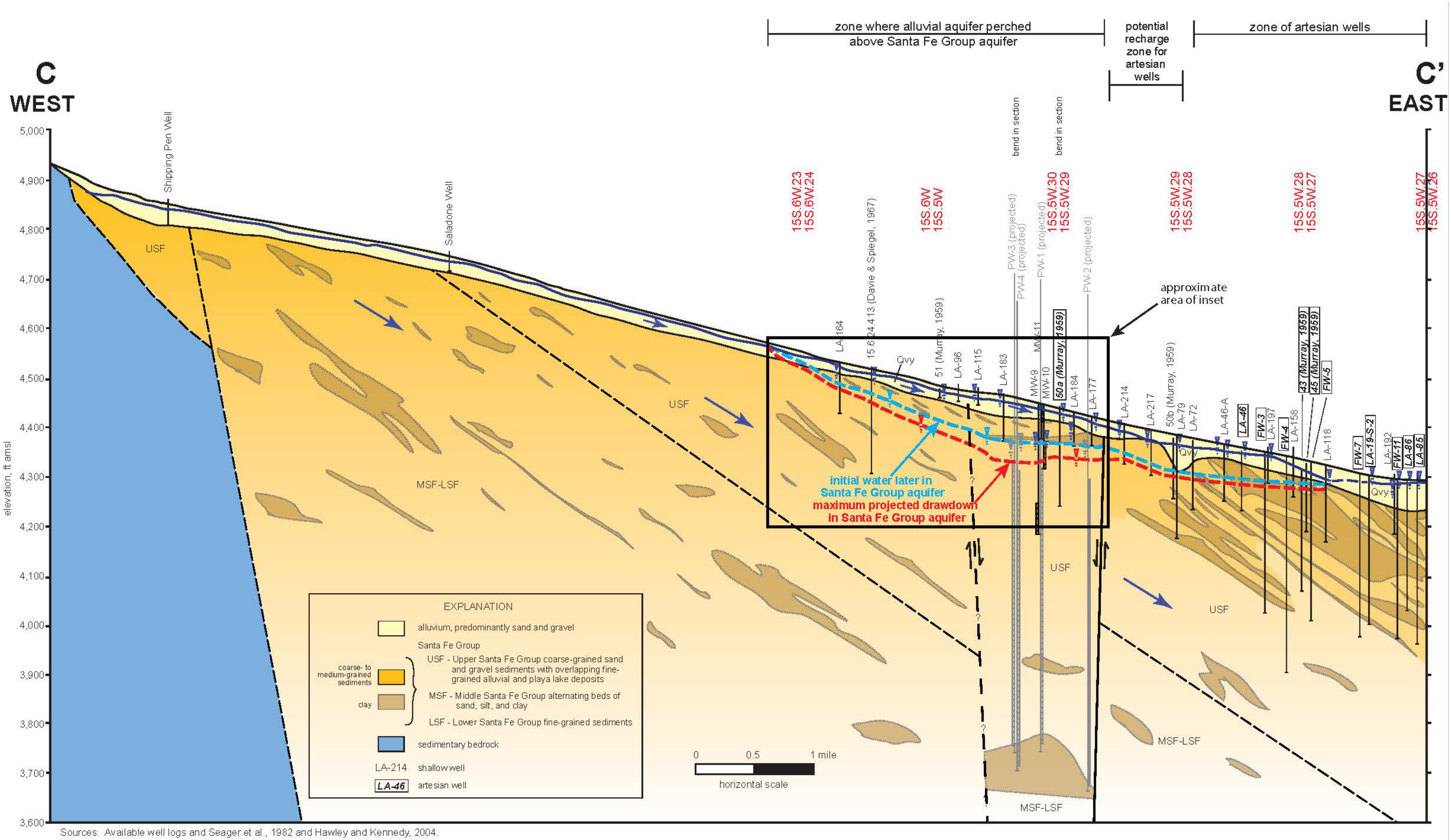

Figure 3.7. Cross-section C-C'.

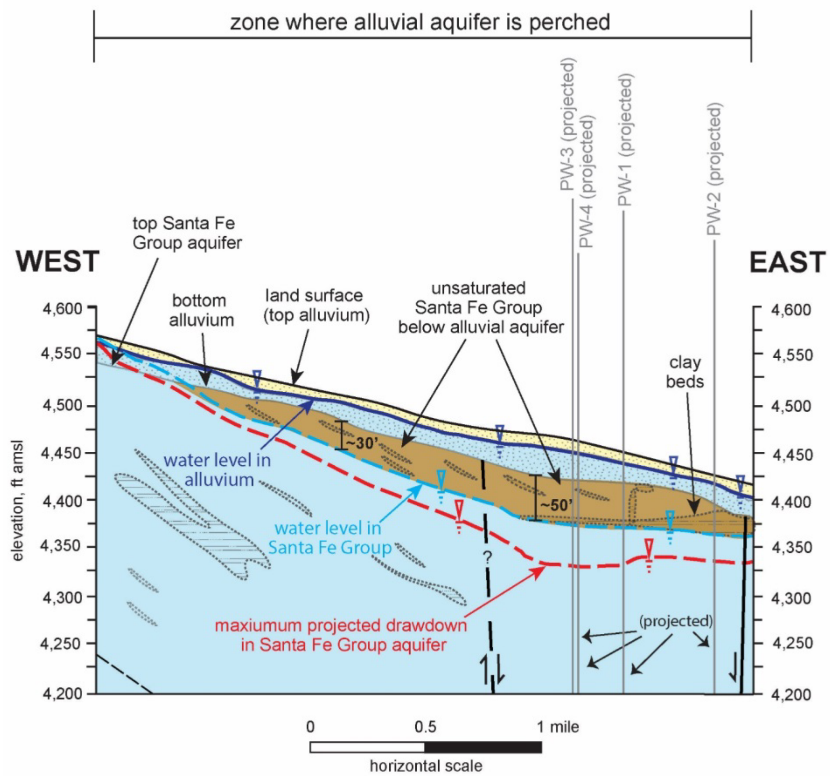

Figure 3.8. Section C-C', inset area of perched shallow aquifer.

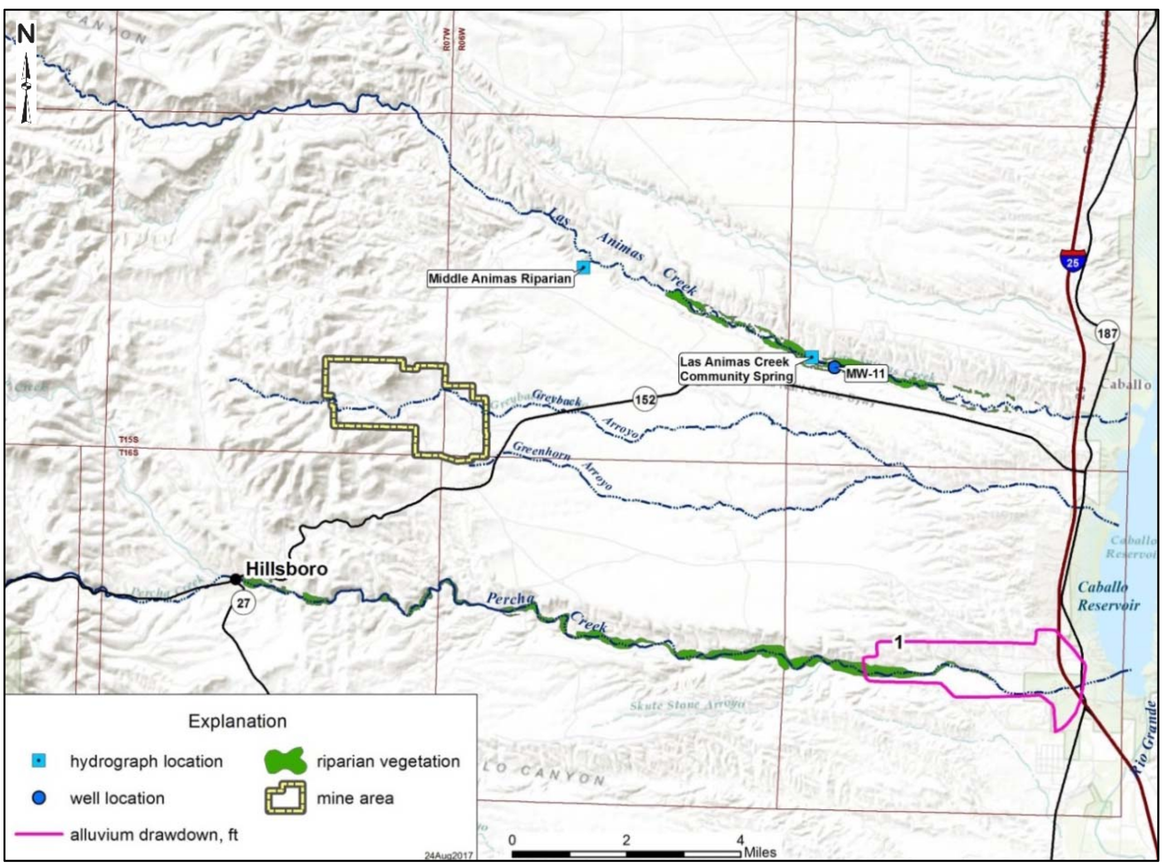

Figure 3.9. Projected end-of-mining groundwater drawdown, shallow aquifers.

3.1.8 Ground Subsidence

The potential for land surface subsidence due to groundwater-level drawdown was evaluated using the method of Hoffman and others (Hoffman et al., 2003). Potential subsidence due to dewatering of the crystalline bedrock is negligible; therefore, subsidence potential was evaluated only for the SFG aquifer around the well field.

Projected maximum drawdown (maximum drawdown near the well field occurs at the end of mining; maximum drawdown farther away may occur later) is shown on Figure 3.10, with an area-wide maximum drawdown of about 70 ft occurring at the well field.

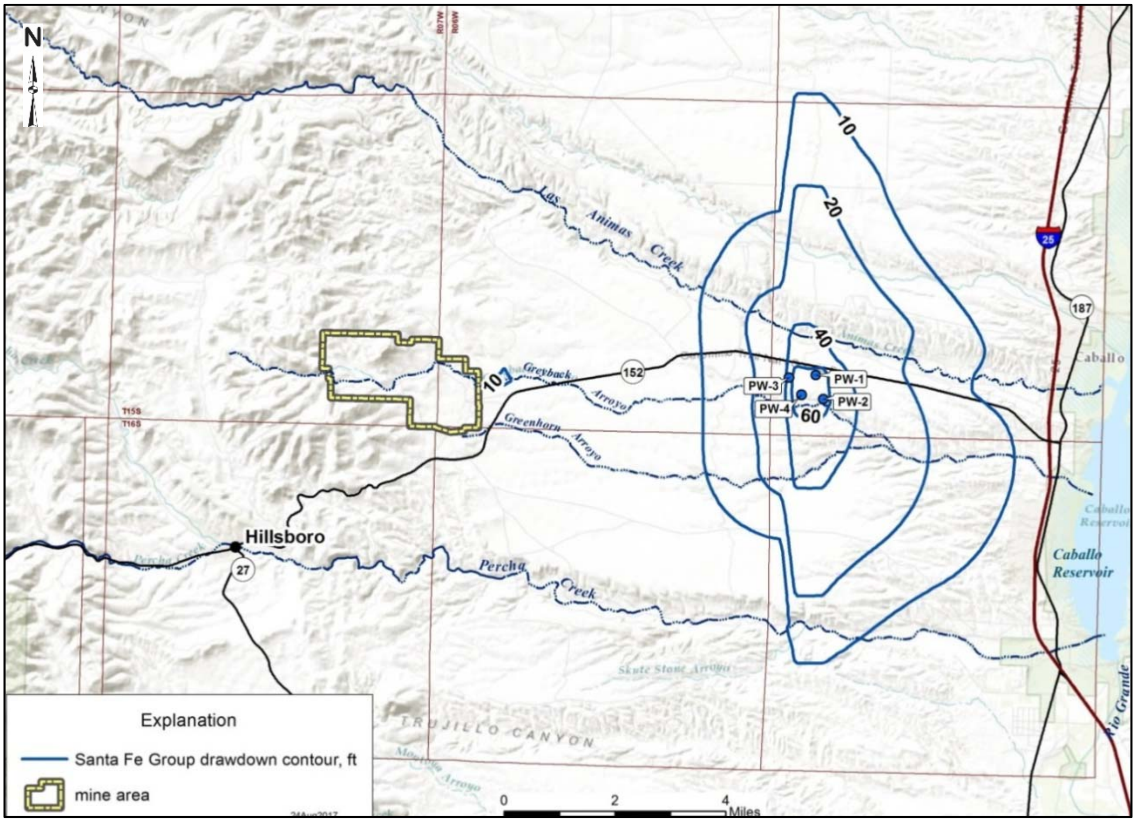

Figure 3.10. Projected maximum drawdown in Santa Fe Group aquifer.

Subsidence is estimated using equation (1) (Hoffman et al., 2003, equation 9):

$$\Delta b = S_s b \Delta h \qquad (1)$$

where, b is the saturated thickness of compressible beds
Δb is land surface subsidence
S_s is the specific storage of the compressible beds
Δh is drawdown

Thickness of compressible beds is assumed at 5,000 ft. Specific storage (storage coefficient per unit aquifer thickness) for SFG is modeled at 2.0 x 10-6/ft. Maximum subsidence is then estimated using equation (2):

$$\Delta b = (2 \times 10^{-6}\ /\text{ft}) \times (5{,}000\ \text{ft}) \times (70\ \text{ft}) = 0.70\ \text{ft} \qquad (2)$$

By using conservative assumptions, a maximum potential subsidence of 0.7 ft is calculated for the immediate area of the well field, where drawdown reaches a maximum. Subsidence decreases with distance from the well field area in proportion to drawdown. Contours of maximum potential subsidence are illustrated on Figure 3.11.

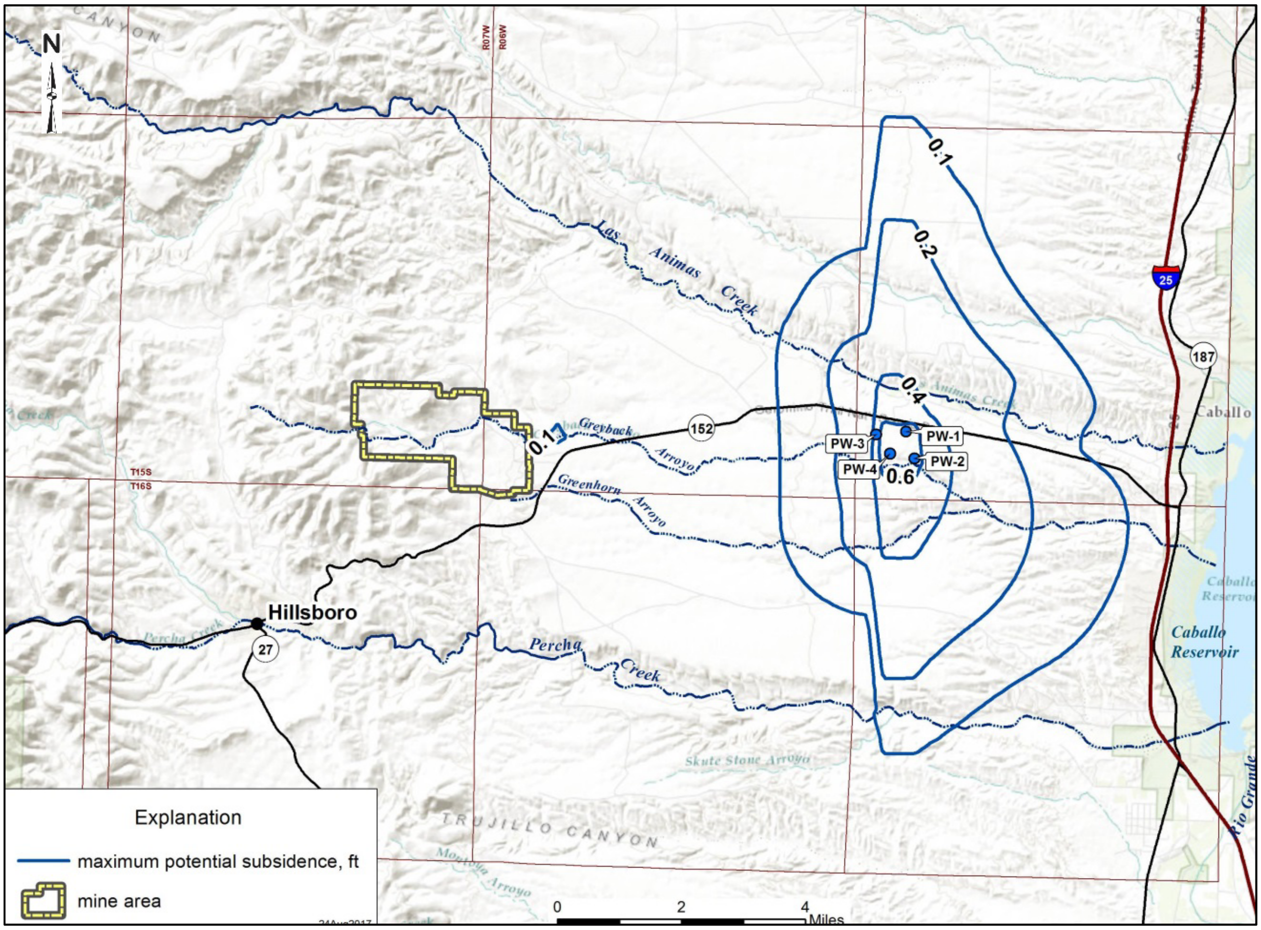

Figure 3.11. Projected worst-case potential maximum subsidence.

Outside of the well field area, the maximum potential subsidence shown on Figure 3.11 is less than about 0.4 ft (less than 5 in.), not noticeable over many years, but still over-estimated; it represents the total long-term subsidence that might be expected if groundwater drawdown is maintained.

Because the maximum groundwater drawdown would only occur near the end of mining, and would be immediately followed by post-mining water-level recovery, the drawdown would not persist for an extended period, and most of the potential subsidence would not occur. Actual subsidence is expected to be minimal at the well field and nil elsewhere.

3.2 Groundwater Withdrawals From the Crystalline Bedrock

Groundwater withdrawals from the crystalline bedrock will occur during dewatering of the open pit and after mining as groundwater flows into the pit. Consequences considered below include the following:

- Groundwater drawdown occurring during dewatering of the open pit is presented in Section 3.2.1.
- Groundwater discharge to the pit and the post-mining pit water balance are presented in Section 3.2.2.
- Potential discharge of groundwater from the open pit is discussed in Section 3.2.3.
- Long-term groundwater drawdown and potential effects on springs discharging from the crystalline bedrock are discussed in Section 3.2.4.

3.2.1 End-of-Mining Groundwater Drawdown

Groundwater drawdown in the crystalline bedrock at the end of mining is shown on Figure 3.12. Drawdown approaches a maximum of about 750 ft at the bottom of the dewatered pit. Drawdown of 1 ft extends for an approximately 2-mile radius around the pit.

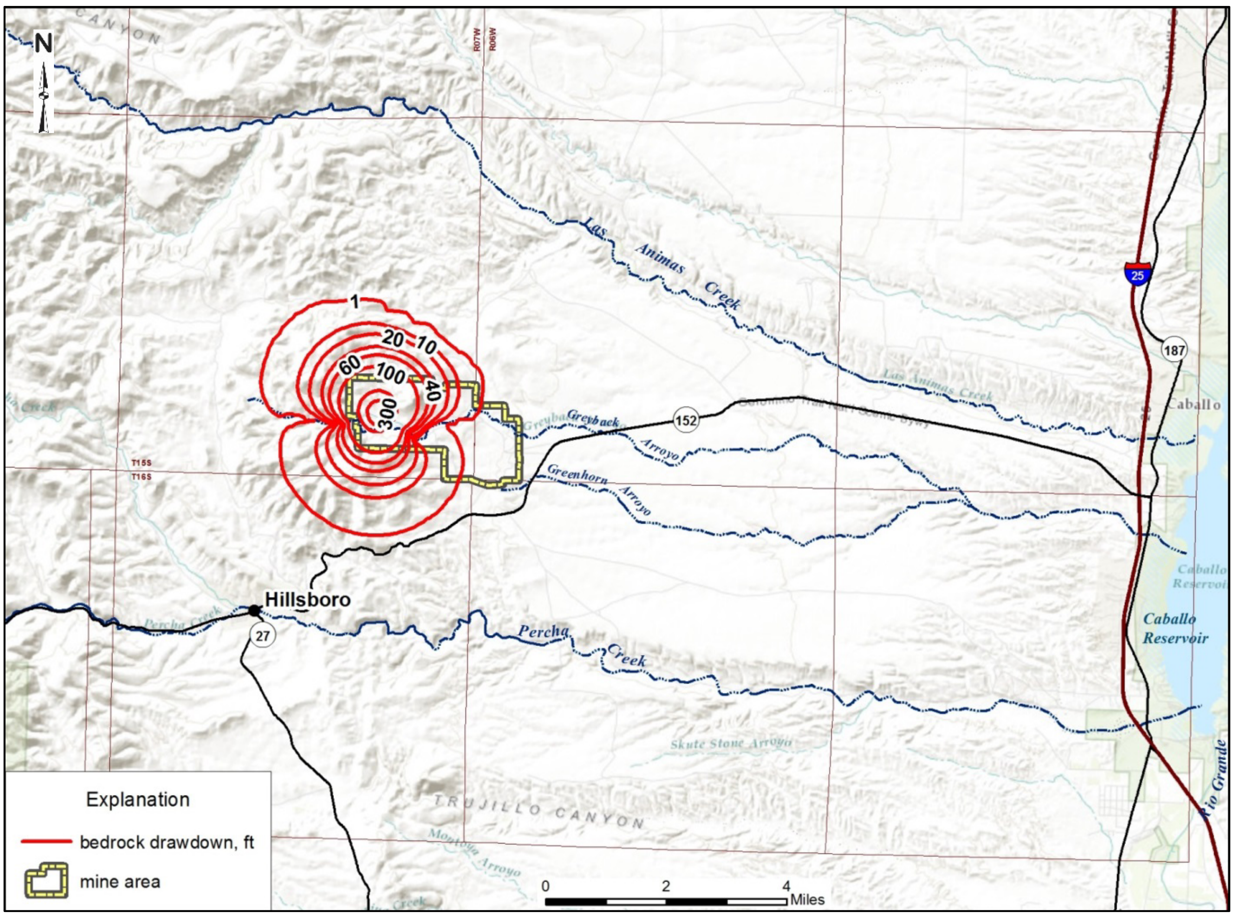

Figure 3.12. Projected end-of-mining groundwater drawdown in the crystalline bedrock.

3.2.2 Open Pit Water Balance

The post-mining pit water level and water balance were simulated assuming the pit geometry and watershed shown on Figure 3.13. The area within the pit highwall is about 129 acres, and the total pit watershed area is about 314 acres.

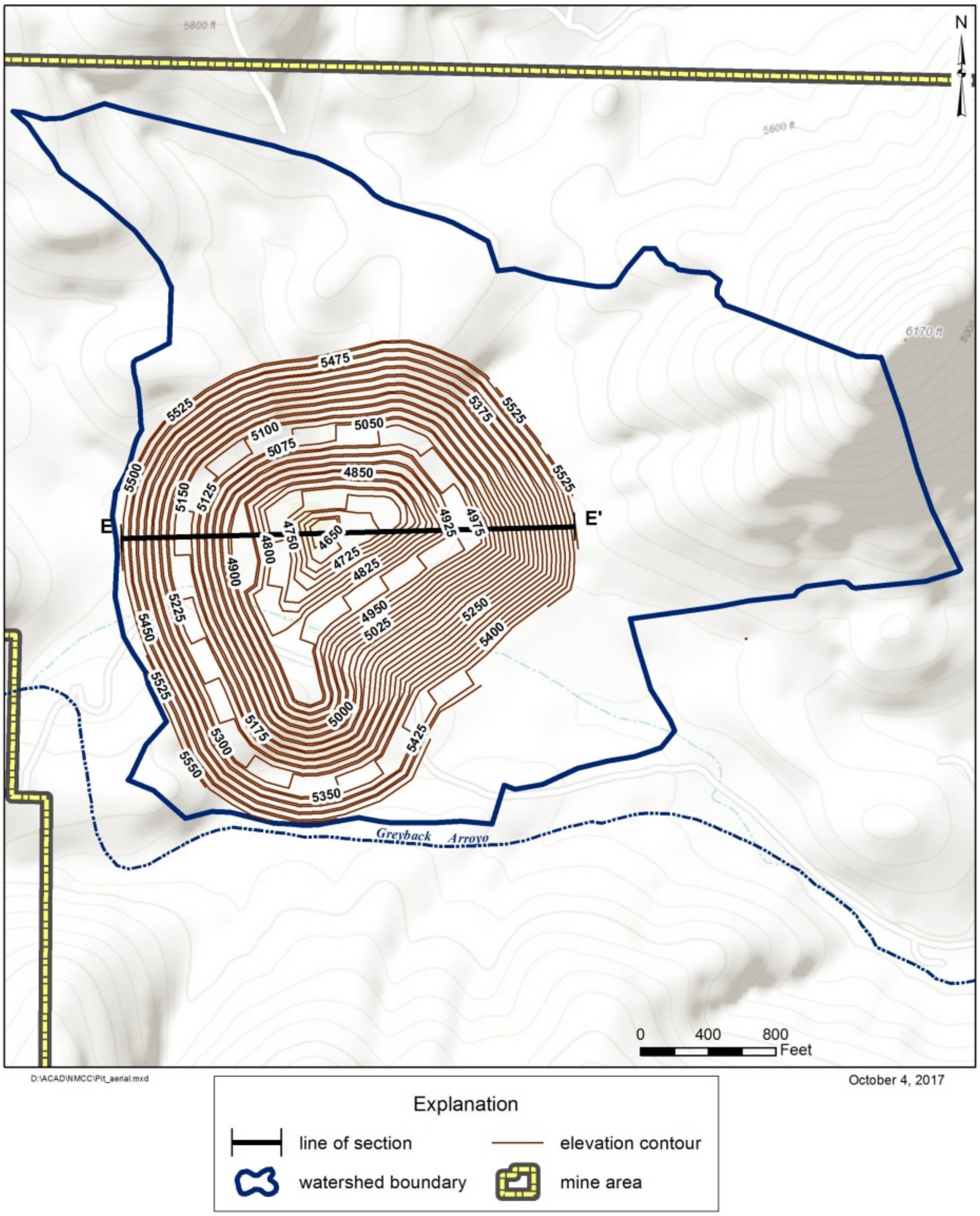

Figure 3.13. Ultimate open pit and watershed area.

Precipitation on the pit area was estimated for each month based on the record at Hillsboro (JSAI, 2014, section 2.0), with annual average precipitation of 12.5 in. Runoff from the un-reclaimed sections of the pit was simulated at 12.6 percent of precipitation, and runoff from reclaimed sections of the pit was simulated at 30.3 percent. Runoff from the remainder of the watershed was simulated at 7.1 percent of precipitation.

Evaporation from the open pit was assumed at 50 in./yr, less than the 65 in./yr estimated potential evaporation (JSAI, 2014, section 2.4) for the area. The lower rate reflects the wind and sun sheltering effects of the deep pit. Monthly evaporation rates based on the record at Hillsboro were scaled to match the annual rate of 50 in./yr.

Post-mining reclamation would include use of the water-supply wells PW-1 through PW-4, and a temporary pipeline to the bottom of the pit, to rapidly fill the pit to the expected long-term post-mining equilibrium water level. The post-mining simulation assumes this “rapid fill” scenario. Rapid filling will result in better water quality in the open pit by filling it with clean water and inhibiting oxidation of sulfide by submerging potential acid-generating sections of the pit wall (SRK, 2017).

A pumping rate of 2,726 gpm is simulated in the model, sufficient to fill the pit to elevation 4,894 ft amsl in 6 months. Total volume pumped from the supply wells will be 2,200 ac-ft. The open pit water body elevation of about 4,894 ft amsl corresponds to a water-surface area of about 21.7 acres. Simulated water level in the pit after the end of mining is presented on Figure 3.14. The final long-term water level of about 4,897 ft amsl corresponds to a water-surface area of about 22.3 acres. Water levels will fluctuate around this mean, rising and falling seasonally and with wet and dry climatic conditions. The largest potential effect on pit water levels would result from environmental circumstances such as a 100-year flood event or the occurrence of a prolonged drought. Probability is an indicator for the likelihood of an event’s occurrence. As such, the probability is 1 in a 100 that it will be higher. Similarly, the probability that it will be lower than 4,897 ft is based on a worst-case drought of zero precipitation for 1 year. The historical precipitation record at Hillsboro indicates that a 100-year 24-hour precipitation event is 3.29 in. (JSAI, September 25, 2017 Technical Memorandum regarding OPSDA runoff). This event would generate 36 ac-ft of runoff to the pit (JSAI, September 25, 2017.). For a 22-acre water surface, the water level would rise 1.6 ft. Conversely, if there was zero runoff for 1 year, the water level would decline 2.6 ft. Therefore, the bracket for maximum short-term potential rise and decline would be 4,898.6 ft to 4,891.4 ft amsl.

The simulated annual pit water balance is presented on Figure 3.15, showing a final pit water balance of about 93 ac-ft/yr, with about 57 ac-ft/yr from precipitation and runoff, and 36 ac-ft/yr from groundwater inflow, all discharging as evaporation from the pit water surface.

After reclamation, groundwater levels in the bedrock around the open pit will remain below pre-mining levels, due to groundwater flowing to the open pit and discharging as evaporation from the hydrologic sink. Future water-level patterns can be seen in the hydrographs at selected locations, presented in Appendix A.

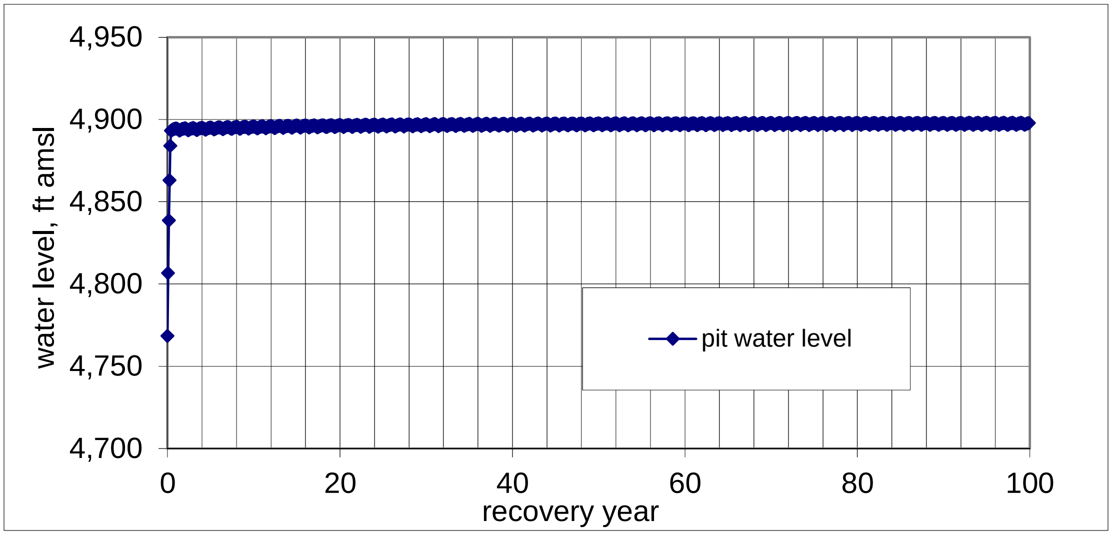

Figure 3.14. Projected open-pit water level (rapid fill in year 1).

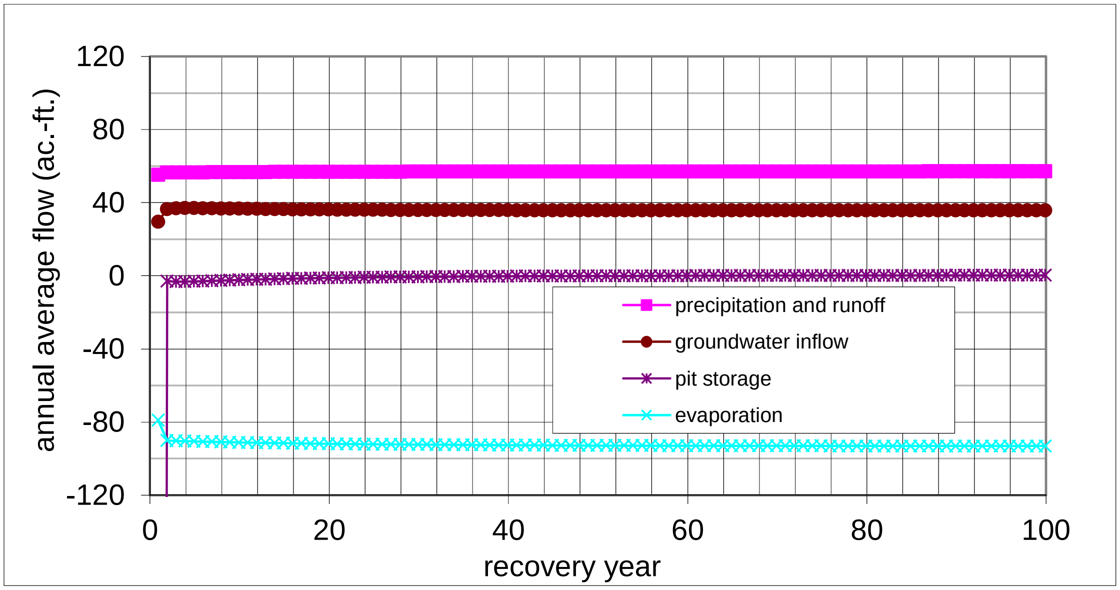

Figure 3.15. Projected open-pit water balance (rapid fill in year 1).

3.2.3 Potential Open Pit Discharge to Groundwater

The post-mining pit will be a groundwater sink, with the open pit water level below surrounding groundwater levels in the crystalline bedrock. The pit will remain a hydraulic sink after rapid filling of the pit during reclamation, and after precipitation events that raise the pit water level.

For a short period immediately following rapid fill, water may flow out of the pit into the dewatered space around it, then return to the pit as conditions equilibrate. Model-simulated flow to this dewatered space during the 6-month rapid filling totals 0.74 ac-ft. This water remains in the immediate vicinity of the pit wall before returning to the pit.

The hydraulic conditions around the pit are shown in cross-section on Figure 3.16 for pre-mining, end-of-mining, and 100-year post-mining conditions. The pit will remain as a hydraulic sink during temporary water level fluctuations because of the deep cone of depression caused by dewatering and maintained by water surface evaporation.

In order for it to be possible for water to flow from the pit to groundwater, the open pit water level would have to be higher than surrounding groundwater (>5,100 ft elevation). No conceivable storm event, wet year, or even wet decade could possibly add enough water to the pit to reach the water level required to achieve flow-through.

The projected post-mining potentiometric surface, including the closed contours around the hydraulic sink of the open pit, is shown in plan view on Figure 3.17.

3.2.4 Effects on Springs

Spring locations identified in the area (INTERA et al., 2012; BLM, 2015) are shown on Figure 3.18. The springs fall into several groups: (1) springs discharging on the Animas Uplift, (2) springs discharging in the Animas graben west of the uplift, and (3) springs discharging to the Palomas Basin, at the eastern edge of the uplift and along parallel fault trends stepping down from the uplift into the Basin.

The springs of the Animas Uplift (BG1, BG2, and other occasional seeps) are fed by local, perched groundwater systems or by near-surface circulation of local precipitation, and are ephemeral (INTERA et al., 2012), flowing only after precipitation events. These would not be affected by the flow of groundwater toward the open pit within the crystalline bedrock.

Springs of the Animas Graben, including Warm Spring (WS), WSCS-A, CSCS-B, CSCS-C and Cave Creek Spring, discharge from the SFG deposits west of the Animas Uplift. The source of their water is the Las Animas Creek and Percha Creek watersheds west of the Animas Uplift. The andesite of the uplift acts as a barrier to flow at depth (JSAI, 2014, p. 24) and the groundwater systems of the graben and the uplift are separate. Flow at springs in the Animas Graben will therefore not be directly affected by the movement of groundwater in the Animas Uplift toward the open pit.

Springs discharging at the east edge of the Animas Uplift include Warm Spring on Animas Creek and PCS-A on Percha Creek. In the Palomas Basin east of the uplift, springs discharge from alluvium along Las Animas Creek, along a set of fault structures parallel to the uplift.

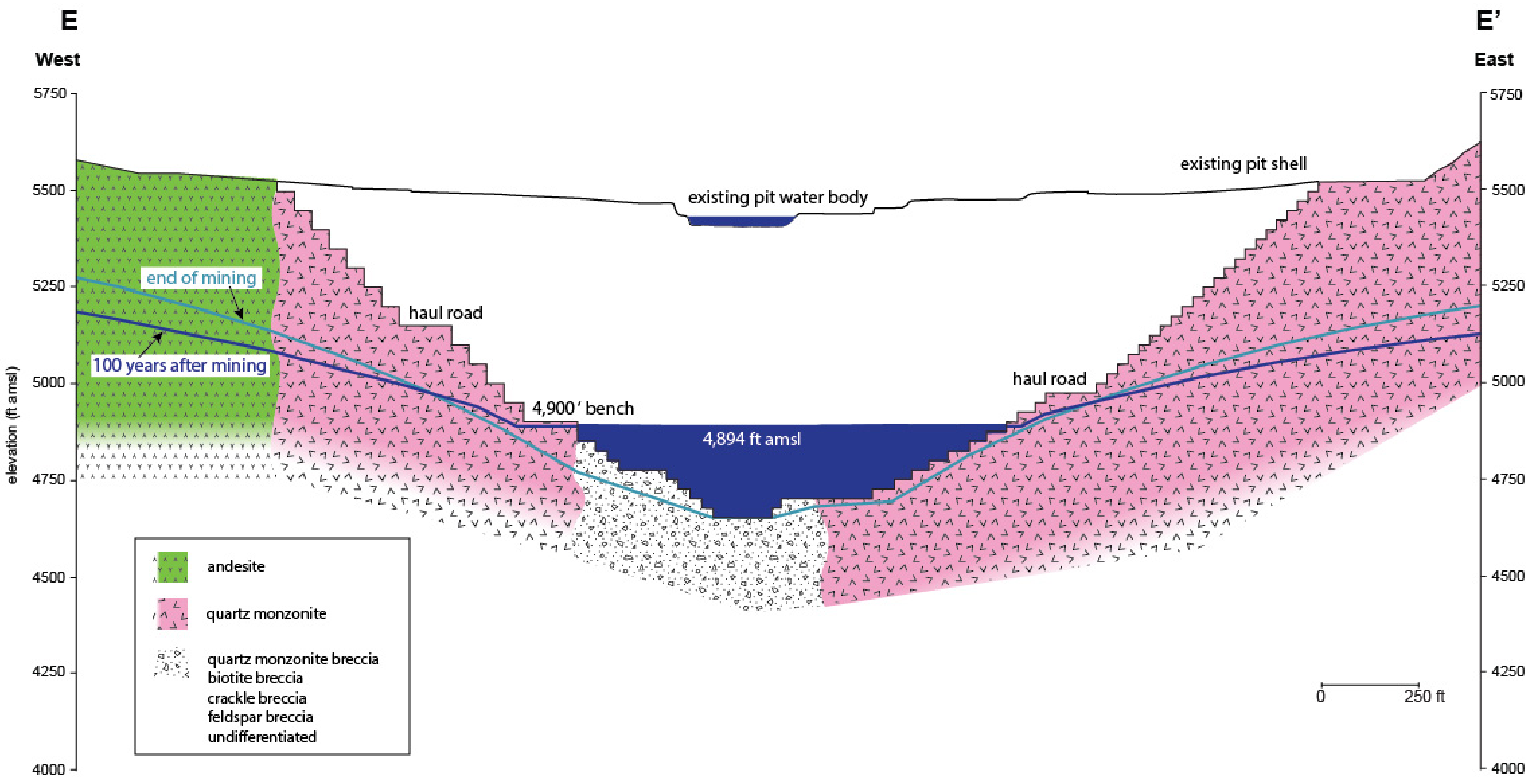

Figure 3.16. West-to-east hydrogeologic cross-section E-E' showing water-level profile across existing pit and proposed open pit after rapid fill.

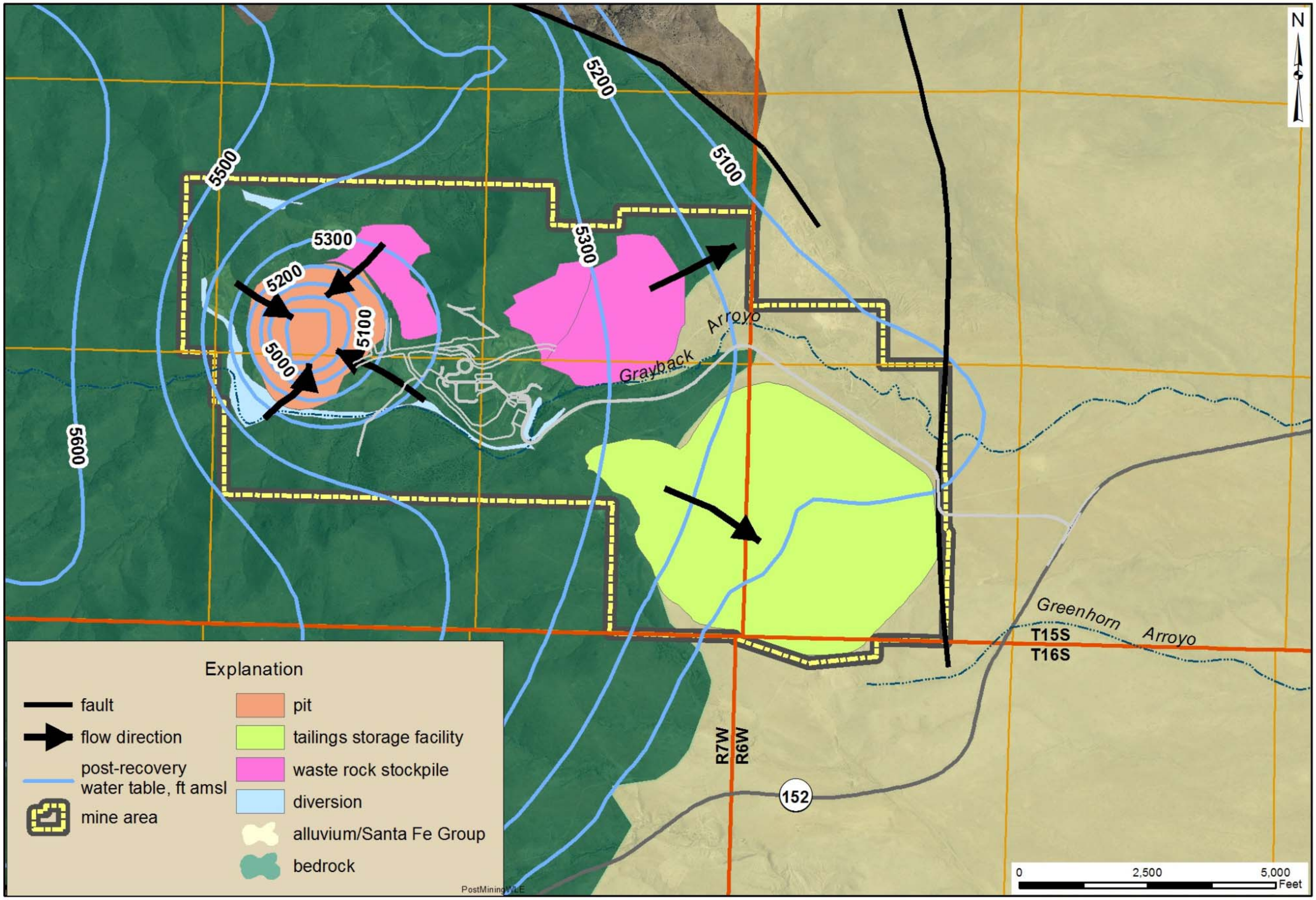

Figure 3.17. Proposed mine facilities and projected post-mining groundwater elevation.

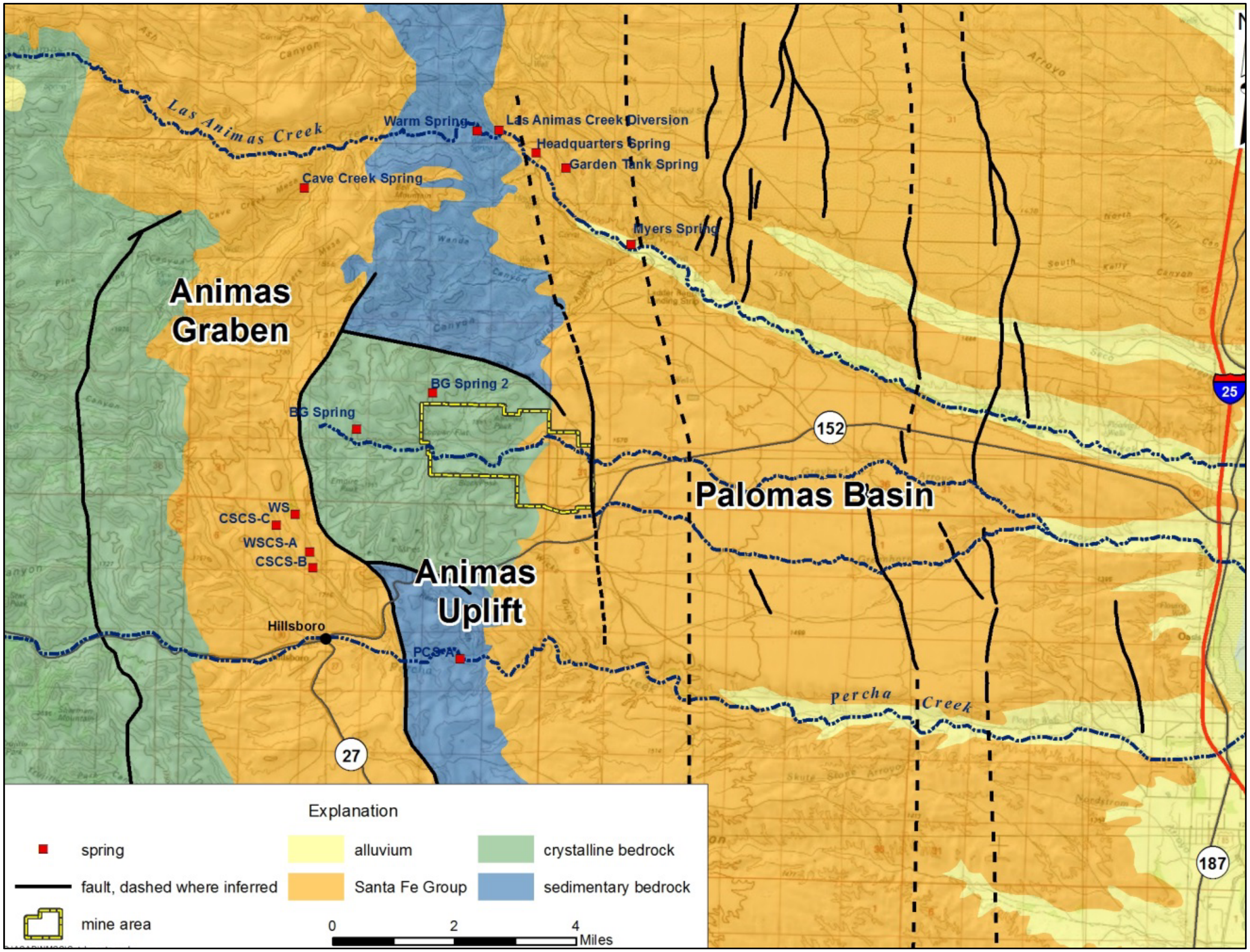

Figure 3.18. Locations of springs in and around the Animas Uplift.

The active springs of the Animas Graben and of the eastern edge of the uplift and the Palomas basin could be indirectly affected by the project if groundwater levels were lowered through indirect connection to the Animas Uplift. Future groundwater level change at each potentially affected location was evaluated using the numerical model. Results are summarized on Table 3.5.

Table 3.5. Projected groundwater-level change (in feet) at spring locations

	end of mining	100y post-mining
CSCS-C	0.01	0.16
WS	0.02	0.19
WSCS-A	0.01	0.13
CSCS-B	0.01	0.12
Cave Creek	0.05	0.15
PCS-A	0	0
(Animas) Warm	0.02	0.05
Myers	0.01	0.01

For the Animas Graben springs, groundwater level is projected to decline by up to 0.19 ft (2.3 in.), 100 years after the end of mining. Discharge is not expected to decrease because the source of water for these springs is west of the Animas Uplift (JSAI, 2014, p. 24). However, discharge locations could move a short distance due to a change in water level.

In the eastern part of the uplift, projected maximum change in water level is 0.05 ft (0.6 in.) at Animas Warm Spring. On Percha Creek, no water level change is projected at PCS-A, either during mining or in the 100 years following the end of mining. In the Palomas Basin, water level at Myers Spring is projected to decline by 0.01 ft (0.12 in.).

No direct effects to identified springs are predicted to occur as a result of the project, because (1) the springs of the Animas Uplift are ephemeral, precipitation-event-fed springs unrelated to the bedrock groundwater system, (2) the springs of the Animas Graben are fed by groundwater from the west and from depth, chemically unrelated to groundwater of the uplift.

Small indirect effects may occur, however, due to lowering of groundwater levels in the Animas Graben or in the western edge of the Palomas Basin, due to an attenuated connection with the crystalline bedrock of the Animas Uplift. The small, long-term projected effects presented on Table 3.5 conservatively assume that these attenuated connections exist, although they have not been observed in reality.

In conclusion, the direct effects of the Project on mapped springs are projected to be zero. The long-term indirect effects presented (maximum of 2.3 in. over 100 years) are too small and manifest too slowly to be measureable or significant.

3.3 Potential Discharge From Tailings Impoundment and Waste Rock Stockpiles

Potential for net percolation to groundwater from the TSF is evaluated in Section 3.3.1. Potential for net percolation to groundwater from the WRSPs is evaluated in Section 3.3.2. Groundwater flow paths and travel times down-gradient from the facilities are evaluated in Section 3.3.3.

The area of the mine including the open pit, waste rock storage facilities, and the tailings impoundment are shown above on Figure 3.17. The WRSPs lie on crystalline bedrock, while the TSF lies partially on SFG sediments.

Any net percolation through the WRSP around the pit would flow into the pit, while any net percolation to groundwater from the eastern-most WRSP or from the TSF would flow northeast and southeast, respectively.

3.3.1 Tailings Impoundment

Because the tailings impoundment will be lined, net percolation to groundwater from the tailings impoundment is not expected. However, unexpected sources of potential infiltration through the liner include manufacturing defects in the liner and other holes, in the liner and along the seams, developed during placement.

NMCC considers the potential for leaks in the liner to be very unlikely. Nonetheless, the potential occurrence of leaks in the tailings facility liner was evaluated based on previous analyses presented in Appendix B. An assumed liner leak occurrence for the purpose of evaluation is one circular defect per acre, with a standard defect area of 1.0 cm^2 (corresponding to a round hole diameter of 1.128 cm).

The rate of leakage through the defect, assuming a compacted bedding layer beneath the liner and an underdrain system above the liner (Golder, 2016), is given (Appendix B, equation 1) by

$$q=\beta_c[1+0.1(h_w/L_s)^{0.95}]a_d^{0.1}h_w^{0.9}K_s^{0.74}$$

where, q is flow through a circular defect

β_c is the coefficient relating to liner contact with bedding material (0.21 for good contact)

h_w is the depth of water above the geomembrane

L_s is the thickness of bedding material

a_d is the area of the defect (1 cm^2)

K_s is the saturated hydraulic conductivity of bedding material

Because the impoundment is designed with a 1.5-ft-thick drainage layer above the liner (Golder, 2016), head on the liner h_w will be less than 1.5 ft. Assuming the standard defect size (a_d = 1.0 cm²) occurring once per acre and the design bedding layer conductivity (K_s =10^{-6} cm/s), leakage from the lined 536-acre (Golder, 2016) tailings storage facility is estimated in Table 3.6 at about 0.5 gpm. The total area of the tailings storage including surrounding facilities is approximately 630 acres, but the active storage area is 536 acres.

Table 3.6. Potential tailings liner leakage

B_c	0.21
h_w	1.5 ft
L_s	1 ft
a_d	1.0 cm²
K_s	1×10^{-6} cm/s
q	0.0009 gpm/acre
total flow	0.5 gpm

The probable hydrologic consequence from a potential leak in the liner, of realistic magnitude, is nil. Not only is the projected rate of potential leakage insignificant, the groundwater beneath the tailings has a low travel velocity (JSAI, 2014, Section 5.3); any leakage from the tailings will remain beneath the tailings for hundreds of years.

3.3.2 Waste Rock Stockpiles

The probable hydrologic consequences during operation of the WRSPs are related to (1) surface runoff from the facility and (2) subsurface infiltration through the waste rock. The probable hydrologic consequences after reclamation and covering of the WRSPs are only related to subsurface infiltration through the waste rock.

Subsurface infiltration into the waste material or the cover has the potential to (1) evaporate or be transpired by vegetation, (2) remain held in storage, or (3) percolate downward through the waste material. Net infiltration is water infiltrated from surface past the effects of evapotranspiration. Percolation is water movement in the WRSPs.

The component of "surface infiltration" that makes it to groundwater can be said to be "net percolation" to groundwater. The potential impacts of net-percolation during the operation of the project and the post-closure phase are discussed as follows.

3.3.2.1 WRSP Hydrologic Setting

As detailed in the MORP (NMCC, 2017) and Discharge Permit Application (THEMAC, 2017), WRSPs 2 and 3 will be built in stages consisting of 75 ft lifts using the end-dumping method.

The end-dumping method partially sorts the waste rock, with the coarser material at the bottom of each lift. The crest of each lift will contain finer-grained material and will be compacted from vehicle traffic; as a result, most of the WRSP surface will limit infiltration of water. The coarser-grained base allows for a free draining toe to the collection system, if saturation were to occur.

As described in Section 1.1, the operating life will be 11 to 12 years. The areal extent of the WRSP 2 and 3 footprints will be fully built out by year 7. Waste rock produced from the mine beyond year 7 will be stockpiled in lifts within that footprint. WRSP 2 and 3 are conceptually illustrated on Figure 3.19.

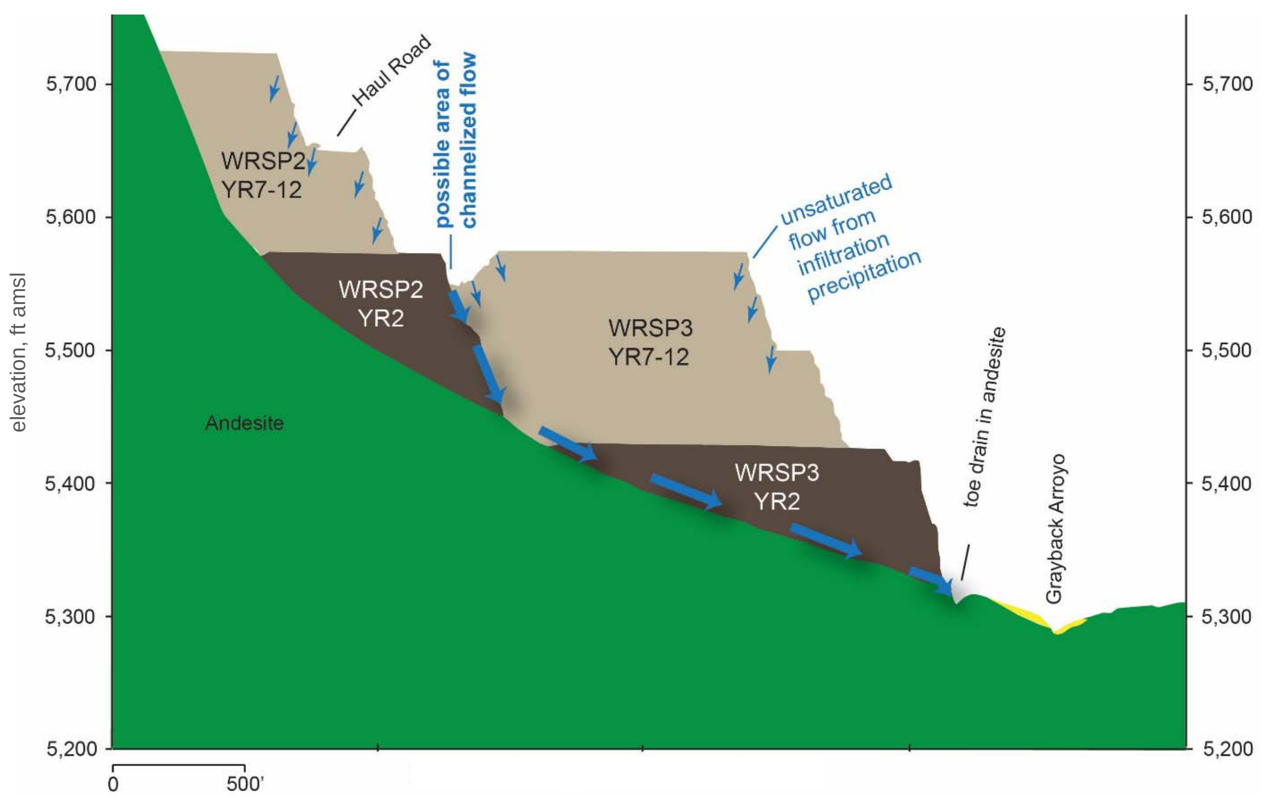

Figure 3.19. Waste rock stockpiles conceptual model.

Surface-water collection trenches will be constructed to collect and route surface runoff and subsurface seepage from the WRSPs as discussed in Section 2.4.2 of the MORP and 20.6.7.J.(6) of the Discharge Plan. Because the WRSP sits on sloping low-permeability andesite (<1.0x10^{-6} cm/s), net percolation to groundwater is not expected.

The WRSP slope areas, which concentrate and channelize the flow of storm water, will be the primary source of water for surface runoff and infiltration along preferential subsurface pathways. Both surface runoff and preferential subsurface flow will drain to the collection system.

The flat WRSP bench areas will be the primary source of water for subsurface infiltration into the main mass of the waste rock. Infiltrated water may be subsequently evaporated, continue to be held in storage in the pore space of the waste rock, or percolate through WRSP preferential pathways.

3.3.2.2 WRSP Operational Conditions

The water balance of the WRSP was evaluated for the period of operations considering climate inputs (precipitation, evaporation, and temperature), surface runoff from the WRSP, preferential subsurface flow, and net percolation through the mass of the waste rock.

Climate inputs were obtained from the record at Hillsboro and used to evaluate runoff and subsurface flow. A total of 67.8 years of complete daily data including precipitation, potential evaporation, and maximum and minimum temperature were available.

Runoff was estimated based on the U.S. Soil Conservation Service Curve Number method (USDA, 1986). A curve number of 80 was chosen based on the recommended range for unvegetated, and compacted surface of finer-grained material representative of the WRSP during operations.

Small precipitation events do not generate runoff, due to evaporation and subsurface infiltration. In addition, daily potential evaporation will likely be greater than the potential for surface infiltration, so stored infiltration from previous days' precipitation will also evaporate.

Based on the selected curve number of 80, precipitation events greater than 0.5 in. are expected to generate runoff. Daily precipitation data indicate an average of 1.4 runoff events per year, averaging 0.73 in./yr of runoff, or 9.6 ac-ft over the 158-acre maximum area.

The 68-year dataset indicates annual runoff ranging from zero to 2.3 in., or zero to 30.3 ac-ft over the 158-acre maximum catchment of the WRSP footprint. This water will be collected in the surface-water collection system.

The estimated daily runoff was subtracted from daily precipitation to obtain the precipitation available for infiltrating the subsurface, as preferential flow or as net infiltration into the main mass of waste rock.

Because the waste rock will be deposited dry, water infiltrating the waste rock will be initially held in void space and will not move downward due to the low moisture content and high negative soil pore-water pressure of the coarse-grained material. Most of this infiltration will be evaporated. Downward percolation can only occur when enough net infiltration has accumulated in the waste rock and the moisture storage potential is depleted. Until there is a minimum level of saturation throughout the thickness of waste rock, piston flow (where infiltration to the top of the pile pushes water out the bottom) cannot occur (Swanson and O'Kane, 1999).

The existing WRSPs at Copper Flat have been in place and un-reclaimed for approximately 30 years, with no observed net percolation through the WRSP or outflow at the base. Climate conditions (low precipitation, high potential evaporation) and waste rock properties (hydraulic conductivity and volumetric water content) ensure that flow through the waste rock could only occur, if at all, after a much longer period of time.

Therefore, infiltration of flow through the proposed WRSPs is not expected during operations. However, channelized (preferential) flow is a common phenomenon for un-reclaimed WRSPs (Smith et al., 1995), and the possibility for preferential flow was considered.

The potential for both preferential flow and for infiltration through the mass of the waste rock were evaluated following a similar example (Keller et al., 2015), utilizing a computer program (MACRO5; Larsbo et al., 2005) developed as a dual-porosity vadose zone model representing both preferential (macropore) flow and normal (micropore) infiltration. Input parameters are presented in Table 3.7.

Table 3.7 Summary of input parameters for MACRO5 model of WRSP operational conditions

property	symbol	unit	macropore value	micropore value
Soil Matrix Potential	Ψb	-cm	1	10
saturated hydraulic conductivity	Ks	cm/s	a	$4.5x10^{-2}$
unsaturated hydraulic conductivity	Kb	cm/s	a	$1.06x10^{-4}$
residual volumetric water content	θr	cm^3/cm^3	0.048	0.048
saturated volumetric water content	θs	cm^3/cm^3	0.215	0.315

a see Keller et al., 2015

Based on Hillsboro climate data and typical hydraulic properties of coarse waste rock from Keller et al. (2015) (see Table 3.7), net infiltration into the waste rock (below effects of evaporation) during operations is expected to range from zero to 6.7 in./yr, and average 1.4 in./yr. Of this infiltration, about 60 percent will be held in waste rock void space, with the remainder discharging to the collection system along preferential pathways. The waste rock saturation level is not expected to generate seepage during the 12-year period of operations for any plausible precipitation scenario. A summary of model-predicted water balance for WRSP operational period is presented as Table 3.8

Table 3.8. Model-predicted water balance for WRSP operational period

component	average rate (in./yr)	percent of total precipitation
total precipitation	12.50	
runoff	0.73	6
net infiltration	1.40	11
evaporation	10.37	83

The preferential flow path analyzed included simulating annual discharge from these pathways ranges from zero to 2.9 in. (39 ac-ft), averaging 0.5 in./yr (7 ac-ft/yr over the 158-acre catchment). As noted above, this water will be collected in the WRSP water collection system.

3.3.2.3 WRSP Post Reclamation Conditions

The Copper Rule (20.6.7 NMAC), requires that a 36-in.-thick store-and-release cover be placed on top of the WRSPs as part of reclamation of the waste rock storage facilities. NMCC's Closure Plan contains such a proposal, therefore, meeting the regulatory requirement.

A store-and-release cover is designed to control infiltration into the underlying waste rock by storing precipitation during storm and snowmelt events and releasing it to the atmosphere (by evapotranspiration) between events. It typically consists of a single well-graded soil layer, but it can also be a two-layer system that features a fine-grained soil layer overlying a coarser-grained layer, which forms a capillary break between the cover and the waste rock.

The effectiveness of a 36-in.-thick cover on water entering the waste rock was evaluated using a numerical model of vadose zone hydraulics (Niswonger et al., 2006) employing the Richards Equations for unsaturated flow and the Hillsboro climate data. Results for the worst-case scenario (without transpiration from vegetative cover) indicate that infiltration to the waste rock would be less than 2 percent of precipitation, or about 0.25 in./yr.

A sample set of cover material hydraulic properties for a single-layer cover that limits infiltration of precipitation, consistent with that proposed by NMCC, is presented as Table 3.9. Storm-water runoff controls and re-vegetation proposed in the Closure Plan further reduce infiltration potential.

Table 3.9. Sample single-layer waste rock cover properties

saturated water content (percent)	20
initial water content (percent)	6
residual water content (percent)	6
Brooks-Corey exponent	2.5
cover thickness (ft)	3.0
saturated hydraulic conductivity (cm/s)	1.0E-04
specific storage (ft^{-1})	1.00E-06

cm/s - centimeter per second

Of the estimated infiltration through the cover, almost all is expected to be released by evapotranspiration or retained in the cover and waste rock. Discharge to groundwater after reclamation will be nil, when considering the reclaimed cover system and low permeability andesite underlying the WRSP.

NMCC has committed to conduct a more detailed analysis of net infiltration when data are available on the material properties of the waste rock and the hydraulic properties of the cover materials. As noted by NMED, the draft DP-1840 requires that additional soil/water characteristic curves for reclamation cover material.

4.0 CONCLUSIONS

The probable hydrologic consequences from development of the Copper Flat Project were evaluated for the mine area and affected area using the numerical model of groundwater flow developed by JSAI (2014).

The objective of this report was to develop a determination of the probable hydrologic consequences of the operation and reclamation, on both the permit area and the affected area, with respect to the hydrologic regime, quantity and quality of surface and groundwater systems that may be affected by the proposed operations (NMAC 19.10.6.602.(13)(g)(v) of the Mining Act regulations).

Groundwater systems include:

- The regional SFG aquifer.
- Quaternary-age alluvial aquifers along Animas Creek and Percha Creek.
- The crystalline bedrock of the Animas Uplift.

Surface water includes:

- Perennial flow in the Rio Grande and Caballo Reservoir that is supplied in part by discharge from the SFG aquifer.
- An area of perennial flow and riparian vegetation along Animas Creek where the Quaternary alluvial aquifer discharges to the surface.
- An area of perennial flow and riparian vegetation along Percha Creek, atop the crystalline bedrock.
- Springs discharging from the crystalline bedrock.
- Storm-water flows in Grayback Arroyo.

The sources of possible hydrologic consequences of the Project include:

1. Groundwater withdrawals from the SFG aquifer: The mine water supply will be withdrawn from pumping wells PW-1, PW-2, PW-3, and PW-4. Water level in the SFG aquifer will be lowered around the well field and then gradually recover after mining. Secondary effects evaluated include:
   a. Reduced groundwater discharge to Rio Grande and Caballo Reservoir.
   b. Reduced flow to artesian wells and other effects to local groundwater users.
   c. Potential reduced discharge to shallow aquifers along Animas Creek and Percha Creek, leading to lower alluvial water levels and reduced discharge to the perennial flow and riparian areas along Animas Creek.
   d. Potential ground subsidence.

2. Groundwater withdrawals from the crystalline bedrock associated with the open pit. Water levels in the bedrock around the pit will be permanently lowered, and groundwater will flow to the pit and evaporate. Groundwater flow rates to the pit and the future open pit water level and water balance area assessed. Secondary effects evaluated include:
   a. Potential groundwater discharge from the open pit.
   b. Potential effects on springs discharging from the crystalline bedrock and on the Percha Creek perennial (riparian) area.
3. Potential for groundwater discharge from the WRSPs and TSF.

4.1 Groundwater Withdrawals From the SFG Aquifer

Water-level drawdown in the SFG aquifer is projected to reach a maximum of about 70 ft at the well field, at the end of mining. Maximum drawdown decreases with distance from the well field. Water levels will then recover over a period of about 20 to 30 years.

Total reductions in discharge to the system are projected to peak at a total of about 3,100 ac-ft/yr shortly after the end of mining, then diminish to near-zero over about 30 years (Fig. 3.3).

- Flow induced from the Palomas Graben north of the study area is projected to reach a maximum of less than 800 ac-ft/yr at the end of mining, which is estimated to result in an additional reduction of discharge to the Rio Grande by a maximum of 275 ac-ft/yr.
- Effects on the shallow groundwater (riparian) systems along Las Animas Creek and Percha Creek are projected to be minimal, with a maximum of less than 2 ft of groundwater-level change on Percha Creek, less than 1 ft of groundwater-level change on Animas, and non-measureable small changes in surface flow and riparian evapotranspiration.
- Depletion to the Rio Grande is projected to peak around 2,080 ac-ft/yr at the end of mining, then reduce to 28 ac-ft/yr 100 years after mining (Fig. 3.3; Table 3.1)
- Groundwater withdrawals for water supply are not expected to result in measurable ground subsidence.

As required by NMOSE, NMCC will offset any reductions in discharge to the Rio Grande by lease or purchase of additional water rights in the amount of the model-simulated reductions to flow.

NMCC will work with the NMOSE to ensure that impairment to existing water rights by NMCC pumping, according to NMOSE criteria, will be mitigated, as appropriate, so that there is no net loss of available water to existing water rights.

No water-quality effects are expected from pumping the proposed supply wells in the affected area.

4.2 Groundwater Withdrawals From the Crystalline Bedrock

At the end of mining, groundwater-level drawdown in the bedrock around the open pit reaches a maximum of about 800 ft at the pit. A permanent cone of depression will form around the pit, with maximum drawdown of about 600 ft at the edge of the pit. The pit, which currently is an evaporative hydrologic sink, will form an evaporative hydrologic sink again in the future.

Final pit water level after mining is projected to be about 4,894 ft amsl, about 640 ft below the pit rim. The open pit water body that forms after mining and rapid fill remediation will be about 250 ft in depth and have a steady-state surface area of about 22 acres. Steady state groundwater inflow is estimated at 36 ac-ft/yr and captured storm-water runoff is estimated at 57 ac-ft/yr. Pit water evaporation is projected to be about 93 ac-ft/yr.

During operations and after reclamation, storm-water flows from Grayback Arroyo will be conveyed around the open pit in the existing bypass channel and through the mine area with no expected hydrologic consequences. Water quality effects for the open pit water body are addressed in a separate report prepared for the project.

Long-term, indirect effects to springs discharging in and around the Animas Uplift are projected to be minimal and not measureable.

4.3 Potential Groundwater Discharge From Tailings and Waste Rock

Infiltration to groundwater from the tailings and waste rock storage areas is not expected. The meteoric water that may infiltrate is expected to remain in the immediate area for centuries, due to the low permeability of the SFG sediments near the Animas Uplift and due to the presence of flow-inhibiting faults. The impact to groundwater chemistry is expected to be minimal.

5.0 REFERENCES

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APPENDICES

Appendix A.

Projected Groundwater-Level Hydrographs at Selected Locations

APPENDIX A.

HYDROGRAPHS

Projected groundwater drawdown 100 years after mining is shown on Figure A1. Water-level change in the bedrock will be about 580 ft near the bottom of the pit. Water levels in the bedrock near the pit rapidly equilibrate to the pit water level. The rate of propagation of the drawdown away from the pit is a function of the low permeability of the andesite bedrock. Locations closer to the pit reach equilibrium sooner (see Fig. A20) than locations farther from the pit (see Fig. A22). By 100 years post-mining, the propagation of drawdown has essentially stopped; the contours in Figure A1 represent the post-mining equilibrium condition.

Projected water-level hydrographs for most well locations shown on Figure A1 are shown on Figures A2 through A23.

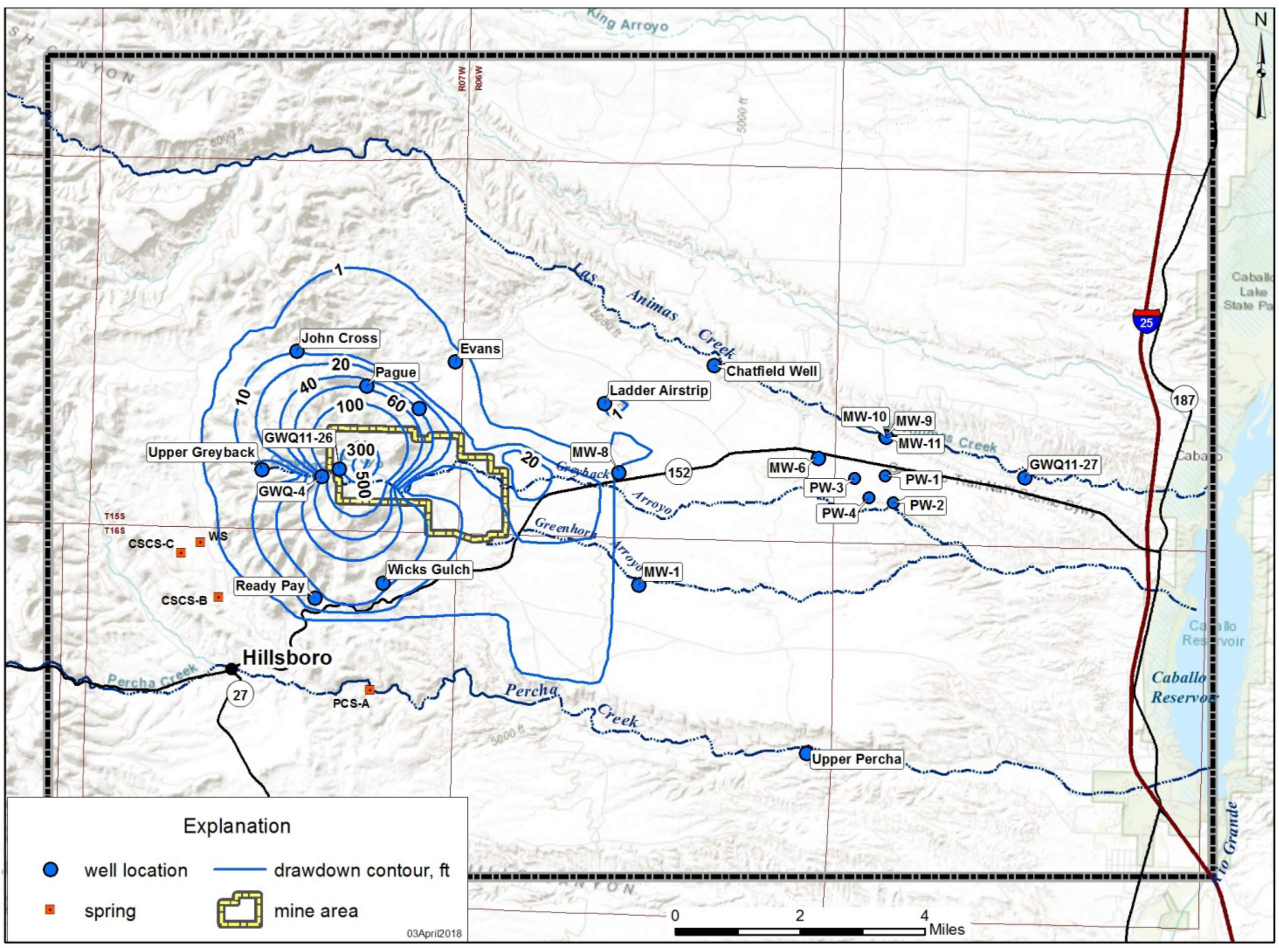

Figure A1. Projected groundwater drawdown 100 years after mining.

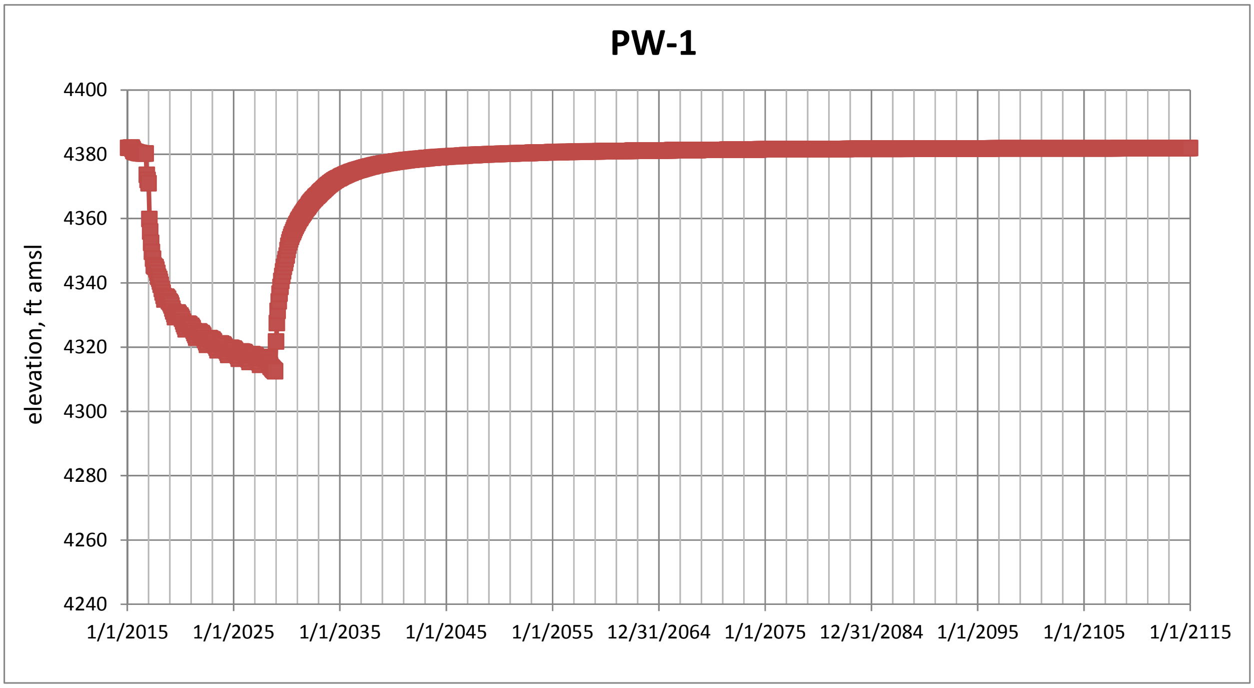

Figure A2. Projected water levels at PW-1.

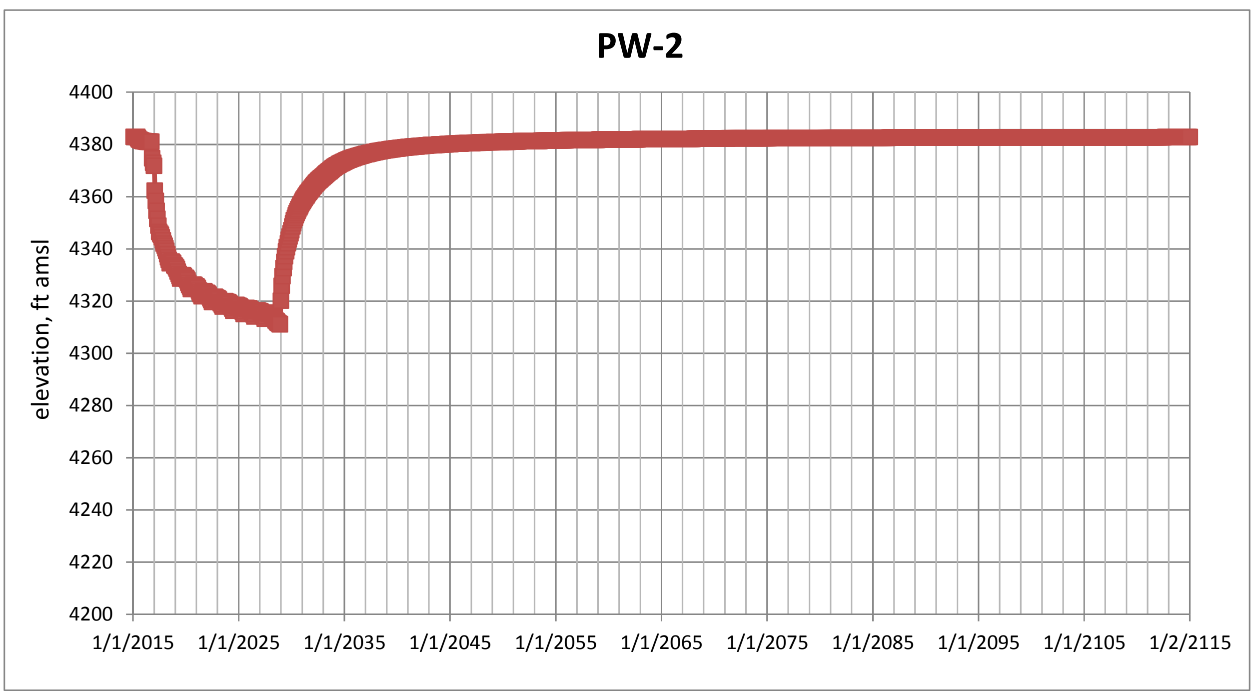

Figure A3. Projected water levels at PW-2.

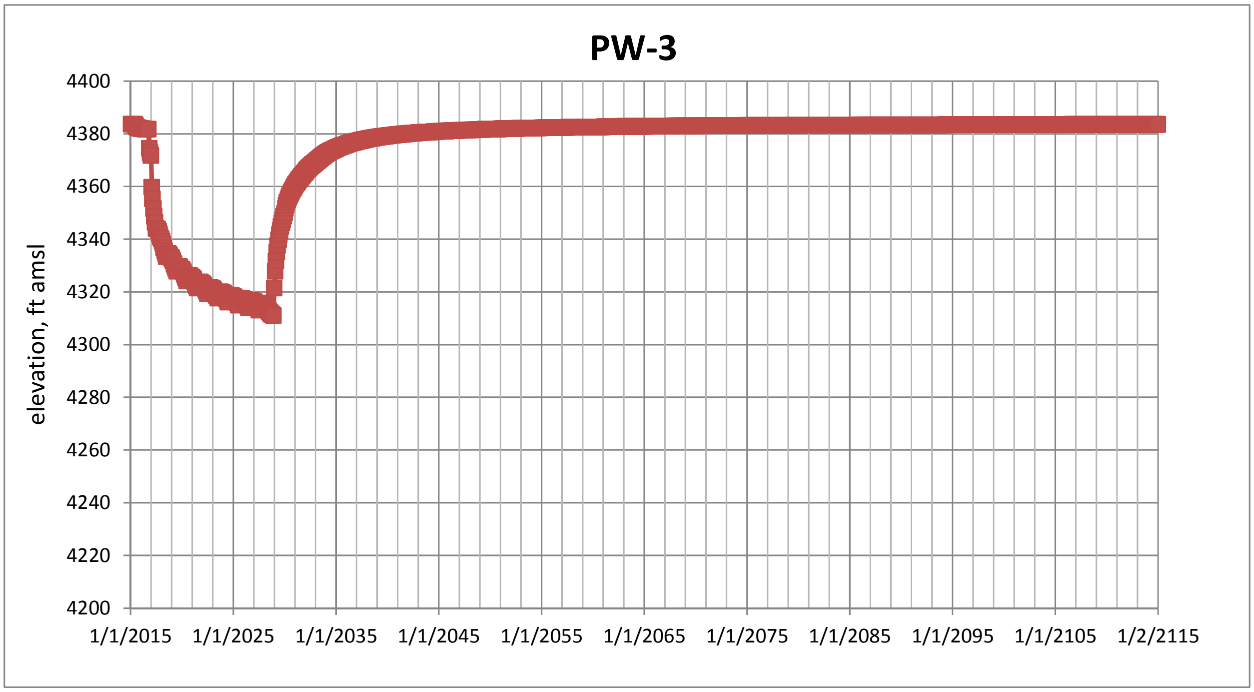

Figure A4. Projected water levels at PW-3.

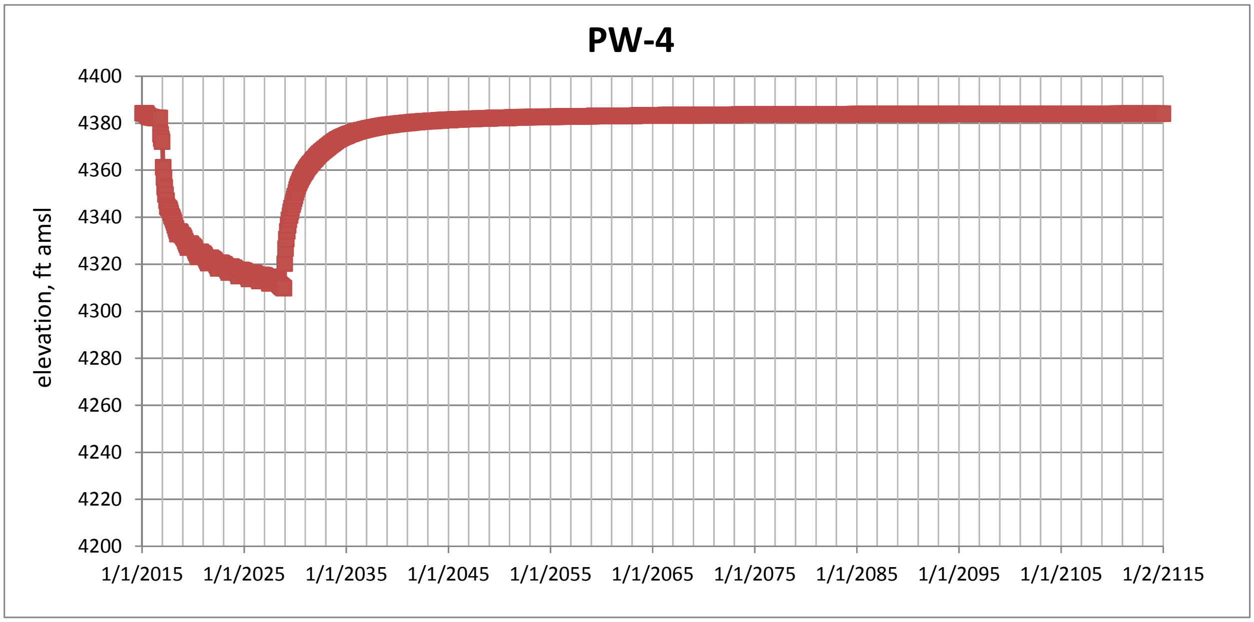

Figure A5. Projected water levels at PW-4.

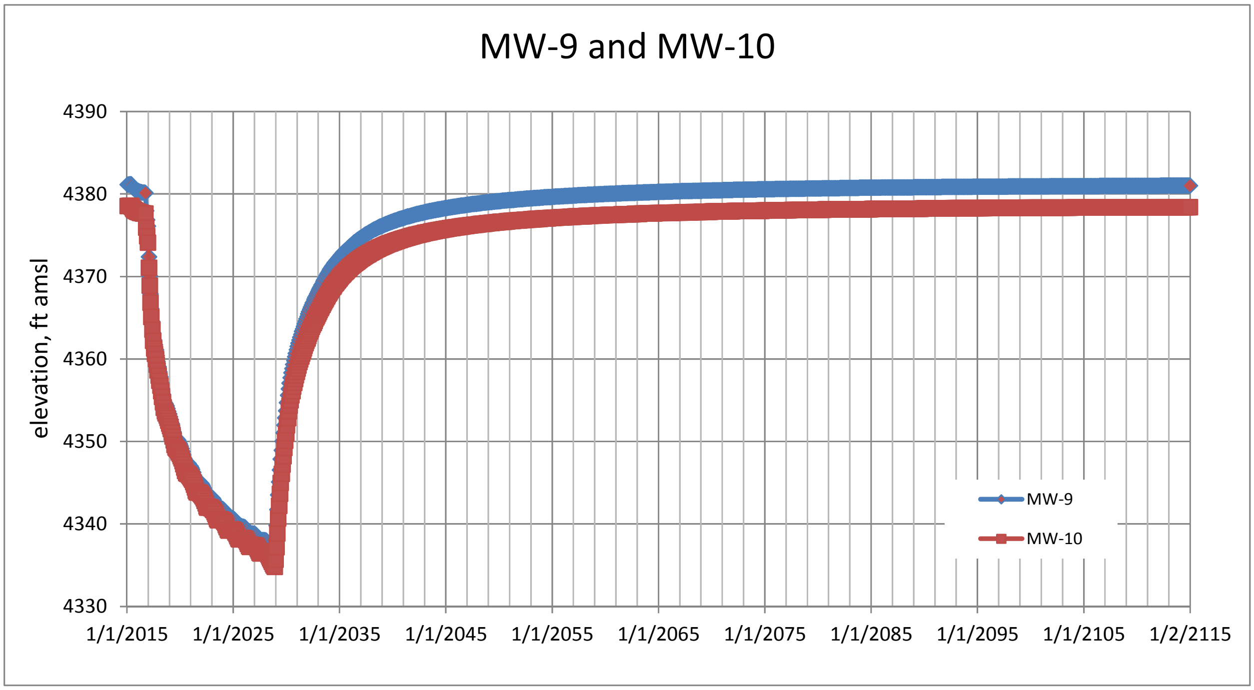

Figure A6. Projected water levels at MW-9 and MW-10.

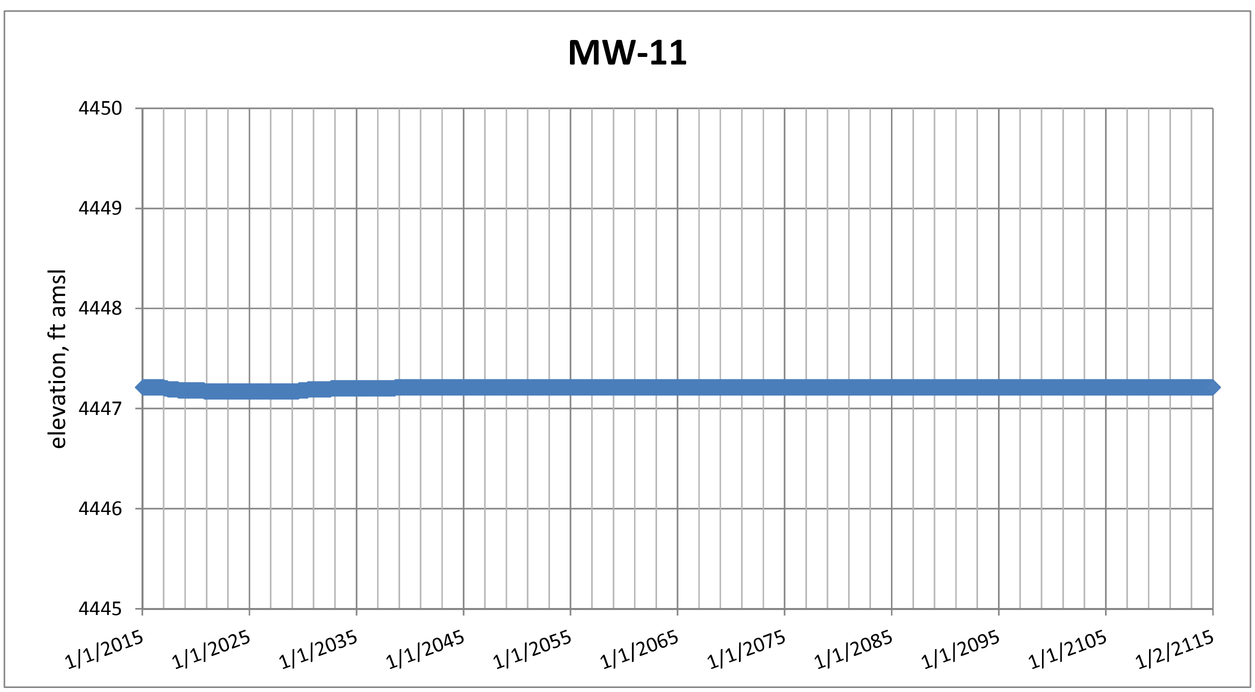

Figure A7. Projected water levels at MW-11.

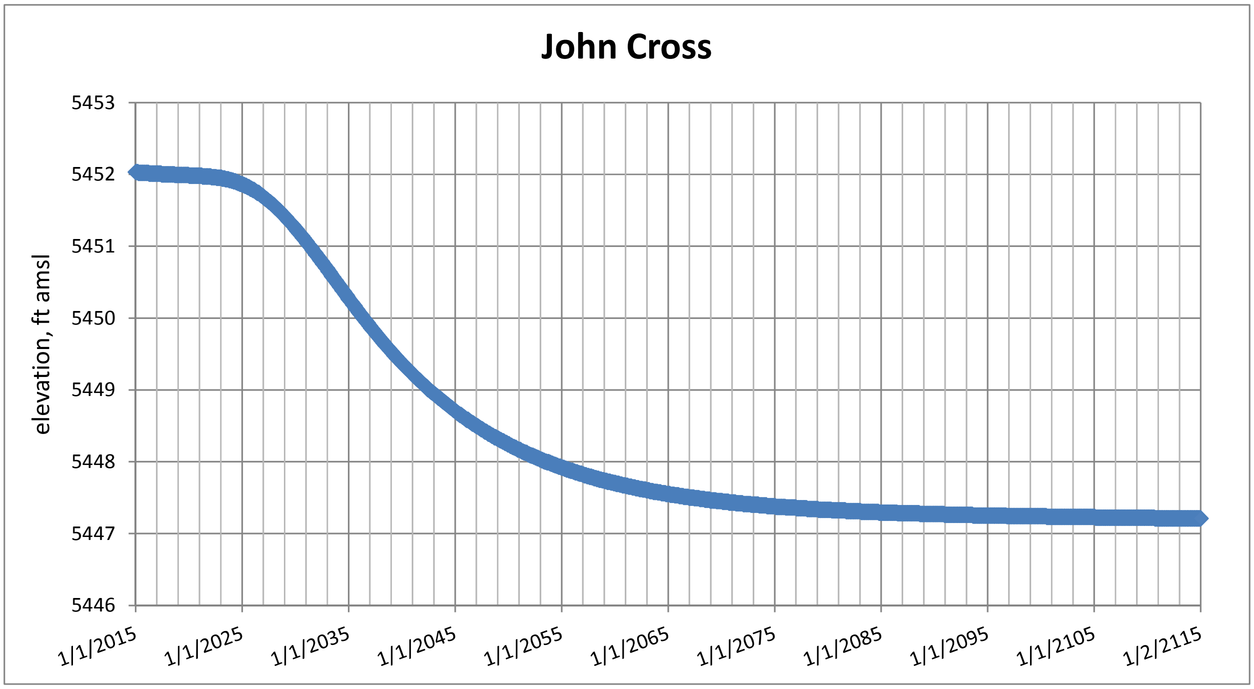

Figure A8. Projected water levels at John Cross.

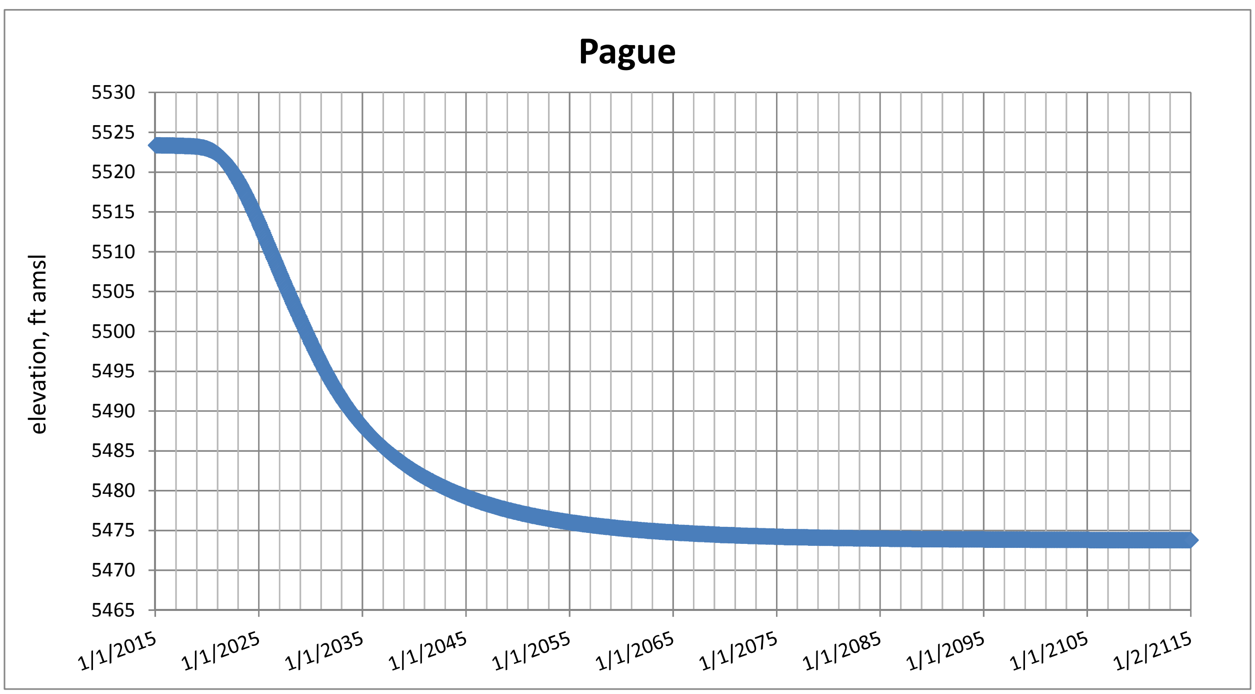

Figure A9. Projected water levels at Pague.

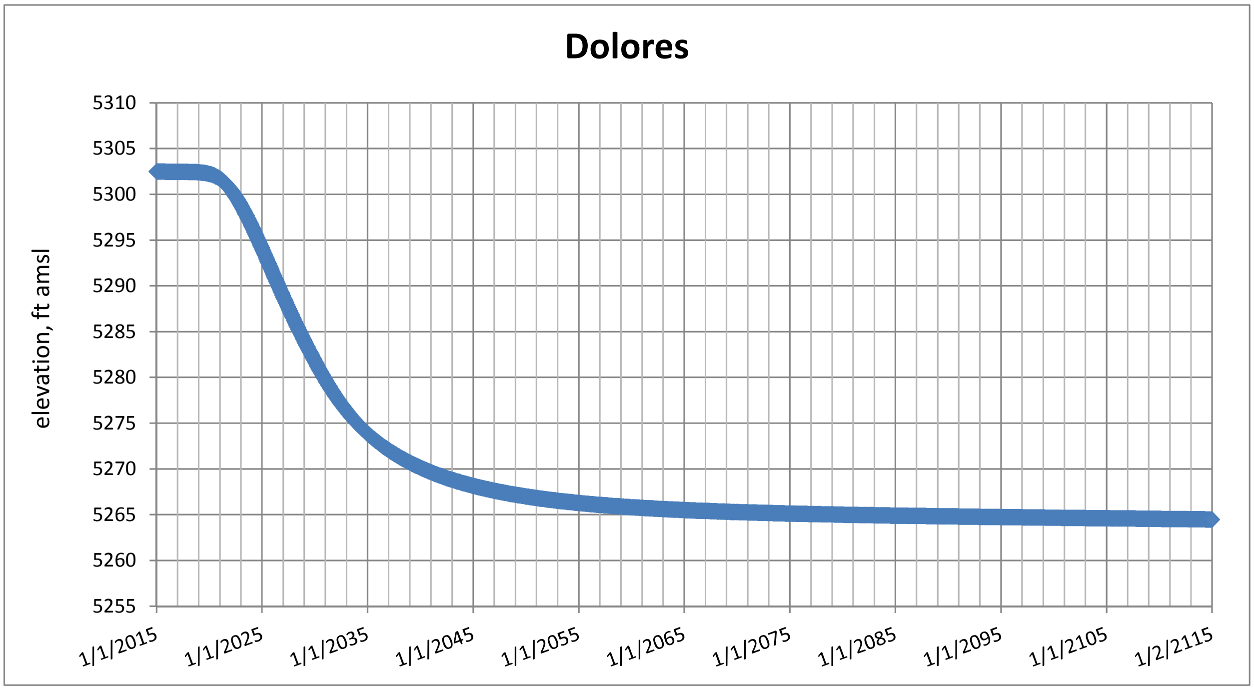

Figure A10. Projected water levels at Dolores.

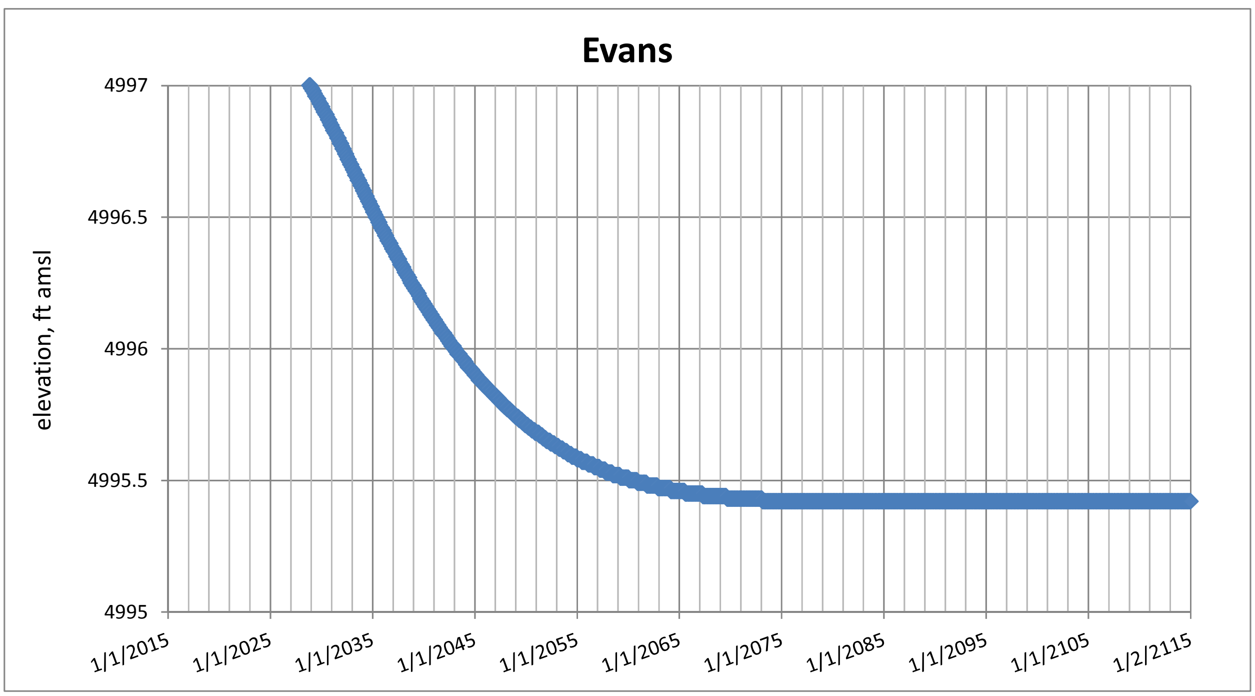

Figure A11. Projected water levels at Evans.

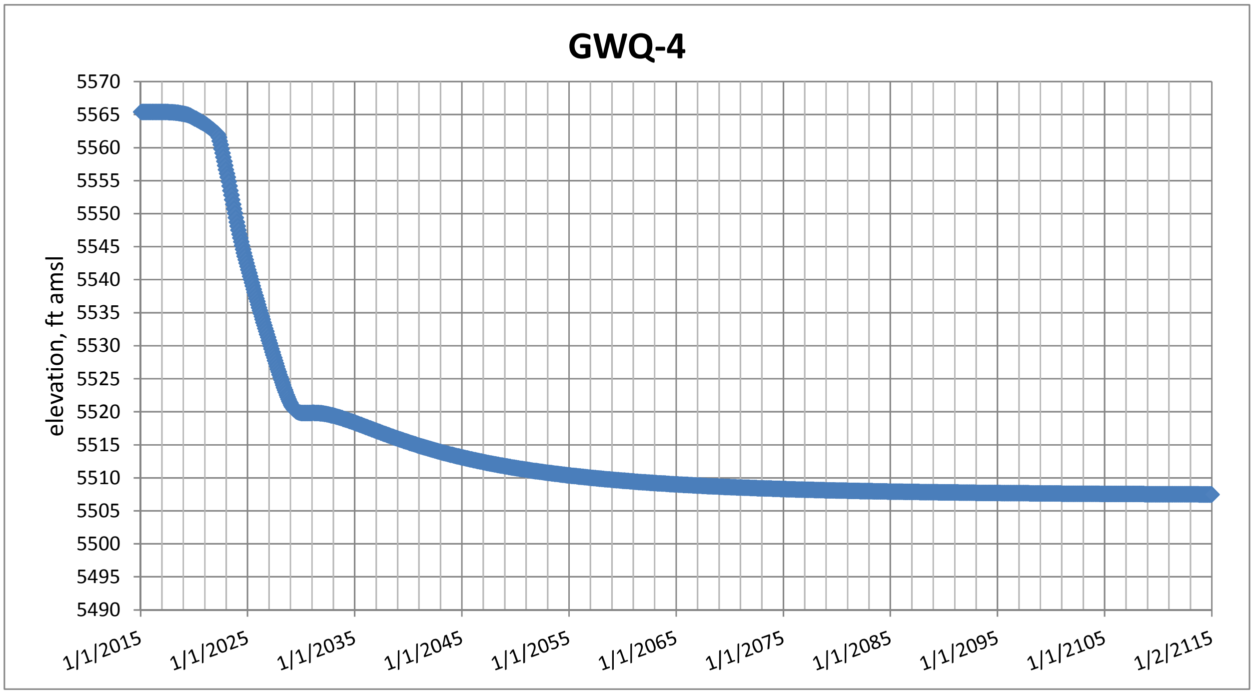

Figure A12. Projected water levels at GWQ-4.

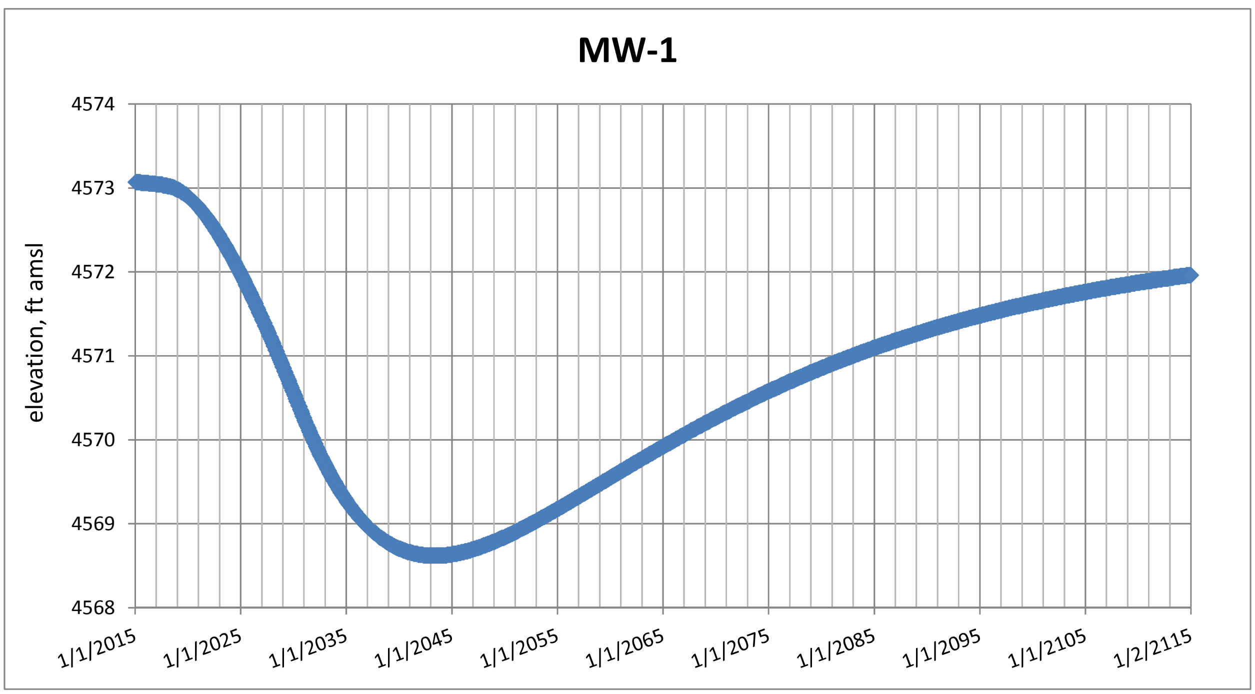

Figure A13. Projected water levels at MW-1.

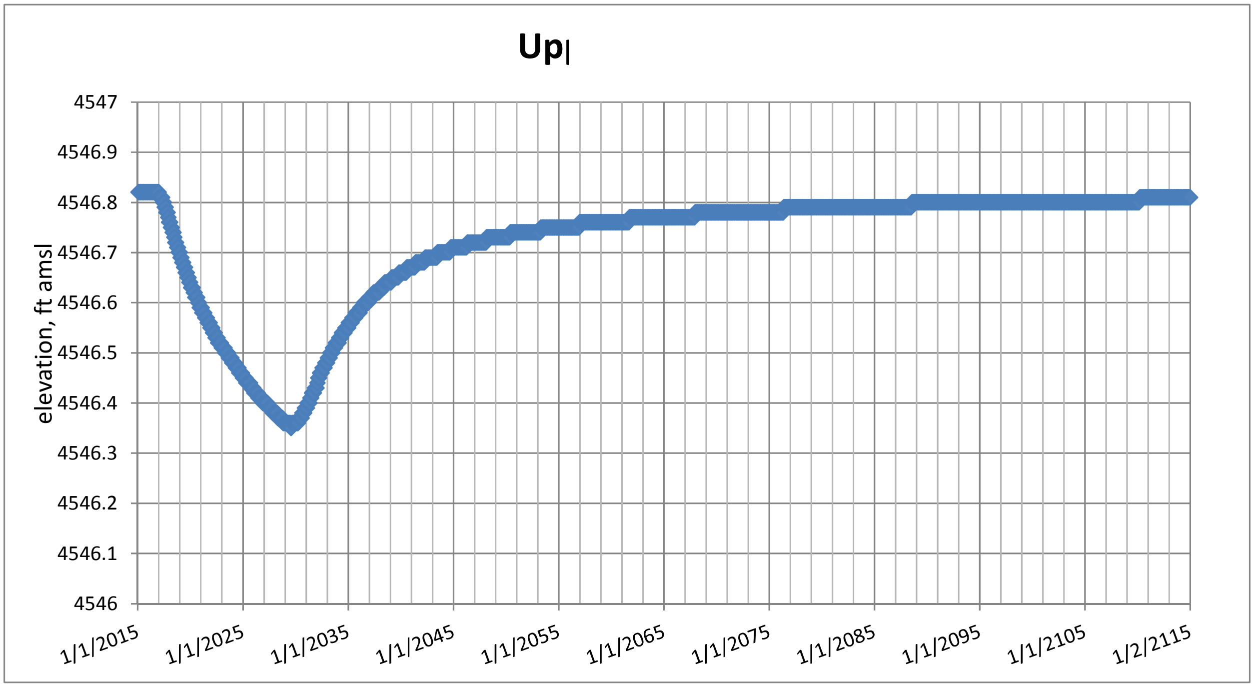

Figure A14. Projected water levels at Upper Percha.

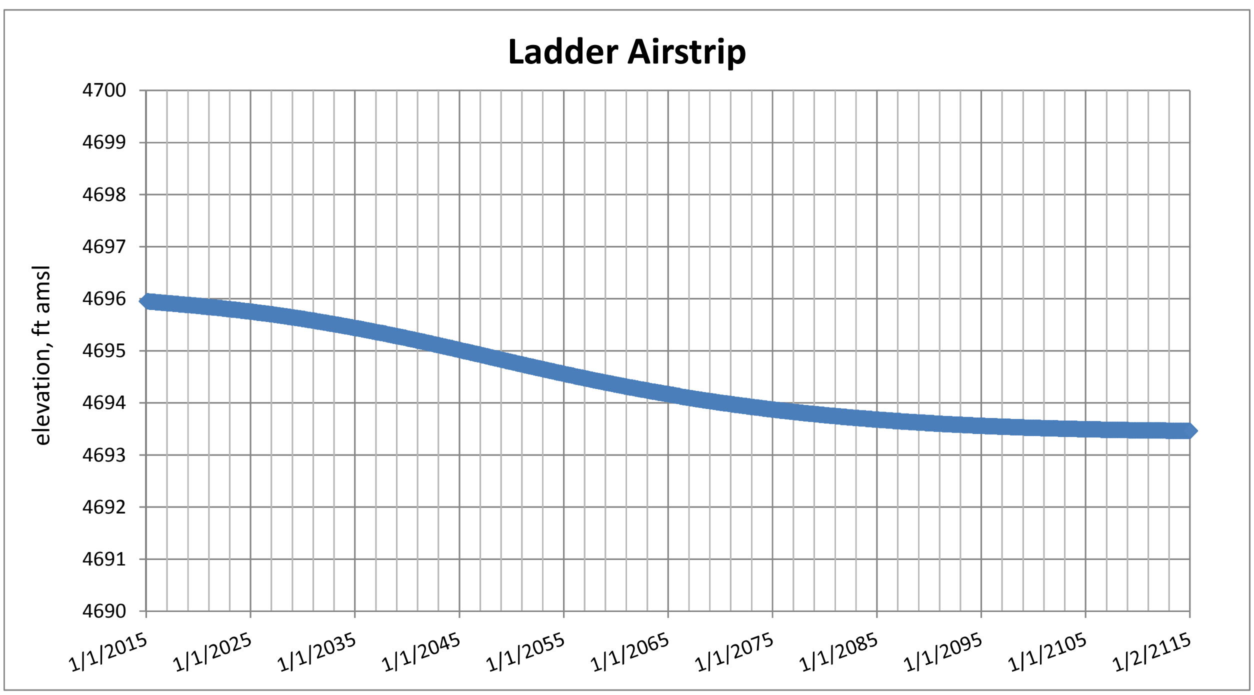

Figure A15. Projected water levels at Ladder Airstrip.

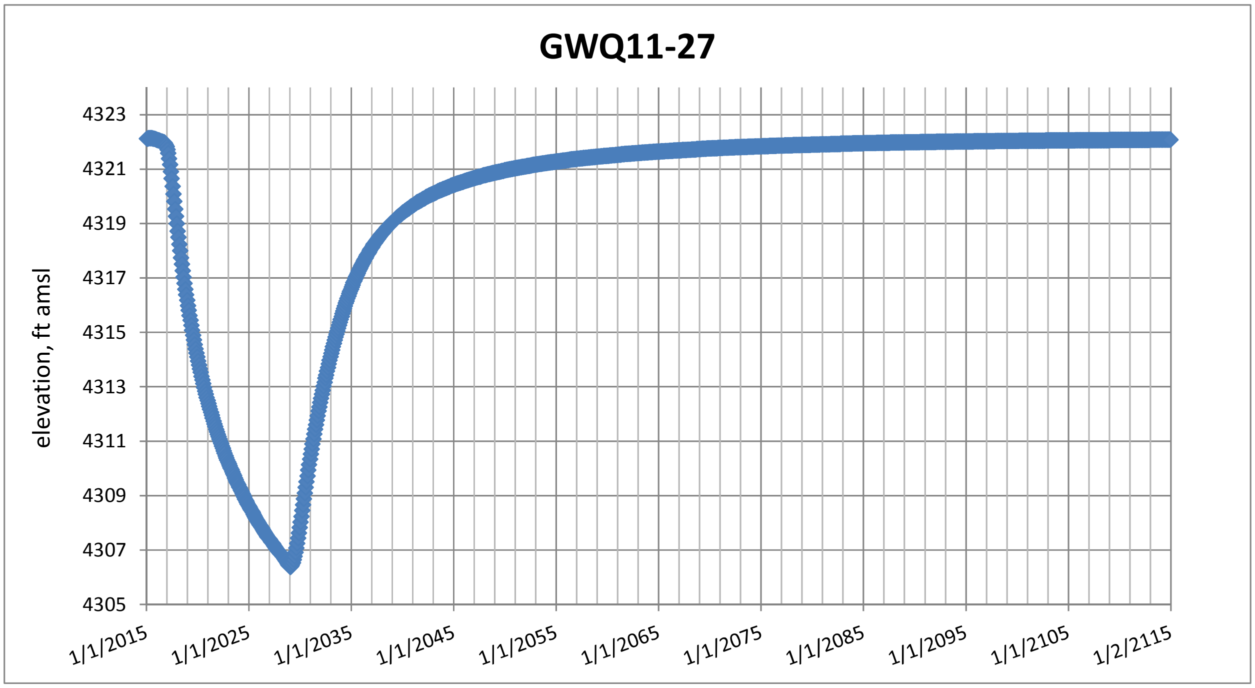

Figure A16. Projected water levels at GWQ11-27.

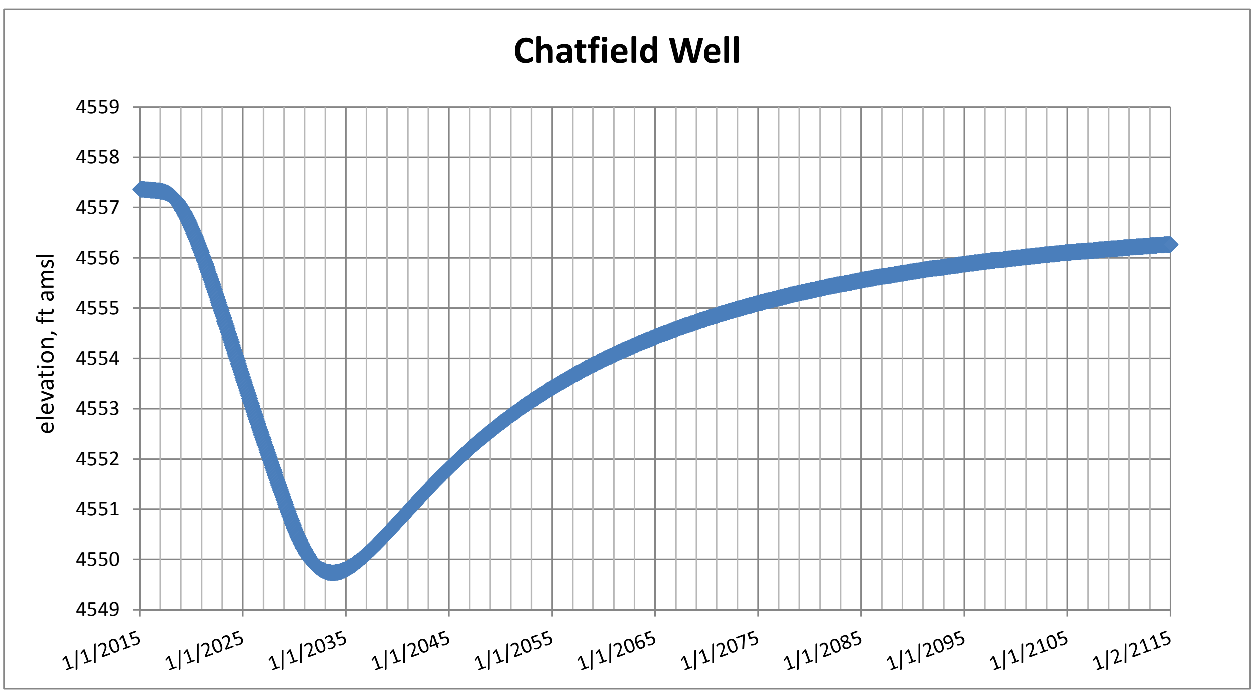

Figure A17. Projected water levels at Chatfield Well.

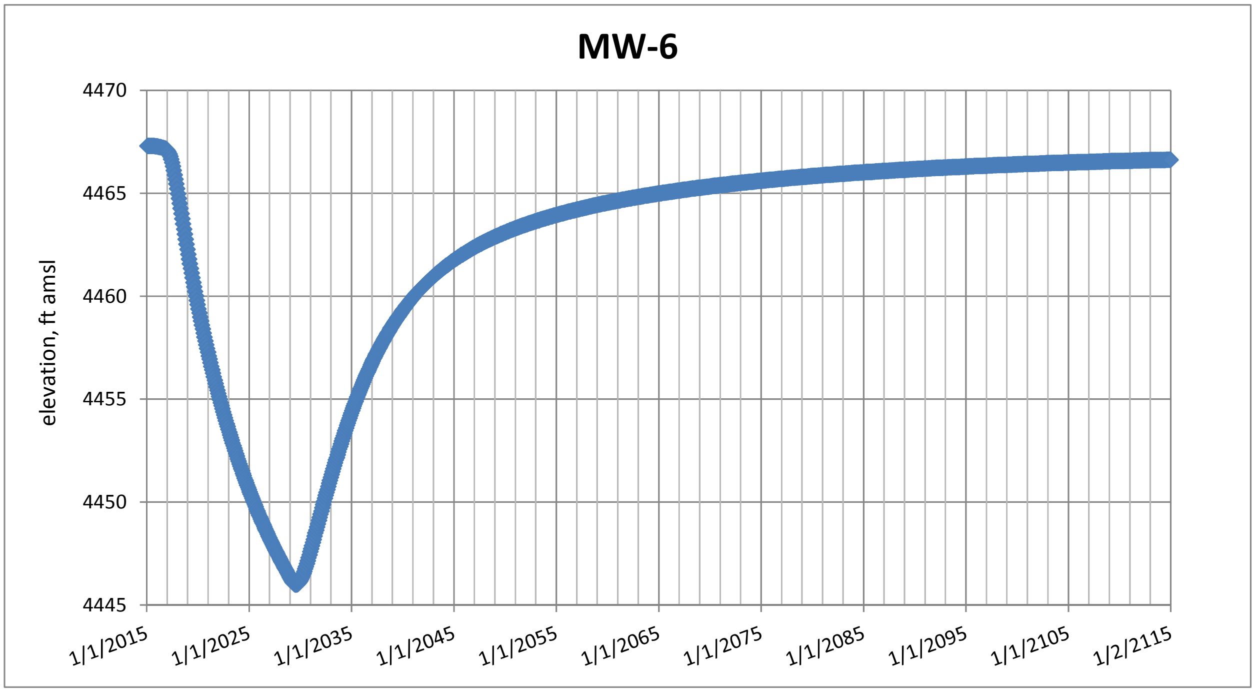

Figure A18. Projected water levels at MW-6.

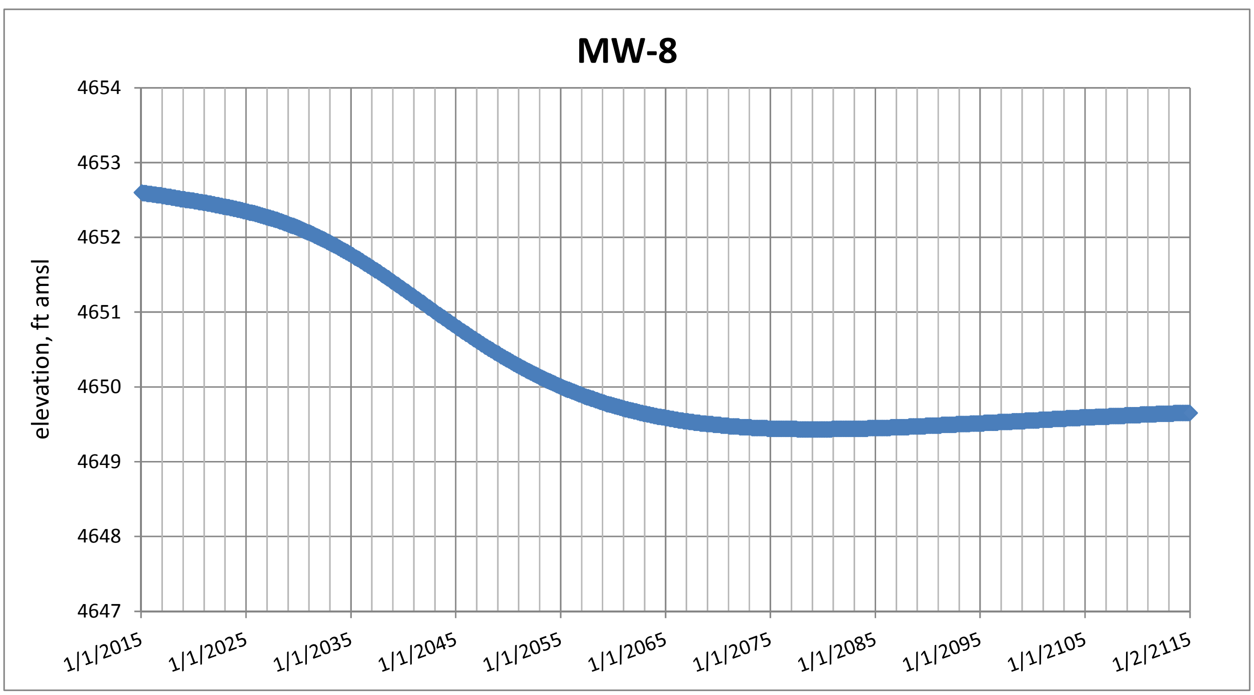

Figure A19. Projected water levels at MW-8.

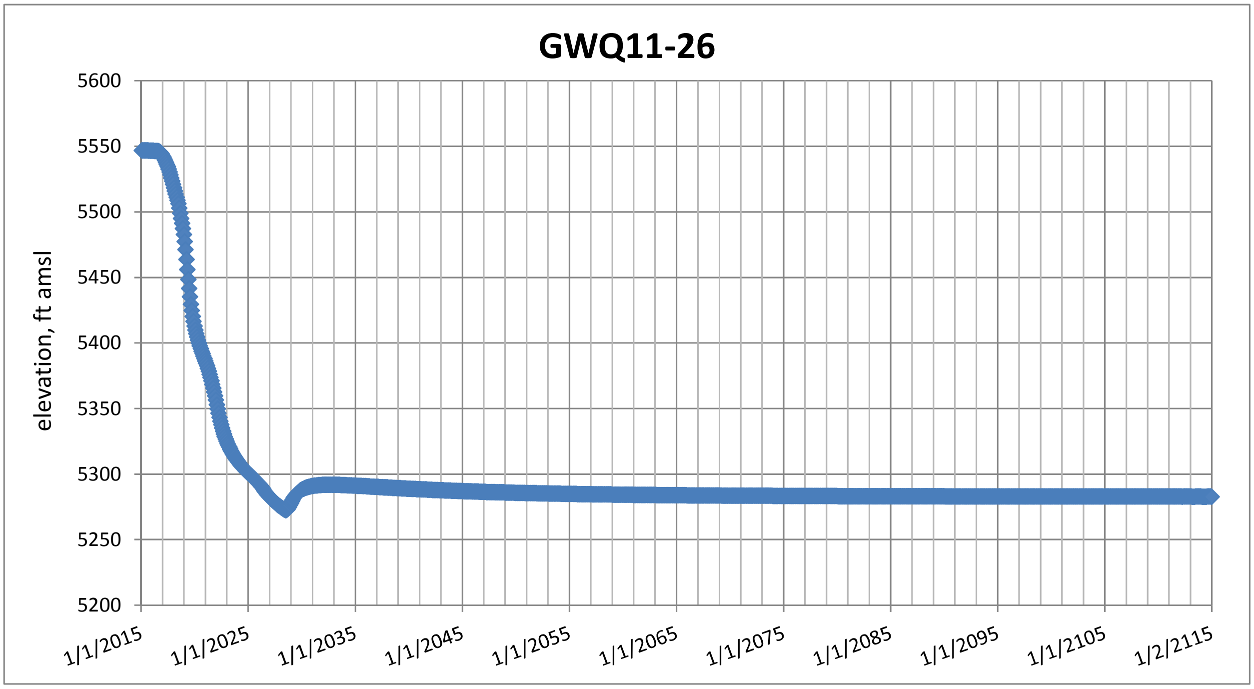

Figure A20. Projected water levels at GWQ11-26.

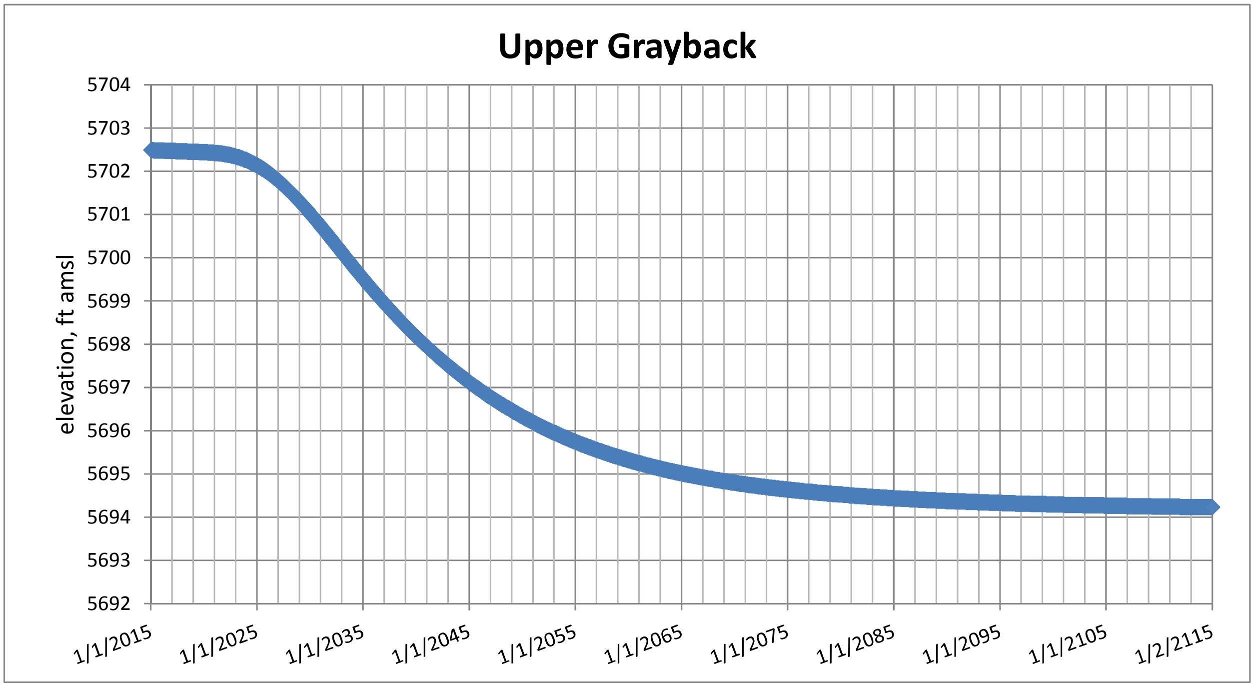

Figure A21. Projected water levels at Upper Grayback.

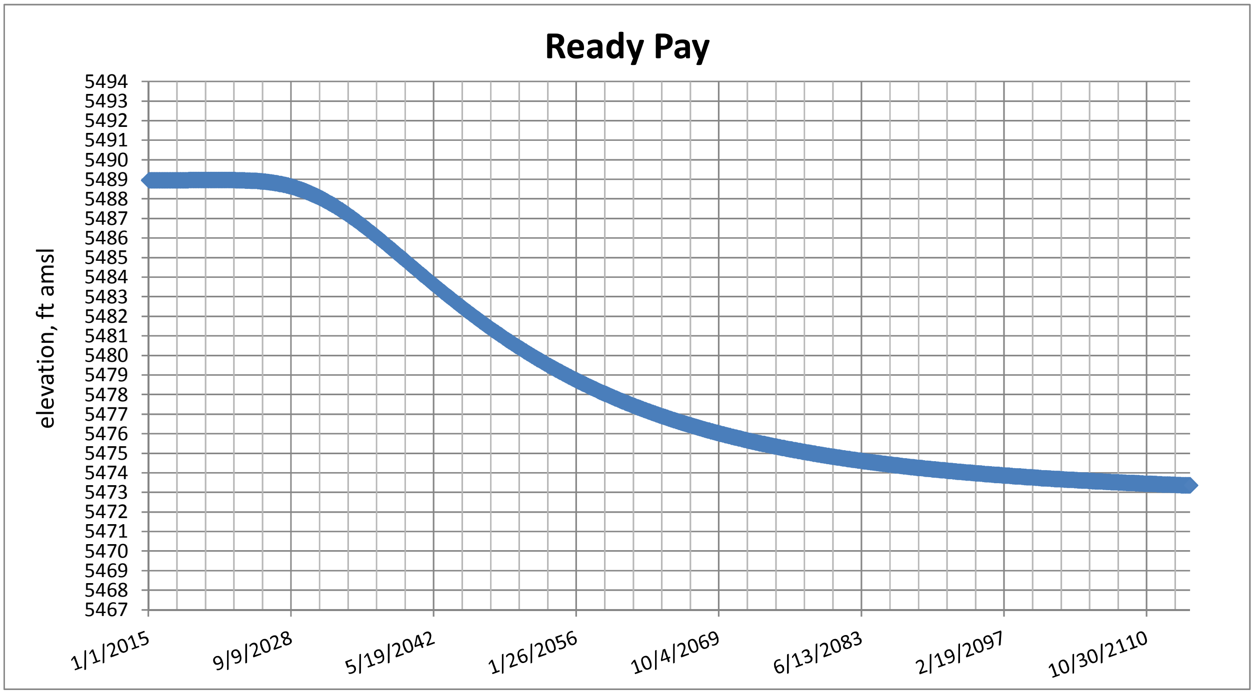

Figure A22. Projected water levels at Ready Pay.

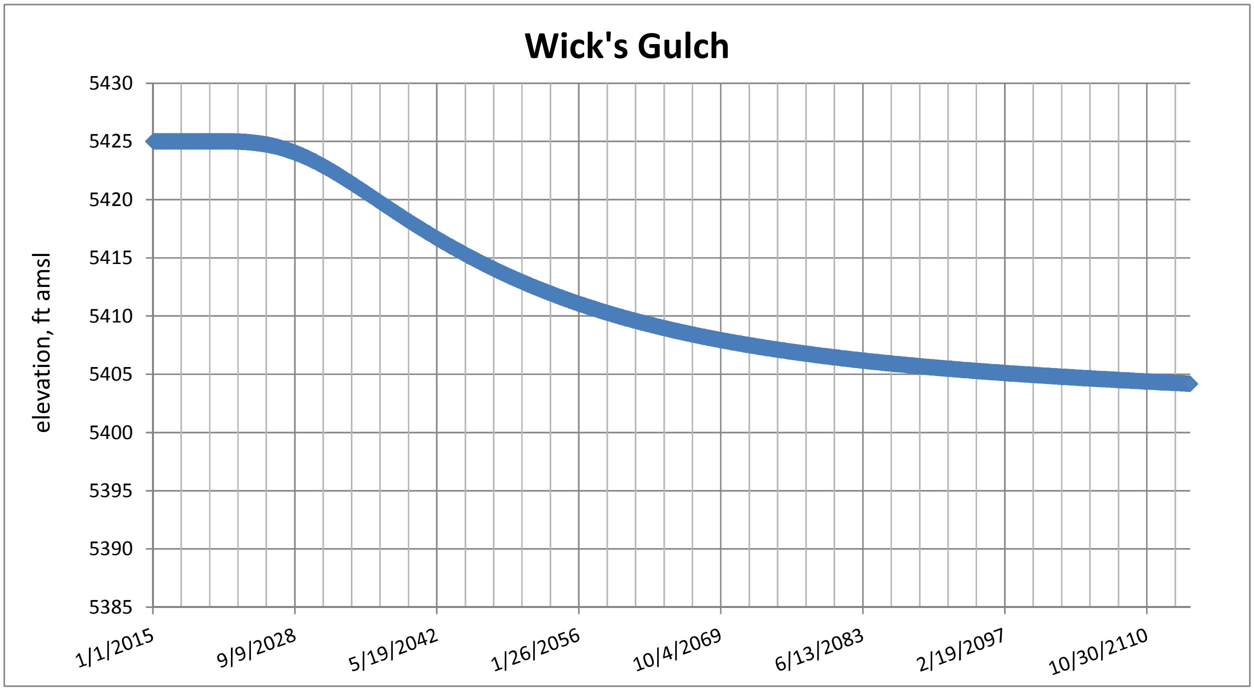

Figure A23. Projected water levels at Wick's Gulch.

Appendix B.

Technical Memo Regarding Liner Leakage Rates

JOHN SHOMAKER & ASSOCIATES, INC.
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MEMORANDUM

To: JSAI Internal Memo

From: Michael A. Jones, Principal Hydrologist

Date: December 8, 2010

Subject: liner leakage projection

Introduction

Synthetic liners have been widely used in the modern mining industry to minimize/eliminate mine contact water intrusion to the surrounding surface water and groundwater systems. Even though the liner materials are virtually impermeable, holes and tears regularly occur and synthetic liners leak. In general, the leakage rates depend on many factors including liner quality, installation quality, stress due to weight of the impounded material and traffic, water pressure on the liner, over-liner/under-liner material hydrogeologic and geotechnical properties and conditions, and so on.

Environmental Impact Assessment (EIS) on any new project always requires estimating leakage through the lined mine facilities including leach pads, tailing storage facilities (TSF), contact water ponds, and waste rock dumps. Based on the estimated seepage (source) and hydrologic properties of the underlying aquifers (receiver), evaluation of solute transport downstream can be carried out using numerical or analytical methods. In certain circumstances, the liner leakage must be estimated in order to properly design the seepage collection systems.

Various assumptions and methods have been used by different professionals to estimate liner leakage. Depending on which firm is contracted, different seepage estimates can be obtained for the same facility.

This memorandum intends to provide guidance on how to estimate liner leakage for future projects. Standardizing the approach will make the liner leakage estimates more defendable and irrelevant to the selection of consulting firm.

Liner Defect Assumptions

There are few papers on the size and frequency of occurrence of defects in liners (Erickson and Thiel, 2002; Colucci and Lavagnolo,1995; Rowel, 2005). The studies are generally in agreement. In a 3-year field study, Colucci and Lavagnolo (1995) found that the size of liner defects in waste landfills varies substantially with a median hole area of about 1 cm2 (Table 1).

Holes can be detected by electrical leak survey. Rowel et al. (2005) found that (1) no holes were detected for 30% of electrical leak surveys, and (2) fewer than 5 holes/ha were detected for 50% of the surveys with remaining 20% surveys having more than 5 holes/ha.

Some analyses have assumed a more frequent occurrence of smaller defects. In an EPA funded study, defect hole diameters were assumed to be 0.3 and 1 cm, but the corresponding numbers of holes were assumed to be 9 and 3.6 hole/ha, respectively (Barlaz et al., 2002).

Table 1. Reported size of holes in geomembranes (after Colucci & Lavagnolo, 1995)

Leak area (mm^2)	Equivalent radius for circular hole, r_o (mm)	Percentage (%)	Cumulative percentage (%)
0-20	0-2.5	23.2	23.2
20-100	2.5-5.64	26.3	49.5
100-500	5.64-12.6	28.2	77.7
500-1000	12.6-17.8	8.8	86.5
10^3-10^4	17.8-56.4	7.8	94.3
10^4-10^5	56.4-178	4.5	98.2
10^5-10^6	178-517	1.2	100

For estimating liner leakage, we recommend using the following assumptions for the occurrence and size of liner defects:

- 1 circular defect per acre (or 2.5 defects per hectare)
- Area of defect = 1 cm^2 (equivalent hole diameter of about 1.13 cm)

These recommendations are in agreement with Giroud and Bonaparte (1989) for calculations to size the components of the lining system, and have been used by some consulting firms.

Liner Leakage Equation 1 (for non TSF Facility)

We recommend an equation (Giruoud et al., 1997) to estimate liner leakage for non TSF facilities. The equation represents an impeded flow condition with a geomembrane underlain by a low permeable medium such as a (compacted) soil foundation.

The Giruoud et al. (1997) Equation is listed below:

$$q = \beta_c \left[1 + 0.1 \left(\frac{h_w}{L_s} \right)^{0.95} \right] a_d^{\ 0.1} h_w^{\ 0.9} K_s^{\ 0.74}$$

q =	leakage through a circular defect in composite liner (m^3/sec)
β_c =	coefficient relating to liner contact (0.21 for good and 1.15 for poor)
h_w =	depth of water above the geomembrane (m)
L_s =	thickness of soil liner (m)
a_d =	area of defect (m^2)
K_s =	saturated hydraulic conductivity of soil liner (m/s)

It should be noted that, in the above equation, the leakage rate has a non-linear relationship with the area of the defect. Therefore, the leakage through a single hole should be calculated first; then total leakage through the facility should be calculated based on the total number of defect holes within the facility footprint.

Liner Leakage Equation 2 (for TSF Facility)

The Giruoud et al. (1997) Equation is only suitable for lined leach pads, waste dumps and landfills where leakage is only impeded by defect size and conductance of the underlying soil liner. In a TSF, however, seepage through a liner defect will be most likely restricted by the permeability of tailings around the hole. In other words, hydraulic properties of both the over-liner tailings and the under-liner soil restrict the flow of water through the defect.

Coffey (Appendix A) has proposed an analytical solution to calculate liner leakage through a defect confined by both aquifers:

$$Q = (h_T - h_A)\ \pi\ D_H / (1/k_T + 1/k_A) \qquad (1)$$

Where, Q is leakage rate through a defect; hT and hA are, respectively, total head in the tailings and in the underlying soil; kT and kA are, respectively, hydraulic conductivity of the tailings and underneath soil; and DH is the diameter of the defect.

If the underlying soil is not pressurized, i.e., in an unsaturated condition, the above equation can be simplified to:

$$\boldsymbol{Q} = h_T \, \pi \, D_H \, k_T \qquad (2)$$

Derivation of equations is provided in Appendix A. We have reviewed and verified the Coffey work and found it is correct mathematically.

The analytical solution proposed by Coffey was also validated by John Shomaker & Associates, Inc. (JSAI) using a spreadsheet-based numerical model and U.S. Geological Survey (USGS) finite difference code MODFLOW. Results obtained for an example problem, using both analytical and numerical solutions, are compared in Table 2. Apparently, they are in close agreement.

Table 2. Calculated seepage through a defect - numerical and analytical solutions

	Case
D_H (cm)	1.128
A (cm^2)	1.000
h_T(m)	30
K_T (cm/s)	1.00E-06
Coffey - Eq2 Q (cm^3/s)	0.011
JSAI - Spreadsheet Q (cm^3/s)	0.011
JSAI - MODFLOW Q (cm^3/s)	0.012

Discussion

Rowe (2005) reports landfill liner seepage as detected by liner detection systems (LDS) for various liner configurations (Table 3). It was found that (1) average leakage rates through single geomembrane liners were between 130-190 liters per ha per day (lphd), and (2) average leakage rates through geomembrane plus compacted clay liners were between 50- 90 lphd.

The following assumptions were used in an example calculation:

> β_c = 0.21, h_w = 60 cm, L_s = 30 cm, a_d = 0.0001 m^2, K_s =1.00E-7 m/s, and defect frequency (n) is 1 hole/acre,

Estimated liner leakage from the Giruoud et al. (1997) Equation is:

$$Q = n \times q = 36 \text{ liters/acre/day} = 89 \text{ liters/ha/day (lphd)}$$

The calculated result is in close agreement with the Rowe (2005) field measurements. Therefore, we suggest a general rule that leakage of a lined leach pad (or waste dump) is likely about 100 lphd.

Table 3. Field-measured liner seepage (after Rowe, 2005)

Liner/stage	No. of cells	Average monthly flows: lphd			Peak monthly flows: lphd		
		Mean*	SD†	Max‡	Mean*	SD†	Max‡
Single liner: GM alone							
Active	25	190	330	1600§ 790¶	360	610	3070§ 1830¶
Post-closure	6	130	120	330	330	30	1130
Composite GM/GCL liner							
Active	22	1·5	2·7	11¶	9	16	54¶
Post-closure	5	0·6	0·9	2	4	5	10
Composite GM/CCL or GM/GCL/CCL liner							
Active	11	90	90	370§ 260¶	250	370	1990§ 1240¶
Post-closure	3	50	50	220	60	90	250

*Mean and †standard deviation of reported average and peak average monthly flows: these were obtained for different cells over different periods, and include data obtained for systems with sand, gravel and GN LDS.
‡Maximum value reported.
§Largest value reported, but it is for sand LDS and so may reflect stored water in the LDS shortly after construction.
¶Largest value for liner system with GN LDS.

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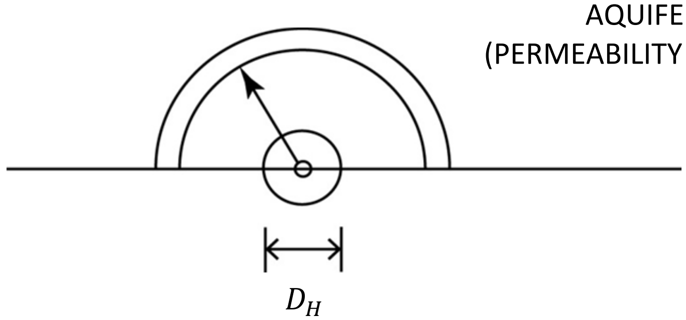
Appendix A

Seepage Loss through a Circular Hole in Geomemberance
(Coffey, 2010)

CONSIDER SEEPAGE LOSS THROUGH A CIRCULAR HOLE OF DIAMETER D_H
IN A MEMBRANE SEPARATING TWO MATERIALS OF DIFFERENT PERMEABILITY.

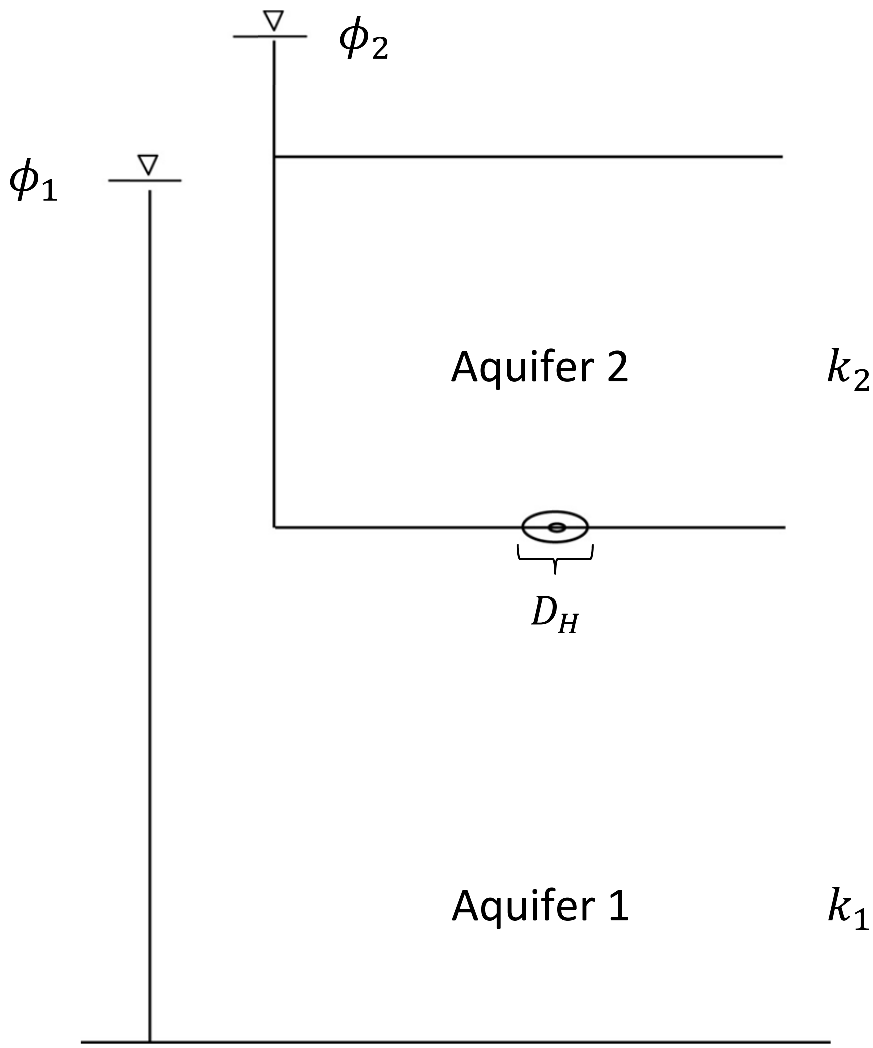


$$Q = k \overbrace{2\pi r^2}^{\textit{area of half sphere}} \frac{d\phi}{dr}$$

Under steady state, Q is uniform over r

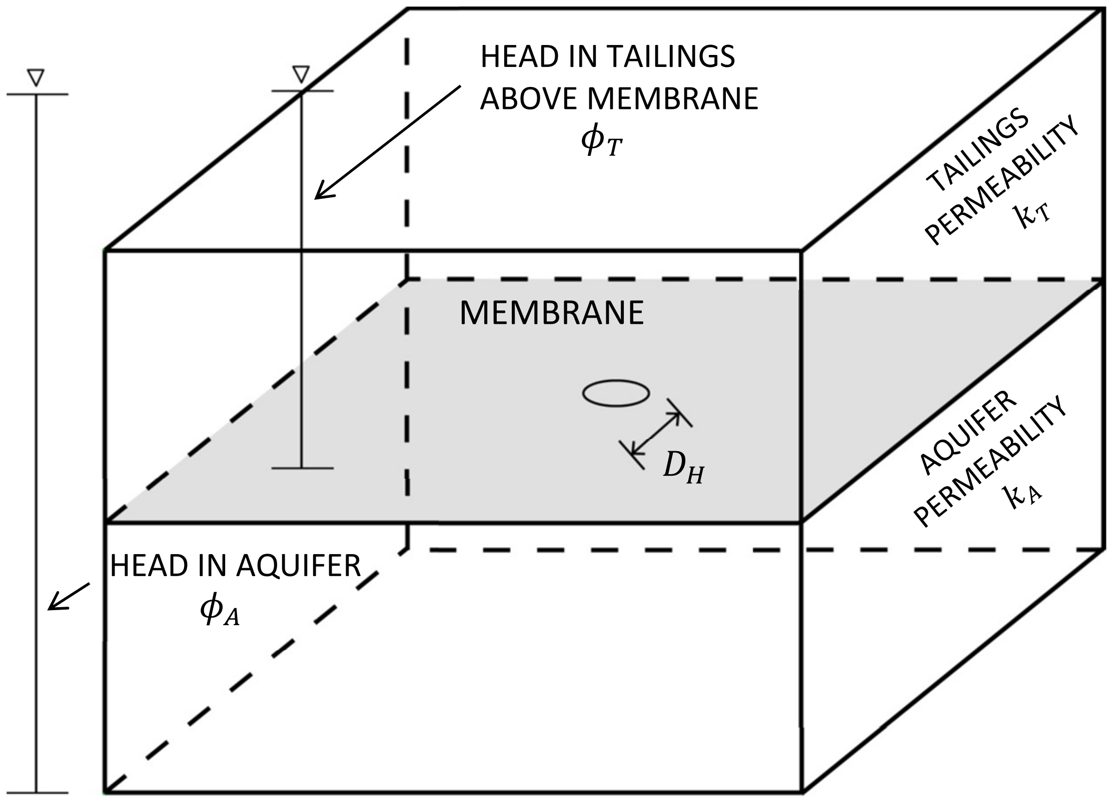
$$\phi = \int_{r_a}^{\infty} \frac{Q}{2\pi k r^2} dr = -\left[\frac{Q}{2\pi k r}\right]_{r_a}^{\infty} = \frac{Q}{2\pi k r_a}$$

Head loss to hole: $\Delta\phi = \frac{Q}{\pi k D_H}$ (noting $2r_H = D_H$)



$$\phi_2 - \phi_1 = \frac{Q}{\pi D_H k_2} + \frac{Q}{\pi D_H k_1} = \frac{Q}{\pi D_H}\left(\frac{1}{k_2} + \frac{1}{k_1}\right)$$

$$Q = \frac{\pi D_H(\phi_2 - \phi_1)}{\left(\frac{1}{k_2} + \frac{1}{k_1}\right)}$$



LEAKAGE THROUGH HOLE OF DIAMETER D_H:

$$\boxed{Q = \frac{\pi D_H(\phi_T - \phi_A)}{\left(\frac{1}{k_A} + \frac{1}{k_T}\right)}}$$

$Q = \pi \phi_T k_T D_H$ for fully drained layer below

Predictive Geochemical Modeling of Pit Lake Water Quality at the Copper Flat Project, New Mexico

Report Prepared for

THEMAC Resources Group Ltd.

Report Prepared by

SRK Consulting (U.S.), Inc.
SRK Project Number 191000.03
May 2018

Predictive Geochemical Modeling of Pit Lake Water Quality at the Copper Flat Project, New Mexico

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Executive Summary

SRK Consulting (SRK) has undertaken a predictive geochemical modeling exercise to assess future pit lake chemistry associated with the Copper Flat Project, New Mexico and to compare this to existing pit lake water quality. This work has been undertaken on behalf of New Mexico Copper Corporation (NMCC – a subsidiary of THEMAC Resources Group Ltd. [THEMAC]) to demonstrate compliance with New Mexico Mining Act regulations "Performance and Reclamation Standards for New Mining Operations" at 19.10.6.603 NMAC, applicable to the future pit water body, specifically that:

- The operations must be planned and conducted to minimize change in the hydrologic balance in both the permit and potentially affected areas; and
- Reclamation must result in a hydrologic balance similar to pre-mining conditions.

The work also forms part of the geochemical characterization study to assess the Acid Rock Drainage and Metal Leaching (ARDML) potential of the Project.

The Copper Flat Project is a porphyry copper-molybdenum deposit located on the western margin of the Rio Grande Rift. The deposit also contains minor, but potentially recoverable, gold and silver mineralization. The deposit is hosted by a quartz monzonite stock that intrudes a sequence of andesitic volcanic rocks.

Preliminary pit lake predictions for the Project were presented in the SRK December 2014 report entitled *'Predictive Geochemical Modeling of Pit Lake Water Quality at the Copper Flat Project, New Mexico'*, which was presented to Regulatory authorities to generate discussion and input. A number of modifications and refinements have been made to the pit lake models since this report was submitted, including:

- Incorporation of the Feasibility Study geologic block model;
- Incorporation of the current open pit design, which is detailed in the 2017 Mine Operation and Reclamation Plan (2017 MORP pit);
- Refinement of the pit wall composition to include delineation of material types by primary lithology, oxidation and mineralized versus weakly-mineralized material;
- Refinement of humidity cell test (HCT) inputs to include separate source terms for major and trace elements, reflecting the different processes that control their release;
- Refinement of mineral equilibrium phases based on predicted chemistry;
- Refinement of the water balance to use a reduced annual evaporation rate of 50 inches and to include a separate runoff term for reclaimed areas in the pit and the open pit watershed;
- Revisions to the groundwater chemistry inputs; and
- Incorporation of pit management and reclamation measures; including rapid fill of the pit and reclamation of the pit haul road and other areas within the pit and the pit watershed.

The objective of the report is to provide an analysis that demonstrates that future pit lake water quality results in a water body with similar chemistry to that of pre-mining conditions upon implementation of the reclamation actions proposed by NMCC in its MORP and Reclamation Plan, including rapid-fill of the open pit after closure of the mine.

Geochemical predictions were developed for three scenarios, including: (i) a calibration model for the existing pit lake; (ii) a natural fill model for the future unreclaimed pit; and (iii) a rapid fill model for the future reclaimed pit. Rapid fill has been proposed as the water quality component of NMCC's reclamation strategy for the future pit lake. It will include filling the pit with 2,200 acre-feet of good quality water from the production water supply wells during the first six months of groundwater recovery and pit infilling.

This report describes the approach taken for the revised pit lake predictive modeling effort, details the assumptions made, and presents the results of the revised pit lake geochemical predictions.

Model Calibration

The results of the existing pit lake model show good calibration of constituents, demonstrating water quality can be predicted with a good degree of accuracy for the future pit lake. The baseline water quality data utilized in the calibration model are data for existing water quality chemistry in the pit lake between 2010 and 2013. This is a subset of the entire baseline data generated between 1998 and July 2017. The full data set was utilized in comparing existing water quality chemistry to projected future water quality of the pit lake in discussed in Sections 5 and 6.

Unreclaimed Fill Scenario

In the unreclaimed pit scenario, allowing the pit to fill naturally will result in the pit walls and benches being exposed over a much longer period of time, i.e., approximately 150 years, before the pit lake reaches hydrologic equilibrium. In this scenario, the proposed future Copper Flat open pit is expected to be seasonally stratified but otherwise well-mixed, oxygenated and not acidic. Waters are predicted to be moderately alkaline (pH 7.9 – 8.2), primarily due to the buffering capacity of the inflowing groundwater. During the early stages of pit infilling (i.e., the first six months post-closure), removal/flushing of soluble salts will occur through precipitation contacting the pit walls and is likely to result in a spike in boron, lead, mercury, manganese, molybdenum, nickel, selenium, vanadium, zinc and sulfate in the early pit lake. The effects of this initial flush will be dissipated by inflowing groundwater and precipitation, and pit lake chemistry will then evolve over time, with some parameters increasing in concentration as a result of evaporation effects. This is similar to the trends observed in the existing pit lake where elemental concentrations have increased since the start of pit infilling in response to evapoconcentration.

A comparison of predicted pit lake water chemistry for the unreclaimed fill scenario to chemistry measured in the existing pit lake between 1989 and 2017 demonstrates that the concentrations of the majority of constituents are comparable to existing concentrations, and therefore water quality of the future pit lake is expected to be similar to existing pit lake water quality.

Reclaimed Fill Scenario

Rapidly refilling the pit with water from the water supply wells during the first six months post-closure will result in a better initial water quality within the pit lake due to the good quality of the water that will be used. The long-term result is that the effects of evapoconcentration are not as pronounced as the pit lake reaches hydrogeologic equilibrium, and predicted concentrations of many major ions and trace elements will remain lower than in the unreclaimed fill scenario. This is particularly the case for constituents such as boron, sulfate and chloride, which are strongly influenced by evaporation effects and are predicted to be much lower in concentration for the rapid fill scenario compared to the natural fill scenario. In addition, the rapid fill will also quickly submerge walls and benches within six months and thus limit the exposure of sulfide minerals to oxygen, which will reduce trace element release into the pit lake. By contrast, the unreclaimed fill scenario allows the pit to fill naturally and results in the pit walls and benches being exposed over a much longer period of time, i.e., approximately 150 years, before the pit lake reaches hydrologic equilibrium. A comparison of predicted pit lake chemistry for the reclaimed pit rapid fill scenario to chemistry measured in the existing pit lake between 1989 and 2017 demonstrates that concentrations of the majority of predicted constituent concentrations are comparable to existing concentrations and therefore, water quality of the future pit lake is expected to be similar to existing pit lake water quality.

Conclusion

Based on the model results presented herein, the changes to the hydrologic balance of the future pit water body that will form post-mining will be nil or minimal and the water quality will be very similar to that of the existing pit lake. The existing pit lake at Copper Flat is an artificial water body created as a result of mineral extraction with little or limited ability to sustain aquatic life (Aquatic Consultants, Inc. 2014). The post-mining water body is anticipated to be similar to the existing pit lake and is not expected to be conductive to providing aquatic habitat or supporting fish life.

This geochemical modeling report demonstrates that the mine pit reclamation proposed for the Copper Flat mine that is outlined in Section 3.1.8 of this report meets the water quality similarity requirements of 19.10.6.603 NMAC.

Table of Contents

Executive Summary ii

1 Introduction 1

1.1 Purpose and Scope 1

1.2 Background 2

1.2.1 Climate 3

1.2.2 Prior Mining Operations 3

1.2.3 Mine Plan 4

1.2.4 Geology and Mineralization 6

1.2.5 Hydrology 11

1.2.6 Hydrogeology 11

1.2.7 Existing Pit Lake 14

2 Geochemical Characterization Testwork Summary 20

3 Pit Lake Modeling 22

3.1 Summary of Modifications to Pit Lake Models since submittal of SRK (2014a) Preliminary Report 22

3.1.1 Incorporation of Current Geologic Block Model 22

3.1.2 Incorporation of Current Pit Design 22

3.1.3 Refinement of Pit Wall Composition 22

3.1.4 Refinement of HCT Inputs 22

3.1.5 Refinement of Mineral Equilibrium Phases 23

3.1.6 Refinement of Water Balance 23

3.1.7 Revisions to Groundwater Chemistry Inputs 23

3.1.8 Incorporation of Pit Reclamation Measures 23

3.2 General Pit Lake Modeling Approach 27

3.3 Model Logic and Coding 28

3.4 Mineral and Gas Phase Equilibration 30

3.5 Adsorption 31

3.6 Evapoconcentration 31

3.7 Treatment of Analytical Reporting Limits 32

3.8 Model Assumptions and Limitations 32

3.9 Analysis of Model Input Variability 33

3.10 Comparative Guidelines 35

4 Existing Pit Calibration Model 37

4.1 Conceptual Model 37

4.2 Pit Wall Surface Areas 37

4.3 Calculation of Pit Wall Rock Available for Leaching 38

4.4 Water Balance 39

4.5 Solution Inputs 41
4.5.1 Precipitation Chemistry 41
4.5.2 Groundwater Chemistry 41
4.5.3 Wall Rock Chemistry 42
4.6 Results 44
5 Unreclaimed Pit Model with Natural Fill 46
5.1 Conceptual Model 46
5.2 Pit Wall Surface Areas 47
5.3 Calculation of Pit Wall Rock Available for Leaching 48
5.4 Water Balance 50
5.5 Solution Inputs 52
5.5.1 Precipitation Chemistry 52
5.5.2 Groundwater Chemistry 52
5.5.3 Wall Rock Chemistry 53
5.6 Potential for Future Pit Lake Stratification 55
5.7 Results 58
6 Reclaimed Pit Model with Rapid Fill 68
6.1 Conceptual Model 68
6.2 Pit Wall Surface Areas 69
6.3 Calculation of Pit Wall Rock Available for Leaching 70
6.4 Water Balance 71
6.5 Solution Inputs 72
6.5.1 Precipitation Chemistry 72
6.5.2 Groundwater Chemistry 72
6.5.3 Wall Rock Chemistry 72
6.5.4 Water Supply Well Chemistry 72
6.5.5 Reclaimed Surface Chemistry 73
6.6 Results 74
7 Summary and Conclusions 84
7.1 Model Calibration 84
7.2 Unreclaimed Fill Scenario 84
7.3 Reclaimed Fill Scenario 85
7.4 Conclusions 85
8 References 87

List of Tables

Table 1-1: Summary of Hydrochemical Information in the Grayback Arroyo (INTERA, 2012) 11
Table 1-2: Existing Pit Lake Chemistry (1989 – 2017) 18
Table 3-1: Summary of Modifications to Pit Lake Models since Submittal of Preliminary SRK (2014a) Report 26
Table 3-2: Equilibrium Phases Included in the Pit Lake Geochemical Model 31
Table 3-3: Analysis of Pit Lake Model Input Variability 34
Table 4-1: Pit Wall Surface Areas used in Existing Pit (Calibration) Model 38
Table 4-2: Groundwater, Wall Rock and Precipitation Chemistry used as Input to the Existing Pit Model 43
Table 4-3: Existing Pit (Calibration) Model Results 45
Table 5-1: Three-dimensional Surface Areas of Pit Wall Rock Material Types for Final Unreclaimed Pit .47
Table 5-2: Groundwater, Wall Rock, Haul Road and Precipitation Chemistry used as Input to the Unreclaimed Pit Model 54
Table 5-3: Summary of open pit water bodies and stratification characteristics (JSAI, 2014c) 57
Table 5-4: Unreclaimed Pit Model Results 60
Table 6-1: Three-dimensional Surface Areas of Pit Wall Rock Material Types for Final Reclaimed Pit.....69
Table 6-2: Water Supply Well Chemistry for PW-1 and PW-3 used to Represent Rapid Fill Water Quality in the Reclaimed Pit Model 73
Table 6-3: Water Supply Well Chemistry for SWQ-1 used to Represent reclaimed pit Run-off Water Quality in the Reclaimed Pit Model 74
Table 6-4: Reclaimed Pit Model Results 76

List of Figures

Figure 1-1: Project Location 2
Figure 1-2: Copper Flat Facility Layout (2017 MORP, THEMAC, 2017a) 5
Figure 1-3: Geology of the Copper Flat Mine (Dunn, 1982) 7
Figure 1-4: Detailed Geologic Map of the Copper Flat Orebody (M3, 2013) 8
Figure 1-5: Geologic Cross Section through the Copper Flat Orebody (M3, 2013) 8
Figure 1-6: Map Showing Location of Crystalline Bedrock, Santa Fe Group Sediments and Alluvial Aquifer Zones (INTERA, 2012) 12
Figure 1-7: Piper Plot of Major Ion Chemistry of Groundwater in the Mine Permit Area (analyses from 2010 and 2011 only) 14
Figure 1-8: Plot of Sulfate and Chloride Concentrations in Existing Pit Lake 16
Figure 1-9: Plot of Copper Concentrations in Existing Pit Lake 16
Figure 1-10: Plot of pH in Existing Pit Lake 17
Figure 1-11: Precipitated Salts around Rim of Existing Pit Lake 17
Figure 1-12: Depth Profiles of Key Constituents in Existing Pit Lake 19
Figure 3-1: 2017 MORP Pit Showing Expanded 4900 Catch Bench and Pit Surfaces Scheduled for Cover 24
Figure 3-2: 2017 MORP Pit Showing Reclaimed Pit with Pit Lake 25

Figure 3-3: Copper Flat Pit Lake Model Execution Mechanics 28
Figure 4-1: Existing Pit Conceptual Model 37
Figure 4-2: Material Types Exposed in Existing Pit (Calibration) Model 38
Figure 4-3: Existing Pit Wall Conceptual Model 39
Figure 4-4: Simulated Water Level for the Existing Pit Lake 40
Figure 4-5: Existing Pit Lake Inflows/Outflows 40
Figure 4-6: Location of Gila Cliff Dwellings National Monument Meteorological Station 41
Figure 5-1: Conceptual Model for Unreclaimed Pit with Natural Fill 46
Figure 5-2: Exposed Material Types in Final Walls of Unreclaimed Pit 48
Figure 5-3: Future Pit Wall Conceptual Model 50
Figure 5-4: Pit Lake Elevation Curve for Unreclaimed Pit Model (source: JSAI) 51
Figure 5-5: Pit Lake Flux for Unreclaimed Pit Model (source: JSAI) 52
Figure 5-6: Time-series Plot of Predicted pH for the Unreclaimed Pit Model 61
Figure 5-7: Time-series Plot of Predicted Copper for the Unreclaimed Pit Model 61
Figure 5-8: Time-series Plot of Predicted Arsenic for the Unreclaimed Pit Model 62
Figure 5-9: Time-series Plot of Predicted Cadmium for the Unreclaimed Pit Model 62
Figure 5-10: Time-series Plot of Predicted Boron for the Unreclaimed Pit Model 63
Figure 5-11: Time-series Plot of Predicted Fluoride for the Unreclaimed Pit Model 63
Figure 5-12: Time-series Plot of Predicted Mercury for the Unreclaimed Pit Model 64
Figure 5-13: Time-series Plot of Predicted Lead for the Unreclaimed Pit Model 64
Figure 5-14: Time-series Plot of Predicted Zinc for the Unreclaimed Pit Model 65
Figure 5-15: Time-series Plot of Predicted Selenium for the Unreclaimed Pit Model 65
Figure 5-16: Time-series Plot of Predicted Sulfate for the Unreclaimed Pit Model 66
Figure 5-17: Time-series Plot of Predicted TDS for the Unreclaimed Pit Model 66
Figure 5-18: Ficklin Plot for the Unreclaimed Pit Model 67
Figure 5-19: Piper Plot of Predicted Major Ion Chemistry for the Unreclaimed Pit Model 67
Figure 6-1: Conceptual Model for Reclaimed Pit with Rapid Fill 68
Figure 6-2: Exposed Material Types in Final Walls of the Reclaimed Pit 70
Figure 6-3: Pit Lake Elevation Curve for Reclaimed Pit Model with Rapid Fill 71
Figure 6-4: Pit Lake Flux for Reclaimed Pit Model with Rapid Fill 72
Figure 6-5: Time-series Plot of Predicted pH for the Reclaimed Pit Model 77
Figure 6-6: Time-series Plot of Predicted Copper for the Reclaimed Pit Model 77
Figure 6-7: Time-series Plot of Predicted Arsenic for the Reclaimed Pit Model 78
Figure 6-8: Time-series Plot of Predicted Cadmium for the Reclaimed Pit Model 78
Figure 6-9: Time-series Plot of Predicted Boron for the Reclaimed Pit Model 79
Figure 6-10: Time-series Plot of Predicted Fluoride for the Reclaimed Pit Model 79
Figure 6-11: Time-series Plot of Predicted Mercury for the Reclaimed Pit Model 80
Figure 6-12: Time-series Plot of Predicted Lead for the Reclaimed Pit Model 80

Figure 6-13: Time-series Plot of Predicted Zinc for the Reclaimed Pit Model 81
Figure 6-14: Time-series Plot of Predicted Selenium for the Reclaimed Pit Model 81
Figure 6-15: Time-series Plot of Predicted Sulfate for the for the Reclaimed Pit Model 82
Figure 6-16: Time-series Plot of Predicted TDS for the for the Reclaimed Pit Model 82
Figure 6-17: Ficklin Plot for the Reclaimed Pit Model 83
Figure 6-18: Piper Plot of Predicted Major Ion Chemistry for the Reclaimed Pit Model 83

Appendices

Appendix A: Time-Series Plots of Existing Pit Lake Chemistry
Appendix B: Humidity Cell Elemental Release Rate Graphs
Appendix C: JSAI Evaporation Rate Technical Memorandum
Appendix D: JSAI Groundwater Chemistry Technical Memorandum
Appendix E: Water Supply Well Chemistry
Appendix F: JSAI Review of Methods and Assumptions for Predicting Open Pit Water Quality
Appendix G: JSAI Future Pit Water Balance
Appendix H: PHREEQC Input Files (electronic)
Appendix I: PHREEQC Output File (electronic)
Appendix J: Aquatic Consultants Inc. Biological Assessment of the Existing Copper Flat Pit Lake

1 Introduction

1.1 Purpose and Scope

SRK Consulting, Inc. (SRK) has undertaken a geochemical modeling assessment on behalf of New Mexico Copper Corporation (NMCC – a subsidiary of THEMAC Resources Group Ltd. [THEMAC]) to predict future pit lake chemistry associated with the Copper Flat Project (the Project), New Mexico. The purpose of the assessment is to evaluate the future environmental impacts of the Project as required by the New Mexico Mining Act and State environmental regulations. The work forms part of the geochemical characterization study to assess the Acid Rock Drainage and Metal Leaching (ARDML) potential of the Project.

Preliminary pit lake model results were presented in the December 18, 2014 report entitled *'Predictive Geochemical Modeling of Pit Lake Water Quality at the Copper Flat Project, New Mexico'* (SRK, 2014a). The purpose of this preliminary report was to outline the methodology for the pit lake modeling in order to seek feedback from the agencies, and to present the initial results of the pit lake modeling. Since this preliminary report was submitted, a number of modifications and refinements have been made to the pit lake models, including:

- Incorporation of the Feasibility Study geologic block model;
- Incorporation of the current open pit design, which is detailed in the 2017 Mine Operation and Reclamation Plan (2017 MORP pit);
- Refinement of the pit wall composition to include delineation of material types by primary lithology, oxidation and mineralized versus non-mineralized material;
- Refinement of humidity cell test (HCT) inputs to include separate source terms for major and trace elements, reflecting the different processes that control their release;
- Refinement of mineral equilibrium phases based on predicted chemistry;
- Refinement of the water balance to use a reduced annual evaporation rate of 50 inches and to include a separate runoff term for reclaimed areas in the pit and the open pit watershed;
- Revisions to the groundwater chemistry inputs; and
- Incorporation of pit reclamation measures, including rapid fill of the pit and reclamation of the pit haul road and other areas within the pit and the pit watershed.

This final report describes the approach taken for the revised pit lake predictive modeling effort, details the assumptions made, and presents the final results of the revised pit lake geochemical predictions.

Applicable standards to the post-mining Copper Flat pit lake are contained in the New Mexico Mining and Minerals Division (MMD) regulations administered under the Mining Act. Specifically, the performance and reclamation standards require that reclamation must result in a hydrologic balance similar to pre-mining conditions. With respect to water quality in the pit lake, post mining water quality must be similar to baseline pre-mining water quality in the pit lake. The model results presented herein have been compared to pre-mining baseline water quality of the existing pit lake.

1.2 Background

The Copper Flat Project is a porphyry copper/molybdenum deposit located in the Hillsboro Mining District in South Central New Mexico, in Sierra County located approximately 150 miles south of Albuquerque, New Mexico and approximately 20 miles southwest of Truth or Consequences, New Mexico straight-line distances). Access from Truth or Consequences is by 24 miles of paved highway and 3 miles of all-weather gravel road. The Copper Flat Project location is shown in Figure 1-1.

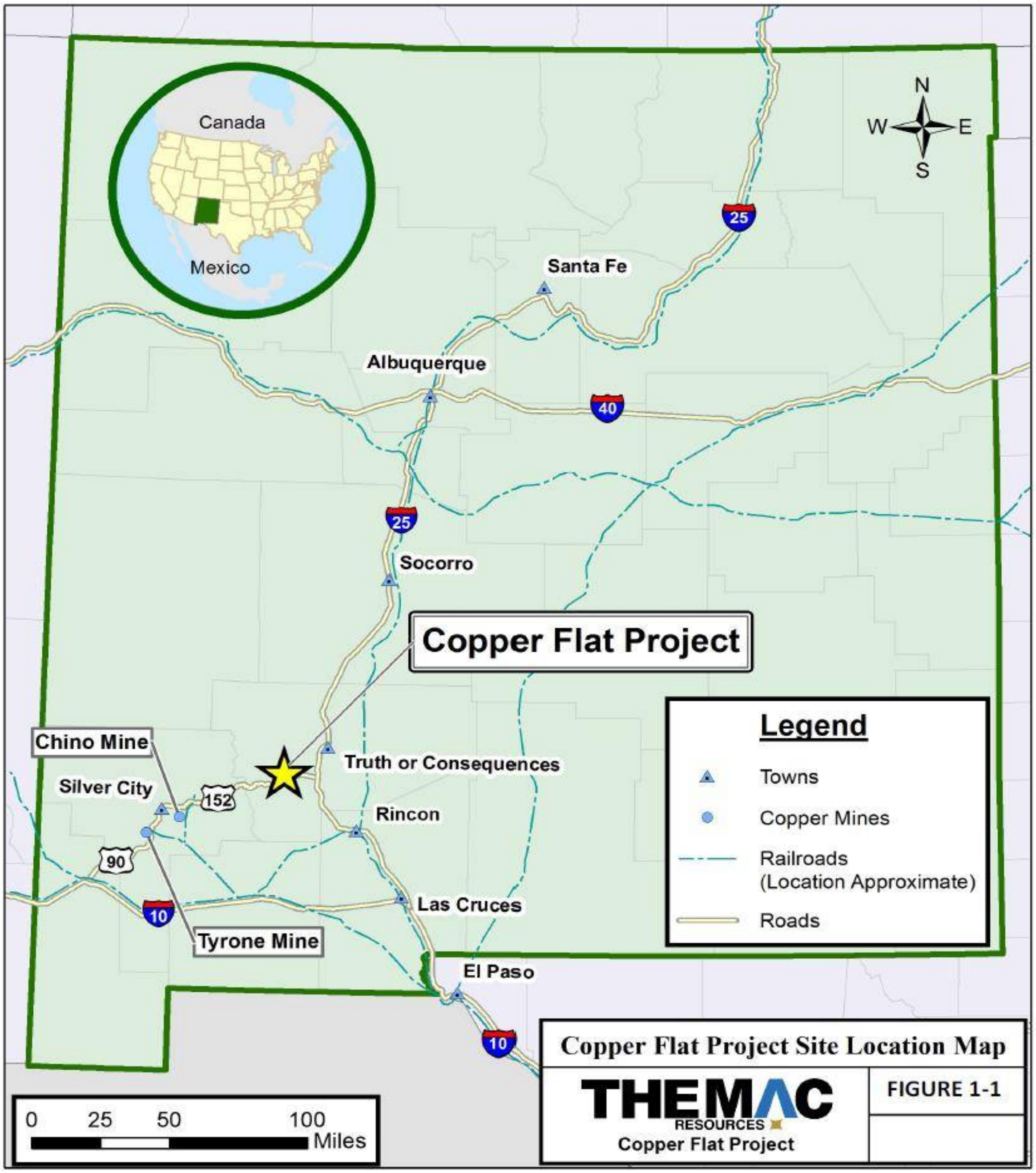


Figure 1-1: Project Location

1.2.1 Climate

The regional climate is high desert, and is generally hot with a July average of 76°F (record maximum 107°F), and January average of 39°F (record minimum 1°F). The area is generally dry with about 13 inches of average annual precipitation, which occurs mostly as rainfall during July to September.

Winters are cold and dry. Snowfall is possible from October through April, but more typically occurring between December and February. The average annual total is 8 inches of snowfall. Prevailing wind direction is predominantly from the west, and secondarily from the north, and averages 10 to 15 miles per hour. Wind speeds in excess of 50 mph may occur as major storms pass through the area.

1.2.2 Prior Mining Operations

Mining activities in the Hillsboro Mining District began in the late-1800s. Gold was mined from shafts and adits at Copper Flat and from placer workings developed along drainages to the east and southwest of Black and Animas Peaks. Gold mining was further developed during the early 1900s and continued until World War II. Today, small scale placer mining continues. Copper exploration began in the 1950s and continued to the early 1980s, when Quintana Minerals Corporation defined 60 Mt of reserves sufficient to operate for a 11-year mine life at an extraction rate of 15,000 tons of ore per day (tpd). Operations included the development of the open pit, waste rock stockpiles, TSF and other mine disturbances observed today, but mining stopped after three months due to low metal prices. Mine buildings and equipment were dismantled in 1985; however structural foundations, power lines, water wells, and in-ground infrastructure were left in-place for a future restart. During the 1990s, plans to reopen the mine were considered. Existing surface disturbances and facilities in the Project area include the following:

- A pit with a small pit lake;
- Waste rock stockpiles (WRSP);
- A 115-kilovolt power line from the Caballo Substation to the mine site;
- Production wellfield and 20-inch pipeline from the wellfield to the mine site;
- A diversion channel collecting stormwater from west and south of the pit and diverting unimpacted flows down Grayback wash;
- A diversion channel collecting stormwater from north of the pit and diverting unimpacted flows to the east;
- Existing concrete foundations and structures including:
    - Primary crusher structure and stacking conveyor tunnel
    - Coarse ore reclaim tunnel
    - Concentrator building foundation
    - Truck shop foundation
    - Administration building foundation
    - Concentrate storage foundation
    - Mine office and change house foundation.
- Site grading and roads; and
- A tailings storage facility (TSF) containing approximately 1.4 Mt of tailings from the Quintana mining operation.

1.2.3 Mine Plan

The proposed Project consists of an open pit mine, flotation mill, tailings storage facility, waste rock stockpiles and ancillary facilities. During the mine life, the proposed Project is expected to produce approximately 113 million tons of copper ore and 45 million tons of waste rock. Ore extraction will take place by conventional truck and loader methods using 25-foot high benches. Backfilling of the pit will not take place during or after mining.

Beneficiation will be achieved through the use of a conventional concentrator using standard crushing, grinding and flotation technologies. The operation is designed to recover copper, molybdenum, gold, and silver into separate copper and molybdenum concentrates. The nominal ore throughput rate is 30,000 tpd and an operational life of 11 to 12 years is currently projected. The proposed layout of the mine facilities is shown in Figure 1-2. The current pit configuration is modified from the pit design developed for the Copper Flat Feasibility Study (FS) published in November 2013 (M3, 2013) and matches the pit design presented in the 2017 MORP (THEMAC, 2017a).

EWRSP = EXISTING WASTE ROCK STOCKPILE
WRSP = WASTE ROCK STOCKPILE

SITE PLAN
SCALE: 1:500

500' 250' 0' 500' 1000'
1" = 500'
DO NOT SCALE 11x17 DRAWINGS

PRELIMINARY
FOR AGENCY REVIEW

THE MAC RESOURCES

REFERENCES		REFERENCES		REVISIONS						REVISIONS					
DWG. NO.	TITLE	DWG. NO.	TITLE	NO.	DESCRIPTION	BY	APP'D	DATE	CLIENT	NO.	DESCRIPTION	BY	APP'D	DATE	CLIENT

SCALE:	1" = 500'	DATE
DESIGNED BY	SAM	DEC12
DRAWN BY	SAM	DEC12
CHECKED BY	TDL	JAN13
PROJECT MGR	RKZ	
CLIENT APPR.		

m3 ARCHITECTURE ENGINEERING CONSTRUCTION MANAGEMENT
www.m3eng.com

COPPER FLAT PROJECT

SITE GENERAL
CIVIL
PROJECT AREA
PROPOSED SITE PLAN

JOB NO. M3 PN-120085
DWG NO.
FIGURE 1-2
REV NO. P18
DATE 16 NOV 15

18397

1.2.4 Geology and Mineralization

The following description of geology and mineralization is from the Copper Flat Feasibility Study (FS) published in November 2013 (M3, 2013). The Copper Flat Project is a porphyry copper-molybdenum deposit located on the western margin of the Rio Grande Rift. The deposit also contains recoverable, gold and silver. The deposit is hosted by a small quartz monzonite stock having a porphyritic texture that intrudes a sequence of andesitic volcanic rocks of similar age covering an area approximately 4 miles in diameter.

Regional Geology

The Copper Flat Project lies within the Mexican Highlands portion of the Basin and Range Physiographic Province. The Project is located in the Hillsboro Mining District in the Las Animas Hills, which are part of the Animas Uplift, a horst on the western edge of the Rio Grande valley. The Animas Uplift is separated from the Rio Grande by nearly 20 miles of Santa Fe Group alluvial sediments, referred to as the Palomas Basin of the Rio Grande valley. To the west of the Animas Uplift is the Warm Springs valley, a graben that parallels the Rio Grande valley. Further west, the Black Mountains form the backbone of the Continental Divide, rising to about 9,000 feet above sea level. The regional geology is discussed in more detail in the *Baseline Data Report for the Copper Flat Mine* (BDR) (INTERA, 2012). The focus of this report is on the local and Copper Flat ore body geology.

Basement rocks in the area consist of Precambrian granite and Paleozoic and Mesozoic sandstones, shales, limestones, and evaporites. Sedimentary units that crop out within the Animas Uplift include the Ordovician Montoya Limestone, the Silurian Fusselman Dolomite, and the Devonian Percha Shale. The Cretaceous-age Laramide orogeny, which was characterized by the intrusion of magma associated with the subduction of the Farallon plate beneath the North American plate, affected this region between 75 and 50 million years ago (Ma). Volcanic activity during the late Cretaceous and Tertiary periods resulted in localized flows, dikes, and intrusive bodies, some of which were associated with the development of the nearby Tertiary Emory and Good Sight-Cedar Hills calderas. Later basaltic flows resulted from the tectonic activity associated with the formation of the Rio Grande rift. Tertiary and Quaternary alluvial sediments of the Santa Fe Group and more recent valley fill overlie the older Paleozoic and Mesozoic units in the area.

Local Geology

The district geology described below is modified from McLemore et al. (2000) and Raugust (2003). The predominant geologic feature of the Hillsboro Mining District is the Cretaceous Copper Flat stratovolcano, a circular body of Cretaceous andesite that is 4 miles in diameter (Figure 1-3). The Hillsboro Mining District comprises the Las Animas Hills, a low range formed by the Animas Hills horst at the western edge of the Rio Grande Rift. Faults that bound the Animas Hills horst are related to the tectonic activity of the Miocene-age Rio Grande Rift (Dunn, 1982). Due to the difference in ages and in spite of its close proximity, there is no known connection between the Rio Grande rift and the Copper Flat volcanic/intrusive complex. The Copper Flat volcanic/intrusive complex has been interpreted as an eroded stratovolcano based on the presence of agglomerate and flow band textures in some of the andesite (Richards, 2003).

The Copper Flat Quartz Monzonite (CFQM) intrudes the core of the volcanic complex. The CFQM stock has a surface expression of approximately 0.4 mi^2 and has been dated by the argon-argon (40Ar/39Ar) techniques to be 74.93 ±0.66 million years old (McLemore et al., 2000). The surrounding andesite has also been dated using argon-argon techniques to be 75.4 ±3.5 million years old (McLemore et al., 2000).

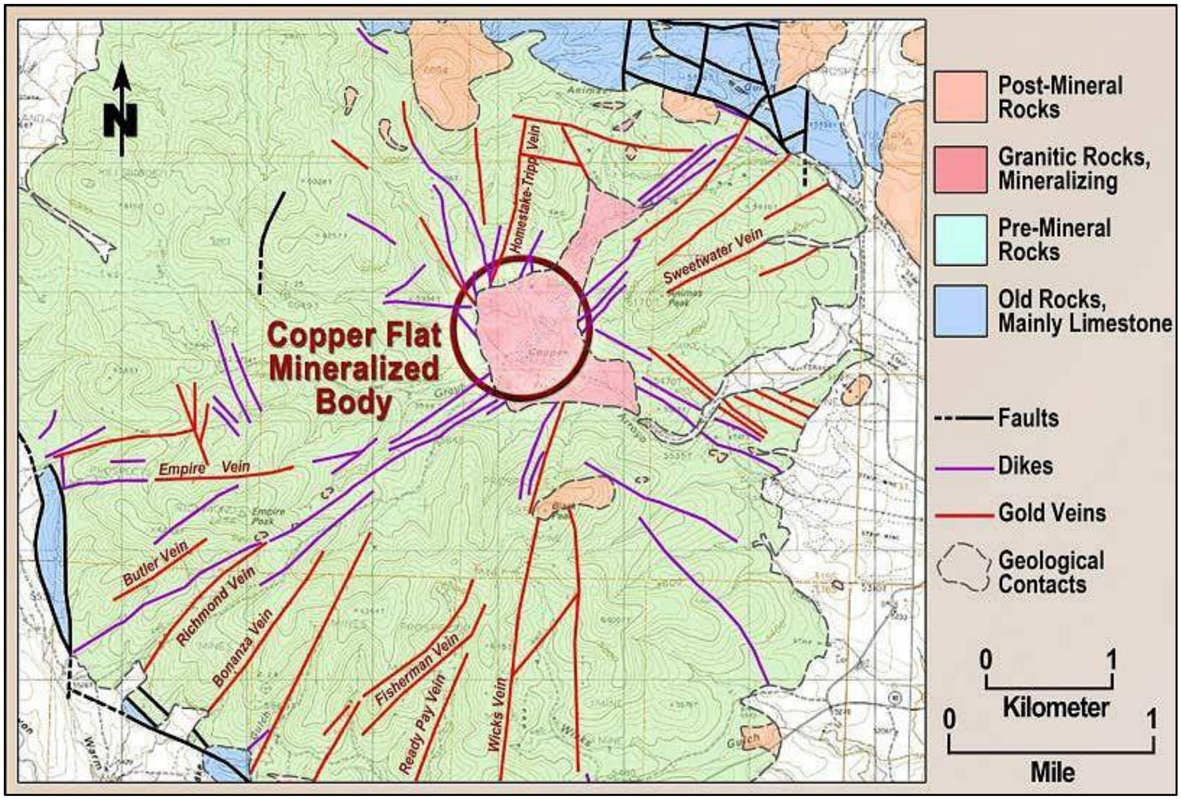


Figure 1-3: Geology of the Copper Flat Mine (Dunn, 1982)

Geology of the Copper Flat Orebody

The Copper Flat andesite is generally fine-grained with phenocrysts of plagioclase (andesine) and amphibole in a groundmass of plagioclase and potassium feldspar and rare quartz. Some agglomerates or flow breccias are locally present, but the andesite is generally massive. Magnetite is commonly associated with the mafic phenocrysts, and accessory apatite is commonly found.

Although the depth of erosion is uncertain, the center of the stratovolcano was eroded to form a topographic low. To the east of the site, this andesite body is in fault contact with Santa Fe Group sediments, which are at least 2,000 feet thick in the immediate Copper Flat area and thickening to the east. Near-vertical faults characterize the contacts on the remaining perimeter of the andesite body; these faults juxtapose the andesite with Paleozoic sedimentary rocks. Historical drill holes indicate the andesite is locally more than 3,000 feet thick. This feature, combined with the concentric fault pattern, indicate that the local geology represents a deeply eroded Cretaceous-age volcanic complex. A detailed geologic map of the Copper Flat orebody is provided in Figure 1-4 and a south-north geologic cross section through the Copper Flat orebody is provided in Figure 1-5.

Copper Flat Quartz Monzonite (CFQM) intrudes the core of the volcanic complex. Sulfide mineralization is present as veinlets and disseminations in the CFQM, but is most strongly developed in and adjacent to the west end of a steeply dipping breccia pipe that is centrally located within the CFQM stock and elongated in the northwest-southeast direction (Figure 1-5).

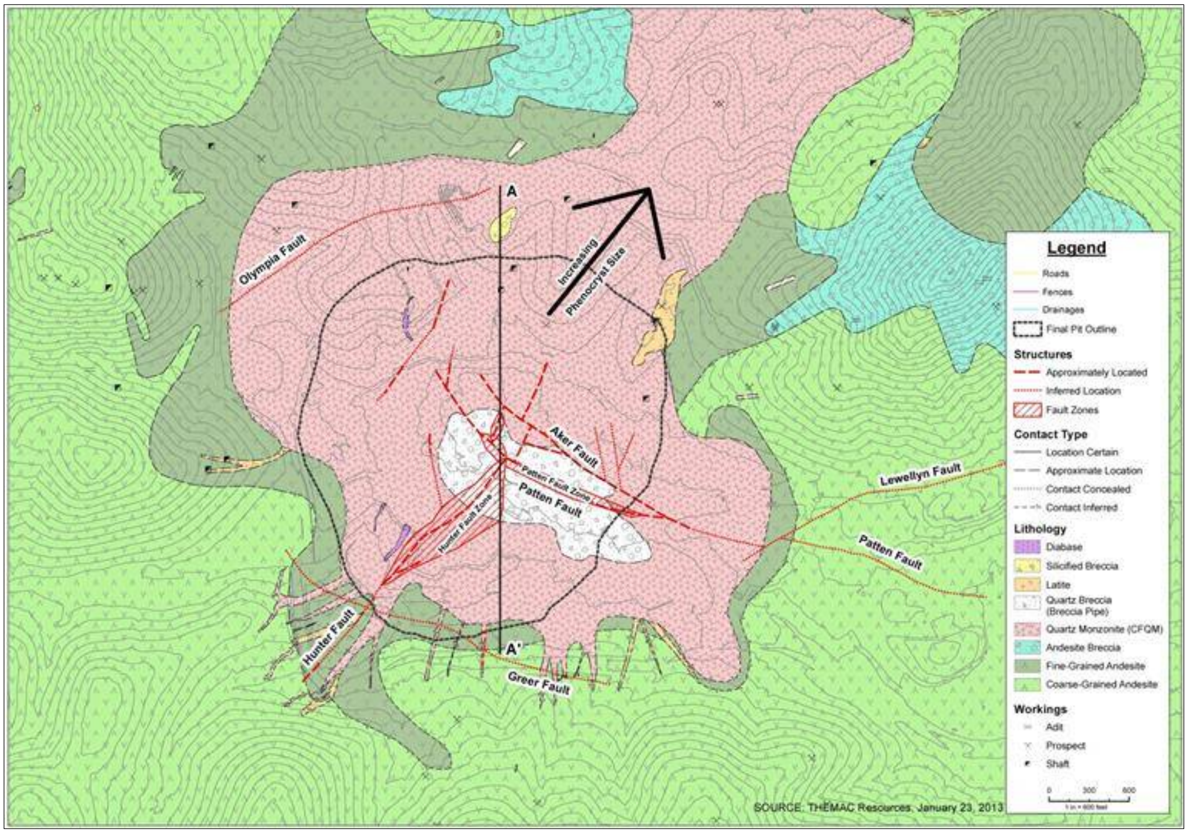


Figure 1-4: Detailed Geologic Map of the Copper Flat Orebody (M3, 2013)

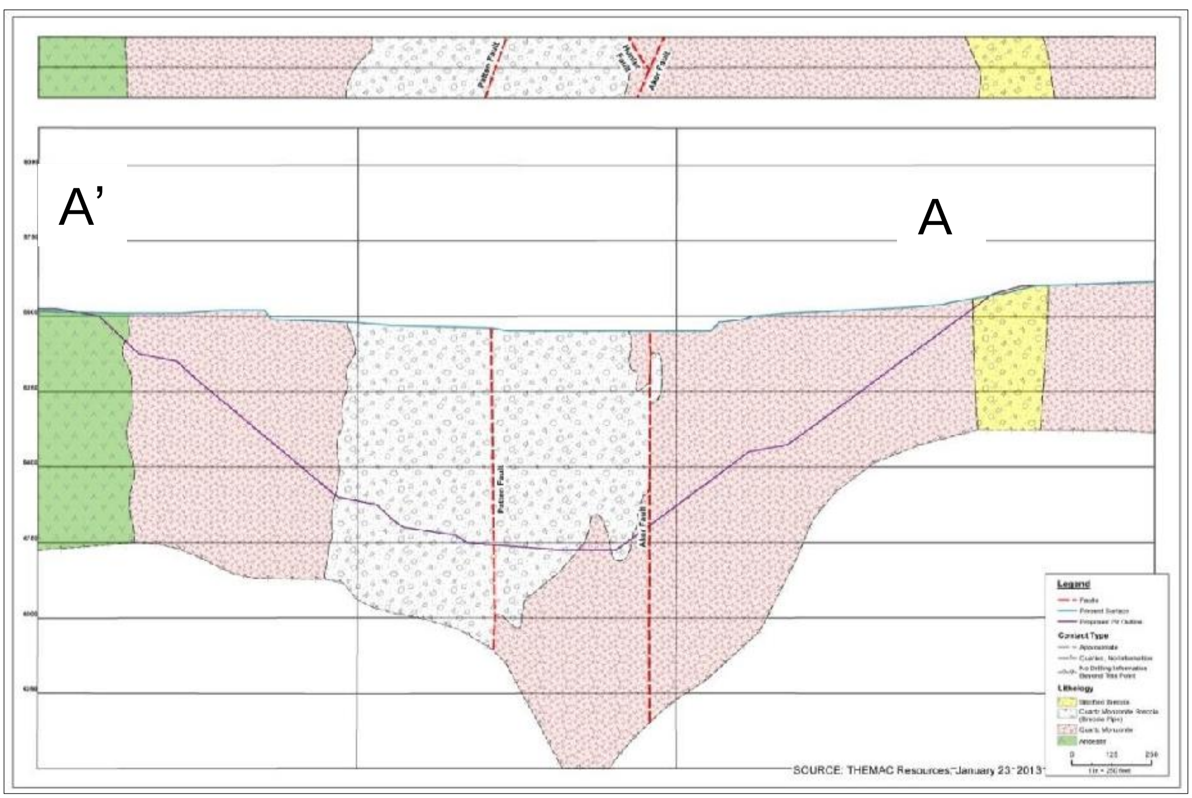


Figure 1-5: Geologic Cross Section through the Copper Flat Orebody (M3, 2013)

Lithology

The CFQM intruded into the center of the andesite sequence at the intersection of two principal structures that trend respectively N50°W and N20°E. The CFQM is an irregular-shaped stock underlying a surface area of approximately 0.40 square miles and has been dated to approximately 75 Ma. In the few exposures in which the CFQM is in contact with the andesite, the andesite shows no obvious signs of contact metamorphism. The CFQM is a medium- to coarse-grained, holocrystalline porphyry composed primarily of potassium feldspar, plagioclase, hornblende, and biotite; trace amounts of magnetite, apatite, zircon, and rutile are also present, along with localized mineralized zones containing pyrite, chalcopyrite, and molybdenite. About 15 percent of the monzonite is quartz, which occurs both as small phenocrysts and as part of the groundmass; however, quartz is absent in some parts of the stock.

Numerous dikes, some of which are more than a mile in length and mostly of latite composition, radiate from and cut the CFQM stock. Most of the dikes trend to the northeast or northwest and represent late stage differentiation of the CFQM stock. Diabase has been mapped in contact with the CFQM at Copper Flat. Immediately south of the quartz monzonite, the andesite is coarse-grained, perhaps indicating a shallow intrusive phase. An irregular mass of andesite breccia along the northwestern contact of the quartz monzonite contains potassium feldspar phenocrysts and andesitic rock fragments in a matrix of sericite with minor quartz. This may represent a pyroclastic unit. Magnetite, chlorite, epidote, and accessory apatite are also present in the andesite breccia.

Structure

Three principal structural zones are present at Copper Flat, the most prominent of which is a northeast-striking fault that trends N 20°-40°E that includes the Hunter and parallel faults or the Hunter fault zone. In addition, west-northwest striking zones of structural weakness (N50°-70°W) are marked by the Patten and Greer faults, and east-northeast striking zones are marked by the Olympia and Lewellyn faults. All faults have a near-vertical dip; the Hunter fault system dips 80°W, the Patten dips approximately 70°S-80°S, and both the Olympia and Lewellyn fault systems dip between 80°S and 90°S. These three major fault zones appear to have been established prior to the emplacement of the CFQM and controlled subsequent igneous events and in the case of the Patten and Hunter controlled mineralization.

As previously stated, the CFQM emplacement is largely controlled by the three structural zones. The southern contact parallels and is cut by the Greer fault, although the contact is cut by the fault, and the southeastern and northwestern contacts are roughly parallel to the Olympia and Lewellyn faults, respectively. The CFQM stock is principally elongated along the Patten fault, as well as along the Hunter fault zone.

Although latite dikes strike in all the three principal fracture directions, most of the dikes strike northeast. The northeast trending fault zones contain a high proportion of wet gouge, often with no recognizable rock fragments. Reportedly in underground exposures the material comprising the Hunter fault zone has the same consistency as wet concrete and has been observed to flow in underground headings. Based on recent drilling the Patten fault consists of a mixture of breccia and gouge. However, the material in the east-northeast fault zones contains only highly broken rock and minor gouge. The width of individual structures in all three systems varies along strike from less than a foot to nearly 25 feet in the Patten fault east of the Project. Despite intense brecciation, the total displacement along the faults does not appear to exceed a few tens of feet. At the western edge of the CFQM intrusion, a younger porphyritic dike was emplaced in a fault that offsets an early latite dike, indicating that fault movement occurred during the time that dikes were being emplaced.

Post-dike movement is evident in all the three principal fault zones, and both the Hunter and Patten fault systems show signs of definite post-mineral movement. Fault movement has smeared sulfide deposits and offset the breccia pipe as well as the zones within the breccia pipe. Post-mineral movement along faults has resulted in wide, strongly brecciated fault zones. Some of the post-mineral dikes have been emplaced within these fault zones.

NMCC has mapped the pit area and diversion cuts in detail at 1 inch equals 40 feet (1:480) and has examined the pre- and post-mineral stress orientations in the andesite and CFQM. Findings indicate no significant difference in the stress fields before and after mineralization. During NMCC's mapping efforts, the Greer and Olympia previously mapped fault locations could not be verified; therefore, these faults were labeled as inferred.

Mineralization

The CFQM hosts mineralization dominated by pyrite and chalcopyrite with subsidiary molybdenite, minor bornite and recoverable amounts of gold and silver. The mineralization is focused along intersecting northeast- and northwest-trending faults, and these intersections may have originally controlled emplacement of the CFQM.

Although copper occurs almost exclusively as chalcopyrite locally accompanied by trace amounts of bornite, minor amounts of chalcocite and copper oxide minerals are locally present near the surface and along fractures. The supergene enrichment typical of many porphyry copper deposits in the Southwest is virtually non-existent at Copper Flat. During the early mining days, a 20 to 50-foot leached oxide zone existed over the ore body, but this material was stripped during the mining activities that occurred in the early 1980s. Most of the remaining ore is unoxidized and consists primarily of chalcopyrite and pyrite with some molybdenite and locally traces of bornite, galena and sphalerite. Recently completed mineralogical studies indicate that fine grained disseminated chalcopyrite is often inter grown with pyrite and occurs interstitial to silicate minerals. Deposition of chalcopyrite and molybdenite (76.2 Ma) occurred within the same mineralizing event as the pyrite.

Sulfide mineralization is present as veinlets and disseminations in the CFQM, but is most strongly developed in and adjacent to the west end of a steeply dipping breccia pipe, that is centrally located within the CFQM stock and elongated in the northwest-southeast direction roughly along, but south of the Patten fault. The sulfide mineralization first formed in narrow veinlets and as disseminations in the quartz monzonite with weakly developed sericitic alteration. This stage of mineralization was followed by the formation of the breccia pipe with the introduction of coarse "clotty" pyrite and chalcopyrite along with veinlet controlled molybdenite and milky quartz, and the development of strong potassic alteration.

The breccia pipe, which can best be described as a crackle breccia, consists largely of subangular fragments of mineralized CFQM, with locally abundant mineralized latite where dikes exposed in the CFQM projected into the brecciated zone that range in size from an inch to several inches in diameter. Andesite occurs only as mixed fragments partially in contact with intrusive CFQM and appears to represent the brecciation of relatively unaltered andesite xenoliths in the CFQM. The matrix contains varying proportions of quartz, biotite (phlogopite), potassium feldspar, pyrite, and chalcopyrite, with magnetite, molybdenite, fluorite, anhydrite, and calcite locally common. Apatite is a common accessory mineral. Breccia fragments are rimmed with either biotite or potassium feldspar, and the quartz and sulfide minerals have generally formed in the center of the matrix.

Two types of breccia within the quartz monzonite breccia pipe have been identified as distinguishable units based on the dominant mineral filling the matrix between clasts. Recent drilling has shown that the two breccia types, biotite breccia and feldspar breccia, grade into one another as well as with the CFQM. Interestingly, from a recovery perspective, metallurgical testing has shown that the mineralization behaves virtually the same irrespective of the lithology.

The total sulfide content ranges from 1 percent (by volume) in the eastern part of the breccia pipe and the surrounding CFQM to 5 percent in the CFQM to the south, north, and west. Sulfide content is highly variable within the breccia, with portions in the western part of the breccia containing as much as 20 percent sulfide minerals. The strongest copper mineralization is concentrated in the western half of the breccia pipe and in the adjoining stockwork veined CFQM in the vicinity of the intersection of the Patten fault and the Hunter fault zone. Sulfide mineralization is concentrated in the CFQM and breccia pipe, and drops significantly at the andesite contact. Minor pyrite mineralization extends into the andesite along the pre-mineral dikes and in quartz-pyrite-bearing structures, some of which were historically prospected for gold.

Molybdenite occurs in some steeply dipping quartz veins or as thin coatings on fractures. Minor sphalerite and galena are present in both carbonate and quartz veinlets in the CFQM stock. Preliminary 2011 evaluations of the mineralization at Copper Flat indicate that copper mineralization concentrates and trends along the N50°W structural influences, whereas the molybdenum, gold and silver appear to favor a N10°-20°E trend.

1.2.5 Hydrology

Hydrological information pertaining to the Copper Flat Project has been summarized from the Baseline Data Report (INTERA, 2012) and is provided herein to provide a context for the pit lake modeling. The mine permit area is located in the Lower Rio Grande watershed, which includes approximately 5,000 square miles in Catron, Socorro, Sierra, and Doña Ana Counties and is dominated by the Rio Grande and its tributaries as well as the two large reservoirs of Elephant Butte and Caballo. Numerous tributaries drain into the Rio Grande from the west, but none contribute perennial flow to the Rio Grande. The mine permit area is drained by ephemeral streams (arroyos) within the Greenhorn Arroyo Drainage Basin. The Greenhorn Arroyo Drainage Basin is composed of Greenhorn Arroyo, Grayback Arroyo, and Hunkidori Gulch. The Grayback Arroyo passes through the permitted mine area and is diverted around the existing mine pit. Drainages within this watershed are ephemeral, flowing in response to heavy or sustained precipitation events. Water quality data for the Greyback Arroyo are summarized in Table 1-1.

Table 1-1: Summary of Hydrochemical Information in the Grayback Arroyo (INTERA, 2012)

Details	pH (s.u.)	Chloride (mg/L)	Sulfate (mg/L)	TDS (mg/L)
Min	7.42	0.71	11	78
Max	7.92	130	2,900	4,500

Surface waters in the Grayback Arroyo are typically characterized by higher major ion and trace element concentrations, with sulfate concentrations up to 2,900 mg/L and TDS up to 4,500 mg/L.

1.2.6 Hydrogeology

Hydrogeological information pertaining to the Copper Flat Project has been summarized from the Baseline Data Report (INTERA, 2012) and is provided herein. This report identifies three aquifers within the Copper Flat Project area (Figure 1-6) including:

1. Crystalline bedrock aquifer;
2. Santa Fe Group aquifer; and
3. Quaternary alluvial aquifer.

Details of these aquifers are provided below.

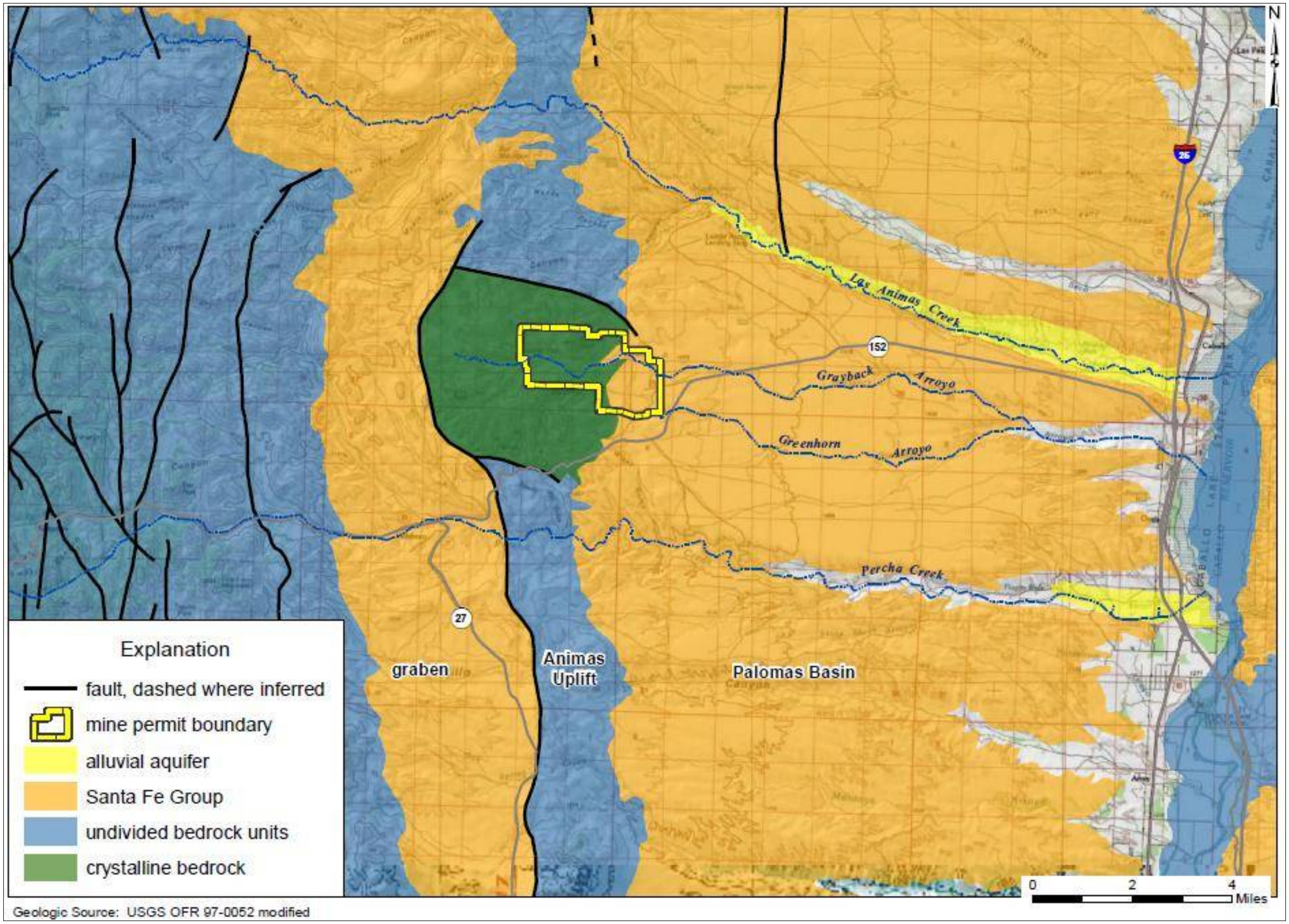


Figure 1-6: Map Showing Location of Crystalline Bedrock, Santa Fe Group Sediments and Alluvial Aquifer Zones (INTERA, 2012)

1. ***Crystalline Bedrock Aquifer:*** Groundwater is present within the crystalline volcanic rocks (quartz monzonite and andesite) that constitute much of the western portion of the mine permit area. Though the rocks themselves have practically no inter-granular permeability, faulting and jointing of the monzonite have created locally permeable zones through which water can move. Groundwater flow is generally from west to east, with the exception of the area surrounding the pit lake, which behaves as an evaporative sink. The permeability of the andesite is extremely low (<0.003 feet/day), whereas the permeability of the monzonite rocks averages 0.1 feet/day due to localized secondary porosity from fracturing. Groundwater in the Crystalline Bedrock Aquifer is characterized by moderately alkaline pH (~8 s.u.) and can generally be classed as sodium / calcium plus bicarbonate (Na / Ca + HCO_3) type waters based on their major ion signature (Figure 1-7).
2. ***Santa Fe Group Aquifer:*** Overlying and adjacent to the crystalline bedrock aquifer is the Santa Fe Group Aquifer system, which receives recharge from precipitation. The aquifer is located approximately 1 mile downgradient of the existing pit lake, and the low hydraulic conductivity of the andesite limits cross formational flow. The sediments of the Santa Fe Group are stratified, contain a wide variety of grain sizes, and, in general, dip to the east. The direction of groundwater flow is from west to east and the groundwater elevation contours indicate groundwater flows from the andesite to the alluvium and Santa Fe Group sediments. Groundwater in the Santa Fe Group Aquifer is characterized by circum-neutral to moderately alkaline pH (7 – 8 s.u.) and can generally be grouped into the calcium plus bicarbonate (Ca + HCO_3) or calcium plus sulfate (Ca + SO_4) hydrochemical facies based on major ion chemistry (Figure 1-7). The sulfate signature of some of the groundwater samples is associated with wells within the Santa Fe Group Aquifer near the existing TSF, which are known to be influenced by a sulfate plume from the historic tailings.
3. ***Quaternary Alluvial Aquifer:*** This aquifer is comprised of channel and floodplain gravels, sands and silts and represents the uppermost aquifer in the vicinity of the Copper Flat Project. The alluvial aquifer is typically recharged by infiltration of rainfall.

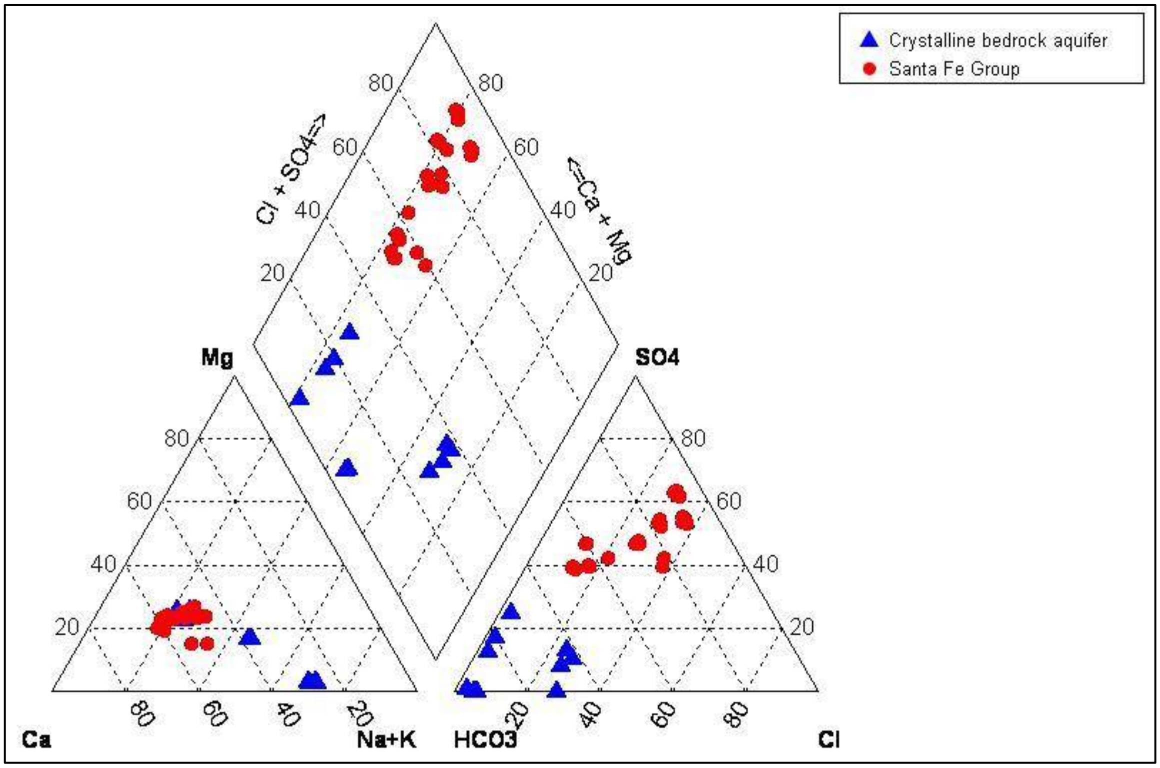


Figure 1-7: Piper Plot of Major Ion Chemistry of Groundwater in the Mine Permit Area (analyses from 2010 and 2011 only)

1.2.7 Existing Pit Lake

Beginning in the late 1980s, a pit lake formed in the existing pit. This lake represents an artificial water body that has formed in a man-made void. The surface area of the pit lake was approximately 13.8 acres at its maximum extent, but the lake has subsequently reduced in size as a result of evaporation and limited precipitation (i.e., drought conditions). A recent evaluation by John Shomaker and Associates (JSAI, who have been assisting THEMAC with site management of water resources) indicates that the pit lake currently covers an area of approximately 5.2 acres and contains approximately 70 acre-feet of water (NMCC estimate, 2015). Bathymetric measurements carried out as part of the INTERA (2012) baseline data collection program indicate that the depth of the existing pit lake varies between 10 and 35 feet. Water levels are typically highest in the winter month of January and lowest in the summer month of July. The analytical results do not indicate the presence of a chemocline or any chemical stratification in the lake. However, the temperature profiles for the winter and summer sampling showed a greater than 1°C per meter change, indicating the presence of a seasonal thermocline. The pit currently represents a hydraulic sink, with evaporation from the lake surface exceeding groundwater inflow, precipitation and surface runon (M3, 2012).

Monitoring of the existing pit lake water quality has taken place periodically between 1989 and present, with a total of 57 samples being collected for analysis. Monitoring took place on at least an annual basis between 1989 and 1997, with 26 samples collected during this period. The monitoring program was then re-established in 2010 as part of the INTERA (2012) baseline data collection program, which included collection of samples from the deepest part of the pit lake in September 2010, January 2011, April 2011 and July 2011. JSAI collected four quarters of additional data in 2013 as part of the Stage 1 abatement investigation (JSAI, 2014a). Monitoring of pit lake water quality is ongoing, with NMCC collecting three samples in 2014, two samples in 2015, 13 samples in 2016 and two samples to date in 2017.

The results of the existing pit lake monitoring are summarized in Table 1-2 and time-series plots of key parameters are provided in Appendix A. This demonstrates that the pH of the pit lake waters has been variable over the period of record, ranging from a minimum of pH 3.6 to a maximum of pH 8.3. In general, the pit lake waters are circum-neutral (average of pH 6.5); any periodic decreases in pH (for example between March and October 1992, June 2008 and June 2015 [Figure 1-10]) are associated with periodic Acid Wall Seep (AWS) events. Concentrations of sulfate, chloride, TDS, manganese, magnesium, cobalt, fluoride, sodium and potassium have increased between 1989 and 2017 (Appendix A). In particular, evapoconcentration effects have increased the concentrations of sulfate and chloride (Figure 1-8), resulting in supersaturation of pit lake waters and subsequent precipitation of salts (primarily gypsum) around the rim of the existing pit lake. These precipitated solids form a thick crust on the pit walls (Figure 1-11).

Copper concentrations in the open pit are influenced by AWS events (Figure 1-9). The elevated copper concentrations observed in 2010 are naturally mitigated to below analytical detection limits by 2011. This demonstrates that pit lake chemistry is temporally variable, with copper concentrations varying from below analytical detection limits up to a maximum of 26.5 mg/L.

Temperature and dissolved oxygen profiles for the existing pit lake (INTERA, 2012, Aquatic Consultants, 2014) show the pit water is not significantly stratified. The water stays well oxygenated for the entire depth for each season (6 to 8 mg/L dissolved oxygen). Thermal stratification requires a 1°C change in temperature per meter (Wetzel, 2001), which can occur in the summer months as the upper water column heats up and the lower water column remains cool, and well oxygenated. Figure 1-12 also shows that there is no depth-dependent variation in key chemical constituents (pH, TDS, copper, iron, zinc, manganese). This supports the assumption that the current pit lake is not stratified and that no chemocline exists.

A biological assessment of the pit lake was performed by Aquatic Consultants, Inc. (Aquatic Consultants, 2014, Appendix J) as part of the baseline data gathering effort to determine if aquatic life was present in the existing pit lake. While some algae were identified in the waters, no zooplankton, macroinvertebrates and no fish species were recovered during sampling, indicating the pit lake does not provide a suitable aquatic habitat. The biological assessment in conjunction with the other information provided in this section demonstrates that the existing pit lake is an artificial water body created as a result of mineral extraction with little or limited ability to sustain aquatic life and should not be equated to conditions that may be encountered in natural lakes.

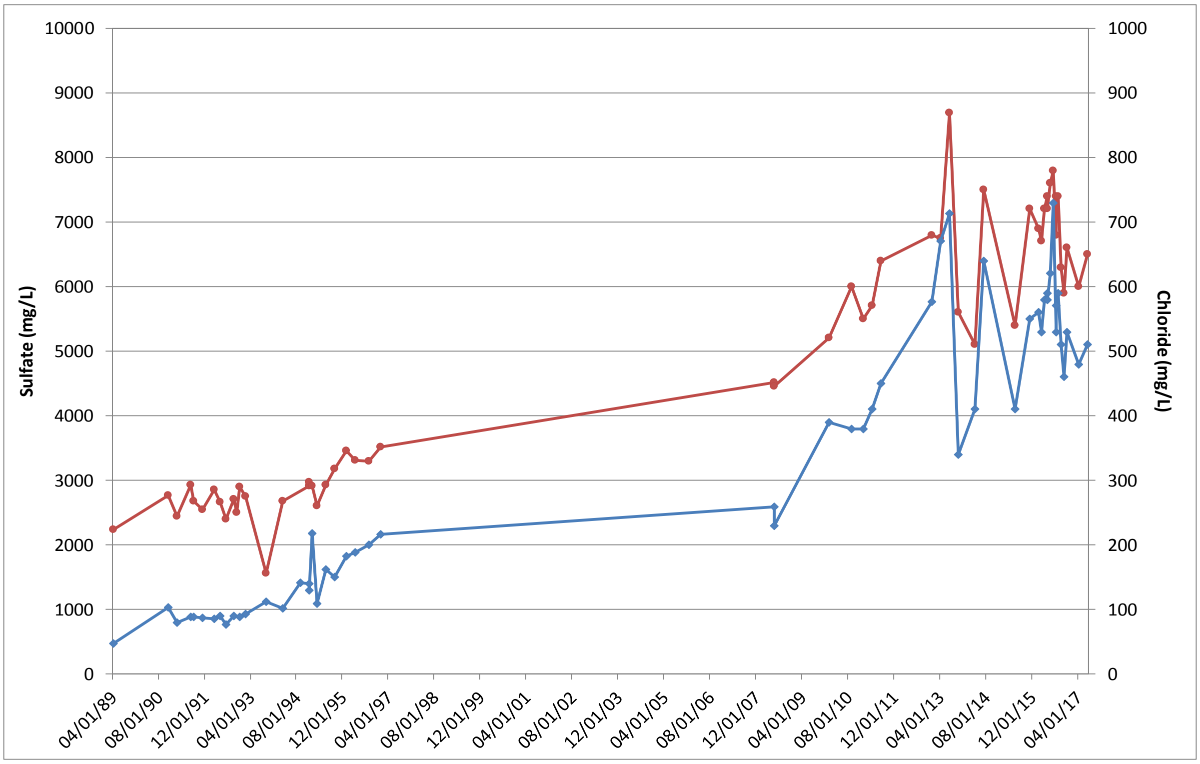


Figure 1-8: Plot of Sulfate and Chloride Concentrations in Existing Pit Lake

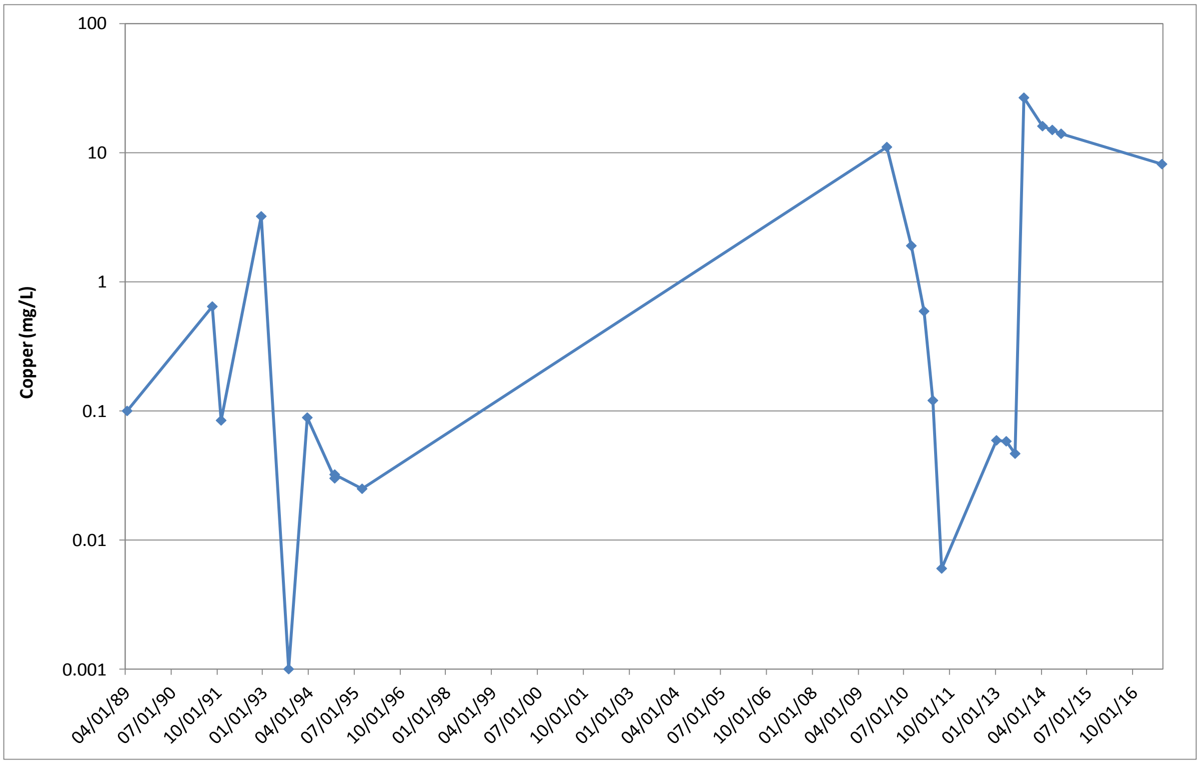


Figure 1-9: Plot of Copper Concentrations in Existing Pit Lake

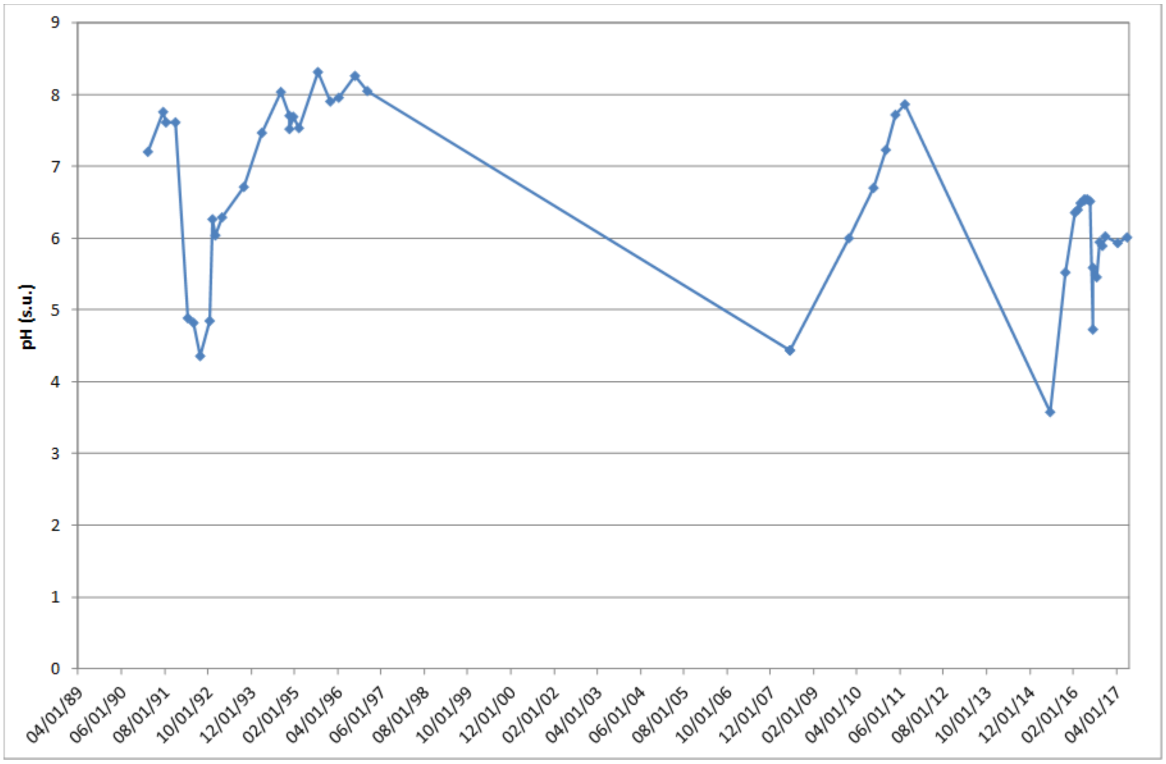


Figure 1-10: Plot of pH in Existing Pit Lake

Figure 1-11: Precipitated Salts around Rim of Existing Pit Lake

Table 1-2: Existing Pit Lake Chemistry (1989 – 2017)

Parameter	Units	n	Average	Minimum	Maximum
pH	s.u.	47	6.5	3.6	8.3
TDS	mg/L	56	7,538	2,711	14,800
Bicarbonate	mg/L	37	40.4	<3	122
Sulfate	mg/L	55	4,803	1,566	8,690
Chloride	mg/L	55	332	47.3	730
Fluoride	mg/L	33	19.2	4.8	34
Calcium	mg/L	37	550	455	684
Magnesium	mg/L	37	698	43	1,120
Sodium	mg/L	37	888	165	1,400
Potassium	mg/L	37	32.1	11	60.6
Aluminum	mg/L	33	10.4	<0.02	82.6
Antimony	mg/L	7	<0.001*		
Arsenic	mg/L	10	0.004	<0.001	0.006
Boron	mg/L	9	0.14	<0.1	0.2
Cadmium	mg/L	35	0.05	<0.005	0.1
Chromium	mg/L	11	0.03	<0.006	0.1
Cobalt	mg/L	32	0.29	<0.05	0.49
Copper	mg/L	22	4.44	0.001	26.5
Iron	mg/L	11	0.2	<0.02	1.3
Lead	mg/L	11	0.02	<0.005	0.1
Manganese	mg/L	35	34.8	0.02	59
Mercury	mg/L	10	0.0005	<0.0002	0.001
Molybdenum	mg/L	9	0.04	0.015	0.1
Nickel	mg/L	9	0.06	0.039	0.1
Selenium	mg/L	34	0.028	<0.001	0.25
Silver	mg/L	12	0.026	<0.005	0.1
Thallium	mg/L	8	0.0045	<0.001	0.005
Uranium	mg/L	4	0.11	0.11	0.12
Vanadium	mg/L	4	0.1	<0.05	0.25
Zinc	mg/L	33	5.4	0.01	9
Total Dissolved Solids	mg/L	56	7,538	2,711	14,800

n *Number of samples*

* *Indicates parameter was uniformly below analytical detection limits in pit lake water over monitoring period, but detection limit was variable. Concentration shown in table represents lower limit of analytical detection.*

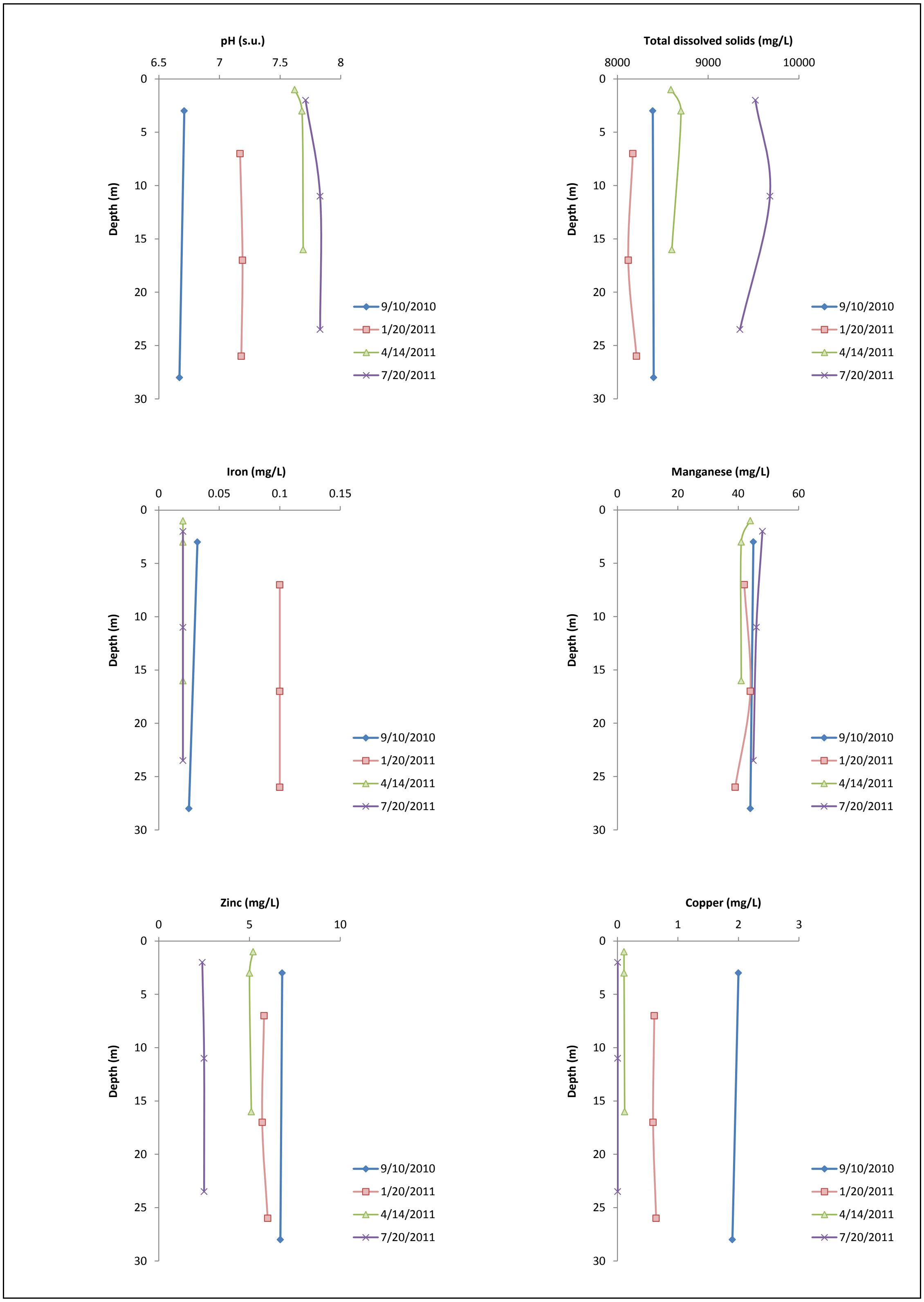


Figure 1-12: Depth Profiles of Key Constituents in Existing Pit Lake

2 Geochemical Characterization Testwork Summary

SRK has conducted a geochemical characterization program for the Copper Flat Project, which has included the testing of 91 waste rock samples, 41 samples representative of low grade ore and 11 samples of tailings material to investigate the potential for ARDML generation. The results of this program are presented in the *Geochemical Characterization Report for the Copper Flat Project, New Mexico* (SRK, 2012) and the main findings are summarized below.

Waste rock and ore sample intervals were selected from both exploration core holes drilled within the proposed pit boundaries in 2009, 2010 and 2011 and from the surface of existing WRSPs and pit walls on site. Samples were selected to represent the range of waste rock and ore material types that will be encountered during future mining. Tailings samples were collected from the metallurgical program and from the existing (historic) TSF on site. The static test methods used for the geochemical characterization program include multi-element analysis using four-acid digest and ICP-MS analysis, modified Sobek Acid Base Accounting (ABA), Net Acid Generation (NAG) test and the ASTM E2242-13 Meteoric Water Mobility Procedure (MWMP; ASTM, 2013). These static tests were selected to address total acid generation or neutralization potential of the samples and concentration of constituents in leachates derived from the material. However, these static tests do not consider the temporal variations that may occur in leachate chemistry as a result of long-term changes in oxidation, dissolution and desorption reaction rates. To address these factors, kinetic testing was also carried out as part of the geochemical characterization program and includes 32 humidity cell tests (HCTs) conducted on samples of waste rock, ore and tailings according to the ASTM D-5744-96 methodology (ASTM, 1996).

The results of the characterization program demonstrate that the acid generating potential of the Copper Flat waste rock is generally low and is largely dependent on the sulfide mineral content, with sulfide concentrations varying from less than analytical detection limits to a maximum of 2.52 wt%. The static testwork results indicate that the transitional waste material (i.e. mixed sulfide/oxide) is likely to be potentially acid forming based on a generally higher sulfide mineral content and the presence of secondary oxide minerals that formed as a result of supergene weathering. In contrast, the diabase, andesite and tailings are likely to be non-acid forming materials. The main material type for the Project consists of sulfide (i.e., non-oxidized) Quartz Monzonite and Breccia, which typically exhibited either non-acid forming characteristics or a low potential for acid generation. This is related to the encapsulation of sulfide minerals in a quartz matrix or occasionally in potassium feldspar. In addition, the sulfide minerals in the Copper Flat deposit are crystalline and often coarse grained and as such have slow weathering reaction kinetics. It is likely that the Copper Flat materials will offer limited silicate buffering (neutralizing) capacity; although this is unlikely to be high magnitude, it may modify/buffer pH in the near neutral range.

The Copper Flat waste rock and ore materials were found to be enriched in copper, sulfur and selenium in whole rock chemistry, which relates to the primary mineralization (predominantly chalcopyrite - $CuFeS_2$). Silver, arsenic, cadmium, molybdenum, lead, thallium, uranium, tungsten, and zinc were also found to be enriched in one or more material types, with the greatest levels of enrichment occurring in the sulfide and transitional ore material types. Many of these elements are typically associated with copper porphyry deposits, which explain their enrichment in the Copper Flat materials (and more specifically in the ore grade samples). The diabase and andesite material types typically showed much lower levels of elemental enrichment, which is likely related to the lack of primary mineralization in these lithological units.

MWMP tests were conducted on a total of 49 waste rock and tailings samples to provide an indication of elemental mobility and metal(loid) release from the Copper Flat materials during meteoric rinsing. Metal mobility and release was also assessed from the results of the HCT program, the results of which are summarized in Appendix B. In general, metal leaching from the Copper Flat materials was found to be low and the majority of leachates generated during the MWMP and HCT test programs could be classed as near-neutral, low-metal waters. However, several of the grab samples of transitional material collected from historic waste rock stockpiles produced acidic leachates and showed the potential for higher metal release than observed for the unoxidized sulfide materials. The higher release of acidity and metals from the transitional material likely represents the flushing of soluble acidic sulfate salts from the material surface that were produced by the prolonged weathering (over geological time) of the material.

3 Pit Lake Modeling

3.1 Summary of Modifications to Pit Lake Models since submittal of SRK (2014a) Preliminary Report

A number of modifications and refinements have been made to the Copper Flat pit lake models since the preliminary Pit Lake Geochemical Modeling Report was submitted in December 2014 (SRK, 2014a). These are detailed in Sections 3.1.1 to 3.1.8 below and are summarized in Table 3-1 at the end of this section.

3.1.1 Incorporation of Current Geologic Block Model

The revised models presented herein use the FS geologic block model to calculate the exposed surface areas of each lithology in the final pit walls. The FS block model represents the most up-to-date geological classification for the Project. Using the FS geologic block model results in minor changes to the relative proportions of each lithology that will be exposed in the final pit walls. In addition, the FS block model groups the biotite breccia and quartz feldspar breccia units together.

3.1.2 Incorporation of Current Pit Design

The revised models presented herein use the current pit design. The current pit design was developed along with the FS block model during the feasibility study and then modified to limit the future pit water body to private property with an expanded bench at the 4900 elevation in the NW corner of the pit (Figure 3-1). The current open pit design is detailed in the 2017 Mine Operation and Reclamation Plan (THEMAC, 2017a).

3.1.3 Refinement of Pit Wall Composition

The revised models include differentiation of the pit walls into mineralized and weakly to non-mineralized material, using a copper grade of 0.164% to differentiate between the two. This differentiation was used in addition to the lithology and oxidation classifications that were used in the original pit lake models (SRK, 2014a). The rationale for this refinement was based on a more in-depth review of the humidity cell chemistry data (see Appendix B), which showed that the release of certain parameters is greater from the mineralized material compared to weakly or non-mineralized material. As such, the source terms for these materials were defined separately. The redefinition and refinement of materials types within the pit walls provides a more representative calibration of existing pit lake conditions as described in Section 4 below.

3.1.4 Refinement of HCT Inputs

The revised models use different HCT inputs for trace elements and major ions to represent the different geochemical processes that control their release. An average of all weeks of humidity cell data were used for major ions (calcium, magnesium, sodium, potassium, aluminum, iron, manganese, chloride, sulfate, fluoride, bicarbonate) and an average of steady-state humidity cell data (i.e. minus the first 20 weeks of testing) were used for trace elements (silver, arsenic, boron, barium, cadmium, cobalt, chromium, copper, mercury, molybdenum, nickel, lead, antimony, selenium, uranium, vanadium and zinc). The main driver for this change in the input of HCT data was based around the improved calibration to existing conditions obtained by using the different sources of data. The results indicate that soluble salts are important in the input of major elements to the existing lake and, as such, all weeks of humidity cell data are needed for a valid prediction. By contrast, the release of trace elements is predominantly associated with longer term weathering processes, possibly sulfide oxidation and as a result the initial HCT flush concentrations were not included in the source term chemistry. Consequently, a closer calibration between predicted and observed chemistry in the existing pit lake is achieved using this 'mixed' approach to humidity cell chemistry as described in Section 4.

3.1.5 Refinement of Mineral Equilibrium Phases

Minor modifications have been made to the mineral equilibrium phases specified in the PHREEQC model input file. This refinement was based on mineral phases that were observed to be close to saturation in the preliminary outputs to the refined model.

3.1.6 Refinement of Water Balance

Since submission of the December 2014 preliminary pit lake modeling report, JSAI has refined the pit lake water balance for the future pit lake to reflect an evaporation rate of 50 inches per year, compared to the 64 inch evaporation rate used previously. This refinement was based on the relationship between maximum ET (ET_0), meteorological parameters including temperature, relatively humidity and wind speed, and geographical parameters including altitude, latitude and time of year. Further details are provided in Appendix C.

In addition to the revised evaporation rate, the water balance and geochemical models were revised to reflect post-reclamation conditions for the proposed open pit and surface drainage area as presented in the 2017 MORP (THEMAC, 2017a) and summarized herein. The revised geochemical model includes separate source terms for reclaimed and unreclaimed areas of the pit and receiving watershed. Stormwater sourced from reclaimed pit areas is expected to have a chemistry similar to background surface water quality from SWQ-1.

Further details of how runoff coefficients were defined are provided in Appendix G.

3.1.7 Revisions to Groundwater Chemistry Inputs

JSAI developed a revised groundwater input chemistry from the available historic data. JSAI used the water quality database, well construction data and groundwater flow model results to determine the most representative groundwater flow chemistry to the existing and future open pits. Further details on how the groundwater chemistry inputs were refined are provided in Appendix D.

3.1.8 Incorporation of Pit Reclamation Measures

NMCC has developed a Mine Reclamation Plan for the Copper Flat Project (THEMAC, 2017a, THEMAC, 2017b, Golder, 2017). Pit reclamation aspects included in the MORP are:

- Reclamation of the pit haul road;
- Reclamation of the expanded section of the 4900 catch bench;
- Reclamation of benches at the crest of the pit; and
- Rapid fill of the open pit with fresh water from the production water supply wells after mining to create a pit lake with water surface at the 4987 feet elevation.

These reclamation measures are described in the following sections.

Pit Haul Road and Pit Bottom

The open pit will be mined in benches over a 12 year period to create a terraced pit wall (Figure 3-1). Access into the open pit during mining will be via a 90 foot wide haul road constructed in the pit wall as mining advances. After mining, the haul road from pit crest to pit bottom will be covered with a suitable reclamation material. In addition, several benches at the bottom of the pit will also be covered in a similar manner before pit flooding occurs (Figure 3-2). The section of haul road above the final pit lake water surface will be prepared for revegetation as described in the MORP (JSAI, 2017a).

The reclaimed haul road will be used to convey stormwater to the bottom of the pit in a controlled manner. A system of surface water conveyance channels will be constructed around the pit crest to intercept and direct stormwater to the bottom of the pit through an engineered stormwater channel that is constructed in the alignment of the pit haul road.

Expanded 4900 Catch Bench

The 4900 elevation catch bench will be expanded to approximately 2 acres in size in the northwest corner of the pit (Figure 3-1). The surface of this catch bench will remain above water after rapid-fill is complete and the pit lake is established. The catch bench surface will be ripped and a growth media cover placed. The covered area will be revegetated.

Pit Crest

The upper benches of the pit shell will be laid back at an approximate 2:1 slope angle at the end of the mine operations to accommodate revegetation. The reclaimed benches will be blended into the surrounding reclaimed pit perimeter area described in the MORP. Revegetation will be accomplished by ripping the area and a growth media cover placed and re-contoured to blend with reclamation of the pit perimeter area and revegetated as described in the MORP.

Rapid Fill

After mining, the pit will be filled with fresh water coming from the mine freshwater production wells to rapidly create a pit lake (rapid fill). The rapid fill will begin immediately after mining and will be completed in approximately six months. The rapid fill requires pumping 2,200 acre-feet into the pit and will fill the pit to the 4894 ft elevation (JSAI 2017b).

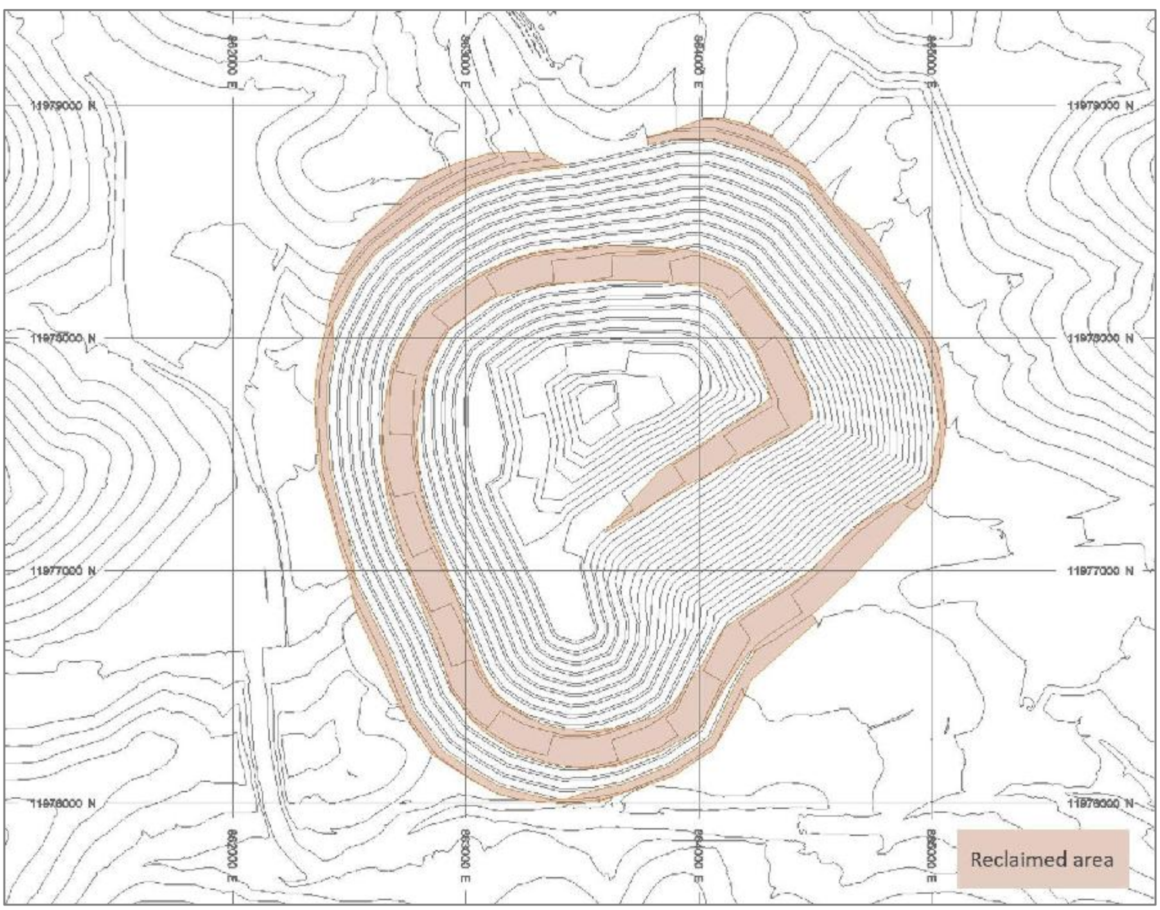


Figure 3-1: 2017 MORP Pit Showing Expanded 4900 Catch Bench and Pit Surfaces Scheduled for Cover

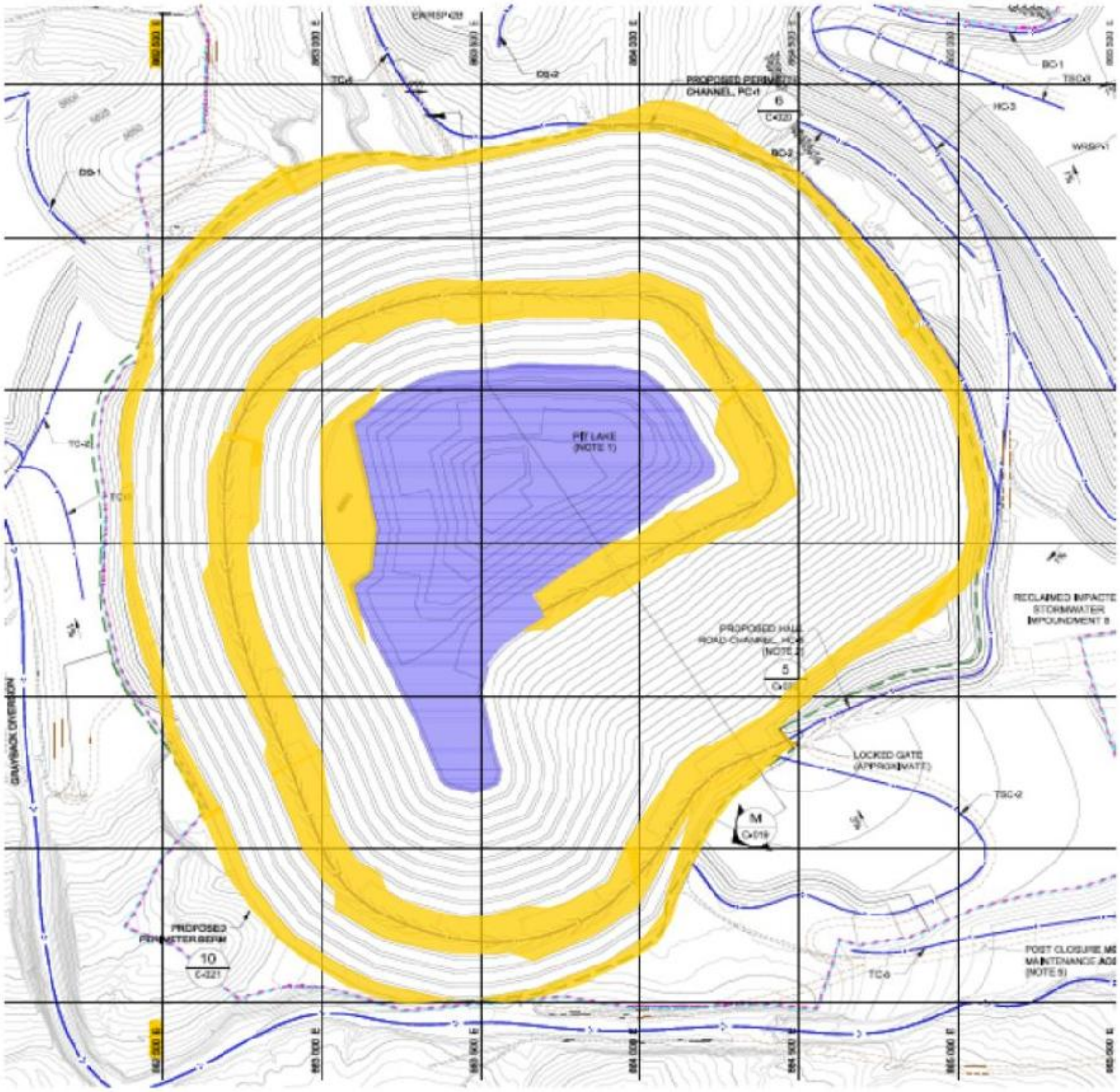


Figure 3-2: 2017 MORP Pit Showing Reclaimed Pit with Pit Lake

Table 3-1: Summary of Modifications to Pit Lake Models since Submittal of Preliminary SRK (2014a) Report

Component	Changed from (SRK, 2014a)	Changed to (current)
Geologic block model	PFS block model	FS block model
Pit shell	PFS pit shell	2017 MORP Pit
Pit wall composition	Delineated based on lithology and oxidation only	Delineated based on lithology, oxidation and mineralized versus weakly/non-mineralized
Source terms/HCT inputs	An average of all weeks of HCT data were used to develop source terms for each material type	Separate source terms were developed for major ions and trace elements. • **Major ions** (Ca, Mg, Na, K, Al, Fe, Mn, Cl, SO_4, F, HCO_3): used an average of all weeks of HCT data • **Trace elements** (Ag, As, B, Ba, Cd, Co, Cr, Cu, Hg, Mo, Ni, Pb, Sb, Se, U, V, Zn): used steady-state HCT chemistry (i.e., minus the first 20 weeks of testing).
Mineral equilibrium phases	Alunite, Ag_2Se, albite, anhydrite, azurite, barite, boehmite, brochantite, brucite, calcite, chrysotile, Cr_2O_3, diaspore, epsomite, ferrihydrite, fluoride, gypsum, gibbsite, gummite, kaolinite, magnesite, malachite, mirabilite, otavite, pyromorphite, rhodochrosite, rutherfordine, schoepite, sepiolite, SiO_2; tenorite, U_3O_8, UO_3, $UO_2(OH)_2$	Minor modifications were made to the equilibrium phases based on the predicted geochemical conditions. • **Phases added:** $CaMoO_4$, $CaSeO_3$:$2H_2O$, $CdMoO_4$, Cr2O3, $CuMoO_4$, Cu_2Se, $Mg_3(PO_4)_2$, $MnSeO_3$, $NiMoO_4$, $Ni(OH)_2$, $Ni_3(AsO_4)_2$:$8H_2O$, $PbMoO_4$, SbO_2, $ZnMoO_4$. • **Phases removed:** boehmite, diaspore, gibbsite, magnesite, malachite, pyromorphite, rhodochrosite, tenorite.
Water balance	Evaporation rate of 64 inches.	Evaporation rate of 50 inches. Separate water balance terms were also developed for run-off from reclaimed surfaces in the pit and pit catchment.
Groundwater chemistry	Average of data for wells GWQ96-22A, GWQ96-22B, GWQ96-23A, GWQ96-22B, GWQ11-24B and GWQ11-25B.	Average of data for wells GWQ96-22A, GWQ96-22B, GWQ96-23A, GWQ96-22B and GWQ11-24B. Different groundwater inputs were also developed for the current and future pits according to the relative contribution of flow from the Quartz Monzonite and Andesite units.
Pit reclamation	None	Haul road will be reclaimed and revegetated, pit shell crest and expanded 4900 catch bench will be revegetated. Pit void will be rapidly filled with water from water supply wells.

3.2 General Pit Lake Modeling Approach

The results of the geochemical characterization testwork have been coupled with site-specific hydrologic, hydrogeologic and mine plan information to develop geochemical predictions of pit lake water quality for the Copper Flat Project. Geochemical predictions have been developed for three scenarios, including:

(i) Calibration model for the existing pit lake;

(ii) Natural fill model for the future unreclaimed pit; and

(iii) Rapid fill model for the future reclaimed pit.

The conceptual models, inputs and assumptions for each of these model scenarios are presented in Sections 4, 5 and 6. The general approach to the modeling is provided in Sections 3.4 to 3.10 below.

Water chemistry predictions were made using the USGS code PHREEQC (Parkhurst and Appelo, 2010), which has been rigorously tested and is the industry standard for pit lake, waste rock dump and tailings facility geochemical predictions. The approach used herein is consistent with the industry-standard approach for modeling pit lake chemistry. Comparable approaches are reported in Tempel et al. (2000), Eary (1998) and Castendyk and Webster-Brown (2007).

The PHREEQC software uses thermodynamic equilibrium chemistry and solubility calculations to determine the residual concentration of mixing of solutions, allowing for mineral precipitation and attenuation of solutes through sorption reactions with specified mineral surface area. Furthermore, dissolution and oxidation can also be factored into the model to account for reaction with solid mineral phases which can be declared in the model in finite quantities. The resulting model output predicts not only the concentration of modeled elements but also the speciation of the aqueous solutes and the potential saturation indices of minerals of constituent components. This allows a geochemist to interpret trends in water quality data and to predict the resulting chemistry of the mixing reactions. These results are then compared to environmental and ecological risk water quality criteria to determine if a potential impact will result from the mineral-solute reactions. If appropriate, these data can also inform the development of mitigation strategies.

Data used as inputs to the models were derived from the following sources:

- Geological and mine planning information from the Baseline Data Report (INTERA, 2012), Feasibility Study (M3, 2013), the FS geologic block model, and the 2017 MORP (THEMAC, 2017a);
- Hydrologic and hydrogeologic information from the JSAI pit lake water balances developed for the three model scenarios;
- Geochemical data from laboratory humidity cell tests performed on representative mineralized and non-mineralized materials and then scaled to field conditions. These data were utilized to provide source term data for chemical leaching of exposed rock in the pit walls;
- Precipitation chemistry data from long-term monitoring at the Gila Cliff Dwellings National Monument meteorological station, New Mexico (NADP, 2012);
- Groundwater chemistry data from the groundwater monitoring program; and
- Published thermodynamic data provided with USGS PHREEQC and updated with additional sorption data for arsenic and manganese species.

These data were used to develop representative conceptual hydrogeochemical models for the three model scenarios.

3.3 Model Logic and Coding

The conceptual models developed for the Copper Flat pit lake were translated into numerical models using a geochemical thermodynamic equilibrium code and several limiting and simplifying assumptions. The Copper Flat models used a modified version of the minteq.v4 thermodynamic database supplied with the v3.3.12.12704 version of PHREEQC (released May 10th 2017). This database is widely used for geochemical modeling and was selected for this study because it includes the full range of elements for consideration in this water quality prediction as well as key sorption reactions for iron oxyhydroxides. The database was modified to include sorption data for arsenic and manganese species.

The PHREEQC model consists of several components including the input data file, the thermodynamic database, the executable code and the output file. The input file consists of a series of logic statements and commands that define each of the components of the system and explains how these components interact. The input file is read by the executable code and commands are executed in a stepwise manner. Influent component waters were speciated and mixed to generate a series of intermediate waters, solid phases, and adsorbed phases. Selected outputs are specified and parceled out to various output files for analysis of results.

A logic flow diagram for the structure of the input code is provided in Figure 3-3 and discussed below. The PHREEQC input code is provided in Appendix H.

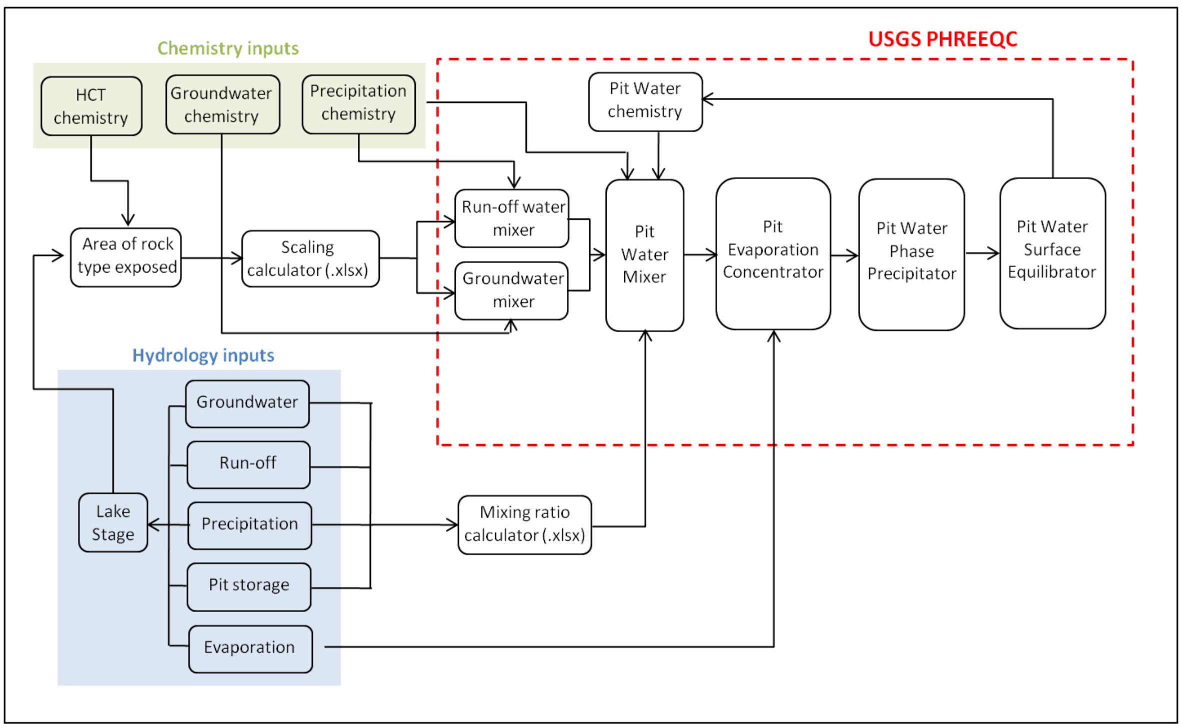


Figure 3-3: Copper Flat Pit Lake Model Execution Mechanics

The steps in the modeling process include the following items:

1. Define run-off water input specific to each exposed rock type. The run-off solution chemistries are comprised of scaled kinetic test cell leachate concentrations for each material type. These leachates are scaled to the water:rock ratio from the cell to the field based on the estimated presence of fractures in the wallrock and the thickness of the reaction rind.
2. Define the run-off solution mixing ratios. Mixing ratios are based on the amount of each material type that is sub-aerially exposed in the pit high wall at each time step.
3. Define the groundwater input. Groundwater chemistry is based on a mass addition function that combines the existing mass found within the groundwater with the mass of solute (per unit surface area and rock mass) released in the kinetic tests for specific material types exposed in the final pit walls. This is scaled to the water:rock ratio from the cell to the field, based on the estimated thickness of the reaction rind within the fractured wallrock.
4. Define groundwater solution mixing ratios based on the exposed surface area for each material type within the pit wall below the pit lake surface (i.e., within the submerged pit wallrock). As with the run-off mixing ratio, this ratio is dependent on the pit lake elevation and changes at each simulated time step.
5. Define precipitation water chemistry based on representative chemical analyses of rainwater.
6. Perform a master mixing calculation where run-off waters, groundwater, atmospheric precipitation and existing pit lake waters are mixed in ratios defined by the site-wide water balance for each time step.
7. Evapoconcentration. The resulting pit water is concentrated by a factor equivalent to the calculated evapoconcentration determined by the site-wide water balance for each determined time step. A fixed percentage of water is removed as a reverse titration of water. At the end of each titration, the volume of water is readjusted to one liter.
8. Equilibrate and precipitate. Once mixed, the model is equilibrated with atmospheric gases and select mineral phases are allowed to precipitate at the calculated pH, with pE fixed at a subatmospheric value equal to 12 minus pH. This represents a transitional equilibrium between mixed pit lake water and the atmosphere and is the most likely scenario based on the conceptual model.
9. Calculate sorption. After mineral precipitation, trace elements were allowed to adsorb onto iron oxyhydroxides (i.e., ferrihydrite). The total mass of ferrihydrite is equivalent to the mass predicted to be generated during the previous reaction step. This assumption is conservative in that it does not account for sorption to other minerals such as aluminum oxide or clay, or to iron oxides present in the pit wallrock.
10. Save chemistry for the next time step. At the end of each time step, the predicted pit water chemistry is exported to a spreadsheet for analysis.
11. The model was terminated after sufficient iterations to simulate water quality over a 100-year filling period.

3.4 Mineral and Gas Phase Equilibration

For the purpose of the Copper Flat geochemical models, it was assumed that any run-off, groundwater and precipitation entering the pit would mix evenly and completely. Under these circumstances the solutes in these waters will react with each other and may form chemical precipitates if the concentrations and geochemical conditions (Eh, pH, pCO_2, pO_2, and ionic strength) allow super saturation to occur. The geochemical models required the specification of a number of equilibrium phases that were allowed to precipitate if they become oversaturated. The suite of minerals chosen was based on the geology and mineralization of the deposit and an understanding of the types of minerals commonly observed in waste rock leachates.

The relative saturation of all minerals was calculated by comparing the calculated concentration of dissolved ionic pairs with their theoretical thermodynamic limit. Where these values were equal, the saturation index was zero and the solution was said to be at equilibrium with that mineral. At equilibrium, any amount of the mineral that dissolves will precipitate to maintain the relative solute: mineral balance. The target saturation index was set to zero and the minerals that were allowed to form in the geochemical model are given in Table 3-2. These precipitates will sink to the bottom of the pit lake and be removed from future chemical interactions as a sediment layer accumulates on the pit bottom. The precipitated mineral phases are unlikely to re-dissolve unless the pH or redox conditions of the pit lake change substantially. As such, the model assumes that precipitated mineral phases are removed from the system and that subsequent re-dissolution of these phases does not occur. Sulfide mineral reactions are already accounted for in the model because HCT data were used as inputs. The HCT test provides an estimate of long-term accelerated rates of elemental release as a result of oxidation reactions, including sulfide mineral oxidation. Kinetic data for sulfide mineral phases are also limited, with data generally being limited to silicate mineral phases. Further, in evaluating long term changes to water chemistry it is reasonable to assume thermodynamic equilibrium will be attained by the system and as such the approach taken in this study is valid.

Table 3-2: Equilibrium Phases Included in the Pit Lake Geochemical Model

Equilibrium phase*	Ideal formula	Rationale for inclusion in PHREEQC model
Alunite	$KAl_3(SO_4)_2(OH)_6$	Mineral observed at Copper Flat (SRK, 1996; 1997)
Barite	$BaSO_4$	Primary control on barium at neutral to alkaline pH (Eary, 1999). Mineral observed in Copper Flat mineralogical study (SRK, 2014b)
Brochantite	$Cu_4^{2+}(SO_4)(OH)_6$	Primary control on copper at neutral to alkaline pH (Eary, 1999). Mineral observed at Copper Flat (SRK, 1996; 1997).
Calcite	$CaCO_3$	Primary control on alkalinity at neutral to alkaline pH (Eary, 1999). Mineral observed at Copper Flat (SRK, 1996; 1997)
Ferrihydrite	$5Fe_2O_3.9H_2O$	Major control on iron chemistry and on the sorption of trace elements within pit lakes. Thermodynamic properties well defined (Dzombak and Morel, 1990).
Fluorite	CaF_2	Primary control on fluoride (Eary, 1999). Mineral observed in Copper Flat mineralogical study (SRK, 2014b)
Gypsum	$CaSO_4.2H_2O$	Primary control on sulfate (Eary, 1999). Observed in significant quantities around existing pit lake (SRK, 1996; 1997; 2014b).
Mirabilite	$NaSO_4.10H_2O$	Mineral observed at Copper Flat (SRK, 1996; 1997)

3.5 Adsorption

In solution, trace element concentrations are mostly controlled by adsorption onto common mineral phases or are removed from solution through a process of co-precipitation. The Copper Flat pit lake models assumed that trace metals may be removed from solution via sorption onto freshly generated mineral precipitates such as iron oxides. Sorption is likely to represent an important metal removal mechanism at circum-neutral to moderately alkaline pH, with many metal ions sorbing more effectively under these pH conditions. Ferrihydrite ($5Fe_2O_3.9H_2O$) was selected as a sorption surface because it is a common sorption substrate in oxygenated natural waters and because the trace element sorption thermodynamic properties of these reactions are well defined by numerous empirical studies. Adsorption of soluble phases to hydrous ferric oxides (HFO) is highly pH dependent as is the solubility of HFO itself. Below a pH of around 4.5, only minimal sorption of most dissolved metal species is observed (Stumm and Morgan, 1996). The mass of ferrihydrite used in the models was assumed to be identical to the mass of the mineral phase ferrihydrite precipitated in the previous model reaction step and is controlled by the chemistry of the system. The model assumes that the ferrihydrite is characterized by both strong (HFO_s) and weak (HFO_w) surface adsorption sites. In order to be consistent with the properties of ferrihydrite published by Dzombak and Morel (1990) the geochemical models assumed a surface site density of 0.2 moles of weak sites and 0.005 moles of strong sites per mole of ferrihydrite. Because the future pit lake predictions start from time zero (i.e., cessation of mining), there will be no prior pit lake in the void at that point. Any HFO/ferrihydrite will therefore originate from the precipitation of oversaturated mineral phases that develop upon solution mixing.

As with mineral phase precipitation, the adsorbed mass of trace elements removed through this mechanism is assumed in the conceptual model to be permanently removed from the system following incorporation and co-precipitation with the HFO phase. In the case of a major shift in pH or redox conditions, it is possible that material adsorbed to the HFO surface may be released. However, based on the HCT results available to date, a major shift in pH conditions is not likely.

3.6 Evapoconcentration

The Copper Flat pit lake is an evaporative sink, both in its current state and under future post-operational conditions (JSAI, 2017b). There will be no outflow to groundwater and the only mechanism of water loss will be through direct evaporation from the pit lake surface. As such, solutes within the pit lake will evapoconcentrate and the only mechanism for removing solutes is the formation and settling of chemical precipitates and the adsorption of trace elements onto these particulates.

3.7 Treatment of Analytical Reporting Limits

The Copper Flat pit lake models incorporate groundwater and humidity cell data that have been collected over extended periods of time, including both detectable elemental concentrations and constituent concentrations that may be below analytical reporting limits (ARL). The treatment of analytical reporting limits within the geochemical model has important implications for the model results, particularly where the data are scaled to address the difference in solid:liquid ratio between the laboratory-scale test and field conditions.

When analysis of the humidity cell leachates identified certain elements to be below the ARL, the reporting limit was adjusted to 10% of the reported limit for the purpose of calculating the average release rate for the model input. Where a constituent was consistently below the ARL throughout the course of the humidity cell testwork, the constituent was excluded from the model input for that material type to limit overstating constituent concentrations that may arise as an artifact of the modeling exercise from the scaling of humidity cell data to field conditions or from equilibration of groundwater source data that are below ARLs.

Nitrate was excluded from the geochemical predictions due to the lack of mineralogical controls in PHREEQC code. The exemption of nitrate is supported by the data as this parameter is consistently below the ARL in both the humidity cell effluent leachates and the groundwater surrounding the pit. Nitrate is also below the ARL in the existing pit lake, supporting the assumption that this parameter is unlikely to be a problem during future operations.

3.8 Model Assumptions and Limitations

The pit water quality predictions presented herein are considered the best representation of likely future water quality associated with the Copper Flat pit lake. However, it is recognized that there are a number of assumptions and limitations associated with the predictive calculations including:

- The models have been developed using site-specific geochemical, hydrochemical, geological, hydrogeological and mine plan information. Therefore, changes in operational decisions may result in a change in the future pit lake water quality at Copper Flat.
- The models assume that groundwater and surface water input chemistry can be simulated using laboratory kinetic (humidity cell) leachate chemistries, which are appropriately scaled to field conditions. The reactive surface area, ratio of water-to-rock and flushing rates in laboratory tests are different from actual field conditions. Grain size is smaller in the kinetic and static test cells and the resulting surface area for reactivity is greater that field conditions. The laboratory test cells are operated at a higher water-to-rock ratio than would be expected in the field and are flushed more frequently, so that mineral-water reaction rates are enhanced. Because the future Copper Flat pit does not yet exist, field scale parameters cannot be measured, so scaling relies on published estimates of future groundwater flux and fracture density. These estimates and assumptions are supported by the geochemical model for the existing pit (Section 4), which shows good calibration to current conditions.
- Modeling was limited to predicting water quality within the pit lake for a 100-year time period. This length of time is not intended to imply that the pit lake geochemistry or hydrogeology for the natural fill scenario will achieve steady-state, hydrogeochemical equilibrium at 100-years.
- The models rely on an external database of thermodynamic constants for mineral phase precipitates and sorbed surface complexes. These thermodynamic constants are valid at 25°C and 1 atmosphere of pressure. The models do not consider the effects associated with the formation and precipitation of mineral species other than those specified. Due to kinetic constraints, a portion of the potentially oversaturated mineral phases will not actually precipitate. A select suite of minerals is therefore specified that are allowed to precipitate, based on relevance for the environment in question, site-specific knowledge, experience in evaluating kinetic constraints and relevance of key phases for given styles of mineralization, and literature

review (Eary, 1999). The nature of the thermodynamic databases means that the constants for all major elements and a large number of trace elements are well understood and have been rigorously tested and verified. However, constants for certain parameters (for example vanadium, boron and nitrate) are not as well understood. As such, the mineralogical controls on these elements in PHREEQC are poorly defined, which may affect their precipitation (i.e., removal) from solution in the predictive calculations.

- The models assume atmospheric equilibrium with oxygen and carbon dioxide gas, with pH + pE equal to 12 (based on calculations by Baas-Becking et al., 1960 to define stability limits of natural waters).
- The models are limited to thermodynamic equilibrium reactions and do not simulate the effects of reaction kinetics and rates.
- The models are limited to inorganic reactions and do not take into account the complexities associated with biologically mediated reactions.

None of these limitations affect the ability to use model as intended, which is to assess potential future pit lake chemistry and evaluate the future environmental impacts of the Project.

3.9 Analysis of Model Input Variability

The various parameters that have been used as data inputs for the pit lake geochemical model have been assessed to determine their relative significance in influencing the model results. For the purpose of this exercise, each parameter has been assigned a qualitative value based on the degree to which it influences the final predicted solution chemistry:

- “Minor” represents less than 1% control on the final model output;
- “Moderate” represents between 1% and 10% control on the final model output; and
- “Significant” represents between 10% and 50% control on the final model output.

The results of this exercise are displayed in Table 3-3.

Table 3-3: Analysis of Pit Lake Model Input Variability

Category	Parameter	Assumptions / data used in model	Source	Control on final model results*
Hydrogeologic information	Pit lake water balances	Water balances provided by JSAI for the three model scenarios, including water elevation and surface area, groundwater inflows, direct precipitation, run-off and evaporation data.	JSAI, 2017	Significant. The water balances define the mixing ratios for the PHREEQC input solutions.
Chemical inputs	Groundwater chemistry	Baseline groundwater chemistry data from the ongoing monitoring program: average of data for wells GWQ96-22A, GWQ96-22B, GWQ96-23A, GWQ96-22B and GWQ11-24B.	INTERA, 2012; JSAI, 2017a	Significant during the early years post-closure when groundwater is likely to represent the dominant solution input to the pit lake.
	Precipitation chemistry	Averaged precipitation chemistry from Gila Cliff Dwelling National Monument Meteorological Station (1985-2011)	NADP, 2012	Minor. The precipitation chemistry represents a near-pure solution chemistry. In the absence of site-specific data, published precipitation chemistry from this meteorological station in New Mexico is the best representation of precipitation chemistry in the area.
	HCT chemistry	Averaged HCT chemistry from the HCT programs.	SRK 2012; 2014b	Significant. The solutions generated by the HCT programs represent the main chemical inputs for the pit wall source terms.
	Water Supply well chemistry (rapid fill model only)	Groundwater quality data from water supply wells PW-1 and PW-3	JSAI, 2017c	Significant. The water supply well chemistry represents the largest solution contributor to the pit lake during the first six months of filling.
Geological information	Pit wall surface area and lithologic composition	Pit wall surface areas were calculated for each simulated time step using the geologic block model and 2017 MORP pit	SRK/ NMCC	Significant. The lithological composition of the pit wall defines the mixing ratios for the PHREEQC input solutions.
Geochemical model assumptions	Mass of pit wall rock available for reaction	Mass of future pit wall available for reaction was calculated assuming an oxidized rind of 0.04 feet thickness and a fractured zone of 1 feet thickness (with 10% fractures).	SRK/ NMCC	Moderate. The values were assigned based on communication with NMCC regarding future blasting practices for the Project and are considered a conservative estimate and are consistent with industry practice.
	Equilibrium/mineral phases	The equilibrium/mineral phases listed in Table 3-2 were used as input to the models	SRK	Moderate. Mineral precipitation will influence final solution chemistry. Equilibrium phases were selected based on knowledge of site-specific geologic and mineralogic conditions and were then verified and refined by calibrating with the existing pit lake chemistry.

* Minor: <1%
Moderate: 1 - 10%
Significant: 10 - 50%

3.10 Comparative Guidelines

The standards that apply to the post-mining Copper Flat pit water body are contained in the regulations MMD administers under the Mining Act; specifically “Performance and Reclamation Standards for New Mining Operations” at 19.10.6.603 NMAC. These MMD standards require that the pit water body comply to the following performance standard:

- Operations must be planned and conducted to minimize change in the hydrologic balance in both the permit and potentially affected areas; and
- Reclamation must result in a hydrologic balance similar to pre-mining conditions.

MMD must determine that the NMCC mine operating and reclamation plan complies with these standards before a mining permit can be issued. The mine plan must take into account the site-specific characteristics of the mining operation and the site in meeting the standards and requirements. The MMD regulations require that the permit area be reclaimed to a self-sustaining ecosystem appropriate for the life zone of the surrounding area following closure unless conflicting with the approved post-mining land use. Specifically, NMAC 19.10.6.603.C.(4), Hydrologic Balance states that the performance and reclamation standards identified in this subsection require that, if not in conflict with the approved post-mining land use, reclamation must result in a hydrologic balance similar to pre-mining conditions.

Section 19.10.6.602.D.(13)(g)(v) of the regulations identifies the environmental baseline information required to establish pre-mining conditions and outlines the hydrologic and water quality data requirements for baseline data.

There are several site-specific factors to consider regarding the Copper Flat Project in determining what standards apply. First, the existing pit water body is and the future pit water body will be fully confined to private land. The two-acre catch bench at the 4900 ft amsl elevation of the pit ensures that the future pit lake remains on private property. The pit is and will be a hydraulic evaporative sink in the future, and, as such, is not a flow-through system (INTERA, 2012; JSAI, 2017b). As a result of being confined to private land and remaining a hydrologic sink, the current and future pit water body will not be a water of the state and the surface water standards the NMED Surface Water Quality Bureau (SWQB) administers will not apply to the pit water. Because the pit is and will be a hydraulic evaporative sink in the future, NMED Groundwater Quality Bureau (GWQB) standards are also not applicable to the future pit water body.

Therefore, the applicable standard for the future pit water body as provided by the MMD regulations will be “similarity”, NMCC must demonstrate that post-mining hydrologic conditions, i.e., the post-mining hydrologic balance is similar to the pre-mining hydrologic conditions. The MMD regulations do not contain a definition of “hydrologic balance”. Nonetheless, Section 19.10.6.602.D.(13)(g)(v) requires that a determination be made of the probable hydrologic consequences of the operation and reclamation, including water quality. These two regulatory requirements are interpreted to require the NMCC demonstrate that that the water quality of the future pit lake be similar to that of the pre-mining pit water quality and, thus, allow NMCC to demonstrate that the water quality hydrologic consequence is nil.

This report provides the required demonstration as to the similarity of the future pit lake water quality to present pit lake water quality. In this report, the pit lake predictive model results are compared to existing pit lake water quality to demonstrate that the anticipated post-mining water quality of the future pit is similar to pre-mining pit water body quality present at Copper Flat today.

In addition, the existing pit water body has been previously studied by Aquatic Consultants, Inc. (Aquatic Consultants, 2014) and it has been determined that the environment within the existing water body does not reflect a natural lake environment. There are no fish in the existing pit water body and water quality reflects the mineralized nature of the surrounding pit walls. When mining is complete, the pit water body will re-form; the NMCC reclamation and closure plan is designed to leave the future pit water body in a condition similar to its current condition.

4 Existing Pit Calibration Model

Numerical predictions have been undertaken to model the current (i.e., existing) pit lake chemistry in order to calibrate and verify the future pit lake geochemical predictions. A water balance for the existing pit was provided to SRK by JSAI and this was coupled with the results of the HCT testwork and data relating to the existing pit wall geology to carry out numerical simulations of water quality in the existing pit lake.

4.1 Conceptual Model

A conceptual model for the existing pit lake at Copper Flat is provided in Figure 4-1. The inputs to the model are discussed in Sections 4.2 to 4.5 below.

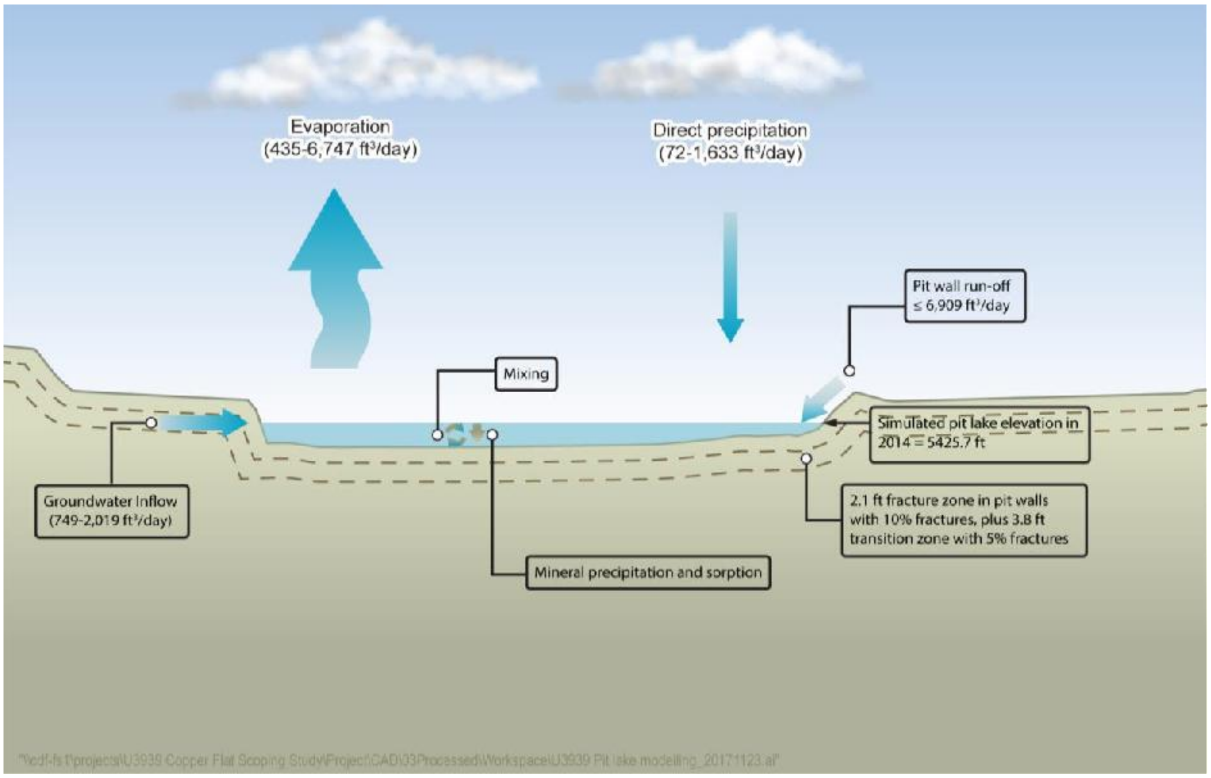


Figure 4-1: Existing Pit Conceptual Model

4.2 Pit Wall Surface Areas

The proportional surface areas of the main material types that are exposed in the existing pit walls have been calculated from the FS geologic block model. Material types have been delineated based on primary lithology, oxidation (redox) and mineralization (i.e., mineralized versus weakly/non-mineralized).

The three-dimensional surface areas used as input to the existing pit model are provided in Table 4-1 and are illustrated in Figure 4-2. This demonstrates that mineralized, oxidized quartz monzonite represents the dominant material type exposed in the existing pit walls.

Table 4-1: Pit Wall Surface Areas used in Existing Pit (Calibration) Model

Mineralization	Rock Type	Redox	Three-dimensional surface area	
			Square feet	%
Weakly/non-mineralized	Biotite Breccia	Oxide	88,213	8.5
		Sulfide (non-ox.)	5,073	0.5
	Quartz Monzonite	Oxide	171,155	16.5
		Sulfide (non-ox.)	27,011	2.6
Mineralized	Biotite Breccia	Oxide	118,474	11.4
		Sulfide (non-ox.)	153,348	14.8
	Quartz Monzonite	Oxide	291,547	28.1
		Sulfide (non-ox.)	184,085	17.1
		Total	**1,038,906**	**100%**

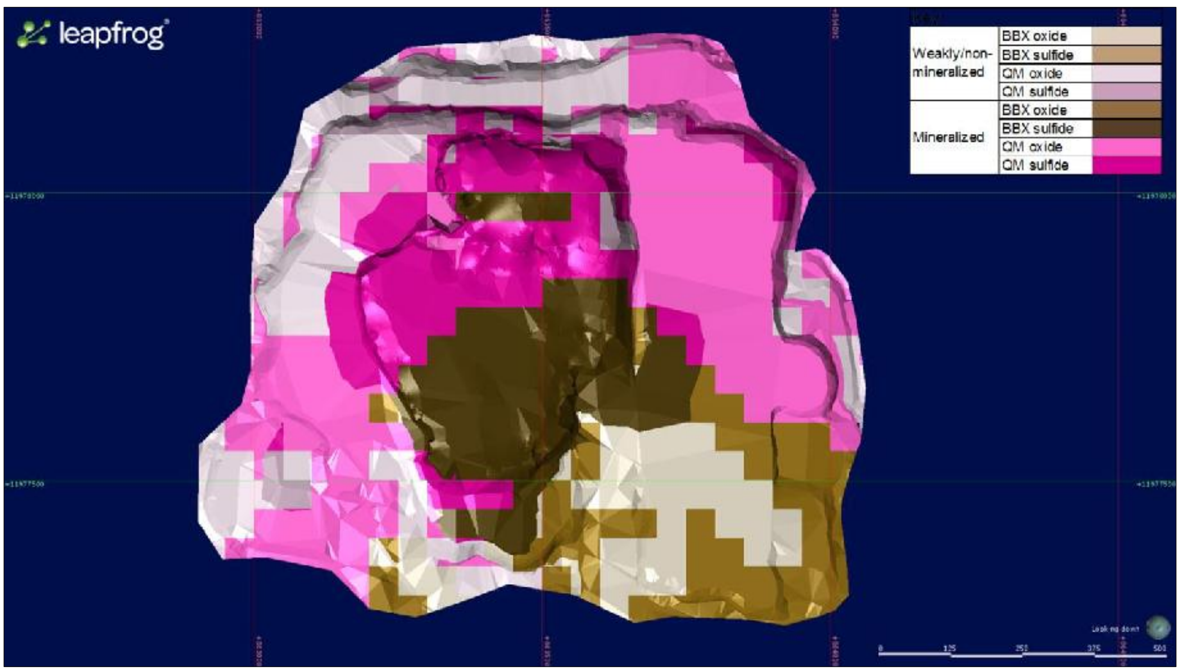


Figure 4-2: Material Types Exposed in Existing Pit (Calibration) Model

4.3 Calculation of Pit Wall Rock Available for Leaching

During Quintana's operations, the existing pit at Copper Flat did not reach its final configuration and the pit walls were not prepared using pre-split drilling and smooth wall blasting. Therefore, the existing pit wall has significantly deeper fracturing than predicted for the future final pit wall from the proposed operation. The literature demonstrates that open pit wall blast damage for granite, granodiorite and quartz monzonite rocks extends 2 to 4 ft in depth when assessing effects from production type blasting (e.g., Carroll and Scott, 1966; Siskind and Fumanti, 1974; Kelsall et al., 1984) (Appendix F).

For the existing pit lake scenario, an estimate of the reactive rind thickness is provided by results from a U.S. Bureau of Mines experimental study on fracturing produced in the vicinity of large-diameter blast holes in Lithonia granite (Siskind and Fumanti, 1974). From this study, a fractured zone ('fracture zone') was identified that extends approximately 2 feet into the pit wall and a second zone ('transition zone') characterized by a lesser degree of fracturing extends from approximately 2 to 4 feet (Figure 4-3). Oxygen infiltration extends no further than the predicted depth of fracturing of 2 feet, and that the percent of the rim rock mass fractured during mining will range from 10% within the fracture zone to 5% within the transition zone. This estimate of fracturing is supported by Atchison (1968). An oxidized rind of 0.04 feet thickness has also been assumed in the pit walls. This scenario is considered a conservative input of pit wall fracturing based on the information provided in Appendix F.

Using these assumptions for the fracture zone, transition zone and oxidized rind, the reactive mass (R_m) of each material type in the pit wall was calculated as:

$$R_m = (S \times F_{FZ} \times L_{FZ} \times D) + (S \times F_{TZ} \times L_{TZ} \times D) + (S \times L_{OR} \times D)$$

Where:

S is the three-dimensional pit wall surface area of the given material type in square meters (defined by the geological block model; see Table 4-1);

F_{FZ} is the fracture density in the fracture zone (10%);

L_{FZ} is the thickness of the fracture zone in meters (0.64m);

F_{TZ} is the fracture density in the transition zone (5%);

L_{TZ} is the thickness of the transition zone in meters (1.16m);

L_{OR} is the thickness of the oxidized rind in meters (0.012m);

D is the rock density in kg/m^3 (2700 kg/m^3, Young and Olhoeft, 1976).

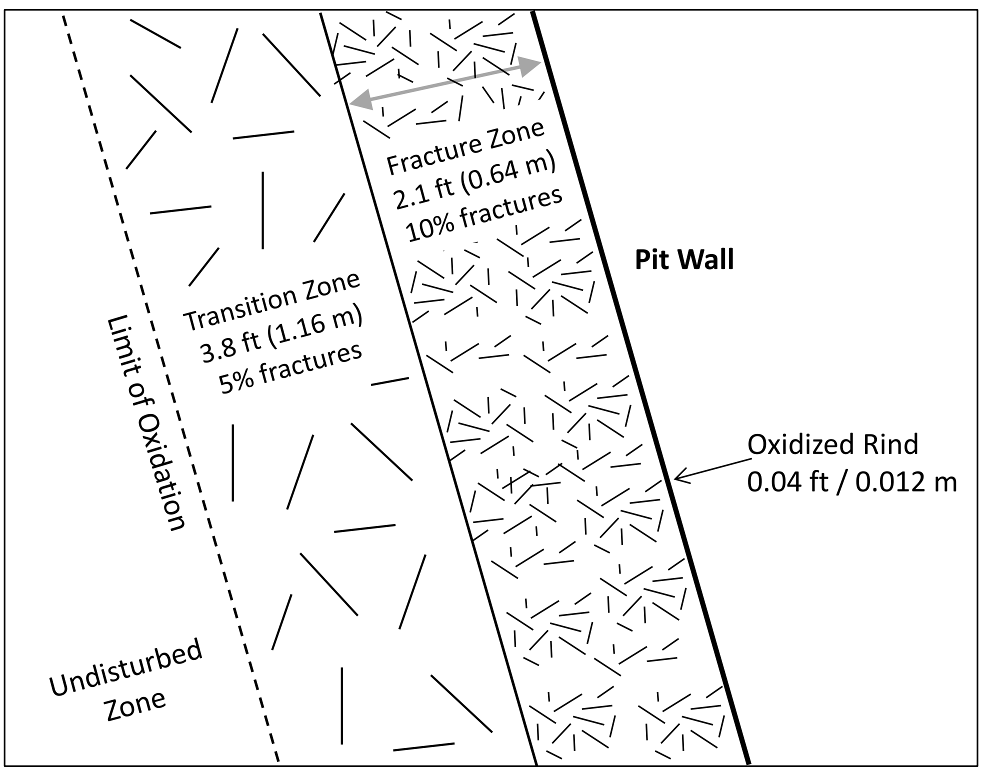


Figure 4-3: Existing Pit Wall Conceptual Model

4.4 Water Balance

A pit lake water balance for the existing pit lake was provided to SRK by JSAI. The water balance data used in the existing pit lake predictions are summarized in Figure 4-4 and Figure 4-5 below.

Figure 4-4 shows the simulated pit lake elevation with time and Figure 4-5 shows the simulated inflows and outflows to the existing pit.

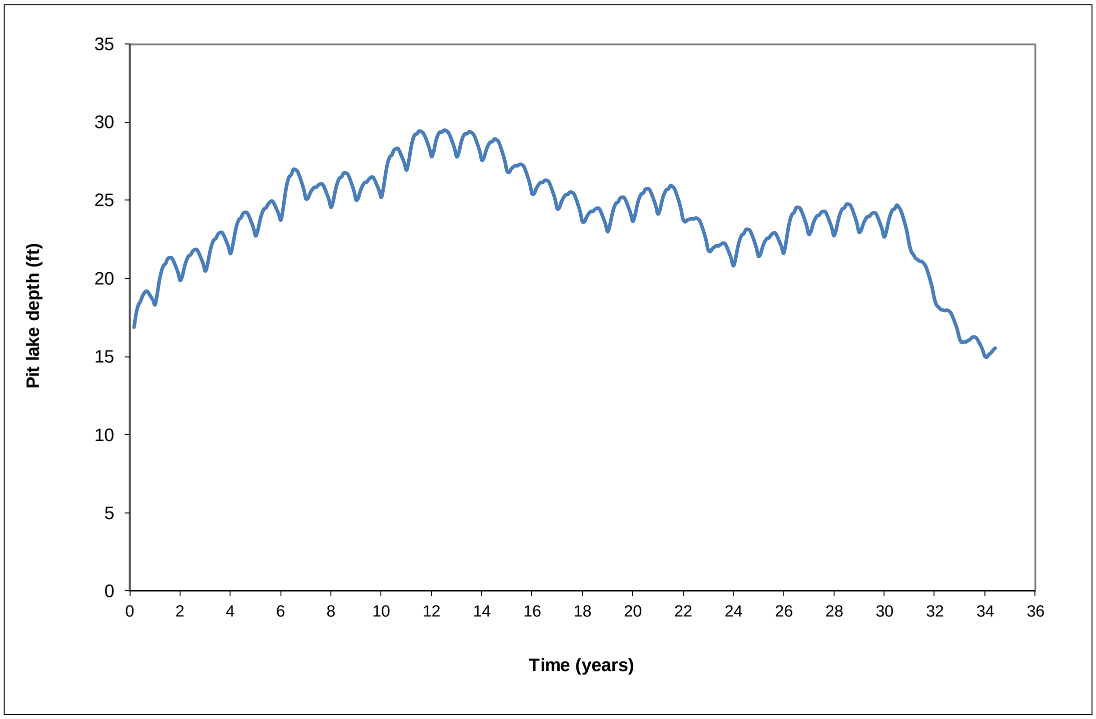


Figure 4-4: Simulated Water Level for the Existing Pit Lake

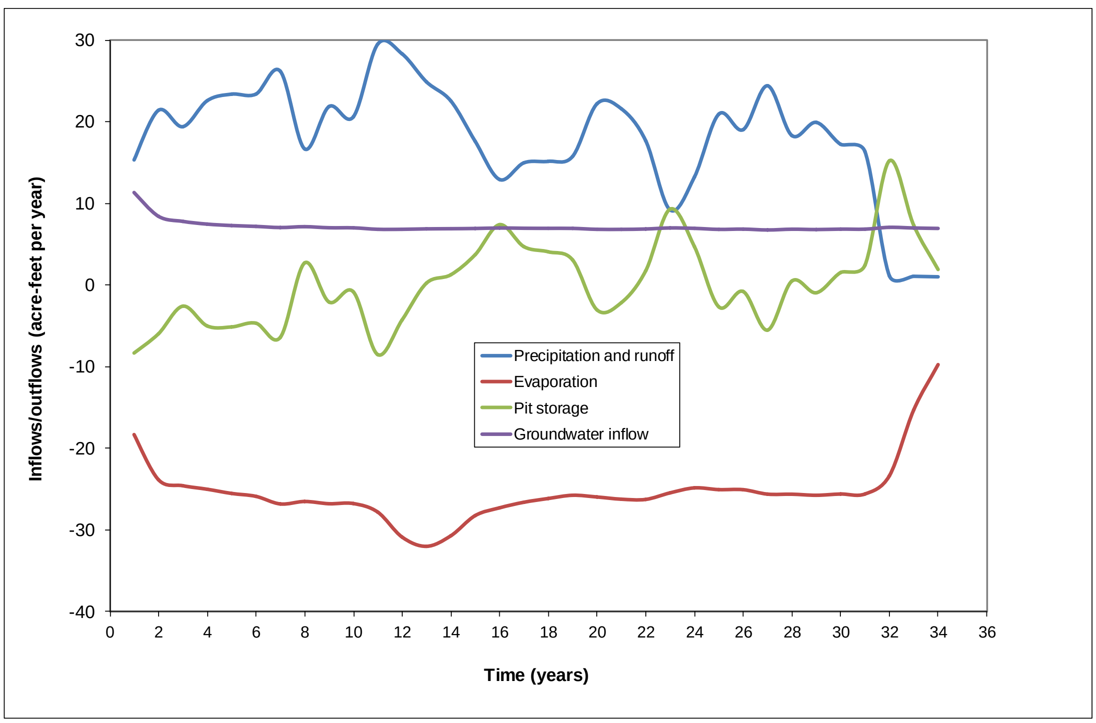


Figure 4-5: Existing Pit Lake Inflows/Outflows

4.5 Solution Inputs

4.5.1 Precipitation Chemistry

The primary wall rock lixiviant for the pit high walls in both the existing pit and the future pit is assumed to be rainwater (i.e. meteoric precipitation). Representative precipitation chemistry data were obtained from monthly monitoring carried out between 1985 and 2011 at the Gila Cliff Dwellings National Monument meteorological station, Catron County, New Mexico (NADP, 2012) (Figure 4-6). In the absence of any site-specific precipitation chemistry, this is considered the most representative precipitation chemistry available for use in both the existing and future pit lake models.

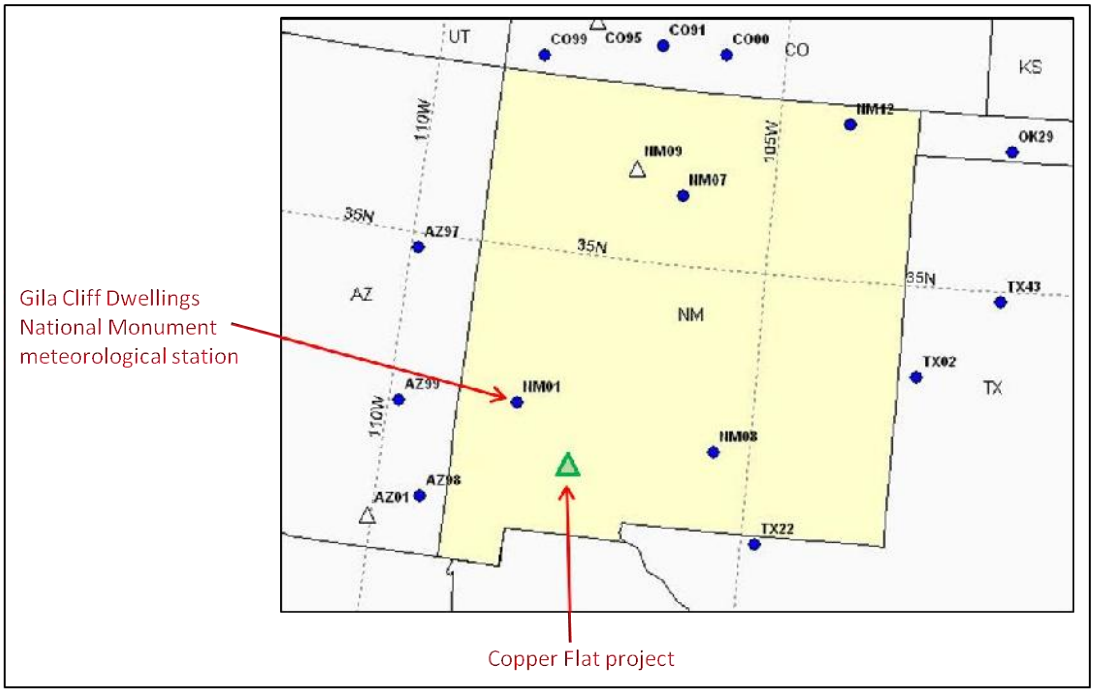


Figure 4-6: Location of Gila Cliff Dwellings National Monument Meteorological Station

4.5.2 Groundwater Chemistry

Representative groundwater chemistry data for the existing pit lake model were obtained from the historical data compiled by JSAI and NMCC. There are four sets of piezometers surrounding the existing pit that have been sampled, with two piezometer sets representing groundwater in the andesite (GWQ96-22[A,B] and GWQ96-23[A,B]), and two in the quartz monzonite (GWQ11-24[A,B] and GWQ11-25[A,B]). GWQ96-23(A,B) is located at the transition between andesite and quartz monzonite; however the water quality is similar to GWQ96-22(A,B) and indicative of andesite.

The results from wells GWQ96-22(A,B), GWQ96-23(A,B), GWQ11-24(B) and GWQ11-25(B) were averaged and used as input to the existing pit lake geochemical model (Table 4-2). Wells GWQ11-24A and GWQ11-25A were not used in the model input as they may have been affected by oxidation of sulfides in fractures during well development and may not be representative of groundwater reporting to the open pit. Furthermore, GWQ11-25A represents a localized and isolated fracture system recharged by oxygenated meteoric water that is not connected to the open pit (JSAI, 2017a). For these reasons, data from GWQ11-24(A) and GWQ11-25(A) were not considered as part of the groundwater inflow to the existing pit.

Further information on how the groundwater chemistry data were derived is provided in the JSAI technical memorandum in Appendix D.

4.5.3 Wall Rock Chemistry

Source term solutions for material types exposed in the existing pit walls at Copper Flat were developed from the results of site-specific HCT testing conducted as part of the SRK (2012) geochemical characterization program that were scaled to field conditions. The application of a scaling factor is necessary because laboratory tests are operated at a higher water-to-rock ratio than would be expected in the field, meaning that mineral-water reaction rates are enhanced in the laboratory. The scaling factor is based on site-specific information relating to the pit water balance, geological model, pit wall fracturing and wall rock density.

The reactive mass (R_m) of pit wall rock available for chemical weathering reactions in both the unsaturated high wall and the submerged pit wall was calculated using the methodology outlined in Section 4.3. The reactive mass for each material type was coupled with the pit water balance to determine the changes in run-off and groundwater chemistry as any water that interacts with the pit walls migrates through the reactive fracture zones. This is demonstrated by the equation below:

$$C_i = \frac{r_i . R_m}{Q}$$

Where:

C_i represents the predicted concentration (in mg/L) of element *i*;

r_i represents the average release rate of element *i* in mg/kg/week in the humidity cell tests;

R_m indicates the pit wall reactive mass in kg; and

Q represents either the rate of groundwater inflow into the pit or the rate of pit wall run-off in L/week.

The modified chemistry of the precipitation from these pit rim reactions was then used as the source term contribution to the pit. Separate source terms were developed for each of the material types exposed in the current pit walls (see Table 4-1).

Different HCT inputs were used for trace elements and major ions to represent the different geochemical processes that control their release. Soluble salts are important in the input of major elements to the existing lake and, as such, all weeks of humidity cell data are needed for a valid prediction. By contrast, the release of trace elements is predominantly associated with longer term weathering processes, possibly sulfide oxidation and as a result the initial HCT flush information does not contribute sufficiently. As such, an average of all weeks of humidity cell data were used for major ions (calcium, magnesium, sodium, potassium, aluminum, iron, manganese, chloride, sulfate, fluoride, bicarbonate) and an average of steady-state humidity cell data (i.e., minus the first 20 weeks of testing) were used for trace elements (silver, arsenic, boron, barium, cadmium, cobalt, chromium, copper, mercury, molybdenum, nickel, lead, antimony, selenium, uranium, vanadium and zinc).

The solutions used as inputs to the geochemical model are provided in Table 4-2.

Table 4-2: Groundwater, Wall Rock and Precipitation Chemistry used as Input to the Existing Pit Model

Parameter		Units	Precipitation chemistry	Groundwater chemistry	Wall rock chemistry							
					Mineralized				Weakly/non-mineralized			
					Biotite breccia oxide	Biotite breccia sulfide	Quartz Monzonite oxide	Quartz Monzonite sulfide	Biotite breccia oxide	Biotite breccia sulfide	Quartz Monzonite oxide	Quartz Monzonite sulfide
			Gila Cliff Dwellings National Monument meteorological station	*Average of wells GWQ96-22(A,B), GWQ96-23(A,B), GWQ11-24(B) and GWQ11-25(B).*	*Average of HCT SRK 0854*	*Average of HCTs 604767, 604787, 604811, 604854, 604862, 604867 and 605033*	*Average of HCT SRK 0867*	*Average of HCTs 604652, 604606, 604653, 604656 and 604669*	*Average of HCT SRK 0872*	*Average of HCTs 604811, 604854, 604862, 604867 and 605033*	*Average of HCT 604569*	*Average of HCTs 604673 and 605153*
pH	pH	s.u	4.93	6.91	5.22	7.86	6.9	7.95	6.51	7.91	7.85	5.74
HCO_3	Bicarbonate	mg/L		316	0.47	45	9.27	38.2	6.4	54.9	22.6	12.3
Ag	Silver	mg/L		0.009	-	-	-	-	-	-	-	-
Al	Aluminum	mg/L		0.12	0.39	0.005	0.07	0.008	0.08	0.006	0.03	0.04
As	Arsenic	mg/L		0.0023	0.0011	0.00034	-	-	0.00095	0.00025	0.00025	-
B	Boron	mg/L		0.136	-	0.005	0.0047	0.0049	-	0.0049	0.005	0.005
Ba	Barium	mg/L		0.089	0.012	0.0091	0.0075	0.012	0.01	0.0062	0.0005	0.035
Ca	Calcium	mg/L	0.21	336	14.1	24.1	25.9	19.5	27.8	28	9.05	6.32
Cd	Cadmium	mg/L		0.001	0.0013	-	0.00005	-	0.00008	-	0.00005	0.00034
Co	Cobalt	mg/L		0.01	0.0009	-	0.0005	-	0.0005	-	-	-
Cr	Chromium	mg/L		0.0066	-	-	-	-	-	-	0.00025	-
Cu	Copper	mg/L		0.0037	18.2	0.0085	0.0056	-	0.0034	0.013	0.0025	0.38
F	Fluoride	mg/L		4.6	0.25	1.09	0.56	0.81	0.33	1.2	0.74	0.43
Fe	Iron	mg/L		1.48	0.7	0.001	0.1	0.001	0.1	0.001	0.001	0.004
Hg	Mercury	mg/L		0.000002	-	-	-	-	-	-	-	0.00002
K	Potassium	mg/L	0.03	4.39	1.42	3.75	1.08	3.84	0.48	4.43	2.5	1.84
Mg	Magnesium	mg/L	0.02	57.8	1.44	3.97	2.24	3.51	1.16	4	2.54	0.98
Mn	Manganese	mg/L		2.47	0.32	0.07	0.47	0.13	0.18	0.04	0.04	0.02
Mo	Molybdenum	mg/L		0.0119	-	0.0052	0.0051	0.0074	0.079	0.0056	0.0005	0.002
Na	Sodium	mg/L	0.08	115	0.61	2.41	0.93	3.46	0.45	2.6	3.23	1.69
Ni	Nickel	mg/L		0.0125	0.0005	-	0.0005	-	0.0005	-	0.0005	-
Pb	Lead	mg/L		0.0025	0.0034	-	-	0.00012	0.00012	-	0.00012	0.0016
Sb	Antimony	mg/L		0.0009	-	-	0.003	-	0.00051	-	-	-
Se	Selenium	mg/L		0.0022	0.00023	0.00031	0.00024	0.00032	0.00024	0.00035	0.00025	0.00025
U	Uranium	mg/L		0.0015	0.0013	0.0033	0.0005	0.0012	0.0013	0.0017	0.0005	0.0046
V	Vanadium	mg/L		0.0009	0.0005	0.001	0.0005	0.0005	0.0005	0.0015	0.0005	0.0005
Zn	Zinc	mg/L		0.08	0.088	0.0027	0.0016	0.0046	0.0013	0.0014	0.0023	0.015
SO_4	Sulfate	mg/L	0.86	954	99.6	44.5	72.3	38.7	74.4	47.3	21.6	14.9
Cl	Chloride	mg/L	0.12	34	0.69	1.3	0.74	2.17	0.6	1.34	1.07	0.71

\- Indicates parameter was uniformly below ARLs in the HCT effluent leachates and was excluded from the PHREEQC model input for the specified material type

4.6 Results

The results of the existing pit calculations are shown in Table 4-3. This shows predicated pit lake chemistry in 2014 (i.e., the final point in the simulated water balance). The predicted chemistry has been compared to average measured chemistry in the existing pit lake between 2010 and 2013 and also the range of chemistry observed during this time period. The PHREEQC model only predicts chemistry at a fixed point in time and does not account for seasonal or longer-term variations in chemistry that may occur. As such, comparison of predicted pit lake chemistry to the range of measured chemistry is likely a more reliable indicator of the accuracy of the model in predicting future chemical conditions.

The model results show good calibration for pH, bicarbonate, calcium, aluminum, cobalt, chromium, copper, mercury, manganese, sodium, nickel, selenium, uranium, zinc and TDS. Predicted concentrations of these constituents are within the range of chemistry measured in the existing pit lake between 2010 and 2013. This demonstrates that they can be predicted with a good degree of accuracy for the future pit lake. In comparison, a few constituents are either positively or negatively-biased in the pit lake calibration model.

Boron, potassium, molybdenum and antimony are overestimated by the PHREEQC model. This likely relates to a combination of factors, including: evapoconcentration effects within the PHREEQC model and a lack of appropriate mineralogical controls in the minteq thermodynamic code. This means the geochemical mechanisms that are responsible for removal of these constituents from solution in the existing pit lake (e.g., adsorption only clays or precipitation of mineralogical phases that are not included in the minteq database) are not accounted for in the PHREEQC geochemical model. This lack of appropriate mineralogical controls in the thermodynamic code prevents these elements from precipitating (i.e. be removed from solution) within the model, thus resulting in predicted concentrations of these constituents being artificially increased over time. This is a limitation of the minteq thermodynamic database, which is discussed further in Section 3.8.

By contrast, concentrations of arsenic, barium, cadmium, fluoride and iron are slightly underestimated by the PHREEQC model. For iron, this underestimate likely relates to the fact that PHREEQC reports only truly dissolved phases. It is possible that iron in the existing pit lake may exist in the form of fine-grained colloids that pass through a 0.45 µm filter, which explains the high measured concentrations of iron in the existing pit lake. This has implications for arsenic concentrations due to the strong affinity of arsenic for Fe-oxyhydroxides (Bowell, 1994). The model predicts that arsenic concentrations will primarily be controlled by adsorption onto Fe-oxyhydroxides, therefore any underestimate in iron concentrations and/or Fe-oxyhydroxide precipitation by the model will affect the predicted arsenic chemistry. Furthermore, the calculations assume thermodynamic equilibrium and it may be that speciation of arsenic in the lake is more complex than predicted and adsorption of arsenic onto Fe-oxyhydroxide may be affected as a result.

For fluoride and barium, the lower concentrations predicted by the model may relate to the over-estimation of precipitation for mineral phases that control the chemistry of these constituents (i.e., fluorite and barite for fluoride and barium, respectively). Although both of these minerals have been observed around the existing pit lake at Copper Flat (SRK, 2014b) and are likely to form based on the predicted chemistry, the model may overestimate the mass of these minerals that will precipitate (i.e. be removed from solution), resulting in lower predicted concentrations.

Despite these minor differences in predicted and measured concentrations for a small number of parameters, the existing pit lake model shows that the majority of parameters can be predicted with a good degree of accuracy for the future pit lake.

Table 4-3: Existing Pit (Calibration) Model Results

Parameter		Units	Average measured chemistry in existing pit lake (2010 - 2013)	Range of measured chemistry in existing pit lake (2010 - 2013)	PHREEQC predicted chemistry for existing pit lake
pH	**pH**	s.u.	7.30	6.0 – 7.9	7.94
pe	**pe**	s.u.	-	-	4.84
HCO_3	**Bicarbonate**	mg/L	49.7	<20 – 123	37.9
Ag	**Silver**	mg/L	<0.005	<0.005	0.012
Al	**Aluminium**	mg/L	4.58	<0.02 – 82.6	0.02
As	**Arsenic**	mg/L	0.003	<0.001 – 0.0077	0.0012
B	**Boron**	mg/L	0.17	0.13 – 0.19	0.85
Ba	**Barium**	mg/L	0.012	<0.01 – 0.014	0.003
Ca	**Calcium**	mg/L	567	453 – 670	461
Cd	**Cadmium**	mg/L	0.055	0.038 – 0.064	0.03
Co	**Cobalt**	mg/L	0.29	0.049 – 0.49	0.06
Cr	**Chromium**	mg/L	<0.006	<0.006	0.0015
Cu	**Copper**	mg/L	2.21	<0.006 – 26.5	0.03
F	**Fluoride**	mg/L	18.4	15 – 29.8	4.74
Fe	**Iron**	mg/L	0.12	<0.02 – 1.3	0.0001
Hg	**Mercury**	mg/L	<0.0002	<0.0002	0.0002
K	**Potassium**	mg/L	33	24 – 49	397
Mg	**Magnesium**	mg/L	720	570 – 1120	524
Mn	**Manganese**	mg/L	41	28 - 48	38.7
Mo	**Molybdenum**	mg/L	0.02	<0.015 – 0.025	1.66
Na	**Sodium**	mg/L	871	604 – 1400	923
Ni	**Nickel**	mg/L	0.058	0.039 – 0.069	0.06
Pb	**Lead**	mg/L	0.011	<0.005 – 0.026	0.019
Sb	**Antimony**	mg/L	<0.001	<0.001	0.13
Se	**Selenium**	mg/L	0.027	0.013 – 0.059	0.034
U	**Uranium**	mg/L	0.12	0.11 – 0.12	0.14
V	**Vanadium**	mg/L	<0.05	<0.05	0.020
Zn	**Zinc**	mg/L	4.29	0.78 – 7.36	2.05
SO_4	**Sulfate**	mg/L	6,128	5,200 – 8,690	5,302
Cl	**Chloride**	mg/L	451	340 – 714	224
TDS	**Total Dissolved Solids**	mg/L	9,188	7,770 – 14,800	7,918

5 Unreclaimed Pit Model with Natural Fill

5.1 Conceptual Model

The unreclaimed model assumes that dewatering will occur during mining operations and limited water will pond within the pit itself. At the end of open pit mining operations, dewatering will cease and a pit lake will ultimately form by natural refill as a result of inflow of groundwater into the pit, direct precipitation onto the pit lake, run-off from the pit walls and runoff from the open pit surface drainage area. Predictions of future pit lake chemistry for this scenario were made at selected time intervals (beginning when the pit lake starts to fill after mining and dewatering operations cease). Water quality predictions were made for the time periods of 0.5, 1, 2, 5, 10, 25, 50, 75, and 100 years after the start of pit lake formation. These predictions were based on mass load mixing of waters from different sources and allowing the resulting mix to establish thermodynamic equilibrium under imposed conditions by dissolving or precipitating specified solids, with attenuation of trace elements through sorption reactions.

A conceptual geochemical model was developed for the unreclaimed pit model from a review of background and site-specific data in addition to experience with similar projects. The conceptual model is provided in Figure 5-1 and the inputs to the model are discussed in Sections 5.2 to 5.5, below.

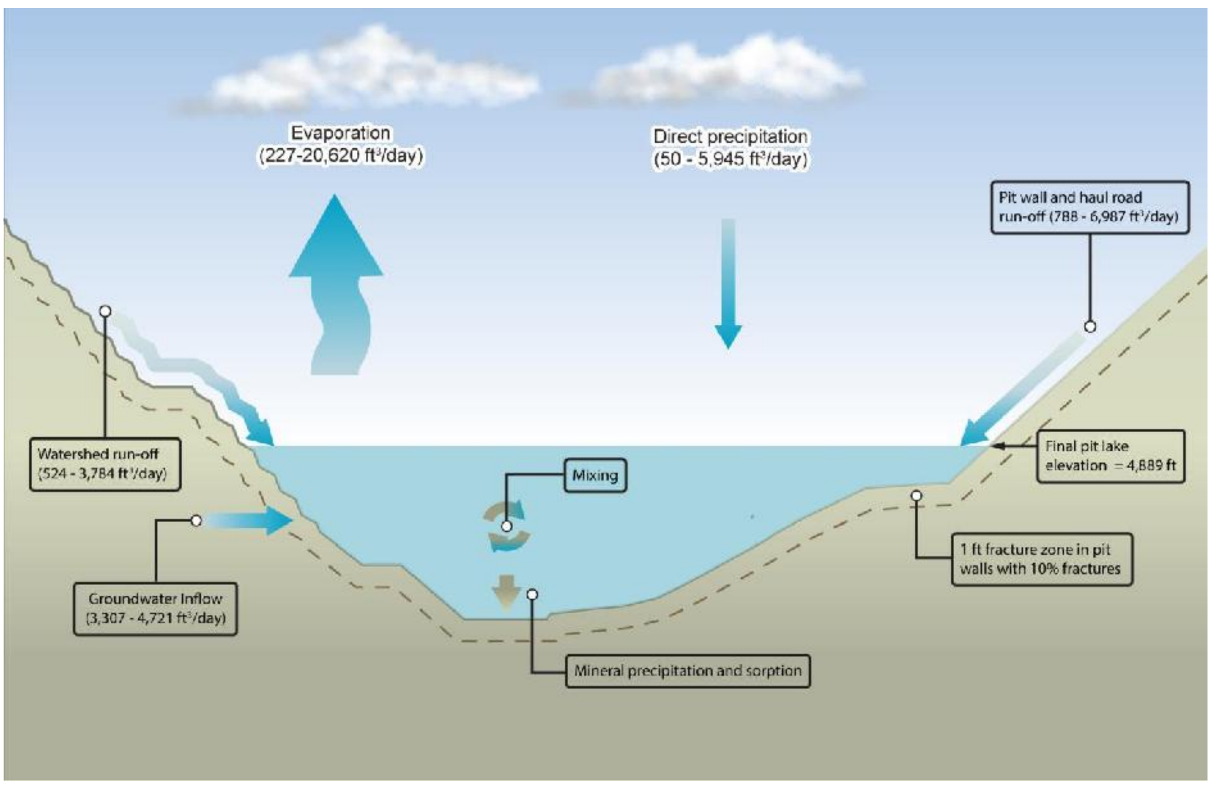


Figure 5-1: Conceptual Model for Unreclaimed Pit with Natural Fill

5.2 Pit Wall Surface Areas

The proportional surface areas of the main material types that will be exposed in the final walls of the unreclaimed pit have been calculated from the FS geologic block model and pit shell with expanded 4900 catch bench. The block model was used to calculate the three-dimensional surface area of each material type that will be exposed in the pit wall both above and below the water level as pit filling progresses. Three-dimensional surface areas were calculated for each of the modeled time steps (i.e., for 0.5, 1, 2, 5, 10, 25, 50, 75 and 100 years after the start of pit lake formation). Material types were delineated based on primary lithology, oxidation (redox) and mineralization (i.e., mineralized versus weakly/non-mineralized).

The three-dimensional surface areas of each material type in the unreclaimed pit at the end of mine life are provided in Table 5-1 and are illustrated in Figure 5-2. This demonstrates that unoxidized Quartz Monzonite will represent the dominant material type that will be exposed in the final walls of the unreclaimed pit.

Table 5-1: Three-dimensional Surface Areas of Pit Wall Rock Material Types for Final Unreclaimed Pit

Mineralization	Rock Type	Redox	Three-dimensional surface area	
			Square feet	%
Weakly/non-mineralized	Andesite	Oxide	4,150	0.05%
		Sulfide (non-ox.)	171,177	2.2%
	Biotite Breccia	Oxide	13,856	0.2%
		Sulfide (non-ox.)	340,496	4.4%
	Quartz Monzonite	Oxide	12,826	0.2%
		Sulfide (non-ox.)	2,823,022	36.3%
	Coarse Crystalline Porphyry	Oxide	8,874	0.1%
		Sulfide (non-ox.)	705,534	9.1%
Mineralized	Biotite Breccia	Sulfide (non-ox.)	813,861	10.5%
	Quartz Monzonite	Oxide	1,768	0.02%
		Sulfide (non-ox.)	2,543,813	32.7%
	Coarse Crystalline Porphyry	Oxide	77	0.001%
		Sulfide (non-ox.)	335,045	4.3%
		Total	**7,774,501**	**100%**

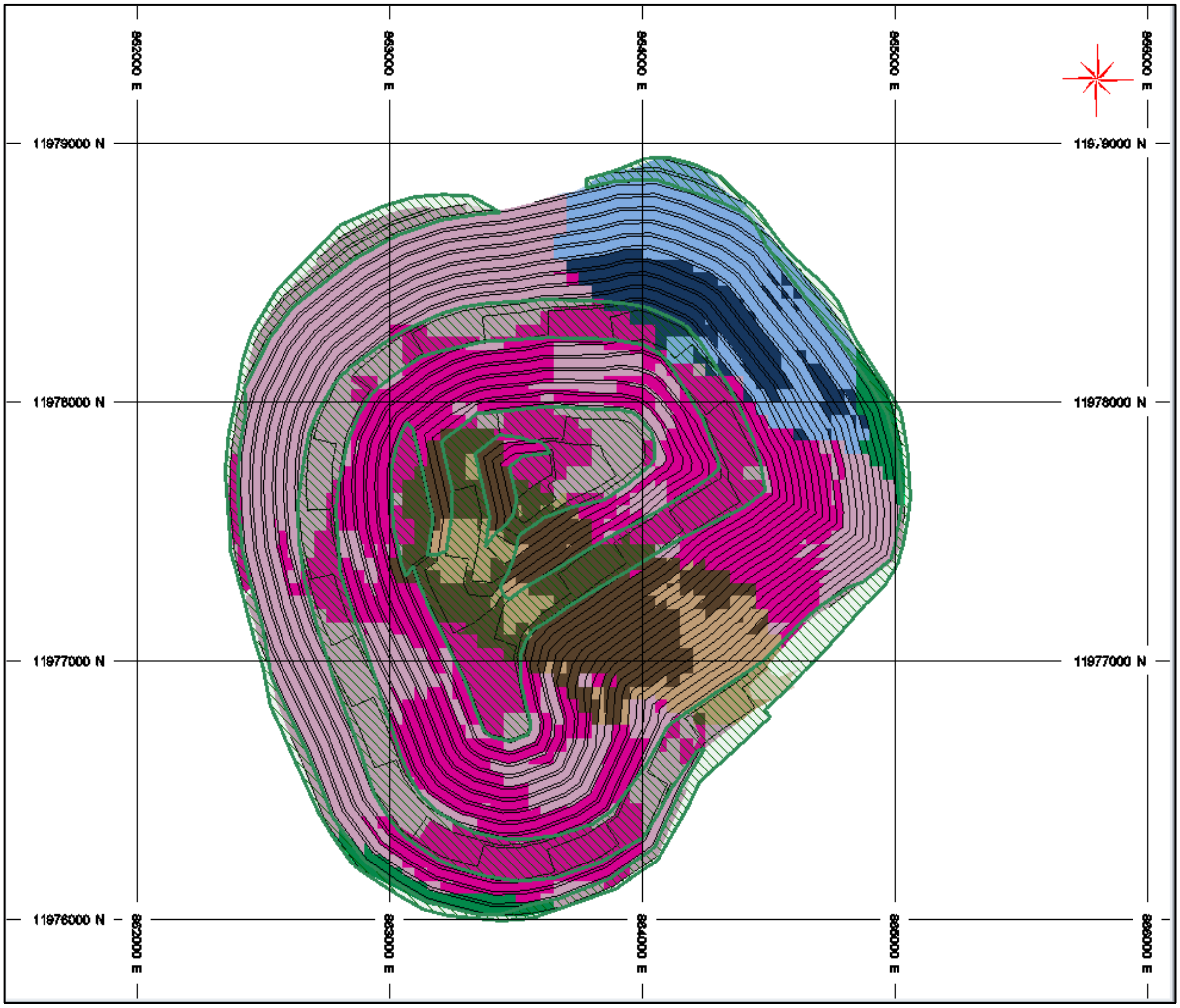


Figure 5-2: Exposed Material Types in Final Walls of Unreclaimed Pit

5.3 Calculation of Pit Wall Rock Available for Leaching

During the period of dewatering the pit walls will be exposed to oxygenated conditions and will weather to form secondary minerals, including soluble salts. As the pit wall re-saturates during rebound of the groundwater table, soluble salts and other weathering products will dissolve into the ambient groundwater that drains into the pit. In addition, dissolution of these soluble salts by run-off waters in the unsaturated high wall of the pit may occur. In order that laboratory leach data can be used to determine the mass release of solutes under field leaching conditions, it was necessary to determine the total reactive mass (R_m) of material available for leaching in the pit walls based on the exposed surface areas of each lithology in both the unsaturated high wall and in the submerged pit walls. The reactive mass will be dependent on the density of the pit wall rocks, the density of any fractures produced by blasting, and the depth to which this fracturing penetrates in the pit walls.

Several studies have evaluated the density and thickness of pit wall fracturing caused by blasting (e.g., Carroll and Scott, 1966; Siskind and Fumanti, 1974; Kelsall et al., 1984; Molebatsi et al., 2009). A detailed summary of this research is presented in Appendix F. This demonstrates that the depth of pit wall fracturing is found to be variable between 1 and 16 feet.

An estimate of the reactive mass in the future pit high wall at Copper Flat was made based on the review of the published information on pit wall fracturing (Appendix F) and from site-specific information provided by NMCC. Future blasting practices at Copper Flat will include pre-split drilling and smooth wall blasting to protect final pit walls, which is considered best practice for geotechnical stability and will effectively reduce fracturing within the final pit walls. Kelsall et al. (1984) studied blasting effects in granite and basalt wall rock and found that blasting enhances permeability by approximately 10 times near the blast face. However, the extent of blast effects is generally limited to <1m (<3.3ft), and as little as 0.3m (1ft) when using low-charge blast methods. Given that the future blasting techniques at Copper Flat will include protective measures such as smooth wall blasting at the final pit wall and that the pit wall composition (i.e., quartz monzonite) will be similar to the granitic material studied in Kelsall et al. (1984), a 1 foot thickness of reactive rock in the pit walls has been assumed for the purpose of the future pit lake model. It is assumed that fracturing in this zone will average 10% (Siskind and Fumanti, 1974; Kelsall et al., 1984). This assumption (i.e., 10% fractures) is considered conservative because the rock comprising the proposed pit shell has low fracture permeability and the limited natural fractures are mineralized (quartz and calcite are common minerals in fractures).

In addition to the fracture zone described above, mineralogy work carried out by SRK on humidity cell tests for previous projects indicates particles generally show water infiltration and products of reactivity up to 0.04 feet into the individual rock fragments. Therefore an oxidized rind of 0.04 feet (0.012 m) thickness has also been assumed on the surface of the pit walls (Figure 5-3).

Using these assumptions for the fracture zone and oxidized rind, the reactive mass (R_m) of each material type in the pit wall was calculated as:

$$R_m = (S \times F_{FZ} \times L_{FZ} \times D) + (S \times L_{OR} \times D)$$

Where:

S is the three-dimensional pit wall surface area of a given material type in square meters (defined by the geological block model; see Table 3-1);

F_{FZ} is the fracture density in the fracture zone (10%);

L_{FZ} is the thickness of the fracture zone in meters (0.3m);

L_{OR} is the thickness of the oxidized rind in meters (0.012m);

D is the rock density in kg/m^3 (2700 kg/m^3, Young and Olhoeft, 1976).

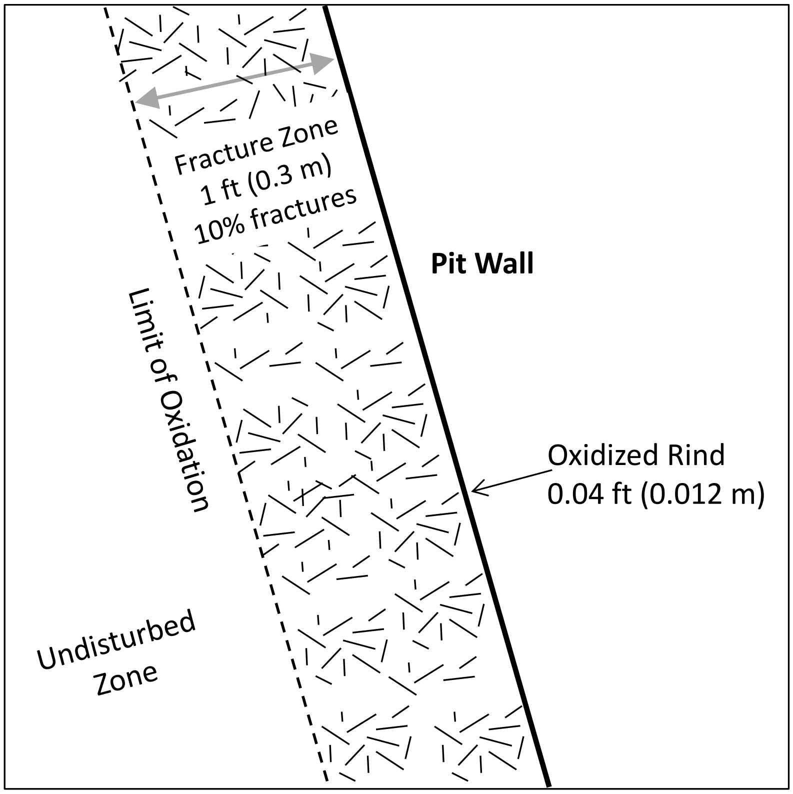


Figure 5-3: Future Pit Wall Conceptual Model

5.4 Water Balance

A pit lake water balance for the unreclaimed pit model was developed by JSAI; details of the groundwater flow model are presented in JSAI (2014b). The post-mining pit water levels and water balance for this scenario were simulated assuming the 2017 MORP pit geometry with expanded 4900 catch bench and watershed shown in Figure 3-1. The model assumes that upon cessation of mining, pumping will cease in and around the pit, allowing the pit to naturally refill over a number of years.

The water balance for the unreclaimed pit natural fill model is based on the following inputs/assumptions from JSAI (JSAI, 2014b; JSAI, 2015a; JSAI, 2017b):

- The primary solution inputs to the pit are assumed to be groundwater inflow, direct precipitation onto the high walls of the pit and run-off from the pit walls, haul road and receiving watershed;
- Evaporation will represent the dominant solution loss;
- The annual average precipitation rate is 12.5 inches per year; and
- The pit lake evaporation rate is 50 inches per year (JSAI, 2015a).

The JSAI water balance projects that the final pit lake elevation for the unreclaimed pit model will be 4,897 ft. The resulting lake will cover an area of approximately 20.7 acres with a depth of approximately 247 ft. The final pit water balance will be approximately 93 acre-feet per year, comprising 57 acre-feet of precipitation and run-off and 36 acre-feet per year of groundwater inflow.

The future pit will be a hydrologic sink, capturing groundwater flowing from all directions (INTERA, 2012; JSAI, 2017b). Surface water from within the footprint of the pit and runoff from the open pit surface drainage area will also be captured. Even with the surface water inflows, the pit will be a hydraulic sink with evaporation rates greatly exceeding precipitation and groundwater inflows on an annual basis (JSAI, 2017b). It is expected that the water levels of the lake will fluctuate seasonally by a few feet depending on precipitation and evaporation rates; rising during periods of lower evaporation (winter months) and decreasing during summer months.

The pit lake filling curve for the unreclaimed pit model is shown in Figure 4-4 and the various inputs/outputs to the pit are shown in Figure 5-5.

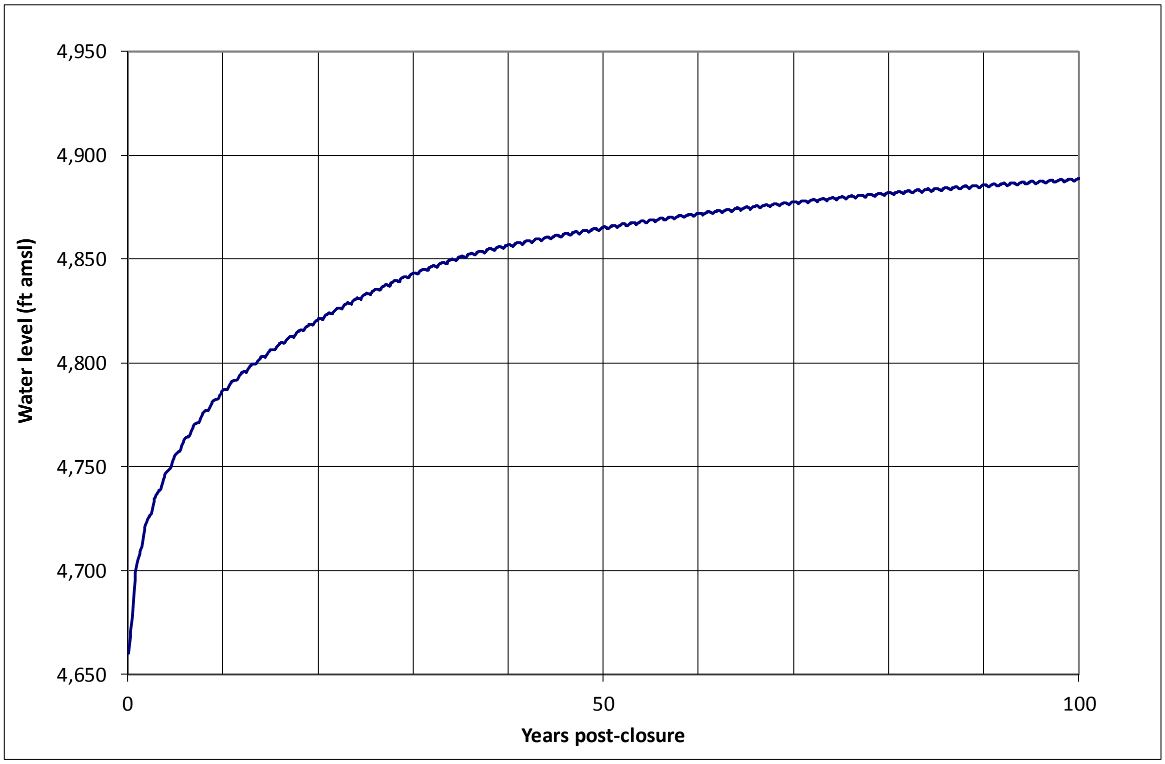


Figure 5-4: Pit Lake Elevation Curve for Unreclaimed Pit Model (source: JSAI)

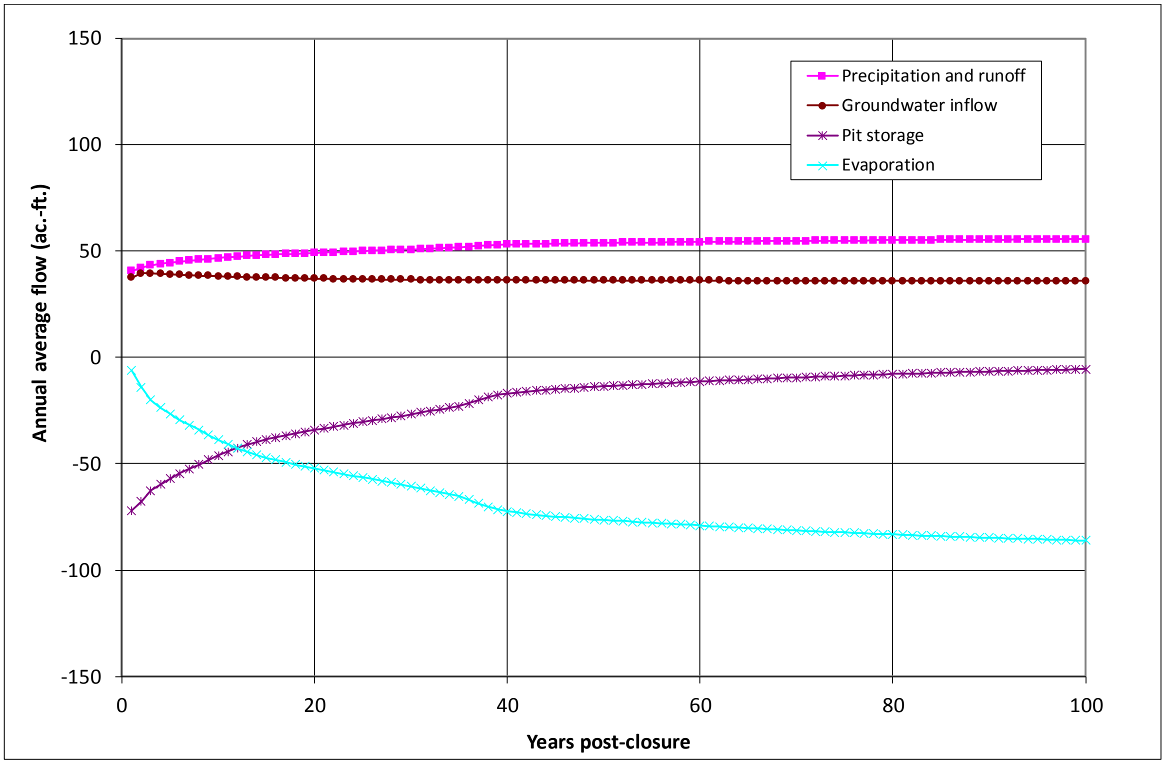


Figure 5-5: Pit Lake Flux for Unreclaimed Pit Model (source: JSAI)

5.5 Solution Inputs

5.5.1 Precipitation Chemistry

As with the existing pit model, the primary wall rock lixiviant for the future pit high walls is assumed to be precipitation. Representative precipitation chemistry data were obtained from monthly monitoring carried out between 1985 and 2011 at the Gila Cliff Dwellings National Monument meteorological station, Catron County, New Mexico (NADP, 2012) (Figure 4-6, Table 5-2).

5.5.2 Groundwater Chemistry

Representative groundwater chemistry data for the future pit lake model were obtained from the historical data compiled by JSAI and NMCC. Based on the current mine plan, a large proportion of the quartz monzonite is removed by mining and the remaining quartz monzonite is dewatered. Groundwater reporting to the future pit is therefore likely to be representative of the andesite rock. Based on this assumption, data from wells GWQ96-22(A), GWQ96-22(B) GWQ96-23(A) and GWQ96-23(B) were used as input to the future pit lake geochemical model.

Further information on how the groundwater chemistry data were derived is provided in the JSAI technical memorandum in Appendix D. The groundwater chemistry used as input to the unreclaimed pit model is presented in Table 5-2.

5.5.3 Wall Rock Chemistry

As with the existing pit model, source term solutions for the future pit lake were developed from the results of site-specific HCT testing conducted as part of the SRK (2012) geochemical characterization program and scaled to field conditions. The HCT testwork results were used to develop separate source terms for each material type that will be exposed in the final pit wall (see Table 5-1). The method used to scale the laboratory HCT data to field conditions was identical to that described in Section 4.5.3 and was based on site-specific information relating to the pit water balance, geological model, pit wall fracturing and wall rock density.

As with the existing pit lake model, different HCT inputs were used for trace elements and major ions to represent the different geochemical processes that control their release. An average of all weeks of humidity cell data were used for major ions (calcium, magnesium, sodium, potassium, aluminum, iron, manganese, chloride, sulfate, fluoride, bicarbonate) and an average of steady-state humidity cell data (i.e., minus the first 20 weeks of testing) were used for trace elements (silver, arsenic, boron, barium, cadmium, cobalt, chromium, copper, mercury, molybdenum, nickel, lead, antimony, selenium, uranium, vanadium and zinc).

The solutions used as inputs to the geochemical model are provided in Table 5-2. In order to maintain charge balance, the solutions were balanced by adjusting the concentration of a conservative ion (either chloride or sodium) which have a low potential to influence model outcome.

Table 5-2: Groundwater, Wall Rock, Haul Road and Precipitation Chemistry used as Input to the Unreclaimed Pit Model

Parameter		Units	Precipitation chemistry	Groundwater chemistry	Haul road and watershed run-off chemistry	Wall Rock Chemistry												
						Mineralized					Weakly/non-mineralized							
						Biotite breccia sulfide	Quartz Monzonite oxide	Quartz Monzonite sulfide	Coarse Crystalline Porphyry oxide	Coarse Crystalline Porphyry sulfide	Andesite oxide	Andesite sulfide	Biotite breccia oxide	Biotite breccia sulfide	Quartz Monzonite oxide	Quartz Monzonite sulfide	Coarse Crystalline Porphyry oxide	Coarse Crystalline Porphyry sulfide
			Gila Cliff Dwellings National Monument meteorological station	*Average of wells GWQ96-22(A,B) and GWQ96-23(A,B)*	*Average of SWQ-1*	*Average of HCTs 604767, 604787, 604811, 604854, 604862, 604867 and 605033*	*Average of HCT SRK 0867*	*Average of HCTs 604652, 604606, 604653, 604656 and 604669*	*Average of HCT CF-11-02 (0-27)*	*Average of HCT CF-11-02 (367-408)*	*Average of HCTs SRK 0864 and SRK 0866*	*Average of HCTs SRK 0864 and SRK 0866*	*Average of HCTs SRK 0872 and SRK 0854*	*Average of HCTs 604811, 604854, 604862, 604867 and 605033*	*Average of HCTs SRK 0858 604569*	*Average of HCTs 604673 and 605153*	*Average of HCT CF-11-02 (0-27)*	*Average of HCT CF-11-02 (367-408)*
pH	pH	s.u	4.93	7.85	8.3	7.86	6.90	7.95	7.92	7.74	7.32	7.32	5.50	7.91	2.99	5.74	7.92	7.74
HCO_3	Bicarbonate	mg/L		408	430	45.0	9.27	38.2	30.1	19.9	10.6	10.6	3.44	54.9	N/A	12.2	30.1	19.9
Ag	Silver	mg/L		0.009		-	-	-	-	-	-	-	-	-	-	-	-	-
Al	Aluminum	mg/L		0.029		0.0046	0.070	0.0078	0.019	0.050	0.0090	0.0090	0.237	0.0059	2.96	0.037	0.019	0.050
As	Arsenic	mg/L		0.0023		0.00034	-	-	-	-	-	-	0.0010	0.00025	0.00036	-	-	-
B	Boron	mg/L		0.136	0.02	0.0050	0.0047	0.0049	0.0049	0.0048	-	-	-	0.0049	0.018	0.0050	0.0049	0.0048
Ba	Barium	mg/L		0.089		0.0091	0.0075	0.012	0.00049	0.0028	0.0033	0.0033	0.011	0.0062	0.0021	0.035	0.00049	0.0028
Ca	Calcium	mg/L	0.21	85.8	109	24.1	25.9	19.5	9.95	7.36	8.36	8.36	20.9	28.0	9.59	6.32	9.95	7.36
Cd	Cadmium	mg/L		0.0008		-	4.72E-05	-	-	-	-	-	0.00068	-	0.0014	0.00034	-	-
Co	Cobalt	mg/L		0.008		-	0.00047	-	-	-	-	-	0.00070	-	0.015	-	-	-
Cr	Chromium	mg/L		0.0066		-	-	-	-	-	-	-	-	-	0.0056	-	-	-
Cu	Copper	mg/L		0.0061		0.0085	0.0056	-	-	0.0049	-	-	9.11	0.013	2.41	0.384	-	0.0049
F	Fluoride	mg/L		2.1	0.3	1.09	0.558	0.807	0.820	0.548	0.425	0.425	0.289	1.20	1.98	0.432	0.820	0.548
Fe	Iron	mg/L		1.48		0.00069	0.099	0.00087	0.0025	0.0022	0.0014	0.0014	0.400	0.00074	6.75	0.0039	0.0025	0.0022
Hg	Mercury	mg/L		0.000002		-	-	4.91E-06	9.97E-06	4.83E-06	-	-	-	-	-	1.62E-05	9.97E-06	4.83E-06
K	Potassium	mg/L	0.03	2.96	1.80	3.75	1.08	3.84	2.18	1.70	0.974	0.974	0.950	4.43	1.66	1.84	2.18	1.70
Mg	Magnesium	mg/L	0.02	19.3	36.0	3.97	2.24	3.51	1.74	0.570	1.27	1.27	1.30	4.00	1.64	0.978	1.74	0.570
Mn	Manganese	mg/L		0.66		0.072	0.468	0.130	0.019	0.0094	0.0095	0.0095	0.248	0.043	0.125	0.018	0.019	0.0094
Mo	Molybdenum	mg/L		0.012		0.0052	0.0051	0.0074	0.00049	0.00048	0.00046	0.00046	0.040	0.0056	0.0018	0.0020	0.00049	0.00048
Na	Sodium	mg/L	0.08	119	107	2.41	0.932	3.46	2.31	2.04	1.71	1.71	0.530	2.60	1.98	1.69	2.31	2.04
Ni	Nickel	mg/L		0.0125		-	0.00047	-	-	-	-	-	0.00047	-	0.0018	-	-	-
Pb	Lead	mg/L		0.0025		-	-	-	0.00012	0.00012	0.00012	-	0.0018	-	0.0019	0.0016	0.00012	0.00012
Sb	Antimony	mg/L		0.0009		0.00012	0.0030	0.00012	-	-	-	-	0.00040	0.00012	-	-	-	-
Se	Selenium	mg/L		0.0015		0.00031	0.00024	0.00032	0.00024	0.00024	0.00023	0.00023	0.00024	0.00035	0.00023	0.00025	0.00024	0.00024
U	Uranium	mg/L		0.0015		0.0033	0.00047	0.0012	0.0024	0.0024	-	-	0.0013	0.0017	0.0051	0.0046	0.0024	0.0024
V	Vanadium	mg/L		0.0009		0.0010	0.00047	0.00049	0.00049	-	0.00046	0.00046	0.00047	0.0015	0.0018	0.00050	0.00049	-
Zn	Zinc	mg/L		0.03		0.0027	0.0016	0.0046	-	-	-	-	0.045	0.0014	0.017	0.015	-	-
SO_4	Sulfate	mg/L	0.86	84	261	44.5	72.3	38.7	12.1	7.66	20.3	20.3	87.0	47.3	89.1	14.9	12.1	7.66
Cl	Chloride	mg/L	0.12	49	30	1.30	0.739	2.17	0.999	1.37	0.708	0.708	0.647	1.34	1.26	0.711	0.999	1.37

\- Indicates parameter was uniformly below ARLs in the HCT effluent leachates and was excluded from the PHREEQC model input for the specified material type

5.6 Potential for Future Pit Lake Stratification

The existing Copper Flat pit lake contained approximately 70 acre feet of water in 2014 (NMCC estimate). The water surface measures 5.2 acres with an average diameter of 537 feet (Figure 8-8in INTERA, 2012). The average depth is approximately 13 feet deep and the maximum depth is 35 feet (INTERA, 2012), which results in a relative depth (RD) of 7%. Samples taken from various depths of the existing pit lake demonstrate that the pit lake is homogeneous and no stratification exists (SRK, 1996, INTERA, 2012, Aquatic Consultants Inc., 2014). Baseline data from the existing pit water body provides evidence that a thermocline develops in the summer and mixing occurs in the winter (INTERA, 2012). A chemocline does not appear to develop, and the water body remains oxygenated (DO = 6 to 9 mg/L) throughout the full water column year-round with similar chemistry throughout the lake (see JSAI, 2014c, Appendix F). Based on elevation and latitude, the Copper Flat open pit water body is classified as a warm monomitic type lake (Wetzel, 2001). A warm monomitic lake mixes freely once a year in the winter assuming the temperature is above 4°C. However, wind effects and water body geometry can have an effect on the magnitude and frequency of mixing (Castendyk, 2009).

Mine pit lakes can develop vertical density stratification that may be seasonal or permanent. The density of water is a function of both its temperature and its salinity or total dissolved solids (TDS) content. Freshwater is most dense at a temperature of about 4ºC. At a given temperature, water density increases with increasing TDS. As TDS increases, the temperature of the maximum density of water also decreases (Atkins et al., 1997; Parshley and Bowell, 2003).

Long-term (multi-year) or permanent density stratification can occur if a lake has a significant vertical variation in TDS due to large differences in the TDS of various source waters to the lake and/or to processes in the lake that increase the TDS. This in turn affects the density of the deeper water. For example, if a lake contains enough organic matter to deplete oxygen in the hypolimnion, then during the summer, ferric hydroxide that precipitates at the surface will sink, become reduced, and dissolve in the basal anoxic water, raising the TDS content and the density of the bottom water.

Water in the hypolimnion will generally become anoxic and will continuously dissolve any ferric hydroxide precipitates falling into it from above. This process further increases the TDS of the hypolimnion and strengthens the density gradient between it and the overlying layer, perpetuating the stratification. Sulfidization in the hypolimnion will lead to natural attenuation of metals and metalloids as well as sulfur. Few studies reporting site-specific limnological data have been published to date (Atkins et al., 1997; Parshley and Bowell, 2003). For Copper Flat, the presence of solute material that will modify pit lake chemistry (i.e., sulfide minerals and gypsum) will likely prevent permanent chemical stratification or layering of the lake. This was validated in the 1990s from depth sampling of the pit lake at Copper Flat (SRK, 1996), and in 2010 and 2011 from baseline data collection (INTERA, 2012). The results from this study demonstrated that the current pit lake is homogeneous and no stratification exists. Temperature and dissolved oxygen profiles for the existing pit lake (INTERA, 2012, Aquatic Consultants Inc., 2014) show the pit water is not significantly stratified. The water stays well oxygenated for the entire depth for each season (6 to 8 mg/L). Thermal stratification requires a 1ºC change in temperature per meter (Wetzel, 2001), which can occur in the summer months as the upper water column heats up and the lower water column remains cool, and well oxygenated.

When established, the future Copper Flat pit lake will contain approximately 2,300 acre feet of water. The water surface is projected to measure 22 acres with an average diameter of 1,105 feet. The average depth will be approximately 105 feet and the maximum depth will be 247 feet, which results in a relative depth (RD) of 22% (JSAI Pit Water Balance, 2017).

The 23% RD for the future Copper Flat pit lake is greater than the average value of 2% for natural lakes and suggests the lake may stratify. Such stratification may result in oxidizing conditions in the upper portions of the lake and more chemically reducing (oxygen-deprived) conditions at depth. However, this stratification is likely to be temporary and influenced by seasonal changes. A prerequisite for permanent stratification is that precipitation plus runoff is greater than evaporation during the summer months when the water body is potentially undergoing temporary thermal stratification (Jewell, 2009). This is not the case at Copper Flat, where annual evaporation from the pit lake (100 acre-feet per year) will greatly exceed precipitation plus run-off (63 acre-feet per year). As such, permanent stratification is unlikely for the current and future Copper Flat pit lake. Consequently, in keeping with many pit lakes in arid regions there is a lower potential for stratification than a single relative depth metric would imply (Jewell, 2009).

Jewell (2009) evaluated six permanently stratified and eight seasonally stratified open pit lakes, and concludes that permanently stratified lakes have vertical density contrast greater than 0.0005 g/cm^3 and a Wedderburn number greater than 1. The Wedderburn number considers thermocline depth, maximum lake length, water density, and wind speed. Jewell (2009) failed to note that most permanently-stratified open pit lakes receive AWS inputs and have resulting acidic water at the surface. A summary table of existing open pit water bodies and their characteristics is presented in Table 5-3.

The future Copper Flat open pit lake is expected to be well mixed, oxygenated, and not acidic, although seasonal stratification may occur. Relative depth does not appear to govern the conditions for creating a permanently stratified open pit water body; however acidic water and higher latitude are key conditions for creating permanent stratification. In addition, another related control is the total dissolved solids or salinity which will also exert control over the density or buoyancy of the mine pit lake. At Copper Flat, direct surface water inputs to the existing lake over time are unlikely to be significant and therefore the potential for turnover is less.

Stratification within the pit lake has implications for redox conditions, mineral solubility and sorption reactions. The pit lake model results presented herein assume the pit lake will be fully mixed. A number of studies on deep mine pit lakes, including Summer Camp Pit in Nevada (Parshley and Bowell, 2003) and unpublished reports on Lone Tree Mines, Yerrington mine and the Robinson Mining District, also in Nevada, have demonstrated the tendency for incomplete seasonal overturn.

Based on observations of the current Copper Flat pit lake, the development of a metal-rich brine in the hypolimnion of the future pit lake is unlikely. The conditions for this are summarized in Castendyk (2009). Rather, the future pit lake is expected to be mixed and well oxygenated because: (i) the existing and future pit lake can be classified as monomictic with frequent or continuous periods of circulation with no ice cover in the winter; and (ii) the existing and future pit lake can also be characterized as oligotrophic, i.e., having little to no nutrient input and organic production, with dissolved oxygen content regulated largely by physical processes.

While stratification of an open pit water body has implications for water chemistry at depth, particularly in terms of redox changes, the near surface waters of the future Copper Flat pit lake are expected to remain oxidizing. These near surface waters are considered the most critical from a perspective of potential ecological risks associated with the lake, reduced water quality that may develop at depth is less important since the proposed Copper Flat pit will remain a terminal sink post closure.

Table 5-3: Summary of open pit water bodies and stratification characteristics (JSAI, 2014c)

Open pit	Location	Effective length (ft)	Maximum depth (ft)	Relative depth (%)	Thermocline depth (ft)	Acidic
Permanently stratified						
Brenda	British Colombia	2,296	492	21	39	No
Spenceville	California	253	50	20	13	Yes
Berkeley	Montana	5,900	426	7	23	Yes
Seasonally stratified and well mixed						
Humbolt	Nevada	944	137	15	8	No
Blackhawk	Utah	492	na	na	33	No
Blowout	Utah	656	230	35	39	No
Colosseum	California	482	157	33	na	No
Cunningham	New Mexico	407	90	22	20	No
Copper Flat (existing)**	New Mexico	537	35	7	20	No*
Copper Flat (proposed)***	New Mexico	1105	247	22	TBD	No
Yerington	Nevada	5,412	400	13	49	No

* Predominantly circum-neutral with the development of occasional temporary acidity

** Updated from JSAI (2014c) to reflect Baseline Data Report (INTERA, 2012)

*** Updated from JSAI (2014c) to reflect current pit water balance and mine plan

TBD – to be determined

5.7 Results

The predicted pit lake chemistry for the unreclaimed pit model is summarized in Table 5-4 and illustrated in Figure 5-6 to Figure 5-19 for selected parameters. These show predicted pit lake chemistry at each of the modeled time steps (i.e., 0.5, 1, 2, 5, 10, 25, 50, 75 and 100 years post-closure). In each case, the predicted pit lake chemistry is compared to the chemistry measured in the existing pit lake between 1989 and 2017. The full PHREEQC output file is provided in Appendix I, which shows precipitating and dissolving mineral species at each time step as part of the mass transfer calculations.

Pit lake waters for the unreclaimed pit are predicted to be moderately alkaline (pH 7.9– 8.2) with a magnesium plus sulfate (Mg + SO_4) major ion signature. During the early stages of pit infilling (i.e., the first six months post-closure), the prediction is that an early flush will occur in boron, lead, mercury, manganese, molybdenum, nickel, selenium, vanadium, zinc and sulfate. This initial flush occurs due to dissolution of soluble sulfate salts that will have developed on the pit walls during the life of mine. This initial flush is only observed for the natural fill model, but the effects are dissipated in the rapid fill model (Section 6) and no initial flush is observed.

Inflowing groundwater and direct precipitation on the pit lake surface will then provide some dilution and the effects of this initial flush will be dissipated. Following this initial flush, pit lake waters are predicted to evolve over time, with increasing concentrations of chloride, sulfate, TDS and trace elements owing to the effects of evapoconcentration. This is similar to the trends observed in the existing pit lake, where elemental concentrations (particularly boron, cadmium, fluoride, magnesium, manganese, sodium and sulfate) have increased over time. The macrochemistry (Ng-Na-SO_4) changes are reflected in the Piper plot in Figure 5-19, which shows a progressive change in pit lake major ion chemistry post-closure, with waters becoming increasingly dominated by sulfate and magnesium over time. However, pH remains moderately alkaline throughout pit infilling.

Pit lake chemistry is likely to be dominated by groundwater chemistry plus evapoconcentration effects. Over time, the groundwater contribution will decrease slightly as the pit lake is established. Both adsorption and secondary mineral precipitation are likely to be the major controls on trace element chemistry. Mineral precipitation processes are shown to be the dominant control on major ion chemistry. For example, sulfate concentrations are controlled by the precipitation of gypsum, alunite, barite, mirabilite and brochantite. Calcium and fluoride concentrations are controlled by the precipitation of fluorite, iron concentrations are controlled by the precipitation of ferrihydrite, potassium and aluminum concentrations are controlled by the precipitation of alunite, copper is controlled by the precipitation of brochantite and sodium is controlled by the precipitation of mirabilite. In comparison, trace element concentrations (including arsenic, antimony, cadmium, copper, chromium, lead, manganese, nickel, molybdenum, selenium and zinc) are shown to be controlled primarily by adsorption onto ferrihydrite.

Pit lake waters for the unreclaimed pit are predicted to be ‘near-neutral, low-metal’ waters for years zero (i.e., end of mine life) to year 50, based on pH values between 7.9 and 8.2 and total Ficklin metal concentrations[1] less than 1 mg/L (Figure 5-18). The effects of evapoconcentration are predicted to result in increasing metal concentrations, with pit lake waters being classed as ‘near-neutral, high metal’ from year 75 onwards (Figure 5-18).

A comparison of predicted pit lake chemistry to chemistry measured in the existing pit lake between 1989 and 2017 demonstrates that concentrations of the majority of constituents are either comparable to or less than existing concentrations. In particular, predicted concentrations of arsenic, cadmium, copper, cobalt, chromium, fluoride, lead, manganese, nickel, zinc and sulfate in the future unmitigated

[1] Ficklin metals are the base metals copper, cobalt, cadmium, lead, nickel and zinc (Ficklin et al., 1992)

pit are lower than those observed in the existing pit lake at Copper Flat. This relates to a number of factors, including:

- The future pit walls will be prepared using pre-split drilling and smooth wall blasting, which will reduce the depth of fracturing and oxidation, and consequently reduce solute loading to the pit lake;
- The future pit walls will contain less mineralized material than the existing Copper Flat pit, which will also reduce solute loading to the pit lake;
- The future pit walls will contain less transitional material than the existing Copper Flat pit, that is the source of the AWS events; and
- The dominant groundwater flow into the future pit will originate from the Andesite, which is typically characterized by lower constituent concentrations than the Quartz Monzonite groundwater (JSAI, 2017a).

The only constituents that are predicted to be higher in the future pit lake compared to the existing pit lake are boron, molybdenum, potassium and antimony. From the calibration model (Section 3.10) these constituents are known to be over-predicted by PHREEQC, and therefore the predicted concentrations of boron, molybdenum, potassium and antimony presented in Table 5-4 are likely to be an overestimate.

Table 5-4: Unreclaimed Pit Model Results

Parameter		Units	*Measured Chemistry in Existing Pit (1989 - 2017)*			Predicted Future Chemistry (Years Post-Closure)								
			Average	*Minimum*	*Maximum*	0.5	1	2	5	10	25	50	75	100
pH	pH	s.u.	*6.5*	*3.6*	*8.3*	8.2	8.1	8.1	8.0	8.0	8.0	7.9	7.9	7.9
HCO_3	Bicarbonate	mg/L	*40.4*	*<3*	*122*	54.8	45.5	42.7	40.6	39.4	37.3	35.3	33.9	34.7
Al	Aluminium	mg/L	*10.4*	*<0.02*	*82.6*	0.06	0.10	0.10	0.11	0.12	0.13	0.16	0.18	0.16
As	Arsenic	mg/L	*0.004*	*<0.001*	*0.006*	2.23E-04	1.47E-04	1.47E-04	1.46E-04	1.41E-04	1.36E-04	1.49E-04	1.71E-04	1.94E-04
B	Boron	mg/L	*0.14*	*<0.1*	*0.2*	0.44	0.30	0.31	0.34	0.38	0.49	0.67	0.85	1.04
Ca	Calcium	mg/L	*550*	*455*	*684*	99.8	127	150	177	202	262	360	460	489
Cd	Cadmium	mg/L	*0.05*	*<0.005*	*0.1*	0.0093	0.0064	0.0066	0.0072	0.0080	0.0103	0.0140	0.018	0.022
Co	Cobalt	mg/L	*0.29*	*<0.05*	*0.49*	0.008	0.005	0.006	0.006	0.007	0.009	0.01	0.02	0.02
Cr	Chromium	mg/L	*0.03*	*<0.006*	*0.1*	4.82E-04	4.80E-04	6.52E-04	9.35E-04	1.20E-03	1.73E-03	2.55E-03	3.34E-03	4.12E-03
Cu	Copper	mg/L	*4.44*	*0.001*	*26.5*	0.012	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
F	Fluoride	mg/L	*19.2*	*4.8*	*34*	3.30	3.02	3.34	3.83	4.25	4.11	4.00	3.94	4.16
Fe	Iron	mg/L	*0.2*	*<0.02*	*1.3*	4.64E-05	4.88E-05	5.03E-05	5.18E-05	5.30E-05	5.55E-05	5.88E-05	6.17E-05	6.20E-05
Hg	Mercury	mg/L	*0.0005*	*<0.0002*	*0.001*	0.0006	0.0004	0.0004	0.0004	0.0005	0.0006	0.0008	0.0011	0.0013
K	Potassium	mg/L	*32.1*	*11.0*	*60.6*	192	131	135	148	166	212	290	372	453
Mg	Magnesium	mg/L	*698*	*43*	*1,120*	171	121	125	136	152	194	266	341	416
Mn	Manganese	mg/L	*34.8*	*0.02*	*59.0*	4.66	3.19	3.30	3.62	4.04	5.15	7.04	9.02	11.00
Mo	Molybdenum	mg/L	*0.04*	*0.015*	*0.1*	0.29	0.20	0.20	0.22	0.25	0.32	0.44	0.56	0.68
Na	Sodium	mg/L	*888*	*165*	*1,400*	278	202	210	230	257	326	445	570	694
Ni	Nickel	mg/L	*0.06*	*0.039*	*0.1*	0.009	0.007	0.007	0.008	0.009	0.011	0.015	0.019	0.022
Pb	Lead	mg/L	*0.02*	*<0.005*	*0.1*	0.0082	0.0068	0.0073	0.0083	0.0094	0.0123	0.017	0.0220	0.0270
Sb	Antimony	mg/L		*<0.001**		0.005	0.003	0.003	0.004	0.004	0.005	0.007	0.009	0.011
Se	Selenium	mg/L	*0.028*	*<0.001*	*0.25*	0.019	0.013	0.013	0.014	0.016	0.020	0.027	0.034	0.042
U	Uranium	mg/L	*0.11*	*0.11*	*0.12*	0.114	0.078	0.080	0.09	0.10	0.13	0.17	0.22	0.27
V	Vanadium	mg/L	*0.1*	*<0.05*	*0.25*	0.0033	0.0025	0.0026	0.0027	0.0027	0.0028	0.0032	0.0038	0.004
Zn	Zinc	mg/L	*5.4*	*0.01*	*9*	0.52	0.36	0.37	0.40	0.45	0.58	0.79	1.01	1.23
SO_4	Sulfate	mg/L	*4,803*	*1,566*	*8,690*	1,505	1,196	1,284	1,441	1,626	2,096	2,887	3,708	4,353
Cl	Chloride	mg/L	*332*	*47.3*	*730*	135	95.6	99.1	109	121	154	210	269	328
TDS	Total Dissolved Solids	mg/L	*7,538*	*2,711*	*14,800*	2,447	1,926	2,053	2,291	2,573	3,293	4,507	5,770	6,786

* *Indicates parameter was uniformly below analytical detection limits in pit lake water over monitoring period, but detection limit was variable. Concentration shown in table represents lower limit of analytical detection.*

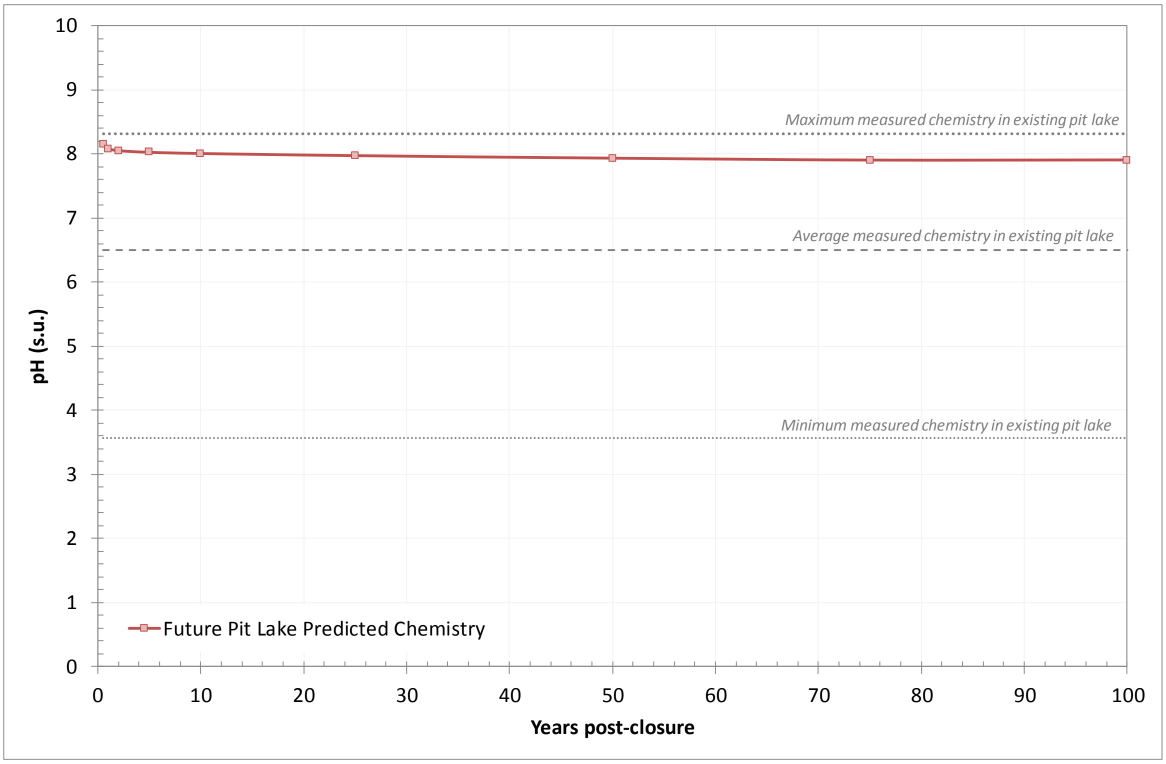


Figure 5-6: Time-series Plot of Predicted pH for the Unreclaimed Pit Model

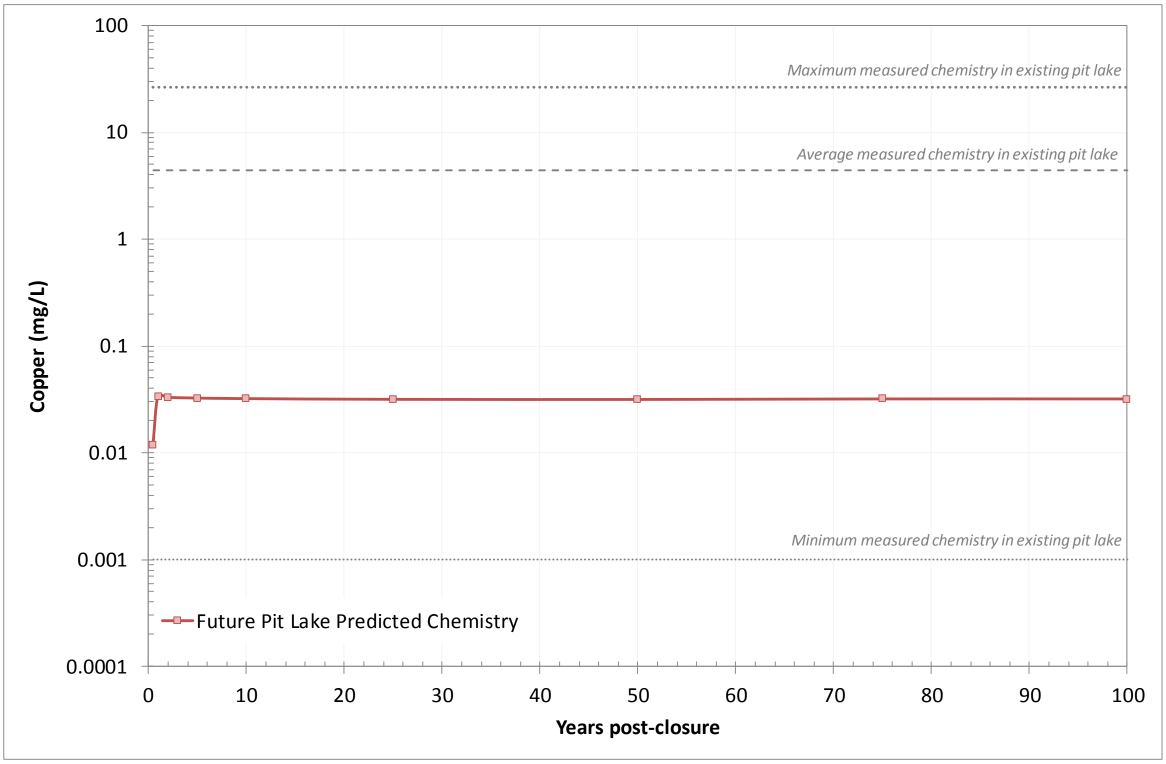


Figure 5-7: Time-series Plot of Predicted Copper for the Unreclaimed Pit Model

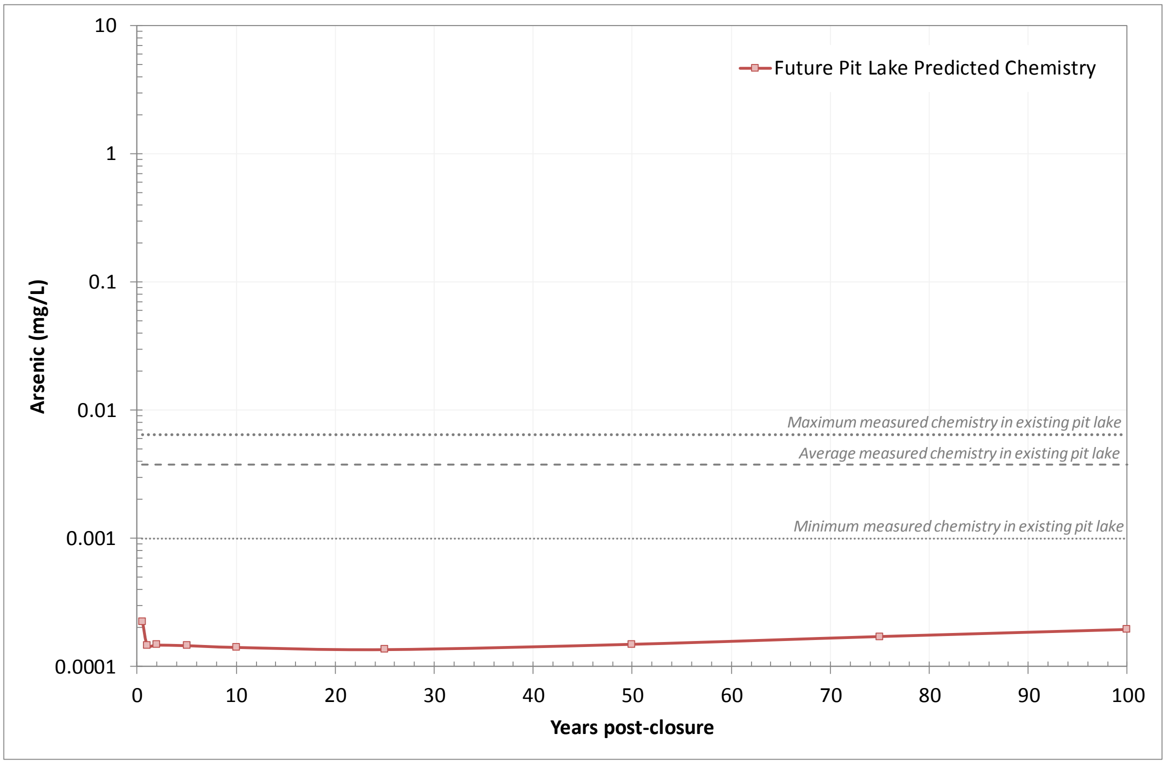


Figure 5-8: Time-series Plot of Predicted Arsenic for the Unreclaimed Pit Model

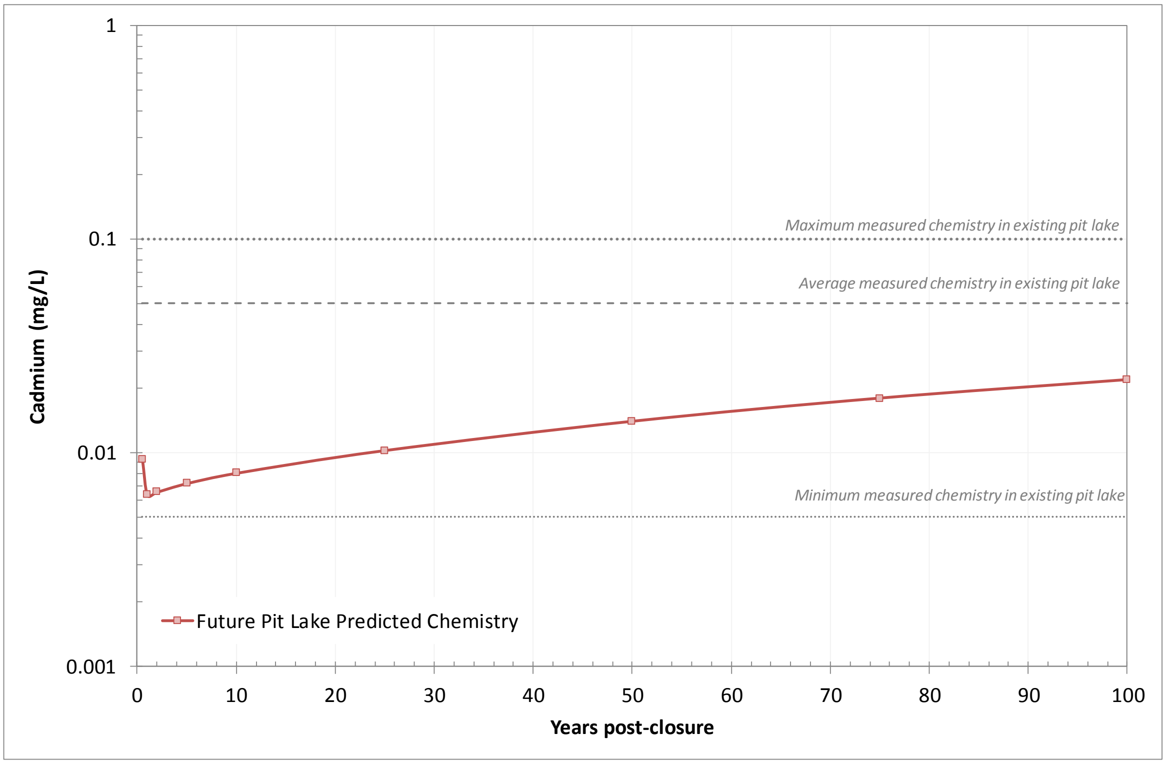


Figure 5-9: Time-series Plot of Predicted Cadmium for the Unreclaimed Pit Model

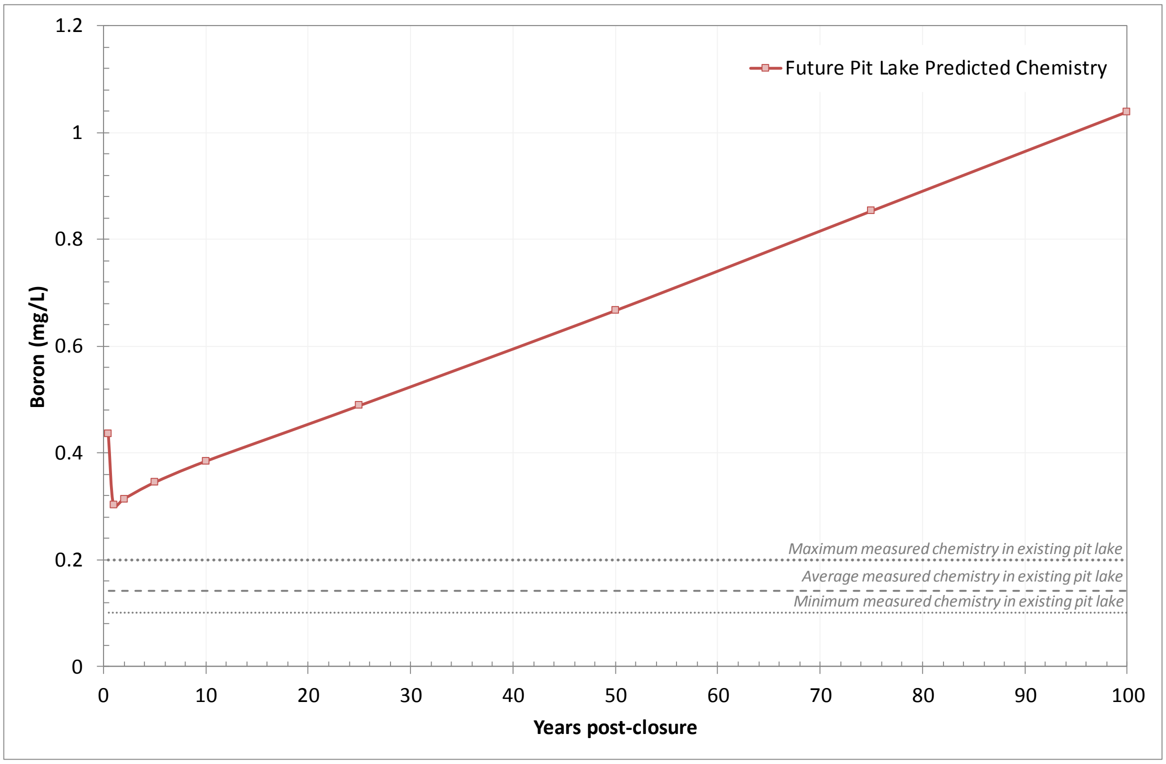


Figure 5-10: Time-series Plot of Predicted Boron for the Unreclaimed Pit Model

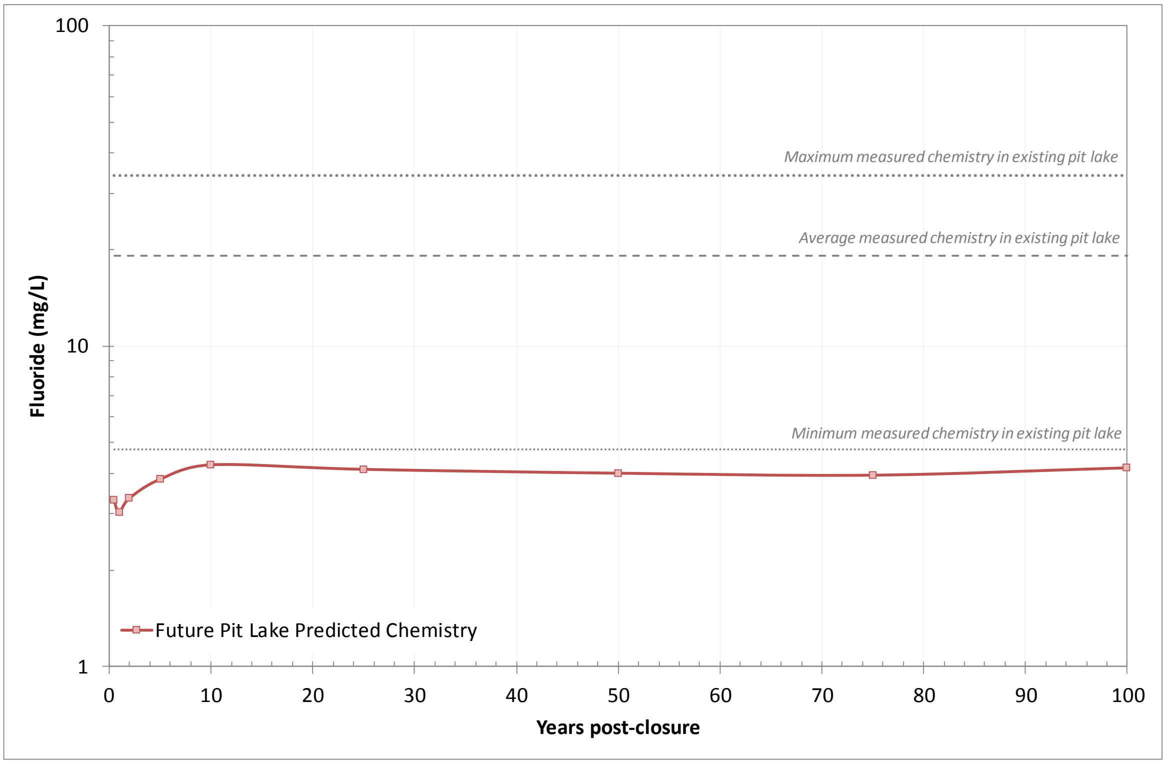


Figure 5-11: Time-series Plot of Predicted Fluoride for the Unreclaimed Pit Model

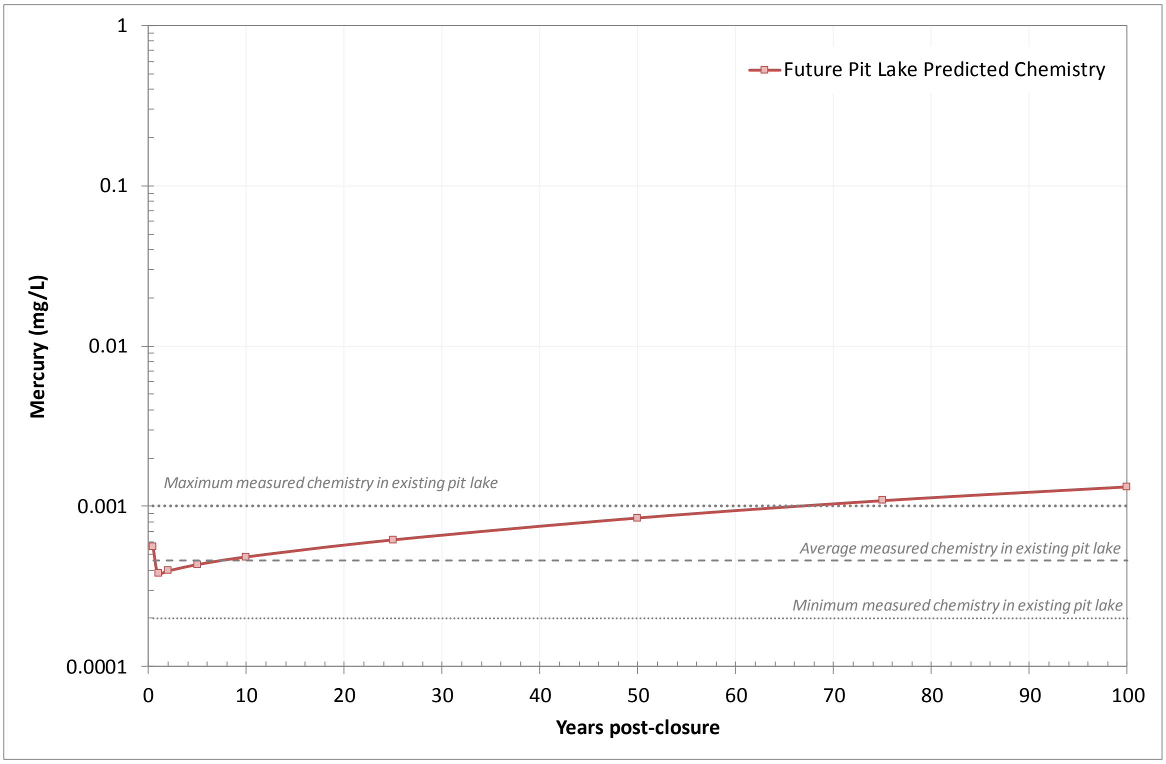


Figure 5-12: Time-series Plot of Predicted Mercury for the Unreclaimed Pit Model

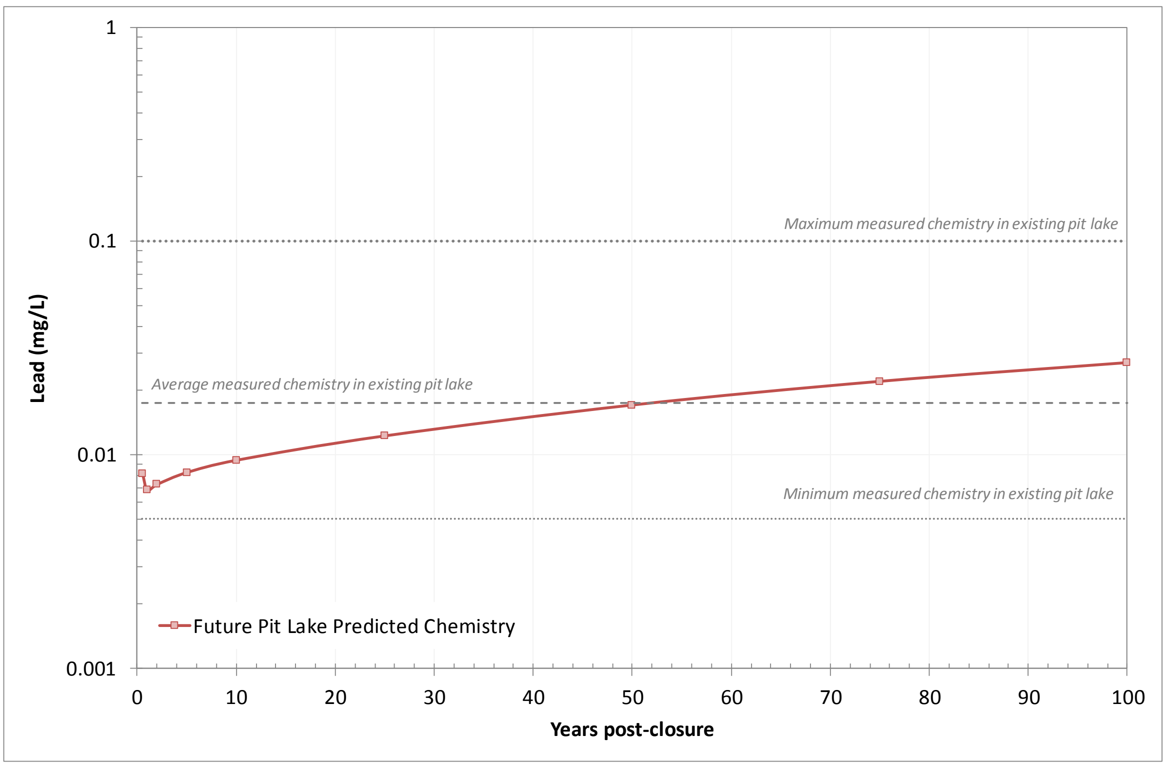


Figure 5-13: Time-series Plot of Predicted Lead for the Unreclaimed Pit Model

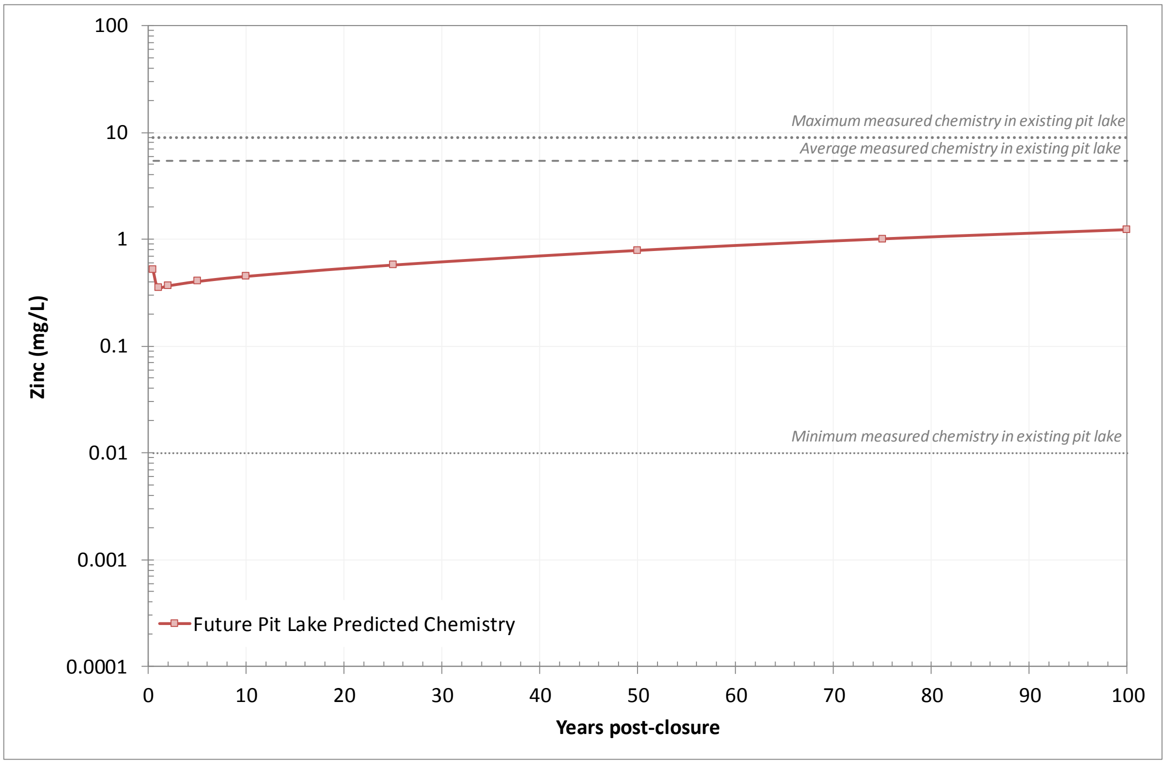


Figure 5-14: Time-series Plot of Predicted Zinc for the Unreclaimed Pit Model

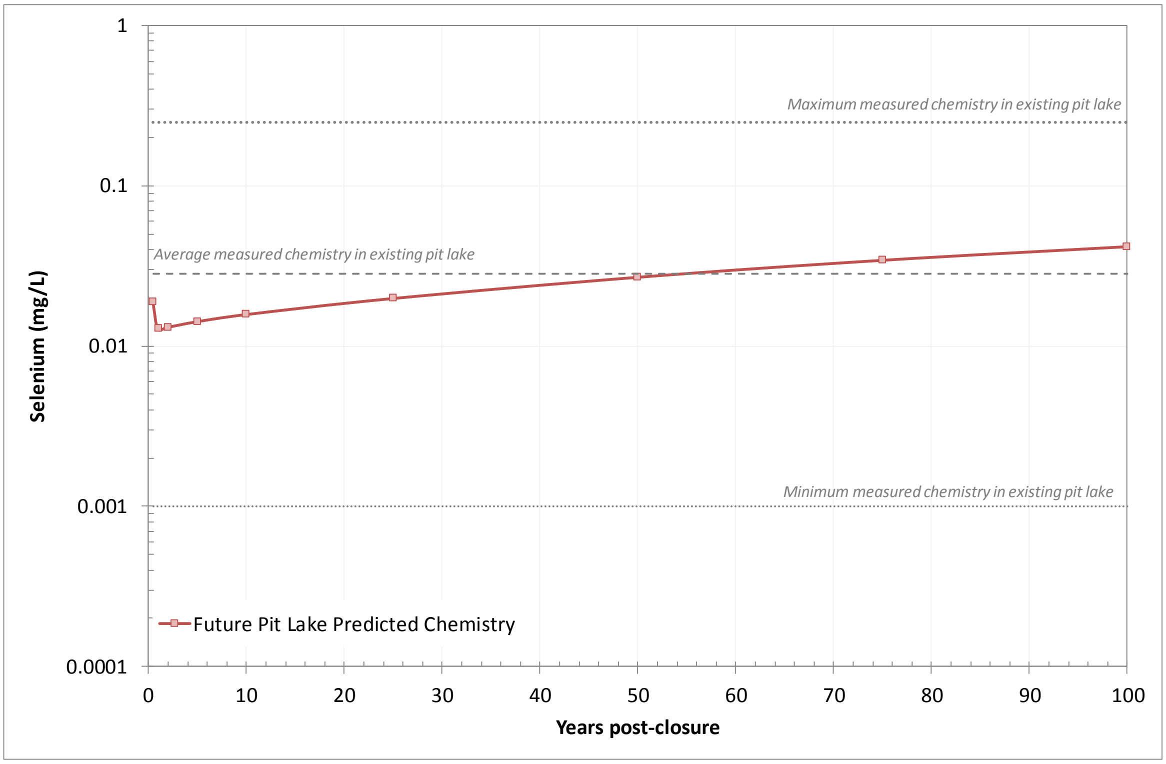


Figure 5-15: Time-series Plot of Predicted Selenium for the Unreclaimed Pit Model

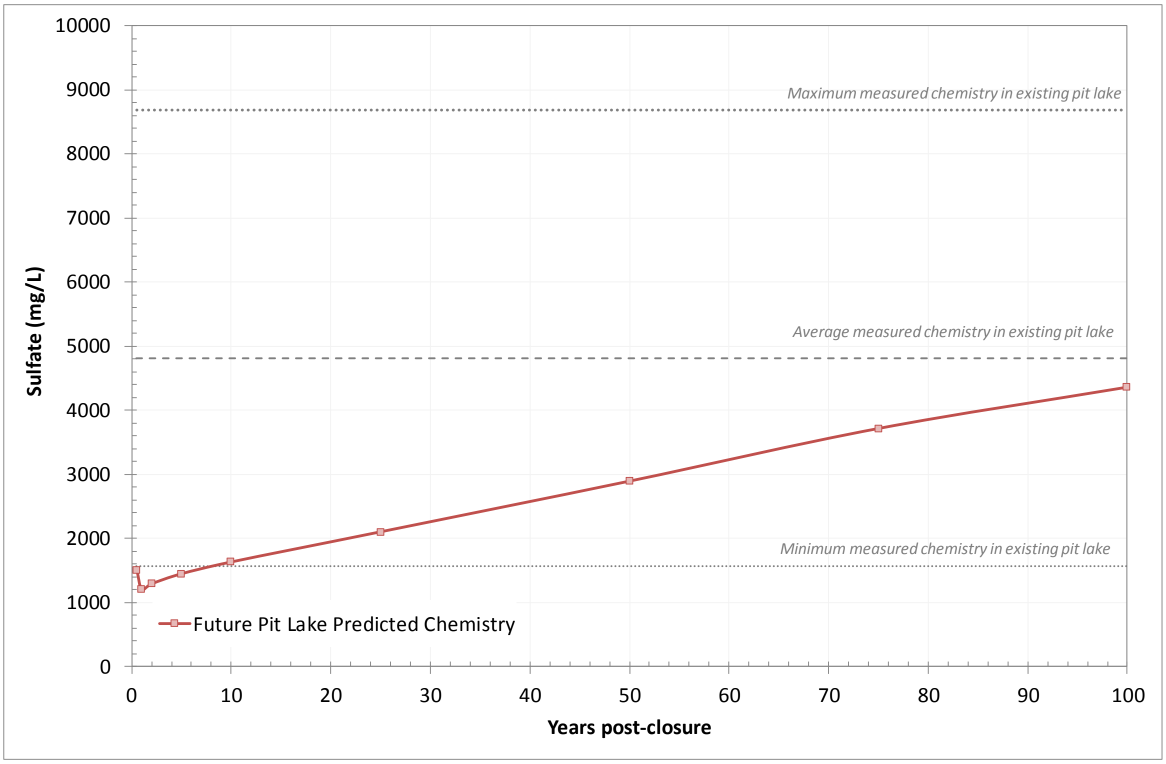


Figure 5-16: Time-series Plot of Predicted Sulfate for the Unreclaimed Pit Model

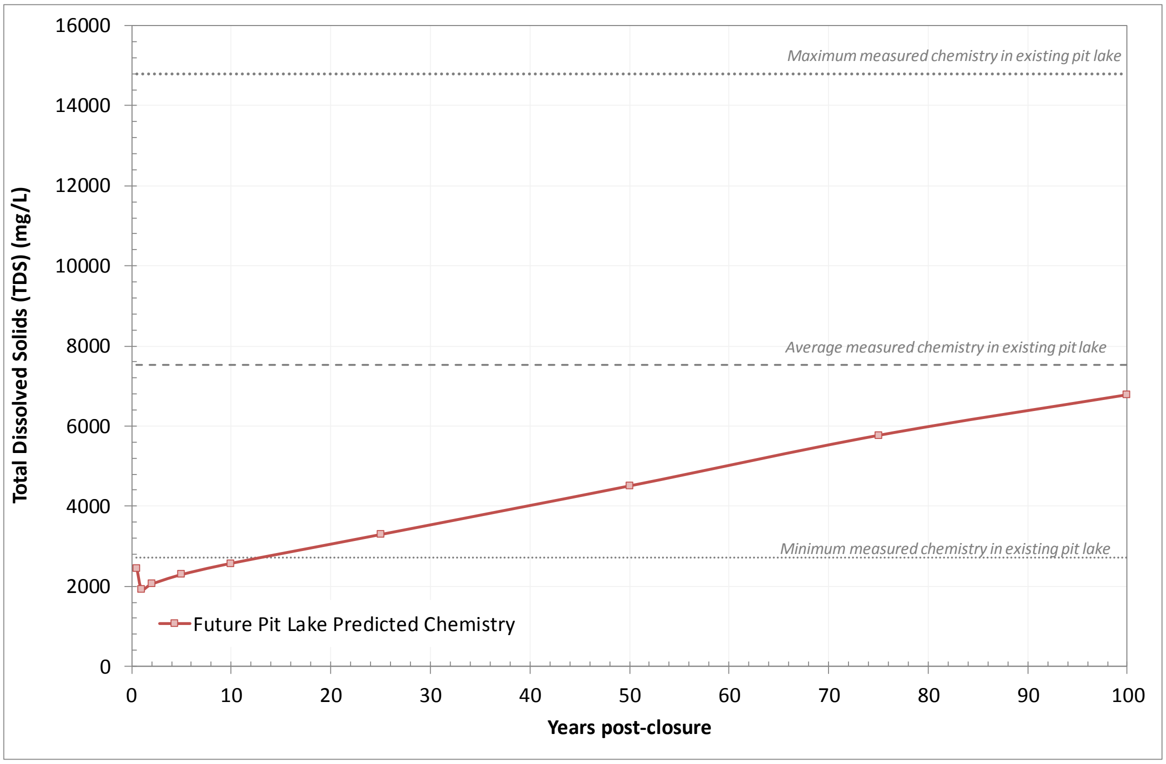


Figure 5-17: Time-series Plot of Predicted TDS for the Unreclaimed Pit Model

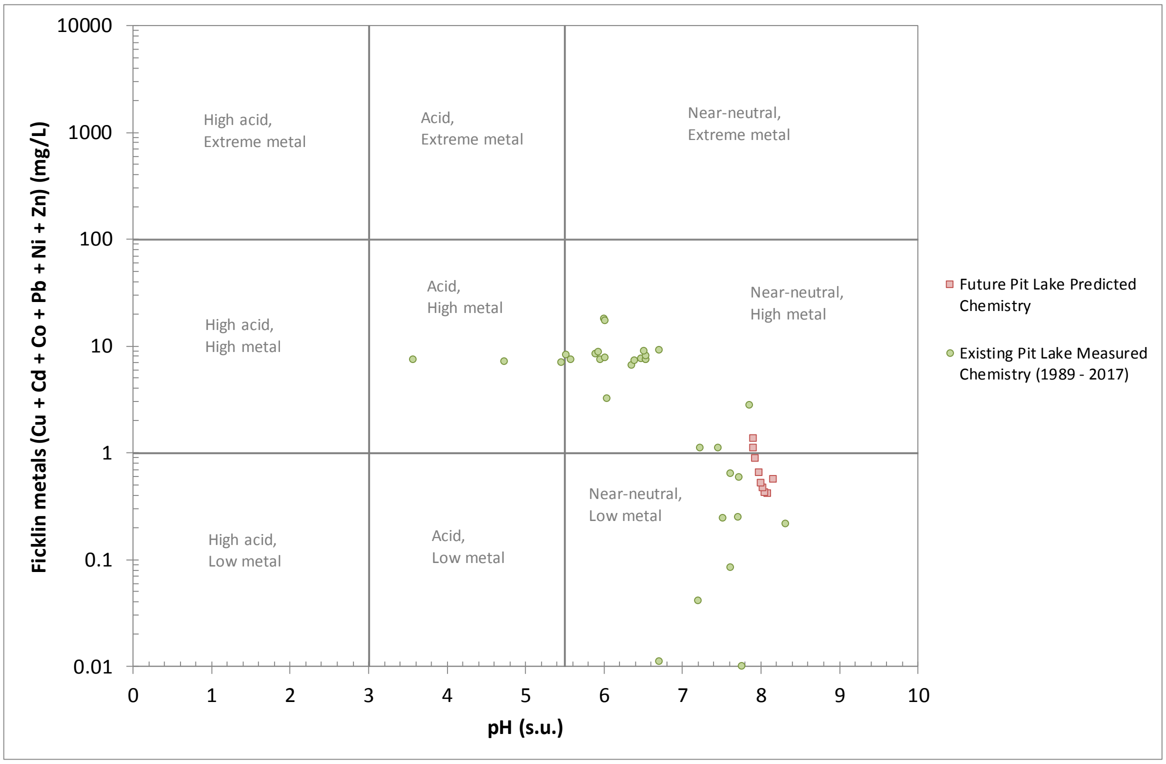


Figure 5-18: Ficklin Plot for the Unreclaimed Pit Model

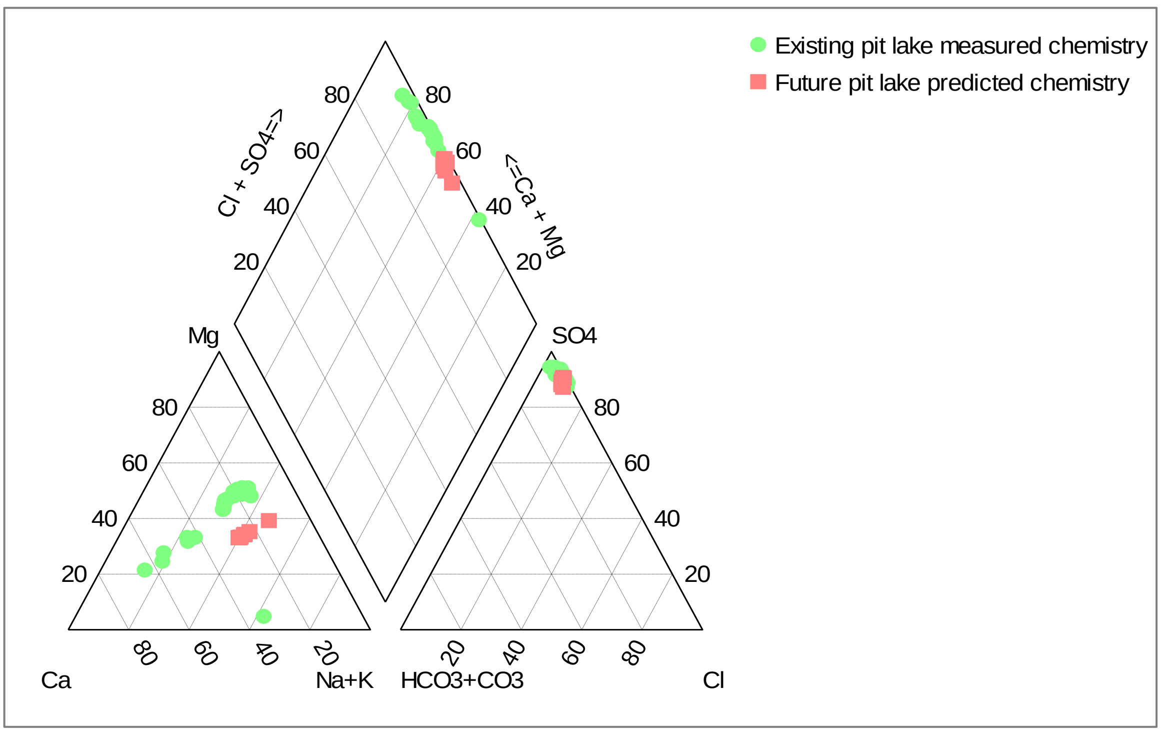


Figure 5-19: Piper Plot of Predicted Major Ion Chemistry for the Unreclaimed Pit Model

6 Reclaimed Pit Model with Rapid Fill

6.1 Conceptual Model

Rapid fill has been proposed as a reclamation strategy for the future pit and will dilute solutes derived from water-rock interaction. Rapid fill will quickly submerge walls and benches to limit the exposure of sulfide minerals to oxygen, and will reduce the effects of evapoconcentration over time. To assess the effects of initial rapid fill on predicted pit lake chemistry for the future pit, an alternative model has been run. This alternative fills the pit with 2,200 acre-feet from the water supply wells during the six months of pit filling. Rapid fill stops when the 4,897 ft water elevation is achieved. Additional reclamation activities for this scenario includes reclamation of the haul road, the expanded section of the 4900-catch bench and the pit shell crest (see Section 3.1.8).

Water quality predictions for this scenario were made for time periods of 0.5, 1, 2, 5, 10, 25, 50, 75, and, 100 years after the start of pit lake formation. A conceptual model for the reclaimed pit rapid fill scenario is presented in Figure 6-1 and inputs to the model are discussed in Sections 6.2 to 6.5.

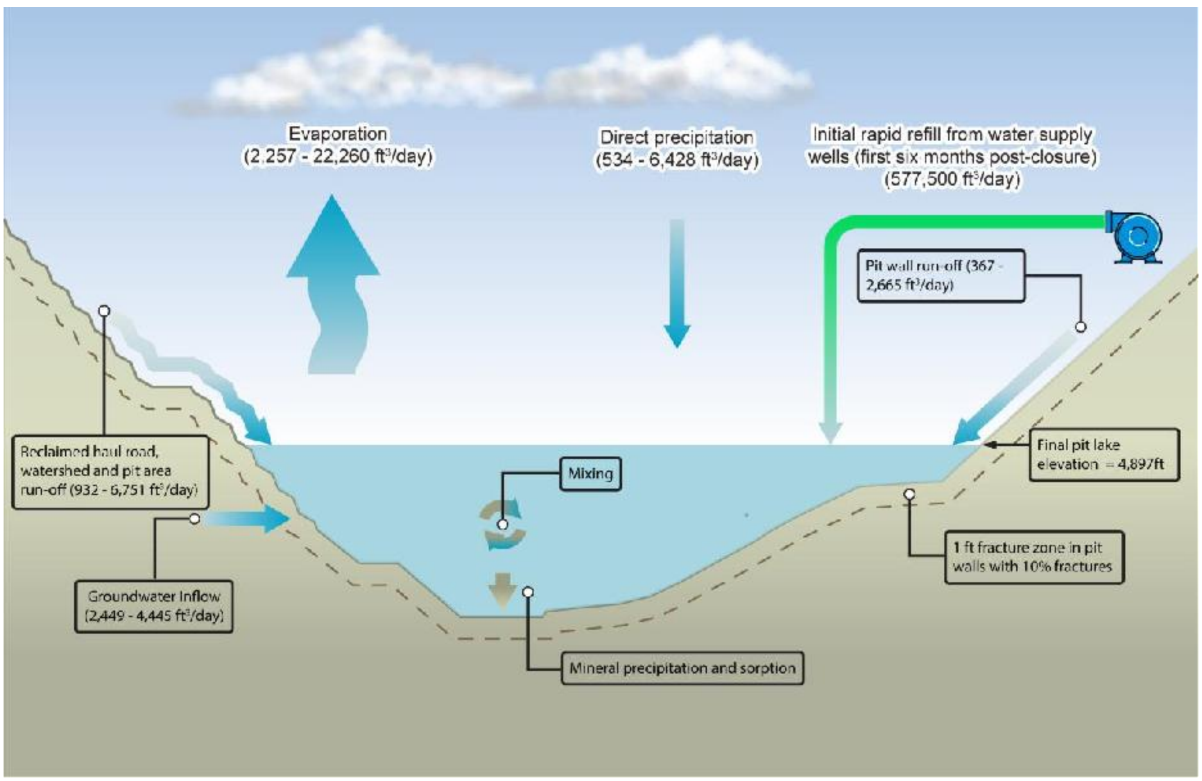


Figure 6-1: Conceptual Model for Reclaimed Pit with Rapid Fill

6.2 Pit Wall Surface Areas

The proportional surface areas of the main material types that will be exposed in the final walls of the reclaimed pit have been calculated from the FS geologic block model and the 2017 MORP pit. The block model was used to calculate the three-dimensional surface area of each material type that will be exposed in the pit wall both above and below the water level as pit filling progresses. Three-dimensional surface areas were calculated for each of the modeled time steps (i.e., for 0.5, 1, 2, 5, 10, 25, 50, 75 and 100 years after the start of pit lake formation). Material types were delineated based on primary lithology, oxidation (redox) and mineralization (i.e., mineralized versus weakly/non-mineralized). Areas proposed for cover and reclamation are excluded from the exposed surface areas.

The three-dimensional surface areas of each material type in the reclaimed pit at the end of mine life are provided in Table 6-1 and are illustrated in Figure 6-2. This demonstrates that unoxidized Quartz Monzonite will represent the dominant material type that will be exposed in the final walls of the reclaimed pit.

Table 6-1: Three-dimensional Surface Areas of Pit Wall Rock Material Types for Final Reclaimed Pit

Mineralization	Rock Type	Redox	Three-dimensional surface area	
			Square feet	%
Weakly/non-mineralized	Andesite	Oxide	41	0.001%
		Sulfide (non-ox.)	118,926	1.5%
	Biotite Breccia	Oxide	434	0.01%
		Sulfide (non-ox.)	300,158	3.9%
	Quartz Monzonite	Oxide	236	0.003%
		Sulfide (non-ox.)	2,165,968	27.9%
	Coarse Crystalline Porphyry	Oxide	790	0.01%
		Sulfide (non-ox.)	596,808	7.7%
Mineralized	Biotite Breccia	Sulfide (non-ox.)	787,435	10.1%
	Quartz Monzonite	Oxide	0	0%
		Sulfide (non-ox.)	1,993,567	25.6%
	Coarse Crystalline Porphyry	Oxide	0	0%
		Sulfide (non-ox.)	302,134	3.9%
Reclaimed area (above water level)			1,508,004	19.4%
Total			**7,774,501**	**100%**

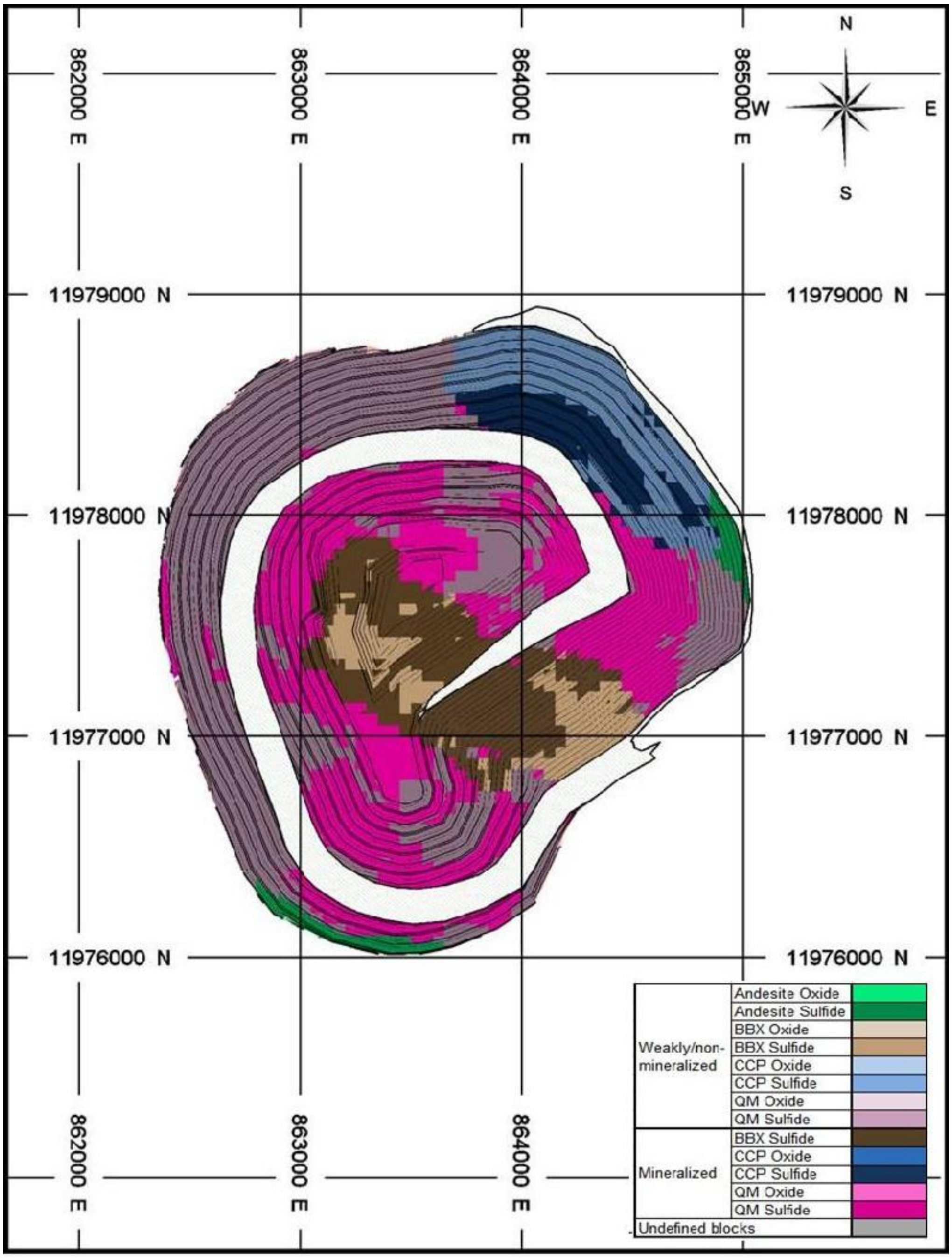


Figure 6-2: Exposed Material Types in Final Walls of the Reclaimed Pit

6.3 Calculation of Pit Wall Rock Available for Leaching

The blasting techniques that will be used for the reclaimed pit will be identical to those for the unreclaimed pit model. As such, a 1 foot thickness of reactive rock in the pit walls has also been assumed for the reclaimed pit model (Siskind and Fumanti, 1974; Kelsall et al., 1984). The method used to calculate the mass of pit wall available for leaching was identical to that used for the unreclaimed pit model (Section 5.3).

6.4 Water Balance

A pit lake water balance for the reclaimed pit model with rapid fill has been developed by JSAI and is based on the following inputs/assumptions (JSAI, 2017):

- The pit will be filled with 2,200 acre-feet from the water supply wells during the six months of pit infilling;
- Rapid fill stops when the 4,897 ft water elevation is achieved;
- Evaporation will represent the dominant solution loss; and
- The pit lake evaporation rate is 50 inches per year.

As with the unreclaimed pit model, the pit lake for the reclaimed pit model will also be a hydrologic sink. The pit lake filling curve is shown in Figure 6-3 and the various inputs/outputs to the pit are shown in Figure 6-4.

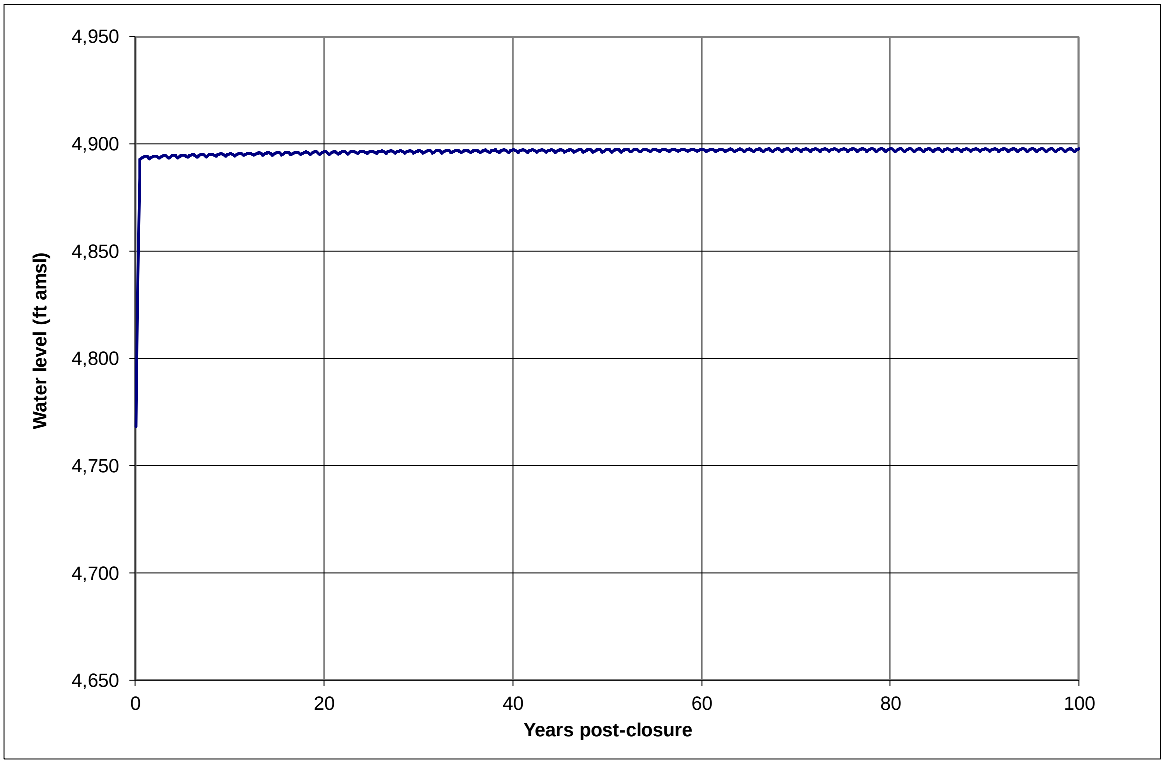


Figure 6-3: Pit Lake Elevation Curve for Reclaimed Pit Model with Rapid Fill

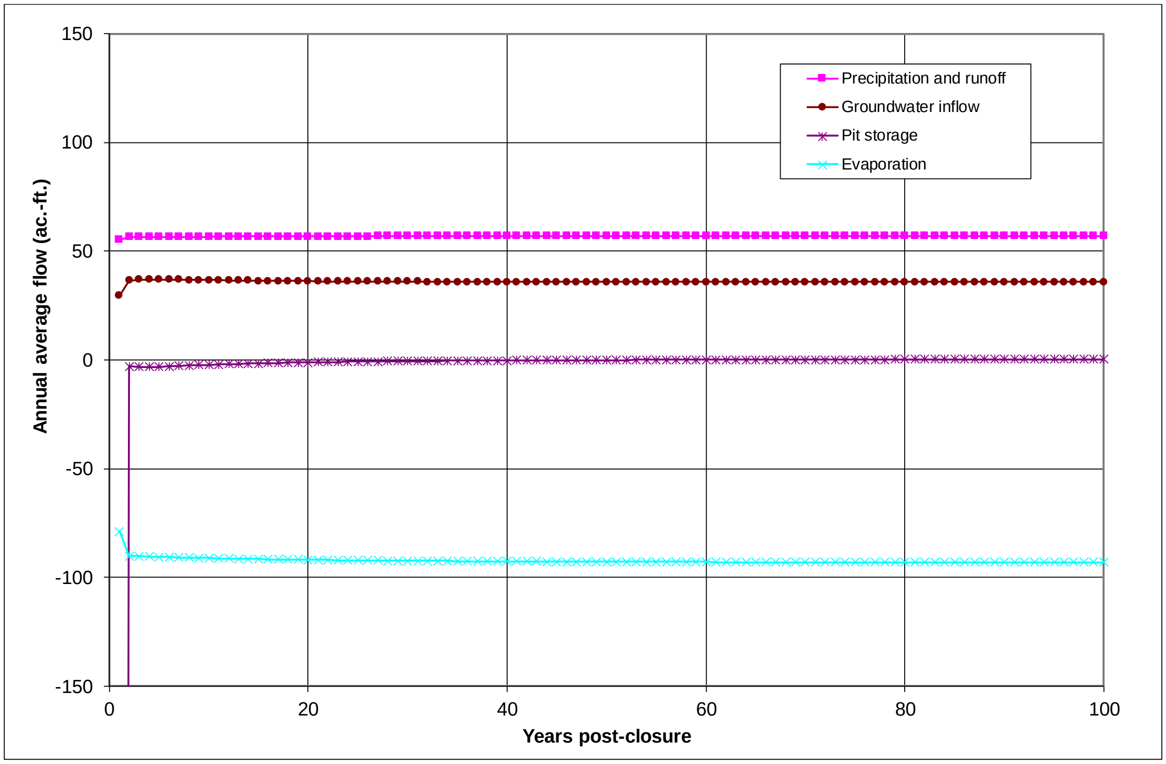


Figure 6-4: Pit Lake Flux for Reclaimed Pit Model with Rapid Fill

6.5 Solution Inputs

6.5.1 Precipitation Chemistry

As with the existing pit model (Section 4) and unreclaimed pit model (Section 5), the primary wall rock lixiviant for the pit high walls in the reclaimed pit model is assumed to be precipitation. Representative precipitation chemistry data were obtained from monthly monitoring carried out between 1985 and 2011 at the Gila Cliff Dwellings National Monument meteorological station, Catron County, New Mexico (NADP, 2012).

6.5.2 Groundwater Chemistry

Following the initial rapid fill with water from the supply wells, groundwater will continue to enter the pit. The groundwater chemistry used for the reclaimed pit model was identical to that used for the unreclaimed pit model (Section 5.5.2, Table 5-2).

6.5.3 Wall Rock Chemistry

The pit shell and exposed wall rocks for the reclaimed pit model will be identical to those in the unreclaimed model. As such, the same wall rock source terms were used in the model (Section 5.5.3, Table 5-2).

6.5.4 Water Supply Well Chemistry

Water used to rapidly fill the pit is represented by hydrochemical data from water supply wells PW-1 and PW-3 (Table 6-2; JSAI, 2017c; Appendix E).

Table 6-2: Water Supply Well Chemistry for PW-1 and PW-3 used to Represent Rapid Fill Water Quality in the Reclaimed Pit Model

Parameter		Units	Average Chemistry for PW-1 and PW-3
pH	pH	s.u.	8.03
HCO_3	Bicarbonate	mg/L	135
Ag	Silver	mg/L	<0.005*
Al	Aluminum	mg/L	<0.02*
As	Arsenic	mg/L	0.005
B	Boron	mg/L	0.08
Ba	Barium	mg/L	0.009
Be	Beryllium	mg/L	<0.002*
Ca	Calcium	mg/L	28
Cd	Cadmium	mg/L	<0.002*
Cl	Chloride	mg/L	41
Co	Cobalt	mg/L	<0.006*
Cu	Copper	mg/L	<0.006*
Cr	Chromium	mg/L	0.006
F	Fluoride	mg/L	1.45
Fe	Iron	mg/L	0.053
Hg	Mercury	mg/L	<0.0002*
K	Potassium	mg/L	3.35
Mg	Magnesium	mg/L	2.05
Mn	Manganese	mg/L	0.0025
Mo	Molybdenum	mg/L	<0.008*
Na	Sodium	mg/L	69.5
Ni	Nickel	mg/L	<0.01*
Pb	Lead	mg/L	<0.005*
SO_4	Sulfate	mg/L	27
Se	Selenium	mg/L	<0.001*
Si	Silica	mg/L	19
U	Uranium	mg/L	0.0023
V	Vanadium	mg/L	<0.05*
Tl	Thallium	mg/L	<0.001
Zn	Zinc	mg/L	0.023

* Parameters below analytical detection limits were not included in the input to the PHREEQC model

6.5.5 Reclaimed Surface Chemistry

At closure, several areas of the pit will be reclaimed. Water quality associated with run-off from these areas is therefore likely to have a different chemical composition from the rest of the pit walls. As such, the water balance provided by JSAI includes a separate input to the water balance for the reclaimed areas and receiving watershed. Conveyed stormwater is expected to have a chemistry similar to background surface water quality from SWQ-1 (Table 6-3; JSAI, 2015b).

Table 6-3: Water Supply Well Chemistry for SWQ-1 used to Represent reclaimed pit Run-off Water Quality in the Reclaimed Pit Model

Parameter		Units	Average Chemistry for SWQ-1
pH	pH	s.u.	8.3
HCO_3	Bicarbonate	mg/L	430
Al	Aluminum	mg/L	<0.1*
As	Arsenic	mg/L	<0.005*
B	Boron	mg/L	0.02
Ba	Barium	mg/L	<0.5*
Ca	Calcium	mg/L	109
Cd	Cadmium	mg/L	<0.002*
Cl	Chloride	mg/L	30
Co	Cobalt	mg/L	<0.05*
Cu	Copper	mg/L	<0.01*
Cr	Chromium	mg/L	<0.02*
F	Fluoride	mg/L	0.3
Fe	Iron	mg/L	<0.05*
Hg	Mercury	mg/L	<0.001*
K	Potassium	mg/L	1.8
Mg	Magnesium	mg/L	36
Mn	Manganese	mg/L	<0.02*
Mo	Molybdenum	mg/L	<0.02*
Na	Sodium	mg/L	107
Pb	Lead	mg/L	<0.02*
Se	Selenium	mg/L	<0.005*
SO_4	Sulfate	mg/L	261
Zn	Zinc	mg/L	<0.01*

* Parameters below analytical detection limits were not included in the input to the PHREEQC model

6.6 Results

The predicted pit lake chemistry for the reclaimed pit model is summarized in Table 6-4 and illustrated in Figure 6-5 to Figure 6-18 for selected parameters. These show predicted pit lake chemistry at each of the modeled time steps (i.e., 0.5, 1, 2, 5, 10, 25, 50, 75 and 100 years post-closure) compared to water quality in the existing pit lake. The full PHREEQC output file is provided in Appendix I, which shows precipitating and dissolving mineral species at each time step as part of the mass transfer calculations.

As with the unreclaimed pit model, pit lake waters for the reclaimed pit model are predicted to be moderately alkaline (pH 8.0 – 8.4) with a predominantly sodium + chloride/sulfate (Na + SO_4/Cl) major ion signature (Figure 6-18). Rapidly filling the pit with the water supply wells during the first six months post-closure results in a more dilute initial water chemistry with a sodium-chloride (Na+Cl) signature. The result is that the effects of evapoconcentration are not as pronounced as the pit lake reaches hydrogeologic equilibrium, and predicted concentrations of many major ions and trace elements at 100 years remain lower than if natural fill were used. This is particularly the case for constituents such as boron, sulfate and chloride, which are strongly influenced by evaporation effects and are predicted to be much lower in concentration for the rapid fill scenario compared to the natural fill scenario. The rapid fill will also quickly submerge walls and benches to limit the exposure of sulfide minerals to oxygen, which will reduce trace element release into the pit lake.

As with the unreclaimed model, concentrations of the majority of constituents are either comparable to or less than concentrations in the existing pit lake at Copper Flat. Pit lake waters for the reclaimed pit model are predicted to be ‘near-neutral, low-metal’ waters based on pH values between 8.0 and 8.4 and total Ficklin metal concentrations less than 1 mg/L (Figure 6-17). Ficklin metal concentrations are predicted to evolve and increase over time as a result of evapoconcentration effects. This evolution in chemistry is similar to the trends observed in the existing pit lake and reflects the environment or climate control rather than one related to mining; however, for the future reclaimed pit, water chemistry is predicted to remain in the ‘near-neutral, low-metal’ classification for all modeled time steps as the metal-releasing material will not be exposed.

Table 6-4: Reclaimed Pit Model Results

Parameter		Units	*Measured Chemistry in Existing Pit (1989 - 2017)*			Predicted Future Chemistry (Years Post-Closure)								
			Average	*Minimum*	*Maximum*	**0.5**	**1**	**2**	**5**	**10**	**25**	**50**	**75**	**100**
pH	**pH**	s.u.	*6.5*	*3.6*	*8.3*	8.4	8.4	8.4	8.3	8.3	8.2	8.1	8.1	8.0
HCO_3	**Bicarbonate**	mg/L	*40.4*	*<3*	*122*	84.7	82.5	80.3	74.9	68.3	57.7	50.2	46.8	44.6
Al	**Aluminium**	mg/L	*10.4*	*<0.02*	*82.6*	0.0003	0.001	0.002	0.005	0.01	0.03	0.05	0.08	0.10
As	**Arsenic**	mg/L	*0.004*	*<0.001*	*0.006*	0.003	0.003	0.003	0.003	0.003	0.004	0.004	0.005	0.005
B	**Boron**	mg/L	*0.14*	*<0.1*	*0.2*	0.08	0.09	0.10	0.12	0.16	0.28	0.49	0.69	0.89
Ca	**Calcium**	mg/L	*550*	*455*	*684*	13.0	14.3	16.2	22.1	32.6	66.7	126.4	185	244
Cd	**Cadmium**	mg/L	*0.05*	*<0.005*	*0.1*	0.00008	0.00016	0.0003	0.0008	0.0016	0.0039	0.0077	0.012	0.015
Co	**Cobalt**	mg/L	*0.29*	*<0.05*	*0.49*	0.00005	0.0001	0.0002	0.0006	0.001	0.003	0.006	0.010	0.013
Cr	**Chromium**	mg/L	*0.03*	*<0.006*	*0.1*	0.006	0.006	0.006	0.006	0.006	0.006	0.007	0.008	0.009
Cu	**Copper**	mg/L	*4.44*	*0.001*	*26.5*	0.002	0.01	0.02	0.05	0.05	0.04	0.03	0.03	0.03
F	**Fluoride**	mg/L	*19.2*	*4.8*	*34*	1.49	1.52	1.61	1.86	2.28	3.50	5.53	5.38	5.29
Fe	**Iron**	mg/L	*0.2*	*<0.02*	*1.3*	3.93E-05	3.95E-05	3.97E-05	4.04E-05	4.15E-05	4.44E-05	4.81E-05	5.08E-05	5.31E-05
Hg	**Mercury**	mg/L	*0.0005*	*<0.0002*	*0.001*	0.000005	0.00001	0.00002	0.00005	0.0001	0.0002	0.0005	0.0007	0.0009
K	**Potassium**	mg/L	*32.1*	*11.0*	*60.6*	5.16	6.88	10.4	20.9	38.2	89.5	174	259	344
Mg	**Magnesium**	mg/L	*698*	*43*	*1,120*	3.70	5.52	9.03	19.5	36.7	87.6	172	256	340
Mn	**Manganese**	mg/L	*34.8*	*0.02*	*59.0*	0.04	0.09	0.17	0.43	0.85	2.09	4.14	6.19	8.23
Mo	**Molybdenum**	mg/L	*0.04*	*0.015*	*0.1*	0.003	0.005	0.01	0.03	0.05	0.13	0.25	0.38	0.50
Na	**Sodium**	mg/L	*888*	*165*	*1,400*	72.8	75.3	81.5	99.7	130	219	368	517	665
Ni	**Nickel**	mg/L	*0.06*	*0.039*	*0.1*	0.0001	0.0002	0.000	0.001	0.002	0.005	0.010	0.015	0.020
Pb	**Lead**	mg/L	*0.02*	*<0.005*	*0.1*	0.0002	0.0004	0.0009	0.0024	0.0049	0.012	0.024	0.037	0.049
Sb	**Antimony**	mg/L		*<0.001**		0.00004	0.0001	0.0002	0.0004	0.001	0.002	0.004	0.006	0.008
Se	**Selenium**	mg/L	*0.028*	*<0.001*	*0.25*	0.0002	0.0003	0.001	0.002	0.003	0.008	0.017	0.025	0.033
U	**Uranium**	mg/L	*0.11*	*0.11*	*0.12*	0.002	0.003	0.005	0.01	0.02	0.05	0.10	0.15	0.20
V	**Vanadium**	mg/L	*0.1*	*<0.05*	*0.25*	0.0001	0.0003	0.0007	0.002	0.004	0.009	0.02	0.03	0.04
Zn	**Zinc**	mg/L	*5.4*	*0.01*	*9*	0.03	0.03	0.04	0.07	0.11	0.25	0.47	0.70	0.92
SO_4	**Sulfate**	mg/L	*4,803*	*1,566*	*8,690*	42.0	60.5	94.1	194	358	845	1,651	2,455	3,258
Cl	**Chloride**	mg/L	*332*	*47.3*	*730*	66.6	67.3	69.9	77.9	91.0	130	196	262	327
TDS	**Total Dissolved Solids**	mg/L	*7,538*	*2,711*	*14,800*	290	314	363	511	759	1,503	2,749	3,995	5,239

* *Indicates parameter was uniformly below analytical detection limits in pit lake water over monitoring period, but detection limit was variable. Concentration shown in table represents lower limit of analytical detection.*

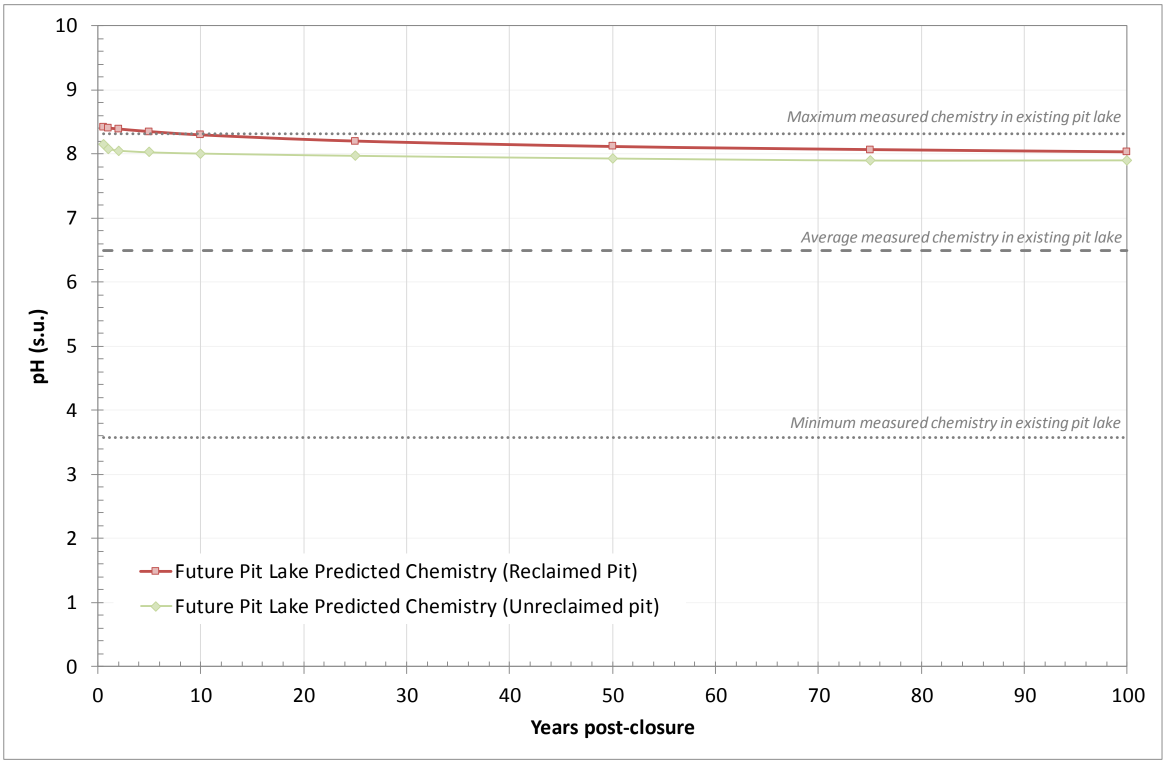


Figure 6-5: Time-series Plot of Predicted pH for the Reclaimed Pit Model

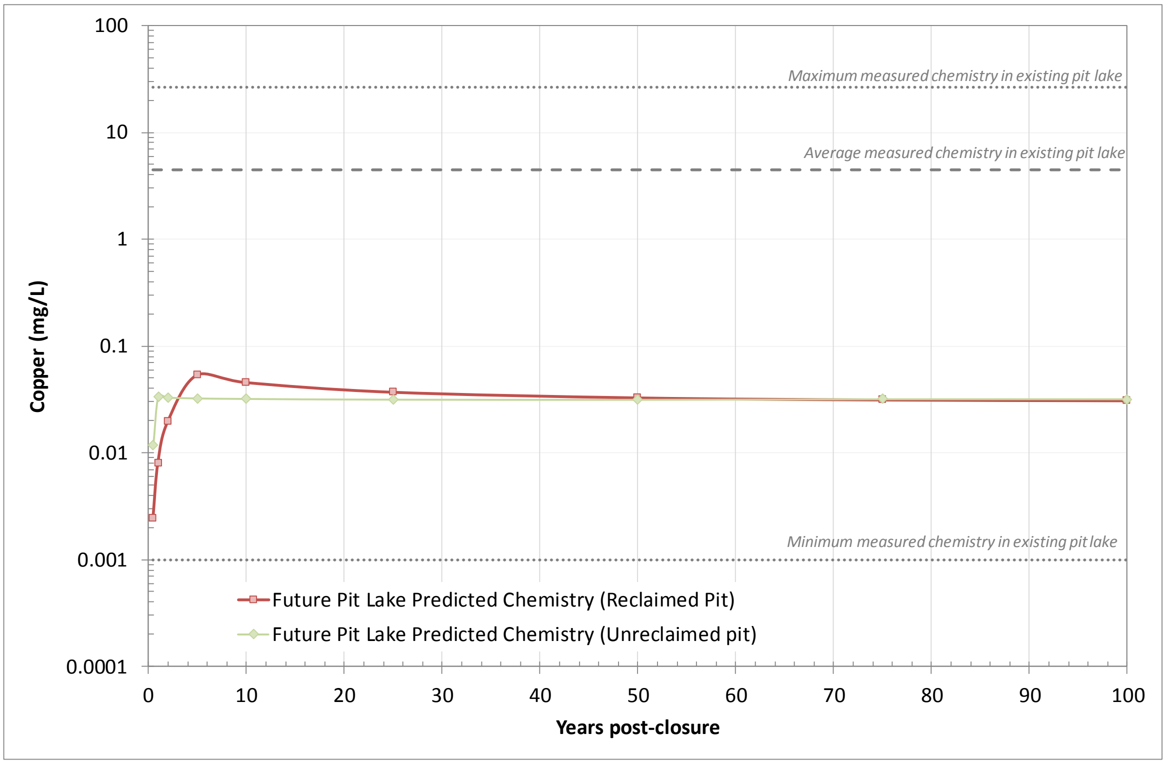


Figure 6-6: Time-series Plot of Predicted Copper for the Reclaimed Pit Model

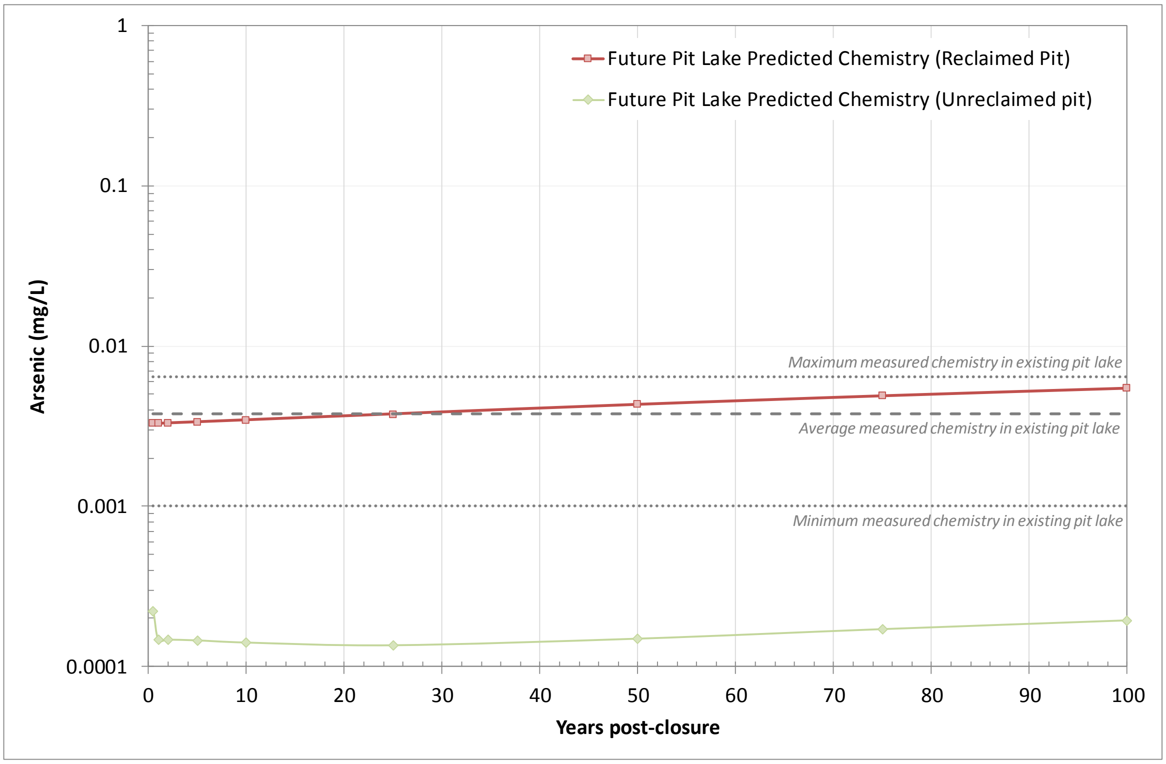


Figure 6-7: Time-series Plot of Predicted Arsenic for the Reclaimed Pit Model

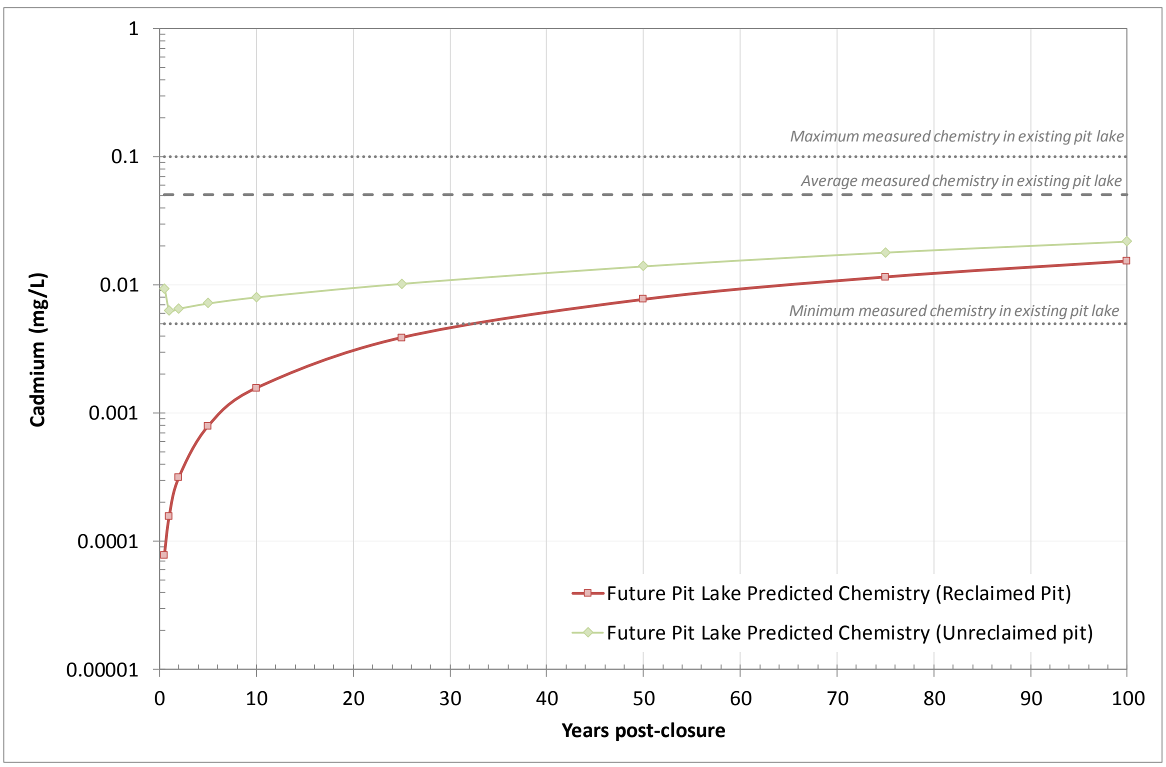


Figure 6-8: Time-series Plot of Predicted Cadmium for the Reclaimed Pit Model

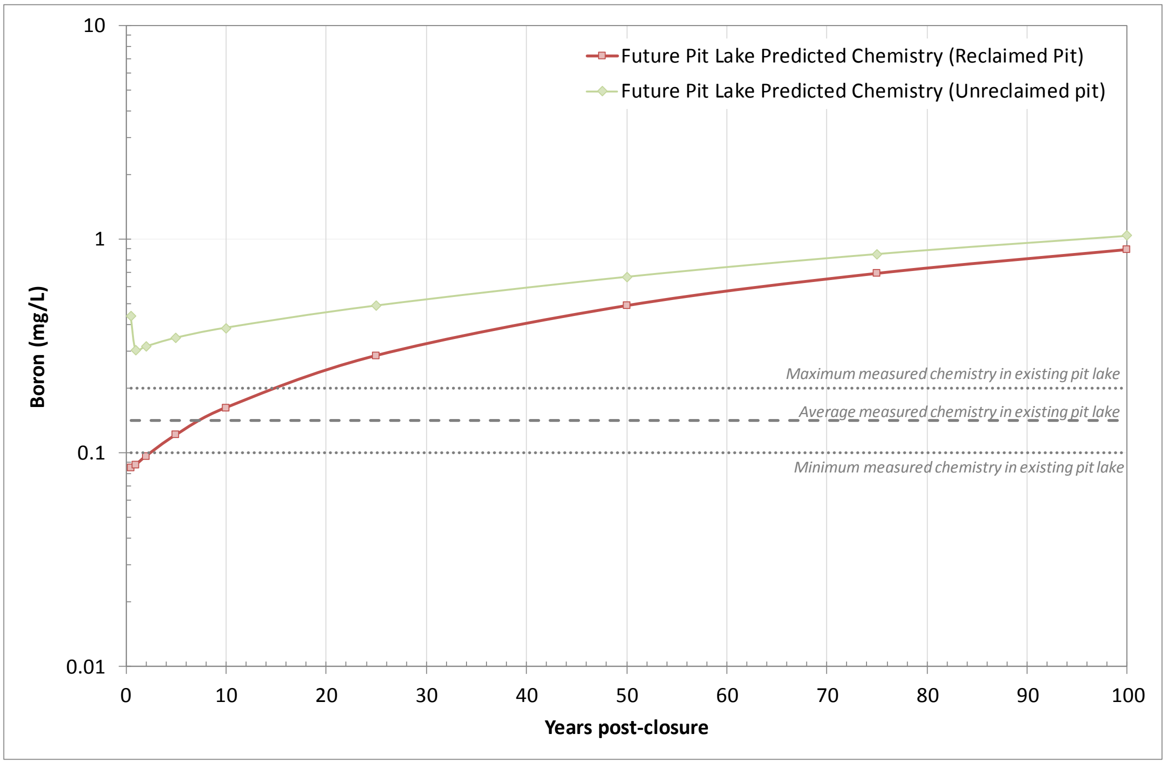


Figure 6-9: Time-series Plot of Predicted Boron for the Reclaimed Pit Model

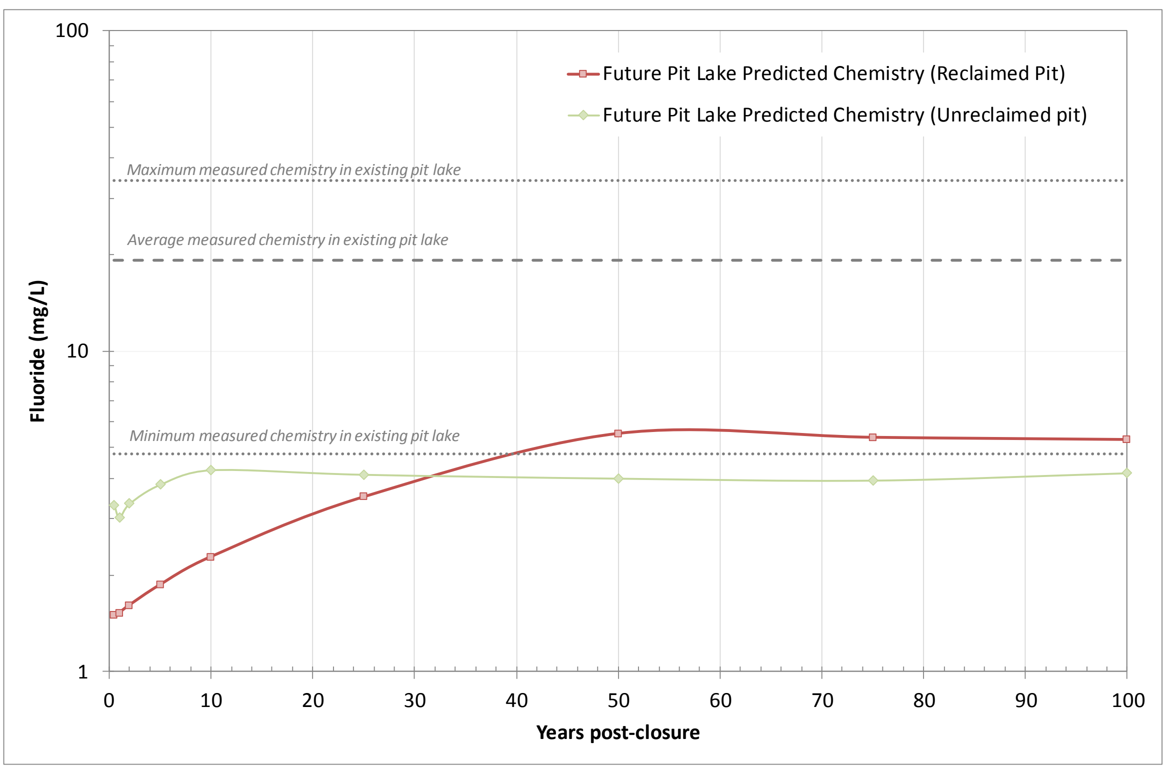


Figure 6-10: Time-series Plot of Predicted Fluoride for the Reclaimed Pit Model

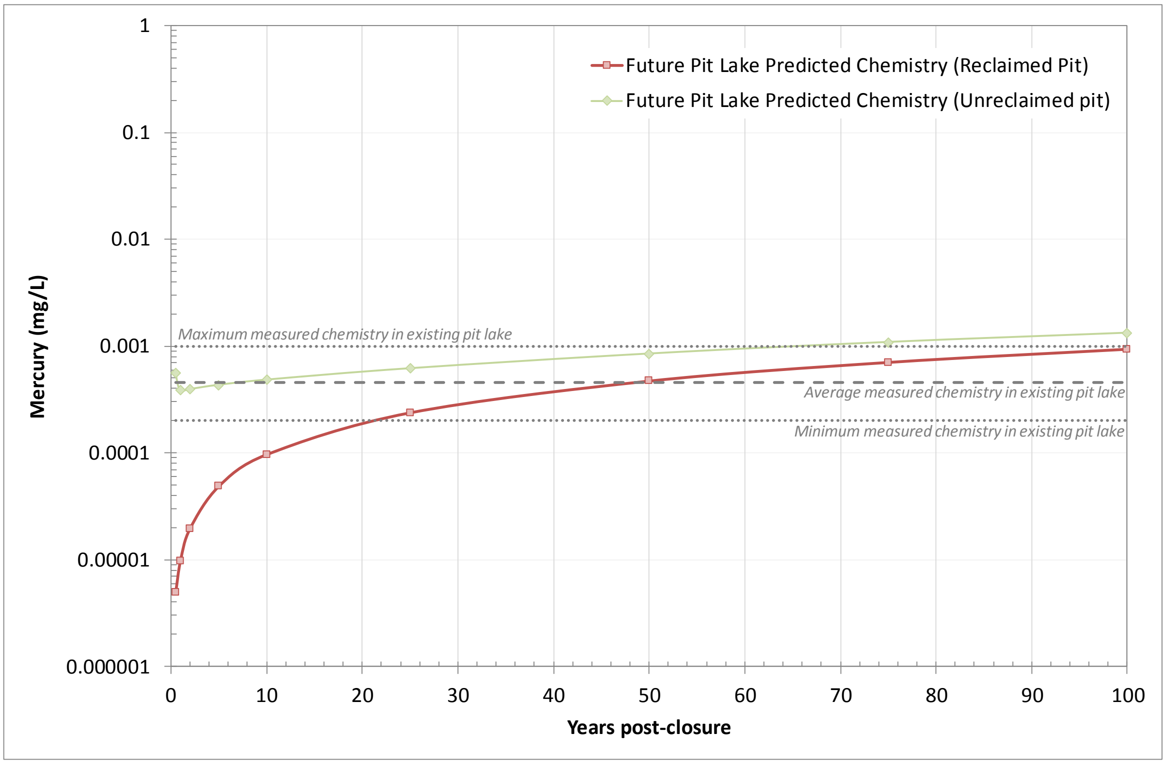


Figure 6-11: Time-series Plot of Predicted Mercury for the Reclaimed Pit Model

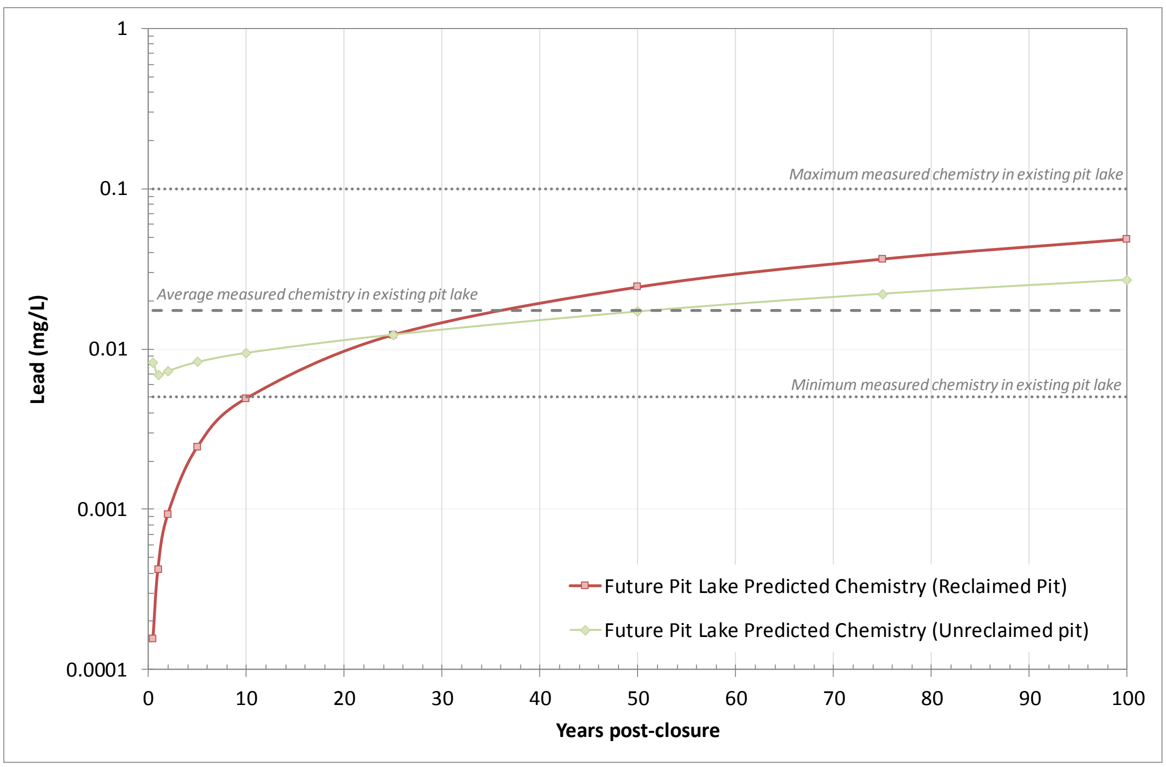


Figure 6-12: Time-series Plot of Predicted Lead for the Reclaimed Pit Model

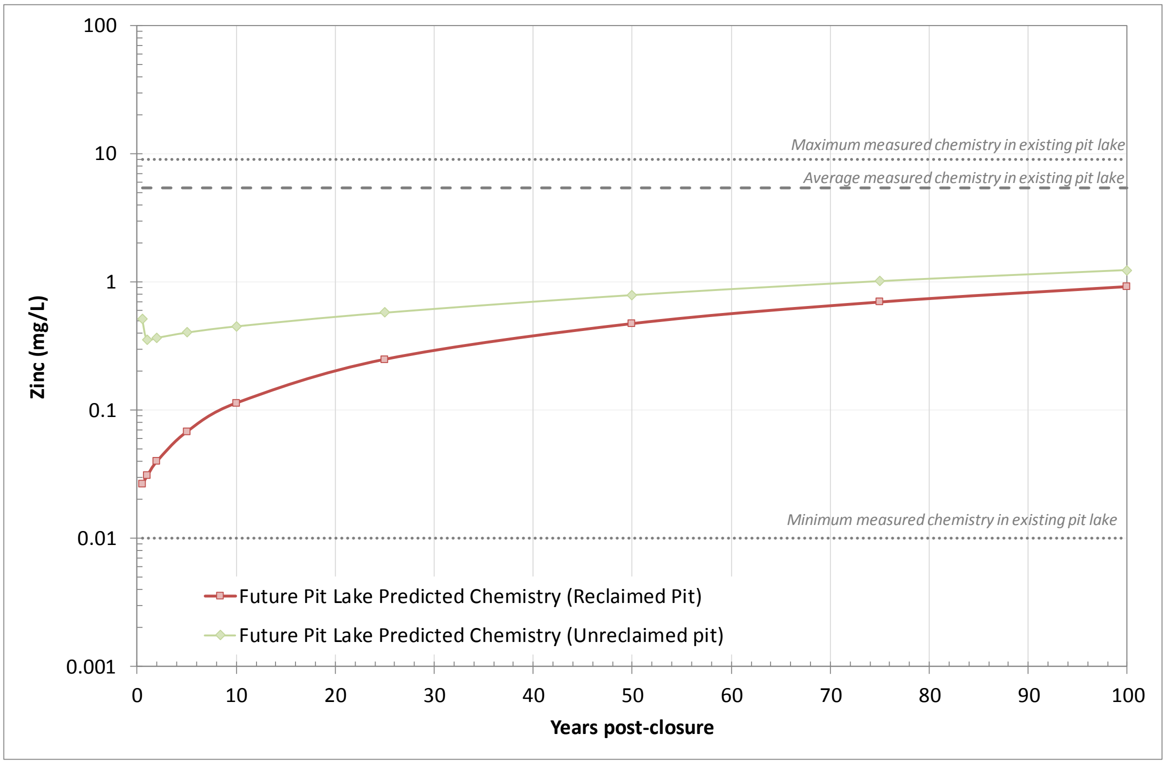


Figure 6-13: Time-series Plot of Predicted Zinc for the Reclaimed Pit Model

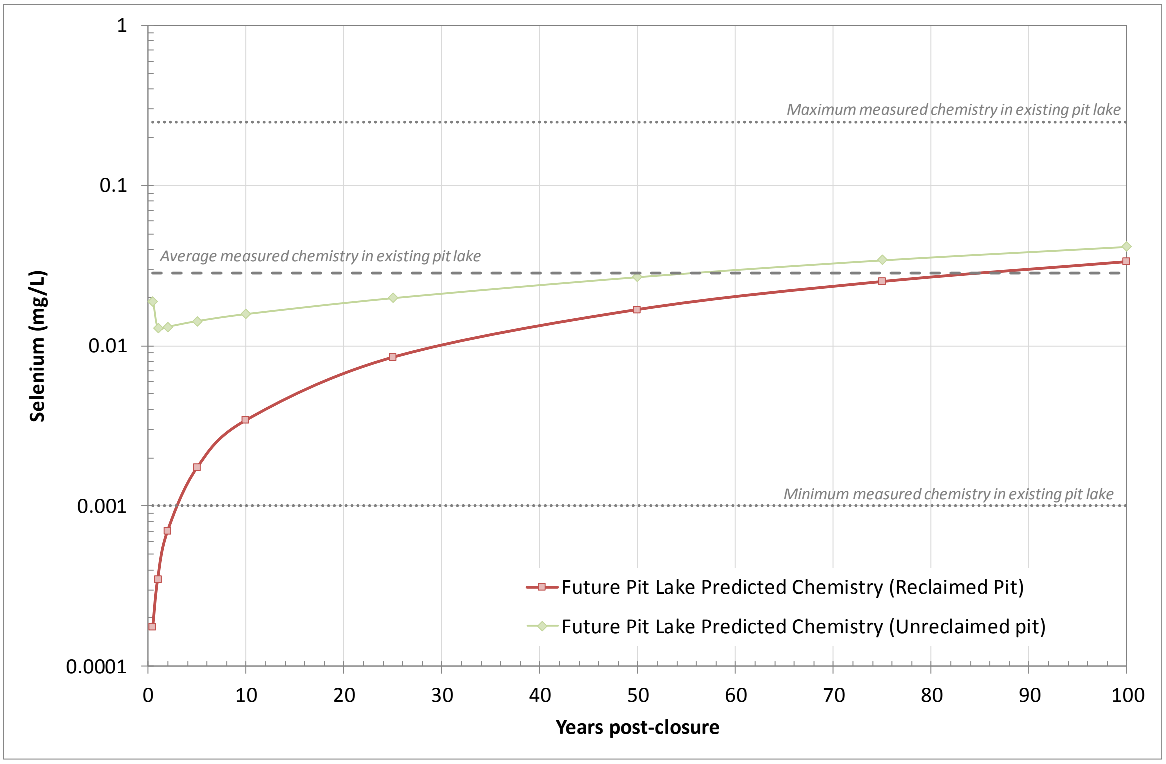


Figure 6-14: Time-series Plot of Predicted Selenium for the Reclaimed Pit Model

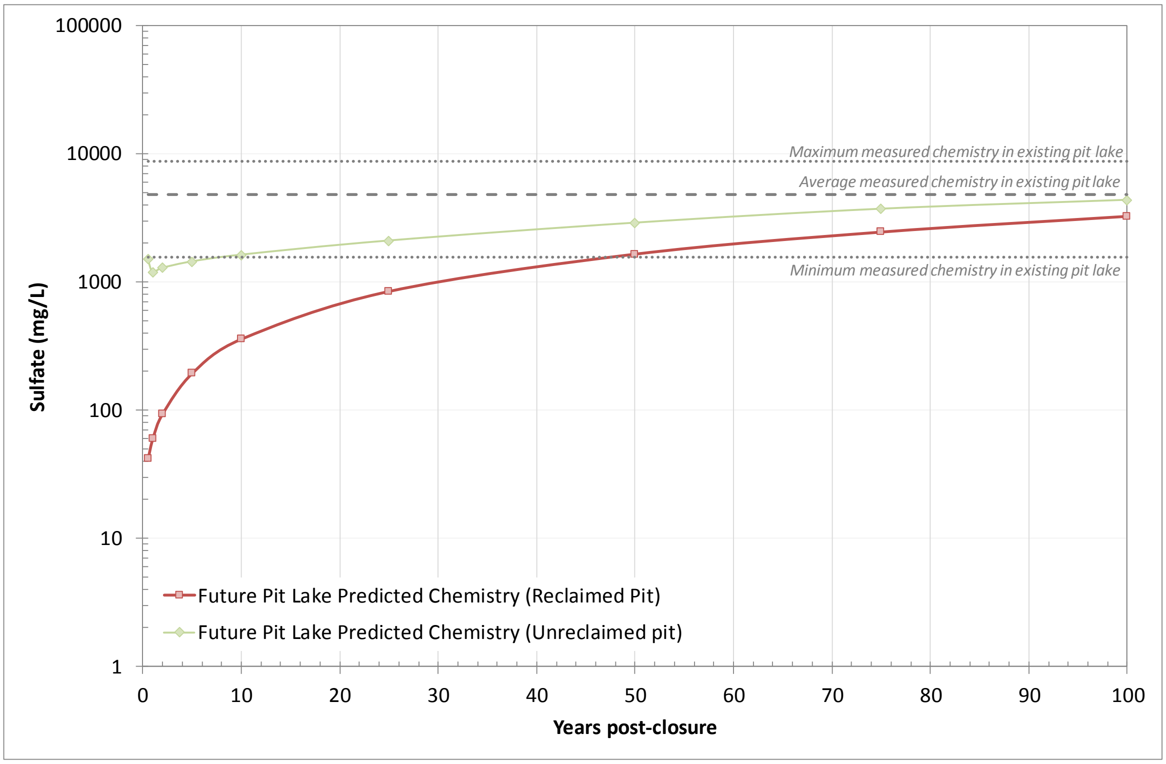


Figure 6-15: Time-series Plot of Predicted Sulfate for the for the Reclaimed Pit Model

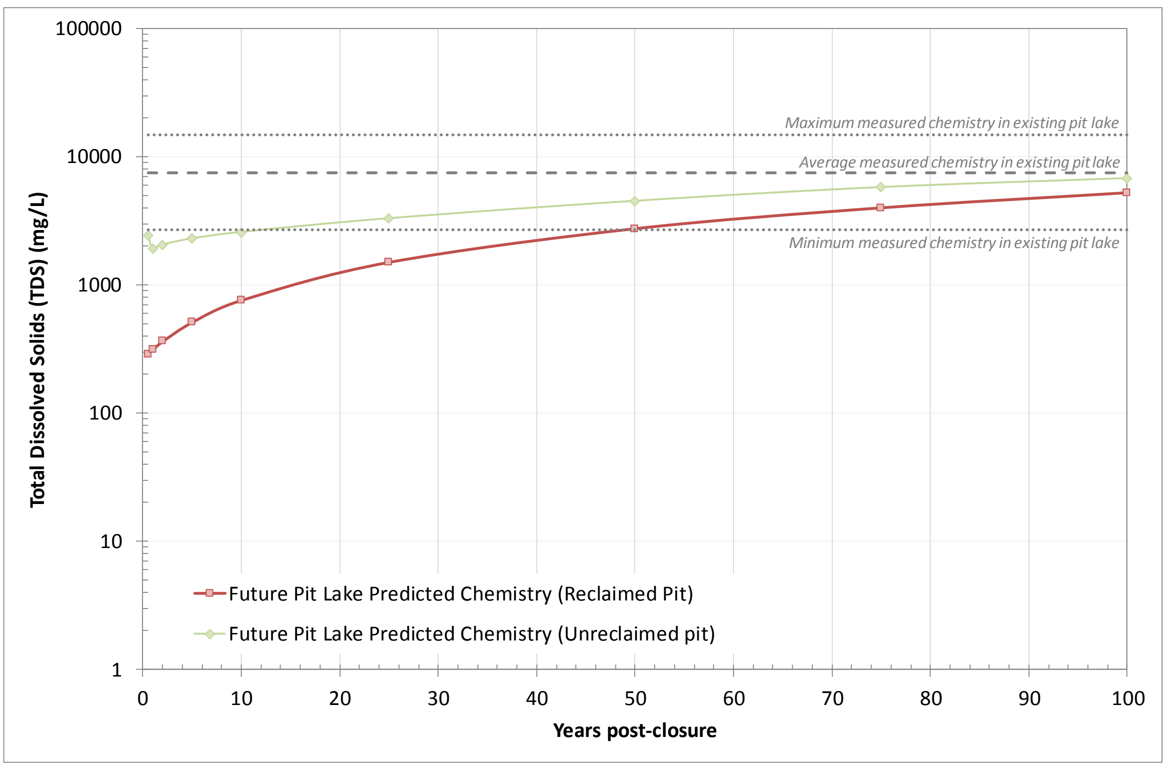


Figure 6-16: Time-series Plot of Predicted TDS for the for the Reclaimed Pit Model

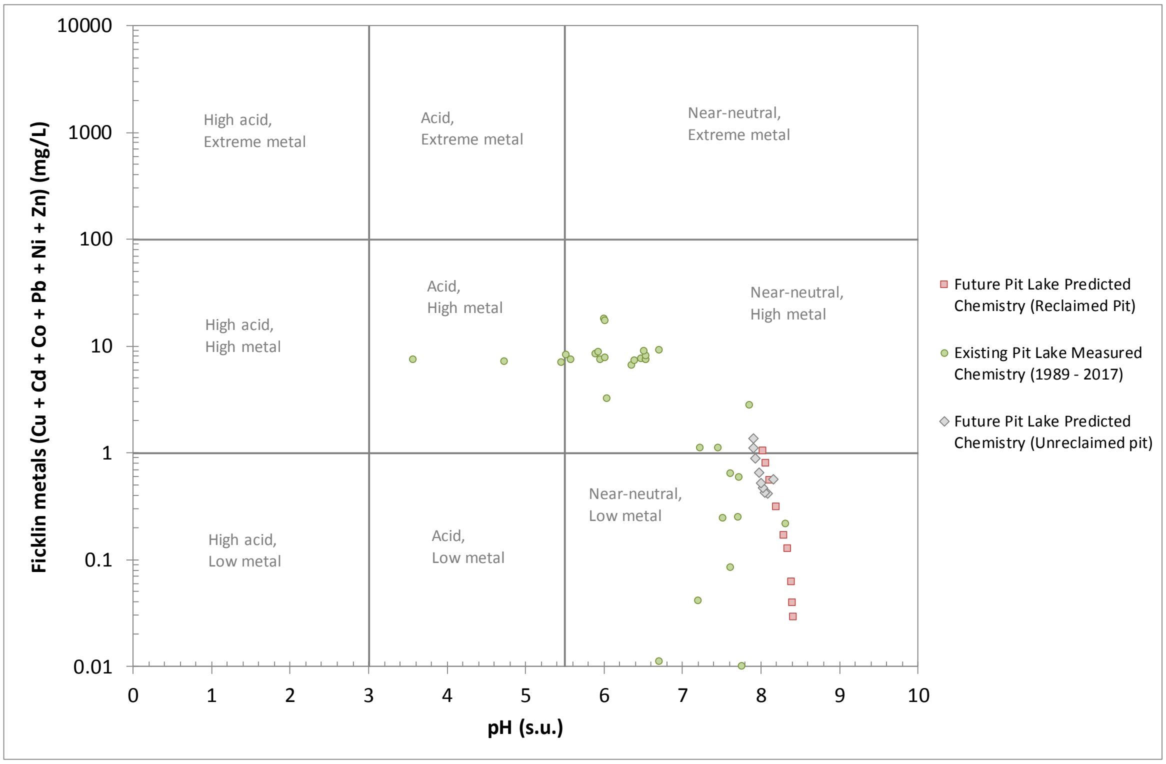


Figure 6-17: Ficklin Plot for the Reclaimed Pit Model

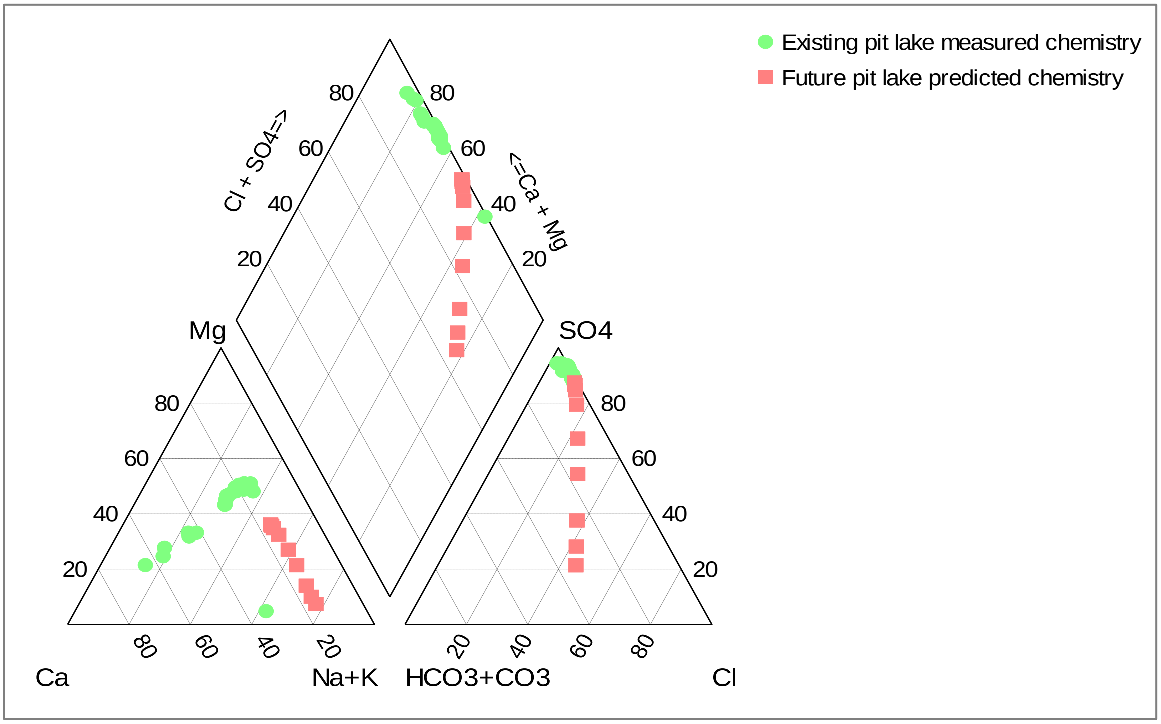


Figure 6-18: Piper Plot of Predicted Major Ion Chemistry for the Reclaimed Pit Model

7 Summary and Conclusions

SRK has undertaken a predictive geochemical modeling exercise to assess potential future pit lake chemistry associated with the Copper Flat Project in New Mexico and to compare this to the chemistry of the existing pit lake. The objective of this model and report is to provide the analysis that demonstrates that future pit lake water quality results in a hydrologic balance similar to that of pre-mining conditions upon implementation of the reclamation actions proposed by NMCC in its MORP and Reclamation Plan, including rapid fill of the open pit after closure of the mine.

Geochemical predictions were developed for three scenarios, including: (i) a calibration model for the existing pit lake; (ii) a natural fill model for the future unreclaimed pit; and (iii) a rapid fill model for the future reclaimed pit. Rapid fill has been proposed as the water component of NMCC's reclamation strategy for the future pit lake. It will include filling the pit with 2,200 acre-feet of good quality water from the production water supply wells during the first six months of groundwater recovery and pit infilling.

7.1 Model Calibration

The results of the existing pit lake model show good calibration for pH, bicarbonate, calcium, aluminum, cobalt, chromium, copper, mercury, manganese, sodium, nickel, selenium, uranium, zinc and TDS, demonstrating these constituents can be predicted with a good degree of accuracy for the future pit lake. The baseline water quality data utilized in the calibration model are data for existing water quality chemistry in the pit lake between 2010 and 2013, as discussed in Section 4. Model calibration was performed as part of the preliminary pit lake model results presented in the December 2014 report (SRK, 2014a). This is a subset of the entire baseline data generated between 1998 and July 2017. The full data set was utilized in comparing existing water quality chemistry to projected future water quality of the pit lake, as discussed in Sections 5 and 6.

7.2 Unreclaimed Fill Scenario

For the unreclaimed fill scenario, allowing the pit to fill naturally will result in the pit walls and benches being exposed over a much longer period of time, i.e., approximately 150 years, before the pit lake reaches hydrologic equilibrium. In the unreclaimed fill scenario, the proposed future Copper Flat open pit is expected to be seasonally stratified but otherwise well-mixed, oxygenated and not acidic. Waters are predicted to be moderately alkaline (pH 7.9 – 8.2), primarily due to the buffering capacity of the inflowing groundwater. During the early stages of pit infilling (i.e., the first six months post-closure), removal/flushing of soluble salts from the pit walls is likely to result in a flush in boron, lead, mercury, manganese, molybdenum, nickel, selenium, vanadium, zinc and sulfate in the early pit lake. The effects of this initial flush will be dissipated by inflowing groundwater and precipitation, and pit lake chemistry will then evolve over time, with some parameters increasing in concentration as a result of evapoconcentration effects. This is similar to the trends observed in the existing pit lake where elemental concentrations have increased since the start of pit infilling. However, the mineralized material to be mined and the future pit walls will be prepared using pre-split drilling and smooth wall blasting. This will reduce the depth of fracturing and oxidation and consequently reduce solute loading to the future pit lake.

A comparison of predicted pit lake water chemistry for the unreclaimed fill scenario to chemistry measured in the existing pit lake between 1989 and 2017 demonstrates that the predicted concentrations of the majority of constituents are comparable to existing concentrations.

7.3 Reclaimed Fill Scenario

Rapidly filling the pit with water from the production supply wells during the first six months post-closure will result in a better initial water quality within the pit lake due to the good quality of the water that will be used. The long-term result is that the effects of evapoconcentration will not be as pronounced as the pit lake reaches hydrogeologic equilibrium. Predicted concentrations of many major ions and trace elements remain lower in the reclaimed fill scenario. This is the case for constituents such as boron, sulfate and chloride, which are strongly influenced by evaporation effects and are predicted to be much lower in concentration for the reclaimed pit rapid fill scenario compared to the unreclaimed pit natural fill scenario. In addition, the rapid fill will also quickly submerge walls and benches to limit the exposure of sulfide minerals to oxygen, which will reduce trace element release into the pit lake. By contrast, the unreclaimed fill scenario allows the pit to fill naturally and results in the pit walls and benches being exposed over a much longer period of time, i.e., approximately 150 years, before the pit lake reaches hydrologic equilibrium. As is the case in the unreclaimed fill scenario, the mineralized material to be mined and the future pit walls will be prepared using pre-split drilling and smooth wall blasting, which will also reduce the depth of fracturing and oxidation and consequently reduce solute loading to the pit lake.

A comparison of predicted pit lake chemistry for the reclaimed pit rapid fill scenario to chemistry measured in the existing pit lake between 1989 and 2017 demonstrates that concentrations of the majority of predicted constituent concentrations are either comparable to or less than concentrations in the existing pit lake.

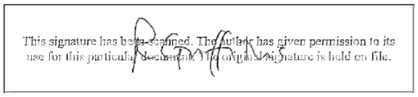
7.4 Conclusions

Standards applicable to the post-mining Copper Flat pit lake are contained in the New Mexico Mining and Minerals Division (MMD) regulations administered under the Mining Act. Specifically, the performance and reclamation standards require that reclamation must result in a hydrologic balance similar to pre-mining conditions. With respect to water quality in the pit lake, post mining water quality must be similar to baseline pre-mining water quality in the pit lake. The predictive geochemical model results presented herein have been compared to pre-mining baseline water quality of the existing pit lake, which has been in existence for more than 35 years.

Based on the model results presented herein, the changes to the hydrologic balance of the future pit water body that will form post-mining will be nil or minimal, and the water quality will be very similar to that of the existing pit lake. As noted above, the existing pit lake at Copper Flat is an artificial water body created as a result of mineral extraction that has little or limited ability to sustain aquatic life (Aquatic Consultants, Inc. 2014). The post-mining water body is anticipated to be similar to the existing pit lake and is not expected to be conductive to providing aquatic habitat or supporting fish life.

This report demonstrates that implementation of either the unreclaimed fill or reclaimed fill scenario will provide compliance with water quality requirements discussed in Section 3.10 above. However, the reclaimed fill scenario leads to improved water quality during the modeled period. In addition, the overall performance and reclamation standards and requirements of the Mining Act regulations set forth additional standards, beyond those which are the subject of analysis in this report. In this regard, NMCC has committed to the reclamation plan as described in the MORP, including the pit reclamation measures outlined in Section 3.1.8 of this report.

Prepared by



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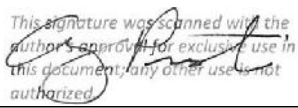

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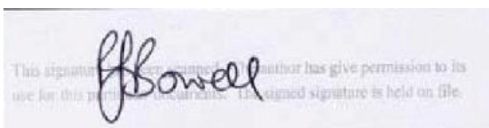

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Appendix A – Time-Series Plots of Existing Pit Lake Chemistry

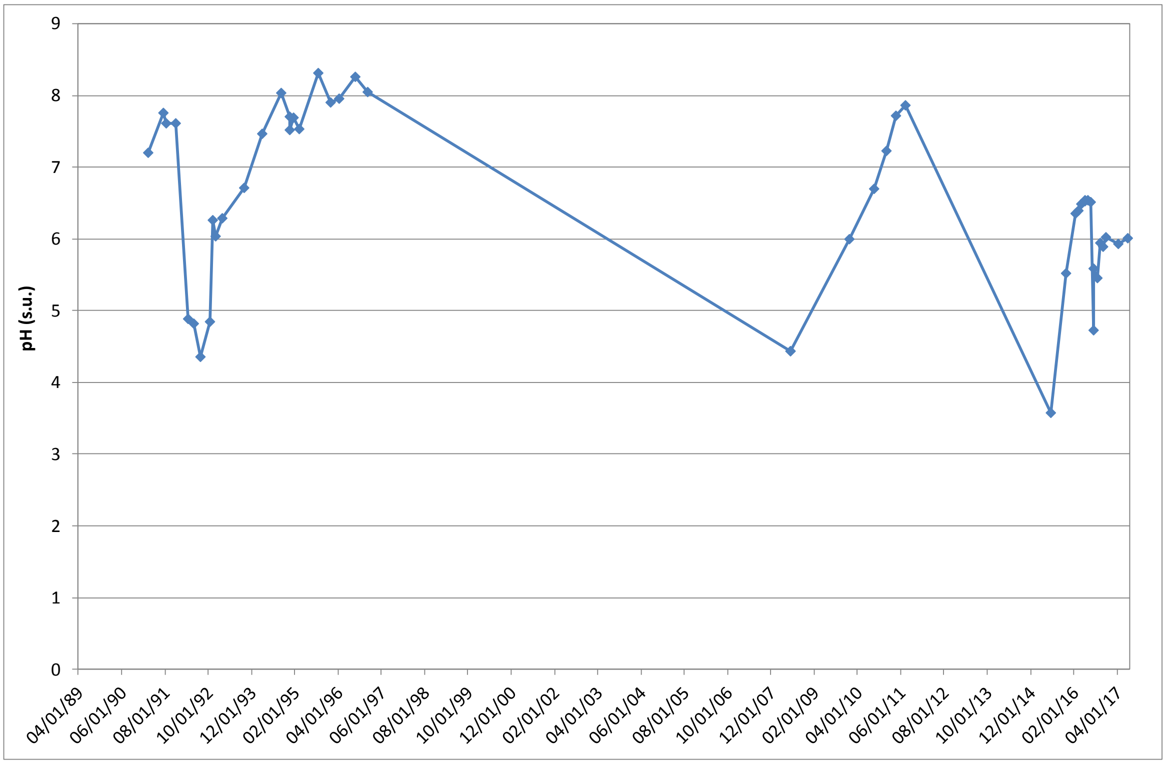

Figure A-1: pH Trends in Existing Pit Lake

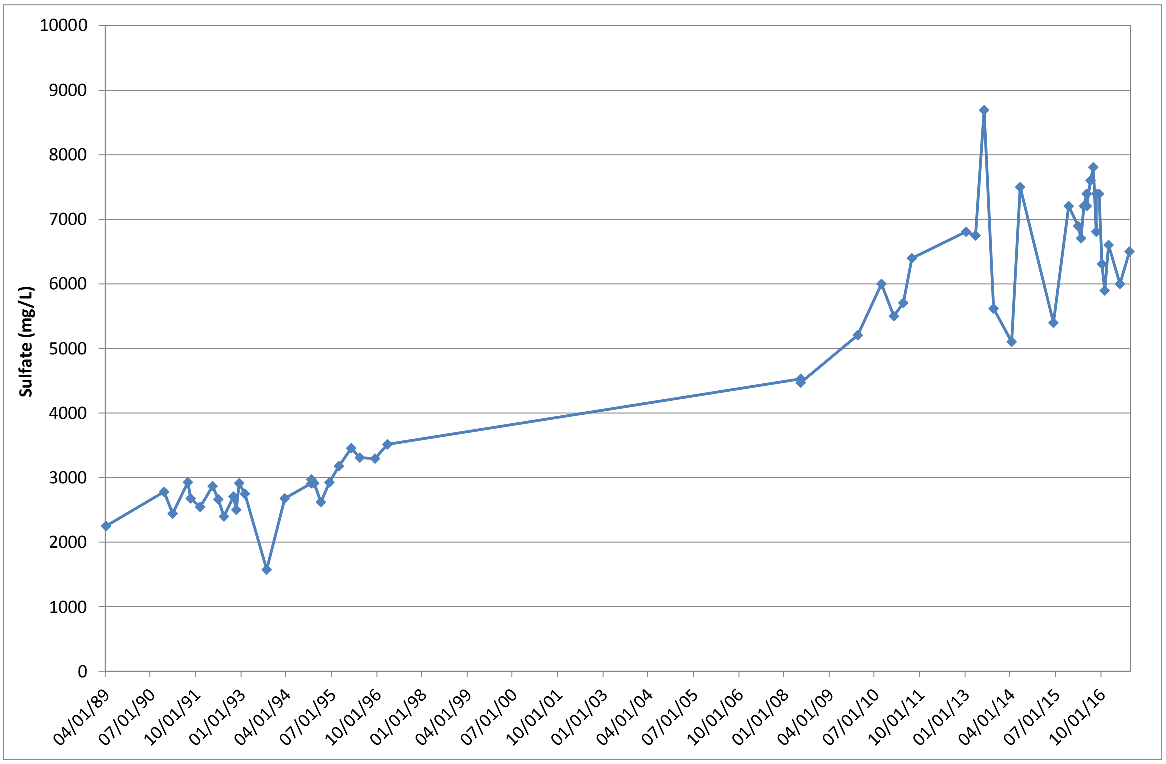

Figure A-2: Sulfate Trends in Existing Pit Lake

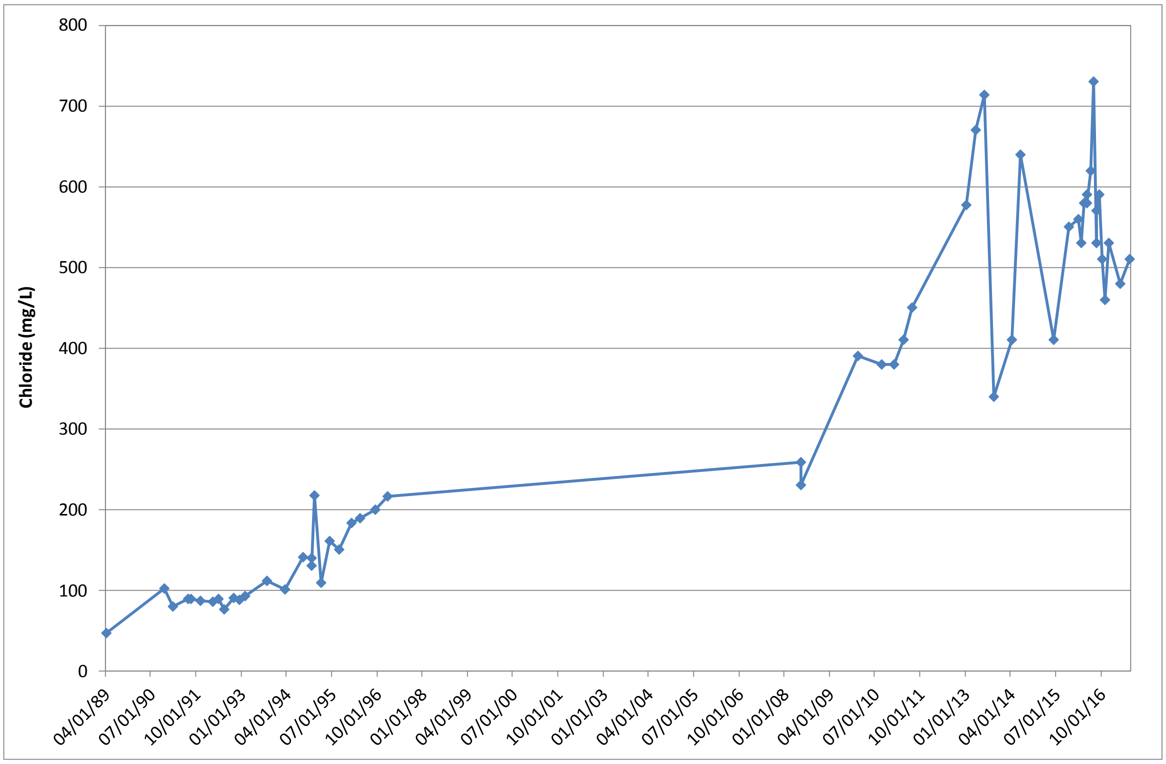

Figure A-3: Chloride Trends in Existing Pit Lake

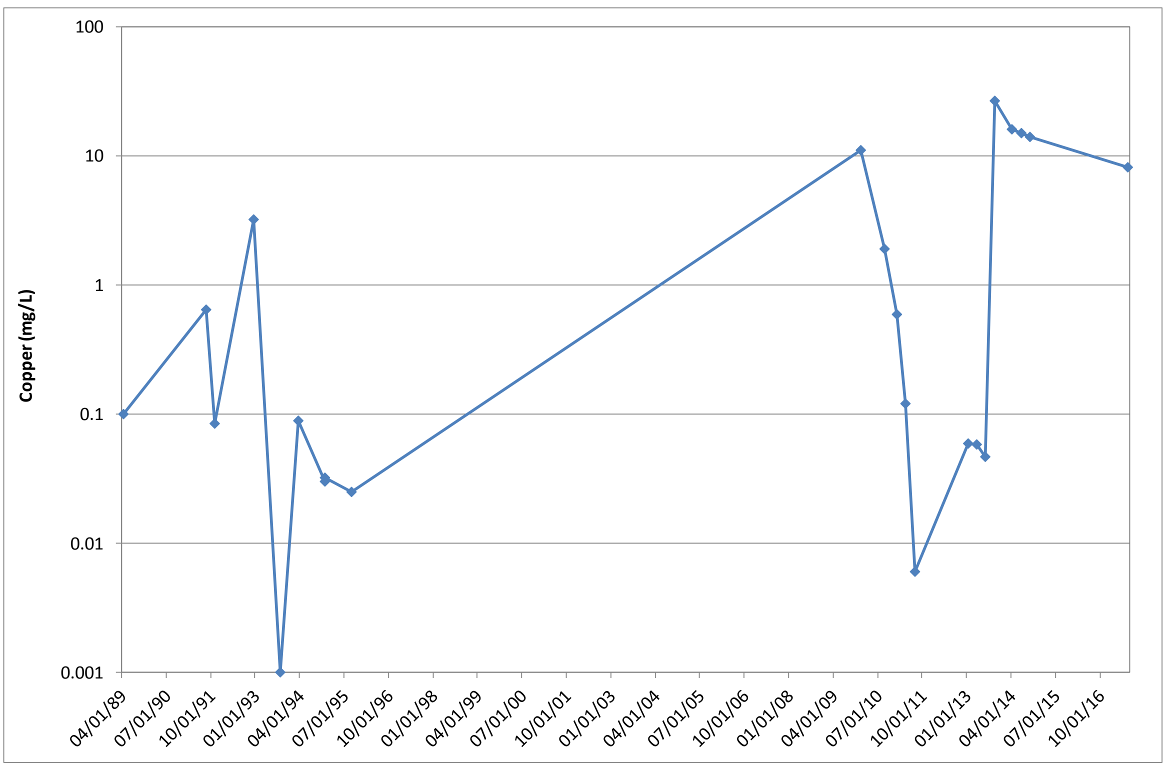

Figure A-4: Copper Trends in Existing Pit Lake

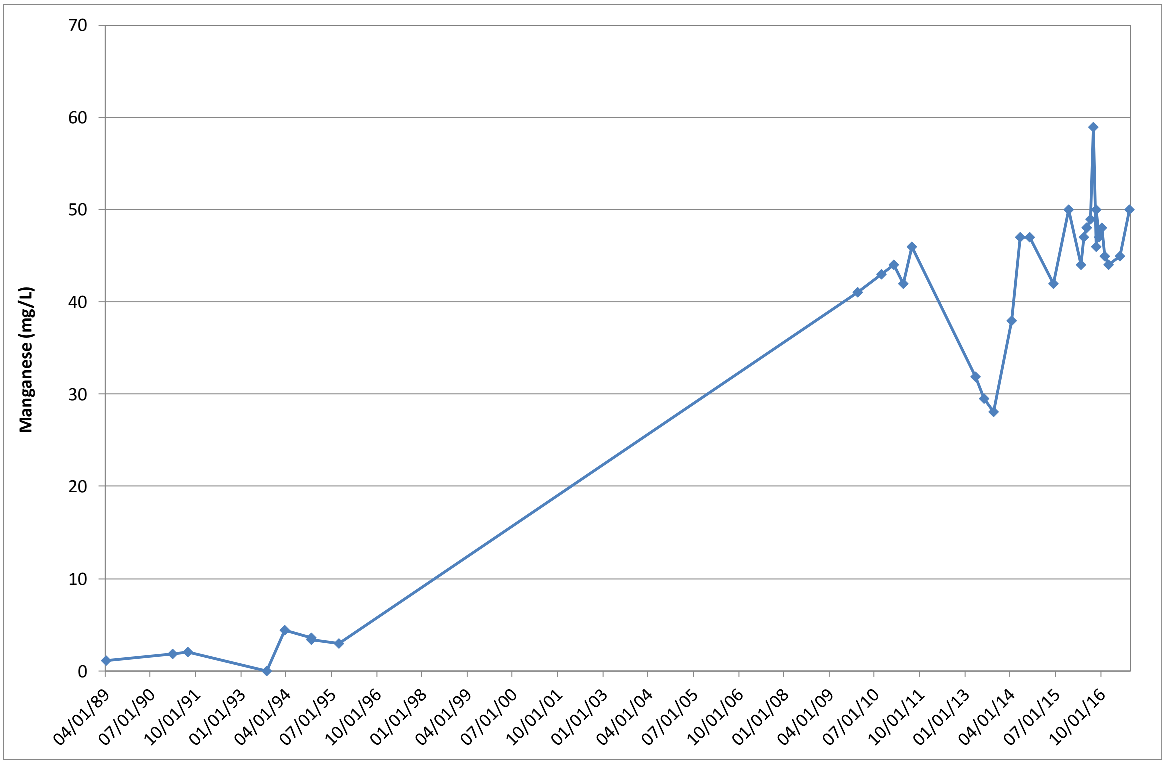

Figure A-5: Manganese Trends in Existing Pit Lake

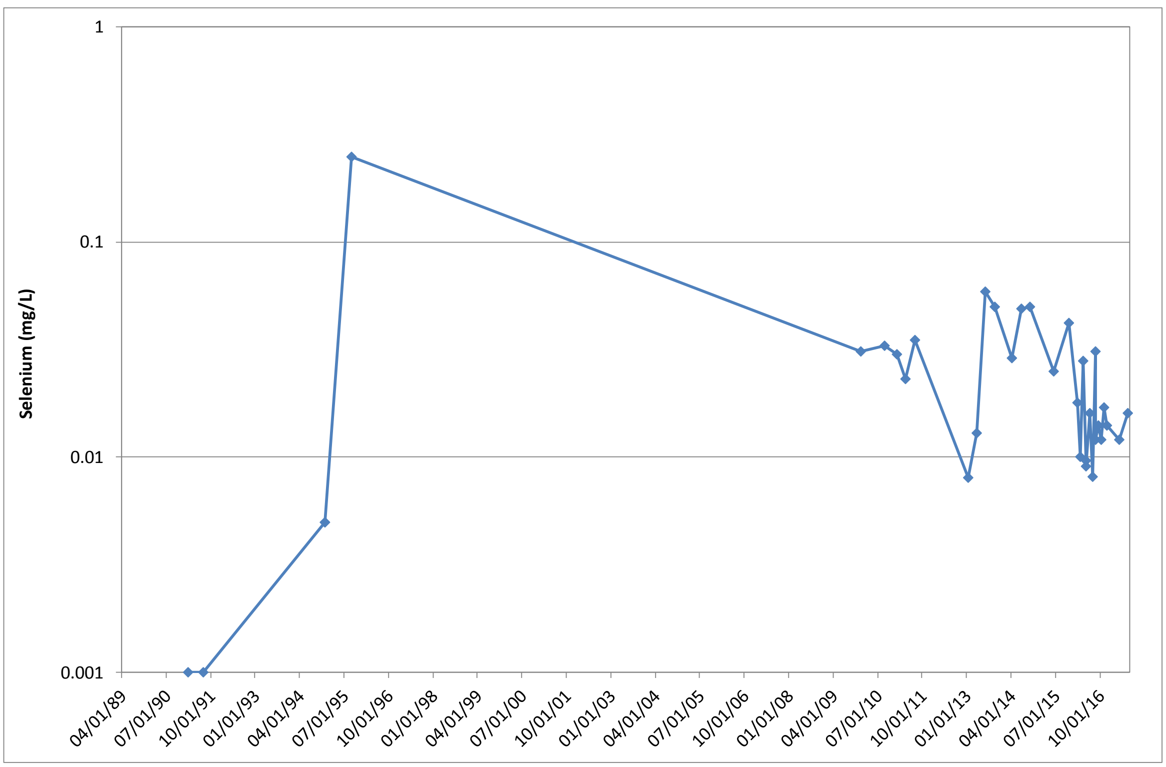

Figure A-6: Selenium Trends in Existing Pit Lake

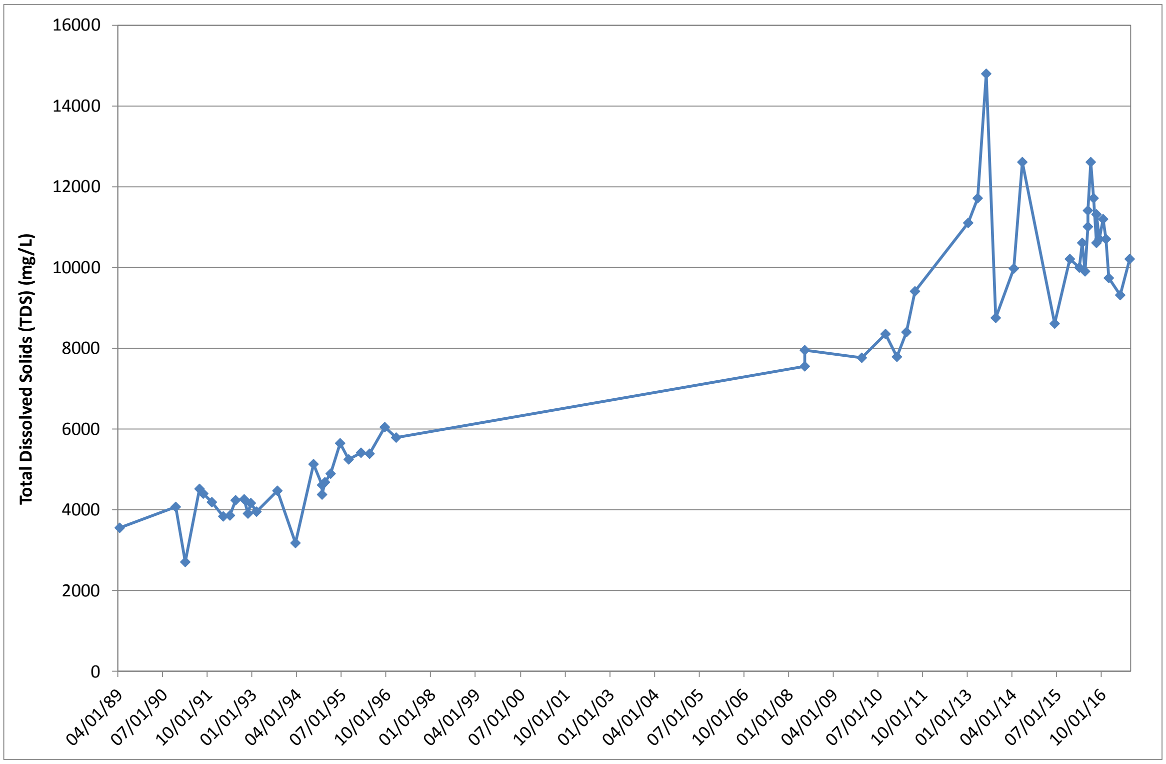

Figure A-7: TDS Trends in Existing Pit Lake

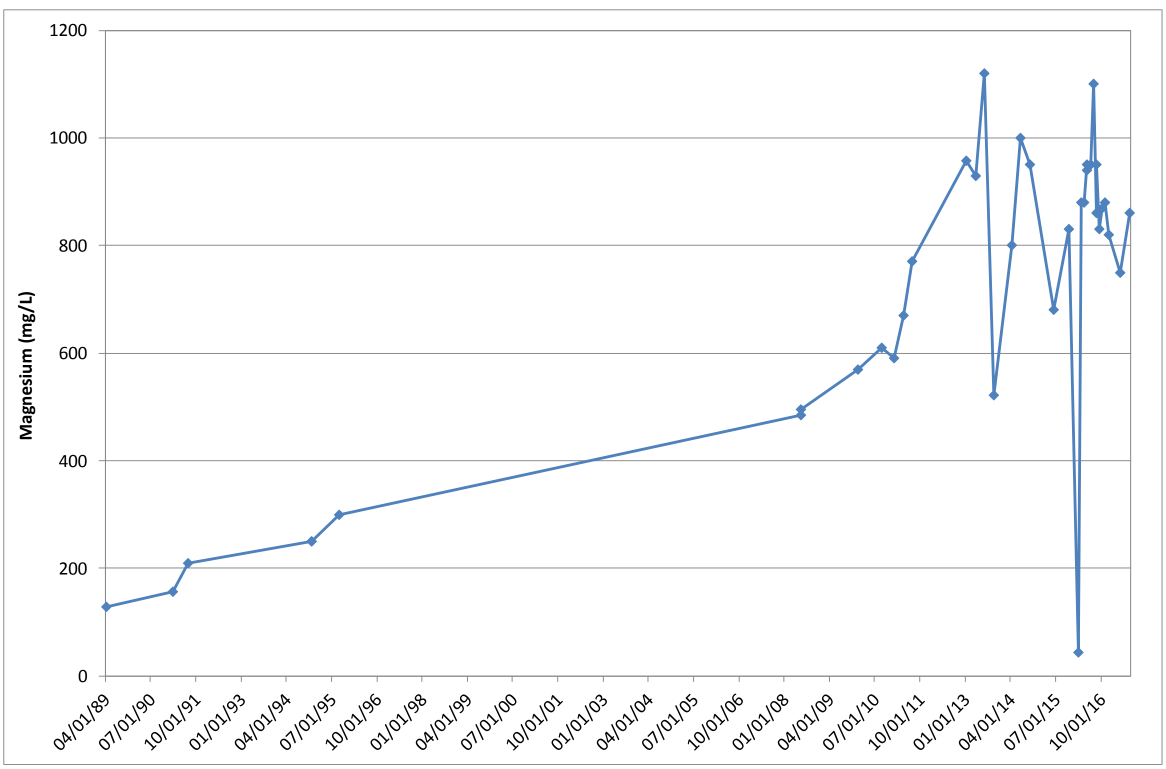

Figure A-8: Magnesium Trends in Existing Pit Lake

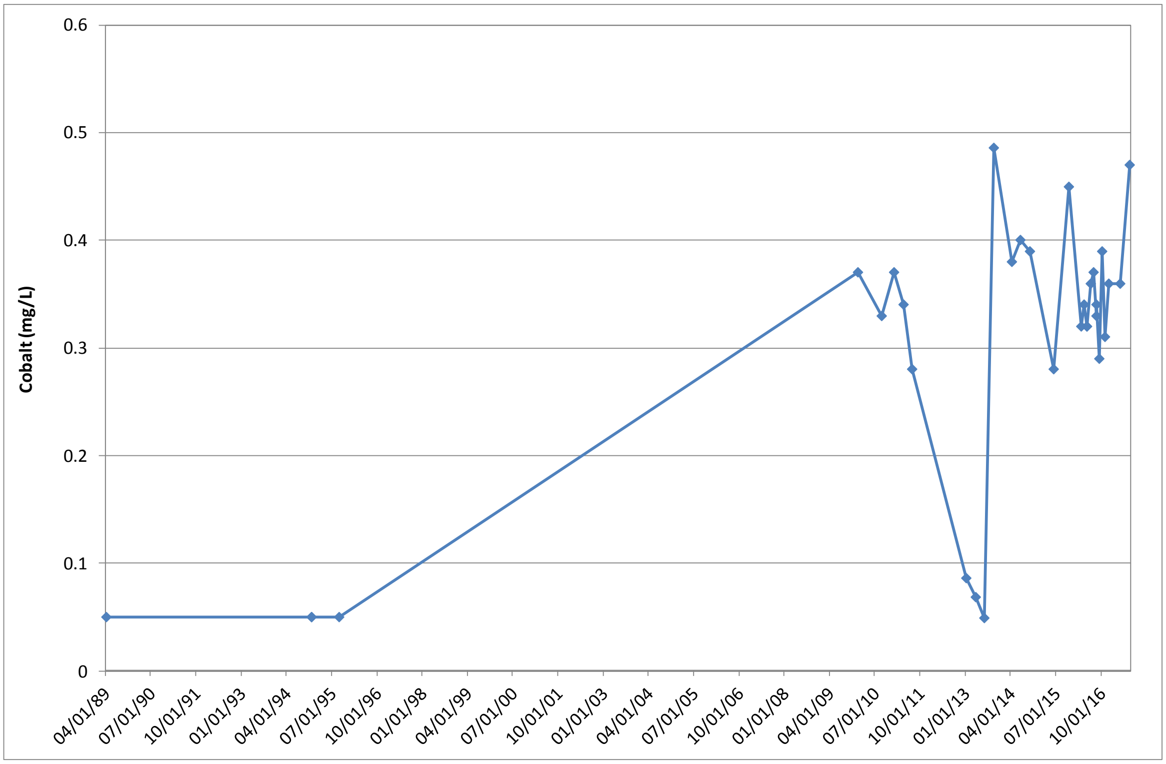

Figure A-9: Cobalt Trends in Existing Pit Lake

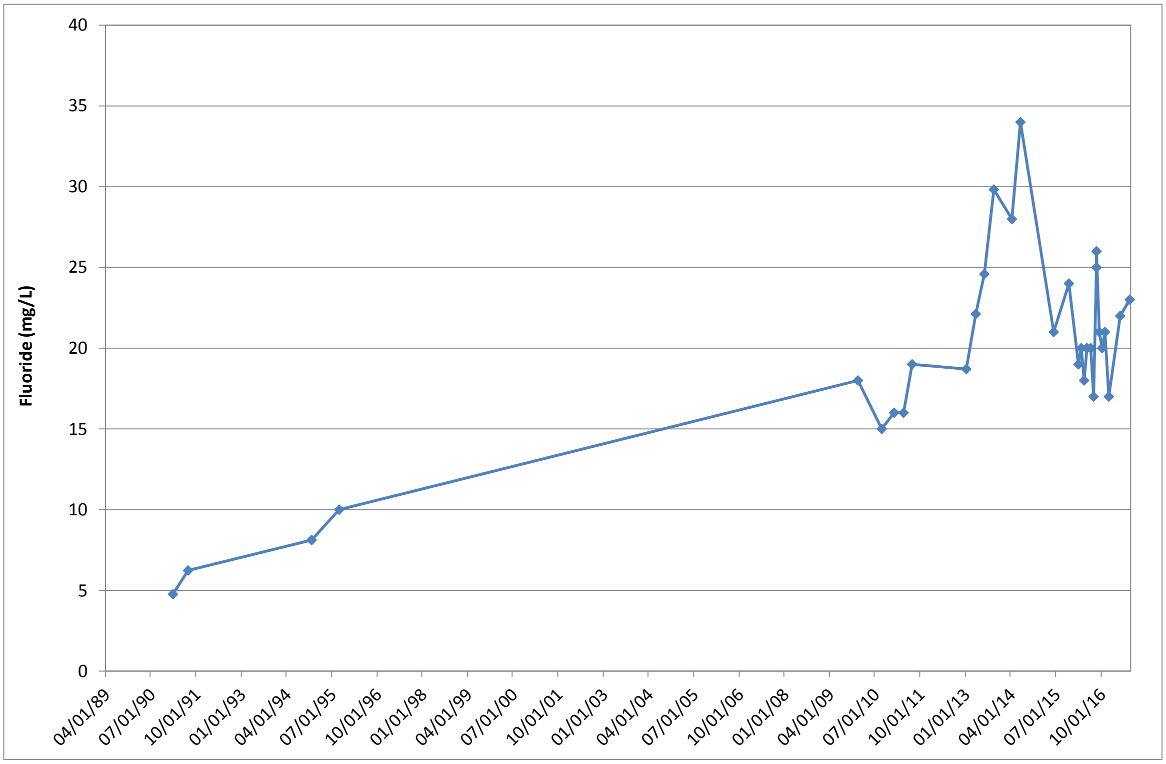

Figure A-10: Fluoride Trends in Existing Pit Lake

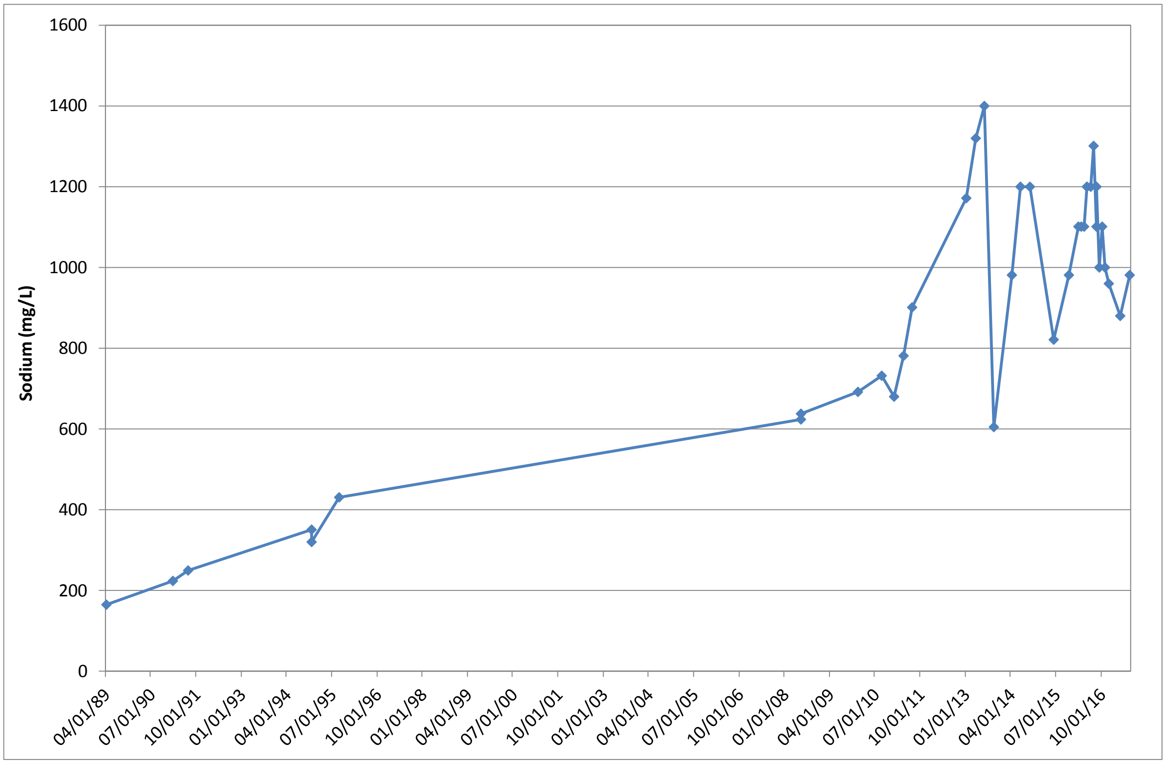

Figure A-11: Sodium Trends in Existing Pit Lake

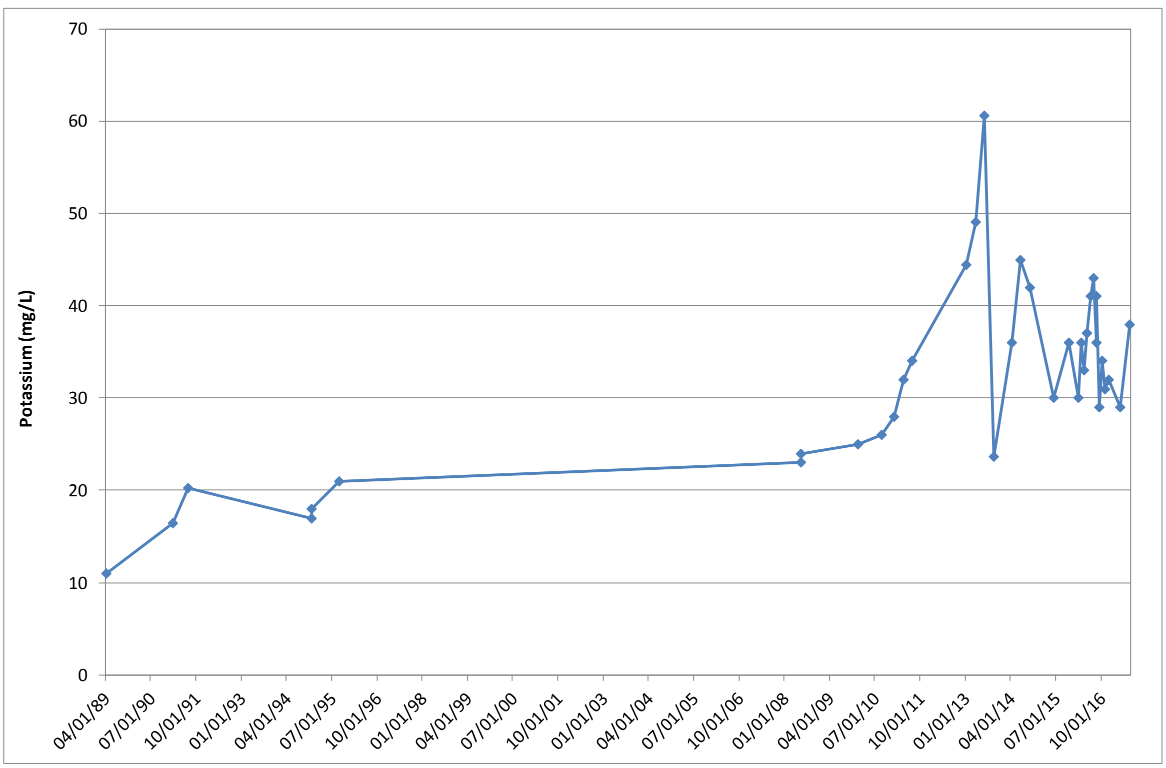

Figure A-12: Potassium Trends in Existing Pit Lake

Appendix B – Humidity Cell Elemental Release Rate Graphs

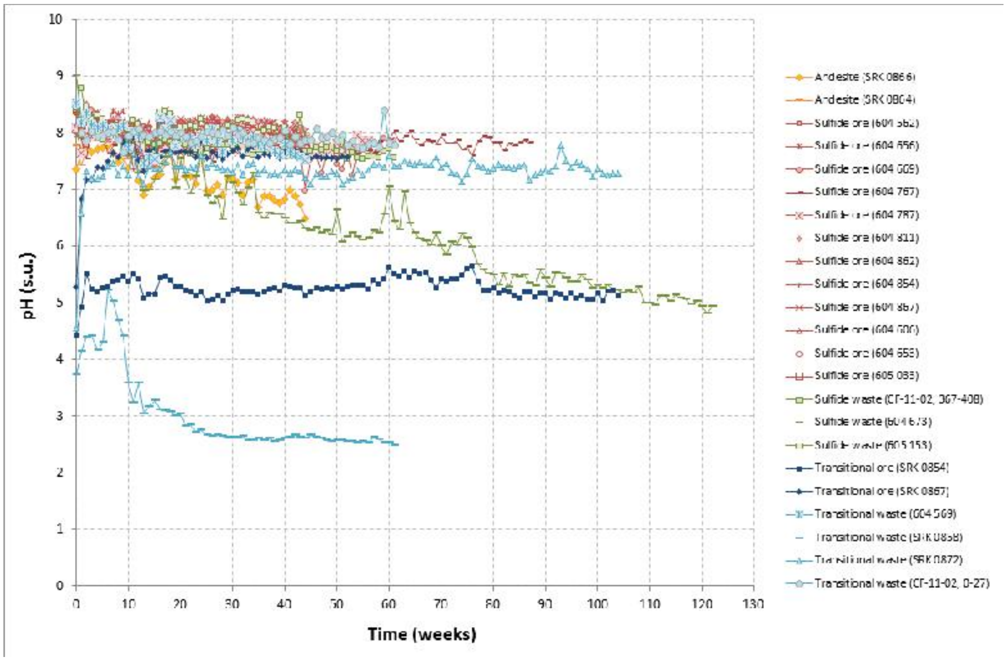

Figure B-1: Humidity Cell Effluent pH

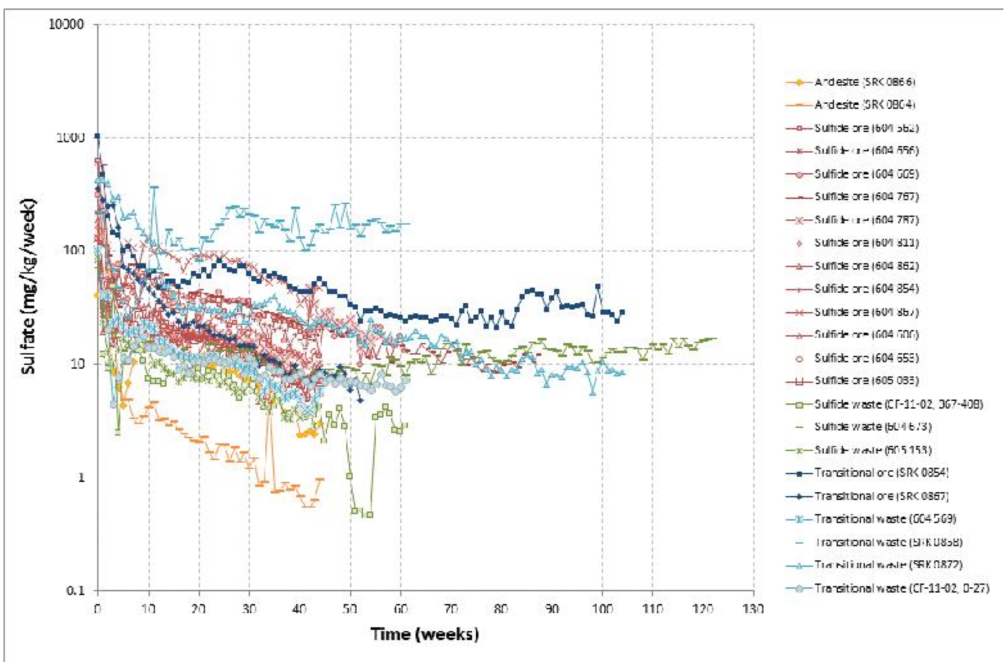

Figure B-2: Humidity Cell Effluent Sulfate

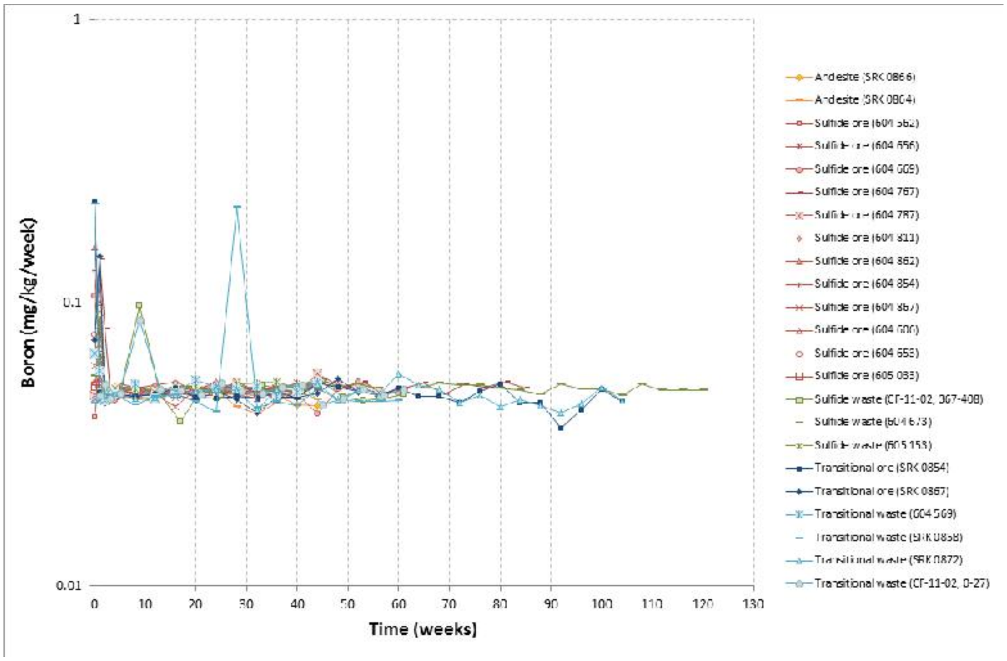

Figure B-3: Humidity Cell Effluent Boron

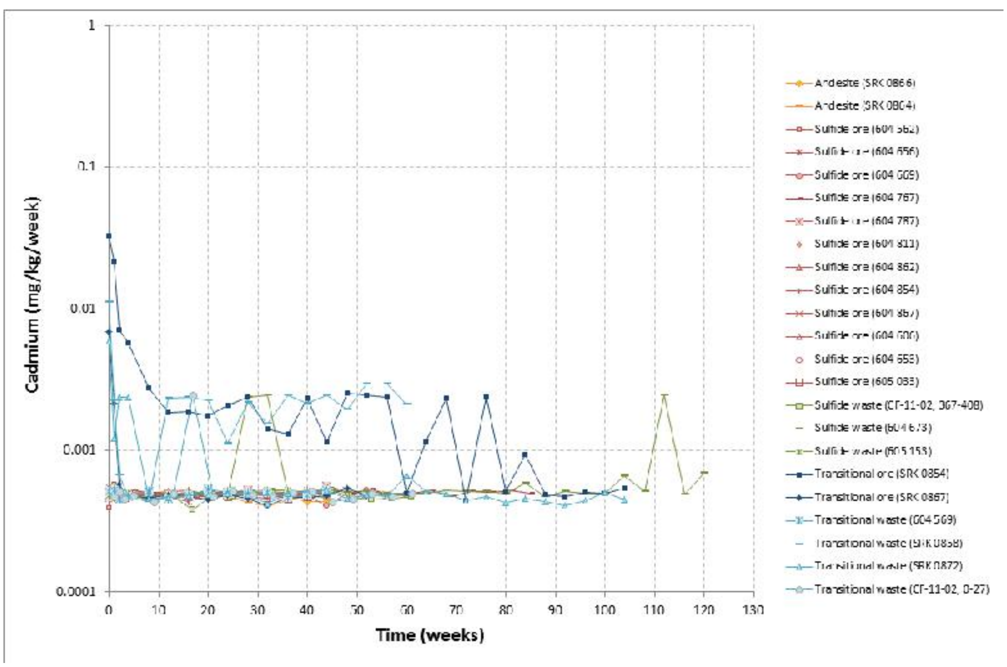

Figure B-4: Humidity Cell Effluent Cadmium

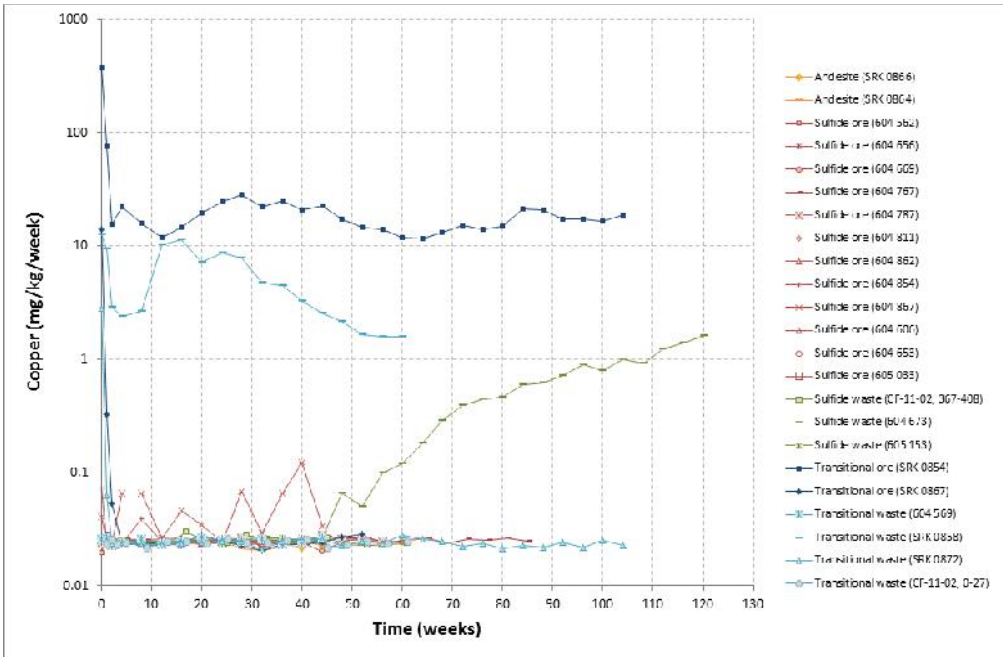

Figure B-5: Humidity Cell Effluent Copper

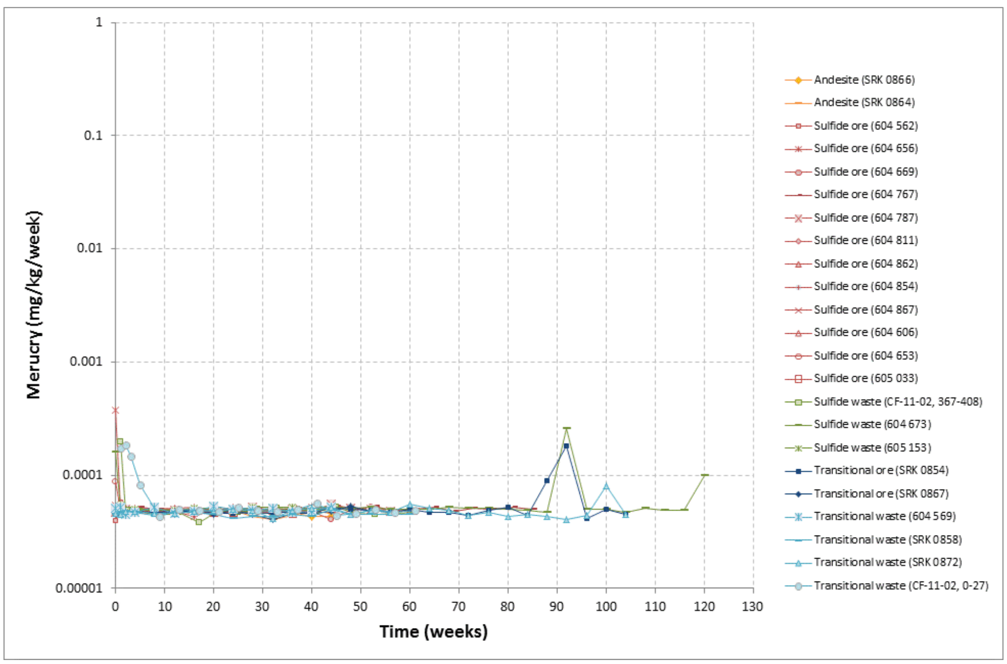

Figure B-6: Humidity Cell Effluent Mercury

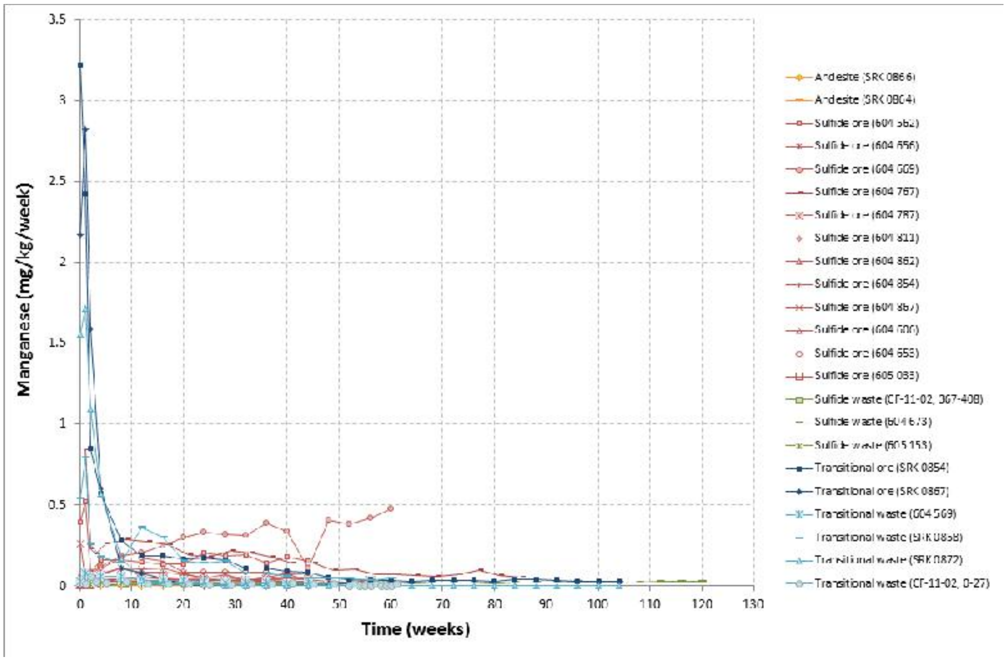

Figure B-7: Humidity Cell Effluent Manganese

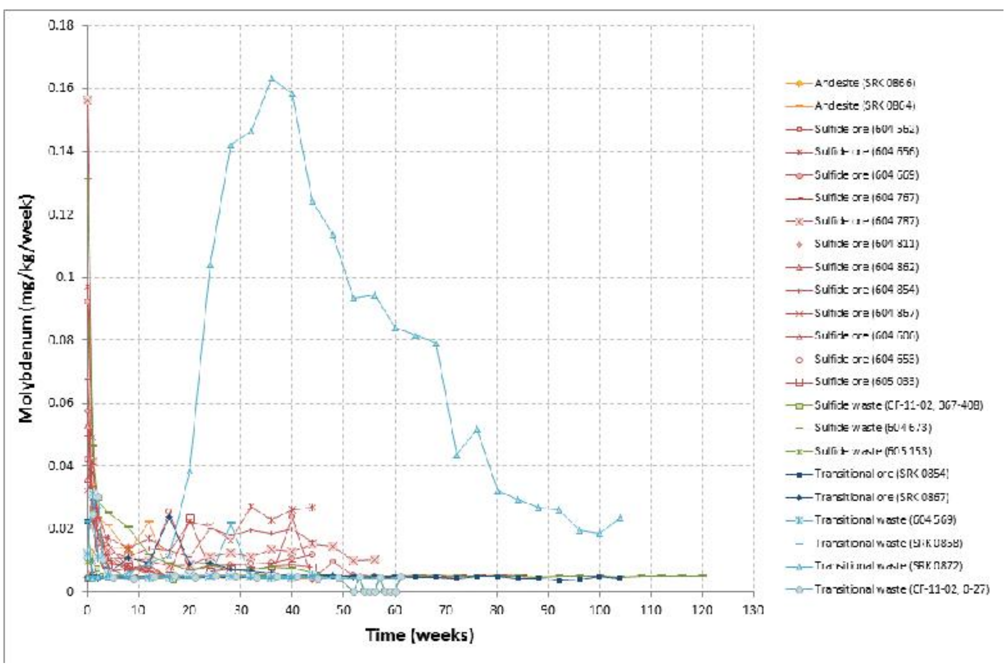

Figure B-8: Humidity Cell Effluent Molybdenum

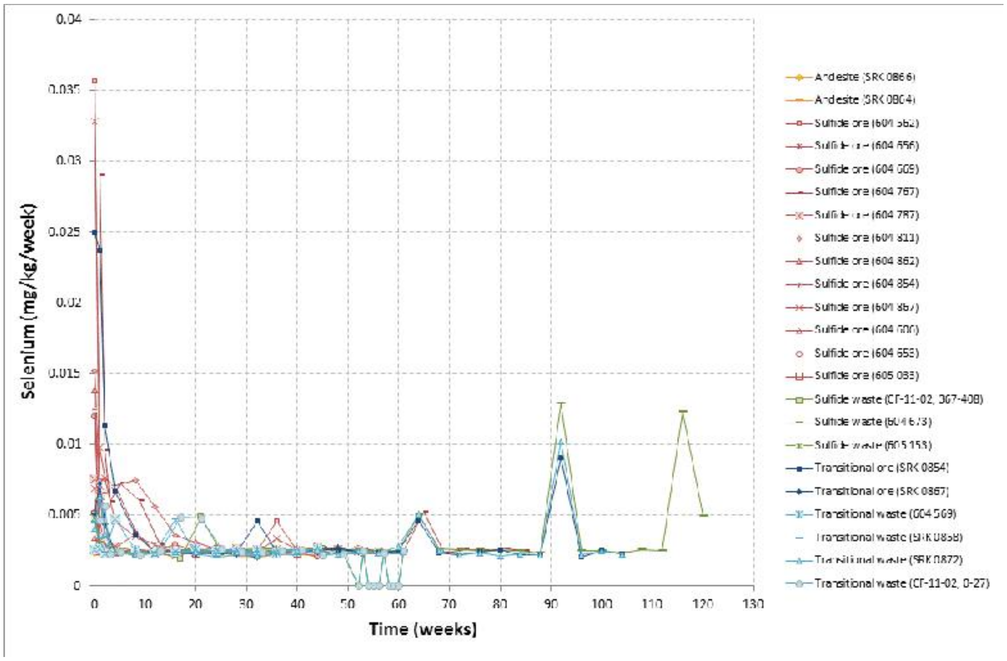

Figure B-9: Humidity Cell Effluent Selenium

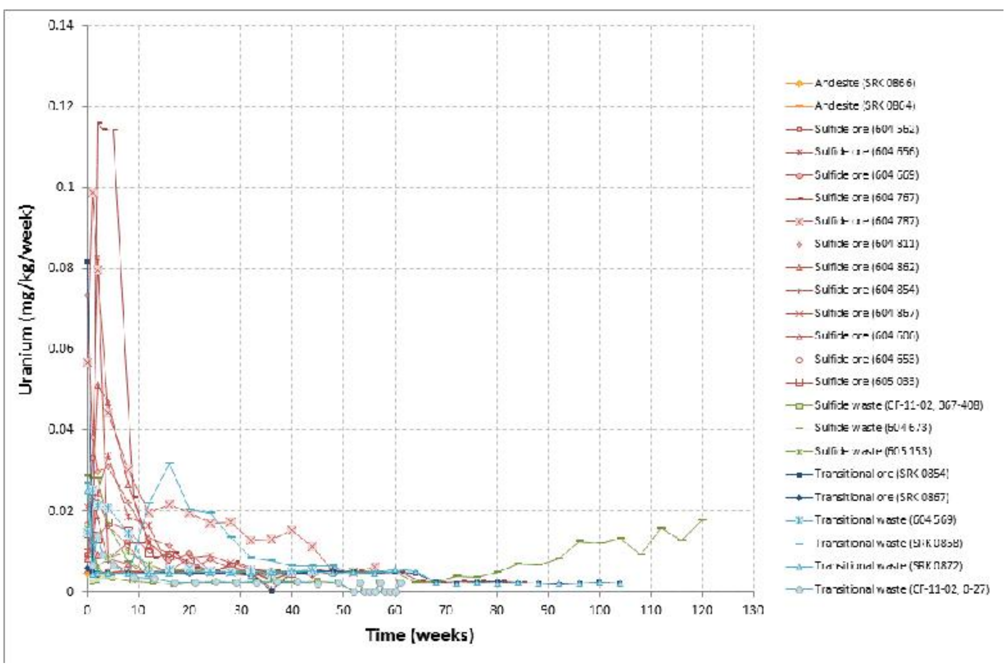

Figure B-10: Humidity Cell Effluent Uranium

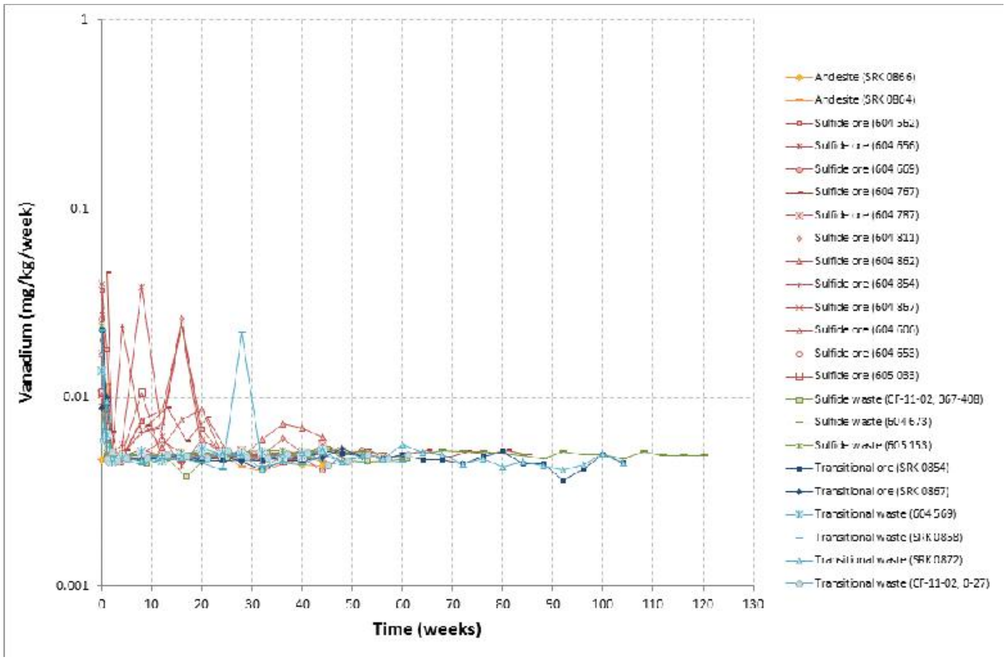

Figure B-11: Humidity Cell Effluent Vanadium

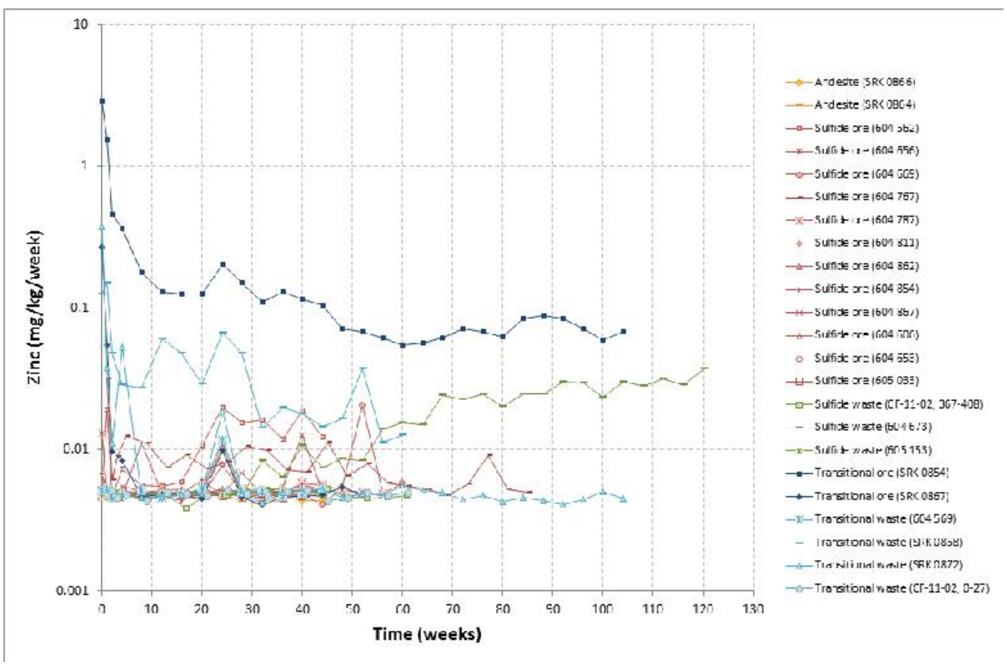

Figure B-12: Humidity Cell Effluent Zinc

Appendix C – JSAI Evaporation Rate Technical Memorandum

JOHN SHOMAKER & ASSOCIATES, INC.
WATER-RESOURCE AND ENVIRONMENTAL CONSULTANTS
2611 BROADBENT PARKWAY NE
ALBUQUERQUE, NM 87107
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TECHNICAL MEMORANDUM

To: Steve Raugust, JS Raugust Consulting
Jeff Smith, New Mexico Copper Corporation

From: Steven T. Finch, Jr., Principal Hydrogeologist-Geochemist, JSAI
Annie McCoy, Senior Hydrogeologist, JSAI

Date: September 1, 2015

Subject: **Estimated evaporation rate for future Copper Flat open pit**

As discussed in the Copper Flat Project groundwater-flow model report (JSAI, 2014), potential evapotranspiration (ET), or the maximum evaporation and plant transpiration that can occur given full availability of water, is a function of geographical and climatic conditions, and is commonly estimated using the Penman-Monteith equations (Monteith, 1965). These relate maximum ET (ET_0) to meteorological parameters including temperature, relative humidity and wind speed, and to geographical parameters (altitude, latitude, and time of year). Annual ET_0 computed from results at Hillsboro meteorological station is about 60 in./yr, which compares well to previous estimates (SRK, 1997) of 65 in./yr of potential evaporation, and 64.6 in./yr estimated as 74 percent (an accepted conversion factor for the region (NOAA, 1982) between pan evaporation and evaporation from a normal open water surface) of Copper Flat pan evaporation. Actual evaporation or ET is less, depending on sun and wind exposure, ground conditions, and availability of water.

If ET_0 is estimated to be 60 to 65 in./yr at the rim of the ultimate Copper Flat open pit (where the prior land surface intersects the open pit), ET_0 will be somewhat less at the bottom of the ultimate open pit due to the fact that the bottom of the pit will have less exposure to sun and wind compared to the rim.

To estimate ET_0 for the bottom of the ultimate Copper Flat open pit, the duration of sunlight at analogous established open pits was evaluated using the “sunlight across the landscape” tool in Google Earth, for the date April 29, 2015. April is a month with close-to-average duration of sunlight (as are the months of March, September, and October; Dunne and Leopold, 1978). Table 1 presents a summary of hours of sunlight for analogous pits ranging in depth from 300 to 1,400 ft.

Table 1. Summary of hours of sunlight for selected open pits in New Mexico and California, April 29, 2015

pit	rim elevation, ft amsl	bottom elevation, ft amsl	sunlight at rim, hours	sunlight at bottom, hours	bottom / rim sunlight ratio
Cobre pit, SW NM	6,800	6,300	6:30 to 19:30 = 13 hours	9:30 to 18:30 = 9 hours	0.69
Santa Rita pit, SW NM	6,600	5,200	7:00 to 19:50 = 12.5 hours	9:30 to 16:30 = 7 hours	0.56
Tyrone main pit, SW NM	6,200	4,900	6:30 to 19:30 = 13 hours	8:30 to 17:30 = 9 hours	0.69
CHMRP pit, N. NM	7,100	6,800	7:30 to 19:30 = 12 hours	8:45 to 16:00 = 7.25 hours	0.60
Colosseum pit, S. CA	5,800	5,400	8:00 to 19:00 = 11 hours	9:00 to 16:00 = 7 hours	0.64
average			**12.3 hours**	**7.85 hours**	**0.64**

CHMRP – Cunningham Hill Mine Reclamation Project
ft amsl – feet above mean sea level
SW – southwest
N. – north
S. – south

Pan evaporation data were collected at the Cunningham Hill Mine Reclamation Project (CHMRP), near the rim of the open pit in June 2000, and at the bottom of the pit between April and July 2011 (JSAI, 2011). Pan evaporation was higher at the rim, despite higher summer precipitation in 2001 compared to 2011. The pan evaporation data were interpreted to represent an average evaporation rate of about 60 in./yr at the rim, and 54 in./yr at the bottom.

CHMRP evaporation data were used for an upper bound of 90 percent, in terms of percentage of evaporation at the rim that represents actual evaporation at the bottom of the pit, and the average sunlight ratio presented in Table 1 was used for a lower bound of 64 percent. For the ultimate Copper Flat open pit, actual evaporation at the bottom of the pit was assumed to be 50 in./yr, which is 77 to 83 percent of ET_0 values 60 to 65 in./yr estimated at the rim.

The estimate of 50 in./yr evaporation for the ultimate Copper Flat open pit is also in close agreement with the estimate of open water evaporation of 53 in./yr for the North Mine Area (Santa Rita pit) at Chino Mine in southwestern New Mexico (Golder, 2005).

STF:AMM

Enc: References

References

Dunne, T., and Leopold, L.B., 1978, Water in environmental planning: W.H. Freeman and Company, New York, 818 p.

[Golder] Golder Associates, Inc., 2005, Report on North Mine Area groundwater flow model: Chino Mine, New Mexico: consultant's report prepared for Chino Mines Company, January 13, 2005, 64 p. plus tables, figures, and appendices.

[JSAI] John Shomaker & Associates, Inc., 2011, Update and recalibration of groundwater-flow and solute-transport model for predicting potential effects from the Cunningham Hill Mine Open Pit, Santa Fe County, New Mexico: consultant's report prepared for LAC Minerals (USA) LLC, June 27, 2011, 29 p. plus figures and appendices.

[JSAI] John Shomaker & Associates, Inc., 2014, Model of groundwater flow in the Animas Uplift and Palomas Basin, Copper Flat Project, Sierra County, New Mexico: consultant's report prepared for New Mexico Copper Corporation, August 15, 2014, 89 p. plus figures and appendices.

Monteith, J.L., 1965, Evaporation and environment: Symp. Soc. Exp. Biol. 19, 205-224 obtained from Forest Hydrology and Watershed Management - Hydrologie Forestiere et Amenagement des Bassins Hydrologiques (Proceedings of the Vancouver Symposium, August 1987, Actes du Co11oque de Vancouver, Aout 1987): IAHS-AISH Publication No. 167, 1987, pp. 319–327.

[NOAA] National Oceanic and Atmospheric Administration, 1982, Evaporation atlas for the contiguous 48 United States: NOAA Technical Report NWS 33.

[SRK] Steffen Robertson and Kirsten, Inc., 1997, Copper Flat Mine compilation of pit lake studies: consultant's report prepared by Steffen Robertson and Kirsten, Inc. prepared for Alta Gold Co., December 1997.

Appendix D – JSAI Groundwater Chemistry Technical Memorandum

TECHNICAL MEMORANDUM

To: Jeff Smith, New Mexico Copper Corporation jsmith@themacresourcesgroup.com

From: Steve Finch, Principal Hydrogeologist-Geochemist

Date: September 26, 2017

Subject: Copper Flat open pit area groundwater chemistry data and application to SRK geochemistry model

John Shomaker & Associates, Inc. (JSAI) has evaluated the water quality data regarding Copper Flat open pit influent groundwater chemistry in order to assist SRK with completion of the open pit geochemistry model. All historical data and the Stage 1 abatement data were compiled and reported in JSAI (2014). JSAI used the water quality database, well construction data, and groundwater flow model results to determine the most representative groundwater flow chemistry to the existing and future open pits.

Groundwater quality data for the open pit area come from wells GWQ96-22(A,B), GWQ96-23(A,B), GWQ11-24(A,B), and GWQ11-25(A,B). Monitoring wells GWQ96-22(A,B) and GWQ96(A,B) represents groundwater in the andesite, where monitoring wells GWQ11-24(A) represents groundwater in the quartz monzonite ore body, and GWQ11-24(B) and GWQ11-25(B) represent parts of the quartz monzonite with lower grade of the ore body. Piezometers GWQ11-24(A) and GWQ11-25(A) may have been affected by oxidation of sulfides in fractures during well development, and not representative of groundwater reporting to the open pit. Further analysis of GWQ11-25(A) provided evidence that it represents a localized and isolated fracture system recharged by oxygenated meteoric water that is not connected to the open pit (JSAI, 2014).

Existing Open Pit Influent Groundwater Chemistry

Table 1 is a summary of groundwater chemistry potentially influencing the existing open pit. Individual samples with values less than detection limits were assigned a value of one-half the detection limit. Results for selenium, mercury, and vanadium were evaluated for the lowest possible detection limit. Not all of the constituents analyzed in the baseline data report were analyzed as part of the Stage 1 abatement investigation, so results for GWQ11-24(A,B) and GWQ11-25(A,B) are limited by the Stage 1 constituent list (see Table 1).

Future Post-Mining Open Pit Influent Groundwater Chemistry

Based on the mining plan, a good portion of the quartz monzonite is removed by mining and the remaining quartz monzonite is dewatered. The groundwater flow model simulates localized dewatering rates and volumes (JSAI, 2014a). Groundwater representative of the andesite rocks reports to the future pit, and all of the groundwater in the quartz monzonite surrounding the future pit is dewatered during mining and replaced with groundwater from the surrounding andesite (JSAI, 2014a). The calculated volume of groundwater in the quartz monzonite is removed and flushed three times by inflow of groundwater representative of andesite. A volume of 500 acre feet is calculated to be dewatered during mining of the proposed open pit of which 165 ac-ft represents groundwater stored in quartz monzonite.

A summary of groundwater chemistry potentially influencing the future open pit during post mining conditions is listed in Table 1. Groundwater chemistry representative of the future pit was determined by using data representative of the andesite rocks (column A). These “Column A” sample results represent groundwater from the andesite rocks after dewatering and mining to create the future pit.

Attachments

Table 1. Summary of groundwater chemistry for Copper Flat open pit area

References

JSAI, 2014, Results of first year of Stage 1 investigation at the Copper Flat Mine Site, Hillsboro, New Mexico: Consultant’s report prepared by Steven T. Finch of John Shomaker & Associates, Inc. for New Mexico Copper Corporation.

[JSAI] John Shomaker & Associates, Inc., 2014a, Model of groundwater flow in the Animas Uplift and Palomas Basin, Copper Flat Project, Sierra County, New Mexico: consultant’s report prepared for New Mexico Copper Corporation, August 15, 2014, 89 p. plus figures and appendices.

Table 1. Summary of Copper Flat open pit influent groundwater chemistry

		Column:	A	B	C	AVERAGE A-C	
parameter	parameter name	unit	Groundwater chemistry (average of samples collected from wells GWQ96-22(A,B), GWQ96-23(A,B) between 1996 and 2013)	GWQ11-24B 2013 average	GWQ11-25B 2013 average	Blended Groundwater chemistry representative of inflow to current open pit[b]	Groundwater chemistry representative of inflow to future open pit
pH	pH	s.u	7.85	6.44	6.45	6.91	7.85
HCO3	bicarbonate	mg/L	408	191	350	316.3	408
Ag	silver	mg/L	0.009	nm	nm	0.009	0.009
Al	aluminum	mg/L	0.029	0.013	0.308	0.12	0.029
As	arsenic	mg/L	0.0023	nm	nm	0.0023	0.0023
B	boron	mg/L	0.136	nm	nm	0.136	0.136
Ba	barium	mg/L	0.089	nm	nm	0.089	0.089
Ca	calcium	mg/L	85.8	442	481	336	85.8
Cd	cadmium	mg/L	0.0008	0.001	0.001	0.001	0.0008
Co	cobalt	mg/L	0.008	0.017	0.004	0.010	0.008
Cr	chromium	mg/L	0.0066	nm	nm	0.0066	0.0066
Cu	copper	mg/L	0.0061	0.0024	0.0026	0.0	0.0061
F	fluoride	mg/L	2.1	3.80	7.90	4.60	2.1
Fe	iron	mg/L	1.48	nm	nm	1.48	1.48
Hg	mercury[a]	mg/L	0.000002	nm	nm	0.000002	0.000002
K	potassium	mg/L	2.96	6.2	4	4.4	2.96
Mg	magnessium	mg/L	19.3	79	75	57.8	19.3
Mn	manganese	mg/L	0.66	3.5	3.25	2.47	0.66
Mo	molybdenum	mg/L	0.012	nm	nm	0.0119	0.012
Na	sodium	mg/L	119	94	131	114.5	119
Ni	nickel	mg/L	0.0125	nm	nm	0.0125	0.0125
Pb	lead	mg/L	0.0025	nm	nm	0.0025	0.0025
Sb	antimony	mg/L	0.0009	nm	nm	0.0009	0.0009
Se	selenium	mg/L	0.0015	0.0024	0.0028	0.0022	0.0015
U	uranium	mg/L	0.0015	nm	nm	0.0015	0.0015
V	vanadium[a]	mg/L	0.0009	nm	nm	0.0009	0.0009
Zn	zinc	mg/L	0.03	0.18	0.02	0.08	0.03
SO4	sulfate	mg/L	84	1408	1370	954	84
Cl	chloride	mg/L	49	27	27	34	49
TDS	total dissolved solids	mg/L	649	2,440	2,540	1,876	649

notes:

nm = not measured

[a] = results from sample analyzed for low detection limits for SRK geochemical model (samples collected July 10, 2013)

Appendix E – Water Supply Well Chemistry

Production Well Water Quality Samples				
Parameter		PW1 May 1, 2012	PW3 May 3, 2012	Average
pH	pH	8.02	8.03	8.025
HCO_3	Bicarbonate	150	120	135
Al	Aluminum	nd	nd	nd
As	Arsenic	0.0033	0.0074	0.00535
B	Boron	0.065	0.095	0.0800
Ba	Barium	0.011	0.0078	0.0094
Ca	Calcium	36	20	28
Cl	Chloride	32	50	41
Cu	Copper	nd	nd	nd
Cr	Chromium	nd	0.006	0.006
F	Fluoride	1	1.9	1.45
Fe	Iron	0.04	0.065	0.0525
Hg	Mercury	nd	nd	nd
K	Potassium	3.4	3.3	3.35
Mg	Magnesium	3.1	1	2.05
Mn	Manganese	0.0024	0.0026	0.0025
Mo	Molybdenum	nd	nd	nd
Na	Sodium	58	81	69.5
Ni	Nickel	nd	nd	nd
Pb	Lead	nd	nd	nd
SO_4	Sulfate	28	26	27
Se	Selenium	nd	nd	nd
Si	Silica	17	21	19
U	Uranium	0.0032	0.0013	0.00225
V	Vanadium	nd	nd	nd
Tl	Thallium	nd	nd	nd
Zn	Zinc	0.024	0.021	0.0225

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

May 14, 2012

Katie Emmer

New Mexico Copper Corp
2425 San Pedro Dr NE Ste 100
Albuquerque, New Mexico 87109
TEL: (505) 400-7925
FAX

RE: Cu Flat — OrderNo.: 1205076

Dear Katie Emmer:

Hall Environmental Analysis Laboratory received 1 sample(s) on 5/2/2012 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. All samples are reported as received unless otherwise indicated.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Date Reported: **5/14/2012**

CLIENT: New Mexico Copper Corp **Client Sample ID:** PW-1
Project: Cu Flat **Collection Date:** 5/1/2012 2:00:00 PM
Lab ID: 1205076-001 **Matrix:** AQUEOUS **Received Date:** 5/2/2012 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **BRM**
Fluoride	1.0	0.10		mg/L	1	5/2/2012 12:52:03 PM
Chloride	32	10		mg/L	20	5/2/2012 1:03:17 PM
Nitrogen, Nitrite (As N)	ND	0.10		mg/L	1	5/2/2012 12:52:03 PM
Nitrogen, Nitrate (As N)	0.59	0.10		mg/L	1	5/2/2012 12:52:03 PM
Sulfate	28	0.50		mg/L	1	5/2/2012 12:52:03 PM
EPA METHOD 200.7: DISSOLVED METALS						Analyst: **ELS**
Aluminum	ND	0.020		mg/L	1	5/8/2012 8:02:55 AM
Barium	0.011	0.0020		mg/L	1	5/8/2012 8:02:55 AM
Beryllium	ND	0.0020		mg/L	1	5/8/2012 8:02:55 AM
Boron	0.065	0.040		mg/L	1	5/9/2012 8:36:51 AM
Cadmium	ND	0.0020		mg/L	1	5/8/2012 8:02:55 AM
Calcium	36	1.0		mg/L	1	5/9/2012 8:36:51 AM
Chromium	ND	0.0060		mg/L	1	5/8/2012 8:02:55 AM
Cobalt	ND	0.0060		mg/L	1	5/8/2012 8:02:55 AM
Copper	ND	0.0060		mg/L	1	5/8/2012 8:02:55 AM
Iron	0.040	0.020		mg/L	1	5/9/2012 8:36:51 AM
Lead	ND	0.0050		mg/L	1	5/8/2012 8:02:55 AM
Magnesium	3.1	1.0		mg/L	1	5/9/2012 8:36:51 AM
Manganese	0.0024	0.0020		mg/L	1	5/8/2012 8:02:55 AM
Molybdenum	ND	0.0080		mg/L	1	5/8/2012 8:02:55 AM
Nickel	ND	0.010		mg/L	1	5/8/2012 8:02:55 AM
Potassium	3.4	1.0		mg/L	1	5/9/2012 8:36:51 AM
Silicon	17	0.40		mg/L	5	5/8/2012 8:06:09 AM
Silver	ND	0.0050		mg/L	1	5/8/2012 8:02:55 AM
Sodium	58	1.0		mg/L	1	5/9/2012 8:36:51 AM
Vanadium	ND	0.050		mg/L	1	5/8/2012 8:02:55 AM
Zinc	0.024	0.010		mg/L	1	5/8/2012 8:02:55 AM
EPA 200.8: DISSOLVED METALS						Analyst: **SNV**
Antimony	ND	0.0010		mg/L	1	5/8/2012 1:15:26 PM
Arsenic	0.0033	0.0010		mg/L	1	5/8/2012 1:15:26 PM
Selenium	ND	0.0010		mg/L	1	5/10/2012 2:28:58 PM
Thallium	ND	0.0010		mg/L	1	5/8/2012 1:15:26 PM
Uranium	0.0032	0.0010		mg/L	1	5/10/2012 2:28:58 PM
EPA METHOD 245.1: MERCURY						Analyst: **ELS**
Mercury	ND	0.00020		mg/L	1	5/9/2012 11:59:45 AM
SM2340B: HARDNESS						Analyst: **ELS**
Hardness (As CaCO3)	100	6.6		mg/L	1	5/9/2012
EPA 120.1: SPECIFIC CONDUCTANCE						Analyst: **DBD**
Conductivity	450	0.010		µmhos/cm	1	5/7/2012 12:31:49 PM

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

Date Reported: **5/14/2012**

CLIENT: New Mexico Copper Corp
Client Sample ID: PW-1
Project: Cu Flat
Collection Date: 5/1/2012 2:00:00 PM
Lab ID: 1205076-001
Matrix: AQUEOUS
Received Date: 5/2/2012 7:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
SM4500-H+B: PH						Analyst: **JLF**
pH	8.02	1.68	H	pH units	1	5/3/2012 1:22:52 PM
SM2320B: ALKALINITY						Analyst: **JLF**
Bicarbonate (As CaCO3)	150	20		mg/L CaCO3	1	5/3/2012 1:22:52 PM
Carbonate (As CaCO3)	ND	2.0		mg/L CaCO3	1	5/3/2012 1:22:52 PM
Total Alkalinity (as CaCO3)	150	20		mg/L CaCO3	1	5/3/2012 1:22:52 PM
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**
Total Dissolved Solids	294	20.0		mg/L	1	5/8/2012 3:12:00 PM
SM 2540D: TSS						Analyst: **KS**
Suspended Solids	ND	4.0		mg/L	1	5/3/2012 5:30:00 PM

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Anatek Labs, Inc.

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com
504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	120503026
Address:	4901 HAWKINS NE SUITE D	**Project Name:**	1205076
	ALBUQUERQUE, NM 87109		
Attn:	ANDY FREEMAN		

Analytical Results Report

Sample Number	120503026-001	**Sampling Date**	5/1/2012	**Date/Time Received**	5/3/2012	12:24 PM
Client Sample ID	1205076-001D / PW-1	**Sampling Time**	2:00 PM	**Extraction Date**		
Matrix	Water	**Sample Location**				
Comments						

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/L	0.01	5/11/2012	CRW	EPA 335.4	

Authorized Signature

John Coddington, Lab Manager

MCL EPA's Maximum Contaminant Level
ND Not Detected
PQL Practical Quantitation Limit

This report shall not be reproduced except in full, without the written approval of the laboratory.
The results reported relate only to the samples indicated.
Soil/solid results are reported on a dry-weight basis unless otherwise noted.

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1205076**

14-May-12

Client: New Mexico Copper Corp

Project: Cu Flat

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **PBW**	Batch ID: **R2622**	RunNo: **2622**
Prep Date:	Analysis Date: **5/8/2012**	SeqNo: **72991** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	ND	0.020								
Barium	ND	0.0020								
Beryllium	ND	0.0020								
Cadmium	ND	0.0020								
Chromium	ND	0.0060								
Cobalt	ND	0.0060								
Copper	ND	0.0060								
Lead	ND	0.0050								
Manganese	ND	0.0020								
Molybdenum	ND	0.0080								
Nickel	ND	0.010								
Silicon	ND	0.080								
Silver	ND	0.0050								
Vanadium	ND	0.050								
Zinc	ND	0.010								

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **LCSW**	Batch ID: **R2622**	RunNo: **2622**
Prep Date:	Analysis Date: **5/8/2012**	SeqNo: **72992** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	0.52	0.020	0.5000	0	105	85	115			
Barium	0.49	0.0020	0.5000	0	98.9	85	115			
Beryllium	0.52	0.0020	0.5000	0	103	85	115			
Cadmium	0.50	0.0020	0.5000	0	99.2	85	115			
Chromium	0.49	0.0060	0.5000	0	98.5	85	115			
Cobalt	0.47	0.0060	0.5000	0	94.9	85	115			
Copper	0.50	0.0060	0.5000	0	99.9	85	115			
Lead	0.50	0.0050	0.5000	0	99.3	85	115			
Manganese	0.48	0.0020	0.5000	0	96.9	85	115			
Molybdenum	0.49	0.0080	0.5000	0.002030	98.4	85	115			
Nickel	0.47	0.010	0.5000	0	93.9	85	115			
Silicon	2.6	0.080	2.500	0	104	85	115			
Silver	0.094	0.0050	0.1000	0	94.1	85	115			
Vanadium	0.52	0.050	0.5000	0	104	85	115			
Zinc	0.50	0.010	0.5000	0	101	85	115			

Sample ID **1205193-005EMS**	SampType: **MS**	TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **BatchQC**	Batch ID: **R2622**	RunNo: **2622**
Prep Date:	Analysis Date: **5/8/2012**	SeqNo: **73030** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

QC SUMMARY REPORT

WO#: **1205076**

Hall Environmental Analysis Laboratory, Inc.

14-May-12

Client: New Mexico Copper Corp
Project: Cu Flat

Sample ID **1205193-005EMS** SampType: **MS** TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **BatchQC** Batch ID: **R2622** RunNo: **2622**
Prep Date: Analysis Date: **5/8/2012** SeqNo: **73030** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	0.54	0.020	0.5000	0	107	70	130			
Barium	0.52	0.0020	0.5000	0.02182	98.9	70	130			
Zinc	0.54	0.010	0.5000	0.03785	101	70	130			

Sample ID **1205193-005EMSD** SampType: **MSD** TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **BatchQC** Batch ID: **R2622** RunNo: **2622**
Prep Date: Analysis Date: **5/8/2012** SeqNo: **73031** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	0.53	0.020	0.5000	0	106	70	130	1.33	20	
Barium	0.51	0.0020	0.5000	0.02182	97.2	70	130	1.71	20	
Zinc	0.53	0.010	0.5000	0.03785	98.0	70	130	2.48	20	

Sample ID **1205193-005EMS** SampType: **MS** TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **BatchQC** Batch ID: **R2670** RunNo: **2670**
Prep Date: Analysis Date: **5/9/2012** SeqNo: **74182** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Potassium	56	1.0	50.00	4.808	102	70	130			

Sample ID **1205193-005EMSD** SampType: **MSD** TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **BatchQC** Batch ID: **R2670** RunNo: **2670**
Prep Date: Analysis Date: **5/9/2012** SeqNo: **74183** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Potassium	57	1.0	50.00	4.808	104	70	130	2.44	20	

Sample ID **1205193-005EMS** SampType: **MS** TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **BatchQC** Batch ID: **R2670** RunNo: **2670**
Prep Date: Analysis Date: **5/9/2012** SeqNo: **74185** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	4.5	0.10	2.500	2.034	99.6	70	130			
Magnesium	390	5.0	250.0	124.9	107	70	130			
Sodium	460	5.0	250.0	192.5	107	70	130			

Sample ID **1205193-005EMSD** SampType: **MSD** TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **BatchQC** Batch ID: **R2670** RunNo: **2670**
Prep Date: Analysis Date: **5/9/2012** SeqNo: **74186** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	4.6	0.10	2.500	2.034	101	70	130	1.03	20	

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1205076**

14-May-12

Client: New Mexico Copper Corp

Project: Cu Flat

Sample ID **1205193-005EMSD**	SampType: **MSD**	TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **BatchQC**	Batch ID: **R2670**	RunNo: **2670**
Prep Date:	Analysis Date: **5/9/2012**	SeqNo: **74186** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Magnesium	390	5.0	250.0	124.9	106	70	130	0.684	20	
Sodium	460	5.0	250.0	192.5	106	70	130	0.966	20	

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **PBW**	Batch ID: **R2670**	RunNo: **2670**
Prep Date: **5/9/2012**	Analysis Date: **5/9/2012**	SeqNo: **74215** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	ND	0.040								
Calcium	ND	1.0								
Iron	ND	0.020								
Magnesium	ND	1.0								
Potassium	ND	1.0								
Sodium	ND	1.0								

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **LCSW**	Batch ID: **R2670**	RunNo: **2670**
Prep Date:	Analysis Date: **5/9/2012**	SeqNo: **74216** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	0.51	0.040	0.5000	0	101	85	115			
Calcium	54	1.0	50.00	0	107	85	115			
Iron	0.47	0.020	0.5000	0.004190	93.2	85	115			
Magnesium	54	1.0	50.00	0	109	85	115			
Potassium	53	1.0	50.00	0	106	85	115			
Sodium	54	1.0	50.00	0	107	85	115			

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

QC SUMMARY REPORT

WO#: **1205076**

Hall Environmental Analysis Laboratory, Inc.

14-May-12

Client: New Mexico Copper Corp

Project: Cu Flat

Sample ID **LCS** SampType: **LCS** TestCode: **EPA 200.8: Dissolved Metals**
Client ID: **LCSW** Batch ID: **R2629** RunNo: **2629**
Prep Date: Analysis Date: **5/8/2012** SeqNo: **73283** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.023	0.0010	0.02500	0	92.8	85	115			
Arsenic	0.023	0.0010	0.02500	0	93.1	85	115			
Thallium	0.023	0.0010	0.02500	0	92.9	85	115			

Sample ID **MB** SampType: **MBLK** TestCode: **EPA 200.8: Dissolved Metals**
Client ID: **PBW** Batch ID: **R2629** RunNo: **2629**
Prep Date: Analysis Date: **5/8/2012** SeqNo: **73284** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	ND	0.0010								
Arsenic	ND	0.0010								
Thallium	ND	0.0010								

Sample ID **LCS** SampType: **LCS** TestCode: **EPA 200.8: Dissolved Metals**
Client ID: **LCSW** Batch ID: **R2708** RunNo: **2708**
Prep Date: Analysis Date: **5/10/2012** SeqNo: **75447** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Selenium	0.026	0.0010	0.02500	0	104	85	115			
Uranium	0.025	0.0010	0.02500	0	99.2	85	115			

Sample ID **MB** SampType: **MBLK** TestCode: **EPA 200.8: Dissolved Metals**
Client ID: **PBW** Batch ID: **R2708** RunNo: **2708**
Prep Date: Analysis Date: **5/10/2012** SeqNo: **75448** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Selenium	ND	0.0010								
Uranium	ND	0.0010								

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1205076**

14-May-12

Client: New Mexico Copper Corp

Project: Cu Flat

Sample ID **MB-1862** SampType: **MBLK** TestCode: **EPA Method 245.1: Mercury**

Client ID: **PBW** Batch ID: **1862** RunNo: **2669**

Prep Date: **5/9/2012** Analysis Date: **5/9/2012** SeqNo: **74223** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	ND	0.00020								

Sample ID **LCS-1862** SampType: **LCS** TestCode: **EPA Method 245.1: Mercury**

Client ID: **LCSW** Batch ID: **1862** RunNo: **2669**

Prep Date: **5/9/2012** Analysis Date: **5/9/2012** SeqNo: **74224** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0049	0.00020	0.005000	0	97.4	80	120			

Sample ID **1204854-004AMS** SampType: **MS** TestCode: **EPA Method 245.1: Mercury**

Client ID: **BatchQC** Batch ID: **1862** RunNo: **2669**

Prep Date: **5/9/2012** Analysis Date: **5/9/2012** SeqNo: **74226** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0049	0.00020	0.005000	0	97.2	75	125			

Sample ID **1204854-004AMSD** SampType: **MSD** TestCode: **EPA Method 245.1: Mercury**

Client ID: **BatchQC** Batch ID: **1862** RunNo: **2669**

Prep Date: **5/9/2012** Analysis Date: **5/9/2012** SeqNo: **74227** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0049	0.00020	0.005000	0	97.1	75	125	0.0957	20	

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1205076**

14-May-12

Client: New Mexico Copper Corp

Project: Cu Flat

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**	
Client ID: **PBW**	Batch ID: **R2544**	RunNo: **2544**	
Prep Date:	Analysis Date: **5/2/2012**	SeqNo: **70797**	Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	ND	0.10								
Chloride	ND	0.50								
Nitrogen, Nitrite (As N)	ND	0.10								
Nitrogen, Nitrate (As N)	ND	0.10								
Sulfate	ND	0.50								

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**	
Client ID: **LCSW**	Batch ID: **R2544**	RunNo: **2544**	
Prep Date:	Analysis Date: **5/2/2012**	SeqNo: **70798**	Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.47	0.10	0.5000	0	93.8	90	110			
Chloride	4.6	0.50	5.000	0	92.9	90	110			
Nitrogen, Nitrite (As N)	0.93	0.10	1.000	0	92.9	90	110			
Nitrogen, Nitrate (As N)	2.4	0.10	2.500	0	97.4	90	110			
Sulfate	9.5	0.50	10.00	0	94.8	90	110			

Sample ID **1205075-001BMS**	SampType: **MS**	TestCode: **EPA Method 300.0: Anions**	
Client ID: **BatchQC**	Batch ID: **R2544**	RunNo: **2544**	
Prep Date:	Analysis Date: **5/2/2012**	SeqNo: **70800**	Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.68	0.10	0.5000	0.1911	98.1	72.9	113			
Nitrogen, Nitrite (As N)	1.0	0.10	1.000	0	101	77.6	111			
Nitrogen, Nitrate (As N)	2.5	0.10	2.500	0	99.9	82.8	116			

Sample ID **1205075-001BMSD**	SampType: **MSD**	TestCode: **EPA Method 300.0: Anions**	
Client ID: **BatchQC**	Batch ID: **R2544**	RunNo: **2544**	
Prep Date:	Analysis Date: **5/2/2012**	SeqNo: **70801**	Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.65	0.10	0.5000	0.1911	90.9	72.9	113	5.39	20	
Nitrogen, Nitrite (As N)	0.90	0.10	1.000	0	90.2	77.6	111	10.8	20	
Nitrogen, Nitrate (As N)	2.3	0.10	2.500	0	91.3	82.8	116	8.94	20	

Sample ID **1205079-001AMS**	SampType: **MS**	TestCode: **EPA Method 300.0: Anions**	
Client ID: **BatchQC**	Batch ID: **R2544**	RunNo: **2544**	
Prep Date:	Analysis Date: **5/2/2012**	SeqNo: **70809**	Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Nitrite (As N)	1.3	0.10	1.000	0	127	77.6	111			S
Nitrogen, Nitrate (As N)	2.4	0.10	2.500	0	97.8	82.8	116			

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

Client: New Mexico Copper Corp
Project: Cu Flat

Sample ID **1205079-001AMSD** SampType: **MSD** TestCode: **EPA Method 300.0: Anions**
Client ID: **BatchQC** Batch ID: **R2544** RunNo: **2544**
Prep Date: Analysis Date: **5/2/2012** SeqNo: **70810** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Nitrite (As N)	1.2	0.10	1.000	0	122	77.6	111	4.14	20	S
Nitrogen, Nitrate (As N)	2.4	0.10	2.500	0	95.5	82.8	116	2.38	20	

Sample ID **MB** SampType: **MBLK** TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW** Batch ID: **R2544** RunNo: **2544**
Prep Date: Analysis Date: **5/2/2012** SeqNo: **70849** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	ND	0.10								
Chloride	ND	0.50								
Nitrogen, Nitrite (As N)	ND	0.10								
Nitrogen, Nitrate (As N)	ND	0.10								
Sulfate	ND	0.50								

Sample ID **LCS** SampType: **LCS** TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW** Batch ID: **R2544** RunNo: **2544**
Prep Date: Analysis Date: **5/2/2012** SeqNo: **70850** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.50	0.10	0.5000	0	99.0	90	110			
Chloride	4.7	0.50	5.000	0	94.2	90	110			
Nitrogen, Nitrite (As N)	0.98	0.10	1.000	0	98.0	90	110			
Nitrogen, Nitrate (As N)	2.5	0.10	2.500	0	98.3	90	110			
Sulfate	9.6	0.50	10.00	0	95.7	90	110			

Sample ID **1205066-002AMS** SampType: **MS** TestCode: **EPA Method 300.0: Anions**
Client ID: **BatchQC** Batch ID: **R2544** RunNo: **2544**
Prep Date: Analysis Date: **5/2/2012** SeqNo: **70852** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	1.1	0.10	0.5000	0.5616	101	72.9	113			
Nitrogen, Nitrite (As N)	0.93	0.10	1.000	0	92.7	77.6	111			
Nitrogen, Nitrate (As N)	3.3	0.10	2.500	0.5059	111	82.8	116			
Sulfate	48	0.50	10.00	36.66	113	80.5	119			

Sample ID **1205066-002AMSD** SampType: **MSD** TestCode: **EPA Method 300.0: Anions**
Client ID: **BatchQC** Batch ID: **R2544** RunNo: **2544**
Prep Date: Analysis Date: **5/2/2012** SeqNo: **70853** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	1.0	0.10	0.5000	0.5616	93.8	72.9	113	3.52	20	
Nitrogen, Nitrite (As N)	0.79	0.10	1.000	0	78.5	77.6	111	16.5	20	

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

QC SUMMARY REPORT

WO#: **1205076**

Hall Environmental Analysis Laboratory, Inc.

14-May-12

Client: New Mexico Copper Corp
Project: Cu Flat

Sample ID **1205066-002AMSD** SampType: **MSD** TestCode: **EPA Method 300.0: Anions**
Client ID: **BatchQC** Batch ID: **R2544** RunNo: **2544**
Prep Date: Analysis Date: **5/2/2012** SeqNo: **70853** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Nitrate (As N)	3.0	0.10	2.500	0.5059	98.7	82.8	116	10.2	20	
Sulfate	47	0.50	10.00	36.66	101	80.5	119	2.50	20	

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1205076**
14-May-12

Client: New Mexico Copper Corp
Project: Cu Flat

Sample ID **1205170-001D** SampType: **DUP** TestCode: **EPA 120.1: Specific Conductance**
Client ID: **BatchQC** Batch ID: **R2646** RunNo: **2646**
Prep Date: Analysis Date: **5/7/2012** SeqNo: **73516** Units: **µmhos/cm**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Conductivity	610	0.010						0	20	

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1205076**

14-May-12

Client: New Mexico Copper Corp

Project: Cu Flat

Sample ID **1205005-001A DUP** SampType: **DUP** TestCode: **SM4500-H+B: pH**

Client ID: **BatchQC** Batch ID: **R2560** RunNo: **2560**

Prep Date: Analysis Date: **5/3/2012** SeqNo: **71363** Units: **pH units**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
pH	3.92	1.68						0.762		H

Sample ID **1205120-001B DUP** SampType: **DUP** TestCode: **SM4500-H+B: pH**

Client ID: **BatchQC** Batch ID: **R2560** RunNo: **2560**

Prep Date: Analysis Date: **5/3/2012** SeqNo: **71373** Units: **pH units**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
pH	7.73	1.68						0.645		H

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1205076**

14-May-12

Client: New Mexico Copper Corp

Project: Cu Flat

Sample ID **1205005-001A MS** SampType: **MS** TestCode: **SM2320B: Alkalinity**
Client ID: **BatchQC** Batch ID: **R2560** RunNo: **2560**
Prep Date: Analysis Date: **5/3/2012** SeqNo: **71221** Units: **mg/L CaCO3**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20	80.00	0	0	62.6	110			S

Sample ID **1205005-001A MSD** SampType: **MSD** TestCode: **SM2320B: Alkalinity**
Client ID: **BatchQC** Batch ID: **R2560** RunNo: **2560**
Prep Date: Analysis Date: **5/3/2012** SeqNo: **71222** Units: **mg/L CaCO3**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20	80.00	0	0	59.9	111	0	10	S

Sample ID **1205120-001B MS** SampType: **MS** TestCode: **SM2320B: Alkalinity**
Client ID: **BatchQC** Batch ID: **R2560** RunNo: **2560**
Prep Date: Analysis Date: **5/3/2012** SeqNo: **71242** Units: **mg/L CaCO3**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	360	20	80.00	299.4	70.9	62.6	110			

Sample ID **1205120-001B MSD** SampType: **MSD** TestCode: **SM2320B: Alkalinity**
Client ID: **BatchQC** Batch ID: **R2560** RunNo: **2560**
Prep Date: Analysis Date: **5/3/2012** SeqNo: **71243** Units: **mg/L CaCO3**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	350	20	80.00	299.4	67.1	59.9	111	0.869	10	

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1205076**

14-May-12

Client: New Mexico Copper Corp

Project: Cu Flat

Sample ID	MB-1832	SampType:	MBLK	TestCode:	SM2540C MOD: Total Dissolved Solids				
Client ID:	PBW	Batch ID:	1832	RunNo:	2634				
Prep Date:	5/7/2012	Analysis Date:	5/8/2012	SeqNo:	73329	Units:	mg/L		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	20.0								

Sample ID	LCS-1832	SampType:	LCS	TestCode:	SM2540C MOD: Total Dissolved Solids				
Client ID:	LCSW	Batch ID:	1832	RunNo:	2634				
Prep Date:	5/7/2012	Analysis Date:	5/8/2012	SeqNo:	73330	Units:	mg/L		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	1,020	20.0	1,000	0	102	80	120			

Sample ID	1205078-002GMS	SampType:	MS	TestCode:	SM2540C MOD: Total Dissolved Solids				
Client ID:	BatchQC	Batch ID:	1832	RunNo:	2634				
Prep Date:	5/7/2012	Analysis Date:	5/8/2012	SeqNo:	73337	Units:	mg/L		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	4,890	20.0	1,000	3,791	110	80	120			

Sample ID	1205078-002GMSD	SampType:	MSD	TestCode:	SM2540C MOD: Total Dissolved Solids				
Client ID:	BatchQC	Batch ID:	1832	RunNo:	2634				
Prep Date:	5/7/2012	Analysis Date:	5/8/2012	SeqNo:	73338	Units:	mg/L		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	4,930	20.0	1,000	3,791	114	80	120	0.733	20	

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1205076**

14-May-12

Client: New Mexico Copper Corp

Project: Cu Flat

Sample ID **MB-1800** SampType: **MBLK** TestCode: **SM 2540D: TSS**
Client ID: **PBW** Batch ID: **1800** RunNo: **2570**
Prep Date: **5/3/2012** Analysis Date: **5/3/2012** SeqNo: **71656** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Suspended Solids	ND	4.0								

Sample ID **LCS-1800** SampType: **LCS** TestCode: **SM 2540D: TSS**
Client ID: **LCSW** Batch ID: **1800** RunNo: **2570**
Prep Date: **5/3/2012** Analysis Date: **5/3/2012** SeqNo: **71657** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Suspended Solids	93	4.0	96.60	0	96.3	82.9	110			

Sample ID **1205034-001BDUP** SampType: **DUP** TestCode: **SM 2540D: TSS**
Client ID: **BatchQC** Batch ID: **1800** RunNo: **2570**
Prep Date: **5/3/2012** Analysis Date: **5/3/2012** SeqNo: **71663** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Suspended Solids	ND	4.0						0	15	

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: NEW MEXICO COPPER CORP Work Order Number: 1205076

Received by/date: AT 05/02/12

Logged By: Anne Thorne 5/2/2012 7:30:00 AM Anne Thorne

Completed By: Anne Thorne 5/2/2012 Anne Thorne

Reviewed By: AT 05/02/12

Chain of Custody

1. Were seals intact? Yes ☐ No ☐ Not Present ☑
2. Is Chain of Custody complete? Yes ☑ No ☐ Not Present ☐
3. How was the sample delivered? Client

Log In

4. Coolers are present? (see 19. for cooler specific information) Yes ☑ No ☐ NA ☐
5. Was an attempt made to cool the samples? Yes ☑ No ☐ NA ☐
6. Were all samples received at a temperature of >0° C to 6.0°C Yes ☑ No ☐ NA ☐
7. Sample(s) in proper container(s)? Yes ☑ No ☐
8. Sufficient sample volume for indicated test(s)? Yes ☑ No ☐
9. Are samples (except VOA and ONG) properly preserved? Yes ☑ No ☐
10. Was preservative added to bottles? Yes ☐ No ☑ NA ☐
11. VOA vials have zero headspace? Yes ☑ No ☐ No VOA Vials ☐
12. Were any sample containers received broken? Yes ☐ No ☑
13. Does paperwork match bottle labels? Yes ☑ No ☐
    (Note discrepancies on chain of custody)
14. Are matrices correctly identified on Chain of Custody? Yes ☑ No ☐
15. Is it clear what analyses were requested? Yes ☑ No ☐
16. Were all holding times able to be met? Yes ☑ No ☐
    (If no, notify customer for authorization.)

\# of preserved bottles checked for pH: 1
(<2 or >12 unless noted)
Adjusted?
Checked by: AT 05/02/12

Special Handling (if applicable)

17. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: Date
By Whom: Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:
Client Instructions:

18. Additional remarks:

19. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	3.4	Good	Not Present			

Chain-of-Custody Record

Client: New Mexico Copper Corp

Mailing Address: 2425 San Pedro Dr NE
Suite 100, ABQ NM

Phone #: 505.400.7925

email or Fax#:

QA/QC Package:
☐ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other ____

☐ EDD (Type) ____

Turn-Around Time:
☐ Standard ☒ Rush Need Results by May 11 via email

Project Name: CuFlat

Project #: Production Well Sampling

Project Manager: Katie Emmer

Sampler: CMC

On Ice: ☒ Yes ☐ No

Sample Temperature: 3.7°

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1205076	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	8310 (PNA or PAH)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	see enclosed list				Air Bubbles (Y or N)
5.1.12	1400	H_2O	PW-1	500		-001												X				
				125	H_2SO_4	-001																
				125	HNO_3 + filter	-001																
				500	HNO_3	-001																
				500	NaOH	-001																

Date:	Time:	Relinquished by:	Received by:	Date	Time
5/1/12	14:30	[signature]	[signature]	May 2012	14:30
5/2/12	07:30	[signature]	[signature]	05/02/12	0730

Remarks: Please email results to: Katie Emmer
kemmer@themacresourcesgroup.com
Please add Hardness, per Katie. 5/3

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

NM Copper
May 1, 2012

Table 9-3
Analytical Parameters and Analysis Methods for Groundwater Samples

Analytical Parameter	Analysis Method	Lab Detection Limit (mg/L unless noted)
Anions		
Fluoride	EPA Method 300.0	0.1
Chloride	EPA Method 300.0	0.1
Nitrogen, Nitrite (as N)	EPA Method 300.0	0.1
Nitrogen, Nitrate (as N)	EPA Method 300.0	0.1
Sulfate	EPA Method 300.0	0.5
Dissolved Metals		
Aluminum	EPA Method 200.7	0.02
Antimony	EPA Method 200.8	0.005
Arsenic	EPA Method 200.8	0.02
Barium	EPA Method 200.7	0.002
Beryllium	EPA Method 200.7	0.002
Boron	EPA Method 200.7	0.04
Cadmium	EPA Method 200.7	0.002
Calcium	EPA Method 200.7	0.50
Chromium	EPA Method 200.7	0.006
Cobalt	EPA Method 200.7	0.006
Copper	EPA Method 200.7	0.0003
Iron	EPA Method 200.7	0.02
Lead	EPA Method 200.7	0.005
Magnesium	EPA Method 200.7	0.50
Manganese	EPA Method 200.7	0.002
Mercury	EPA Method 7470 CVAA	0.0002
Molybdenum	EPA Method 200.7	0.008
Nickel	EPA Method 200.7	0.01
Potassium	EPA Method 200.7	1.0
Selenium	EPA Method 200.8	0.02
Silicon	EPA Method 200.7	0.08
Silver	EPA Method 200.7	0.005
Sodium	EPA Method 200.7	0.5

NM Copper
May 1, 2012

Analytical Parameter	Analysis Method	Lab Detection Limit (mg/L unless noted)
Thallium	EPA Method 200.7	0.01
~~Titanium~~	~~EPA Method 200.7~~	~~0.005~~
Uranium	EPA Method 200.8	0.01
Vanadium	EPA Method 200.7	0.005
Zinc	EPA Method 200.7	0.005
Solids		
Total Suspended Solids (TSS)	SM 2540D	1.0 µg/L
Total Dissolved Solids (TDS)	SM 2540C	10
Alkalinity		
Alkalinity, total (as $CaCO_3$)	SM 2320B	20
Carbonate	SM 2320B	20
Bicarbonate	SM 2320B	20
Other		
pH	150.1	12.45
Specific Conductance	120.1	0.01 µS/cm
Cyanide	Kelada-01	0.005

Note: NA = not applicable as sample will not be analyzed for a given parameter.

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

May 14, 2012

Katie Emmer

New Mexico Copper Corp
2425 San Pedro Dr NE Ste 100
Albuquerque, New Mexico 87109
TEL: (505) 400-7925
FAX

RE: Cu Flat OrderNo.: 1205153

Dear Katie Emmer:

Hall Environmental Analysis Laboratory received 1 sample(s) on 5/3/2012 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. All samples are reported as received unless otherwise indicated.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

CLIENT: New Mexico Copper Corp **Client Sample ID:** PW-3
Project: Cu Flat **Collection Date:** 5/2/2012 2:30:00 PM
Lab ID: 1205153-001 **Matrix:** AQUEOUS **Received Date:** 5/3/2012 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **BRM**
Fluoride	1.9	0.10		mg/L	1	5/3/2012 12:04:13 PM
Chloride	50	10		mg/L	20	5/3/2012 12:41:28 PM
Nitrogen, Nitrite (As N)	ND	0.10		mg/L	1	5/3/2012 12:04:13 PM
Nitrogen, Nitrate (As N)	0.70	0.10		mg/L	1	5/3/2012 12:04:13 PM
Sulfate	26	0.50		mg/L	1	5/3/2012 12:04:13 PM
EPA METHOD 200.7: DISSOLVED METALS						Analyst: **ELS**
Aluminum	ND	0.020		mg/L	1	5/8/2012 8:09:23 AM
Barium	0.0078	0.0020		mg/L	1	5/8/2012 8:09:23 AM
Beryllium	ND	0.0020		mg/L	1	5/8/2012 8:09:23 AM
Boron	0.095	0.040		mg/L	1	5/9/2012 8:40:03 AM
Cadmium	ND	0.0020		mg/L	1	5/8/2012 8:09:23 AM
Calcium	20	1.0		mg/L	1	5/9/2012 8:40:03 AM
Chromium	0.0060	0.0060		mg/L	1	5/8/2012 8:09:23 AM
Cobalt	ND	0.0060		mg/L	1	5/8/2012 8:09:23 AM
Copper	ND	0.0060		mg/L	1	5/8/2012 8:09:23 AM
Iron	0.065	0.020		mg/L	1	5/9/2012 8:40:03 AM
Lead	ND	0.0050		mg/L	1	5/8/2012 8:09:23 AM
Magnesium	1.0	1.0		mg/L	1	5/9/2012 8:40:03 AM
Manganese	0.0026	0.0020		mg/L	1	5/8/2012 8:09:23 AM
Molybdenum	ND	0.0080		mg/L	1	5/8/2012 8:09:23 AM
Nickel	ND	0.010		mg/L	1	5/8/2012 8:09:23 AM
Potassium	3.3	1.0		mg/L	1	5/9/2012 8:40:03 AM
Silicon	21	0.40		mg/L	5	5/8/2012 8:12:46 AM
Silver	ND	0.0050		mg/L	1	5/8/2012 8:09:23 AM
Sodium	81	1.0		mg/L	1	5/9/2012 8:40:03 AM
Vanadium	ND	0.050		mg/L	1	5/8/2012 8:09:23 AM
Zinc	0.021	0.010		mg/L	1	5/8/2012 8:09:23 AM
EPA 200.8: DISSOLVED METALS						Analyst: **SNV**
Antimony	ND	0.0010		mg/L	1	5/8/2012 1:19:22 PM
Arsenic	0.0074	0.0010		mg/L	1	5/8/2012 1:19:22 PM
Selenium	ND	0.0010		mg/L	1	5/10/2012 2:32:54 PM
Thallium	ND	0.0010		mg/L	1	5/8/2012 1:19:22 PM
Uranium	0.0013	0.0010		mg/L	1	5/10/2012 2:32:54 PM
EPA METHOD 245.1: MERCURY						Analyst: **ELS**
Mercury	ND	0.00020		mg/L	1	5/9/2012 12:01:31 PM
SM2340B: HARDNESS						Analyst: **ELS**
Hardness (As CaCO3)	53	6.6		mg/L	1	5/9/2012
EPA 120.1: SPECIFIC CONDUCTANCE						Analyst: **DBD**
Conductivity	460	0.010		µmhos/cm	1	5/7/2012 12:36:13 PM

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: New Mexico Copper Corp
Project: Cu Flat
Lab ID: 1205153-001
Matrix: AQUEOUS
Client Sample ID: PW-3
Collection Date: 5/2/2012 2:30:00 PM
Received Date: 5/3/2012 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
SM4500-H+B: PH						Analyst: **JLF**
pH	8.03	1.68	H	pH units	1	5/3/2012 5:14:04 PM
SM2320B: ALKALINITY						Analyst: **JLF**
Bicarbonate (As CaCO3)	120	20		mg/L CaCO3	1	5/3/2012 5:14:04 PM
Carbonate (As CaCO3)	ND	2.0		mg/L CaCO3	1	5/3/2012 5:14:04 PM
Total Alkalinity (as CaCO3)	120	20		mg/L CaCO3	1	5/3/2012 5:14:04 PM
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**
Total Dissolved Solids	303	20.0		mg/L	1	5/8/2012 3:12:00 PM
SM 2540D: TSS						Analyst: **KS**
Suspended Solids	ND	4.0		mg/L	1	5/4/2012 4:36:00 PM

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Anatek Labs, Inc.

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com
504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	120504004
Address:	4901 HAWKINS NE SUITE D	**Project Name:**	1205153
	ALBUQUERQUE, NM 87109		
Attn:	ANDY FREEMAN		

Analytical Results Report

Sample Number	120504004-001	**Sampling Date**	5/2/2012	**Date/Time Received**	5/4/2012	10:18 AM
Client Sample ID	1205153-001D / PW-3	**Sampling Time**	2:30 PM			
Matrix	Water	**Sample Location**				
Comments						

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/L	0.01	5/8/2012	CRW	EPA 335.4	

Authorized Signature

John Coddington, Lab Manager

MCL	EPA's Maximum Contaminant Level
ND	Not Detected
PQL	Practical Quantitation Limit

This report shall not be reproduced except in full, without the written approval of the laboratory.
The results reported relate only to the samples indicated.
Soil/solid results are reported on a dry-weight basis unless otherwise noted.

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1205153**

14-May-12

Client: New Mexico Copper Corp

Project: Cu Flat

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 200.7: Dissolved Metals**	
Client ID: **PBW**	Batch ID: **R2622**	RunNo: **2622**	
Prep Date:	Analysis Date: **5/8/2012**	SeqNo: **72991**	Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	ND	0.020								
Barium	ND	0.0020								
Beryllium	ND	0.0020								
Cadmium	ND	0.0020								
Chromium	ND	0.0060								
Cobalt	ND	0.0060								
Copper	ND	0.0060								
Lead	ND	0.0050								
Manganese	ND	0.0020								
Molybdenum	ND	0.0080								
Nickel	ND	0.010								
Silicon	ND	0.080								
Silver	ND	0.0050								
Vanadium	ND	0.050								
Zinc	ND	0.010								

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA Method 200.7: Dissolved Metals**	
Client ID: **LCSW**	Batch ID: **R2622**	RunNo: **2622**	
Prep Date:	Analysis Date: **5/8/2012**	SeqNo: **72992**	Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	0.52	0.020	0.5000	0	105	85	115			
Barium	0.49	0.0020	0.5000	0	98.9	85	115			
Beryllium	0.52	0.0020	0.5000	0	103	85	115			
Cadmium	0.50	0.0020	0.5000	0	99.2	85	115			
Chromium	0.49	0.0060	0.5000	0	98.5	85	115			
Cobalt	0.47	0.0060	0.5000	0	94.9	85	115			
Copper	0.50	0.0060	0.5000	0	99.9	85	115			
Lead	0.50	0.0050	0.5000	0	99.3	85	115			
Manganese	0.48	0.0020	0.5000	0	96.9	85	115			
Molybdenum	0.49	0.0080	0.5000	0.002030	98.4	85	115			
Nickel	0.47	0.010	0.5000	0	93.9	85	115			
Silicon	2.6	0.080	2.500	0	104	85	115			
Silver	0.094	0.0050	0.1000	0	94.1	85	115			
Vanadium	0.52	0.050	0.5000	0	104	85	115			
Zinc	0.50	0.010	0.5000	0	101	85	115			

Sample ID **1205193-005EMS**	SampType: **MS**	TestCode: **EPA Method 200.7: Dissolved Metals**	
Client ID: **BatchQC**	Batch ID: **R2622**	RunNo: **2622**	
Prep Date:	Analysis Date: **5/8/2012**	SeqNo: **73030**	Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1205153**

14-May-12

Client: New Mexico Copper Corp
Project: Cu Flat

Sample ID **1205193-005EMS** SampType: **MS** TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **BatchQC** Batch ID: **R2622** RunNo: **2622**
Prep Date: Analysis Date: **5/8/2012** SeqNo: **73030** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	0.54	0.020	0.5000	0	107	70	130			
Barium	0.52	0.0020	0.5000	0.02182	98.9	70	130			
Zinc	0.54	0.010	0.5000	0.03785	101	70	130			

Sample ID **1205193-005EMSD** SampType: **MSD** TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **BatchQC** Batch ID: **R2622** RunNo: **2622**
Prep Date: Analysis Date: **5/8/2012** SeqNo: **73031** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Aluminum	0.53	0.020	0.5000	0	106	70	130	1.33	20	
Barium	0.51	0.0020	0.5000	0.02182	97.2	70	130	1.71	20	
Zinc	0.53	0.010	0.5000	0.03785	98.0	70	130	2.48	20	

Sample ID **1205193-005EMS** SampType: **MS** TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **BatchQC** Batch ID: **R2670** RunNo: **2670**
Prep Date: Analysis Date: **5/9/2012** SeqNo: **74182** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Potassium	56	1.0	50.00	4.808	102	70	130			

Sample ID **1205193-005EMSD** SampType: **MSD** TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **BatchQC** Batch ID: **R2670** RunNo: **2670**
Prep Date: Analysis Date: **5/9/2012** SeqNo: **74183** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Potassium	57	1.0	50.00	4.808	104	70	130	2.44	20	

Sample ID **1205193-005EMS** SampType: **MS** TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **BatchQC** Batch ID: **R2670** RunNo: **2670**
Prep Date: Analysis Date: **5/9/2012** SeqNo: **74185** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	4.5	0.10	2.500	2.034	99.6	70	130			
Magnesium	390	5.0	250.0	124.9	107	70	130			
Sodium	460	5.0	250.0	192.5	107	70	130			

Sample ID **1205193-005EMSD** SampType: **MSD** TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **BatchQC** Batch ID: **R2670** RunNo: **2670**
Prep Date: Analysis Date: **5/9/2012** SeqNo: **74186** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	4.6	0.10	2.500	2.034	101	70	130	1.03	20	

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1205153**

14-May-12

Client: New Mexico Copper Corp

Project: Cu Flat

Sample ID **1205193-005EMSD** SampType: **MSD** TestCode: **EPA Method 200.7: Dissolved Metals**

Client ID: **BatchQC** Batch ID: **R2670** RunNo: **2670**

Prep Date: Analysis Date: **5/9/2012** SeqNo: **74186** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Magnesium	390	5.0	250.0	124.9	106	70	130	0.684	20	
Sodium	460	5.0	250.0	192.5	106	70	130	0.966	20	

Sample ID **MB** SampType: **MBLK** TestCode: **EPA Method 200.7: Dissolved Metals**

Client ID: **PBW** Batch ID: **R2670** RunNo: **2670**

Prep Date: **5/9/2012** Analysis Date: **5/9/2012** SeqNo: **74215** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	ND	0.040								
Calcium	ND	1.0								
Iron	ND	0.020								
Magnesium	ND	1.0								
Potassium	ND	1.0								
Sodium	ND	1.0								

Sample ID **LCS** SampType: **LCS** TestCode: **EPA Method 200.7: Dissolved Metals**

Client ID: **LCSW** Batch ID: **R2670** RunNo: **2670**

Prep Date: Analysis Date: **5/9/2012** SeqNo: **74216** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Boron	0.51	0.040	0.5000	0	101	85	115			
Calcium	54	1.0	50.00	0	107	85	115			
Iron	0.47	0.020	0.5000	0.004190	93.2	85	115			
Magnesium	54	1.0	50.00	0	109	85	115			
Potassium	53	1.0	50.00	0	106	85	115			
Sodium	54	1.0	50.00	0	107	85	115			

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1205153**
14-May-12

Client: New Mexico Copper Corp
Project: Cu Flat

Sample ID **LCS** SampType: **LCS** TestCode: **EPA 200.8: Dissolved Metals**
Client ID: **LCSW** Batch ID: **R2629** RunNo: **2629**
Prep Date: Analysis Date: **5/8/2012** SeqNo: **73283** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.023	0.0010	0.02500	0	92.8	85	115			
Arsenic	0.023	0.0010	0.02500	0	93.1	85	115			
Thallium	0.023	0.0010	0.02500	0	92.9	85	115			

Sample ID **MB** SampType: **MBLK** TestCode: **EPA 200.8: Dissolved Metals**
Client ID: **PBW** Batch ID: **R2629** RunNo: **2629**
Prep Date: Analysis Date: **5/8/2012** SeqNo: **73284** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	ND	0.0010								
Arsenic	ND	0.0010								
Thallium	ND	0.0010								

Sample ID **LCS** SampType: **LCS** TestCode: **EPA 200.8: Dissolved Metals**
Client ID: **LCSW** Batch ID: **R2708** RunNo: **2708**
Prep Date: Analysis Date: **5/10/2012** SeqNo: **75447** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Selenium	0.026	0.0010	0.02500	0	104	85	115			
Uranium	0.025	0.0010	0.02500	0	99.2	85	115			

Sample ID **MB** SampType: **MBLK** TestCode: **EPA 200.8: Dissolved Metals**
Client ID: **PBW** Batch ID: **R2708** RunNo: **2708**
Prep Date: Analysis Date: **5/10/2012** SeqNo: **75448** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Selenium	ND	0.0010								
Uranium	ND	0.0010								

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1205153**

14-May-12

Client: New Mexico Copper Corp
Project: Cu Flat

Sample ID **MB-1862** SampType: **MBLK** TestCode: **EPA Method 245.1: Mercury**
Client ID: **PBW** Batch ID: **1862** RunNo: **2669**
Prep Date: **5/9/2012** Analysis Date: **5/9/2012** SeqNo: **74223** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	ND	0.00020								

Sample ID **LCS-1862** SampType: **LCS** TestCode: **EPA Method 245.1: Mercury**
Client ID: **LCSW** Batch ID: **1862** RunNo: **2669**
Prep Date: **5/9/2012** Analysis Date: **5/9/2012** SeqNo: **74224** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0049	0.00020	0.005000	0	97.4	80	120			

Sample ID **1204854-004AMS** SampType: **MS** TestCode: **EPA Method 245.1: Mercury**
Client ID: **BatchQC** Batch ID: **1862** RunNo: **2669**
Prep Date: **5/9/2012** Analysis Date: **5/9/2012** SeqNo: **74226** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0049	0.00020	0.005000	0	97.2	75	125			

Sample ID **1204854-004AMSD** SampType: **MSD** TestCode: **EPA Method 245.1: Mercury**
Client ID: **BatchQC** Batch ID: **1862** RunNo: **2669**
Prep Date: **5/9/2012** Analysis Date: **5/9/2012** SeqNo: **74227** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0049	0.00020	0.005000	0	97.1	75	125	0.0957	20	

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1205153**

14-May-12

Client: New Mexico Copper Corp

Project: Cu Flat

Sample ID **MB** SampType: **MBLK** TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW** Batch ID: **R2561** RunNo: **2561**
Prep Date: Analysis Date: **5/3/2012** SeqNo: **71254** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	ND	0.10								
Chloride	ND	0.50								
Nitrogen, Nitrite (As N)	ND	0.10								
Nitrogen, Nitrate (As N)	ND	0.10								
Sulfate	ND	0.50								

Sample ID **LCS** SampType: **LCS** TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW** Batch ID: **R2561** RunNo: **2561**
Prep Date: Analysis Date: **5/3/2012** SeqNo: **71255** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.48	0.10	0.5000	0	95.5	90	110			
Chloride	4.8	0.50	5.000	0	96.2	90	110			
Nitrogen, Nitrite (As N)	0.98	0.10	1.000	0	98.2	90	110			
Nitrogen, Nitrate (As N)	2.5	0.10	2.500	0	101	90	110			
Sulfate	9.8	0.50	10.00	0	97.5	90	110			

Sample ID **1205153-001AMS** SampType: **MS** TestCode: **EPA Method 300.0: Anions**
Client ID: **PW-3** Batch ID: **R2561** RunNo: **2561**
Prep Date: Analysis Date: **5/3/2012** SeqNo: **71257** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	2.4	0.10	0.5000	1.941	84.8	72.9	113			
Nitrogen, Nitrite (As N)	0.96	0.10	1.000	0	96.5	77.6	111			
Nitrogen, Nitrate (As N)	3.3	0.10	2.500	0.7031	102	82.8	116			
Sulfate	37	0.50	10.00	26.34	106	80.5	119			

Sample ID **1205153-001AMSD** SampType: **MSD** TestCode: **EPA Method 300.0: Anions**
Client ID: **PW-3** Batch ID: **R2561** RunNo: **2561**
Prep Date: Analysis Date: **5/3/2012** SeqNo: **71258** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	2.4	0.10	0.5000	1.941	84.1	72.9	113	0.155	20	
Nitrogen, Nitrite (As N)	0.92	0.10	1.000	0	92.4	77.6	111	4.30	20	
Nitrogen, Nitrate (As N)	3.1	0.10	2.500	0.7031	97.9	82.8	116	3.36	20	
Sulfate	37	0.50	10.00	26.34	102	80.5	119	1.04	20	

Sample ID **1205167-005AMS** SampType: **MS** TestCode: **EPA Method 300.0: Anions**
Client ID: **BatchQC** Batch ID: **R2561** RunNo: **2561**
Prep Date: Analysis Date: **5/3/2012** SeqNo: **71285** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1205153**

14-May-12

Client: New Mexico Copper Corp

Project: Cu Flat

Sample ID **1205167-005AMS** SampType: **MS** TestCode: **EPA Method 300.0: Anions**
Client ID: **BatchQC** Batch ID: **R2561** RunNo: **2561**
Prep Date: Analysis Date: **5/3/2012** SeqNo: **71285** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Nitrite (As N)	0.94	0.10	1.000	0	94.4	77.6	111			

Sample ID **1205167-005AMSD** SampType: **MSD** TestCode: **EPA Method 300.0: Anions**
Client ID: **BatchQC** Batch ID: **R2561** RunNo: **2561**
Prep Date: Analysis Date: **5/3/2012** SeqNo: **71286** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Nitrite (As N)	0.94	0.10	1.000	0	94.4	77.6	111	0.0232	20	

Sample ID **MB** SampType: **MBLK** TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW** Batch ID: **R2561** RunNo: **2561**
Prep Date: Analysis Date: **5/4/2012** SeqNo: **71314** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	ND	0.10								
Chloride	ND	0.50								
Nitrogen, Nitrite (As N)	ND	0.10								
Nitrogen, Nitrate (As N)	ND	0.10								
Sulfate	ND	0.50								

Sample ID **LCS** SampType: **LCS** TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW** Batch ID: **R2561** RunNo: **2561**
Prep Date: Analysis Date: **5/4/2012** SeqNo: **71315** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.51	0.10	0.5000	0	101	90	110			
Chloride	4.7	0.50	5.000	0	93.9	90	110			
Nitrogen, Nitrite (As N)	0.96	0.10	1.000	0	96.1	90	110			
Nitrogen, Nitrate (As N)	2.5	0.10	2.500	0	98.0	90	110			
Sulfate	9.5	0.50	10.00	0	94.7	90	110			

Sample ID **1205174-001BMS** SampType: **MS** TestCode: **EPA Method 300.0: Anions**
Client ID: **BatchQC** Batch ID: **R2561** RunNo: **2561**
Prep Date: Analysis Date: **5/4/2012** SeqNo: **71317** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	1.4	0.10	0.5000	0.9876	91.1	72.9	113			
Chloride	14	0.50	5.000	8.329	103	78	107			
Nitrogen, Nitrite (As N)	0.96	0.10	1.000	0	95.8	77.6	111			
Nitrogen, Nitrate (As N)	6.0	0.10	2.500	3.372	106	82.8	116			
Sulfate	45	0.50	10.00	35.20	102	80.5	119			

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

QC SUMMARY REPORT

WO#: **1205153**

Hall Environmental Analysis Laboratory, Inc.

14-May-12

Client: New Mexico Copper Corp

Project: Cu Flat

Sample ID **1205174-001BMSD**	SampType: **MSD**	TestCode: **EPA Method 300.0: Anions**	
Client ID: **BatchQC**	Batch ID: **R2561**	RunNo: **2561**	
Prep Date:	Analysis Date: **5/4/2012**	SeqNo: **71318**	Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	1.4	0.10	0.5000	0.9876	90.1	72.9	113	0.330	20	
Chloride	13	0.50	5.000	8.329	103	78	107	0.0337	20	
Nitrogen, Nitrite (As N)	0.96	0.10	1.000	0	95.7	77.6	111	0.0653	20	
Nitrogen, Nitrate (As N)	6.0	0.10	2.500	3.372	106	82.8	116	0.00611	20	
Sulfate	45	0.50	10.00	35.20	101	80.5	119	0.199	20	

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

QC SUMMARY REPORT

WO#: **1205153**

Hall Environmental Analysis Laboratory, Inc.

14-May-12

Client: New Mexico Copper Corp

Project: Cu Flat

Sample ID **1205170-001D** SampType: **DUP** TestCode: **EPA 120.1: Specific Conductance**

Client ID: **BatchQC** Batch ID: **R2646** RunNo: **2646**

Prep Date: Analysis Date: **5/7/2012** SeqNo: **73516** Units: **µmhos/cm**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Conductivity	610	0.010						0	20	

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1205153**
14-May-12

Client: New Mexico Copper Corp
Project: Cu Flat

Sample ID **1205005-001A DUP** SampType: **DUP** TestCode: **SM4500-H+B: pH**
Client ID: **BatchQC** Batch ID: **R2560** RunNo: **2560**
Prep Date: Analysis Date: **5/3/2012** SeqNo: **71363** Units: **pH units**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
pH	3.92	1.68						0.762		H

Sample ID **1205120-001B DUP** SampType: **DUP** TestCode: **SM4500-H+B: pH**
Client ID: **BatchQC** Batch ID: **R2560** RunNo: **2560**
Prep Date: Analysis Date: **5/3/2012** SeqNo: **71373** Units: **pH units**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
pH	7.73	1.68						0.645		H

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1205153**

14-May-12

Client: New Mexico Copper Corp

Project: Cu Flat

Sample ID **1205005-001A MS**	SampType: **MS**	TestCode: **SM2320B: Alkalinity**								
Client ID: **BatchQC**	Batch ID: **R2560**	RunNo: **2560**								
Prep Date:	Analysis Date: **5/3/2012**	SeqNo: **71221**	Units: **mg/L CaCO3**							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20	80.00	0	0	62.6	110			S

Sample ID **1205005-001A MSD**	SampType: **MSD**	TestCode: **SM2320B: Alkalinity**								
Client ID: **BatchQC**	Batch ID: **R2560**	RunNo: **2560**								
Prep Date:	Analysis Date: **5/3/2012**	SeqNo: **71222**	Units: **mg/L CaCO3**							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20	80.00	0	0	59.9	111	0	10	S

Sample ID **1205120-001B MS**	SampType: **MS**	TestCode: **SM2320B: Alkalinity**								
Client ID: **BatchQC**	Batch ID: **R2560**	RunNo: **2560**								
Prep Date:	Analysis Date: **5/3/2012**	SeqNo: **71242**	Units: **mg/L CaCO3**							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	360	20	80.00	299.4	70.9	62.6	110			

Sample ID **1205120-001B MSD**	SampType: **MSD**	TestCode: **SM2320B: Alkalinity**								
Client ID: **BatchQC**	Batch ID: **R2560**	RunNo: **2560**								
Prep Date:	Analysis Date: **5/3/2012**	SeqNo: **71243**	Units: **mg/L CaCO3**							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	350	20	80.00	299.4	67.1	59.9	111	0.869	10	

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1205153**

14-May-12

Client: New Mexico Copper Corp

Project: Cu Flat

Sample ID **MB-1832** SampType: **MBLK** TestCode: **SM2540C MOD: Total Dissolved Solids**

Client ID: **PBW** Batch ID: **1832** RunNo: **2634**

Prep Date: **5/7/2012** Analysis Date: **5/8/2012** SeqNo: **73329** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	20.0								

Sample ID **LCS-1832** SampType: **LCS** TestCode: **SM2540C MOD: Total Dissolved Solids**

Client ID: **LCSW** Batch ID: **1832** RunNo: **2634**

Prep Date: **5/7/2012** Analysis Date: **5/8/2012** SeqNo: **73330** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	1,020	20.0	1,000	0	102	80	120			

Sample ID **1205078-002GMS** SampType: **MS** TestCode: **SM2540C MOD: Total Dissolved Solids**

Client ID: **BatchQC** Batch ID: **1832** RunNo: **2634**

Prep Date: **5/7/2012** Analysis Date: **5/8/2012** SeqNo: **73337** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	4,890	20.0	1,000	3,791	110	80	120			

Sample ID **1205078-002GMSD** SampType: **MSD** TestCode: **SM2540C MOD: Total Dissolved Solids**

Client ID: **BatchQC** Batch ID: **1832** RunNo: **2634**

Prep Date: **5/7/2012** Analysis Date: **5/8/2012** SeqNo: **73338** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	4,930	20.0	1,000	3,791	114	80	120	0.733	20	

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

QC SUMMARY REPORT

WO#: **1205153**

Hall Environmental Analysis Laboratory, Inc.

14-May-12

Client: New Mexico Copper Corp
Project: Cu Flat

Sample ID **MB-1808** SampType: **MBLK** TestCode: **SM 2540D: TSS**
Client ID: **PBW** Batch ID: **1808** RunNo: **2606**
Prep Date: **5/4/2012** Analysis Date: **5/4/2012** SeqNo: **72551** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Suspended Solids	ND	4.0								

Sample ID **LCS-1808** SampType: **LCS** TestCode: **SM 2540D: TSS**
Client ID: **LCSW** Batch ID: **1808** RunNo: **2606**
Prep Date: **5/4/2012** Analysis Date: **5/4/2012** SeqNo: **72552** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Suspended Solids	94	4.0	96.60	0	97.3	82.9	110			

Sample ID **1205122-001BDUP** SampType: **DUP** TestCode: **SM 2540D: TSS**
Client ID: **BatchQC** Batch ID: **1808** RunNo: **2606**
Prep Date: **5/4/2012** Analysis Date: **5/4/2012** SeqNo: **72556** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Suspended Solids	ND	4.0						0	15	

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: NEW MEXICO COPPER CORP   Work Order Number: 1205153

Received by/date: AT 05/03/12

Logged By: **Anne Thorne**   5/3/2012 8:35:00 AM   Anne Thorne

Completed By: **Anne Thorne**   5/3/2012   Anne Thorne

Reviewed By: AT 05/03/12

Chain of Custody

1. Were seals intact? Yes ☐ No ☐ Not Present ☑
2. Is Chain of Custody complete? Yes ☑ No ☐ Not Present ☐
3. How was the sample delivered? Client

Log In

4. Coolers are present? (see 19. for cooler specific information) Yes ☑ No ☐ NA ☐
5. Was an attempt made to cool the samples? Yes ☑ No ☐ NA ☐
6. Were all samples received at a temperature of >0° C to 6.0°C Yes ☑ No ☐ NA ☐
7. Sample(s) in proper container(s)? Yes ☑ No ☐
8. Sufficient sample volume for indicated test(s)? Yes ☑ No ☐
9. Are samples (except VOA and ONG) properly preserved? Yes ☑ No ☐
10. Was preservative added to bottles? Yes ☐ No ☑ NA ☐
11. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☑
12. Were any sample containers received broken? Yes ☐ No ☑
13. Does paperwork match bottle labels? Yes ☑ No ☐
    (Note discrepancies on chain of custody)
14. Are matrices correctly identified on Chain of Custody? Yes ☑ No ☐
15. Is it clear what analyses were requested? Yes ☑ No ☐
16. Were all holding times able to be met? Yes ☑ No ☐
    (If no, notify customer for authorization.)

# of preserved bottles checked for pH: 3 /
(<2 or >12 unless noted)
Adjusted?
Checked by: AT 05/03/12

Special Handling (if applicable)

17. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: Date
By Whom: Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:
Client Instructions:

18. Additional remarks:

19. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.6	Good	Not Present			

Chain-of-Custody Record

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Client: NMCC

Mailing Address: 2425 San Pedro NE Ste 100
Albuquerque, NM

Phone #: 505-400-7925

email or Fax#:

QA/QC Package:
☐ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other ______

☐ EDD (Type) ______

Turn-Around Time: ☐ Standard ☒ Rush May 11 — Need Results

Project Name: Cu Flat

Project #: Production Well Sampling

Project Manager: Katie Emmer

Sampler: CMC

On Ice: ☒ Yes ☐ No

Sample Temperature: 1.1°

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1205153	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	8310 (PNA or PAH)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)					Air Bubbles (Y or N)
5.2.12	14:30	H_2O	PW-3	500	none	-001												See attached list				
				125	H_2SO_4	-001																
				125	HNO_3 & filter	-001																
				500	HNO_3	-001																
				500	NaOH	-001																

Date	Time	Relinquished by	Received by	Date	Time
5-3-12	8:35	[signature]	[signature]	05/03/12	0835

Remarks: Please add Hardness per Andy of Katie 5/3
Need Results by May 11
Please email to: Kemmer@themacresourcesgroup.com

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Table 9-3

Analytical Parameters and Analysis Methods for Groundwater Samples

Analytical Parameter	Analysis Method	Lab Detection Limit (mg/L unless noted)
Anions		
Fluoride	EPA Method 300.0	0.1
Chloride	EPA Method 300.0	0.1
Nitrogen, Nitrite (as N)	EPA Method 300.0	0.1
Nitrogen, Nitrate (as N)	EPA Method 300.0	0.1
Sulfate	EPA Method 300.0	0.5
Dissolved Metals		
Aluminum	EPA Method 200.7	0.02
Antimony	EPA Method 200.8	0.005
Arsenic	EPA Method 200.8	0.02
Barium	EPA Method 200.7	0.002
Beryllium	EPA Method 200.7	0.002
Boron	EPA Method 200.7	0.04
Cadmium	EPA Method 200.7	0.002
Calcium	EPA Method 200.7	0.50
Chromium	EPA Method 200.7	0.006
Cobalt	EPA Method 200.7	0.006
Copper	EPA Method 200.7	0.0003
Iron	EPA Method 200.7	0.02
Lead	EPA Method 200.7	0.005
Magnesium	EPA Method 200.7	0.50
Manganese	EPA Method 200.7	0.002
Mercury	EPA Method 7470 CVAA	0.0002
Molybdenum	EPA Method 200.7	0.008
Nickel	EPA Method 200.7	0.01
Potassium	EPA Method 200.7	1.0
Selenium	EPA Method 200.8	0.02
Silicon	EPA Method 200.7	0.08
Silver	EPA Method 200.7	0.005
Sodium	EPA Method 200.7	0.5

Analytical Parameter	Analysis Method	Lab Detection Limit (mg/L unless noted)
Thallium	EPA Method 200.7	0.01
~~Titanium~~	~~EPA Method 200.7~~	~~0.005~~
Uranium	EPA Method 200.8	0.01
Vanadium	EPA Method 200.7	0.005
Zinc	EPA Method 200.7	0.005
Solids		
Total Suspended Solids (TSS)	SM 2540D	1.0 µg/L
Total Dissolved Solids (TDS)	SM 2540C	10
Alkalinity		
Alkalinity, total (as $CaCO_3$)	SM 2320B	20
Carbonate	SM 2320B	20
Bicarbonate	SM 2320B	20
Other		
pH	150.1	12.45
Specific Conductance	120.1	0.01 µS/cm
Cyanide	Kelada-01	0.005

Note: NA = not applicable as sample will not be analyzed for a given parameter.

Appendix F – JSAI Review of Methods and Assumptions for Predicting Open Pit Water Quality

JOHN SHOMAKER & ASSOCIATES, INC.
WATER-RESOURCE AND ENVIRONMENTAL CONSULTANTS
2611 BROADBENT PARKWAY NE
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TECHNICAL MEMORANDUM

To: Steve Raugust, New Mexico Copper Corporation
Katie Emmer, New Mexico Copper Corporation

From: Steven T. Finch, Jr., Principal Hydrogeologist-Geochemist, JSAI

Date: December 17, 2014

Subject: Review of methods and assumptions for predicting open pit water quality, Copper Flat Project, New Mexico

New Mexico Copper Corporation (NMCC) is in the process of obtaining a mining permit for the Copper Flat property near Hillsboro, New Mexico. To determine if the proposed Copper Flat open-pit water would meet New Mexico Water Quality Control Commission (NMWQCC) standards for stock and wildlife use, SRK (2013) prepared a report titled *Predictive Geochemical Modeling of Pit Lake Water Quality at the Copper Flat Project, New Mexico*. The SRK (2013) geochemical model incorporated the water model developed by JSAI (2013). Reviewers of the SRK (2013) report have raised questions about the following issues:

1. More detail is needed to validate the assumption of 10-percent average fracture density in the pit walls and the amount of wall rock available for leaching.
2. More detail is needed to demonstrate that the proposed open pit water body will be well mixed, remain oxygenated, and not chemically stratify.
3. The geochemical model needs to be calibrated to chloride concentrations in the existing open pit to make sure the effects of evaporation are accounted for.

This Technical Memorandum consists of three sections for addressing the issues listed above. Sections 1.0 and 2.0 compare the SRK (2013) approach and assumptions to other open pit geochemical investigations, Section 3.0 presents calibration and sensitivity analysis results of the water model (JSAI, 2013) to historical water-quality data from the existing open pit, and Section 4.0 is a summary of findings.

1.0 REVIEW OF OPEN PIT WALL-ROCK STUDIES

1.1 SRK (2013) Copper Flat Model

SRK (2013) used different conceptual models of wall rock available for leaching: one for the existing and one for the future Copper Flat open pit. The difference is due to the blasting technique; the existing pit was mined in 1982 using production blasting similar to the blasting effects analyzed by Siskind and Fumanti (1974), and the proposed pit would be mined using presplit drilling and smooth wall blasting practices. The two conceptual models are summarized below.

1.1.1 Existing Open Pit

For the existing Copper Flat open pit, SRK (2013) estimated 10-percent fracturing in the first 2 ft of open pit wall rock (crushed zone) and 5-percent fracturing for a 3.8-ft-thick transition zone. The limit of oxidation and depth to undisturbed rock was assumed to be about 6 ft behind the pit wall (see fig. 3-9; SRK, 2013). A reactive rim of 0.04 ft around the fractures was assumed for the rock in the pit walls (based on HCT results).

Quintana Minerals only used production blasting to create the existing pit. Production blasting uses large widely-spaced explosive charges that are designed to fragment a large amount of *burden* (the rock that lies between the existing slope face and the blast hole). Production blasting is the most efficient way to remove large rock burdens, but it typically creates radial fractures around the blast hole and back break (fractures that extend into the final slope face), which reduce the strength of the remaining rock mass and increase its susceptibility to slope raveling and rock fall.

1.1.2 Proposed Open Pit

For the future Copper Flat open pit, SRK (2013) estimated fracturing is 10 percent of rock volume for the first 1 ft of open pit wall rock (crushed zone), with no transition zone between the crushed zone and undisturbed zone (see fig. 3-3; SRK, 2013). The open pit wall rock approximate 1 ft from the surface was assumed to be the limit of oxidation and the depth to undisturbed rock (see fig. 3-9, SRK, 2013). A reactive rim of 0.04 ft around the fractures was assumed for the rock in the pit walls. The 1-ft crushed zone and no transition zone represent presplit drilling and smooth wall blasting practices. Presplit holes are blasted before production blasts. Procedure uses small diameter holes at close spacing and lightly loaded with distributed charges. Presplit holes protect the final pit wall cut by producing a fracture plane along the final slope face that fractures from production blasts cannot pass.

1.1.3 Rock Mass Available for Leaching

For both scenarios, water flow is assumed to be mobile in the crushed zone and oxidized rind. The calculation of reactive mass was based on an average rock density of 169 lb/ft^3 (2,700 kg/m^3).

Chemistry of open pit run-off, for each pit wall material type, is estimated from scaled kinetic test cell (HCT) leachate concentrations. Average HCT solute concentrations are scaled up based on the pit wall water-rock ratio, and computed based on the estimated degree of fracturing and thickness of the reactive rind (SRK, 2013; p. 30).

1.2 Review of Pit Wall Fracturing References

1.2.1 Blasting Effects

Siskind and Fumanti (1974), a key reference used by SRK (2013), studied the fracturing produced in the vicinity of large-diameter blast holes (production blasting) in Lithonia Granite. The purpose of the Siskind and Fumanti (1974) study was to evaluate the use of production blasting to increase permeability for in-situ mining, where the amount of fracturing between holes is intended to be maximized for economic efficiency. A severely fractured zone was found to extend approximately 25 inches (64 cm) from the center of the 6-1/2-inch (16.5 cm) blast holes. A second zone, characterized by a lesser degree of fracturing, extended from 25 to 45 inches (64 to 114 cm). Beyond 45 inches (114 cm), the rock was undamaged. Carroll and Scott (1966) evaluated blasting effects on quartz monzonite and granodiorite (Climax Stock near Mercury, Nevada) and found that production blasting created an altered zone 0 to 8 ft in depth, and blast damage 2 to 4 ft in depth.

Kelsall and others (1984) found that in granite and basalt blasting enhanced permeability by about 10 times near the blast face, but the extent of blast effects were generally limited to <3.3 ft (<1 m), and possibly as little as 1 ft (0.3 m) when using low-charge blast methods.

It is important to note that granite, granodiorite, and quartz monzonite are similar intrusive rocks with similar rock properties. The primary difference is the quartz and feldspar content. The quartz monzonite at Copper Flat is therefore analogous to the granite and granodiorite in the blasting studies cited above. The Siskind and Fumanti (1974) study cites physical properties of the Lithonia Granite. Recent physical properties or the principal rock types of the Copper Flat Ore are presented in a 2013 report prepared by Mine Design Engineering of Kingston, Ontario, Canada for THEMAC Resources (Mine Design, 2013). The Mine Design report (2013) was prepared for the purposes of engineering the future pit walls for geotechnical stability. Table 1 presents a comparison of selected physical properties Lithonia Granite to the Copper Flat Quartz Monzonite and Quartz Monzonite Breccia.

Figure 1 presents the Copper Flat pit outline (Pre-Feasibility Study; PFS) from the 2013 Mine Design report, which shows the major rock types, their distribution, and the locations of the geotechnical drill holes where the samples from Table 1 were collected. From information presented in Mine Design (2013), and other available information, the Definitive Feasibility Study (DFS) pit geometry was developed. For geochemical characterization purposes, the PFS pit is very similar to the DFS Pit (SRK, 2014).

Table 1. Summary of the physical properties of the Lithonia Granite with Copper Flat Quartz Monzonite (QM) and Quartz Monzonite Breccia (QMBX)

Laboratory Analysis	Lithonia Granite (Tested by prevous investigators)	Lithonia Granite (Tested by authors at H-100 control hole)	QM (Average Values)	QM (Maximum Values)	QM (Minimum Values)	QMBX (Average Values)	QMBX (Maximum Values)	QMBX (Minimum Values)
Specific Gravity	2.63	-	2.68	-	-	2.57	-	-
Density (lb/ft^3)	164	-	167	-	-	160	-	-
Tensile Strength (lb/in^2)	450	-	2,132	3,075	493	1,247	1,697	653
Compressive Strength (lb/in^2)	30,000	28,000	18,490	29,400	11,810	6,614	6,614	6,614
Young's Modulus (lb/in^2)	3,000,000	6,400,000	5,018,000	6,135,000	3,626,000	2,973,000	2,973,000	2,973,000
Poisson's Ratio	0.26	-	0.10	0.09	0.11	0.12	0.12	0.12

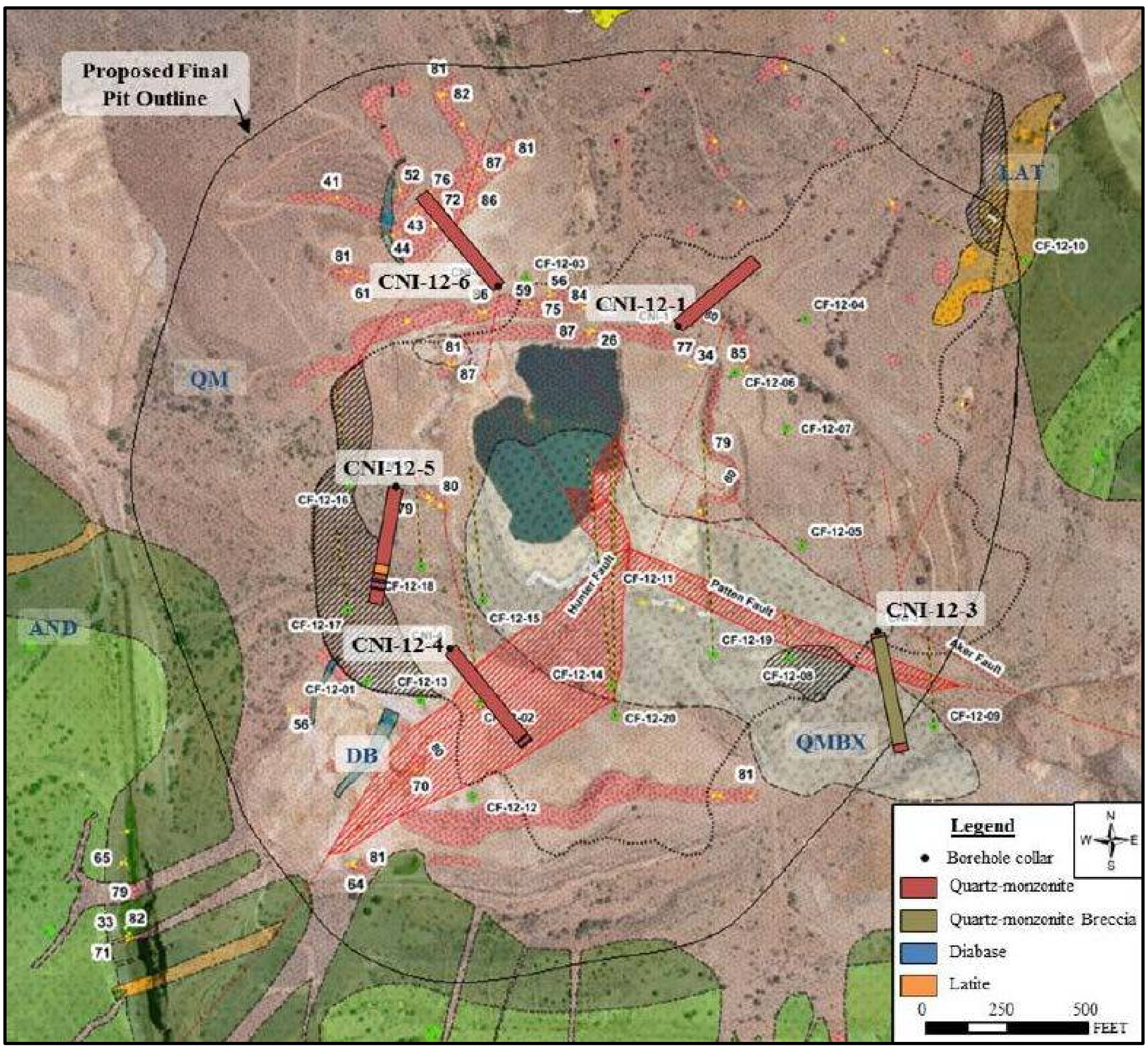

Figure 1. Geotechnical drill hole locations and the Pre-Feasibility Study pit outline (Mine Design, 2013).

1.2.2 Fracture Permeability

Molebatsi and others (2009) noted that many open-pit mines are located in fractured rock systems where water flow paths are complex and difficult to predict. These flow paths are typically controlled by a small subset of fractures that are permeable and interconnected. Most models of flow in fractured rock systems are based on a network of interconnected fractures that are all assumed to be permeable. However, this assumption is rarely observed in natural rocks where a significant number of the fractures within a connected cluster may be impermeable.

Field observations have shown that only a small proportion of fractures contribute to the overall flow, resulting in a complex and heterogeneous flow system. Up to 20 percent of the total number of fractures may contribute to overall flow (Bear et al., 1993). Although fracture connectivity has been used to explain heterogeneous phenomena (de Marsily, 1985), it is likely that additional aspects such as the effect of partial or total closure of individual fractures could further increase flow heterogeneity and tortuosity. Effectively impermeable fractures that (although mappable) will not conduct flow will thus need to be excluded from the conductive fracture cluster.

Not discussed in detail by Molebatsi and others (2009) is the rock type and mineralization of fractures, degree of fracturing, hydraulic conductivity in comparison to fracture density, and specific yield of rock. Obviously, fractured rock with low hydraulic conductivity would have more impermeable fractures than high hydraulic conductivity fractured rock that effectively behaves as a porous medium.

1.3 Other Open-Pit Geochemical Models

1.3.1 URS (2009) Little Rock Mine Post-Closure Pit Lake Model

The Little Rock open pit mine is located near Silver City, New Mexico, and is currently operating. URS (2009) assumed that a mixture of the in-situ field leaching tests and the HCT leachates represents the pit wall runoff. For the most likely case, an equal-weight mixture of the mean in-field leachate results, week-0 HCT results, and HCT results from the first 4-week idle period was used to represent run-on from the exposed pit walls above the pit lake. URS (2009) assumed: 1) rock samples collected within 100 ft of the final pit wall are representative of the exposed wall rock, and 2) a combination of the in-situ field leachates and the HCT leachates mimics weathering of pit wall rock. There is no discussion of blasting effects or increased fracture density on leaching of wall rock.

1.3.2 Tetra Tech (2010) Rosemont Copper Project

The Rosemont Copper project is located in southeastern Arizona. For simulating the initial flushing of blast-fractured pit walls, Tetra Tech (2010) used the first rinse from the HCTs to represent the chemical source terms. The HCT concentrations were generally higher than from the Synthetic Precipitation Leaching Procedure (SPLP) results, which generally correspond to rock that has had more time to weather before contacting water.

The near-surface wall rock of the anticipated ultimate pit shell is expected to be affected by blasting. An initial chemical flushing of the blast-affected pit wall rock was incorporated into the pit lake model. The near-pit wall rock is anticipated to have altered hydraulic properties and increased fracture density as a result of blasting and the extraction of surrounding rock. An increase in the porosity and specific yield (3 to 15 percent) of the near-surface wall rock is expected. The blast-affected wall rock was considered to extend for a distance of six (6) ft behind the ultimate pit wall; there was no basis provided for this assumption.

Where available, the chemical source terms used for flushing of the blast-affected wall rock for each formation were developed using the averaged first-rinse HCT data. Scaling of HCT data was not considered. For formations without HCT data, the concentrations of major cations and anions derived from SPLP tests were multiplied by a factor of three (3) and the trace metals were multiplied by a factor of two (2). Three (3) pore volumes of the blast-affected wall rock were considered in the model for the initial flush, after which standard groundwater inflow chemistry was assumed.

1.3.3 Schafer (2007) Betze Pit Lake Water Quality Predictions

Schafer (2007) estimated the thickness of the weathered zone behind the pit wall by applying the approximate analytical solution (shrinking core model) derived by Davis and others (1986). The shrinking core model considers that particle size and the reactive core shrink simultaneously; therefore, sulfide oxidation rates decrease over time. A porosity of 2 percent was used to represent the highwall, while the rate of interparticle diffusion was determined from historical humidity cell tests. The rate of interparticle diffusion was calculated using the Millington Quirk equation (Jury et al., 1991). For portions of the highwall with relatively low sulfide levels, oxygen can penetrate nearly 16.4 ft (5 m) after 400 years, while the depth of oxygen penetration is closer to 9.8 ft (3 m) after 400 years for higher sulfide zones. The overall average thickness of the oxidized wall rock was estimated to be 9.8 ft (3 m).

1.3.4 Schafer (2010) Dee Pit Lake, Arturo Mine

Schafer (2010) assumes the thickness of a weathered highwall increases with increasing exposure to oxidation. The thickness of the weathered zone was estimated for the Dee pit lakes by applying the approximate analytical solution derived by Davis and others (1986). A porosity of 3 percent was used to represent the highwall. Other data needed to calibrate the Davis and others (1986) equations were determined from pyrite weathering rates observed in humidity cell tests. The rate of interparticle diffusion was calculated using the Millington Quirk equation (Jury et al., 1991). For portions of the highwall with relatively low sulfide levels, oxygen can penetrate over 15 ft (5 m) after 400 years, while the depth of oxygen penetration is closer to 10 ft (3 m) after 400 years for higher sulfide zones (see Fig. 2 below).

1.3.5 Adrian Brown (1997) Cunningham Hill Mine Open Pit

A water model and geochemical model were coupled to predict open pit water quality. The model was calibrated to existing water levels and water-quality data (alkalinity, calcium, and sulfate). Inputs from existing acid wall seepage (AWS) were used to simulate open pit water-rock interactions. The water-quality model was simply a mixing model if open pit water quality remained under-saturated with respect to gypsum.

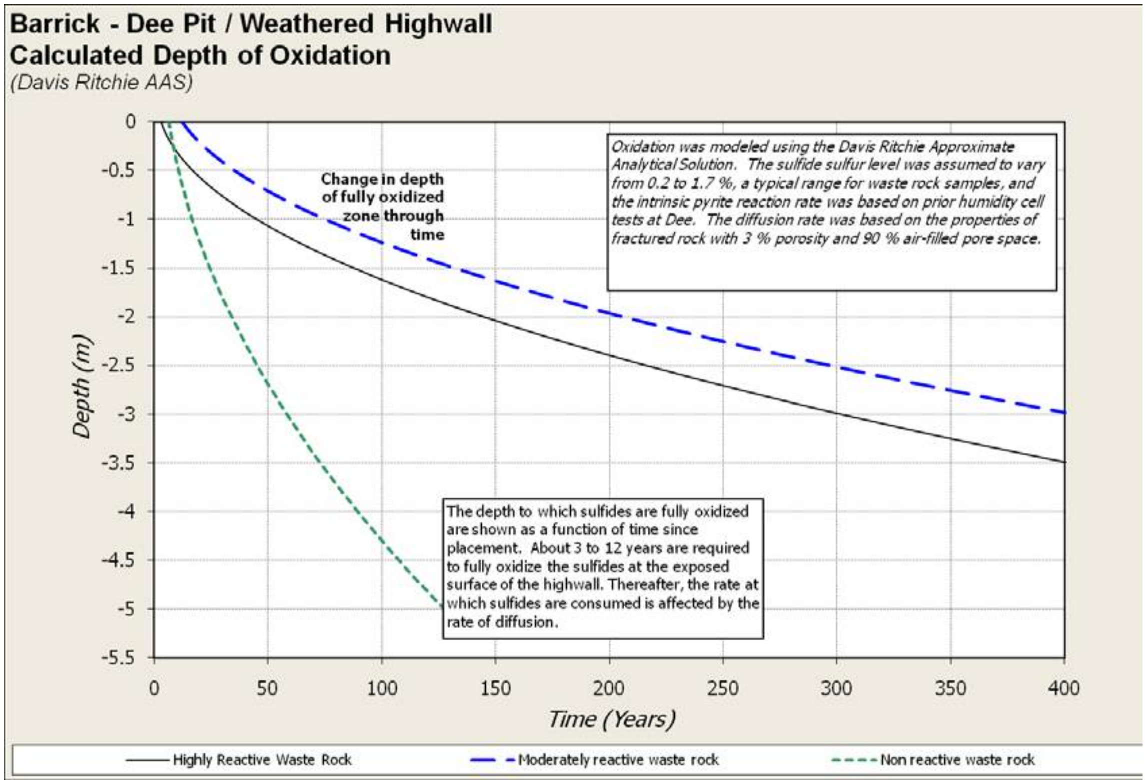

Figure 2. Graph showing depth of oxygen penetration based on the Davis and others (1986) approximate analytical solution (Schafer (2010) Fig. 13).

A groundwater flow and solute transport model of the open pit and surrounding groundwater system was developed by JSAI (1999), and later updated and recalibrated by JSAI (2011). It was demonstrated that the open pit general chemistry is more influenced by water budget components (mixing) than by mineral precipitation reactions.

1.3.6 Kempton and Atkins (2009)

Kempton and Atkins (2009) provide a review of methods for predicting water quality in open pits where sulfide oxidation is a major source term. Shrinking core models have been demonstrated to effectively simulate conditions in uniform materials, such as tailings. However, it is difficult to evaluate accuracy in the more heterogeneous pit benches and walls.

Kempton and Atkins (2009) evaluated a method for direct measurement of sulfide oxidation rates in mine pit benches by sealing a drape-chamber apparatus to the surface. They found that application of this method to benches and waste rock have not found the measured oxidation rates to be meaningfully correlated to sulfide sulfur, presence of surface rubble, moisture conditions, or carbonate content of the underlying rock. This suggests that physical processes such as blast-induced wall rock porosity and depth of pit-wall oxidation were more important than chemical processes. It was noted that fracturing is lower in competent rock, such as granite, and that careful blasting can reduce fracturing. Kempton and Atkins (2009) concluded that reliable comparisons of model-simulated versus observed pit lake water quality are needed to accurately assess model capabilities; this is exactly what SRK (2013) has done.

1.4 Discussion

Geochemical models for predicting open pit water quality are commonly most sensitive to the water budget components and the calculated solute contributions from sulfide oxidation. Open pit water-quality models with the least accurate predictions have under-estimated the potential for sulfide oxidation in wall rock and poorly represented water budget components (Kuipers and others, 2006). One reason for inaccurate water quality predictions is the lack of historical data for model calibration; most projects do not have an existing open pit water body with good time-series data. In contrast, the proposed Copper Flat open pit geochemical and groundwater flow model is calibrated to an existing open pit water body with 30 years of data.

Open pit wall blast damage for granite, granodiorite, and quartz monzonite rocks extends 2 to 4 ft in depth when assessing effects from production type blasting (Carroll and Scott, 1966; Siskind and Fumanti, 1974; and Kelsall and others, 1984).

Kelsall and others (1984) found that production blasting enhances permeability by about 10 times near the blast face. Molebatsi and others (2009) indicate that a small percentage (<20 percent) of the total fractures will contribute to permeability of the system. Typically, fractured rock groundwater systems are assumed to have a specific yield of less than 5 percent, and commonly less than 1 percent. The calibrated Copper Flat groundwater flow model simulates a specific yield of 0.001 (0.1 percent) in the quartz monzonite. If blast fracturing increased the effective porosity (specific yield) by an order of magnitude, the specific yield of the blast zone would be 1 percent. The 5 to 10 percent fracture density used by SRK (2013) can be considered conservative given the properties of the open pit wall rock estimated from the calibrated groundwater flow model.

A summary of the case studies reviewed is presented in Table 2. SRK (2013) is the only open pit water-quality model that includes blasting effects in the pit walls, scaled HCT data, and calibration to existing pit water chemistry.

Table 2. Summary of open pit water-quality prediction studies

reference	open pit	pit wall fracture assumptions	sulfide oxidation model	calibration to existing pit
SRK (2013)	Copper Flat	5 - 10 % fracture density (porosity) with depth based on blasting method; ranging from 1 to 6 ft	based on scaled HCT data	yes
Adrian Brown (1997)	Cunningham Hill	used measured acid wall seepage (AWS) data	used measured AWS data	yes
URS (2009)	Little Rock	none	based on HCT data	no
Tetra Tech (2010)	Rosemont	3 to 6% porosity, 6 ft depth	based on HCT data	no
Schafer (2007)	Betze	2 % porosity with oxidation depth increasing with time; 10 to 16 ft after 400 years	shrinking core model	no
Schafer (2010)	Dee	3 % porosity with oxidation depth increasing with time; 10 to 15 ft after 400 years	shrinking core model	no

2.0 STRATIFICATION OF OPEN PIT WATER BODIES

SRK (2013) concluded the proposed Copper Flat pit will not stratify, and will remain oxygenated. The proposed Copper Flat open pit water body will have a maximum depth of approximately 200 ft with a maximum surface area of about 22 acres.

2.1 Overview

Based on elevation and latitude, the Copper Flat open pit water body is classified as a warm monomitic type lake (Wetzel, 2001; fig 6-7). A warm monomitic lake mixes freely once a year in the winter at or above 4 °C. However, wind effects and water body geometry can have an effect on the degree and frequency of mixing. Baseline data (INTERA, 2012) from the existing pit water body provides evidence that a thermocline develops in the summer and mixing occurs in the winter. A chemocline does not develop, and the water body remains oxygenated (dissolved oxygen = 6 to 9 mg/L) throughout the full water column year-round. The existing open pit water body has an area of about 5 acres, maximum depth of 30 ft, and length of about 460 ft.

The relative depth (RD) of the predicted Copper Flat open pit water body at the maximum pit water stage is approximately 18 percent. RD relates the maximum depth of a lake (Z) to the width (d). Assuming an approximately circular lake, the width is a function of surface area (A) and can be determined from:

$$d = 2(A/\pi)^{0.5}$$

The percent RD is defined as:

$$RD = (Z/d)*100 \text{ percent}$$

The estimated RD of 18 percent is considerably greater than 5 percent, which typically suggests that the lake is likely to stratify. Such stratification may result in oxidizing conditions in the upper portions of the lake and more chemically reducing (oxygen-deprived) conditions at depth. However, pit lakes that form in arid regions are unlikely to stratify, relative to lakes that form in cooler, wetter climates (Jewell, 2009). A prerequisite for permanent stratification is that precipitation plus runoff is greater than evaporation during the summer months when the water body is potentially undergoing temporary thermal stratification (Jewell, 2009).

While stratification of an open pit water body has implications for water quality at depth, the near-surface waters will remain oxidized. These near-surface waters are considered the most important from an open pit water-quality perspective given the potential ecological risks associated with them. The water quality at depth is less important given the expected terminal nature of the open pit water body.

2.2 Case Studies

Jewell (2009) evaluated six permanently-stratified and eight open pit lakes with seasonal thermocline, and concludes that permanently stratified lakes have vertical density contrast greater than 0.0005 g/cm^3 and a Wedderburn number greater than 1. The Wedderburn number considers thermocline depth, maximum lake length, water density, and wind speed. Jewell (2009) failed to note that most permanently-stratified open pit lakes receive AWS inputs and have acidic water. A summary table of existing open pit water bodies and their characteristics is presented in Table 3.

Table 3. Summary of open pit water bodies and stratification characteristics

open pit	location	effective length (ft)	maximum depth (ft)	relative depth (percent)	thermocline depth (ft)	acidic
permanently stratified						
Brenda	B.C.	2,296	492	21	39	no
Spenceville	California	253	50	20	13	yes
Berkeley	Montana	5,900	426	7	23	yes
Seasonal thermocline and well mixed						
Humbolt	Nevada	944	137	15	8	no
Blackhawk	Utah	492	na	na	33	no
Blowout	Utah	656	230	35	39	no
Colosseum	California	482	157	33	na	no
Cunningham Hill	NM	407	90	22	20	no
Copper Flat (existing)	NM	537	30	6	20	no[1]
Copper Flat (proposed)	NM	1,105	200	18	TBD	no
Yerington	Nevada	5,412	400	13	49	no

[1] there have been temporary acidic conditions where the pit water naturally neutralizes over time
TBD - to be determined

2.3 Discussion

The proposed Copper Flat open pit is expected to have a seasonal thermocline, be well mixed, oxygenated, and not acidic. Relative depth does not appear to govern the conditions for creating a permanently stratified open pit water body; however, acidic water and higher latitude are key conditions for creating permanent stratification.

3.0 COPPER FLAT OPEN PIT WATER MODEL

The Copper Flat open pit and groundwater flow model (water model) developed by JSAI (2013) was calibrated to water levels, water budgets, and hydraulic properties. The water model was used by SRK (2013) in the geochemical model. The JSAI (2013) water model was an interim version that was finalized in 2014, but the pit water balance did not change.

The water model is used here to address calibration to the Copper Flat open pit evaporation. Evaporation accounts for all of the outflow from the open pit water body; however, the water model only simulates average climate conditions. Figures 3 through 5 illustrate the model-simulated effects of evaporation on total dissolved solids, (TDS), sulfate, and chloride concentrations in the open pit when considering mixing without mineral precipitation.

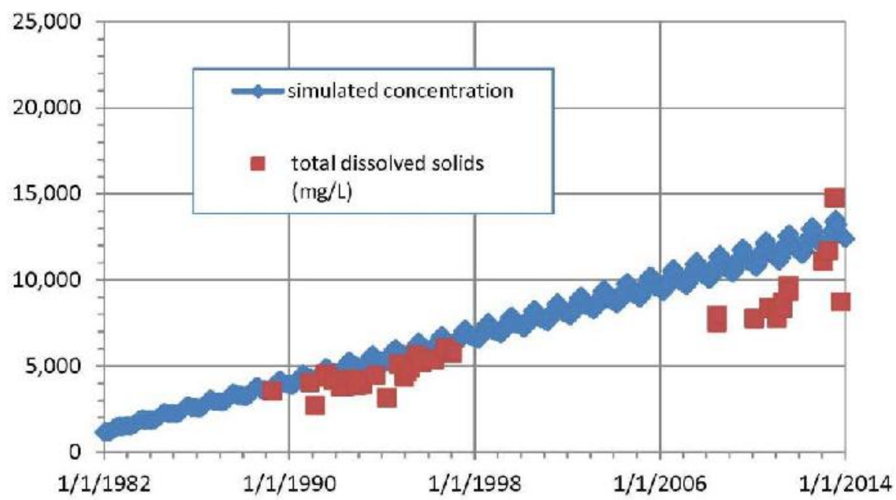

Figure 3. Graph showing water-model simulated and measured TDS concentrations for the Copper Flat open pit water body.

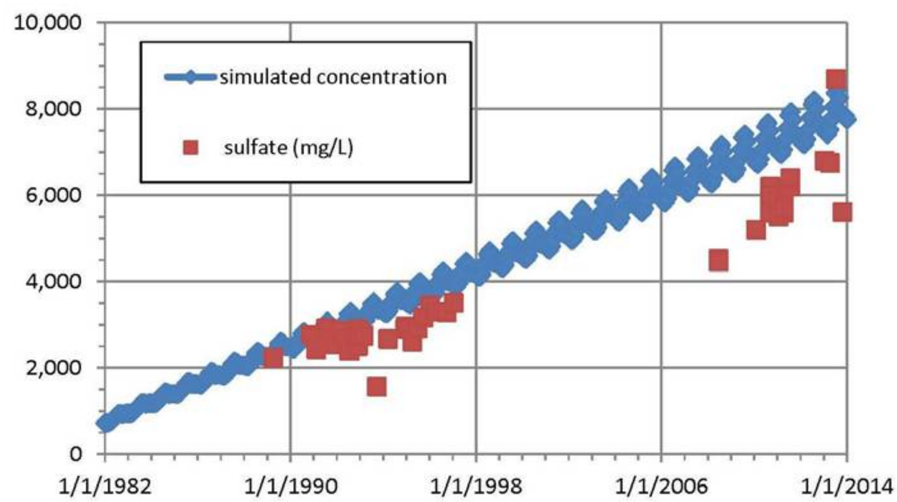

Figure 4. Graph showing water-model simulated and measured sulfate concentrations for the Copper Flat open pit water body.

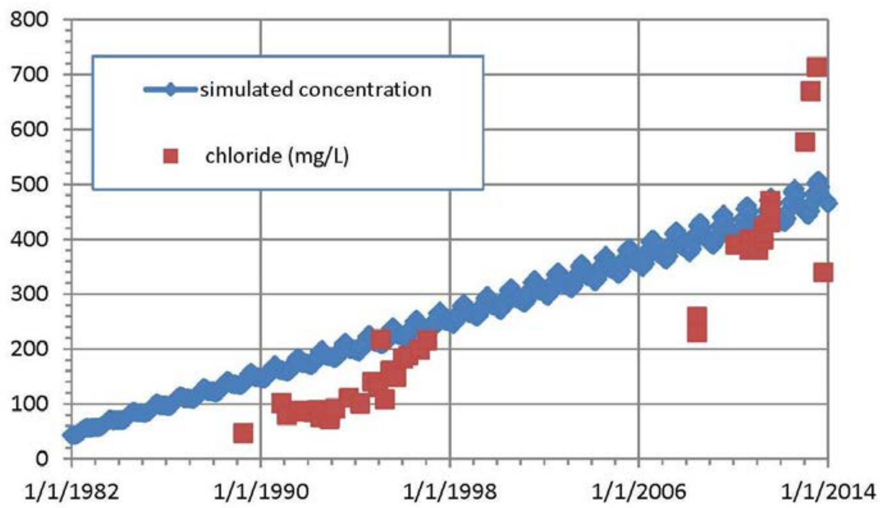

Figure 5. Graph showing water-model simulated and measured chloride concentrations for the Copper Flat open pit water body.

Data collected during 2013 show the evapo-concentration effects of extreme drought with concentrations well above the model-simulated concentrations, but 4th quarter 2013 concentrations were well below the model-simulated concentrations, due to a heavy monsoon period (Figs. 3 through 5). The model appears to reasonably simulate the average climate conditions.

SRK (2013) calibration of the geochemical model to existing pit conditions was performed for the 2011 dataset. The geochemical model considers mixing from the water model and mineral precipitation reactions. The geochemical model calibrates to TDS and sulfate better than the water model with mixing alone, but the water model calibrates better to chloride concentrations than the geochemical model (Table 4). The effects of evaporation are reasonably calibrated in the water model and reflected in the geochemical model.

Table 4. Comparison of water-model and geochemical-model simulated TDS, chloride, and sulfate concentrations to measured concentrations, Copper Flat open pit

constituent	2010-2011 measured range (mg/L)	geochemical-model results (mg/L)	water-model results (mg/L)
total dissolved solids (TDS)	7,770 to 9,410	7,751	11,621
sulfate	5,200 to 6,400	5,152	7,263
chloride	380 to 470	235	436

mg/L - milligrams per liter

4.0 SUMMARY OF FINDINGS

In summary, SRK (2013) assumptions used for reactive wall thickness and fracture density for the existing and proposed future pit are reasonable and supported by detailed studies pertaining to blasting effects on quartz monzonite rocks cited in Section 1.0. SRK (2013) used fracture-density results reflective of production blasting for the existing Quintana pit walls, and fracture density results reflective of low-charge blasting methods for the future open pit. Sensitivity of model results to fracture density and reactive wall thickness is reflected in these two simulations.

Out of the case studies reviewed (Table 2), SRK (2013) is the only open pit water quality model that considers blasting effects in the pit walls, scaled HCT data, and calibration to existing pit water chemistry. Calibration of the water model and geochemical model to existing data strengthens the ability to accurately predict future conditions.

Relative depth does not appear to govern the conditions for creating a permanently stratified open pit water body; however, significant acidic water inputs and higher latitude are key conditions for creating permanent stratification. The proposed Copper Flat open pit is expected to be seasonally stratified (thermocline only), well mixed, oxygenated, and not acidic. Baseline data from profiles in the existing pit at Copper Flat support the conclusion that the proposed pit will be well mixed and oxygenated.

Using the water model to simulate mixing and evapoconcentration effects on chloride, sulfate, and TDS demonstrates that the water model is calibrated to the effects of evaporation. The results in Table 4 compare simulated evapoconcentration with no mineral precipitation (water model only) to simulated evapoconcentration with mineral precipitation (water model and geochemical model). This comparison of model results to historical data is a sensitivity analysis that shows that the water and geochemical models are well calibrated to effects of evaporation.

The SRK (2013) geochemical model is representative of expected conditions at Copper Flat, and presents the best technical approach for predicting water quality at the future Copper Flat open pit.

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Appendix G – JSAI Future Pit Water Balance

TECHNICAL MEMORANDUM

To: Jeff Smith, New Mexico Copper Corporation jsmith@themacresourcesgroup.com

From: Steve Finch, Principal Hydrogeologist-Geochemist
Michael A. Jones, Principal Hydrologist

Date: September 25, 2017

Subject: Post reclamation open pit surface area storm-water runoff calculations, Copper Flat Project, New Mexico Copper Corporation

John Shomaker & Associates, Inc. (JSAI) developed and calibrated a groundwater flow model for the New Mexico Copper Corporation (NMCC) Copper Flat project (JSAI, 2014), which included the proposed Copper Flat open pit. The model was calibrated to historical and current conditions at the Copper Flat Open Pit, and used to predict effects of the proposed mining plan.

The purpose of this technical memorandum is to establish storm-water runoff coefficients and watershed areas representative of the post-mining reclamation of the proposed Copper Flat Open Pit Surface Drainage Area (OPSDA). The post-mining OPSDA and watershed areas discussed in this memo are shown on Figure 1.

After reclamation, there will be three areas with different runoff coefficients inside the OPSDA:

1. Reclaimed watershed area surrounding the open pit;
2. Reclaimed sections of the Open Pit shell; and
3. Un-Reclaimed sections of the Open Pit shell.

Curve numbers for the different areas shown on Figure 1 and listed in Table 1 were derived from the NRCS Part 630 Hydrology National Engineering Handbook. The curve number equation (from NRCS, 2004) and precipitation statistics from the Hillsboro station were used to develop the assigned runoff coefficients presented in Table 1.

Post mining OPSDA reclamation will include re-contouring, placement of cover materials, and revegetation. As described in the NMCC Baseline Data Report, cover materials will resemble sandy to silty loam representative of Hydrologic Soil Group B (NRCS, 2009).

The hydrologic conditions of the reclaimed OPSDA will be classified as poor to fair, resembling desert shrub with less than 40 percent vegetative cover (NRCS, 2004). A Curve Number of 75 is representative of Desert Shrub landscape, Hydrologic Soil Group B, and less than 40 percent vegetative cover (NRCS, 2004; table 9-1).

Table 1. Summary of corresponding Curve Number and assigned Runoff Coefficient for sub-regions within the reclaimed Copper Flat Open Pit Surface Drainage Area

sub-region name	corresponding Curve Number	assigned Runoff Coefficient
Reclaimed OPSDA	75	0.071
Reclaimed Pit Shell	90	0.303
Un-Reclaimed Pit Shell	80	0.126

The reclaimed pit shell includes the haul road and potentially other accessible areas. Reclaimed surface is expected to resemble improved dirt road, and have a corresponding runoff curve number of 90 (NRCS, 2004; table 9-1).

The un-reclaimed pit shell was assigned a runoff curve number of 80, which has been derived from water balance studies for other open pits, such as the Cunningham Hill Mine Reclamation Project (JSAI, 2012).

Precipitation statistics were used with the runoff curve number to calculate the runoff coefficient presented in Table 1. Surface-water runoff is calculated from daily precipitation data, and soil conditions represented by a runoff curve number (NRCS, 2004a). Runoff is estimated using the following equations:

$$Ia = S*0.2$$

$$S = (1{,}000/CN)-10$$

$$Q = \frac{(P-Ia)^2}{(P-Ia)+S}$$

where,

Ia equals the initial abstraction including surface storage, interception by vegetation and infiltration prior to runoff, in inches depth over the drainage area.

S equals the potential maximum retention of water by the soil in equivalent inches depth over the drainage area.

CN equals the runoff curve number

P equals the accumulated rainfall in inches depth over the drainage area

Q equals the accumulate volume of runoff in inches depth over the drainage area

The runoff equations (above) are used to calculate the average annual runoff for the period of record from the Hillsboro Station. An example for Curve Number equal 90 is presented in Table 2. The calculated average annual runoff for period of record is divided by the average annual precipitation for period of record (12.5 in./yr) to derive the runoff coefficient.

Table 2. Summary of Hillsboro Station precipitation statistics and calculated runoff used to derive runoff coefficient for reclaimed pit shell area (CN=90)

Range in daily precipitation events	No. of daily precipitation events within range for period of record*	Average number of precipitation events per year for period of record	average magnitude of precipitation event for range (in.)	P-Ia for CN =90	runoff per average event for range (in.)	average runoff per year (in.)
>3	3	0.031	3.29	3.070	2.86	0.090
2 - 3	21	0.219	2.31	2.090	1.89	0.414
1 - 2	168	1.752	1.32	1.100	0.92	1.606
0.5 - 1	490	5.109	0.7	0.480	0.33	1.682
					sum	3.79
Runoff coefficient (CN=90) = (3.79 in)/(12.5 in) = 0.303						

* Hillsboro station period of record equals 95.9 years or 35,037 days with average annual precipitation of 12.5 inches per year

Attachments

Figure 1. Map showing post-mining watershed areas for the Copper Flat Open Pit Drainage Area.

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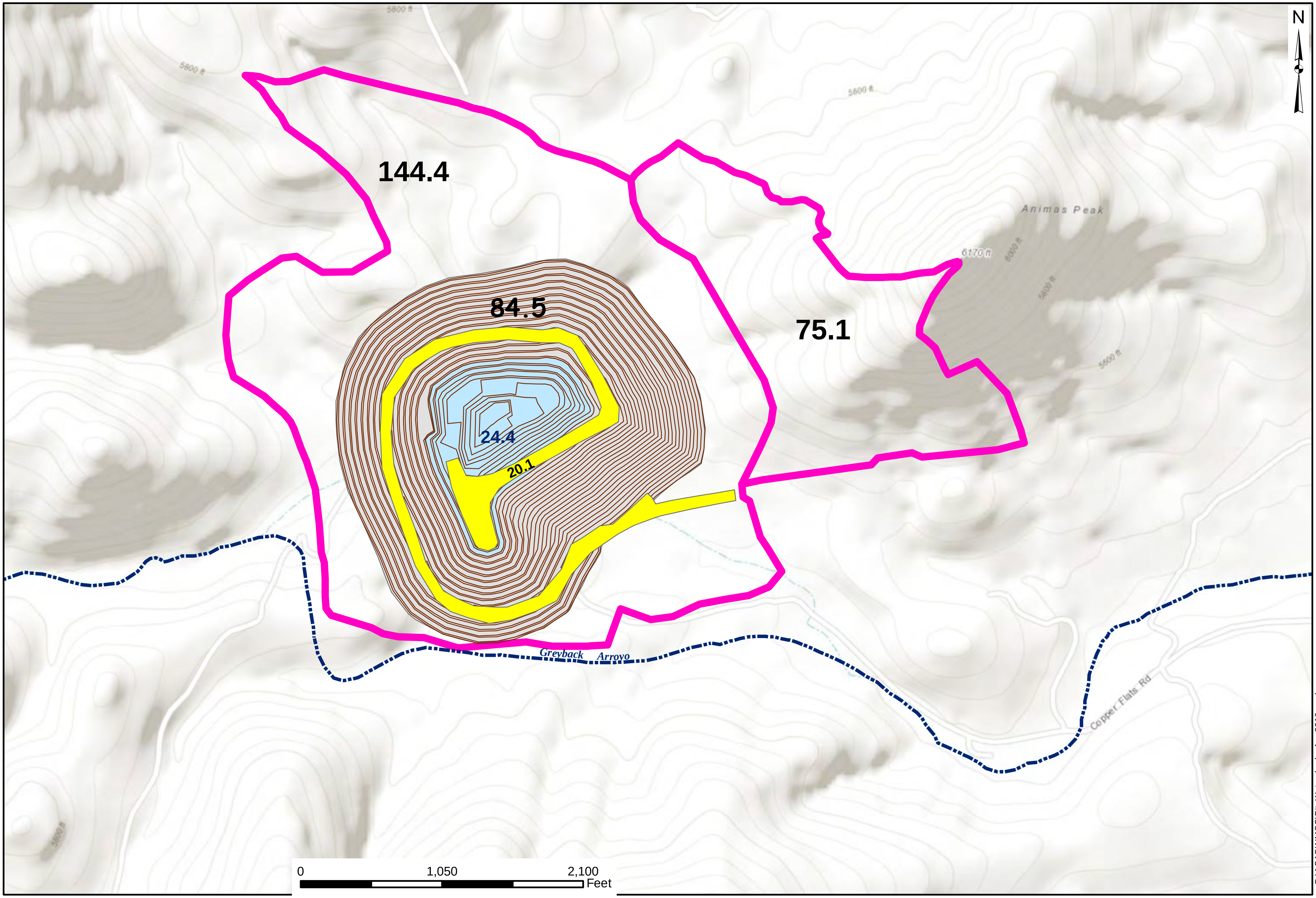

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Figure 1. Map showing post-mining watershed areas for the Copper Flat Open Pit Drainage Area.

JOHN SHOMAKER & ASSOCIATES, INC.
18569

JSAI Pit Water Balance
Summary Statistics

Parameter	Units	Pit Model: Un Reclaimed	Pit Model: Reclaimed
Model Date		Jun 2017	Jul 2017
Pit Fill Method		Natural Fill	Rapid Fill
Total Pit Watershed	Acres	314	314
Watershed Ex-Pit	Acres	185	185
Watershed In-Pit	Acres	129	129
Pit Reclaimed Surfaces	Acres	0	46
Pit Unreclaimed Surfaces	Acres	0	83
Pit Lake Surface Area at Static Level	Acres	22	22
Annual Precipiation Rate	Inches	12	12
Annual Evaporation Rate	Inches	50	50
Runoff Coefficient, Ex-Pit Watershed		0.071	0.071
Runoff Coefficient, In-Pit Watershed Reclaimed		0.303	0.303
Runoff Coefficient, In-Pit Watershed Unreclaimed		0.126	0.126
Fresh Water Fill	Acre-Feet	0	2,201
Pit Lake Annual Evaporation @ Static Level	Acre-Feet	91	92
Annual Groundwater Inflow	Acre-Feet	36	36
Annual Stormwater Inflow, Total Watershed	Acre-Feet	54	57
Annual Stormwater Inflow, Ex-Pit	Acre-Feet	14	14
Annual Stormwater Inflow, In-Pit	Acre-Feet	41	43
Pit Lake Volume at Static Level	Acre-Feet	2,278	2,286
Pit Lake Depth at Static Level	Feet	247	248
Pit Lake Surface Elevation at Static Level	Feet AMSL	4,897	4,898

Appendix H – PHREEQC Input Files (electronic)

Appendix H(i) – Existing pit calibration model

Appendix J – Aquatic Consultants Inc. Biological Assessment of the Existing Copper Flat Pit Lake

Copper Flat Mine

Biological Assessment
November 2014

Aquatic Consultants Inc.

"Your Lake & Stream Experts"

METHODS

All samples were collected and field measurements were completed on 06 November 2014. All testing was conducted by Aquatic Consulting & Testing, Inc. (Arizona Laboratory License No. AZ0004). Measurements and samples were collected from three locations (coordinates shown below) except where otherwise described.

Location 1:	N 32º58’11.97”	W 107º32’03.52”
Location 2:	N 32º58’15.24”	W 107º32’03.08”
Location 3:	N 32º58’14.48”	W 107º32’00.80”

Light transmission was measured using an Apogee MQ300 quantum meter and remote sensor. Transparency was measured using a standard Secchi Disk.

Temperature and oxygen profiles were measured using a YSI Model 550A dissolved oxygen meter with remote sensor. Light extinction coefficient was calculated using the quantum meter data and the following formula:

Light extinction coefficient $k = (\ln I_o - \ln I_d) \times 1/z$
Where k = extinction coefficient
I_o = light intensity at surface
I_d=light intensity at depth umhol/m^2/s [or uE]
Z= depth (m)

Water samples were collected from a depth of 0.5 meter at the three sampling locations and composited into a single sample. Depth-integrated samples were not required because the water was not vertically stratified. Sample preservation and chemical analyses were performed using EPA or APHA (Standard Methods) procedures licensed by Arizona Department of Health Services. Specific test methods are referenced in the attached laboratory reports. Algae identification and counts were made using a Nikon Diaphot phase/contrast inverted microscope. Samples were concentrated using an Utermohl settling chamber. Identifications were made using the following taxonomic references:

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Zooplankton was collected using an 80-um Wisconsin plankton net. A vertical tow from the bottom to top of the water column was made at each location and combined to produce a composite. At the laboratory, the concentrated sample volume was measured and recorded, an aliquot was transferred to a counting chamber, and the sub-sample was observed using a dissecting microscope. Zooplankton forms were identified and counted.

Benthic (sediment) samples were collected with a stainless steel Ponar dredge. The sediment was hand sorted and screened in the laboratory to retrieve and isolate macroinvertebrates. Particle size analysis was conducted using an ATM Arrow shaker equipped with stacked U.S. standard sieves.

Fish sampling was conducted using an 18’ Smith-Root Electro-fishing Boat. Running Direct Current (DC) at 15 pulses per second. Percent of range selected was 40% with output at approximately 200 volts. Pulse width at 40% produced a pulse duration of 2.4 milliseconds. Electro-fishing amperage was between 8 and 10. Electro-fishing effort was continuous at 1800 seconds during daylight and 1800 seconds after dark. Additionally, three experimental mesh gill nets were deployed for 21 hours over night. Two sets were shoreline sets and one in the middle of the pit. Each net was 120ft long and made up of six monofilament 20ft sections with the following mesh sizes ½”, 1”,1 ½”, 2”, 2 ½”, and 3”.

RESULTS AND DISCUSSION

Physical Conditions

Stratification

Temperature and oxygen profiles are presented below. Water temperature measurements varied from 12.6 to 13.7 C and dissolved oxygen concentrations ranged from 8.9 to 9.4 mg/L. At the time of sampling, the pit water was vertically mixed. The greatest change in temperature with depth occurred at Location 2, with a change of only 0.7 C from top to bottom (7.5 m) of the water column. Accordingly, dissolved oxygen was essentially unchanged through the water column at each location, with only a 0.2 mg/L maximum change from surface to pit bottom. Raw data and profiles are presented in Figure 1.

The temperature and oxygen data, aside from other limiting factors, indicate the water should be supportive of a warm water or possibly a cold water fishery (summertime profiles were not available).

Transparency and Solar Radiation

The Secchi disk depth was approximately 4.0 m. PAR measurements indicated penetration through the entire water column. Approximately 110 umhol/m2/s PAR was available at the pit bottom (extinction coefficient 0.35). Sufficient light existed to support a phytoplankton population. Light intensity at the pit bottom was similar to the recommended light intensity for algae cultures (Lavens and Sorgeloos 1996) and possibly benthic algae, although the minimum light requirement for benthic algae is poorly understood (Stevenson et al 1996). Light extinction data and graph are presented in Figure 2.

Sedimentation and Substrate Type

The amount of compacted sediment on the pit bottom ranged from 4 to 6 inches, with up to a 20-inch covering of iron floc. The sediment contained a very low (0.21%) organic carbon concentration, but did contain organic nitrogen (2160 mg/kg) and phosphorus (880 mg/kg). These data indicate that benthic algae or even submerged rooted macrophytes could only exist in areas where the iron floc was limited (littoral zone).

Seive analysis (see Figure 3) indicated that all particles were less than 1.18 mm and 89 percent was finer than 0.6 mm. The sediment is classified as silt (all particles less than 2 mm). The silt provides little to no substrate for diversity in a macroinvertebrate population.

The sieve analysis is presented on the following page. Sediment chemistry data are presented as part of laboratory report package presented at the end of the narrative.

Nutrients

Low nutrient concentrations, typical of oligotrophic lakes, were measured. An available N:P ratio of 3:1 was found. Because of the low pH (4.6 SU) and reported (Hall Environmental Analysis Laboratory) acidity of the water (180 mg/L as $CaCO_3$), bicarbonate and carbonate ions would be essentially absent (Geller et al.). Sufficient inorganic carbon would be available to algae through the equilibrium reactions of absorbed atmospheric carbon dioxide and carbonic acid (University of Montana).

Biologically-available phosphorus (0.018 mg/L phosphate-P), nitrogen (0.24 mg/L NO_3-N and 0.03 NH_3-N) would be adequate to support a modest phytoplankton population. This projection was supported by the very low chlorophyll-a concentration measurement of 0.8 ug/L. At measured pH, no ammonia toxicity could exist. The low pH would be detrimental to cyanobacteria (blue-green algae growth, but not eukaryotic algae species (Brock 1973). The complete water quality report is provided at the end of the report narrative.

Biological Conditions

The pit waters contained a depauperate algal assemblage composed of only six genera of algae. The six consisted of the diatoms (Bacillariophyta) *Diatoma*, *Cymbella*, *Synedra,* and *Navicula*; the cryptomonad, *Cryptomonas*; and the blue-green (Cyanophtya) alga *Chroococcus*. *Cryptomonas* was the dominant organism and is common in cold, acidic waters (Holopaenin 1992; Ojala and Jones 1993). Diatoms have also been found in a number of acidic environments, especially where high concentrations of iron exist as in some pit water environments (Nicola 2000). *Chroococcus* has been reported to dominate acidified Canadian lakes (Seckbach 2007). The total cell count was 603 cells per mL. However, many of the diatoms were frustules only (no protoplasm or chlorophyll observed), suggesting that these were dead and settling cells. The viable cell count is estimated at 312 cells/mL. The algae composition is summarized below (Table 1).

Table 1. Algae composition of Copper Flat pit water 11/06/14

Genus	Division/ form	Count per mL	Percent Comp.
Diatoma	Bacillariophyta (diatom) unicell	22	3.7
Cryptomonas	Cryptophyta (cryptophytes) flagellate	223	37.0
Cymbella	Bacillariophyta (diatom) unicell	34	5.6
Synedra	Bacillariophyta (diatom) unicell	212	35.2
Navicula	Bacillariophyta (diatom) unicell	22	3.7
Chroococcus	Cyanophyta (blue-green) colony	89	14.8

Sediment samples, primarily in the littoral zone, contained diatom frustules (most void of protoplasm or chlorophyll) and a very small number of *Hormidium* (Chlorophyta) filaments. *Hormidium* grows in acid environments as low as pH 3.5 and is least susceptible to copper and zinc toxicity at the pH range of 3.5 to 4.0 SU (Hargraves and Whitton 1976).

No zooplankton were recovered from multiple vertical tows at each location.

No macroinvertebrates were recovered from the sediment.

No fish species were recovered from either electro-fishing or gill nets.

A very small stand (20 sq ft) of cattail (*Typha* sp.) was found along the lake edge, in the dampened soil. No floating or submerged macrophytes were present.

Integrated Conditions and Biological Integrity

Because of the limited variety of organisms recovered from the sampling activities, only a few basic indices were calculated to characterize the pit water. The indices typically characterize the pit water as oligotrophic, with insignificant amounts of organic pollution, but with one or more other water quality variables reducing productivity.

*Carlson Trophic Index (*Carlson 1976) uses chlorophyll-a, transparency and phosphorus concentration to quantitatively categorize the status of a lake ranging from oligotrophic (unproductive) to highly eutrophic (productive). The range of TSI was 28-69. Transparency and chlorophyll were indicative of an oligotrophic lake, but total phosphorus was characteristic of a eutrophic lake.

Nygaard Trophic Index (Nygaard 1976) proposed five indices to evaluate the organic pollution of water bodies based on the tolerance of various groups of planktonic algae occurring in them. These indices include Cyanophycean or Myxophycean index Chlorophycean index Bacillariophycean or Myxophycean index, Chlorophycean index, Bacillariophycean index, Euglenophycean index and a combination of these called compound coefficient index. Because of the paucity of phytoplankton, only the diatom index was appropriate. The Index value was 0, indicating oligotrophic conditions.

Palmer Organic pollution Index (Person 1989). The metric evaluates the degree of organic pollution based on pollution tolerance of key algal genera. The pit water score was 5 indicating minimal or no organic pollution, or that another variable is interfering with algae growth.

CONCLUSION

The collected and historic data demonstrate that the pit waters do not and cannot support a balanced ecosystem. Higher aquatic life forms are absent because of likely chemical toxicity, lack of suitable habitat, and lack of food resources.

The pH of the water is below the range (6.5 to 9.0 SU) typically considered supportive of aquatic ecosystems (EPA 1986). pH has been considered the most important determinant of water quality in a pit environment (Miller 2002), impacting divalent metals solubility and creating toxicity. Groundwater interaction with the walls and surrounding host rock of the pit create oxidation reactions that release sulfate, acid, and metals into the lake. Copper Flat Pit water pH (4.6 SU) is well below the typical tolerance range of most aquatic organisms and the copper concentration (18 mg/L) is well above minimum phytotoxic concentrations.

Although adequate light and some nutrients are available, there is a paucity of primary producers in the pit water. Without available food, zooplankton species are essentially absent. A high concentration of copper in the water and low pH appear likely factors limiting algal growth and survival.

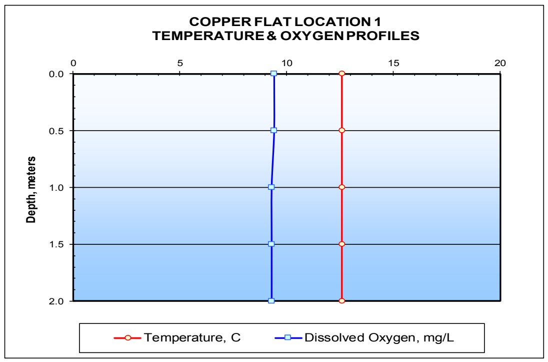
Macroinvertebrates are absent, including those typically considered tolerant of pollution. Habitat availability and diversity is limited. Most of the pit bottom and edge is composed of fine particulates; rocks and rubble are essentially absent. Organic matter is limited. The layer of precipitated iron covering a layer extremely fine silt is not suitable habitat for most benthic organisms. Food reserves for shredders and scrapers is highly limited, as the depauperate and sparse periphyton consisted of a single species of filamentous algae.

FIGURE 1

Copper Flat - 11/06/14
Aquatic Consulting & Testing, Inc.

Copper Flat - Location 1

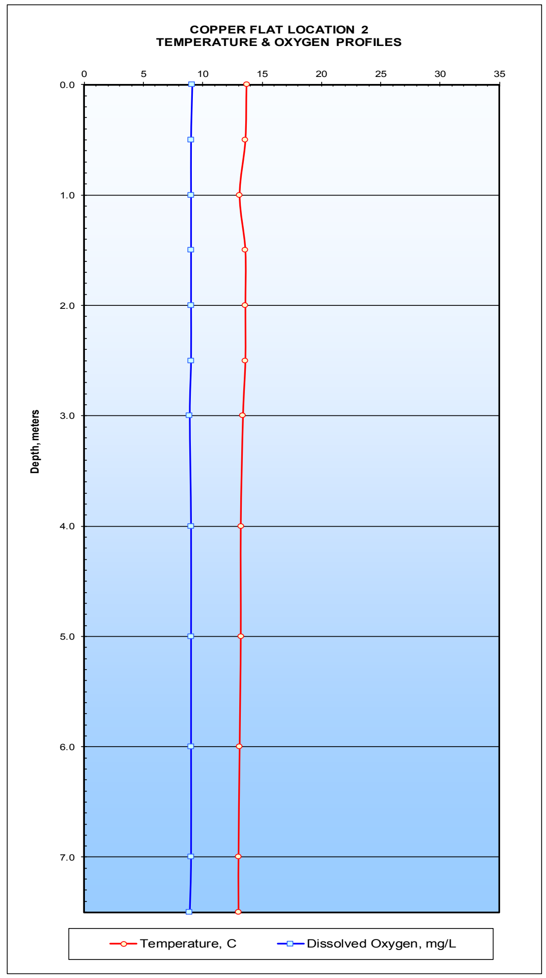
Depth, m	Temp. C	O2, mg/L
0.0	12.6	9.4
0.5	12.6	9.4
1.0	12.6	9.3
1.5	12.6	9.3
2.0	12.6	9.3



Copper Flat - 11/06/14
Aquatic Consulting & Testing, Inc.

Copper Flat - Location 2

Depth, m	Temp. C	O2, mg/L
0.0	13.7	9.1
0.5	13.6	9.0
1.0	13.1	9.0
1.5	13.6	9.0
2.0	13.6	9.0
2.5	13.6	9.0
3.0	13.4	8.9
4.0	13.2	9.0
5.0	13.2	9.0
6.0	13.1	9.0
7.0	13.0	9.0
7.5	13.0	8.9



Copper Flat - 11/06/14
Aquatic Consulting & Testing, Inc.

Copper Flat - Location 3

Depth, m	Temp. C	O2, mg/L
0.0	13.6	9.1
0.5	13.6	9.0
1.0	13.6	9.0
1.5	13.6	8.9
2.0	13.5	9.0
2.5	13.4	9.0
3.0	13.4	9.0
3.5	13.2	9.0
4.0	13.2	9.0

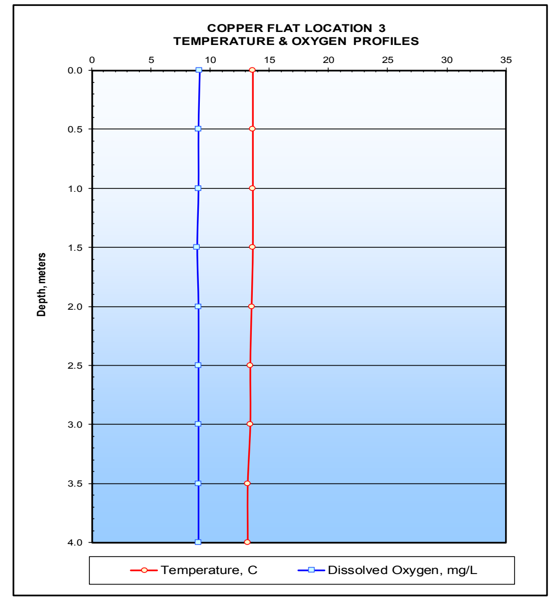
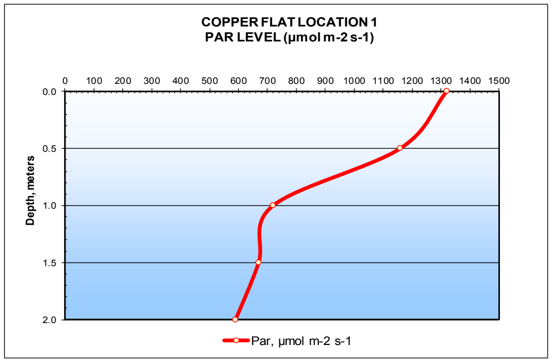


FIGURE 2

Copper Flat - 11/6/14
Aquatic Consulting & Testing, Inc.

Copper Flat - Location 1

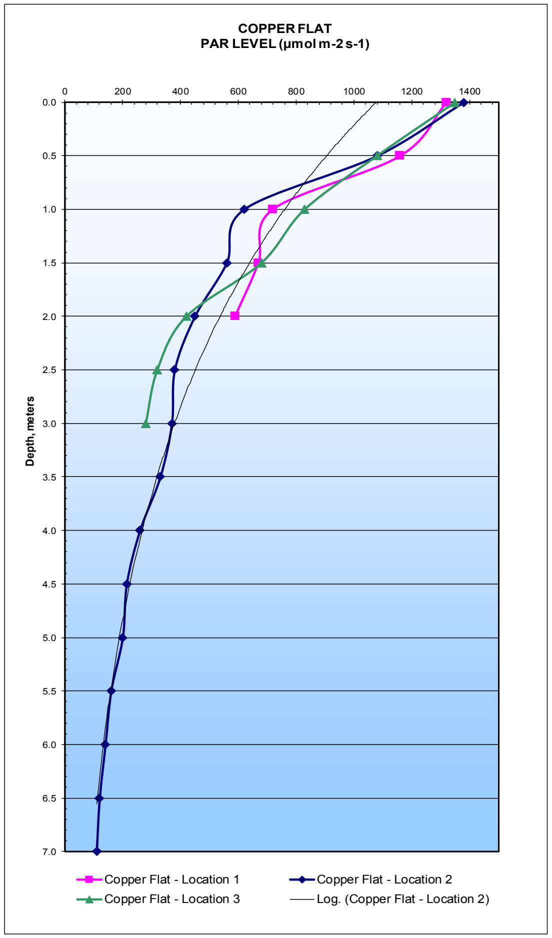
Depth, m	Par, µmol m-2 s-1
0.0	1320.0
0.5	1160.0
1.0	720.0
1.5	670.0
2.0	590.0



Copper Flat - 11/6/14
Aquatic Consulting & Testing, Inc.

Copper Flat - Location 2

Depth, m	Par, µmol m-2 s-1
0.0	1380.0
0.5	1080.0
1.0	620.0
1.5	560.0
2.0	450.0
2.5	380.0
3.0	370.0
3.5	330.0
4.0	260.0
4.5	214.0
5.0	200.0
5.5	160.0
6.0	140
6.5	120
7.0	110



Copper Flat - 11/6/14
Aquatic Consulting & Testing, Inc.

Copper Flat - Location 3

Depth, m	Par, µmol m-2 s-1
0.0	1350.0
0.5	1080.0
1.0	830.0
1.5	680.0
2.0	420.0
2.5	320.0
3.0	280.0

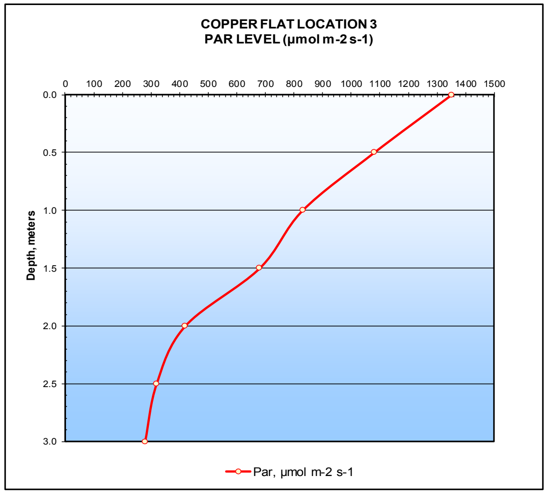
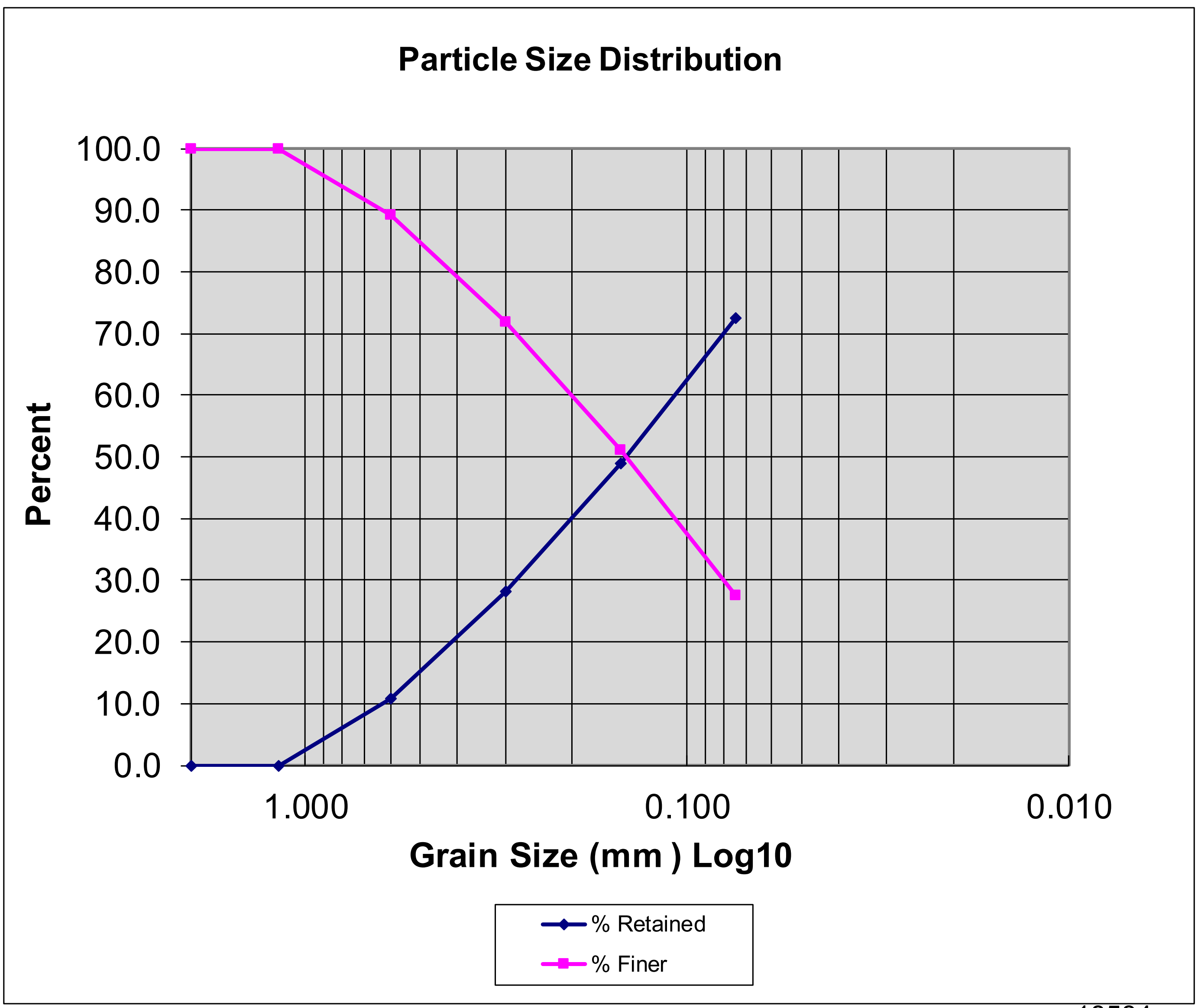


FIGURE 3

Laboratory ID: BW10543
Client ID: Aquatic Consultants - Copper Flat New Mexico

Mesh Size	Nominal Opening (inches)	Grain Size (mm)	Grams retained	Each sieve % Retained	Cumulative % Retained	% Finer
8	0.0937	2.360	0	0.0	0.0	100.0
10	0.0787	2.000	0	0.0	0.0	100.0
16	0.0469	1.180	0	0.0	0.0	100.0
30	0.0234	0.600	34.52	10.8	10.8	89.2
50	0.0117	0.300	55.01	17.3	28.1	71.9
100	0.0059	0.150	66.72	20.9	49.0	51.0
200	0.0029	0.075	74.76	23.5	72.5	27.5
	<0.0029		87.64	27.5	100.0	0.0



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LABORATORY REPORT

Client: Aquatic Consultants
4421 Irving Blvd. NW
Albuquerque, NM 87114

Date Submitted: 11/07/14
Date Reported: 12/02/14

Attn: Paul Cassidy

Project: Copper Flat

RESULTS

Client ID: H2O Comp. Loc 1-3
ACT Lab No.: BW10542

Sample Type: Surface Water
Sample Time: 11/06/14 14:30

Parameter	Analysis Date Start	Analysis Date End	Method No.	Result	Unit
Total Organic Carbon	11/24/14	11/24/14	SM 5310 C	0.7	mg/L
Algae Count	12/01/14	12/01/14	SM 10200 F	See Attached	cells/mL
Algae Identification	12/01/14	12/01/14		See Attached	
Chl/Pheo Ratio	11/25/14	11/25/14	SM10200 H	1.14	
Chlorophyll a	11/25/14	11/25/14	SM10200 H	0.80	ug/L
Pheophytin a	11/25/14	11/25/14	SM10200 H	3.12	ug/L
Zooplankton	11/20/14	11/20/14	SM10200 G	<10.	#/cu. meter
Oxygen, Dissolved Field	11/06/14	11/06/14	SM4500 O G	9.0	mg/L as O2
pH, Field	11/06/14	11/06/14	SM4500H+ B	4.6	SU
Secchi Disk Depth	11/06/14	11/06/14	NALMS	4.0	meters
Temperature, Field	11/06/14	11/06/14	SM2550 B	13.6	C
Ammonia - N	11/20/14	11/20/14	SM4500NH3 D	0.03	mg/L as N
Nitrate + Nitrite - N	11/26/14	11/26/14	SM4500NO3 E	0.24	mg/L as N
Phosphate, ortho	11/07/14	11/07/14	365.3	0.018 *	mg/L as P
Phosphorus, Total	11/25/14	11/25/14	365.3	0.087	mg/L as P
Total Inorganic Carbon	11/24/14	11/24/14	SM 5310 C	0.9	mg/L
Total Kjeldahl Nitrogen	11/20/14	11/20/14	SMNorg C,NH3 C/D	0.3	mg/L as N

* R12=RPD/RSD exceeded the method acceptance limit. Result <5 times the PQL.

18585

RESULTS

Client ID: Sed Comp. Loc 1-3   **Sample Type:** Sediment
ACT Lab No.: BW10543   **Sample Time:** 11/08/14 14:30

Parameter	Analysis Date Start	End	Method No.	Result	Unit
Soil TOC	11/19/14	11/19/14	WalkleyBlack	0.21	% Org-C
Sieve Test	11/25/14	11/25/14	ASTM	See Attached	
Kjeldahl Nitrogen - Soil	11/19/14	11/19/14	SM4500NorgC mod.	2160.	mg/kg as N
Nitrate + Nitrite - N	11/18/14	11/18/14	SM4500NO3E mod.	<1.	mg/kg as N
Phosphorus, Total	11/23/14	11/24/14	365.3 mod.	550. *	mg/kg as P
Total Solids	11/10/14	11/14/14	SM2540 G	10.8	%

* R9-Sample RPD exceeded the method acceptance limit.

Client ID: Sed Floc   **Sample Type:** Sediment
ACT Lab No.: BW10544   **Sample Time:** 11/08/14 14:30

Parameter	Analysis Date Start	End	Method No.	Result	Unit
Microscopic Identification	12/01/14	12/01/14		See Attached	

Reviewed by: Frederick A. Amalfi

Frederick A. Amalfi, Ph.D.
Laboratory Director

18586

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Phone: (480) 921-8044 • Fax: (480) 921-0049

CHAIN OF CUSTODY

PWS ID #________

PAGE___ OF___

PO# Copper Flat
Project ______
Remarks:

Client Name: Aquatic Consultants, Inc.
Address: ______ Street
City, State, Zip
Phone: ______
Fax: ______
Contact: Paul Cassidy
Sampler Signature: SPH

SAMPLE ID	SAMPLE Date	SAMPLE Time	AM/PM	SAMPLE TYPE	Metals (See Below)	☐ TDS ☐ TSS ☒ TS per ☐ SETT ☐ TVS ☐ VSS	☐ O+G ☐ TPHC ☐ MBAS ☐ CN ☐ Sulfide	☐ BOD ☐ COD ☐ New Source	☒ Tot P ☐ O-PO4 ☒ Diss. P	☒ Nitrate + Nitrite ☐ Nitrite	☒ TKN ☒ Ammonia	~~☐ THMs ☐ HAAs~~ TOC, IOC	☐ Phenol ☐ 420.1 ☐ 625 ☐ 8270	~~☐ 8260 ☐ 624 ☐ BTEX~~ TKN, Nitrate, TP	☐ Perchlorate ☐ Radio ☐ Asbestos	Total Coliform ☐ P/A ☐ Colilert ☐ MPN	~~☐ E. Coli ☐ Fecal Strep~~ TOC (w-s)	Fecal Coliform ☐ MPN ☐ MF	☒ MICRO SCOPE ID	~~☐ Plate Count ☐ Biotox~~ Particle Size	F-(pH, DO, T, SDE)	~~☐ Acute ☐ Chronic~~ Periphyton	~~☐ AMET (SWPD)~~ Macroinvert	Chl a, Algae ID Ect.	Zoop.	$Na_2S_2O_3$	H_2SO_4	HNO_3	NONE	Lugols	NaOH/ZnAc	Laboratory Number
H_2O Comp. Loc. F5	11/6/14	1430	PM	SW					X	X	X	X		X							X			X	X		1		5	2		BW-10542
Sed Comp. Loc. F3	↓	1430		Sed		X								X			X			X			X						1			43
Sed. Floc		1430		Sed															X										1			44
Edge Periphyton	↓	1540		Solid																	~~X~~	X							1			45

Metals: ☐ Al ☐ Sb ☐ As ☐ Ba ☐ Be ☐ B ☐ Cd ☐ Ca ☐ Cr ☐ Co ☐ Cu ☐ Au ☐ Fe ☐ Pb ☐ Mg ☐ Mn ☐ Hg ☐ Mo ☐ Ni ☐ Se ☐ Ag ☐ Na
☐ Sr ☐ Tl ☐ Sn ☐ Ti ☐ V ☐ Zn

[ ] TOTAL [ ] DISSOLVED [ ] SDWA [ ] TCLP [ ] RCRA

Sample Types: DW, GW, SW, WW, AQ, Soil, Sludge or Solid

Sample Receiving: MLCL
Intact: X Yes ___ No
Temp: 15C Auth Init: ____
Pres: 1 Yes/V 10 No/Lab
Sterile: ___ Yes X No
Total # containers: 11

1. Relinquished By: Sawley P. Hal
Date: 11/7/14 Time: 1507 AM/PM
1. Received By: T Johnson
Date: 11-7-14 Time: 15:07 AM/PM

2. Relinquished By:
Date: Time: AM/PM
2. Received By:
Date: Time: AM/PM

3. Relinquished By:
Date: Time: AM/PM
3. Received By:
Date: Time: AM/PM

Attn: Your signature on this document authorizes analysis regardless of sample condition at time of submittal

By signing this chain of custody, the designated client and agent agree to pay Aquatic Consulting & Testing, Inc. for all services rendered in conjunction with the submitted samples within 30 days of invoice. It is the client's responsibility to note purchase order numbers or other responsible parties on the form and failure to do so does not constitute justification for non-payment.

White-Laboratory Yellow-Report Pink-Client

Sample delivery group #: -023

New Mexico Copper Corporation

Copper Flat Groundwater Level Monitoring Plan

For

Probable Hydrologic Consequences

and

Predictive Geochemical Modeling
Of Pit Lake Water Quality
Reports

May 2018

New Mexico Copper Corporation
Copper Flat Groundwater Level Monitoring Plan

Table of Contents

1.0 Introduction 3
2.0 Monitoring Well Network 4
  2.1 Santa Fe Group 4
  2.2 Shallow Alluvial Aquifer 5
    2.2.1 Surface Water Along Las Animas and Percha Creeks 5
  2.3 Bedrock Crystalline 5
  2.4 Well Construction 6
3.0 Monitoring Plan 6
  3.1 Monitoring Frequency & Measured Parameters 6
    3.1.1 Access 7
    3.1.2 Resources 7
4.0 Reporting 7
5.0 References 7

Plates

Plate 1 – Ground Water Monitoring Network

Tables

Table 1 – Monitoring Well Network Information

Appendices

Appendix A - Well Construction Diagrams

1.0 Introduction

New Mexico Copper Corporation (NMCC) has prepared this Groundwater Level Monitoring Plan to monitor groundwater levels at its proposed Copper Flat Mine. Groundwater level monitoring will be conducted before, during and after mine operation to compare against ground water model projections. The monitoring network has been established by NMCC to gather data on the three identified groundwater systems that may be affected by pumping the Production Wells that will supply production water for the mine operation. These ground water systems include the Santa Fe Group aquifer, shallow alluvial aquifers along area streams, and the Bedrock Crystalline (JSAI, 2014). Potential effects on these groundwater systems are presented in the report prepared by John Shomaker & Associates (JSAI) on behalf of NMCC and submitted to the Mining & Minerals Division, titled *Probable Hydrologic Consequences of the Copper Flat Project Sierra County New Mexico*, December 2017. The proposed monitoring network is adequately distributed to track potential drawdown effects from proposed Copper Flat pit dewatering and proposed pumping from supply wells PW-1 through PW-4. As designed, the monitoring plan will provide the necessary data to track water-level changes in the crystalline bedrock, shallow alluvial, and Santa Fe Group aquifer units. In addition, the water level data set can be used to verify model predictions and to identify potential hydrologic impacts before becoming significant.

Although some of the wells identified in the monitoring well network presented below will be used for other data collection purposes, this Groundwater Level Monitoring Plan is proposed as a separate adjunct to the Copper Flat Groundwater Quality Monitoring Plan described in Appendix E of the NMCC Discharge Permit Application (and incorporated into NMCC's Mine Operation and Reclamation Plan). Each of these plans will contribute to the collection of data regarding ground water and surface water at Copper Flat and in the surrounding area. For example, water level measurements will be taken at all of the wells identified in the various monitoring networks, providing a comprehensive view of ground water conditions at the site. In addition, while water quality monitoring is not the purpose of this monitoring program, water quality results obtained from the rest of the monitoring network at the site will be utilized to provide a comprehensive view of groundwater conditions in the mine permit area and potential affected areas.

The proposed groundwater level monitoring network will facilitate the collection of groundwater levels prior to mine operation to help establish baseline conditions. Monitoring will continue throughout the time Production Wells are pumped and beyond to monitor the effects of pumping. NMCC anticipates some continued monitoring of groundwater levels after mine operation ceases for a number of years, the timeframe to be determined based on monitoring results, to confirm groundwater levels rebounding. This monitoring will create a body of data for long term use, allowing for analysis of potential impairment to wells or surface waters. This Groundwater Level Monitoring Plan provides a guideline and reference for planning and implementing groundwater level monitoring at the Copper Flat Permit Area and in potential affected area by the proposed operation of Copper Flat. This plan includes a description of the monitoring network as well as proposed data collection plans and protocols.

2.0 Monitoring Well Network

NMCC has identified 27 monitoring wells at the mine and in the potential affected area that will be utilized to assess projected effects on the Santa Fe Group aquifer (eight wells), the Quaternary-age alluvial aquifers along Las Animas Creek (four wells) and Percha Creek (three wells) and the crystalline bedrock (including the Andesite) of the Animas uplift (eight wells). The monitoring plan also includes the four production wells which will be monitored post-mining. Plate 1 presents the locations of these monitoring wells in relation to the mine permit area, potential affected area, and the Production Wells. Table 1 provides additional detailed information for each of these wells.

Some of these wells are also part of the Monitoring Plan in Appendix E of the Discharge Permit, and others are in addition to it. NMCC has obtained permission from private land owners where needed for access to monitor wells through mine operation and reclamation. Many of these wells have been in place for years and NMCC has background data on water levels and water quality. Some of the wells are newly identified monitoring locations. Three of the wells will be new wells drilled to replace wells that will be lost due to the planned pit expansion.

2.1 Santa Fe Group

As reported by JSAI's December 2017 Probable Hydrologic Consequences report, the pumping of Production wells completed in the Santa Fe Group Aquifer for Copper Flat Operation is projected to create water-level drawdown in this aquifer. A maximum drawdown of 70 ft. at the well field is projected to occur at the end of mining. Drawdown will decrease with distance from the Production wells and water levels are projected to recover over a period of approximately 20 to 30 years. Other projected effects from pumping the Production Wells in the Santa Fe group include minimal effects to shallow groundwater systems along Las Animas Creek and Percha Creek, decreases in flow rates of flowing wells along Las Animas and Percha Creeks, and depletion of water that would have flowed to the Rio Grande (JSAI, 2017). In addition to the four Production Wells, eight Santa Fe Group aquifer wells have been selected to monitor effects in the Santa Fe Group Aquifer (see Table 1). As shown on Plate 1, MW-5 is near the Production Wells, MW-9 and MW-10 north of the Production Wells along Las Animas Creek, MW-6 west of the wellfield, MW-8, MW-4 and MW-2 near the mine area to the west and southwest of the wellfield, and GWQ11-27 northeast of the wellfield in the flowing well area along Animas Creek. All of these wells have been monitored historically by NMCC and others and a significant database on historic groundwater levels in these wells already exists. These wells in the Santa Fe Group network have been selected to monitor the projected effects in these areas. The proposed monitoring network is adequately distributed to track potential drawdown effects from proposed Copper Flat pit dewatering and proposed pumping from supply wells PW-1 through PW-4. As designed, the monitoring plan will provide the necessary data to track water-level changes in the Santa Fe Group aquifer.

NMCC has right of way access from BLM (via NMNM 125870) to monitor MW-2, MW-5, MW-6 and MW-8. NMCC owns the land where MW-4 is located. NMCC also has permission from the rangeland allotment holders to monitor MW-6. NMCC owns MW-9 and MW-10 and has permission from the private landowners to access these wells.

Monitoring groundwater levels in the four Production Wells and in the eight identified additional wells completed in the Santa Fe Group aquifer will provide the data necessary to assess groundwater model projections, including effects to shallow groundwater systems along Las Animas Creek and Percha Creek and changes in pressure on flowing wells. Data collected will also be used to track depletions to the Rio Grande.

2.2 Shallow Alluvial Aquifer

Las Animas Creek runs from west to east to the north of the Copper Flat Production Wells and Percha Creek runs from west to east to the south (see Plate 1). Surface flow in these creeks result largely from precipitation and runoff from the Black Range to the west, and have perennial, intermittent and ephemeral reaches. NMCC has identified seven existing wells completed in the shallow alluvial aquifers beneath Las Animas and Percha Creeks to monitor effects of Production Well pumping (see Plate 1).

Four shallow alluvial wells will be monitored along Las Animas Creek. MW-11 has been monitored historically. The other three wells are existing wells that are new additions to the monitoring network. NMCC owns well MW-11 and has permission from the private landowners for access. Three existing shallow alluvial wells owned by private landowners along Animas Creek will be added along Las Animas Creek: one west of MW-11 and another east of MW-11, and a third east of GWQ11-27 near I-25. The private wells will be monitored via transducers that will not interfere with the use of the wells. NMCC has permission from the private landowners to access and monitor the wells.

The three existing wells identified on Plate 1 for monitoring the alluvium along Percha Creek were installed by the Bureau of Reclamation (BOR). BOR has granted NMCC ownership of these wells, which is noted in OSE well file records, and NMCC has permission from the private landowners for access and monitoring.

2.2.1 Surface Water Along Las Animas and Percha Creeks

The data collected from shallow alluvial wells along Las Animas and Percha Creeks will provide data regarding the groundwater model's prediction of no measurable effects in shallow alluvial groundwater on the western side of Las Animas Creek and Percha Creek and, therefore, no measurable effects on the surface water flows on these streams. While performing groundwater level data collection, NMCC will also check and document stream flows, if present, along Las Animas and Percha Creeks. This data will provide seasonal data regarding stream flows that can be tracked before, during and after mine operation.

2.3 Bedrock Crystalline

Groundwater in fractures in the bedrock crystalline around the Copper Flat pit will be drawn down as a result of pumping out water that gathers in the open pit to allow mining to take place. As discussed in the PHC and the Ground Water Model report (JSAI, 2014) the pit is currently a hydrologic sink. At the end of mining, groundwater drawdown in the bedrock around the open pit is projected to be about 800 ft. A permanent cone of depression will form around the pit which will reestablish the evaporative hydrologic sink in the future after mining ceases (JSAI, 2017).

Eight wells are proposed for monitoring the groundwater in the bedrock crystalline (see Table 1). Seven of these wells in the bedrock around the open pit have provided historic data: GWQ-5R, GWQ-6N, GWQ96-22, GWQ96-23, GWQ11-24, GWQ11-25, and GWQ11-26. Wells GWQ11-23 and GWQ11-25 will be lost by the expansion of the pit. Three new wells proposed in the New Mexico Copper Discharge Permit Appendix E Monitoring Plan, PGWQ-1, PGWQ-2, and PGWQ-3, will replace these existing wells. These new wells will be installed prior to operation of Copper Flat. Access to these wells is provided either through NMCC ownership of the well site and well or through an approved access permit with BLM.

2.4 Well Construction

Table 1 presents available well information for the identified monitoring well network. Appendix A presents well construction diagrams where available.

All selected monitoring wells are completed in the groundwater system they are designated to monitor. Some of these wells were completed specifically for monitoring. These wells are generally 2-4" in diameters and have screen lengths designed for groundwater quality monitoring. Other wells were completed for domestic use or exploration purposes and thus have larger diameter casings and/or long saturated screen lengths. When wells are being used for purposes other than monitoring, a transducer may be set it the well to collect well data and not interfere with its use.

3.0 Monitoring Plan

3.1 Monitoring Frequency & Measured Parameters

NMCC will monitor groundwater levels in the bedrock and Santa Fe Group groundwater monitoring network on a quarterly basis beginning 6 months to 12 months prior to initiation of pumping of Production Wells for construction or operation purposes. Collecting groundwater levels prior to pumping of Production wells will supplement previous baseline data collection. The baseline data will establish seasonal groundwater variation patterns not affected by pumping. Groundwater level data collection will occur quarterly and be conducted by NMCC staff or consultants.

Data collected at monitoring wells will include at a minimum depth-to-water measure to the nearest 0.01 foot. Pressure transducers will be installed in the Alluvial monitoring network wells, so continuous water level monitoring can be implemented. The transducers will be programed to measure water levels hourly. Data will be retrieved quarterly.

All data collection will be logged in field books or other appropriate data collection documentation and industry standard practices will be employed to ensure quality of data collection.

During collection of groundwater level data from shallow alluvial wells on Las Animas and Percha Creeks, field personnel will also document if surface water is flowing in the creeks near the monitoring wells. If flow is observed, NMCC staff or consultants will document stream flow rate to the extent practicable.

3.1.1 Access

NMCC will contact private landowners in advance of visiting wells for data collection. If access to monitoring wells requires passing through closed or open gates, staff will leave the gate in the position it was encountered. NMCC staff or consultants will conduct themselves in a professional and courteous manner and will not damage personal property or well heads during data collection. Care will be taken to avoid accessing wells during or directly after heavy rainfall events to prevent rutting dirt roads.

3.1.2 Resources

Monitoring of water levels, data collection and reporting will be conducted at NMCC expense. NMCC will maintain industry standard equipment for data collection.

4.0 Reporting

NMCC will prepare annual reports on groundwater levels collected. Reports will include groundwater levels and an area groundwater level map generated by at least one quarter of the data collected. NMCC reports will be maintained internally and provided to appropriate agencies for review as may be required.

5.0 References

JSAI, 2014, Conceptual Model of Groundwater Flow in the Animas Uplift and Palomas Basin, Copper Flat Project, Sierra County, New Mexico. Prepared for New Mexico Copper Corporation, Albuquerque, New Mexico. August 2014.

JSAI, 2017, Probable Hydrologic Consequences of the Copper Flat Project Sierra County New Mexico. Prepared for New Mexico Copper Corporation, Albuquerque, New Mexico. December 2017.

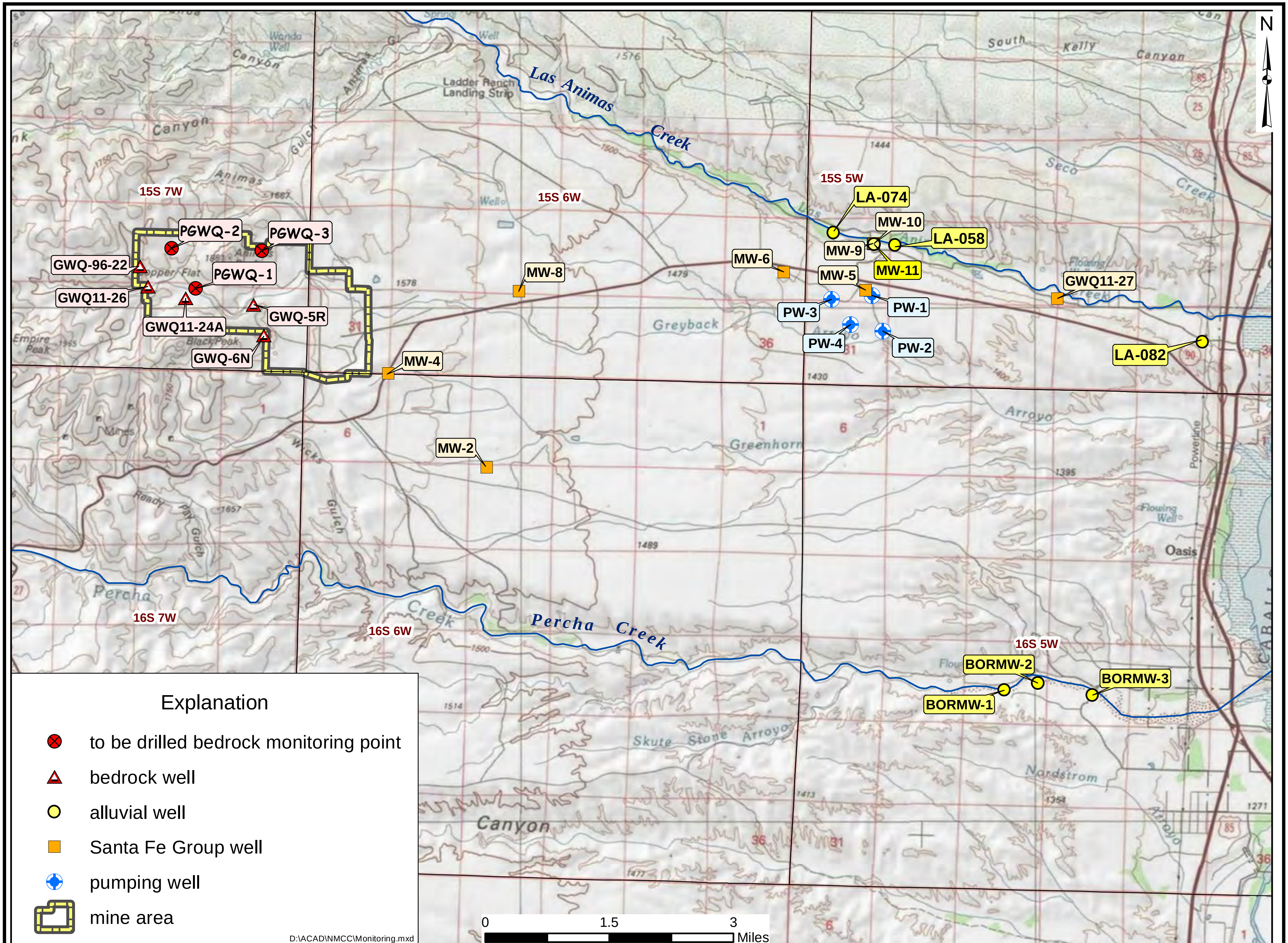


Plate 1. Copper Flat Ground Water Monitoring Network

JOHN SHOMAKER & ASSOCIATES, INC.

Table 1
Copper Flat Monitor Well Network

Aquifer	Well ID	OSE Record Number	Well Access	Well log	Year drilled	Casing diameter (inches)	Total Depth (ft bgl)	DTW (ft bgl)	Screen interval (ft bgl)	Note
Santa Fe	MW-2	LRG-4652-S-12	ROW 125870	yes	1975		1500		133-1500	
Santa Fe	MW-4	LRG-4652-S-13	NMCC Property	yes	1975		2000		123-1500	
Santa Fe	MW-5	LRG-4652-S-14	ROW 125870	yes	1975		1380		306-1000	
Santa Fe	MW-6	LRG-4652-S-15	ROW 125870	yes	1975		1112		310-1000	
Santa Fe	MW-8	LRG-4652-S-16	ROW 125870	yes	1975		1004		366-1000	
Santa Fe	MW-9	LA-00165-EXPL	Signed Agreement 25-Oct-17	yes	1994		250		200-250	Along Animas Creek
Santa Fe	MW-10	LA-00165-EXPL-2	Signed Agreement 25-Oct-17	yes	1994		125		80-120	Along Animas Creek
Santa Fe	GWQ 11-27	LA-228	Signed Agreement 14-Jun-17	yes	2012	10.75	320	Artesian		Along Animas Creek
Santa Fe	PW-1	LRG-4652	ROW 125293/Future ROD	yes	1975		960		368-951	
Santa Fe	PW-2	LRG-4652-S-1	ROW 125293/Future ROD	yes	1976		1005		376-995	
Santa Fe	PW-3	LRG-4652-S-2	ROW 125293/Future ROD	yes	1976		970		380-965	
Santa Fe	PW-4	LRG-4652-S-3	ROW 125293/Future ROD	yes	1980		957		354-954	
Alluvial	MW-11**	LA-00165-EXPL-3	Signed Agreement 25-Oct-17	yes	1994		65		12- 32	Along Animas Creek
Alluvial	LA-074**	LA-074	Signed Agreement 14-Jun-17	no	1974	16	48	10	22-25, 30-47	Along Animas Creek
Alluvial	LA-058**	LA-058	Signed Agreement 14-Jun-17	no	1955	hand dug	15			Along Animas Creek
Alluvial	LA-082**	LA-082	Signed Agreement 14-Jun-17	no	1976	4	77	17	57-77	Along Animas Creek
Alluvial	BORMW-1***	LRG-14545-POD1	Signed Agreement 23-Oct-17	yes	2009	2	32	25	22-32	Along Percha Creek
Alluvial	BORMW-2***	LRG-14545-POD2	Signed Agreement 23-Oct-17	yes	2009	2	29	21	19-29	Along Percha Creek
Alluvial	BORMW-3***	LRG-14545-POD3	Signed Agreement 23-Oct-17	yes	2009	2	24	23	14-24	Along Percha Creek
Bedrock	GWQ-96-22	*none found on OSE database*	ROW 125870	yes	1996	2	244		174-244	
Bedrock	GWQ-11-26	LRG-15080-POD4	NMCC Property	yes	2011	4	43		23-43	
Bedrock	GWQ-11-24A	LRG-15080-POD1	NMCC Property	yes	2011	2	90		60-90	
Bedrock	GWQ-6N	LRG-4648-1	NMCC Property	no	~1900	8	85	na	na	
Bedrock	GWQ-5R	LRG-15080-POD3	NMCC Property	yes	2011	4	120	118	80-120	
Bedrock	PGWQ-1*	Future	NMCC Property	TBD	TBD	TBD	250	40	150-250	New Well
Bedrock	PGWQ-2*	Future	Future ROD	TBD	TBD	TBD	375	115	275-375	New Well
Bedrock	PGWQ-3*	Future	Future ROD	TBD	TBD	TBD	150	130	130-150	New Well

* New well to be drilled
** Alluvial well along Las Animas Creek
***Alluvial well along Percha Creek

Appendices

Appendix A - Well Construction Diagrams

Santa Fe Group Aquifer Wells

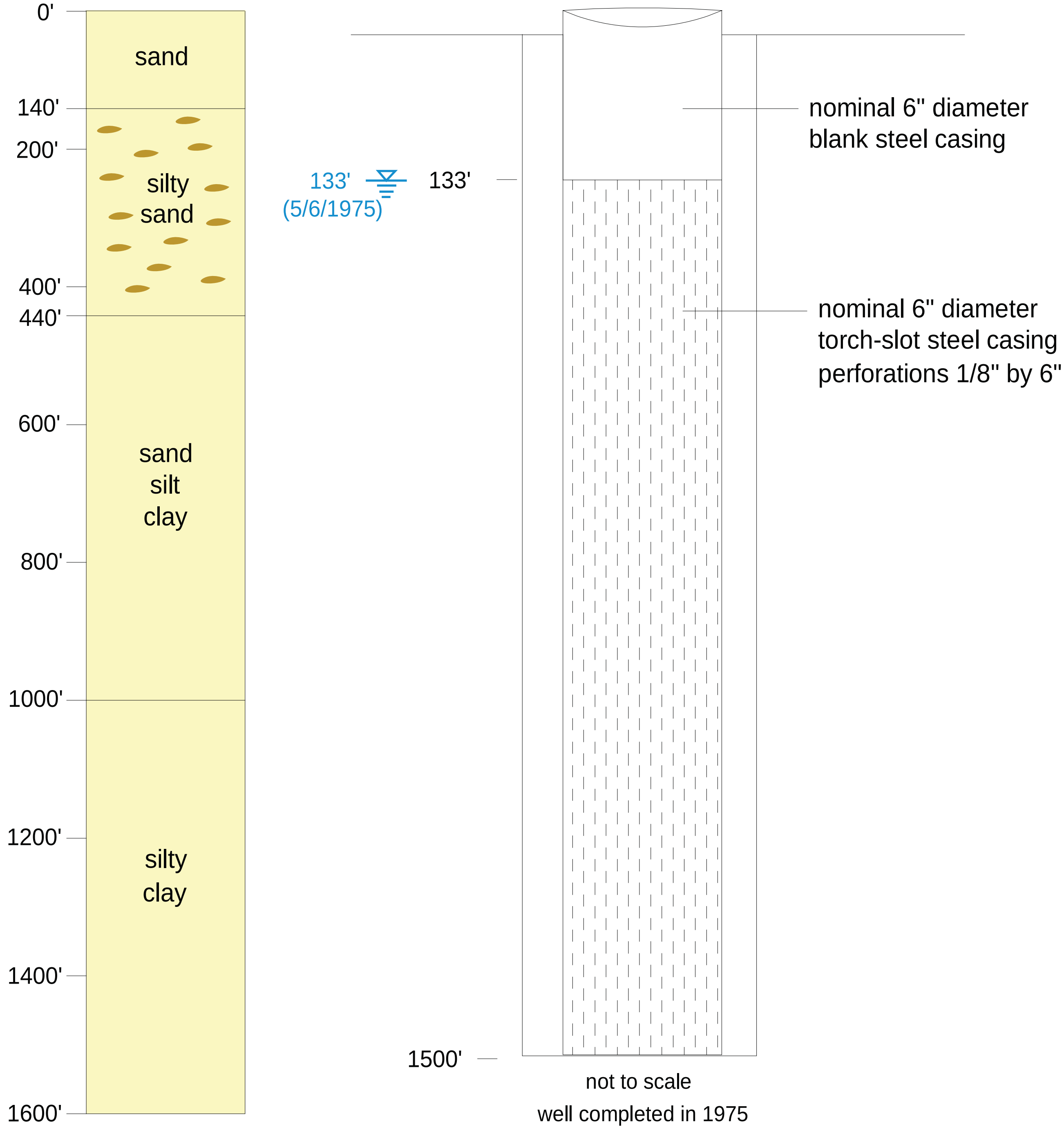


Figure B13. Well completion diagram for LRG-4652-S-12 (MW-2), Copper Flat Mine, Sierra County, New Mexico.

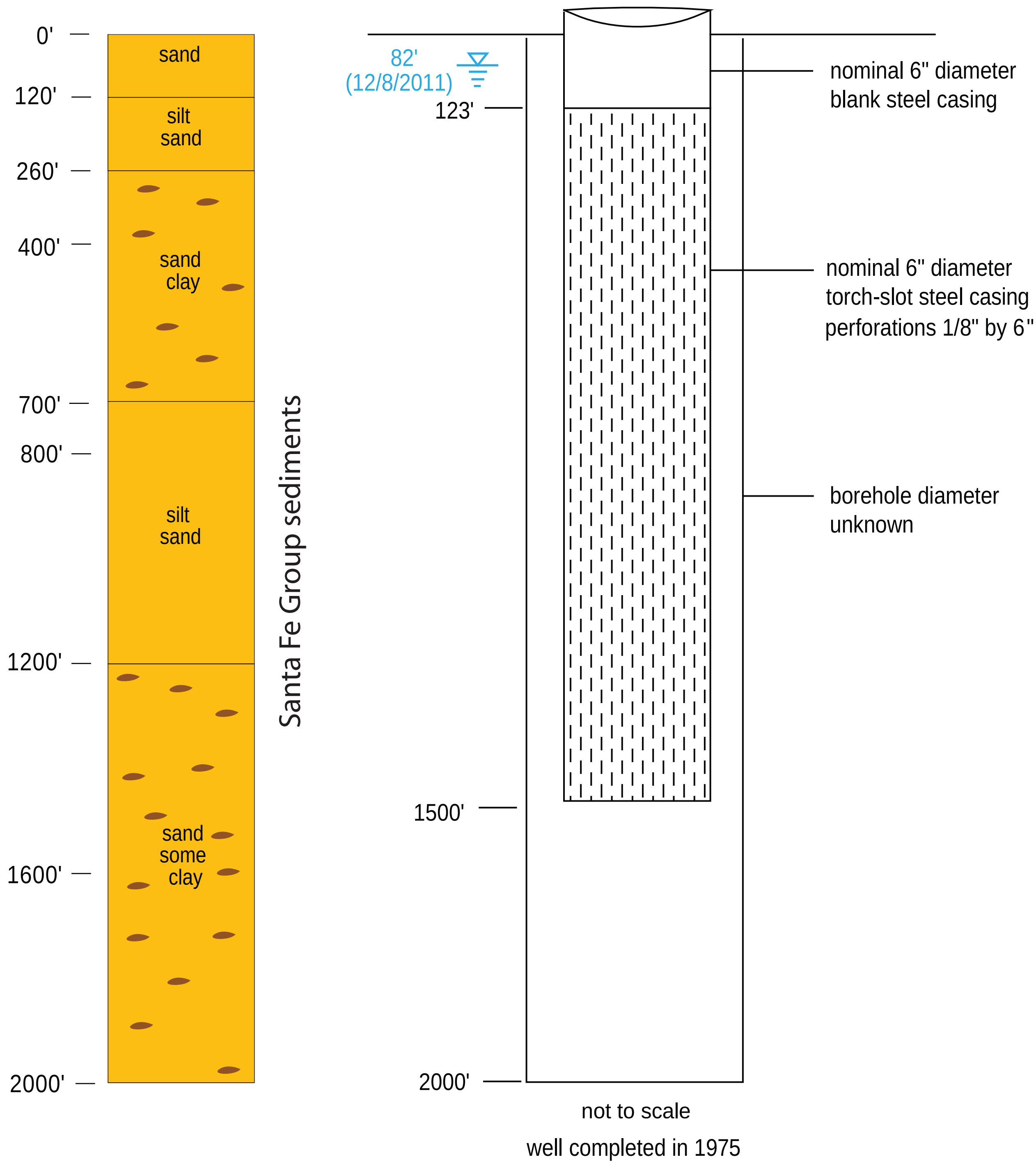


Figure B14. Well completion diagram for LRG-4652-S-13 (MW-4), Copper Flat Mine, Sierra County, New Mexico.

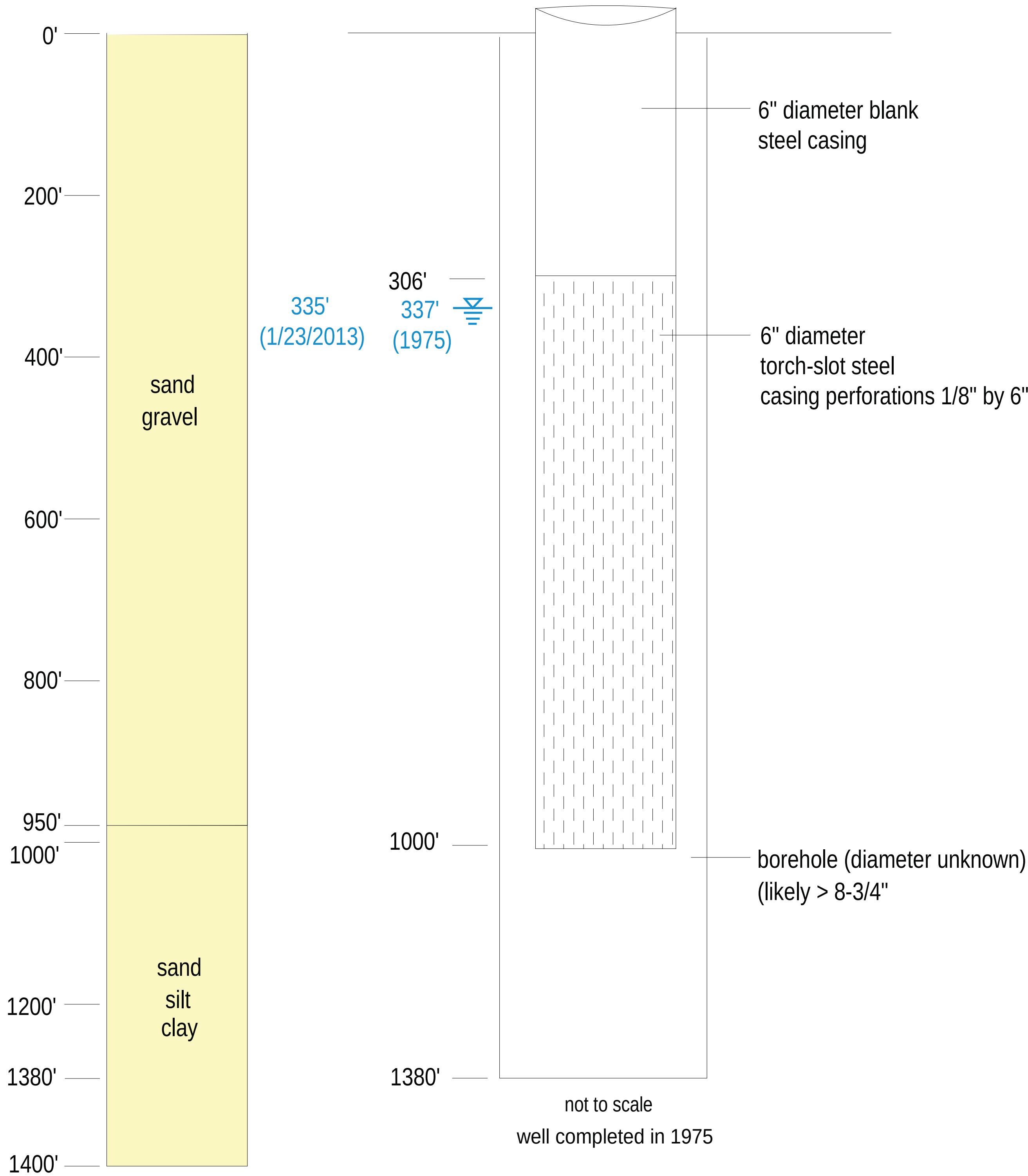


Figure B15. Well completion diagram for LRG-4652-S-14 (MW-5), Copper Flat Mine, Sierra County, New Mexico.

8-21-2013; DA/PW

JOHN SHOMAKER & ASSOCIATES, INC.

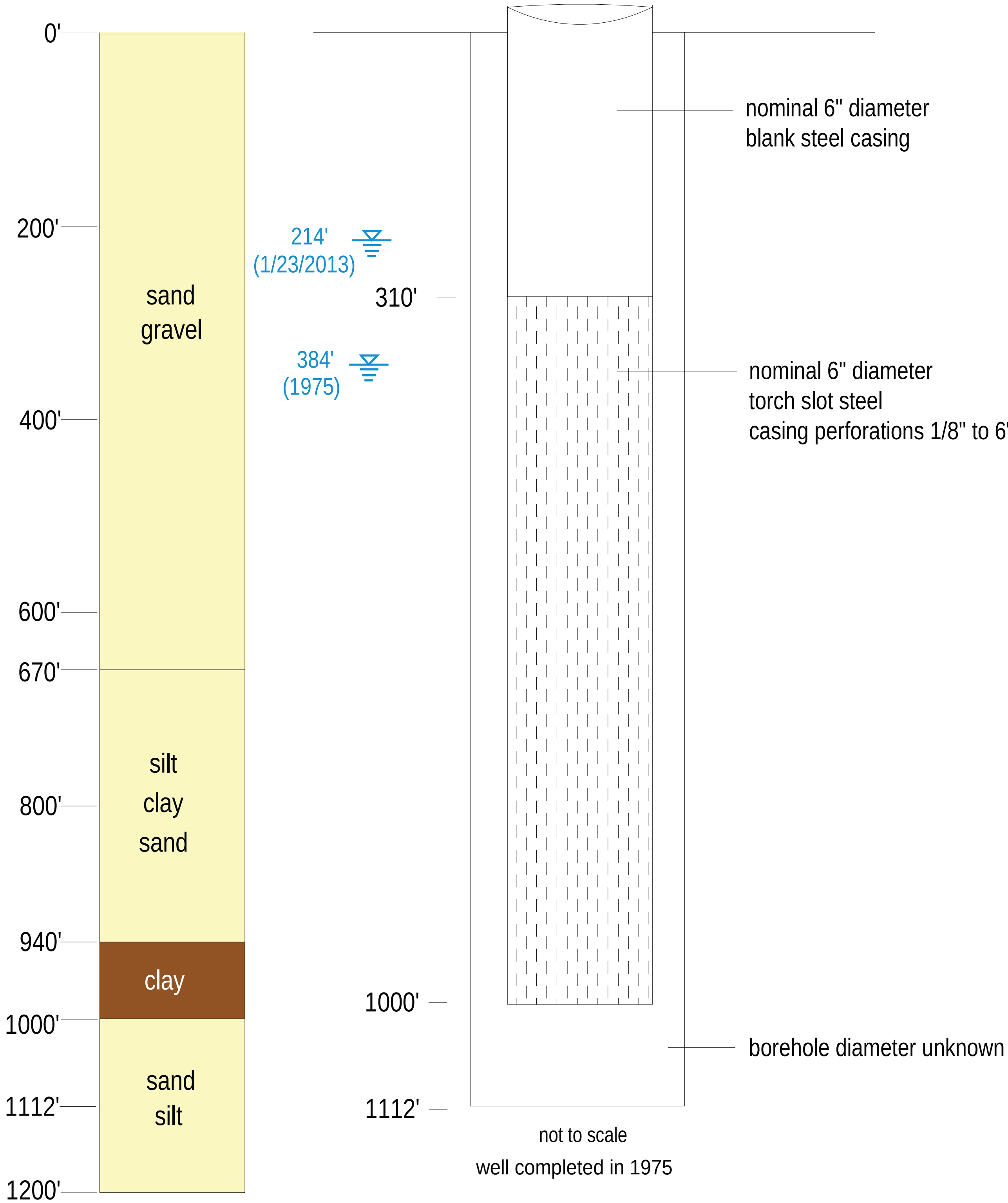


Figure B16. Well completion diagram for LRG-4652-S-15 (MW-6), Copper Flat Mine, Sierra County, New Mexico.

8-21-2013; DA/PW

JOHN SHOMAKER & ASSOCIATES, INC.

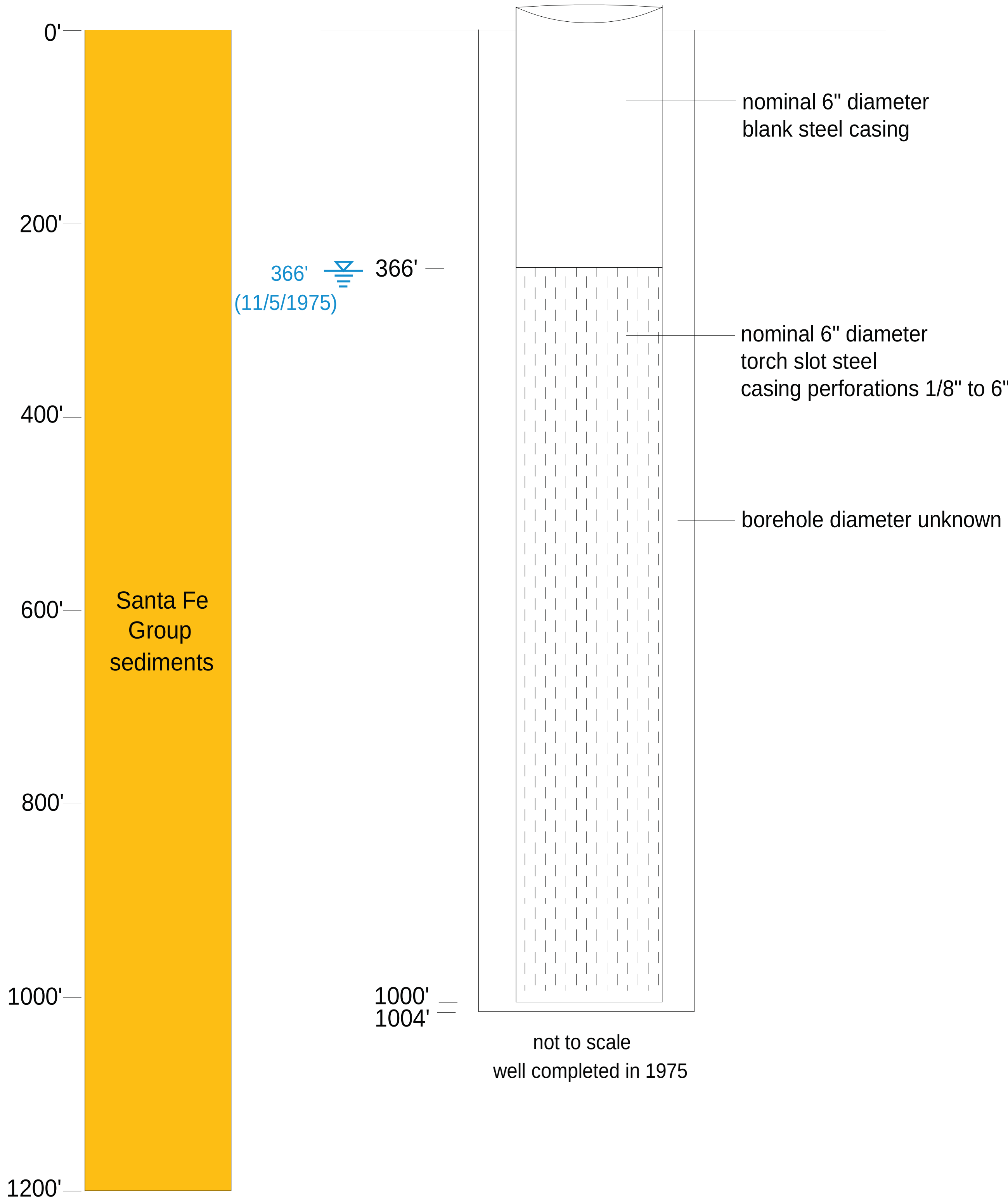


Figure B17. Well completion diagram for LRG-4652-S-16 (MW-8), Copper Flat Mine, Sierra County, New Mexico.

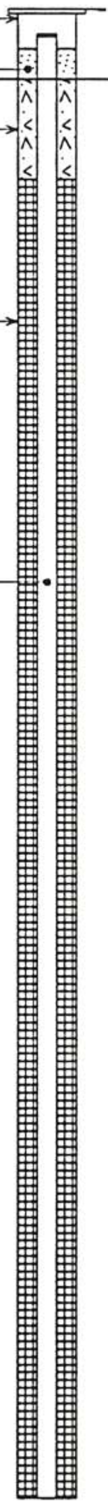
8-21-2013; DA/PW

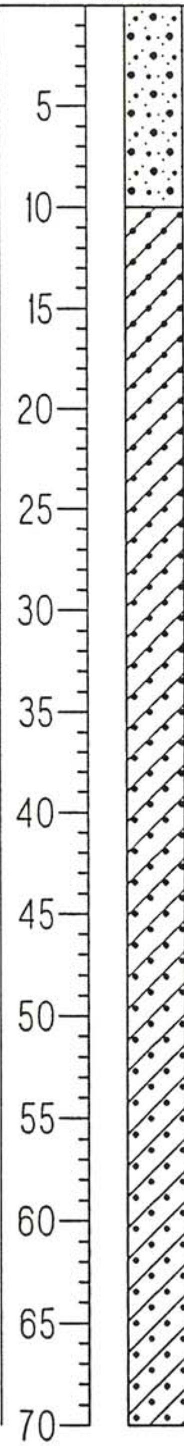
JOHN SHOMAKER & ASSOCIATES, INC.

Steffen Robertson and Kirsten
Engineering and Environmental Consultants

LOG OF MONITORING WELL MW-9

WELL DIAGRAM | PH / Temp. (c) | Conductivity (uS/m) | Water Prod. (gpm) | DEPTH (ft) | SAMPLES | SYMBOLS | MATERIALS DESCRIPTION





Depth	Materials Description
0-10'	0-10', Soil/gravel, dark brown, w/abundant, silt, sand, cobbles/pebbles, wet @ 8' 7.75', ENCOUNTERED GROUNDWATER
10'-30'	10'-30', Alluvial gravels, varying amounts of silt/clay, sand & silt, abundant pebbles/cobbles very poorly sorted, Oxidized, wet
30'-40'	30'-40', Gravel, brown-slightly red brown, within clayey matrix very poorly sorted, min.-mod. sand, Oxidized, wet
40'-48'	40'-48', Gravel, as above with less clay/silt matrix.
48'-52'	48'-52', Gravel, brown-red brown within clay/silt matrix, min.-mod. sand very poorly sorted, wet.
52'-53.5'	52'-53.5', Gravel, as at 40'-48', relatively clean
53.5'-65'	53.5'-65', Gravel, brown-red brown, moderate-abundant clay/silt matrix, minor sand, very poorly sorted; wet
65'-75'	65'-75', clay, dark red-brown, w/min.-mod. sand & pebbles, no cobbles, moist-wet, very smooth drilling

PROJECT: Copper Flat - Hillsboro, N.M.
LOCATION: N713191.10, E603249.22 N.M. S.P.C.
JOB NUMBER: 68607 (ref: 68607M9)
GEOLOGIST: C.W.
DRILL RIG: Air Rotary
DRILLING COMPANY: Beylik Drilling
DATE DRILLED: 09/20/94 - 09/26/94
SURFACE ELEVATION: 4440.14
TOTAL DEPTH OF HOLE: 252.50 Feet
WATER LEVEL: Static, from TOC on 11/7/94: 71.05 Feet

Steffen Robertson and Kirsten
Engineering and Environmental Consultants

LOG OF MONITORING WELL MW-9

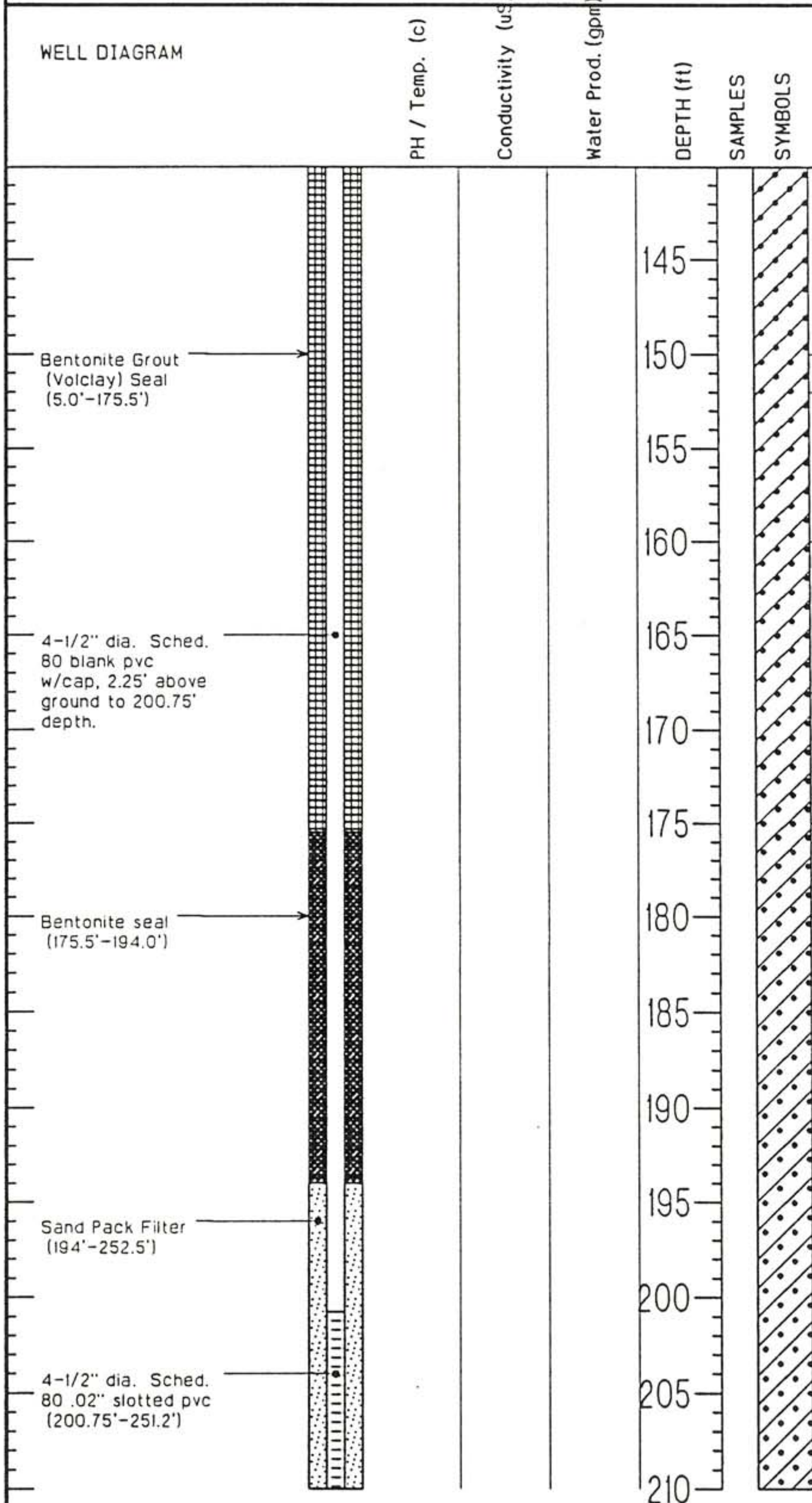
WELL DIAGRAM	PH / Temp. (c)	Conductivity (uS/m)	Water Prod. (gpm)	DEPTH (ft)	SAMPLES	SYMBOLS	MATERIALS DESCRIPTION
				75			75'-80', Gravel, very clayey/silty matrix, red-brown, trace-min. sand, very poorly sorted, wet
				80			80'-112', Gravel, light-med brown-grey brown, min.-mod. dry/silt, min.-mod. sand, wet. Very clayey zone @ 80'-82'.
				85			
				90			
Bentonite Grout (Volclay) Seal (5.0'-175.5')				95			
				100			
				105			
4-1/2" dia. Sched. 80 blank pvc w/cap, 2.25' above ground to 200.75' depth.				110			112'-114', Gravel, med. brown-red brown in clayey matrix, min.-mod. sand, wet.
				115			114'-117', Gravel, dark brown-red brown, min.- mod. clay/silt, trace sand, wet.
							117'-118', As at 114-117 with abundant clay/silt.
				120			118'-125', Gravel, med. red brown, min.-mod. clay/silt matrix, trace-min. sand, Oxidized.
				125			125'-130', Gravel, dark brown-red brown, abundant clay/silt matrix, min. sand, Oxidized
				130			130'-150', Gravel, med. red brown, mod. silt/clay matrix, very poorly sorted, Oxidized.
				135			
				140			

PROJECT Copper Flat - Hillsboro, N.M.
LOCATION N713191.10, E603249.22 N.M. S.P.C.
JOB NUMBER 68607 (ref: 68607M9)
GEOLOGIST C.W.
DRILL RIG Air Rotary

DRILLING COMPANY Beylik Drilling
DATE DRILLED 09/20/94 - 09/26/94
SURFACE ELEVATION 4440.14
TOTAL DEPTH OF HOLE 252.50 Feet
WATER LEVEL Static, from TOC on 11/7/94: 71.05 Feet

Steffen Robertson and Kirsten
Engineering and Environmental Consultants

LOG OF MONITORING WELL MW-9



MATERIALS DESCRIPTION

130'-150', Gravel, med. red brown, mod. silt/clay matrix, very poorly sorted, Oxidized.

150'-152', Gravel as above w/abundant clay/silt matrix.

152'-160', Gravel, med. red brown, mod. clay/silt matrix material (less than @ 150-152)

160'-168', Gravel, dark red brown, abundant clay/silt matrix

168'-175', Gravel, medium brown-red brown, min.- mod. clay/silt matrix (most of matrix material washed out of cuttings)

175'-176', Sand in clay/silt matrix, med-very coarse, minor pebbles.

176'-178', Gravel, dark grey brown - red brown, w/min. - mod. clay/silt matrix, wet w/mod. sand.

178'-180', Gravel, brown-red brown, mod. sand, mod.-abundant clay/silt, Oxidized.

180'-192', Gravel, red brown, min.- mod. sand, min.- mod. clay/silt matrix, wet.

192'-202', Gravel, dark brown-red brown, mod.- abundant clay/silt matrix.

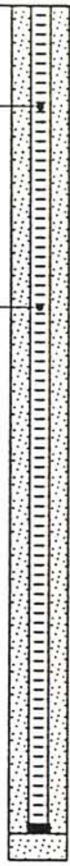
202'-253', Gravel, light-red brown, w/mod. sand, abundant pebbles/cobbles, min.- mod. clay/silt matrix, very poorly sorted, Oxidized, very uniform throughout zone, wet.

PROJECT Copper Flat - Hillsboro, N.M.	DRILLING COMPANY Beylik Drilling
LOCATION N713191.10, E603249.22 N.M. S.P.C.	DATE DRILLED 09/20/94 - 09/26/94
JOB NUMBER 68607 (ref: 68607M9)	SURFACE ELEVATION 4440.14
GEOLOGIST C.W.	TOTAL DEPTH OF HOLE 252.50 Feet
DRILL RIG Air Rotary	WATER LEVEL Static, from TOC on 11/7/94: 71.05 Feet

Steffen Robertson and Kirsten
Engineering and Environmental Consultants

LOG OF MONITORING WELL MW-9

WELL DIAGRAM



4-1/2" dia. Sched. 80 .02" Slotted PVC (200.75'-251.2')

Sand Pack Filter (194'-252.5')

PH / Temp. (c)	Conductivity (uS/m)	Water Prod. (gpm)
7.93 / 20	250	23
8.07 / 21	240	24
8.42 / 22	250	20
8.23 / 22	230	100
7.83 / 22	330	30 - 40

DEPTH (ft): 215, 220, 225, 230, 235, 240, 245, 250, 255, 260, 265, 270, 275, 280

SAMPLES

SYMBOLS

MATERIALS DESCRIPTION

202'-253', Gravel, light-red brown, w/mod. sand, abundant pebbles/cobbles, min.-mod. clay/silt matrix, very poorly sorted, Oxidized, very uniform throughout zone, wet.

Total depth = 252.5'

Total depth = 252.5'

WELL DEVELOPMENT DATA

DATE: Oct. 6, 1994

FLOW: 50 gpm

TIME (hrs.): 1.5

PROJECT Cooper Flat - Hillsboro, N.M.

LOCATION N713191.10, E603249.22 N.M. S.P.C.

JOB NUMBER 68607 (ref: 68607M9)

GEOLOGIST C.W.

DRILL RIG Air Rotary

DRILLING COMPANY Beylik Drilling

DATE DRILLED 09/20/94 - 09/26/94

SURFACE ELEVATION 4440.14

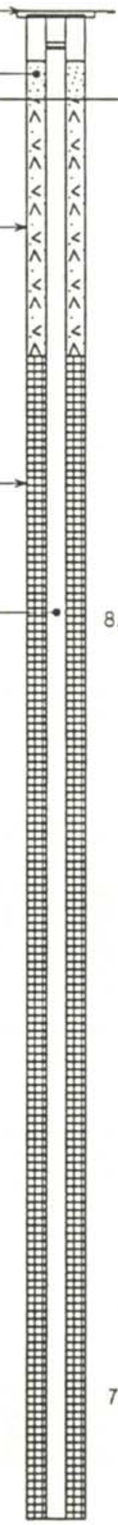
TOTAL DEPTH OF HOLE 252.50 Feet

WATER LEVEL Static, from TOC on 11/7/94: 71.05 Feet

Steffen Robertson and Kirsten
Engineering and Environmental Consultants

LOG OF MONITORING WELL MW-10

WELL DIAGRAM



- 8" dia. Steel Pipe w/locking well cap, approx. 3.5' above surface
- Sand
- Cement Grout Seal (0-10')
- Bentonite Grout (Volclay) Seal (10'-65.7')
- 4-1/2" dia. Sched. 80 Blank pvc w/cap, 2.29' above ground to 80.36' depth

DEPTH (ft)	PH / TEMP. (c)	Conductivity (uS/m)	Water Prod. (gpm)
20	8.3 / 24	400	3-5
25			0
40			0
50	7.7 / 17	500	< 3

MATERIALS DESCRIPTION

0 - 12', Gravelly soil, dark brown w/abundant cobbles & pebbles, and moderately abundant sand, silt soil, very poorly sorted, Oxidized, dry to 7.75'

Groundwater encountered @ 7.75'

12'-22', Gravel - medium brown-light red brown, min-mod clay/silt, Oxidized, wet

22'-24', Red-brown, abundant cobbles/pebbles, min-mod sand, abundant silt, Oxidized, no water

24-34.5', clay, brown-red brown, min pebbles, min-mod cobbles, "dry"

34.5-40', Gravel, grey brown, abundant brown-red brown clay/silt, Oxidized, "dry", tr-min sand

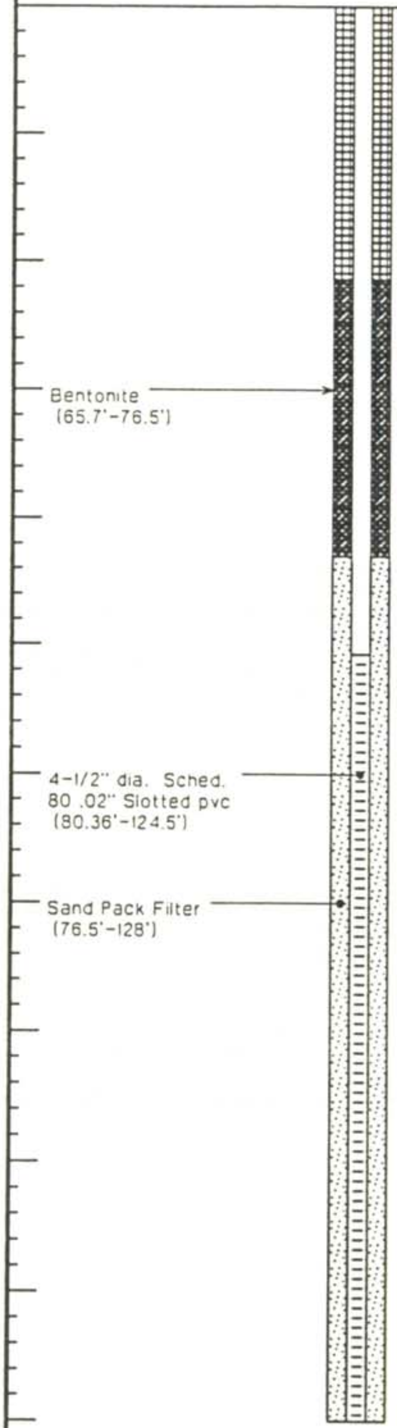
40-60', Gravel: med brown-red brown, abundant cobbles/pebbles, min-mod med-very coarse sand, "dry", Oxidized

PROJECT Copper Flat - Hillsboro, N.M.
LOCATION N719968.25, E636740.99 N.M. S.P.C.
JOB NUMBER 68607 (ref: 68607M10)
GEOLOGIST CW
DRILL RIG Air Rotary
DRILLING COMPANY Beylik Drilling
DATE DRILLED 10/94
SURFACE ELEVATION 4439.27
TOTAL DEPTH OF HOLE 128.0 Feet
WATER LEVEL Static, from TOC on 11/7/94: 70.625 Feet

Steffen Robertson and Kirsten
Engineering and Environmental Consultants

LOG OF MONITORING WELL MW-10

WELL DIAGRAM



PH / TEMP. (c)	Conductivity (uS/m)	Water Prod. (gpm)	DEPTH (ft)
		0	60
7.6 / 19	400	< .5	80
7.8 / 21	300	< 1	90
7.8 / 20	300	1.5-2	100
7.6 / 20	300	2 - 2.5	
7.3 / 20	300	3 - 3.5	
7.8 / 19	300	1 - 1.5	110

SAMPLES

SYMBOLS

MATERIALS DESCRIPTION

40'-60', Gravel: med brown-red brown, abundant cobbles/pebbles, min-mod med-very coarse sand, "dry", Oxidized

60-64', Gravel, med brown, within clay/silt matrix, WET (not saturated)

64-78', Clay med brown-grey brown, w/some red brown zones, min-mod sand, wet (not saturated) does not produce water on drilling

78-83', Clay, as above w/slight increase in cobbles/pebbles & trace water

83-83.5', Gravel, medium brown-grey brown w/clay/silt matrix, produces 2-3 gpm water on drilling

83.5-87', Gravel, medium brown-red brown, abundant clay/silt matrix, mod sand, Oxidized

87-95', Gravel: medium brown, abundant clay/silt matrix produces 1/2-1 gpm on drilling

95-105', Gravel - medium brown - w/abundant clay/silt, mod-abundant sand, 1 1/2-2 gpm water when blowing

105-115', Gravel - medium brown-grey brown, abundant clay/silt matrix, minor sand, produces 1 1/2-2 gpm on drilling

PROJECT Copper Flat - Hillsboro, N.M.
LOCATION N719968.25, E636740.99 N.M. S.P.C.
JOB NUMBER 68607 (ref: 68607M10)
GEOLOGIST CW
DRILL RIG Air Rotary

DRILLING COMPANY Beylik Drilling
DATE DRILLED 10/94
SURFACE ELEVATION 4439.27
TOTAL DEPTH OF HOLE 128.0 Feet
WATER LEVEL Static, from TOC on 11/7/94: 70.625 Feet

Steffen Robertson and Kirsten
Engineering and Environmental Consultants

LOG OF MONITORING WELL MW-10

WELL DIAGRAM	PH / TEMP. (c)	Conductivity (uS/m)	Water Prod. (gpm)	DEPTH (ft)	SAMPLES	SYMBOLS	MATERIALS DESCRIPTION
	7.6 / 19	300	< .5				105-115', Gravel - medium brown-grey brown, abundant clay/silt matrix, minor sand, produces 1 1/2-2 gpm on drilling
4-1/2" dia. Sched. 80 .02" Slotted pvc (80.36'-124.5')				115			115-128, Gravel - medium brown-grey brown, abundant clay/silt matrix, mod-abundant sand, produces less than 1 gpm on drilling
Sand Pack Filter (76.5'-128')	7.9 / 19.5	300	< .5	120			
	7.8 / 20.5	300	< 1	125			
Total depth = 128'							Total depth = 128'
				130			
NOTE: Well developed 10/07/94 for 2.25 hrs. at 25 to 30 gpm				135			
				140			
				145			
				150			
				155			
				160			
				165			

PROJECT Copper Flat - Hillsboro, N.M.
LOCATION N719968.25, E636740.99 N.M. S.P.C.
JOB NUMBER 68607 (ref: 68607M10)
GEOLOGIST CW
DRILL RIG Air Rotary

DRILLING COMPANY Beylik Drilling
DATE DRILLED 10/94
SURFACE ELEVATION 4439.27
TOTAL DEPTH OF HOLE 128.0 Feet
WATER LEVEL Static, from TOC on 11/7/94: 70.625 Feet

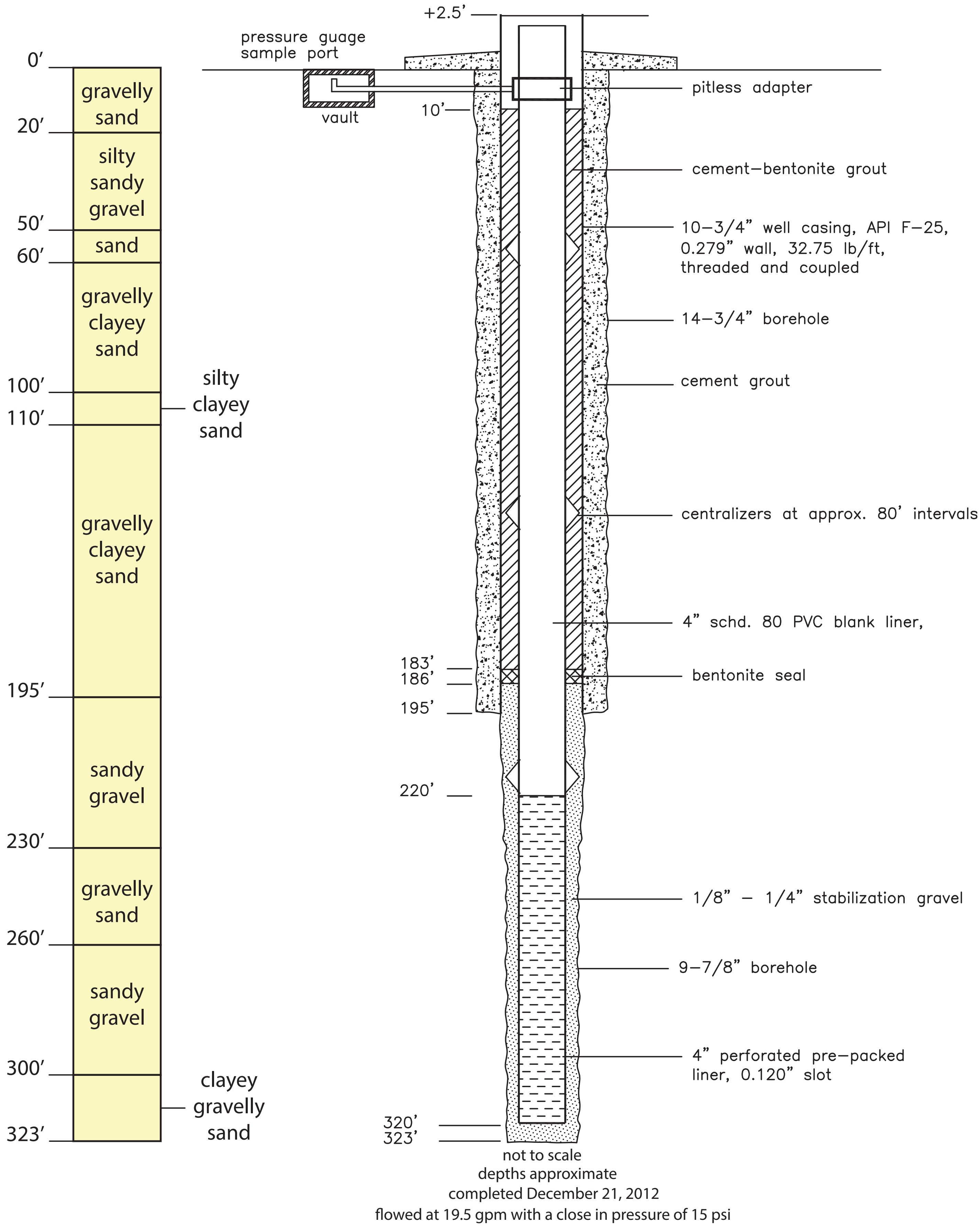


Figure B19. Well completion diagram for GWQ-11-27 (LA 00228 POD 1), Copper Flat Mine, Sierra County, New Mexico

2-21-2014

JOHN SHOMAKER & ASSOCIATES, INC.

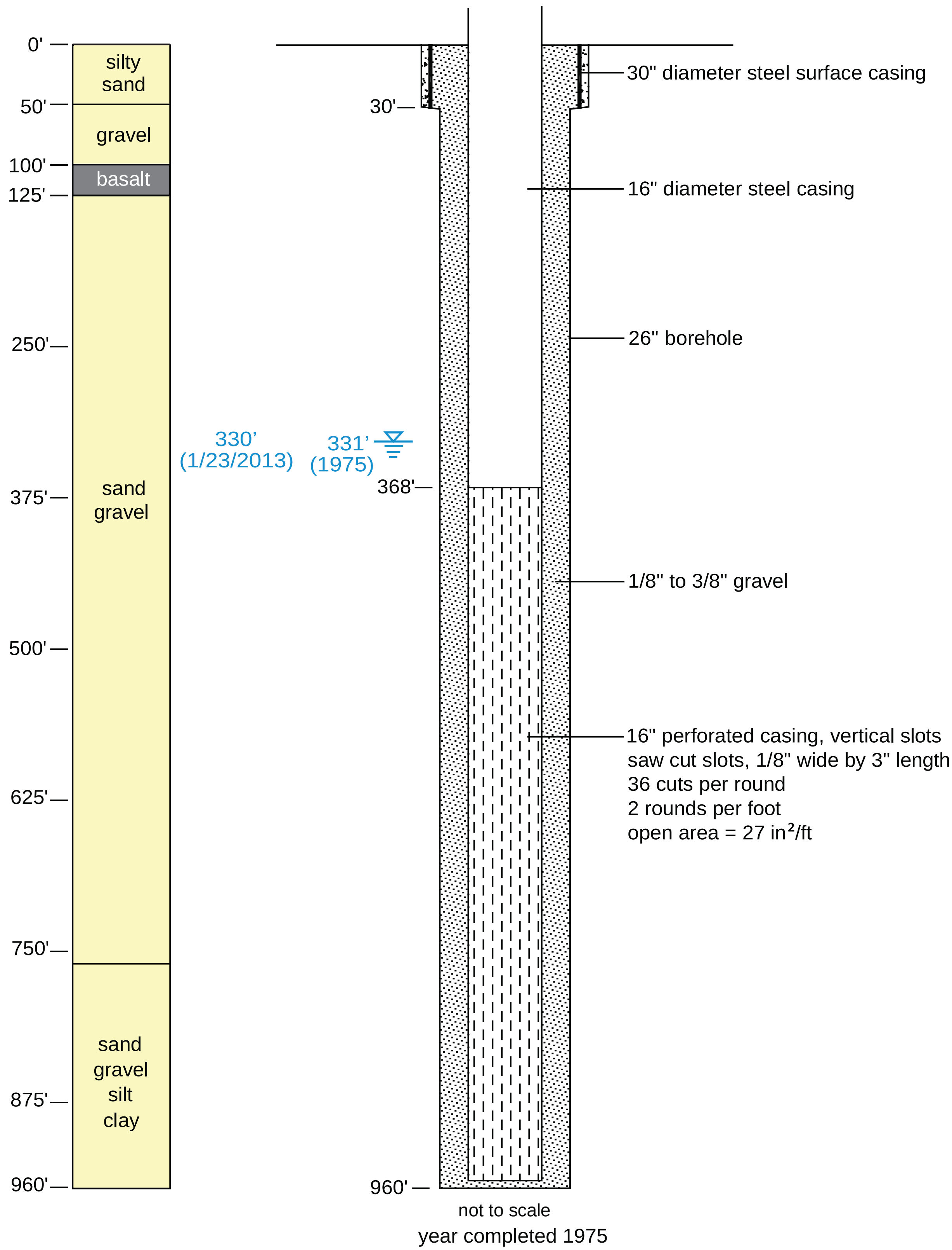


Figure B1. Well completion diagram for LRG-4652 (PW-1), Copper Flat Mine, Sierra County, New Mexico.

8-21-2013; DA/PW

JOHN SHOMAKER & ASSOCIATES, INC.

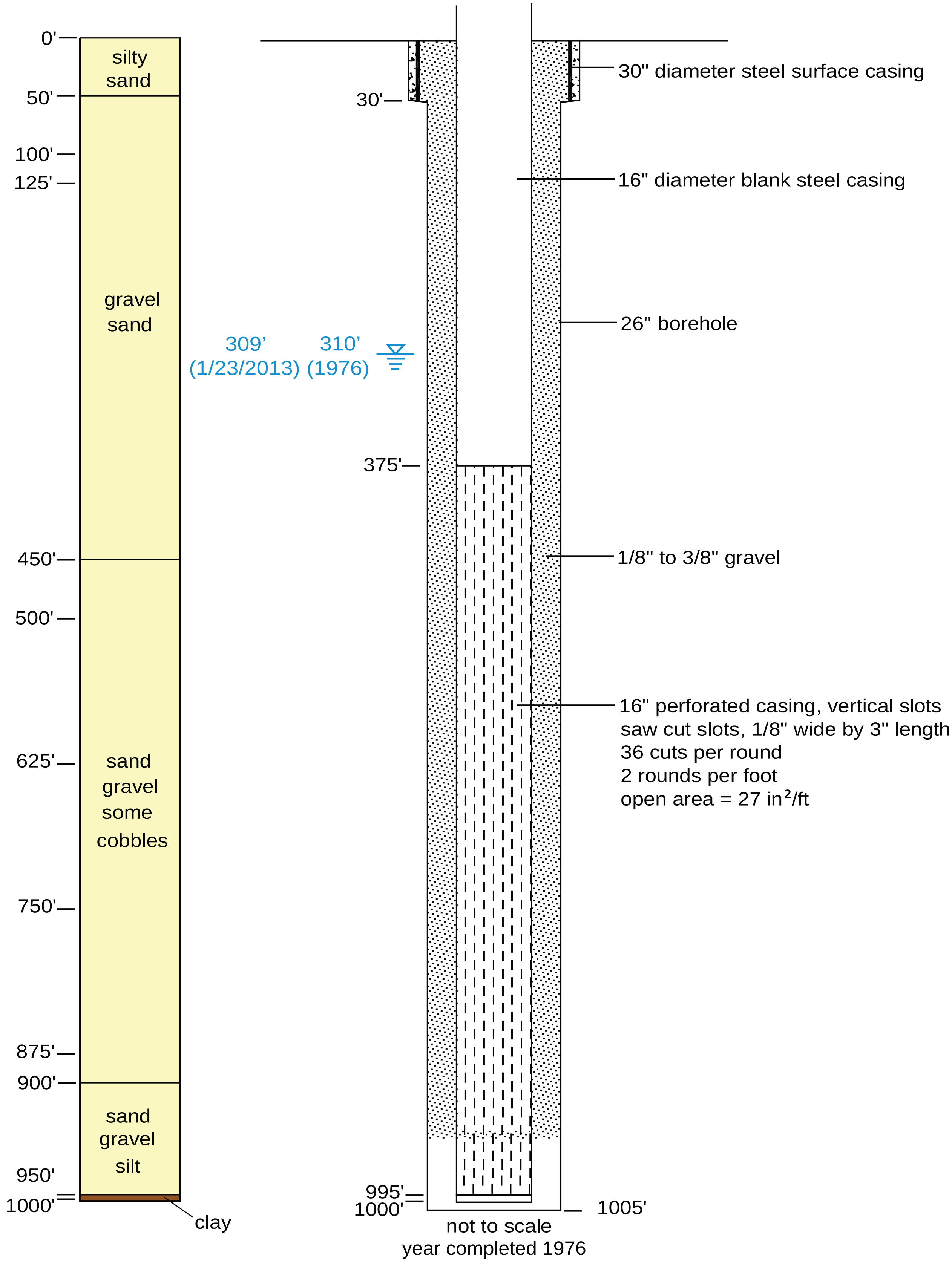


Figure B2. Well completion diagram for LRG-4652-S (PW-2), Copper Flat Mine, Sierra County, New Mexico.

8-21-2013; DA/PW

JOHN SHOMAKER & ASSOCIATES, INC.

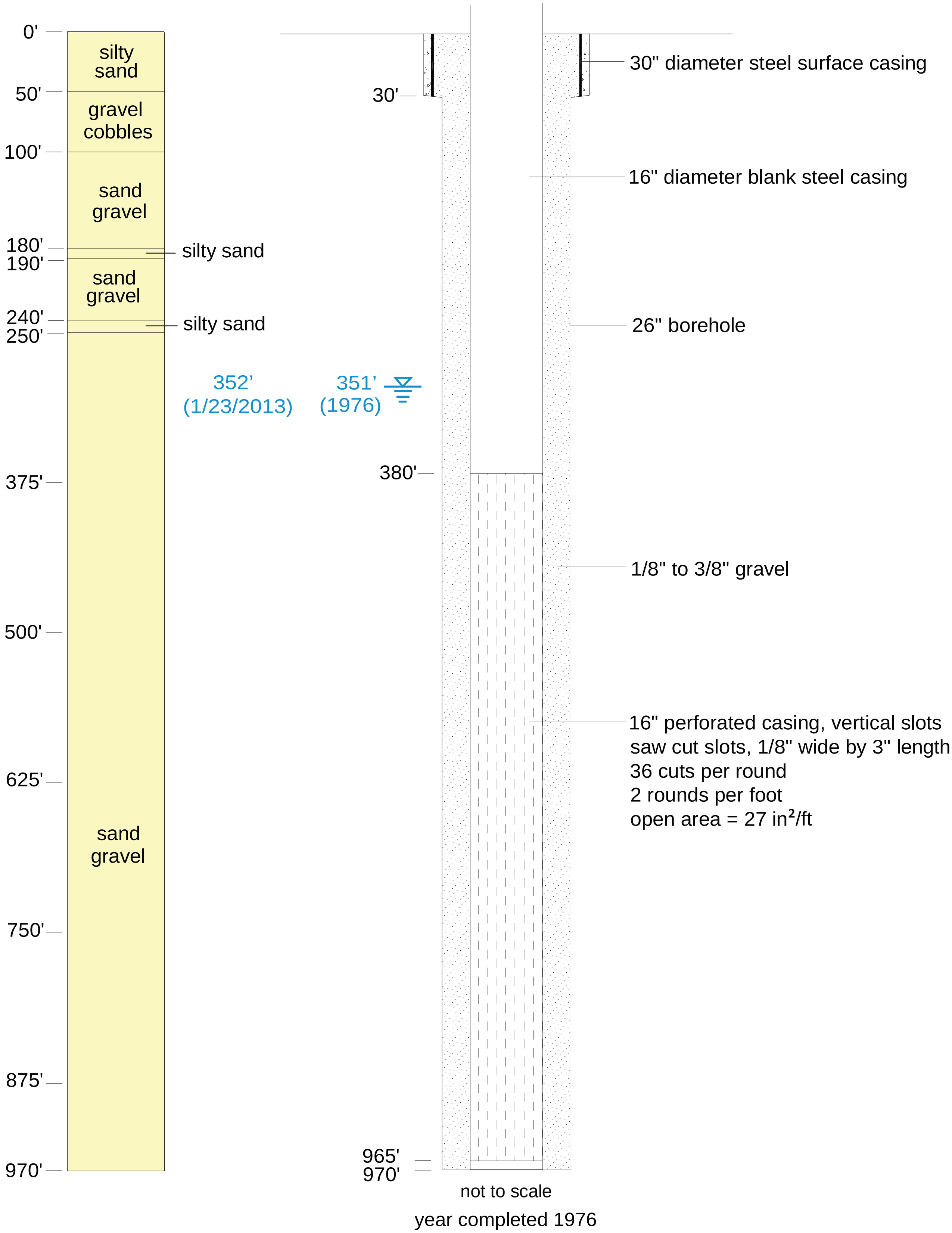


Figure B3. Well completion diagram for LRG-4652-S-2 (PW-3), Copper Flat Mine, Sierra County, New Mexico.

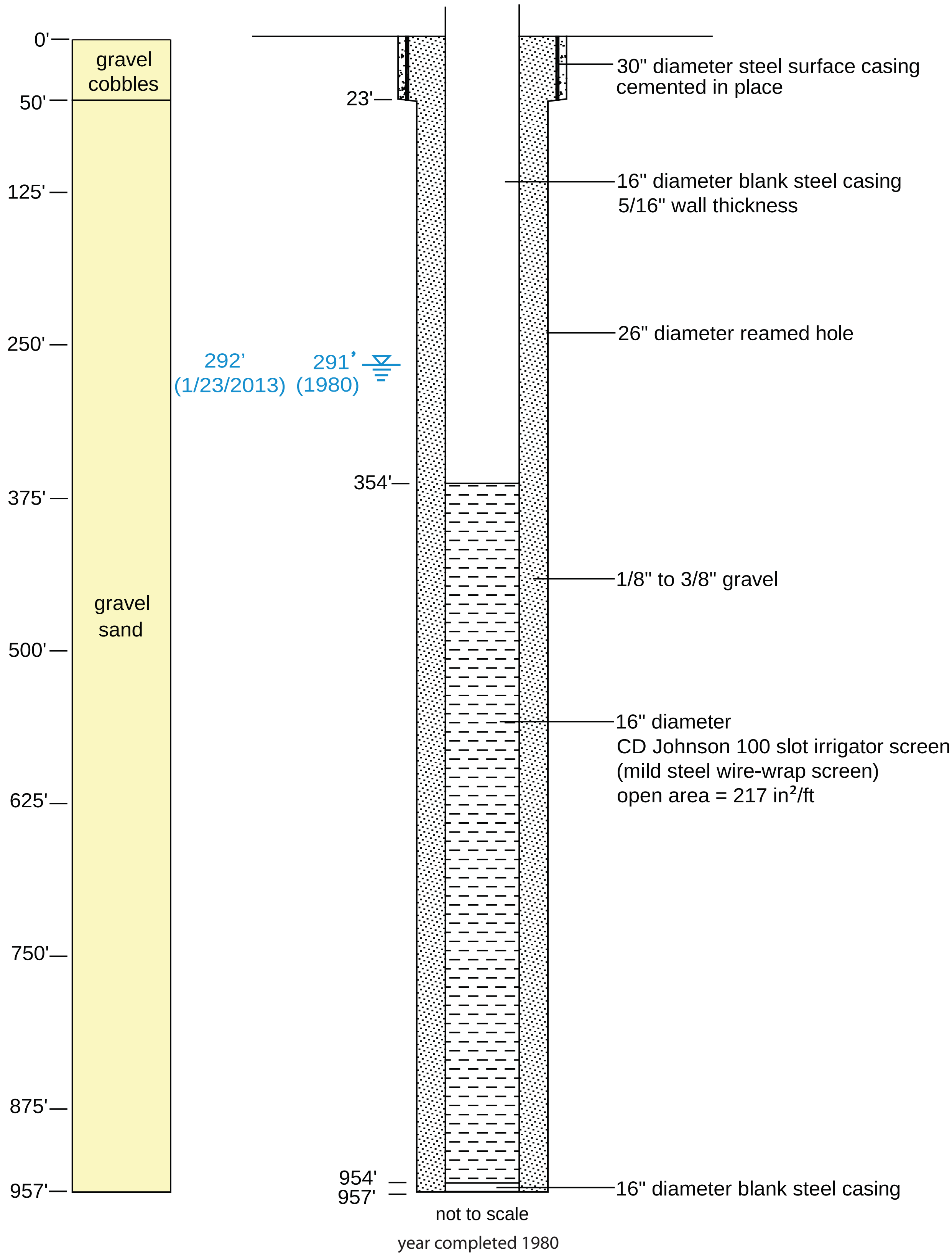
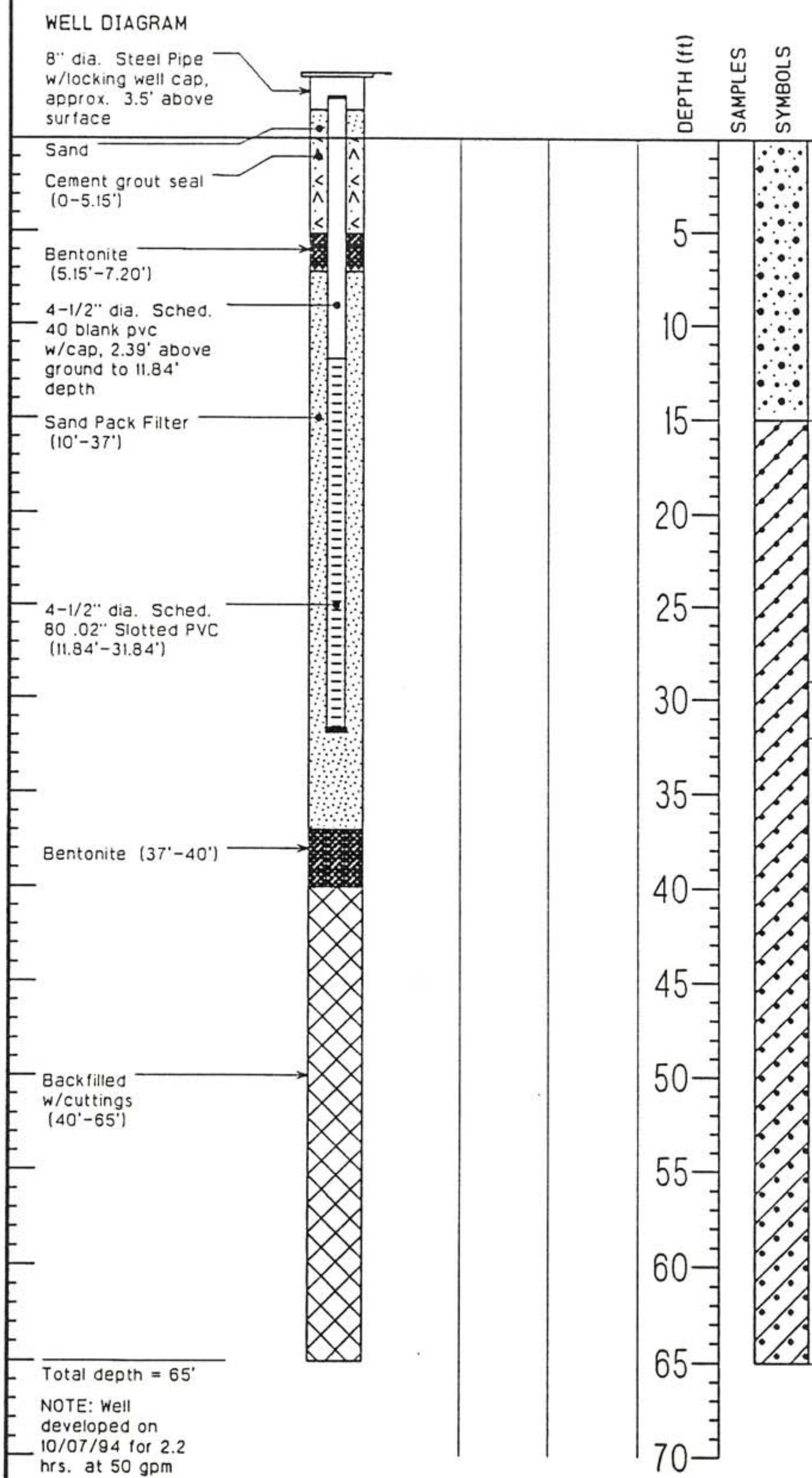


Figure B4. Well completion diagram for LRG-4652-S-3 (PW-4), Copper Flat Mine, Sierra County, New Mexico.

Shallow Alluvial Aquifer Wells

Steffen Robertson and Kirsten
Engineering and Environmental Consultants

LOG OF MONITORING WELL MW-11



MATERIALS DESCRIPTION

0-15', Soil and gravel, dark brown, abundant cobbles, min.- mod. sand, wet @ 15'.

15'-29', Gravel: med. dark brown, silty soil matrix w/mod. clay, wet.

29'-32', Clay/silt, med. dark brown, moist - damp, (not saturated) abundant cobbles/pebbles, min.- mod. sand.

32'-65', Clay, as above but "dry"

Total depth = 65'

PROJECT Copper Flat - Hillsboro, N.M.	DRILLING COMPANY Beylik Drilling
LOCATION N713751.31, E603378.24 N.M. S.P.C.	DATE DRILLED 10/11/94
JOB NUMBER 68607 (ref: 68607M11)	SURFACE ELEVATION 4439.48
GEOLOGIST CW	TOTAL DEPTH OF HOLE 65 Feet
DRILL RIG Air Rotary	WATER LEVEL Static, from TOC on 11/7/94: 10.65 Feet

WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

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LAS CRUCES, NEW MEXICO

1. GENERAL AND WELL LOCATION

POD NUMBER (WELL NUMBER): LRG-14545-POD1 (MW01)	OSE FILE NUMBER(S): LRG-14545
WELL OWNER NAME(S): U.S. Bureau of Reclamation	PHONE (OPTIONAL): 575-894-6661 Ext 105
WELL OWNER MAILING ADDRESS: H.C. 32 Box 312	CITY: Truth or Consequences STATE: N.M ZIP: 87901

WELL LOCATION (FROM GPS)	DEGREES	MINUTES	SECONDS	
LATITUDE			N	* ACCURACY REQUIRED: ONE TENTH OF A SECOND
LONGITUDE			W	* DATUM REQUIRED: WGS 84

DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS

2. OPTIONAL

(2.5 ACRE)	(10 ACRE)	(40 ACRE)	(160 ACRE)	SECTION	TOWNSHIP	RANGE
NE ¼	NE ¼	SW ¼	¼	21	16 ☐ NORTH ☒ SOUTH	5 ☐ EAST ☒ WEST

SUBDIVISION NAME	LOT NUMBER	BLOCK NUMBER	UNIT/TRACT
HYDROGRAPHIC SURVEY		MAP NUMBER	TRACT NUMBER

3. DRILLING INFORMATION

LICENSE NUMBER	NAME OF LICENSED DRILLER			NAME OF WELL DRILLING COMPANY
WD-1433	Jefferie Van Ausdal			U.S. Bureau of Reclamation
DRILLING STARTED	DRILLING ENDED	DEPTH OF COMPLETED WELL (FT)	BORE HOLE DEPTH (FT)	DEPTH WATER FIRST ENCOUNTERED (FT)
1-5-09	1-6-09	32.9'	32.9'	25.75'

COMPLETED WELL IS: ☐ ARTESIAN ☐ DRY HOLE ☒ SHALLOW (UNCONFINED)

STATIC WATER LEVEL IN COMPLETED WELL (FT): 25.75'

DRILLING FLUID: ☐ AIR ☐ MUD ☐ ADDITIVES – SPECIFY:

DRILLING METHOD: ☐ ROTARY ☐ HAMMER ☐ CABLE TOOL ☒ OTHER – SPECIFY: Auger

DEPTH (FT) FROM	TO	BORE HOLE DIA. (IN)	CASING MATERIAL	CONNECTION TYPE (CASING)	INSIDE DIA. CASING (IN)	CASING WALL THICKNESS (IN)	SLOT SIZE (IN)
32.9'	22.9'	6"	PVC SCH 40	Threaded	2"	SCH 40	0.010
22.9'	+18"	6"	PVC SCH 40	Threaded	2"	SCH 40	BLANK

4. WATER BEARING STRATA

DEPTH (FT) FROM	TO	THICKNESS (FT)	FORMATION DESCRIPTION OF PRINCIPAL WATER-BEARING STRATA (INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES)	YIELD (GPM)
25.75'	32.9'	7.15'	Sand & Gravel and Clay	Not Tested

METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA	TOTAL ESTIMATED WELL YIELD (GPM)

FOR OSE INTERNAL USE — WELL RECORD & LOG (Version 6/9/08)

FILE NUMBER	POD NUMBER	TRN NUMBER
LOCATION		PAGE 1 OF 2

5. SEAL AND PUMP

TYPE OF PUMP: ☐ SUBMERSIBLE ☐ JET ☒ NO PUMP – WELL NOT EQUIPPED ☐ TURBINE ☐ CYLINDER ☐ OTHER – SPECIFY:

ANNULAR SEAL AND GRAVEL PACK	DEPTH (FT) FROM	DEPTH (FT) TO	BORE HOLE DIA. (IN)	MATERIAL TYPE AND SIZE	AMOUNT (CUBIC FT)	METHOD OF PLACEMENT
	32.9'	5.0'	6"	No Filter Pack		
	5.0'	0.0'	6"	3/8" Gravel Bentonite	1	Poured in

6. GEOLOGIC LOG OF WELL

DEPTH (FT) FROM	DEPTH (FT) TO	THICKNESS (FT)	COLOR AND TYPE OF MATERIAL ENCOUNTERED (INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES)	WATER BEARING?
0.0'	3.0'	3.0'	Dark Brown Silt, Sand, Clay, Gravel	☐ YES ☒ NO
3.0'	9.5'	6.5'	Dark Brown Sandy, Silt, Clay, Gravel	☐ YES ☒ NO
9.5'	14.0'	4.5'	Dark Brown Sandy, Clay, silt, Gravel	☐ YES ☒ NO
14.0	28.0'	14.0'	Dark Brown Gravelly, Sand, Clay, Silt	☒ YES ☐ NO
28.0'	29.0'	1.0'	Dark Brown Gravelly, Sand, Clay, silt	☒ YES ☐ NO
29.0'	32.9'	3.9'	Dark Brown Gravelly, Sand, Clay, silt	☒ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO

ATTACH ADDITIONAL PAGES AS NEEDED TO FULLY DESCRIBE THE GEOLOGIC LOG OF THE WELL

7. TEST & ADDITIONAL INFO

WELL TEST — METHOD: ☐ BAILER ☐ PUMP ☐ AIR LIFT ☐ OTHER – SPECIFY:

TEST RESULTS - ATTACH A COPY OF DATA COLLECTED DURING WELL TESTING, INCLUDING START TIME, END TIME, AND A TABLE SHOWING DISCHARGE AND DRAWDOWN OVER THE TESTING PERIOD.

ADDITIONAL STATEMENTS OR EXPLANATIONS:

Well Has A 4" Stand Pipe 18" Above Ground Level

8. SIGNATURE

THE UNDERSIGNED HEREBY CERTIFIES THAT, TO THE BEST OF HIS OR HER KNOWLEDGE AND BELIEF, THE FOREGOING IS A TRUE AND CORRECT RECORD OF THE ABOVE DESCRIBED HOLE AND THAT HE OR SHE WILL FILE THIS WELL RECORD WITH THE STATE ENGINEER AND THE PERMIT HOLDER WITHIN 20 DAYS AFTER COMPLETION OF WELL DRILLING:

Jefferie Van Arsdale — SIGNATURE OF DRILLER

1-12-09 — DATE

FOR OSE INTERNAL USE — WELL RECORD & LOG (Version 6/9/08)

FILE NUMBER	POD NUMBER	TRN NUMBER
LOCATION		PAGE 2 OF 2

LRG-14545
TRN-420799

RECEIVED
2009 JAN 20 PM 4:30
STATE ENGINEER OFFICE
LAS CRUCES, NEW MEXICO

WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

1. GENERAL AND WELL LOCATION

POD NUMBER (WELL NUMBER): LRG-14545-POD2 (MW02)	OSE FILE NUMBER(S): LRG-14545
WELL OWNER NAME(S): U.S. Bureau of Reclamation	PHONE (OPTIONAL): 575-894-6661 Ext. 105
WELL OWNER MAILING ADDRESS: H.C. 32 Box 312	CITY: Truth or Consequences STATE: NM ZIP: 87901

WELL LOCATION (FROM GPS)	DEGREES	MINUTES	SECONDS	
LATITUDE			N	* ACCURACY REQUIRED: ONE TENTH OF A SECOND
LONGITUDE			W	* DATUM REQUIRED: WGS 84

DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS

2. OPTIONAL

(2.5 ACRE)	(10 ACRE)	(40 ACRE)	(160 ACRE)	SECTION	TOWNSHIP	RANGE
SW ¼	SE ¼	NW ¼	¼	21	16 ☐ NORTH ☒ SOUTH	5 ☐ EAST ☒ WEST

SUBDIVISION NAME	LOT NUMBER	BLOCK NUMBER	UNIT/TRACT
HYDROGRAPHIC SURVEY		MAP NUMBER	TRACT NUMBER

3. DRILLING INFORMATION

LICENSE NUMBER: WD-1433	NAME OF LICENSED DRILLER: Jefferic Van Ausdal	NAME OF WELL DRILLING COMPANY: U.S. Bureau of Reclamation

DRILLING STARTED	DRILLING ENDED	DEPTH OF COMPLETED WELL (FT)	BORE HOLE DEPTH (FT)	DEPTH WATER FIRST ENCOUNTERED (FT)
1-6-09	1-6-09	29.0'	29.0'	21.1'

COMPLETED WELL IS: ☐ ARTESIAN ☐ DRY HOLE ☒ SHALLOW (UNCONFINED)

STATIC WATER LEVEL IN COMPLETED WELL (FT): 21.1'

DRILLING FLUID: ☐ AIR ☐ MUD ☐ ADDITIVES – SPECIFY:

DRILLING METHOD: ☐ ROTARY ☐ HAMMER ☐ CABLE TOOL ☒ OTHER – SPECIFY: AUGER

DEPTH (FT) FROM	TO	BORE HOLE DIA. (IN)	CASING MATERIAL	CONNECTION TYPE (CASING)	INSIDE DIA. CASING (IN)	CASING WALL THICKNESS (IN)	SLOT SIZE (IN)
29.0'	19.0'	6"	P.V.C SCH 40	Threaded	2"	SCH 40	0.010
19.0'	+18"	6"	P.V.C SCH 40	Threaded	2"	SCH 40	BLANK

4. WATER BEARING STRATA

DEPTH (FT) FROM	TO	THICKNESS (FT)	FORMATION DESCRIPTION OF PRINCIPAL WATER-BEARING STRATA (INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES)	YIELD (GPM)
21.1'	29.0'	8.9'	SAND, GRAVEL AND CLAY	Not Tested

METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA	TOTAL ESTIMATED WELL YIELD (GPM)

FOR OSE INTERNAL USE — WELL RECORD & LOG (Version 6/9/08)

FILE NUMBER	POD NUMBER	TRN NUMBER
LOCATION		PAGE 1 OF 2

LRG-14545 TRN-420799

18620

5. SEAL AND PUMP

TYPE OF PUMP: ☐ SUBMERSIBLE ☐ JET ☒ NO PUMP – WELL NOT EQUIPPED ☐ TURBINE ☐ CYLINDER ☐ OTHER – SPECIFY:

ANNULAR SEAL AND GRAVEL PACK	DEPTH (FT) FROM	DEPTH (FT) TO	BORE HOLE DIA. (IN)	MATERIAL TYPE AND SIZE	AMOUNT (CUBIC FT)	METHOD OF PLACEMENT
	29.0'	5.0'	6"	No Filter Pack		
	5.0'	0.0'	6"	3/8" Gravel Bentonite	1	Poured in

6. GEOLOGIC LOG OF WELL

DEPTH (FT) FROM	DEPTH (FT) TO	THICKNESS (FT)	COLOR AND TYPE OF MATERIAL ENCOUNTERED (INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES)	WATER BEARING?
0.0'	1.5'	1.5'	Dark Brown Silt, Sand, Clay, Gravel	☐ YES ☒ NO
1.5'	5.0'	3.5'	Dark Brown Gravelly, Sand, Silt, Clay	☐ YES ☒ NO
5.0'	7.0'	2.0'	Dark Brown Gravelly, Sand	☐ YES ☒ NO
7.0'	14.0'	7.0'	Dark Brown Gravelly, Sand, Clay	☐ YES ☒ NO
14.0'	29.0'	15.0'	Dark Brown Gravelly, Sand, Clay	☒ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO

ATTACH ADDITIONAL PAGES AS NEEDED TO FULLY DESCRIBE THE GEOLOGIC LOG OF THE WELL

7. TEST & ADDITIONAL INFO

WELL TEST — METHOD: ☐ BAILER ☐ PUMP ☐ AIR LIFT ☐ OTHER – SPECIFY:

TEST RESULTS - ATTACH A COPY OF DATA COLLECTED DURING WELL TESTING, INCLUDING START TIME, END TIME, AND A TABLE SHOWING DISCHARGE AND DRAWDOWN OVER THE TESTING PERIOD.

ADDITIONAL STATEMENTS OR EXPLANATIONS:

Well Has A 4" Stand pipe 18" Above Ground Level

8. SIGNATURE

THE UNDERSIGNED HEREBY CERTIFIES THAT, TO THE BEST OF HIS OR HER KNOWLEDGE AND BELIEF, THE FOREGOING IS A TRUE AND CORRECT RECORD OF THE ABOVE DESCRIBED HOLE AND THAT HE OR SHE WILL FILE THIS WELL RECORD WITH THE STATE ENGINEER AND THE PERMIT HOLDER WITHIN 20 DAYS AFTER COMPLETION OF WELL DRILLING:

Jefferie Van Auselel — SIGNATURE OF DRILLER

1-12-09 — DATE

FOR OSE INTERNAL USE

WELL RECORD & LOG (Version 6/9/08)

FILE NUMBER	POD NUMBER	TRN NUMBER
LOCATION		PAGE 2 OF 2

LRG-14545
TRN-420799

WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

RECEIVED 2009 JAN 20 PM 4:30 STATE ENGINEER OFFICE LAS CRUCES, NEW MEXICO

1. GENERAL AND WELL LOCATION

POD NUMBER (WELL NUMBER): LRG-14545-POD3 (MW03)	OSE FILE NUMBER(S): LRG-14545
WELL OWNER NAME(S): U.S. Bureau of Reclamation	PHONE (OPTIONAL): 575-894-6661 Ext 105
WELL OWNER MAILING ADDRESS: H.C. 32 Box 312	CITY: Truth or Consequences STATE: NM ZIP: 87901

WELL LOCATION (FROM GPS)	DEGREES	MINUTES	SECONDS	
LATITUDE			N	* ACCURACY REQUIRED: ONE TENTH OF A SECOND
LONGITUDE			W	* DATUM REQUIRED: WGS 84

DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS

2. OPTIONAL

(2.5 ACRE)	(10 ACRE)	(40 ACRE)	(160 ACRE)	SECTION	TOWNSHIP	RANGE
SW ¼	NW ¼	SE ¼	¼	22	16 ☐ NORTH ☒ SOUTH	5 ☐ EAST ☒ WEST

SUBDIVISION NAME	LOT NUMBER	BLOCK NUMBER	UNIT/TRACT
HYDROGRAPHIC SURVEY		MAP NUMBER	TRACT NUMBER

3. DRILLING INFORMATION

LICENSE NUMBER: WD-1433	NAME OF LICENSED DRILLER: Jefferic Van Ausdal			NAME OF WELL DRILLING COMPANY: U.S. Bureau of Reclamation
DRILLING STARTED: 1-7-09	DRILLING ENDED: 1-7-09	DEPTH OF COMPLETED WELL (FT): 24.8'	BORE HOLE DEPTH (FT): 24.8'	DEPTH WATER FIRST ENCOUNTERED (FT): 23.3'

COMPLETED WELL IS: ☐ ARTESIAN ☐ DRY HOLE ☒ SHALLOW (UNCONFINED)

STATIC WATER LEVEL IN COMPLETED WELL (FT): 23.3'

DRILLING FLUID: ☐ AIR ☐ MUD ☐ ADDITIVES – SPECIFY:

DRILLING METHOD: ☐ ROTARY ☐ HAMMER ☐ CABLE TOOL ☒ OTHER – SPECIFY: Auger

DEPTH (FT) FROM	DEPTH (FT) TO	BORE HOLE DIA. (IN)	CASING MATERIAL	CONNECTION TYPE (CASING)	INSIDE DIA. CASING (IN)	CASING WALL THICKNESS (IN)	SLOT SIZE (IN)
24.8'	14.8'	6"	P.V.C SCH 40	Threaded	2"	SCH 40	0.010
14.8'	+18"	6"	P.V.C SCH 40	Threaded	2"	SCH 40	Blank

4. WATER BEARING STRATA

DEPTH (FT) FROM	DEPTH (FT) TO	THICKNESS (FT)	FORMATION DESCRIPTION OF PRINCIPAL WATER-BEARING STRATA (INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES)	YIELD (GPM)
23.3'	24.8'	1.5'	Sand, Gravel, Clay	Not Tested

METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA	TOTAL ESTIMATED WELL YIELD (GPM)

FOR OSE INTERNAL USE

WELL RECORD & LOG (Version 6/9/08)

FILE NUMBER	POD NUMBER	TRN NUMBER
LOCATION		PAGE 1 OF 2

LRG-14545

TRN-420799

5. SEAL AND PUMP

TYPE OF PUMP: ☐ SUBMERSIBLE ☐ JET ☒ NO PUMP – WELL NOT EQUIPPED ☐ TURBINE ☐ CYLINDER ☐ OTHER – SPECIFY:

ANNULAR SEAL AND GRAVEL PACK	DEPTH (FT) FROM	DEPTH (FT) TO	BORE HOLE DIA. (IN)	MATERIAL TYPE AND SIZE	AMOUNT (CUBIC FT)	METHOD OF PLACEMENT
	24.8'	5.0'	6"	No Filter Pack		
	5.0'	0.0'	6"	3/8" Gravel Bentonite	1	Poured in

6. GEOLOGIC LOG OF WELL

DEPTH (FT) FROM	DEPTH (FT) TO	THICKNESS (FT)	COLOR AND TYPE OF MATERIAL ENCOUNTERED (INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES)	WATER BEARING?
0.0'	0.4'	0.4'	Dark Brown Silt, Sand, Clay	☐ YES ☒ NO
0.4'	3.0'	2.6'	Dark Brown Clay, Sand, Silt	☐ YES ☒ NO
3.0'	4.0'	1.0'	Dark Brown Clay, Sand, Silt	☐ YES ☒ NO
4.0'	5.0'	1.0'	Dark Brown Gravelly, Sand, Clay, Silt	☐ YES ☒ NO
5.0'	18.0'	13.0'	Dark Brown Gravelly, Sand, Clay, Silt	☐ YES ☒ NO
18.0'	24.8'	6.8'	Dark Brown Gravelly, Sand, Clay, Silt	☒ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO

ATTACH ADDITIONAL PAGES AS NEEDED TO FULLY DESCRIBE THE GEOLOGIC LOG OF THE WELL

7. TEST & ADDITIONAL INFO

WELL TEST

METHOD: ☐ BAILER ☐ PUMP ☐ AIR LIFT ☐ OTHER – SPECIFY:

TEST RESULTS - ATTACH A COPY OF DATA COLLECTED DURING WELL TESTING, INCLUDING START TIME, END TIME, AND A TABLE SHOWING DISCHARGE AND DRAWDOWN OVER THE TESTING PERIOD.

ADDITIONAL STATEMENTS OR EXPLANATIONS:

Well Has A 4" standpipe 18" Above Ground Level

8. SIGNATURE

THE UNDERSIGNED HEREBY CERTIFIES THAT, TO THE BEST OF HIS OR HER KNOWLEDGE AND BELIEF, THE FOREGOING IS A TRUE AND CORRECT RECORD OF THE ABOVE DESCRIBED HOLE AND THAT HE OR SHE WILL FILE THIS WELL RECORD WITH THE STATE ENGINEER AND THE PERMIT HOLDER WITHIN 20 DAYS AFTER COMPLETION OF WELL DRILLING:

Jefferie Van Aradol — SIGNATURE OF DRILLER

1-12-09 — DATE

FOR OSE INTERNAL USE — WELL RECORD & LOG (Version 6/9/08)

FILE NUMBER	POD NUMBER	TRN NUMBER
LOCATION		PAGE 2 OF 2

Crystalline Bedrock Wells

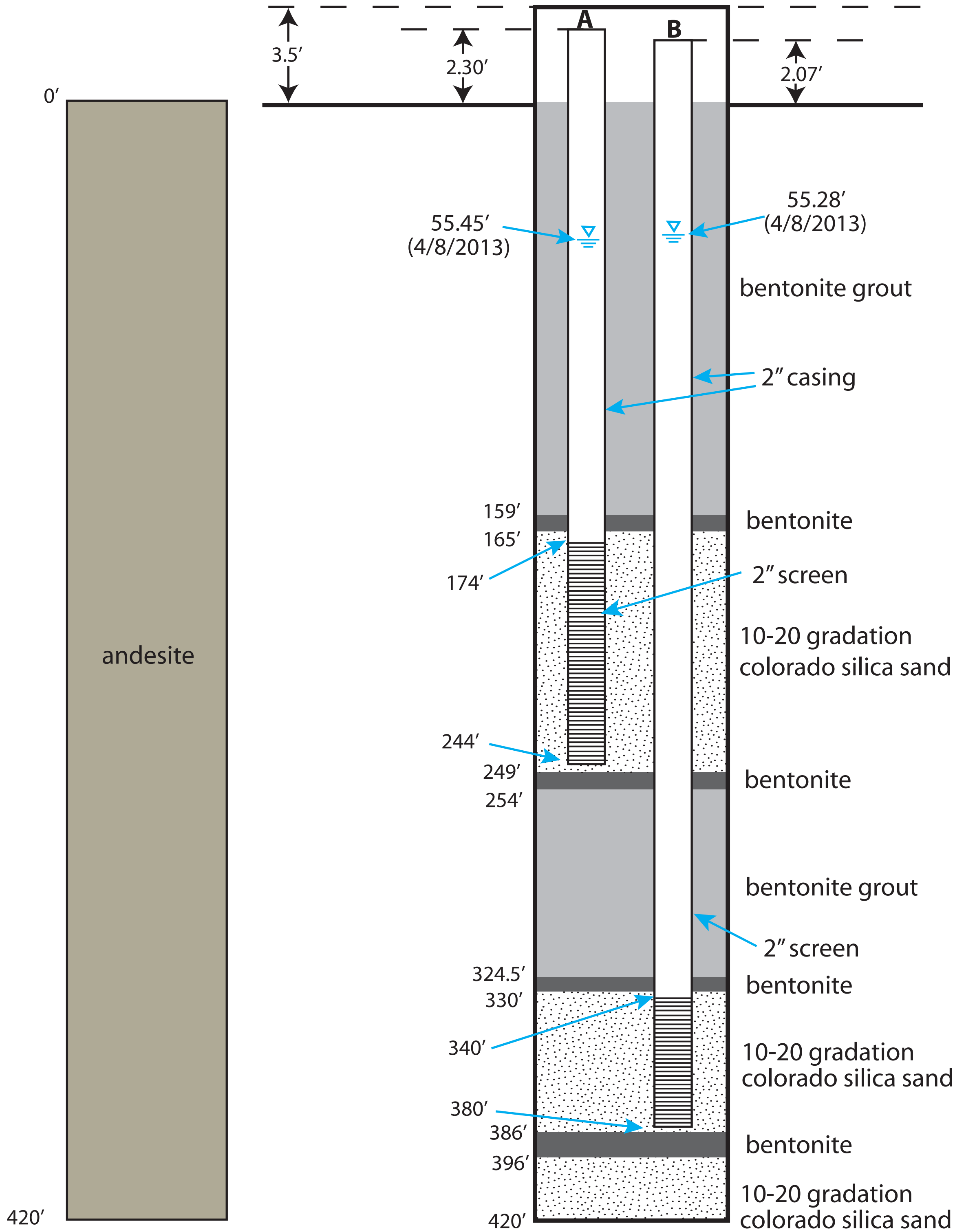


Figure A1. Well diagram, GWQ96-22, Copper Flat Mine, Sierra County, New Mexico.

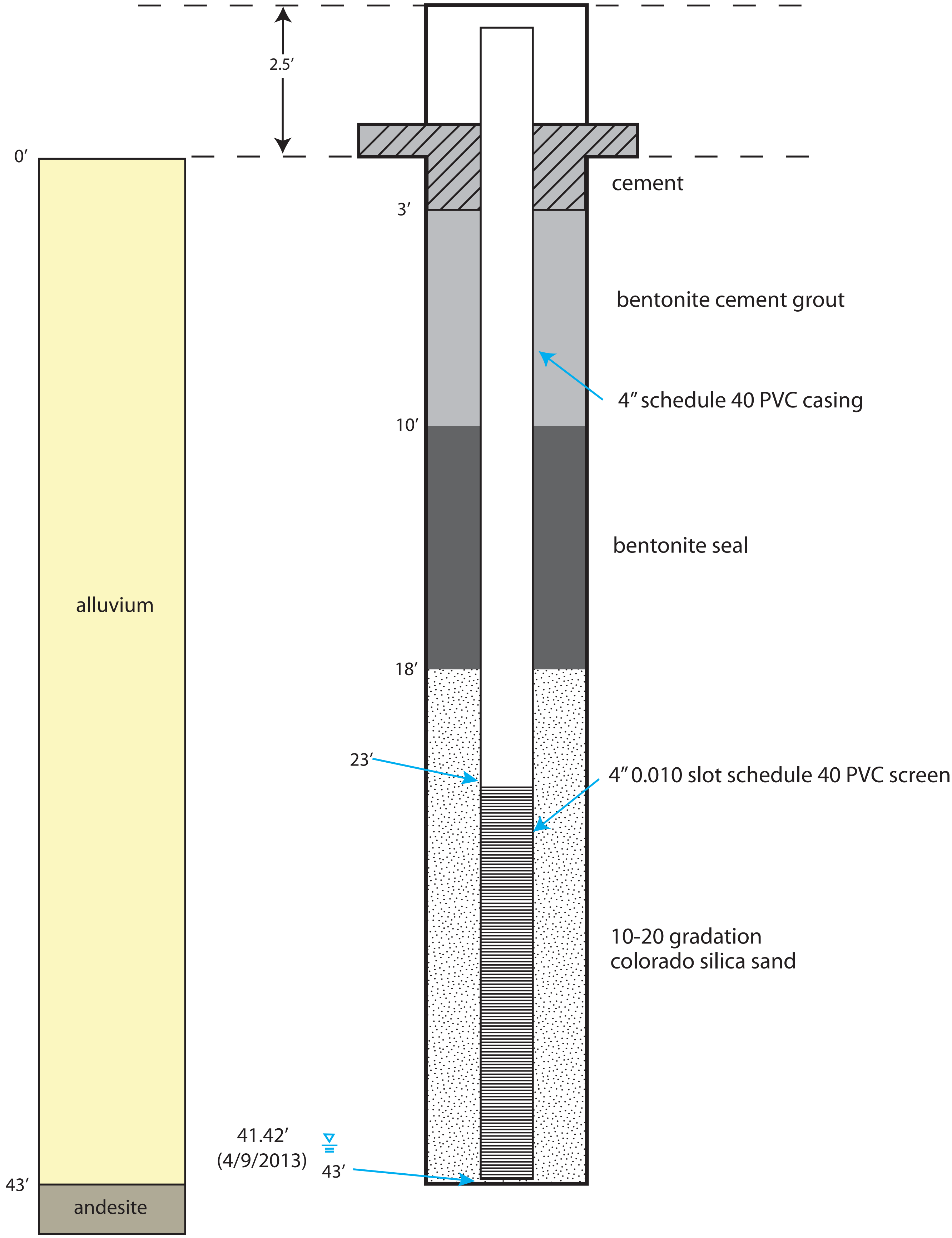


Figure A5. Well diagram, GWQ11-26, Copper Flat Mine, Sierra County, New Mexico.

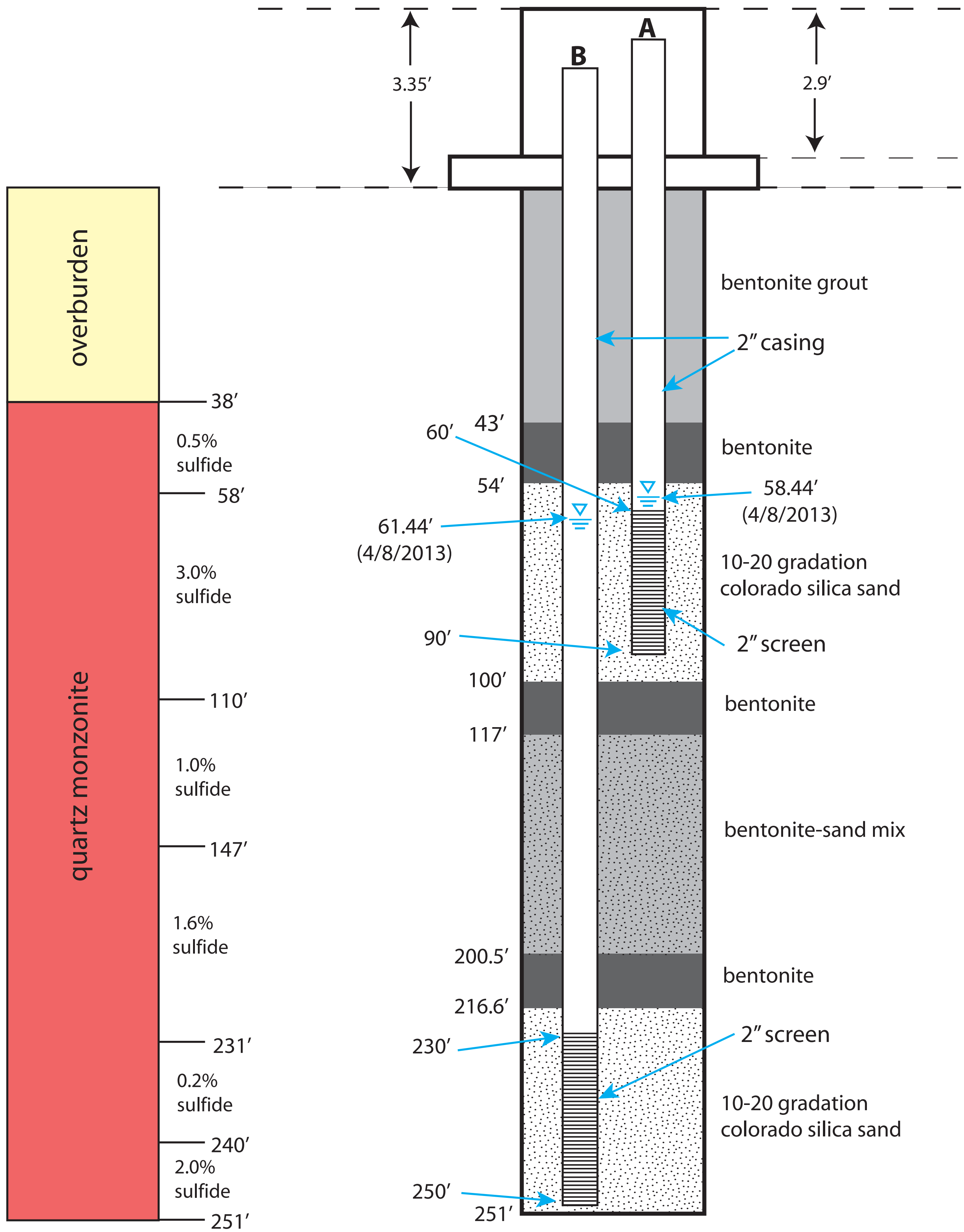


Figure A3. Well diagram, GWQ11-24, Copper Flat Mine, Sierra County, New Mexico.

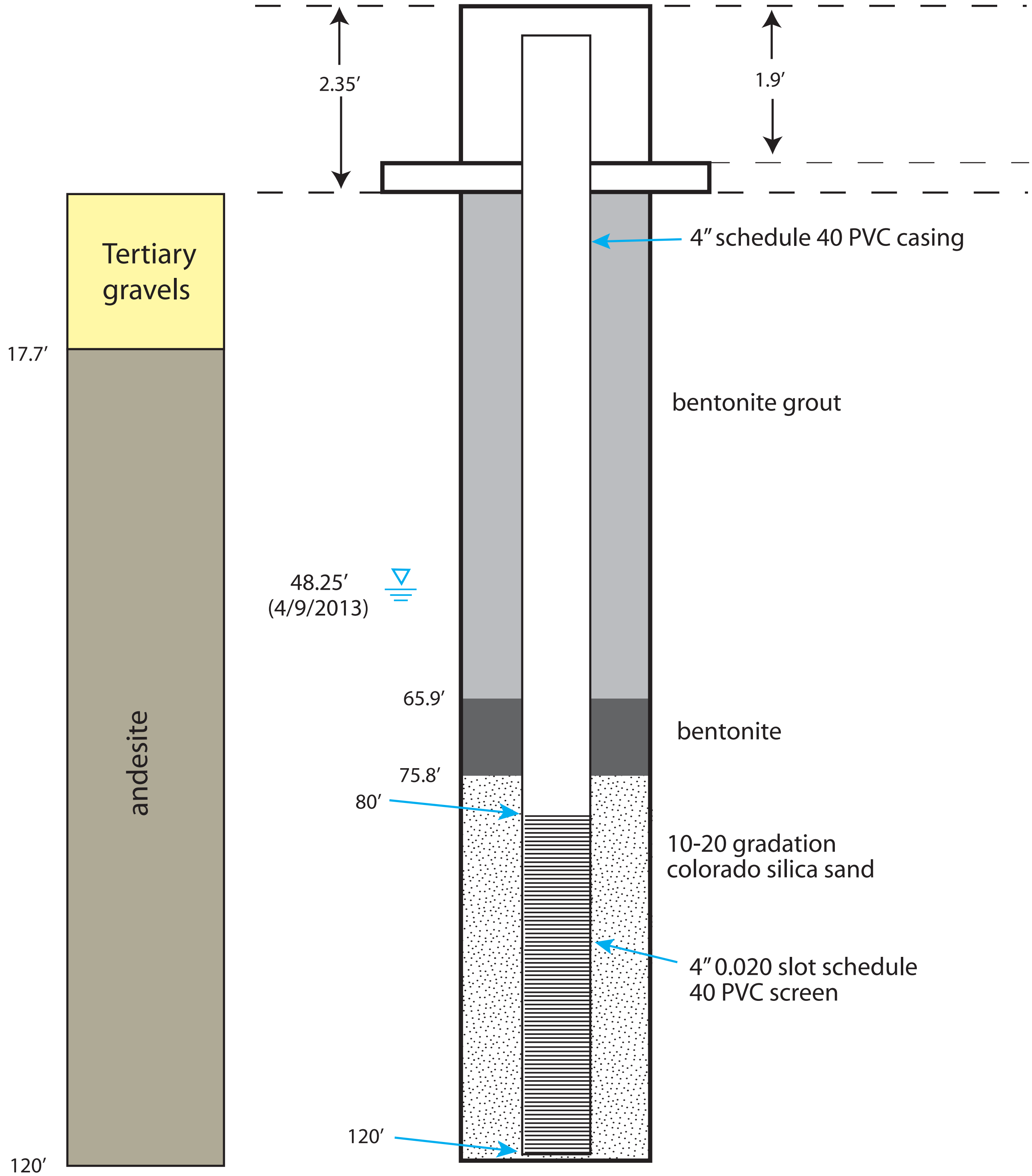


Figure A7. Well diagram, GWQ-5R, Copper Flat Mine, Sierra County, New Mexico.

6-27-2013; DA/PW

JOHN SHOMAKER & ASSOCIATES, INC.

18629

FORM C

Ground Water Quality Bureau
INSPECTION OF PUBLIC RECORDS REVIEW DOCUMENTATION

Files provided for inspection or private copy:

DP-1840 File

On-site Inspection (if applicable):

Date: 5/22/18 Time: 1:30 pm

Reviewer Name: Katie Emmer Phone #: 505.400.7975

Signature: Katie Emmer

Off-Site copying (if applicable):

Fill out Inspection of Public Records Act Private Copy Facility Authorization Form.

Post-Review:

All documents returned? Yes No

Documents returned in good condition? Yes No

GWQB Staff member: Brad Reid

Date: 5/22/18

FORM C

Ground Water Quality Bureau
INSPECTION OF PUBLIC RECORDS REVIEW DOCUMENTATION

Files provided for inspection or private copy:

DP -1840 Files

On-site Inspection (if applicable):

Date: 5/23/18 Time: 9:30

Reviewer Name: Michael Jensen Phone #: 505 362-1063

Signature:

Off-Site copying (if applicable):

Fill out Inspection of Public Records Act Private Copy Facility Authorization Form.

Post-Review:

All documents returned? Yes No

Documents returned in good condition? Yes No

GWQB Staff member:

Date: 5/23/18

Reid, Brad, NMENV

From:	Lewellin, Jeffrey, NMENV
Sent:	Wednesday, May 30, 2018 3:15 PM
To:	Reid, Brad, NMENV; Lemon, Shelly, NMENV
Cc:	Kuehn, Elizabeth, NMENV; Franklin, Abraham, NMENV; Hunter, Michelle, NMENV; Vollbrecht, Kurt, NMENV; Shepherd, Holland, EMNRD; Ennis, David, EMNRD
Subject:	MMD Request for Comments - Copper Flat Responses to NMED Related to Submitted Reports and NMED Comments
Attachments:	2018_05_30 NMED Comment Request_Copper Flat Mine_SI027RN.doc; 2018-05-29 _MMD Request for Agency Comments - Copper Flat Responses.pdf

Brad and Shelly – Attached are the two documents related to the above referenced MARP request for NMED review and comment for the Copper Flat responses to our review of their models and reports. Please contact me with any questions. Thanks, Jeff

Jeff Lewellin, Mining Act Team Leader
Mining Environmental Compliance Section
Ground Water Quality Bureau
New Mexico Environment Department
(505) 827-1049

ENVIRONMENT DEPARTMENT INTERNAL MEMORANDUM

TO: Brad Reid, Mining Environmental Compliance Section
Shelley Lemon, Chief, SWQB

FROM: Jeff Lewellin, NMED Mining Act Team Leader

DATE: May 30, 2018

SUBJECT: **Request for Comments, Regular New Mine, New Mexico Copper Corporation, Copper Flat Mine, Review of Documents, Sierra County, MMD Permit No. SI027RN**

Attached is a copy of an e-mail received from the Mining Act Reclamation Program (MARP) by the New Mexico Environment Department (NMED) requesting comments regarding the Copper Flat Mine. This is designated as a regular new mine and assigned permit tracking No. SI027RN. New Mexico Copper Corporation has responded to NMED and other agency comments for the reports listed below. As indicated by MARP, NMED has 20 days to provide comment. Please have any comments back to me by June 14, 2018.

Probable Hydrologic Consequences of the Copper Flat Project, New Mexico by John Shoemaker & Associates, Inc. December 2017;

Predictive Geochemical Modeling of Pit Lake Water Quality, Copper Flat Project, New Mexico by SRK Consulting, December 11, 2017.

The New Mexico Copper Corporation responses to the previous NMED comments are comprised of eight separate documents or models and are listed on the Mining and Minerals Division webpage as: 05-2018, NMCC Responses to Technical Comments from MMD, NMOSE, NMED, and NMDG&F

http://www.emnrd.state.nm.us/MMD/MARP/PermitSI027RN.html

Please send all responses to Jeff Lewellin, NMED Mining Act Team Leader.

Attachments:
May 29, 2018 MARP, DJ Ennis, E-Mail Request for Comments

xc: Liz Bisbey-Kuehn, Chief, AQB
Abe Franklin, Program Manager, SWQB
Michelle Hunter, Chief, GWQB
Kurt Vollbrecht, Program Manager, GWQB, MECS
Holland Shepherd, Program Manager, MMD
DJ Ennis, Lead Staff, MMD

From:	Ennis, David, EMNRD
To:	Lewellin, Jeffrey, NMENV; Kellermueller, Ronald, DGF
Cc:	Shepherd, Holland, EMNRD; Reid, Brad, NMENV
Subject:	Request for Agency Comments - Copper Flat Responses
Date:	Tuesday, May 29, 2018 9:36:09 AM

Jeff and Ron,

MMD has received New Mexico Copper Corporation's (NMCC) Response to Agency Comments on the Probable Hydrologic Consequences and Pit Lake Geochemistry reports. The documents provided by NMCC in response can be found on MMD's website under the 05-2018 date: http://www.emnrd.state.nm.us/mmd/MARP/PermitSI027RN.html

MMD requests any additional comments, if any, from your agencies regarding the latest submittals by NMCC within 20-days from this request (by COB Monday, June 18).

If you have any questions, please let me know.

Thanks,
DJ

DJ Ennis, P.G.
Mining and Minerals Division / 1220 S. St. Francis Drive / Santa Fe, NM 87505
(505) 476-3434 / david.ennis@state.nm.us

THEMAC RESOURCES | NEW MEXICO COPPER CORPORATION

May 31, 2018

Charles N. Thompson, PE
Dam Safety Bureau Chief
Office of the State Engineer Dam Safety Bureau
5550 San Antonio Dr. NE
Albuquerque, NM 87109-4127

RE: OSE File No. D-564
Copper Flat Tailings Dam, Sierra County, NM
Breach of Internal Splitter Dike
Construction Completion Report

Dear Mr. Thompson,

Submitted herewith are two copies of the Engineer's Construction Report for the splitter dike breach project. This work was performed under the January 31, 2018, Permit to Alter or Repair the Copper Flat Tailings Dam. The Engineer's Report transmitted with this letter confirms that construction of the breach conforms to engineer designs and the Agency's permit conditions.

In addition to completion of this project, New Mexico Copper Corporation continues to operate the Copper Flat Tailings Dam in accordance with all other conditions of the Maintenance Waiver Extension issued by your office on September 1, 2017.

Please contact me by email at jsmith@themacresourcesgroup.com or by telephone at (520) 991-4588 with any questions regarding this letter or any other matter concerning the Copper Flat Tailings Dam.

Best regards,
New Mexico Copper Corporation

J Smith

Jeff Smith
Chief Operating Officer

CC: Bud Brock, P.E. , OSE Dam Safety Bureau
Doug Rappuhn, OSE Hydrologist (email)
Kurt Vollbrecht, NMED (email)
David Ennis, MMD (email)

REPORT

Construction Completion Report - Copper Flat Tailings Dam Internal Splitter Dike Breach

Dam: Copper Flat Tailings Dam

OSE File No: D-564

County: Sierra County, NM

Owner: THEMAC Resources Ltd

4253 Montgomery Boulevard, NE, Suite 130, Albuquerque, New Mexico 87109

Submitted to:

Charles N. Thompson, PE
New Mexico Office of the State Engineer
Dam Safety Bureau
Concha Ortiz Y Pino Building
P.O. Box 25102
Santa Fe, New Mexico 87504

Submitted by:

Golder Associates Inc.
4730 North Oracle Road, Suite 210,
Tucson, Arizona, USA 85705
+1 520 888-8818

1789021

May 9, 2018

Distribution List

1 Copy - NMOSE DSB

1 Copy - THEMAC Resources, Ltd.

1 Copy - Golder

COPPER FLAT TAILINGS DAM
CONSTRUCTION COMPLETION REPORT
SIERRA COUNTY, NEW MEXICO

Engineer's Certificate:

I, David A. Kidd, hereby certify that I am a professional engineer licensed in the state of New Mexico, qualified in civil and geotechnical engineering; that the accompanying construction completion report for Copper Flat Tailings dam was prepared by me or under my supervision; that the accompanying construction completion report for Copper Flat Tailings Dam is in compliance with the Dam Design, Construction and Dam Safety Regulations (NMAC 19.25.12) and that the same are true and correct to the best of my knowledge and belief.

DAVID ALAN KIDD
NEW MEXICO
13778
REGISTERED PROFESSIONAL ENGINEER
5-9-18

______________________________________,

David A. Kidd

License number: 13778

Date submitted: May 9, 2018

State Engineer's Certificate:

I hereby certify that the accompanying construction completion report for Copper Flat Tailings dam and appurtenant structures has been duly examined by me and accepted for filing on the ________day of____ ______________________________________, 20____

____

State Engineer

Executive Summary

Golder Associates Inc. (Golder) has prepared this construction report to document the completion of the interim breach to the internal splitter dike at the Copper Flat Tailings Storage (TSF) Facility near Hillsboro, New Mexico. This report describes the construction activities self-performed by New Mexico Copper Corporation (NMCC) and construction quality activities performed by Golder.

The internal splitter dike divides the TSF into a North Cell and a South Cell, with runoff initially reporting to the North Cell. Tailings deposition during mining operations was limited to the North Cell, which reduced the available stormwater storage capacity in the North Cell. As part of NMCC's request for an extension of a maintenance waiver for the TSF starter dam, the New Mexico Office of the State Engineer Dam Safety Bureau (OSE-DSB) requested that the internal splitter dike be breached to allow stormwater to flow into the South Cell to maintain a dry freeboard of 4 feet within the TSF. In December 2017 Golder prepared a design for this breach that was approved by OSE-DSB for construction in January 2018.

Construction of the breach to the splitter dike began on April 19, 2018. Primary construction activities consisted of excavating an opening through the splitter dike using one CAT D6T bulldozer. The excavated material was pushed to the south and spread outside of the weir excavation. On April 23, 2018, NMCC notified Golder that excavation activity was complete. Golder field staff arrived on-site on April 25, 2018 to collect photo documentation and conduct the as-built survey of the breach. While conducting the survey it was noted that along the north side of the breach, the total depth from the weir floor to the crest was shallower than the 10-foot minimum design. Golder requested NMCC excavate additional material to attain the minimum depth. This excavation was completed on the same day (April 25) and the depth confirmed by the survey. Based on the collected data, the constructed breach of the internal splitter dike conforms to the intent of Golder's 2017 design.

Table of Contents

1.0 INTRODUCTION **1**

1.1 Background 1

1.2 Project Coordination 1

2.0 SUMMARY OF CONSTRUCTION ACTIVITY **2**

3.0 AS-BUILT DRAWINGS **6**

4.0 CONCLUSIONS **7**

FIGURES

Figure 1: Breach Weir Cross Section Staking along Top of Dike Crest - Looking West (2018-03-28) 2

Figure 2: Excavation Centerline Staking Looking from Top of Dike South into South Cell (2018-03-28) 2

Figure 3: Excavation Centerline Staking Looking West from Top of Dike (2018-03-28) 3

Figure 4: Breach Excavation Start (2018-04-19) 3

Figure 5: Breach Excavation End (2018-04-23) 4

Figure 6: At SE Weir Crest Looking Northwest (2018-04-25) 4

Figure 7: Transit Level East of Weir Breach (2018-04-25) 5

Figure 8: Regrading of North Side of Breach Weir (2018-04-25) 5

DRAWINGS

G-001: Title Sheet

C-001: As-Built Revisions

1.0 INTRODUCTION

Golder Associates Inc. (Golder) has prepared this construction report to document the completion of the interim breach to the internal splitter dike at the Copper Flat Tailings Storage (TSF) Facility near Hillsboro, New Mexico. This report describes the construction activities self-performed by New Mexico Copper Corporation (NMCC) and construction quality activities performed by Golder.

1.1 Background

The existing starter dam for the TSF is located along the east side of the facility at a minimum crest elevation of 5,240 feet above mean sea level (ft-msl). The TSF impoundment was separated into North and South Cells by the construction of an internal splitter dike, with a crest elevation varying between 5,240 ft-msl and 5,242 ft-msl.

Tailings deposition during mining operations was limited to the North Cell, with placement such that accumulated water would be forced to the west, away from the starter dam face. The tailings deposition reduced the available stormwater storage capacity in the North Cell.

As part of NMCC's request for an extension of a dam maintenance waiver, the New Mexico Office of the State Engineer Dam Safety Bureau (OSE-DSB) requested that the internal splitter dike be breached to allow stormwater to flow into the South Cell to maintain a dry freeboard of 4 feet within the TSF. Golder prepared a design for this breach dated December 11, 2017. This design was approved by OSE-DSB for construction on January 31, 2018, with the stipulation that construction be completed by May 31, 2018.

1.2 Project Coordination

The following personnel helped to coordinate the construction and documentation activities:

- Mr. Jeffrey Smith - Project Manager (NMCC)
- Mr. Clay Hein – Site Supervisor (NMCC)
- Mr. David A, Kidd, PE – Engineer of Record (Golder)
- Mr. Samuel Keller – Construction Quality Assurance (Golder)
- Ms. Sheina Sadza – Project Manager (Golder)

2.0 SUMMARY OF CONSTRUCTION ACTIVITY

Golder field staff was on-site on March 28, 2018 to detail pre-construction activities, which included photo documentation and verification that pre-construction staking was in accordance with the design.

Figure 1: Breach Weir Cross Section Staking along Top of Dike Crest - Looking West (2018-03-28)

Figure 2: Excavation Centerline Staking Looking from Top of Dike South into South Cell (2018-03-28)

Figure 3: Excavation Centerline Staking Looking West from Top of Dike (2018-03-28)

NMCC began construction of the breach to the splitter dike on April 19, 2018. Primary construction activities consisted of excavating an opening through the splitter dike using one CAT D6T bulldozer. The excavated material was pushed to the south and spread outside of the weir excavation.

Figure 4: Breach Excavation Start (2018-04-19)

The breach floor width was developed per plan. For ease of construction the planned 2H:1V cut of the breach side slopes was modified to a 3H:1V cut slope. On April 23, 2018, NMCC notified Golder that excavation activity was complete.

Figure 5: Breach Excavation End (2018-04-23)

Golder field staff arrived on-site on April 25, 2018 to collect photo documentation and conduct the as-built survey of the breach.

Figure 6: At SE Weir Crest Looking Northwest (2018-04-25)

A transit level was set up on top of the splitter dike east of the weir cut to collect differential elevations at various point along the crest and toe of the excavation using a temporary benchmark set at the top of the splitter dike.

Figure 7: Transit Level East of Weir Breach (2018-04-25)

While conducting the survey it was noted that along the north side of the breach, the total depth from the weir floor to the crest was shallower than the 10-foot minimum design. Golder requested NMCC excavate additional material to attain the minimum depth. This excavation was completed on the same day (April 25) and the depth confirmed by the survey.

Figure 8: Regrading of North Side of Breach Weir (2018-04-25)

3.0 AS-BUILT DRAWINGS

Golder used the collected survey data to develop as-built construction drawings for the splitter dike breach weir. The drawings are provided as Drawing G-001 and C-001. The following items are noted:

- Average bottom elevation of the weir is 5,231.7 ft-msl, consistent with the 5,232 ft-msl design elevation.
- The average weir bottom width is a minimum of 40 feet, as per the design.
- The weir side slopes are generally 3H:1V along both sides, flatter than the original design of 2H:1V.

4.0 CONCLUSIONS

In accordance with our responsibilities as the Engineer of Record for Copper Flat TSF, Golder attests that the constructed breach of the internal splitter dike conforms to the intent of the design as presented in Golder's 2017 design memorandum.

Signature Page

Golder Associates Inc.

Sheina Sadza	David A. Kidd, PE
Senior Project Engineer	*Principal, Engineer of Record*

SS/DAK/pb

x:\tucson\projects\17 proj\1789021 copper flat dike breach\003\rev 0\1789021-r-003-rev 0-20180509.docx

DRAWINGS

THE MAC RESOURCES | NEW MEXICO COPPER CORPORATION

Environmentally Responsible. Community-Minded. Local Opportunities.

COPPER FLAT TAILINGS DAM
INTERNAL SPLITTER DIKE BREACH
COPPER FLAT MINE
SIERRA COUNTY, NEW MEXICO

The existing starter dam is located in the NW ¼ of the SW ¼, Section 31, Township 15 South, Range 6 West, New Mexico Prime Meridian in Sierra County. This dam is located along the east side of the tailings storage facility at elevation of 5,240 feet above mean sea level (ft-amsl). The impoundment was previously separated into North and South Cells by the construction of an internal splitter dike. The improvements will breach the internal splitter dike to allow stormwater to flow into the South Cell.

DAM OWNER'S CERTIFICATE:

I, Jeffrey Smith ,being first duly sworn, upon my oath, state that I am the Chief Operating Officer of the New Mexico Copper Corporation, a corporation duly organized under the laws of the state of New Mexico, that the accompanying record construction drawings consisting of 2 sheets and Construction Completion Report for Copper Flat Tailings dam were made under authority of the board of directors of said corporation and that, in their behalf, I have read and examined the statements and representations and all that is shown herein is done with their free consent and in accordance with their wishes and state that the same are true and correct to the best of my knowledge and belief.

J Smith, COO 5/16/2018

Representative signature, title Date

Subscribed and sworn to before me this 16th day of May, 2018

Katharyn Emmer

Notary public

My commission expires 14 March 2020 (SEAL)

OFFICIAL SEAL
Katharyn Emmer
NOTARY PUBLIC
STATE OF NEW MEXICO
My Commission Expires: 14 March 2020

ENGINEER'S CERTIFICATE:

I, David A. Kidd, hereby certify that I am a professional engineer licensed in the state of New Mexico, qualified in Civil engineering; that the accompanying record construction drawings consisting of 2 sheets and Construction Completion Report, for Copper Flat Tailings dam was prepared by me or under my supervision; that the accompanying record construction drawings consisting of 2 sheets and Construction Completion Report, is in compliance with the Dam Design, Construction and Dam Safety Regulations (19.25.12 NMAC) and that the same are true and correct to the best of my knowledge and belief.

David A. Kidd, License number 13778 (SEAL)

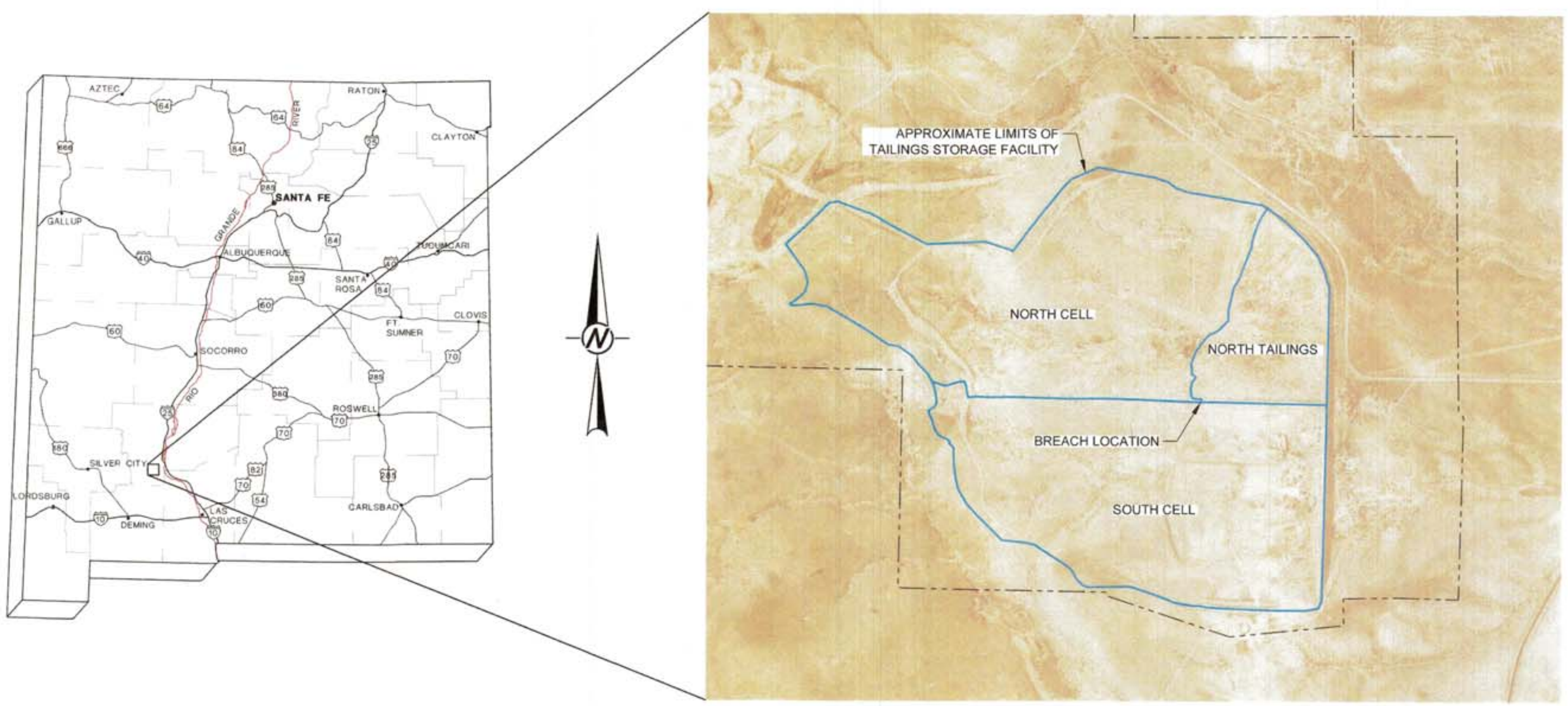
Date: 5-9-2018

DAVID ALAN KIDD
NEW MEXICO
13778
REGISTERED PROFESSIONAL ENGINEER
5-9-18

STATE ENGINEER'S CERTIFICATE:

I hereby certify that the accompanying record construction drawings and Construction Completion Report, for Copper Flat Tailings dam and appurtenant structures has been duly examined by me and accepted for filing on the _____ day of _____________, 20__.

____
State engineer



STATE OF NEW MEXICO
NOT TO SCALE

LOCATION MAP
NOT TO SCALE

REV	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
AB	2018-05-09	AS-BUILT	HNL	JAD	SPS	DAK
0	2017-12-11	ISSUED FOR CONSTRUCTION	HNL	NIL	SPS	DAK
B	2017-12-07	ISSUED FOR CLIENT REVIEW	HNL	NIL	SPS	DAK
A	2017-12-05	ISSUED FOR INTERNAL REVIEW	HNL	NIL	SPS	DAK

SEAL

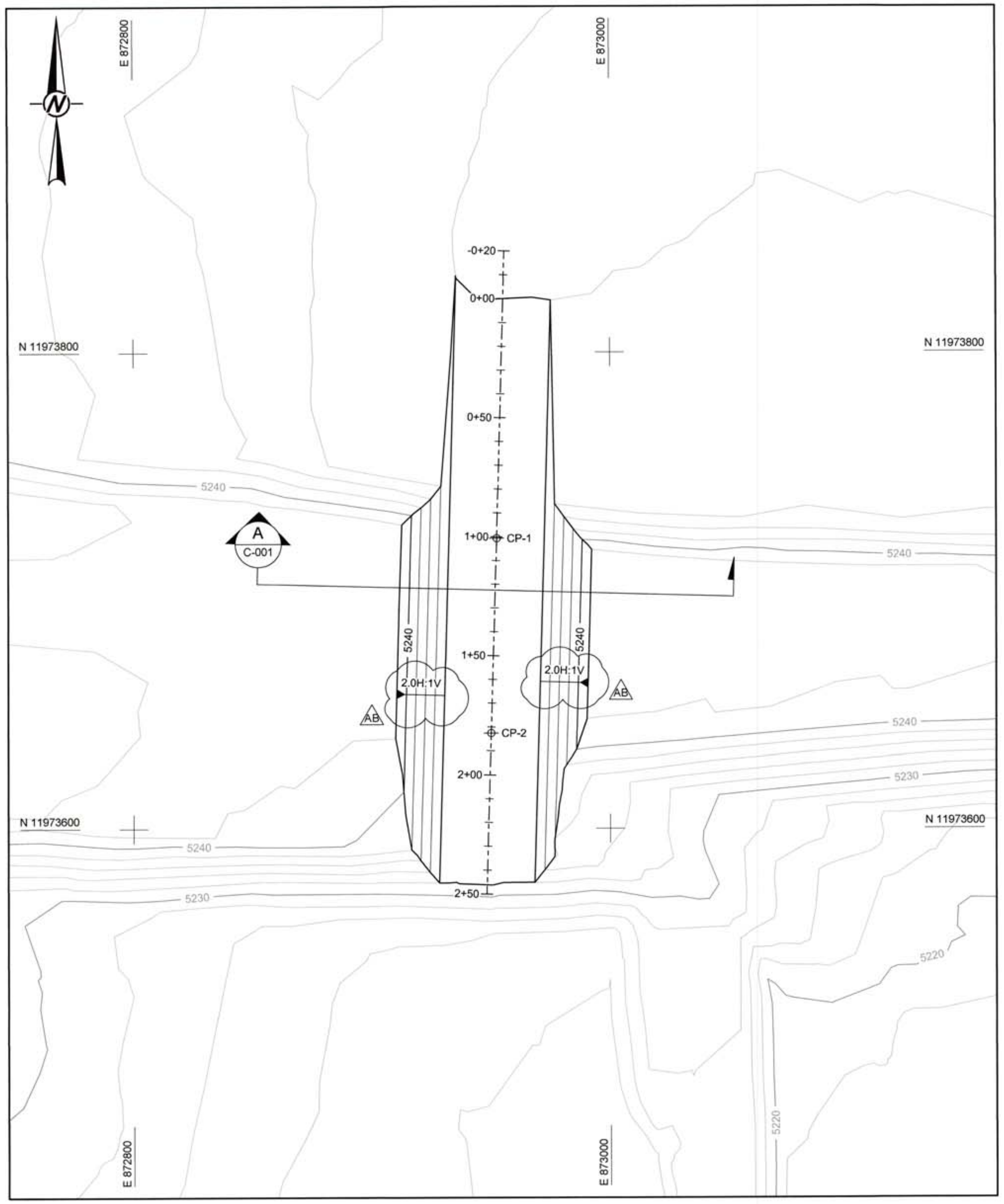
CLIENT
THE MAC RESOURCES | NEW MEXICO COPPER CORPORATION
Environmentally Responsible. Community-Minded. Local Opportunities.

CONSULTANT
GOLDER
TUCSON OFFICE
4730 N. ORACLE ROAD, SUITE 210
TUCSON, ARIZONA
UNITED STATES OF AMERICA
[+1] (520) 888 8818
www.golder.com

PROJECT
COPPER FLAT TAILINGS DAM
INTERNAL SPLITTER DIKE BREACH
SIERRA COUNTY, NEW MEXICO

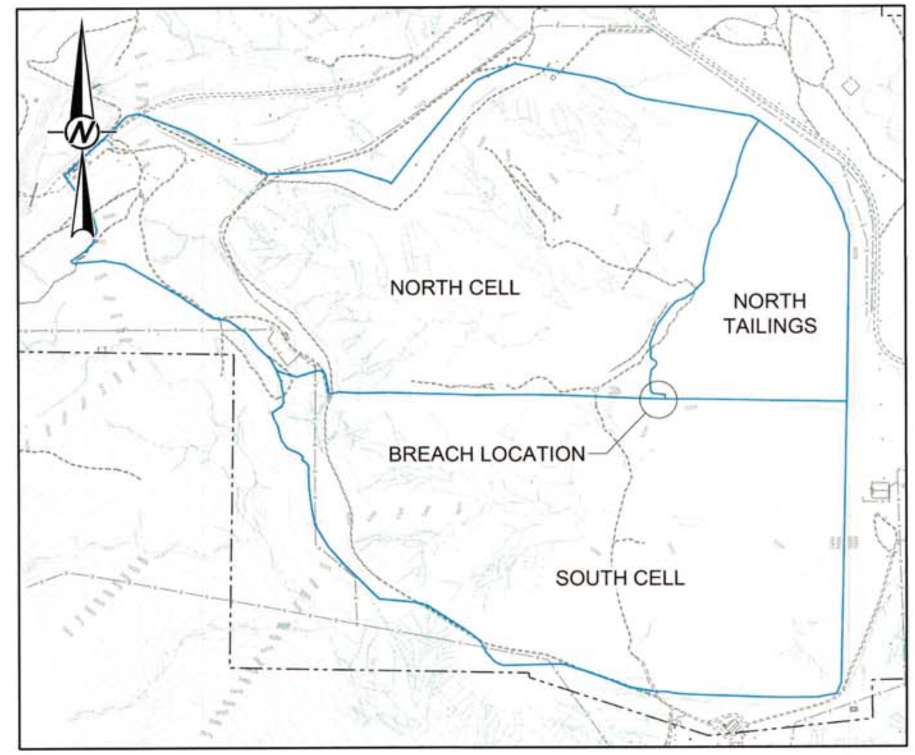
TITLE
TITLE SHEET

PROJECT NO.	CONTROL	REV		DRAWING
1789021	4000	AB	1 of 2	G-001



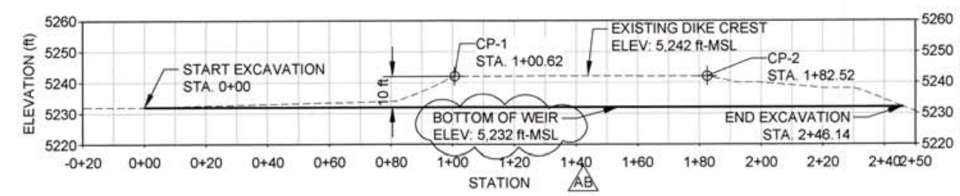
BREACH WEIR GRADING PLAN

SCALE 1" = 30'



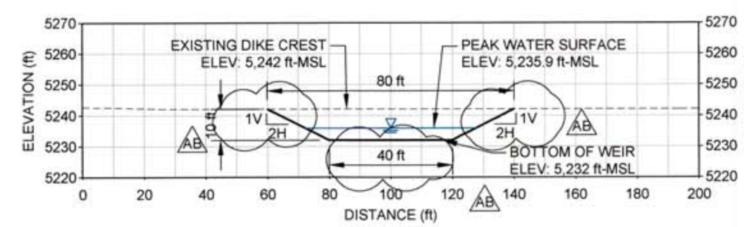
SITE LOCATION MAP

N.T.S.



WEIR EXCAVATION PROFILE

SCALE 1" = 30'



SCALE 1" = 30' A C-001 TYPICAL WEIR CROSS-SECTION

LEGEND

- 3600 EXISTING GROUND CONTOURS (ft -MSL)
- 3600 FINAL GRADE CONTOURS (ft -MSL)
- GRADE BREAK
- CP-1 SURVEY CONTROL POINT
- 2H:1V or 2H/1V 2 HORIZONTAL TO 1 VERTICAL SLOPE
- A / C-002 CROSS-SECTION CALLOUT, SECTION ID, DRAWING SHEET LOCATION
- AS-BUILT REVISIONS

NOTE(S)

1. PROPOSED BREACH WEIR CONFIGURATION RESULTS IN APPROXIMATELY 3,000 CY OF EXCAVATION.

REFERENCE(S)

1. 2-FOOT TOPOGRAPHY DEVELOPED BY COOPER AERIAL SURVEY COMPANY BASED ON A JUNE 18, 2011 AERIAL SURVEY AND PROVIDED BY THEMAC RESOURCES.
2. COORDINATE SYSTEM IS UTM ZONE 13, ON THE NAD83 DATUM, U.S. FOOT.

AB REVISIONS

1. AVERAGE BOTTOM OF WEIR ELEVATION: 5231.7 ft-MSL
2. AVERAGE WEIR BOTTOM WIDTH: 44 ft
3. WEIR SIDE SLOPE IS 3H:1V

SURVEY CONTROL POINT TABLE

ID	STATION	UTM83-13F NORTHING (ft)	UTM83-13F EASTING (ft)	LATITUDE	LONGITUDE	CREST ELEVATION (ft)
CP-1	1+00.62	11973721.8	872952.3	N032° 57' 34.61"	W107° 30' 09.54"	5242.0
CP-2	1+82.52	11973639.9	872950.0	N032° 57' 33.80"	W107° 30' 09.54"	5242.0

0 30 60
1" = 30' FEET

REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
AB	2018-05-09	AS-BUILT	HNL	JAD	SPS	DAK
0	2017-12-11	ISSUED FOR CONSTRUCTION	HNL	NIL	SPS	DAK
B	2017-12-07	ISSUED FOR CLIENT REVIEW	HNL	NIL	SPS	DAK
A	2017-12-05	ISSUED FOR INTERNAL REVIEW	HNL	NIL	SPS	DAK

SEAL

18778
5-9-18

CLIENT

THEMAC RESOURCES
NEW MEXICO COPPER CORPORATION
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CONSULTANT

GOLDER

TUCSON OFFICE
4730 N. ORACLE ROAD, SUITE 210
TUCSON, ARIZONA
UNITED STATES OF AMERICA
[+1] (520) 888 8818
www.golder.com

PROJECT
COPPER FLAT TAILINGS DAM
INTERNAL SPLITTER DIKE BREACH
SIERRA COUNTY, NEW MEXICO

TITLE
AS-BUILT REVISIONS

PROJECT NO.	CONTROL	REV.		DRAWING
1789021	4000	AB	2 of 2	C-001

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI D golder.com

NEW MEXICO ENVIRONMENT DEPARTMENT
INSPECTION OF PUBLIC RECORD REQUEST FORM

Please fill out the following information:

1. Date: June 1, 2018

2. Requestor's Name: Juan Velasquez - NMCC

3. Requestor's Address: 4253 Montgomery Blvd NE Suite 130, Albuquerque, NM 87111

4. Phone No.: (505) 239-3728

5. Email: jvelasquez@vemsinc.com

6. Company Being Represented: New Mexico Copper Corp.

7. Address: Same as above

8. Document or File being requested to be reviewed or copied (please describe the records in sufficient detail to enable Department personnel to reasonably identify & locate the records:

The most recent complete electronic copy of all DP-1840 documentation being prepared for the ~~pr~~ administrative record

9. NMED Bureau where Document/File can be found (if known): DP-1840

Signature

The cost for copying by NMED is as indicated on Attachment A. Please send this request to:

Melissa Y. Mascareñas
Inspection of Public Records Officer
1190 St. Francis Drive, Ste. N-4050
Santa Fe, New Mexico 87505
fax: (505) 827-1628 or
email: melissa.mascarenas@state.nm.us

Revised 6/14/12

From: Reid, Brad, NMENV
To: Max Yeh
Subject: DP-1840 Hearing date
Date: Thursday, June 07, 2018 11:25:16 AM

Hi Max,

Just wanted to inform you that, since our phone call earlier this week, a hearing date has been finalized for the draft Groundwater Discharge Permit (DP-1840). It will commence the week of August 20. Thanks, Brad

Brad Reid, Geologist
Mining Environmental Compliance Section / PO Box 5469 / Santa Fe, NM / 87502
(505) 827-2963 / brad.reid@state.nm.us

JUN 2018
DOCKETED BY THE HEARING CLERK BEFORE THE SECRETARY OF ENVIRONMENT

STATE OF NEW MEXICO
BEFORE THE OFFICE OF THE SECRETARY

IN THE MATTER OF:

COPPER FLAT MINE, **GWB 18-06 (P)**
DISCHARGE PERMIT DP-1840

NOTICE OF DOCKETING AND APPOINTMENT OF HEARING OFFICER

On March 30, 2018, the New Mexico Environment Department, Ground Water Quality Bureau, Requested a Hearing for the Discharge Permit, DP-1840, Copper Flat Mine. The Cabinet Secretary of the New Mexico Environment Department, Butch Tongate, herby appoints Felicia Orth, to serve as Hearing Officer in this matter pursuant to 20.6.2.3110(A) NMAC. The Hearing Officer shall exercise all powers and duties granted under 20.6.2 NMAC and all other applicable law.

Butch Tongate

Butch Tongate, Cabinet Secretary
New Mexico Environment Department

STATE OF NEW MEXICO
BEFORE THE SECRETARY OF ENVIRONMENT

IN THE MATTER OF:

COPPER FLAT MINE, **GWB 18-06 (P)**
DISCHARGE PERMIT DP-1840

CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing **Notice of Docketing and Appointment of Hearing Officer** was sent by first class mail and hand delivered via the stated methods below to the following parties on June 7, 2018:

Via first class mail:

Andrew Knight
Assistant General Counsel
New Mexico Environment Department
121 Tijeras Avenue NE, Ste. 1000
Albuquerque, New Mexico 87502
email: Andrew.knight@state.nm.us
Counsel for the New Mexico Environment Department

Via hand delivery and email:

Jaimie Park
Douglas Meiklejohn
Eric Jantz
Jonathan Block
1405 Luisa St., Suite 5
Santa Fe, NM 87505
jpark@nmelc.org
Counsel New Mexico Environmental Law Center

John Baca
John Baca
Hearing Clerk
Harold Runnels Bldg., Rm. S-2100
1190 St. Francis Drive
Santa Fe, New Mexico 87505
John.Baca2@state.nm.us
(505) 827-2430
(505) 827-1628 Fax

NEW MEXICO
ENVIRONMENT DEPARTMENT

SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lt. Governor

Harold Runnels Building
1190 Saint Francis Drive (87505)
PO Box 5469, Santa Fe, NM 87502-5469
Phone (505) 827-2990 Fax (505) 827-1628
www.env.nm.gov

BUTCH TONGATE
Cabinet Secretary

J.C. BORREGO
Deputy Secretary

June 15, 2018

VIA E-MAIL

Juan Velasquez
jvelasquez@vemsinc.com

Re: Request to Inspect Public Records

Dear Mr. Velasquez:

On June 15, 2018, this office received your request for public information. You request information pertaining to: DP-1840 Copper Flat Copper Mine. (See attached request).

I forwarded your request to the bureau on June 15, 2018. The bureau will respond by June 29, 2018.

Should you have any questions, please contact the Ground Water Quality Bureau at (505) 827-2919.

Sincerely,

Melissa Y. Mascareñas
New Mexico Environment Department
Department Public Records Custodian

cc: Andrew Knight, Assistant General Counsel
Michelle Hunter, Chief, Ground Water Quality Bureau

NEW MEXICO ENVIRONMENT DEPARTMENT
INSPECTION OF PUBLIC RECORD REQUEST FORM

Please fill out the following information:

1. Date: June 15, 2018

2. Requestor's Name: Juan R. Velasquez

3. Requestor's Address: 12912 Sand Cherry Pl. NE, Albuquerque, NM 87111

4. Phone No.: (505) 239-3728

5. Email: jvelasquez@vemsinc.com

6. Company Being Represented: New Mexico Copper Corporation

7. Address: 4253 Montgomery Blvd. NE, Suite 130, Albuquerque, NM 87109

8. Document or File being requested to be reviewed or copied (please describe the records in sufficient detail to enable Department personnel to reasonably identify & locate the records:

All documents that are in the Administrative Record for DP-1840 for the Copper Flat project from March 28, 2018 to the present. I would also request a continuing IPRA request for all other documents that may be added to the Administrative Record for DP-1840 thereafter until the public hearing is held. Electronic copies with suffice and I can pick them up from the NMED offices when available if they cannot easily be transmitted via email

9. NMED Bureau where Document/File can be found (if known): in the DP-1840 NMED file maintained by Mr. Brad Reid of your office

Signature

The cost for copying by NMED is as indicated on Attachment A. Please send this request to:

Melissa Y. Mascareñas
Inspection of Public Records Officer
1190 St. Francis Drive, Ste. N-4050
Santa Fe, New Mexico 87505
fax: (505) 827-1628 or
email: melissa.mascarenas@state.nm.us

Revised 6/14/12

NEW MEXICO
ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau
1190 South St. Francis Drive (87505)
P.O. Box 5469, Santa Fe, New Mexico 87502-5469
Phone (505) 827-2900 Fax (505) 827-2965
www.env.nm.gov

SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lieutenant Governor

BUTCH TONGATE
Cabinet Secretary

J.C. BORREGO
Deputy Secretary

MEMORANDUM

DATE: June 18, 2018

TO: Holland Shepherd, Program Manager, Mining Act Reclamation Program

FROM: Brad Reid, Mining Environmental Compliance Section
Shelly Lemon, Bureau Chief, Surface Water Quality Bureau
Patrick Longmire, Ph.D., Principal Aqueous Geochemist, Ground Water Quality Bureau
Joe Marcoline, PhD., Mining Environmental Compliance Section, Ground Water Quality Bureau

THROUGH: Jeff Lewellin, Mining Act Team Leader, Mining Environmental Compliance Section

RE: NMED Comments for the Copper Flat Mine Permit Application, Applicant Response Related to NMED Review of Two Technical Reports, Sierra County, MMD Permit No. SI027RN

The New Mexico Environment Department (NMED) received correspondence from the Mining and Minerals Division (MMD) on May 29, 2018 requesting that NMED review the responses provided to MMD by the Applicant for two technical reports the NMED commented on in a memo to MMD dated March 16, 2018. NMED comments are set forth below.

Background

On December 13, 2017, New Mexico Copper Corporation (Applicant) for the Copper Flat Mine submitted two documents as addendum to MMD Permit No. SI027RN. The titles of the two documents submitted are as follows: *Probable Hydrologic Consequences of the Copper Flat Project, Sierra County, New Mexico* by John Shoemaker & Associates, Inc., December 2017; and, *Predictive Geochemical Modeling of Pit Lake Water Quality, Copper Flat Project, New Mexico* by SRK Consulting, December 11, 2017. NMED is providing comment on the responses provided to MMD by the Applicant on May 22, 2018.

Mining Environmental Compliance Section

NMED reviewed the New Mexico Copper Corporation (NMCC) "response to agency comment table" and the updated reports titled *Predictive Geochemical Modeling of Pit Lake Water Quality, Copper Flat Project, New Mexico* and the *Probable Hydrologic Consequences of the Copper Flat Project, Sierra County, New Mexico* (updated reports). With respect to the updated hydrologic consequences report, while NMED disagrees with a few of the assertions by NMCC in the response to comment table, we are pleased to see all the substantive issues raised in the agency comments were thoroughly addressed and that all the requested updates were included in the reports.

Regarding the responses contained in the updated geochemical modeling report prepared by SRK Consulting (U.S.), Inc. for THEMAC Resources Group Ltd., SRK utilized the geochemical computer program PHREEQC developed by the US Geological Survey (USGS) to model different water-rock interactions. These interactions include groundwater and pit lake/wall rock mixing, precipitation/dissolution, and adsorption/desorption processes expected to occur at Copper Flat. The revised PHREEQC simulations are reasonable and applicable to post-mining, aqueous geochemical conditions expected to be encountered after cessation of mining operations at the Copper Flat site. A significant amount of site-specific water chemistry and mineralogical data, and experimental results obtained from leachate testing have been conducted that are used as relevant inputs to the revised PHREEQC simulations for Copper Flat. Site-specific geochemical data and information provide relevant and meaningful input parameters for modeling complex geochemical interactions currently taking place at the site, and those that are hypothesized or predicted to take place in the future. NMED independently ran all PHREEQC simulations using input files provided in the May 2018 report submitted by SRK Consulting Inc., and evaluated and verified different output files serving as the primary source of material described in the text and shown in various figures in the SRK report.

Surface Water Quality Bureau

The Surface Water Quality Bureau comments are attached to this memo.

NMED Summary Comment

NMED has no additional comments at this time.

If you have any questions regarding the above comments, please contact Jeff Lewellin at (505) 827-1049.

cc: Bruce Yurdin, Division Director, NMED-WPD
Shelly Lemon, Bureau Chief, SWQB
Liz Bisbey-Kuehn, Bureau Chief, AQB
Fernando Martinez, Division Director, EMNRD-MMD
DJ Ennis, Copper Flat Mine, Lead Staff, EMNRD-MMD
Kurt Vollbrecht, Program Manager, MECS

TO: Jeff Lewellin, Mining Act Team Leader
Mining Environmental Compliance Section
Ground Water Quality Bureau (GWQB)

FROM: Shelly Lemon, Surface Water Quality Bureau Chief

SUBJECT: SWQB Comments on NMCC Response to Comments, Regular New Mine, New Mexico Copper Corporation, Copper Flat Mine, Review of Documents, Sierra County, MMD Permit No. SI027RN

DATE: June 8, 2018

On March 22, 2018, the New Mexico Energy. Minerals and Natural Resources Department ("MMD") and the New Mexico Environment Department ("NMED") provided comments regarding the Copper Flat Mine's "Predictive Geochemical Modeling of Pit Lake Water Quality..." (dated December 11, 2017) and the "Probable Hydrologic Consequences ("PHC") of the Copper Flat Project..." (dated December 2017). New Mexico Copper Corporation ("NMCC") responded to MMD and NMED on May 22, 2018 in the form of a response matrix. Below, we consider the responses to the Surface Water Quality Bureau ("SWQB") only.

NMED SWQB PHC Comment 2. Monitoring Plan.

NMCC Response. *The Monitoring Plan contained in Appendix E of NMCC's Discharge Plan Application which is incorporated into NMCC's Mining Operation and Reclamation Plan meets part of the MMD's request to provide surface and groundwater monitoring to verify predicted direction of the models. In addition, a monitoring plan has been developed to verify the similarity of the hydrologic balance in the potentially affected areas, a copy of which is provided herewith.*

NMED SWQB supplemental response: NMED SWQB appreciates more insight on the proposed Ground Water Level Monitoring Plan. The Plan identifies quarterly monitoring (with hourly measurements for the alluvial aquifers through pressure transducers) on 27 wells in total over three distinct aquifer systems [Santa Fe Group aquifer (twelve wells); shallow alluvial aquifer along Animas (four wells) and Percha (three wells); and crystalline bedrock (eight wells)]. The Plan also states, "[w]hile performing groundwater level data collection, NMCC will also check and document stream flows, if present, along Las Animas and Percha Creeks." NMED SWQB encourages NMCC to not only document but measure stream flows, if present and practicable. NMED SWQB also recommends that a water chemistry sample also be collected during quarterly monitoring events to provide additional information regarding surface and subsurface connectivity.

NMED SWQB PHC Comment 3. Potential hydrologic consequences to perennial flows.

NMCC Response. *The Monitoring Plan contained in Appendix E of NMCC's Discharge Plan Application which is incorporated into NMCC's Mining Operation and Reclamation Plan meets* *part of the MMD's request to provide surface and groundwater monitoring to verify predicted direction of the models. In addition, a monitoring plan has been developed to verify the similarity of the hydrologic balance in the potentially affected areas, a copy of which is provided herewith. Also, note that the model simulated effects on Percha Creek occur on the alluvial system where there is no perennial streamflow, therefore no effect on streamflow. The effect on evapotranspiration is proportionally small and would not be measurable.*

The model does not independently simulate streamflow, but rather includes flow (groundwater inflow and recharge) into the alluvial system and evapotranspiration from the riparian area. This is similar to the description of Las Animas Creek by Davie and Spegiel (1967) in which they stated "the stream plus the adjoining shallow aquifer is called a water course." Most of the temporary reduction in flow into the alluvial system will be manifested as a reduction in evapotranspiration, rather than a reduction in stream flow. The model-simulated changes are non-measurable because they are such a small part of the system water balance, and because they are temporary.

Furthermore, the model is conservative by assuming a hydraulic connection between the Las Animas alluvial system and the underlying Santa Fe Group west of MW-11 to the Animas uplift. The model may be overstating the reduction in flow to the alluvial system. The water budget for perennial segments of Las Animas Creek is more significantly influenced by inflow from snowmelt runoff, and infiltration of storm water runoff events than by groundwater inflow from the Santa Fe Group aquifer. Any above-average snowmelt or storm runoff event will mask the model-simulated reduction of inflow from SFG groundwater. Likewise, just one irrigation well pumping from the alluvial aquifer, such as those on Ladder Ranch and other locations along Animas Creek, will obscure smaller potential effects to streamflow. Maximum model simulated change in Las Animas Creek evapotranspiration and flow reduction is 18 ac-ft./yr. (0.025 cf.). Water-level monitoring in the alluvial aquifer has shown seasonal changes of more than 10 ft. (INTERA, 2012), which would make it difficult to identify a smaller effect of less than 1 ft. Detecting the effect would require water-balance measurements to three significant digits. This would be impossible, particularly when the largest stress on the alluvial system (irrigated agriculture) is unmetered and ongoing.

<u>NMED SWQB supplemental response</u>: The JSAI Report states that groundwater-level drawdown along Las Animas Creek and most of Percha Creek will be minor and the projected effects on evapotranspiration and surface discharge will be correspondingly small. The report also states that the impacts to the shallow alluvial aquifer are temporary and water levels will recover to pre-mining levels. While NMED SWQB can appreciate the model and projected outcomes, the Bureau takes temporary as being the life of the active mining activities and the recovery time after mining ceases. This temporary impact may be significant to aquatic life, stream habitat and riparian vegetation.

If you have any questions or require clarifications, please contact me (505) 827-2819, or Jennifer Fullam (505) 827-2637.

SUSANA MARTINEZ
Governor
JOHN A. SANCHEZ
Lt. Governor

NEW MEXICO
ENVIRONMENT DEPARTMENT

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BUTCH TONGATE
Cabinet Secretary
J.C. BORREGO
Deputy Secretary

June 28, 2018

VIA E-MAIL

Samantha Barncastle
Samantha@h2o-legal.com

Re: Request to Inspect Public Records

Dear Ms. Barncastle:

On June 28, 2018, this office received your request for public information. You request information pertaining to: all information regarding agreements between OSE and NMED regarding NM Copper Corporation DP-1840. (See attached request).

I forwarded your request to the bureaus on June 28, 2018. The bureaus will respond by July 12, 2018.

Should you have any questions, please contact the Ground Water Quality Bureau at (505) 827-2919 and the Surface Water Quality Bureau at (505) 827-2819.

Sincerely,

Melissa Y. Mascareñas
New Mexico Environment Department
Department Public Records Custodian

cc: Andrew Knight, Assistant General Counsel
Michelle Hunter, Chief, Ground Water Quality Bureau
Shelly Lemon, Chief, Surface Water Quality Bureau

NEW MEXICO ENVIRONMENT DEPARTMENT
INSPECTION OF PUBLIC RECORD REQUEST FORM

Please fill out the following information:

1. Date: 6/28/2018
2. Requestor's Name: Samantha R. Barncastle, Esq., Barncastle Law Firm
3. Requestor's Address: P.O. Box 1556, Las Cruces, NM 88004
4. Phone No.: (575) 636-2377
5. Email: **Samantha@h2o-legal.com**
6. Company Being Represented: Elephant Butte Irrigation District
7. Address: 530 S. Melendres St., Las Cruces, NM 88005
8. Document or File being requested to be reviewed or copied (please describe the records in sufficient detail to enable Department personnel to reasonably identify & locate the records:

   Any and all memoranda of understanding, joint powers agreements, or other agreements by and between the Office of the State Engineer and the New Mexico Environment Department, to include multiple party agreements including other state or federal agencies, regarding coordination for implementation of either OSE or NMED permitting or other statutory authority. Any and all memoranda of understanding or other agreements between OSE and NMED should be included regardless of the stated purpose or goals of such agreement.

9. NMED Bureau where Document/File can be found (if known):

Signature [Samantha R. Barncastle]

The cost for copying by NMED is as indicated on Attachment A. Please send this request to:

Melissa Y. Mascareñas
Inspection of Public Records Officer
1190 St. Francis Drive, Ste. N-4050
Santa Fe, New Mexico 87505
fax: (505) 827-1628 or
email: melissa.mascarenas@state.nm.us

Revised 6/14/12