

ENVIRONMENTAL PLUS, INC.

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Site Characterization and Work Plan

**Vanguard
Karlsbad Corral 11 SWD 1
Eddy County, New Mexico
Unit Letter "J", Section 11, Township 25 South, Range 29 East
Latitude 32.143476 North, Longitude 103.955108 West**

Prepared For:

Vanguard Operating, LLC
4001 Penbrook, Suite 201
Odessa, Texas 79762

Prepared By:

Environmental Plus, Inc.
2100 Ave 'O'
Eunice, NM 88231

October 2017

Brandon Boone
Project Manager



The following *Site Characterization and Work Plan* serves as a condensed update on field activities undertaken and proposed actions for the afore referenced Site.

Background:

The site is located in Unit Letter J, Section 11, Township 25 South, Range 29 East, approximately nine miles south-east of Malaga, in Eddy County, New Mexico. Vanguard Permian owns the property.

The release site is located on the caliche pad on an active disposal well; latitude 32.143476° North, longitude -103.955108° West. Area Map, Site Location Map, and Sample/Site Map are included as Figure 1, Figure 2, respectively. The Initial NMOCD Form C-141 is included as Attachment IV.

NMOCD Site Classification:

A search for water wells was completed utilizing the New Mexico Office of the State Engineer's (NMOSE) website. There is one well located in the area surrounding the release site (reference *Table 1*). Also, no wells (domestic, agriculture or public) and no bodies of surface water exist within a 1,000-foot radius of the release site (reference *Figure 2*). The USGS database located no wells within the surrounding area. The NMOSE database indicates average water depth is approximately 150 feet below ground surface (bgs) within an 1,868-meter radius (reference *Attachment II*). However, as this is too great a distance to accurately determine depth to water for this location as the closest documented well is 1,800 meters away, the Eddy county groundwater flowline map was utilized to determine an approximate depth to water of over one hundred feet bgs.

Utilizing this information, the NMOCD guidelines indicate the Karlsbad Corral 11 SWD 1 release site to have a ranking score of zero. Based on this score, the NMOCD Recommended Remedial Action Levels (RRALs) for delineation at this Site were determined as follows: Benzene – 10 mg/Kg, BTEX – 50 mg/Kg, TPH – 5,000 mg/Kg, and Chloride – 600 mg/Kg.

The visually stained area totals an area of approximately 3,800 square feet. The area is caliche approximately two feet thick on the pad.

Delineation Progress:

On August 23, 2017 EPI personnel mobilized on site to collect soil samples to determine the vertical extent of contamination. A total of twenty-three soil samples were collected from six sample locations; SP1 – SP6. Two soil samples from each sample location were sent to Cardinal Labs in Hobbs, New Mexico, for testing. Laboratory analytical results indicate Chlorides above NMOCD RRALs (reference *Figure 3* and *Table 2*).

Portions of select soil samples were field tested for organic vapors and chloride concentrations. Soil samples collected for field testing of organic vapors were placed in self-sealing polyethylene

bags and allowed to equilibrate to ~70° F. Field testing of organic vapors utilized a Mini-Rae™ Photoionization Detector (PID) equipped with a 10.6 electron-volt (eV) calibrated for benzene response. Chloride concentrations were determined via use of a LaMotte Chloride Kit (Titration Method).

Soil samples designated for laboratory analyses were collected into laboratory provided glass containers, labeled and inserted into self-sealing polyethylene bags, placed in a cooler, chilled and transported to an independent laboratory for quantification of contaminant concentrations under Chain-of-Custody protocol.

Proposed Actions:

Based on field testing and laboratory analytical data, EPI proposes to excavate the release area to approximately three feet bgs, with all contaminated soil hauled to a state approved disposal facility. At the conclusion of excavation activities, a twenty-mil poly-ethylene liner will be installed. Bottom and sidewall confirmation samples will also be collected and analyzed. If laboratory analytical results are below NMOCD RRALs the excavation will be backfilled with select caliche to finish grade. If analytical results are above RRALs the process will be repeated until acceptable levels are achieved.

Backfill soil will be free of deleterious material or rocks or large clumps. Backfilling will continue until the excavation is closed.

Revegetation Plan:

As the area in question is a tank battery on an active lease pad, no seeding will be required.

Noxious Weed Management Plan:

In an effort to prevent the spread of noxious weeds such as African Rue, Siberian Elm, Jointed Goatgrass, Russian Olive, Camelthorn, Saltcedar, Starthistle varieties, Hoary Cress and Russian Knapweed, the area will be confirmed to be clear of any noxious weeds. If any are located they will be removed by hand and the area treated with an appropriate herbicide. After a period of three months the area will be examined for noxious weed growth and re-treated if any growth has occurred.

Following completion of NMOCD and NMSLO approved Proposed Actions, EPI will provide a detailed *Final Closure Report* to Vanguard, NMOCD, and NMSLO personnel. Vanguard and EPI personnel would welcome an opportunity to briefly discuss the *Work Plan* at your earliest convenience.

Should you have any questions or concerns please feel free to contact me at (575) 390-7865 or via e-mail bboone.emp@gmail.com or Mr. Chuck Johnston at (432) 202-4771 or via e-mail at cjohnston@vnrlc.com. All official communication should be addressed to:

Mr. Chuck Johnston
Vanguard
4001 Penbrook, Suite 2001
Odessa, Texas 79762

Sincerely,

ENVIRONMENTAL PLUS, INC.

Brandon Boone
Environmental Consultant

cc: Mike Bratcher, Environmental Specialist – NMOCD District 2, Hobbs, NM
Amber Groves, Remediation Specialist – NMSLO, Hobbs, NM
Chuck Johnston, EHS – Vanguard
File

Encl.: Figure 1 – Area Map
Figure 2 – Sample/Site Map
Table 1 – Well Data
Table 2 – Summary of Soil Sample Field Testing and Laboratory Analytical
Results Attachment I – Photographs
Attachment II – NMOSE Average Depth to Groundwater, USGS Well Sites
Attachment III – Laboratory Analytical Results
Attachment IV – Copy of Initial NMOCD Form C-141

FIGURES

Figure 1

Area Map
Vanguard
Karlsbad Corral 11 SWD 1

Eddy County, New Mexico
UL J, Sec 11, 25S-29E
N 32.14338 W -103.95515
Elevation: 3,100 feet AMSL

Legend

- Carlsbad PBR
- Karlsbad corral 11 SWD #1
- Malaga

Google Earth

© 2017 Google

Karlsbad corral 11 SWD #1








N

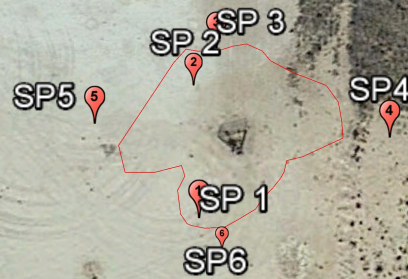
6 mi

Karlsbad Corral 11 SWD 1

Vanguard Permian
Eddy County, New Mexico
UL J, Sec 11, 25S-29E
N 32.14348 W -103.95515
Elevation 3,100 ft. AMSL

Legend




-  Release Area
-  SP 1
-  SP 2
-  SP 3
-  SP4
-  SP5
-  SP6



200 ft

TABLES

TABLE 1**Well Data****Vanguard - Karlsbad Corral 11 SWD 1**

Ref #	Well Number	Use	Diversion ^A	Owner				Sec	Twsp	Rng	Easting	Northing	Distance ^B	Date Measured	Surface Elevation ^C	Depth to Water
					(ft bgs)											
1	C02459	PRO	0	Santa Fe Energy Resources inc.	4	4	1	2	25S	29E	598422	3558663	1,387	09-Sep-16	3,105	150

* = Data obtained from the USGS and New Mexico Office of the State Engineer websites

^A = In acre feet per annum

^B = In meters

^C = Elevation interpolated from Google Earth based on referenced location.

STK = 72-12-1 Livestock watering

quarters are 1=NW, 2=NE, 3=SW, 4=SE; quarters are smallest to biggest

-- = Data not provided on the NM iwaters website

Shaded area indicates wells not shown in Figure 2

MON = Monitoring Well

PRO = 72-12-1 Prospecting or development of Natural Resource

IND = Industrial

PDM = Non 72-12-1 Domestic

OIL = Oil Production

TABLE 2
Summary of Soil Sample Field Testing and Laboratory Analytical Results
Vanguard
Karlsbad Corral 11 SWD 1

Lab Sample ID	Depth (feet)	Soil Status	Sample Date	PID Reading (ppm)	Field Chloride (mg/Kg)	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethylbenzene (mg/Kg)	Total Xylenes (mg/Kg)	Total BTEX (mg/Kg)	GRO C6-C10 (mg/Kg)	DRO C10-C28 (mg/Kg)	Total TPH (mg/Kg)	Chloride (mg/Kg)
SP1	Surface	In-Situ	23-Aug-17	0.0	>4,000	--	--	--	--	--	--	--	--	11,800
	2	In-Situ	23-Aug-17	0.0	400	--	--	--	--	--	--	--	--	--
	4	In-Situ	23-Aug-17	0.0	1,040	--	--	--	--	--	--	--	--	--
	6	In-Situ	23-Aug-17	0.0	2,080	--	--	--	--	--	--	--	--	--
	10	In-Situ	23-Aug-17	0.0	640	--	--	--	--	--	--	--	--	--
	14	In-Situ	23-Aug-17	0.0	480	--	--	--	--	--	--	--	--	--
	18	In-Situ	23-Aug-17	0.0	160	--	--	--	--	--	--	--	--	--
	22	In-Situ	23-Aug-17	0.0	160	--	--	--	--	--	--	--	--	80
SP2	Surface	In-Situ	23-Aug-17	1.8	>4,000	--	--	--	--	--	--	--	--	12,300
	2	In-Situ	23-Aug-17	1.7	640	--	--	--	--	--	--	--	--	--
	4	In-Situ	23-Aug-17	1.7	800	--	--	--	--	--	--	--	--	--
	6	In-Situ	23-Aug-17	1.6	240	--	--	--	--	--	--	--	--	--
	10	In-Situ	23-Aug-17	1.4	240	--	--	--	--	--	--	--	--	--
	14	In-Situ	23-Aug-17	1.5	200	--	--	--	--	--	--	--	--	--
	17	In-Situ	23-Aug-17	1.4	160	--	--	--	--	--	--	--	--	128
SP3	Surface	In-Situ	11-Aug-17	1.8	80	--	--	--	--	--	--	--	--	32

TABLE 2
Summary of Soil Sample Field Testing and Laboratory Analytical Results
Vanguard
Karlsbad Corral 11 SWD 1

Lab Sample ID	Depth (feet)	Soil Status	Sample Date	PID Reading (ppm)	Field Chloride (mg/Kg)	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethylbenzene (mg/Kg)	Total Xylenes (mg/Kg)	Total BTEX (mg/Kg)	GRO C6-C10 (mg/Kg)	DRO C10-C28 (mg/Kg)	Total TPH (mg/Kg)	Chloride (mg/Kg)
SP3	3	In-Situ	11-Aug-17	1.8	80	--	--	--	--	--	--	--	--	128
SP4	Surface	In-Situ	14-Aug-17	1.6	80	--	--	--	--	--	--	--	--	16
	3	In-Situ	14-Aug-17	1.7	80	--	--	--	--	--	--	--	--	144
SP5	Surface	In-Situ	15-Aug-17	0.0	80	--	--	--	--	--	--	--	--	<16.0
	3	In-Situ	15-Aug-17	0.0	80	--	--	--	--	--	--	--	--	144
SP6	Surface	In-Situ	16-Aug-17	1.9	80	--	--	--	--	--	--	--	--	16
	3	In-Situ	16-Aug-17	1.9	80	--	--	--	--	--	--	--	--	128
NMOCD Recommended Remedial Action Levels				100		10				50			5,000	600

-- = Not Analyzed

Red values are in excess of NMOCD Recommended Remedial Action Levels

Shaded values indicates soil has been excavated

ATTACHMENTS

ATTACHMENT I
Photographs



Photograph #1- Lease sign



Photograph #2- Release area and sample location



Photograph #3- Release area and sample location



Photograph #4- Release area and sample location



Photograph #5- Release area and sample location



Photograph #6- Release area and sample location

ATTACHMENT II
NMOSE Average Depth to Groundwater



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

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

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

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

(NAD83 UTM in meters)

(In feet)

POD Number	POD Sub- Code	basin	County	Q	Q	Q	Sec	Tws	Rng	X	Y	Distance	Depth Well	Depth Water	Water Column
C 02459	C		ED	4	4	1	02	25S	29E	598422	3558863*	1858	150		

Average Depth to Water: --

Minimum Depth: --

Maximum Depth: --

Record Count: 1

UTMNA83 Radius Search (in meters):

Easting (X): 598522.37

Northing (Y): 3558807.52

Radius: 2000

*UTM location was derived from PLSS - see Help

The data is furnished by the NMOSE/ISC and is accepted by the recipient with the expressed understanding that the OSE/ISC make no warranties, expressed or implied, concerning the accuracy, completeness, reliability, usability, or suitability for any particular purpose of the data.

10/6/17 2:10 PM

Page 1 of 1

WATER COLUMN/ AVERAGE
DEPTH TO WATER

USGS Well Sites

10/6/2017

USGS No sites found



[USGS Home](#)
[Contact USGS](#)
[Search USGS](#)

National Water Information System: Web Interface

USGS Water Resources

Data Category:

Groundwater ▼

Geographic Area:

United States ▼

GO

Click to hideNews Bulletins

- [Please see news on new formats](#)
- [Full News](#) 

Search Results -- No sites found

No sites were found for groundwater level data using your search criteria.

The sites you requested may be available offline. For more information, contact [USGS Water Data Inquiries](#).

lat_long_bounding_box =

Position	Latitude	Longitude
Corner 1	32.157665	-103.972075
Corner 2	32.128977	-103.938064
Coordinates are entered as Decimal Degrees. DMS values are converted to Decimal degrees using NAD83 as the datum. Make your bounding box bigger if you are using NAD27 Datum for your DMS values		

Minimum number of 1
levels =

Use the "Back" button on your browser to change your search criteria.

[Return To Previous Page](#)

ATTACHMENT III
Laboratory Analytical Results

Analytical Results For:

Environmental Plus, Inc.
Daniel Dominguez
P.O. Box 1558
Eunice NM, 88231
Fax To: (505) 394-2601

Received:	08/24/2017	Sampling Date:	08/23/2017
Reported:	08/31/2017	Sampling Type:	Soil
Project Name:	KARLSBAD CORRAL	Sampling Condition:	Cool & Intact
Project Number:	11 SWD #1	Sample Received By:	Tamara Oldaker
Project Location:	VANGUARD - UL -J SEC. 11, T25S, R29E		

Sample ID: SP1 (SURFACE) (H702250-01)

BTEX 8021B		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	08/28/2017	ND	1.87	93.7	2.00	0.863	
Toluene*	<0.050	0.050	08/28/2017	ND	1.80	89.8	2.00	0.927	
Ethylbenzene*	<0.050	0.050	08/28/2017	ND	1.88	93.9	2.00	0.0366	
Total Xylenes*	<0.150	0.150	08/28/2017	ND	5.81	96.8	6.00	0.297	
Total BTEX	<0.300	0.300	08/28/2017	ND					

Surrogate: 4-Bromofluorobenzene (PID) 112 % 72-148

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	11800	16.0	08/28/2017	ND	448	112	400	3.64	

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/25/2017	ND	201	100	200	0.00199	
DRO >C10-C28	<10.0	10.0	08/25/2017	ND	199	99.3	200	0.836	
EXT DRO >C28-C36	<10.0	10.0	08/25/2017	ND					

Surrogate: 1-Chlorooctane 94.9 % 28.3-164

Surrogate: 1-Chlorooctadecane 99.2 % 34.7-157

Cardinal Laboratories

*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

 Environmental Plus, Inc.
 Daniel Dominguez
 P.O. Box 1558
 Eunice NM, 88231
 Fax To: (505) 394-2601

Received:	08/24/2017	Sampling Date:	08/23/2017
Reported:	08/31/2017	Sampling Type:	Soil
Project Name:	KARLSBAD CORRAL	Sampling Condition:	Cool & Intact
Project Number:	11 SWD #1	Sample Received By:	Tamara Oldaker
Project Location:	VANGUARD - UL -J SEC. 11, T25S, R29E		

Sample ID: SP1 (22') (H702250-02)

BTEx 8021B		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	08/28/2017	ND	1.87	93.7	2.00	0.863		
Toluene*	<0.050	0.050	08/28/2017	ND	1.80	89.8	2.00	0.927		
Ethylbenzene*	<0.050	0.050	08/28/2017	ND	1.88	93.9	2.00	0.0366		
Total Xylenes*	<0.150	0.150	08/28/2017	ND	5.81	96.8	6.00	0.297		
Total BTEx	<0.300	0.300	08/28/2017	ND						

Surrogate: 4-Bromofluorobenzene (PID) 108 % 72-148

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	80.0	16.0	08/28/2017	ND	448	112	400	3.64	

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/25/2017	ND	201	100	200	0.00199	
DRO >C10-C28	<10.0	10.0	08/25/2017	ND	199	99.3	200	0.836	
EXT DRO >C28-C36	<10.0	10.0	08/25/2017	ND					

Surrogate: 1-Chlorooctane 88.1 % 28.3-164

Surrogate: 1-Chlorooctadecane 95.8 % 34.7-157

Cardinal Laboratories

*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

 Environmental Plus, Inc.
 Daniel Dominguez
 P.O. Box 1558
 Eunice NM, 88231
 Fax To: (505) 394-2601

Received:	08/24/2017	Sampling Date:	08/23/2017
Reported:	08/31/2017	Sampling Type:	Soil
Project Name:	KARLSBAD CORRAL	Sampling Condition:	Cool & Intact
Project Number:	11 SWD #1	Sample Received By:	Tamara Oldaker
Project Location:	VANGUARD - UL -J SEC. 11, T25S, R29E		

Sample ID: SP2 (SURFACE) (H702250-03)

BTEx 8021B		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	08/28/2017	ND	1.87	93.7	2.00	0.863		
Toluene*	<0.050	0.050	08/28/2017	ND	1.80	89.8	2.00	0.927		
Ethylbenzene*	<0.050	0.050	08/28/2017	ND	1.88	93.9	2.00	0.0366		
Total Xylenes*	<0.150	0.150	08/28/2017	ND	5.81	96.8	6.00	0.297		
Total BTEX	<0.300	0.300	08/28/2017	ND						

Surrogate: 4-Bromofluorobenzene (PID) 107 % 72-148

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	12300	16.0	08/28/2017	ND	448	112	400	3.64	

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/25/2017	ND	201	100	200	0.00199	
DRO >C10-C28	<10.0	10.0	08/25/2017	ND	199	99.3	200	0.836	
EXT DRO >C28-C36	<10.0	10.0	08/25/2017	ND					

Surrogate: 1-Chlorooctane 92.2 % 28.3-164

Surrogate: 1-Chlorooctadecane 96.6 % 34.7-157

Cardinal Laboratories

*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

August 31, 2017

Daniel Dominguez

Environmental Plus, Inc.

P.O. Box 1558

Eunice, NM 88231

RE: KARLSBAD CORRAL

Enclosed are the results of analyses for samples received by the laboratory on 08/24/17 15:30.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-16-8. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

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

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

Accreditation applies to public drinking water matrices.

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

Sincerely,



Celey D. Keene

Lab Director/Quality Manager

Analytical Results For:

Environmental Plus, Inc.
Daniel Dominguez
P.O. Box 1558
Eunice NM, 88231
Fax To: (505) 394-2601

Received:	08/24/2017	Sampling Date:	08/23/2017
Reported:	08/31/2017	Sampling Type:	Soil
Project Name:	KARLSBAD CORRAL	Sampling Condition:	Cool & Intact
Project Number:	11 SWD #1	Sample Received By:	Tamara Oldaker
Project Location:	VANGUARD - UL -J SEC. 11, T25S, R29E		

Sample ID: SP2 (17') (H702250-04)

BTX 8021B		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	08/28/2017	ND	1.87	93.7	2.00	0.863	
Toluene*	<0.050	0.050	08/28/2017	ND	1.80	89.8	2.00	0.927	
Ethylbenzene*	<0.050	0.050	08/28/2017	ND	1.88	93.9	2.00	0.0366	
Total Xylenes*	<0.150	0.150	08/28/2017	ND	5.81	96.8	6.00	0.297	
Total BTX	<0.300	0.300	08/28/2017	ND					

Surrogate: 4-Bromofluorobenzene (PID) 109 % 72-148

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	128	16.0	08/28/2017	ND	448	112	400	3.64	

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/25/2017	ND	201	100	200	0.00199	
DRO >C10-C28	<10.0	10.0	08/25/2017	ND	199	99.3	200	0.836	
EXT DRO >C28-C36	<10.0	10.0	08/25/2017	ND					

Surrogate: 1-Chlorooctane 80.9 % 28.3-164

Surrogate: 1-Chlorooctadecane 88.4 % 34.7-157

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Analytical Results For:

Environmental Plus, Inc.
Daniel Dominguez
P.O. Box 1558
Eunice NM, 88231
Fax To: (505) 394-2601

Received:	08/24/2017	Sampling Date:	08/23/2017
Reported:	08/31/2017	Sampling Type:	Soil
Project Name:	KARLSBAD CORRAL	Sampling Condition:	Cool & Intact
Project Number:	11 SWD #1	Sample Received By:	Tamara Oldaker
Project Location:	VANGUARD - UL -J SEC. 11, T25S, R29E		

Sample ID: SP3 (SURFACE) (H702250-05)

BTEx 8021B		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	08/28/2017	ND	1.87	93.7	2.00	0.863	
Toluene*	<0.050	0.050	08/28/2017	ND	1.80	89.8	2.00	0.927	
Ethylbenzene*	<0.050	0.050	08/28/2017	ND	1.88	93.9	2.00	0.0366	
Total Xylenes*	<0.150	0.150	08/28/2017	ND	5.81	96.8	6.00	0.297	
Total BTEX	<0.300	0.300	08/28/2017	ND					

Surrogate: 4-Bromofluorobenzene (PID) 108 % 72-148

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	32.0	16.0	08/28/2017	ND	448	112	400	3.64	

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/25/2017	ND	201	100	200	0.00199	
DRO >C10-C28	<10.0	10.0	08/25/2017	ND	199	99.3	200	0.836	
EXT DRO >C28-C36	<10.0	10.0	08/25/2017	ND					

Surrogate: 1-Chlorooctane 89.2 % 28.3-164

Surrogate: 1-Chlorooctadecane 92.8 % 34.7-157

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Fax To: (505) 394-2601

Received:	08/24/2017	Sampling Date:	08/23/2017
Reported:	08/31/2017	Sampling Type:	Soil
Project Name:	KARLSBAD CORRAL	Sampling Condition:	Cool & Intact
Project Number:	11 SWD #1	Sample Received By:	Tamara Oldaker
Project Location:	VANGUARD - UL -J SEC. 11, T25S, R29E		

Sample ID: SP3 (3') (H702250-06)

BTX 8021B		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	08/28/2017	ND	1.87	93.7	2.00	0.863	
Toluene*	<0.050	0.050	08/28/2017	ND	1.80	89.8	2.00	0.927	
Ethylbenzene*	<0.050	0.050	08/28/2017	ND	1.88	93.9	2.00	0.0366	
Total Xylenes*	<0.150	0.150	08/28/2017	ND	5.81	96.8	6.00	0.297	
Total BTX	<0.300	0.300	08/28/2017	ND					

Surrogate: 4-Bromofluorobenzene (PID) 107 % 72-148

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	128	16.0	08/28/2017	ND	448	112	400	3.64	

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/25/2017	ND	201	100	200	0.00199	
DRO >C10-C28	<10.0	10.0	08/25/2017	ND	199	99.3	200	0.836	
EXT DRO >C28-C36	<10.0	10.0	08/25/2017	ND					

Surrogate: 1-Chlorooctane 95.0 % 28.3-164

Surrogate: 1-Chlorooctadecane 103 % 34.7-157

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Received:	08/24/2017	Sampling Date:	08/23/2017
Reported:	08/31/2017	Sampling Type:	Soil
Project Name:	KARLSBAD CORRAL	Sampling Condition:	Cool & Intact
Project Number:	11 SWD #1	Sample Received By:	Tamara Oldaker
Project Location:	VANGUARD - UL -J SEC. 11, T25S, R29E		

Sample ID: SP4 (SURFACE) (H702250-07)

BTEx 8021B		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	08/28/2017	ND	1.87	93.7	2.00	0.863	
Toluene*	<0.050	0.050	08/28/2017	ND	1.80	89.8	2.00	0.927	
Ethylbenzene*	<0.050	0.050	08/28/2017	ND	1.88	93.9	2.00	0.0366	
Total Xylenes*	<0.150	0.150	08/28/2017	ND	5.81	96.8	6.00	0.297	
Total BTEX	<0.300	0.300	08/28/2017	ND					

Surrogate: 4-Bromofluorobenzene (PID) 107 % 72-148

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	16.0	16.0	08/28/2017	ND	448	112	400	3.64	

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/25/2017	ND	201	100	200	0.00199	
DRO >C10-C28	<10.0	10.0	08/25/2017	ND	199	99.3	200	0.836	
EXT DRO >C28-C36	<10.0	10.0	08/25/2017	ND					

Surrogate: 1-Chlorooctane 82.4 % 28.3-164

Surrogate: 1-Chlorooctadecane 87.7 % 34.7-157

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Received:	08/24/2017	Sampling Date:	08/23/2017
Reported:	08/31/2017	Sampling Type:	Soil
Project Name:	KARLSBAD CORRAL	Sampling Condition:	Cool & Intact
Project Number:	11 SWD #1	Sample Received By:	Tamara Oldaker
Project Location:	VANGUARD - UL -J SEC. 11, T25S, R29E		

Sample ID: SP4 (3') (H702250-08)

BTX 8021B		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	08/28/2017	ND	1.87	93.7	2.00	0.863	
Toluene*	<0.050	0.050	08/28/2017	ND	1.80	89.8	2.00	0.927	
Ethylbenzene*	<0.050	0.050	08/28/2017	ND	1.88	93.9	2.00	0.0366	
Total Xylenes*	<0.150	0.150	08/28/2017	ND	5.81	96.8	6.00	0.297	
Total BTX	<0.300	0.300	08/28/2017	ND					

Surrogate: 4-Bromofluorobenzene (PID) 108 % 72-148

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	144	16.0	08/28/2017	ND	448	112	400	3.64	

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/28/2017	ND	206	103	200	3.80	
DRO >C10-C28	<10.0	10.0	08/28/2017	ND	206	103	200	2.85	
EXT DRO >C28-C36	<10.0	10.0	08/28/2017	ND					

Surrogate: 1-Chlorooctane 98.5 % 28.3-164

Surrogate: 1-Chlorooctadecane 102 % 34.7-157

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Received:	08/24/2017	Sampling Date:	08/23/2017
Reported:	08/31/2017	Sampling Type:	Soil
Project Name:	KARLSBAD CORRAL	Sampling Condition:	Cool & Intact
Project Number:	11 SWD #1	Sample Received By:	Tamara Oldaker
Project Location:	VANGUARD - UL -J SEC. 11, T25S, R29E		

Sample ID: SP5 (SURFACE) (H702250-09)

BTEx 8021B		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	08/28/2017	ND	1.87	93.7	2.00	0.863	
Toluene*	<0.050	0.050	08/28/2017	ND	1.80	89.8	2.00	0.927	
Ethylbenzene*	<0.050	0.050	08/28/2017	ND	1.88	93.9	2.00	0.0366	
Total Xylenes*	<0.150	0.150	08/28/2017	ND	5.81	96.8	6.00	0.297	
Total BTEX	<0.300	0.300	08/28/2017	ND					

Surrogate: 4-Bromofluorobenzene (PID) 106 % 72-148

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	08/28/2017	ND	448	112	400	3.64	

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/28/2017	ND	206	103	200	3.80	
DRO >C10-C28	<10.0	10.0	08/28/2017	ND	206	103	200	2.85	
EXT DRO >C28-C36	<10.0	10.0	08/28/2017	ND					

Surrogate: 1-Chlorooctane 86.8 % 28.3-164

Surrogate: 1-Chlorooctadecane 91.7 % 34.7-157

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Fax To: (505) 394-2601

Received:	08/24/2017	Sampling Date:	08/23/2017
Reported:	08/31/2017	Sampling Type:	Soil
Project Name:	KARLSBAD CORRAL	Sampling Condition:	Cool & Intact
Project Number:	11 SWD #1	Sample Received By:	Tamara Oldaker
Project Location:	VANGUARD - UL -J SEC. 11, T25S, R29E		

Sample ID: SP5 (3') (H702250-10)

BTX 8021B		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	08/28/2017	ND	1.87	93.7	2.00	0.863	
Toluene*	<0.050	0.050	08/28/2017	ND	1.80	89.8	2.00	0.927	
Ethylbenzene*	<0.050	0.050	08/28/2017	ND	1.88	93.9	2.00	0.0366	
Total Xylenes*	<0.150	0.150	08/28/2017	ND	5.81	96.8	6.00	0.297	
Total BTX	<0.300	0.300	08/28/2017	ND					

Surrogate: 4-Bromofluorobenzene (PID) 106 % 72-148

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	144	16.0	08/28/2017	ND	448	112	400	3.64	

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/28/2017	ND	206	103	200	3.80	
DRO >C10-C28	<10.0	10.0	08/28/2017	ND	206	103	200	2.85	
EXT DRO >C28-C36	<10.0	10.0	08/28/2017	ND					

Surrogate: 1-Chlorooctane 106 % 28.3-164

Surrogate: 1-Chlorooctadecane 108 % 34.7-157

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Fax To: (505) 394-2601

Received:	08/24/2017	Sampling Date:	08/23/2017
Reported:	08/31/2017	Sampling Type:	Soil
Project Name:	KARLSBAD CORRAL	Sampling Condition:	Cool & Intact
Project Number:	11 SWD #1	Sample Received By:	Tamara Oldaker
Project Location:	VANGUARD - UL -J SEC. 11, T25S, R29E		

Sample ID: SP6 (SURFACE) (H702250-11)

BTX 8021B		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	08/28/2017	ND	1.87	93.7	2.00	0.863		
Toluene*	<0.050	0.050	08/28/2017	ND	1.80	89.8	2.00	0.927		
Ethylbenzene*	<0.050	0.050	08/28/2017	ND	1.88	93.9	2.00	0.0366		
Total Xylenes*	<0.150	0.150	08/28/2017	ND	5.81	96.8	6.00	0.297		
Total BTX	<0.300	0.300	08/28/2017	ND						

Surrogate: 4-Bromofluorobenzene (PID) 106 % 72-148

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	16.0	16.0	08/28/2017	ND	448	112	400	3.64	

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/28/2017	ND	206	103	200	3.80	
DRO >C10-C28	<10.0	10.0	08/28/2017	ND	206	103	200	2.85	
EXT DRO >C28-C36	<10.0	10.0	08/28/2017	ND					

Surrogate: 1-Chlorooctane 99.0 % 28.3-164

Surrogate: 1-Chlorooctadecane 101 % 34.7-157

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Fax To: (505) 394-2601

Received:	08/24/2017	Sampling Date:	08/23/2017
Reported:	08/31/2017	Sampling Type:	Soil
Project Name:	KARLSBAD CORRAL	Sampling Condition:	Cool & Intact
Project Number:	11 SWD #1	Sample Received By:	Tamara Oldaker
Project Location:	VANGUARD - UL -J SEC. 11, T25S, R29E		

Sample ID: SP6 (3') (H702250-12)

BTX 8021B		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	08/28/2017	ND	1.87	93.7	2.00	0.863	
Toluene*	<0.050	0.050	08/28/2017	ND	1.80	89.8	2.00	0.927	
Ethylbenzene*	<0.050	0.050	08/28/2017	ND	1.88	93.9	2.00	0.0366	
Total Xylenes*	<0.150	0.150	08/28/2017	ND	5.81	96.8	6.00	0.297	
Total BTX	<0.300	0.300	08/28/2017	ND					

Surrogate: 4-Bromofluorobenzene (PID) 106 % 72-148

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	128	16.0	08/28/2017	ND	448	112	400	3.64	

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/28/2017	ND	206	103	200	3.80	
DRO >C10-C28	<10.0	10.0	08/28/2017	ND	206	103	200	2.85	
EXT DRO >C28-C36	<10.0	10.0	08/28/2017	ND					

Surrogate: 1-Chlorooctane 84.7 % 28.3-164

Surrogate: 1-Chlorooctadecane 88.3 % 34.7-157

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Celey D. Keene, Lab Director/Quality Manager

Notes and Definitions

S-06	The recovery of this surrogate is outside control limits due to sample dilution required from high analyte concentration and/or matrix interference's.
QR-03	The RPD value for the sample duplicate or MS/MSD was outside of QC acceptance limits due to matrix interference. QC batch accepted based on LCS and/or LCSD recovery and/or RPD values.
ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C Samples reported on an as received basis (wet) unless otherwise noted on report

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Celey D. Keene, Lab Director/Quality Manager

Environmental Plus, Inc.

2100 Avenue O, Eunice, NM 88231
(575) 394-3481 FAX: (575) 394-2601

P.O. Box 1558, Eunice, NM 88231

Chain of Custody Form
LAB Cardinal

Company Name Environmental Plus, Inc.

EPI Project Manager Daniel Dominguez

Mailing Address P.O. BOX 1558

City, State, Zip Eunice New Mexico 88231

EPI Phone#/Fax# 575-394-3481 / 575-394-2601

Client Company Vanguard

Facility Name Karlsbad Corral 11 SWD #1

Location UL- J Sec. 11, T25S, R29E

Project Reference

Dustin Crockett

Attn: Daniel Dominguez
P.O. Box 1558
Eunice, NM 88231



Bill To

ANALYSIS REQUEST

Company Name		Daniel Dominguez	
EPI Project Manager		P.O. BOX 1558	
Mailing Address		Eunice New Mexico 88231	
City, State, Zip		575-394-3481 / 575-394-2601	
EPI Phone#/Fax#		Vanguard	
Client Company		Karlsbad Corral 11 SWD #1	
Facility Name		UL-J Sec. 11, T25S, R29E	
Location			
Project Reference			
EPI Sampler Name		Dustin Crockett	

LAB I.D.	SAMPLE I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX							PRESERV.	SAMPLING																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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Sampler Relinquished:

Date 8-24-17

Received By:

Relinquished by:

Date 8-24-17

Received By: (lab staff)

Delivered by:

Sample Cool & Intact

Checked By:

E-mail results to: ddominguezepi@gmail.com & cjohnston@vntrenergy.com
NOTES: & dboonepi@gmail.com

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Client Company Vanguard

Facility Name Karlsbad Corral 11 SWD #1

Location UL- J Sec. 11, T25S, R29E

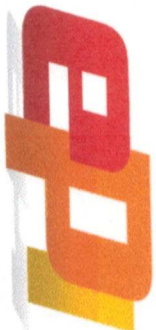
Project Reference

Dustin Crockett

Attn: Daniel Dominguez
P.O. Box 1558
Eunice, NM 88231

Bill To

ANALYSIS REQUEST



LAB I.D.		SAMPLE I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX							PRESERV.	SAMPLING		BTEX 8021B	TPH 8015M Ext.	CHLORIDES (Cl ⁻)	SULFATES (SO ₄ ²⁻)	pH	TCLP	OTHER >>>	PAH
					GROUND WATER	WASTEWATER	SOIL	CRUDE OIL	SLUDGE	OTHER:	ACID/BASE		ICE/COOL	OTHER								
H702850																						
11	SP6 (Surface)		G	1			X				X		23-Aug-17	15:38	X	X	X					
12	SP6 (3')		G	1			X				X		23-Aug-17	15:55	X	X	X					
13																						
14																						
15																						
16																						
17																						
18																						
19																						
20																						

Sampler Relinquished:

Relinquished by:

Date 8-24-17

Time 6:00 am

Date 8-24-17

Time 3:30

Received By:

Received By: (lab staff)

Sample Cool & Intact

Yes No

Checked By:

E-mail results to: ddominguezepi@gmail.com & cjohnston@vntenergy.com
NOTES: & bbooneepi@gmail.com

Delivered by:

-14.8°C

-13.5°C

ATTACHMENT IV
Copy of Initial NMOCD Form C-141

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

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

Form C-141
Revised April 3, 2017

Submit 1 Copy to appropriate District Office in
accordance with 19.15.29 NMAC.

Release Notification and Corrective Action

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company: Vanguard Permian	Contact: Chuck Johnston
Address: 4001 Penbrook, Suite 201, Odessa Texas 79+762	Telephone No.: 432-202-4771
Facility Name: Karlsbad Corral 11 SWD 1	Facility Type: SWD

Surface Owner State	Mineral Owner	API No. 3001535341
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LOCATION OF RELEASE

Unit Letter J	Section 11	Township 25S	Range 29E	Feet from the	North/South Line	Feet from the	East/West Line	County Eddy
------------------	---------------	-----------------	--------------	---------------	------------------	---------------	----------------	----------------

Latitude N 32.143476 Longitude W -103.955108 NAD83

NATURE OF RELEASE

Type of Release Produced Water	Volume of Release: Unknown	Volume Recovered: Unknown
Source of Release: SWD well head	Date and Hour of Occurrence: Historic	Date and Hour of Discovery: Historic
Was Immediate Notice Given? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Not Required	If YES, To Whom?	
By Whom?	Date and Hour	
Was a Watercourse Reached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse. Not Applicable	

If a Watercourse was Impacted, Describe Fully.*

Historic release of Produced water from SWD well.

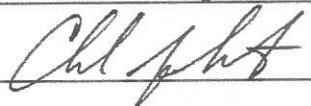
Describe Cause of Problem and Remedial Action Taken.*

Discovered historic release area from SWD well. Samples have been collected and sent to lab for testing.

Describe Area Affected and Cleanup Action Taken.*

Samples have been taken, leak remained on well pad.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD 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 NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Signature: 	OIL CONSERVATION DIVISION	
Printed Name: Chuck Johnston	Approved by Environmental Specialist:	
Title: EHS Specialist	Approval Date:	Expiration Date:
E-mail Address: cjohnston@vnrenergy.com	Conditions of Approval:	Attached <input type="checkbox"/>
Date: 10-10-2017	Phone: 1-432-202-4771	

* Attach Additional Sheets If Necessary