

January 16, 2020

**Tracking #: NRM2000358734
Wool Head 20 State Com #3 Battery
Characterization, Remediation & Closure Report**



**Prepared for
Advance Energy Partners Hat Mesa LLC
Houston, Texas**

**Prepared by
R.T. Hicks Consultants, Ltd.
Albuquerque, New Mexico**

C-141

Including Closure Form

R.T. Hicks Consultants, Ltd.
901 Rio Grande Blvd. NW, Suite F-142
Albuquerque, NM 87104

Incident ID	
District RP	
Facility ID	
Application ID	

Release Notification

Responsible Party

Responsible Party: Advance Energy Partners Hat Mesa LLC	OGRID: 372417
Contact Name: David Harwell	Contact Telephone: 281-235-3431
Contact email: DHarwell@advanceenergypartners.com	Incident # (assigned by OCD)
Contact mailing address: 11490 Westheimer Rd. Suite 950. Houston, TX 77077	

Location of Release Source

Latitude 32.458389Longitude -103.600912

(NAD 83 in decimal degrees to 5 decimal places)

Site Name: Wool Head 20 State Com #003 Battery	Site Type: Tank Battery
Date Release Discovered: October 18, 2019 at 06:30 hrs	API# 30-025-42142

Unit Letter	Section	Township	Range	County
M	20	T21S	R33E	Lea

Surface Owner: ☒ State ☐ Federal ☐ Tribal ☐ Private (Merchant Livestock)

Nature and Volume of Release

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

<input checked="" type="checkbox"/> Crude Oil	Volume Released (bbls) 13.7	Volume Recovered (bbls): 10
<input checked="" type="checkbox"/> Produced Water	Volume Released (bbls) 123.3	Volume Recovered (bbls) 90
	Is the concentration of dissolved chloride in the produced water >10,000 mg/l?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<input type="checkbox"/> Condensate	Volume Released (bbls)	Volume Recovered (bbls)
<input type="checkbox"/> Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
<input type="checkbox"/> Other (describe)	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)

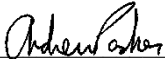
Cause of Release: Failure of the pressure relieve valve (pop-off valve) at the tank battery. Oil/produced water flowed out of the pop-off valve into the secondary containment. High winds caused limited volume of oil/produced water to spray beyond the containment wall onto the production pad and pasture land.

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Was this a major release as defined by 19.15.29.7(A) NMAC? ✓Yes <input type="checkbox"/> No	If YES, for what reason(s) does the responsible party consider this a major release? > 25 bbls.
If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)? Immediate notice was giving via email to 'EMNRD-OCD-District1spills@state.nm.us' on October 18, 2019, 2019 by Andrew Parker of R.T. Hicks Consultants on the behalf of Advance Energy Partners Hat Mesa, LLC. See attached.	

Initial Response

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

<input checked="" type="checkbox"/> The source of the release has been stopped. <input checked="" type="checkbox"/> The impacted area has been secured to protect human health and the environment. <input checked="" type="checkbox"/> Released materials have been contained via the use of berms or dikes, absorbent pads, or other containment devices. <input checked="" type="checkbox"/> 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>Andrew Parker</u> Title: <u>Sr. Env. Specialist</u> Signature: <u></u> Date: <u>October 22, 2019</u> email: <u>andrew@rthicksconsult.com</u> Telephone: <u>970-570-9535</u>
<u>OCD Only</u> Received by: _____ Date: _____

Spill Dimensions to Volume of Release

Input	Length	[feet]	198.0
Input	Width	[feet]	79.2
Input	Depth of impacted area	[feet]	0.25
Input	Porosity: typically is .35 to .40 for most soils	[-]	0.35

Output	volume of affected soil	[feet^3]	3920.4
---------------	-------------------------	----------	---------------

Input	Proportion of porosity filled with release fluid [0,1]	[-]	0.15
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Output	volume of fluid	[feet^3]	205.8
		[gal]	1539.6
		Barrels	36.7

Volumes (bbls)	Released	Recovered	Unrecovered
Total	137	100	37
Crude (10%)	13.7	10	3.7
Produced Water (90%)	123.3	90	33.3

andrew@rthicksconsult.com

From: andrew@rthicksconsult.com
Sent: Friday, October 18, 2019 5:36 PM
To: 'EMNRD-OCD-District1spills@state.nm.us'
Cc: 'dharwell@advanceenergypartners.com'
Subject: Wool Head 20 State Com 003 Battery Release Notification

NMOCD:

On the behalf of Advance Energy Partners Hat Mesa LLC, R.T. Hicks Consultants submits this email as the 24-hour notification of a major release (>25 bbls). A C-141 will be submitted within 15-days of this notification.

Date of discovery: October 18, 2019 at 09:00 hrs.

Responsible Party: Advance Energy Partners Hat Mesa LLC

Location Name: Wool Head 20 State Com #003 Tank Battery

API: 30-025-42142

Coordinates: 32.458389, -103.600912 (NAD83)

UL, Sec. T.R.: M-30-21S-R33E

The knockout valve at the tank battery failed. Approximately 350 bbls (320 bbls produced water; 30 bbls of oil) was contained within the battery's secondary containment and recovered. A calculated 36 bbls of produced water and oil was release onto the production pad and windblown onto pasture land.

Andrew Parker
R.T. Hicks Consultants
Durango Field Office
Cell: (970) 570-9535

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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? (Plates 2 and 3)	<u>187</u> (ft bgs)
Did this release impact groundwater or surface water?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 300 feet of a continuously flowing watercourse or any other significant watercourse? (Plate 5)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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)? (Plates 5)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 300 feet of an occupied permanent residence, school, hospital, institution, or church? (Plate 6)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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? (Plates 4)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 1000 feet of any other fresh water well or spring? (Plates 4)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within incorporated municipal boundaries or within a defined municipal fresh water well field? (Plate 4)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 300 feet of a wetland? (Plate 7)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release overlying a subsurface mine? (Plate 8) <u>In a Potash District</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release overlying an unstable area such as karst geology? (Plate 9)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within a 100-year floodplain? (Plate 10)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Did the release impact areas not on an exploration, development, production, or storage site?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> 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.

Oil Conservation Division

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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: Andrew Parker Title: Sr. Env. Specialist

Signature:  Date: January 16, 2020

email: andrew@rthicksconsult.com Telephone: 970-570-9535

OCD Only

Received by: Cristina Eads Date: 02/27/2020

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Remediation Plan

Remediation Plan Checklist: *Each of the following items must be included in the plan.*

- ☒ Detailed description of proposed remediation technique
- ☒ Scaled sitemap with GPS coordinates showing delineation points
- ☒ Estimated volume of material to be remediated
- ☒ Closure criteria is to Table 1 specifications subject to 19.15.29.12(C)(4) NMAC
- ☒ Proposed schedule for remediation (note if remediation plan timeline is more than 90 days OCD approval is required)

Deferral Requests Only: *Each of the following items must be confirmed as part of any request for deferral of remediation.*

- ☐ Contamination must be in areas immediately under or around production equipment where remediation could cause a major facility deconstruction.
- ☐ Extents of contamination must be fully delineated.
- ☐ Contamination does not cause an imminent risk to human health, the environment, or groundwater.

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: Andrew Parker Title: Sr. Env. SpecialistSignature:  Date: January 16, 2020email: andrew@rthicksconsult.com Telephone: 970-570-9535**OCD Only**Received by: Cristina Eads Date: 02/27/2020☐ Approved ☐ Approved with Attached Conditions of Approval ☐ Denied ☐ Deferral Approved

Signature: _____ Date: _____

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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: Andrew Parker Title: Sr. Env. Specialist

Signature:  Date: January 16, 2020

email: andrew@rthicksconsult.com Telephone: 970-570-9535

OCD Only

Received by: Cristina Eads Date: 02/27/2020

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: Denied Date: 02/27/2020

Printed Name: Cristina Eads Title: Environmental Specialist

Closure Report

Characterization, Remediation & Closure

R.T. Hicks Consultants, Ltd.

901 Rio Grande Blvd. NW, Suite F-142
Albuquerque, NM 87104

R. T. HICKS CONSULTANTS, LTD.

901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Since 1996
Artesia ▲ Carlsbad ▲ Durango ▲ Midland

January 16, 2020

NMOCD District 1
District 1 - HOBBS
1625 N. French Drive
Hobbs, New Mexico 88240
Via Email:
Electronic Submittal via Portal

RE: Tracking #: NRM2000358734
Characterization, Remediation, and Closure Report
Wool Head 20 State Com 3 Battery

NMOCD:

R.T. Hicks Consultants submits this characterization, remediation, and closure report on the behalf of Advance Energy Partners Hat Mesa, LLC (Advance Energy).

The release occurred on October 18th, 2019 and was caused by the failure of the pressure relieve valve (pop-off valve) at the tank battery. Oil/produced water flowed out of the pop-off valve into the secondary containment. High winds caused limited volume of oil/produced water to spray beyond the containment wall onto the production pad and pasture land.

On October 18th the release extent was characterized by visual identification of moist soil and verified using an Electromagnetic (EM Survey) and soil sampling. Remediation of impacted soil began on October 21st.

Remediation and reclamation was completed by November 12, 2019. The C-141 including the Characterization, Remediation and Closure Forms is attached. We respectfully ask NMOCD for closure of the regulatory file.

Hick Consultants relied on 19.15.29 NMAC for characterization, remediation, and closure reporting for Tracking Number NRM2000358734.

The location of the release is at north of the Wool Head 20 State Com 3 Tank Battery (Latitude/Longitude: 32.458389, -103.600912; NAD 83).

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The report is divided into three sections:

- I. Initial Response
- II. Characterization
- III. Remediation and Closure

Plates

- Plate 1 – Site Map
- Plates 2 through 10 – As labeled on the C-141 Characterization Checklist

Tables

- Table 1 – Nearby OSE Well Summary
- Table 2 – Final Excavation Confirmation Sampling Data Summary

Appendices

- Appendix A – Primer of EM38 Survey
- Appendix B – OSE Well Logs
- Appendix C - Laboratory Certificate of Analyses

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I. Initial Response

The release occurred on October 18th, 2019 and was caused by the failure of the pressure relieve valve (pop-off valve) at the Wool Head 20 State Com 703H tank battery. The well supplying the tank battery was shut down and the tank battery equipment was repaired.

A vacuum truck was mobilized to the site shortly after the discovery of the release and standing liquid in the containment and production pad was recovered (Figure 1).



Figure 1: Recovery of released produced water and oil. Photograph is viewing east. The area between the containment wall and north berm of the production pad defines the north/south extent of sampling grid S1 (Plate 1). Date/Time: 2019-10-18 14:01:32. GPS: 32.4584722 N, 103.6010361 W

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II. Characterization

The following sections address items as described in 19.15.29.11.A, paragraphs 1- 4. Please refer to the C-141 characterization checklist for additional setback criteria and verification (Plates 2-10).

1. **Site Map**

On October 18, 2019 Mr. Saenz of R.T. Hicks Consultants identified the release extent with visual identification of moist soil and verified by conducting an electromagnetic (EM) survey with a Geonics EM-38 (see Appendix A for a discussion on EM surveys). The release extent was delineated to a temperature corrected electrical conductivity (EC) reading of 0.20 dS/m. As discussed in Appendix A, an EC reading of 0.20 dS/m correlates with chloride concentrations below 600 mg/kg. Plate 1 shows the release extent relative to the confirmation sampling grid, where

- Sampling grids S1 through S4 represents the area impacted by oil and produced water spray (Figure 2).
- Sample grid S5 represents the extent of the production pad where pooling of oil and produced water was observed (Figure 1).



Figure 2: Area north of the production pad and tank battery in area of produced water and oil spray with sampling grids S1 through S4 (See Plate 1). Photograph is viewing north. Date: 10.18.2019. GPS: 32.4584722 N, 103.6010361 W.

2. **Depth to Ground Water**

Most recent depth to water data was queried from the USGS and New Mexico Office of the State Engineer (OSE) online databases (Plate 2). Spatial analysis shows:

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- The nearest water well is located 1.3-miles southeast of the release; identified as MISC-392 (OSE well CP-601). Depth to water at this well 178 ft.
- The next two nearest water wells with recorded depth to water are located
 - 1.45-miles southeast (USGS-15377) with a depth to water of 178.75-feet.
 - 1.8-miles northwest (USGS-15845) with a depth to water of 141.9- feet.

Review of well logs available from the New Mexico Office of the State Engineer (OSE) online database (see Table 1) shows that the average depth to the top of the water-bearing zone, for nearby wells under Artesian pressure, exceeds 900 feet below land surface, as shown in the “top of water bearing strata” column. Appendix B contains well logs available online from the OSE.

OSE well logs show that the nearby wells have a minimum of 376 feet of pressure head above the confining layer. It is important to recognize that at CP-01349 ground water is at a depth of 990 feet and confining pressure causes the water column to rise 418 feet for a perceived depth to water of 572 feet bgs.

We recognize that thin water-bearing units above the regional water-bearing zone may not have been recorded by the well drillers. However, more shallow water-bearing zones would be sandstone units within the Dockum Group redbeds and, like the regional water-bearing zone, would be under artesian pressure.

Ground water flow is to the south as demonstrated on the potentiometric map (Plate 3). We relied on the USGS water wells to generate the potentiometric surface. Regionally, USGS water wells show that ground water is within the Alluvium/Bolsom and Chinle Formations.

The potentiometric surface indicates that the depth to water, which is under artesian flow, is approximately 187 feet below ground surface, where
 $187 \text{ feet} = 3737 \text{ ft surface elevation} - 3550 \text{ ft potentiometric surface}.$

3. Wellhead Protection Area

Plate 4 shows that the release extent is not:

- Within incorporated municipal boundaries or within a defined municipal fresh water well field.
- Within ½-mile private and domestic water sources (wells and springs).
- 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
- Within 1000 feet of any other fresh water well or spring

4. Distance to Nearest Significant Water Course

Plate 5 shows that the release extent is not:

- Within ½ mile of a significant watercourse.

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- Within 300 feet of a continuously flowing watercourse or any other significant watercourse.
- Within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark).

5. Soil/Waste Characteristics

The release occurred in an area:

- where depth to water is greater than 100 ft below ground surface (bgs),
- on an active production pad,
- and within pasture land not in-use for oil, gas, or exploration.

According to Table 1 of 19.15.29 NMAC, closure criteria limits are as follows:

Table 1 19.15.29 NMAC		Chloride	GRO+DRO	TPH+Ext	BTEX	Benzene
DTW > 100ft		(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Closure Criteria	0-4 ft (not in-use)	600	--	2,500	50	10
Closure Criteria	>4 ft or "in-use"	20,000	1,000	2,500	50	10

Soil sampling, an EM Survey, and field screening for EC was employed to characterize and delineate the release extent.

Initial field screening of soil during remediation efforts showed that chloride and/or hydrocarbon within the upper 4-feet exceeded closure criteria.

The release occurred within silty sands from the surface to 4.5-feet below ground surface (bgs).

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III. Remediation and Closure

1. **Excavation Protocol**

Excavation of impacted material was determined by field screening with an EM-38 or a Hanna HI98304 DiST 4 handheld meter. EC readings >0.20 dS/m indicated that chloride concentrations are likely to exceed 600 mg/kg. With respect to the upper 4-feet, excavation continued until EC readings showed concentrations <0.20 dS/m within the area of concern – at which time a 5-point composite soil sample was collected for laboratory confirmation via EPA Method

- SM4500 (Chloride)
- 8021B (BTEX)
- 8015M (TPH)

If soil confirmation sample results exceeded closure criteria at the excavation walls, the excavation wall was extended horizontally and resampled. Horizontal excavation continued until subsequent laboratory confirmation showed results below closure criteria.

Excavation depth was determined by 5-point composite sampling of the base. Vertical excavation continued until the base of the excavation exhibited concentrations below closure criteria.



Figure 3: Excavation/remediation of sampling grid S5. Figure 1 shows the same area prior to remediation activities. Photo is viewing east. Date/Time: 2019-11-04 13:21:09. GPS: 32.4584617 N, 103.6009903 W.

Excavated soil was transported to R360 or Lea Land for proper disposal. Clean backfill soil was purchased from Merchant Livestock Company under a Surface Use Agreement.

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2. Remediation Activities

The excavation extent is irregular in shape and covers a surface area of approximately 987 square yards with a volume of approximately 1,182 cu. yds. As shown on Plate 1 the excavation consists of five (5) soil sampling grids representing a 5-point composite sample for the bases and walls of each grid, where

- S1 – S4 was covered by oil and produced water spray only (Figure 2). The top 1-foot of soil was removed to remediate vegetation and surface soils coated with oil and produced water spray. Confirmation sampling shows closure criteria constituents below laboratory detections limits (non-detect).
- S5 was within the production pad (Figure 1). The north berm prevented produced water and oil from migrating off-site. S5 base was divided into two sampling grids (Figure 4),
 - S5 North Base – the area where pooling was observed along the production pad berm
 - S5 South Base – near the tank battery container wall.

S5 grid was excavated to a depth of 4.5 feet where confirmation sampling shows constituents of concern below closure criteria.

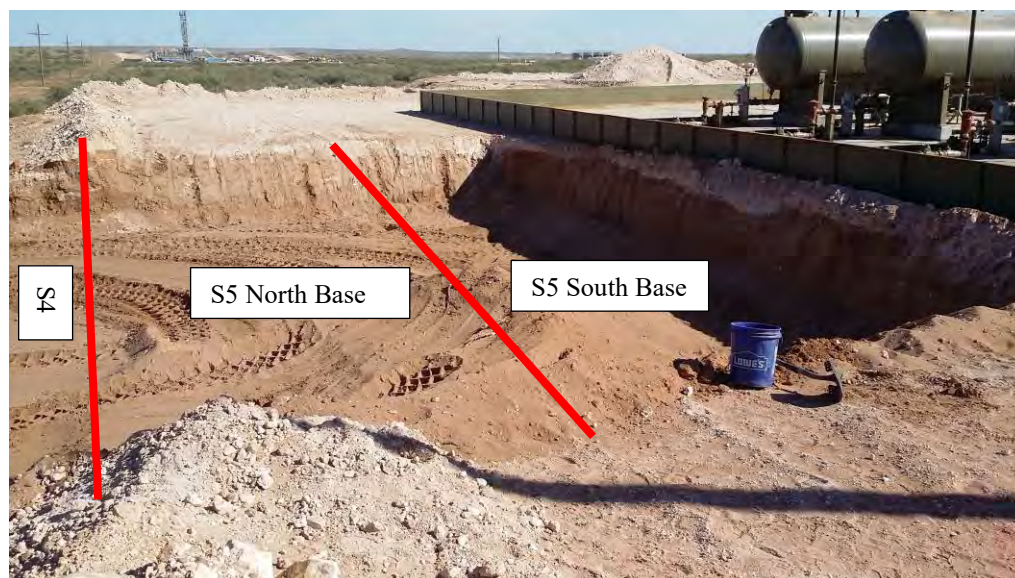


Figure 4: Layout of sampling grid S5. Photo is viewing east.

Table 2 is a summary of analytical results showing final confirmation sampling of the excavation walls and bases. Laboratory Certificate of Analyses are in Appendix C. Chloride, BTEX, and TPH are below Table 1 19.15.29 NMAC closure criteria.

Figure 5, below, shows final restoration after seeding and surface contouring of sampling grids S1 through S4 to blend with the surrounding topography. Figure 6 shows the restored production pad that is within sampling grid S5.

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Figure 6: Backfilling and contouring of sampling grids S1 (background) through S4 (foreground). Photo is viewing northwest.



Figure 5: Final restoration sampling grid S5 that is on an active production pad. Photo is viewing west.

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3. Closure

As discussed above, the release has been reclaimed and restored to meet closure requirements per 19.15.29.12 and 19.15.29.13 NMAC. Therefore, we respectfully request closure of the regulatory file.

Please contact me with any questions at andrew@rthicksconsult.com or 970-570-9535.

Sincerely,
R.T. Hicks Consultants, Ltd.



Andrew Parker
Sr. Env. Specialist

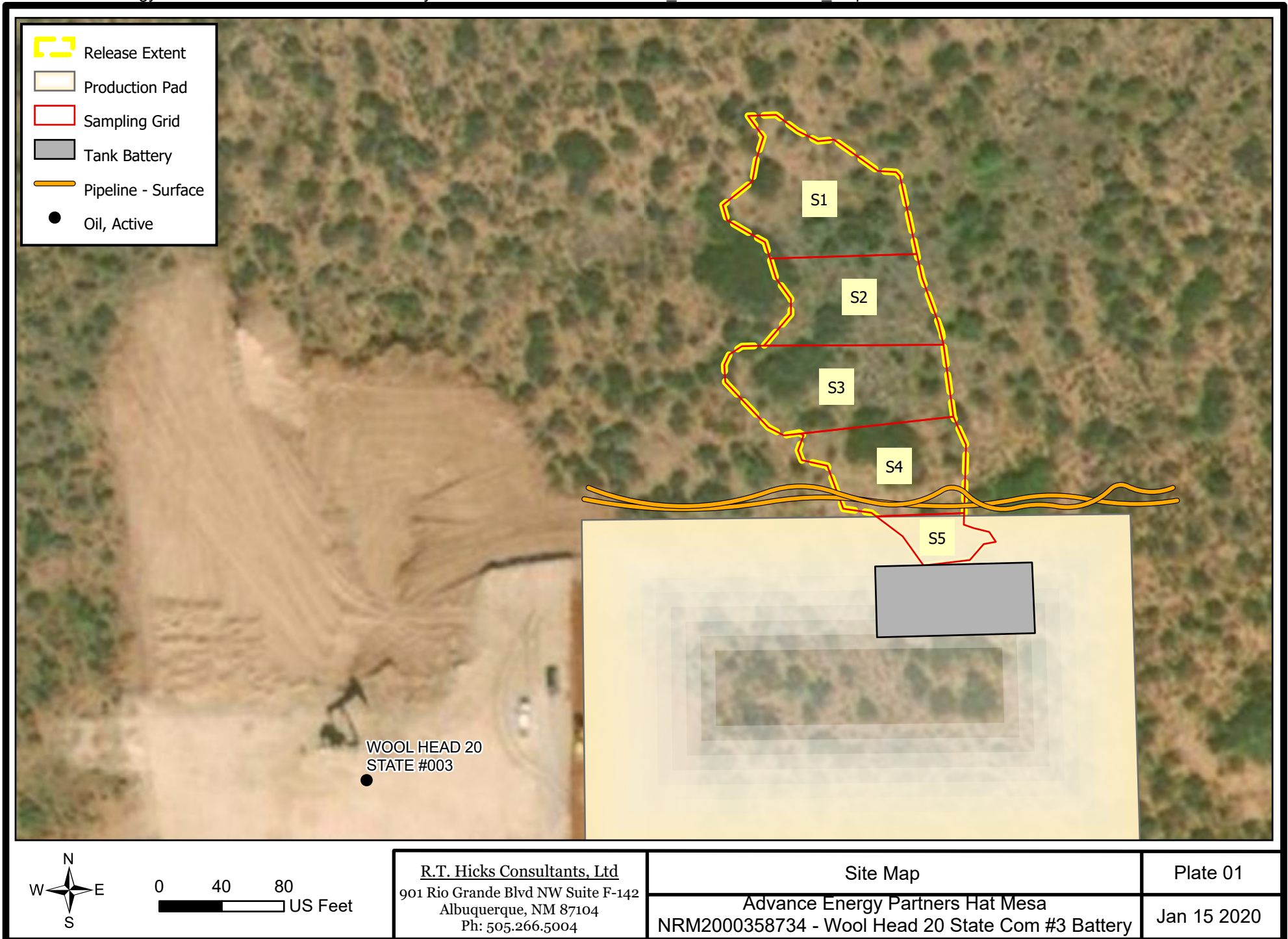
Copy: David Harwell (DHarwell@advanceenergypartners.com);
Advance Energy Partners Hat Mesa, LLC

Plates

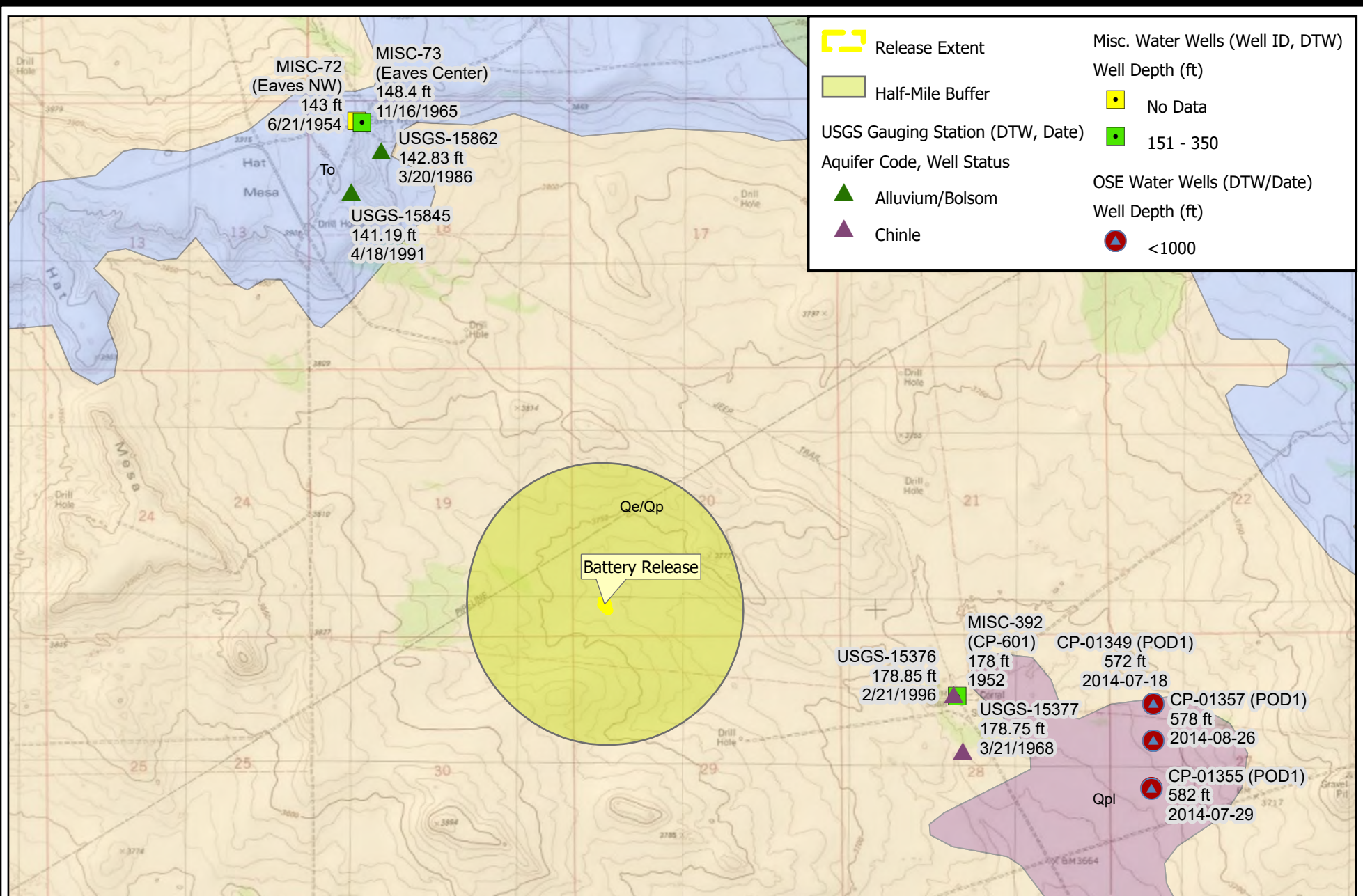
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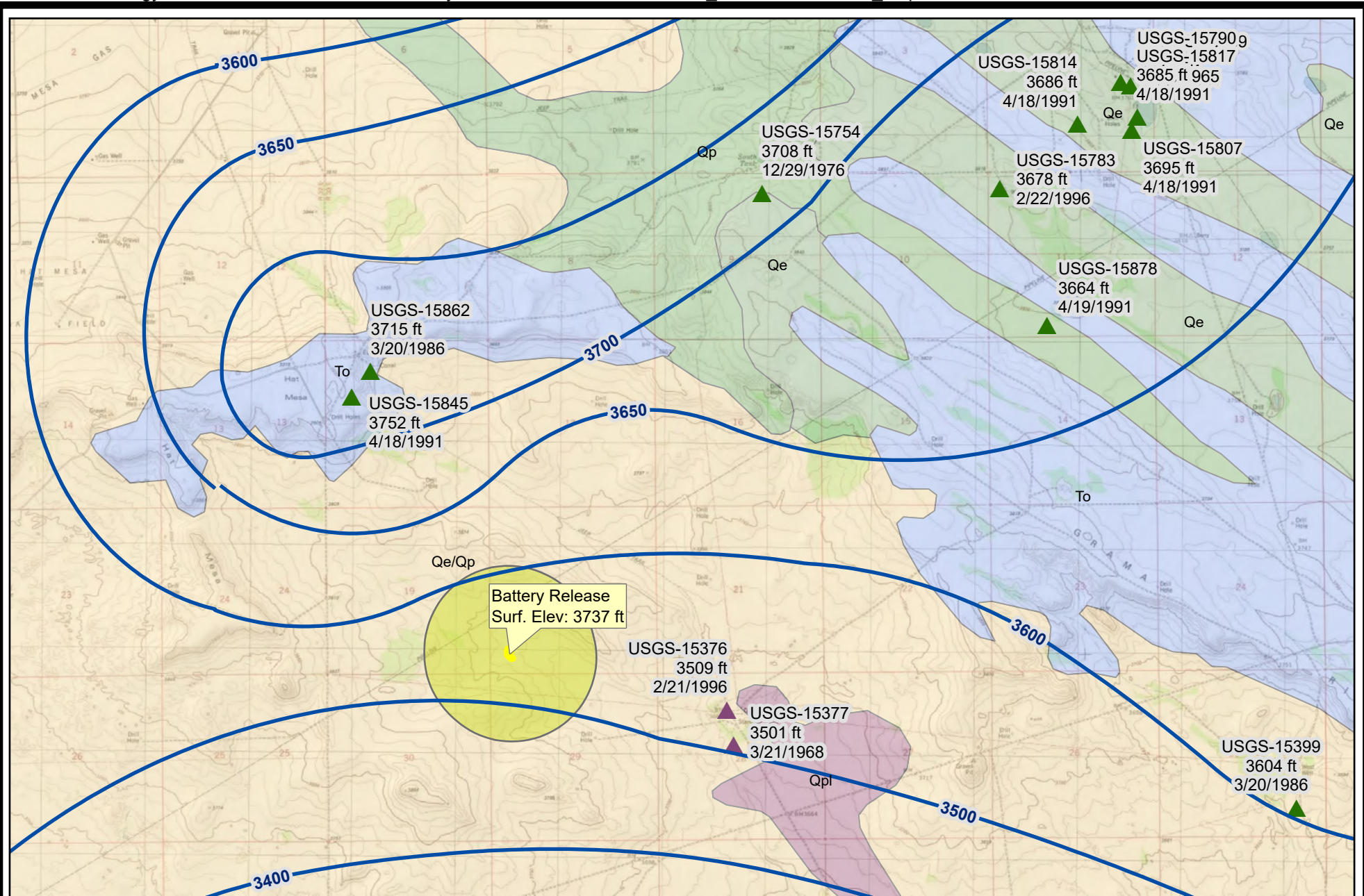
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R.T. Hicks Consultants, Ltd
901 Rio Grande Blvd NW Suite F-142
Albuquerque, NM 87104
Ph: 505.266.5004

Depth to Water
Advance Energy Partners Hat Mesa
NRM2000358734 - Wool Head 20 State Com #3 Battery

Plate 02
Jan 15 2020

M:\Advance Energy\Wool Head 20 State Com 3 Battery Oct 18 2019\ArcGISPro\WH20 3\ArcGISPro\WH20 3.aprx



0 0.5 1
Miles

R.T. Hicks Consultants, Ltd
901 Rio Grande Blvd NW Suite F-142
Albuquerque, NM 87104
Ph: 505.266.5004

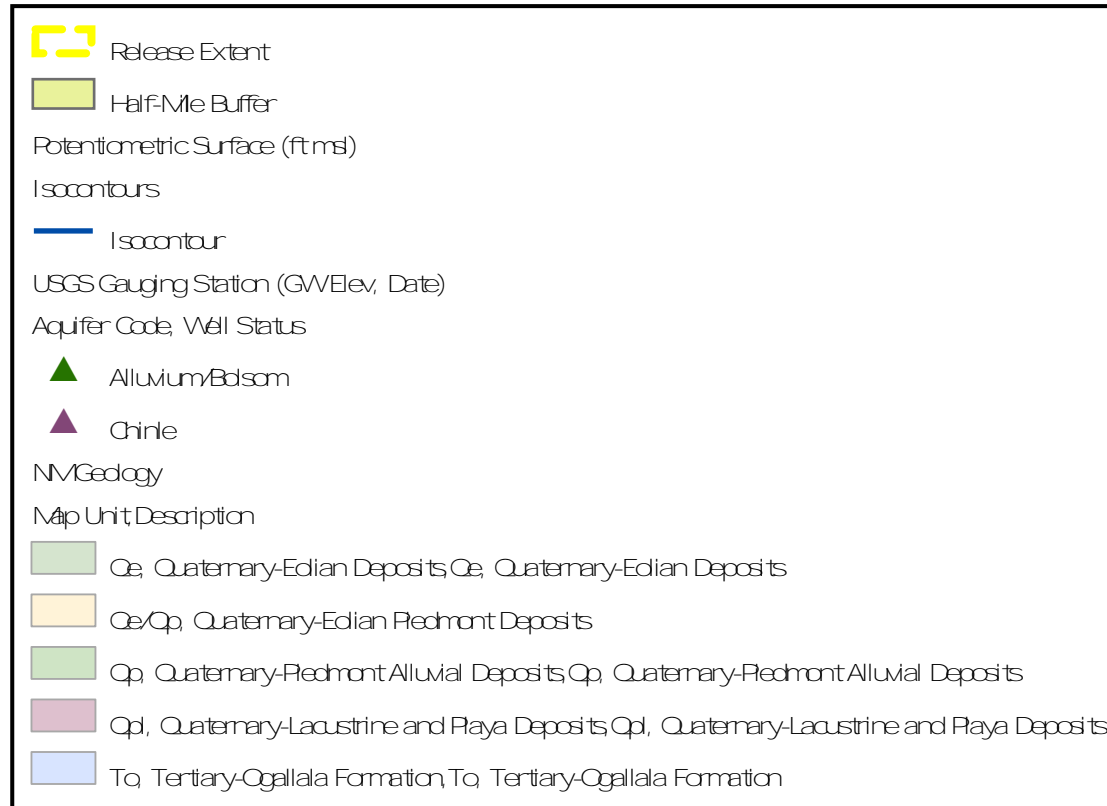
Groundwater Elevation and Potentiometric Surface

Advance Energy Partners Hat Mesa
NRM2000358734 - Wool Head 20 State Com #3 Battery

Plate 03

Jan 15 2020

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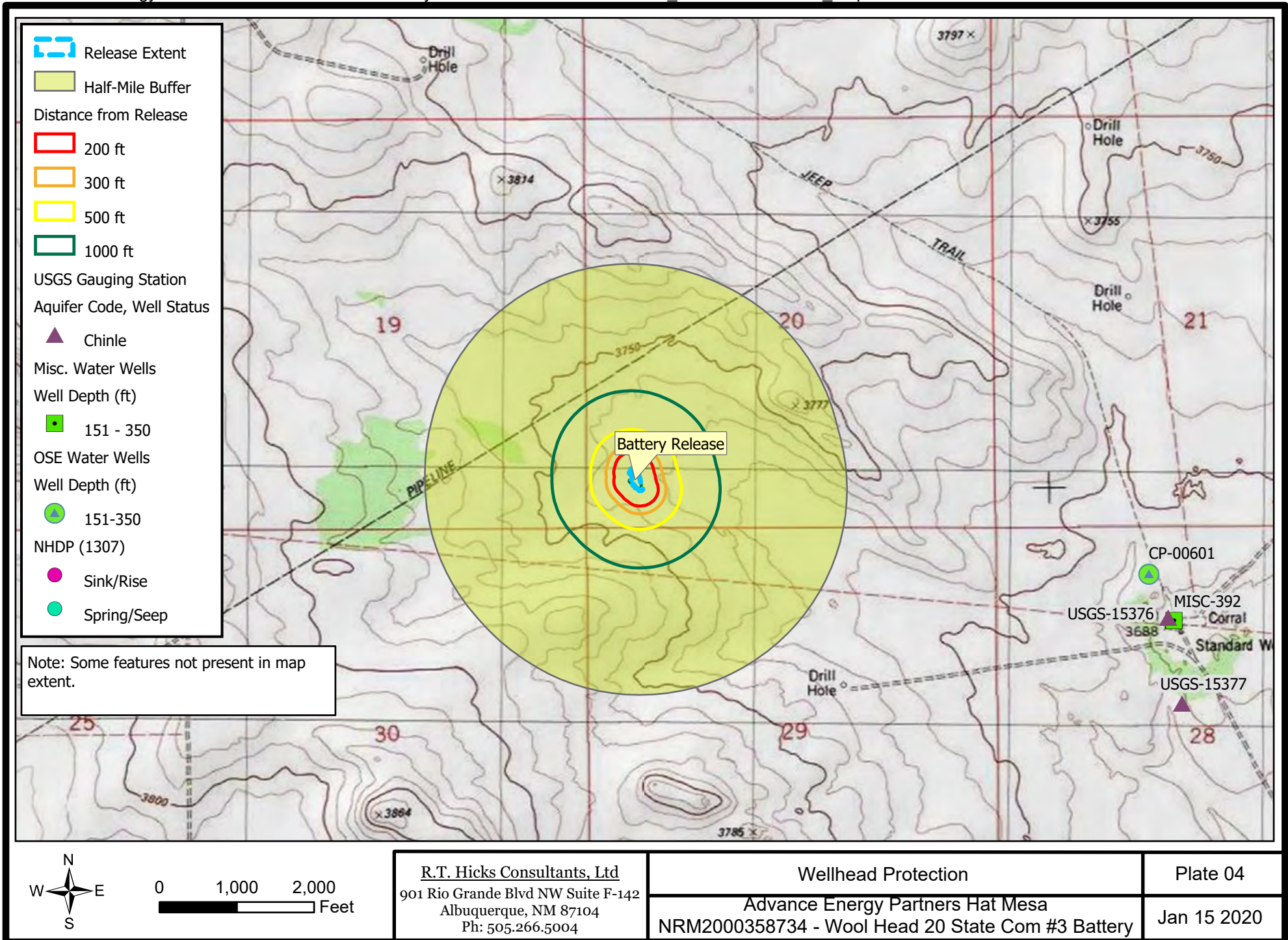


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 901 Rio Grande Blvd NW Suite F-142
 Albuquerque, NM 87104
 Ph: 505.266.5004

Groundwater Elevation and Potentiometric Surface
 Advance Energy Partners Hat Mesa
 NRM2000358734 - Wool Head 20 State Com #3 Battery

Plate 03
 LEGEND
 Jan 15 2020

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0 1,000 2,000
Feet

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901 Rio Grande Blvd NW Suite F-142
Albuquerque, NM 87104
Ph: 505.266.5004

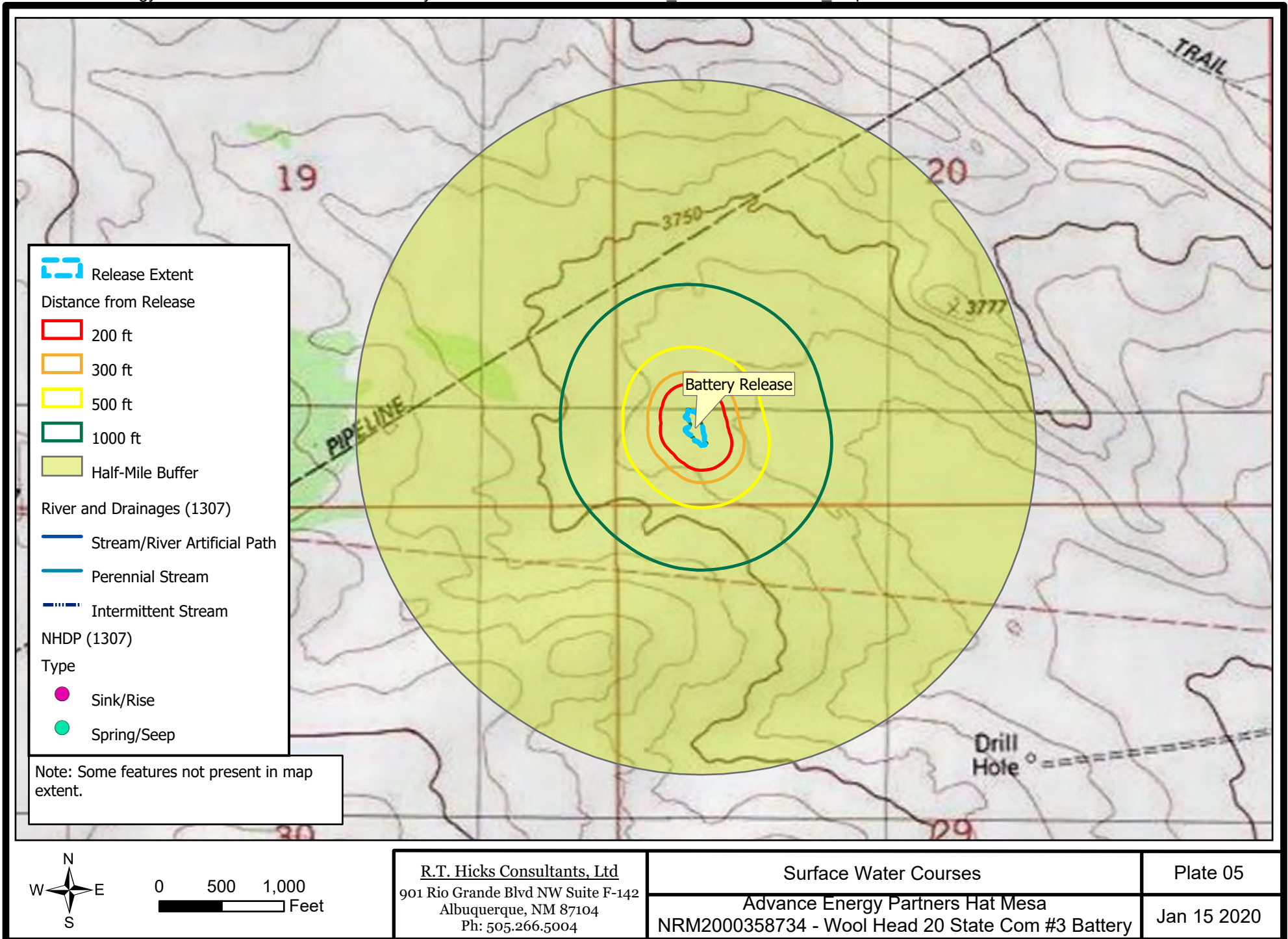
Wellhead Protection

Advance Energy Partners Hat Mesa
NRM2000358734 - Wool Head 20 State Com #3 Battery

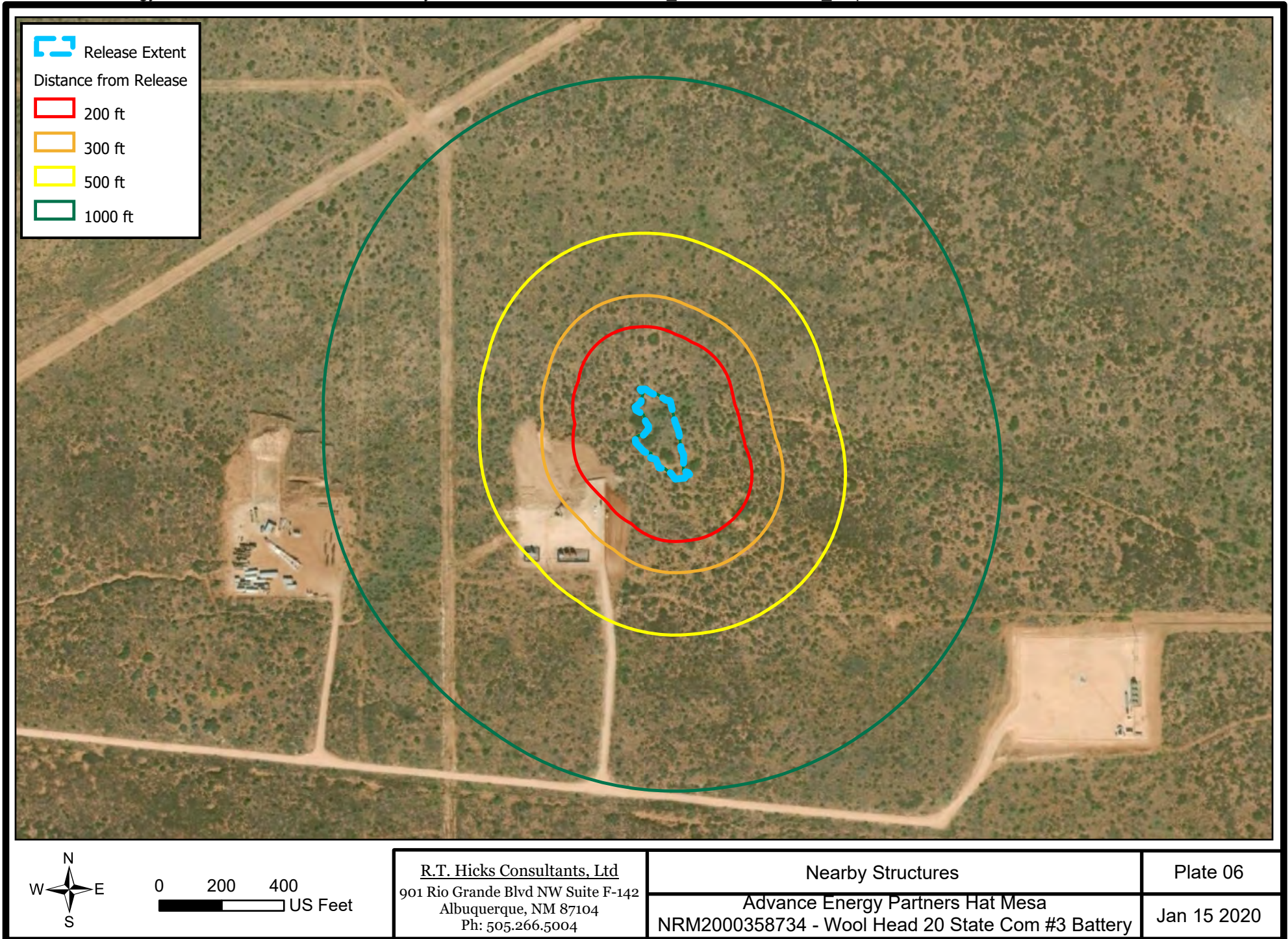
Plate 04

Jan 15 2020

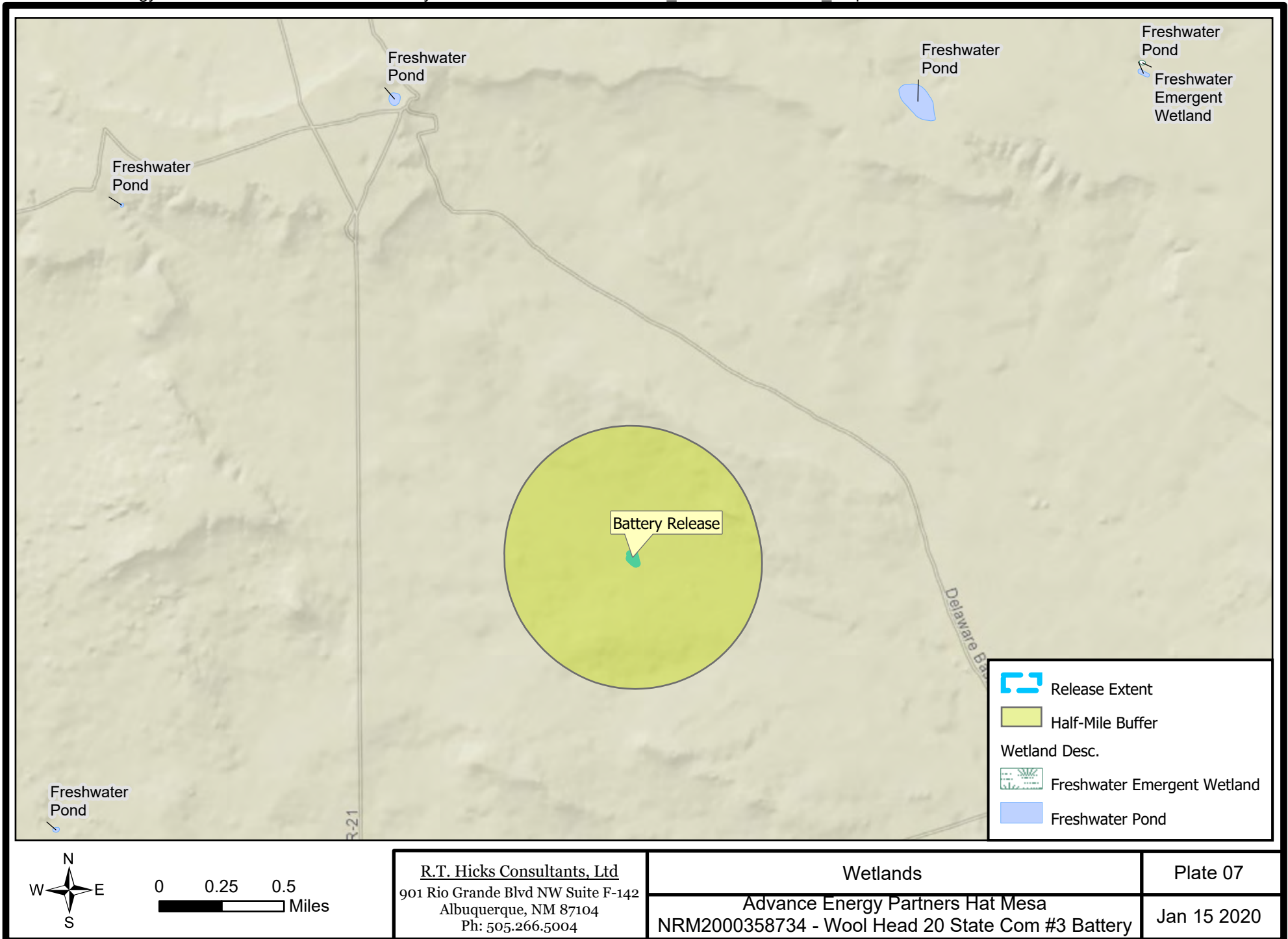
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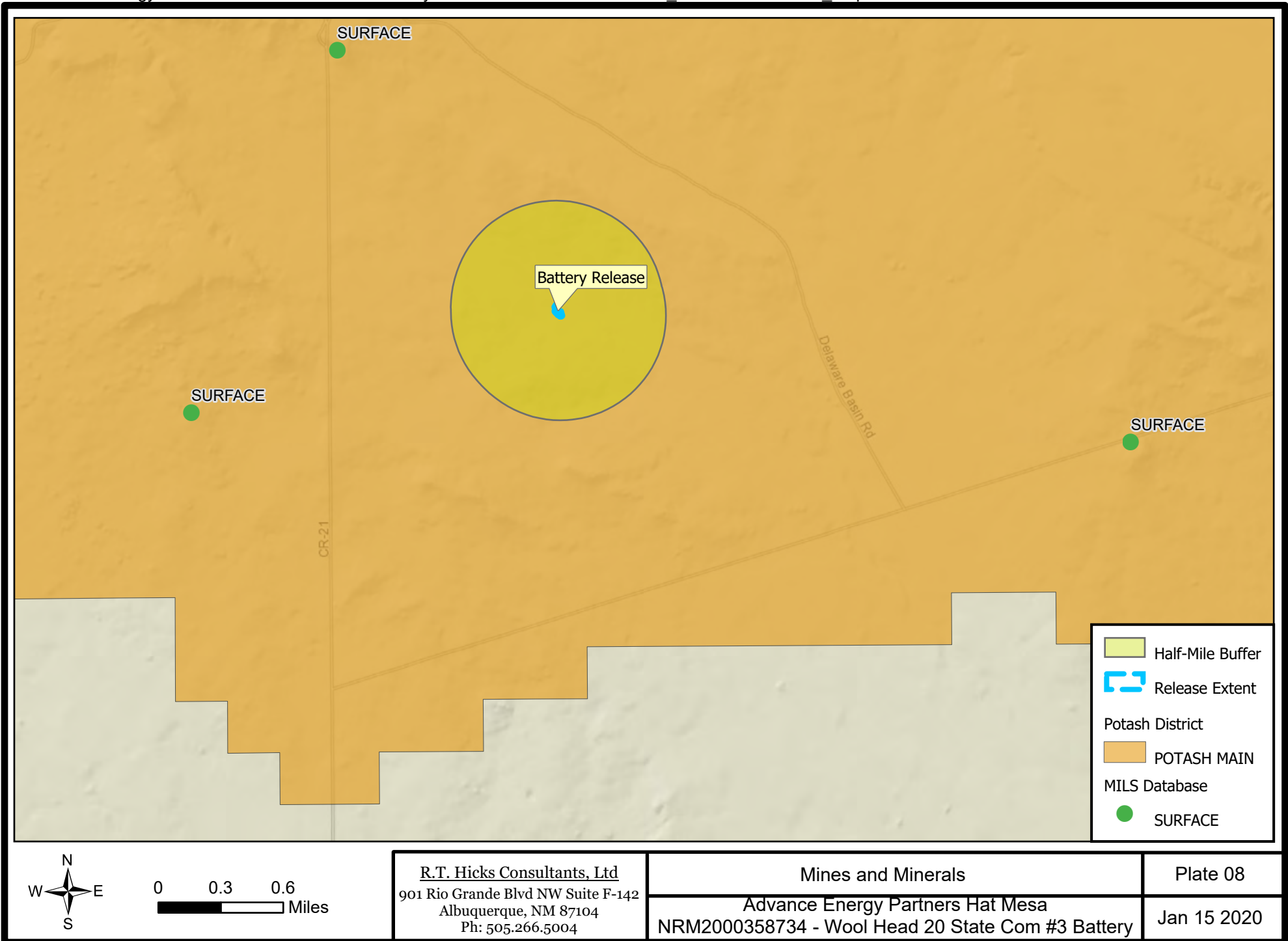
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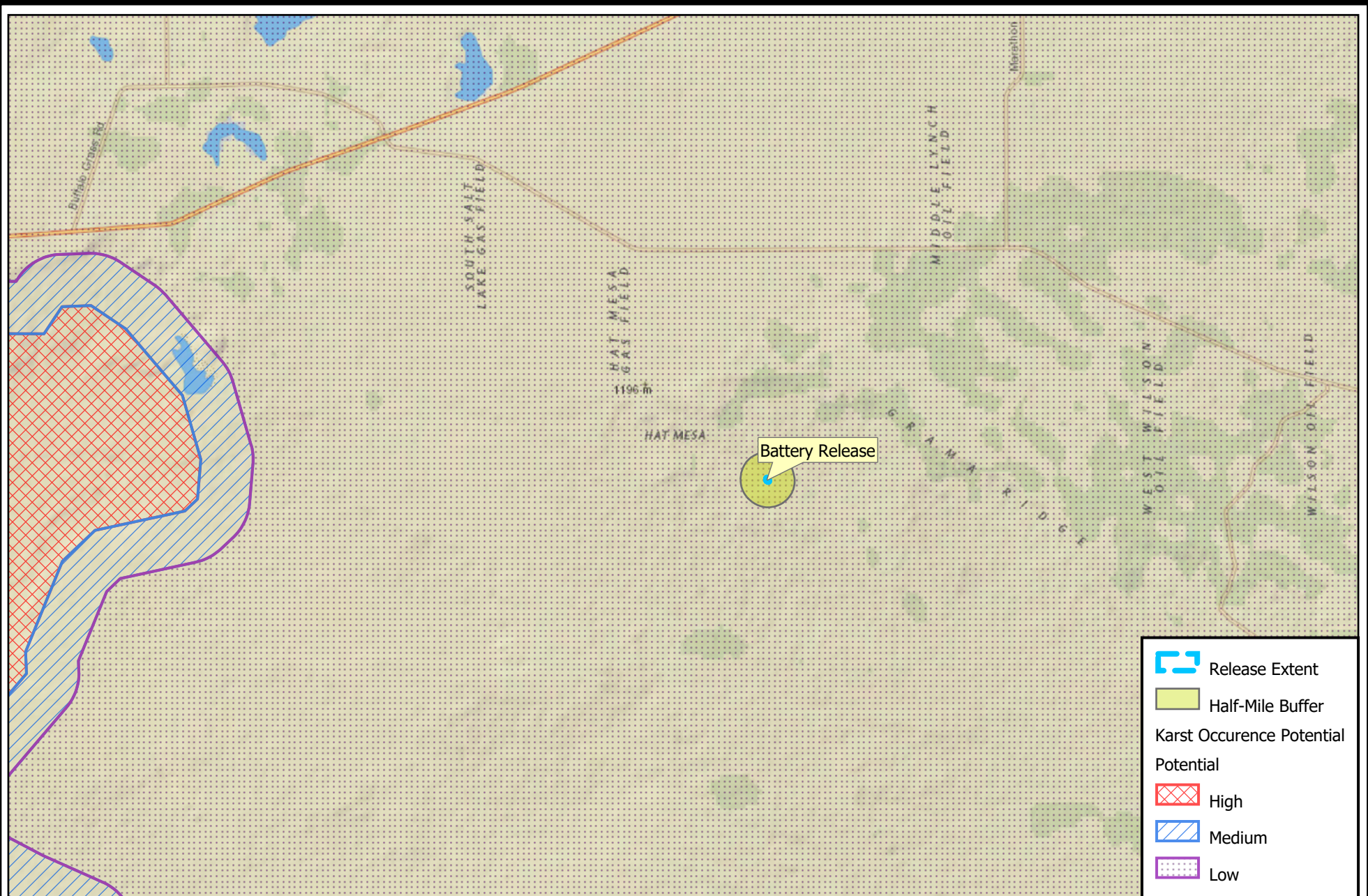
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0 2 4 Miles

R.T. Hicks Consultants, Ltd
901 Rio Grande Blvd NW Suite F-142
Albuquerque, NM 87104
Ph: 505.266.5004

Karst

Plate 09

Advance Energy Partners Hat Mesa
NRM2000358734 - Wool Head 20 State Com #3 Battery

Jan 15 2020

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 Albuquerque, NM 87104
 Ph: 505.266.5004

FEMA Flood Zones
 Advance Energy Partners Hat Mesa
 NRM2000358734 - Wool Head 20 State Com #3 Battery

Plate 10
 Jan 15 2020

Tables

R.T. Hicks Consultants, Ltd.

901 Rio Grande Blvd. NW, Suite F-142
Albuquerque, NM 87104

January 15, 2020

Table 1
OSE Water Well Log Data SummaryTracking #: NRM2000358734
Advance Energy Partners Hat Mesa, LLC

POD Number	Date	Top of Water Bearing Strata	Bottom of Water Bearing Strata	Depth to Water	Source	Height Above Confining Layer
		Feet	Feet	Feet		Feet
CP-00601	1952		223	178		
CP 01349 POD 1	7/18/2014	990	1188	572	Artesian	418
CP 01355 POD 1	7/29/2014	925	1185	582	Artesian	343
CP 01357 POD 1	8/26/2014	945	1286	578	Artesian	367

Jan 15 2020

Table 2
Summary of Analytical

Wool Head 20 State Com 3 Battery
Advance Energy Partners Hat Mesa

Sample ID	Date	Matrix (Soil/Water)	Discrete Depth (Feet)	Top Depth (Feet)	Bottom Depth (Feet)	Chloride (PPM)	GRO+DRO (PPM)	TPH Ext. (PPM)	Benzene (PPM)	BTEX (PPM)	Comments
NMOCD Closure Criteria											
0 - 4 feet & "not in-use"						600	--	2,500	10	50	
> 4 ft or "in-use"						20,000	1,000	2,500	10	50	
Confirmation Sampling											
S1 Base	10/21/2019	Soil		0.0	1.0	<16	<20	<30	<0.05	<0.30	
S1 ER	10/21/2019	Soil		0.0	1.0	<16	<20	<30	<0.05	<0.30	
S1 NR	10/21/2019	Soil		0.0	1.0	<16	<20	<30	<0.05	<0.30	
S1 WR	10/21/2019	Soil		0.0	1.0	<16	<20	<30	<0.05	<0.30	
S2 Base	10/21/2019	Soil	1.0			<16	<20	<30	< 0.05	<0.3	
S2 ER	10/21/2019	Soil		0.0	1.0	<16	<20	<30	<0.05	<0.30	
S2 WR	10/21/2019	Soil		0.0	1.0	<16	<20	<30	<0.05	<0.30	
S3 Base	10/21/2019	Soil	1.0			16	<20	<30	< 0.05	<0.3	
S3 ER	10/21/2019	Soil		0.0	1.0	<16	<20	<30	<0.05	<0.30	
S3 WR	10/21/2019	Soil		0.0	1.0	<16	<20	<30	<0.05	<0.30	
S4 Base	10/23/2019	Soil	1.0			16	<20	<30	<0.05	<0.30	
S4 ER	10/23/2019	Soil		0.0	1.0	<16	<20	<30	<0.05	<0.30	
S4 WR	10/23/2019	Soil		0.0	1.0	<16	<20	<30	<0.05	<0.30	
S5 North Base	10/25/2019	Soil	4.5			48	<128	<147.3	<0.05	<0.30	
S5 South Base	11/4/2019	Soil	4.5			16	<20	<30	<0.05	<0.30	
(S5 Base Averaged)		Soil	4.5			32	<74	<88.65	<0.05	<0.3	
S5 East Wall	11/4/2019	Soil		0.0	4.0	16	<20	<30	<0.05	<0.30	
S5 West Wall	11/4/2019	Soil		0.0	4.0	32	<20	<30	<0.05	<0.30	
S5 South Wall	11/4/2019	Soil		0.0	4.0	48	<20	<30	<0.05	<0.30	Below Containment
S5 South Wall Base	11/4/2019	Soil	4.5			16	<20	<30	<0.05	<0.30	Below Containment

Notes:

ER East Ramp (Wall)
WR West Ramp (Wall)
NR North Ramp (Wall)

Appendix A

EM Survey Calibration

R.T. Hicks Consultants, Ltd.

901 Rio Grande Blvd. NW, Suite F-142
Albuquerque, NM 87104

R. T. HICKS CONSULTANTS, LTD.

901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Fax: 505.266-0745
✱ Durango, CO ✱ Carlsbad, NM ✱ Midland, TX

ELECTROMAGNETIC SURVEY

RELATIONSHIP WITH ELECTRICAL CONDUCTIVITY AND CHLORIDE

Revised: October 12, 2019 (DRAFT)

Electromagnetic surveys (EM Survey) are commonly used to measure electrical conductivity (EC, “soil salinity”) in soils. Employing a Geonics EM38 (Exhibit 1), field personnel can effectively delineate the horizontal extent of a produced water release by measuring EC and monitoring for EC changes between background and higher EC readings. Increasing EC measurements suggest that the edge of the release extent is approaching.



Exhibit 1: Measuring EC with the EM38 in the vertical position.

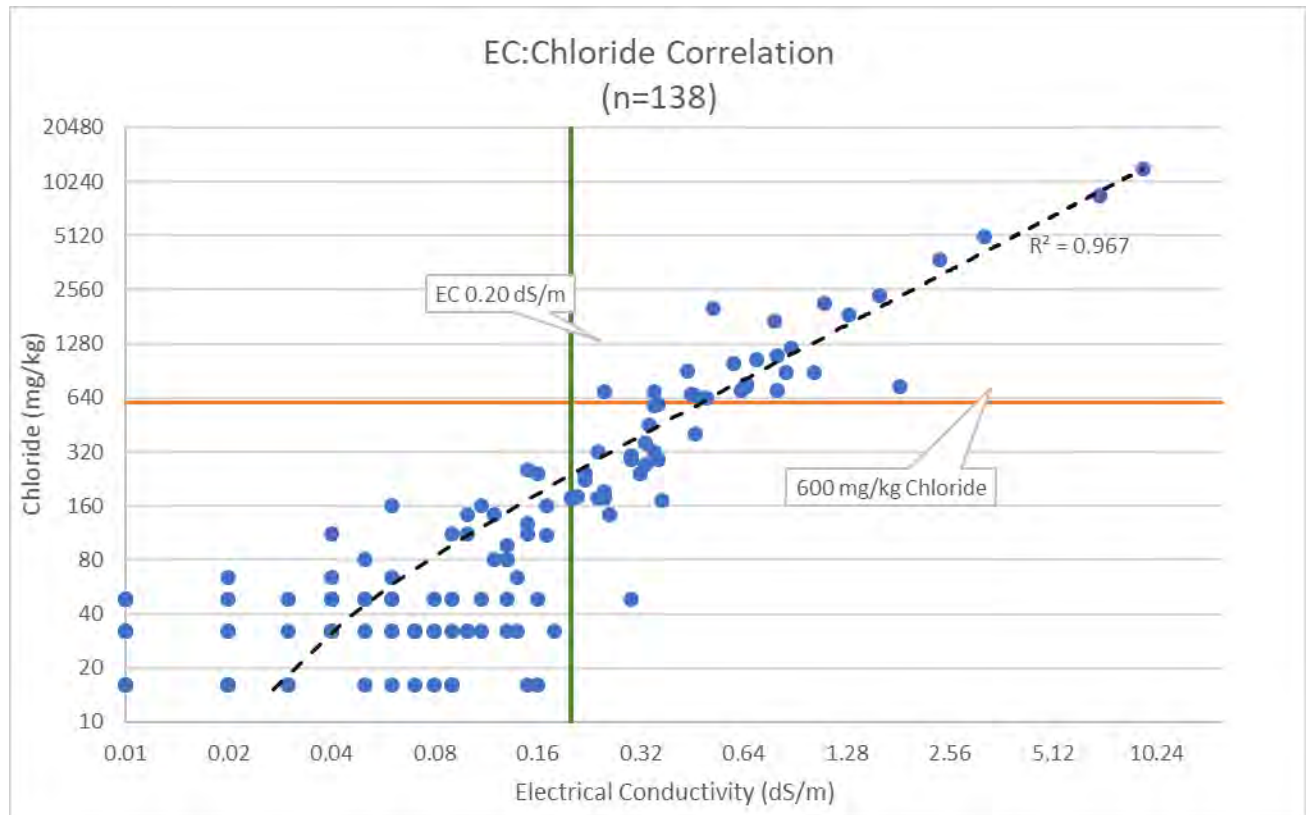
The EM38 detects EC from the surface to a depth of approximately 4-feet. EC measurements can be obtained in the vertical or horizontal positions. In the vertical position, EC readings are weighted toward the lower depths of 3 to 4 feet. In the horizontal position, EC readings are weighted toward the upper 0 to 2 feet. If a higher EC reading is obtained in the horizontal position than the vertical position, produced water has likely impacted the upper surface more than at lower depths. If a higher EC reading is obtained in the vertical position than the horizontal position, produced water has likely impacted lower soils than the upper surface soils.

The below charts show the correlation between EC and Chloride (Cl) measurements measured over 139 sample points (n=138). The EC measurements collected in the field are temperature corrected (TC) to 25° Celsius.

25 November 2019

Page 2

Analysis of data shows that an EC values greater than 0.20 dS/m is the delineation threshold where chloride in soil has a potential to be greater than 600 mg/kg. Furthermore, field personnel can survey a release and identify “hot spots” with the highest EC readings. These hot spots are likely areas where impacted to near surface soils (0 to 4 feet) from released produced water will be the greatest.



Appendix B

OSE Well Logs

R.T. Hicks Consultants, Ltd.
901 Rio Grande Blvd. NW, Suite F-142
Albuquerque, NM 87104

Revised December 1975

IMPORTANT — READ INSTRUCTIONS ON BACK BEFORE FILLING OUT THIS FORM.

Declaration of Owner of Underground Water Right

CAPITAN BASIN
BASIN NAME

Declaration No. CP-601

Date received April 17, 1979

STATE ENGINEER OFFICE
SANTA FE, N.M. 87501

STATEMENT

1. Name of Declarant THE MERCHANT LIVESTOCK COMPANY
Mailing Address P.O. Box 548 Carlsbad
County of Eddy, State of New Mexico
2. Source of water supply shallow
(artesian or shallow water aquifer)
3. Describe well location under one of the following subheadings:
a. $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$ of Sec. 28 Twp. 21S Rge. 33-E N.M.P.M., in
Lea County.
b. Tract No. _____ of Map No. _____ of the _____
c. X = _____ feet, Y = _____ feet, N. M. Coordinate System _____ Zone
in the _____ Grant.
On land owned by _____
4. Description of well: date drilled 1952 driller _____ depth 223 feet.
outside diameter of casing 6 5/8 inches; original capacity _____ gal. per min.; present capacity 3
gal. per min.; pumping lift _____ feet; static water level 178 feet (above) (below) land surface;
make and type of pump _____
make, type, horsepower, etc., of power plant _____
Fractional or percentage interest claimed in well 100%
5. Quantity of water appropriated and beneficially used up to 3
(~~acre feet per annum~~) (acre feet per annum)
for stock water purposes.
6. Acreage actually irrigated _____ acres, located and described as follows (describe only lands actually irrigated):

Subdivision	Sec.	Twp.	Range	Acres Irrigated	Owner
			<u>stock only</u>		<u>The Merchant Livestock Co.</u>

(Note: location of well and acreage actually irrigated must be shown on plat on reverse side.)

7. Water was first applied to beneficial use _____ 1952 _____ and since that time
month day year
has been used fully and continuously on all of the above described lands or for the above described purposes except
as follows: _____

8. Additional statements or explanations _____

name of well - Standard

I, J. D. Merchant, Jr., President being first duly sworn upon my oath, depose and say that the above is a full and complete statement prepared in accordance with the instructions on the reverse side of this form and submitted in evidence of ownership of a valid underground water right, that I have carefully read each and all of the items contained therein and that the same are true to the best of my knowledge and belief.

THE MERCHANT LIVESTOCK CO. declarant.by: J. D. Merchant, Jr., President
day of April, A.D. 1979Subscribed and sworn to before me this 12thMy commission expires March 2, 1980

Notary Public

FILED

UNDER NEW MEXICO LAW A DECLARATION IS ONLY A STATEMENT OF DECLARANT'S CLAIM.
ACCEPTANCE FOR FILING DOES NOT CONSTITUTE APPROVAL OR REJECTION OF THE CLAIM.

563298

Locate well and areas actually irrigated as accurately as possible on following plat:

Section (s) _____, Township _____, Range _____ N. M. P. M.

INSTRUCTIONS

Declaration shall be executed (preferably typewritten) in triplicate and must be accompanied by a \$1.00 filing fee. Each of triplicate copies must be properly signed and attested.

A separate declaration must be filed for each well in use.

All blanks shall be filled out fully. Required information which cannot be sworn to by declarant shall be supplied by affidavit of person or persons familiar with the facts and shall be submitted herewith.

Secs. 1-3. Complete all blanks.

Sec. 4. Fill out all blanks applicable as fully as possible.

Sec. 5. Irrigation use shall be stated in acre feet of water per acre per year applied on the land. If used for domestic, municipal, or other purposes, state total quantity in acre feet used annually.

Sec. 6. Describe only the acreage actually irrigated. When necessary to clearly define irrigated acreages, describe to nearest $2\frac{1}{2}$ acre subdivision. If located on unsurveyed lands, describe by legal subdivision "as projected" from the nearest government survey corners, or describe by metes and bounds and tie survey to some permanent, easily-located natural object.

Sec. 7. Explain and give dates as nearly as possible of any years when all or part of acreage claimed was not irrigated.

Sec. 8. If well irrigates or supplies supplemental water to any other land than that described above, or if land is also irrigated from any other source, explain under this section. Give any other data necessary to fully describe water right.

If additional space is necessary, use a separate sheet or sheets and attach securely hereto.

SF

EL

*70 APR 20 PM 3 00

April 17, 1979

STATE ENGINEER OFFICE
CARLSBAD, NM. 81501

Files: CP-584; CP-585; CP-586; CP-587; CP-588;
CP-589; CP-590; CP-591; CP-592; CP-593;
CP-594; CP-595; CP-596; CP-597; CP-598;
CP-599; CP-600; CP-601; CP-602

The Merchant Livestock Company
P. O. Box 548
Carlsbad, NM 88220

Gentlemen:

Enclosed are your copies of Declarations of Owner of Underground Water Right as numbered above, which have been filed for record in the office of the State Engineer.

Please refer to each individual number in all future correspondence concerning these declarations.

The filing of these declarations does not indicate affirmation or rejection of the statements contained therein.

Yours very truly,

J. C. Groseclose
Basin Supervisor

JCG/fh
Encls.
cc: Santa Fe

563298



New Mexico Office of the State Engineer

Point of Diversion Summary

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

Well Tag	POD Number	Q64	Q16	Q4	Sec	Tws	Rng	X	Y
CP 01349	POD1	2	3	1	27	21S	33E	635304	3591576

Driller License: 421	Driller Company: GLENN'S WATER WELL SERVICE	
Driller Name: GLENN, CLARK A."CORKY"		
Drill Start Date: 07/12/2014	Drill Finish Date: 07/18/2014	Plug Date:
Log File Date: 08/04/2014	PCW Rcv Date:	Source: Artesian
Pump Type:	Pipe Discharge Size:	Estimated Yield:
Casing Size: 7.00	Depth Well: 1188 feet	Depth Water: 572 feet

Water Bearing Stratifications:	Top	Bottom	Description
	990	1188	Sandstone/Gravel/Conglomerate

Casing Perforations:	Top	Bottom
	721	1188



WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

STATE ENGINEER OFFICE
SOSWELL, NEW MEXICO



2014 SEP 10 PM 2:15

1. GENERAL AND WELL LOCATION	OSE POD NUMBER (WELL NUMBER) CP-1355 (East Standard South) *** Revised 09/09/14 ***				OSE FILE NUMBER(S)			
	WELL OWNER NAME(S) Merchants/Glenn's Water Well Service, Inc.				PHONE (OPTIONAL) 575-398-2424			
	WELL OWNER MAILING ADDRESS P. O. Box 692				CITY Tatum		STATE NM	ZIP 88267
	WELL LOCATION (FROM GPS)	DEGREES LATITUDE 32	MINUTES 26	SECONDS 54.8 N	* ACCURACY REQUIRED: ONE TENTH OF A SECOND			
		LONGITUDE 103	33	58.3 W	* DATUM REQUIRED: WGS 84			
DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS - PLSS (SECTION, TOWNSHIP, RANGE) WHERE AVAILABLE NE1/4NW1/4SW1/4 Section 27, Township 21 South, Range 33 East on Merchants Livestock Land								
2. DRILLING & CASING INFORMATION	LICENSE NUMBER WD 421		NAME OF LICENSED DRILLER Corky Glenn			NAME OF WELL DRILLING COMPANY Glenn's Water Well Service, Inc.		
	DRILLING STARTED 07/22/14		DRILLING ENDED 07/29/14		DEPTH OF COMPLETED WELL (FT) 1,192'		BORE HOLE DEPTH (FT) 1,192'	
							DEPTH WATER FIRST ENCOUNTERED (FT) 925'	
	COMPLETED WELL IS: <input checked="" type="radio"/> ARTESIAN <input type="radio"/> DRY HOLE <input type="radio"/> SHALLOW (UNCONFINED)						STATIC WATER LEVEL IN COMPLETED WELL (FT) 582'	
	DRILLING FLUID: <input checked="" type="radio"/> AIR <input type="radio"/> MUD ADDITIVES - SPECIFY:							
	DRILLING METHOD: <input checked="" type="radio"/> ROTARY <input type="radio"/> HAMMER <input type="radio"/> CABLE TOOL <input type="radio"/> OTHER - SPECIFY:							
	DEPTH (feet bgl)		BORE HOLE DIAM (inches)	CASING MATERIAL AND/OR GRADE (include each casing string, and note sections of screen)	CASING CONNECTION TYPE	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches)
	FROM	TO						
	0'	40'	20"	16"	None	15 1/2"	.250	
	0'	757'	14 3/4"	9 5/8"	Thread & Collar	8.921"	36 lbs.	none
690'	1,192'	8 3/4"	7" (502.14' Total)	Thread & Collar	6.366"	23 lbs.	1/8"	
			317.96 perforated					
			on bottom of liner					
3. ANNULAR MATERIAL	DEPTH (feet bgl)		BORE HOLE DIAM. (inches)	LIST ANNULAR SEAL MATERIAL AND GRAVEL PACK SIZE-RANGE BY INTERVAL	AMOUNT (cubic feet)	METHOD OF PLACEMENT		
	FROM	TO						
	0'	40'	20"	Cemented	2 yds.	Top Pour		
	0	757'	14 3/4"	Float and shoe cemented to surface	962	Circulated		

FOR OSE INTERNAL USE

WR-20 WELL RECORD & LOG (Version 06/08/2012)

FILE NUMBER	CP-1355	POD NUMBER	1	TRN NUMBER	549450
LOCATION	Expi	215.33E.27.312			PAGE 1 OF 2

4. HYDROGEOLOGIC LOG OF WELL	DEPTH (feet bgl)		THICKNESS (feet)	COLOR AND TYPE OF MATERIAL ENCOUNTERED - INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES (attach supplemental sheets to fully describe all units)	WATER BEARING? (YES / NO)	ESTIMATED YIELD FOR WATER- BEARING ZONES (gpm)
	FROM	TO				
	0	4'	4'	Sand	<input type="radio"/> Y <input checked="" type="radio"/> N	
	4'	28'	24'	Caliche	<input type="radio"/> Y <input checked="" type="radio"/> N	
	28'	120'	92'	Sand & Clay	<input type="radio"/> Y <input checked="" type="radio"/> N	
	120'	260'	140'	Red Clay	<input type="radio"/> Y <input checked="" type="radio"/> N	
	260'	757'	497'	Red & Brown Shale, and Clay (some blue)	<input type="radio"/> Y <input checked="" type="radio"/> N	
	757'	815'	58'	Red & Brown Shale	<input type="radio"/> Y <input checked="" type="radio"/> N	
	815'	840'	25'	Blue Clay & Shale	<input type="radio"/> Y <input checked="" type="radio"/> N	
	840'	925'	85'	Red and Brown Shale (some sandrock)	<input type="radio"/> Y <input checked="" type="radio"/> N	
	925'	975'	50'	Watersand and Gravel	<input checked="" type="radio"/> Y <input type="radio"/> N	
	975'	1,185'	210'	Watersand (brown sandrock)	<input checked="" type="radio"/> Y <input type="radio"/> N	
	1,185'	1,192'	7'	Red Shale	<input type="radio"/> Y <input checked="" type="radio"/> N	
					<input type="radio"/> Y <input checked="" type="radio"/> N	
					<input type="radio"/> Y <input checked="" type="radio"/> N	
					<input type="radio"/> Y <input checked="" type="radio"/> N	
					<input type="radio"/> Y <input checked="" type="radio"/> N	
					<input type="radio"/> Y <input checked="" type="radio"/> N	
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					<input type="radio"/> Y <input checked="" type="radio"/> N	
					<input type="radio"/> Y <input checked="" type="radio"/> N	
					<input type="radio"/> Y <input checked="" type="radio"/> N	
					<input type="radio"/> Y <input checked="" type="radio"/> N	
METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA: <input checked="" type="radio"/> PUMP					TOTAL ESTIMATED WELL YIELD (gpm):	
<input type="radio"/> AIR LIFT <input type="radio"/> BAILER <input type="radio"/> OTHER - SPECIFY:						
5. TEST; RIG SUPERVISION	WELL TEST TEST RESULTS - ATTACH A COPY OF DATA COLLECTED DURING WELL TESTING, INCLUDING DISCHARGE METHOD, START TIME, END TIME, AND A TABLE SHOWING DISCHARGE AND DRAWDOWN OVER THE TESTING PERIOD.					
	MISCELLANEOUS INFORMATION:					
	0' to 757' drilled with mud. 757' to 1192' drilled with air and foam.					
PRINT NAME(S) OF DRILL RIG SUPERVISOR(S) THAT PROVIDED ONSITE SUPERVISION OF WELL CONSTRUCTION OTHER THAN LICENSEE:						
6. SIGNATURE	THE UNDERSIGNED HEREBY CERTIFIES THAT, TO THE BEST OF HIS OR HER KNOWLEDGE AND BELIEF, THE FOREGOING IS A TRUE AND CORRECT RECORD OF THE ABOVE DESCRIBED HOLE AND THAT HE OR SHE WILL FILE THIS WELL RECORD WITH THE STATE ENGINEER AND THE PERMIT HOLDER WITHIN 20 DAYS AFTER COMPLETION OF WELL DRILLING:					
	<div style="display: flex; justify-content: space-between;"> <div>  SIGNATURE OF DRILLER / PRINT SIGNED NAME </div> <div>  DATE </div> </div>					

FOR USE INTERNAL USE

WR-20 WELL RECORD & LOG (Version 06/08/2012)

FILE NUMBER	CP-1355	POD NUMBER	1	TRN NUMBER	549450
LOCATION	215.33E.27.312				PAGE 2 OF 2



WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

1. GENERAL AND WELL LOCATION	OSE POD NUMBER (WELL NUMBER) CP - 1355 East Standard (South)				OSE FILE NUMBER(S)			
	WELL OWNER NAME(S) Merchants Livestock/Glenn's Water Well Service, Inc.				PHONE (OPTIONAL) (575)398-2424			
	WELL OWNER MAILING ADDRESS P.O. Box 692				CITY Tatum		STATE NM	ZIP 88267
	WELL LOCATION (FROM GPS)	DEGREES LATITUDE 32	MINUTES 26	SECONDS 54.8	N	* ACCURACY REQUIRED: ONE TENTH OF A SECOND		
	LONGITUDE 103	33	58.3	W	* DATUM REQUIRED: WGS 84			
DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS - PLSS (SECTION, TOWNSHIP, RANGE) WHERE AVAILABLE NE/NW/SW Sec. 27, T21S, R33E on Merchants Livestock Land								
2. DRILLING & CASING INFORMATION	LICENSE NUMBER WD 421		NAME OF LICENSED DRILLER Corky Glenn			NAME OF WELL DRILLING COMPANY Glenn's Water Well Service, Inc.		
	DRILLING STARTED 7/29/14		DRILLING ENDED 8/2/14		DEPTH OF COMPLETED WELL (FT) 1192'		BORE HOLE DEPTH (FT) 1192'	
					DEPTH WATER FIRST ENCOUNTERED (FT) 925'			
	COMPLETED WELL IS: <input checked="" type="radio"/> ARTESIAN <input type="radio"/> DRY HOLE <input type="radio"/> SHALLOW (UNCONFINED)						STATIC WATER LEVEL IN COMPLETED WELL (FT) 582'	
	DRILLING FLUID: <input type="radio"/> AIR <input type="radio"/> MUD ADDITIVES - SPECIFY:							
	DRILLING METHOD: <input checked="" type="radio"/> ROTARY <input type="radio"/> HAMMER <input type="radio"/> CABLE TOOL <input type="radio"/> OTHER - SPECIFY:							
	DEPTH (feet bgl)		BORE HOLE DIAM (inches)	CASING MATERIAL AND/OR GRADE (include each casing string, and note sections of screen)	CASING CONNECTION TYPE	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches)
	FROM	TO						
	0'	40'	20"	16"	None	15 1/2"	.250	
	0'	757'	14 3/4"	9 5/8"	Thread and Collar	.352	36 lbs.	none
757'	1192'	8 3/4"	7"	Thread and Collar	6.5"	23 lbs.	1/8"	
3. ANNULAR MATERIAL	DEPTH (feet bgl)		BORE HOLE DIAM. (inches)	LIST ANNULAR SEAL MATERIAL AND GRAVEL PACK SIZE-RANGE BY INTERVAL	AMOUNT (cubic feet)	METHOD OF PLACEMENT		
	FROM	TO						
	0'	40'	20"	Cemented	2 yds	Top Pour		
	0'	757'	14 3/4"	Float and Shoe Cemented to Surface	1034	Circulated		


FOR OSE INTERNAL USE

WR-20 WELL RECORD & LOG (Version 06/08/2012)

FILE NUMBER	CP-1355	POD NUMBER	1	TRN NUMBER	549450
LOCATION	Exp	21S.33E.27.312			PAGE 1 OF 2

DEPTH (feet bgl)	THICKNESS (feet)	COLOR AND TYPE OF MATERIAL ENCOUNTERED - INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES (attach supplemental sheets to fully describe all units)	WATER BEARING? (YES / NO)	ESTIMATED YIELD FOR WATER-BEARING ZONES (gpm)	
					FROM
0'	4'	4'	Soil	<input type="radio"/> Y <input checked="" type="radio"/> N	
4'	28'	24'	Caleche	<input type="radio"/> Y <input checked="" type="radio"/> N	
28'	120'	92'	Sand and Clay	<input type="radio"/> Y <input checked="" type="radio"/> N	
120'	260'	140'	Red Clay	<input type="radio"/> Y <input checked="" type="radio"/> N	
260'	757'	497'	Red and Brown Shale and Clay(some blue)	<input type="radio"/> Y <input checked="" type="radio"/> N	
757'	815'	58'	Red and Brown Shale	<input type="radio"/> Y <input checked="" type="radio"/> N	
815'	840'	25'	Blue Clay and Shale	<input type="radio"/> Y <input checked="" type="radio"/> N	
840'	925'	85'	Red and Brown Shale(some sandrock)	<input type="radio"/> Y <input checked="" type="radio"/> N	
925'	975'	50'	Watersand and Gravel	<input checked="" type="radio"/> Y <input type="radio"/> N	
975'	1185'	210'	Watersand(brown sandrock)	<input checked="" type="radio"/> Y <input type="radio"/> N	
1185'	1192'	7'	Red Shale	<input type="radio"/> Y <input checked="" type="radio"/> N	
				<input type="radio"/> Y <input type="radio"/> N	
				<input type="radio"/> Y <input type="radio"/> N	
				<input type="radio"/> Y <input type="radio"/> N	
				<input type="radio"/> Y <input type="radio"/> N	
				<input type="radio"/> Y <input type="radio"/> N	
				<input type="radio"/> Y <input type="radio"/> N	
				<input type="radio"/> Y <input type="radio"/> N	
				<input type="radio"/> Y <input type="radio"/> N	
				<input type="radio"/> Y <input type="radio"/> N	
				<input type="radio"/> Y <input type="radio"/> N	
				<input type="radio"/> Y <input type="radio"/> N	
				<input type="radio"/> Y <input type="radio"/> N	
METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA: <input checked="" type="radio"/> PUMP			TOTAL ESTIMATED WELL YIELD (gpm): 50		
<input type="radio"/> AIR LIFT <input type="radio"/> BAILER <input type="radio"/> OTHER - SPECIFY:					

5. TEST; RIG SUPERVISION	WELL TEST	TEST RESULTS - ATTACH A COPY OF DATA COLLECTED DURING WELL TESTING, INCLUDING DISCHARGE METHOD, START TIME, END TIME, AND A TABLE SHOWING DISCHARGE AND DRAWDOWN OVER THE TESTING PERIOD.
	MISCELLANEOUS INFORMATION:	
	0' to 757' drilled with mud. 757' to 1192' drilled with air and foam.	
PRINT NAME(S) OF DRILL RIG SUPERVISOR(S) THAT PROVIDED ONSITE SUPERVISION OF WELL CONSTRUCTION OTHER THAN LICENSEE:		

6. SIGNATURE	THE UNDERSIGNED HEREBY CERTIFIES THAT, TO THE BEST OF HIS OR HER KNOWLEDGE AND BELIEF, THE FOREGOING IS A TRUE AND CORRECT RECORD OF THE ABOVE DESCRIBED HOLE AND THAT HE OR SHE WILL FILE THIS WELL RECORD WITH THE STATE ENGINEER AND THE PERMIT HOLDER WITHIN 20 DAYS AFTER COMPLETION OF WELL DRILLING:	
	<div style="display: flex; justify-content: space-between;"> <div>  SIGNATURE OF DRILLER / PRINT SIGNEE NAME </div> <div> 8/7/14 DATE </div> </div>	

FOR USE INTERNAL USE

WR-20 WELL RECORD & LOG (Version 06/08/2012)

FILE NUMBER	CP-1355	POD NUMBER	1	TRN NUMBER	549450
LOCATION	Exp1	215.33E.27.312			PAGE 2 OF 2



New Mexico Office of the State Engineer

Point of Diversion Summary

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

Well Tag	POD Number	Q64	Q16	Q4	Sec	Tws	Rng	X	Y
	CP 01357 POD1	4	3	1	27	21S	33E	634782	3591347

Driller License: 421	Driller Company: GLENN'S WATER WELL SERVICE	
Driller Name: GLENN, CLARK A."CORKY"		
Drill Start Date: 08/16/2014	Drill Finish Date: 08/26/2014	Plug Date:
Log File Date: 09/10/2014	PCW Rcv Date:	Source: Artesian
Pump Type:	Pipe Discharge Size:	Estimated Yield:
Casing Size: 6.37	Depth Well: 1286 feet	Depth Water: 578 feet

Water Bearing Stratifications:	Top	Bottom	Description
	945	960	Sandstone/Gravel/Conglomerate
	960	1077	Shale/Mudstone/Siltstone
	1077	1215	Sandstone/Gravel/Conglomerate
	1215	1286	Shale/Mudstone/Siltstone

Casing Perforations:	Top	Bottom
	846	1286

Appendix C

Laboratory Certificates of Analyses

R.T. Hicks Consultants, Ltd.

901 Rio Grande Blvd. NW, Suite F-142
Albuquerque, NM 87104

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

October 25, 2019

ANDREW PARKER

R T HICKS CONSULTANTS

901 RIO GRANDE BLVD SUITE F-142

ALBUQUERQUE, NM 87104

RE: ADVANCE ENERGY

Enclosed are the results of analyses for samples received by the laboratory on 10/21/19 16:40.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-18-11. 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:

R T HICKS CONSULTANTS
901 RIO GRANDE BLVD SUITE F-142
ALBUQUERQUE NM, 87104

Project: ADVANCE ENERGY
Project Number: WOOLHEAD 20 STATE #003
Project Manager: ANDREW PARKER
Fax To: NONE

Reported:
25-Oct-19 14:30

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
S1 WR 0-1'	H903591-01	Soil	21-Oct-19 09:00	21-Oct-19 16:40
S1 NR 0-1'	H903591-02	Soil	21-Oct-19 09:30	21-Oct-19 16:40
S1 ER 0-1'	H903591-03	Soil	21-Oct-19 10:00	21-Oct-19 16:40
S1 BASE 1'	H903591-04	Soil	21-Oct-19 10:30	21-Oct-19 16:40
S2 WR 0-1'	H903591-05	Soil	21-Oct-19 11:00	21-Oct-19 16:40
S2 ER 0-1'	H903591-06	Soil	21-Oct-19 11:30	21-Oct-19 16:40
S2 BASE 1'	H903591-07	Soil	21-Oct-19 12:00	21-Oct-19 16:40
S3 WR 0-1'	H903591-08	Soil	21-Oct-19 12:30	21-Oct-19 16:40
S3 ER 0-1'	H903591-09	Soil	21-Oct-19 13:00	21-Oct-19 16:40
S3 BASE 1'	H903591-10	Soil	21-Oct-19 13:30	21-Oct-19 16:40
S5 BASE 1'	H903591-13	Soil	21-Oct-19 15:00	21-Oct-19 16:40

Client added analysis on 10/23/19. This is the revised report and will replace the one sent on 10/22/19,

Cardinal Laboratories

*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

R T HICKS CONSULTANTS
901 RIO GRANDE BLVD SUITE F-142
ALBUQUERQUE NM, 87104

Project: ADVANCE ENERGY
Project Number: WOOLHEAD 20 STATE #003
Project Manager: ANDREW PARKER
Fax To: NONE

Reported:
25-Oct-19 14:30

S1 WR 0-1'
H903591-01 (Soil)

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

Chloride	<16.0		16.0	mg/kg	4	9102405	AC	24-Oct-19	4500-Cl-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	9102311	MS	23-Oct-19	8021B	
Toluene*	<0.050		0.050	mg/kg	50	9102311	MS	23-Oct-19	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	9102311	MS	23-Oct-19	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	9102311	MS	23-Oct-19	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	9102311	MS	23-Oct-19	8021B	

Surrogate: 4-Bromofluorobenzene (PID) 98.3 % 73.3-129 9102311 MS 23-Oct-19 8021B

Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	9102303	MS	23-Oct-19	8015B	
DRO >C10-C28*	<10.0		10.0	mg/kg	1	9102303	MS	23-Oct-19	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	9102303	MS	23-Oct-19	8015B	

Surrogate: 1-Chlorooctane 80.6 % 41-142 9102303 MS 23-Oct-19 8015B

Surrogate: 1-Chlorooctadecane 81.8 % 37.6-147 9102303 MS 23-Oct-19 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:

R T HICKS CONSULTANTS
901 RIO GRANDE BLVD SUITE F-142
ALBUQUERQUE NM, 87104

Project: ADVANCE ENERGY
Project Number: WOOLHEAD 20 STATE #003
Project Manager: ANDREW PARKER
Fax To: NONE

Reported:
25-Oct-19 14:30

S1 NR 0-1'
H903591-02 (Soil)

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

Chloride	<16.0		16.0	mg/kg	4	9102405	AC	24-Oct-19	4500-Cl-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	9102311	MS	23-Oct-19	8021B	
Toluene*	<0.050		0.050	mg/kg	50	9102311	MS	23-Oct-19	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	9102311	MS	23-Oct-19	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	9102311	MS	23-Oct-19	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	9102311	MS	23-Oct-19	8021B	

Surrogate: 4-Bromofluorobenzene (PID)			99.1 %		73.3-129	9102311	MS	23-Oct-19	8021B	
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Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	9102303	MS	23-Oct-19	8015B	
DRO >C10-C28*	<10.0		10.0	mg/kg	1	9102303	MS	23-Oct-19	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	9102303	MS	23-Oct-19	8015B	

Surrogate: 1-Chlorooctane			86.3 %		41-142	9102303	MS	23-Oct-19	8015B	
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Surrogate: 1-Chlorooctadecane			85.3 %		37.6-147	9102303	MS	23-Oct-19	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:

R T HICKS CONSULTANTS
901 RIO GRANDE BLVD SUITE F-142
ALBUQUERQUE NM, 87104

Project: ADVANCE ENERGY
Project Number: WOOLHEAD 20 STATE #003
Project Manager: ANDREW PARKER
Fax To: NONE

Reported:
25-Oct-19 14:30

S1 ER 0-1'
H903591-03 (Soil)

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

Chloride	<16.0		16.0	mg/kg	4	9102405	AC	24-Oct-19	4500-Cl-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	9102311	MS	24-Oct-19	8021B	
Toluene*	<0.050		0.050	mg/kg	50	9102311	MS	24-Oct-19	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	9102311	MS	24-Oct-19	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	9102311	MS	24-Oct-19	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	9102311	MS	24-Oct-19	8021B	

Surrogate: 4-Bromofluorobenzene (PID)			99.3 %		73.3-129	9102311	MS	24-Oct-19	8021B	
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Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	9102303	MS	23-Oct-19	8015B	
DRO >C10-C28*	<10.0		10.0	mg/kg	1	9102303	MS	23-Oct-19	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	9102303	MS	23-Oct-19	8015B	

Surrogate: 1-Chlorooctane			79.6 %		41-142	9102303	MS	23-Oct-19	8015B	
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Surrogate: 1-Chlorooctadecane			80.6 %		37.6-147	9102303	MS	23-Oct-19	8015B	
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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:

R T HICKS CONSULTANTS
901 RIO GRANDE BLVD SUITE F-142
ALBUQUERQUE NM, 87104

Project: ADVANCE ENERGY
Project Number: WOOLHEAD 20 STATE #003
Project Manager: ANDREW PARKER
Fax To: NONE

Reported:
25-Oct-19 14:30

S1 BASE 1'
H903591-04 (Soil)

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

Chloride	<16.0		16.0	mg/kg	4	9102405	AC	24-Oct-19	4500-Cl-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	9102311	MS	24-Oct-19	8021B	
Toluene*	<0.050		0.050	mg/kg	50	9102311	MS	24-Oct-19	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	9102311	MS	24-Oct-19	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	9102311	MS	24-Oct-19	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	9102311	MS	24-Oct-19	8021B	

Surrogate: 4-Bromofluorobenzene (PID)			99.3 %		73.3-129	9102311	MS	24-Oct-19	8021B	
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Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	9102303	MS	23-Oct-19	8015B	
DRO >C10-C28*	<10.0		10.0	mg/kg	1	9102303	MS	23-Oct-19	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	9102303	MS	23-Oct-19	8015B	

Surrogate: 1-Chlorooctane			86.7 %		41-142	9102303	MS	23-Oct-19	8015B	
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Surrogate: 1-Chlorooctadecane			86.2 %		37.6-147	9102303	MS	23-Oct-19	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:

R T HICKS CONSULTANTS
901 RIO GRANDE BLVD SUITE F-142
ALBUQUERQUE NM, 87104

Project: ADVANCE ENERGY
Project Number: WOOLHEAD 20 STATE #003
Project Manager: ANDREW PARKER
Fax To: NONE

Reported:
25-Oct-19 14:30

S2 WR 0-1'
H903591-05 (Soil)

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

Chloride	<16.0		16.0	mg/kg	4	9102405	AC	24-Oct-19	4500-Cl-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	9102311	MS	24-Oct-19	8021B	
Toluene*	<0.050		0.050	mg/kg	50	9102311	MS	24-Oct-19	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	9102311	MS	24-Oct-19	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	9102311	MS	24-Oct-19	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	9102311	MS	24-Oct-19	8021B	

Surrogate: 4-Bromofluorobenzene (PID)			98.5 %		73.3-129	9102311	MS	24-Oct-19	8021B	
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Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	9102303	MS	23-Oct-19	8015B	
DRO >C10-C28*	<10.0		10.0	mg/kg	1	9102303	MS	23-Oct-19	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	9102303	MS	23-Oct-19	8015B	

Surrogate: 1-Chlorooctane			88.5 %		41-142	9102303	MS	23-Oct-19	8015B	
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Surrogate: 1-Chlorooctadecane			88.4 %		37.6-147	9102303	MS	23-Oct-19	8015B	
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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:

R T HICKS CONSULTANTS
901 RIO GRANDE BLVD SUITE F-142
ALBUQUERQUE NM, 87104

Project: ADVANCE ENERGY
Project Number: WOOLHEAD 20 STATE #003
Project Manager: ANDREW PARKER
Fax To: NONE

Reported:
25-Oct-19 14:30

S2 ER 0-1'
H903591-06 (Soil)

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

Chloride	<16.0		16.0	mg/kg	4	9102405	AC	24-Oct-19	4500-Cl-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	9102311	MS	24-Oct-19	8021B	
Toluene*	<0.050		0.050	mg/kg	50	9102311	MS	24-Oct-19	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	9102311	MS	24-Oct-19	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	9102311	MS	24-Oct-19	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	9102311	MS	24-Oct-19	8021B	

Surrogate: 4-Bromofluorobenzene (PID)			98.7 %		73.3-129	9102311	MS	24-Oct-19	8021B	
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Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	9102303	MS	23-Oct-19	8015B	
DRO >C10-C28*	<10.0		10.0	mg/kg	1	9102303	MS	23-Oct-19	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	9102303	MS	23-Oct-19	8015B	

Surrogate: 1-Chlorooctane			88.4 %		41-142	9102303	MS	23-Oct-19	8015B	
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Surrogate: 1-Chlorooctadecane			87.4 %		37.6-147	9102303	MS	23-Oct-19	8015B	
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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

R T HICKS CONSULTANTS
901 RIO GRANDE BLVD SUITE F-142
ALBUQUERQUE NM, 87104

Project: ADVANCE ENERGY
Project Number: WOOLHEAD 20 STATE #003
Project Manager: ANDREW PARKER
Fax To: NONE

Reported:
25-Oct-19 14:30

S2 BASE 1'
H903591-07 (Soil)

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

Chloride	<16.0		16.0	mg/kg	4	9102214	AC	22-Oct-19	4500-Cl-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	9102201	MS	22-Oct-19	8021B	
Toluene*	<0.050		0.050	mg/kg	50	9102201	MS	22-Oct-19	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	9102201	MS	22-Oct-19	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	9102201	MS	22-Oct-19	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	9102201	MS	22-Oct-19	8021B	

Surrogate: 4-Bromofluorobenzene (PID)			99.2 %	73.3-129		9102201	MS	22-Oct-19	8021B	
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Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	9102204	MS	22-Oct-19	8015B	
DRO >C10-C28*	<10.0		10.0	mg/kg	1	9102204	MS	22-Oct-19	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	9102204	MS	22-Oct-19	8015B	

Surrogate: 1-Chlorooctane			95.5 %	41-142		9102204	MS	22-Oct-19	8015B	
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Surrogate: 1-Chlorooctadecane			108 %	37.6-147		9102204	MS	22-Oct-19	8015B	
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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

R T HICKS CONSULTANTS
901 RIO GRANDE BLVD SUITE F-142
ALBUQUERQUE NM, 87104

Project: ADVANCE ENERGY
Project Number: WOOLHEAD 20 STATE #003
Project Manager: ANDREW PARKER
Fax To: NONE

Reported:
25-Oct-19 14:30

S3 WR 0-1'
H903591-08 (Soil)

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

Chloride	16.0		16.0	mg/kg	4	9102405	AC	24-Oct-19	4500-Cl-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	9102311	MS	24-Oct-19	8021B	
Toluene*	<0.050		0.050	mg/kg	50	9102311	MS	24-Oct-19	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	9102311	MS	24-Oct-19	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	9102311	MS	24-Oct-19	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	9102311	MS	24-Oct-19	8021B	

Surrogate: 4-Bromofluorobenzene (PID) 98.5 % 73.3-129 9102311 MS 24-Oct-19 8021B

Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	9102303	MS	23-Oct-19	8015B	
DRO >C10-C28*	<10.0		10.0	mg/kg	1	9102303	MS	23-Oct-19	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	9102303	MS	23-Oct-19	8015B	

Surrogate: 1-Chlorooctane 83.3 % 41-142 9102303 MS 23-Oct-19 8015B

Surrogate: 1-Chlorooctadecane 81.3 % 37.6-147 9102303 MS 23-Oct-19 8015B

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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

R T HICKS CONSULTANTS
901 RIO GRANDE BLVD SUITE F-142
ALBUQUERQUE NM, 87104

Project: ADVANCE ENERGY
Project Number: WOOLHEAD 20 STATE #003
Project Manager: ANDREW PARKER
Fax To: NONE

Reported:
25-Oct-19 14:30

S3 ER 0-1'
H903591-09 (Soil)

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

Chloride	<16.0		16.0	mg/kg	4	9102405	AC	24-Oct-19	4500-Cl-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	9102311	MS	24-Oct-19	8021B	
Toluene*	<0.050		0.050	mg/kg	50	9102311	MS	24-Oct-19	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	9102311	MS	24-Oct-19	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	9102311	MS	24-Oct-19	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	9102311	MS	24-Oct-19	8021B	

Surrogate: 4-Bromofluorobenzene (PID)			99.2 %	73.3-129		9102311	MS	24-Oct-19	8021B	
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Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	9102303	MS	23-Oct-19	8015B	
DRO >C10-C28*	<10.0		10.0	mg/kg	1	9102303	MS	23-Oct-19	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	9102303	MS	23-Oct-19	8015B	

Surrogate: 1-Chlorooctane			89.6 %	41-142		9102303	MS	23-Oct-19	8015B	
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Surrogate: 1-Chlorooctadecane			88.2 %	37.6-147		9102303	MS	23-Oct-19	8015B	
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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

R T HICKS CONSULTANTS
901 RIO GRANDE BLVD SUITE F-142
ALBUQUERQUE NM, 87104

Project: ADVANCE ENERGY
Project Number: WOOLHEAD 20 STATE #003
Project Manager: ANDREW PARKER
Fax To: NONE

Reported:
25-Oct-19 14:30

S3 BASE 1'
H903591-10 (Soil)

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

Chloride	16.0		16.0	mg/kg	4	9102214	AC	22-Oct-19	4500-Cl-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	9102201	MS	22-Oct-19	8021B	
Toluene*	<0.050		0.050	mg/kg	50	9102201	MS	22-Oct-19	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	9102201	MS	22-Oct-19	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	9102201	MS	22-Oct-19	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	9102201	MS	22-Oct-19	8021B	

Surrogate: 4-Bromofluorobenzene (PID)			99.3 %	73.3-129		9102201	MS	22-Oct-19	8021B	
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Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	9102204	MS	22-Oct-19	8015B	
DRO >C10-C28*	<10.0		10.0	mg/kg	1	9102204	MS	22-Oct-19	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	9102204	MS	22-Oct-19	8015B	

Surrogate: 1-Chlorooctane			93.3 %	41-142		9102204	MS	22-Oct-19	8015B	
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Surrogate: 1-Chlorooctadecane			106 %	37.6-147		9102204	MS	22-Oct-19	8015B	
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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

R T HICKS CONSULTANTS
901 RIO GRANDE BLVD SUITE F-142
ALBUQUERQUE NM, 87104

Project: ADVANCE ENERGY
Project Number: WOOLHEAD 20 STATE #003
Project Manager: ANDREW PARKER
Fax To: NONE

Reported:
25-Oct-19 14:30

S5 BASE 1'
H903591-13 (Soil)

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

Chloride	64.0		16.0	mg/kg	4	9102214	AC	22-Oct-19	4500-Cl-B	
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Volatile Organic Compounds by EPA Method 8021**S-04**

Benzene*	<0.050		0.050	mg/kg	50	9102201	MS	22-Oct-19	8021B	
Toluene*	1.73		0.050	mg/kg	50	9102201	MS	22-Oct-19	8021B	
Ethylbenzene*	1.22		0.050	mg/kg	50	9102201	MS	22-Oct-19	8021B	
Total Xylenes*	8.23		0.150	mg/kg	50	9102201	MS	22-Oct-19	8021B	
Total BTEX	11.2		0.300	mg/kg	50	9102201	MS	22-Oct-19	8021B	

Surrogate: 4-Bromofluorobenzene (PID)			171 %	73.3-129		9102201	MS	22-Oct-19	8021B	
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Petroleum Hydrocarbons by GC FID

GRO C6-C10*	270		10.0	mg/kg	1	9102204	MS	22-Oct-19	8015B	
DRO >C10-C28*	1010		10.0	mg/kg	1	9102204	MS	22-Oct-19	8015B	
EXT DRO >C28-C36	120		10.0	mg/kg	1	9102204	MS	22-Oct-19	8015B	

Surrogate: 1-Chlorooctane			127 %	41-142		9102204	MS	22-Oct-19	8015B	
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Surrogate: 1-Chlorooctadecane			103 %	37.6-147		9102204	MS	22-Oct-19	8015B	
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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

R T HICKS CONSULTANTS
901 RIO GRANDE BLVD SUITE F-142
ALBUQUERQUE NM, 87104

Project: ADVANCE ENERGY
Project Number: WOOLHEAD 20 STATE #003
Project Manager: ANDREW PARKER
Fax To: NONE

Reported:
25-Oct-19 14:30

Inorganic Compounds - Quality Control**Cardinal Laboratories**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 9102214 - 1:4 DI Water										
Blank (9102214-BLK1)				Prepared & Analyzed: 22-Oct-19						
Chloride	ND	16.0	mg/kg							
LCS (9102214-BS1)				Prepared & Analyzed: 22-Oct-19						
Chloride	432	16.0	mg/kg	400		108	80-120			
LCS Dup (9102214-BSD1)				Prepared & Analyzed: 22-Oct-19						
Chloride	432	16.0	mg/kg	400		108	80-120	0.00	20	
Batch 9102405 - 1:4 DI Water										
Blank (9102405-BLK1)				Prepared & Analyzed: 24-Oct-19						
Chloride	ND	16.0	mg/kg							
LCS (9102405-BS1)				Prepared & Analyzed: 24-Oct-19						
Chloride	432	16.0	mg/kg	400		108	80-120			
LCS Dup (9102405-BSD1)				Prepared & Analyzed: 24-Oct-19						
Chloride	448	16.0	mg/kg	400		112	80-120	3.64	20	

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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

R T HICKS CONSULTANTS
901 RIO GRANDE BLVD SUITE F-142
ALBUQUERQUE NM, 87104

Project: ADVANCE ENERGY
Project Number: WOOLHEAD 20 STATE #003
Project Manager: ANDREW PARKER
Fax To: NONE

Reported:
25-Oct-19 14:30

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 9102201 - Volatiles**Blank (9102201-BLK1)**

Prepared & Analyzed: 22-Oct-19

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		98.9	73.3-129			

LCS (9102201-BS1)

Prepared & Analyzed: 22-Oct-19

Benzene	1.94	0.050	mg/kg	2.00		97.1	72.2-131			
Toluene	1.95	0.050	mg/kg	2.00		97.5	71.7-126			
Ethylbenzene	1.98	0.050	mg/kg	2.00		98.9	68.9-126			
Total Xylenes	5.92	0.150	mg/kg	6.00		98.7	71.4-125			
Surrogate: 4-Bromofluorobenzene (PID)	0.0492		mg/kg	0.0500		98.4	73.3-129			

LCS Dup (9102201-BSD1)

Prepared & Analyzed: 22-Oct-19

Benzene	1.84	0.050	mg/kg	2.00		92.2	72.2-131	5.15	6.91	
Toluene	1.85	0.050	mg/kg	2.00		92.3	71.7-126	5.57	7.12	
Ethylbenzene	1.90	0.050	mg/kg	2.00		95.0	68.9-126	4.01	7.88	
Total Xylenes	5.70	0.150	mg/kg	6.00		95.1	71.4-125	3.72	7.46	
Surrogate: 4-Bromofluorobenzene (PID)	0.0498		mg/kg	0.0500		99.6	73.3-129			

Batch 9102311 - Volatiles**Blank (9102311-BLK1)**

Prepared & Analyzed: 23-Oct-19

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		99.3	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:

R T HICKS CONSULTANTS
901 RIO GRANDE BLVD SUITE F-142
ALBUQUERQUE NM, 87104

Project: ADVANCE ENERGY
Project Number: WOOLHEAD 20 STATE #003
Project Manager: ANDREW PARKER
Fax To: NONE

Reported:
25-Oct-19 14:30

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
---------	--------	--------------------	-------	----------------	------------------	------	----------------	-----	--------------	-------

Batch 9102311 - Volatiles**LCS (9102311-BS1)**

Prepared & Analyzed: 23-Oct-19

Benzene	1.94	0.050	mg/kg	2.00		96.8	72.2-131			
Toluene	1.88	0.050	mg/kg	2.00		93.8	71.7-126			
Ethylbenzene	1.89	0.050	mg/kg	2.00		94.3	68.9-126			
Total Xylenes	5.66	0.150	mg/kg	6.00		94.4	71.4-125			
Surrogate: 4-Bromofluorobenzene (PID)	0.0491		mg/kg	0.0500		98.2	73.3-129			

LCS Dup (9102311-BS1)

Prepared & Analyzed: 23-Oct-19

Benzene	1.82	0.050	mg/kg	2.00		91.1	72.2-131	6.04	6.91	
Toluene	1.77	0.050	mg/kg	2.00		88.7	71.7-126	5.57	7.12	
Ethylbenzene	1.79	0.050	mg/kg	2.00		89.4	68.9-126	5.26	7.88	
Total Xylenes	5.39	0.150	mg/kg	6.00		89.8	71.4-125	5.00	7.46	
Surrogate: 4-Bromofluorobenzene (PID)	0.0495		mg/kg	0.0500		99.0	73.3-129			

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Analytical Results For:

R T HICKS CONSULTANTS
901 RIO GRANDE BLVD SUITE F-142
ALBUQUERQUE NM, 87104

Project: ADVANCE ENERGY
Project Number: WOOLHEAD 20 STATE #003
Project Manager: ANDREW PARKER
Fax To: NONE

Reported:
25-Oct-19 14:30

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
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Batch 9102204 - General Prep - Organics**Blank (9102204-BLK1)**

Prepared & Analyzed: 22-Oct-19

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		94.3		41-142	
Surrogate: 1-Chlorooctadecane	51.6		mg/kg	50.0		103		37.6-147	

LCS (9102204-BS1)

Prepared & Analyzed: 22-Oct-19

GRO C6-C10	168	10.0	mg/kg	200		83.9		76.5-133	
DRO >C10-C28	161	10.0	mg/kg	200		80.7		72.9-138	
Total TPH C6-C28	329	10.0	mg/kg	400		82.3		78-132	
Surrogate: 1-Chlorooctane	52.4		mg/kg	50.0		105		41-142	
Surrogate: 1-Chlorooctadecane	55.0		mg/kg	50.0		110		37.6-147	

LCS Dup (9102204-BS1)

Prepared & Analyzed: 22-Oct-19

GRO C6-C10	177	10.0	mg/kg	200		88.3		76.5-133	5.17	20.6
DRO >C10-C28	170	10.0	mg/kg	200		85.1		72.9-138	5.35	20.6
Total TPH C6-C28	347	10.0	mg/kg	400		86.7		78-132	5.26	18
Surrogate: 1-Chlorooctane	51.1		mg/kg	50.0		102		41-142		
Surrogate: 1-Chlorooctadecane	55.3		mg/kg	50.0		111		37.6-147		

Batch 9102303 - General Prep - Organics**Blank (9102303-BLK1)**

Prepared & Analyzed: 23-Oct-19

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	48.1		mg/kg	50.0		96.1		41-142		
Surrogate: 1-Chlorooctadecane	47.9		mg/kg	50.0		95.7		37.6-147		

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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

R T HICKS CONSULTANTS
901 RIO GRANDE BLVD SUITE F-142
ALBUQUERQUE NM, 87104

Project: ADVANCE ENERGY
Project Number: WOOLHEAD 20 STATE #003
Project Manager: ANDREW PARKER
Fax To: NONE

Reported:
25-Oct-19 14:30

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 9102303 - General Prep - Organics**LCS (9102303-BS1)**

Prepared & Analyzed: 23-Oct-19

GRO C6-C10	208	10.0	mg/kg	200		104	76.5-133			
DRO >C10-C28	203	10.0	mg/kg	200		101	72.9-138			
Total TPH C6-C28	411	10.0	mg/kg	400		103	78-132			
Surrogate: 1-Chlorooctane	51.8		mg/kg	50.0		104	41-142			
Surrogate: 1-Chlorooctadecane	50.8		mg/kg	50.0		102	37.6-147			

LCS Dup (9102303-BS1)

Prepared & Analyzed: 23-Oct-19

GRO C6-C10	203	10.0	mg/kg	200		101	76.5-133	2.82	20.6	
DRO >C10-C28	196	10.0	mg/kg	200		98.0	72.9-138	3.26	20.6	
Total TPH C6-C28	399	10.0	mg/kg	400		99.7	78-132	3.04	18	
Surrogate: 1-Chlorooctane	49.7		mg/kg	50.0		99.4	41-142			
Surrogate: 1-Chlorooctadecane	48.5		mg/kg	50.0		97.0	37.6-147			

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Notes and Definitions

S-04	The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.
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 SM4500Cl-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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A handwritten signature in cursive script, reading "Celey D. Keene".

Celey D. Keene, Lab Director/Quality Manager

12 jo 02 ega



CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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

BILL TO

ANALYSIS REQUEST

Company Name: <u>R.T. Hicks</u>		P.O. #:	
Project Manager: <u>Andrew Parker</u>		Company: <u>R.T. Hicks</u>	
Address: <u>ON FILE</u>		Attn: <u>Sed to OBR</u>	
City:	State:	Zip:	Address:
Phone #:	Fax #:	City:	State:
Project #:	Project Owner:	Phone #:	Zip:
Project Name: <u>Adventure Energy</u>		Fax #:	
Project Location: <u>Wool Head 20 State #003</u>			
Sampler Name: <u>SHARON SPENZ</u>			

Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX						PRESERV.			DATE	TIME	ANALYSIS REQUEST
				GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER:	ACID/BASE:	ICE / COOL	OTHER:			
<u>H903591</u>	<u>1 SI WR 0-1FT</u>	<u>C</u>	<u>1</u>			<u>X</u>							<u>10/24/18</u>	<u>9:00a</u>	<u>chloride</u>
	<u>2 SI NR 0-1FT</u>	<u>C</u>	<u>1</u>										<u>9:30a</u>	<u>Rem</u>	<u>BTEX, GRO, DRO, mfo</u>
	<u>3 SI ER 0-1FT</u>	<u>C</u>	<u>1</u>										<u>10:30a</u>	<u>Rem</u>	<u>TPH</u>
	<u>4 SI BASE 0-1FT</u>	<u>C</u>	<u>1</u>										<u>11:00a</u>	<u>Rem</u>	<u>PH</u>
	<u>5 SI WR 0-1FT</u>	<u>C</u>	<u>1</u>										<u>11:30a</u>	<u>Rem</u>	<u>Added 10/23/19</u>
	<u>6 SI ER 0-1FT</u>	<u>C</u>	<u>1</u>										<u>12:30a</u>	<u>Rem</u>	
	<u>7 SI BASE 1FT</u>	<u>C</u>	<u>1</u>										<u>1:00a</u>	<u>Rem</u>	
	<u>8 SI WR 0-1FT</u>	<u>C</u>	<u>1</u>										<u>1:30a</u>	<u>Rem</u>	
	<u>9 SI ER 0-1FT</u>	<u>C</u>	<u>1</u>										<u>1:00a</u>	<u>Rem</u>	
	<u>10 SI BASE 1FT</u>	<u>C</u>	<u>1</u>										<u>1:30a</u>	<u>Rem</u>	

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Relinquished By: [Signature] Date: 10/21 Received By: [Signature] Date: 10/21

Relinquished By: [Signature] Date: 10/21 Received By: [Signature] Date: 10/21

Delivered By: (Circle One) 1.7c #47 Sample Condition: ☒ Cool ☒ Intact ☐ Yes ☐ No

Sampler - UPS - Bus - Other: Corrected 2.1c CHECKED BY: [Signature] (Initials) 45

Phone Result: ☐ Yes ☐ No Add'l Phone #: 125
Fax Result: ☐ Yes ☐ No Add'l Fax #: 125

REMARKS:

125



CARDINAL
Laboratories

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

[illegible]



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

October 24, 2019

ANDREW PARKER

R T HICKS CONSULTANTS

901 RIO GRANDE BLVD SUITE F-142

ALBUQUERQUE, NM 87104

RE: ADVANCE ENERGY

Enclosed are the results of analyses for samples received by the laboratory on 10/23/19 14:00.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-18-11. 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/qa/lab_accred_certif.html.

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

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

Accreditation applies to public drinking water matrices.

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,

A handwritten signature in black ink that reads "Celey D. Keene". The signature is written in a cursive, flowing style.

Celey D. Keene

Lab Director/Quality Manager



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

Analytical Results For:

R T HICKS CONSULTANTS
 ANDREW PARKER
 901 RIO GRANDE BLVD SUITE F-142
 ALBUQUERQUE NM, 87104
 Fax To: NONE

Received:	10/23/2019	Sampling Date:	10/23/2019
Reported:	10/24/2019	Sampling Type:	Soil
Project Name:	ADVANCE ENERGY	Sampling Condition:	Cool & Intact
Project Number:	WOOL HEAD 20 STATE #003	Sample Received By:	Tamara Oldaker
Project Location:	NOT GIVEN		

Sample ID: S4 BASE 0-1' (H903626-01)

BTEX 8021B		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	10/24/2019	ND	1.94	96.8	2.00	6.04	
Toluene*	<0.050	0.050	10/24/2019	ND	1.88	93.8	2.00	5.57	
Ethylbenzene*	<0.050	0.050	10/24/2019	ND	1.89	94.3	2.00	5.26	
Total Xylenes*	<0.150	0.150	10/24/2019	ND	5.66	94.4	6.00	5.00	
Total BTEX	<0.300	0.300	10/24/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID) 99.5 % 73.3-129

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	16.0	16.0	10/24/2019	ND	432	108	400	3.64		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	10/23/2019	ND	208	104	200	2.82	
DRO >C10-C28*	<10.0	10.0	10/23/2019	ND	203	101	200	3.26	
EXT DRO >C28-C36	<10.0	10.0	10/23/2019	ND					

Surrogate: 1-Chlorooctane 87.2 % 41-142

Surrogate: 1-Chlorooctadecane 87.7 % 37.6-147

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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

R T HICKS CONSULTANTS
 ANDREW PARKER
 901 RIO GRANDE BLVD SUITE F-142
 ALBUQUERQUE NM, 87104
 Fax To: NONE

Received:	10/23/2019	Sampling Date:	10/23/2019
Reported:	10/24/2019	Sampling Type:	Soil
Project Name:	ADVANCE ENERGY	Sampling Condition:	Cool & Intact
Project Number:	WOOL HEAD 20 STATE #003	Sample Received By:	Tamara Oldaker
Project Location:	NOT GIVEN		

Sample ID: S4 ER 0-1' (H903626-02)

BTEx 8021B		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	10/24/2019	ND	1.94	96.8	2.00	6.04		
Toluene*	<0.050	0.050	10/24/2019	ND	1.88	93.8	2.00	5.57		
Ethylbenzene*	<0.050	0.050	10/24/2019	ND	1.89	94.3	2.00	5.26		
Total Xylenes*	<0.150	0.150	10/24/2019	ND	5.66	94.4	6.00	5.00		
Total BTEx	<0.300	0.300	10/24/2019	ND						

Surrogate: 4-Bromofluorobenzene (PID) 100 % 73.3-129

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	<16.0	16.0	10/24/2019	ND	432	108	400	3.64		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	10/23/2019	ND	208	104	200	2.82	
DRO >C10-C28*	<10.0	10.0	10/23/2019	ND	203	101	200	3.26	
EXT DRO >C28-C36	<10.0	10.0	10/23/2019	ND					

Surrogate: 1-Chlorooctane 80.7 % 41-142

Surrogate: 1-Chlorooctadecane 80.1 % 37.6-147

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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

R T HICKS CONSULTANTS
 ANDREW PARKER
 901 RIO GRANDE BLVD SUITE F-142
 ALBUQUERQUE NM, 87104
 Fax To: NONE

Received:	10/23/2019	Sampling Date:	10/23/2019
Reported:	10/24/2019	Sampling Type:	Soil
Project Name:	ADVANCE ENERGY	Sampling Condition:	Cool & Intact
Project Number:	WOOL HEAD 20 STATE #003	Sample Received By:	Tamara Oldaker
Project Location:	NOT GIVEN		

Sample ID: S4 WR 0-1' (H903626-03)

BTEx 8021B		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	10/24/2019	ND	1.94	96.8	2.00	6.04		
Toluene*	<0.050	0.050	10/24/2019	ND	1.88	93.8	2.00	5.57		
Ethylbenzene*	<0.050	0.050	10/24/2019	ND	1.89	94.3	2.00	5.26		
Total Xylenes*	<0.150	0.150	10/24/2019	ND	5.66	94.4	6.00	5.00		
Total BTEx	<0.300	0.300	10/24/2019	ND						

Surrogate: 4-Bromofluorobenzene (PID) 98.8 % 73.3-129

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	<16.0	16.0	10/24/2019	ND	432	108	400	3.64		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	10/23/2019	ND	208	104	200	2.82	
DRO >C10-C28*	<10.0	10.0	10/23/2019	ND	203	101	200	3.26	
EXT DRO >C28-C36	<10.0	10.0	10/23/2019	ND					

Surrogate: 1-Chlorooctane 85.8 % 41-142

Surrogate: 1-Chlorooctadecane 85.3 % 37.6-147

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Celey D. Keene, Lab Director/Quality Manager



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Notes and Definitions

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 SM4500Cl-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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*=Accredited Analyte

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A handwritten signature in black ink, appearing to read "Celey D. Keene".

Celey D. Keene, Lab Director/Quality Manager



CARDINAL
Laboratories

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

Push!!
E-mail @ Andrew
+
Shabb@rthinks.org.uk

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

October 29, 2019

ANDREW PARKER

R T HICKS CONSULTANTS

901 RIO GRANDE BLVD SUITE F-142

ALBUQUERQUE, NM 87104

RE: ADVANCE ENERGY

Enclosed are the results of analyses for samples received by the laboratory on 10/25/19 11:30.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-18-11. 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:

R T HICKS CONSULTANTS
901 RIO GRANDE BLVD SUITE F-142
ALBUQUERQUE NM, 87104

Project: ADVANCE ENERGY
Project Number: WOOL HEAD 20 STATE #003
Project Manager: ANDREW PARKER
Fax To: NONE

Reported:
29-Oct-19 11:10

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
S5 ER 0-4.5'	H903658-01	Soil	25-Oct-19 08:00	25-Oct-19 11:30
S5 WR 0-4.5'	H903658-02	Soil	25-Oct-19 08:30	25-Oct-19 11:30
S5 SOUTH BASE 2'	H903658-03	Soil	25-Oct-19 09:00	25-Oct-19 11:30
S5 NORTH BASE 4.5'	H903658-04	Soil	25-Oct-19 09:30	25-Oct-19 11:30

Client revised the sample IDs for -03 and -04. This is the revised report and will replace the one sent on 10/28/19.

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A handwritten signature in cursive script, appearing to read "Celey D. Keene", written in black ink.

Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

R T HICKS CONSULTANTS
901 RIO GRANDE BLVD SUITE F-142
ALBUQUERQUE NM, 87104

Project: ADVANCE ENERGY
Project Number: WOOL HEAD 20 STATE #003
Project Manager: ANDREW PARKER
Fax To: NONE

Reported:
29-Oct-19 11:10

S5 ER 0-4.5'
H903658-01 (Soil)

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

Chloride	64.0		16.0	mg/kg	4	9102514	AC	25-Oct-19	4500-Cl-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	9102508	MS	26-Oct-19	8021B	
Toluene*	<0.050		0.050	mg/kg	50	9102508	MS	26-Oct-19	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	9102508	MS	26-Oct-19	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	9102508	MS	26-Oct-19	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	9102508	MS	26-Oct-19	8021B	

Surrogate: 4-Bromofluorobenzene (PID) 109 % 73.3-129 9102508 MS 26-Oct-19 8021B

Petroleum Hydrocarbons by GC FID**S-04**

GRO C6-C10*	<10.0		10.0	mg/kg	1	9102417	MS	25-Oct-19	8015B	
DRO >C10-C28*	1710		10.0	mg/kg	1	9102417	MS	25-Oct-19	8015B	
EXT DRO >C28-C36	303		10.0	mg/kg	1	9102417	MS	25-Oct-19	8015B	

Surrogate: 1-Chlorooctane 93.4 % 41-142 9102417 MS 25-Oct-19 8015B

Surrogate: 1-Chlorooctadecane 154 % 37.6-147 9102417 MS 25-Oct-19 8015B

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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

R T HICKS CONSULTANTS
901 RIO GRANDE BLVD SUITE F-142
ALBUQUERQUE NM, 87104

Project: ADVANCE ENERGY
Project Number: WOOL HEAD 20 STATE #003
Project Manager: ANDREW PARKER
Fax To: NONE

Reported:
29-Oct-19 11:10

S5 WR 0-4.5'**H903658-02 (Soil)**

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

Chloride	64.0		16.0	mg/kg	4	9102514	AC	25-Oct-19	4500-Cl-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	9102508	MS	26-Oct-19	8021B	
Toluene*	<0.050		0.050	mg/kg	50	9102508	MS	26-Oct-19	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	9102508	MS	26-Oct-19	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	9102508	MS	26-Oct-19	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	9102508	MS	26-Oct-19	8021B	

Surrogate: 4-Bromofluorobenzene (PID) 103 % 73.3-129 9102508 MS 26-Oct-19 8021B

Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	9102417	MS	25-Oct-19	8015B	
DRO >C10-C28*	20.4		10.0	mg/kg	1	9102417	MS	25-Oct-19	8015B	
EXT DRO >C28-C36	23.5		10.0	mg/kg	1	9102417	MS	25-Oct-19	8015B	

Surrogate: 1-Chlorooctane 98.2 % 41-142 9102417 MS 25-Oct-19 8015B

Surrogate: 1-Chlorooctadecane 109 % 37.6-147 9102417 MS 25-Oct-19 8015B

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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

R T HICKS CONSULTANTS
901 RIO GRANDE BLVD SUITE F-142
ALBUQUERQUE NM, 87104

Project: ADVANCE ENERGY
Project Number: WOOL HEAD 20 STATE #003
Project Manager: ANDREW PARKER
Fax To: NONE

Reported:
29-Oct-19 11:10

S5 SOUTH BASE 2'**H903658-03 (Soil)**

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

Chloride	48.0		16.0	mg/kg	4	9102514	AC	25-Oct-19	4500-Cl-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	9102508	MS	26-Oct-19	8021B	
Toluene*	<0.050		0.050	mg/kg	50	9102508	MS	26-Oct-19	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	9102508	MS	26-Oct-19	8021B	
Total Xylenes*	0.218		0.150	mg/kg	50	9102508	MS	26-Oct-19	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	9102508	MS	26-Oct-19	8021B	

Surrogate: 4-Bromofluorobenzene (PID)			109 %	73.3-129		9102508	MS	26-Oct-19	8021B	
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Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	9102417	MS	25-Oct-19	8015B	
DRO >C10-C28*	370		10.0	mg/kg	1	9102417	MS	25-Oct-19	8015B	
EXT DRO >C28-C36	48.4		10.0	mg/kg	1	9102417	MS	25-Oct-19	8015B	

Surrogate: 1-Chlorooctane			100 %	41-142		9102417	MS	25-Oct-19	8015B	
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Surrogate: 1-Chlorooctadecane			116 %	37.6-147		9102417	MS	25-Oct-19	8015B	
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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

R T HICKS CONSULTANTS
901 RIO GRANDE BLVD SUITE F-142
ALBUQUERQUE NM, 87104

Project: ADVANCE ENERGY
Project Number: WOOL HEAD 20 STATE #003
Project Manager: ANDREW PARKER
Fax To: NONE

Reported:
29-Oct-19 11:10

S5 NORTH BASE 4.5'**H903658-04 (Soil)**

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

Chloride	48.0		16.0	mg/kg	4	9102514	AC	25-Oct-19	4500-Cl-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	9102508	MS	26-Oct-19	8021B	
Toluene*	<0.050		0.050	mg/kg	50	9102508	MS	26-Oct-19	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	9102508	MS	26-Oct-19	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	9102508	MS	26-Oct-19	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	9102508	MS	26-Oct-19	8021B	

Surrogate: 4-Bromofluorobenzene (PID) 105 % 73.3-129 9102508 MS 26-Oct-19 8021B

Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	9102417	MS	25-Oct-19	8015B	
DRO >C10-C28*	118		10.0	mg/kg	1	9102417	MS	25-Oct-19	8015B	
EXT DRO >C28-C36	19.3		10.0	mg/kg	1	9102417	MS	25-Oct-19	8015B	

Surrogate: 1-Chlorooctane 103 % 41-142 9102417 MS 25-Oct-19 8015B

Surrogate: 1-Chlorooctadecane 117 % 37.6-147 9102417 MS 25-Oct-19 8015B

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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

R T HICKS CONSULTANTS
901 RIO GRANDE BLVD SUITE F-142
ALBUQUERQUE NM, 87104

Project: ADVANCE ENERGY
Project Number: WOOL HEAD 20 STATE #003
Project Manager: ANDREW PARKER
Fax To: NONE

Reported:
29-Oct-19 11:10

Inorganic Compounds - Quality Control**Cardinal Laboratories**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
Batch 9102514 - 1:4 DI Water									
Blank (9102514-BLK1)					Prepared & Analyzed: 25-Oct-19				
Chloride	ND	16.0	mg/kg						
LCS (9102514-BS1)					Prepared & Analyzed: 25-Oct-19				
Chloride	416	16.0	mg/kg	400	104	80-120			
LCS Dup (9102514-BSD1)					Prepared & Analyzed: 25-Oct-19				
Chloride	416	16.0	mg/kg	400	104	80-120	0.00	20	

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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

R T HICKS CONSULTANTS
901 RIO GRANDE BLVD SUITE F-142
ALBUQUERQUE NM, 87104

Project: ADVANCE ENERGY
Project Number: WOOL HEAD 20 STATE #003
Project Manager: ANDREW PARKER
Fax To: NONE

Reported:
29-Oct-19 11:10

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 9102508 - Volatiles**Blank (9102508-BLK1)**

Prepared & Analyzed: 25-Oct-19

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)	0.103		mg/kg	0.100		103	73.3-129			

LCS (9102508-BS1)

Prepared & Analyzed: 25-Oct-19

Benzene	1.81	0.050	mg/kg	2.00		90.4	72.2-131			
Toluene	1.92	0.050	mg/kg	2.00		95.8	71.7-126			
Ethylbenzene	1.90	0.050	mg/kg	2.00		95.0	68.9-126			
Total Xylenes	5.90	0.150	mg/kg	6.00		98.4	71.4-125			
Surrogate: 4-Bromofluorobenzene (PID)	0.106		mg/kg	0.100		106	73.3-129			

LCS Dup (9102508-BSD1)

Prepared & Analyzed: 25-Oct-19

Benzene	1.83	0.050	mg/kg	2.00		91.3	72.2-131	0.948	6.91	
Toluene	1.91	0.050	mg/kg	2.00		95.6	71.7-126	0.181	7.12	
Ethylbenzene	1.90	0.050	mg/kg	2.00		94.8	68.9-126	0.181	7.88	
Total Xylenes	5.87	0.150	mg/kg	6.00		97.9	71.4-125	0.540	7.46	
Surrogate: 4-Bromofluorobenzene (PID)	0.105		mg/kg	0.100		105	73.3-129			

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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

R T HICKS CONSULTANTS
901 RIO GRANDE BLVD SUITE F-142
ALBUQUERQUE NM, 87104

Project: ADVANCE ENERGY
Project Number: WOOL HEAD 20 STATE #003
Project Manager: ANDREW PARKER
Fax To: NONE

Reported:
29-Oct-19 11:10

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
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Batch 9102417 - General Prep - Organics**Blank (9102417-BLK1)**

Prepared: 24-Oct-19 Analyzed: 25-Oct-19

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	49.0		mg/kg	50.0		98.0	41-142		
Surrogate: 1-Chlorooctadecane	55.6		mg/kg	50.0		111	37.6-147		

LCS (9102417-BS1)

Prepared: 24-Oct-19 Analyzed: 25-Oct-19

GRO C6-C10	220	10.0	mg/kg	200		110	76.5-133		
DRO >C10-C28	220	10.0	mg/kg	200		110	72.9-138		
Total TPH C6-C28	439	10.0	mg/kg	400		110	78-132		
Surrogate: 1-Chlorooctane	55.0		mg/kg	50.0		110	41-142		
Surrogate: 1-Chlorooctadecane	58.1		mg/kg	50.0		116	37.6-147		

LCS Dup (9102417-BS1)

Prepared: 24-Oct-19 Analyzed: 25-Oct-19

GRO C6-C10	208	10.0	mg/kg	200		104	76.5-133	5.72	20.6
DRO >C10-C28	205	10.0	mg/kg	200		103	72.9-138	6.63	20.6
Total TPH C6-C28	413	10.0	mg/kg	400		103	78-132	6.17	18
Surrogate: 1-Chlorooctane	53.5		mg/kg	50.0		107	41-142		
Surrogate: 1-Chlorooctadecane	56.6		mg/kg	50.0		113	37.6-147		

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Celey D. Keene, Lab Director/Quality Manager



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Notes and Definitions

S-04	The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.
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 SM4500Cl-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

Cardinal Laboratories

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A handwritten signature in cursive script, reading "Celey D. Keene".

Celey D. Keene, Lab Director/Quality Manager

11 jo 11 ead



CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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

BILL TO

ANALYSIS REQUEST

Company Name: R.T. Hicks
Project Manager: Andrew Parker
Address: ON File
City: _____ State: _____ Zip: _____
Phone #: _____ Fax #: _____
Project #: _____ Project Owner: _____
Project Name: Advance Energy
Project Location: Wool Head 20 state #003
Sampler Name: SAcOB SAcv2
P.O. #: _____
Company: R.T. Hicks
Attn: Send to HBA
Address: office
City: _____ State: _____ Zip: _____
Phone #: _____ Fax #: _____

FOR LAB USE ONLY

Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX	PRESERV.	SAMPLING	DATE	TIME	ANALYSIS	REMARKS
H903058	1	ER	0-4.5FT	< 1			10/25	8am	X	chloride
	2	SS	W R South O-4.5FT					8:30am	X	PTEX, GRO, BRO, MRO
	3	SS	R North base 2.5FT					9:30am	X	TCH
	* 4	SS	South base 4.5FT							
			North							

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Relinquished By: _____

Date: 10/25

Received By: _____

Phone Result: _____

Fax Result: _____

Add'l Phone #: _____

Add'l Fax #: _____

REMARKS:

* Sample IDs revised as per

Advised 10/29/19

ca RFN

Sample Condition

Checked BY: _____

Initials

5AcOB@ATHickson.com

Delivered By: (Circle One)

3.3c

3.7c

Corrected 3.7c

Sample - UPS - Bus - Other:

Yes

Yes

Yes



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

November 05, 2019

ANDREW PARKER

R T HICKS CONSULTANTS

901 RIO GRANDE BLVD SUITE F-142

ALBUQUERQUE, NM 87104

RE: ADVANCE ENERGY

Enclosed are the results of analyses for samples received by the laboratory on 11/04/19 16:20.

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/qa/lab_accred_certif.html.

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

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

Accreditation applies to public drinking water matrices.

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,

A handwritten signature in black ink that reads "Celey D. Keene". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

Celey D. Keene

Lab Director/Quality Manager



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Analytical Results For:

R T HICKS CONSULTANTS
 ANDREW PARKER
 901 RIO GRANDE BLVD SUITE F-142
 ALBUQUERQUE NM, 87104
 Fax To: NONE

Received:	11/04/2019	Sampling Date:	11/04/2019
Reported:	11/05/2019	Sampling Type:	Soil
Project Name:	ADVANCE ENERGY	Sampling Condition:	Cool & Intact
Project Number:	WOOL HEAD 20 STATE COM 3	Sample Received By:	Tamara Oldaker
Project Location:	NOT GIVEN		

Sample ID: S5 EAST WALL 0-4' (H903753-01)

BTEX 8021B		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	11/05/2019	ND	1.97	98.4	2.00	4.52	
Toluene*	<0.050	0.050	11/05/2019	ND	1.65	82.6	2.00	2.64	
Ethylbenzene*	<0.050	0.050	11/05/2019	ND	1.74	87.0	2.00	0.291	
Total Xylenes*	<0.150	0.150	11/05/2019	ND	5.23	87.1	6.00	1.94	
Total BTEX	<0.300	0.300	11/05/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID) 98.8 % 73.3-129

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	16.0	16.0	11/05/2019	ND	416	104	400	0.00	

TPH 8015M		mg/kg		Analyzed By: CK					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	11/05/2019	ND	230	115	200	2.19	
DRO >C10-C28*	<10.0	10.0	11/05/2019	ND	227	114	200	1.44	
EXT DRO >C28-C36	<10.0	10.0	11/05/2019	ND					

Surrogate: 1-Chlorooctane 97.6 % 41-142

Surrogate: 1-Chlorooctadecane 101 % 37.6-147

Cardinal Laboratories

*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

R T HICKS CONSULTANTS
 ANDREW PARKER
 901 RIO GRANDE BLVD SUITE F-142
 ALBUQUERQUE NM, 87104
 Fax To: NONE

Received:	11/04/2019	Sampling Date:	11/04/2019
Reported:	11/05/2019	Sampling Type:	Soil
Project Name:	ADVANCE ENERGY	Sampling Condition:	Cool & Intact
Project Number:	WOOL HEAD 20 STATE COM 3	Sample Received By:	Tamara Oldaker
Project Location:	NOT GIVEN		

Sample ID: S5 WEST WALL 0-4' (H903753-02)

BTX 8021B		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	11/05/2019	ND	1.97	98.4	2.00	4.52	
Toluene*	<0.050	0.050	11/05/2019	ND	1.65	82.6	2.00	2.64	
Ethylbenzene*	<0.050	0.050	11/05/2019	ND	1.74	87.0	2.00	0.291	
Total Xylenes*	<0.150	0.150	11/05/2019	ND	5.23	87.1	6.00	1.94	
Total BTX	<0.300	0.300	11/05/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID) 107 % 73.3-129

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	32.0	16.0	11/05/2019	ND	416	104	400	0.00	

TPH 8015M		mg/kg		Analyzed By: CK					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	11/05/2019	ND	231	116	200	0.986	
DRO >C10-C28*	<10.0	10.0	11/05/2019	ND	228	114	200	2.88	
EXT DRO >C28-C36	<10.0	10.0	11/05/2019	ND					

Surrogate: 1-Chlorooctane 99.8 % 41-142

Surrogate: 1-Chlorooctadecane 104 % 37.6-147

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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

R T HICKS CONSULTANTS
 ANDREW PARKER
 901 RIO GRANDE BLVD SUITE F-142
 ALBUQUERQUE NM, 87104
 Fax To: NONE

Received:	11/04/2019	Sampling Date:	11/04/2019
Reported:	11/05/2019	Sampling Type:	Soil
Project Name:	ADVANCE ENERGY	Sampling Condition:	Cool & Intact
Project Number:	WOOL HEAD 20 STATE COM 3	Sample Received By:	Tamara Oldaker
Project Location:	NOT GIVEN		

Sample ID: S5 SOUTH WALL BASE 4.5' (H903753-03)

BTX 8021B		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	11/05/2019	ND	1.97	98.4	2.00	4.52	
Toluene*	<0.050	0.050	11/05/2019	ND	1.65	82.6	2.00	2.64	
Ethylbenzene*	<0.050	0.050	11/05/2019	ND	1.74	87.0	2.00	0.291	
Total Xylenes*	<0.150	0.150	11/05/2019	ND	5.23	87.1	6.00	1.94	
Total BTX	<0.300	0.300	11/05/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID) 103 % 73.3-129

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	16.0	16.0	11/05/2019	ND	416	104	400	0.00	

TPH 8015M		mg/kg		Analyzed By: CK					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	11/05/2019	ND	231	116	200	0.986	
DRO >C10-C28*	<10.0	10.0	11/05/2019	ND	228	114	200	2.88	
EXT DRO >C28-C36	<10.0	10.0	11/05/2019	ND					

Surrogate: 1-Chlorooctane 97.2 % 41-142

Surrogate: 1-Chlorooctadecane 101 % 37.6-147

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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

R T HICKS CONSULTANTS
 ANDREW PARKER
 901 RIO GRANDE BLVD SUITE F-142
 ALBUQUERQUE NM, 87104
 Fax To: NONE

Received:	11/04/2019	Sampling Date:	11/04/2019
Reported:	11/05/2019	Sampling Type:	Soil
Project Name:	ADVANCE ENERGY	Sampling Condition:	Cool & Intact
Project Number:	WOOL HEAD 20 STATE COM 3	Sample Received By:	Tamara Oldaker
Project Location:	NOT GIVEN		

Sample ID: S5 SOUTH WALL 0-4' (H903753-04)

BTX 8021B		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	11/05/2019	ND	1.97	98.4	2.00	4.52	
Toluene*	<0.050	0.050	11/05/2019	ND	1.65	82.6	2.00	2.64	
Ethylbenzene*	<0.050	0.050	11/05/2019	ND	1.74	87.0	2.00	0.291	
Total Xylenes*	<0.150	0.150	11/05/2019	ND	5.23	87.1	6.00	1.94	
Total BTX	<0.300	0.300	11/05/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID) 102 % 73.3-129

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	48.0	16.0	11/05/2019	ND	416	104	400	0.00	

TPH 8015M		mg/kg		Analyzed By: CK					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	11/05/2019	ND	231	116	200	0.986	
DRO >C10-C28*	<10.0	10.0	11/05/2019	ND	228	114	200	2.88	
EXT DRO >C28-C36	<10.0	10.0	11/05/2019	ND					

Surrogate: 1-Chlorooctane 98.7 % 41-142

Surrogate: 1-Chlorooctadecane 101 % 37.6-147

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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

R T HICKS CONSULTANTS
 ANDREW PARKER
 901 RIO GRANDE BLVD SUITE F-142
 ALBUQUERQUE NM, 87104
 Fax To: NONE

Received:	11/04/2019	Sampling Date:	11/04/2019
Reported:	11/05/2019	Sampling Type:	Soil
Project Name:	ADVANCE ENERGY	Sampling Condition:	Cool & Intact
Project Number:	WOOL HEAD 20 STATE COM 3	Sample Received By:	Tamara Oldaker
Project Location:	NOT GIVEN		

Sample ID: S5 SOUTH BASE 4.5' (H903753-05)

BTEX 8021B		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	11/05/2019	ND	1.97	98.4	2.00	4.52		
Toluene*	<0.050	0.050	11/05/2019	ND	1.65	82.6	2.00	2.64		
Ethylbenzene*	<0.050	0.050	11/05/2019	ND	1.74	87.0	2.00	0.291		
Total Xylenes*	<0.150	0.150	11/05/2019	ND	5.23	87.1	6.00	1.94		
Total BTEX	<0.300	0.300	11/05/2019	ND						

Surrogate: 4-Bromofluorobenzene (PID) 103 % 73.3-129

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	16.0	16.0	11/05/2019	ND	416	104	400	0.00		

TPH 8015M		mg/kg		Analyzed By: CK					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	11/05/2019	ND	231	116	200	0.986	
DRO >C10-C28*	<10.0	10.0	11/05/2019	ND	228	114	200	2.88	
EXT DRO >C28-C36	<10.0	10.0	11/05/2019	ND					

Surrogate: 1-Chlorooctane 97.9 % 41-142

Surrogate: 1-Chlorooctadecane 102 % 37.6-147

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Celey D. Keene, Lab Director/Quality Manager



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Notes and Definitions

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 SM4500Cl-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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A handwritten signature in black ink, appearing to read "Celey D. Keene", is written over a horizontal line.

Celey D. Keene, Lab Director/Quality Manager

