

October 20, 2020

Vertex Project #: 20E-00239-007

Spill Closure Report:Shinnery Oak Federal SWD #001Unit I, Section 12, Township 21 South, Range 28 EastCounty: EddyIncident Tracking Number: NRM2009032079

Prepared For:Matador Production Company5400 LBJ FreewaySuite 1500Dallas, Texas 75240

New Mexico Oil Conservation Division – District 2 – Artesia 811 South First Street Artesia, New Mexico 88210

Matador Production Company (Matador) retained Vertex Resource Services Inc. (Vertex) to conduct a spill assessment and remediation for a produced water release that occurred at Shinnery Oak Federal SWD #001 (hereafter referred to as "Shinnery Oak"). Matador provided notification of the spill to New Mexico Oil Conservation Division (NM OCD) District 2 and the Bureau of Land Management (BLM), who own the land, via submission of an initial C-141 Release Notification (Attachment 1) on March 30, 2020. The NM OCD tracking number assigned to this incident is NRM2009032079.

This letter provides a description of the spill assessment and remediation activities, and demonstrates that closure criteria established in 19.15.29.12 *New Mexico Administrative Code* (NMAC; New Mexico Oil Conservation Division, 2018) have been met and all applicable regulations are being followed. This document is intended to serve as a final report to obtain approval from NM OCD for closure of this release.

Incident Description

On March 25, 2020, a release occurred at Matador's Shinnery Oak site when a fitting on the produced water bypass meter blew out. This incident resulted in the release of approximately 19.81 barrels (bbls) of produced water onto the engineered pad. A vac truck arrived on-site to recover free fluids; approximately 12 bbls of produced water were recovered. The spill was contained within the boundaries of the engineered pad. No produced water was released into undisturbed areas or waterways.

Site Characterization

The release at Shinnery Oak occurred on federally-owned land, N 32.49297, W 104.03371, approximately 12 miles northeast of Carlsbad, New Mexico. The legal description for the site is Unit I, Section 12, Township 21 South, Range 28 East, Eddy County, New Mexico. This location is within the Permian Basin in southeast New Mexico and has historically been used for oil and gas exploration and production, and rangeland. An aerial photograph and site schematic are included in Attachment 2.

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The Shinnery Oak complex consists of saltwater disposal (SWD) equipment, a tank battery, and nearby oil and gas exploration and production wellpads, and is typical of oil and gas-related sites in the western portion of the Permian Basin. The following sections specifically describe the release area on the northern edge of the tank battery containment and towards the fence line of the lease at the north edge of the pad.

The surrounding landscape is associated with the sandy plains and interdunes typical of elevations between 2,700 and 5,500 feet above sea level. The climate is semi-arid with an average annual precipitation ranging between 5 and 15 inches. Historically, the plant communities in this area have been dominated by black grama, dropseeds, and bluestems with scattered shinnery oak and sand sage. Perennial and annual forb abundance and distribution are dependent on precipitation. Litter and, to a lesser extent, bare ground make up a significant proportion of ground cover (United States Department of Agriculture, Natural Resources Conservation Service, 2020). Limited to no vegetation is allowed to grow on the compacted facility and disposal pad area.

The Geological Map of New Mexico indicates the surface geology at Shinnery Oak is comprised of Qe – Eolian deposits of upland plains, fan piedmonts and inter-dunal areas (New Mexico Bureau of Geology and Mineral Resources, 2020). The Natural Resources Conservation Service Web Soil Survey characterizes the soil at Shinnery Oak as Pajarito loamy fine sand, which is characterized by loamy fine sand over deep fine sandy loam. This soil tends to be well drained with very low runoff and moderate water storage in the soil profile (United States Department of Agriculture, Natural Resources Conservation Service, 2020). There is low-to-medium potential for karst geology to be present near Shinnery Oak (United States Department of the Interior, Bureau of Land Management, 2020).

There is no surface water located on-site. The nearest significant watercourse, as defined in Subsection P of 19.15.17.7 NMAC, is Lake Avalon, located approximately 10 miles west of the site (United States Fish and Wildlife Service, 2020). There are no continuously flowing watercourses, lakebeds, sinkholes, playa lakes, or other critical water or community features at Shinnery Oak, as outlined in Paragraph (4) of Subsection C of 19.15.29.12 NMAC.

The nearest recent well to the site is a United States Geological Survey-identified well, located approximately 0.8 miles south-southeast of Shinnery Oak, with a depth to groundwater of 134 feet below ground surface (bgs; United States Department of the Interior, United States Geological Survey, 2020). Documentation pertaining to site characterization and depth to groundwater determination is included in Attachment 3.

Closure Criteria Determination

Using site characterization information, a closure criteria determination worksheet (Attachment 3) was completed to determine if the release was subject to any of the special case scenarios outlined in Paragraph (4) of Subsection C of 19.15.29.12 NMAC.

Based on data included in the closure criteria determination worksheet, the release at Shinnery Oak is not subject to the requirements of Paragraph (4) of Subsection C of 19.15.29.12 NMAC and the closure criteria for the site are determined to be associated with the following constituent concentration limits based on depth to groundwater.

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Table 1. Closure Criteria for Soils Impacted by a Release			
Depth to Groundwater	Constituent	Limit	
	Chloride	20,000 mg/kg	
>100 feet	TPH ¹ (GRO + DRO + MRO)	2,500 mg/kg	
	GRO + DRO	1,000 mg/kg	
	BTEX ²	50 mg/kg	
	Benzene	10 mg/kg	

¹Total petroleum hydrocarbons (TPH) = gasoline range organics (GRO) + diesel range organics (DRO) + motor oil range organics (MRO) ²Benzene, toluene, ethylbenzene and xylenes (BTEX)

Remedial Actions

On March 26, 2020, Matador contracted with Vertex to complete release delineation and remediation at Shinnery Oak through field screen procedures, oversight of the remediation fieldwork and final confirmatory sampling. The initial spill inspection and site characterization activities at Shinnery Oak were completed by Vertex on March 26, 2020. The Daily Field Report (DFR) and field screening data associated with the visit is included in Attachment 4. Using initial field screening data, the release was delineated horizontally and vertically, and remediation was started. Excavation of impacted soils was conducted between March 26 and March 27, 2020, with a Vertex representative on-site to conduct field screen procedures to determine final horizontal and vertical extents of the excavation area.

On March 27, 2020, following the completion of excavation activities, Vertex provided notification of confirmation sampling to NM OCD (Attachment 5), as required by Subparagraph (a) of Paragraph (1) of Subsection D 19.15.29.12 NMAC.

On April 1, 2020, Vertex collected a total of 18 five-point composite confirmatory samples from the base and side walls of the excavation, at depths ranging between ground surface and 0.5 feet bgs. Each composite sample was representative of no more than 200 square feet per the alternate sampling method outlined in Subparagraph (c) of Paragraph (1) of Subsection D 19.15.29.12 NMAC, which does not require prior NM OCD approval. The composite samples were placed into laboratory-provided containers, preserved on ice, and submitted to a National Environmental Laboratory Accreditation Program-approved laboratory for chemical analysis.

Laboratory analyses included Method 300.0 for chlorides, Method 8021B for volatile organics, including BTEX, and EPA Method 8015 for TPH, including MRO, DRO and GRO. Confirmatory sample analytical data are summarized in Attachment 6. Laboratory data reports and chain of custody forms are included in Attachment 7.

A GeoExplorer 7000 Series Trimble global positioning system (GPS) unit, or equivalent, was used to map the approximate center of each of the five-point composite samples. The confirmatory sample locations are presented on Figure 1 (Attachment 2). Relevant equipment and prominent features/reference points at the site are mapped as well.

Closure Request Denial and Additional Activities

On May 7, 2020, Matador requested closure for the release at Shinnery Oak, at Vertex's recommendation. On August 18, 2020, the NM OCD denied closure for this incident based on the following reason:

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 Horizontal delineation was not completed in accordance with Subparagraph (b) of Paragraph (5) of Subsection A 19.15.29.11 NMAC.

On August 24, 2020, Vertex returned to Shinnery Oak to re-delineate the horizontal boundaries of the release as required by 19.15.29.11 NMAC, to verify that the release was remediated to the extent required. A total of 4 surface samples were collected at the horizontal extents of the original release and remediation area to verify the edges of the release had been accurately identified. The surface samples were placed into laboratory-provided containers and submitted to an approved laboratory for chemical analysis.

Laboratory analyses included Method 300.0 for chlorides, Method 8021B for volatile organics, including BTEX, and EPA Method 8015 for TPH, including MRO, DRO and GRO. The additional delineation sampling analytical data are summarized in the revised Table 2 (Attachment 6). Laboratory data reports and chain of custody forms are included in Attachment 7.

A GeoExplorer 7000 Series Trimble GPS unit, or equivalent, was used to map the additional release delineation samples. The additional delineation surface samples are presented along with the original confirmatory base and side wall samples on the revised Figure 1. The new samples are identified with the prefix "SS20-" (Attachment 2).

Closure Request

Vertex recommends no additional action to address the release at Shinnery Oak. Laboratory analyses of the final confirmatory samples showed constituent of concern concentration levels below NM OCD closure criteria for areas where depth to groundwater is greater than 100 feet bgs as shown in Table 1. The additional delineation samples showed constituent of concern concentration levels below the most-strict closure criteria or background level and are indicative of full horizontal delineation. There are no anticipated risks to human, ecological or hydrological receptors associated with the release site.

Vertex requests that this incident (NRM2009032079) be closed as the original closure request denial (Attachment 8) reason has been addressed and closure requirements set forth in Subsection E of 19.15.29.12 NMAC have been met. Matador certifies that all information in this report and the attachments is correct, and that they have complied with all applicable closure requirements and conditions specified in Division rules and directives to meet NM OCD requirements to obtain closure on the March 25, 2020, release at Shinnery Oak.

Should you have any questions or concerns, please do not hesitate to contact the undersigned at 505.506.0040 or ngordon@vertex.ca.

Sincerely,

alex

Natalie Gordon PROJECT MANAGER

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Attachments

- Attachment 2. Site Schematic and Confirmatory Sample Locations (Rev'd)
- Attachment 3. Closure Criteria for Soils Impacted by a Release Research Determination Documentation
- Attachment 4. Daily Field Report(s) with Photographs
- Attachment 5. Required 48-hr Notification of Confirmation Sampling to Regulatory Agencies
- Attachment 6. Confirmatory Sampling Laboratory Results (Rev'd)
- Attachment 7. Laboratory Data Reports/Chain of Custody Forms
- Attachment 8. NM OCD Original Closure Denial



References

- New Mexico Bureau of Geology and Mineral Resources. (2020). *Interactive Geologic Map.* Retrieved from http://geoinfo.nmt.edu
- New Mexico Oil Conservation Division. (2018). New Mexico Administrative Code Natural Resources and Wildlife Oil and Gas Releases. Santa Fe, New Mexico.
- United States Department of Agriculture, Natural Resources Conservation Service. (2020). Web Soil Survey. Retrieved from https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx
- United States Department of the Interior, Bureau of Land Management. (2020). *New Mexico Cave/Karsts*. Retrieved from https://www.blm.gov/programs/recreation/recreation-programs/caves/new-mexico
- United States Department of the Interior, United States Geological Survey. (2020). *Groundwater for New Mexico: Water Levels*. Retrieved from https://nwis.waterdata.usgs.gov/nm/nwis/gwlevels?
- United States Fish and Wildlife Service. (2020). *National Wetlands Inventory*. Retrieved from https://www.fws.gov /wetlands/Data/Mapper.html

Limitations

This report has been prepared for the sole benefit of Matador Production Company (Matador). This document may not be used by any other person or entity, with the exception of the New Mexico Oil Conservation Division, without the express written consent of Vertex Resource Services Inc. (Vertex) and Matador. Any use of this report by a third party, or any reliance on decisions made based on it, or damages suffered as a result of the use of this report are the sole responsibility of the user.

The information and conclusions contained in this report are based upon work undertaken by trained professional and technical staff in accordance with generally accepted scientific practices current at the time the work was performed. The conclusions and recommendations presented represent the best judgement of Vertex based on the data collected during the assessment. Due to the nature of the assessment and the data available, Vertex cannot warrant against undiscovered environmental liabilities. Conclusions and recommendations presented in this report should not be considered legal advice.



ATTACHMENT 1

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

State of New Mexico Energy Minerals and Natural Resources Department

Oil Conservation Division 1220 South St. Francis Dr. Santa Fe, NM 87505 Form C-141 Revised August 24, 2018 Submit to appropriate OCD District office

Incident ID	NR M2009032079
District RP	
Facility ID	
Application ID	

Release Notification

Responsible Party

Responsible Party: Matador Production Company	OGRID: 228937
Contact Name: John Hurt	Contact Telephone: 972-371-5200
Contact email: JHurt@matadorresources.com	Incident # (assigned by OCD)
Contact mailing address: 5400 LBJ Freeway, Suite 1500 Dallas, T	X 75240

Location of Release Source

Latitude	

32.49297

Longitude <u>-104.03371</u>

(NAD 83 in decimal degrees to 5 decimal places)

Site Name: Shinnery Oak Federal SWD #001	Site Type: SWD
Date Release Discovered: 03/25/2020	API# (if applicable) 30-015-20866

Unit Letter	Section	Township	Range	County
I	12	218	28E	Eddy

Surface Owner: State Federal Tribal Private (Name: .

Nature and Volume of Release

Material(s) Released (Select all that apply and attach calculations or specific justification for the volumes provided below) Crude Oil Volume Released (bbls) Volume Recovered (bbls)				
Produced Water	Volume Released (bbls) 19.81 bbls	Volume Recovered (bbls) 12 bbls		
	Is the concentration of dissolved chloride in the produced water >10,000 mg/l?	Yes No		
Condensate	Volume Released (bbls)	Volume Recovered (bbls)		
🗌 Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)		
	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)		

Cause of Release:

A fitting on the PW bypass meter blew out.

Re

Incident ID NRM20090 Oil Conservation Division Incident ID NRM20090 Using 2 Oil Conservation Division Incident ID NRM20090 Was this a major release as defined by 19.15.29.7(A) NMAC? If YES, for what reason(s) does the responsible party consider this a major release? If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)? If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)? If the source of the release has been stopped. The source of the release has been stopped. Release materials have been contained via the use of berms or dikes, absorbent pads, or other containment devices. All free liquids and recoverable materials have been removed and managed appropriately. If all the actions described above have ngg 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 re has begun, please attach a narrative of actions to date. If remedial efforts have been successfully completed or if the release within a line domination given above is true and complete to the best of my kowledge and understand that pursuant to CD mki the ather at the information given above is true and complete to the best of my kowledge and understand that pursuant to CD mki the ather ato grandwark suffice which may other telever, stude with any other televers, stude, yring a stude of release of lacling toport by the CD Does not releve the operator of r	13207
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Page 3

Oil Conservation Division

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Incident ID	NRM2009032079
District RP	
Facility ID	
Application ID	

Site Assessment/Characterization

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

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

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

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

- Scaled site map showing impacted area, surface features, subsurface features, delineation points, and monitoring wells.
- Field data
- **X** Data table of soil contaminant concentration data
- **X** Depth to water determination
- X Determination of water sources and significant watercourses within ¹/₂-mile of the lateral extents of the release
- × Boring or excavation logs
- X Photographs including date and GIS information
- X Topographic/Aerial maps
- **x** 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.

eceived_by_OCD: 10/27/	2020 10:14:23 AM e of New Mexico			Page 12 of
Page 4			Incident ID	NRM2009032079
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OCD Only Received by: Cristin	na Eads	Date:10/2	7/2020	

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Incident ID	NRM2009032079
District RP	
Facility ID	
Application ID	

Closure

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

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

x A scaled site and sampling diagram as described in 19.15.29.11 NMAC

X 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)

 \mathbf{x} Laboratory analyses of final sampling (Note: appropriate ODC District office must be notified 2 days prior to final sampling)

X 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 :	John Hurt	Title:	RES Specialist	
Signature:	Alle Att	_ Date:	16/27/20	
email:	JHurt@matadorresources.com .	Telephone:	972-371-5200	

OCD Only

Received by: Cristina Eads

10/27/2020 Date:

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

Closure Approved by://///

Printed Name: Cristina Eads

Date: 01/22/2021

Title: Environmental Specialist

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ATTACHMENT 2

. Released to Imaging: 1/22/2021 11:06:17 AM

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ATTACHMENT 3

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pill Coo	ne: Shinnery Oak Federal SWD #001 rdinates:	32.49297	Y: -104.03371				
ite Spec	ific Conditions	Value	Unit				
1	Depth to Groundwater	134	feet				
2	Within 300 feet of any continuously flowing watercourse or any other significant watercourse	2,093	feet				
3	Within 200 feet of any lakebed, sinkhole or playa lake (measured from the ordinary high-water mark)	61,776	feet				
4	Within 300 feet from an occupied residence, school, hospital, institution or church	19,346	feet				
5	i) Within 500 feet of a spring or a private, domestic fresh water well used by less than five households for domestic or stock watering purposes, or	4,882	feet				
	ii) Within 1000 feet of any fresh water well or spring		feet				
6	Within incorporated municipal boundaries or within a defined municipal fresh water field covered under a municipal ordinance adopted pursuant to Section 3-27- 3 NMSA 1978 as amended, unless the municipality specifically approves	No	(Y/N)				
7	Within 300 feet of a wetland	4,452	feet				
8	Within the area overlying a subsurface mine	No	(Y/N)				
9	Within an unstable area (Karst Map)	Low	Critical High Medium Low				
10	Within a 100-year Floodplain	>100	year				
11	Soil Type	Pajarito loa	amy fine sand				
12	Ecological Classification	Loamy Sand					
13	Geology		Qe				
	NMAC 19.15.29.12 E (Table 1) Closure Criteria	>100'	<50' 51-100' >100'				



Water Resources of the United States---National Water Information System (NWIS) Mapper



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https://maps.waterdata.usgs.gov/mapper/index.html





32°29'34.7"N 104°02'01.4"W - Google Maps

32°29'34.7"N 104°02'01.4"W

4/30/2020



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Shinnery Oak

Eddy Area, New Mexico

LA—Largo loam, 1 to 5 percent slopes

Map Unit Setting

National map unit symbol: 1w4y Elevation: 2,000 to 5,700 feet Mean annual precipitation: 6 to 14 inches Mean annual air temperature: 57 to 70 degrees F Frost-free period: 180 to 260 days Farmland classification: Not prime farmland

Map Unit Composition

Largo and similar soils: 98 percent Minor components: 2 percent Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Largo

Setting

Landform: Plains, alluvial fans Landform position (three-dimensional): Talf, rise Down-slope shape: Convex, linear Across-slope shape: Linear Parent material: Calcareous alluvium

Typical profile

H1 - 0 to 4 inches: loam *H2 - 4 to 47 inches:* silt loam *H3 - 47 to 65 inches:* loam

Properties and qualities

Slope: 1 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 1.0
Available water storage in profile: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): 3e

Land capability classification (nonirrigated): 7e

Hydrologic Soil Group: B

USDA Natural Resources

Web Soil Survey National Cooperative Soil Survey 4/30/2020 Page 1 of 2 *Ecological site:* Loamy (R042XC007NM) *Hydric soil rating:* No

Minor Components

Largo

Percent of map unit: 1 percent Ecological site: Bottomland (R042XC017NM) Hydric soil rating: No

Pajarito

Percent of map unit: 1 percent Ecological site: Loamy Sand (R042XC003NM) Hydric soil rating: No

Data Source Information

Soil Survey Area: Eddy Area, New Mexico Survey Area Data: Version 15, Sep 15, 2019



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Area of Interest (AOI)SoilsArea of Interest (AOI)SoilsSoil Map Unit PolygonsSoil Map Unit LinesSoil Map Unit LinesSoil Map Unit PointsSoil Map Unit PointsSoil BlowoutBlowoutSpecial Point FeaturesClay SpotSoil Stavel PitStavel PitSoil Stavel PitClavel PitSoil Stavel PitLandfill	st (AOI) and Spot Polygons and Ven Lines and Oth Points an Spe Water Features	Spoil Area Stony Spot	
			The soil surveys that comprise your AOI were mapped at 1:20,000.
 Soil Map Unit Soil Map Unit Special Point Features Blowout Blowout Clay Spot Clay Spot Clay Spot Clay Spot Clay Spot Clay Spot 		Very Stony Spot	Warning: Soil Map may not be valid at this scale.
 Soil Map Unit Soil Map Unit Special Point Features Blowout Blowout Clay Spot Clay Spot Closed Depre Closed Depre Gravel Pit Gravel Pit 		Wet Spot	Enlargement of maps beyond the scale of mapping can cause
Special Point Features Special Point Features Blowout Blowout Clay Spot Clay Spot Closed Depre Closed Depre Closed Depre Closed Pit		Other	misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of
Special Point Features Blowout Clay Spot Closed Depre Closed Depre Closed Depre Closed Pit Closed Depre	Water Fea	Special Line Features	contrasting soils that could have been shown at a more detailed
		tures	scale.
	{	Streams and Canals	Please rely on the bar scale on each map sheet for map measurements
	Transportation	ation	Source of Man. Natural Recourses Concentration Service
	+	Rails	~
		Interstate Highways	Coordinate System: Web Mercator (EPSG:3857)
_	\$	US Routes	Maps from the Web Soil Survey are based on the Web Mercator
	2	Major Roads	projection, which preserves direction and shape but distorts
	Ŕ	Local Roads	distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more
🙏 Lava Flow	Background	þ	accurate calculations of distance or area are required.
👑 Marsh or swamp		Aerial Photography	This product is generated from the USDA-NRCS certified data as
🙊 Mine or Quarry	×		
Miscellaneous Water	Water		Soli Survey Area. Eduy Area, New Mexico Survey Area Data: Version 15, Sep 15, 2019
Perennial Water	er		Soil map units are labeled (as space allows) for map scales
 Rock Outcrop 			1:50,000 or larger.
+ Saline Spot			Date(s) aerial images were photographed: Dec 31, 2009—Sep
ِ * ِ Sandy Spot			u, sour The orthorhoto or other base man on which the soil lines were
Severely Eroded Spot	ed Spot		compiled and digitized probably differs from the background
Sinkhole			imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.
Slide or Slip			-
🙍 Sodic Spot			

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Natural Resources Conservation Service

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Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI				
BB	Berino complex, 0 to 3 percent slopes, eroded	5.1	2.8%				
КМ	Kermit-Berino fine sands, 0 to 3 percent slopes	35.6	20.0%				
LA	Largo loam, 1 to 5 percent slopes	69.0	38.8%				
PA	Pajarito loamy fine sand, 0 to 3 percent slopes, eroded	63.7	35.8%				
UG	Upton gravelly loam, 0 to 9 percent slopes	4.5	2.5%				
Totals for Area of Interest		177.9	100.0%				



Web Soil Survey National Cooperative Soil Survey



USGS 323015104032301 20S.29E.28.244111

Available data for this site SUMMARY OF ALL AVAILABLE DATA V GO

Well Site

DESCRIPTION:

Latitude 32°30'15", Longitude 104°03'23" NAD27 Eddy County, New Mexico , Hydrologic Unit 13060011 Well depth: 205 feet Land surface altitude: 3,268 feet above NGVD29. Well gompleted in "Rustler Formation" (312RSLR) local aquifer

AVAILABLE DATA:

	ISGS 323015104032	USGS 323015104032301 20S.29E.28.244111	
Data Type	Begin Date	Begin Date End Date Count	Count
Field groundwater-level measurements 1994-03-02 1999-01-20	994-03-02	1999-01-20	2
Revisions	Jnavailable (Unavailable (site:0) (timeseries:0)	eries:0)
OPERATION: Record for this site is maintained by the USGS New Mexico Water Science Center Email questions about this site to <u>New Mexico Water Science Center Water-Data Inquiries</u>	New Mexico Nater Scienc	Water Science e Center Wate	Center r-Data Inquiries

Title: NWIS Site Information for USA: Site Inventory	URL: https://waterdata.usgs.gov/nwis/inventory?agency_code=USGS&site_no=323015104032301
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Vog.A.C

0.43 caww02 Page Page 0.44 https://waterdata.usgs.gov/nwis/inventory?agency_code=USGS&site_no=323015104032301



Well Site

DESCRIPTION:

Latitude 32°30'28", Longitude 104°05'00" NAD27 Eddy County, New Mexico , Hydrologic Unit 13060011 Well depth: 185 feet Land surface altitude: 3,238 feet above NAVD88.

Well completed in "Rustler Formation" (312RSLR) local aquifer

AVAILABUE DATA:

https://waterdata.usgs.gov/nwis/inventory?agency_code=USGS&site_no=323028104050001

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ATTACHMENT 4

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Daily Site Visit Report	VERTEX
	Summary of Daily Operations
9:23 Initial characterization and delineal vertically at sample points to clean	9:23 Initial characterization and delineation of produced water spill, map spill footprint and sample points, delineate horizontally and vertically at sample points to clean
9:32 Footprint is very apparent for ou from a meter. Point of release ha lines will have to be hydrovacced	9:32 Footprint is very apparent for outline of where spill went. One set of tire tracks through middle of spill due to operator getting numbers from a meter. Point of release has been repaired and put back into service, multiple flow line coming out of containment underground, lines will have to be hydrovacced before any excavation can take place
10:31 Contaminated area is cleaning up	10:31 Contaminated area is cleaning up at 0.5", a recommended emergency scrape is needed to keep saturation from sinking any lower
12:38 Emergency 811 call placed for en	12:38 Emergency 811 call placed for emergency scrape, operator coming with equipment to perform 0.5" scrape
	Next Steps & Recommendations
 Complete 0.5" scrape Place 48 hour notice 	
3 Complete confirmation sampling	
Run on 3/26/2020 11:59 PM UTC	Powered by www.krinkleldar.com

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Daily Site Visit Report	sit Report		<pre></pre>
	Site	Site Photos	
	Viewing Direction: East	Viewing Direction: Southeast	
-			
. W.			
	Spill area	Spill area in front of containment	
	Viewing Direction: North	Viewing Direction: North	
-			
	Development Processi International International Internati		
	Spill area on north side next to fence	Spill area next to containment on west side	

RIEX

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. Released to Imaging: 1/22/2021 11:06:17 AM

Page 4 of 6

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¹ 'Ruh on 4/1/2020 11:42 PM UTC



ATTACHMENT 5

Natalie Gordon

From:	Dhugal Hanton <vertexresourcegroupusa@gmail.com></vertexresourcegroupusa@gmail.com>
Sent:	Friday, March 27, 2020 3:57 PM
То:	Natalie Gordon
Subject:	Fwd: Shinnery Oak Federal SWD #1 - DOR: 3/25/2020 - 48-hr Notification of
	Confirmatory Sampling

----- Forwarded message ------

From: Dhugal Hanton <vertexresourcegroupusa@gmail.com>

Date: Fri, Mar 27, 2020 at 3:56 PM

Subject: Shinnery Oak Federal SWD #1 - DOR: 3/25/2020 - 48-hr Notification of Confirmatory Sampling To: Bratcher, Mike, EMNRD <<u>Mike.Bratcher@state.nm.us</u>>, Venegas, Victoria, EMNRD <<u>Victoria.Venegas@state.nm.us</u>>, Hamlet, Robert, EMNRD <<u>Robert.Hamlet@state.nm.us</u>>, <<u>blm_nm_cfo_spill@blm.gov</u>>, Kelsey <<u>KWade@blm.gov</u>>, <<u>Jamos@blm.gov</u>>

All,

Please accept this email as 48-hr notification that Vertex Resource Services has scheduled confirmatory sampling to be conducted at Shinnery Oak Federal SWD #001 for the produced water release that occurred on March 25, 2020 (initial C-141 notification submission pending).

This work will be completed on behalf of Matador Production Company.

On Wednesday, April 1, 2020 at approximately 8:00 a.m., Monica Peppin of Vertex will be onsite to conduct confirmatory sampling. She can be reached at 575-361-9880. If you need directions to the site, please do not hesitate to contact her. If you have any questions or concerns regarding this notification, please give me a call at 505-506-0040.

Thank you, Natalie

Natalie Gordon Project Manager

Vertex Resource Group Ltd. 213 S. Mesa Street Carlsbad, NM 88220

P 575.725.5001 ext 709 C 505.506.0040 F

www.vertex.ca

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ATTACHMENT 6

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Client Name: Matador Production Company Site Name: Shinnery Oak Federal SWD #001 NM OCD Incident Tracking Number: NM2009032079 Project #: 20E-00239-007 Lab Report: 2004136, 2008D86

		Revised Table 2. C	onfirmatory S	ampling Labor	atory Data - D	epth to Grour	ndwater >100 f	ft		
	Sample Description	1	2		Petr	oleum Hydroca	rbons			Inorganic
			Vol	atile			Extractable			inorganic
Sample ID	Depth (ft)	Sample Date	Benzene	BTEX (Total)	Gasoline Range Organics (GRO)	Diesel Range Organics (DRO)	Motor Oil Range Organics (MRO)	(GRO + DRO)	Total Petroleum Hydrocarbons (TPH)	Chloride
SS20-01	0.0.5	1	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
SS20-01	0-0.5	August 24, 2020	<0.023	<0.207	<4,6	<10.0	<50	<14.6	<64,6	150
SS20-02	0-0.5	August 24, 2020	<0.024	<0.212	<4.7	<9.7	<48	<14.4	<62.4	<60
SS20-03	0-0.5	August 24, 2020 August 24, 2020	<0.024	<0.217	<4.8 <4.9	<9.8	<49	<14.6	<63.6	<59
BS20-01	0.5	August 24, 2020	<0.025	<0.222		<8,6	<43 <47	<13.5	<56.5	79
BS20-01	0.5				<4.9	<9.5		<14.4	<61.4	320
BS20-02 BS20-03	0.5	April 1, 2020	<0.025	<0.221	<4.9	<10	<51	<14.9	<65.9	70
		April 1, 2020	<0.025	<0.221	<4.9	<9.5	<48	<14.4	<62.4	190
BS20-04	0.5	April 1, 2020	<0,025	<0.221	<4,9	<9.3	<46	<14.2	<60.2	410
BS20-05	0.5	April 1, 2020	<0.025	<0.224	<5.0	<8.8	<44	<13.8	<57.8	520
BS20-06	0.5	April 1, 2020	<0.025	<0.221	<4.9	<9.5	<47	<14.4	<61.4	<60
BS20-07	0.5	April 1, 2020	<0.025	<0.225	<5.0	<9.4	<47	<14_4	<61.4	<60
BS20-08	0.5	April 1, 2020	<0,024	<0.219	<4.9	<9,1	<46	<14	<60	<60
BS20-09	0.5	April 1, 2020	<0.025	<0,225	<5.0	<9.6	<48	<14.6	<62.6	<60
BS20-10	0.5	April 1, 2020	<0.025	<0.221	<4.9	<8.6	<43	<13.5	<56.5	240
BS20-11	0.5	April 1, 2020	<0.025	<0.222	<4.9	<8.8	<44	<13.7	<57.7	160
WS20-01	0.5	April 1, 2020	<0.025	<0.224	<5.0	<9.0	<45	<14.0	<59	370
WS20-02	0.5	Apríl 1, 2020	<0.025	<0.222	<4.9	<8.8	<44	<13.7	<57.7	840
WS20-03	0.5	April 1, 2020	<0.024	<0.22	<4.9	<9.0	<45	<13.9	<58.9	930
WS20-04	0,5	April 1, 2020	<0.025	<0.222	<4.9	<9_4	<47	<14.3	<61.3	2,100
WS20-05	0.5	April 1, 2020	<0.025	<0.222	<4.9	<9.5	<47	<14.4	<61.4	3,300
W\$20-06	0.5	April 1, 2020	<0.024	<0.216	<4.8	<8.9	<45	<13.7	<58.7	1,500
WS20-07	0.5	April 1, 2020	<0.025	<0,221	<4.9	<8.9	<44	<13.8	<57.8	1,400

"-" indicates not sampled/analyzed

Bold and shaded indicates exceedance outside of NM OCD Closure Criteria

ATTACHMENT 7

. Released to Imaging: 1/22/2021 11:06:17 AM



April 10, 2020 Natalie Gordon Vertex Resource Group Ltd. 213 S. Mesa St Carlsbad, NM 88220 TEL: FAX: Hall Environmental Analysis Laboratory 4901 Hawkins NE Albuquerque, NM 87109 TEL: 505-345-3975 FAX: 505-345-4107 Website: www.hallenvironmental.com

RE: Shinnery Oaks SWD 1

OrderNo.: 2004136

Dear Natalie Gordon:

Hall Environmental Analysis Laboratory received 18 sample(s) on 4/3/2020 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

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

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

Sincerely,

much

Andy Freeman Laboratory Manager 4901 Hawkins NE Albuquerque, NM 87109

Lab ID:

CLIENT: Vertex Resource Group Ltd.

2004136-001

Shinnery Oaks SWD 1

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Analytical Report Lab Order 2004136

Date Reported: 4/10/2020

Hall Environmental Analysis Laboratory, Inc.

Client Sample ID: BS20-01 0.5' Collection Date: 4/1/2020 1:45:00 PM Received Date: 4/3/2020 8:30:00 AM

Analyses	Result	RL	Qual Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS					Analyst	ЈМТ
Chloride	320	60	mg/Kg	20	4/6/2020 12:49:01 PM	51578
EPA METHOD 8015M/D: DIESEL RANGE ORC	GANICS				Analyst	BRM
Diesel Range Organics (DRO)	ND	9.5	mg/Kg	1	4/7/2020 1:57:50 PM	51553
Motor Oil Range Organics (MRO)	NÐ	47	mg/Kg	1	4/7/2020 1:57:50 PM	51553
Surr: DNOP	103	55.1-146	%Rec	1	4/7/2020 1:57:50 PM	51553
EPA METHOD 8015D: GASOLINE RANGE					Analyst	NSB
Gasoline Range Organics (GRO)	ND	4.9	mg/Kg	1	4/7/2020 12:52:11 AM	51549
Surr: BFB	100	66.6-105	%Rec	1	4/7/2020 12:52:11 AM	51549
EPA METHOD 8021B: VOLATILES					Analyst	NSB
Benzene	ND	0.024	mg/Kg	1	4/7/2020 12:52:11 AM	51549
Toluene	ND	0.049	mg/Kg	1	4/7/2020 12:52:11 AM	51549
Ethylbenzene	ND	0.049	mg/Kg	1	4/7/2020 12:52:11 AM	51549
Xylenes, Total	ND	0.098	mg/Kg	1	4/7/2020 12:52:11 AM	51549
Surr: 4-Bromofluorobenzene	102	80-120	%Rec	1	4/7/2020 12:52:11 AM	51549

Matrix: SOIL

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

	-	Practical Quanitative % Recovery outside	ilution or matr	ix	RL	Reporting Limit		Page 1 of

Analytical Report Lab Order 2004136

Lab Order 2004136 Date Reported: 4/10/2020

CLIENT: Vertex Resource Group Ltd.		C	ient Sa	mple II	D:BS	20-02 0.5'	
Project: Shinnery Oaks SWD 1		(Collect	ion Dat	e: 4 /1	/2020 1:55:00 PM	
Lab ID: 2004136-002	Matrix: SOIL		Recei	ved Dat	e: 4/3	6/2020 8:30:00 AM	
Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analysi	t: JMT
Chloride	70	60		mg/Kg	20	4/6/2020 1:26:04 PM	51578
EPA METHOD 8015M/D: DIESEL RANGE	ORGANICS					Analyst	t: BRM
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	4/7/2020 2:20:00 PM	51553
Motor Oil Range Organics (MRO)	ND	51		mg/Kg	1	4/7/2020 2:20:00 PM	51553
Surr: DNOP	99.6	55.1-146		%Rec	1	4/7/2020 2:20:00 PM	51553
EPA METHOD 8015D: GASOLINE RANGE						Analyst	I: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	4/7/2020 1:15:59 AM	51549
Surr: BFB	99.1	66.6-105		%Rec	1	4/7/2020 1:15:59 AM	51549
EPA METHOD 8021B: VOLATILES						Analyst	t: NSB
Benzene	ND	0.025		mg/Kg	1	4/7/2020 1:15:59 AM	51549
Toluene	ND	0.049		mg/Kg	1	4/7/2020 1:15:59 AM	51549
Ethylbenzene	ND	0.049		mg/Kg	1	4/7/2020 1:15:59 AM	51549
Xylenes, Total	ND	0.098		mg/Kg	1	4/7/2020 1:15:59 AM	51549
Surr: 4-Bromofluorobenzene	100	80-120		%Rec	1	4/7/2020 1:15:59 AM	51549

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

Qualifiers:	*	Value exceeds Maxim	im Contaminant Lev	el.	В	Analyte dctected in the ass	ociated Method Bl	ank	
And and a second se	D	Sample Diluted Due to	Matrix		E	Value above quantitation r	ange		Concerne and Concerne
Same in the		Holding times for prep	aration or analysis e		j.	Analyte detected below qu	antitation limits	-	
	ND	Not Detected at the Re	porting Limit		P	Sample pH Not In Range			D 0 000
	PQL	Practical Quanitative L	imit		RL	Reporting Limit			Page 2 of 26
	-s	% Recovery outside of	range due to dilutio	n or matrix					

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Analytical Report
Lab Order 2004136

Date Reported: 4/10/2020

CLIENT: Vertex Resource Group Ltd.	Client Sample ID: BS20-03 0.5'								
Project: Shinnery Oaks SWD 1	Collection Date: 4/1/2020 2:05:00 PM								
Lab ID: 2004136-003	Matrix: SOIL		Received D	ate: 4/	/3/2020 8:30:00 AM				
Analyses	Result	RL	Qual Unit	s DI	F Date Analyzed	Batch			
EPA METHOD 300.0: ANIONS					Analys	st: JMT			
Chloride	190	60	mg/ł	(g 20	0 4/6/2020 1:38:25 PM	51578			
EPA METHOD 8015M/D: DIESEL RANGE	ORGANICS				Analys	st: BRM			
Diesel Range Organics (DRO)	ND	9.5	mg/ł	(g 1	4/7/2020 2:42:04 PM	51553			
Motor Oil Range Organics (MRO)	ND	48	mg/ł	(g 1	4/7/2020 2:42:04 PM	51553			
Surr: DNOP	103	55.1-146	%Re	c 1	4/7/2020 2:42:04 PM	51553			
EPA METHOD 8015D: GASOLINE RANGE					Analys	st: NSB			
Gasoline Range Organics (GRO)	ND	4.9	mg/ł	(g 1	4/7/2020 1:39:52 AM	51549			
Surr: BFB	98.7	66.6-105	%Re	c 1	4/7/2020 1:39:52 AM	51549			
EPA METHOD 8021B: VOLATILES					Analys	st: NSB			
Benzene	ND	0.025	mg/ł	(g 1	4/7/2020 1:39:52 AM	51549			
Toluene	ND	0.049	mg/ł	(g 1	4/7/2020 1:39:52 AM	51549			
Ethylbenzene	ND	0.049	mg/ł	(g 1	4/7/2020 1:39:52 AM	51549			
Xylenes, Total	ND	0.098	mg/ł	(g 1	4/7/2020 1:39:52 AM	51549			
Surr: 4-Bromofluorobenzene	98.9	80-120	%Re	c 1	4/7/2020 1:39:52 AM	51549			

	Qualifiers:	 Value exceeds Maximum Contaminant Level, DSample Diluted Due to Matrix 	B Analyte detected in the associated Method Blank E Value above quantitation range	
11.21		Heiding times for preparation or analysis exceeded	F Analyte detected below quantitation limits	
		ND Not Detected at the Reporting Limit POL Practical Quanitative Limit	P Sample pH <u>Not</u> In Range RL Reporting Limit	Page 3 of 26
		S — % Recovery outside of range due to dilution or matrix		0

Lab ID:

CLIENT: Vertex Resource Group Ltd.

2004136-004

Shinnery Oaks SWD 1

Analytical Report Lab Order 2004136 Date Reported: 4/10/2020

Hall Environmental Analysis Laboratory, Inc	Hall	Environ	nental A	nalysis	Labora	atory, Inc
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Client Sample ID: BS20-04 0.5' Collection Date: 4/1/2020 2:15:00 PM Received Date: 4/3/2020 8:30:00 AM

Analyses	Result	RL	Qual Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS					Analyst	: JMT
Chloride	410	60	mg/Kg	20	4/6/2020 1:50:45 PM	51578
EPA METHOD 8015M/D: DIESEL RANGE ORG	ANICS				Analyst	BRM
Diesel Range Organics (DRO)	ND	9.3	mg/Kg	1	4/7/2020 3:04:14 PM	51553
Motor Oil Range Organics (MRO)	ND	46	mg/Kg	1	4/7/2020 3:04:14 PM	51553
Surr: DNOP	108	55.1-146	%Rec	1	4/7/2020 3:04:14 PM	51553
EPA METHOD 8015D: GASOLINE RANGE					Analyst	: NSB
Gasoline Range Organics (GRO)	ND	4.9	mg/Kg	1	4/7/2020 2:03:44 AM	51549
Surr: BFB	97.4	66.6-105	%Rec	1	4/7/2020 2:03:44 AM	51549
EPA METHOD 8021B: VOLATILES					Analyst	: NSB
Benzene	ND	0.025	mg/Kg	1	4/7/2020 2:03:44 AM	51549
Toluene	ND	0.049	mg/Kg	1	4/7/2020 2:03:44 AM	51549
Ethylbenzene	ND	0.049	mg/Kg	1	4/7/2020 2:03:44 AM	51549
Xylenes, Total	ND	0.098	mg/Kg	1	4/7/2020 2:03:44 AM	51549
Surr: 4-Bromofluorobenzene	98.8	80-120	%Rec	1	4/7/2020 2:03:44 AM	51549

Matrix: SOIL

Qualifiers:		Value exceeds Maximum Contaminant Level.		В		eted in the associated Method Blank			
	D	Sample Diluted Due to Matrix		E		quantitation range			
	н	Holding times for preparation or analysis exceeded	and the second second	J	Analyte detection	ted below quantitation limits			12.02.0
	ND	Not Detected at the Reporting Limit		Р	Sample pH N	lot In Range	т		606
	PQL	Practical Quanitative Limit		RL	Reporting Lin	mit	F	'age 4	of 26
	S	% Recovery outside of range due to dilution or matri	ix						

Lab ID:

CLIENT: Vertex Resource Group Ltd.

2004136-005

Shinnery Oaks SWD 1

Analytical Report Lab Order 2004136

Hall Environmental Analy	sis Laboratory, Inc.
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Date Reported: 4/10/2020

Client Sample ID: BS20-05 0.5' Collection Date: 4/1/2020 2:25:00 PM Received Date: 4/3/2020 8:30:00 AM

Analyses	Result	RL Q	ual Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS					Analys	t: JMT
Chloride	520	60	mg/Kg	20	4/6/2020 2:03:07 PM	51578
EPA METHOD 8015M/D: DIESEL RANGE OF	RGANICS				Analys	t: BRM
Diesel Range Organics (DRO)	17	8.8	mg/Kg	1	4/7/2020 3:26:19 PM	51553
Motor Oil Range Organics (MRO)	ND	44	mg/Kg	1	4/7/2020 3:26:19 PM	51553
Surr: DNOP	111	55.1-146	%Rec	1	4/7/2020 3:26:19 PM	51553
EPA METHOD 8015D: GASOLINE RANGE					Analys	t: NSB
Gasoline Range Organics (GRO)	ND	5.0	mg/Kg	1	4/7/2020 3:38:45 AM	51549
Surr: BFB	94.1	66.6-105	%Rec	1	4/7/2020 3:38:45 AM	51549
EPA METHOD 8021B: VOLATILES					Analys	t: NSB
Benzene	ND	0.025	mg/Kg	1	4/7/2020 3:38:45 AM	51549
Toluene	ND	0.050	mg/Kg	1	4/7/2020 3:38:45 AM	51549
Ethylbenzene	ND	0.050	mg/Kg	1	4/7/2020 3:38:45 AM	51549
Xylenes, Total	ND	0.099	mg/Kg	1	4/7/2020 3:38:45 AM	51549
Surr: 4-Bromofluorobenzene	94.8	80-120	%Rec	1	4/7/2020 3:38:45 AM	51549

Matrix: SOIL

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

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age 5 of 26	I
	age 5 of 26

Analytical Report Lab Order 2004136

Date Reported: 4/10/2020

CLIENT: Vertex Resource Group Ltd.		Cl	ient Saı	nple II): BS	20-06 0.5'		
Project: Shinnery Oaks SWD 1	Collection Date: 4/1/2020 2:35:00 PM							
Lab ID: 2004136-006	Matrix: SOIL		Receiv	ed Dat	e: 4/3	8/2020 8:30:00 AM		
Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch	
EPA METHOD 300.0: ANIONS						Analyst	: JMT	
Chloride	ND	60		mg/Kg	20	4/6/2020 2:15:28 PM	51578	
EPA METHOD 8015M/D: DIESEL RANGE	ORGANICS					Analyst	BRM	
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	4/7/2020 3:48:30 PM	51553	
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	4/7/2020 3:48:30 PM	51553	
Surr: DNOP	104	55.1-146		%Rec	1	4/7/2020 3:48:30 PM	51553	
EPA METHOD 8015D: GASOLINE RANGE						Analyst	: NSB	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	4/7/2020 4:02:31 AM	51549	
Surr: BFB	96.2	66.6-105		%Rec	1	4/7/2020 4:02:31 AM	51549	
EPA METHOD 8021B: VOLATILES						Analyst	: NSB	
Benzene	ND	0.025		mg/Kg	1	4/7/2020 4:02:31 AM	51549	
Toluene	ND	0.049		mg/Kg	1	4/7/2020 4:02:31 AM	51549	
Ethylbenzene	ND	0.049		mg/Kg	1	4/7/2020 4:02:31 AM	51549	
Xylenes, Total	ND	0.098		mg/Kg	1	4/7/2020 4:02:31 AM	51549	
Surr: 4-Bromofluorobenzene	96.5	80-120		%Rec	1	4/7/2020 4:02:31 AM	51549	

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

	S: * Value exceeds Maximum Co D Sample Diluted Due to Matri H Holding times for preparation ND Not Detected at the Reportin PQL Practical Quanitative Limit S % Recovery-outside of range			r analysis exceeded	B E J P RL		Analyte detected in the associated Method Blank Value above quantitation_gage Analyte detected below quantitation.limits Sample pH Not In Range Reporting Limit		Page 6 of 26		

Lab ID:

CLIENT: Vertex Resource Group Ltd.

2004136-007

Shinnery Oaks SWD 1

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Analytical Report Lab Order 2004136 Date Reported: 4/10/2020

Hall Environmental Analysis Laboratory, Inc.

Client Sample ID: BS20-07 0.5' Collection Date: 4/1/2020 2:45:00 PM Received Date: 4/3/2020 8:30:00 AM

Analyses	Result	RL	Qual Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS					Analyst	: JMT
Chloride	ND	60	mg/Kg	20	4/6/2020 2:52:31 PM	51578
EPA METHOD 8015M/D: DIESEL RANGE OR	GANICS				Analyst	BRM
Diesel Range Organics (DRO)	ND	9.4	mg/Kg	1	4/7/2020 4:10:27 PM	51553
Motor Oil Range Organics (MRO)	ND	47	mg/Kg	1	4/7/2020 4:10:27 PM	51553
Surr: DNOP	98.9	55.1-146	%Rec	1	4/7/2020 4:10:27 PM	51553
EPA METHOD 8015D: GASOLINE RANGE					Analyst	NSB
Gasoline Range Organics (GRO)	ND	5.0	mg/Kg	1	4/7/2020 4:26:17 AM	51549
Surr: BFB	94.8	66.6-105	%Rec	1	4/7/2020 4:26:17 AM	51549
EPA METHOD 8021B: VOLATILES					Analyst	NSB
Benzene	ND	0.025	mg/Kg	1	4/7/2020 4:26:17 AM	51549
Toluene	ND	0.050	mg/Kg	1	4/7/2020 4:26:17 AM	51549
Ethylbenzene	ND	0.050	mg/Kg	1	4/7/2020 4:26:17 AM	51549
Xylenes, Total	ND	0.10	mg/Kg	1	4/7/2020 4:26:17 AM	51549
Surr: 4-Bromofluorobenzene	96.0	80-120	%Rec	1	4/7/2020 4:26:17 AM	51549

Matrix: SOIL

Qualifiers:	D Sample D	eeds Maximum Contaminant luted Due to Matrix mes for preparation or analy.		BE	Analyte detected in the asso Value above quantitation ra	nge	
	ND Not Detec PQL Practical (ted at the Reporting Limit Quanitative Limit		P RL	Analyte detected below qua Sample pH Not In Range Reporting Limit	nettation umits	Page 7 of 2
	S % Recove	ry outside of range due to di	lution of matrix				
				_			

CLIENT: Vertex Resource Group Ltd.

Analytical Report Lab Order 2004136

Date Reported: 4/10/2020

Hall Environmental Analysis Laboratory, Inc.

Client Sample ID: BS20-08 0.5'

Project:	Shinnery Oaks SWD 1		(Collection Dat	e: 4/	1/2020 2:55:00 PM	
Lab ID:	2004136-008	Matrix: SOIL		Received Dat	e: 4/.	3/2020 8:30:00 AM	
Analyses		Result	RL	Qual Units	DF	Date Analyzed	Batch
EPA MET	HOD 300.0: ANIONS					Analyst	: JMT
Chloride		ND	60	mg/Kg	20	4/6/2020 3:04:53 PM	51578
ΕΡΑ ΜΕΤ	HOD 8015D MOD: GASOLIN	E RANGE				Analyst	DJF
Gasoline	Range Organics (GRO)	ND	4.9	mg/Kg	1	4/6/2020 9:58:52 PM	51551
Surr: E	BFB	99.6	70-130	%Rec	1	4/6/2020 9:58:52 PM	51551
EPA MET	HOD 8015M/D: DIESEL RAN	GE ORGANICS				Analyst	CLP
Diesel Ra	ange Organics (DRO)	ND	9.1	mg/Kg	1	4/6/2020 1:41:32 AM	51554
Motor Oi	Range Organics (MRO)	ND	46	mg/Kg	1	4/6/2020 1:41:32 AM	51554
Surr: [DNOP	115	55.1-146	%Rec	1	4/6/2020 1:41:32 AM	51554
EPA MET	HOD 8260B: VOLATILES SH	IORT LIST				Analyst	: DJF
Benzene		ND	0.024	mg/Kg	1	4/6/2020 9:58:52 PM	51551
Toluene		ND	0.049	mg/Kg	1	4/6/2020 9:58:52 PM	51551
Ethylben	zene	ND	0.049	mg/Kg	1	4/6/2020 9:58:52 PM	51551
Xylenes,	Total	ND	0.097	mg/Kg	1	4/6/2020 9:58:52 PM	51551
Surr: 1	,2-Dichloroethane-d4	88.1	70-130	%Rec	1	4/6/2020 9:58:52 PM	51551
Surr: 4	-Bromofluorobenzene	93.6	70-130	%Rec	1	4/6/2020 9:58:52 PM	51551
Surr: E	Dibromofluoromethane	91.2	70-130	%Rec	1	4/6/2020 9:58:52 PM	51551
Surr: 1	oluene-d8	101	70-130	%Rec	1	4/6/2020 9:58:52 PM	51551

Qualifiers:	* D	Value exceeds Maximum Contaminant Level, Sample Diluted Due to Matrix.		B	Analyte detected in the associa Value above quantitation range		
	н	-Holding times for preparation or analysis exceeded	-15	 Ĵ	Analyte detected below quanti	interest of a second se	
	ND	Not Detected at the Reporting Limit		Р	Sample pH Not In Range	1	D 0 CO (
	PQL	Practical Quanitative Limit		RL	Reporting Limit		Page 8 of 26
	S	% Recovery outside of range due to dilution or matrix					

Lab ID:

CLIENT: Vertex Resource Group Ltd.

2004136-009

Shinnery Oaks SWD 1

Analytical Report Lab Order 2004136

Date Reported: 4/10/2020

Analytical Rep	0

Hall Environmental Analy	vsis Laboratory, Inc.
man Environmental Anal	ysis Laboratory, me.

Client Sample ID: BS20-09 0.5' Collection Date: 4/1/2020 3:05:00 PM Received Date: 4/3/2020 8:30:00 AM

Analyses	Result	RL	Qual Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS					Analyst	JMT
Chloride	ND	60	mg/Kg	20	4/6/2020 3:17:13 PM	51578
EPA METHOD 8015D MOD: GASOLINE RANG	E				Analyst	DJF
Gasoline Range Organics (GRO)	ND	5.0	mg/Kg	1	4/6/2020 10:28:23 PM	51551
Surr: BFB	97.3	70-130	%Rec	1	4/6/2020 10:28:23 PM	51551
EPA METHOD 8015M/D: DIESEL RANGE ORG	ANICS				Analyst	CLP
Diesel Range Organics (DRO)	ND	9.6	mg/Kg	1	4/6/2020 2:53:06 AM	51554
Motor Oil Range Organics (MRO)	ND	48	mg/Kg	1	4/6/2020 2:53:06 AM	51554
Surr: DNOP	99.8	55.1-146	%Rec	1	4/6/2020 2:53:06 AM	51554
EPA METHOD 8260B: VOLATILES SHORT LIS	т				Analyst	DJF
Benzene	NÐ	0.025	mg/Kg	1	4/6/2020 10:28:23 PM	51551
Toluene	ND	0.050	mg/Kg	1	4/6/2020 10:28:23 PM	51551
Ethylbenzene	ND	0.050	mg/Kg	1	4/6/2020 10:28:23 PM	51551
Xylenes, Total	ND	0.10	mg/Kg	1	4/6/2020 10:28:23 PM	5155 1
Surr: 1,2-Dichloroethane-d4	89.1	70-130	%Rec	1	4/6/2020 10:28:23 PM	51551
Surr: 4-Bromofluorobenzene	96.2	70-130	%Rec	1	4/6/2020 10:28:23 PM	51551
Surr: Dibromofluoromethane	92.0	70-130	%Rec	1	4/6/2020 10:28:23 PM	51551
Surr: Toluene-d8	98.2	70-130	%Rec	1	4/6/2020 10:28:23 PM	51551

Matrix: SOIL

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

Qualifie	*	Value exceeds Maximum Contaminant Level		в	Analyte detected in the associated	i Method Blank	
Quanner	D	Sample Diluted Due to Matrix Holding times for preparation or analysis exceeded Not Detected at the Reporting Limit Practical Quanitative Limit		E -J P RL	Value above quantitation range Analyte detected below quantitati Sample pH Not In Range Reporting Limit		Page 9 of 26
	S	% Recovery outside of range due to dilution or matrix		KL.	Reporting Linni		U
						-	

Project: Lab ID:

CLIENT: Vertex Resource Group Ltd.

2004136-010

Shinnery Oaks SWD 1

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Analytical Report Lab Order 2004136 Date Reported: 4/10/2020

Client Sample ID: BS20-10 0.5' Collection Date: 4/1/2020 3:15:00 PM

	Rec	cei	ved	Dat	te: 4/3	/20)20	8:2	30:0	0 AM	
-	~			•.							

Analyses	Result	RL	Qual Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS					Analyst	JMT
Chloride	240	60	mg/Kg	20	4/6/2020 3:29:34 PM	51578
EPA METHOD 8015D MOD: GASOLINE RANGE					Analyst	DJF
Gasoline Range Organics (GRO)	ND	4.9	mg/Kg	1	4/6/2020 11:57:03 PM	51551
Surr: BFB	97.6	70-130	%Rec	1	4/6/2020 11:57:03 PM	51551
EPA METHOD 8015M/D: DIESEL RANGE ORGA	NICS				Analyst	CLP
Diesel Range Organics (DRO)	ND	8.6	mg/Kg	1	4/6/2020 3:16:55 AM	51554
Motor Oil Range Organics (MRO)	ND	43	mg/Kg	1	4/6/2020 3:16:55 AM	51554
Surr: DNOP	106	55.1-146	%Rec	1	4/6/2020 3:16:55 AM	51554
EPA METHOD 8260B: VOLATILES SHORT LIST					Analyst	DJF
Benzene	ND	0.025	mg/Kg	1	4/6/2020 11:57:03 PM	51551
Toluene	ND	0.049	mg/Kg	1	4/6/2020 11:57:03 PM	51551
Ethylbenzene	ND	0.049	mg/Kg	1	4/6/2020 11:57:03 PM	51551
Xylenes, Total	ND	0.098	mg/Kg	1	4/6/2020 11:57:03 PM	51551
Surr: 1,2-Dichloroethane-d4	91.3	70-130	%Rec	1	4/6/2020 11:57:03 PM	51551
Surr: 4-Bromofluorobenzene	94.0	70-130	%Rec	1	4/6/2020 11:57:03 PM	51551
Surr: Dibromofluoromethane	92.9	70-130	%Rec	1	4/6/2020 11:57:03 PM	51551
Surr: Toluene-d8	96.1	70-130	%Rec	1	4/6/2020 11:57:03 PM	51551

Matrix: SOIL

PQ	 Practical Quanitative Limit % Recovery outside of range due to dilution or matrix 		RL	Reporting Limit	-	Page 10 of 26
					_	

Lab ID:

CLIENT: Vertex Resource Group Ltd.

2004136-011

Shinnery Oaks SWD 1

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Analytical Report Lab Order 2004136 Date Reported: 4/10/2020

Client Sample ID: BS20-11 0.5' Collection Date: 4/1/2020 3:25:00 PM Received Date: 4/3/2020 8:30:00 AM

Analyses	Result	RL	Qual Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS					Analyst	: JMT
Chloride	160	60	mg/Kg	20	4/6/2020 3:41:55 PM	51578
EPA METHOD 8015D MOD: GASOLINE RANGE					Analyst	DJF
Gasoline Range Organics (GRO)	ND	4.9	mg/Kg	1	4/7/2020 12:26:34 AM	51551
Surr: BFB	101	70-130	%Rec	1	4/7/2020 12:26:34 AM	51551
EPA METHOD 8015M/D: DIESEL RANGE ORGA	NICS				Analyst	CLP
Diesel Range Organics (DRO)	ND	8.8	mg/Kg	1	4/6/2020 3:40:39 AM	51554
Motor Oil Range Organics (MRO)	ND	44	mg/Kg	1	4/6/2020 3:40:39 AM	51554
Surr: DNOP	89.3	55.1-146	%Rec	1	4/6/2020 3:40:39 AM	51554
EPA METHOD 8260B: VOLATILES SHORT LIST					Analyst	DJF
Benzene	ND	0.025	mg/Kg	1	4/7/2020 12:26:34 AM	51551
Toluene	ND	0.049	mg/Kg	1	4/7/2020 12:26:34 AM	51551
Ethylbenzene	ND	0.049	mg/Kg	1	4/7/2020 12:26:34 AM	51551
Xylenes, Total	ND	0.099	mg/Kg	1	4/7/2020 12:26:34 AM	51551
Surr: 1,2-Dichloroethane-d4	93.1	70-130	%Rec	1	4/7/2020 12:26:34 AM	51551
Surr: 4-Bromofluorobenzene	96.5	70-130	%Rec	1	4/7/2020 12:26:34 AM	51551
Surr: Dibromofluoromethane	94.4	70-130	%Rec	1	4/7/2020 12:26:34 AM	51551
Surr: Toluene-d8	98.9	70-130	%Rec	1	4/7/2020 12:26:34 AM	51551

Matrix: SOIL

Qualifiers:	*	Value exceeds Maximum Contaminant Level,	в	Analyte detected in the associated Method B	lank	
		Sample Diluted Due to Matrix	E J P RL	Value above quantitation range Analyte detected below quantitation-limits Sample pH Not In Range Reporting Limit		Page 11 of 2
	S	% Recovery outside of range due to dilution or matrix				

Lab ID:

CLIENT: Vertex Resource Group Ltd.

2004136-012

Shinnery Oaks SWD 1

Analytical Report

Hall Environmenta	l Analysis Laboratory, Inc.
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Lab Order 2004136 Date Reported: 4/10/2020

Client Sample ID: WS20-01 0-0.5 Collection Date: 4/1/2020 3:35:00 PM Received Date: 4/3/2020 8:30:00 AM

Analyses	Result	RL	Qual Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS					Analyst	ЈМТ
Chloride	370	60	mg/Kg	20	4/6/2020 3:54:16 PM	51578
EPA METHOD 8015D MOD: GASOLINE RANGE					Analyst:	DJF
Gasoline Range Organics (GRO)	ND	5.0	mg/Kg	1	4/7/2020 3:53:48 AM	51551
Surr: BFB	97.9	70-130	%Rec	1	4/7/2020 3:53:48 AM	51551
EPA METHOD 8015M/D: DIESEL RANGE ORGA	NICS				Analyst:	CLP
Diesel Range Organics (DRO)	ND	9.0	mg/Kg	1	4/6/2020 4:04:23 AM	51554
Motor Oil Range Organics (MRO)	ND	45	mg/Kg	1	4/6/2020 4:04:23 AM	51554
Surr: DNOP	104	55.1-146	%Rec	1	4/6/2020 4:04:23 AM	51554
EPA METHOD 8260B: VOLATILES SHORT LIST					Analyst:	DJF
Benzene	ND	0.025	mg/Kg	1	4/7/2020 3:53:48 AM	51551
Toluene	ND	0.050	mg/Kg	1	4/7/2020 3:53:48 AM	51551
Ethylbenzene	ND	0.050	mg/Kg	1	4/7/2020 3:53:48 AM	51551
Xylenes, Total	ND	0.099	mg/Kg	1	4/7/2020 3:53:48 AM	51551
Surr: 1,2-Dichloroethane-d4	89.8	70-130	%Rec	1	4/7/2020 3:53:48 AM	51551
Surr: 4-Bromofluorobenzene	94.9	70-130	%Rec	1	4/7/2020 3:53:48 AM	51551
Surr: Dibromofluoromethane	92.2	70-130	%Rec	1	4/7/2020 3:53:48 AM	51551
Surr: Toluene-d8	97.2	70-130	%Rec	1	4/7/2020 3:53:48 AM	51551

Matrix: SOIL

Qualifiers:	* Value exceeds Maximum Contaminant Level,	B Analyte detected in the associated Met	hod Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range	and the second
	H Holding times for preparation or analysis exceeded	J -Analyte detected below quantitation-lin	nits-
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range	-D 10 60
	PQL Practical Quanitative Limit	RL Reporting Limit	Page 12 of 2
	S % Recovery outside of range due to dilution or matrix		
	1		
			1

Lab ID:

CLIENT: Vertex Resource Group Ltd.

2004136-013

Shinnery Oaks SWD 1

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Analytical Report Lab Order 2004136 Date Reported: 4/10/2020

Client Sample ID: WS20-02 0-0.5 Collection Date: 4/1/2020 3:45:00 PM Received Date: 4/3/2020 8:30:00 AM

Analyses	Result	RL	Qual U	nits	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst:	JMT
Chloride	840	61	rr	ng/Kg	20	4/6/2020 8:13:32 PM	51590
EPA METHOD 8015D MOD: GASOLINE RANGE						Analyst:	DJF
Gasoline Range Organics (GRO)	ND	4.9	m	ng/Kg	1	4/7/2020 4:23:16 AM	51551
Surr: BFB	98.0	70-130	%	6Rec	1	4/7/2020 4:23:16 AM	51551
EPA METHOD 8015M/D: DIESEL RANGE ORGA	NICS					Analyst:	CLP
Diesel Range Organics (DRO)	ND	8.8	m	ng/Kg	1	4/6/2020 4:28:08 AM	51554
Motor Oil Range Organics (MRO)	ND	44	п	ng/Kg	1	4/6/2020 4:28:08 AM	51554
Surr: DNOP	110	55.1-146	%	6Rec	1	4/6/2020 4:28:08 AM	51554
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst:	DJF
Benzene	ND	0.025	m	ng/Kg	1	4/7/2020 4:23:16 AM	51551
Toluene	ND	0.049	m	ng/Kg	1	4/7/2020 4:23:16 AM	51551
Ethylbenzene	ND	0.049	m	ng/Kg	1	4/7/2020 4:23:16 AM	51551
Xylenes, Total	ND	0.099	m	ng/Kg	1	4/7/2020 4:23:16 AM	51551
Surr: 1,2-Dichloroethane-d4	89.7	70-130	%	6Rec	1	4/7/2020 4:23:16 AM	51551
Surr: 4-Bromofluorobenzene	98.6	70-130	%	6Rec	1	4/7/2020 4:23:16 AM	51551
Surr: Dibromofluoromethane	92.4	70-130	%	6Rec	1	4/7/2020 4:23:16 AM	51551
Surr: Toluene-d8	97.7	70-130	%	6Rec	1	4/7/2020 4:23:16 AM	51551

Matrix: SOIL

Qualifiers:	*	Value exceeds Maximum Contaminant Level	в	Analyte detected in the associated Method Blank	
Quanners.	D	Sample Diluted Due to Matrix	E	Value above quantitation range	1960
-		Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits	100
	ND	Not Detected at the Reporting Limit	Р	Sample pH Not In Range	D
	PQL	Practical Quanitative Limit	RL	Reporting Limit	Page 13 of 2
	S	% Recovery outside of range due to dilution or matrix			

Lab ID:

CLIENT: Vertex Resource Group Ltd.

2004136-014

Shinnery Oaks SWD 1

Analytical Report

Lab Order 2004136 Date Reported: 4/10/2020

Client Sample ID: WS20-03 0-0.5 Collection Date: 4/1/2020 3:55:00 PM Received Date: 4/3/2020 8:30:00 AM

Analyses	Result	RL	Qual Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS					Analyst	: JMT
Chloride	930	59	mg/Kg	20	4/6/2020 8:50:32 PM	51590
EPA METHOD 8015D MOD: GASOLINE RANGE					Analyst	DJF
Gasoline Range Organics (GRO)	ND	4.9	mg/Kg	1	4/7/2020 4:52:07 AM	5155 1
Surr: BFB	96.7	70-130	%Rec	1	4/7/2020 4:52:07 AM	51551
EPA METHOD 8015M/D: DIESEL RANGE ORGA	NICS				Analyst	CLP
Diesel Range Organics (DRO)	70	9.0	mg/Kg	1	4/6/2020 4:51:49 AM	51554
Motor Oil Range Organics (MRO)	86	45	mg/Kg	1	4/6/2020 4:51:49 AM	51554
Surr: DNOP	99.0	55.1-146	%Rec	1	4/6/2020 4:51:49 AM	51554
EPA METHOD 8260B: VOLATILES SHORT LIST					Analyst	DJF
Benzene	ND	0.024	mg/Kg	1	4/7/2020 4:52:07 AM	51551
Toluene	ND	0.049	mg/Kg	1	4/7/2020 4:52:07 AM	51551
Ethylbenzene	ND	0.049	mg/Kg	1	4/7/2020 4:52:07 AM	51551
Xylenes, Total	ND	0.098	mg/Kg	1	4/7/2020 4:52:07 AM	51551
Surr: 1,2-Dichloroethane-d4	92.1	70-130	%Rec	1	4/7/2020 4:52:07 AM	51551
Surr: 4-Bromofluorobenzene	95.5	70-130	%Rec	1	4/7/2020 4:52:07 AM	51551
Surr: Dibromofluoromethane	99.3	70-130	%Rec	1	4/7/2020 4:52:07 AM	51551
Surr: Toluene-d8	99.8	70-130	%Rec	1	4/7/2020 4:52:07 AM	51551

Matrix: SOIL

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

Qualifiers:	* H ND PQL S	Sample Diluted Due Holding times for p Not Detected at the Practical Quanitativ	reparation or analysis Reporting Limit	exceeded	B E J P RL	Value a Analyte Sample	above qua	antitation 5 below q In Range	range uantitation I	ethod Blank	age 14 of 2
		, ,									
				100							

CLIENT: Vertex Resource Group Ltd.

Shinnery Oaks SWD 1

Analytical Report

Lab Order 2004136 Date Reported: 4/10/2020

Client Sample ID: WS20-04 0-0.5 Collection Date: 4/1/2020 4:05:00 PM Received Date: 4/3/2020 8:30:00 AM

Lab ID: 2004136-015	Matrix: SOIL		Received Date: 4/3/2020 8:30:00 AM							
Analyses	Result	RL	Qual Units	DF	Date Analyzed	Batch				
EPA METHOD 300.0: ANIONS					Analyst	: JMT				
Chloride	2100	60	mg/Kg	20	4/6/2020 9:02:54 PM	51590				
EPA METHOD 8015D MOD: GASOLINE	RANGE				Analyst	DJF				
Gasoline Range Organics (GRO)	ND	4.9	mg/Kg	1	4/7/2020 5:21:19 AM	51551				
Surr: BFB	99.3	70-130	%Rec	1	4/7/2020 5:21:19 AM	51551				
EPA METHOD 8015M/D: DIESEL RANG	E ORGANICS				Analyst	CLP				
Diesel Range Organics (DRO)	ND	9.4	mg/Kg	1	4/6/2020 5:15:31 AM	51554				
Motor Oil Range Organics (MRO)	ND	47	mg/Kg	1	4/6/2020 5:15:31 AM	51554				
Surr: DNOP	110	55.1-146	%Rec	1	4/6/2020 5:15:31 AM	51554				
EPA METHOD 8260B: VOLATILES SHO	RTLIST				Analyst	DJF				
Benzene	ND	0.025	mg/Kg	1	4/7/2020 5:21:19 AM	51551				
Toluene	ND	0.049	mg/Kg	1	4/7/2020 5:21:19 AM	51551				
Ethylbenzene	ND	0.049	mg/Kg	1	4/7/2020 5:21:19 AM	51551				
Xylenes, Total	ND	0.099	mg/Kg	1	4/7/2020 5:21:19 AM	51551				
Surr: 1,2-Dichloroethane-d4	89.9	70-130	%Rec	1	4/7/2020 5:21:19 AM	51551				
Surr: 4-Bromofluorobenzene	101	70-130	%Rec	1	4/7/2020 5:21:19 AM	51551				
Surr: Dibromofluoromethane	94.0	70-130	%Rec	1	4/7/2020 5:21:19 AM	51551				
Surr: Toluene-d8	100	70-130	%Rec	1	4/7/2020 5:21:19 AM	51551				

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

Oualifiers:	*	Value exceeds Maximum Contaminant Level,	B Analyte detected in the associated Method Blank	
C	D	Sample Diluted Due to Matrix	E Value above quantitation range	
	H	Holding-times for preparation or analysis exceeded	J Analyte detected below quantitation limits	
	ND	Not Detected at the Reporting Limit	P Sample pH Not In Range	
	PQL	Practical Quanitative Limit	RL Reporting Limit Page 1	5 of 26
	S	% Recovery outside of range due to dilution or matrix -		
	S	% Recovery outside of range due to dilution or matrix -		
	S			

Lab ID:

Shinnery Oaks SWD 1

2004136-016

Analytical Report Lab Order 2004136

Hall Environmental Analysis	Laboratory, Inc.		- 1
CLIENT: Vertex Resource Group Ltd.		Client Samp	le ID: WS

Matrix: SOIL

Date Reported: 4/10/2020

Client Sample ID: WS20-05 0-0.5 Collection Date: 4/1/2020 4:15:00 PM Received Date: 4/3/2020 8:30:00 AM

Analyses	Result	RL	Qual Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS					Analyst	JMT
Chloride	3300	150	mg/Kg	50	4/7/2020 4:09:33 PM	51590
EPA METHOD 8015D MOD: GASOLINE RANGE					Analyst	DJF
Gasoline Range Organics (GRO)	ND	4.9	mg/Kg	1	4/7/2020 5:50:20 AM	51551
Surr: BFB	97.0	70-130	%Rec	1	4/7/2020 5:50:20 AM	51551
EPA METHOD 8015M/D: DIESEL RANGE ORGA				Analyst	CLP	
Diesel Range Organics (DRO)	ND	9.5	mg/Kg	1	4/6/2020 5:39:11 AM	51554
Motor Oil Range Organics (MRO)	ND	47	mg/Kg	1	4/6/2020 5:39:11 AM	51554
Surr: DNOP	97.4	55.1-146	%Rec	1	4/6/2020 5:39:11 AM	51554
EPA METHOD 8260B: VOLATILES SHORT LIST					Analyst	DJF
Benzene	ND	0.025	mg/Kg	1	4/7/2020 5:50:20 AM	51551
Toluene	ND	0.049	mg/Kg	1	4/7/2020 5:50:20 AM	51551
Ethylbenzene	ND	0.049	mg/Kg	1	4/7/2020 5:50:20 AM	51551
Xylenes, Total	ND	0.099	mg/Kg	1	4/7/2020 5:50:20 AM	51551
Surr: 1,2-Dichloroethane-d4	94.5	70-130	%Rec	1	4/7/2020 5:50:20 AM	51551
Surr: 4-Bromofluorobenzene	96.4	70-130	%Rec	1	4/7/2020 5:50:20 AM	51551
Surr: Dibromofluoromethane	97.9	70-130	%Rec	1	4/7/2020 5:50:20 AM	51551
Surr: Toluene-d8	97.1	70-130	%Rec	1	4/7/2020 5:50:20 AM	51551

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

Qualifiers:	* D H	Value exceeds Maximum Contaminant Level, Sample Diluted Due to Matrix Holding times for preparation or analysis exceeded	BE	Analyte detected in the associated Method Value above quantitation range Analyte detected below quantitation limits	Blank	-
	ND PQL S	Not Detected at the Reporting Limit Practical Quanitative Limit % Recovery outside of range due to dilution or matrix	P RL	Sample pH Not In Range Reporting Limit		6 of 26

Analytical Report Lab Order 2004136

	Lab 01001 200413
Hall Environmental Analysis Laboratory, Inc.	Date Reported: 4/1

/10/2020 Client Sample ID: WS20-06 0-0.5

CLIENT:	Vertex Resource Group Ltd.		C	ient Sar	mple II	D: W	820-06 0-0.5	
Project:	Shinnery Oaks SWD 1		(Collectio	on Dat	e: 4/1	/2020 4:25:00 PM	
Lab ID:	2004136-017	Matrix: SOIL	/2020 8:30:00 AM					
Analyses		Result	RL	Qual	Qual Units		Date Analyzed	Batch
EPA MET	HOD 300.0: ANIONS						Analyst	: JMT
Chloride		1500	60		mg/Kg	20	4/6/2020 9:27:34 PM	51590
EPA MET	HOD 8015D MOD: GASOLINE	RANGE					Analyst	DJF
Gasoline	Range Organics (GRO)	ND	4.8		mg/Kg	1	4/7/2020 6:19:33 AM	51551
Surr: E	3FB	99.0	70-130		%Rec	1	4/7/2020 6:19:33 AM	51551
EPA MET	HOD 8015M/D: DIESEL RANGI	E ORGANICS					Analyst	
Diesel R	ange Organics (DRO)	ND	8.9		mg/Kg	1	4/6/2020 6:02:47 AM	51554
Motor Oi	l Range Organics (MRO)	ND	45		mg/Kg	1	4/6/2020 6:02:47 AM	51554
Surr: [ONOP	80.5	55.1-146		%Rec	1	4/6/2020 6:02:47 AM	51554
ЕРА МЕТ	HOD 8260B: VOLATILES SHO	RT LIST					Analyst	: DJF
Benzene		ND	0.024		mg/Kg	1	4/7/2020 6:19:33 AM	51551
Toluene		ND	0.048		mg/Kg	1	4/7/2020 6:19:33 AM	51551
Ethylben	zene	ND	0.048		mg/Kg	1	4/7/2020 6:19:33 AM	51551
Xylenes,	Total	ND	0.097		mg/Kg	1	4/7/2020 6:19:33 AM	51551
Surr: 1	1,2-Dichloroethane-d4	90.8	70-130		%Rec	1	4/7/2020 6:19:33 AM	51551
Surr: 4	1-Bromofluorobenzene	97.3	70-130		%Rec	1	4/7/2020 6:19:33 AM	51551
Surr: [Dibromofluoromethane	96.3	70-130		%Rec	1	4/7/2020 6:19:33 AM	51551
Surr: 1	Foluene-d8	99.5	70-130		%Rec	1	4/7/2020 6:19:33 AM	51551

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

0			Value exceeds Ma	vinum Contami	nant Level		в	Analyte detected	in the associated Me	hod Blank			
Qu	alifiers:	D	Sample Diluted Di										
			· //				E		ntitation range				-
		Н :	Holding times for	preparation or an	nalysis-exceeded	HER CALLER	J	Analyte detected	below-quantitation li	mits-	the second second	-	
	ND		Not Detected at th	e Reporting Lim	nit		Sample pH Not I	Sample pH Not In Range					
		PQL	Practical Quanitative Limit			RL	Reporting Limit			Page I	7 of 26		
		S	% Recovery outsi	de of range due t	o dilution or matrix			, ,					
												·	
												-	_

Analytical Report

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Hall E	nvironmental Analysis		Lab Order 2004136 Date Reported: 4/10/2020										
CLIENT:	Vertex Resource Group Ltd.	Client Sample ID: WS20-07 0-0.5											
Project:	Shinnery Oaks SWD 1	Collection Date: 4/1/2020 4:35:00 PM											
Lab ID:	2004136-018	Matrix: SOIL		ved Dat	Date: 4/3/2020 8:30:00 AM								
Analyses		Result	RL	Qual	Units	DF	Date Analyzed	Batch					
	THOD 300.0: ANIONS						Analyst	: JMT					
Chloride		1400	60		mg/Kg	20	4/6/2020 9:39:55 PM	51590					
EPA ME	THOD 8015D MOD: GASOLINE	RANGE					Analyst	DJF					
Gasoline	Range Organics (GRO)	ND	4.9		mg/Kg	1	4/7/2020 6:48:53 AM	51551					
Surr:	BFB	98.9	70-130		%Rec	1	4/7/2020 6:48:53 AM	51551					
EPA MET	THOD 8015M/D: DIESEL RANG	E ORGANICS					Analyst	CLP					
Diesel R	ange Organics (DRO)	ND	8.9		mg/Kg	1	4/6/2020 6:26:24 AM	51554					
Motor Oi	il Range Organics (MRO)	ND	44		mg/Kg	1	4/6/2020 6:26:24 AM	51554					
Surr: I	DNOP	86.3	55.1-146		%Rec	1	4/6/2020 6:26:24 AM	51554					
EPA MET	THOD 8260B: VOLATILES SHO	RT LIST					Analyst	DJF					
Benzene	9	ND	0.025		mg/Kg	1	4/7/2020 6:48:53 AM	51551					
Toluene		ND	0.049		mg/Kg	1	4/7/2020 6:48:53 AM	51551					
Ethylben	zene	ND	0.049		mg/Kg	1	4/7/2020 6:48:53 AM	51551					
Xylenes,	Total	ND	0.098		mg/Kg	1	4/7/2020 6:48:53 AM	51551					
Surr:	1,2-Dichloroethane-d4	90.9	70-130		%Rec	1	4/7/2020 6:48:53 AM	51551					
Surr: 4	4-Bromofluorobenzene	93.8	70-130		%Rec	1	4/7/2020 6:48:53 AM	51551					
Surr: I	Dibromofluoromethane	99.0	70-130		%Rec	1	4/7/2020 6:48:53 AM	51551					
Surr:	Toluene-d8	99.5	70-130		%Rec	1	4/7/2020 6:48:53 AM	51551					

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

Qualifiers:	* D ND PQL S	Sample Holding Not Det Practica	Diluted Du timesifor: ected at th I Quanitati	te to Matr preparatio e Reportin ve Limit	n or analysis ng Limit	s exceeded		B E J P RL	Analyte dete Value above Analyte dete Sample pH Reporting [e quantitati ected-belov Not In Rar	on range v quantitatio		Page 18 of 26	
							100.000							 -
							and the second sec							

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

Client: Project:		Resource Gr / Oaks SWI		1.							
Sample ID:	MB-51578 SampType: mblk				TestCode: EPA Method 300.0: Anions						
Client ID:	PBS	Batch ID: 51578			RunNo: 67894						
Prep Date:	4/6/2020	Analysis Date: 4/6/2020			SeqNo: 2345598			Units: mg/Kg			
Analyte Chloride		Result ND	PQL 1.5	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
	LCS-51578 SampType: Ics TestCode: EPA Method 300.0: Anions										
Client ID:	LCSS	S Batch ID: 51578				RunNo: 67894					
Prep Date:	4/6/2020	Analysis Date: 4/6/2020			SeqNo: 2345599			Units: mg/Kg			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride		14	1.5	15.00	0	92.6	90	110			
Sample ID:	MB-51590	/IB-51590 SampType: mblk TestCode: EPA Method 300.0: Anions									
Client ID:	PBS	Batch ID: 51590			RunNo: 67894						
Prep Date:	4/6/2020	Analysis Date: 4/6/2020			SeqNo: 2345638			Units: mg/Kg			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride		ND	1.5								
Sample ID:	LCS-51590 SampType: Ics TestCode: EPA Method 300.0: Anions										
Client ID:	LCSS	Batch ID: 51590			RunNo: 67894						
Prep Date:	4/6/2020	Analysis Date: 4/6/2020			SeqNo: 2345639			Units: mg/Kg			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride		14	1.5	15.00	0	93.0	90	110			

Qualifiers:

* Value exceeds Maximum Contaminant Level,

D ____Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND := Not Detected at the Reporting Limit

Practical Quanitative Limit PQL

S % Recovery outside of range due to dilution or matrix

- Analyte detected in the associated Method Blank В
- Value above quantitation range Е
- Analyte detected below quantitation limits I
- Sample pH Not In Range Р
- RL Reporting Limit

WO#: 2004136 10-Apr-20

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Hall Environmental Analysis Laboratory, Inc.

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2004136 *10-Apr-20*

WO#:

Client: Vertex I	Resource Group Ltd.	
Project: Shinnery	y Oaks SWD 1	
Sample ID: LCS-51553	SampType: LCS	TestCode: EPA Method 8015M/D: Diesel Range Organics
Client ID: LCSS	Batch ID: 51553	RunNo: 67874
Prep Date: 4/4/2020	Analysis Date: 4/6/2020	
Analyte Diesel Range Organics (DRO)		value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual 50.00 0 99.7 70 130
Surr: DNOP		5.000 76.7 55.1 146
Sample ID: MB-51553	SampType: MBLK	TestCode: EPA Method 8015M/D: Diesel Range Organics
Client ID: PBS	Batch ID: 51553	RunNo: 67874
Prep Date: 4/4/2020	Analysis Date: 4/6/2020	SeqNo: 2344831 Units: mg/Kg
Analyte	Result PQL SPK	value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Diesel Range Organics (DRO)	ND 10	
Motor Oil Range Organics (MRO)	ND 50	10.00 7 0.4 5 5.4 440
Surr: DNOP	7.9 1	10.00 79.1 55.1 146
Sample ID: MB-51554	SampType: MBLK	TestCode: EPA Method 8015M/D: Diesel Range Organics
Client ID: PBS	Batch ID: 51554	RunNo: 67859
Prep Date: 4/4/2020	Analysis Date: 4/6/2020	SeqNo: 2345130 Units: mg/Kg
Analyte	Result PQL SPK	value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Diesel Range Organics (DRO)	ND 10	
Motor Oil Range Organics (MRO)	ND 50	
Surr: DNOP	10 1	10.00 100 55.1 146
Sample ID: LCS-51554	SampType: LCS	TestCode: EPA Method 8015M/D: Diesel Range Organics
Client ID: LCSS	Batch ID: 51554	RunNo: 67859
Prep Date: 4/4/2020	Analysis Date: 4/6/2020	SeqNo: 2345131 Units: mg/Kg
Analyte	Result PQL SPK	value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
Diesel Range Organics (DRO)	45 10 5	50.00 0 90.6 70 130
Surr: DNOP	4.4 5	5.000 87.3 55.1 146
Sample ID: 2004136-008AMS	S SampType: MS	TestCode: EPA Method 8015M/D: Diesel Range Organics
Client ID: BS20-08 0.5'	Batch ID: 51554	RunNo: 67859
Prep Date: 4/4/2020	Analysis Date: 4/6/2020	SeqNo: 2345133 Units: mg/Kg
Prep Date: 4/4/2020 Analyte	5	value SPK Ref Val %REC LowLimit HighLimit %RPD RPDLimit Qual
	Result PQL SPK	

Qualifiers:

* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

II Floiding times for preparation or analysis exceeded

ND Not:Detected at the Reporting Limit

PQL Practical Quanitative Limit

S % Recovery outside of range due to dilution or matrix

- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

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B Analyte detected in the associated Method Blank

Hall Environmental Analysis Laboratory, Inc.

8.8

10.00

Client:	Vertex Re	source Gro	oup Lto	d.							
Project:	Shinnery (Oaks SWD	1								
Sample ID:	2004136-008AMSD	SampTy	/pe: MS	5D	Tes	tCode: El	PA Method	8015M/D: Die	esel Rang	e Organics	
Client ID:	BS20-08 0.5'	Batch	ID: 51	554	F	RunNo: 6	7859				
Prep Date:	4/4/2020	Analysis Da	ate: 4 /	6/2020	S	SeqNo: 2	345134	Units: mg/K	(g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range C	Organics (DRO)	44	9.3	46.69	0	93.9	47.4	136	3.37	43.4	
Surr: DNOP		4.3		4.669		93.1	55.1	146	0	0	
Sample ID:	LCS-51589	SampTy	vpe: LC	s	Tes	tCode: El	PA Method	8015M/D: Die	esel Rang	e Organics	
Client ID:	LCSS	Batch	ID: 51	58 9	F	RunNo: 6	7897				
Client ID: Prep Date:		Batch Analysis Da				RunNo: 6 SeqNo: 2 :		Units: %Re e	C		
				7/2020		SeqNo: 2		Units: %Re e HighLimit	c %RPD	RPDLimit	Qual
Prep Date:		Analysis Da	ate: 4/	7/2020	S	SeqNo: 2	347620		-	RPDLimit	Qual
Prep Date: Analyte	4/6/2020	Analysis Da Result	ate: 4/ PQL	7/2020 SPK value 5.000	SPK Ref Val	SeqNo: 2 %REC 83.2	347620 LowLimit 55.1	HighLimit	%RPD		Qual
Prep Date: Analyte Surr: DNOP Sample ID:	4/6/2020	Analysis Da Result 4.2 SampTy	ate: 4/ PQL	7/2020 SPK value 5.000 BLK	SPK Ref Val	SeqNo: 2 %REC 83.2	347620 LowLimit 55.1 PA Method	HighLimit 146	%RPD		Qual
Prep Date: Analyte Surr: DNOP	4/6/2020 MB-51589 PBS	Analysis Da Result 4.2 SampTy	PQL PQL pe: ME ID: 51	7/2020 SPK value 5.000 BLK 589	SPK Ref Val Tes	SeqNo: 2 %REC 83.2 tCode: EI	347620 LowLimit 55.1 PA Method 7897	HighLimit 146	%RPD		Qual

88.4

55.1

146

Surr: DNOP

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- % Recovery outside of range due to dilution or matrix S

- В Analyte detected in the associated Method Blank
- Value above quantitation range Е
- J
- Sample pH Not In Range
- RL Reporting Limit

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WO#:

Analyte detected below quantitation limits

- P

Hall Environmental Analysis Laboratory, Inc.

	Resource Group ery Oaks SWD 1	Ltd.							
Sample ID: mb-51549	SampType:	PA Method	8015D: Gaso	line Rang	e				
Client ID: PBS	Batch ID: 51549 RunNo: 67892								
Prep Date: 4/3/2020	Analysis Date:	4/6/2020	5	SeqNo: 2	345521	Units: mg/K	g		
Analyte	Result PC	L SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0							
Surr: BFB	940	1000		93.7	66.6	105			
Sample ID: Ics-51549	SampType:	LCS	Tes	tCode: EF	PA Method	8015D: Gaso	line Rang	e	
Client ID: LCSS	Batch ID:	51549	F	RunNo: 6	7892				
Prep Date: 4/3/2020	Analysis Date:	4/6/2020	5	SeqNo: 2	345530	Units: mg/K	g		
Analyte	Result PC	L SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	5.0 25.00	0	95.1	80	120			
Surr: BFB	1100	1000		107	66.6	105			S

Qualifiers:

Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

II Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quanitative Limit

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

- Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

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WO#:

QC SUMMARY REPORT Hall Environmental Analysis Laboratory, Inc.

Client: Vertex l	Resource G	roup Lto	1.							
Project: Shinner	y Oaks SW	D 1								
Sample ID: mb-51549	SampT	Type: ME	BLK	Tes	tCode: EF	PA Method	8021B: Volat	iles		
Client ID: PBS	Batcl	h ID: 51	549	F	RunNo: 6	7892				
Prep Date: 4/3/2020	Analysis E	Date: 4/	6/2020	5	SeqNo: 2	345571	Units: mg/K	g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	0.97		1.000		97.3	80	120			
Sample ID: LCS-51549	SampT	Type: LC	S	Tes	tCode: EF	PA Method	8021B: Volat	iles		
Client ID: LCSS	Batcl	h ID: 51	549	F	RunNo: 67	7892				
Prep Date: 4/3/2020	Analysis D	Date: 4/	6/2020	5	SeqNo: 2	345572	Units: mg/K	g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.89	0.025	1.000	0	89.1	80	120			
Toluene	0.94	0.050	1.000	0	94.3	80	120			
Ethylbenzene	0.95	0.050	1.000	0	95.1	80	120			
Xylenes, Total	2.9	0.10	3.000	0	95.1	80	120			
Surr: 4-Bromofluorobenzene	0.97		1.000		97.4	80	120			

Qualifiers:

Value exceeds Maximum Contaminant Level. n Sample Diluted Due to Matrix H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit PQL

Practical Quanitative Limit

% Recovery outside of range due to dilution or matrix S

- В Analyte detected in the associated Method Blank E Value above quantitation range J Analyte detected below quantitation limits
- Р Sample pH Not In Range - ----
- RL Reporting Limit

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WO#: 2004136 10-Apr-20

Client:

Hall Environmental Analysis Laboratory, Inc.

Vertex Resource Group Ltd.

Project: Shinner	ry Oaks SWI	D 1								
Sample ID: Ics-51551	SampT	ype: LC	s	Tes	tCode: El	PA Method	8260B: Volat	tiles Short	List	
Client ID: LCSS	Batcl	h ID: 51	551	٩	RunNo: 6	7889				
Prep Date: 4/3/2020	Analysis D	Date: 4/	6/2020	S	eqNo: 2	345914	Units: mg/K	٢g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.97	0.025	1.000	0	97.5	70	130			
Toluene	1.1	0.050	1.000	0	105	70	130			
Surr: 1,2-Dichloroethane-d4	0.45		0.5000		90.7	70	130			
Surr: 4-Bromofluorobenzene	0.47		0.5000		94.7	70	130			
Surr: Dibromofluoromethane	0.47		0.5000		93.7	70	130			
Surr: Toluene-d8	0.50		0.5000		99.5	70	130			
Sample ID: mb-51551	SampT	уре: МЕ	BLK	Tes	tCode: El	PA Method	8260B: Volat	tiles Short	List	
Sample ID: mb-51551 Client ID: PBS	·	ype: ME			tCode: El RunNo: 6		8260B: Volat	tiles Short	List	
	·	h ID: 51:	551	F		7889	8260B: Volat Units: mg/K		List	
Client ID: PBS	Batcl	h ID: 51:	551 6/2020	F	RunNo: 6 GeqNo: 2	7889			List	Qual
Client ID: PBS Prep Date: 4/3/2020 Analyte	Batcl Analysis E	h ID: 51: Date: 4/	551 6/2020	F	RunNo: 6 GeqNo: 2	7889 345916	Units: mg/K	٢g		Qual
Client ID: PBS Prep Date: 4/3/2020	Batcl Analysis D Result	h ID: 51: Date: 4/0 PQL	551 6/2020	F	RunNo: 6 GeqNo: 2	7889 345916	Units: mg/K	٢g		Qual
Client ID: PBS Prep Date: 4/3/2020 Analyte Benzene Toluene	Batcl Analysis E Result ND	h ID: 51: Date: 4/ PQL 0.025	551 6/2020	F	RunNo: 6 GeqNo: 2	7889 345916	Units: mg/K	٢g		Qual
Client ID: PBS Prep Date: 4/3/2020 Analyte Benzene Toluene Ethylbenzene	Batcl Analysis E Result ND ND	h ID: 51 Date: 4/1 PQL 0.025 0.050	551 6/2020	F	RunNo: 6 GeqNo: 2	7889 345916	Units: mg/K	٢g		Qual
Client ID: PBS Prep Date: 4/3/2020 Analyte Benzene Toluene Ethylbenzene	Batcl Analysis E Result ND ND ND	h ID: 51: Date: 4/ PQL 0.025 0.050 0.050	551 6/2020	F	RunNo: 6 GeqNo: 2	7889 345916	Units: mg/K	٢g		Qual
Client ID: PBS Prep Date: 4/3/2020 Analyte Benzene Toluene Ethylbenzene Xylenes, Total	Batcl Analysis E Result ND ND ND ND	h ID: 51: Date: 4/ PQL 0.025 0.050 0.050	551 6/2020 SPK value	F	RunNo: 6 GeqNo: 2: %REC	7889 345916 LowLimit	Units: mg/K HighLimit	٢g		Qual
Client ID: PBS Prep Date: 4/3/2020 Analyte Benzene Toluene Ethylbenzene Xylenes, Total Surr: 1,2-Dichloroethane-d4	Batcl Analysis E Result ND ND ND ND 0.45	h ID: 51: Date: 4/ PQL 0.025 0.050 0.050	551 6/2020 SPK value 0.5000	F	RunNo: 6 GeqNo: 2 %REC 90.0	7889 345916 LowLimit 70	Units: mg/K HighLimit 130	٢g		Qual



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Hall Environmental Analysis Laboratory, Inc.

Client: Project:		esource Gro Oaks SWD	•	d.							
Sample ID:	2004136-009ams	SampTy	/pe: M\$	3	Tes	tCode: E	PA Method	8015D Mod:	Gasoline	Range	
Client ID:	BS20-09 0.5'	Batch	ID: 51 :	551	F	RunNo: 6	7889				
Prep Date:	4/3/2020	Analysis Da	ate: 4/	6/2020	S	SeqNo: 2	345922	Units: mg/M	(g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Surr: BFB	e Organics (GRO)	22 490	5.0	24.93 498.5	0	89.2 97.7	70 70	130 130			
Sample ID:	2004136-009amsd	SampTy	/pe: MS	 SD	Tes	tCode: E	PA Method	8015D Mod:	Gasoline	Range	
Client ID:	BS20-09 0.5'	Batch	ID: 51 :	551	F	RunNo: 6	7889				
Prep Date:	4/3/2020	Analysis Da	ate: 4/	6/2020	S	SeqNo: 2	345923	Units: mg/k	(g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
-	e Organics (GRO)	22	5.0	25.00	0	90.0	70	130	1.24	20	
Surr: BFB		490		500.0		97.8	70	130	0	0	
Sample ID:	lcs-51551	SampTy	/pe: LC	S	Tes	tCode: E	PA Method	8015D Mod:	Gasoline I	Range	
Client ID:	LCSS	Batch	ID: 51	551	F	RunNo: 6	7889				
Prep Date:	4/3/2020	Analysis Da	ate: 4/	6/2020	5	SeqNo: 2	345940	Units: mg/k	(g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
	e Organics (GRO)	22	5.0	25.00	0	87.9	70	130			
Surr: BFB		500		500.0		99.0	70	130			
Sample ID:	mb-51551	SampTy	vpe: ME	BLK	Tes	tCode: Ei	PA Method	8015D Mod:	Gasoline I	Range	
Client ID:	PBS	Batch	ID: 51	551	F	RunNo: 6	7889				
Prep Date:	4/3/2020	Analysis Da	ate: 4/	6/2020	5	SeqNo: 2	345942	Units: mg/M	(g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
-	e Organics (GRO)	ND	5.0								
Surr: BFB		490		500.0		98.9	70	130			
Sample ID:	lcs-51551	SampTy	pe: LC	S	Tes	tCode: El	PA Method	8015D Mod:	Gasoline I	Range	
Client ID:	LCSS	Batch	ID: 51	551	F	RunNo: 6	7929				
Prep Date:	4/3/2020	Analysis Da	ate: 4 /	7/2020	S	BeqNo: 2	347503	Units: mg/K	(g		
Analyte		Result	PQL		SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
	Organics (GRO)	22	5.0	25.00	0	86.3	70	130			
Surr: BFB		500		500.0		99.5	70	130			
					-	fCode: El	DA Mothod	8015D Mod:	Gasolina	Jongo	
Sample ID:	mb-51551	SampTy	pe: ME	SLK	les		FA Welliou	0015D WOU.	Gasonne i	Nange	
Sample ID: Client ID:			/pe: ME ID: 51:			RunNo: 6		0015D WOU.	Gasonne i	vange	
	PBS		ID: 51	551	F		7929	Units: mg/K		Valige	

Qualifiers:

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

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WO#:

В

Hall Environmental Analysis Laboratory, Inc.

	Resource Gr y Oaks SWI	•	1.							
Sample ID: mb-51551	SampT	ype: ME	BLK	Tes	tCode: EF	PA Method	8015D Mod:	Gasoline	Range	
Client ID: PBS	Batch	n ID: 51	551	F	RunNo: 67	7929				
Prep Date: 4/3/2020	Analysis D	ate: 4/	7/2020	S	SeqNo: 23	347505	Units: mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	510		500.0		102	70	130			

Qualifiers:

- Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting-Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E .Value above quantitation range
- Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit



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10-Apr-20

WO#:

HALL ENVIRONMENTAL ANALYSIS LABORATORY	Hall Environmental Albu TEL: 505-345-3975 Website: www.ha	4901 Ho uquerque, 1 FAX: 505-	nvkins NE NM 87109 -345-4107	Sam	nple Log-In Cł	neck List
Client Name: VERTEX CARLSBAD	Work Order Number:	2004136	3		RcptNo:	1
Received By: Juan Rojas	4/3/2020 8:30:00 AM		Gua	ray	Б.	
Completed By: John Caldwell Reviewed By:	4/3/2020 10:05:17 AM 3 20		Ģi	nCillar	U	
Chain of Custody						
1. Is Chain of Custody sufficiently complete?	2	Yes 🗹	N	b	Not Present	
2. How was the sample delivered?		<u>Courier</u>				
Log In 3. Was an attempt made to cool the samples	s?	Yes 🗹	No		NA 🗌	
4. Were all samples received at a temperature	re of >0° C to 6.0°C	Yes 🗹	No	b	NA 🗌	
5. Sample(s) in proper container(s)?		Yes 🗹	No	b		
6. Sufficient sample volume for indicated test	i(s)?	Yes 🔽	No			
7. Are samples (except VOA and ONG) prope	erly preserved?	Yes 🗹	Na			
8. Was preservative added to bottles?		Yes 🗌	No		NA 🗌	
9. Received at least 1 vial with headspace <1	/4" for AQ VOA?	Yes 🗌	No		NA 🗹	
10. Were any sample containers received brok	ken?	Yes 🗌	No		# of preserved bottles checked	/
11. Does paperwork match bottle labels? (Note discrepancies on chain of custody)		Yes 🗹	No		for pH:	12 unless noted)
12. Are matrices correctly identified on Chain of	of Custody?	Yes 🗹	Na		Adjusted?	
13. Is it clear what analyses were requested?		Yes 🗹	No	_		
14. Were all holding times able to be met? (If no, notify customer for authorization.)		Yes 🗹	Na		Checked by:	DAD 4/5/20
Special Handling (if applicable)						
15. Was client notified of all discrepancies wit	h this order?	Yes 🗌	No	b	NA 🗹	
Person Notified: By Whom: Regarding: Client Instructions:	Date Via;] eMail	Dhone] Fax	📋 In Person	
16. Additional remarks:						
17. <u>Cooler Information</u>	a. 11 - 10 1		1			
Cooler No Temp °C Condition 1. 2.7 Good	Seal Intact Seal No S	eal Date	Signed	Ву		-
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Page 1 of 1				-		

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Time:	2	D Rush		ry Oaks SUD #		00237	h		MIP		1	3	Preservative Type	5-	1									-	7	Via:	Via:	COUPLEY	If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.
Turn-Around T		E Standard	Project Name:	Jun uner	Project #:	30E-	Project Manager:	Natel	Sampler:	1	# of Coolers:	Cooler Temp(including CF):	Container Type and #	1	-										7	Received by:	Received by:	and	ontracted to other a
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Client: Jac			Date Ti Date: Ti Date: Tin
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ATTACHMENT 8



Natalie Gordon

From: Eads, Cristina, EMNRD [mailto:Cristina.Eads@state.nm.us]
Sent: Tuesday, August 18, 2020 11:43 AM
To: John Hurt <JHurt@matadorresources.com>
Cc: CFO_Spill, BLM_NM <blm_nm_cfo_spill@blm.gov>; Bratcher, Mike, EMNRD <mike.bratcher@state.nm.us>; Hamlet,

Robert, EMNRD <Robert.Hamlet@state.nm.us>; Venegas, Victoria, EMNRD <Victoria.Venegas@state.nm.us> Subject: NRM2009032079 SHINNERY OAK FEDERAL SWD #001 @ 30-015-20866

EXTERNAL EMAIL John,

The OCD has denied the submitted Closure Request C-141 for incident # NRM2009032079 for the following reason:

Horizontal delineation has not been completed. The values for determination of horizontal impact are derived by either "background" value as determined appropriate to Rule 29, or, for chloride, 600 mg/Kg in soils. This is especially important for "on-pad" releases to ensure the release did not extend to the "off-pad"/pasture area. A visual footprint on the surface is not sufficient to assess the horizontal extent of the release. Lab data must be provided as evidence of delineation efforts. All sidewall samples, with the exception of WS20-01 exceed the criteria described above.

The site characterization is approved, and no additional remediation will be required, given that additional sidewall samples demonstrate the release did not extend to the off-pad area and/or do not exceed closure criteria where groundwater is greater than 100' below ground surface. This site characterization will need like approval from the BLM.

The Denied C-141 can be found in the online image file. Please review and make the required correction prior to resubmitting though the fee portal. If you have any questions or believe this denial is in error, please contact me prior to submitting an additional C-141.

1

Thanks,

Cristina Eads

Environmental Bureau EMNRD – Oil Conservation Division 5200 Oakland Avenue NE, Suite 100 Albuquerque, New Mexico 87113 505.670-5601 email: <u>Cristina.Eads@state.nm.us</u> OCD approval does not relieve the operator of liability should their operations fail to adequately investigate and remediate contamination that may pose a threat to groundwater, surface water, human health or the environment. In addition, OCD approval does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

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CONDITIONS

Action 10859

District I 1625 N. French Dr., Hobbs, NM 88240 Phone:(575) 393-6161 Fax:(575) 393-0720 District II

811 S. First St., Artesia, NM 88210 Phone:(575) 748-1283 Fax:(575) 748-9720

District III 1000 Rio Brazos Rd., Aztec, NM 87410

Phone:(505) 334-6178 Fax:(505) 334-6170 <u>District IV</u> 1220 S. St Francis Dr., Santa Fe, NM 87505 Phone:(505) 476-3470 Fax:(505) 476-3462

State of New Mexico Energy, Minerals and Natural Resources Oil Conservation Division 1220 S. St Francis Dr. Santa Fe, NM 87505

CONDITIONS OF APPROVAL

Operator:	OGRID:	Action Number:	Action Type:
MATADOR PRODUCTION COMPANY One Lincoln Centre	228937	10859	C-141
5400 LBJ Freeway, Ste 1500 Dallas, TX75240			
OCD Reviewer	Condition		
ceads	None		