



2350 W Marland Blvd Hobbs, NM 88240

Closure Report

February 18, 2020

Re: Empire ABO Unit C-49 SWD
Case #NCE2002455549

On 11/20/2019 a release occurred due to line corrosion resulting in the loss fluid. An initial C-141 was submitted and approved by NMOCD on 1/24/2020. The release (GPS Coordinates: 32.804718, -104.105080) is located east of Artesia, New Mexico in unit letter L section 29 township 17S range 29E. Apache Corporation drilled a temporary monitor well on May 26, 2011 to a depth of 100 feet. The temporary well was set with 2 inch PVC casing and screen from 80 ft. to 100 ft. On June 28, 2011 a Solinst Water Level Meter was used and found no water to a depth of 99.12 feet.

On February 11, 2020 Apache Corporation took final five point bottom and horizontal composite samples not to exceed 200 square feet. All samples were submitted to a commercial laboratory for analysis of chloride, TPH, and BTEX. All Laboratory results were below table one standards for releases 51-100 feet.

Apache Corporation respectfully request closure of case NCE202455549.

Enclosed: C-141, Groundwater Data, Maps, Sample Data, Laboratory Analysis, and Photos

Submitted by;

Bruce Baker

Environmental Technician

larry.baker@apachecorp.com

Cell# 432-631-6982

Off# 575-393-7106

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	
District RP	
Facility ID	
Application ID	

Release Notification

Responsible Party

Responsible Party: Apache Corporation	OGRID 873
Contact Name: Bruce Baker	Contact Telephone: (432) 631-6982
Contact email: Larry.Baker@apachecorp.com	Incident # (assigned by OCD)
Contact Mailing Address: 2350 W. Marland Blvd, Hobbs, NM 88240	

Location of Release Source

Latitude: W 32.804718 Longitude: N -104.105080

(NAD 83 in decimal degrees to 5 decimal places)

Site Name: Empire Abo Unit C-49 SWD	Site Type: SWD
Date Release Discovered: November 20, 2019	API #

Unit Letter	Section	Township	Range	County
L	29	17S	29E	Eddy

Surface Owner: ☐ State ☒ Federal ☐ Tribal ☐ Private (Name: Not Applicable)

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 (N/A)	Volume Recovered (N/A)
☒ Produced Water	Volume Released (201 Barrels)	Volume Recovered (190 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)

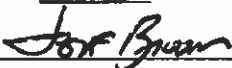
Cause of Release

Line Corrosion causing a release inside the containment.

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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? Release is greater than 25 barrels. Release was contained to the containment area.
If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)? Via email given to NM OCD on 11/20/2019 by Bruce Baker, Senior Environmental Technician, Apache Corporation	

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 <u>not</u> 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.	
Printed Name: <u>Jeff Broom</u>	Title: <u>Environmental Technician</u>
Signature: <u></u>	Date: <u>11/25/2019</u>
Email: <u>Jeffrey.Broom@apachecorp.com</u>	Telephone: <u>(432) 664-4677</u>
<u>OCD Only</u>	
Received by: _____	Date: _____

Volume Calculation

182.40 cubic feet of soil contamination X 7.48 gallons per cubic foot = 1,364/42 gallons to a barrel=32 barrels X .33 soil porosity= 11 barrels fluid in soil + 190 barrels recovered = 201 barrels total loss.

Incident ID	
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Facility ID	
Application ID	

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?	<u>None</u> (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 1/2-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	
District RP	
Facility ID	
Application ID	

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: Bruce BAKER Title: Environmental Tech SR.
Signature: Bruce Baker Date: 2-18-20
email: larry.baker@apachecorp.com Telephone: 432-631-6982

OCD Only

Received by: _____ Date: _____

Incident ID	
District RP	
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Application ID	

Closure

The responsible party must attach information demonstrating they have complied with all applicable closure requirements and any conditions or directives of the OCD. This demonstration should be in the form of a comprehensive report (electronic submittals in .pdf format are preferred) including a scaled site map, sampling diagrams, relevant field notes, photographs of any excavation prior to backfilling, laboratory data including chain of custody documents of final sampling, and a narrative of the remedial activities. Refer to 19.15.29.12 NMAC.

Closure Report Attachment Checklist: *Each of the following items must be included in the closure report.*

- ☒ A scaled site and sampling diagram as described in 19.15.29.11 NMAC
- ☒ Photographs of the remediated site prior to backfill or photos of the liner integrity if applicable (Note: appropriate OCD District office must be notified 2 days prior to liner inspection)
- ☒ Laboratory analyses of final sampling (Note: appropriate ODC District office must be notified 2 days prior to final sampling)
- ☒ Description of remediation activities

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. The responsible party acknowledges they must substantially restore, reclaim, and re-vegetate the impacted surface area to the conditions that existed prior to the release or their final land use in accordance with 19.15.29.13 NMAC including notification to the OCD when reclamation and re-vegetation are complete.

Printed Name: Bruce Baker Title: Environmental Tech SR.
 Signature: Bruce Baker Date: 2-18-20
 email: larry.baker@apachecorp.com Telephone: 432-631-6982

OCD Only

Received by: _____ Date: _____

Closure approval by the OCD does not relieve the responsible party of liability should their operations have failed to adequately investigate and remediate contamination that poses a threat to groundwater, surface water, human health, or the environment nor does not relieve the responsible party of compliance with any other federal, state, or local laws and/or regulations.

Closure Approved by: _____ Date: _____

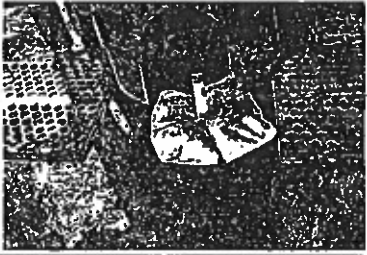
Printed Name: _____ Title: _____



Temporary MW 2014

Google Earth

Imagery Date: 12/21/2019 Lat: 32.8050849 Lon: -104.1080019 Elevation: 4080 ft

Logger:	Jordan Woodfin			
Driller:	Harrison & Cooper, Inc		Company: Apache Project Name: Empire Abo Unit C-49 SWD Well ID: MW-1 temp Project Consultant: RECS Location: UL/L sec 29 T17S R29E	
Drilling Method:	Air rotary			
Start Date:	4/15/2011			
End Date:	4/15/2011	Lat: N32°48.294' County: Eddy Long: W104°06.310' State: NM		
Comments:		No sampling occurred on this well Well was set as a temporary well DRAFTED BY: L. Weinheimer TD = 55 ft GW = none		

Depth (feet)	chloride field tests	LAB	PID	Description	Lithology	Well Construction
				NO SAMPLES TAKEN		annular space left open
5 ft						
10 ft						
15 ft						
20 ft						
25 ft						
30 ft						
				RED BED CLAY MIXED WITH SAND		
35 ft						
				RED BED CLAY		
40 ft						
45 ft						

Depth (feet)	chloride field tests	LAB	PID	Description	Lithology	Well Construction
50 ft						
55 ft						

Rice Environmental Consulting & Safety

P.O. Box 5630 Hobbs, NM 88241

Phone 575.393.4411 Fax 575.393.0293

July 11th, 2011

Natalie Gladden

Apache Corp.

P.O. Box 1849

Eunice, New Mexico 88231

Re: Empire Abo Unit C-49 SWD

Ms. Gladden,

On May 26th, 2011, RECS personnel drilled an observational well at the Empire Abo Unit C-49 SWD. On June 28th, I supervised RECS personnel checking for water accumulation within the borehole using a Solinst Water Level Meter. The meter indicated no water had accumulated within the borehole at the total depth of 99.12 ft.

Sincerely,



Bruce Baker

Head Foreman

Rice Environmental Consulting & Safety



Wall Samples

Map ID	Date	Sample ID	Depth	Chloride	Benzene	Toulene	Ethybenzene	Total Xylenes	Total BTEX	GRO	DRO	EXT DRO	GPS Coordinates
W1	2/11/2020	W1 @ Surface	S	496	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	<10.0	<10.0	32.8045941 -104.1047679
W2	2/11/2020	W2 @ Surface	S	112	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	<10.0	<10.0	32.8045011 -104.1046298
W3	2/11/2020	W3 @ Surface	S	560	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	<10.0	<10.0	32.8046372 -104.1044786
W4	2/11/2020	W4 @ Surface	S	112	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	<10.0	<10.0	32.8047037 -104.1046486



Surface Samples

Map ID	Date	Sample ID	Depth	Chloride	Benzene	Toulene	Ethybenzene	Total Xylenes	Total BTEX	GRO	DRO	EXT DRO	GPS Coordinates
B1	2/11/2020	B1 @ Surface	S	1440	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	<10.0	<10.0	32.8046781 -104.1047522
B2	2/11/2020	B2 @ Surface	S	1790	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	<10.0	<10.0	32.8046835 -104.1046908
B3	2/11/2020	B3 @ Surface	S	3400	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	33.9	<10.0	32.8046880 -104.1045832
B4	2/11/2020	B4 @ Surface	S	4520	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	47.5	<10.0	32.8046795 -104.1045376
B5	2/11/2020	B5 @ Surface	S	3120	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	25.3	<10.0	32.8046426 -104.1045758
B6	2/11/2020	B6 @ Surface	S	8260	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	20.3	<10.0	32.8046494 -104.1045440
B7	2/11/2020	B7 @ Surface	S	3360	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	<10.0	<10.0	32.8046105 -104.1045802
B8	2/11/2020	B8 @ Surface	S	5160	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	<10.0	<10.0	32.8046062 -104.1045453
B9	2/11/2020	B9 @ Surface	S	7360	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	<10.0	<10.0	32.8045775 -104.1045882
B10	2/11/2020	B10 @ Surface	S	6660	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	<10.0	<10.0	32.8045752 -104.1045476
B11	2/11/2020	B11 @ Surface	S	8260	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	<10.0	<10.0	32.8045462 -104.1045537
B12	2/11/2020	B12 @ Surface	S	2920	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	<10.0	<10.0	32.8045457 -104.1046053
B13	2/11/2020	B13 @ Surface	S	2800	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	<10.0	<10.0	32.8045468 -104.1046938
B14	2/11/2020	B14 @ Surface	S	3480	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	<10.0	<10.0	32.8046200 -104.1047579
B15	2/11/2020	B15 @ Surface	S	2360	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	<10.0	<10.0	32.8045116 -104.1046968
B16	2/11/2020	B16 @ Surface	S	384	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	<10.0	<10.0	32.8045220 -104.1045818
B17	2/11/2020	B17 @ Surface	S	368	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	<10.0	<10.0	32.8045834 -104.1044900
B18	2/11/2020	B18 @ Surface	S	80	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	<10.0	<10.0	32.8046708 -104.1044967



PHONE (575) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

February 18, 2020

BRUCE BAKER

APACHE CORP - HOBBS

2350 W. MARLAND BLVD.

HOBBS, NM 88240

RE: EMPIRE ABO C-49 SWD

Enclosed are the results of analyses for samples received by the laboratory on 02/11/20 14:39.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-19-12. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/ga/lab_accred_certif.html.

Cardinal Laboratories is accredited through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Total Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Cardinal Laboratories is accredited through the State of New Mexico Environment Department for:

Method SM 9223-B	Total Coliform and E. coli (Colilert MMO-MUG)
Method EPA 524.2	Regulated VOCs and Total Trihalomethanes (TTHM)
Method EPA 552.2	Total Haloacetic Acids (HAA-5)

Accreditation applies to public drinking water matrices for State of Colorado and New Mexico.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Celey D. Keene

Lab Director/Quality Manager



PHONE (575) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

Analytical Results For:

APACHE CORP - HOBBS
2350 W. MARLAND BLVD.
HOBBS NM, 88240

Project: EMPIRE ABO C-49 SWD
Project Number: NONE GIVEN
Project Manager: BRUCE BAKER
Fax To: (575) 393-2432

Reported:
18-Feb-20 14:31

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
W 2 @ SURFACE 32.8045011 - 104.	H000411-01	Soil	11-Feb-20 09:45	11-Feb-20 14:39
W 3 @ SURFACE 32.8046372 - 104.	H000411-02	Soil	11-Feb-20 09:47	11-Feb-20 14:39
W 1 @ SURFACE 32.8045941 - 104.	H000411-03	Soil	11-Feb-20 10:18	11-Feb-20 14:39
W 4 @ SURFACE 32.8047037 - 104.	H000411-04	Soil	11-Feb-20 10:20	11-Feb-20 14:39
B 1 @ SURFACE 32.8046781 - 104.1	H000411-05	Soil	11-Feb-20 11:12	11-Feb-20 14:39
B 2 @ SURFACE 32.8046835 - 104.1	H000411-06	Soil	11-Feb-20 11:14	11-Feb-20 14:39
B 3 @ SURFACE 32.8046880 - 104.1	H000411-07	Soil	11-Feb-20 11:16	11-Feb-20 14:39
B 4 @ SURFACE 32.8046795 - 104.1	H000411-08	Soil	11-Feb-20 11:18	11-Feb-20 14:39
B 5 @ SURFACE 32.8046426 - 104.1	H000411-09	Soil	11-Feb-20 11:20	11-Feb-20 14:39
B 6 @ SURFACE 32.8046494 - 104.1	H000411-10	Soil	11-Feb-20 11:22	11-Feb-20 14:39
B 7 @ SURFACE 32.8046105 - 104.1	H000411-11	Soil	11-Feb-20 11:24	11-Feb-20 14:39
B 8 @ SURFACE 32.8046062 - 104.1	H000411-12	Soil	11-Feb-20 11:26	11-Feb-20 14:39
B 9 @ SURFACE 32.8045775 - 104.1	H000411-13	Soil	11-Feb-20 11:28	11-Feb-20 14:39
B 10 @ SURFACE 32.8045752 - 104	H000411-14	Soil	11-Feb-20 11:30	11-Feb-20 14:39
B 11 @ SURFACE 32.8045462 - 104	H000411-15	Soil	11-Feb-20 11:32	11-Feb-20 14:39
B 12 @ SURFACE 32.8045462 - 104	H000411-16	Soil	11-Feb-20 11:34	11-Feb-20 14:39
B 13 @ SURFACE 32.8045468 - 104	H000411-17	Soil	11-Feb-20 11:36	11-Feb-20 14:39
B 14 @ SURFACE 32.8046200 - 104	H000411-18	Soil	11-Feb-20 11:38	11-Feb-20 14:39
B 15 @ SURFACE 32.8045718 - 104	H000411-19	Soil	11-Feb-20 11:40	11-Feb-20 14:39
B 16 @ SURFACE 32.8045220 - 104	H000411-20	Soil	11-Feb-20 11:42	11-Feb-20 14:39
B 17 @ SURFACE 32.8045834 - 104	H000411-21	Soil	11-Feb-20 11:44	11-Feb-20 14:39
B 18 @ SURFACE 32.8046708 - 104	H000411-22	Soil	11-Feb-20 11:46	11-Feb-20 14:39

02/14/20 - Client asked to rerun the chloride on sample -02.

02/18/20 - Client asked to replace the chloride results for sample -02 with the re-extract run on 02/17/20. This is the revised report to reflect those instructions. This report will replace the one sent on 02/14/20.

Cardinal Laboratories

*=Accredited Analyte

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence or any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damage including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of the services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise. Results relate only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.

Celey D. Keene, Lab Director/Quality Manager



PHONE (575) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

Analytical Results For:

APACHE CORP - HOBBS
2350 W. MARLAND BLVD.
HOBBS NM, 88240

Project: EMPIRE ABO C-49 SWD
Project Number: NONE GIVEN
Project Manager: BRUCE BAKER
Fax To: (575) 393-2432

Reported:
18-Feb-20 14:31

W 2 @ SURFACE 32.8045011 - 104.1046291

H000411-01 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories**Inorganic Compounds**

Chloride	112		16.0	mg/kg	4	0021212	GM	13-Feb-20	4500-Cl-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	0021203	MS	12-Feb-20	8021B	
Toluene*	<0.050		0.050	mg/kg	50	0021203	MS	12-Feb-20	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	0021203	MS	12-Feb-20	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	0021203	MS	12-Feb-20	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	0021203	MS	12-Feb-20	8021B	
Surrogate: 4-Bromofluorobenzene (P11)			98.5 %	73.3-129		0021203	MS	12-Feb-20	8021B	

Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	0021201	MS	12-Feb-20	8015B	
DRO >C10-C28*	<10.0		10.0	mg/kg	1	0021201	MS	12-Feb-20	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	0021201	MS	12-Feb-20	8015B	
Surrogate: 1-Chlorooctane			87.3 %	41-142		0021201	MS	12-Feb-20	8015B	
Surrogate: 1-Chlorooctadecane			91.0 %	37.6-147		0021201	MS	12-Feb-20	8015B	

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Celey D. Keene, Lab Director/Quality Manager



PHONE (575) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

Analytical Results For:

APACHE CORP - HOBBS
2350 W. MARLAND BLVD.
HOBBS NM, 88240

Project: EMPIRE ABO C-49 SWD
Project Number: NONE GIVEN
Project Manager: BRUCE BAKER
Fax To: (575) 393-2432

Reported:
18-Feb-20 14:31

W 3 @ SURFACE 32.8046372 - 104.1044786

H000411-02 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories**Inorganic Compounds**

Chloride	560		16.0	mg/kg	4	0021212	GM	13-Feb-20	4500-Cl-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	0021203	MS	12-Feb-20	8021B	
Toluene*	<0.050		0.050	mg/kg	50	0021203	MS	12-Feb-20	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	0021203	MS	12-Feb-20	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	0021203	MS	12-Feb-20	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	0021203	MS	12-Feb-20	8021B	
Surrogate: 4-Bromofluorobenzene (PID)			101 %	73.3-129		0021203	MS	12-Feb-20	8021B	

Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	0021201	MS	12-Feb-20	8015B	
DRO >C10-C28*	<10.0		10.0	mg/kg	1	0021201	MS	12-Feb-20	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	0021201	MS	12-Feb-20	8015B	
Surrogate: 1-Chlorooctane			86.4 %	41-142		0021201	MS	12-Feb-20	8015B	
Surrogate: 1-Chlorononadecane			88.5 %	37.6-147		0021201	MS	12-Feb-20	8015B	

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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

APACHE CORP - HOBBS
2350 W. MARLAND BLVD.
HOBBS NM, 88240

Project: EMPIRE ABO C-49 SWD
Project Number: NONE GIVEN
Project Manager: BRUCE BAKER
Fax To: (575) 393-2432

Reported:
18-Feb-20 14:31

W 1 @ SURFACE 32.8045941 - 104.1047679
H000411-03 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories**Inorganic Compounds**

Chloride	496		16.0	mg/kg	4	0021212	GM	13-Feb-20	4500-Cl-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	0021203	MS	12-Feb-20	8021B	
Toluene*	<0.050		0.050	mg/kg	50	0021203	MS	12-Feb-20	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	0021203	MS	12-Feb-20	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	0021203	MS	12-Feb-20	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	0021203	MS	12-Feb-20	8021B	
Surrogate: 4-Bromofluorobenzene (PID)			101 %	73.3-129		0021203	MS	12-Feb-20	8021B	

Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	0021201	MS	12-Feb-20	8015B	
DRO >C10-C28*	<10.0		10.0	mg/kg	1	0021201	MS	12-Feb-20	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	0021201	MS	12-Feb-20	8015B	
Surrogate: 1-Chlorooctane			92.3 %	41-142		0021201	MS	12-Feb-20	8015B	
Surrogate: 1-Chlorooctadecane			94.8 %	37.6-147		0021201	MS	12-Feb-20	8015B	

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Page 5 of 35



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Analytical Results For:

APACHE CORP - HOBBS
2350 W. MARLAND BLVD.
HOBBS NM, 88240

Project: EMPIRE ABO C-49 SWD
Project Number: NONE GIVEN
Project Manager: BRUCE BAKER
Fax To: (575) 393-2432

Reported:
18-Feb-20 14:31

W 4 @ SURFACE 32.8047037 - 104.1046486

H000411-04 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories**Inorganic Compounds**

Chloride	112		16.0	mg/kg	4	0021212	GM	13-Feb-20	4500-CI-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	0021203	MS	12-Feb-20	8021B	
Toluene*	<0.050		0.050	mg/kg	50	0021203	MS	12-Feb-20	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	0021203	MS	12-Feb-20	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	0021203	MS	12-Feb-20	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	0021203	MS	12-Feb-20	8021B	

Surrogate: 4-Bromofluorobenzene (P11)		99.5 %		73.3-129		0021203	MS	12-Feb-20	8021B	
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Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	0021201	MS	12-Feb-20	8015B	
DRO >C10-C28*	<10.0		10.0	mg/kg	1	0021201	MS	12-Feb-20	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	0021201	MS	12-Feb-20	8015B	

Surrogate: 1-Chlorooctane		91.8 %		41-142		0021201	MS	12-Feb-20	8015B	
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Surrogate: 1-Chlorooctadecane		93.8 %		37.6-147		0021201	MS	12-Feb-20	8015B	
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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

APACHE CORP - HOBBS
2350 W. MARLAND BLVD.
HOBBS NM, 88240

Project: EMPIRE ABO C-49 SWD
Project Number: NONE GIVEN
Project Manager: BRUCE BAKER
Fax To: (575) 393-2432

Reported:
18-Feb-20 14:31

B 1 @ SURFACE 32.8046781 - 104.1047522
H000411-05 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories**Inorganic Compounds**

Chloride	1440		16.0	mg/kg	4	0021212	GM	13-Feb-20	4500-C1-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	0021203	MS	12-Feb-20	8021B	
Toluene*	<0.050		0.050	mg/kg	50	0021203	MS	12-Feb-20	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	0021203	MS	12-Feb-20	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	0021203	MS	12-Feb-20	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	0021203	MS	12-Feb-20	8021B	

Surrogate: 4-Bromofluorobenzene (P1D)			99.6 %	73.3-129		0021203	MS	12-Feb-20	8021B	
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Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	
DRO >C10-C28*	<10.0		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	

Surrogate: 1-Chlorooctane			84.7 %	41-142		0021202	MS	12-Feb-20	8015B	
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Surrogate: 1-Chlorooctadecane			88.0 %	37.6-147		0021202	MS	12-Feb-20	8015B	
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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

APACHE CORP - HOBBS
2350 W. MARLAND BLVD.
HOBBS NM, 88240

Project: EMPIRE ABO C-49 SWD
Project Number: NONE GIVEN
Project Manager: BRUCE BAKER
Fax To: (575) 393-2432

Reported:
18-Feb-20 14:31

B 2 @ SURFACE 32.8046835 - 104.1046908
H000411-06 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories**Inorganic Compounds**

Chloride	1790		16.0	mg/kg	4	0021212	GM	13-Feb-20	4500-Cl-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	0021203	MS	12-Feb-20	8021B	
Toluene*	<0.050		0.050	mg/kg	50	0021203	MS	12-Feb-20	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	0021203	MS	12-Feb-20	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	0021203	MS	12-Feb-20	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	0021203	MS	12-Feb-20	8021B	
Surrogate: 4-Bromofluorobenzene (P1D)			99.6 %	73.3-129		0021203	MS	12-Feb-20	8021B	

Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	
DRO >C10-C28*	<10.0		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	
Surrogate: 1-Chlorooctane			88.5 %	41-142		0021202	MS	12-Feb-20	8015B	
Surrogate: 1-Chlorooctadecane			93.0 %	37.6-147		0021202	MS	12-Feb-20	8015B	

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Analytical Results For:

APACHE CORP - HOBBS
2350 W. MARLAND BLVD.
HOBBS NM, 88240

Project: EMPIRE ABO C-49 SWD
Project Number: NONE GIVEN
Project Manager: BRUCE BAKER
Fax To: (575) 393-2432

Reported:
18-Feb-20 14:31

B 3 @ SURFACE 32.8046880 - 104.1045832**H000411-07 (Soil)**

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories**Inorganic Compounds**

Chloride	3400		16.0	mg/kg	4	0021212	GM	13-Feb-20	4500-Cl-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Toluene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Surrogate: 4-Bromofluorobenzene (P1D)			99.9 %	73.3-129		0021204	MS	12-Feb-20	8021B	

Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	
DRO >C10-C28*	33.9		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	
Surrogate: 1-Chlorooctane			89.1 %	41-142		0021202	MS	12-Feb-20	8015B	
Surrogate: 1-Chlorooctadecane			97.0 %	37.6-147		0021202	MS	12-Feb-20	8015B	

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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

APACHE CORP - HOBBS
2350 W. MARLAND BLVD.
HOBBS NM, 88240

Project: EMPIRE ABO C-49 SWD
Project Number: NONE GIVEN
Project Manager: BRUCE BAKER
Fax To: (575) 393-2432

Reported:
18-Feb-20 14:31

B 4 @ SURFACE 32.8046795 - 104.1045376
H000411-08 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories**Inorganic Compounds**

Chloride	4520		16.0	mg/kg	4	0021212	GM	13-Feb-20	4500-Cl-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Toluene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Surrogate: 4-Bromofluorobenzene (P11)			100 %	73.3-129		0021204	MS	12-Feb-20	8021B	

Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	
DRO >C10-C28*	47.5		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	
Surrogate: 1-Chlorooctane			89.7 %	41-142		0021202	MS	12-Feb-20	8015B	
Surrogate: 1-Chlorooctadecane			98.3 %	37.6-147		0021202	MS	12-Feb-20	8015B	

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Celey D. Keene, Lab Director/Quality Manager



PHONE (575) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

Analytical Results For:

APACHE CORP - HOBBS
2350 W. MARLAND BLVD.
HOBBS NM, 88240

Project: EMPIRE ABO C-49 SWD
Project Number: NONE GIVEN
Project Manager: BRUCE BAKER
Fax To: (575) 393-2432

Reported:
18-Feb-20 14:31

B 5 @ SURFACE 32.8046426 - 104.1045758
H000411-09 (Soil)

Analyte	Result	NIDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories**Inorganic Compounds**

Chloride	3120		16.0	mg/kg	4	0021212	GM	13-Feb-20	4500-Cl-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Toluene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	0021204	MS	12-Feb-20	8021B	

Surrogate: 4-Bromofluorobenzene (PFD)			99.5 %	73.3-129		0021204	MS	12-Feb-20	8021B	
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Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	
DRO >C10-C28*	25.3		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	

Surrogate: 1-Chlorooctane			89.0 %	41-142		0021202	MS	12-Feb-20	8015B	
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Surrogate: 1-Chlorooctadecane			97.4 %	37.6-147		0021202	MS	12-Feb-20	8015B	
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Celey D. Keene, Lab Director/Quality Manager



PHONE (575) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

Analytical Results For:

APACHE CORP - HOBBS
2350 W. MARLAND BLVD.
HOBBS NM, 88240

Project: EMPIRE ABO C-49 SWD
Project Number: NONE GIVEN
Project Manager: BRUCE BAKER
Fax To: (575) 393-2432

Reported:
18-Feb-20 14:31

B 6 @ SURFACE 32.8046494 - 104.1045440
H000411-10 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories**Inorganic Compounds**

Chloride	8260		16.0	mg/kg	4	0021212	GM	13-Feb-20	4500-Cl-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Toluene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	0021204	MS	12-Feb-20	8021B	

Surrogate: 4-Bromofluorobenzene (PFD)			99.9 %		73.3-129	0021204	MS	12-Feb-20	8021B	
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Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	
DRO >C10-C28*	20.3		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	

Surrogate: 1-Chlorooctane			89.1 %		41-142	0021202	MS	12-Feb-20	8015B	
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Surrogate: 1-Chlorooctadecane			93.2 %		37.6-147	0021202	MS	12-Feb-20	8015B	
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Celey D. Keene, Lab Director/Quality Manager



PHONE (575) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

Analytical Results For:

APACHE CORP - HOBBS
2350 W. MARLAND BLVD.
HOBBS NM, 88240

Project: EMPIRE ABO C-49 SWD
Project Number: NONE GIVEN
Project Manager: BRUCE BAKER
Fax To: (575) 393-2432

Reported:
18-Feb-20 14:31

B 7 @ SURFACE 32.8046105 - 104.1045802**H000411-11 (Soil)**

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories**Inorganic Compounds**

Chloride	3360		16.0	mg/kg	4	0021212	GM	13-Feb-20	4500-Cl-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Toluene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Surrogate: 4-Bromofluorobenzene (P11)			100 %	73.3-129		0021204	MS	12-Feb-20	8021B	

Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	
DRO >C10-C28*	<10.0		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	
Surrogate: 1-Chlorooctane			85.6 %	41-142		0021202	MS	12-Feb-20	8015B	
Surrogate: 1-Chlorooctadecane			89.6 %	37.6-147		0021202	MS	12-Feb-20	8015B	

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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

APACHE CORP - HOBBS
2350 W. MARLAND BLVD.
HOBBS NM, 88240

Project: EMPIRE ABO C-49 SWD
Project Number: NONE GIVEN
Project Manager: BRUCE BAKER
Fax To: (575) 393-2432

Reported:
18-Feb-20 14:31

B 8 @ SURFACE 32.8046062 - 104.1045453
H000411-12 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories**Inorganic Compounds**

Chloride	5160		16.0	mg/kg	4	0021306	GM	13-Feb-20	4500-Cl-B	QM-07
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Toluene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Surrogate: 4-Bromofluorobenzene (PID)			100 %	73.3-129		0021204	MS	12-Feb-20	8021B	

Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	
DRO >C10-C28*	<10.0		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	
Surrogate: 1-Chlorooctane			88.8 %	41-142		0021202	MS	12-Feb-20	8015B	
Surrogate: 1-Chlorooctadecane			92.4 %	37.6-147		0021202	MS	12-Feb-20	8015B	

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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

APACHE CORP - HOBBS
2350 W. MARLAND BLVD.
HOBBS NM, 88240

Project: EMPIRE ABO C-49 SWD
Project Number: NONE GIVEN
Project Manager: BRUCE BAKER
Fax To: (575) 393-2432

Reported:
18-Feb-20 14:31

B 9 @ SURFACE 32.8045775 - 104.1045882
H000411-13 (Soil)

Analyte	Result	NIDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories**Inorganic Compounds**

Chloride	7360		16.0	mg/kg	4	0021306	GM	13-Feb-20	4500-Cl-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Toluene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	0021204	MS	12-Feb-20	8021B	

Surrogate: 4-Bromofluorobenzene (PHI) 101 % 73.3-129 0021204 MS 12-Feb-20 8021B

Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	
DRO >C10-C28*	<10.0		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	

Surrogate: 1-Chlorooctane 86.7 % 41-142 0021202 MS 12-Feb-20 8015B

Surrogate: 1-Chlorooctadecane 91.1 % 37.6-147 0021202 MS 12-Feb-20 8015B

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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

APACHE CORP - HOBBS
2350 W. MARLAND BLVD.
HOBBS NM, 88240

Project: EMPIRE ABO C-49 SWD
Project Number: NONE GIVEN
Project Manager: BRUCE BAKER
Fax To: (575) 393-2432

Reported:
18-Feb-20 14:31

B 10 @ SURFACE 32.8045752 - 104.1045476**H000411-14 (Soil)**

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories**Inorganic Compounds**

Chloride	6660		16.0	mg/kg	4	0021306	GM	13-Feb-20	4500-C1-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Toluene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Surrogate: 4-Bromofluorobenzene (PHD)			99.9 %	73.3-129		0021204	MS	12-Feb-20	8021B	

Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	
DRO >C10-C28*	<10.0		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	
Surrogate: 1-Chlorooctane			88.2 %	41-142		0021202	MS	12-Feb-20	8015B	
Surrogate: 1-Chlorooctadecane			91.3 %	37.6-147		0021202	MS	12-Feb-20	8015B	

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Analytical Results For:

APACHE CORP - HOBBS
2350 W. MARLAND BLVD.
HOBBS NM, 88240

Project: EMPIRE ABO C-49 SWD
Project Number: NONE GIVEN
Project Manager: BRUCE BAKER
Fax To: (575) 393-2432

Reported:
18-Feb-20 14:31

B 11 @ SURFACE 32.8045462 - 104.1045537
H000411-15 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories**Inorganic Compounds**

Chloride	8260		16.0	mg/kg	4	0021306	GM	13-Feb-20	4500-Cl-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Toluene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Surrogate: 4-Bromofluorobenzene (P1H)			100 %	73.3-129		0021204	MS	12-Feb-20	8021B	

Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	
DRO >C10-C28*	<10.0		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	
Surrogate: 1-Chlorooctane			87.2 %	41-142		0021202	MS	12-Feb-20	8015B	
Surrogate: 1-Chlorooctadecane			91.6 %	37.6-147		0021202	MS	12-Feb-20	8015B	

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Page 17 of 35



PHONE (575) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

Analytical Results For:

APACHE CORP - HOBBS
2350 W. MARLAND BLVD.
HOBBS NM, 88240

Project: EMPIRE ABO C-49 SWD
Project Number: NONE GIVEN
Project Manager: BRUCE BAKER
Fax To: (575) 393-2432

Reported:
18-Feb-20 14:31

B 12 @ SURFACE 32.8045462 - 104.1046053
H000411-16 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories**Inorganic Compounds**

Chloride	2920		16.0	mg/kg	4	0021306	GM	13-Feb-20	4500-CL-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Toluene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Surrogate: 4-Bromofluorobenzene (P1D)			101 %	73.3-129		0021204	MS	12-Feb-20	8021B	

Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	
DRO >C10-C28*	<10.0		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	
Surrogate: 1-Chlorooctane			89.2 %	41-142		0021202	MS	12-Feb-20	8015B	
Surrogate: 1-Chlorooctadecane			92.6 %	37.6-147		0021202	MS	12-Feb-20	8015B	

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Analytical Results For:

APACHE CORP - HOBBS
2350 W. MARLAND BLVD.
HOBBS NM, 88240

Project: EMPIRE ABO C-49 SWD
Project Number: NONE GIVEN
Project Manager: BRUCE BAKER
Fax To: (575) 393-2432

Reported:
18-Feb-20 14:31

B 13 @ SURFACE 32.8045468 - 104.1046938**H000411-17 (Soil)**

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories**Inorganic Compounds**

Chloride	2800		16.0	mg/kg	4	0021306	GM	13-Feb-20	4500-Cl-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Toluene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Surrogate: 4-Bromofluorobenzene (P11)			100 %	73.3-129		0021204	MS	12-Feb-20	8021B	

Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	
DRO >C10-C28*	<10.0		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	
Surrogate: 1-Chlorooctane			84.6 %	41-142		0021202	MS	12-Feb-20	8015B	
Surrogate: 1-Chlorooctadecane			89.7 %	37.6-147		0021202	MS	12-Feb-20	8015B	

Cardinal Laboratories

*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager



PHONE (575) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

Analytical Results For:

APACHE CORP - HOBBS
2350 W. MARLAND BLVD.
HOBBS NM, 88240

Project: EMPIRE ABO C-49 SWD
Project Number: NONE GIVEN
Project Manager: BRUCE BAKER
Fax To: (575) 393-2432

Reported:
18-Feb-20 14:31

B 14 @ SURFACE 32.8046200 - 104.1047579
H000411-18 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories**Inorganic Compounds**

Chloride	3480		16.0	mg/kg	4	0021306	GM	13-Feb-20	4500-Cl-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Toluene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Surrogate: 4-Bromofluorobenzene (P11)			100 %	73.3-129		0021204	MS	12-Feb-20	8021B	

Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	
DRO >C10-C28*	<10.0		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	
Surrogate: 1-Chlorooctane			79.1 %	41-142		0021202	MS	12-Feb-20	8015B	
Surrogate: 1-Chlorooctadecane			82.7 %	37.6-147		0021202	MS	12-Feb-20	8015B	

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Celey D. Keene, Lab Director/Quality Manager



PHONE (575) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

Analytical Results For:

APACHE CORP - HOBBS
2350 W. MARLAND BLVD.
HOBBS NM, 88240

Project: EMPIRE ABO C-49 SWD
Project Number: NONE GIVEN
Project Manager: BRUCE BAKER
Fax To: (575) 393-2432

Reported:
18-Feb-20 14:31

B 15 @ SURFACE 32.8045718 - 104.1046968
H000411-19 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories**Inorganic Compounds**

Chloride	2360		16.0	mg/kg	4	0021306	GM	13-Feb-20	4500-Cl-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Toluene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	0021204	MS	12-Feb-20	8021B	

Surrogate: 4-Bromofluorobenzene (PHD)			101 %	73.3-129		0021204	MS	12-Feb-20	8021B	
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Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	
DRO >C10-C28*	<10.0		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	

Surrogate: 1-Chlorooctane			84.8 %	41-142		0021202	MS	12-Feb-20	8015B	
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Surrogate: 1-Chlorooctadecane			88.8 %	37.6-147		0021202	MS	12-Feb-20	8015B	
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Celey D. Keene, Lab Director/Quality Manager



PHONE (575) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

Analytical Results For:

APACHE CORP - HOBBS
2350 W. MARLAND BLVD.
HOBBS NM, 88240

Project: EMPIRE ABO C-49 SWD
Project Number: NONE GIVEN
Project Manager: BRUCE BAKER
Fax To: (575) 393-2432

Reported:
18-Feb-20 14:31

B 16 @ SURFACE 32.8045220 - 104.1045818**H000411-20 (Soil)**

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories**Inorganic Compounds**

Chloride	384		16.0	mg/kg	4	0021306	GM	13-Feb-20	4500-C1-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Toluene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Surrogate: 4-Bromofluorobenzene (PFB)			100 %	73.3-129		0021204	MS	12-Feb-20	8021B	

Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	
DRO >C10-C28*	<10.0		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	0021202	MS	12-Feb-20	8015B	
Surrogate: 1-Chlorooctane			86.5 %	41-142		0021202	MS	12-Feb-20	8015B	
Surrogate: 1-Chlorooctadecane			91.4 %	37.6-147		0021202	MS	12-Feb-20	8015B	

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Page 22 of 35



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Analytical Results For:

APACHE CORP - HOBBS
2350 W. MARLAND BLVD.
HOBBS NM, 88240

Project: EMPIRE ABO C-49 SWD
Project Number: NONE GIVEN
Project Manager: BRUCE BAKER
Fax To: (575) 393-2432

Reported:
18-Feb-20 14:31

B 17 @ SURFACE 32.8045834 - 104.1044900
H000411-21 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories**Inorganic Compounds**

Chloride	368		16.0	mg/kg	4	0021306	GM	13-Feb-20	4500-Cl-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Toluene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Surrogate: 4-Bromofluorobenzene (PID)			99.7 %	73.3-129		0021204	MS	12-Feb-20	8021B	

Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	0021202	MS	13-Feb-20	8015B	
DRO >C10-C28*	<10.0		10.0	mg/kg	1	0021202	MS	13-Feb-20	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	0021202	MS	13-Feb-20	8015B	
Surrogate: 1-Chlorooctane			84.4 %	41-142		0021202	MS	13-Feb-20	8015B	
Surrogate: 1-Chlorooctadecane			87.6 %	37.6-147		0021202	MS	13-Feb-20	8015B	

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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

APACHE CORP - HOBBS
2350 W. MARLAND BLVD.
HOBBS NM, 88240

Project: EMPIRE ABO C-49 SWD
Project Number: NONE GIVEN
Project Manager: BRUCE BAKER
Fax To: (575) 393-2432

Reported:
18-Feb-20 14:31

B 18 @ SURFACE 32.8046708 - 104.1044967
H000411-22 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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Cardinal Laboratories**Inorganic Compounds**

Chloride	80.0		16.0	mg/kg	4	0021306	GM	13-Feb-20	4500-Cl-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Toluene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	0021204	MS	12-Feb-20	8021B	
Surrogate: 4-Bromofluorobenzene (PFB)			100 %	73.3-129		0021204	MS	12-Feb-20	8021B	

Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	0021202	MS	13-Feb-20	8015B	
DRO >C10-C28*	<10.0		10.0	mg/kg	1	0021202	MS	13-Feb-20	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	0021202	MS	13-Feb-20	8015B	
Surrogate: 1-Chlorooctane			88.5 %	41-142		0021202	MS	13-Feb-20	8015B	
Surrogate: 1-Chlorooctadecane			92.3 %	37.6-147		0021202	MS	13-Feb-20	8015B	

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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

APACHE CORP - HOBBS
2350 W. MARLAND BLVD.
HOBBS NM, 88240

Project: EMPIRE ABO C-49 SWD
Project Number: NONE GIVEN
Project Manager: BRUCE BAKER
Fax To: (575) 393-2432

Reported:
18-Feb-20 14:31

Inorganic Compounds - Quality Control**Cardinal Laboratories**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0021212 - 1:4 DI Water										
Blank (0021212-BLK1)				Prepared & Analyzed: 12-Feb-20						
Chloride	ND	16.0	mg/kg							
LCS (0021212-BS1)				Prepared & Analyzed: 12-Feb-20						
Chloride	432	16.0	mg/kg	400		108	80-120			
LCS Dup (0021212-BSD1)				Prepared & Analyzed: 12-Feb-20						
Chloride	432	16.0	mg/kg	400		108	80-120	0.00	20	
Batch 0021306 - 1:4 DI Water										
Blank (0021306-BLK1)				Prepared & Analyzed: 13-Feb-20						
Chloride	ND	16.0	mg/kg							
LCS (0021306-BS1)				Prepared & Analyzed: 13-Feb-20						
Chloride	432	16.0	mg/kg	400		108	80-120			
LCS Dup (0021306-BSD1)				Prepared & Analyzed: 13-Feb-20						
Chloride	432	16.0	mg/kg	400		108	80-120	0.00	20	

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Analytical Results For:

APACHE CORP - HOBBS
2350 W. MARLAND BLVD.
HOBBS NM, 88240

Project: EMPIRE ABO C-49 SWD
Project Number: NONE GIVEN
Project Manager: BRUCE BAKER
Fax To: (575) 393-2432

Reported:
18-Feb-20 14:31

Volatile Organic Compounds by EPA Method 8021 - Quality Control**Cardinal Laboratories**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 0021203 - Volatiles**Blank (0021203-BLK1)**

Prepared & Analyzed: 12-Feb-20

Benzene	ND	0.050	mg/kg							
Toluene	ND	0.050	mg/kg							
Ethylbenzene	ND	0.050	mg/kg							
Total Xylenes	ND	0.150	mg/kg							
Total BTEX	ND	0.300	mg/kg							
Surrogate: 4-Bromofluorobenzene (PID)	ND		mg/kg	0.0500		98.5	73.3-129			

LCS (0021203-BS1)

Prepared & Analyzed: 12-Feb-20

Benzene	1.90	0.050	mg/kg	2.00		95.2	72.2-131			
Toluene	1.97	0.050	mg/kg	2.00		98.3	71.7-126			
Ethylbenzene	1.99	0.050	mg/kg	2.00		99.5	68.9-126			
Total Xylenes	5.79	0.150	mg/kg	6.00		96.5	71.4-125			
Surrogate: 4-Bromofluorobenzene (PID)	0.0490		mg/kg	0.0500		98.0	73.3-129			

LCS Dup (0021203-BS1)

Prepared & Analyzed: 12-Feb-20

Benzene	1.69	0.050	mg/kg	2.00		84.6	72.2-131	11.8	14.6	
Toluene	1.73	0.050	mg/kg	2.00		86.6	71.7-126	12.7	17.4	
Ethylbenzene	1.77	0.050	mg/kg	2.00		88.7	68.9-126	11.5	18.9	
Total Xylenes	5.15	0.150	mg/kg	6.00		85.9	71.4-125	11.7	18.5	
Surrogate: 4-Bromofluorobenzene (PID)	0.0493		mg/kg	0.0500		98.6	73.3-129			

Batch 0021204 - Volatiles**Blank (0021204-BLK1)**

Prepared & Analyzed: 12-Feb-20

Benzene	ND	0.050	mg/kg							
Toluene	ND	0.050	mg/kg							
Ethylbenzene	ND	0.050	mg/kg							
Total Xylenes	ND	0.150	mg/kg							
Total BTEX	ND	0.300	mg/kg							
Surrogate: 4-Bromofluorobenzene (PID)	0.0500		mg/kg	0.0500		100	73.3-129			

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Analytical Results For:

APACHE CORP - HOBBS
2350 W. MARLAND BLVD.
HOBBS NM, 88240

Project: EMPIRE ABO C-49 SWD
Project Number: NONE GIVEN
Project Manager: BRUCE BAKER
Fax To: (575) 393-2432

Reported:
18-Feb-20 14:31

Volatile Organic Compounds by EPA Method 8021 - Quality Control**Cardinal Laboratories**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 0021204 - Volatiles**LCS (0021204-BS1)**

Prepared & Analyzed: 12-Feb-20

Benzene	1.89	0.050	mg/kg	2.00		94.6	72.2-131			
Toluene	1.94	0.050	mg/kg	2.00		97.0	71.7-126			
Ethylbenzene	1.98	0.050	mg/kg	2.00		98.8	68.9-126			
Total Xylenes	5.76	0.150	mg/kg	6.00		96.0	71.4-125			
Surrogate: 4-Bromofluorobenzene (PHD)	0.0506		mg/kg	0.0500		101	73.3-129			

LCS Dup (0021204-BSD1)

Prepared & Analyzed: 12-Feb-20

Benzene	1.71	0.050	mg/kg	2.00		85.4	72.2-131	10.2	14.6	
Toluene	1.75	0.050	mg/kg	2.00		87.3	71.7-126	10.5	17.4	
Ethylbenzene	1.79	0.050	mg/kg	2.00		89.3	68.9-126	10.1	18.9	
Total Xylenes	5.19	0.150	mg/kg	6.00		86.5	71.4-125	10.3	18.5	
Surrogate: 4-Bromofluorobenzene (PHD)	0.0505		mg/kg	0.0500		101	73.3-129			

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Celey D. Keene, Lab Director/Quality Manager



PHONE (575) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

Analytical Results For:

APACHE CORP - HOBBS
2350 W. MARLAND BLVD.
HOBBS NM, 88240

Project: EMPIRE ABO C-49 SWD
Project Number: NONE GIVEN
Project Manager: BRUCE BAKER
Fax To: (575) 393-2432

Reported:
18-Feb-20 14:31

Petroleum Hydrocarbons by GC FID - Quality Control**Cardinal Laboratories**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 0021201 - General Prep - Organics**Blank (0021201-BLK1)**

Prepared & Analyzed: 12-Feb-20

GRO C6-C10	ND	10.0	mg/kg							
DRO >C10-C28	ND	10.0	mg/kg							
EXT DRO >C28-C36	ND	10.0	mg/kg							
Surrogate: 1-Chlorooctane	47.1		mg/kg	50.0		94.2	41-142			
Surrogate: 1-Chlorooctadecane	48.9		mg/kg	50.0		97.7	37.6-147			

LCS (0021201-BS1)

Prepared & Analyzed: 12-Feb-20

GRO C6-C10	201	10.0	mg/kg	200		101	76.5-133			
DRO >C10-C28	199	10.0	mg/kg	200		99.5	72.9-138			
Total TPH C6-C28	400	10.0	mg/kg	400		100	78-132			
Surrogate: 1-Chlorooctane	45.3		mg/kg	50.0		90.7	41-142			
Surrogate: 1-Chlorooctadecane	44.5		mg/kg	50.0		89.1	37.6-147			

LCS Dup (0021201-BSD1)

Prepared & Analyzed: 12-Feb-20

GRO C6-C10	213	10.0	mg/kg	200		106	76.5-133	5.43	20.6	
DRO >C10-C28	213	10.0	mg/kg	200		106	72.9-138	6.77	20.6	
Total TPH C6-C28	425	10.0	mg/kg	400		106	78-132	6.10	18	
Surrogate: 1-Chlorooctane	47.2		mg/kg	50.0		94.3	41-142			
Surrogate: 1-Chlorooctadecane	48.0		mg/kg	50.0		96.1	37.6-147			

Batch 0021202 - General Prep - Organics**Blank (0021202-BLK1)**

Prepared & Analyzed: 12-Feb-20

GRO C6-C10	ND	10.0	mg/kg							
DRO >C10-C28	ND	10.0	mg/kg							
EXT DRO >C28-C36	ND	10.0	mg/kg							
Surrogate: 1-Chlorooctane	44.7		mg/kg	50.0		89.5	41-142			
Surrogate: 1-Chlorooctadecane	46.2		mg/kg	50.0		92.4	37.6-147			

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*—Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager



PHONE (575) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

Analytical Results For:

APACHE CORP - HOBBS
2350 W. MARLAND BLVD.
HOBBS NM, 88240

Project: EMPIRE ABO C-49 SWD
Project Number: NONE GIVEN
Project Manager: BRUCE BAKER
Fax To: (575) 393-2432

Reported:
18-Feb-20 14:31

Petroleum Hydrocarbons by GC FID - Quality Control**Cardinal Laboratories**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 0021202 - General Prep - Organics**LCS (0021202-BS1)**

Prepared & Analyzed 12-Feb-20

GRO C6-C10	195	10.0	mg/kg	200		97.5	76.5-133			
DRO >C10-C28	185	10.0	mg/kg	200		92.4	72.9-138			
Total TPH C6-C28	380	10.0	mg/kg	400		94.9	78-132			
Surrogate: 1-Chlorooctane	48.1		mg/kg	50.0		96.2	41-142			
Surrogate: 1-Chlorooctadecane	47.8		mg/kg	50.0		95.7	37.6-147			

LCS Dup (0021202-BSD1)

Prepared & Analyzed 12-Feb-20

GRO C6-C10	200	10.0	mg/kg	200		100	76.5-133	2.66	20.6	
DRO >C10-C28	184	10.0	mg/kg	200		92.1	72.9-138	0.355	20.6	
Total TPH C6-C28	384	10.0	mg/kg	400		96.1	78-132	1.21	18	
Surrogate: 1-Chlorooctane	46.8		mg/kg	50.0		93.6	41-142			
Surrogate: 1-Chlorooctadecane	47.8		mg/kg	50.0		95.6	37.6-147			

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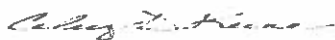
Notes and Definitions

QM-07	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500-Cl-B does not require samples be received at or below 6°C Samples reported on an as received basis (wet) unless otherwise noted on report

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101 East Marland, Hobbs, NM 88240
(575) 393-2326 FAX (575) 393-2476

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Company Name: Apache Project Manager: Bruce Baker Address: City: Hobbs State: NM Zip: 88240 Phone #: Fax #: Project #: Project Name: Project Location: Empire ABO C-49 Seal Sampler Name: Dr. Quessel Jr.		P.O. #: Company: Attn: Address: City: State: Zip: Phone #: Fax #:	
BILL TO			
ANALYSIS REQUEST			
FOR LAB USE ONLY Lab I.D. Sample I.D. 4800411 all Surface Samples 5 B1. 32.8046781 6 B2. 32.8046835 7 B3. 32.8046880 8 B4. 32.8046795 9 B5. 32.8046486 -104.1045758		MATRIX (G) GRAB OR (C) COMP # CONTAINERS GROUNDWATER WASTEWATER SOIL OIL SLUDGE OTHER: ACID/BASE ICE COOL OTHER:	
DATE TIME 2/11 11:12 11:14 11:16 11:18 11:20		EXT TPH BTEX	
PLEASE NOTE: Laboratory and client's liability and client's analysis remedy for any claim arising from this report shall be limited to the amount paid by the client for the analysis. All claims including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within 30 days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise.		Verbal Result: ☐ Yes ☒ No Add'l Phone #: All Results are emailed. Please provide Email address: REMARKS: Email Results	
Relinquished By: [Signature] Date: 2/11 Time: 14:40 Received By: [Signature] Date: 2/11 Time:		Delivered By: (Circle One) Observed Temp. °C 21.1 Sampler - UPS - Bus - Other: Corrected Temp. °C Sample Condition: Cool ☒ Intact ☐ Thermometer ID: 443 Standard ☒ Rush ☐ Correction Factor: 72 Bacteria (only) ☐ Sample Condition: Cool ☒ Intact ☐ Turnaround Time: Corrected Temp. °C	

† Cardinal cannot accept verbal changes. Please email changes to celey.keene@cardinallabsnm.com



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CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Company Name: Apache Project Manager: Bruce Baker Address: City: Hobbs State: NM Zip: 88240 Phone #: Fax #: Project #: Project Owner: Project Name: Project Location: Empire ABQ City SWP Sampler Name: Joe Quisada Jr. FOR LAB USE ONLY				BILL TO P.O. #: Company: Attn: Address: City: State: Zip: Phone #: Fax #:				ANALYSIS REQUEST			
Lab I.D. Sample I.D.		MATRIX ☐ GROUNDWATER ☐ WASTEWATER ☐ SOIL ☐ OIL ☐ SLUDGE ☐ OTHER		PRESERV. ☒ ACID/BASE ☒ COOL ☐ OTHER		SAMPLING					
H000 412 all @ Surface 10 BG. 32.8041684 -104.1045440 11 BG. 32.8041105 -104.1045802 12 BG. 32.8041602 -104.1045453 13 BG. 32.8045775 -104.1045852 14 BG. 32.8045752 -104.1045716		☒ (G)RAB OR ☒ (C)OMF # CONTAINERS		DATE 2/11 11:22 2/11 11:24 2/11 11:26 2/11 11:28 2/11 11:30		TIME		C/ Ex+TPH BTEX			
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CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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