



CERTIFIED MAIL – RETURN RECEIPT REQUESTED

March 30, 2023

Carlos Martinez
Midway Chevron LPST Site
PO Box 13
Sapello, New Mexico 87745

RE: Draft UIC General Discharge Permit, DP-1960, Midway Chevron LPST Site

Dear Carlo Martinez:

The New Mexico Environment Department (NMED) hereby provides notice to you of the proposed approval of UIC General Ground Water Discharge Permit, DP-1960, (copy enclosed), pursuant to Subsection H of 20.6.2.3108 NMAC. NMED will publish notice of the availability of the draft Discharge Permit in the near future for public review and comment and will forward a copy of that notice to you.

Prior to making a final ruling on the proposed Discharge Permit, NMED will allow 30 days from the date the public notice is published in the newspaper for any interested party, including the Discharge Permit applicant, i.e., yourself, to submit written comments and/or a request a public hearing. A hearing request shall set forth the reasons why a hearing is requested. NMED will hold a hearing in response to a timely hearing request if the NMED Secretary determines there is substantial public interest in the proposed Discharge Permit.

Please review the enclosed draft Discharge Permit carefully. Please be aware that this Discharge Permit may contain conditions that require the permittee to implement operational, monitoring or closure actions by a specified deadline.

Please submit written comments or a request for hearing to my attention at the address below, via email to andrewc.romero@env.nm.gov or to pps.general@env.nm.gov, or directly into the NMED Public Comment Portal at <https://nmed.commentinput.com/comment/search>. If NMED does not receive written comments or a request for hearing during the public comment period, the draft Discharge Permit will become final.

Thank you for your cooperation during the review process. Feel free to contact me with any questions at (505) 660-8624.

Carlos Martinez, DP-1960

March 30, 2023

Page 2 of 2

Sincerely,

Andrew Romero, Environmental Scientist

Encl: Draft UIC General Discharge Permit, DP-1960

cc: Timothy Haller, timhaller@vcimail.com
Tim Noger, NMED PSTB, tim.noger@env.nm.gov



**NEW MEXICO ENVIRONMENT DEPARTMENT
GROUND WATER QUALITY BUREAU
UNDERGROUND INJECTION CONTROL
GENERAL DISCHARGE PERMIT**



Certified Mail- Return Receipt Requested

Facility Name: Midway Chevron LPST Site
Facility Location: State Highway 518, Sapello, New Mexico
Latitude: 35.772599 Longitude: -105.253536
San Miguel

Responsible Party: Mr. Carlos Martinez
P.O. Box 13, Sapello, NM 87745
505-425-8094

Remediation Oversight Agency Contact: New Mexico Environment Department
Petroleum Storage Tank Bureau
Tim Noger (Project Manager)
505-372-8150

Remediation or Injection Plan Identification: "Remediation System O&M and Groundwater Monitoring Workplan"

Permitting Action: New

PPS Contact Andrew Romero
(505) 660-8624

EFFECTIVE DATE: **TERM ENDS:**

Justin Ball
Chief, Ground Water Quality Bureau

[Subsection H of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.I]

I. UIC GENERAL DISCHARGE PERMIT

The New Mexico Environment Department (NMED) Ground Water Quality Bureau (GWQB) issues this Underground Injection Control General Discharge Permit (UIC Permit) for the subsurface emplacement of additive fluids through a Class V UIC injection well for the purpose of facilitating vadose zone or groundwater remediation. The GWQB issues this UIC Permit to Mr. Carlos Martinez, P.O. Box 13, Sapello, NM 87745 (Permittee) pursuant to the New Mexico Water Quality Act (WQA), NMSA 1978 §§74-6-1 through 74-6-17, and the New Mexico Water Quality Control Commission (WQCC) Ground and Surface Water Protection Regulations, 20.6.2 NMAC.

In issuing this UIC Permit, the GWQB has determined that the requirements of Subsection C of 20.6.2.3109 NMAC have been met. The activities authorized by this UIC Permit are principally governed by the Remediation System O&M and Groundwater Monitoring Work Plan (Injection Plan), under the authority of NMAC 20.5.119.1925 through 1929 - Corrective Action for Storage Tank Systems Containing Petroleum Products, with oversight by the Petroleum Storage Tank Bureau Remedial Action Program. Compliance with this UIC Permit requires compliance with the terms, requirements, and conditions of the Injection Plan. The term of this UIC Permit shall be no longer than five years from the effective date of this UIC Permit.

The injection activities, the location of the injection site, the type of injection and quantities of additives being used are briefly described as follows:

Injection Activities (summary: including injection well type, number of wells, and injection frequency)

Copy of the Injection Plan Attached (required):

The attached workplan provides methods and specifications for mixing nutrient solution and clean potable water for injection into 13 existing remediation wells and monitor wells, not exceeding 3,600 gallons per day. The objective is to stimulate aerobic biodegradation of petroleum contaminants by injecting aerobic bacterial nutrients in conjunction with ongoing air sparging.

Injection Site Information

Depth to groundwater: Ranging from approximately 7 ft to 27 ft

Existing concentration of total dissolved solids (TDS) in groundwater: 785 mg/L

Location: Midway Chevron, located on the southwest corner of NM HWY-518 and NM HWY-94, Sapello, NM

County: San Miguel

Latitude: 35.772599

Longitude: -105.253536

Map Showing Area of Injection Sites Attached (required) -:

Additives Being Used (including volumes, manufacturer, and mixing ratios)

Urea, Di-ammonium phosphate (DAP) and Potassium chloride (KCl)
5.9 pounds of urea, 2.6 pounds of DAP, 1.5 pounds of KCl and 3,600 gallons of clean potable water
Approximately 3,600 gallons per day maximum
300 gallons each for 11 wells and 120 gallons each for 2 low permeability wells
Mixed onsite in 300-gallon batches
Ratios of nutrient powder to water is well dependant (see Workplan Appendix B)
Injection into the shallow aquifer by gravity drainage and/or with 1/6 horsepower centrifugal pump
Depth to groundwater ranges from 7 to 27 feet

Anticipated Precipitation, Dissolution, Adsorption, and Desorption Products

Anticipated Increases: nitrate, phosphate, potassium chloride and oxidation-reduction potential
Anticipated Decreases: dissolved iron, dissolved manganese and petroleum contaminants.
Anticipated Precipitants: reduced-state Fe and Mn will precipitate as solid oxides in response to increased aerobic processes.
The hydrogeologic regime will change from anaerobic to aerobic due to injection of aerobic nutrient solution and ongoing air sparging.

Public Notice Posting Locations

2 inch by 3 inch Newspaper Ad required for Renewal applications.
Newspaper: Not Applicable – New Application
3 inch by 4 inch Newspaper Ad required for New, Modification, and Renewal/Modification applications.
Newspaper: Las Vegas Optic
2 feet by 3 feet sign posted for 30 days in a location conspicuous to the public at or near the facility required for New, Modification, and Renewal/Modification applications.
Sign Location: Sign post installed on-site, facing NM HWY-518
8.5 inch by 11 inch or larger posted off-site location conspicuous to the public (e.g. public library). Required for New, Modification, and Renewal/Modification applications.
Flyer Location: Sapello Post Office (No public library in Sapello)

This UIC Permit consists of the complete and accurate completion of this UIC Permit form as determined by the GWQB.

Issuance of this UIC Permit does not relieve the Permittee of the responsibility to comply with the WQA, WQCC Regulations, and any other applicable federal, state and/or local laws and regulations, such as zoning requirements and nuisance ordinances.

Signatures

Signature must be that of the person listed as the legally responsible party on this application.

I, the applicant, attest under penalty of law to the truth of the information and supporting documentation contained in this application for an Underground Injection Control General Discharge Permit.

Applicant's Signature

Signature: _____

Date: _____

Printed Name: _____

Carlos Martinez

Title: _____

Owner/Responsible Party

DRAFT

II. FINDINGS

In issuing this UIC Permit, GWQB finds:

1. The Permittee is injecting fluids so that such injections will move directly or indirectly into groundwater within the meaning of Section 20.6.2.3104 NMAC.
2. The Permittee is injecting fluids so that such fluids will move into groundwater of the State of New Mexico which has an existing concentration of 10,000 mg/L or less of TDS within the meaning of Subsection A of 20.6.2.3101 NMAC.
3. The Permittee is using a Class V UIC well as described in 20.6.2.5002(B)(5)(d)(ii) NMAC for in situ groundwater remediation by injecting a fluid that facilitates vadose zone or groundwater remediation.
4. The Permittee is injecting fluids into groundwater in order to achieve the remediation goals identified in the Injection Plan.

III. AUTHORIZATION TO DISCHARGE

The Permittee is authorized to inject chemical additives into groundwater in accordance with this UIC Permit and the Injection Plan under the oversight of the Petroleum Storage Tank Bureau.

[20.6.2.3104 NMAC, Subsection C of 20.6.2.3106 NMAC, Subsection C of 20.6.2.3109 NMAC]

IV. CONDITIONS

The conditions of this UIC Permit shall be complied with by the Permittee and are enforceable by GWQB.

1. The Permittee shall perform remediation activities in accordance with the Injection Plan and shall notify GWQB of any changes prior to making them.

[20.6.2.3107 NMAC]

2. The Permittee shall monitor the injection activities and their effects on groundwater quality as required by the Injection Plan and shall provide GWQB with electronic copies of the required reporting and any pertinent documentation of activities at the site.

[20.6.2.3107.A NMAC, 20.6.2.3109.A NMAC]

3. If GWQB or the Permittee identifies any failure of the Injection Plan or this UIC Permit to comply with 20.6.2 NMAC not specifically noted herein, GWQB may require the Permittee to submit a corrective action plan and schedule for completion of corrective actions to address the failure.

Additionally, the GWQB may require the Permittee to submit a proposed modification to the Injection Plan, this UIC Permit, or both.

[20.6.2.3107.A NMAC, 20.6.2.3109.E NMAC]

4. ADDITIONAL MONITORING REQUIREMENTS – (RESERVED)
5. TERMINATION – Within 30 days of completion of activities authorized by this UIC Permit the Permittee shall submit a closure report and a request to terminate the UIC Permit to the GWQB for its approval. The closure report shall identify how the injection well(s) was (were) closed in accordance with the Injection Plan. The Permittee shall provide the Petroleum Storage Tank Bureau with a copy of this closure report.

[20.6.2.5005 NMAC, 19.27.4 NMAC]

6. INSPECTION and ENTRY – The Permittee shall allow a representative of the NMED to inspect the facility and its operations subject to this UIC Permit and the WQCC regulations. The GWQB representative may, upon presentation of proper credentials, enter at reasonable times upon or through any premises in which a water contaminant source is located or in which are located any records required to be maintained by regulations of the federal government or the WQCC.

The Permittee shall allow the GWQB representative to have access to, and reproduce for their use, any copy of the records, and to perform assessments, sampling or monitoring during an inspection for the purpose of evaluating compliance with this UIC Permit and the WQCC regulations.

Nothing in this UIC Permit shall be construed as limiting in any way the inspection and entry authority of GWQB under the WQA, the WQCC Regulations, or any other local, state, or federal regulations.

[20.6.2.3107.D NMAC, NMSA 1978, §§ 74-6-9.B and 74-6-9.E]

7. MODIFICATIONS and/or AMENDMENTS – In the event the Permittee proposes a change to the injection plan that would result in a change in the volume injected; the location of the injections; or the concentration of the additives being injected by the facility, the Permittee shall notify GWQB prior to implementing such changes. The Permittee shall obtain approval (which may require modification of this UIC Permit) by GWQB prior to implementing such changes.

[20.6.2.3107.C NMAC, 20.6.2.3109.E and G NMAC]

8. COMPLIANCE with OTHER LAWS – Nothing in this UIC Permit shall be construed in any way as relieving the Permittee of the obligation to comply with all applicable federal, state, and local laws, regulations, permits, or orders.

[NMSA 1978, § 74-6-5.L]

9. PERMIT FEES – Payment of permit fees is due at the time of UIC Permit approval. Permit fees shall be paid in a single payment remitted to GWQB no later than 30 days after the UIC Permit effective date.

Permit fees are associated with issuance of this UIC Permit. Nothing in this UIC Permit shall be construed as relieving the Permittee of the obligation to pay all permit fees assessed by GWQB. A Permittee that ceases injecting or does not commence injecting during the term of the UIC Permit shall pay all permit fees assessed by GWQB. An approved UIC Permit shall be suspended or terminated if the facility fails to remit a payment by its due date.

[20.6.2.3114.F NMAC, NMSA 1978, § 74-6-5.K]

INJECTION WORKPLAN

August 12, 2022

Ms. Susan von Gonten
New Mexico Environment Department
Petroleum Storage Tank Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505

RE: Remediation System O&M and Groundwater Monitoring Workplan
Midway Chevron, State Highway 518, Sapello, New Mexico
Facility #29408 Release ID #2964
Responsible Party: Carlos Martinez, P.O. Box 13, Sapello, NM 87745

Dear Ms. von Gonten:


Haller & Associates, Inc. (HAI) is pleased to submit this workplan for one year of continued remediation system operation and maintenance and groundwater monitoring. In addition, the proposed scope of work includes amendment of groundwater with nutrients to support aerobic biodegradation processes.

This workplan was prepared on behalf of the responsible party: Mr. Carlos Martinez, P.O. Box 13, Sapello, New Mexico 87745.

If you have any questions, please call me at (505) 281-9333.

Sincerely,

HALLER & ASSOCIATES, INC.


Timothy M. Haller, CPG
VP / Hydrogeologist

Attachments: Midway Chevron Remediation O&M Workplan

cc: Mr. Carlos Martinez
Vener Mustafin, PE

REMEDIATION O&M AND GROUNDWATER MONITORING WORKPLAN

MIDWAY CHEVRON STATE HIGHWAY 518, SAPELLO, NEW MEXICO FACILITY ID #29408, RELEASE ID #2964

1.0 OVERVIEW

This workplan was prepared by Haller & Associates, Inc. (HAI) on behalf of the responsible party, Mr. Carlos Martinez. The scope of this workplan consists of one year of remediation system operation and maintenance (O&M) and groundwater monitoring. The scope of work also includes preparation of a discharge permit application and amendment of groundwater with nutrients to support aerobic biodegradation processes.

Field data have demonstrated that the air sparge (AS) system was effective in maintaining dissolved oxygen (DO) concentrations at levels supportive of aerobic biodegradation processes. The AS system has decreased the magnitude of petroleum contaminants. However, the rates of contaminant reductions were less than expected, given the elevated DO concentrations. In April 2022, HAI evaluated naturally-occurring concentrations of aerobic micro-nutrients: nitrate, phosphate and potassium. Nitrate and phosphate were not detected in groundwater samples from wells MW-14 and MW-17. Potassium was very low at 1.6 to 2.3 milligrams per liter (mg/L). Therefore, micro-nutrient amendment is proposed in conjunction with AS system operation to accelerate aerobic processes.

A discharge permit application will be prepared upon workplan approval. The AS system will be operated while the discharge permit is pending approval. This will ensure that site-wide DO concentrations are already sufficiently elevated prior to micro-nutrient injection.

2.0 DISCHARGE PERMIT APPLICATION

HAI will prepare an application for an Underground Injection Control (UIC) General Discharge Permit in accordance with 20.6.2.5006 NMAC. The application will be prepared using forms issued by the New Mexico Environment Department – Ground Water Quality Bureau (NMED-GWQB) Pollution Prevention Section. The permit application will include injection plan and groundwater monitoring plan presented herein. The permit application will be submitted with payment of the \$100.00 application fee. The \$600.00 general permit fee will be paid after permit approval.

The following public notice items are typically required and may be adjusted based on NMED GWQB UIC DP public notice instructions:

- Post a 2-foot by 3-foot laminated sign for 30 days in a conspicuous location at the site.
- Post a notice flyer at a location conspicuous to the public like a library or a USPS office.
- Mail a public notice flyer to the owners within 1/3-mile of the site using 1st class mail.
- Mail a public notice flyer to the owner of the site using certified mail, return requested.
- Publish a 3-inch by 4-inch display ad in the Santa Fe New Mexican newspaper.

The GWQB will provide instructions, flyer, and the newspaper ad in English and Spanish.

After publishing, HAI will prepare the affidavit of completion of public notice as required by the NMED GWQB. The affidavit will include the following:

- Photographs of the public notice posting onsite at the public place.
- List of names and addresses to whom the public notice flyer was mailed.
- List of names and addresses of owners of the site.
- Certified mail receipts for mailing to discharge site owners.
- Copy of the newspaper ad.

3.0 SYSTEM OPERATION SUMMARY

The AS system will operate continuously. The SVE system will not be in operation for the duration of this workplan. However, the SVE system will be activated while HAI personnel are on-site during the biweekly, monthly and quarterly O&M events. The objectives as follows: 1) ensure the blower and motor bearings remain free and lubricated; 2) remove condensation from the conveyance lines; and 3) remove low-level petroleum vapors that may result from AS system operation.

Any of the following wells may be used for air sparging: MPE-1, MPE-2, MPE-3, MPE-5, MPE-6, MPE-7, MPE-8, MPE-9, MPE-10, MPE-11, MPE-12, MPE-13, MPE-14, MW-1, MW-7R, MW-10, MW-14, MW-17, MW-18 and P-2R. Each of these wells can be used for either sparging or observation. Any of these wells exhibiting the highest petroleum contaminant concentrations will be utilized for sparging. Any of the wells that are not activated for sparging will be used for observation.

Monitor wells MW-4, MW-11, MW-12 and P-1 will be utilized as observation wells to track changes in DO and ORP in response to AS.

4.0 OPERATION AND MAINTENANCE

4.1 Bi-Weekly, Monthly and Quarterly O&M

Bi-weekly service calls and monthly O&M events will be performed to monitor equipment operation, make necessary adjustments, perform routine maintenance, clean sparge air screens, and remove sediment from sparge wells as needed. O&M forms will be used to record parameters and activities.

Bi-weekly service calls will include, at a minimum, each of the following:

- Record AS pressure and temperature at the header
- Perform routine maintenance as per the manufacturer recommendations, repair leaks, and address minor issues
- Clean slotted air screens as needed to remove sediment and/or biofouling
- Visually inspect lines and fittings and repair or tighten as needed
- Respond to system shutdowns

Monthly O&M events will include the bi-weekly tasks, plus the following:

- Measure DO and ORP in all sparge wells
- Clean or replace AS blower inlet and outlet air filters
- Grease bearings in accordance with manufacturer's recommendations

Quarterly O&M events will include the bi-weekly and monthly tasks, plus the following:

- Gauge water levels in all sparge and observation wells
- Measure DO, ORP and vapor concentrations in all sparge and observation wells
- General cleanup and weed removal around equipment compound

In the event of a change in conditions that poses a risk to public health, safety, or welfare of the environment, the system will be shut off. Conditions will be evaluated and, if necessary, modifications will be made to the system and/or operations to mitigate the potential risk. The scope and frequency of O&M tasks are summarized in Table 1.

4.2 System Optimization

System operation will be adjusted as necessary to optimize remedial effectiveness. Monthly DO and ORP readings and quarterly groundwater analytical data will be used as the basis for optimization adjustments.

Sparge and observation wells with elevated DO and rapidly declining contaminant concentrations will be considered as optimum. Wells with low DO and stable or slowly decreasing contaminant concentrations will be adjusted and optimized.

Operational adjustments to optimize system effectiveness may include the following:

- Pulsed operation between AS wells in the north portion of the site and AS wells in the south portion of the site.
- Pulsed operation between AS wells that share a common conveyance line.
- Increasing or decreasing sparge flowrate to certain wells.

Substantive changes in AS system operation will be coordinated between HAI and PSTB.

5.0 QUARTERLY MONITORING

Quarterly groundwater monitoring will be performed to evaluate dissolved contaminant concentration trends and remediation system performance. Eleven (11) wells will be sampled in the first, second and third quarters. Twenty-two (22) wells will be sampled in the fourth quarter (Table 2).

5.1 Water Level Gauging

Prior to sampling, water levels will be gauged in all wells using an electronic water level indicator. Wells will be gauged in order of increasing contamination (“clean to dirty”) based on historic data. Gauging equipment will be decontaminated prior to use and between wells using an Alconox detergent solution and clean tap water rinse.

5.2 Groundwater Sampling

Selected wells will be purged and sampled using new disposable polyethylene bailers. The wells will be purged of 3 well volumes or until dry, whichever occurs first. Field measurements of pH, temperature, specific conductance, DO and ORP will be recorded during purging. Purging will be considered complete when field parameters have stabilized for two consecutive well volumes. Purge water will be discharged on the ground and paved surfaces where present. Purge volumes, field parameter measurements, and field observations will be recorded on monitor well sampling data forms and presented in the quarterly reports.

The groundwater samples will be decanted at a slow, non-turbulent rate into clean 40-milliliter vials with Teflon septum caps. Each vial will be filled to a meniscus, leaving no air bubbles or headspace. All groundwater samples will be analyzed for volatile organic compounds (VOCs) by EPA Method 8260B and ethylene dibromide (EDB) by EPA Method 504.1. Samples for VOCs analysis will be preserved with mercuric chloride.

Samples for EDB analysis will be preserved with sodium thiosulfate. The groundwater monitoring schedule is summarized in Table 2.

5.3 Sample Custody and Quality Control

A laboratory trip blank will accompany the samples at all times and will be analyzed for VOCs and EDB by EPA Methods 8260B and 504.1, respectively. All samples will be labeled with well ID, site name, time and date of collection, preservative, sampler initials and requested analyses. The samples will be placed in a cooler with ice, chilled to less than 6 degrees Centigrade, and delivered to Hall Environmental Analysis Laboratory, Inc., with chain-of-custody records.

5.4 Annual Sparge Blower Maintenance

The Rietschle V-DTA 60 rotary vane sparge blower utilizes a set of six (6) internal carbon blades that wear out during normal operation. The blades must be replaced as a set. During the blade replacement, the rotor shaft bearing will be re-greased and inlet and outlet air filters will be replaced.

HAI will purchase two sets of six (6) new Rietschle carbon blades and two sets of inlet and outlet air filters from Update, LLC or similar competitive vendor. HAI will remove the existing blades, clean the inside of the blower, install the new blades and filters, and re-grease the rotor shaft bearing. Blower maintenance will require the following Rietschle parts:

- Carbon blades (two sets of 6) – Part #3, Rietschle Drawing E 356
- Inlet air filters (two sets of 2) – Part #39, Rietschle Drawing E 356
- Outlet air filter (total of 2) – Part #41, Rietschle Drawing E 356

6.0 NUTRIENT AMENDMENT PILOT TESTING

Groundwater samples were collected from MW-14 and MW-17 on April 5, 2022 and analyzed for general inorganic chemistry. The objective was to determine if nitrogen, phosphorus and potassium were present in concentrations sufficient to support aerobic biodegradation processes. Nitrogen and phosphorus were not detected in MW-14 or MW-17. Potassium was detected in MW-14 and MW-17 at low concentrations of 2.3 mg/L and 1.6 mg/L, respectively. The results indicate that naturally-occurring nitrogen, phosphorus and potassium are either low or absent, and aerobic biodegradation of dissolved petroleum contaminants is limited by the availability of these microbial nutrients.

Nitrogen, phosphorus and potassium will be injected into the areas with the highest dissolved petroleum contaminant concentrations. Air sparging will be performed to maintain elevated

DO concentrations. The availability of both DO and microbial nutrients will stimulate microbial activity and accelerate the rate of aerobic degradation of dissolved petroleum contaminants.

Nutrient amendment will be performed as a pilot test. If the initial injection results in acceleration of aerobic degradation, subsequent nutrient injection can be performed as warranted to focus on hot spots and recalcitrant areas.

6.1 Mixing and Injection Equipment

The nutrient solution will be batched on-site using fresh water from the private domestic wells. Batch mixing will be performed using a portable 300-gallon poly tank, a portable 55-gallon poly tank and a 3-horsepower portable centrifugal pump. The nutrient solution will be injected into the target wells using gravity draining and/or a 1/6-horsepower centrifugal pump capable of 23 gallons per minute at no pressure and approximately 10 gallons per minute at 9 pounds per square inch.

6.2 Nutrient Solution Components and Ratios

The nutrient solution will consist of reagent grade di-ammonium phosphate (DAP), urea and potassium chloride (KCl). The dosing design for DAP and urea were based on stoichiometric demand for aerobic respiration of gasoline. The stoichiometric demand for KCl was based on 2.8% by mass of potassium and 2.6% by mass chloride for each mole of bacterial cell. The stoichiometric ratios were derived as follows:

$$\text{DAP} : \text{Urea} : \text{KCl} : \text{Gasoline} = 0.165 : 0.376 : 0.093 : 1$$

$$\text{Carbon} : \text{Nitrogen} : \text{Potassium} : \text{Phosphorus} = 24 : 5.4 : 1.3 : 1$$

TPH mass was estimated based on BTEX concentrations in groundwater, a conservative ratio of sorbed mass versus dissolved mass, estimated fracture porosity, and number of pore volume exchanges per year. The stoichiometry, nutrient dosage, and batching are presented in Appendix B.

6.3 Nutrient Mass and Injection Volume

The total mass of nutrients that will be injected at the site is as follows:

<u>Total Mass</u>	<u>grams</u>	<u>pounds</u>
Total Mass Urea	2,683	5.9
Total Mass DAP	1,180	2.6
Total Mass KCl	666	1.5
TOTAL	4,530	10.0

The total volume of nutrient solution that will be injected is approximately 3,500 gallons. 300 gallons of solution will be injected into each of the eleven wells with moderate permeability for a total of 3,300 gallons. 120 gallons of solution will be injected into each of the two wells with low permeability for a total of 240 gallons. The final volumes may be adjusted based on actual well permeability.

The mass of nutrients injected into a well is based on the contaminant concentrations present in the well. Wells with higher contaminant concentrations will be injected with higher mass of nutrients relative to wells with lower contaminant concentrations. Contaminant-mass-based nutrient dosage for each well is provided in Appendix B.

A digital scale with a sensitivity of 0.1 gram will be used to apportion the prescribed mass of each nutrient to the makeup water. The nutrients will be pre-dissolved in one to two gallons of water in a 5-gallon bucket. After visual confirmation that the nutrients have been completely dissolved, they will be poured into the batch tank and mixed with the makeup water. The objective of this approach is to ensure that all of the prescribed mass of nutrients is completely dissolved prior to injection.

6.4 Nutrient Concentration Monitoring

Groundwater samples will be collected from MW-17, MPE-14, MW-7R, MPE-8 and MPE-11 to monitor nutrient concentrations. The wells will be purged prior to sampling as described in Section 5.2. Baseline samples will be collected immediately following injection. Post-injection samples will be collected one month, two months and three months after injection. The samples will be analyzed for VOCs, nitrate, phosphate, chloride and potassium.

The analytical results will be submitted to PSTB in letter reports and evaluated in the corresponding quarterly O&M report.

7.0 DELIVERABLES

7.1 Monthly O&M Status Reports

Monthly O&M reports will describe and summarize system operational parameters, DO and ORP trends, significant field observations, maintenance and repairs, operational adjustments, and other pertinent data or observations. The monthly reports will present field data collected during the bi-weekly and monthly O&M events. The monthly reports will contain updated tables of system operational data, DO and ORP. Field O&M data forms and field notes will be provided.

7.2 Baseline and Monthly Nutrient Concentration Letter Reports

Results of monthly nutrient concentration sampling will be provided to PSTB in letter reports with attached monitor well sampling data forms and laboratory analytical reports.

7.3 Quarterly O&M and Groundwater Monitoring Reports

HAI will prepare quarterly reports summarizing groundwater analytical results and remediation system operation. The reports will summarize dissolved contaminant concentration trends and DO/ORP trends in response to system operation. Quarterly reports will include conclusions and recommendations based on field and laboratory data obtained during the quarter. Quarterly reports prepared after the nutrient injection event will include evaluation of nutrient concentration trends with respect to natural attenuation and depletion by aerobic processes.

Field and laboratory data will be summarized in cumulative data tables and graphs. Figures and attachments will include a site location map, site map, water table map, dissolved contaminant concentration maps (for actionable contaminants of concern), DO and ORP maps, field data forms and notes, and laboratory reports. Quarterly reports will be reviewed by Vener Mustafin PE, the engineer-of-record.

7.4 Discharge Permit Application

The copy of the discharge permit application and proof of payment of the application fee will serve as the deliverables for this task. HAI will also provide PSTB with a copy of the affidavit of completion of public notice procedures when it is submitted to GWQB.

7.5 Annual Sparge Blower Maintenance Report

The report of sparge blower annual will summarize the work performed, visual condition of replaced parts, and blower performance observed after completion of work. The report will include a replacement parts list and photographs of parts replacement.

7.6 Nutrient Injection Report

The nutrient injection report will be submitted to PSTB approximately 30 days after completion of fieldwork. The report will contain a narrative describing fieldwork, field observations, and any deviations from the workplan. Injection mass and volume for each of 13 wells will be summarized in a data table. Field records and photographs will also be presented. The injection report will be reviewed and signed by the engineer-of-record.

8.0 SCHEDULE OF DELIVERABLES

Monthly O&M Status Reports – The monthly O&M reports will be submitted approximately 30 days after the end of each month. For example, the monthly O&M status report for the month of May will be submitted by the end of June.

Monthly Nutrient Concentration Letter Reports – The baseline report and the post-injection reports will be submitted approximately 3 weeks after completion of fieldwork.

Quarterly O&M and Groundwater Monitoring Reports – The quarterly reports will be submitted approximately 60 days after the end of the month in which the quarterly monitoring event was performed. For example, the report for quarterly O&M and monitoring performed in June will be submitted by the end of August.

Discharge Permit Application – The permit application will be submitted with the payment of the application fee within 30 days of receipt of workplan approval. The schedule of the Nutrient Injection Report will be determined by the amount of time taken by GWQB to approve the application and publish public notice on the NMED website. Fieldwork will commence with 30 days of permit approval. Fieldwork will be completed in 5 working days. The report will be submitted to PSTB and GWQB approximately 30 days after completion of fieldwork.

Annual Sparge Blower Maintenance Report – Rotary vane replacement and maintenance kit installation will be performed in the first or second quarter of system operation. The report will be submitted within 30 days after completion of fieldwork.

9.0 PROJECT COSTS

Deliverable costs and disbursement schedule are summarized in Table 3.

TABLES

TABLE 1
OPERATION AND MAINTENANCE SCOPE AND FREQUENCY SCHEDULE
MIDWAY CHEVRON, SAPELLO, NEW MEXICO

Task	Task Description	Frequency			Number of Events
		Bi-Weekly	Monthly	Quarterly	
1	Record system operating parameters and hour meter readings	X	X	X	24
2	Visually inspect system, cleanup, assess security	X	X	X	24
3	Identify issues and/or problems to be addressed	X	X	X	24
4	Check AS blower air filters, clean as necessary	X	X	X	24
5	Clean surfaces of blowers, as necessary	X	X	X	24
6	Record AS pressure and temperature at manifold	X	X	X	24
7	Adjust AS well pressure at manifolds	X	X	X	24
8	Confirm audible/visual evidence of sparging in AS wells	X	X	X	24
9	Grease all nonsealed blower and motor bearings		X	X	12
10	Clean AS air diffuser screens, as necessary		X	X	12
11	Measure DO and ORP in all AS wells		X	X	12
12	Monthly operation and maintenance status report		X	X	8
13	Gauge fluid levels in all monitor wells and SVE wells			X	4
14	Measure DO and ORP in all monitor wells and SVE wells			X	4
15	Replace air filters, as necessary			X	4
16	Quarterly groundwater sampling			X	4
17	Quarterly Monitoring & System Performance Report			X	3
18	Annual Monitoring & System Performance Report				1
19	Annual maintenance kit for Reitschle rotary vane sparge blower				1

TABLE 2
QUARTERLY GROUNDWATER MONITORING SCHEDULE
MIDWAY CHEVRON,
SAPELLO, NEW MEXICO

EVENT:	1ST QUARTER	2ND QUARTER	3RD QUARTER	4TH QUARTER
WELLS TO BE SAMPLED:	MW-4	MW-7R	MW-1	MW-1
	MW-7R	MW-11	MW-4	MW-4
	MW-10	MW-17	MW-7R	MW-7R
	MW-14	MW-18	MW-14	MW-10
	MW-17	MPE-3	MW-17	MW-11
	MW-18	MPE-6	MW-18	MW-14
	MPE-2	MPE-7	MPE-2	MW-17
	MPE-7	MPE-9	MPE-7	MW-18
	MPE-8	MPE-10	MPE-8	MPE-1
	MPE-13	MPE-11	MPE-13	MPE-2
	P-2R	MPE-14	P-2R	MPE-3
				MPE-5
				MPE-6
				MPE-7
			MPE-8	
			MPE-9	
			MPE-10	
			MPE-11	
			MPE-12	
			MPE-13	
			MPE-14	
			P-2R	
TOTAL WELLS:	11	11	11	22
LABORATORY ANALYSIS:	VOCs 8260B EDB 504.1	VOCs 8260B EDB 504.1	VOCs 8260B EDB 504.1	VOCs 8260B EDB 504.1
FIELD PARAMETERS:	T, pH, SC, DO, ORP	T, pH, SC, DO, ORP	T, pH, SC, DO, ORP	T, pH, SC, DO, ORP

Note: Wells may be substituted based on inaccessibility or changes in plume configuration.

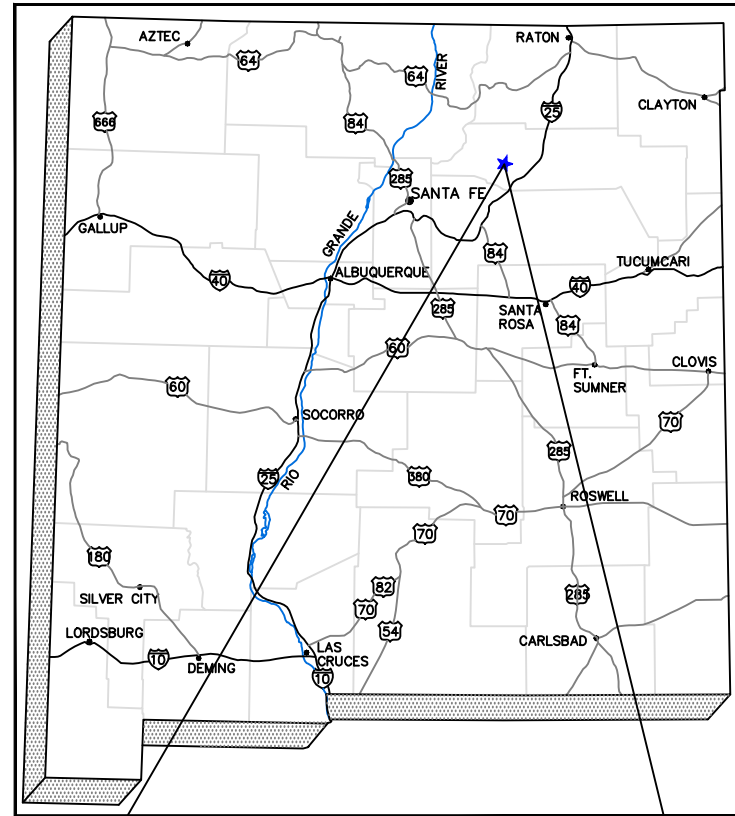
TABLE 3
PHASE 5 O&M DISBURSEMENT SCHEDULE 2022-2023
MIDWAY CHEVRON, SAPELLO, NEW MEXICO

Description	Units	Unit Cost w/Labor	Number of Units	Deliverable	Frequency	Report Due Date	Extended Cost
Workplan Preparation	LS	\$2,500.00	1	Workplan Approval Letter	Once	August 31, 2022 (WP Approval)	\$2,500.00
Monthly O&M	LS	\$4,400.00	8	Monthly O&M Status Reports	Monthly	October 30, 2022 and monthly thereafter	\$35,200.00
1st Quarterly O&M and Groundwater Monitoring	LS	\$14,453.75	1	Quarterly O&M and Monitoring Report	Quarterly	January 30, 2023	\$14,453.75
2nd Quarterly O&M and Groundwater Monitoring	LS	\$14,453.75	1	Quarterly O&M and Monitoring Report	Quarterly	April 30, 2023	\$14,453.75
3rd Quarterly O&M and Groundwater Monitoring	LS	\$14,453.75	1	Quarterly O&M and Monitoring Report	Quarterly	July 30, 2023	\$14,453.75
4th Quarterly/2nd Annual O&M and Groundwater Monitoring	LS	\$20,817.50	1	Annual O&M and Monitoring Report	Annual	October 30, 2023	\$20,817.50
Reitschle Blower Maintenance Kit Purchase and Installation	LS	\$2,288.01	1	Letter Report of Sparge Blower Annual Maintenance	Annual	December 30, 2022	\$2,288.01
Nutrient Amendment Design, Discharge Permit and Public Notice	LS	\$6,870.00	1	DP Application and Public Notice Procedures	Once	October 30, 2022	\$6,870.00
Nutrient Injection Implementation and Report	LS	\$13,423.50	1	Nutrient Injection Report	Once	March 30, 2023	\$13,423.50
Nutrient Sampling and Reports	LS	\$3,452.50	4	Nutrient Sampling Letter Reports	Monthly	March 30, 2023 and monthly thereafter	\$13,810.00
Contingency Set-Aside	LS	\$3,762.49	1	Written PSTB approval	NA	October 30, 2023	\$3,762.49
Total Taxable Cost for One Year O&M, Monitoring and Reporting:					Taxable Subtotal		\$142,032.75
New Mexico Gross Receipts Tax:					NMGRT @ 6.3125%		\$8,965.82
DP Application Fee	Actual Cost	\$100.00	1	DP Application Submitted With Payment of Fee	Once	October 30, 2023	\$100.00
Discharge Fee	Actual Cost	\$600.00	1	Proof of Payment of DP Fee	Once	October 30, 2023	\$600.00
Monthly Utilities	Actual Cost	\$450.00	12	Electricity Bills	Monthly	October 30, 2023	\$5,400.00
PROJECT TOTAL							\$157,098.56

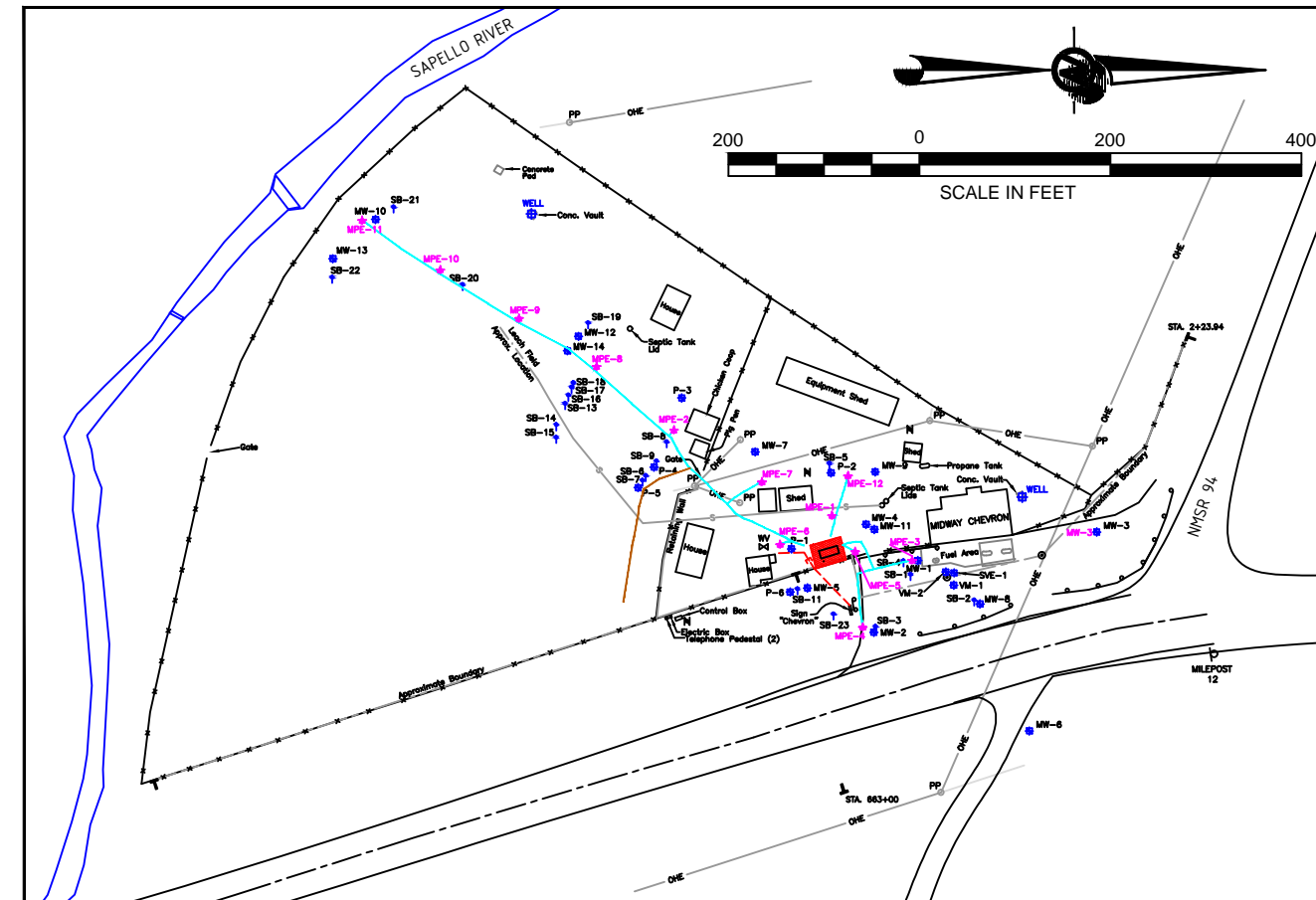
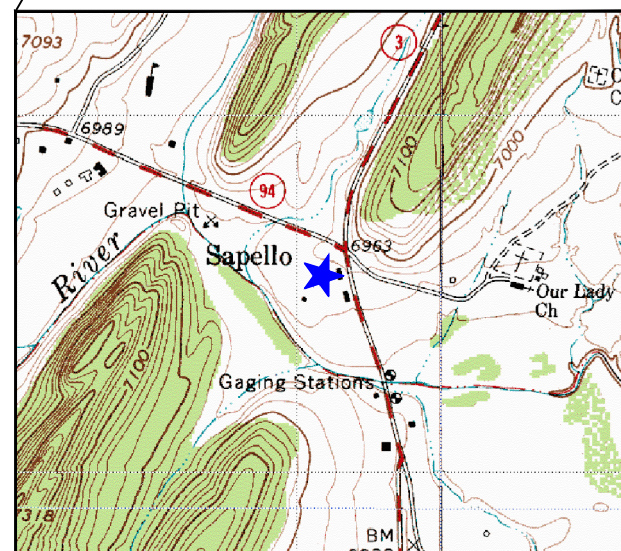
FIGURES


MIDWAY CHEVRON SAPELLO, NEW MEXICO

SITE LOCATION



SITE LOCATION



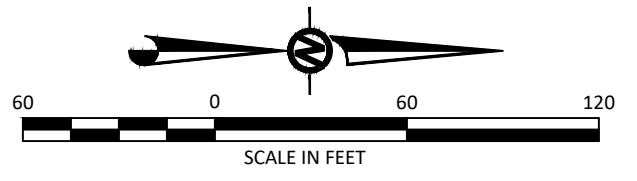
PROJECT	MIDWAY CHEVRON SAPELLO, NEW MEXICO
TITLE	SITE LOCATION AND LAYOUT
 Haller & Associates, Inc. Environmental Services & Geoscience <small>P.O. BOX 1667, 12216B N. HWY 14, SUITE 6 CEDAR CREST, NEW MEXICO 87008</small>	
Figure 1	



LEGEND	
MW-1 [Symbol: crosshair]	MONITOR WELL OR PIEZOMETER LOCATION
MPE-1 [Symbol: pink square]	SPARGE WELLS
[Symbol: blue circle]	PRIVATE WATER WELL
[Symbol: line with circles]	WIRE FENCE

GOOGLE EARTH IMAGE DATED 10-4-16

Haller & Associates, Inc.
 Environmental Services & Geoscience
 P.O. BOX 1667, 12220 N. HWY 14, SUITE C
 CEDAR CREST, NEW MEXICO 87008



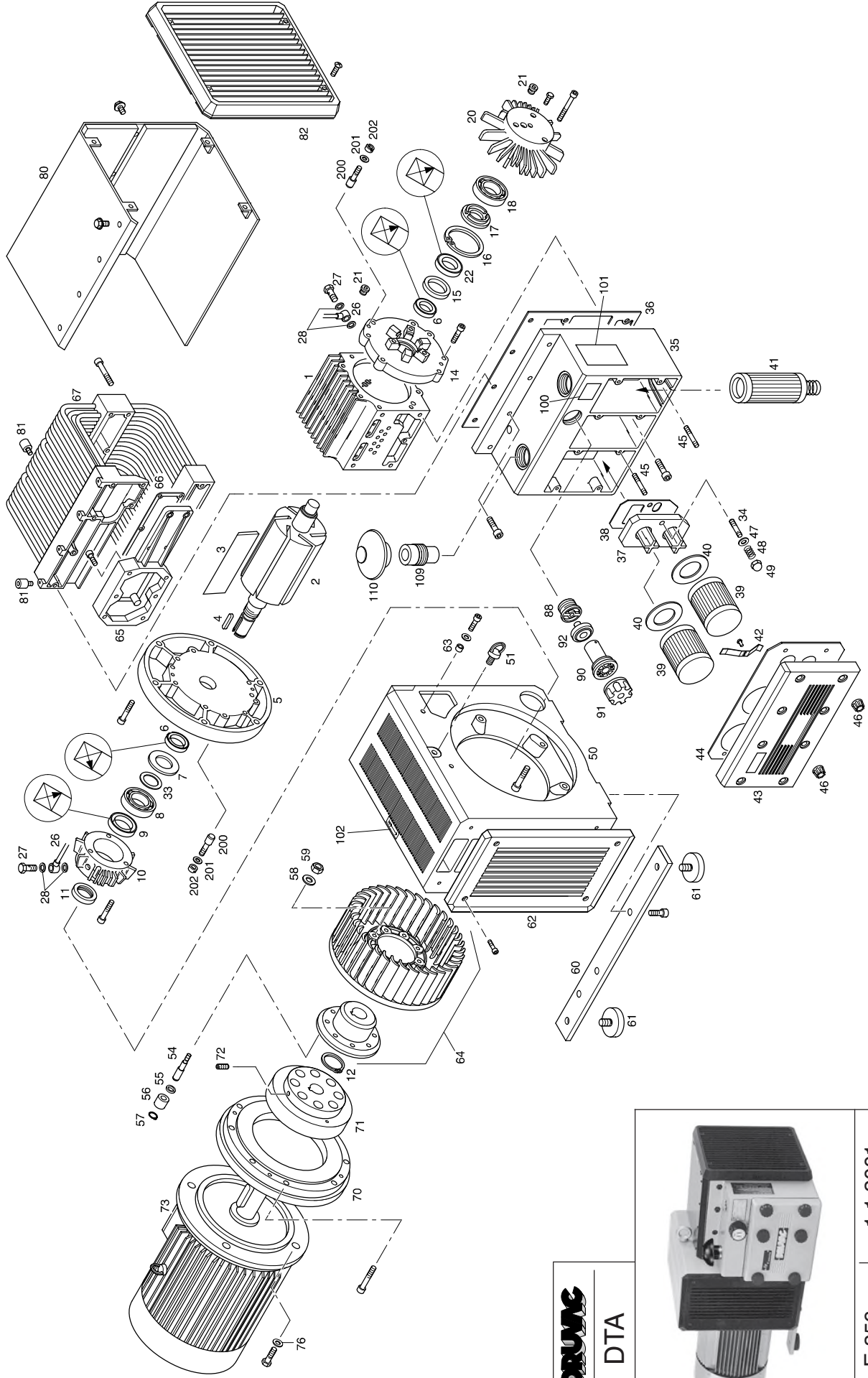
SITE MAP
MIDWAY CHEVRON
STATE HIGHWAY 518
SAPELLO, NEW MEXICO

FIGURE
2

APPENDIX A

REITSCHLE V-DTA 60 MAINTENANCE INSTRUCTIONS AND PARTS DIAGRAM

DTA 60 (81) → DTA 140 (81)



DTA



E 356

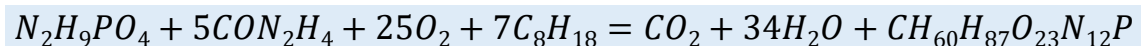
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APPENDIX B

**NUTRIENT STOICHIOMETRY, DOSAGE,
AND BATCHING**

AEROBIC RESPIRATION OF GASOLINE - STOICHIOMETRY
MIDWAY CHEVRON, SAPELLO, NEW MEXICO

Compound	Chemical Formula	Molecular Weight	Number of Moles	Mass	Theoretical Mass Ratio Relative to Gasoline
		<i>grams/mole</i>		<i>grams</i>	<i>gram per gram</i>
DAP	N ₂ H ₉ PO ₄	132	1	132	0.165
Urea	CON ₂ H ₄	60	5	300	0.376
Oxygen	O ₂	32	25	800	1.003
Gasoline	C ₈ H ₁₈	114	7	798	1.000
Carbon Dioxide	CO ₂	44	1	44	0.055
Water	H ₂ O	18	34	612	0.767
Bacterial Cell	C ₆₀ H ₈₇ O ₂₃ N ₁₂ P	1,374	1	1,374	1.722
Potassium Chloride	KCl	75	1	75	0.093
Nitrogen	N	14			
Phosphorus	P	31			
Carbon	C	12			
Oxygen	O	16			
Hydrogen	H	1			
Potassium	K	39	1	2.8%	per mol of bacterial cell
Chlorine	Cl	35.5	1	2.6%	per mol of bacterial cell



DAP : Urea : KCl : Gasoline = 0.165 : 0.376 : 0.093 : 1

	Mass - Left Part of the Equation	Mass - Right Part of the Equation	Theoretical Mass Ratio Relative to Proosphorus
	<i>grams</i>	<i>grams</i>	<i>gram per gram</i>
Carbon	732	732	24
Oxygen	944	944	30
Nitrogen	168	168	5.4
Phosphorus	31	31	1.0
Hydrogen	155	155	5.0
Potassium	39	39	1.3
Chloride	35.5	35.5	1.1

Carbon : Nitrogen : Potassium : Phosphorus = 24 : 5.4 : 1.3 : 1

**NUTRIENT DOSAGE
MIDWAY CHEVRON, SAPELLO, NEW MEXICO**

Well ID	BTEX	TPH	Area	Radius	Thickness	Fracture Porosity	Pore Volume	TPH Mass in Ground Water	TPH Mass Sorbed	TPH Total Mass	Number of GW Flushes Per Year	Additional Demand Factor	Mass of Urea	Urea Concentration	Mass of DAP	DAP Concentration	Mass of KCl	KCl Concentration
		5							10		6	4	0.376		0.165		0.093	
	<i>µg/L</i>	<i>µg/L</i>	<i>SF</i>	<i>feet</i>	<i>feet</i>	<i>%</i>	<i>gal</i>	<i>gram</i>	<i>gram</i>	<i>gram</i>			<i>gram</i>	<i>mg/L</i>	<i>gram</i>	<i>mg/L</i>	<i>gram</i>	<i>mg/L</i>
MPE-11	144	720	1,335	20.6	12	0.25%	300	0.8	8	9	6	4	81	72	36	31	20	17.8
MPE-10	100	500	1,335	20.6	12	0.25%	300	0.6	6	6	6	4	56	50	25	22	14	12.3
MPE-9	500	2,500	1,335	20.6	12	0.25%	300	2.8	28	31	6	4	281	248	124	109	70	61.7
MW-14	200	1,000	1,335	20.6	12	0.25%	300	1.1	11	12	6	4	113	99	50	44	28	24.7
MW-7R	4,200	21,000	1,335	20.6	12	0.100%	120	10	95	105	1	4	158	348	69	153	39	86.4
P-2R	1,150	5,750	1,335	20.6	12	0.100%	120	2.6	26	29	1	4	43	95	19	42	11	23.7
MPE-7	1,000	5,000	1,335	20.6	12	0.25%	300	6	57	62	4	4	375	331	165	146	93	82.3
MPE-8	1,350	6,750	1,335	20.6	12	0.25%	300	8	77	84	3	4	380	335	167	148	94	83.3
MPE-14	200	1,000	1,335	20.6	12	0.25%	300	1.1	11	12	6	4	113	99	50	44	28	24.7
MPE-12	600	3,000	1,335	20.6	12	0.25%	300	3.4	34	37	6	4	338	298	149	131	84	74.0
MPE-3	25	125	1,335	20.6	12	0.25%	300	0.14	1.4	1.6	6	4	14	12	6	5	3	3.1
MW-17	6,000	30,000	1,335	20.6	12	0.25%	300	34	340	374	1	4	563	497	248	219	140	123
MW-18	300	1,500	1,335	20.6	12	0.25%	300	2	17	19	6	4	169	149	74	66	42	37.0
Total							3,535	71	712	783			2,683		1,180		666	
Average	1,289	6,445												203		89		50.3

Conversion Factors	
µg/L * gal	8.35E-09 pounds
µg/L * gal	3.79E-06 grams

BTEX = benzene, toluene, ethylbenzene, xylenes
DAP = di-ammonium phosphate
GW = groundwater
KCl = potassium chloride
TPH = total petroleum hydrocarbons

µg/L = micrograms per liter
gal = gallon
mg/L = milligrams per liter
SF = square feet

**BIOSTIMULATION BATCHING
MIDWAY CHEVRON, SAPELLO, NEW MEXICO**

300 Gallon Batch					120 Gallon Batch				50 Gallon Batch															
Well	Dosage, in gram				Well	Dosage, in gram				Well	Dosage, in gram													
	Urea	DAP	KCl	K ₃ PO ₄		Urea	DAP	KCl	K ₃ PO ₄		Urea	DAP	KCl	K ₃ PO ₄										
MPE-11	81	36	20	19																				
MPE-10	56	25	14	13																				
MPE-9	281	124	70	66																				
MW-14	113	50	28	27																				
					MW-7R	158	69	39	37	MW-7R	66	29	16	15										
					P-2R	43	19	11	10	P-2R	18	8	4	4										
MPE-7	375	165	93	88																				
MPE-8	380	167	94	89																				
MPE-14	113	50	28	27																				
MPE-12	338	149	84	80																				
MPE-3	14	6	3	3																				
MW-17	563	248	140	133																				
MW-18	169	74	42	40																				
Totals	2,482	1,092	616	585												201	88	50	47		84	37	21	20

Total Mass	grams	pounds
Total Mass Urea	2,683	5.9
Total Mass DAP	1,180	2.6
Total Mass KCl	666	1.5
TOTAL	4,530	10.0

Notes: MW-7R and P-2R may be injected in multiple partial batches until 120-gallon injection volume is achieved.
If 55-gallon drums are used for batching in MW-7R and P-2R, the provided 50 gallon batch mixture will be used.

APPENDIX C
FIELD FORMS

**MIDWAY CHEVRON, SAPELLO, NEW MEXICO
REMEDICATION SYSTEM OPERATIONAL DATA**

Date	Bi-Weekly	Monthly	Quarterly
Technician:	System Running Upon Arrival? Yes No		
SVE System Operation	Measurement		
SVE Blower VFD Setting (%)			
Vacuum at SVE Blower (in wc)			
Vacuum at KO Pot (in wc)			
SVE Effluent Pressure (in wc)			
SVE Effluent Temperature (°F)			
SVE Vapors (PID ppm-v)			
AS System Operation	Measurement		
AS Blower Hour Meter (hours)			
AS Header Pressure (psi)			
AS Header Temperature (°F):			
Enclosure Fan Operating? (yes / no)			
Routine Maintenance	Comment		
SVE Blower Bearings Greased? (yes / no)			
SVE Blower Oil (checked / changed)			
SVE Knockout Pot Drained? (yes / no)			
SVE Timer Switch Settings			
AS Timer Switch Settings			
AS Motor Bearings Greased? (yes / no)			
AS Blower Intake Filters (checked / cleaned)			
Noise / Vibration? (describe)			
Comments / Other:			

**MIDWAY CHEVRON, SAPELLO, NEW MEXICO
SOIL VAPOR EXTRACTION DATA**

Date:		Bi-Weekly	Monthly	Quarterly
Technician:				
Well ID	Air Flow Rate at Manifold (scfm)	Vapor Concentration at Manifold (ppm-v)	Field Observations	
MPE-1				
MPE-2				
MPE-3 / MPE-13				
MPE-4 / MW-11				
MPE-5				
MPE-6				
MPE-7 / MW-7R				
MPE-8				
MPE-9				
MPE-10				
MPE-11				
MPE-12 / MPE -14 / P-2R				
SVE HEADER				
COMMENTS / ACTIONS TAKEN				

**MIDWAY CHEVRON, SAPELLO, NEW MEXICO
SPARGE WELL AND OBSERVATION WELL DATA**

Date: Monthly Quarterly

Technician:

Well ID	DTW (feet)	DO (ppm)	ORP (mV)	Wellhead Vapor (ppm-v)	Wellhead Vacuum	Field Observations
MPE-1						
MPE-2						
MPE-3						
MPE-5						
MPE-6						
MPE-7						
MPE-8						
MPE-9						
MPE-10						
MPE-11						
MPE-12						
MPE-13						
MPE-14						
MW-1						
MW-7R						
MW-10						
MW-14						
MW-17						
MW-18						
P-2R						
MW-4						
MW-9						
MW-11						
MW-12						
P-1						

COMMENTS / ACTIONS TAKEN
