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2020 3rd Quarter Groundwater Monitoring Report

Chevron Isleta Site
3401 Isleta Boulevard
Albuquerque, New Mexico
Bernalillo County

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NMED PSTB Facility No. 30681
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October 27, 2020

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Acronyms

°C	Degrees Celsius
µg/L	micrograms per liter
AECOM	AECOM Technical Services
BTEX	Dissolved toluene, ethylbenzene, and xylenes
ft	feet
ft/ft	feet per foot
HEAL	Hall Environmental Analysis Laboratory
$HgCl_2$	mercuric chloride
ml	milliliter
NMAC	New Mexico Administrative Code
NMED PSTB	New Mexico Environment Department Petroleum Storage Tank Bureau
NMWQCC	New Mexico Water Quality Control Commission
Site	The Chevron Isleta Site
USEPA	US Environmental Protection Agency

2020 3rd QUARTER GROUNDWATER MONITORING REPORT

Site Name:	Chevron Isleta
Site Address:	3401 Isleta Boulevard SW Albuquerque, New Mexico
Facility Number:	30681
Author/Consulting Company:	AECOM One Park Square 6501 Americas Parkway, N.E. Suite 900 Albuquerque, NM 87110
Date of Confirmation of Release:	Unknown
Date of Report:	July 30, 2020

STATEMENT OF FAMILIARITY

I am familiar with the information submitted in this report and the attached documents and attest that it is true and complete to the best of my knowledge.

Sincerely,

AECOM

Dale Flores
Project Manager

1. Introduction

AECOM Technical Services (AECOM) prepared this report to describe the sampling activities and results from the groundwater monitoring event that was performed on October 6, 2020 at the Chevron Isleta Site in Albuquerque, New Mexico.

1.1 Background

The Chevron Isleta Site (Site) is located at 3401 Isleta Boulevard southwest in the Albuquerque South Valley (Figure 1). A Walgreens store was built at the Site in 2012. Previously, remedial activities at the Site have included dig-and-haul followed by operation of a sparge/vent system. A total of ten monitor wells have been plugged and abandoned between 2005 and 2007. Two replacement wells (MW-8A and MW-11A) were installed at the Site in August 2012 (Haller & Associates, Inc., 2014). Currently, there are three active monitoring wells at the Site (MW-8A, MW-11A, and MW-26) (Figure 2). Groundwater monitoring has been on-going since 1995. Dissolved petroleum constituent concentrations above the New Mexico Water Quality Control Commission (NMWQCC) groundwater standard at the Site include dissolved benzene in MW-8A and naphthalene in monitor wells MW-8A and MW-11A.

AECOM performed Injection of BOS 200® at the Site on March 16, 2019 to address remaining dissolved phase benzene and naphthalene in groundwater exceeding their respective NMWQCC groundwater standards. A post-injection report was submitted to the New Mexico Environment Department Petroleum Storage Tank Bureau (NMED PSTB) documenting the injection details, including injection spacing, volumes injected at each location, design mix, site photos and map of injection points (AECOM 2019a and AECOM 2019b).

During the October 6, 2020 groundwater samples were collected from monitoring wells MW-8A, MW-11A, and MW-26 and analyzed for volatile organic compounds by US Environmental Protection Agency (USEPA) method 8260 including total naphthalenes.

1.2 Scope of Work

This 2020 third Quarter Groundwater Monitoring Report was completed in accordance with the work plan prepared by AECOM dated June 12, 2019. The NMED PSTB approved AECOM's work plan in a work plan approval letter for one quarter of groundwater sampling dated February 19, 2020 (AECOM, 2019c) and NMED PSTB Regulations (NMED, 2003).

The scope of work performed during this quarterly event consisted of the following activities:

- Locate and document the condition of the three existing monitor wells MW-8A, MW-11, and MW-26.
- Gauging, purging, and sampling of three monitor wells.
- Preparation of a quarterly monitoring report.

1.3 Summary of Observations

Upon arrival at the site, all three monitor wells were found to be in good condition and in plain sight. Groundwater was observed at an average depth of 7.05 feet (ft) below top of casing.

2. Previous Groundwater Monitoring Event

The previous groundwater monitoring event was performed on July 8, 2020. Post-injection groundwater samples were collected from monitor wells MW-8A, MW-11A, and MW-26. Results for the previous sampling event are summarized below.

- The concentration for dissolved benzene from monitor well MW-8A was 2.2 micrograms per liter (µg/L), below the NMWQCC groundwater standard of 5 µg/L. The total naphthalene concentration in monitor well MW-8A was 12 µg/L, falling below the NMWQCC groundwater standard of 30 µg/L.
- The concentration of total naphthalenes from monitor well MW-11A was <10.0 µg/L, falling below the NMWQCC groundwater standard of 30 µg/L.
- All other groundwater sample results from petroleum compounds were below NMWQCC standards.

3. Groundwater Monitoring Activities

3.1 Fluid Level Measurements

On October 6, 2020, prior to monitor well purging and sampling, fluid levels and total depths were measured in each monitor well with an electronic oil/water interface probe. Monitor wells were gauged in order of increasing contamination (MW-26, MW-11A, and MW-8A) to minimize the potential of cross contamination and the interface probe was decontaminated prior to each use. During this event, groundwater elevations declined by an average of 0.29 ft and were within their historic fluctuation range. Groundwater flowed at an approximate gradient of 0.0008 feet per foot (ft/ft) (see calculation below) to the south (Figure 3), relatively consistent with historic conditions. Historic fluid level data are summarized in Table 1.

Hydraulic Gradient Calculation

MW-8A groundwater elevation = 4852.88

MW-26 groundwater elevation = 4852.62

Distance between MW-8A and MW-26 = 325 feet

(4852.88-4852.62)/325 = 0.26/325 = **0.0008 ft/ft**

3.2 Groundwater Sampling and Analyses

During the groundwater monitoring event performed on October 6, 2020, groundwater samples were collected from monitor wells MW-8A, MW-11A, and MW-26.

After monitor well gauging was completed, an initial set of field parameters were collected using a calibrated YSI Pro DSS water parameter probe. Each monitor well was purged of three well volumes with a new disposable bailer. During purging, water quality measurements were collected approximately every well volume for temperature, pH, specific conductance, dissolved oxygen, and oxidation reduction potential. Purge water was temporarily contained in a 5-gallon bucket and observed for the presence of hydrocarbon sheen or non-aqueous phase liquid, odors, and any other notable characteristics. Purge water was then discharged onsite to evaporate.

Following well purging, groundwater samples were collected by slowly lowering a new disposable bailer into the monitor well and decanting the sample into laboratory prepared, pre-cleaned, acid-preserved sample containers. Each sample was labeled with respect to date, time, site, monitor well number, preservative and analytical method requested. Groundwater samples were immediately placed on ice and shipped to the laboratory for analysis within the required hold times.

On October 6, 2020 AECOM personnel delivered the samples to Hall Environmental Analysis Laboratory (HEAL), directly from the field. Complete chain-of-custody records accompanied groundwater samples at all times. Each groundwater sample was analyzed by the following USEPA Method:

Chevron Isleta Groundwater Analytical Requirements

Analysis	Analytical Method	Container /Preservation
Volatile Organic Compounds	EPA 8260B	3x40 ml, $HgCl_2$, 4˚C

Notes:
°C = Degrees Celsius
$HgCl_2$ = mercuric chloride
ml = milliliter

Historic and recent groundwater analytical data are summarized in Table 2. Groundwater sampling procedures are attached as Appendix A. Groundwater field sampling forms are attached as Appendix B. The laboratory report from HEAL is attached as Appendix C.

3.3 Discussion of Trends and Changes

On October 6, 2020 water levels were within their historic fluctuation range.

MW-8A – Dissolved benzene was detected below the NMWQCC groundwater standard (5 µg/L) at a convention of 1.2 µg/L. The dissolved benzene concentration was less than the previous sampling event (July 2020) of 2.2 µg/L. Dissolved toluene, ethylbenzene, and xylenes (BTEX) constituents in monitor well MW-8A were all below their respective NMWQCC standards. The total naphthalene concentration (<10 µg/L) was below the NMWQCC groundwater standard of 30 µg/L.

MW-11A – Dissolved BTEX constituents in monitor well in MW-11A were all below their respective NMWQCC groundwater standards. Total naphthalenes were not detected during the October 6, 2020 event.

MW-26 – Dissolved organic contaminants were not detected at monitor well MW-26 and have not been detected at MW-26 since at least October 1999 (Table 2).

3.4 Containment of Release

Injection of BTEX BOS 200® in March 2019 was effective at lowering petroleum constituents in groundwater below to below their respective NMWQCC groundwater standards. Dissolved total naphthalene concentrations in monitor wells MW-8A and MW-11 have declined and are now below the NMWQCC Standard. A summary of results for the groundwater samples collected from monitor wells MW-8A and MW-11A are shown on Figure 4.

4. Summary and Recommendations

Groundwater elevations in October 2020 have declined by an average of approximately 0.29 ft since the July 2020 sampling event and are within their historical fluctuation range (Table 1). During the third quarter sampling event (October 2020) no petroleum contaminants exceeded NMWQCC groundwater standards at the Site. Total naphthalenes concentrations in monitor wells MW-8A and MW-11 have now been below the NMWQCC groundwater standard of 30 µg/L for two consecutive quarters Table 2 and Graphs 1 and 2). The dissolved benzene concentration in monitor well MW-8A has now been below the NMWQCC groundwater standard for four consecutive quarters. It is recommended that future quarterly groundwater sampling at the Site continue to document that petroleum groundwater standards are consistently below groundwater standards. Should the groundwater concentrations remain below NMWQCC groundwater standards, No Further Action in accordance with Petroleum Storage Tank Regulations 20.5.119.1930 should be recommended for the Site.

5. References

AECOM. 2019a. In-situ BOS 200® Post Injection Implementation Letter Report Chevron Isleta (FID #30681, RID #314), Deliverable 3999-2, April 19.

AECOM. 2019b. Chevron Isleta (FID #30681, RID #314) Phase 4 Activities, Post Injection Groundwater Sampling Letter Report, Deliverable 3999-4, Contract No.18-667-3200-0019, May 9.

AECOM Technical Services (AECOM). 2019c. Work Plan Submittal for Chevron Isleta (Facility ID No. 30681), Albuquerque, New Mexico, Professional Services Contract # 18-667-3200-0010, October.

Haller and Associates Inc. 2014. Groundwater Monitoring Report Chevron Isleta PSTB # 30681, 3401 Isleta Boulevard, Albuquerque, New Mexico, April 22.

New Mexico Environment Department Petroleum Storage Tank Bureau (NMED PSTB) Regulations. 2003. 20.5 New Mexico Administrative Code (NMAC), December.

Tables

Table 1. Groundwater Elevation
Chevron Isleta (NMED-PSTB Facility # 30681)
3401 Isleta Boulevard SW, Albuquerque, New Mexico

Well ID	Date	Casing Elevation (ft msl)	Depth to NAPL (ft)	Depth to Groundwater (ft btoc)	NAPL Thickness (ft)	Groundwater Elevation (ft msl)
MW-8	12/10/1999	4928.80	---	7.96	---	4920.84
	11/16/2000		---	7.60	---	4921.20
	12/18/2000		---	7.91	---	4920.89
	2/20/2001		---	8.14	---	4920.66
	5/30/2001		---	7.73	---	4921.07
	8/20/2001		---	7.75	---	4921.05
	12/6/2001		---	7.95	---	4920.85
	3/8/2002		---	8.23	---	4920.57
	5/30/2002		---	7.78	---	4921.02
	9/9/2002		---	8.04	---	4920.76
	8/26/2003		---	7.96	---	4920.84
	1/29/2004		---	8.38	---	4920.42
MW-8R	4/16/2004	4928.62	---	7.63	---	4920.99
	5/10/2007		---	7.25	---	4921.37
	11/12/2007		---	7.85	---	4920.77
	9/16/2011	4860.66	---	7.62	---	4853.04
MW-8A	8/29/2012	4860.53	---	7.62	---	4852.91
	1/11/2013		---	7.95	---	4852.58
	7/15/2013		---	7.32	---	4853.21
	1/15/2014		---	7.71	---	4852.82
	4/14/2014		---	7.50	---	4853.03
	1/30/2015		---	7.80	---	4852.73
	4/29/2015		---	7.68	---	4852.85
	7/20/2015		---	7.20	---	4853.33
	10/30/2015		---	7.21	---	4853.32
	10/26/2017		---	6.95	---	4853.58
	4/17/2018		---	7.43	---	4853.10
Pre-Injection	1/9/2019		---	7.79	---	4852.74
Post-Injection	4/29/2019		---	7.21	---	4853.32
	4/9/2020		---	7.28	---	4853.25
	7/8/2020		---	7.38	---	4853.15
	10/6/2020		---	7.65	---	4852.88
MW-11	12/10/1999	4929.20	---	8.43	---	4920.77
	11/16/2000		---	8.31	---	4920.89
	12/18/2000		---	8.38	---	4920.82
	2/20/2001		---	8.61	---	4920.59
	5/30/2001		---	8.21	---	4920.99
	8/20/2001		---	8.19	---	4921.01
	12/6/2001		---	8.41	---	4920.79
	3/8/2002		---	8.71	---	4920.49
	5/30/2002		---	8.24	---	4920.96
	9/9/2002		---	8.51	---	4920.69
	8/26/2003		---	8.44	---	4920.76
	1/29/2004		---	8.86	---	4920.34
MW-11R	4/16/2004	4928.99	---	8.09	---	4920.90
	5/10/2007		---	7.77	---	4921.22
	11/12/2007		---	7.07	---	4921.92
	9/16/2011	4861.09	---	8.12	---	4920.87
MW-11A	8/29/2012		---	6.74	---	4852.95
	1/11/2013		---	7.07	---	4852.62
	7/15/2013		---	6.49	---	4853.20
	1/15/2014		---	6.89	---	4852.80
	4/14/2014		---	6.62	---	4853.07
	1/30/2015		---	6.94	---	4852.75
	4/29/2015		---	6.87	---	4852.82

--- not detected
btoc - below top of casing
ft - feet
msl - mean sea level
NAPL - non-aqueous phase liquid
All depths recorded relative to top of casing
All elevations recorded relative to mean sea level

Table 1. Groundwater Elevation
Chevron Isleta (NMED-PSTB Facility # 30681)
3401 Isleta Boulevard SW, Albuquerque, New Mexico

Well ID	Date	Casing Elevation (ft msl)	Depth to NAPL (ft)	Depth to Groundwater (ft btoc)	NAPL Thickness (ft)	Groundwater Elevation (ft msl)
	7/20/2015	4859.69	---	6.32	---	4853.37
	10/30/2015		---	6.31	---	4853.38
	10/26/2017		---	6.08	---	4853.61
	4/17/2018		---	6.57	---	4853.12
Pre-Injection	1/9/2019		---	6.91	---	4852.78
Post-Injection	4/29/2019		---	6.28	---	4853.41
	4/9/2020		---	6.40	---	4853.29
	7/8/2020		---	6.49	---	4853.20
	10/6/2020		---	6.72	---	4852.97
MW-26	12/10/1999	4927.33	---	7.03	---	20.00
	12/18/2000		---	6.77	---	4920.56
	2/20/2001		---	6.99	---	4920.34
	5/30/2001		---	6.53	---	4920.80
	8/20/2001		---	6.53	---	4920.80
	12/6/2001		---	6.79	---	4920.54
	3/8/2002		---	7.09	---	4920.24
	5/30/2002		---	6.54	---	4920.79
	9/9/2002		---	7.82	---	4919.51
	8/26/2003		---	6.74	---	4920.59
	1/29/2004		---	7.23	---	4920.10
	4/16/2004		---	6.40	---	4920.93
	5/10/2007		---	6.24	---	4921.09
	11/12/2007		---	6.60	---	4920.73
	9/16/2011	4859.41	---	6.67	---	4852.74
	8/29/2012		---	6.67	---	4852.74
	1/11/2013		---	7.06	---	4852.35
	7/15/2013		---	6.51	---	4852.90
	1/15/2014		---	6.90	---	4852.51
	4/14/2014		---	6.65	---	4852.76
	1/30/2015		---	6.95	---	4852.46
	4/29/2015		---	6.75	---	4852.66
	7/20/2015		---	6.28	---	4853.13
	10/30/2015		---	6.24	---	4853.17
	10/26/2017		---	6.05	---	4853.36
	4/17/2018		---	6.54	---	4852.87
Pre-Injection	1/9/2019		---	6.94	---	4852.47
Post-Injection	4/29/2019		---	6.25	---	4853.16
	4/9/2020		---	6.40	---	4853.01
	7/8/2020		---	6.43	---	4852.98
	10/6/2020		---	6.79	---	4852.62

--- not detected
btoc - below top of casing
ft - feet
msl - mean sea level
NAPL - non-aqueous phase liquid
All depths recorded relative to top of casing
All elevations recorded relative to mean sea level

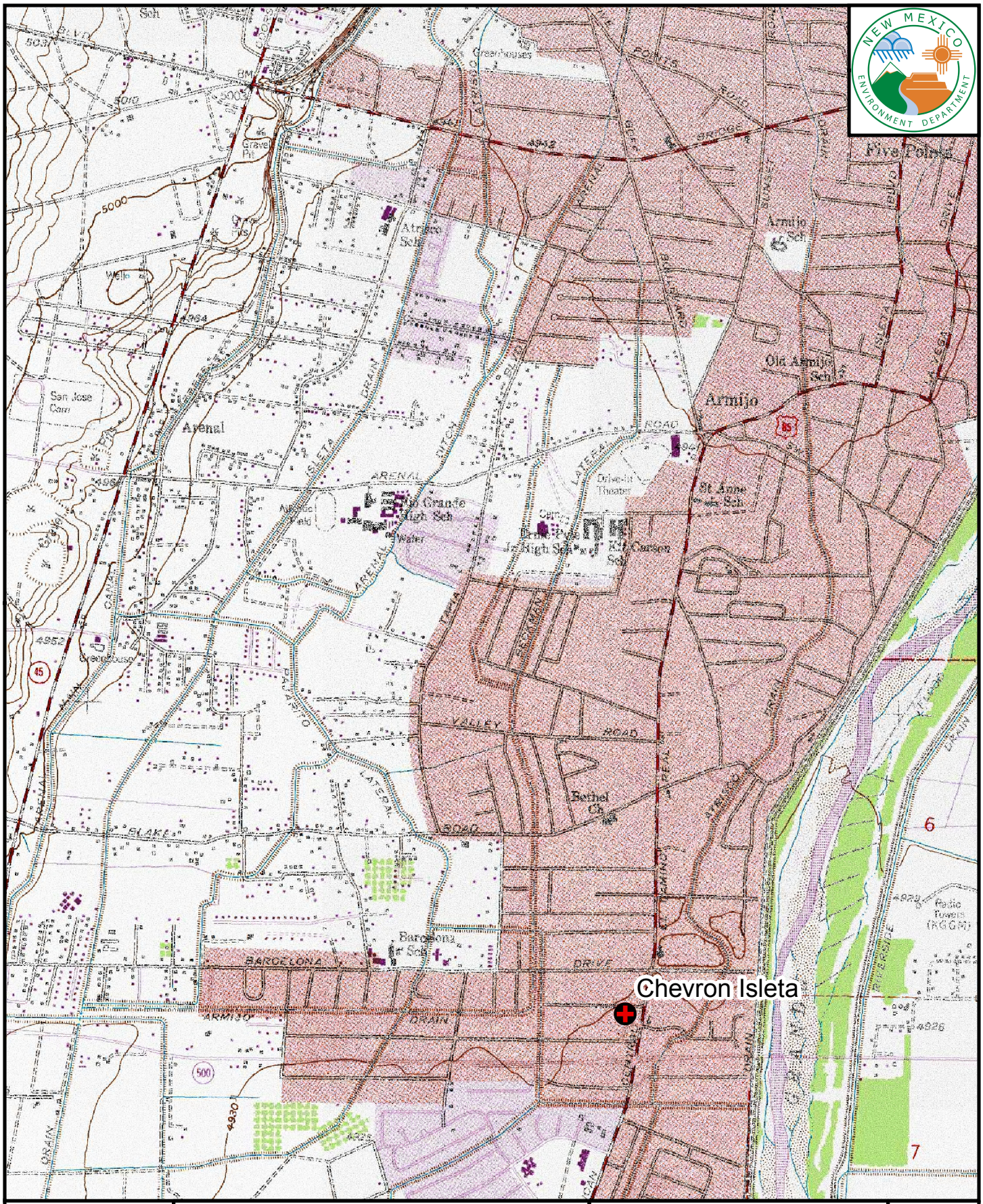
Table 2. Groundwater Organics Results
Chevron Isleta (NMED-PSTB Facility # 30681)
3401 Isleta Boulevard SW, Albuquerque, New Mexico

Well ID	Sample Date	Benzene	Toluene	Ethylbenzene	Xylenes	Ethylene Dibromide	Ethylene Dichloride	Methyl Tert Butyl Ether	Total Naphthalenes	TDS
NMWQCC/EIB Standards (µg/L)		5	1000	700	620	0.05	5	100	30	1000
MW-8A	8/29/2012	64	95	2100	7800	<10	<10	<10	1300	--
	1/11/2013	22	14	340	1200	<1.0	<1.0	<1.0	250	--
	7/15/2013	40	12	260	890	<10	<10	<10	100	--
	1/15/2014	19	<10	230	1000	<10	<10	<10	76	--
	4/14/2014	65	<10	190	810	<10	<10	<10	87	--
	1/30/2015	10	0.81	40	120	<0.50	<0.50	<0.50	21	--
	4/29/2015	100	14	110	200	<1.0	<1.0	<1.0	195	--
	7/20/2015	85	7.0	53	120	<1.0	<1.0	<1.0	185	--
	10/30/2015	60	3.8	53	83	<1.0	<1.0	<1.0	86	--
	10/26/2017	21	4.3	32	30	<1.0	<1.0	<1.0	122	--
	4/14/2018	18	4.1	35	26	<1.0	<1.0	<1.0	93	--
Pre-injection	1/9/2019	12	3.4	15	13	<1.0	<1.0	<1.0	61.4	569
Post-Injection	4/29/2019	1.5	<1.0	3.3	3.2	<1.0	<1.0	<1.0	<10.0	594
	4/9/2020	1.2	1.9	5.8	10	<1.0	<1.0	<1.0	39.8	--
	7/8/2020	2.2	<1.0	<1.0	1.6	<1.0	<1.0	<1.0	12	--
	10/6/2020	1.2	<1.0	<1.0	<1.5	<1.0	<1.0	<1.0	<10.0	--
MW-11A	8/29/2012	26	<10	230	40	<10	<10	<10	1060	--
	1/11/2013	2.5	<1.0	9.7	<1.5	<1.0	<1.0	<1.0	126	--
	7/15/2013	13	<1.0	9.3	<1.5	<1.0	<1.0	<1.0	81	--
	1/15/2014	4.3	<1.0	7.2	<1.5	<1.0	<1.0	<1.0	58	--
	4/14/2014	1.6	<1.0	13	3.3	<1.0	<1.0	<1.0	40.5	--
	1/30/2015	5.4	<0.50	4.7	<1.5	<0.50	<0.50	<0.50	43	--
	4/29/2015	13	1.3	27	15	<1.0	<1.0	<1.0	86	--
	7/20/2015	6.6	1.1	7.1	3.9	<1.0	<1.0	<1.0	106	--
	10/30/2015	2.9	<1.0	3.4	<1.5	<1.0	<1.0	<1.0	45.7	--
	10/26/2017	<1.0	<1.0	5.4	<1.5	<1.0	<1.0	<1.0	120	--
	4/17/2018	<1.0	<1.0	3.6	<1.5	<1.0	<1.0	<1.0	54.7	--
Pre-injection	1/9/2019	<1.0	<1.0	4.6	<1.0	<1.0	<1.0	<1.0	37.9	519
Post-Injection	4/29/2019	<1.0	<1.0	1.7	<1.5	<1.0	<1.0	<1.0	18.3	530
	4/9/2020	<1.0	<1.0	3.1	<1.5	<1.0	<1.0	<1.0	57.2	--
	7/8/2020	<1.0	<1.0	<1.0	<1.5	<1.0	<1.0	<1.0	<10.0	--
	10/6/2020	<1.0	<1.0	<1.0	<1.5	<1.0	<1.0	<1.0	<12.4	--
MW-26	10/8/1999	BDL	BDL	BDL	BDL	NA	NA	BDL	BDL	--
	12/10/1999	BDL	BDL	BDL	BDL	NA	NA	BDL	BDL	--
	12/18/2000	BDL	BDL	BDL	BDL	NA	NA	BDL	BDL	--
	2/20/2001	BDL	BDL	BDL	BDL	NA	NA	BDL	BDL	--
	5/30/2001	BDL	BDL	BDL	BDL	NA	NA	BDL	BDL	--
	8/20/2001	BDL	BDL	BDL	BDL	NA	NA	BDL	BDL	--
	12/6/2001	BDL	BDL	BDL	BDL	NA	NA	BDL	BDL	--
	3/8/2002	BDL	BDL	BDL	BDL	NA	NA	BDL	BDL	--
	5/30/2002	BDL	BDL	BDL	BDL	NA	NA	BDL	BDL	--
	9/9/2002	BDL	BDL	BDL	BDL	NA	NA	BDL	BDL	--
	8/26/2003	BDL	BDL	BDL	BDL	NA	NA	BDL	BDL	--
	1/29/2004	BDL	BDL	BDL	BDL	NA	NA	BDL	BDL	--
	4/16/2004	NS	NS	NS	NS	NS	NS	NS	NS	--
	5/10/2007	BDL	BDL	BDL	BDL	NA	NA	BDL	BDL	--
	11/12/2007	BDL	BDL	BDL	BDL	NA	NA	BDL	BDL	--
	9/16/2011	<1.0	<1.0	<1.0	<1.5	<1.0	<1.0	<1.0	<4.0	--
	8/29/2012	<1.0	<1.0	<1.0	<1.5	<1.0	<1.0	<1.0	<4.0	--
	1/11/2013	<1.0	<1.0	<1.0	<1.5	<1.0	<1.0	<1.0	<4.0	--
	7/15/2013	<1.0	<1.0	<1.0	<1.5	<1.0	<1.0	<1.0	<4.0	--
	1/15/2014	<1.0	<1.0	<1.0	<1.5	<1.0	<1.0	<1.0	<4.0	--
	4/14/2014	<1.0	<1.0	<1.0	<1.5	<1.0	<1.0	<1.0	<4.0	--
	1/30/2015	<0.50	<0.50	<0.50	<1.5	<0.50	<0.50	<0.50	<2..5	--
	4/29/2015	<1.0	<1.0	<1.0	<1.5	<1.0	<1.0	<1.0	<10.0	--
	7/20/2015	<1.0	<1.0	<1.0	<1.5	<1.0	<1.0	<1.0	<10.0	--
	10/30/2015	<1.0	<1.0	<1.0	<1.5	<1.0	<1.0	<1.0	<10.0	--
	10/26/2017	<1.0	<1.0	<1.0	<1.5	<1.0	<1.0	<1.0	<10.0	--
	4/17/2018	<1.0	<1.0	<1.0	<1.5	<1.0	<1.0	<1.0	<10.0	--
Pre-injection	1/9/2019	<1.0	<1.0	<1.0	<1.5	<1.0	<1.0	<1.0	<10.0	524
Post-Injection	4/29/2019	<1.0	<1.0	<1.0	<1.5	<1.0	<1.0	<1.0	<10.0	513
	4/9/2020	<1.0	<1.0	<1.0	<1.5	<1.0	<1.0	<1.0	<10.0	--
	7/8/2020	<1.0	<1.0	<1.0	<1.5	<1.0	<1.0	<1.0	<10.0	--
	10/6/2020	<1.0	<1.0	<!.0	<1.5	<1.0	<1.0	<1.0	<10.0	--

µg/L - micrograms per liter
BDL - below detection limit
NA - not analyzed
NAPL - non-aqueous phase liquid
NMWQCC - New Mexico Water Quality Control Board
EIB - Environmental Improvement Board

Data presented in bold exceeds NMWQCC/EIB standards

Figures



AECOM
6501 Americas Pkwy NE
Suite 900
Albuquerque, NM 87110

Source: USGS Albuquerque West 7.5 Minute Topo
http://rgis.unm.edu/

0 0.35 0.7 Miles

SITE LOCATION
CHEVRON ISLETA
3401 ISLETA BOULEVARD SW
ALBUQUERQUE, NM

FIGURE 1

AECOM
6501 Americas Pkwy NE
Suite 900
Albuquerque, NM 87110

Source: MRCOG 2014 Digital OrthoImagery
http://www.bernco.gov/gis-program/

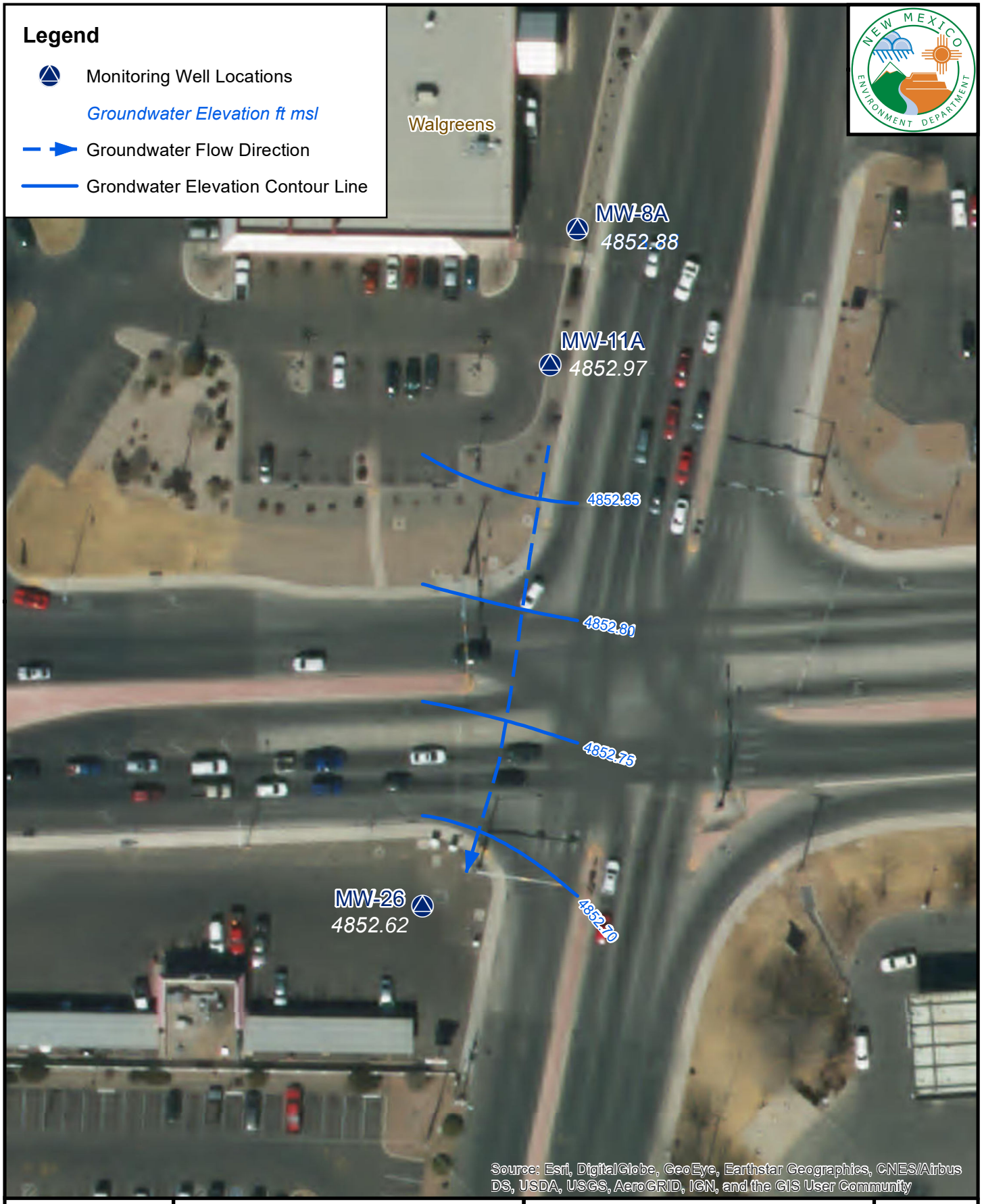
1 inch = 60 feet

0 30 60 120 Feet

SITE MAP

CHEVRON ISLETA
3401 ISLETA BOULEVARD SW
ALBUQUERQUE, NM

FIGURE 2



AECOM
6501 Americas Pkwy NE
Suite 900
Albuquerque, NM 87110

Source: MRCOG 2014 Digital Orthoimagery
http://www.bernco.gov/gis-program/
1 inch = 60 feet
0 30 60 120 Feet

WATER TABLE MAP
CHEVRON ISLETA
3401 ISLETA BOULEVARD SW
ALBUQUERQUE, NM

FIGURE 3
Gauging Date
10/6/2020

Legend

Monitor Well Location

B	BENZENE
T	TOLUENE
E	ETHYLBENZENE
X	TOTAL XYLENES
EDB	ETHYLENE DIBROMIDE
EDC	ETHYLENE DICHLORIDE
MTBE	METHYL TERT BUTYL ETHER
NAP	TOTAL NAPHTHALENES

RED AND BOLD INDICATES EXCEEDANCE OF NMWQCC STANDARDS

ALL RESULTS EXPRESSED IN ug/L

AECOM
6501 Americas Pkwy NE
Suite 900
Albuquerque, NM 87110

Source: MRCOG 2014 Digital Ortholmagery
http://www.bernco.gov/gis-program/

1 inch = 60 feet

N 0 30 60 120 Feet

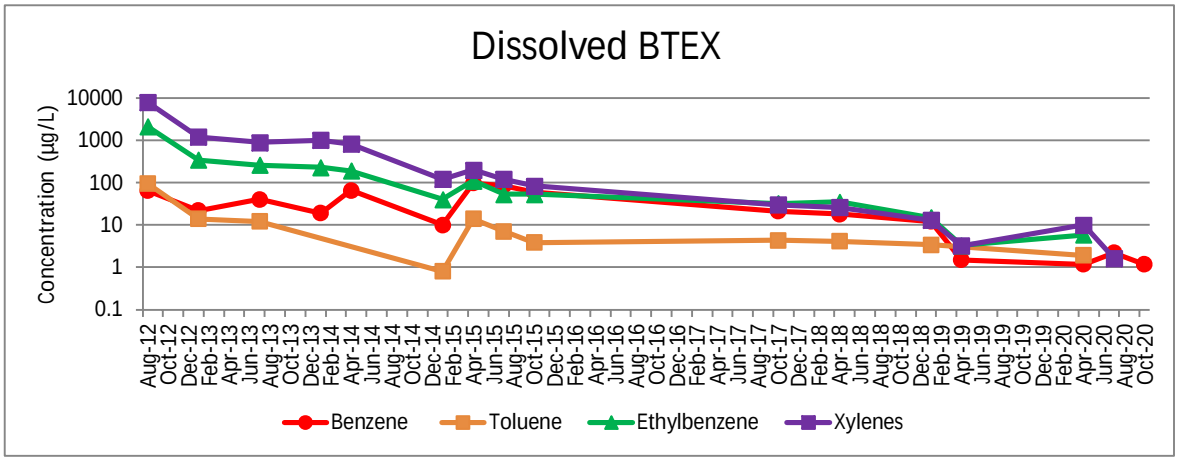
DISSOLVED ORGANIC RESULTS MAP
CHEVRON ISLETA
3401 ISLETA BOULEVARD SW
ALBUQUERQUE, NM

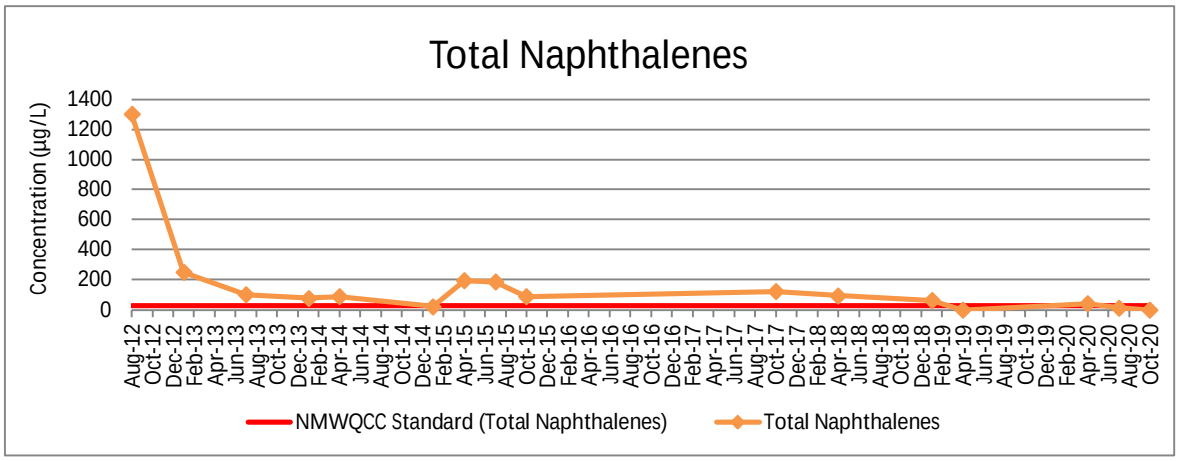
FIGURE 4

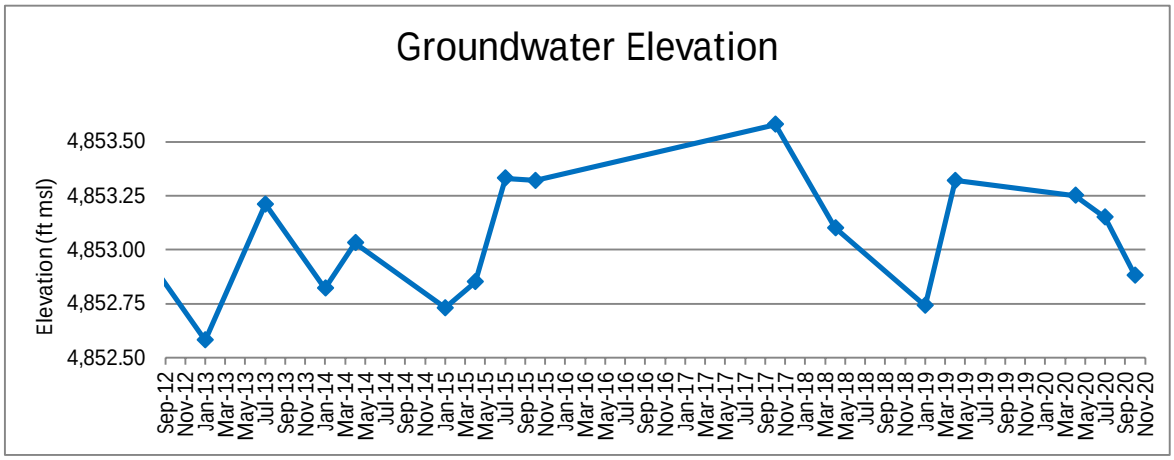
Sample Date
10/6/2020

Graphs

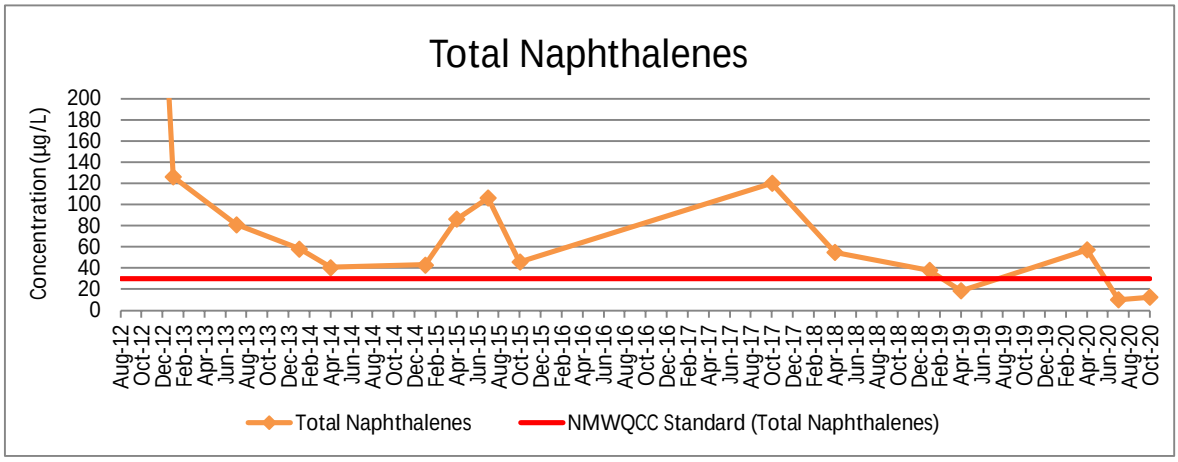
Graph 1
MW-8/MW-8R/MW-8A Dissolved BTEX and Naphthalenes Concentrations Vs Time
Chevron Isleta Site, Albuquerque, New Mexico

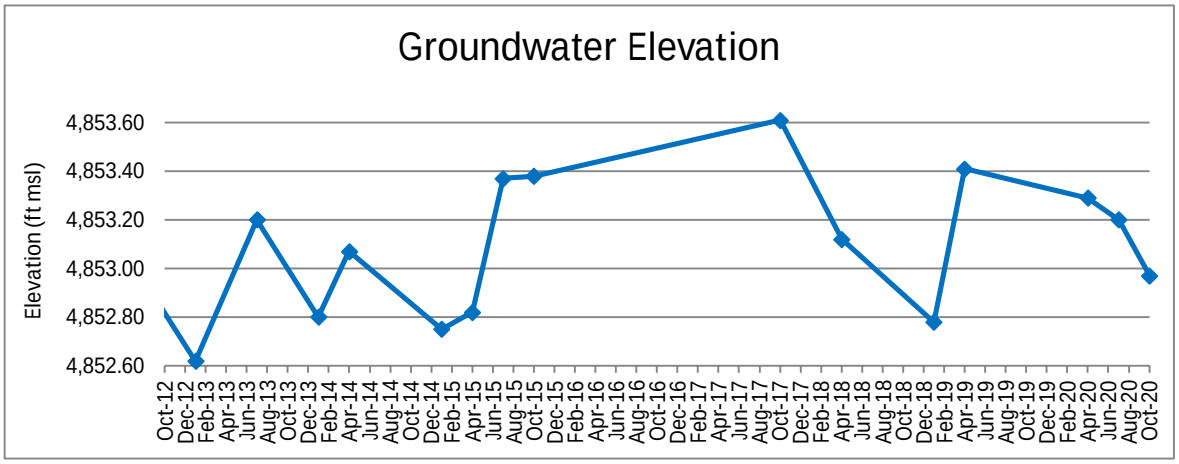






Graph 2
MW-11/MW-11R/MW-11A Total Naphthalenes Concentrations Vs Time
Chevron Isleta Site, Albuquerque, New Mexico





Appendix A

Groundwater Sampling Procedures

This Standard Operating Procedure (SOP) details the procedures for decontamination of personnel and equipment during field activities. Decontamination of personnel and equipment (e.g., water and soil sampling equipment, vehicles, etc.), is required to minimize the possibility of cross-contamination of environmental samples between sampling locations. In addition to this SOP, refer to the site-specific Health and Safety Plan (HASP) for additional requirements regarding decontamination procedures.

1.0 EQUIPMENT

The following is a list of equipment that may be necessary to perform decontamination activities:

- Personal protective equipment (PPE) as outlined in the HASP
- Paper towels
- Alconox® / Liquinox® detergent (or equivalent)
- Potable or non-potable water
- Deionized or distilled water
- Water sprayers or hand-held spray bottles
- Disposable nitrile gloves
- Clean plastic sheeting, and/or trash bags

2.0 DECONTAMINATION PROCEDURES

Section 2 describes decontamination of sampling equipment that may be utilized to prevent cross-contamination between sampling locations. Decontamination procedures to be implemented for the protection of worker and public health, safety, and the environment are also set forth in the following section. Different types of decontamination may be necessary for the following:

- Soil sampling equipment;
- Water sampling equipment;
- Instruments; and
- Vehicles and personnel.

2.1 DECONTAMINATION OF SAMPLING EQUIPMENT

The procedures in this section are designed to prevent cross-contamination of samples collected in different sample locations. Procedures for decontamination of sampling equipment apply to equipment that is re-usable (e.g. funnels and shovels) and contacts a sampled medium (e.g., water). Decontamination of sampling equipment may be performed at each sample collection location upon completion of sampling.

General requirements for decontamination are listed below:

- Personnel may wear appropriate safety equipment to reduce personal exposure, as required by the HASP.
- New nitrile gloves may be worn when performing equipment decontamination.
- Detergent and rinse solutions to be used for decontamination procedures may be replaced with new solutions between sample collection events unless the solution is stored in a water sprayer.
- Bulk contamination, such as large pieces of soil, may first be removed by hand or tools.
- Equipment may then be washed in a detergent/water solution, using brushes and other tools, as appropriate, until clean. The water used may be clean and may be potable, non-potable, deionized, or distilled.
- Washed equipment may be rinsed first by potable water, or by deionized/distilled water, if potable water is not available.
- A final rinse may be by deionized or distilled water.
- Equipment may be inspected for visible contamination and washed again if necessary.
- Equipment may be dried and stored in a clean location. Air-drying is an acceptable method for most equipment.

2.2 DECONTAMINATION OF PERSONNEL

The procedures in this section are designed to protect the worker and public health, safety, and the environment. Procedures for decontamination of personnel apply to any person (including clothing) who is exposed to contaminated site material such as groundwater or soil. Decontamination of personnel may be performed prior to leaving the site, or as necessary to protect health and safety.

General requirements for decontamination are listed below:

- Personnel may wear appropriate safety equipment to reduce personal exposure, as required by the HASP.
- Bulk contamination, such as large pieces of soil, may first be removed by hand or tools, with special attention to boots and coveralls.
- Personnel and clothing may then be washed with a detergent/water solution, using brushes and other tools, as appropriate, until clean. The water used may be clean and may be potable, non-potable, deionized, or distilled.
- Following washing, a water rinse may be conducted to flush contaminated media and detergents from the affected area.

2.3 DECONTAMINATION OF VEHICLES

The procedures in this section are designed to protect the worker and public health, safety, and the environment. Procedures for decontamination of vehicles apply to any vehicle or piece of heavy equipment that is exposed to contaminated site material such as groundwater or soil. Decontamination of vehicles may be performed prior to leaving the site, or as necessary to protect health and safety.

General requirements for decontamination are listed below:

- Personnel may wear appropriate safety equipment to reduce personal exposure, as required by the HASP.
- Bulk contamination, such as large pieces of soil, may first be removed by hand or tools, with special attention to tires or tracks, wheel-wells, and compartments such as dump truck beds and excavator or backhoe buckets.
- A rinse with water may be conducted to flush contaminated media from the affected area. If necessary, a high-pressure washer and/or detergent solution may be used to remove contaminated media.

2.4 INVESTIGATION DERIVED WASTE MANAGEMENT

Solid and liquid IDW generated during decontamination procedures may be managed as described in the SOP for IDW.

Solid IDW generated during decontamination procedures may consist of: (1) PPE used during the decontamination process and (2) disposable material used to decontaminate equipment.

Liquid IDW may generally consist of wash/rinse water, and may contain a substantial amount of solids. It is permissible, after solids settle, to decant clear water from such a container to another IDW container, thus separating solid and liquid IDW.

3.0 DOCUMENTATION

Sampling personnel may document the decontamination that occurs within a sample collection site in the field log book. The information entered in field log books concerning decontamination may include the following:

- Decontamination personnel
- Date/time
- Location
- Type of containment for decontamination fluids
- Other pertinent information

This Standard Operating Procedure (SOP) provides technical guidance and methods that will be used for monitoring well purging and groundwater sampling using low-flow sampling methods. The samples will be analyzed to provide data on the presence and concentration of Site constituents in groundwater on the site. The procedures outlined in this SOP are accordance with groundwater sampling methods recommended by the U.S. Environmental Protection Agency (EPA) (1992, 1996). Details on site-specific sampling activities, equipment selection (i.e., pumps), site-specific field parameters, and laboratory analyses are presented in the Work Plan and/or the Quality Assurance Project Plan (QAPP).

This SOP will provide descriptions of equipment, field procedures, and documentation necessary to properly collect groundwater samples for laboratory analysis. Sampling locations are specified and shown in the Work Plan.

All activities will be conducted in accordance with the site-specific Health and Safety Plan (HASP).

1.0 EQUIPMENT AND MATERIALS

- Field log book
- Electronic water level indicator or interface probe
- Peristaltic pump, bladder pump, centrifugal pump, bailer, or submersible pump
- Appropriate power source and cords for pump (i.e., generator, compressor, or inverter)
- Flow-rate controller for pump, as applicable
- Graduated cylinder or other volumetric measuring device
- Plastic sheeting or other clean work surface
- Disposable polyethylene discharge tubing
- Disposable Pharmed®, Tygon®, or equivalent tubing (for peristaltic pump only)
- Water quality meters (at a minimum pH, conductance, and temperature; ORP, and turbidity may also be used)
- New disposable or decontaminated stainless-steel bailer, if specified in the Work Plan
- Rope or twine: nylon, polypropylene, or similar
- Watch
- Purge water collection system (bucket(s) with lid(s), drum, etc.)
- Standard hand tools (wrench, pliers, screwdrivers, cutting tools, etc.)
- Keys to well locks
- Decontamination equipment per SOP 2
- Appropriate health and safety equipment as required by the HASP
- Personal protective equipment (PPE) as required by the HASP
- Paper towels

- Copies of well drilling and installation records, including boring logs and well completion diagrams for the wells to be sampled
- 0.45-µm in-line filter or other appropriate filtering approaches (for dissolved constituents only), if applicable
- Flow-through cell
- Sample containers (including temperature blanks)
- Sample labels
- Sample logs / well sampling forms
- Chain of custody forms
- Custody seals
- Shipping labels / AirBills
- Strapping / shipping tape
- Garbage bags
- Ziploc®, or similar, bags
- Cooler(s)
- Ice

2.0 PURGING AND SAMPLING METHODOLOGY

Groundwater sampling incorporates several phases of multiple steps in order to achieve the highest possible accuracy and precision of laboratory analytical results. Proper preparation, purging, and sampling techniques greatly reduce the risk of cross-contamination or other unwanted variances of the analytical data. Where possible, sampling should be conducted first in areas least affected by Site constituents, followed by increasingly affected areas. The proper information will be recorded in the field log book or well sampling form as specified in Section 3 of this SOP.

2.1 PREPARATION FOR SAMPLING

Preparation for sampling includes inspecting the condition of the well, monitoring health and safety conditions, and calibrating and decontaminating sampling equipment. General procedures are presented below:

1. Make sure area around well head is clean and free of debris.
2. Inspect condition of well (e.g., well locked, loose-fitting cap, measuring point well marked, surface casing disturbed, well casing straight, condition of concrete pad). Indicate condition of well on the sampling form.
3. Remove well cap. If the HASP identifies organic compounds as potential contaminants of concern and requires breathing zone monitoring, screen well headspace and breathing zone headspace for organic vapors using the appropriate field monitoring instrument.

4. All equipment should be decontaminated in accordance with SOPs before introduction to each well. Protective latex or nitrile gloves should be worn during possible water-contact or equipment-contact activities. At a minimum, gloves should be changed between each well or when introduction of potential contaminants to the well is possible.
5. Measure water level using a decontaminated electronic water level meter as described in SOPs. Sounding the bottom of the well using a weighted tape (i.e., for well casing volume calculations) prior to sampling is not recommended due to the potential for resuspension of settled solids in the formation. Well depth information should be obtained from the well logs or collected after sampling activities are complete, if possible.
6. If light non-aqueous phase liquid (LNAPL) is suspected, measure fluid level in accordance with SOPs.
7. Calculate the well casing volume as follows:

   $$\text{well casing volume (gal)} = \pi (r^2)(h)(7.48 \text{ gal/ft}^3)$$

   Where h = height of water in the well casing (i.e., depth to bottom of the well minus depth to water (in ft), and r = radius of well casing in feet. Record this volume on the well sampling form.
8. Calibrate water quality meters for measuring field parameters as specified by the equipment manufacturer(s). At a minimum, temperature, pH, and specific conductance measurements will be collected during purging and prior to sampling; however, do not immerse water quality meter probes into purge water containing free product. Other field parameters, including dissolved oxygen, Eh (redox, ORP), and turbidity (recommended for inorganics), etc. may be required as specified in the Work Plan. Record equipment calibration and maintenance in the field book. Decontaminate meters between wells by rinsing with distilled water. Manage rinse water used for these measurements in the same manner as purge water, as defined in the Work Plan.

2.2 WELL PURGING METHODS

Monitoring wells will be purged prior to collecting groundwater samples for analyses. Low flow purging procedures (EPA 1996) generally will be followed; however, certain wells or sites may also be sampled by purging three well volumes of groundwater prior to sample collection. The purpose of well purging is to remove stagnant groundwater from the well (which has interacted with air in the well casing). Field parameters (i.e., pH, temperature, and specific conductance) are measured during the purging process to verify that stagnant water has been removed and groundwater conditions are stable prior to sampling. A variety of pumps may be used to purge and sample the monitoring well: the pump type will be specified in the Work Plan. Refer to the manufacturer's instructions for operation of the specified pump. General procedures for purging are outlined below:

1. Lower the pump intake, bailer, or tubing (as applicable) into the water column. The pump intake or tubing should be placed at the middle or slightly above the bottom of the screened interval.
2. For low-flow purging, conduct purging at a rate that will minimize drawdown in the well (i.e., purge at a rate less than or equal to recharge, if possible). Recommended purge

rates are generally less than 0.13 gal/min (0.5 L/min), or a rate that results in minimal drawdown in the well (e.g., less than 1 foot). Actual purge rates will vary based on aquifer material and well construction.

3. Continue purging the well until field parameters have stabilized within 10 percent, according to SOPs. Once field parameters have stabilized, reduce the pump rate to approximately 0.025 to 0.13 gal/min (0.1 L/min to 0.5 L/min). The pump should continue to operate at the lower rate to allow the water collected at that rate to travel to the surface discharge point.
4. In the event that even very low purge rates result in evacuation of the well, groundwater samples for laboratory analyses should be collected as soon as sufficient groundwater accumulates in the well, regardless of field parameters or total volume purged.
5. If the three-volume purge method is utilized, field parameters will be recorded after each well volume of groundwater is purged.

2.3 GROUNDWATER SAMPLING METHODS

Groundwater sampling is conducted following purging of the well. Where possible, groundwater samples for analyses should be collected directly from the pump discharge at the lowest rate possible to minimize cross contamination, suspension of solids, and aeration of the sample. Bladder pumps, peristaltic pumps, and submersible pumps (e.g. Grundfos®, Whale, Typhoon) are generally suitable for purging and sampling of all groundwater parameters. Bailers are generally not recommended for purging or sampling of groundwater monitoring wells due to the potential for agitating solids in and adjacent to the well; however, the three-volume purge method often uses bailers, especially when turbidity of the groundwater is not a concern.

Target analytes, container types, and preservatives are specified in the Work Plan, or QAPP.

The general procedures for groundwater sample collection are as follows:

1. Groundwater samples should be introduced directly from the pump discharge into the proper sample container and filled to capacity.
2. In general, groundwater samples collected for multiple compounds should be collected in the following order (EPA 1992):
   - VOCs
   - Dissolved gases and total organic carbon (TOC)
   - SVOCs
   - Metals and cyanide
   - Major water quality cations and anions
   - Radionuclides
   - Other analytes
3. When collecting samples for VOCs, direct flow from the pump discharge down the interior side of the sample container to minimize aeration. Hold caps in hand to minimize contamination of sample. Fill all VOC sample containers to the top. A

positive meniscus at the top of the container will help ensure that no air is trapped inside when cap is screwed down on the container. No air bubbles should be trapped in the sample when the container is sealed.

4. In some cases, field filtration may be required (recommended for dissolved metals). If applicable, attach a new, disposable filter cartridge (typically 0.45 µm) to the discharge line. Filtered water should be introduced directly into the appropriate sample container. Alternate field filtration methods may be specified in the Work Plan or QAPP. *Although not recommended, the laboratory can sometimes filter the samples if the samples are NOT preserved and are filtered within 24–48 hours of collection.*
5. Collect quality assurance and quality control (QA/QC) samples (i.e., field duplicate, laboratory matrix spike, and laboratory matrix spike duplicate, as applicable) at the same time by filling all bottles from the same flow. Ambient or field blanks should be filled using distilled or de-ionized (DI) water (supplied by the laboratory) in the same area as the primary samples. The number and types of QA/QC samples are specified in the Work Plan or QAPP.
6. Sample bottles must be labeled with date, sample number, time, sampler's name, and type of preservative, as described in the QAPP. Sample bottles must be placed in a cooler or on ice to keep the sample cool (≤6 °C). Samples must be cooled continuously from time of collection to time of receipt at the laboratory.
7. Disconnect the peristaltic pump from the dedicated tubing in the well. If using a submersible pump, remove the pump and tubing from the well. Close and lock the well. Decontaminate the sampling equipment in accordance with SOPs. Purge, wash, and rinse water should be managed as specified in the Work Plan.
8. Complete chain-of-custody forms, package samples for shipment, and ship samples or arrange for courier to laboratory.
9. All field observations made and data generated in conjunction with the sample collection will be documented on the groundwater field sampling form.

3.0 DOCUMENTATION

Documentation during well purging and sampling will be in accordance with the work plan. Documentation of the observations and data acquired in the field will provide information on the activities conducted and also provide a permanent record of field activities. Observations and data will be recorded on a well sampling form and in the field logbook.

3.1 FIELD NOTES

The following groundwater purging and sampling information will be recorded in a bound field logbook using indelible ink:

- Names of sampling personnel
- Weather conditions
- Date and time of sampling
- Sampling locations, including locations of QA/QC samples

- Start and stop time for each well sampled
- Decontamination and calibration records
- Other information as specified in the Work Plan
- Any other pertinent information that may have a bearing on sample quality

3.2 FIELD FORMS

A well sampling form will be completed for each well sampled. The following information will be recorded:

- Project name / number
- Location
- Date
- Sampling personnel
- Monitoring well identification number
- Static water depth
- Well depth and diameter
- Water column thickness and well volume, if necessary
- Depth of pump or tubing intake
- Time of purge monitoring readings
- Sample time
- Identification of QA/QC samples
- Sampling equipment (pump and tubing types, etc.)
- Sampling pump rate

4.0 REFERENCES

EPA. 1992. RCRA Ground-Water Monitoring: Draft Technical Guidance. Office of Solid Waste, Washington, DC EPA/530/R-93/001, NTIS PB 93-139350, November.

EPA. 1996. Low-flow (minimal drawdown) ground-water sampling procedures, by R.W. Puls and M.J. Barcelona. U.S. EPA Ground Water Issue: EPA/540/S-95/504, April.

Attachment 1
Example of Well Sampling Form

1.0 PURPOSE AND SCOPE

The purpose and scope of this Standard Operating Procedure (SOP) is to describe the equipment and methods used to accurately determine static water level and total depth in a groundwater monitoring well, pumping well, or piezometer.

2.0 RESPONSIBILITIES AND QUALIFICATIONS

The Project Manager has the overall responsibility for implementing this SOP. The Project Manager will be responsible for assigning staff to implement this SOP and for ensuring that the procedures are followed by all personnel.

All personnel performing this procedure are required to have the appropriate health and safety training as described in either the project-specific Health and Safety Plan or the Safe Work Plan, as applicable. In addition, all personnel are required to have a complete understanding of the procedures described within this SOP and receive specific training to these procedures, if necessary.

All project staff are responsible for reporting deviations from this SOP to the Project Manager.

3.0 RELATED STANDARD OPERATING PROCEDURES

This procedure is intended to be used with the following SOPs:

- SOP-1 – Use and Maintenance of Field Log Books
- SOP-3 – Decontamination

4.0 EQUIPMENT

The equipment and supplies that may be necessary to measure water levels include:

- Water level indicator with an audible alarm and a cable marked in 0.01-foot increments. The point on the probe that triggers the alarm corresponds to the zero point.
- If free-phase product is present, an interface probe capable of distinguishing between product and water
- Decontamination supplies
- Field logbook or field data sheets.

5.0 PROCEDURES

This procedure requires the use of an electronic water level device that employs a battery-powered probe assembly attached to a cable marked in 0.01-foot increments. When the probe makes contact with the water surface, a circuit is closed and energy is transmitted through the cable to sound an audible alarm. This equipment will have a sensitivity adjustment switch that

enables the operator to distinguish between actual and false readings. The manufacturer's operating manual should be consulted for instructions on use of the sensitivity adjustment.

If there is the potential for free-phase product to be present on the surface of the water table in a well, then an oil-water interface probe will be used to collect water level measurements. Interface probes are used in the same manner as a water level indicator. The difference is that the interface probes have two different audible signals to differentiate between water and oil. If a layer of free-phase product is present, the probe will emit a different signal than for water. Most probes emit an intermittent beep when product is encountered, as opposed to a constant tone for water. The alarm codes for individual probes are marked on the reel casing.

The measurements must be taken at an established reference point, generally from the top of the well casing at the surveyor's mark. The mark should be permanent, such as a notch or mark on the top of the casing. If the surveyor's point is not marked at the time of water level measurement, the north side of the casing should be used and marked.

5.1 Calibration

The water level indicator or interface probe should be calibrated in accordance with the manufacturer's procedure prior to use.

1. Place the end of the probe in a bucket of water to ensure that the audible alarm is in working condition and responds when the electrical contacts encounter water.

2. Verify the marked length units on the probe line for accuracy by comparing to a standard steel tape measure. If there is any noted discrepancy between the water level indicator and the measuring tape, the difference in length will be noted on the field log and identified on the water level indicator. All subsequent water level measurements will be corrected as necessary.

5.2 Static Water Level Measurement

The static water level will be measured each time a well is sampled. This must be done before any fluids are withdrawn and before any purging or sampling equipment enters a well.

1. Before mobilization, obtain previous water level data, a description of the measuring point for water level measurements for all wells, and the appropriate well keys (if the wells are locked).

2. Test the water level probe to ensure that it is working properly by pushing the circuit test button or as specified in the instrument manufacturer's instructions.

3. Decontaminate the water level indicator probe according to SOP-20, *Decontamination*, before the first measurement, between wells, and after measuring the water level in the last well.

4. Unlock and open the well. Follow the health and safety procedures specified in the project health and safety plan or safe work plan, as applicable. If necessary, let the well vent any gases that may be present in the well casing. Also, this allows the water to equilibrate to barometric changes.

5. After opening the well cover, locate the water level measuring point. If a measuring point is not marked, the measurement should be taken from the north side of the well casing, if possible.

6. With the water level indicator switched on, slowly lower the probe until it contacts the water surface as indicated by the audible alarm.

7. Raise the probe out of the water until the alarm turns off. Three or more measurements will be taken at each well until two measurements agree to within +/- 0.01 feet.

8. Record the reading on the cable at the established reference point to the nearest 0.01 foot in the field logbook and/or on a field data sheet. In addition, document the measuring point location. Compare the most recent measurement with past measurements to verify that the new measurement is reasonable before leaving the well. If the measurement does not seem reasonable, repeat the water level measurement.

9. If the water level indicator fails to activate and is operating properly, lower the water level probe to the bottom of the well to ensure that the well is dry. Document that the well is dry, measure the total depth in accordance with the following method.

5.3 Total Depth Measurement

Depending on the type of instrument used, the total depth measurement may need to be adjusted for the offset between the bottom of the probe and the water level sensor. Some instruments have the sensor at the bottom of the probe so the depth reading is accurate without an adjustment. However, the water indicator sensor on some probes is not located at the bottom of the probe. To get a true total depth reading, the distance from the water indicator sensors to the bottom of the probe housing must be added to the depth reading.

1. Slowly lower the water level indicator, with weight attached if necessary, until the cable goes slack.

2. Raise and lower the probe until the precise location of the bottom is determined.

3. Account for the length of the probe tip in determining the total depth.

4. Record the reading on the cable at the established reference point to the nearest 0.01 foot.

If it is not possible to measure the depth of a well in which pumping equipment is installed, then the as-built well construction diagram will provide the total depth.

5.4 Interface Probe Measurement

1. Before mobilization, obtain previous water level data, a description of the measuring point for water level measurements for all wells, and the appropriate well keys (if the wells are locked).

2. Test the interface probe to ensure that it is working properly by pushing the circuit test button or as specified in the instrument manufacturer's instructions.

3. Decontaminate the interface probe according to SOP-20, *Decontamination,* before the first measurement, between wells, and after measuring the water level is the last well.

4. Unlock and open the well. Follow the health and safety procedures specified in the project health and safety plan or safe work plan, as applicable. If necessary, let the well vent any gases that may be present in the well casing. Also, this allows the water to equilibrate to barometric changes.

5. After opening the well cover, locate the water level measuring point. If a measuring point is not marked, the measurement should be taken from the north side of the well casing, if possible.

6. With the interface probe indicator switched on, slowly lower the probe until it contacts the liquid surface as indicated by the audible alarm.

7. If product is encountered, continue to raise and lower the probe until a precise level (within 0.01 foot) is determined.

8. Record the measurement in the field logbook and/or on the field data sheet to the nearest 0.01 foot and identify it as a product measurement.

9. Lower the interface probe until the water interface is encountered. Repeat the level measurement process a minimum of three or more measurements until two measurements agree to within +/- 0.01 feet.

> **NOTE: CARE SHOULD BE TAKEN DURING THE MEASUREMENT PROCESS TO MINIMIZE DISTURBANCE OF THE PRODUCT/WATER INTERFACE.**

10. Record the measurement in the field logbook and/or on the field data sheet to the nearest 0.01 foot and identify it as the water level measurement. In addition, document the measuring point location. Compare the most recent measurements with past measurements to verify that the new measurements are reasonable before leaving the well. If the product and/or water level measurements do not seem reasonable, repeat both measurements.

6.0 RECORDS

All field notes for water level, product level (if applicable), and well depth measurements will be recorded in the field logbook and/or the field data sheets in accordance with SOP-1, *Use and Maintenance of Field Log Books*. Entries shall be legible, signed or initialed, and dated. Documented information shall include, as appropriate:

- Personnel who performed the measurement
- Date of measurement
- Time of measurement
- Well number
- Depth to water from the measuring point
- Description of the measuring point location for the well
- Water-level or interface probe manufacturer and serial/identification number
- Calculations performed (if any)
- Other observations (i.e., well condition, evidence of tampering, artesian conditions).

7.0 REFERENCES

Driscoll, F.G., 1986. *Groundwater and Wells*, 2nd Edition, Johnson Division, St. Paul, MN, pp. 1089.

Thornhill, J.T., 1989. *Accuracy of Depth to Ground Water Measurements*, from U.S. Environmental Protection Agency (USEPA) Superfund Ground Water Issue, USEPA/540/4-89/002.

U.S. Department of the Interior, 1981. *Groundwater Manual, A Water Resource Technical Publication*, Water and Power Resources Services, U.S. Government Printing Office, Denver, CO, pp. 480.

1.0 PURPOSE

The purpose of this Standard Operating Procedure is to establish guidelines for the use of a multiple parameter water quality meter such as the Horiba or U-22 or equivalent. Multiple parameter meters measuring water quality parameters including pH, temperature, salinity, turbidity, dissolved oxygen (DO), oxidation reduction potential (ORP), and specific conductance (conductivity) in water during well purging, well development, and surface water sampling for chemical analysis.

2.0 SCOPE

This Standard Operating Procedure applies to all personnel who measure water quality parameters using a multiple parameter water quality meter.

3.0 METHOD

Water quality parameters such as pH, temperature, turbidity, DO, conductivity, ORP, and salinity are collected to determine conditions in surface or groundwater at a given location. A series of such determinations can be used to evaluate a variety of situations, from the performance of a groundwater treatment system to the spread of contaminant plume in groundwater. A multiple parameter water quality meter measures each of these parameters digitally. The pH is a primary parameter measured in the field to determine hydrogen-ion activity. It is measured using a glass electrode in combination with a reference potential. Temperature is measured because many water quality parameters vary with temperature. The solubility of oxygen is temperature dependent, as are all electrochemically determined water quality parameters (pH, conductivity).

Turbidity serves as a measure of suspended solids in a water sample. Since these suspended solids might result in elevated apparent concentrations of some contaminants (especially metals) to above levels of concern, the measurement of turbidity is a critical determination before collection of groundwater samples. Turbidity above acceptable levels will typically result in additional efforts to reduce the turbidity of the well water before collecting samples, since samples will be collected unfiltered unless otherwise approved.

DO is an indicator of the oxygen-consuming and oxygen-providing process taking place. It is an indicator of the biochemical processes occurring in the water and is related to the ORP. The most common membrane electrode (ME) meters for determining the DO in water are dependent upon electrochemical reactions. Under steady-state conditions, the current or potential can be correlated with DO concentration. Interfacial dynamics at the ME/sample interface are a factor in probe response and a significant degree of interfacial turbulence is necessary to avoid a "stagnant layer" at the interface and resulting biased determinations. For acceptable precision to be obtained, flow over the DO membrane should be constant, as in the case of a flow-through cell used for groundwater sampling or a flowing stream for stream sampling.

Specific conductance is the ability of a volume of a solution to conduct an electrical current as compared to the same volume of pure water. Chemically pure water has a very low electrical

conductance, indicating that it is a good insulator. However, minute amounts of dissolved mineral matter (total dissolved solids, TDS) in water increase the electrical conductance of water. In dilute solutions, the specific conductance varies almost directly with the TDS content of the samples. Salinity of the sample is computed from conductivity data.

3.1 Materials and Equipment

Equipment that will be used to collect water quality measurements using a multiple parameter water quality meter includes, but is not limited to, the following items:

- Multiple parameter water quality meter with power supply;
- Calibration solutions, as specified by the manufacturer;
- Calibration log form and field logbook for recording calibration;
- Clean sample containers (glass, plastic);
- Distilled or deionized water in wash bottle; and
- Operating manual for the multiple parameter water quality meter.

3.2 Calibration

The multiple parameter water quality meter may be calibrated in the field by using calibration solutions supplied by a commercial laboratory supply house. The specific calibration procedures in the owner's manual for the multiple parameter water quality meter should be followed. Generally, the calibration procedure involves measuring the value of a specific parameter in a standard calibration solution of a known value. The meter is typically calibrated to read the known value to within the acceptance criteria. The instrument should be calibrated prior to each workday of use. The initial instrument response and the final (calibrated) response will be recorded on the calibration log, along with the date and time of calibration. Calibration will be performed in accordance with the manufacturers' instructions..

3.3 Taking Measurements

After the unit is calibrated, it is ready for use. To take measurements, turn the unit on and gently place the probe in the water sample. Typically, a select button can be pressed to toggle between the different parameters, if they are not all displayed on screen simultaneously.

Care should be exercised when handling the probes. The multiple parameter water quality meter should be lowered gently into the sample. The water quality meter should be allowed to stabilize for at least several seconds before collecting water quality parameter data. When conducting groundwater sampling, a flow-through cell should be used whenever possible to minimize wear and tear on the probes, eliminate the need for stabilization (since the electrode is constantly immersed in groundwater flowing over the probes), and improve the consistency of the readings. Multiple determinations as an indication of field precision should be conducted more frequently than every tenth reading if precision problems are apparent.

3.4 Storage

After using the water quality meter, thoroughly wash all probes with analyte free water. The turbidity sensor tube should be periodically washed out with a test tube brush and analyte free water, or according to the manufacturer's instructions. The conductivity guard should be periodically removed to brush away any dirt from the sensor unit. If storing the unit for a week or less, fill the calibration cup with tap water (*not distilled or deionized water, which can damage the probes*) and fit the cap over it. For long-term storage, follow the manufacturer's instructions.

3.5 Additional Considerations

Operators of field equipment should refer to the manufacturer's instructions for step-by-step calibration and usage guidelines. Additional considerations of a general nature include:

- The water quality meter must be checked for mechanical and electrical failures, weak batteries, and cracked or fouled electrodes before field activities.
- Perform calibration using the appropriate solutions as described in the manufacturer's instructions.
- Clean and rinse probes thoroughly using distilled or deionized water in a wash bottle between all samples and at the end of the day. Each time the electrodes are cleaned, they should be examined for damage.
- Some electrodes (e.g., pH and DO electrodes) must NOT be allowed to dry completely, as this may permanently alter the physical or electrochemical properties of the electrode surface.
- Note that oily samples are likely to result in fouling of the electrodes and more aggressive cleaning procedures (such as mild acid washing) will be required, as described in the manufacturer's instruction manual. After such cleaning, a calibration check must be performed; typically such cleaning will necessitate recalibration.

4.0 REFERENCES

American Society for Testing and Materials (ASTM). *Tests for Dissolved Oxygen in Water,* Annual Book of ASTM Standards; Part 31, "Water," Standard D888-92(A). Philadelphia, PA.

Instruction Manual, Horiba U-10 Water Quality Checker, Horiba Instruments, Inc.

USEPA, 1991. *Environmental Branch Standard Operating Procedures and Quality Assurance Manual*. EPA Region IV, Athens, GA.

USEPA, 1983. *Methods for Chemical Analyses of Water and Wastes.* Environmental Monitoring and Support Laboratory, Cincinnati, OH.

5.0 RECORDS

Documentation, including field survey measurements and QC measurements, will be recorded in the field log book in accordance with the project SAP and appropriate SOP. Personnel collecting field measurements are responsible for documenting sampling activities in the field logbook. The observations and data will be recorded with waterproof ink in a permanently bound weatherproof field logbook with consecutively numbered pages.

6.0 ATTACHMENTS

Not applicable.

Appendix B

Groundwater Field Sampling Forms

10-6-20 Chevron Isleta 3rd Qtr Gw

0715 Arrive at office, load equipment depart to site.

0750 Arrive on site. Complete HAS tailgate, set up on MW-26.

0824 Collect sample MW-26. Move to MW-11A.
- Check in w/ Walgreens manager.

0845 Begin setup & Purge on MW-11A.

0902 Collect sample MW-11A. Move to MW-8A.

0910 Begin setup & Purge on MW-8A.

0932 Collect sample MW-8A. Begin decorning equipment and filling out CoC.

1015 Depart site. End of day.

10-6-20

Chain-of-Custody Record

Client: AECOM

Mailing Address: 6501 Americas PKwy STE 900 Albuquerque, NM 87110

Phone #: 505-855-7500

email or Fax#: dale.flores@aecom.com

QA/QC Package:
☑ Standard ☐ Level 4 (Full Validation)

Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other

☐ EDD (Type)

Turn-Around Time:
☑ Standard ☐ Rush

Project Name: Chevron Isleta

Project #: 126433

Project Manager: Dale Flores

Sampler: Tanner Grubbs

On Ice: ☐ Yes ☐ No

# of Coolers:

Cooler Temp (including CF): (°C)

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No.
10-6-20	0932	GW	MW-8A	40 mL-3	$HgCl_2$	
10-6-20	0902	GW	MW-11A	40 mL-3	$HgCl_2$	
10-6-20	0824	GW	MW-26	40 mL-3	$HgCl_2$	
10-6-20			Trip Blank	40 mL-3	$HgCl_2$	

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
10-6-20	1236					
Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time

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.

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

BTEX / MTBE / TMB's (8021)	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	Cl, F, Br, NO_3, NO_2, PO_4, SO_4	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)							
X							X									
							X									
							X									
							X									

Remarks:

AECOM
6501 Americas Pkwy
Albuquerque, NM 87110
Tel: 505.855.7500
Fax: 505.855.7555

Groundwater Sample Field Data Form

Well Identification: MW-8A

Page 1 of 1

Project Name:	Chevron Isleta	**Sampled By:**	T Grulke
Project Number:	60607553	**Sample ID:**	MW-8A
Location:	Albuquerque, NM	**Sample Date:**	10/6/2020
Date:	6-Oct-20	**Sample Time:**	0932

Equipment

		Field Parameters	
Purging Method/Equipment	3 volumes/peristaltic	Initial Water Temp. (C)	
Sampling Equipment	Peristaltic Pump/Horiba U-52	Initial pH:	
Filtering Equipment		Initial Conductance (mS/cm):	

Purging Information

Casing ID (in)	2.0	Length of Static Water Column (ft)	6.95
Unit Casing Volume (gal/ft)	0.16	Casing Water Volume (gal)	1.11
Depth to Water (ft below TOC)	7.65	Total Purge Volume	3.5
Total Depth (ft below TOC)	14.60	Number of Purge Volumes	3

Volume Purged (gal)	Temp (C)	pH	Conductance (mS/cm)	Orp millivolts	DO (mg/L)	Turbidity (NTU)	Time	Water Description
0	24.4	7.33	0.754	-130.8	0.32	9.84	0920	
1	24.5	7.27	0.759	-154.7	0.15	17.07	0924	
2	24.5	7.23	0.772	-163.6	0.12	15.23	0928	
3.5	24.6	7.22	0.770	-167.1	0.10	16.11	0932	

Total Volumes Removed (gallons): 3.5 **Time:** 0932 **Purged Dry (Y/N):** N

Casing Volume

Casing I.D. (in.)	Unit Casing Volume Gal/Lin. Ft.)
1.0	0.04
1.5	0.09
2.0	0.16
2.2	0.20
3.0	0.37
4.0	0.65
4.3	0.75
5.0	1.00
6.0	1.55
7.0	2.00
8.0	2.60

Additional Remarks

Slight HC odor
NO HC Sheen
Clear/Colorless

10-6-20

AECOM

6501 Americas Pkwy
Albuquerque, NM 87110
Tel: 505.855.7500
Fax: 505.855.7555

Groundwater Sample Field Data Form

Well Identification MW-11A

Page 1 of 1

Project Name:	Chevron Isleta	**Sampled By:**	T.Grulke
Project Number:	60607553	**Sample ID:**	MW-11A
Location:	Albuquerque, NM	**Sample Date:**	10/6/2020
Date:	6-Oct-20	**Sample Time:**	0902

Equipment

Purging Method/Equipment	3 volumes/peristaltic
Sampling Equipment	Peristaltic Pump/Horiba U-52
Filtering Equipment	-

Field Parameters

Initial Water Temp. (C)	24.2
Initial pH:	7.17
Initial Conductance (mS/cm):	0.786

Purging Information

Casing ID (in)	2.0	Length of Static Water Column (ft)	8.26
Unit Casing Volume (gal/ft)	0.16	Casing Water Volume (gal)	1.3
Depth to Water (ft below TOC)	6.72	Total Purge Volume	4
Total Depth (ft below TOC)	14.98	Number of Purge Volumes	3

Volume Purged (gal)	Temp (C)	pH	Conductance (mS/cm)	Orp millivolts	DO (mg/L)	Turbidity (NTU)	Time	Water Description
0	24.2	7.17	0.786	-102.4	0.27	15.20	0850	
1.5	24.3	7.15	0.792	-125.7	0.17	13.08	0854	
3	24.3	7.17	0.793	-135.5	0.11	11.91	0858	
4	24.3	7.17	0.794	-143.6	0.10	10.55	0902	

Total Volumes Removed (gallons): 4 Time: 0902 Purged Dry (Y/N): N

Casing Volume

Casing I.D. (in.)	Unit Casing Volume Gal/Lin. Ft.)
1.0	0.04
1.5	0.09
2.0	0.16
2.2	0.20
3.0	0.37
4.0	0.65
4.3	0.75
5.0	1.00
6.0	1.55
7.0	2.00
8.0	2.60

Additional Remarks

Clear/Colorless

No HC odor/Sheen

JT 10-6-20

AECOM

6501 Americas Pkwy
Albuquerque, NM 87110
Tel: 505.855.7500
Fax: 505.855.7555

Groundwater Sample Field Data Form

Well Identification MW-26

Page 1 of 1

Project Name:	Chevron Isleta	Sampled By:	T Grulke
Project Number:	60607553	Sample ID:	MW-26
Location:	Albuquerque, NM	Sample Date:	10/6/2020
Date:	6-Oct-20	Sample Time:	0824

Equipment

Purging Method/Equipment	3 volumes/peristaltic
Sampling Equipment	Peristaltic Pump/Horiba U-52
Filtering Equipment	

Field Parameters

Initial Water Temp. (C)	25.0
Initial pH:	7.72
Initial Conductance (mS/cm):	0.902

Purging Information

Casing ID (in)	2.0	Length of Static Water Column (ft)	6.39
Unit Casing Volume (gal/ft)	0.16	Casing Water Volume (gal)	1.02
Depth to Water (ft below TOC)	6.79	Total Purge Volume	3.1
Total Depth (ft below TOC)	13.18	Number of Purge Volumes	3

Volume Purged (gal)	Temp (C)	pH	Conductance (mS/cm)	Orp millivolts	DO (mg/L)	Turbidity (NTU)	Time	Water Description
0	25.0	7.72	~~7.902~~ .902	78.3	0.39	5.38	0815	
1	25.1	7.26	.878	83.9	0.21	5.96	0818	
2	25.2	7.22	0.875	84.1	0.19	7.04	0821	
3.1	25.1	7.16	0.866	84.2	0.15	7.80	0824	

Total Volumes Removed (gallons): 3.1 Time: 0824 Purged Dry (Y/N): N

Casing Volume

Casing I.D. (in.)	Unit Casing Volume Gal/Lin. Ft.)
1.0	0.04
1.5	0.09
2.0	0.16
2.2	0.20
3.0	0.37
4.0	0.65
4.3	0.75
5.0	1.00
6.0	1.55
7.0	2.00
8.0	2.60

Additional Remarks

Clear/Colorless
No HC Odor/Sheen

10-8-20

Appendix C

Laboratory Analytical Report

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: clients.hallenvironmental.com

October 13, 2020

Dale Flores
AECOM
6501 Americas Parkway NE Suite 900
Albuquerque, NM 87110
TEL: (505) 855-7484
FAX:

RE: Chevron Isleta OrderNo.: 2010265

Dear Dale Flores:

Hall Environmental Analysis Laboratory received 4 sample(s) on 10/6/2020 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. In order to properly interpret your results, it is imperative that you review this report in its entirety. 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. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

CLIENT: AECOM
Client Sample ID: MW-8A
Project: Chevron Isleta
Collection Date: 10/6/2020 9:32:00 AM
Lab ID: 2010265-001
Matrix: GROUNDWA
Received Date: 10/6/2020 1:07:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **JMR**	
Benzene	1.2	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
Toluene	ND	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
Ethylbenzene	ND	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
Naphthalene	ND	2.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
1-Methylnaphthalene	ND	4.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
2-Methylnaphthalene	ND	4.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
Acetone	ND	10		µg/L	1	10/6/2020 11:07:39 PM	F72449
Bromobenzene	ND	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
Bromodichloromethane	ND	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
Bromoform	ND	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
Bromomethane	ND	3.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
2-Butanone	ND	10		µg/L	1	10/6/2020 11:07:39 PM	F72449
Carbon disulfide	ND	10		µg/L	1	10/6/2020 11:07:39 PM	F72449
Carbon Tetrachloride	ND	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
Chlorobenzene	ND	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
Chloroethane	ND	2.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
Chloroform	ND	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
Chloromethane	ND	3.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
2-Chlorotoluene	ND	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
4-Chlorotoluene	ND	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
cis-1,2-DCE	ND	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
Dibromochloromethane	ND	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
Dibromomethane	ND	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
1,2-Dichlorobenzene	ND	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
1,3-Dichlorobenzene	ND	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
1,4-Dichlorobenzene	ND	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
Dichlorodifluoromethane	ND	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
1,1-Dichloroethane	ND	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
1,1-Dichloroethene	ND	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
1,2-Dichloropropane	ND	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
1,3-Dichloropropane	ND	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
2,2-Dichloropropane	ND	2.0		µg/L	1	10/6/2020 11:07:39 PM	F72449

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	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	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: AECOM
Client Sample ID: MW-8A
Project: Chevron Isleta
Collection Date: 10/6/2020 9:32:00 AM
Lab ID: 2010265-001
Matrix: GROUNDWA
Received Date: 10/6/2020 1:07:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **JMR**	
1,1-Dichloropropene	ND	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
Hexachlorobutadiene	ND	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
2-Hexanone	ND	10		µg/L	1	10/6/2020 11:07:39 PM	F72449
Isopropylbenzene	1.2	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
4-Isopropyltoluene	ND	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
4-Methyl-2-pentanone	ND	10		µg/L	1	10/6/2020 11:07:39 PM	F72449
Methylene Chloride	ND	3.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
n-Butylbenzene	ND	3.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
n-Propylbenzene	1.6	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
sec-Butylbenzene	ND	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
Styrene	ND	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
tert-Butylbenzene	ND	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
trans-1,2-DCE	ND	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
1,1,1-Trichloroethane	ND	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
1,1,2-Trichloroethane	ND	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
Trichloroethene (TCE)	ND	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
Trichlorofluoromethane	ND	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
1,2,3-Trichloropropane	ND	2.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
Vinyl chloride	ND	1.0		µg/L	1	10/6/2020 11:07:39 PM	F72449
Xylenes, Total	ND	1.5		µg/L	1	10/6/2020 11:07:39 PM	F72449
Surr: 1,2-Dichloroethane-d4	103	70-130		%Rec	1	10/6/2020 11:07:39 PM	F72449
Surr: 4-Bromofluorobenzene	106	70-130		%Rec	1	10/6/2020 11:07:39 PM	F72449
Surr: Dibromofluoromethane	114	70-130		%Rec	1	10/6/2020 11:07:39 PM	F72449
Surr: Toluene-d8	97.6	70-130		%Rec	1	10/6/2020 11:07:39 PM	F72449

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	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	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: AECOM
Client Sample ID: MW-11A
Project: Chevron Isleta
Collection Date: 10/6/2020 9:02:00 AM
Lab ID: 2010265-002
Matrix: GROUNDWA
Received Date: 10/6/2020 1:07:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **JMR**	
Benzene	ND	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
Toluene	ND	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
Ethylbenzene	ND	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
Naphthalene	4.4	2.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
1-Methylnaphthalene	ND	4.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
2-Methylnaphthalene	ND	4.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
Acetone	ND	10		µg/L	1	10/6/2020 11:36:12 PM	F72449
Bromobenzene	ND	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
Bromodichloromethane	ND	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
Bromoform	ND	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
Bromomethane	ND	3.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
2-Butanone	ND	10		µg/L	1	10/6/2020 11:36:12 PM	F72449
Carbon disulfide	ND	10		µg/L	1	10/6/2020 11:36:12 PM	F72449
Carbon Tetrachloride	ND	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
Chlorobenzene	ND	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
Chloroethane	ND	2.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
Chloroform	ND	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
Chloromethane	ND	3.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
2-Chlorotoluene	ND	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
4-Chlorotoluene	ND	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
cis-1,2-DCE	ND	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
Dibromochloromethane	ND	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
Dibromomethane	ND	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
1,2-Dichlorobenzene	ND	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
1,3-Dichlorobenzene	ND	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
1,4-Dichlorobenzene	ND	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
Dichlorodifluoromethane	ND	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
1,1-Dichloroethane	ND	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
1,1-Dichloroethene	ND	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
1,2-Dichloropropane	ND	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
1,3-Dichloropropane	ND	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
2,2-Dichloropropane	ND	2.0		µg/L	1	10/6/2020 11:36:12 PM	F72449

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	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	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: AECOM
Client Sample ID: MW-11A
Project: Chevron Isleta
Collection Date: 10/6/2020 9:02:00 AM
Lab ID: 2010265-002
Matrix: GROUNDWA
Received Date: 10/6/2020 1:07:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **JMR**	
1,1-Dichloropropene	ND	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
Hexachlorobutadiene	ND	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
2-Hexanone	ND	10		µg/L	1	10/6/2020 11:36:12 PM	F72449
Isopropylbenzene	4.5	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
4-Isopropyltoluene	ND	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
4-Methyl-2-pentanone	ND	10		µg/L	1	10/6/2020 11:36:12 PM	F72449
Methylene Chloride	ND	3.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
n-Butylbenzene	ND	3.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
n-Propylbenzene	1.5	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
sec-Butylbenzene	ND	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
Styrene	ND	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
tert-Butylbenzene	ND	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
trans-1,2-DCE	ND	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
1,1,1-Trichloroethane	ND	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
1,1,2-Trichloroethane	ND	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
Trichloroethene (TCE)	ND	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
Trichlorofluoromethane	ND	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
1,2,3-Trichloropropane	ND	2.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
Vinyl chloride	ND	1.0		µg/L	1	10/6/2020 11:36:12 PM	F72449
Xylenes, Total	ND	1.5		µg/L	1	10/6/2020 11:36:12 PM	F72449
Surr: 1,2-Dichloroethane-d4	103	70-130		%Rec	1	10/6/2020 11:36:12 PM	F72449
Surr: 4-Bromofluorobenzene	102	70-130		%Rec	1	10/6/2020 11:36:12 PM	F72449
Surr: Dibromofluoromethane	111	70-130		%Rec	1	10/6/2020 11:36:12 PM	F72449
Surr: Toluene-d8	101	70-130		%Rec	1	10/6/2020 11:36:12 PM	F72449

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	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	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: AECOM
Client Sample ID: MW-26
Project: Chevron Isleta
Collection Date: 10/6/2020 8:24:00 AM
Lab ID: 2010265-003
Matrix: GROUNDWA
Received Date: 10/6/2020 1:07:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **JMR**	
Benzene	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
Toluene	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
Ethylbenzene	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
Naphthalene	ND	2.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
1-Methylnaphthalene	ND	4.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
2-Methylnaphthalene	ND	4.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
Acetone	ND	10		µg/L	1	10/7/2020 12:04:38 AM	F72449
Bromobenzene	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
Bromodichloromethane	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
Bromoform	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
Bromomethane	ND	3.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
2-Butanone	ND	10		µg/L	1	10/7/2020 12:04:38 AM	F72449
Carbon disulfide	ND	10		µg/L	1	10/7/2020 12:04:38 AM	F72449
Carbon Tetrachloride	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
Chlorobenzene	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
Chloroethane	ND	2.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
Chloroform	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
Chloromethane	ND	3.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
2-Chlorotoluene	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
4-Chlorotoluene	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
cis-1,2-DCE	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
Dibromochloromethane	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
Dibromomethane	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
1,2-Dichlorobenzene	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
1,3-Dichlorobenzene	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
1,4-Dichlorobenzene	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
Dichlorodifluoromethane	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
1,1-Dichloroethane	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
1,1-Dichloroethene	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
1,2-Dichloropropane	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
1,3-Dichloropropane	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
2,2-Dichloropropane	ND	2.0		µg/L	1	10/7/2020 12:04:38 AM	F72449

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	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	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: AECOM
Client Sample ID: MW-26
Project: Chevron Isleta
Collection Date: 10/6/2020 8:24:00 AM
Lab ID: 2010265-003
Matrix: GROUNDWA
Received Date: 10/6/2020 1:07:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **JMR**	
1,1-Dichloropropene	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
Hexachlorobutadiene	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
2-Hexanone	ND	10		µg/L	1	10/7/2020 12:04:38 AM	F72449
Isopropylbenzene	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
4-Isopropyltoluene	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
4-Methyl-2-pentanone	ND	10		µg/L	1	10/7/2020 12:04:38 AM	F72449
Methylene Chloride	ND	3.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
n-Butylbenzene	ND	3.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
n-Propylbenzene	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
sec-Butylbenzene	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
Styrene	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
tert-Butylbenzene	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
trans-1,2-DCE	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
1,1,1-Trichloroethane	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
1,1,2-Trichloroethane	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
Trichloroethene (TCE)	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
Trichlorofluoromethane	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
1,2,3-Trichloropropane	ND	2.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
Vinyl chloride	ND	1.0		µg/L	1	10/7/2020 12:04:38 AM	F72449
Xylenes, Total	ND	1.5		µg/L	1	10/7/2020 12:04:38 AM	F72449
Surr: 1,2-Dichloroethane-d4	94.8	70-130		%Rec	1	10/7/2020 12:04:38 AM	F72449
Surr: 4-Bromofluorobenzene	99.9	70-130		%Rec	1	10/7/2020 12:04:38 AM	F72449
Surr: Dibromofluoromethane	106	70-130		%Rec	1	10/7/2020 12:04:38 AM	F72449
Surr: Toluene-d8	96.8	70-130		%Rec	1	10/7/2020 12:04:38 AM	F72449

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	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	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: AECOM
Client Sample ID: Trip Blank
Project: Chevron Isleta
Collection Date:
Lab ID: 2010265-004
Matrix: TRIP BLANK
Received Date: 10/6/2020 1:07:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **JMR**	
Benzene	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
Toluene	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
Ethylbenzene	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
Naphthalene	ND	2.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
1-Methylnaphthalene	ND	4.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
2-Methylnaphthalene	ND	4.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
Acetone	ND	10		µg/L	1	10/7/2020 12:33:02 AM	F72449
Bromobenzene	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
Bromodichloromethane	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
Bromoform	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
Bromomethane	ND	3.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
2-Butanone	ND	10		µg/L	1	10/7/2020 12:33:02 AM	F72449
Carbon disulfide	ND	10		µg/L	1	10/7/2020 12:33:02 AM	F72449
Carbon Tetrachloride	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
Chlorobenzene	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
Chloroethane	ND	2.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
Chloroform	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
Chloromethane	ND	3.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
2-Chlorotoluene	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
4-Chlorotoluene	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
cis-1,2-DCE	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
Dibromochloromethane	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
Dibromomethane	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
1,2-Dichlorobenzene	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
1,3-Dichlorobenzene	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
1,4-Dichlorobenzene	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
Dichlorodifluoromethane	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
1,1-Dichloroethane	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
1,1-Dichloroethene	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
1,2-Dichloropropane	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
1,3-Dichloropropane	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
2,2-Dichloropropane	ND	2.0		µg/L	1	10/7/2020 12:33:02 AM	F72449

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	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	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: AECOM
Client Sample ID: Trip Blank
Project: Chevron Isleta
Collection Date:
Lab ID: 2010265-004
Matrix: TRIP BLANK
Received Date: 10/6/2020 1:07:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **JMR**	
1,1-Dichloropropene	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
Hexachlorobutadiene	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
2-Hexanone	ND	10		µg/L	1	10/7/2020 12:33:02 AM	F72449
Isopropylbenzene	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
4-Isopropyltoluene	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
4-Methyl-2-pentanone	ND	10		µg/L	1	10/7/2020 12:33:02 AM	F72449
Methylene Chloride	ND	3.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
n-Butylbenzene	ND	3.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
n-Propylbenzene	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
sec-Butylbenzene	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
Styrene	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
tert-Butylbenzene	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
trans-1,2-DCE	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
1,1,1-Trichloroethane	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
1,1,2-Trichloroethane	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
Trichloroethene (TCE)	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
Trichlorofluoromethane	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
1,2,3-Trichloropropane	ND	2.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
Vinyl chloride	ND	1.0		µg/L	1	10/7/2020 12:33:02 AM	F72449
Xylenes, Total	ND	1.5		µg/L	1	10/7/2020 12:33:02 AM	F72449
Surr: 1,2-Dichloroethane-d4	89.9	70-130		%Rec	1	10/7/2020 12:33:02 AM	F72449
Surr: 4-Bromofluorobenzene	101	70-130		%Rec	1	10/7/2020 12:33:02 AM	F72449
Surr: Dibromofluoromethane	106	70-130		%Rec	1	10/7/2020 12:33:02 AM	F72449
Surr: Toluene-d8	105	70-130		%Rec	1	10/7/2020 12:33:02 AM	F72449

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	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	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2010265**

13-Oct-20

Client: AECOM

Project: Chevron Isleta

Sample ID: **100ng lcs** SampType: **LCS** TestCode: **EPA Method 8260B: VOLATILES**

Client ID: **LCSW** Batch ID: **F72449** RunNo: **72449**

Prep Date: Analysis Date: **10/6/2020** SeqNo: **2542650** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	18	1.0	20.00	0	91.8	70	130			
Toluene	20	1.0	20.00	0	99.8	70	130			
Chlorobenzene	19	1.0	20.00	0	96.2	70	130			
1,1-Dichloroethene	20	1.0	20.00	0	102	70	130			
Trichloroethene (TCE)	19	1.0	20.00	0	95.7	70	130			
Surr: 1,2-Dichloroethane-d4	9.7		10.00		96.7	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		104	70	130			
Surr: Dibromofluoromethane	11		10.00		108	70	130			
Surr: Toluene-d8	10		10.00		99.9	70	130			

Sample ID: **mb1** SampType: **MBLK** TestCode: **EPA Method 8260B: VOLATILES**

Client ID: **PBW** Batch ID: **F72449** RunNo: **72449**

Prep Date: Analysis Date: **10/6/2020** SeqNo: **2542651** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								
1,2,4-Trimethylbenzene	ND	1.0								
1,3,5-Trimethylbenzene	ND	1.0								
1,2-Dichloroethane (EDC)	ND	1.0								
1,2-Dibromoethane (EDB)	ND	1.0								
Naphthalene	ND	2.0								
1-Methylnaphthalene	ND	4.0								
2-Methylnaphthalene	ND	4.0								
Acetone	ND	10								
Bromobenzene	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	3.0								
2-Butanone	ND	10								
Carbon disulfide	ND	10								
Carbon Tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	2.0								
Chloroform	ND	1.0								
Chloromethane	ND	3.0								
2-Chlorotoluene	ND	1.0								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2010265**
13-Oct-20

Client: AECOM
Project: Chevron Isleta

Sample ID: **mb1**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **F72449**	RunNo: **72449**
Prep Date:	Analysis Date: **10/6/2020**	SeqNo: **2542651** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
4-Chlorotoluene	ND	1.0								
cis-1,2-DCE	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
1,2-Dibromo-3-chloropropane	ND	2.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,3-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
Dichlorodifluoromethane	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2-Dichloropropane	ND	1.0								
1,3-Dichloropropane	ND	1.0								
2,2-Dichloropropane	ND	2.0								
1,1-Dichloropropene	ND	1.0								
Hexachlorobutadiene	ND	1.0								
2-Hexanone	ND	10								
Isopropylbenzene	ND	1.0								
4-Isopropyltoluene	ND	1.0								
4-Methyl-2-pentanone	ND	10								
Methylene Chloride	ND	3.0								
n-Butylbenzene	ND	3.0								
n-Propylbenzene	ND	1.0								
sec-Butylbenzene	ND	1.0								
Styrene	ND	1.0								
tert-Butylbenzene	ND	1.0								
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	2.0								
Tetrachloroethene (PCE)	ND	1.0								
trans-1,2-DCE	ND	1.0								
trans-1,3-Dichloropropene	ND	1.0								
1,2,3-Trichlorobenzene	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
1,2,3-Trichloropropane	ND	2.0								

Qualifiers:

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D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2010265**

13-Oct-20

Client: AECOM

Project: Chevron Isleta

Sample ID: **mb1**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **F72449**	RunNo: **72449**
Prep Date:	Analysis Date: **10/6/2020**	SeqNo: **2542651** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Vinyl chloride	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	9.6		10.00		96.1	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		101	70	130			
Surr: Dibromofluoromethane	10		10.00		104	70	130			
Surr: Toluene-d8	10		10.00		102	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
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P	Sample pH Not In Range
RL	Reporting Limit

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: clients.hallenvironmental.com

Sample Log-In Check List

Client Name: **AECOM** Work Order Number: **2010265** RcptNo: **1**

Received By: **Cheyenne Cason** **10/6/2020 1:07:00 PM**

Completed By: **Isaiah Ortiz** **10/6/2020 1:46:30 PM** I-OX

Reviewed By: JR 10/6/20

Chain of Custody

1. Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2. How was the sample delivered?	Client		

Log In

3. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
5. Sample(s) in proper container(s)?	Yes ☑	No ☐	
6. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
7. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
8. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
9. Received at least 1 vial with headspace <1/4" for AQ VOA?	Yes ☑	No ☐	NA ☐
10. Were any sample containers received broken?	Yes ☐	No ☑	
11. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
12. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
13. Is it clear what analyses were requested?	Yes ☑	No ☐	
14. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

# of preserved bottles checked for pH: (<2 or >12 unless noted)

Adjusted?

Checked by: 10/6/20

Special Handling (if applicable)

15. 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:

16. Additional remarks:

17. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	5.8	Good	Not Present			

Chain-of-Custody Record

Client: AECOM

Mailing Address: 6501 Americas PKwy STE 900. Albuquerque, NM 87110

Phone #: 505-855-7500

email or Fax#: dale.flores@aecom.com

QA/QC Package:

☑ Standard ☐ Level 4 (Full Validation)

Accreditation: ☐ Az Compliance ☐ NELAC ☐ Other

☐ EDD (Type)

Turn-Around Time:

☑ Standard ☐ **Rush**

Project Name: Chevron Isleta

Project #: 126433

Project Manager: Dale Flores

Sampler: Tanner Gawlik

On Ice: ☑ Yes ☐ No

# of Coolers: 1

Cooler Temp(including CF): 5.8+0=5.8c (°C)

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 Name	Container Type and #	Preservative Type	HEAL No. 2010265	BTEX / MTBE / TMB's (8021)	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	Cl, F, Br, NO_3, NO_2, PO_4, SO_4	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)
10-6-20	0932	GW	MW-8A	40mL-3	$HgCl_2$	001	X							X		
10-6-20	0902	GW	MW-11A	40mL-3	$HgCl_2$	002								X		
10-6-20	0824	GW	MW-26	40mL-3	$HgCl_2$	003								X		
10-6-20			Trip Blank	40mL-3	$HgCl_2$	004								X		

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
10-6-20	1238			COO	10/6/20	1307
Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time

Remarks:

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.