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Initial Site Assessment/Characterization Report

Vacuum Grayburg San Andres Injection Station New Mexico Oil Conservation Division (NMOCD) District RP #1RP-5643

Prepared For:
Chevron Mid-Continent Business Unit (MCBU)

Prepared By:
AECOM
19219 Katy Freeway, Suite 100
Houston, Texas 77094

October 2019

Initial Site Assessment/Characterization Report

Vacuum Grayburg San Andres Injection Station
Produced Water Spill Site
Lea County, New Mexico
NMOCD RP #1RP-5643

Chevron Mid-Continent Business Unit (MCBU)

October 2019
AECOM Project No. 60614104

Prepared by: Wally Gilmore, P.G.
Senior Project Manager

Reviewed by: Peter Hicks
Team Leader

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1. Introduction

On behalf of Chevron Mid-Continent Business Unit (MCBU), AECOM Technical Services, Inc. (AECOM) has prepared this Initial Assessment/Characterization Report to describe the initial assessment activities that have been conducted to characterize potential impacts to environmental media (soil and groundwater) resulting from a produced water spill that occurred at the Vacuum Grayburg San Andres Injection Station site in Lea County, New Mexico ("the Site").

2. Background

The Site is located at Latitude 32.780809 ° North, Longitude 103.532550 ° West in Lea County, New Mexico (**Figure 1**).

On July 17, 2019, approximately 64.33 barrels (bbls) of produced water and 5.33 bbls of crude oil were released at the Site due to a lightning strike and resulting tank fire. Approximately 29 bbls of produced water and 5 bbls of crude oil were reported to have been recovered. As required by the New Mexico Oil Conservation Division (NMOCD) under 19.15.29 New Mexico Administrative Code (NMAC), Chevron's initial response to the release included:

- Stopping the release at the source;
- Securing the impacted soil area to protect human health and the environment;
- Containing the released produced water and crude oil; and
- Recovering approximately 29 bbls of produced water and 5 bbls of crude oil.

A Release Notification, Form C-141, dated July 29, 2019, was submitted to the NMOCD. The Form C-141 documents the responsible party, location of the release source, nature and volume of the release, and initial response to the release. NMOCD assigned District RP #1RP-5643 to the release. An updated Form C-141 is provided as **Appendix A**.

3. Initial Site Assessment/Characterization

The findings from an initial desktop assessment/characterization of the Site are summarized below.

- The Site is situated within the Vacuum Oil Field, approximately five miles northeast of the Mescalero Ridge, which forms the western edge of the Llano Estacado. The Llano Estacado is a vast plateau in Southeastern New Mexico and West Texas that is capped by erosion-resistant caliche, which is typically referred to as the Caprock.
- Based on an online Water Column/Average Depth to Water Report from the New Mexico Water Rights Reporting System (NMWRRS) for wells located within 1,000 meters (about 3,281 feet) of the Site, the shallowest potential depth to groundwater beneath the site is 70 feet below ground surface (ft bgs) and the average depth to groundwater is 95 ft bgs. A copy of the Water Column/Average Depth to Water Report is provided as Appendix B.
- The underlying soils at the Site are comprised of gravelly loam and caliche. Soil sampling has been initiated to characterize potential chloride and petroleum hydrocarbon impacts to the Site.
- There are no continuously flowing watercourses or other significant watercourses within ½ mile of the Site.
- The Site is not located within 200 ft of any lakebed, known sinkhole, or playa lake.

- The nearest occupied permanent residence, school, hospital, institution, or church is 14 miles from the Site.
- There are no possible springs or wells used for domestic or stock watering purposes within ½ mile of the Site.
- There are twenty-five known water wells within ½ mile of the Site, however, many are plugged. The closest relevant water well identified in the online NMWRRS report with depth to water data is a well drilled by The Abbott Brothers Company in 1967 and screened from 134 to 236 ft bgs at a location approximately 0.14-miles northeast of the Site. The initial use and current status of this water well is currently unknown.
- The closest incorporated municipal boundaries or defined municipal fresh water well fields are located 15 miles northeast of the Site, which is the approximate distance from the Site to Lovington, NM.
- No wetlands are present within 300 feet of the Site. A review of the online U.S. Fish & Wildlife Wetlands Mapper tool indicates a 1.74-acre palustrine, unconsolidated bottom, semi-permanently flooded, wetland area present 0.2 miles northwest of the Site.
- No subsurface mines are located beneath the Site.
- No karst geology features or other unstable areas are known to be located near the Site.
- A 100-year floodplain was not identified near the site.
- Operations near the Site are for oil and gas exploration, development, production, or storage only, and no impact to areas that are not associated with these activities are expected.

In summary, no sensitive environmental and/or ecological receptors were identified within the search criteria distances described in 19.15.29.11 and 19.15.29.12.C.(4) NMAC. **Figure 1** shows the Site and surrounding area on a topographic map. Based on information obtained during the initial desktop assessment/characterization and the volume of produced water released and recovered, no impact to groundwater, surface water, springs, or other sources of fresh water is suspected.

4. Initial Soil Assessment

On September 17, 2019, initial soil assessment activities were conducted at the Site, which included collection of soil samples from six hand auger boring locations (VG-1 through VG-6) as shown on **Figure 2**. Hand auger borings VG-3 and VG-6 were drilled in the reported spill area (tank fire). The remaining borings were drilled at locations outside the release area for horizontal delineation purposes. Site photographs are provided **in Appendix C**.

In each of the hand auger borings, silty sand and caliche (well pad material) were encountered from the ground surface to depths of one to two ft bgs. Borings were terminated due to auger refusal in hard caliche material. Soil samples were collected from each of the borings and field-screened for petroleum hydrocarbons using a photoionization detector (PID) to measure volatile organic vapor concentrations. Samples were also field screened to identify elevated chloride concentrations using a Field Scout Direct Soil EC Meter to measure electrical conductivity (EC) and a procedure described in *A Guide for Remediation of Salt/Hydrocarbon Impacted Soil* developed by the North Dakota Industrial Commission Department of Mineral Resources. A copy of this procedure is provided in **Appendix D**. A Summary of Field Sample Collection and Screening Activities is provided as **Appendix E**.

The soil samples were transferred into clean, laboratory-provided sample containers, labeled and placed on ice in laboratory-provided coolers. Chain of Custody forms were completed, and the samples were shipped to the ALS Laboratory in Houston, Texas for analysis of benzene, toluene, ethylbenzene and xylenes (BTEX) by EPA Method 8260C, total petroleum hydrocarbons (TPH) by EPA Method 8015M and chloride by EPA Method 9056A.The laboratory results are summarized in **Table 1** and the laboratory analytical report is provided as **Appendix F**.

At the conclusion of drilling and soil sampling activities, the soil borings were backfilled with bentonite chips. Investigation derived waste (IDW) (including soil cuttings, disposable sampling equipment and disposable personal protective equipment (PPE) such as nitrile gloves) was placed in a 55-gallon drum currently stored at the Chevron Central Vacuum Unit #084 site pending characterization and offsite disposal.

4.1 Initial Soil Sampling Results

The soil analytical results were initially compared to *Table I, Closure Criteria for Soils Impacted by a Release* provided in 19.15.29.12 NMAC, which includes the following:

Table I Closure Criteria for Soils Impacted by a Release		
Minimum depth below any point within the horizontal boundary of the release to groundwater less than 10,000 mg/L TDS	**Constituent**	**Limit**
≤ 50 feet bgs	Chloride	600 mg/kg
	TPH (GRO+DRO+MRO)	100 mg/kg
51 feet – 100 feet bgs	Chloride	10,000 mg/kg
	TPH (GRO+DRO+MRO)	2,500 mg/kg

The regulatory limits in Table I above are associated with protection of sensitive receptors, which are primarily water resources for this Site. Only the TPH concentration of 3,400 mg/kg exceeded the regulatory limits shown above in Table I for sites where groundwater is deeper than 50 ft bgs. As described above in *Section 3*, it is currently anticipated that depth to groundwater is greater than 50 ft bgs at the Site.

The soil analytical results for the Site were also compared to the chloride regulatory limit of 600 milligrams per kilogram (mg/kg) specified for the upper four feet of soil under 19.15.29.13.D.(1) NMAC for *RESTORATION, RECLAMATION AND RE-VEGETATION*. Chloride concentrations ranging from 1,610 mg/kg to 5,520 mg/kg in soil samples collected from borings VG-2 through VG-6 exceed the regulatory limit of 600 mg/kg for future Site reclamation. It should be noted that the sample collected at 0 to 1 ft bgs from boring VG-6 exhibited a chloride concentration of 5,520 mg/kg, while the sample collected from the same boring at 1 to 2 ft bgs exhibited a chloride concentration of 440 mg/kg, which is below the reclamation standard of 600 mg/kg.

The laboratory analytical results for the initial soil assessment samples are summarized in **Table 1** and on **Figure 2**. The laboratory analytical report is provided in **Appendix F**.

5. Additional Proposed Soil Assessment

Additional soil assessment is planned pursuant to the following project objectives:

- Delineate the vertical and horizontal extent of soil impacted by chloride and petroleum hydrocarbons associated with the release; and
- Develop an appropriate Remediation/Restoration Plan for the Site.

Proposed additional soil assessment activities include drilling and sampling of seven additional borings as shown on **Figure 3** and further described below. Borings PVG -7 and PVG-8 are proposed primarily for vertical delineation, while borings PVG-9 through PVG-13 are proposed for both vertical and horizontal delineation of soil impacted by elevated concentrations of chloride and TPH. The borings will be drilled to a total depth of five ft bgs using a combination of hand auger and air rotary drilling methods as

appropriate for sample collection and Chevron safety requirements. Soil samples will be collected at one ft depth intervals to a total depth of five ft bgs in each of the borings. Each depth interval sample will be field-screened for elevated petroleum hydrocarbon concentrations using a PID to measure organic vapor concentrations and for elevated chloride concentrations using an EC meter.

Each of the depth interval samples from all borings will be submitted for laboratory analysis of chloride. In addition, up to two samples from each of the borings, including the sample interval that records the highest PID reading and the sample interval at the borehole terminus, will be submitted for laboratory analysis of TPH.

The selected soil samples will be submitted for laboratory analysis of chloride by EPA Method 9056A and TPH by EPA Method 8015M. The soil samples will be collected in clean, laboratory-provided sample containers, labeled, and placed on ice in laboratory-provided coolers. AECOM will complete Chain of Custody forms and arrange for shipment/transportation of the samples to AECOM's subcontractor, ALS Laboratory in Houston, Texas.

After soil sampling activities have been completed, the soil borings will be backfilled with bentonite chips. Investigation-derived waste (IDW) (including soil cuttings, disposable sampling equipment and disposable personal protective equipment (PPE) such as nitrile gloves) will be placed in a 55-gallon drum. One composite IDW sample from the drum will be collected for waste characterization. The IDW characterization sample will be analyzed for:

- Inorganic Anions (including chloride) by EPA Method 9056A;
- Toxicity Characteristic Leaching Procedure (TCLP) Resource Conservation and Recovery Act (RCRA) Metals by SW-846 1311/6010C;
- BTEX by EPA Method 8021 or 8260B; and
- TPH by EPA Method 8015M.

AECOM will subcontract with S Brothers Waste Services, Inc. for waste manifesting, transportation and disposal. Upon receipt of the laboratory analytical report, AECOM will prepare a waste profile. AECOM will coordinate with MCBU to obtain the appropriate signatures from the waste generator (MCBU) on the waste profile and waste manifest. AECOM will then coordinate pick-up of the drums by S Brothers Waste Services, Inc. for transportation and disposal at a Chevron approved waste disposal facility that accepts oil and gas exploration and production (E&P) exempt wastes. The IDW drum(s) will be disposed at the Chevron-approved Sundance disposal facility near Eunice, New Mexico.

6. Schedule and Reporting

The additional drilling and soil sampling activities will be scheduled upon receipt of NMOCD comments regarding the proposed soil assessment activities described herein. A report describing the soil sampling activities and results will be provided to NMOCD within 30 days of receipt of the analytical results from ALS Laboratory. The report will include the following:

- Executive Summary;
- Background information;
- Scaled map showing the impacted area, surface features, subsurface features, and delineation points;
- Summary of the field and laboratory analytical data;
- Field soil boring logs;
- Photographs of the Site;

- Data interpretation relative to the nature and extent of potential impacted soil; and
- Recommendations for Site Remediation/Reclamation.

7. References

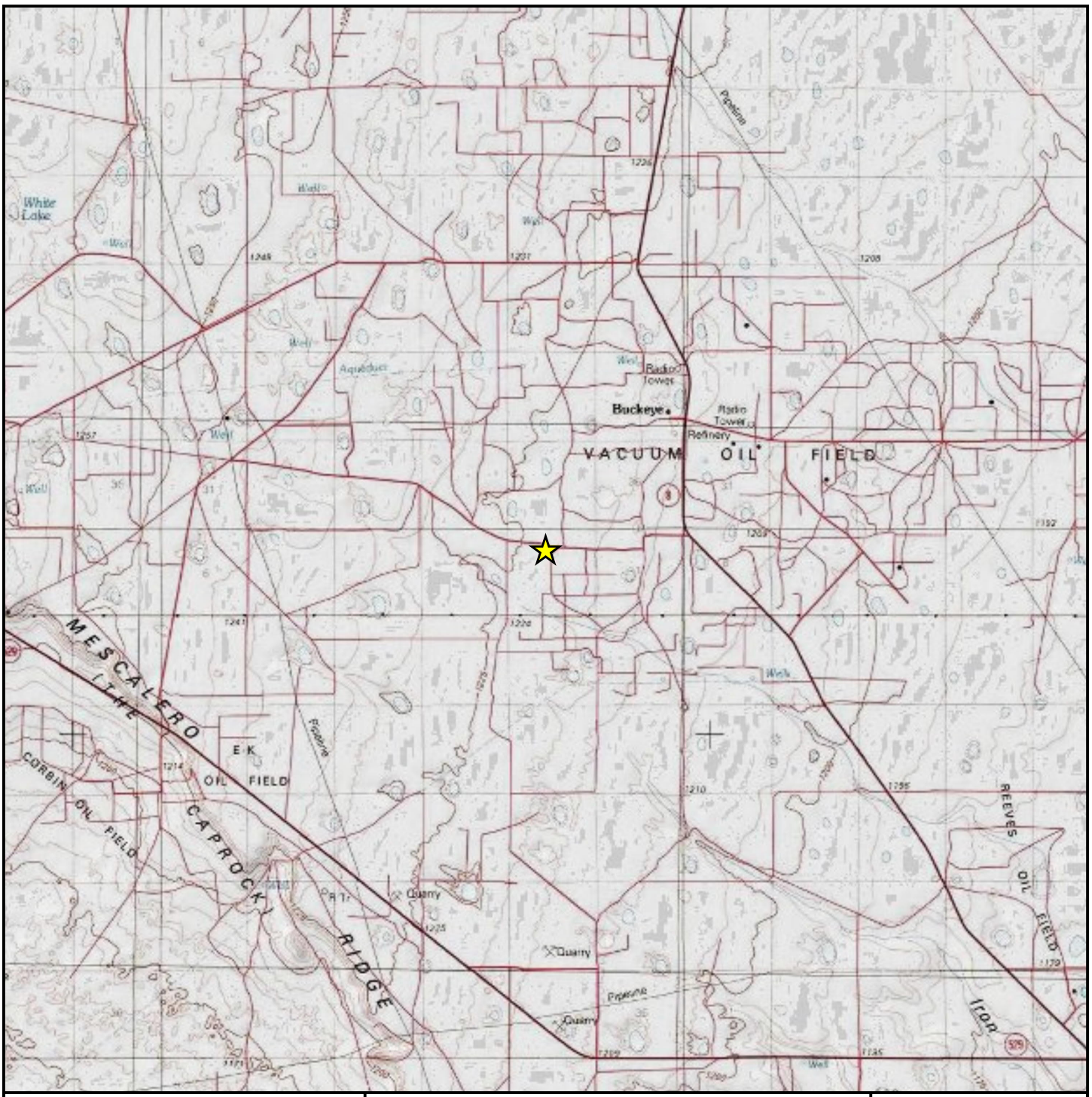
New Mexico Water Rights Reporting System (NMWRRS), Water Column/Average Depth to Water Report. http://nmwrrs.ose.state.nm.us/nmwrrs/waterColumn.html .

National Wetlands Inventory, surface waters and wetlands. https://www.fws.gov/wetlands/data/mapper.html

Google Earth Pro.

United States Department of Agriculture – Natural Resources Conservation Service. Web Soil Survey. Available on line at https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx.

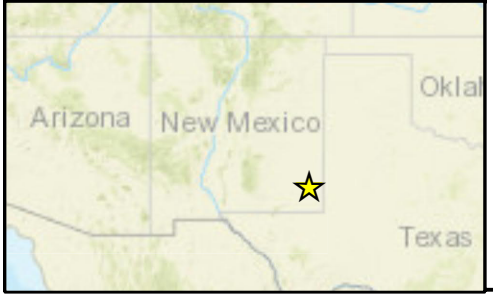
Figures



Legend

☆ Vacuum Grayburg Site Location

Map Location



Site Location Map

Vacuum Grayburg San Andres
Injection Station
Lea County, New Mexico
Chevron MCBU

N

0 1 2 3 4 Miles

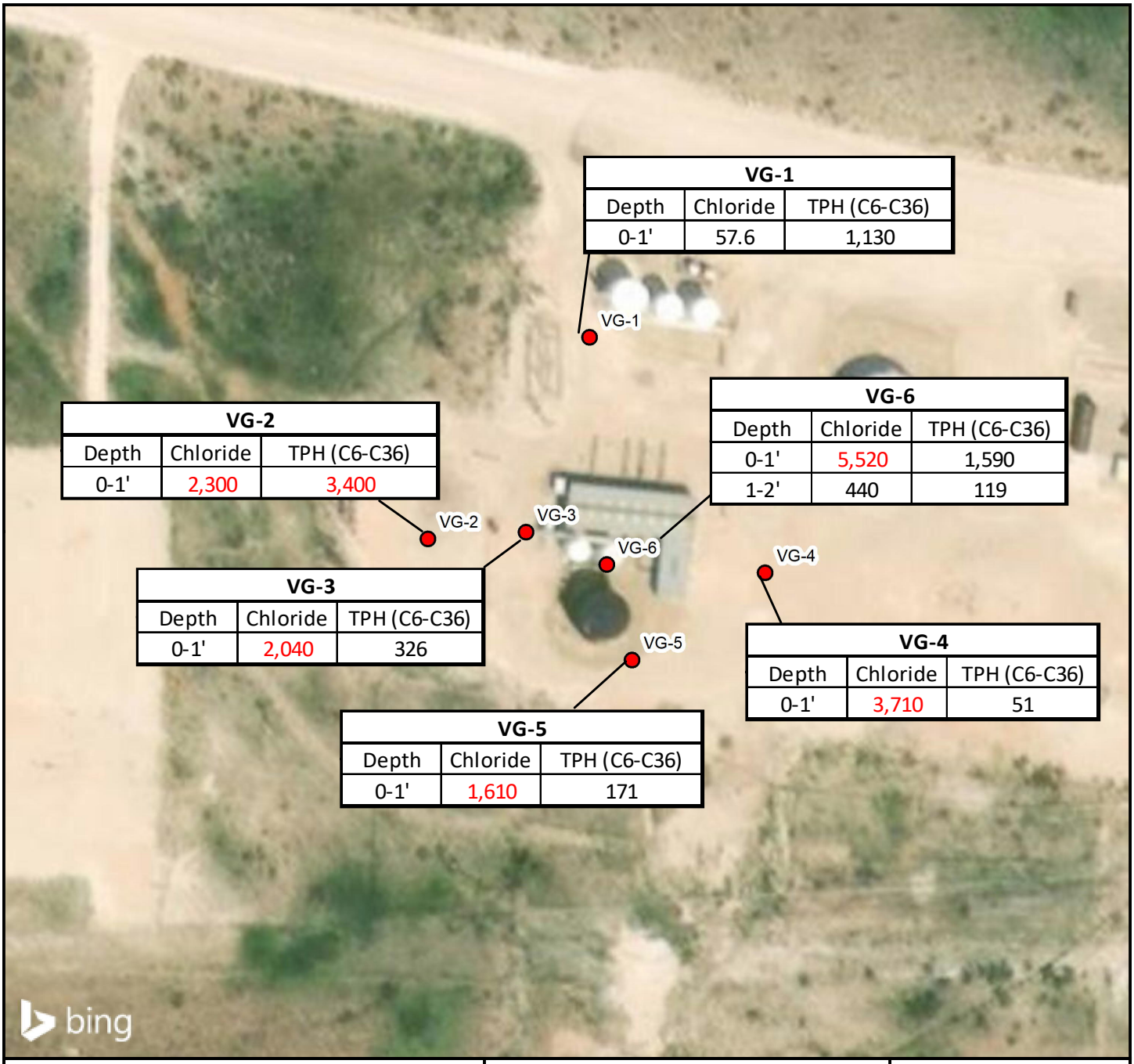
Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere
Projection: Mercator Auxiliary Sphere

AECOM

Figure 1

Date: September 2019

Project #: 60614104



Legend

- Soil Boring Locations

Samples Collected September 17, 2019

Soil analytical results reported in milligrams per kilogram (mg/kg)

Regulatory Limits:
TPH - 2,500 mg/kg (Based on depth to groundwater greater than 50 feet)
Chloride - 600 mg/kg (Soil Reclamation Limit)

Red Font -
Exceeds Regulatory Limit

Sample Location Map

Vacuum Grayburg San Andres Injection Site
Lea County, New Mexico
Chevron MCBU

N

0 50 100 150 200 Feet

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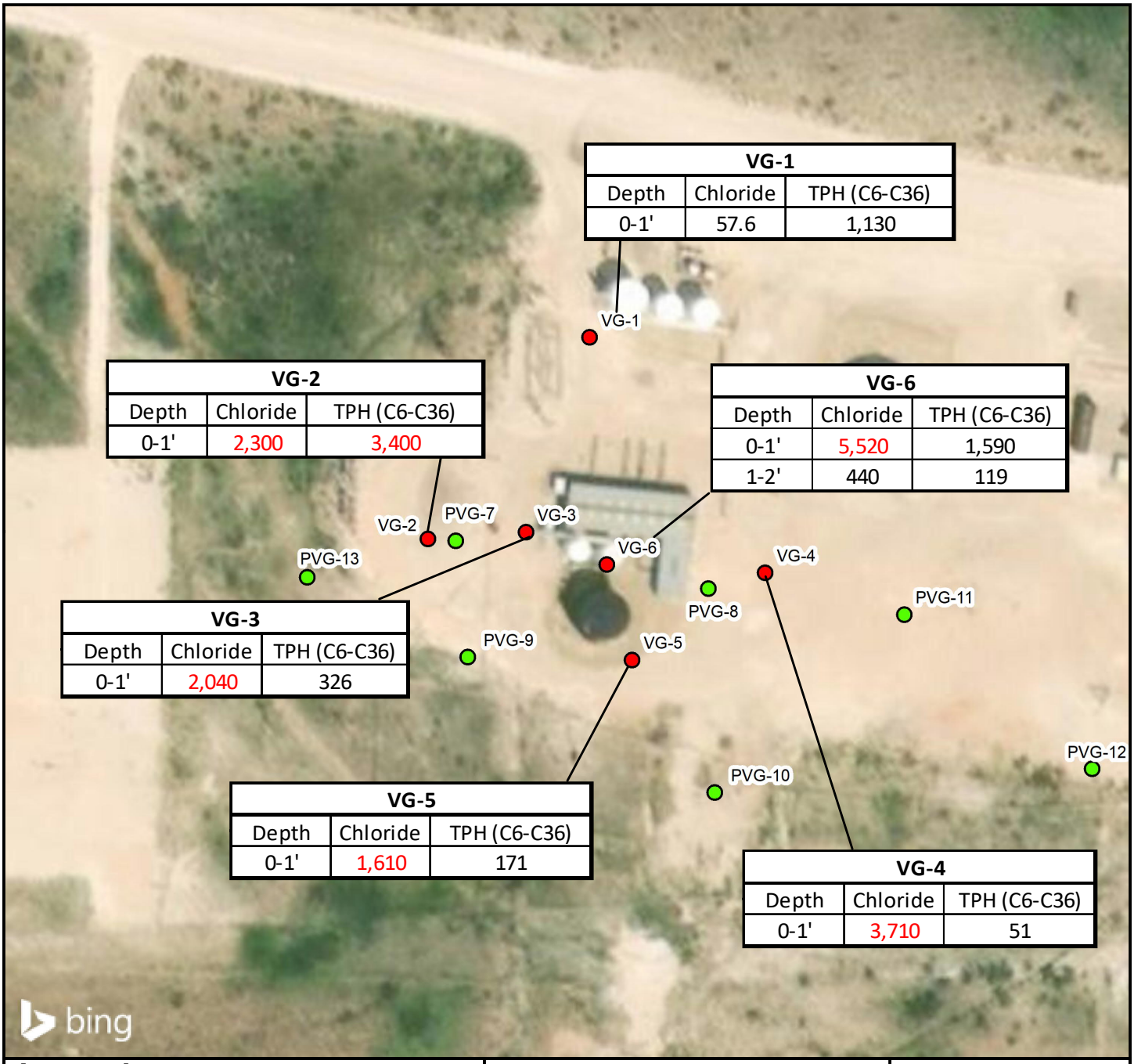
Figure 2

Date: September 2019

Project #: 60614104



Legend

- Proposed Soil Boring
- Soil Boring Locations

Samples Collected September 17, 2019

Soil analytical results reported in milligrams per kilogram (mg/kg)

Regulatory Limits:
TPH - 2,500 mg/kg (Based on depth to groundwater greater than 50 feet)
Chloride - 600 mg/kg (Soil Reclamation Limit)

Red Font -
Exceeds Regulatory Limit

Proposed Soil Boring Location Map

Vacuum Grayburg San Andres Injection Site
Lea County, New Mexico
Chevron MCBU

N

0 50 100 150 200 Feet

AECOM

Figure 3

Date: September 2019

Project #: 60614104

Tables

Table 1
Soil Analytical Results
Vacuum Grayburg San Andres Injection Station
Lea County, New Mexico

Sample ID	Sample Date	Sample Depth (ft bgs)	Total Petroleum Hydrocarbons (EPA 8015B)				Volatile Organics (EPA 8260B)				Chloride (Method 9056A)
			GRO C6-C10	DRO C10-C28	MRO C28-C36	TPH GRO+DRO+MRO	Benzene	Toluene	Ethylbenzene	Total Xylenes	
Regulatory Limits			--	--	--	**2500***	**10**	--	--	--	**600****
VG-1 0-1	09/17/19	0-1	0.011 U	**160**	**970**	**1,130**	0.00054 U	0.00064 U	0.00075 U	0.0011 U	**57.6**
VG-2 0-1	09/17/19	0-1	0.011 U	**1,400**	**2,000**	**3,400**	0.00057 U	0.00068 U	0.00079 U	0.0011 U	**2,300**
VG-3 0-1	09/17/19	0-1	0.012 U	**96**	**230**	**326**	0.00057 U	0.00068 U	**0.0023** J	**0.0095**	**2,040**
VG-4 0-1	09/17/19	0-1	0.010 U	**15**	**36**	**51**	0.00051 U	0.00061 U	0.00071 U	0.0010 U	**3,710**
VG-5 0-1	09/17/19	0-1	0.012 U	**41**	**130**	**171**	0.000570 U	0.00069 U	0.0008 U	0.0011 U	**1,610**
VG-6 0-1	09/17/19	0-1	0.011 U	**390**	**1,200**	**1,590**	0.00053 U	0.00063 U	0.00074 U	0.0011 U	**5,520**
VG-6 1-2	09/17/19	1-2	0.012 U	**24**	**95**	**119**	0.00056 U	0.00068 U	0.00079 U	0.0011 U	**440**

Notes:

1. Soil analyses performed by ALS Laboratory in Houston, Texas.
2. Units for all analytical data provided are mg/Kg (milligrams per kilogram).
3. GRO - Gasoline Range Organic Compounds
4. DRO - Diesel Range Organic Compounds
5. MRO - Motor Oil/Lube Range Organic Compounds
6. Regulatory Limits are from 19.15.29 New Mexico Administrative Code (NMAC).
7. J - Indicates that the result is less than the Method Quantitation Limit (MQL) but greater than or equal to the Method Detection Limit (MDL).
8. U - Indicates that the analyte was analyzed but not detected at or above the laboratory MDL.
9. **Bold** - Detectable concentration that exceeds laboratory method reporting limits.
10. **Bold and Shaded** - Reported concentration exceeds Regulatory Limits.
11. ft bgs - feet below ground surface.
12. -- Indicates that no applicable regulatory limit exists for that analyte.

* Based on anticipated depth to groundwater > 50 ft bgs.

** Regulatory limit for final soil reclamation. The regulatory limit for protection of sensitive receptors may be 10,000 mg/kg based on anticipated depth to groundwater > 50 ft bgs.

Appendix A

Form C-141 – Vacuum Grayburg San Andres Injection Station

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources Department

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-141
Revised August 24, 2018
Submit to appropriate OCD District office

Incident ID	nDHR1923135777
District RP	1RP-5643
Facility ID	fDHR1923131309
Application ID	pDHR1922854912

Release Notification

Responsible Party

Responsible Party: Chevron USA Inc.	OGRID: 4323
Contact Name: Josepha DeLeon	Contact Telephone: 575-263-0424
Contact email: jdxd@chevron.com	Incident # *(assigned by OCD)* nDHR1923135777
Contact mailing address: 1616 E. Bender Blvd., Hobbs, NM 88240	

Location of Release Source

Latitude 32.780809 Longitude -103.532550

(NAD 83 in decimal degrees to 5 decimal places)

Site Name: Vacuum Grayburg San Andres Injection Station	Site Type: Injection Station
Date Release Discovered: July 17, 2019	API# *(if applicable): N/A*

Unit Letter	Section	Township	Range	County
F	2	18S	34E	Lea

Surface Owner: ☒ State ☐ Federal ☐ Tribal ☐ Private (*Name:* _____)

Nature and Volume of Release

Material(s) Released (Select all that apply and attach calculations or specific justification for the volumes provided below)

☒ Crude Oil	Volume Released (bbls): 5.33 barrels	Volume Recovered (bbls): 5 barrels
☒ Produced Water	Volume Released (bbls): 64.33 barrels	Volume Recovered (bbls): 29 barrels
	Is the concentration of dissolved chloride in the produced water >10,000 mg/l?	☐ Yes ☒ No
☐ Condensate	Volume Released (bbls)	Volume Recovered (bbls)
☐ Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
☐ Other (describe)	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)

Cause of Release:
Lightning strike to the VGSAU Injection Station resulted in tank fire and spill.

State of New Mexico
Oil Conservation Division

Incident ID	nDHR1923135777
District RP	1RP-5643
Facility ID	fDHR1923131309
Application ID	pDHR1922854912

Was this a major release as defined by 19.15.29.7(A) NMAC? ☒ Yes ☐ No	If YES, for what reason(s) does the responsible party consider this a major release? Greater than 25 barrels total fluid and fire.

If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)?

Yes, by Josepha DeLeon to Dylan Ross-Coss by phone voicemail message followed by email and another phone call to confirm messages received on July 18, 2019 at 6:00 a.m. and email shortly thereafter followed by another phone call before end of day.

Initial Response

The responsible party must undertake the following actions immediately unless they could create a safety hazard that would result in injury

☒ The source of the release has been stopped.

☒ The impacted area has been secured to protect human health and the environment.

☒ Released materials have been contained via the use of berms or dikes, absorbent pads, or other containment devices.

☒ All free liquids and recoverable materials have been removed and managed appropriately.

If all the actions described above have not been undertaken, explain why:

Per 19.15.29.8 B. (4) NMAC the responsible party may commence remediation immediately after discovery of a release. If remediation has begun, please attach a narrative of actions to date. If remedial efforts have been successfully completed or if the release occurred within a lined containment area (see 19.15.29.11(A)(5)(a) NMAC), please attach all information needed for closure evaluation.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Signature: JdeLeon Date: July 29, 2019

Printed Name: Josepha DeLeon Title: Environmental Compliance Specialist

email: jdxd@chevron.com Telephone: 575-263-0424

OCD Only

Received by: Dylan Rose-Coss Date: 08/19/2019

State of New Mexico
Oil Conservation Division

Incident ID	nDHR1923135777
District RP	1RP-5643
Facility ID	fDHR1923131309
Application ID	pDHR1922854912

Calculations: Assumed soil pore space: 15%

Area	size	**Standing Liquid** Oil/Water mixture (bbl)	**In Soil**, water only no oil (bbl)	**Oil Volume** (bbl)	**Water Volume** (bbl)
1	60'x175' free liquid: ~3" depth in soil: ~1" depth	11.5	11.7	1.78	21.42
2	81'x55'	4.88	4.96	0.75	9.09
3	300'x42'	13.83	14.04	2.13	25.74
4	62'x60'	4.34	4.41	0.67	8.08
Total Fluid spilled				**5.33**	**64.33**
Total Fluid recovered				**5**	**29**

State of New Mexico
Oil Conservation Division

Incident ID	nDHR1923135777
District RP	1RP-5643
Facility ID	fDHR1923131309
Application ID	pDHR1922854912

Site Assessment/Characterization

This information must be provided to the appropriate district office no later than 90 days after the release discovery date.

What is the shallowest depth to groundwater beneath the area affected by the release?	70 (ft bgs)
Did this release impact groundwater or surface water?	☐ Yes ☑ No
Are the lateral extents of the release within 300 feet of a continuously flowing watercourse or any other significant watercourse?	☐ Yes ☑ No
Are the lateral extents of the release within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark)?	☐ Yes ☑ No
Are the lateral extents of the release within 300 feet of an occupied permanent residence, school, hospital, institution, or church?	☐ Yes ☑ No
Are the lateral extents of the release within 500 horizontal feet of a spring or a private domestic fresh water well used by less than five households for domestic or stock watering purposes?	☐ Yes ☑ No
Are the lateral extents of the release within 1000 feet of any other fresh water well or spring?	☐ Yes ☑ No
Are the lateral extents of the release within incorporated municipal boundaries or within a defined municipal fresh water well field?	☐ Yes ☑ No
Are the lateral extents of the release within 300 feet of a wetland?	☐ Yes ☑ No
Are the lateral extents of the release overlying a subsurface mine?	☐ Yes ☑ No
Are the lateral extents of the release overlying an unstable area such as karst geology?	☐ Yes ☑ No
Are the lateral extents of the release within a 100-year floodplain?	☐ Yes ☑ No
Did the release impact areas **not** on an exploration, development, production, or storage site?	☐ Yes ☑ No

Attach a comprehensive report (electronic submittals in .pdf format are preferred) demonstrating the lateral and vertical extents of soil contamination associated with the release have been determined. Refer to 19.15.29.11 NMAC for specifics.

Characterization Report Checklist: ***Each of the following items must be included in the report.***

- ☐ Scaled site map showing impacted area, surface features, subsurface features, delineation points, and monitoring wells.
- ☐ Field data
- ☐ Data table of soil contaminant concentration data
- ☐ Depth to water determination
- ☐ Determination of water sources and significant watercourses within ½-mile of the lateral extents of the release
- ☐ Boring or excavation logs
- ☐ Photographs including date and GIS information
- ☐ Topographic/Aerial maps
- ☐ Laboratory data including chain of custody

If the site characterization report does not include completed efforts at remediation of the release, the report must include a proposed remediation plan. That plan must include the estimated volume of material to be remediated, the proposed remediation technique, proposed sampling plan and methods, anticipated timelines for beginning and completing the remediation. The closure criteria for a release are contained in Table 1 of 19.15.29.12 NMAC, however, use of the table is modified by site- and release-specific parameters.

State of New Mexico
Oil Conservation Division

Incident ID	nDHR1923135777
District RP	1RP-5643
Facility ID	fDHR1923131309
Application ID	pDHR1922854912

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Printed Name: Amy Barnhill Title: Waste & Water Specialist

Signature: Amy Barnhill Date: 10-16-19

email: ABarnhill@Chevron.com Telephone: 432-687-7108

OCD Only

Received by: _____ Date: _____

Appendix B

NMWRRS Water Column/Average Depth to Water

New Mexico Office of the State Engineer
Water Column/Average Depth to Water

(A CLW##### in the POD suffix indicates the POD has been replaced & no longer serves a water right file.)

(R=POD has been replaced, O=orphaned, C=the file is closed)

(quarters are 1=NW 2=NE 3=SW 4=SE)
(quarters are smallest to largest)

(NAD83 UTM in meters)

(In feet)

POD Number	POD Sub-basin	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	Distance	Depth Well	Depth Water	Water Column
L 05788 POD15	L	LE	4	2	1	02	18S	34E	637451	3627998*	61	240		
L 05788 POD4	L	LE	4	2	1	02	18S	34E	637451	3627998*	61	240	98	142
L 05788 POD19	L	LE	2	4	1	02	18S	34E	637459	3627796*	148	240	98	142
L 02722 S	L	LE	3	1	2	02	18S	34E	637654	3628004*	235	236	70	166
L 05788 POD14	L	LE	3	1	2	02	18S	34E	637654	3628004*	235	240	97	143
L 05788 POD18	L	LE	3	1	2	02	18S	34E	637654	3628004*	235	240	97	143
L 05788 POD21	L	LE	3	1	2	02	18S	34E	637654	3628004*	235	240	96	144
L 05788 POD20	L	LE	1	3	2	02	18S	34E	637662	3627802*	273	240	96	144
L 05788 POD7	L	LE	1	3	2	02	18S	34E	637662	3627802*	273	240		
L 05788 POD10	L	LE	4	4	1	02	18S	34E	637459	3627596*	346	240	100	140
L 05788 POD17	L	LE	4	4	1	02	18S	34E	637459	3627596*	346	240	97	143
L 05788	L	LE	4	1	2	02	18S	34E	637854	3628004*	431	230	97	133
L 05788 POD12	L	LE	4	1	2	02	18S	34E	637854	3628004*	431	240	94	146
L 05788 POD13	L	LE	4	1	2	02	18S	34E	637854	3628004*	431	240	95	145
L 05788 POD11	L	LE	2	3	2	02	18S	34E	637862	3627802*	456	240	95	145
L 05788 POD16	L	LE	2	3	2	02	18S	34E	637862	3627802*	456	240	96	144
L 05788 POD6	L	LE	2	3	2	02	18S	34E	637862	3627802*	456	240	94	146
L 05788 POD9	L	LE	2	3	2	02	18S	34E	637862	3627802*	456	250	95	155
L 05788 POD3	L	LE	2	1	2	02	18S	34E	637854	3628204*	501	240	97	143
L 02722 S2	L	LE	3	2	2	02	18S	34E	638057	3628011*	633	228	89	139
L 05788 POD2	L	LE	3	2	2	02	18S	34E	638057	3628011*	633	240	98	142
L 05788 POD5	L	LE	3	2	2	02	18S	34E	638057	3628011*	633	240	94	146
L 05788 POD8	L	LE	3	2	2	02	18S	34E	638057	3628011*	633	240	95	145
L 06031	L	LE		2	2	02	18S	34E	638158	3628112*	750	230	102	128
L 05788 POD22	L	LE	4	2	2	02	18S	34E	638257	3628011*	832			
L 06029	L	LE		4	4	35	17S	34E	638150	3628523*	928	230	102	128

***UTM location was derived from PLSS - see Help**

(A CLW##### in the POD suffix indicates the POD has been replaced & no longer serves a water right file.)

(R=POD has been replaced, O=orphaned, C=the file is closed)

(quarters are 1=NW 2=NE 3=SW 4=SE)
(quarters are smallest to largest) (NAD83 UTM in meters) (In feet)

POD Number	POD Sub-basin	Code	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	Distance	Depth Well	Depth Water	Water Column
L 05842	L		LE			4	35	17S	34E	637948	3628716*	933	240	95	145

Average Depth to Water: **95 feet**

Minimum Depth: **70 feet**

Maximum Depth: **102 feet**

Record Count: 27

UTMNAD83 Radius Search (in meters):

Easting (X): 637427 **Northing (Y):** 3627941 **Radius:** 1000

***UTM location was derived from PLSS - see Help**

Appendix C

Photographic Documentation

Client: Chevron MCBU	**Project Number: 60614104**
Project Name: Vacuum Grayburg San Andres Injection Area	**Site Location: Lea County, New Mexico**

SPILL AREA	
Photograph No. 1 **Photographer:** J. Lovely **Date:** 9/17/2019 **Comments:** Looking northeast at the tank fire spill area.	
SPILL AREA	
Photograph No. 2 **Photographer:** J. Lovely **Date:** 9/17/2019 **Comments:** Closer view of tank fire spill area looking north-northeast.	

Appendix D

Field Screening Procedure for Chloride

A GUIDE FOR REMEDIATION

OF

SALT/HYDROCARBON

IMPACTED SOIL

Distributed by:
North Dakota Industrial Commission
Department of Mineral Resources
Bismarck, ND 58505-0840

Funded by the Oil and Gas Research Council

Technical Author
Len J. Gawel, Ph.D.
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V. Soil Analytical Tests

A. Analytical Procedure to Determine the Electrical Conductivity (EC) of Soil:

- Soil sample preparation

  a) Mix soil sample from 0-6 inch analysis.
  b) If soil is "wet," reduce soil moisture content by air drying.
  c) If soil is "damp," proceed with analysis.

- Measure a level tablespoon of soil into 60 ml of distilled water. This will result in a 1 to 5 dilution of soil, one part soil into four parts distilled water. The volume of one level tablespoon is 15 ml.

- Shake mixture for 2 minutes. After mixing, allow sample to stand for additional 2 minutes.

- Prepare the syringe with the millipore filter adaptor and draw the fluid sample (0.5 to 1 ml) into syringe.

- Place the fluid sample onto the instrument sensor and discard the first sample load. Repeat this "flushing" procedure, then test and record the third load. **AECOM to also use chloride test strips.**

- Calculate the EC by multiplying the EC reading on the meter by five.
  Instrument EC reading x 5 = soil EC

- Wash the instrument sensor using a dedicated "wash syringe" and distilled water.

- Record results of the test and other information and disable and discard the syringe.

- Repeat procedure for additional depths, if necessary.

Note: Use the same fluid sample to measure the pH. No additional calculations are needed; pH is measured directly by the meter.

Note: Most EC units read as microsiemens per centimeter (uS/cm). In addition, high EC readings may read as millisiemens per centimeter (mS/cm). It should be noted one millisiemen (mS/cm) is equal to 1,000 microsiemens (uS/cm). Either unit may be used, but to compare data, choose one unit for all analyses, and convert all readings to the chosen unit. This remediation guide uses uS/cm.

A siemen is an inverse ohm (conductance = 1/resistance). The original siemen was measured though a distance of one meter. Most of the field equipment measure one centimeter unit (cm). Although not precise, one millimhos/cm is equal to one millisiemen/cm. For remediation purposes the field guide uses mS/cm or uS/cm.

Appendix E

Summary of Field Sample Collection and Screening Activities

Sample Collection and Screening
Vacuum Grayburg San Andres Injection Station

Date	Boring ID	Depth (ft bgs)	Lithology	Time	PID (ppm)	Conductivity Probe (µS/cm)	EC Meter (µS/cm)	Chloride Lab Result (mg/kg)
9/17/2019	VG-1	0-1	Brown silty sand and caliche (pad material)	1120	1.8	19.2	2,275	57.6
9/17/2019	VG-2	0-1	Dark brown silty sand and caliche (pad material)	1042	1.1	92.2	8,245	2,300
9/17/2019	VG-3	0-1	Gray silty sand and caliche (pad material)	1053	4	843	7,060	2,040
9/17/2019	VG-4	0-1	Brown silty sand and caliche (pad material)	1059	1.3	77.6	7,610	3,710
9/17/2019	VG-5	0-1	Tan silty sand and caliche (pad material)	1107	1.1	12.5	10,275	1,610
9/17/2019	VG-6	0-1	Brown silty sand and caliche (pad material)	1115	1.3	1,360	11,490	5,520
9/17/2019		1-2	Gray silty sand	1120	3.5	1,017	4,110	440

Appendix F

Laboratory Analytical Report

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

September 26, 2019

Wallace Gilmore
AECOM
19219 Katy Freeway
Suite 100
Houston, TX 77094

Work Order: **HS19090854**

Laboratory Results for: **60614104 GRAYBURG SAN ANDREAS INJ. UNIT**

Dear Wallace,

ALS Environmental received 7 sample(s) on Sep 18, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

Client: AECOM
Project: 60614104 GRAYBURG SAN ANDREAS INJ. UNIT
Work Order: HS19090854

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19090854-01	VG-1 0-1	Solid		17-Sep-2019 10:20	18-Sep-2019 09:00	☐
HS19090854-02	VG-2 0-1	Solid		17-Sep-2019 10:42	18-Sep-2019 09:00	☐
HS19090854-03	VG-3 0-1	Solid		17-Sep-2019 10:53	18-Sep-2019 09:00	☐
HS19090854-04	VG-4 0-1	Solid		17-Sep-2019 10:59	18-Sep-2019 09:00	☐
HS19090854-05	VG-5 0-1	Solid		17-Sep-2019 11:07	18-Sep-2019 09:00	☐
HS19090854-06	VG-6 0-1	Solid		17-Sep-2019 11:15	18-Sep-2019 09:00	☐
HS19090854-07	VG-6 1-2	Solid		17-Sep-2019 11:20	18-Sep-2019 09:00	☐

Client: AECOM **CASE NARRATIVE**
Project: 60614104 GRAYBURG SAN ANDREAS INJ. UNIT
Work Order: HS19090854

GC Semivolatiles by Method SW8015M

Batch ID: 145421

Sample ID: VG-2 0-1 (HS19090854-02)

• The surrogate recoveries could not be determined due to dilution below the calibration range.

Sample ID: VG-6 0-1 (HS19090854-06)

• The surrogate recoveries could not be determined due to dilution below the calibration range.

Sample ID: VG-6 1-2 (HS19090854-07)

• Surrogate recoveries were outside of the control limits due to matrix interference.

Sample ID: HS19090789-01MS

• MS and MSD are for an unrelated sample

GC Volatiles by Method SW8015

Batch ID: R346706

Sample ID: HS19090789-02MSD

• MSD is for an unrelated sample

GCMS Volatiles by Method SW8260

Batch ID: R346513

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Wet Chemistry by Method SW9056

Batch ID: 145683

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method ASTM D2216

Batch ID: R346670

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Client: AECOM **ANALYTICAL REPORT**
Project: 60614104 GRAYBURG SAN ANDREAS INJ. UNIT WorkOrder:HS19090854
Sample ID: VG-1 0-1 Lab ID:HS19090854-01
Collection Date: 17-Sep-2019 10:20 Matrix:Solid

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene	< 0.00054		0.00054	0.0054	mg/Kg-dry	1	19-Sep-2019 14:36
Ethylbenzene	< 0.00075		0.00075	0.0054	mg/Kg-dry	1	19-Sep-2019 14:36
Toluene	< 0.00064		0.00064	0.0054	mg/Kg-dry	1	19-Sep-2019 14:36
Xylenes, Total	< 0.0011		0.0011	0.0054	mg/Kg-dry	1	19-Sep-2019 14:36
Surr: 1,2-Dichloroethane-d4	*80.8*			*70-126*	*%REC*	*1*	*19-Sep-2019 14:36*
Surr: 4-Bromofluorobenzene	*95.2*			*70-130*	*%REC*	*1*	*19-Sep-2019 14:36*
Surr: Dibromofluoromethane	*86.0*			*70-130*	*%REC*	*1*	*19-Sep-2019 14:36*
Surr: Toluene-d8	*95.5*			*70-130*	*%REC*	*1*	*19-Sep-2019 14:36*
GASOLINE RANGE ORGANICS BY SW8015C		**Method:SW8015**					Analyst: QX
Gasoline Range Organics	< 0.011		0.011	0.055	mg/Kg-dry	1	21-Sep-2019 19:03
Surr: 4-Bromofluorobenzene	*117*			*70-123*	*%REC*	*1*	*21-Sep-2019 19:03*
TPH DRO/ORO BY SW8015C		**Method:SW8015M**			Prep:SW3541 / 19-Sep-2019		Analyst: PVL
TPH (Diesel Range)	**160**		**27**	**92**	**mg/Kg-dry**	50	20-Sep-2019 23:46
TPH (Motor Oil Range)	**970**		**27**	**180**	**mg/Kg-dry**	50	20-Sep-2019 23:46
Surr: 2-Fluorobiphenyl	*62.3*	*J*		*60-129*	*%REC*	*50*	*20-Sep-2019 23:46*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: DFF
Percent Moisture	**7.77**		**0.0100**	**0.0100**	**wt%**	1	20-Sep-2019 09:57
ANIONS BY SW9056A		**Method:SW9056**			Prep:SW9056 / 24-Sep-2019		Analyst: KMU
Chloride	**57.6**		**2.14**	**5.36**	**mg/Kg-dry**	1	25-Sep-2019 21:56

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: AECOM **ANALYTICAL REPORT**
Project: 60614104 GRAYBURG SAN ANDREAS INJ. UNIT WorkOrder:HS19090854
Sample ID: VG-2 0-1 Lab ID:HS19090854-02
Collection Date: 17-Sep-2019 10:42 Matrix:Solid

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene	< 0.00057		0.00057	0.0057	mg/Kg-dry	1	19-Sep-2019 15:01
Ethylbenzene	< 0.00079		0.00079	0.0057	mg/Kg-dry	1	19-Sep-2019 15:01
Toluene	< 0.00068		0.00068	0.0057	mg/Kg-dry	1	19-Sep-2019 15:01
Xylenes, Total	< 0.0011		0.0011	0.0057	mg/Kg-dry	1	19-Sep-2019 15:01
Surr: 1,2-Dichloroethane-d4	*83.3*			*70-126*	*%REC*	*1*	*19-Sep-2019 15:01*
Surr: 4-Bromofluorobenzene	*94.7*			*70-130*	*%REC*	*1*	*19-Sep-2019 15:01*
Surr: Dibromofluoromethane	*86.8*			*70-130*	*%REC*	*1*	*19-Sep-2019 15:01*
Surr: Toluene-d8	*95.8*			*70-130*	*%REC*	*1*	*19-Sep-2019 15:01*
GASOLINE RANGE ORGANICS BY SW8015C		**Method:SW8015**					Analyst: QX
Gasoline Range Organics	< 0.011		0.011	0.057	mg/Kg-dry	1	21-Sep-2019 19:20
Surr: 4-Bromofluorobenzene	*118*			*70-123*	*%REC*	*1*	*21-Sep-2019 19:20*
TPH DRO/ORO BY SW8015C		**Method:SW8015M**			Prep:SW3541 / 19-Sep-2019		Analyst: PVL
TPH (Diesel Range)	**1,400**		**56**	**190**	**mg/Kg-dry**	100	20-Sep-2019 13:44
TPH (Motor Oil Range)	**2,000**		**56**	**380**	**mg/Kg-dry**	100	20-Sep-2019 13:44
Surr: 2-Fluorobiphenyl	*0*	*JS*		*60-129*	*%REC*	*100*	*20-Sep-2019 13:44*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: DFF
Percent Moisture	**11.8**		**0.0100**	**0.0100**	**wt%**	1	20-Sep-2019 09:57
ANIONS BY SW9056A		**Method:SW9056**			Prep:SW9056 / 24-Sep-2019		Analyst: KMU
Chloride	**2,300**		**23.1**	**57.7**	**mg/Kg-dry**	10	25-Sep-2019 22:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: AECOM **ANALYTICAL REPORT**
Project: 60614104 GRAYBURG SAN ANDREAS INJ. UNIT WorkOrder:HS19090854
Sample ID: VG-3 0-1 Lab ID:HS19090854-03
Collection Date: 17-Sep-2019 10:53 Matrix:Solid

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene	< 0.00057		0.00057	0.0057	mg/Kg-dry	1	19-Sep-2019 15:27
Ethylbenzene	**0.0023**	J	**0.00080**	**0.0057**	**mg/Kg-dry**	1	19-Sep-2019 15:27
Toluene	< 0.00068		0.00068	0.0057	mg/Kg-dry	1	19-Sep-2019 15:27
Xylenes, Total	**0.0095**		**0.0011**	**0.0057**	**mg/Kg-dry**	1	19-Sep-2019 15:27
Surr: 1,2-Dichloroethane-d4	*83.2*			*70-126*	*%REC*	*1*	*19-Sep-2019 15:27*
Surr: 4-Bromofluorobenzene	*98.8*			*70-130*	*%REC*	*1*	*19-Sep-2019 15:27*
Surr: Dibromofluoromethane	*89.6*			*70-130*	*%REC*	*1*	*19-Sep-2019 15:27*
Surr: Toluene-d8	*100*			*70-130*	*%REC*	*1*	*19-Sep-2019 15:27*
GASOLINE RANGE ORGANICS BY SW8015C		**Method:SW8015**					Analyst: QX
Gasoline Range Organics	< 0.012		0.012	0.058	mg/Kg-dry	1	21-Sep-2019 19:36
Surr: 4-Bromofluorobenzene	*119*			*70-123*	*%REC*	*1*	*21-Sep-2019 19:36*
TPH DRO/ORO BY SW8015C		**Method:SW8015M**			Prep:SW3541 / 19-Sep-2019		Analyst: PVL
TPH (Diesel Range)	**96**		**5.8**	**20**	**mg/Kg-dry**	10	20-Sep-2019 14:08
TPH (Motor Oil Range)	**230**		**5.8**	**39**	**mg/Kg-dry**	10	20-Sep-2019 14:08
Surr: 2-Fluorobiphenyl	*70.3*			*60-129*	*%REC*	*10*	*20-Sep-2019 14:08*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: DFF
Percent Moisture	**13.8**		**0.0100**	**0.0100**	**wt%**	1	20-Sep-2019 09:57
ANIONS BY SW9056A		**Method:SW9056**			Prep:SW9056 / 24-Sep-2019		Analyst: KMU
Chloride	**2,040**		**23.7**	**59.1**	**mg/Kg-dry**	10	25-Sep-2019 23:02

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: AECOM **ANALYTICAL REPORT**
Project: 60614104 GRAYBURG SAN ANDREAS INJ. UNIT WorkOrder:HS19090854
Sample ID: VG-4 0-1 Lab ID:HS19090854-04
Collection Date: 17-Sep-2019 10:59 Matrix:Solid

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene	< 0.00051		0.00051	0.0051	mg/Kg-dry	1	19-Sep-2019 15:52
Ethylbenzene	< 0.00071		0.00071	0.0051	mg/Kg-dry	1	19-Sep-2019 15:52
Toluene	< 0.00061		0.00061	0.0051	mg/Kg-dry	1	19-Sep-2019 15:52
Xylenes, Total	< 0.0010		0.0010	0.0051	mg/Kg-dry	1	19-Sep-2019 15:52
Surr: 1,2-Dichloroethane-d4	*86.5*			*70-126*	*%REC*	*1*	*19-Sep-2019 15:52*
Surr: 4-Bromofluorobenzene	*98.9*			*70-130*	*%REC*	*1*	*19-Sep-2019 15:52*
Surr: Dibromofluoromethane	*89.6*			*70-130*	*%REC*	*1*	*19-Sep-2019 15:52*
Surr: Toluene-d8	*96.4*			*70-130*	*%REC*	*1*	*19-Sep-2019 15:52*
GASOLINE RANGE ORGANICS BY SW8015C		**Method:SW8015**					Analyst: QX
Gasoline Range Organics	< 0.010		0.010	0.051	mg/Kg-dry	1	21-Sep-2019 19:52
Surr: 4-Bromofluorobenzene	*117*			*70-123*	*%REC*	*1*	*21-Sep-2019 19:52*
TPH DRO/ORO BY SW8015C		**Method:SW8015M**			Prep:SW3541 / 19-Sep-2019		Analyst: PVL
TPH (Diesel Range)	**15**	**0.52**		**1.8**	**mg/Kg-dry**	1	23-Sep-2019 15:56
TPH (Motor Oil Range)	**36**	**0.52**		**3.5**	**mg/Kg-dry**	1	23-Sep-2019 15:56
Surr: 2-Fluorobiphenyl	*60.1*			*60-129*	*%REC*	*1*	*23-Sep-2019 15:56*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: DFF
Percent Moisture	**3.74**	**0.0100**		**0.0100**	**wt%**	1	20-Sep-2019 09:57
ANIONS BY SW9056A		**Method:SW9056**			Prep:SW9056 / 24-Sep-2019		Analyst: KMU
Chloride	**3,710**	**21.1**		**52.7**	**mg/Kg-dry**	10	25-Sep-2019 23:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: AECOM **ANALYTICAL REPORT**
Project: 60614104 GRAYBURG SAN ANDREAS INJ. UNIT WorkOrder:HS19090854
Sample ID: VG-5 0-1 Lab ID:HS19090854-05
Collection Date: 17-Sep-2019 11:07 Matrix:Solid

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene	< 0.00057		0.00057	0.0057	mg/Kg-dry	1	19-Sep-2019 16:17
Ethylbenzene	< 0.00080		0.00080	0.0057	mg/Kg-dry	1	19-Sep-2019 16:17
Toluene	< 0.00069		0.00069	0.0057	mg/Kg-dry	1	19-Sep-2019 16:17
Xylenes, Total	< 0.0011		0.0011	0.0057	mg/Kg-dry	1	19-Sep-2019 16:17
Surr: 1,2-Dichloroethane-d4	*80.5*			*70-126*	*%REC*	*1*	*19-Sep-2019 16:17*
Surr: 4-Bromofluorobenzene	*97.0*			*70-130*	*%REC*	*1*	*19-Sep-2019 16:17*
Surr: Dibromofluoromethane	*88.1*			*70-130*	*%REC*	*1*	*19-Sep-2019 16:17*
Surr: Toluene-d8	*99.4*			*70-130*	*%REC*	*1*	*19-Sep-2019 16:17*
GASOLINE RANGE ORGANICS BY SW8015C		**Method:SW8015**					Analyst: QX
Gasoline Range Organics	< 0.012		0.012	0.061	mg/Kg-dry	1	21-Sep-2019 20:08
Surr: 4-Bromofluorobenzene	*118*			*70-123*	*%REC*	*1*	*21-Sep-2019 20:08*
TPH DRO/ORO BY SW8015C		**Method:SW8015M**			Prep:SW3541 / 19-Sep-2019		Analyst: PVL
TPH (Diesel Range)	**41**		**5.7**	**20**	**mg/Kg-dry**	10	20-Sep-2019 16:24
TPH (Motor Oil Range)	**130**		**5.7**	**39**	**mg/Kg-dry**	10	20-Sep-2019 16:24
Surr: 2-Fluorobiphenyl	*62.1*			*60-129*	*%REC*	*10*	*20-Sep-2019 16:24*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: DFF
Percent Moisture	**13.5**		**0.0100**	**0.0100**	**wt%**	1	20-Sep-2019 09:57
ANIONS BY SW9056A		**Method:SW9056**			Prep:SW9056 / 24-Sep-2019		Analyst: KMU
Chloride	**1,610**		**23.5**	**58.7**	**mg/Kg-dry**	10	25-Sep-2019 23:35

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: AECOM **ANALYTICAL REPORT**
Project: 60614104 GRAYBURG SAN ANDREAS INJ. UNIT WorkOrder:HS19090854
Sample ID: VG-6 0-1 Lab ID:HS19090854-06
Collection Date: 17-Sep-2019 11:15 Matrix:Solid

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene	< 0.00053		0.00053	0.0053	mg/Kg-dry	1	19-Sep-2019 16:41
Ethylbenzene	< 0.00074		0.00074	0.0053	mg/Kg-dry	1	19-Sep-2019 16:41
Toluene	< 0.00063		0.00063	0.0053	mg/Kg-dry	1	19-Sep-2019 16:41
Xylenes, Total	< 0.0011		0.0011	0.0053	mg/Kg-dry	1	19-Sep-2019 16:41
Surr: 1,2-Dichloroethane-d4	*76.0*			*70-126*	*%REC*	*1*	*19-Sep-2019 16:41*
Surr: 4-Bromofluorobenzene	*91.6*			*70-130*	*%REC*	*1*	*19-Sep-2019 16:41*
Surr: Dibromofluoromethane	*82.6*			*70-130*	*%REC*	*1*	*19-Sep-2019 16:41*
Surr: Toluene-d8	*94.0*			*70-130*	*%REC*	*1*	*19-Sep-2019 16:41*
GASOLINE RANGE ORGANICS BY SW8015C		**Method:SW8015**					Analyst: QX
Gasoline Range Organics	< 0.011		0.011	0.056	mg/Kg-dry	1	21-Sep-2019 20:24
Surr: 4-Bromofluorobenzene	*114*			*70-123*	*%REC*	*1*	*21-Sep-2019 20:24*
TPH DRO/ORO BY SW8015C		**Method:SW8015M**			Prep:SW3541 / 19-Sep-2019		Analyst: PVL
TPH (Diesel Range)	**390**		**55**	**190**	**mg/Kg-dry**	100	20-Sep-2019 18:02
TPH (Motor Oil Range)	**1,200**		**55**	**370**	**mg/Kg-dry**	100	20-Sep-2019 18:02
Surr: 2-Fluorobiphenyl	*0*	*JS*		*60-129*	*%REC*	*100*	*20-Sep-2019 18:02*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: DFF
Percent Moisture	**9.24**		**0.0100**	**0.0100**	**wt%**	1	20-Sep-2019 09:57
ANIONS BY SW9056A		**Method:SW9056**			Prep:SW9056 / 24-Sep-2019		Analyst: KMU
Chloride	**5,520**		**55.5**	**139**	**mg/Kg-dry**	25	25-Sep-2019 19:24

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: AECOM **ANALYTICAL REPORT**
Project: 60614104 GRAYBURG SAN ANDREAS INJ. UNIT WorkOrder:HS19090854
Sample ID: VG-6 1-2 Lab ID:HS19090854-07
Collection Date: 17-Sep-2019 11:20 Matrix:Solid

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES BY SW8260C		**Method:SW8260**					Analyst: WLR
Benzene	< 0.00056		0.00056	0.0056	mg/Kg-dry	1	19-Sep-2019 17:06
Ethylbenzene	< 0.00079		0.00079	0.0056	mg/Kg-dry	1	19-Sep-2019 17:06
Toluene	< 0.00068		0.00068	0.0056	mg/Kg-dry	1	19-Sep-2019 17:06
Xylenes, Total	< 0.0011		0.0011	0.0056	mg/Kg-dry	1	19-Sep-2019 17:06
Surr: 1,2-Dichloroethane-d4	*77.2*			*70-126*	*%REC*	*1*	*19-Sep-2019 17:06*
Surr: 4-Bromofluorobenzene	*93.3*			*70-130*	*%REC*	*1*	*19-Sep-2019 17:06*
Surr: Dibromofluoromethane	*83.8*			*70-130*	*%REC*	*1*	*19-Sep-2019 17:06*
Surr: Toluene-d8	*94.0*			*70-130*	*%REC*	*1*	*19-Sep-2019 17:06*
GASOLINE RANGE ORGANICS BY SW8015C		**Method:SW8015**					Analyst: QX
Gasoline Range Organics	< 0.012		0.012	0.058	mg/Kg-dry	1	21-Sep-2019 21:44
Surr: 4-Bromofluorobenzene	*116*			*70-123*	*%REC*	*1*	*21-Sep-2019 21:44*
TPH DRO/ORO BY SW8015C		**Method:SW8015M**			Prep:SW3541 / 19-Sep-2019		Analyst: PVL
TPH (Diesel Range)	**24**		**5.8**	**20**	**mg/Kg-dry**	10	20-Sep-2019 18:27
TPH (Motor Oil Range)	**95**		**5.8**	**39**	**mg/Kg-dry**	10	20-Sep-2019 18:27
Surr: 2-Fluorobiphenyl	*130*	*S*		*60-129*	*%REC*	*10*	*20-Sep-2019 18:27*
MOISTURE - ASTM D2216		**Method:ASTM D2216**					Analyst: DFF
Percent Moisture	**14.0**		**0.0100**	**0.0100**	**wt%**	1	20-Sep-2019 09:57
ANIONS BY SW9056A		**Method:SW9056**			Prep:SW9056 / 24-Sep-2019		Analyst: KMU
Chloride	**440**		**2.39**	**5.98**	**mg/Kg-dry**	1	25-Sep-2019 19:41

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: AECOM
Project: 60614104 GRAYBURG SAN ANDREAS INJ. UNIT
WorkOrder: HS19090854

Batch ID: 3331 **Method:** VOLATILES BY SW8260C

SampID	Container	Sample Wt/Vol	Final Volume	Weight Factor	Container Type
HS19090854-01	1	5.072 (g)	5 (mL)	0.99	Bulk (5030B)
HS19090854-02	1	5.004 (g)	5 (mL)	1	Bulk (5030B)
HS19090854-03	1	5.109 (g)	5 (mL)	0.98	Bulk (5030B)
HS19090854-04	1	5.081 (g)	5 (mL)	0.98	Bulk (5030B)
HS19090854-05	1	5.046 (g)	5 (mL)	0.99	Bulk (5030B)
HS19090854-06	1	5.208 (g)	5 (mL)	0.96	Bulk (5030B)
HS19090854-07	1	5.176 (g)	5 (mL)	0.97	Bulk (5030B)

Batch ID: 3333 **Method:** GASOLINE RANGE ORGANICS BY SW8015C **Prep:**

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS19090854-01	1	4.94 (g)	5 (mL)	1.01	Bulk (5030B)
HS19090854-02	1	4.93 (g)	5 (mL)	1.01	Bulk (5030B)
HS19090854-03	1	5 (g)	5 (mL)	1	Bulk (5030B)
HS19090854-04	1	5.04 (g)	5 (mL)	0.99	Bulk (5030B)
HS19090854-05	1	4.77 (g)	5 (mL)	1.05	Bulk (5030B)
HS19090854-06	1	4.91 (g)	5 (mL)	1.02	Bulk (5030B)
HS19090854-07	1	5.07 (g)	5 (mL)	0.99	Bulk (5030B)

Batch ID: 145421 **Method:** TPH DRO/ORO BY SW8015C **Prep:** 8015SPR_LL

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19090854-01	1	30.03	1 (mL)	0.0333
HS19090854-02	1	30.23	1 (mL)	0.03308
HS19090854-03	1	30.21	1 (mL)	0.0331
HS19090854-04	1	30.04	1 (mL)	0.03329
HS19090854-05	1	30.23	1 (mL)	0.03308
HS19090854-06	1	30.12	1 (mL)	0.0332
HS19090854-07	1	30.05	1 (mL)	0.03328

Batch ID: 145683 **Method:** ANIONS BY SW9056A **Prep:** 9056_S_PR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19090854-01	1	5.0577	50 (mL)	9.886
HS19090854-02	1	4.9132	50 (mL)	10.18
HS19090854-03	1	4.9037	50 (mL)	10.2
HS19090854-04	1	4.9315	50 (mL)	10.14
HS19090854-05	1	4.9267	50 (mL)	10.15
HS19090854-06	1	4.9647	50 (mL)	10.07
HS19090854-07	1	4.8642	50 (mL)	10.28

Client: AECOM
Project: 60614104 GRAYBURG SAN ANDREAS INJ. UNIT
WorkOrder: HS19090854

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: 145421 (0)	**Test Name :** TPH DRO/ORO BY SW8015C				**Matrix:** Solid	
HS19090854-01	VG-1 0-1	17 Sep 2019 10:20		19 Sep 2019 09:35	20 Sep 2019 23:46	50
HS19090854-02	VG-2 0-1	17 Sep 2019 10:42		19 Sep 2019 09:35	20 Sep 2019 13:44	100
HS19090854-03	VG-3 0-1	17 Sep 2019 10:53		19 Sep 2019 09:35	20 Sep 2019 14:08	10
HS19090854-04	VG-4 0-1	17 Sep 2019 10:59		19 Sep 2019 09:35	23 Sep 2019 15:56	1
HS19090854-05	VG-5 0-1	17 Sep 2019 11:07		19 Sep 2019 09:35	20 Sep 2019 16:24	10
HS19090854-06	VG-6 0-1	17 Sep 2019 11:15		19 Sep 2019 09:35	20 Sep 2019 18:02	100
HS19090854-07	VG-6 1-2	17 Sep 2019 11:20		19 Sep 2019 09:35	20 Sep 2019 18:27	10
Batch ID: 145683 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Solid	
HS19090854-01	VG-1 0-1	17 Sep 2019 10:20		24 Sep 2019 14:50	25 Sep 2019 21:56	1
HS19090854-02	VG-2 0-1	17 Sep 2019 10:42		24 Sep 2019 14:50	25 Sep 2019 22:45	10
HS19090854-03	VG-3 0-1	17 Sep 2019 10:53		24 Sep 2019 14:50	25 Sep 2019 23:02	10
HS19090854-04	VG-4 0-1	17 Sep 2019 10:59		24 Sep 2019 14:50	25 Sep 2019 23:19	10
HS19090854-05	VG-5 0-1	17 Sep 2019 11:07		24 Sep 2019 14:50	25 Sep 2019 23:35	10
HS19090854-06	VG-6 0-1	17 Sep 2019 11:15		24 Sep 2019 14:50	25 Sep 2019 19:24	25
HS19090854-07	VG-6 1-2	17 Sep 2019 11:20		24 Sep 2019 14:50	25 Sep 2019 19:41	1
Batch ID: R346513 (0)	**Test Name :** VOLATILES BY SW8260C				**Matrix:** Solid	
HS19090854-01	VG-1 0-1	17 Sep 2019 10:20			19 Sep 2019 14:36	1
HS19090854-02	VG-2 0-1	17 Sep 2019 10:42			19 Sep 2019 15:01	1
HS19090854-03	VG-3 0-1	17 Sep 2019 10:53			19 Sep 2019 15:27	1
HS19090854-04	VG-4 0-1	17 Sep 2019 10:59			19 Sep 2019 15:52	1
HS19090854-05	VG-5 0-1	17 Sep 2019 11:07			19 Sep 2019 16:17	1
HS19090854-06	VG-6 0-1	17 Sep 2019 11:15			19 Sep 2019 16:41	1
HS19090854-07	VG-6 1-2	17 Sep 2019 11:20			19 Sep 2019 17:06	1
Batch ID: R346670 (0)	**Test Name :** MOISTURE - ASTM D2216				**Matrix:** Solid	
HS19090854-01	VG-1 0-1	17 Sep 2019 10:20			20 Sep 2019 09:57	1
HS19090854-02	VG-2 0-1	17 Sep 2019 10:42			20 Sep 2019 09:57	1
HS19090854-03	VG-3 0-1	17 Sep 2019 10:53			20 Sep 2019 09:57	1
HS19090854-04	VG-4 0-1	17 Sep 2019 10:59			20 Sep 2019 09:57	1
HS19090854-05	VG-5 0-1	17 Sep 2019 11:07			20 Sep 2019 09:57	1
HS19090854-06	VG-6 0-1	17 Sep 2019 11:15			20 Sep 2019 09:57	1
HS19090854-07	VG-6 1-2	17 Sep 2019 11:20			20 Sep 2019 09:57	1

Client: AECOM
Project: 60614104 GRAYBURG SAN ANDREAS INJ. UNIT
WorkOrder: HS19090854

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: R346706 (0)	**Test Name :** GASOLINE RANGE ORGANICS BY SW8015C				**Matrix:** Solid	
HS19090854-01	VG-1 0-1	17 Sep 2019 10:20			21 Sep 2019 19:03	1
HS19090854-02	VG-2 0-1	17 Sep 2019 10:42			21 Sep 2019 19:20	1
HS19090854-03	VG-3 0-1	17 Sep 2019 10:53			21 Sep 2019 19:36	1
HS19090854-04	VG-4 0-1	17 Sep 2019 10:59			21 Sep 2019 19:52	1
HS19090854-05	VG-5 0-1	17 Sep 2019 11:07			21 Sep 2019 20:08	1
HS19090854-06	VG-6 0-1	17 Sep 2019 11:15			21 Sep 2019 20:24	1
HS19090854-07	VG-6 1-2	17 Sep 2019 11:20			21 Sep 2019 21:44	1

Client: AECOM
Project: 60614104 GRAYBURG SAN ANDREAS INJ. UNIT
WorkOrder: HS19090854

QC BATCH REPORT

Batch ID: 145421 (0) **Instrument: FID-8** **Method: TPH DRO/ORO BY SW8015C**

MBLK Sample ID: **MBLK-145421** Units: **mg/Kg** Analysis Date: **20-Sep-2019 12:31**
Client ID: Run ID: **FID-8_346721** SeqNo: **5263172** PrepDate: **19-Sep-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
TPH (Diesel Range)	< 0.50	1.7								
TPH (Motor Oil Range)	< 0.50	3.4								
Surr: 2-Fluorobiphenyl	*2.341*	*0.10*	*3.33*	*0*	*70.3*	*70 - 130*				

LCS Sample ID: **LCS-145421** Units: **mg/Kg** Analysis Date: **20-Sep-2019 17:37**
Client ID: Run ID: **FID-8_346721** SeqNo: **5263179** PrepDate: **19-Sep-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
TPH (Diesel Range)	39.33	1.7	33.33	0	118	70 - 130				
TPH (Motor Oil Range)	27.28	3.4	33.33	0	81.8	70 - 130				
Surr: 2-Fluorobiphenyl	*3.087*	*0.10*	*3.33*	*0*	*92.7*	*70 - 130*				

MS Sample ID: **HS19090789-01MS** Units: **mg/Kg** Analysis Date: **20-Sep-2019 14:57**
Client ID: Run ID: **FID-8_346721** SeqNo: **5263176** PrepDate: **19-Sep-2019** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
TPH (Diesel Range)	30.56	17	33.23	12.14	55.4	70 - 130				S
TPH (Motor Oil Range)	82.18	34	33.23	99.3	-51.5	70 - 130				S
Surr: 2-Fluorobiphenyl	*2.747*	*1.0*	*3.32*	*0*	*82.7*	*60 - 129*				

MSD Sample ID: **HS19090789-01MSD** Units: **mg/Kg** Analysis Date: **20-Sep-2019 15:21**
Client ID: Run ID: **FID-8_346721** SeqNo: **5263177** PrepDate: **19-Sep-2019** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
TPH (Diesel Range)	36.76	17	32.97	12.14	74.7	70 - 130	30.56	18.4	30	
TPH (Motor Oil Range)	123.6	34	32.97	99.3	73.6	70 - 130	82.18	40.2	30	R
Surr: 2-Fluorobiphenyl	*2.884*	*0.99*	*3.294*	*0*	*87.6*	*60 - 129*	*2.747*	*4.89*	*30*	

The following samples were analyzed in this batch:

HS19090854-01	HS19090854-02	HS19090854-03	HS19090854-04
HS19090854-05	HS19090854-06	HS19090854-07	

Client: AECOM
Project: 60614104 GRAYBURG SAN ANDREAS INJ. UNIT
WorkOrder: HS19090854

QC BATCH REPORT

Batch ID: R346706 (0) **Instrument: FID-14** **Method: GASOLINE RANGE ORGANICS BY SW8015C**

MBLK Sample ID: **MBLK-190921** Units: **mg/Kg** Analysis Date: **21-Sep-2019 14:22**
Client ID: Run ID: **FID-14_346706** SeqNo: **5262767** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Gasoline Range Organics	< 0.010	0.050								
Surr: 4-Bromofluorobenzene	*0.1114*	*0.0050*	*0.1*	*0*	*111*	*75 - 121*				

LCS Sample ID: **LCS-190921** Units: **mg/Kg** Analysis Date: **21-Sep-2019 14:06**
Client ID: Run ID: **FID-14_346706** SeqNo: **5262766** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Gasoline Range Organics	1.041	0.050	1	0	104	72 - 121				
Surr: 4-Bromofluorobenzene	*0.08879*	*0.0050*	*0.1*	*0*	*88.8*	*75 - 121*				

MS Sample ID: **HS19090789-02MS** Units: **mg/Kg** Analysis Date: **21-Sep-2019 15:19**
Client ID: Run ID: **FID-14_346706** SeqNo: **5262770** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Gasoline Range Organics	0.9025	0.052	1.04	0	86.8	70 - 130				
Surr: 4-Bromofluorobenzene	*0.0772*	*0.0052*	*0.104*	*0*	*74.2*	*70 - 123*				

MSD Sample ID: **HS19090789-02MSD** Units: **mg/Kg** Analysis Date: **21-Sep-2019 15:35**
Client ID: Run ID: **FID-14_346706** SeqNo: **5262771** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Gasoline Range Organics	0.868	0.052	1.03	0	84.3	70 - 130	0.9025	3.9	30	
Surr: 4-Bromofluorobenzene	*0.07035*	*0.0052*	*0.103*	*0*	*68.3*	*70 - 123*	*0.0772*	*9.29*	*30*	S

The following samples were analyzed in this batch: HS19090854-01 HS19090854-02 HS19090854-03 HS19090854-04 HS19090854-05 HS19090854-06 HS19090854-07

Client: AECOM
Project: 60614104 GRAYBURG SAN ANDREAS INJ. UNIT
WorkOrder: HS19090854

QC BATCH REPORT

Batch ID: R346513 (0) **Instrument: VOA5** **Method: VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKS1-091919** Units: **ug/Kg** Analysis Date: **19-Sep-2019 09:11**
Client ID: Run ID: **VOA5_346513** SeqNo: **5258739** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	< 0.50	5.0								
Ethylbenzene	< 0.70	5.0								
Toluene	< 0.60	5.0								
Xylenes, Total	< 1.0	5.0								
Surr: 1,2-Dichloroethane-d4	*42.32*	*0*	*50*	*0*	*84.6*	*76 - 125*				
Surr: 4-Bromofluorobenzene	*49.69*	*0*	*50*	*0*	*99.4*	*80 - 120*				
Surr: Dibromofluoromethane	*44.4*	*0*	*50*	*0*	*88.8*	*80 - 119*				
Surr: Toluene-d8	*49.44*	*0*	*50*	*0*	*98.9*	*81 - 118*				

LCS Sample ID: **VLCSS1-091919** Units: **ug/Kg** Analysis Date: **19-Sep-2019 08:21**
Client ID: Run ID: **VOA5_346513** SeqNo: **5258738** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	56.05	5.0	50	0	112	75 - 124				
Ethylbenzene	61.35	5.0	50	0	123	70 - 123				
Toluene	58.15	5.0	50	0	116	76 - 122				
Xylenes, Total	181.7	5.0	150	0	121	77 - 128				
Surr: 1,2-Dichloroethane-d4	*45.26*	*0*	*50*	*0*	*90.5*	*76 - 125*				
Surr: 4-Bromofluorobenzene	*50.62*	*0*	*50*	*0*	*101*	*80 - 120*				
Surr: Dibromofluoromethane	*47.5*	*0*	*50*	*0*	*95.0*	*80 - 119*				
Surr: Toluene-d8	*48.94*	*0*	*50*	*0*	*97.9*	*81 - 118*				

MS Sample ID: **HS19090694-01MS** Units: **ug/Kg** Analysis Date: **19-Sep-2019 11:41**
Client ID: Run ID: **VOA5_346513** SeqNo: **5259633** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	42.74	5.0	50.5	0	84.6	70 - 130				
Ethylbenzene	44.81	5.0	50.5	0	88.7	70 - 130				
Toluene	44.6	5.0	50.5	0	88.3	70 - 130				
Xylenes, Total	134.6	5.0	151.5	0	88.8	70 - 130				
Surr: 1,2-Dichloroethane-d4	*46.75*	*0*	*50.5*	*0*	*92.6*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*50.38*	*0*	*50.5*	*0*	*99.8*	*70 - 130*				
Surr: Dibromofluoromethane	*47.58*	*0*	*50.5*	*0*	*94.2*	*70 - 130*				
Surr: Toluene-d8	*49.38*	*0*	*50.5*	*0*	*97.8*	*70 - 130*				

Client: AECOM
Project: 60614104 GRAYBURG SAN ANDREAS INJ. UNIT
WorkOrder: HS19090854

QC BATCH REPORT

Batch ID: R346513 (0) **Instrument: VOA5** **Method: VOLATILES BY SW8260C**

MSD Sample ID: **HS19090694-01MSD** Units: **ug/Kg** Analysis Date: **19-Sep-2019 12:06**
Client ID: Run ID: **VOA5_346513** SeqNo: **5259634** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	38.94	4.8	48	0	81.1	70 - 130	42.74	9.3	30	
Ethylbenzene	42.14	4.8	48	0	87.8	70 - 130	44.81	6.15	30	
Toluene	41.51	4.8	48	0	86.5	70 - 130	44.6	7.19	30	
Xylenes, Total	126.5	4.8	144	0	87.8	70 - 130	134.6	6.2	30	
Surr: 1,2-Dichloroethane-d4	*44.43*	*0*	*48*	*0*	*92.6*	*70 - 126*	*46.75*	*5.1*	*30*	
Surr: 4-Bromofluorobenzene	*49.19*	*0*	*48*	*0*	*102*	*70 - 130*	*50.38*	*2.39*	*30*	
Surr: Dibromofluoromethane	*46*	*0*	*48*	*0*	*95.8*	*70 - 130*	*47.58*	*3.38*	*30*	
Surr: Toluene-d8	*47.82*	*0*	*48*	*0*	*99.6*	*70 - 130*	*49.38*	*3.2*	*30*	

The following samples were analyzed in this batch: HS19090854-01 HS19090854-02 HS19090854-03 HS19090854-04 HS19090854-05 HS19090854-06 HS19090854-07

Client: AECOM
Project: 60614104 GRAYBURG SAN ANDREAS INJ. UNIT
WorkOrder: HS19090854

QC BATCH REPORT

Batch ID: 145683 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **MBLK-145683** Units: **mg/Kg** Analysis Date: **25-Sep-2019 21:06**
Client ID: Run ID: **ICS-Integrion_346976** SeqNo: **5268831** PrepDate: **24-Sep-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	< 2.00	5.00								

LCS Sample ID: **LCS-145683** Units: **mg/Kg** Analysis Date: **25-Sep-2019 21:22**
Client ID: Run ID: **ICS-Integrion_346976** SeqNo: **5268832** PrepDate: **24-Sep-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	194.4	5.00	200	0	97.2	80 - 120				

LCSD Sample ID: **LCSD-145683** Units: **mg/Kg** Analysis Date: **25-Sep-2019 21:39**
Client ID: Run ID: **ICS-Integrion_346976** SeqNo: **5268833** PrepDate: **24-Sep-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	192.6	5.00	200	0	96.3	80 - 120	194.4	0.935	20	

MS Sample ID: **HS19090854-01MS** Units: **mg/Kg** Analysis Date: **25-Sep-2019 22:12**
Client ID: **VG-1 0-1** Run ID: **ICS-Integrion_346976** SeqNo: **5268835** PrepDate: **24-Sep-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	331.5	4.82	288.9	53.1	96.4	80 - 120				

MSD Sample ID: **HS19090854-01MSD** Units: **mg/Kg** Analysis Date: **25-Sep-2019 22:29**
Client ID: **VG-1 0-1** Run ID: **ICS-Integrion_346976** SeqNo: **5268836** PrepDate: **24-Sep-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	347.3	4.82	289.2	53.1	102	80 - 120	331.5	4.65	20	

The following samples were analyzed in this batch:

HS19090854-01	HS19090854-02	HS19090854-03	HS19090854-04
HS19090854-05	HS19090854-06	HS19090854-07	

Client: AECOM
Project: 60614104 GRAYBURG SAN ANDREAS INJ. UNIT
WorkOrder: HS19090854

QC BATCH REPORT

Batch ID: **R346670 (0)** **Instrument:** **Balance1** **Method:** **MOISTURE - ASTM D2216**

DUP Sample ID: **HS19090874-04DUP** Units: **wt%** Analysis Date: **20-Sep-2019 09:57**
Client ID: Run ID: **Balance1_346670** SeqNo: **5261876** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Percent Moisture	13.1	0.0100					13.4	2.26	20	

The following samples were analyzed in this batch: HS19090854-01 HS19090854-02 HS19090854-03 HS19090854-04 HS19090854-05 HS19090854-06 HS19090854-07

Client: AECOM
Project: 60614104 GRAYBURG SAN ANDREAS INJ. UNIT
WorkOrder: **HS19090854**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/Kg-dry	Milligrams per Kilogram- Dry weight corrected

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-141	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

Sample Receipt Checklist

Client Name: AECOM-Houston
Work Order: HS19090854
Date/Time Received: **18-Sep-2019 09:00**
Received by: **AC**

Checklist completed by: *Asad Chaudhry* eSignature 18-Sep-2019 Date
Reviewed by: *Dane J. Wacasey* eSignature 19-Sep-2019 Date

Matrices: **Solid**
Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☑	Not Present ☐
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	3.0c/2.5c C/UC	IR 11	
Cooler(s)/Kit(s):	5425		
Date/Time sample(s) sent to storage:	09/18/2019 19:00		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Eurofins TestAmerica, Houston
6310 Rothway Street
Houston, TX 77040
Phone (713) 690-4444 Fax (713) 690-5646

Chain of Custody Record

eurofins | Environment Testing TestAmerica

Client Information	Sampler: RAPHAEL FRANCO	Lab PM: Kudchadkar, Sachin G	Carrier Tracking No(s):	COC No: 600-69310-18903.1
Client Contact: Mr. Wallace Gilmore	Phone: 830 688-7816	E-Mail: sachin.kudchadkar@testamericainc.com		Page: Page
Company: AECOM				Job #:
Address: 19219 Katy Freeway Suite 100	Due Date Requested:	Analysis Requested		Preservation Codes:
City: Houston	TAT Requested (days): 3 DAY TAT			A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
State, Zip: TX, 77094	PO #:			Other:
Phone: 713-520-990(Tel) 713-520-680(Fax)	WO #:			
Email: wallace.gilmore@aecom.com	Project #: 60008660			
Project Name: Chevron	SSOW#:			
Site: GRAYBURG SAN ANDREAS INJ. UNIT				

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	TX_1005 - (TPH	8260B - BTEX Only	9056_ORGFM_28D - Chloride	1311/ 6010B, 7470A- TCLP metals	moisture	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	N	N		
VG-1 0-1	9-17-19	1020		Solid			X	X					
VG-2 0-1		1042		Solid			X	X					
VG-3 0-1		1053		Solid			X	X					
VG-4 0-1		1059		Solid			X	X					
VG-5 0-1		1107		Solid			X	X					
VG-6 0-1		1115		Solid									
VG-6 1-2		1120		Solid									
				Solid									
				Solid									
				Solid									
				Solid									

HS19090854
AECOM
GRAYBURG SAN ANDREAS INJ. UNIT

Possible Hazard Identification
[X] Non-Hazard [ ] Flammable [ ] Skin Irritant [ ] Poison B [ ] Unknown [ ] Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
[ ] Return To Client [X] Disposal By Lab [ ] Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:		
Relinquished by: RAPHAEL FRANCO	Date/Time: 9-17-19/1630	Company: AECOM	Received by: AC	Date/Time: 09/18/19 09:00	Company: ALS
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

U/C 3.0c IR#11 CF-0.5 5425

Ver: 01/16/2019

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

5425

CUSTODY SEAL

Date: 9-17-19 Time: 16 00
Name: A. FRANK
Company: FEDEX

Seal Broken By:
Date: 09118119

5425 SEP 18 2019

Must Deliver Next Business Day
Time and Tempature Sensitive!

5425

ORIGIN ID:SGRA (573) 397-8777
JAMES LOVELY (GUEST)
LA QUINTA INN C/O AECOM
3312 N. LOVINGTON HIGHWAY

HOBBS, NM 88240
UNITED STATES US

SHIP DATE: 13SEP19
ACTWGT: 1.00 LB MAN
CAD: 3001307CAFE3211
DIMS: 19x16x13 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: CEMC HOBBS NM - BO 67596 - DW

RMA:

FedEx Express

FedEx
TRK# 0221 4809 7837 9572

WED - 18 SEP 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US IAH

#364B901 09/1 567J1/9D04/05A2

Part # 156469-434 RITE EXP 07/20

Part # 156297-435 RRDB2 EXP 05/20

Laboratory Analytical Report