



Q13EC-190730-C-1410

Remediation Summary and Site Closure Request

July 25, 2019

Willow 17 State SWD #001
(2RP-5044)

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1.0 Introduction and Background Information

TRC Environmental Corporation (TRC), on behalf of COG Operating, LLC (COG), has prepared this *Remediation Summary and Site Closure Request* for the Release at the Site known as the Willow 17 State SWD #001 (the Site). The legal description of the Site is Unit Letter “P”, Section 17, Township 25 South, Range 28 East, in Eddy County, New Mexico. The subject property is owned by the State of New Mexico and administered by New Mexico State Land Office (NMSLO). The GPS coordinates for the Site are N 32.12489°, W 104.10216°. A topographical map is provided as **Figure 1**. Photographs are provided in the photolog as **Appendix A**.

On October 29, 2018, COG discovered a crude oil and produced water release had occurred at the Site. The Release was attributed to a crimped fitting failure, which impacted a caliche pad. On the discovery date, COG notified the New Mexico Oil and Conservation Division (NMOCD) and New Mexico State Land Office (NMSLO) of the Release and the Release was assigned an NMOCD Reference number of 2RP-5044. During initial response activities, a vacuum truck was dispatched to recover all freestanding fluids. On October 31, 2018, the initial Release Notification and Corrective Action (Form C-141) was submitted to the NMOCD. The Form C-141 indicated one half (0.5) barrel (bbl) of crude oil and sixty and one half (60.5) barrels (bbls) of produced water was released. Approximately thirty (30) bbls of produced water was recovered during initial response activities. The release affected an area measuring approximately twelve thousand (12,000) square feet (sq. ft.). The C-141 indicated the impacted area was pastureland, however, the photos from the release date and subsequent visits by TRC personnel indicate a caliche pad was impacted. A copy of the submitted Form C-141 for the Release is provided in **Appendix B**.

A groundwater database maintained by The New Mexico Office of the State Engineer (NMOSE) did not identify any registered water wells in Section 17, Township 25 South, Range 28 East. A reference map utilized by the NMOCD indicates groundwater should be encountered at approximately fifty (50) to seventy-five (75) feet below ground surface (bgs). No water wells were observed within one-thousand (1,000) feet of the Site. No surface water was observed within one-thousand (1,000) feet of the release. An aerial map of the site location is provided as **Figure 2**.

Based on the depth to groundwater at the Willow 17 State SWD #001 Release Site, the NMOCD *Closure Criteria for Soils Impacted by a Release* are not the most stringent closure criteria listed. However, the Willow 17 State SWD #001 is located in the ‘medium karst’ area as outlined in the BLM publicly available Karst Potential Map, provided as **Figure 3**. The NMOCD guidance on the regulation of releases in ‘medium karst’ areas is unclear. Subsequently, COG will utilize the most stringent NMOCD Closure Criteria for Soils Impacted by a Release for the Willow 17 State SWD #001 as follows:

- Benzene – 10 mg/kg
- Benzene, toluene, ethylbenzene, and xylenes (BTEX) – 50 mg/kg
- Total Petroleum Hydrocarbons (TPH) – 100 mg/kg
- Chloride – 600 mg/kg

2.0 Initial Delineation Investigation

January 3, 2019, an initial investigation was conducted at the Release Site. During the initial investigation activities, ten (10) surface samples (SP1 @ S, SP2 @ S, W1 @ S, W1b @ S, E1 @ S, N1 @ S, S1 @ S, S1b @ S, S2 @ S, and N2 @ S) were collected at the Release Site in an effort to characterize the horizontal extent of soil impact based on regulatory guidelines listed in Table 1 of NMAC 19.15.29.12. Collected soil samples were submitted to the laboratory for TPH, BTEX, and chloride analyses. A review of laboratory analytical results indicated TPH and BTEX concentrations were below NMOCD regulatory guidelines in the submitted samples. Chloride concentrations were above ten thousand (10,000) mg/kg in each of the submitted soil sample with the exception of N1 @ S and S2 @ S. Please reference **Figure 4 – Site & Sample Location Map – Initial Investigation**.

On January 11, 2019, a second investigation was conducted at the Release Site. During the investigation, four (4) soil samples (SP-1 @ 6", SP-2 @ 6", W2 @ S, and E2 @ S) were collected at the Release Site in a further effort to characterize the extent of soil impact. Collected soil samples were submitted to the laboratory for TPH, BTEX, and chloride analyses. A review of laboratory analytical results indicated TPH and BTEX concentrations were below the laboratory method detection limit (MDL) in each submitted soil sample. Chloride concentrations were below ten thousand (10,000) mg/kg in each submitted soil sample.

Following discussion with COG personnel, the interpretation of the NMOCD regulatory guidelines for chloride concentration changed to reflect an NMOCD regulatory guideline limit of 600 mg/kg for the Release Site.

On January 29, 2019, further delineation (both horizontal and vertical) was attempted utilizing backhoe trenching. Seventeen (17) soil samples (TT1 @ 0-6", TT1 @ 6"-1', TT1 @ 3', TT1 @ 5', TT1 @ 6', TT2 @ 0-6", TT2 @ 6"-1', TT2 @ 2', TT2 @ 3', TT3 @ 0-6", TT3 @ 6"-1', S TT @ 2.5', N TT @ 3', W1 TT @ 3', W2 TT @ 3', E1 TT @ 3', and E2 TT @ 3') were collected from nine (9) trench locations and were submitted to the laboratory for TPH, BTEX, and chloride analyses. A review of analytical results indicated BTEX and TPH concentrations were below laboratory MDL in the submitted soil samples. Chloride concentrations were above 600 mg/kg in each submitted soil samples, with the exception of S TT @ 2.5', W2 TT @ 3', and E1 TT @ 3'. Please reference **Figure 5 – Site & Sample Location Map – Secondary Investigation**.

On April 18, 2019, the trenches utilized for the January 29, 2019 delineation event were further vertically advanced. Eleven (11) soil samples (TT-1 @ 7', TT-1 @ 8', TT-2 @ 4', TT-2 @ 5', TT-3 @ 2', N-TT @ 4', W1-TT @ 4', W1-TT @ 5', W1-TT @ 6', W1-TT @ 7', and E2-TT @ 4') were collected from the previous trench locations and were submitted to the laboratory for chloride analyses. A review of analytical results indicated soil samples exhibited chloride concentrations above 600 mg/kg in each of the submitted soil sample, with the exception of TT-1 @ 8', TT-2 @ 5', TT-3 @ 2', N-TT @ 4', W1-TT @ 7', and E2-TT @ 4'. In addition, seven (7) soil samples (N2-TT @ 0-1', S2-TT @ 0-1', E3-TT @ 0-1', E4-TT @ 0-1', W3-TT @ 0-1', W4-TT @ 0-1', and W5-TT @ 0-1') were collected from the surface to one (1) foot bgs interval immediately outside the apparent release margins and were submitted to the laboratory for chloride

analysis. A review of analytical results indicated soil samples exhibited chloride concentrations below 600 mg/kg in each submitted soil sample, with the exception of soil sample W3-TT @ 0-1’.

3.0 NMOCD Approved Workplan

Based on the laboratory analytical results from the soil samples collected in January 2019, the Release Site was not impacted above NMOCD regulatory guidelines by TPH or BTEX constituents. In addition, based on laboratory analytical results of soil samples collected in January and April 2019, vertical and horizontal delineation of chloride concentrations to six hundred (600) mg/kg has been achieved. COG proposes the following field activities designed to advance the Willow 17 State SWD #001 Release Site toward an NMOCD-approved closure:

- Impacted soil in the area represented by test trench TT-1 was to be excavated to an approximate depth of at least seven (7) feet bgs.
- Impacted soil in the area represented by test trench W1-TT was to be excavated to an approximate depth of at least six (6) feet bgs.
- Impacted soil in the area represented by test trench TT-2 was to be excavated to an approximate depth of at least four (4) feet bgs.
- Impacted soil in the area represented by test trenches N-TT and E2-TT was to be excavated to an approximate depth of at least three (3) feet bgs.
- Impacted soil in the area represented by test trench TT-3 was to be excavated to an approximate depth of at least one (1) foot bgs.
- Six (6) five point composite sidewall confirmation soil samples, one (1) soil sample to represent the north side wall, two (2) soil samples to represent the west side wall, two (2) soil samples to represent the east side wall, and one (1) soil sample to represent the south side wall were to be collected to ensure the lateral extent of the impact had been removed.
- Collect one (1) five point composite floor confirmation soil sample for every one thousand (1,000) square feet of excavation floor to ensure the vertical extent of impact had been removed.
- Impacted soil excavated during remediation activities was to be staged on a polyurethane liner pending final disposition at a NMOCD-approved disposal facility.
- After review of analytical results from the excavation confirmation soil samples, the excavated area was to be backfilled with locally-sourced, non-impacted ‘like’ material and returned to grade.

On May 7, 2019, the proposed workplan was accepted as it was proposed by the NMOCD.

4.0 Summary of Soil Remediation Activities

On June 10, 2019, remediation activities commenced at the Release Site. The excavation began in the northwest corner of the impacted area, and excavation activities continued to the east, and to the south. Excavated soil was stockpiled on polyurethane liners pending final disposition at an

NMOCD approved disposal facility. On June 11, 2019, three (3) five-point composite floor confirmation samples (FL-1-3, FL-2-3, and FL-3-3) and one (1) five-point composite sidewall confirmation sample (SW-N1-1.5) were collected from the excavated area. On June 13, 2019, two (2) five-point composite sidewall confirmation samples (SW-W1-1 and SW-W2-0.25) were collected from the excavated area. On June 17, 2019, four (4) five-point composite floor confirmation samples (FL-5-7, FL-7-3, FL-8-1.5, and FL-9-3) and one (1) five-point composite sidewall confirmation soil sample (SW-E2-1.5) were collected from the excavated area. Soil samples collected between June 11 and June 17th were submitted to Cardinal Laboratories in Hobbs, NM, for chloride and/or TPH and BTEX analyses. All soil samples submitted for TPH and BTEX analyses were below the laboratory detection limits for each constituent. Each soil sample, with the exception of FL-5-7 and FL-8-1.5, was below NMOCD regulatory guidelines for chloride concentrations. The areas represented by soil samples FL-5-7 and FL-8-1.5 were advanced to greater depths in those areas, and excavation continued to the south and east.

On the second half of June 17, June 18, and June 19, 2019, three (3) five-point composite floor confirmation soil samples (FL-4-8.5, FL-5-8, and FL-6-6) and two (2) five-point composite sidewall confirmation soil samples (SW-E1-3.5 and SW-S1-0.75) were collected and submitted for chloride and/or TPH and BTEX analyses. Each soil sample submitted for TPH and BTEX analyses exhibited TPH and BTEX concentrations below the laboratory detection limits. Each soil sample submitted for chloride analysis exhibited chloride concentrations below NMOCD regulatory guidelines with the exception of FL-4-8.5, FL-5-8, and FL-6-6. The areas represented by soil samples FL-4-8.5, FL-5-8, and FL-6-6 were further excavated to greater depths, and the excavation continued to the south.

On June 20, 2019, four (4) five-point composite floor confirmation soil samples (FL-4-9, FL-5-8.5, FL-6-6.5, and FL-8-3.5) were collected and submitted for chloride analysis. Each soil sample exhibited chloride concentrations below NMOCD regulatory guidelines. Confirmation soil sample locations are depicted in **Figure 6**. A summary of analytical data is shown in **Table 1**. Laboratory analytical reports are provided in **Appendix C**.

5.0 Site Closure Request

Remediation activities were conducted in accordance with NMCOD guidelines and in adherence to the NMOCD approved workplan. Laboratory analytical results from excavation confirmation soil samples indicated TPH, BTEX, and/or chloride concentrations were below the NMOCD regulatory guidelines in the submitted confirmation soil samples. The impacted soil was transported to the R360 Red Bluff Facility, and the Site was returned to grade with locally sourced non-impacted backfill material. Based on laboratory analytical results and field activities conducted to date, TRC recommends COG provide copies of this Remediation Summary and Site Closure Request to the NMOCD and BLM and request closure status to the Willow 17 State SWD #001.

6.0 Limitation



TRC has prepared this Remediation Summary and Site Closure Request to the best of its ability. No other warranty, expressed or implied, is made or intended.

TRC has examined and relied upon documents referenced in the report and has relied on oral statements made by certain individuals. TRC has not conducted an independent examination of the facts contained in referenced materials and statements. We have presumed the genuineness of the documents and that the information provided in documents or statements is true and accurate. TRC has prepared this report, in a professional manner, using the degree of skill and care exercised by similar environmental consultants. TRC also notes that the facts and conditions referenced in this report may change over time and the conclusions and recommendations set forth herein are applicable only to the facts and conditions as described at the time of this report.

This report has been prepared for the benefit of COG Operating, LLC. The information contained in this report, including all exhibits and attachments, may not be used by any other party without the express consent of TRC and/or COG Operating, LLC.

7.0 Distribution

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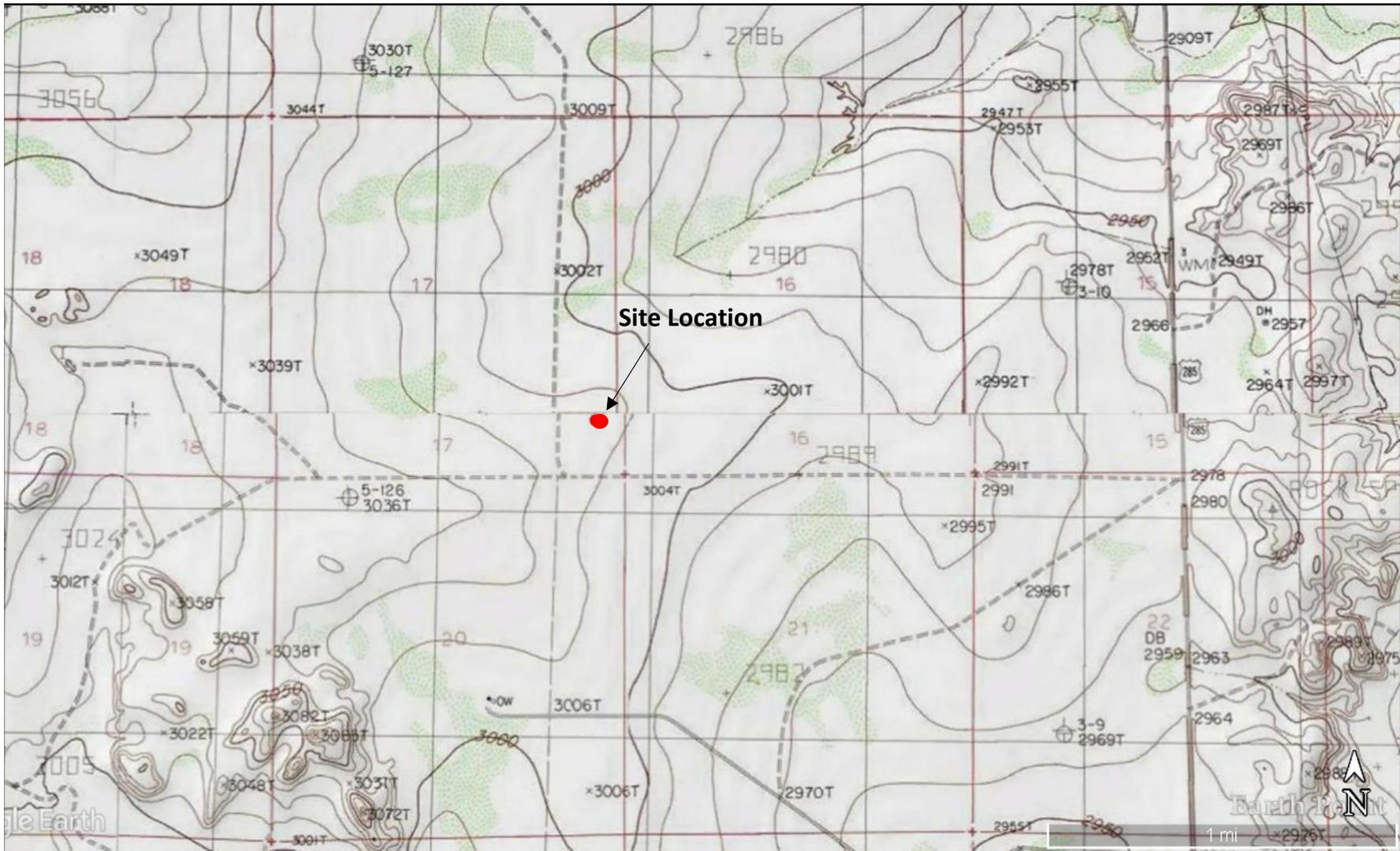
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Concentrations of BTEX, TPH and/or Chloride in Soil											
Sample ID	Date	Depth	Soil Status	SW 846 8021B		SW 846 8015M Ext.					E 300
				Benzene (mg/kg)	BTEX (mg/kg)	GRO C ₆ -C ₁₀ (mg/kg)	DRO C ₁₀ -C ₂₈ (mg/kg)	GRO + DRO C ₆ -C ₂₈ (mg/kg)	ORO C ₂₈ -C ₃₅ (mg/kg)	TPH C ₆ -C ₃₅ (mg/kg)	Chloride (mg/kg)
SP-1 @ S	1/3/19	Surface	Excavated	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	20,600
SP-1 @ 6"	1/11/19	6"	Excavated	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	3,600
W1 @ S	1/3/19	Surface	Excavated	<0.050	<0.300	10.6	<10.0	10.6	<10.0	10.6	41,600
W1B @ S	1/3/19	Surface	Excavated	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	15,600
E1 @ S	1/3/19	Surface	Excavated	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	14,400
N1 @ S	1/3/19	Surface	Excavated	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	2,440
S1 @ S	1/3/19	Surface	Excavated	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	18,000
S1B @ S	1/3/19	Surface	Excavated	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	40,400
SP-2 @ S	1/3/19	Surface	Excavated	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	12,202
SP-2 @ 6"	1/11/19	Surface	Excavated	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	1,970
S2 @ S	1/3/19	Surface	Excavated	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	8,320
N2 @ S	1/3/19	Surface	Excavated	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	32,800
W2 @ S	1/11/19	Surface	Excavated	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	736
E2 @ S	1/11/19	Surface	Excavated	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	896
TT1 @ 0-6"	1/29/19	0-6"	Excavated	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	3,600
TT1 @ 6"-1'	1/29/19	6"-1'	Excavated	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	2,200
TT1 @ 3'	1/29/19	3'	Excavated	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	1,440
TT1 @ 5'	1/29/19	5'	Excavated	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	2,400
TT1 @ 6'	1/29/19	6'	Excavated	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	832
TT-1 @ 7'	4/18/19	7'	Excavated	-	-	-	-	-	-	-	1,010
TT-1 @ 8'	4/18/19	8'	Excavated	-	-	-	-	-	-	-	400
TT2 @ 0-6"	1/29/19	0-6"	Excavated	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	4,480
TT2 @ 6"-1'	1/29/19	6"-1'	Excavated	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	3,360
TT2 @ 2'	1/29/19	2'	Excavated	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	1,650
TT2 @ 3'	1/29/19	3'	Excavated	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	880
NMOCD Closure Criteria				10	50	-	-	1,000	-	2,500	600

Concentrations of BTEX, TPH and/or Chloride in Soil											
Sample ID	Date	Depth	Soil Status	SW 846 8021B		SW 846 8015M Ext.					E 300
				Benzene (mg/kg)	BTEX (mg/kg)	GRO C ₆ -C ₁₀ (mg/kg)	DRO C ₁₀ -C ₂₈ (mg/kg)	GRO + DRO C ₆ -C ₂₈ (mg/kg)	ORO C ₂₈ C ₃₅ (mg/kg)	TPH C ₆ -C ₃₅ (mg/kg)	Chloride (mg/kg)
TT-2 @ 4'	4/18/19	4'	Excavated	-	-	-	-	-	-	-	1,710
TT-2 @ 5'	4/18/19	5'	Excavated	-	-	-	-	-	-	-	129
TT3 @ 0-6"	1/29/19	0-6"	Excavated	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	1,040
TT3 @ 6"-1'	1/29/19	6"-1'	Excavated	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	1,120
TT-3 @ 2'	4/18/19	2'	Excavated	-	-	-	-	-	-	-	584
S TT @ 2.5'	1/29/19	2.5'	In-Situ	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	80.0
N TT @ 3'	1/29/19	3'	Excavated	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	784
N-TT @ 4'	4/18/19	4'	In-Situ	-	-	-	-	-	-	-	581
W1 TT @ 3'	1/29/19	3'	Excavated	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	768
W1-TT @ 4'	4/18/19	4'	Excavated	-	-	-	-	-	-	-	1,360
W1-TT @ 5'	4/18/19	5'	Excavated	-	-	-	-	-	-	-	1,750
W1-TT @ 6'	4/18/19	6'	Excavated	-	-	-	-	-	-	-	935
W1-TT @ 7'	4/18/19	7'	Excavated	-	-	-	-	-	-	-	488
W2 TT @ 3'	1/29/19	3'	In-Situ	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	208
E1 TT @ 3'	1/29/19	3'	In-Situ	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	208
E2 TT @ 3'	1/29/19	3'	Excavated	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	688
E2-TT @ 4'	4/18/19	4'	In-Situ	-	-	-	-	-	-	-	69.0
N2-TT @ 0-1'	4/18/19	0-1'	In-Situ	-	-	-	-	-	-	-	98.2
S2-TT @ 0-1'	4/18/19	0-1'	In-Situ	-	-	-	-	-	-	-	413
NMOCDC Closure Criteria				10	50	-	-	1,000	-	2,500	600

Concentrations of BTEX, TPH and/or Chloride in Soil											
Sample ID	Date	Depth	Soil Status	SW 846 8021B		SW 846 8015M Ext.					E 300
				Benzene (mg/kg)	BTEX (mg/kg)	GRO C ₆ -C ₁₀ (mg/kg)	DRO C ₁₀ -C ₂₈ (mg/kg)	GRO + DRO C ₆ -C ₂₈ (mg/kg)	ORO C ₂₈ C ₃₅ (mg/kg)	TPH C ₆ -C ₃₅ (mg/kg)	Chloride (mg/kg)
E3-TT @ 0-1'	4/18/19	0-1'	In-Situ	-	-	-	-	-	-	-	167
E4-TT @ 0-1'	4/18/19	0-1'	In-Situ	-	-	-	-	-	-	-	220
W3-TT @ 0-1'	4/18/19	0-1'	Excavated	-	-	-	-	-	-	-	714
W4-TT @ 0-1'	4/18/19	0-1'	In-Situ	-	-	-	-	-	-	-	142
W5-TT @ 0-1'	4/18/19	0-1'	In-Situ	-	-	-	-	-	-	-	137
SW-N1-1.5	6/11/19	1.5'	In-Situ	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	224
FL-1-3	6/11/19	3'	In-Situ	-	-	-	-	-	-	-	224
FL-2-3	6/11/19	3'	In-Situ	-	-	-	-	-	-	-	160
FL-3-3	6/11/19	3'	In-Situ	-	-	-	-	-	-	-	208
SW-W1-1	6/13/19	1'	In-Situ	-	-	-	-	-	-	-	240
SW-W2-0.25	6/13/19	0.25'	In-Situ	-	-	-	-	-	-	-	400
SW-E2-1.5	6/17/19	1.5'	In-Situ	-	-	-	-	-	-	-	64.0
FL-5-7	6/17/19	7'	Excavated	-	-	-	-	-	-	-	624
FL-7-3	6/17/19	3'	In-Situ	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	304
FL-8-1.5	6/17/19	1.5'	Excavated	-	-	-	-	-	-	-	880
FL-9-3	6/17/19	3'	In-Situ	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	192
SW-E1-3.5	6/17/19	3.5'	In-Situ	-	-	-	-	-	-	-	576
SW-S1-0.75	6/18/19	0.75'	In-Situ	-	-	-	-	-	-	-	432
FL-4-8.5	6/19/19	8.5'	Excavated	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	704
FL-5-8	6/19/19	8'	Excavated	-	-	-	-	-	-	-	640
FL-6-6	6/19/19	6'	Excavated	-	-	-	-	-	-	-	656
FL-8-3.5	6/20/19	3.5'	In-Situ	-	-	-	-	-	-	-	480
FL-4-9	6/20/19	9'	In-Situ	-	-	-	-	-	-	-	560
FL-5-8.5	6/20/19	8.5'	In-Situ	-	-	-	-	-	-	-	560
FL-6-6.5	6/20/19	6.5'	In-Situ	-	-	-	-	-	-	-	592
NMOCD Closure Criteria				10	50	-	-	1,000	-	2,500	600



LEGEND:  Site Location	Figure 1		 TRC <i>Results you can rely on</i>
	Topographical Map		
	COG Operating, LLC		
	Willow 17 State SWD #001		
	Eddy County, NM		
Drafted by: BC Checked by: JS			
Draft: April 25, 2019			
GPS: 32.12489 -104.10216			
UL "P", Sec. 17, T25S, R28E			
TRC Proj. No: 324488			



LEGEND:

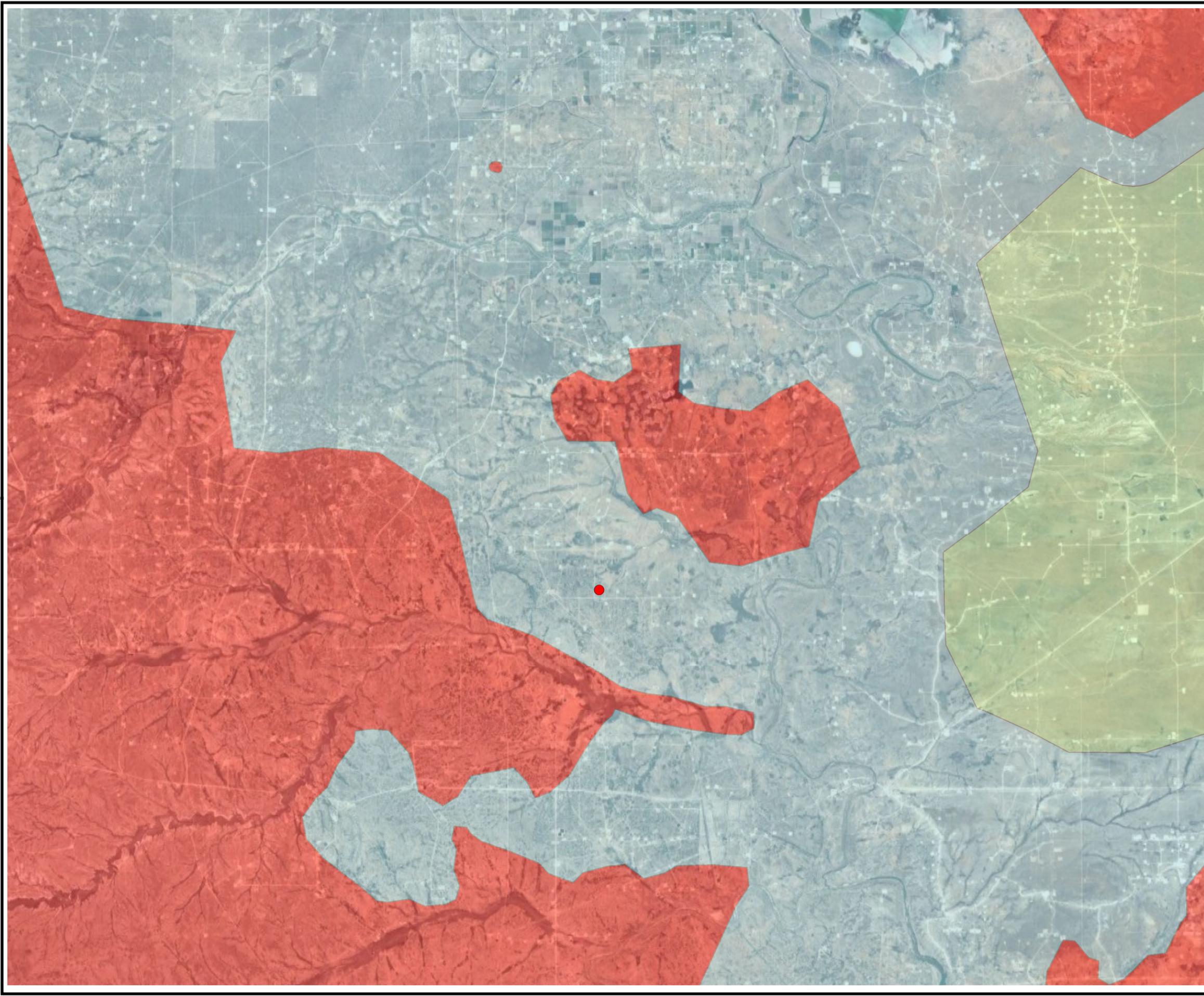
	Site Location		Non-Industrial Building
	Fresh Water Well		Municipal Well Field
	100-Year Floodplain		Subsurface Mine
	High/Critical Karst		1/2 Mile Radius

Figure 2

Aerial Map
 COG Operating, LLC
 Willow 17 State SWD #001
 Eddy County, NM

Drafted by: BC Checked by: JS		
Draft: April 25, 2019		
GPS:	32.12489	-104.10216
UL "P", Sec. 17, T25S, R28E		
TRC Proj. No:	324488	





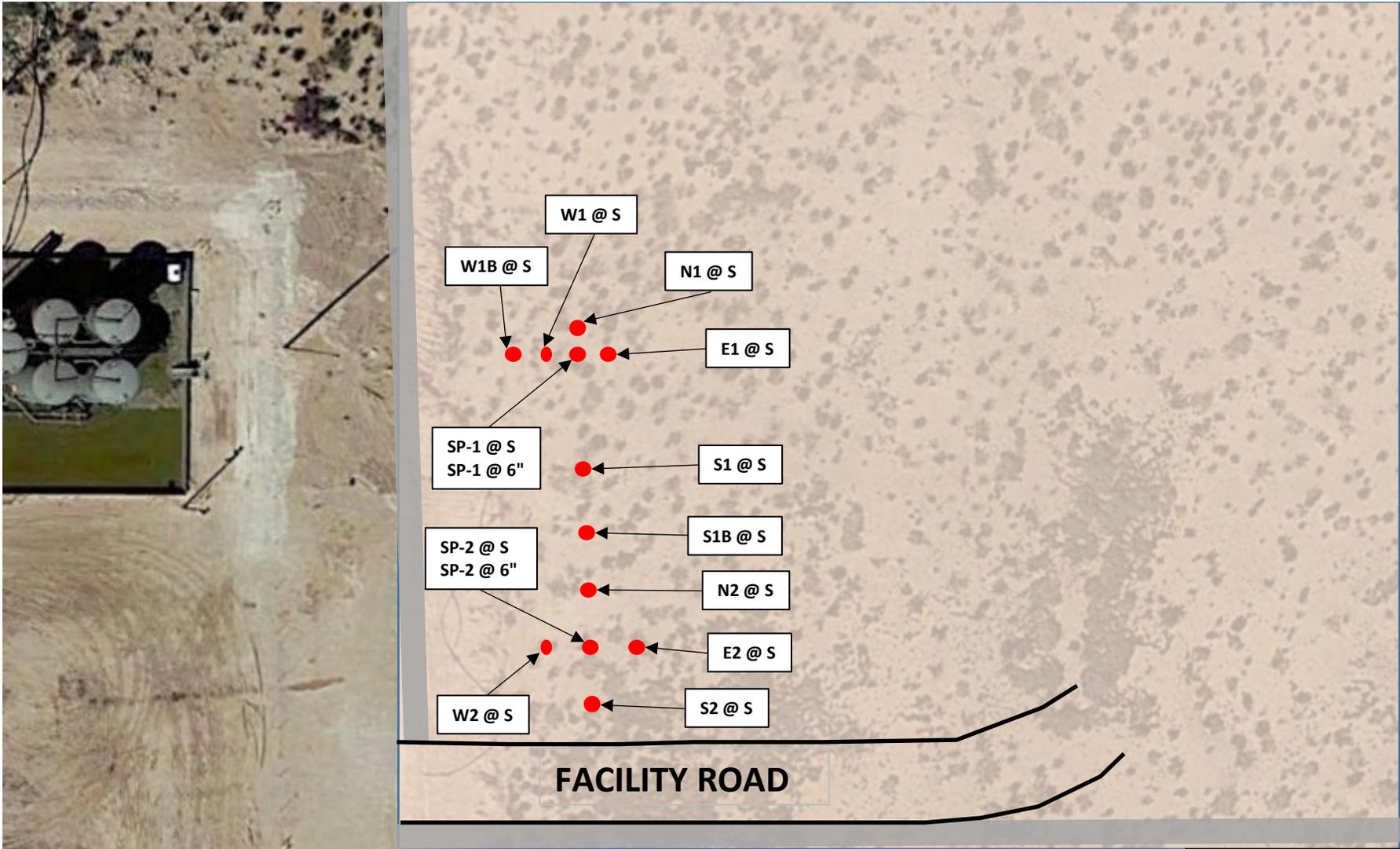
LEGEND

- Site Location
- Low Karst Potential
- Medium Karst Potential
- High Karst Potential



0 2 4 Miles
 1" = 2 MILES
 1:126,720

PROJECT:	COG OPERATING, LLC WILLOW 17 STATE SWD #001 EDDY COUNTY, NM		
TITLE:	WORKING COPY		
DRAWN BY:	S. RAY	PROJ. NO.:	FILE--MDP HYPERLINK BASE
CHECKED BY:		FIGURE 3	
APPROVED BY:			
DATE:	JULY 2019		
		505 East Huntland Drive, Suite 250 Austin, TX 78752 Phone: 512.329.6080 www.trcsolutions.com	
FILE NO.:	324488_3.mxd		



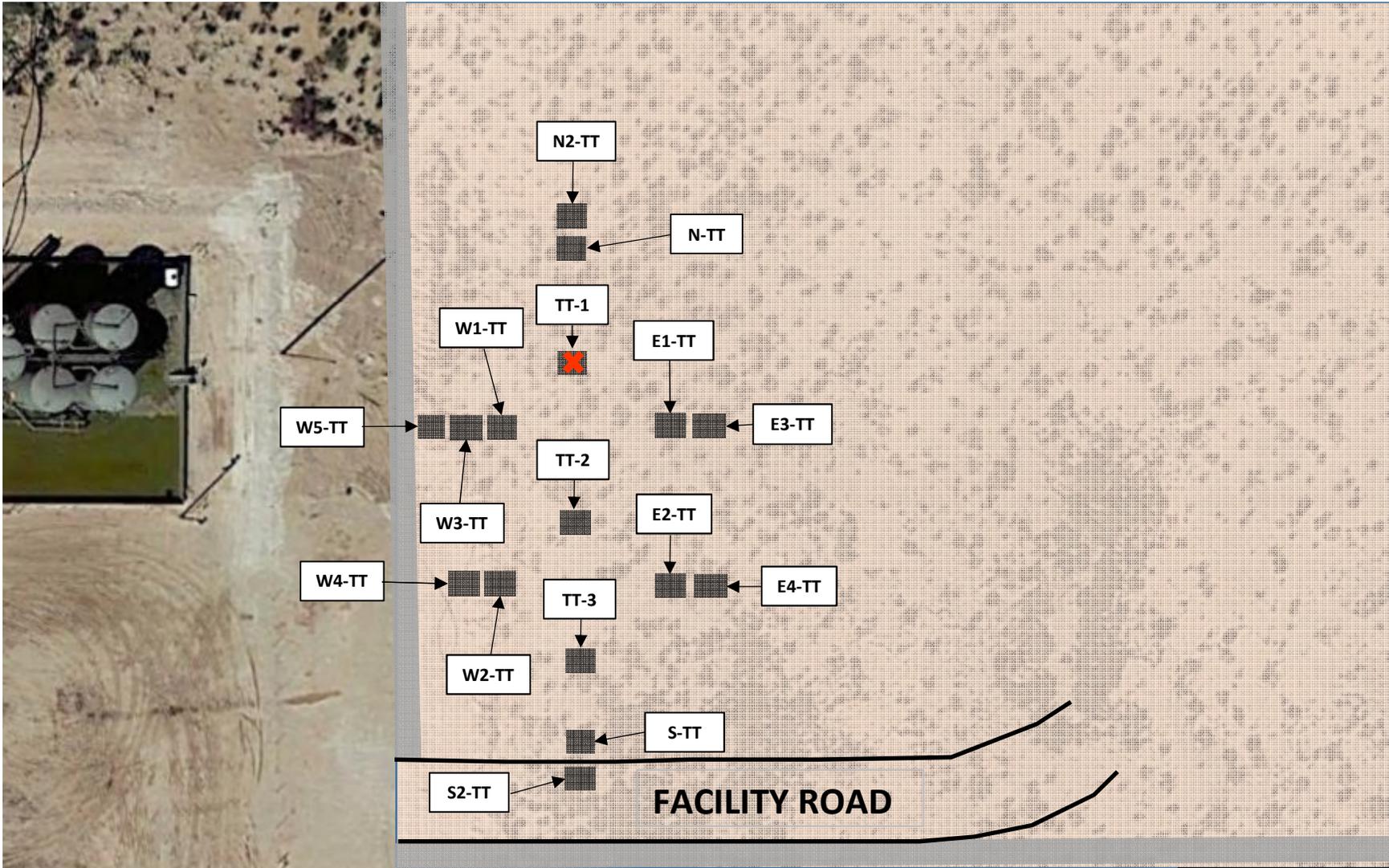
LEGEND:

	Caliche Pad
	Sample Location
	Berm

Figure 3A
 Site & Sample Location Map -
 Initial Investigation
 COG Operating, LLC
 Willow 17 State SWD #001
 Eddy County, NM

Scale: 1" = 50'		
Drafted by: BC Checked by: CS		
Draft: January 23, 2019		
GPS:	32.12489	-104.10216
UL "P", Sec. 17, T25S, R28E		
TRC Proj. No:	324488	





LEGEND:

	Caliche Pad
	Sample Location
	Berm
	Trench Location

Figure 3C
 Site & Sample Location Map
 COG Operating, LLC
 Willow 17 State SWD #001
 Eddy County, NM

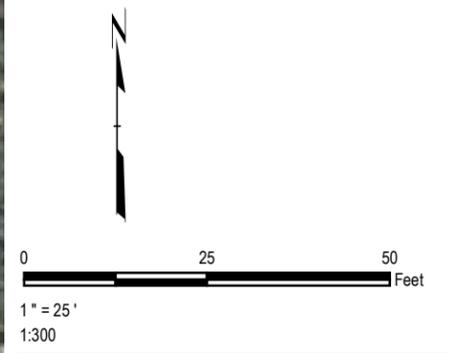
Scale: 1" = 50'	
Drafted by: BC Checked by: CS	
Draft: April 23, 2019	
GPS:	32.12489 -104.10216
UL "P", Sec. 17, T25S, R28E	
TRC Proj. No:	324488





LEGEND

-  Sample Locations
-  Excavation Area



PROJECT:		COG OPERATING, LLC WILLOW 17 STATE SWD #001 EDDY COUNTY, NM	
TITLE:		SITE AND CONFIRMATION SAMPLE LOCATION MAP	
DRAWN BY:	S. RAY	PROJ. NO.:	FILE-->MDP HYPERLINK BASE
CHECKED BY:		FIGURE 6	
APPROVED BY:			
DATE:	JULY 2019		
		505 East Huntland Drive, Suite 250 Austin, TX 78752 Phone: 512.329.6080 www.trcsolutions.com	
FILE NO.:		324488_6.mxd	

Appendix A: Laboratory Analytical Reports



January 14, 2019

JAROD STOFFEL

TRC

10 DESTA DR. SUITE 150 E

MIDLAND, TX 79705

RE: WILLOW 17 STATE SWD #001

Enclosed are the results of analyses for samples received by the laboratory on 01/07/19 15:20.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-18-11. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

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

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

Accreditation applies to public drinking water matrices.

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

Sincerely,

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

Celey D. Keene

Lab Director/Quality Manager

Analytical Results For:

 TRC
 JAROD STOFFEL
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705
 Fax To:

Received:	01/07/2019	Sampling Date:	01/03/2019
Reported:	01/14/2019	Sampling Type:	Soil
Project Name:	WILLOW 17 STATE SWD #001	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	CONCHO-EDDY CO., NM		

Sample ID: SP- 1 @ S (H900028-01)

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	01/11/2019	ND	1.79	89.5	2.00	2.57		
Toluene*	<0.050	0.050	01/11/2019	ND	1.86	92.8	2.00	1.46		
Ethylbenzene*	<0.050	0.050	01/11/2019	ND	1.91	95.3	2.00	2.60		
Total Xylenes*	<0.150	0.150	01/11/2019	ND	5.79	96.6	6.00	2.25		
Total BTEX	<0.300	0.300	01/11/2019	ND						

Surrogate: 4-Bromofluorobenzene (PID) 94.8 % 73.3-129

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	20600	16.0	01/09/2019	ND	416	104	400	0.00		

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	01/09/2019	ND	215	107	200	8.05		
DRO >C10-C28*	<10.0	10.0	01/09/2019	ND	197	98.7	200	8.81		
EXT DRO >C28-C36	<10.0	10.0	01/09/2019	ND						

Surrogate: 1-Chlorooctane 83.2 % 41-142

Surrogate: 1-Chlorooctadecane 80.2 % 37.6-147

Cardinal Laboratories

*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

 TRC
 JAROD STOFFEL
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705
 Fax To:

Received:	01/07/2019	Sampling Date:	01/03/2019
Reported:	01/14/2019	Sampling Type:	Soil
Project Name:	WILLOW 17 STATE SWD #001	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	CONCHO-EDDY CO., NM		

Sample ID: SP- 2 @ S (H900028-02)

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	01/11/2019	ND	1.79	89.5	2.00	2.57	
Toluene*	<0.050	0.050	01/11/2019	ND	1.86	92.8	2.00	1.46	
Ethylbenzene*	<0.050	0.050	01/11/2019	ND	1.91	95.3	2.00	2.60	
Total Xylenes*	<0.150	0.150	01/11/2019	ND	5.79	96.6	6.00	2.25	
Total BTEX	<0.300	0.300	01/11/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID) 96.1 % 73.3-129

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	12200	16.0	01/09/2019	ND	416	104	400	0.00	

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	01/09/2019	ND	215	107	200	8.05	
DRO >C10-C28*	<10.0	10.0	01/09/2019	ND	197	98.7	200	8.81	
EXT DRO >C28-C36	<10.0	10.0	01/09/2019	ND					

Surrogate: 1-Chlorooctane 80.0 % 41-142

Surrogate: 1-Chlorooctadecane 75.0 % 37.6-147

Cardinal Laboratories

*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

 TRC
 JAROD STOFFEL
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705
 Fax To:

Received:	01/07/2019	Sampling Date:	01/03/2019
Reported:	01/14/2019	Sampling Type:	Soil
Project Name:	WILLOW 17 STATE SWD #001	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	CONCHO-EDDY CO., NM		

Sample ID: W 1 @ S (H900028-03)

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	01/10/2019	ND	2.05	103	2.00	3.60	
Toluene*	<0.050	0.050	01/10/2019	ND	2.12	106	2.00	3.35	
Ethylbenzene*	<0.050	0.050	01/10/2019	ND	2.16	108	2.00	2.14	
Total Xylenes*	0.226	0.150	01/10/2019	ND	6.42	107	6.00	6.86	
Total BTEX	<0.300	0.300	01/10/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID) 92.7 % 73.3-129

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	41600	16.0	01/09/2019	ND	416	104	400	0.00	

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	10.6	10.0	01/09/2019	ND	215	107	200	8.05	
DRO >C10-C28*	<10.0	10.0	01/09/2019	ND	197	98.7	200	8.81	
EXT DRO >C28-C36	<10.0	10.0	01/09/2019	ND					

Surrogate: 1-Chlorooctane 87.9 % 41-142

Surrogate: 1-Chlorooctadecane 83.3 % 37.6-147

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*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

 TRC
 JAROD STOFFEL
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705
 Fax To:

Received:	01/07/2019	Sampling Date:	01/03/2019
Reported:	01/14/2019	Sampling Type:	Soil
Project Name:	WILLOW 17 STATE SWD #001	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	CONCHO-EDDY CO., NM		

Sample ID: W 1B @ S (H900028-04)

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	01/10/2019	ND	2.05	103	2.00	3.60	
Toluene*	<0.050	0.050	01/10/2019	ND	2.12	106	2.00	3.35	
Ethylbenzene*	<0.050	0.050	01/10/2019	ND	2.16	108	2.00	2.14	
Total Xylenes*	<0.150	0.150	01/10/2019	ND	6.42	107	6.00	6.86	
Total BTEX	<0.300	0.300	01/10/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID) 90.7 % 73.3-129

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	15600	16.0	01/09/2019	ND	416	104	400	3.77	QM-07

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	01/09/2019	ND	215	107	200	8.05	
DRO >C10-C28*	<10.0	10.0	01/09/2019	ND	197	98.7	200	8.81	
EXT DRO >C28-C36	<10.0	10.0	01/09/2019	ND					

Surrogate: 1-Chlorooctane 89.2 % 41-142

Surrogate: 1-Chlorooctadecane 86.4 % 37.6-147

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*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

 TRC
 JAROD STOFFEL
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705
 Fax To:

Received:	01/07/2019	Sampling Date:	01/03/2019
Reported:	01/14/2019	Sampling Type:	Soil
Project Name:	WILLOW 17 STATE SWD #001	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	CONCHO-EDDY CO., NM		

Sample ID: E 1 @ S (H900028-05)

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	01/10/2019	ND	2.05	103	2.00	3.60		
Toluene*	<0.050	0.050	01/10/2019	ND	2.12	106	2.00	3.35		
Ethylbenzene*	<0.050	0.050	01/10/2019	ND	2.16	108	2.00	2.14		
Total Xylenes*	<0.150	0.150	01/10/2019	ND	6.42	107	6.00	6.86		
Total BTEX	<0.300	0.300	01/10/2019	ND						

Surrogate: 4-Bromofluorobenzene (PID) 99.6 % 73.3-129

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	14400	16.0	01/09/2019	ND	416	104	400	3.77		

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	01/09/2019	ND	215	107	200	8.05		
DRO >C10-C28*	<10.0	10.0	01/09/2019	ND	197	98.7	200	8.81		
EXT DRO >C28-C36	<10.0	10.0	01/09/2019	ND						

Surrogate: 1-Chlorooctane 79.5 % 41-142

Surrogate: 1-Chlorooctadecane 74.9 % 37.6-147

Cardinal Laboratories

*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

 TRC
 JAROD STOFFEL
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705
 Fax To:

Received:	01/07/2019	Sampling Date:	01/03/2019
Reported:	01/14/2019	Sampling Type:	Soil
Project Name:	WILLOW 17 STATE SWD #001	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	CONCHO-EDDY CO., NM		

Sample ID: N 1 @ S (H900028-06)

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	01/10/2019	ND	2.05	103	2.00	3.60	
Toluene*	<0.050	0.050	01/10/2019	ND	2.12	106	2.00	3.35	
Ethylbenzene*	<0.050	0.050	01/10/2019	ND	2.16	108	2.00	2.14	
Total Xylenes*	<0.150	0.150	01/10/2019	ND	6.42	107	6.00	6.86	
Total BTEX	<0.300	0.300	01/10/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID) 96.2 % 73.3-129

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	2440	16.0	01/09/2019	ND	416	104	400	3.77	

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	01/09/2019	ND	215	107	200	8.05	
DRO >C10-C28*	<10.0	10.0	01/09/2019	ND	197	98.7	200	8.81	
EXT DRO >C28-C36	<10.0	10.0	01/09/2019	ND					

Surrogate: 1-Chlorooctane 70.0 % 41-142

Surrogate: 1-Chlorooctadecane 70.2 % 37.6-147

Cardinal Laboratories

*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

 TRC
 JAROD STOFFEL
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705
 Fax To:

Received:	01/07/2019	Sampling Date:	01/03/2019
Reported:	01/14/2019	Sampling Type:	Soil
Project Name:	WILLOW 17 STATE SWD #001	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	CONCHO-EDDY CO., NM		

Sample ID: S 1 @ S (H900028-07)

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	01/10/2019	ND	2.05	103	2.00	3.60		
Toluene*	<0.050	0.050	01/10/2019	ND	2.12	106	2.00	3.35		
Ethylbenzene*	<0.050	0.050	01/10/2019	ND	2.16	108	2.00	2.14		
Total Xylenes*	<0.150	0.150	01/10/2019	ND	6.42	107	6.00	6.86		
Total BTEX	<0.300	0.300	01/10/2019	ND						

Surrogate: 4-Bromofluorobenzene (PID) 90.7 % 73.3-129

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	18000	16.0	01/09/2019	ND	416	104	400	3.77		

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	01/09/2019	ND	215	107	200	8.05		
DRO >C10-C28*	<10.0	10.0	01/09/2019	ND	197	98.7	200	8.81		
EXT DRO >C28-C36	<10.0	10.0	01/09/2019	ND						

Surrogate: 1-Chlorooctane 85.4 % 41-142

Surrogate: 1-Chlorooctadecane 82.3 % 37.6-147

Cardinal Laboratories

*=Accredited Analyte

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



Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

 TRC
 JAROD STOFFEL
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705
 Fax To:

Received:	01/07/2019	Sampling Date:	01/03/2019
Reported:	01/14/2019	Sampling Type:	Soil
Project Name:	WILLOW 17 STATE SWD #001	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	CONCHO-EDDY CO., NM		

Sample ID: S 1B @ S (H900028-08)

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	01/10/2019	ND	2.05	103	2.00	3.60		
Toluene*	<0.050	0.050	01/10/2019	ND	2.12	106	2.00	3.35		
Ethylbenzene*	<0.050	0.050	01/10/2019	ND	2.16	108	2.00	2.14		
Total Xylenes*	<0.150	0.150	01/10/2019	ND	6.42	107	6.00	6.86		
Total BTEX	<0.300	0.300	01/10/2019	ND						

Surrogate: 4-Bromofluorobenzene (PID) 91.2 % 73.3-129

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	40400	16.0	01/09/2019	ND	416	104	400	3.77		

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	01/09/2019	ND	215	107	200	8.05		
DRO >C10-C28*	<10.0	10.0	01/09/2019	ND	197	98.7	200	8.81		
EXT DRO >C28-C36	<10.0	10.0	01/09/2019	ND						

Surrogate: 1-Chlorooctane 89.7 % 41-142

Surrogate: 1-Chlorooctadecane 87.0 % 37.6-147

Cardinal Laboratories

*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

 TRC
 JAROD STOFFEL
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705
 Fax To:

Received:	01/07/2019	Sampling Date:	01/03/2019
Reported:	01/14/2019	Sampling Type:	Soil
Project Name:	WILLOW 17 STATE SWD #001	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	CONCHO-EDDY CO., NM		

Sample ID: S 2 @ S (H900028-09)

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	01/10/2019	ND	2.05	103	2.00	3.60		
Toluene*	<0.050	0.050	01/10/2019	ND	2.12	106	2.00	3.35		
Ethylbenzene*	<0.050	0.050	01/10/2019	ND	2.16	108	2.00	2.14		
Total Xylenes*	<0.150	0.150	01/10/2019	ND	6.42	107	6.00	6.86		
Total BTEX	<0.300	0.300	01/10/2019	ND						

Surrogate: 4-Bromofluorobenzene (PID) 91.0 % 73.3-129

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	8320	16.0	01/09/2019	ND	416	104	400	3.77		

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	01/09/2019	ND	215	107	200	8.05		
DRO >C10-C28*	<10.0	10.0	01/09/2019	ND	197	98.7	200	8.81		
EXT DRO >C28-C36	<10.0	10.0	01/09/2019	ND						

Surrogate: 1-Chlorooctane 74.9 % 41-142

Surrogate: 1-Chlorooctadecane 68.2 % 37.6-147

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

 TRC
 JAROD STOFFEL
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705
 Fax To:

Received:	01/07/2019	Sampling Date:	01/03/2019
Reported:	01/14/2019	Sampling Type:	Soil
Project Name:	WILLOW 17 STATE SWD #001	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	CONCHO-EDDY CO., NM		

Sample ID: N 2 @ S (H900028-10)

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	01/10/2019	ND	2.05	103	2.00	3.60		
Toluene*	<0.050	0.050	01/10/2019	ND	2.12	106	2.00	3.35		
Ethylbenzene*	<0.050	0.050	01/10/2019	ND	2.16	108	2.00	2.14		
Total Xylenes*	<0.150	0.150	01/10/2019	ND	6.42	107	6.00	6.86		
Total BTEX	<0.300	0.300	01/10/2019	ND						

Surrogate: 4-Bromofluorobenzene (PID) 92.6 % 73.3-129

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	32800	16.0	01/09/2019	ND	416	104	400	3.77		

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	01/09/2019	ND	215	107	200	8.05		
DRO >C10-C28*	<10.0	10.0	01/09/2019	ND	197	98.7	200	8.81		
EXT DRO >C28-C36	<10.0	10.0	01/09/2019	ND						

Surrogate: 1-Chlorooctane 75.6 % 41-142

Surrogate: 1-Chlorooctadecane 72.1 % 37.6-147

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Celey D. Keene, Lab Director/Quality Manager

Notes and Definitions

- QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
- ND Analyte NOT DETECTED at or above the reporting limit
- RPD Relative Percent Difference
- ** Samples not received at proper temperature of 6°C or below.
- *** Insufficient time to reach temperature.
- Chloride by 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



Celey D. Keene, Lab Director/Quality Manager



CARDINAL Laboratories

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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

Company Name: TRC Solutions

BILL TO

ANALYSIS REQUEST

Project Manager: ~~Jeffery~~ JARED STOFFEL

P.O. #:

Address: 10 Desta Drive Suite 150E

Company: COUSCHD

City: Midland State: TX Zip: 79705

Attn: BECKY HASKELL

Phone #: ~~432-466-4450~~ Fax #:

Address:

Project #: Project Owner: COUSCHD

City: State: Zip:

Project Name: WILLOW STATE 500 #001

Phone #: Fax #:

Project Location: EDDY CO, NM

State: Zip:

Sampler Name: BECKY HASKELL

Phone #: Fax #:

FOR LAB USE ONLY

(G)RAB OR (C)OMP.

CONTAINERS

MATRIX

PRESERV

SAMPLING

Lab I.D. Sample I.D.

H9DD028

(G)RAB OR (C)OMP.

CONTAINERS

MATRIX

PRESERV

SAMPLING

DATE TIME

ANALYSIS REQUEST

Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX	PRESERV	SAMPLING	DATE	TIME	BTEX	TPH	CHLORIDE
1	SP-105	G	1	X			1-3-19	9:00	X	X	X
2	SP-205			X				9:10	X	X	X
3	W1005			X				9:20	X	X	X
4	W1505			X				9:30	X	X	X
5	E105			X				9:40	X	X	X
6	V105			X				9:50	X	X	X
7	S105			X				10:00	X	X	X
8	S1505			X				10:10	X	X	X
9	S205			X				10:20	X	X	X
10	S205			X				10:30	X	X	X

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Relinquished By: [Signature]

Date: 1-3-19

Received By: [Signature]

Relinquished By: [Signature]

Date: 1-3-20

Received By: [Signature]

Delivered By: (Circle One)

Sample Condition

CHECKED BY: (Initials)

Sampler - UPS - Bus - Other:

290 #99

Cool Intact

YO

REMARKS:
 COOPER@TRCSOLUTIONS.COM
 BECKY@TRCSOLUTIONS.COM
 R.HASKELL@COUSCHD.COM
 J.STOFFEL@TRCSOLUTIONS.COM

January 23, 2019

BRIAN COOPER

TRC

10 DESTA DR. SUITE 150 E

MIDLAND, TX 79705

RE: WILLOW 17 STATE SWD #001

Enclosed are the results of analyses for samples received by the laboratory on 01/14/19 15:10.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-18-11. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/ga/lab_accred_certif.html.

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

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

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

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

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

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

Sincerely,



Celey D. Keene

Lab Director/Quality Manager

Analytical Results For:

 TRC
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705

 Project: WILLOW 17 STATE SWD #001
 Project Number: NONE GIVEN
 Project Manager: BRIAN COOPER
 Fax To:

 Reported:
 23-Jan-19 10:51

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SP- 1 @ 6"	H900110-01	Soil	11-Jan-19 12:00	14-Jan-19 15:10
SP- 2 @ 6"	H900110-02	Soil	11-Jan-19 12:05	14-Jan-19 15:10
W2 @ S	H900110-03	Soil	11-Jan-19 12:10	14-Jan-19 15:10
E2 @ S	H900110-04	Soil	11-Jan-19 12:15	14-Jan-19 15:10

Project name and sample IDs were changed as per Brian Cooper 01/23/19 via email. This is the revised report as per those instructions. This report will replace the one sent on 01/15/19.

Cardinal Laboratories

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

TRC 10 DESTA DR. SUITE 150 E MIDLAND TX, 79705	Project: WILLOW 17 STATE SWD #001 Project Number: NONE GIVEN Project Manager: BRIAN COOPER Fax To:	Reported: 23-Jan-19 10:51
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**SP- 1 @ 6"
H900110-01 (Soil)**

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

Inorganic Compounds

Chloride	3600		16.0	mg/kg	4	9011509	AC	15-Jan-19	4500-Cl-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	9011109	ms	14-Jan-19	8021B	
Toluene*	<0.050		0.050	mg/kg	50	9011109	ms	14-Jan-19	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	9011109	ms	14-Jan-19	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	9011109	ms	14-Jan-19	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	9011109	ms	14-Jan-19	8021B	

<i>Surrogate: 4-Bromofluorobenzene (PID)</i>			97.5 %		73.3-129	9011109	ms	14-Jan-19	8021B	
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Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	9011409	MS	15-Jan-19	8015B	
DRO >C10-C28*	<10.0		10.0	mg/kg	1	9011409	MS	15-Jan-19	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	9011409	MS	15-Jan-19	8015B	

<i>Surrogate: 1-Chlorooctane</i>			85.0 %		41-142	9011409	MS	15-Jan-19	8015B	
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<i>Surrogate: 1-Chlorooctadecane</i>			79.5 %		37.6-147	9011409	MS	15-Jan-19	8015B	
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*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

 TRC
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705

 Project: WILLOW 17 STATE SWD #001
 Project Number: NONE GIVEN
 Project Manager: BRIAN COOPER
 Fax To:

 Reported:
 23-Jan-19 10:51

SP- 2 @ 6"
H900110-02 (Soil)

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

Chloride	1970		16.0	mg/kg	4	9011509	AC	15-Jan-19	4500-Cl-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	9011109	ms	14-Jan-19	8021B	
Toluene*	<0.050		0.050	mg/kg	50	9011109	ms	14-Jan-19	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	9011109	ms	14-Jan-19	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	9011109	ms	14-Jan-19	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	9011109	ms	14-Jan-19	8021B	

Surrogate: 4-Bromofluorobenzene (PID)			97.9 %		73.3-129	9011109	ms	14-Jan-19	8021B	
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Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	9011409	MS	15-Jan-19	8015B	
DRO >C10-C28*	<10.0		10.0	mg/kg	1	9011409	MS	15-Jan-19	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	9011409	MS	15-Jan-19	8015B	

Surrogate: 1-Chlorooctane			88.4 %		41-142	9011409	MS	15-Jan-19	8015B	
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Surrogate: 1-Chlorooctadecane			84.3 %		37.6-147	9011409	MS	15-Jan-19	8015B	
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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

 TRC
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705

 Project: WILLOW 17 STATE SWD #001
 Project Number: NONE GIVEN
 Project Manager: BRIAN COOPER
 Fax To:

 Reported:
 23-Jan-19 10:51

W2 @ S
H900110-03 (Soil)

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

Chloride	736		16.0	mg/kg	4	9011509	AC	15-Jan-19	4500-Cl-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	9011109	ms	14-Jan-19	8021B	
Toluene*	<0.050		0.050	mg/kg	50	9011109	ms	14-Jan-19	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	9011109	ms	14-Jan-19	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	9011109	ms	14-Jan-19	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	9011109	ms	14-Jan-19	8021B	

Surrogate: 4-Bromofluorobenzene (PID)			97.7 %		73.3-129	9011109	ms	14-Jan-19	8021B	
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Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	9011409	MS	15-Jan-19	8015B	
DRO >C10-C28*	<10.0		10.0	mg/kg	1	9011409	MS	15-Jan-19	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	9011409	MS	15-Jan-19	8015B	

Surrogate: 1-Chlorooctane			74.5 %		41-142	9011409	MS	15-Jan-19	8015B	
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Surrogate: 1-Chlorooctadecane			67.1 %		37.6-147	9011409	MS	15-Jan-19	8015B	
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*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

 TRC
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705

 Project: WILLOW 17 STATE SWD #001
 Project Number: NONE GIVEN
 Project Manager: BRIAN COOPER
 Fax To:

 Reported:
 23-Jan-19 10:51

E2 @ S
H900110-04 (Soil)

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

Chloride	896		16.0	mg/kg	4	9011509	AC	15-Jan-19	4500-Cl-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	9011109	ms	14-Jan-19	8021B	
Toluene*	<0.050		0.050	mg/kg	50	9011109	ms	14-Jan-19	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	9011109	ms	14-Jan-19	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	9011109	ms	14-Jan-19	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	9011109	ms	14-Jan-19	8021B	

Surrogate: 4-Bromofluorobenzene (PID)			97.7 %	73.3-129		9011109	ms	14-Jan-19	8021B	
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Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	9011409	MS	15-Jan-19	8015B	
DRO >C10-C28*	<10.0		10.0	mg/kg	1	9011409	MS	15-Jan-19	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	9011409	MS	15-Jan-19	8015B	

Surrogate: 1-Chlorooctane			68.7 %	41-142		9011409	MS	15-Jan-19	8015B	
---------------------------	--	--	--------	--------	--	---------	----	-----------	-------	--

Surrogate: 1-Chlorooctadecane			63.0 %	37.6-147		9011409	MS	15-Jan-19	8015B	
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Cardinal Laboratories

*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

 TRC
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705

 Project: WILLOW 17 STATE SWD #001
 Project Number: NONE GIVEN
 Project Manager: BRIAN COOPER
 Fax To:

 Reported:
 23-Jan-19 10:51

Inorganic Compounds - Quality Control
Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 9011509 - General Prep - Wet Chem										
Blank (9011509-BLK1)										
Prepared & Analyzed: 15-Jan-19										
Chloride	ND	16.0	mg/kg							
LCS (9011509-BS1)										
Prepared & Analyzed: 15-Jan-19										
Chloride	432	16.0	mg/kg	400		108	80-120			
LCS Dup (9011509-BSD1)										
Prepared & Analyzed: 15-Jan-19										
Chloride	400	16.0	mg/kg	400		100	80-120	7.69	20	

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

 TRC
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705

 Project: WILLOW 17 STATE SWD #001
 Project Number: NONE GIVEN
 Project Manager: BRIAN COOPER
 Fax To:

 Reported:
 23-Jan-19 10:51

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 9011109 - Volatiles
Blank (9011109-BLK1)

Prepared: 11-Jan-19 Analyzed: 14-Jan-19

Benzene	ND	0.050	mg/kg							
Toluene	ND	0.050	mg/kg							
Ethylbenzene	ND	0.050	mg/kg							
Total Xylenes	ND	0.150	mg/kg							
Total BTEX	ND	0.300	mg/kg							
<i>Surrogate: 4-Bromofluorobenzene (PID)</i>	<i>0.0977</i>		<i>mg/kg</i>	<i>0.100</i>		<i>97.7</i>	<i>73.3-129</i>			

LCS (9011109-BS1)

Prepared: 11-Jan-19 Analyzed: 14-Jan-19

Benzene	2.11	0.050	mg/kg	2.00		106	72.2-131			
Toluene	2.03	0.050	mg/kg	2.00		102	71.7-126			
Ethylbenzene	2.00	0.050	mg/kg	2.00		100	68.9-126			
Total Xylenes	6.09	0.150	mg/kg	6.00		102	71.4-125			
<i>Surrogate: 4-Bromofluorobenzene (PID)</i>	<i>0.0967</i>		<i>mg/kg</i>	<i>0.100</i>		<i>96.7</i>	<i>73.3-129</i>			

LCS Dup (9011109-BSD1)

Prepared: 11-Jan-19 Analyzed: 14-Jan-19

Benzene	2.09	0.050	mg/kg	2.00		104	72.2-131	1.22	6.91	
Toluene	2.01	0.050	mg/kg	2.00		101	71.7-126	0.860	7.12	
Ethylbenzene	1.98	0.050	mg/kg	2.00		99.1	68.9-126	1.07	7.88	
Total Xylenes	6.04	0.150	mg/kg	6.00		101	71.4-125	0.840	7.46	
<i>Surrogate: 4-Bromofluorobenzene (PID)</i>	<i>0.0950</i>		<i>mg/kg</i>	<i>0.100</i>		<i>95.0</i>	<i>73.3-129</i>			

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

 TRC
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705

 Project: WILLOW 17 STATE SWD #001
 Project Number: NONE GIVEN
 Project Manager: BRIAN COOPER
 Fax To:

 Reported:
 23-Jan-19 10:51

Petroleum Hydrocarbons by GC FID - Quality Control
Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 9011409 - General Prep - Organics
Blank (9011409-BLK1)

Prepared: 14-Jan-19 Analyzed: 15-Jan-19

GRO C6-C10	ND	10.0	mg/kg							
DRO >C10-C28	ND	10.0	mg/kg							
EXT DRO >C28-C36	ND	10.0	mg/kg							
Total TPH C6-C28	ND	10.0	mg/kg							
<i>Surrogate: 1-Chlorooctane</i>	46.5		mg/kg	50.0		93.1	41-142			
<i>Surrogate: 1-Chlorooctadecane</i>	43.1		mg/kg	50.0		86.2	37.6-147			

LCS (9011409-BS1)

Prepared & Analyzed: 14-Jan-19

GRO C6-C10	209	10.0	mg/kg	200		105	76.5-133			
DRO >C10-C28	210	10.0	mg/kg	200		105	72.9-138			
Total TPH C6-C28	419	10.0	mg/kg	400		105	78-132			
<i>Surrogate: 1-Chlorooctane</i>	49.9		mg/kg	50.0		99.8	41-142			
<i>Surrogate: 1-Chlorooctadecane</i>	46.5		mg/kg	50.0		93.0	37.6-147			

LCS Dup (9011409-BSD1)

Prepared: 14-Jan-19 Analyzed: 15-Jan-19

GRO C6-C10	219	10.0	mg/kg	200		110	76.5-133	4.61	20.6	
DRO >C10-C28	207	10.0	mg/kg	200		103	72.9-138	1.44	20.6	
Total TPH C6-C28	426	10.0	mg/kg	400		107	78-132	1.63	18	
<i>Surrogate: 1-Chlorooctane</i>	47.9		mg/kg	50.0		95.8	41-142			
<i>Surrogate: 1-Chlorooctadecane</i>	44.8		mg/kg	50.0		89.6	37.6-147			

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Celey D. Keene, Lab Director/Quality Manager

Notes and Definitions

- ND Analyte NOT DETECTED at or above the reporting limit
- RPD Relative Percent Difference
- ** Samples not received at proper temperature of 6°C or below.
- *** Insufficient time to reach temperature.
- Chloride by SM4500Cl-B does not require samples be received at or below 6°C
Samples reported on an as received basis (wet) unless otherwise noted on report

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Celey D. Keene, Lab Director/Quality Manager

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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

Company Name: <i>Bob IKE</i>		BILL TO		P.O. #:		ANALYSIS REQUEST	
Project Manager: <i>Brian Cooper</i>		Company: <i>COG</i>		City:			
Address: <i>10 Park Dr. Suite 105</i>		Attn:		Address:			
City: <i>Midland TX</i>		State: <i>TX</i>		Zip:			
Phone #:		Fax #:		City:			
Project #:		Project Owner:		State:		Zip:	
Project Name: <i>*Withrow to SWP W. Howard St</i>		Phone #:		Fax #:			
Project Location: <i>SWD #001</i>		Matrix:		PRESERV:		SAMPLING	
Sampler Name: <i>Kyle Schwaide</i>		FOR LAB USE ONLY					

Lab I.D.	Sample I.D. *	(G)RAB OR (C)OMP.	# CONTAINERS	GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :	ACID/BASE:	ICE / COOL	OTHER :	DATE	TIME	CI-	TPH	BTEX
<i>H900110</i>	<i>1 H12011 SP-19 6"</i>		<i>6</i>			<i>X</i>							<i>1-11-19</i>	<i>12:00</i>	<i>X</i>	<i>X</i>	<i>X</i>
	<i>2 H12011 SP-20 6"</i>		<i>6</i>			<i>X</i>							<i>12:05</i>	<i>12:10</i>	<i>X</i>	<i>X</i>	<i>X</i>
	<i>3 55-55-55-55-55-55</i>		<i>6</i>			<i>X</i>							<i>12:15</i>	<i>12:15</i>	<i>X</i>	<i>X</i>	<i>X</i>
	<i>4 55-55-55-55-55-55 EGGS</i>		<i>6</i>			<i>X</i>									<i>X</i>	<i>X</i>	<i>X</i>

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Relinquished By: *[Signature]* Date: *1-14-19* Time: *15:10*

Received By: *Jamara Clark* Date: *1-14-19* Time: *15:10*

Delivered By: (Circle One) UPS Bus Other: *5.9e #77*

Sample Condition: Cool Intact Yes No Sample Condition: *ts*

Checked By: (Initials) *[Initials]*

Phone Result: Yes No Add'l Phone #: *[Blank]*

Fax Result: Yes No Add'l Fax #: *[Blank]*

REMARKS: *Project name & Sample ID changed as per Brian.*

ck 1/23/19



February 06, 2019

BRIAN COOPER

TRC

10 DESTA DR. SUITE 150 E

MIDLAND, TX 79705

RE: WILLOW 17 SWD

Enclosed are the results of analyses for samples received by the laboratory on 01/30/19 16:35.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-18-11. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

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

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

Accreditation applies to public drinking water matrices.

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

Sincerely,

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

Celey D. Keene

Lab Director/Quality Manager

Analytical Results For:

 TRC
 BRIAN COOPER
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705
 Fax To:

Received:	01/30/2019	Sampling Date:	01/29/2019
Reported:	02/06/2019	Sampling Type:	Soil
Project Name:	WILLOW 17 SWD	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: TT 1 @ 0-6" (H900351-01)

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	02/01/2019	ND	1.89	94.7	2.00	1.52		
Toluene*	<0.050	0.050	02/01/2019	ND	1.92	96.2	2.00	1.91		
Ethylbenzene*	<0.050	0.050	02/01/2019	ND	1.82	90.9	2.00	0.955		
Total Xylenes*	<0.150	0.150	02/01/2019	ND	5.32	88.6	6.00	0.800		
Total BTEX	<0.300	0.300	02/01/2019	ND						

Surrogate: 4-Bromofluorobenzene (PID) 89.5 % 73.3-129

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	3600	16.0	02/04/2019	ND	416	104	400	0.00		

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	02/02/2019	ND	167	83.5	200	0.387		
DRO >C10-C28*	<10.0	10.0	02/02/2019	ND	179	89.3	200	4.23		
EXT DRO >C28-C36	<10.0	10.0	02/02/2019	ND						

Surrogate: 1-Chlorooctane 89.1 % 41-142

Surrogate: 1-Chlorooctadecane 88.5 % 37.6-147

Cardinal Laboratories

*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

 TRC
 BRIAN COOPER
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705
 Fax To:

Received:	01/30/2019	Sampling Date:	01/29/2019
Reported:	02/06/2019	Sampling Type:	Soil
Project Name:	WILLOW 17 SWD	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: TT 1 @ 6''-1' (H900351-02)

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	02/01/2019	ND	1.89	94.7	2.00	1.52	
Toluene*	<0.050	0.050	02/01/2019	ND	1.92	96.2	2.00	1.91	
Ethylbenzene*	<0.050	0.050	02/01/2019	ND	1.82	90.9	2.00	0.955	
Total Xylenes*	<0.150	0.150	02/01/2019	ND	5.32	88.6	6.00	0.800	
Total BTEX	<0.300	0.300	02/01/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID) 96.2 % 73.3-129

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	2200	16.0	02/04/2019	ND	400	100	400	3.92	

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	02/02/2019	ND	167	83.5	200	0.387	
DRO >C10-C28*	<10.0	10.0	02/02/2019	ND	179	89.3	200	4.23	
EXT DRO >C28-C36	<10.0	10.0	02/02/2019	ND					

Surrogate: 1-Chlorooctane 85.9 % 41-142

Surrogate: 1-Chlorooctadecane 84.3 % 37.6-147

Cardinal Laboratories

*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

 TRC
 BRIAN COOPER
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705
 Fax To:

Received:	01/30/2019	Sampling Date:	01/29/2019
Reported:	02/06/2019	Sampling Type:	Soil
Project Name:	WILLOW 17 SWD	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: TT 1 @ 3' (H900351-03)

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	02/01/2019	ND	1.89	94.7	2.00	1.52		
Toluene*	<0.050	0.050	02/01/2019	ND	1.92	96.2	2.00	1.91		
Ethylbenzene*	<0.050	0.050	02/01/2019	ND	1.82	90.9	2.00	0.955		
Total Xylenes*	<0.150	0.150	02/01/2019	ND	5.32	88.6	6.00	0.800		
Total BTEX	<0.300	0.300	02/01/2019	ND						

Surrogate: 4-Bromofluorobenzene (PID) 91.3 % 73.3-129

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	1440	16.0	02/04/2019	ND	400	100	400	3.92		

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	02/02/2019	ND	167	83.5	200	0.387		
DRO >C10-C28*	<10.0	10.0	02/02/2019	ND	179	89.3	200	4.23		
EXT DRO >C28-C36	<10.0	10.0	02/02/2019	ND						

Surrogate: 1-Chlorooctane 89.1 % 41-142

Surrogate: 1-Chlorooctadecane 88.4 % 37.6-147

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

 TRC
 BRIAN COOPER
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705
 Fax To:

Received:	01/30/2019	Sampling Date:	01/29/2019
Reported:	02/06/2019	Sampling Type:	Soil
Project Name:	WILLOW 17 SWD	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: TT 1 @ 5' (H900351-04)

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	02/01/2019	ND	1.89	94.7	2.00	1.52	
Toluene*	<0.050	0.050	02/01/2019	ND	1.92	96.2	2.00	1.91	
Ethylbenzene*	<0.050	0.050	02/01/2019	ND	1.82	90.9	2.00	0.955	
Total Xylenes*	<0.150	0.150	02/01/2019	ND	5.32	88.6	6.00	0.800	
Total BTEX	<0.300	0.300	02/01/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID) 94.1 % 73.3-129

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	2400	16.0	02/04/2019	ND	400	100	400	3.92	

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	02/02/2019	ND	167	83.5	200	0.387	
DRO >C10-C28*	<10.0	10.0	02/02/2019	ND	179	89.3	200	4.23	
EXT DRO >C28-C36	<10.0	10.0	02/02/2019	ND					

Surrogate: 1-Chlorooctane 86.5 % 41-142

Surrogate: 1-Chlorooctadecane 86.5 % 37.6-147

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

 TRC
 BRIAN COOPER
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705
 Fax To:

Received:	01/30/2019	Sampling Date:	01/29/2019
Reported:	02/06/2019	Sampling Type:	Soil
Project Name:	WILLOW 17 SWD	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: TT 1 @ 6' (H900351-05)

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	02/01/2019	ND	1.89	94.7	2.00	1.52		
Toluene*	<0.050	0.050	02/01/2019	ND	1.92	96.2	2.00	1.91		
Ethylbenzene*	<0.050	0.050	02/01/2019	ND	1.82	90.9	2.00	0.955		
Total Xylenes*	<0.150	0.150	02/01/2019	ND	5.32	88.6	6.00	0.800		
Total BTEX	<0.300	0.300	02/01/2019	ND						

Surrogate: 4-Bromofluorobenzene (PID) 93.3 % 73.3-129

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	832	16.0	02/04/2019	ND	400	100	400	3.92		

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	02/02/2019	ND	167	83.5	200	0.387		
DRO >C10-C28*	<10.0	10.0	02/02/2019	ND	179	89.3	200	4.23		
EXT DRO >C28-C36	<10.0	10.0	02/02/2019	ND						

Surrogate: 1-Chlorooctane 94.3 % 41-142

Surrogate: 1-Chlorooctadecane 93.0 % 37.6-147

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Analytical Results For:

 TRC
 BRIAN COOPER
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705
 Fax To:

Received:	01/30/2019	Sampling Date:	01/29/2019
Reported:	02/06/2019	Sampling Type:	Soil
Project Name:	WILLOW 17 SWD	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: TT 2 @ 6''-1' (H900351-06)

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	02/01/2019	ND	1.89	94.7	2.00	1.52		
Toluene*	<0.050	0.050	02/01/2019	ND	1.92	96.2	2.00	1.91		
Ethylbenzene*	<0.050	0.050	02/01/2019	ND	1.82	90.9	2.00	0.955		
Total Xylenes*	<0.150	0.150	02/01/2019	ND	5.32	88.6	6.00	0.800		
Total BTEX	<0.300	0.300	02/01/2019	ND						

Surrogate: 4-Bromofluorobenzene (PID) 98.3 % 73.3-129

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	3360	16.0	02/04/2019	ND	400	100	400	3.92		

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	02/02/2019	ND	167	83.5	200	0.387		
DRO >C10-C28*	<10.0	10.0	02/02/2019	ND	179	89.3	200	4.23		
EXT DRO >C28-C36	<10.0	10.0	02/02/2019	ND						

Surrogate: 1-Chlorooctane 87.2 % 41-142

Surrogate: 1-Chlorooctadecane 86.0 % 37.6-147

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Analytical Results For:

 TRC
 BRIAN COOPER
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705
 Fax To:

 Received: 01/30/2019
 Reported: 02/06/2019
 Project Name: WILLOW 17 SWD
 Project Number: NONE GIVEN
 Project Location: NOT GIVEN

 Sampling Date: 01/29/2019
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Jodi Henson

Sample ID: TT 2 @ 2' (H900351-07)

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	02/01/2019	ND	1.89	94.7	2.00	1.52		
Toluene*	<0.050	0.050	02/01/2019	ND	1.92	96.2	2.00	1.91		
Ethylbenzene*	<0.050	0.050	02/01/2019	ND	1.82	90.9	2.00	0.955		
Total Xylenes*	<0.150	0.150	02/01/2019	ND	5.32	88.6	6.00	0.800		
Total BTEX	<0.300	0.300	02/01/2019	ND						

Surrogate: 4-Bromofluorobenzene (PID) 94.2 % 73.3-129

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	1650	16.0	02/04/2019	ND	400	100	400	3.92		

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	02/02/2019	ND	167	83.5	200	0.387		
DRO >C10-C28*	<10.0	10.0	02/02/2019	ND	179	89.3	200	4.23		
EXT DRO >C28-C36	<10.0	10.0	02/02/2019	ND						

Surrogate: 1-Chlorooctane 88.5 % 41-142

Surrogate: 1-Chlorooctadecane 88.2 % 37.6-147

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Analytical Results For:

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 BRIAN COOPER
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705
 Fax To:

Received:	01/30/2019	Sampling Date:	01/29/2019
Reported:	02/06/2019	Sampling Type:	Soil
Project Name:	WILLOW 17 SWD	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: TT 2 @ 3' (H900351-08)

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	02/01/2019	ND	1.89	94.7	2.00	1.52		
Toluene*	<0.050	0.050	02/01/2019	ND	1.92	96.2	2.00	1.91		
Ethylbenzene*	<0.050	0.050	02/01/2019	ND	1.82	90.9	2.00	0.955		
Total Xylenes*	<0.150	0.150	02/01/2019	ND	5.32	88.6	6.00	0.800		
Total BTEX	<0.300	0.300	02/01/2019	ND						

Surrogate: 4-Bromofluorobenzene (PID) 89.6 % 73.3-129

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	880	16.0	02/04/2019	ND	400	100	400	3.92		

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	02/02/2019	ND	167	83.5	200	0.387		
DRO >C10-C28*	<10.0	10.0	02/02/2019	ND	179	89.3	200	4.23		
EXT DRO >C28-C36	<10.0	10.0	02/02/2019	ND						

Surrogate: 1-Chlorooctane 87.1 % 41-142

Surrogate: 1-Chlorooctadecane 86.2 % 37.6-147

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Analytical Results For:

 TRC
 BRIAN COOPER
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705
 Fax To:

Received:	01/30/2019	Sampling Date:	01/29/2019
Reported:	02/06/2019	Sampling Type:	Soil
Project Name:	WILLOW 17 SWD	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: TT 3 @ 0-6" (H900351-09)

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	02/01/2019	ND	1.89	94.7	2.00	1.52		
Toluene*	<0.050	0.050	02/01/2019	ND	1.92	96.2	2.00	1.91		
Ethylbenzene*	<0.050	0.050	02/01/2019	ND	1.82	90.9	2.00	0.955		
Total Xylenes*	<0.150	0.150	02/01/2019	ND	5.32	88.6	6.00	0.800		
Total BTEX	<0.300	0.300	02/01/2019	ND						

Surrogate: 4-Bromofluorobenzene (PID) 93.7 % 73.3-129

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	1040	16.0	02/04/2019	ND	400	100	400	3.92		

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	02/02/2019	ND	167	83.5	200	0.387		
DRO >C10-C28*	<10.0	10.0	02/02/2019	ND	179	89.3	200	4.23		
EXT DRO >C28-C36	<10.0	10.0	02/02/2019	ND						

Surrogate: 1-Chlorooctane 89.4 % 41-142

Surrogate: 1-Chlorooctadecane 87.7 % 37.6-147

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Analytical Results For:

 TRC
 BRIAN COOPER
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705
 Fax To:

Received:	01/30/2019	Sampling Date:	01/29/2019
Reported:	02/06/2019	Sampling Type:	Soil
Project Name:	WILLOW 17 SWD	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: TT 3 @ 6'-1' (H900351-10)

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	02/01/2019	ND	1.89	94.7	2.00	1.52	
Toluene*	<0.050	0.050	02/01/2019	ND	1.92	96.2	2.00	1.91	
Ethylbenzene*	<0.050	0.050	02/01/2019	ND	1.82	90.9	2.00	0.955	
Total Xylenes*	<0.150	0.150	02/01/2019	ND	5.32	88.6	6.00	0.800	
Total BTEX	<0.300	0.300	02/01/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID) 87.5 % 73.3-129

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	1120	16.0	02/04/2019	ND	400	100	400	3.92	

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	02/02/2019	ND	213	107	200	2.00	
DRO >C10-C28*	<10.0	10.0	02/02/2019	ND	210	105	200	0.208	
EXT DRO >C28-C36	<10.0	10.0	02/02/2019	ND					

Surrogate: 1-Chlorooctane 92.0 % 41-142

Surrogate: 1-Chlorooctadecane 93.7 % 37.6-147

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

 TRC
 BRIAN COOPER
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705
 Fax To:

Received:	01/30/2019	Sampling Date:	01/29/2019
Reported:	02/06/2019	Sampling Type:	Soil
Project Name:	WILLOW 17 SWD	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: S TT @ 2.5' (H900351-11)

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	02/01/2019	ND	1.89	94.7	2.00	1.52		
Toluene*	<0.050	0.050	02/01/2019	ND	1.92	96.2	2.00	1.91		
Ethylbenzene*	<0.050	0.050	02/01/2019	ND	1.82	90.9	2.00	0.955		
Total Xylenes*	<0.150	0.150	02/01/2019	ND	5.32	88.6	6.00	0.800		
Total BTEX	<0.300	0.300	02/01/2019	ND						

Surrogate: 4-Bromofluorobenzene (PID) 90.4 % 73.3-129

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	80.0	16.0	02/04/2019	ND	400	100	400	3.92		

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	02/02/2019	ND	213	107	200	2.00		
DRO >C10-C28*	<10.0	10.0	02/02/2019	ND	210	105	200	0.208		
EXT DRO >C28-C36	<10.0	10.0	02/02/2019	ND						

Surrogate: 1-Chlorooctane 81.4 % 41-142

Surrogate: 1-Chlorooctadecane 83.2 % 37.6-147

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Analytical Results For:

 TRC
 BRIAN COOPER
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705
 Fax To:

Received:	01/30/2019	Sampling Date:	01/29/2019
Reported:	02/06/2019	Sampling Type:	Soil
Project Name:	WILLOW 17 SWD	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: N TT @ 3' (H900351-12)

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	02/01/2019	ND	1.89	94.7	2.00	1.52		
Toluene*	<0.050	0.050	02/01/2019	ND	1.92	96.2	2.00	1.91		
Ethylbenzene*	<0.050	0.050	02/01/2019	ND	1.82	90.9	2.00	0.955		
Total Xylenes*	<0.150	0.150	02/01/2019	ND	5.32	88.6	6.00	0.800		
Total BTEX	<0.300	0.300	02/01/2019	ND						

Surrogate: 4-Bromofluorobenzene (PID) 95.3 % 73.3-129

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	784	16.0	02/04/2019	ND	400	100	400	3.92		

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	02/02/2019	ND	213	107	200	2.00		
DRO >C10-C28*	<10.0	10.0	02/02/2019	ND	210	105	200	0.208		
EXT DRO >C28-C36	<10.0	10.0	02/02/2019	ND						

Surrogate: 1-Chlorooctane 95.5 % 41-142

Surrogate: 1-Chlorooctadecane 95.2 % 37.6-147

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Analytical Results For:

 TRC
 BRIAN COOPER
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705
 Fax To:

 Received: 01/30/2019
 Reported: 02/06/2019
 Project Name: WILLOW 17 SWD
 Project Number: NONE GIVEN
 Project Location: NOT GIVEN

 Sampling Date: 01/29/2019
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Jodi Henson

Sample ID: W1 TT @ 3' (H900351-13)

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	02/01/2019	ND	1.89	94.7	2.00	1.52		
Toluene*	<0.050	0.050	02/01/2019	ND	1.92	96.2	2.00	1.91		
Ethylbenzene*	<0.050	0.050	02/01/2019	ND	1.82	90.9	2.00	0.955		
Total Xylenes*	<0.150	0.150	02/01/2019	ND	5.32	88.6	6.00	0.800		
Total BTEX	<0.300	0.300	02/01/2019	ND						

Surrogate: 4-Bromofluorobenzene (PID) 89.1 % 73.3-129

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	768	16.0	02/04/2019	ND	400	100	400	3.92		

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	02/02/2019	ND	213	107	200	2.00		
DRO >C10-C28*	<10.0	10.0	02/02/2019	ND	210	105	200	0.208		
EXT DRO >C28-C36	<10.0	10.0	02/02/2019	ND						

Surrogate: 1-Chlorooctane 93.9 % 41-142

Surrogate: 1-Chlorooctadecane 95.7 % 37.6-147

Cardinal Laboratories

*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

 TRC
 BRIAN COOPER
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705
 Fax To:

Received:	01/30/2019	Sampling Date:	01/29/2019
Reported:	02/06/2019	Sampling Type:	Soil
Project Name:	WILLOW 17 SWD	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: W2 TT @ 3' (H900351-14)

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	02/01/2019	ND	1.89	94.7	2.00	1.52		
Toluene*	<0.050	0.050	02/01/2019	ND	1.92	96.2	2.00	1.91		
Ethylbenzene*	<0.050	0.050	02/01/2019	ND	1.82	90.9	2.00	0.955		
Total Xylenes*	<0.150	0.150	02/01/2019	ND	5.32	88.6	6.00	0.800		
Total BTEX	<0.300	0.300	02/01/2019	ND						

Surrogate: 4-Bromofluorobenzene (PID) 88.5 % 73.3-129

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	208	16.0	02/04/2019	ND	400	100	400	3.92		

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	02/02/2019	ND	213	107	200	2.00		
DRO >C10-C28*	<10.0	10.0	02/02/2019	ND	210	105	200	0.208		
EXT DRO >C28-C36	<10.0	10.0	02/02/2019	ND						

Surrogate: 1-Chlorooctane 91.0 % 41-142

Surrogate: 1-Chlorooctadecane 91.4 % 37.6-147

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

 TRC
 BRIAN COOPER
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705
 Fax To:

Received:	01/30/2019	Sampling Date:	01/29/2019
Reported:	02/06/2019	Sampling Type:	Soil
Project Name:	WILLOW 17 SWD	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: E1 TT @ 3' (H900351-15)

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	02/01/2019	ND	1.89	94.7	2.00	1.52		
Toluene*	<0.050	0.050	02/01/2019	ND	1.92	96.2	2.00	1.91		
Ethylbenzene*	<0.050	0.050	02/01/2019	ND	1.82	90.9	2.00	0.955		
Total Xylenes*	<0.150	0.150	02/01/2019	ND	5.32	88.6	6.00	0.800		
Total BTEX	<0.300	0.300	02/01/2019	ND						

Surrogate: 4-Bromofluorobenzene (PID) 88.4 % 73.3-129

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	208	16.0	02/04/2019	ND	400	100	400	3.92		

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	02/02/2019	ND	213	107	200	2.00		
DRO >C10-C28*	<10.0	10.0	02/02/2019	ND	210	105	200	0.208		
EXT DRO >C28-C36	<10.0	10.0	02/02/2019	ND						

Surrogate: 1-Chlorooctane 94.5 % 41-142

Surrogate: 1-Chlorooctadecane 95.5 % 37.6-147

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

 TRC
 BRIAN COOPER
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705
 Fax To:

Received:	01/30/2019	Sampling Date:	01/29/2019
Reported:	02/06/2019	Sampling Type:	Soil
Project Name:	WILLOW 17 SWD	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: E2 TT @ 3' (H900351-16)

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	02/01/2019	ND	1.89	94.7	2.00	1.52		
Toluene*	<0.050	0.050	02/01/2019	ND	1.92	96.2	2.00	1.91		
Ethylbenzene*	<0.050	0.050	02/01/2019	ND	1.82	90.9	2.00	0.955		
Total Xylenes*	<0.150	0.150	02/01/2019	ND	5.32	88.6	6.00	0.800		
Total BTEX	<0.300	0.300	02/01/2019	ND						

Surrogate: 4-Bromofluorobenzene (PID) 93.7 % 73.3-129

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	688	16.0	02/04/2019	ND	400	100	400	3.92		

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	02/02/2019	ND	213	107	200	2.00		
DRO >C10-C28*	<10.0	10.0	02/02/2019	ND	210	105	200	0.208		
EXT DRO >C28-C36	<10.0	10.0	02/02/2019	ND						

Surrogate: 1-Chlorooctane 92.0 % 41-142

Surrogate: 1-Chlorooctadecane 92.5 % 37.6-147

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

 TRC
 BRIAN COOPER
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705
 Fax To:

Received:	01/30/2019	Sampling Date:	01/29/2019
Reported:	02/06/2019	Sampling Type:	Soil
Project Name:	WILLOW 17 SWD	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: TT 2 @ 0-6" (H900351-17)

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	02/01/2019	ND	1.89	94.7	2.00	1.52		
Toluene*	<0.050	0.050	02/01/2019	ND	1.92	96.2	2.00	1.91		
Ethylbenzene*	<0.050	0.050	02/01/2019	ND	1.82	90.9	2.00	0.955		
Total Xylenes*	<0.150	0.150	02/01/2019	ND	5.32	88.6	6.00	0.800		
Total BTEX	<0.300	0.300	02/01/2019	ND						

Surrogate: 4-Bromofluorobenzene (PID) 94.1 % 73.3-129

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	4480	16.0	02/04/2019	ND	400	100	400	3.92		

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	02/02/2019	ND	213	107	200	2.00		
DRO >C10-C28*	<10.0	10.0	02/02/2019	ND	210	105	200	0.208		
EXT DRO >C28-C36	<10.0	10.0	02/02/2019	ND						

Surrogate: 1-Chlorooctane 93.5 % 41-142

Surrogate: 1-Chlorooctadecane 96.0 % 37.6-147

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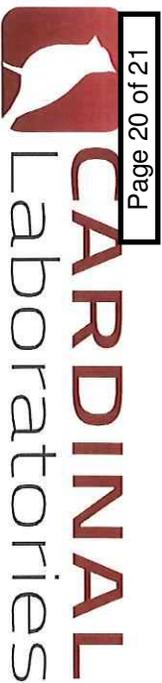


Celey D. Keene, Lab Director/Quality Manager

Notes and Definitions

- 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.
- QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
- ND Analyte NOT DETECTED at or above the reporting limit
- RPD Relative Percent Difference
- ** Samples not received at proper temperature of 6°C or below.
- *** Insufficient time to reach temperature.
- Chloride by 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





CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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

BILL TO

ANALYSIS REQUEST

Company Name: TRC
 Project Manager: Brian Cooper
 Address: 10 Peeta Dr Sorke 105
 City: Marland State: TX Zip: _____
 Phone #: _____ Fax #: _____
 Project #: _____ Project Owner: _____
 Project Name: Willow 17 SWD
 Project Location: _____
 Sampler Name: Kyle Schmidt
 FOR LAB USE ONLY

P.O. #:	<u>COE</u>
Company:	
Attn:	
Address:	
City:	
State:	
Zip:	
Phone #:	
Fax #:	

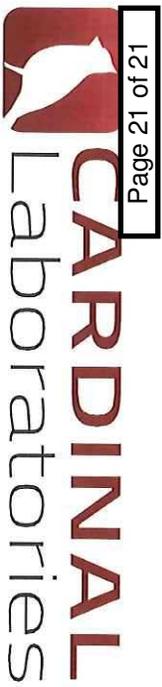
Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX						ACID/BASE:	ICE / COOL	OTHER :	DATE	TIME	CI-	TPH	BTEX
				GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :								
H900351																	
1	TTT @ 0-6"	G	1			X											
2	TTT @ 6"-1'																
3	TTT @ 3'																
4	TTT @ 5'																
5	TTT @ 6'																
6	TTT @ 6"-1'																
7	TTT @ 2'																
8	TTT @ 3'																
9	TTT @ 0-6"																
10	TTT @ 6"-1'																

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Reinquished By: _____ Date: 1-30-19
 Received By: _____ Time: 10:35

Delivered By: (Circle One) UPS - Bus - Other: -1.99c/ #97
 Sampler - UPS - Bus - Other: _____
 Sample Condition: Cool Intact Yes No

REMARKS: 6 samples @ the solutions.com
Kschmidt@ the solutions.com
 Phone Result: Yes No Add'l Phone #: _____
 Fax Result: Yes No Add'l Fax #: _____



CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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

BILL TO

ANALYSIS REQUEST

Company Name: TRC
 Project Manager: Brian Cooper
 Address: 10 Park Dr Suite 105
 City: Midland State: TX Zip: _____
 Phone #: _____ Fax #: _____
 Project #: _____ Project Owner: _____
 Project Name: willow 17 SWP
 Project Location: _____
 Sampler Name: Kyle Schwardt
 P.O. #: CO6
 Company: _____
 Attn: _____
 Address: _____
 City: _____
 State: _____ Zip: _____
 Phone #: _____
 Fax #: _____

Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX						DATE	TIME	CI-	TPH	BTEX
				GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :					
H900351														
11	STT @ 2.5'	G	1	X					1-29-19					
12	WT @ 3'			X										
13	WT @ 3'			X										
14	WT @ 3'			X										
15	WT @ 3'			X										
16	WT @ 3'			X										
17	TT @ 0-6"			X										

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Relinquished By: _____ Date: 1-30-19
 Relinquished By: _____ Date: 10:35
 Received By: _____
 Received By: _____

Phone Result: Yes No Add'l Phone #:
 Fax Result: Yes No Add'l Fax #:
 REMARKS: Cooper @ trcsolutions.com
Schwardt @ trcsolutions.com

Delivered By: (Circle One) -1.99e / #97
 Sampler - UPS - Bus - Other: _____
 Sample Condition: Cool Intact
 Yes No

CHECKED BY: _____
 (Initials)

Analytical Report 621815

for
TRC Solutions, Inc

Project Manager: Jared Stoffel

Willow 17

24-APR-19

Collected By: Client



**1211 W. Florida Ave
Midland TX 79701**

Xenco-Houston (EPA Lab Code: TX00122):
Texas (T104704215-18-28), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2017-142)

Xenco-Dallas (EPA Lab Code: TX01468):
Texas (T104704295-18-17), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab Code: TX00127): Texas (T104704221-18-14)
Xenco-Lubbock (EPA Lab Code: TX00139): Texas (T104704219-18-18)
Xenco-Midland (EPA Lab Code: TX00158): Texas (T104704400-18-18)
Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-18-4)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)
Xenco-Phoenix Mobile (EPA Lab Code: AZ00901): Arizona (AZM757)
Xenco-Atlanta (LELAP Lab ID #04176)
Xenco-Tampa: Florida (E87429), North Carolina (483)
Xenco-Lakeland: Florida (E84098)



24-APR-19

Project Manager: **Jared Stoffel**
TRC Solutions, Inc
2057 Commerce
Midland, TX 79703

Reference: XENCO Report No(s): **621815**
Willow 17
Project Address: ---

Jared Stoffel:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number(s) 621815. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. The uncertainty of measurement associated with the results of analysis reported is available upon request. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 621815 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

Kalei Stout

Midland Laboratory Director

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Certified and approved by numerous States and Agencies.

A Small Business and Minority Status Company that delivers SERVICE and QUALITY

Houston - Dallas - Midland - San Antonio - Phoenix - Oklahoma - Latin America

TRC Solutions, Inc, Midland, TX

Willow 17

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
W1-TT @ 4'	S	04-18-19 10:25	4 ft	621815-001
W1-TT @ 5'	S	04-18-19 10:30	5 ft	621815-002
W1-TT @ 6'	S	04-18-19 10:35	6 ft	621815-003
W1-TT @ 7'	S	04-18-19 10:40	7 ft	621815-004
N-TT @ 4'	S	04-18-19 11:05	4 ft	621815-009
TT-1 @ 7'	S	04-18-19 11:30	7 ft	621815-014
TT-1 @ 8'	S	04-18-19 11:35	8 ft	621815-015
TT-2 @ 4'	S	04-18-19 11:40	4 ft	621815-016
TT-2 @ 5'	S	04-18-19 11:45	5 ft	621815-017
TT-3 @ 2'	S	04-18-19 12:10	2 ft	621815-022
E2-TT @ 4'	S	04-18-19 12:45	4 ft	621815-029
N2-TT @ 0-1'	S	04-18-19 14:30	0 - 1 ft	621815-031
S2-TT @ 0-1'	S	04-18-19 14:40	0 - 1 ft	621815-032
E3-TT @ 0-1'	S	04-18-19 14:50	0 - 1 ft	621815-033
E4-TT @ 0-1'	S	04-18-19 15:00	0 - 1 ft	621815-034
W3-TT @ 0-1'	S	04-18-19 15:10	0 - 1 ft	621815-035
W4-TT @ 0-1'	S	04-18-19 15:20	0 - 1 ft	621815-036
W5-TT @ 0-1'	S	04-18-19 15:30	0 - 1 ft	621815-037
W1-TT @ 8'	S	04-18-19 10:45	8 ft	Not Analyzed
W1-TT @ 9'	S	04-18-19 10:50	9 ft	Not Analyzed
W1-TT @ 10'	S	04-18-19 10:55	10 ft	Not Analyzed
W1-TT @ 11'	S	04-18-19 11:00	11 ft	Not Analyzed
N-TT @ 5'	S	04-18-19 11:10	5 ft	Not Analyzed
N-TT @ 6'	S	04-18-19 11:15	6 ft	Not Analyzed
N-TT @ 7'	S	04-18-19 11:20	7 ft	Not Analyzed
N-TT @ 8'	S	04-18-19 11:25	8 ft	Not Analyzed
TT-2 @ 6'	S	04-18-19 11:50	6 ft	Not Analyzed
TT-2 @ 7'	S	04-18-19 11:55	7 ft	Not Analyzed
TT-2 @ 8'	S	04-18-19 12:00	8 ft	Not Analyzed
TT-2 @ 9'	S	04-18-19 12:05	9 ft	Not Analyzed
TT-3 @ 3'	S	04-18-19 12:15	3 ft	Not Analyzed
TT-3 @ 4'	S	04-18-19 12:20	4 ft	Not Analyzed
TT-3 @ 5'	S	04-18-19 12:25	5 ft	Not Analyzed
TT-3 @ 6'	S	04-18-19 12:30	6 ft	Not Analyzed
TT-3 @ 7'	S	04-18-19 12:35	7 ft	Not Analyzed
TT-3 @ 8'	S	04-18-19 12:40	8 ft	Not Analyzed
E2-TT @ 5'	S	04-18-19 14:50	5 ft	Not Analyzed



CASE NARRATIVE

Client Name: TRC Solutions, Inc

Project Name: Willow 17

Project ID: ---
Work Order Number(s): 621815

Report Date: 24-APR-19
Date Received: 04/22/2019

Sample receipt non conformances and comments:

None

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3086557 Chloride by EPA 300

Lab Sample ID 621815-036 was randomly selected for Matrix Spike/Matrix Spike Duplicate (MS/MSD).

Chloride recovered below QC limits in the Matrix Spike. Outlier/s are due to possible matrix interference.

Samples in the analytical batch are: 621815-002, -003, -004, -005, -009, -014, -015, -016, -017, -018, -022, -029, -031, -032, -033, -034, -035, -036.

The Laboratory Control Sample for Chloride is within laboratory Control Limits, therefore the data was accepted.



Certificate of Analysis Summary 621815

TRC Solutions, Inc, Midland, TX

Project Name: Willow 17



Project Id: ---
 Contact: Jared Stoffel
 Project Location: ---

Date Received in Lab: Mon Apr-22-19 10:26 am
 Report Date: 24-APR-19
 Project Manager: Kalei Stout

<i>Analysis Requested</i>	<i>Lab Id:</i>	621815-001	621815-002	621815-003	621815-004	621815-009	621815-014
		<i>Field Id:</i>	W1-TT @ 4'	W1-TT @ 5'	W1-TT @ 6'	W1-TT @ 7'	N-TT @ 4'
	<i>Depth:</i>	4- ft	5- ft	6- ft	7- ft	4- ft	7- ft
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Apr-18-19 10:25	Apr-18-19 10:30	Apr-18-19 10:35	Apr-18-19 10:40	Apr-18-19 11:05	Apr-18-19 11:30
Chloride by EPA 300	<i>Extracted:</i>	Apr-22-19 14:00	Apr-22-19 16:00				
	<i>Analyzed:</i>	Apr-22-19 19:49	Apr-22-19 20:45	Apr-22-19 20:51	Apr-22-19 20:57	Apr-22-19 21:22	Apr-22-19 21:28
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		1360 99.0	1750 50.3	935 49.8	488 50.0	581 50.0	1010 50.0

This analytical report, and the entire data package it represents, has been made for your exclusive and confidential use. The interpretations and results expressed throughout this analytical report represent the best judgment of XENCO Laboratories. XENCO Laboratories assumes no responsibility and makes no warranty to the end use of the data hereby presented. Our liability is limited to the amount invoiced for this work order unless otherwise agreed to in writing.

Houston - Dallas - Midland - Tampa - Phoenix - Lubbock - San Antonio - El Paso - Atlanta - New Mexico

Kalei Stout
 Midland Laboratory Director



Certificate of Analysis Summary 621815

TRC Solutions, Inc, Midland, TX

Project Name: Willow 17



Project Id: ---
 Contact: Jared Stoffel
 Project Location: ---

Date Received in Lab: Mon Apr-22-19 10:26 am
 Report Date: 24-APR-19
 Project Manager: Kalei Stout

<i>Analysis Requested</i>	<i>Lab Id:</i>	621815-015	621815-016	621815-017	621815-022	621815-029	621815-031
	<i>Field Id:</i>	TT-1 @ 8'	TT-2 @ 4'	TT-2 @ 5'	TT-3 @ 2'	E2-TT @ 4'	N2-TT @ 0-1'
	<i>Depth:</i>	8- ft	4- ft	5- ft	2- ft	4- ft	0-1 ft
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Apr-18-19 11:35	Apr-18-19 11:40	Apr-18-19 11:45	Apr-18-19 12:10	Apr-18-19 12:45	Apr-18-19 14:30
Chloride by EPA 300	<i>Extracted:</i>	Apr-22-19 16:00					
	<i>Analyzed:</i>	Apr-22-19 21:34	Apr-22-19 21:40	Apr-22-19 21:46	Apr-22-19 22:17	Apr-23-19 08:48	Apr-23-19 08:53
	<i>Units/RL:</i>	mg/kg RL					
Chloride		400 50.0	1710 99.6	129 49.8	584 25.1	69.0 24.9	98.2 25.0

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Kalei Stout
 Midland Laboratory Director



Certificate of Analysis Summary 621815

TRC Solutions, Inc, Midland, TX

Project Name: Willow 17



Project Id: ---
 Contact: Jared Stoffel
 Project Location: ---

Date Received in Lab: Mon Apr-22-19 10:26 am
 Report Date: 24-APR-19
 Project Manager: Kalei Stout

<i>Analysis Requested</i>	<i>Lab Id:</i>	621815-032	621815-033	621815-034	621815-035	621815-036	621815-037
	<i>Field Id:</i>	S2-TT @ 0-1'	E3-TT @ 0-1'	E4-TT @ 0-1'	W3-TT @ 0-1'	W4-TT @ 0-1'	W5-TT @ 0-1'
	<i>Depth:</i>	0-1 ft					
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Apr-18-19 14:40	Apr-18-19 14:50	Apr-18-19 15:00	Apr-18-19 15:10	Apr-18-19 15:20	Apr-18-19 15:30
Chloride by EPA 300	<i>Extracted:</i>	Apr-22-19 16:00	Apr-23-19 16:00				
	<i>Analyzed:</i>	Apr-23-19 08:59	Apr-23-19 09:04	Apr-23-19 09:09	Apr-23-19 09:14	Apr-22-19 21:52	Apr-23-19 22:10
	<i>Units/RL:</i>	mg/kg RL					
Chloride		413 50.0	167 25.2	220 50.2	714 24.9	142 5.03	137 4.96

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Kalei Stout
 Midland Laboratory Director



BS / BSD Recoveries



Project Name: Willow 17

Work Order #: 621815, 621815

Project ID: ---

Analyst: CHE

Date Prepared: 04/22/2019

Date Analyzed: 04/22/2019

Lab Batch ID: 3086555

Sample: 7676296-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Chloride	<5.00	250	251	100	250	248	99	1	90-110	20	

Analyst: CHE

Date Prepared: 04/22/2019

Date Analyzed: 04/22/2019

Lab Batch ID: 3086555

Sample: 7676298-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Chloride	<0.858	250	252	101	250	254	102	1	90-110	20	

Analyst: CHE

Date Prepared: 04/23/2019

Date Analyzed: 04/23/2019

Lab Batch ID: 3086701

Sample: 7676388-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Chloride	<5.00	250	246	98	250	249	100	1	90-110	20	

Relative Percent Difference RPD = 200*(C-F)/(C+F)

Blank Spike Recovery [D] = 100*(C)/[B]

Blank Spike Duplicate Recovery [G] = 100*(F)/[E]

All results are based on MDL and Validated for QC Purposes



Form 3 - MS / MSD Recoveries



Project Name: Willow 17

Work Order #: 621815

Project ID: ---

Lab Batch ID: 3086555

QC- Sample ID: 621249-004 S

Batch #: 1 Matrix: Soil

Date Analyzed: 04/22/2019

Date Prepared: 04/22/2019

Analyst: CHE

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	791	250	1020	92	250	1010	88	1	90-110	20	X

Lab Batch ID: 3086555

QC- Sample ID: 621249-008 S

Batch #: 1 Matrix: Soil

Date Analyzed: 04/22/2019

Date Prepared: 04/22/2019

Analyst: CHE

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	457	250	713	102	250	697	96	2	90-110	20	

Lab Batch ID: 3086557

QC- Sample ID: 621156-014 S

Batch #: 1 Matrix: Soil

Date Analyzed: 04/22/2019

Date Prepared: 04/22/2019

Analyst: CHE

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	9.98	248	176	67	248	244	94	32	90-110	20	XF

Matrix Spike Percent Recovery [D] = 100*(C-A)/B
Relative Percent Difference RPD = 200*|(C-F)/(C+F)|

Matrix Spike Duplicate Percent Recovery [G] = 100*(F-A)/E

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable
N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.



Form 3 - MS / MSD Recoveries



Project Name: Willow 17

Work Order # : 621815

Project ID: ---

Lab Batch ID: 3086557

QC- Sample ID: 621815-036 S

Batch #: 1 **Matrix:** Soil

Date Analyzed: 04/22/2019

Date Prepared: 04/22/2019

Analyst: CHE

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	142	252	320	71	252	381	95	17	90-110	20	X

Lab Batch ID: 3086701

QC- Sample ID: 619598-024 S

Batch #: 1 **Matrix:** Soil

Date Analyzed: 04/24/2019

Date Prepared: 04/23/2019

Analyst: CHE

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	338	250	578	96	250	565	91	2	90-110	20	

Lab Batch ID: 3086701

QC- Sample ID: 620657-024 S

Batch #: 1 **Matrix:** Soil

Date Analyzed: 04/24/2019

Date Prepared: 04/23/2019

Analyst: CHE

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	7800	248	10100	NC	248	10100	NC	0	90-110	20	X

Matrix Spike Percent Recovery [D] = 100*(C-A)/B
Relative Percent Difference RPD = 200*|(C-F)/(C+F)|

Matrix Spike Duplicate Percent Recovery [G] = 100*(F-A)/E

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable
N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.



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Page 1 of 4

Chain of Custody

Work Order No:

021815

Project Manager: Sally Stoffel Bill to: (if different) Bobby Haskell II
 Company Name: TRC Company Name: COG
 Address: 10 Dextra Dr STE 150E Address: _____
 City, State ZIP: Milvick, TX 74705 City, State ZIP: _____
 Phone: (432) 238-3003 Email: stoffel@trcsolutions.com

Program: UST/PST PRP Brownfields RRC Superfund
 State of Project: _____
 Reporting Level: I Level II Level III PST/UST TRRP Level IV
 Deliverables: EDD ADAPT Other: _____

Project Name: W1 New 17 Turn Around _____
 Project Number: _____ Routine
 P.O. Number: _____ Rush: 24 hr.
 Sampler's Name: S. Stoffel Due Date: 4/23/11

SAMPLE RECEIPT Temp Blank: Yes No Wet Ice: Yes No
 Temperature (°C): 0.50/0.9 Thermometer ID: AB
 Received In-lot: Yes No
 Cooler Custody Seals: Yes No Correction Factor: 0.1
 Sample Custody Seals: Yes No Total Containers: _____

Sample Identification	Matrix	Date Sampled	Time Sampled	Depth	Number of Containers	Sample Comments
W1-TT @ 4'	Soil	4/18/11	1025	4'	1	Chloride (E300) Hold
W1-TT @ 5'			1030	5'	X	
W1-TT @ 6'			1035	6'	X	
W1-TT @ 7'			1040	7'	X	
W1-TT @ 8'			1045	8'	X	
W1-TT @ 9'			1050	9'	X	Can't get > 600
W1-TT @ 10'			1055	10'	X	Can't get > 600
W1-TT @ 11'			1100	11'	X	Can't get > 600
N-TT @ 4'			1105	4'	X	
N-TT @ 5'			1110	5'	X	Can't get > 600

Total 200.7 / 6010 200.8 / 6020: 8RCRA 13PPM Texas 11 Al Sb As Ba Be B Cd Ca Cr Co Cu Fe Pb Mg Mn Mo Ni K Se Ag SiO2 Na Sr Ti Sn U V Zn
 Circle Method(s) and Metal(s) to be analyzed TCLP / SPLP 6010: 8RCRA Sb As Ba Be Cd Cr Co Cu Pb Mn Mo Ni Se Ag Ti U 1631 / 245.1 / 7470 / 7471 : Hg

Notice: Signature of this document and relinquishment of samples constitutes a valid purchase order from client company to Xenco, its affiliates and subcontractors. It assigns standard terms and conditions of service. Xenco will be liable only for the cost of samples and shall not assume any responsibility for any losses or expenses incurred by the client if such losses are due to circumstances beyond the control of Xenco. A minimum charge of \$75.00 will be applied to each project and a charge of \$5 for each sample submitted to Xenco, but not analyzed. These terms will be enforced unless previously negotiated.

Relinquished by: (Signature)	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Received by: (Signature)	Date/Time
<u>[Signature]</u>	<u>[Signature]</u>	4/22/11			
		10:40			



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Work Order No: 1021815
 Page 3 of 4

Chain of Custody

Project Manager: Steve Stoffel Bill to: (if different) Bobby Haslett
 Company Name: TRC Company Name: COG
 Address: 10 Destr. Dr STE 150E Address:
 City, State ZIP: Midland, TX 79705 City, State ZIP:
 Phone: (432) 238-3005 Email: stoffel@trcsolutions.com

Work Order Comments
 Program: PST PRP Brownfields RRC Superfund
 State of Project:
 Reporting Level II Level III PST/UST TRRP Level IV
 Deliverables: EDD ADAPT Other:

Project Name: W/low 17 Turn Around
 Project Number: --- Routine
 P.O. Number: --- Rush: 24 hr.
 Sampler's Name: S. Stoffel Due Date: 4/23/11

SAMPLE RECEIPT Temp Blank: Yes No Wet Ice: Yes No
 Temperature (°C): 0.5, 0.4 Thermom: 0.0
 Received Intact: Yes No
 Cooler Custody Seals: Yes No Correction Factor: 0.1
 Sample Custody Seals: Yes No Total Containers:

Sample Identification	Matrix	Date Sampled	Time Sampled	Depth	Number of Containers	ANALYSIS REQUEST	Work Order Notes
TT-2 @ 9'	soil	4/18/11	1205	9'	1	Chloride (E300) Hold	TAT starts the day received by the lab, if received by 4:30pm
TT-3 @ 2'			1210	2'	X		run if 2' > 600
TT-3 @ 3'			1215	3'	X		run if 3' > 600
TT-3 @ 4'			1220	4'	X		run if 4' > 600
TT-3 @ 5'			1225	5'	X		run if 5' > 600
TT-3 @ 6'			1230	6'	X		run if 6' > 600
TT-3 @ 7'			1235	7'	X		run if 7' > 600
TT-3 @ 8'			1240	8'	X		run if 7' > 600
TT-3 @ 4'			1245	4'	X		run if 4' > 600
E2-TT @ 5'			1250	5'	X		run if 4' > 600

Total 200.7 / 6010 200.8 / 6020: 8RCRA 13PPM Texas 11 AI Sb As Ba Be B Cd Ca Cr Co Cu Fe Pb Mg Mn Mo Ni K Se Ag SIO2 Na Sr Ti Sn U V Zn
 Circle Method(s) and Metal(s) to be analyzed: TCLP / SPLP 6010: 8RCRA Sb As Ba Be Cd Cr Co Cu Pb Mn Mo Ni Se Ag TI U 1631 / 245.1 / 7470 / 7471 : Hg

Relinquished by: (Signature) [Signature] Received by: (Signature) [Signature] Date/Time 4/18/11
 Relinquished by: (Signature) [Signature] Received by: (Signature) [Signature] Date/Time 4/18/11

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Client: TRC Solutions, Inc

Date/ Time Received: 04/22/2019 10:26:00 AM

Work Order #: 621815

Acceptable Temperature Range: 0 - 6 degC
Air and Metal samples Acceptable Range: Ambient
Temperature Measuring device used : R8

Sample Receipt Checklist	Comments
#1 *Temperature of cooler(s)?	.4
#2 *Shipping container in good condition?	Yes
#3 *Samples received on ice?	Yes
#4 *Custody Seals intact on shipping container/ cooler?	N/A
#5 Custody Seals intact on sample bottles?	N/A
#6*Custody Seals Signed and dated?	Yes
#7 *Chain of Custody present?	Yes
#8 Any missing/extra samples?	No
#9 Chain of Custody signed when relinquished/ received?	Yes
#10 Chain of Custody agrees with sample labels/matrix?	Yes
#11 Container label(s) legible and intact?	Yes
#12 Samples in proper container/ bottle?	Yes
#13 Samples properly preserved?	Yes
#14 Sample container(s) intact?	Yes
#15 Sufficient sample amount for indicated test(s)?	Yes
#16 All samples received within hold time?	Yes
#17 Subcontract of sample(s)?	N/A
#18 Water VOC samples have zero headspace?	N/A

*** Must be completed for after-hours delivery of samples prior to placing in the refrigerator**

Analyst:

PH Device/Lot#:

Checklist completed by: Brianna Teel Date: 04/22/2019
 Brianna Teel

Checklist reviewed by: Kalei Stout Date: 04/22/2019
 Kalei Stout



June 18, 2019

JARED STOFFEL

TRC

10 DESTA DR. SUITE 150 E

MIDLAND, TX 79705

RE: WILLOW 17 STATE

Enclosed are the results of analyses for samples received by the laboratory on 06/17/19 15:30.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-18-11. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

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

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

Accreditation applies to public drinking water matrices.

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

Sincerely,

A handwritten signature in black ink that reads "Celey D. Keene".

Celey D. Keene

Lab Director/Quality Manager

Analytical Results For:

 TRC
 JARED STOFFEL
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705
 Fax To:

Received:	06/17/2019	Sampling Date:	06/13/2019
Reported:	06/18/2019	Sampling Type:	Soil
Project Name:	WILLOW 17 STATE	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	COG- MALAGA NM		

Sample ID: SW - W1 - 1 (H902082-01)

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	240	16.0	06/18/2019	ND	400	100	400	18.2	

Sample ID: SW - W2 - 0.25 (H902082-02)

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	400	16.0	06/18/2019	ND	400	100	400	18.2	

Sample ID: SW - E2 - 1.5 (H902082-03)

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	64.0	16.0	06/18/2019	ND	400	100	400	18.2	

Cardinal Laboratories

*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

 TRC
 JARED STOFFEL
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705
 Fax To:

 Received: 06/17/2019
 Reported: 06/18/2019
 Project Name: WILLOW 17 STATE
 Project Number: NONE GIVEN
 Project Location: COG- MALAGA NM

 Sampling Date: 06/11/2019
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Tamara Oldaker

Sample ID: SW - N1 - 1.5 (H902082-04)

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	06/17/2019	ND	2.28	114	2.00	3.01		
Toluene*	<0.050	0.050	06/17/2019	ND	2.31	116	2.00	3.49		
Ethylbenzene*	<0.050	0.050	06/17/2019	ND	2.16	108	2.00	2.78		
Total Xylenes*	<0.150	0.150	06/17/2019	ND	6.59	110	6.00	3.15		
Total BTEX	<0.300	0.300	06/17/2019	ND						

Surrogate: 4-Bromofluorobenzene (PID) 105 % 73.3-129

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	224	16.0	06/18/2019	ND	400	100	400	18.2		

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	06/17/2019	ND	235	117	200	0.757		
DRO >C10-C28*	<10.0	10.0	06/17/2019	ND	199	99.3	200	0.575		
EXT DRO >C28-C36	<10.0	10.0	06/17/2019	ND						

Surrogate: 1-Chlorooctane 88.7 % 41-142

Surrogate: 1-Chlorooctadecane 77.8 % 37.6-147

Cardinal Laboratories

*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

 TRC
 JARED STOFFEL
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705
 Fax To:

 Received: 06/17/2019
 Reported: 06/18/2019
 Project Name: WILLOW 17 STATE
 Project Number: NONE GIVEN
 Project Location: COG- MALAGA NM

 Sampling Date: 06/11/2019
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Tamara Oldaker

Sample ID: FL - 1-3 (H902082-05)

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	224	16.0	06/18/2019	ND	400	100	400	18.2	

Sample ID: FL - 2-3 (H902082-06)

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	160	16.0	06/18/2019	ND	400	100	400	18.2	

Sample ID: FL - 3-3 (H902082-07)

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	208	16.0	06/18/2019	ND	400	100	400	18.2	

Sample ID: FL - 5-7 (H902082-08)

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	624	16.0	06/18/2019	ND	400	100	400	18.2	

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

 TRC
 JARED STOFFEL
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705
 Fax To:

 Received: 06/17/2019
 Reported: 06/18/2019
 Project Name: WILLOW 17 STATE
 Project Number: NONE GIVEN
 Project Location: COG- MALAGA NM

 Sampling Date: 06/17/2019
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Tamara Oldaker

Sample ID: FL - 7-3 (H902082-09)

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	06/17/2019	ND	2.28	114	2.00	3.01		
Toluene*	<0.050	0.050	06/17/2019	ND	2.31	116	2.00	3.49		
Ethylbenzene*	<0.050	0.050	06/17/2019	ND	2.16	108	2.00	2.78		
Total Xylenes*	<0.150	0.150	06/17/2019	ND	6.59	110	6.00	3.15		
Total BTEX	<0.300	0.300	06/17/2019	ND						

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

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	304	16.0	06/18/2019	ND	400	100	400	18.2		

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	06/17/2019	ND	235	117	200	0.757		
DRO >C10-C28*	<10.0	10.0	06/17/2019	ND	199	99.3	200	0.575		
EXT DRO >C28-C36	<10.0	10.0	06/17/2019	ND						

Surrogate: 1-Chlorooctane 98.0 % 41-142

Surrogate: 1-Chlorooctadecane 84.1 % 37.6-147

Cardinal Laboratories

*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

 TRC
 JARED STOFFEL
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705
 Fax To:

 Received: 06/17/2019
 Reported: 06/18/2019
 Project Name: WILLOW 17 STATE
 Project Number: NONE GIVEN
 Project Location: COG- MALAGA NM

 Sampling Date: 06/17/2019
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Tamara Oldaker

Sample ID: FL - 8-1.5 (H902082-10)
Chloride, SM4500Cl-B
mg/kg
Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	880	16.0	06/18/2019	ND	400	100	400	18.2	

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

 TRC
 JARED STOFFEL
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705
 Fax To:

 Received: 06/17/2019
 Reported: 06/18/2019
 Project Name: WILLOW 17 STATE
 Project Number: NONE GIVEN
 Project Location: COG- MALAGA NM

 Sampling Date: 06/17/2019
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Tamara Oldaker

Sample ID: FL - 9-3 (H902082-11)

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	06/17/2019	ND	2.28	114	2.00	3.01		
Toluene*	<0.050	0.050	06/17/2019	ND	2.31	116	2.00	3.49		
Ethylbenzene*	<0.050	0.050	06/17/2019	ND	2.16	108	2.00	2.78		
Total Xylenes*	<0.150	0.150	06/17/2019	ND	6.59	110	6.00	3.15		
Total BTEX	<0.300	0.300	06/17/2019	ND						

Surrogate: 4-Bromofluorobenzene (PID) 105 % 73.3-129

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	192	16.0	06/18/2019	ND	400	100	400	18.2		

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	06/17/2019	ND	235	117	200	0.757		
DRO >C10-C28*	<10.0	10.0	06/17/2019	ND	199	99.3	200	0.575		
EXT DRO >C28-C36	<10.0	10.0	06/17/2019	ND						

Surrogate: 1-Chlorooctane 101 % 41-142

Surrogate: 1-Chlorooctadecane 93.0 % 37.6-147

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Celey D. Keene, Lab Director/Quality Manager

Notes and Definitions

- ND Analyte NOT DETECTED at or above the reporting limit
- RPD Relative Percent Difference
- ** Samples not received at proper temperature of 6°C or below.
- *** Insufficient time to reach temperature.
- Chloride by SM4500Cl-B does not require samples be received at or below 6°C
Samples reported on an as received basis (wet) unless otherwise noted on report

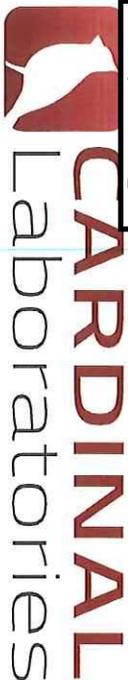
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Celey D. Keene, Lab Director/Quality Manager



CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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

Company Name: **TRC**

Project Manager: **Jared Staffell**

Address: **10 Deste Dr STE 150E**

City: **Midland** State: **Tx** Zip: **79705**

Phone #: **(432) 234-9005** Fax #: **-**

Project #: **-** Project Owner: **COG**

Project Name: **Willow 17 State**

Project Location: **Malaga, NM**

Sampler Name: **J Staffell**

BILL TO

ANALYSIS REQUEST

P.O. #:

Company: **COG**

Attn: **Billy Hestell**

Address:

City:

State:

Phone #:

Fax #:

FOR LAB USE ONLY

Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX						PRESERV.			DATE	TIME	TPH(8015)	BTEX(8021B)	Chloride(4500)
				GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :	ACID/BASE:	ICE / COOL	OTHER :					
H902082	SM-W1-1	C	1			X							6/3/19	1530			X
	SM-W2-0.25												6/3/19	1535			
	SM-E2-1.5												6/11/19	1300			
	SM-N1-1.5												6/11/19	1445	X	X	
	FL-1-3												6/11/19	1430			
	FL-2-3												6/11/19	1435			
	FL-3-3												6/11/19	1440			
	FL-5-7												6/12/19	1245			
	FL-7-3												6/17/19	1005	X	X	
	FL-8-1.5												6/17/19	1330			

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Relinquished By: *[Signature]* Date: **6/12/19** Time: **1530**
 Received By: *[Signature]*

Delivered By: (Circle One) **UPS**
 Sampler - UPS - Bus - Other: **S.O.C #97**

Sample Condition
 Cool Intact
 Yes No
 Checked By: **TR**

REMARKS:
Rush
Verbal on chloride results by noon if possible

July 24, 2019

JARED STOFFEL

TRC

10 DESTA DR. SUITE 150 E

MIDLAND, TX 79705

RE: WILLOW 17 STATE

Enclosed are the results of analyses for samples received by the laboratory on 06/19/19 16:20.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-18-11. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/ga/lab_accred_certif.html.

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

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

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

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

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

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

Sincerely,



Celey D. Keene

Lab Director/Quality Manager

Analytical Results For:

 TRC
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705

 Project: WILLOW 17 STATE
 Project Number: NONE GIVEN
 Project Manager: JARED STOFFEL
 Fax To:

 Reported:
 24-Jul-19 15:51

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SW - E1 - 3.5	H902116-01	Soil	17-Jun-19 00:00	19-Jun-19 16:20
SW - S1 - 0.75'	H902116-02	Soil	18-Jun-19 00:00	19-Jun-19 16:20
FL - 4-8.5'	H902116-03	Soil	19-Jun-19 00:00	19-Jun-19 16:20
FL - 5-8'	H902116-04	Soil	19-Jun-19 00:00	19-Jun-19 16:20
FL - 6-6'	H902116-05	Soil	19-Jun-19 00:00	19-Jun-19 16:20

07/24/19- The client brought to our attention that the wrong COC was attached to the original report sent on 06/20/19. This is the revised report with the correct COC attached. This report will replace the one sent on 06/20/19.

Cardinal Laboratories

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

 TRC
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705

 Project: WILLOW 17 STATE
 Project Number: NONE GIVEN
 Project Manager: JARED STOFFEL
 Fax To:

 Reported:
 24-Jul-19 15:51

SW - E1 - 3.5
H902116-01 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
---------	--------	-----	-----------------	-------	----------	-------	---------	----------	--------	-------

Cardinal Laboratories
Inorganic Compounds

Chloride	576		16.0	mg/kg	4	9062002	AC	20-Jun-19	4500-Cl-B	
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Cardinal Laboratories

* = Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

 TRC
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705

 Project: WILLOW 17 STATE
 Project Number: NONE GIVEN
 Project Manager: JARED STOFFEL
 Fax To:

 Reported:
 24-Jul-19 15:51

SW - S1 - 0.75'
H902116-02 (Soil)

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

Chloride	432		16.0	mg/kg	4	9062002	AC	20-Jun-19	4500-CI-B	
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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

 TRC
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705

 Project: WILLOW 17 STATE
 Project Number: NONE GIVEN
 Project Manager: JARED STOFFEL
 Fax To:

 Reported:
 24-Jul-19 15:51

FL - 4-8.5'
H902116-03 (Soil)

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

Chloride	704		16.0	mg/kg	4	9062002	AC	20-Jun-19	4500-Cl-B	
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Volatile Organic Compounds by EPA Method 8021

Benzene*	<0.050		0.050	mg/kg	50	9062003	BF	20-Jun-19	8021B	
Toluene*	<0.050		0.050	mg/kg	50	9062003	BF	20-Jun-19	8021B	
Ethylbenzene*	<0.050		0.050	mg/kg	50	9062003	BF	20-Jun-19	8021B	
Total Xylenes*	<0.150		0.150	mg/kg	50	9062003	BF	20-Jun-19	8021B	
Total BTEX	<0.300		0.300	mg/kg	50	9062003	BF	20-Jun-19	8021B	

Surrogate: 4-Bromofluorobenzene (PID)			106 %	73.3-129		9062003	BF	20-Jun-19	8021B	
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Petroleum Hydrocarbons by GC FID

GRO C6-C10*	<10.0		10.0	mg/kg	1	9061915	MS	19-Jun-19	8015B	
DRO >C10-C28*	<10.0		10.0	mg/kg	1	9061915	MS	19-Jun-19	8015B	
EXT DRO >C28-C36	<10.0		10.0	mg/kg	1	9061915	MS	19-Jun-19	8015B	

Surrogate: 1-Chlorooctane			86.9 %	41-142		9061915	MS	19-Jun-19	8015B	
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Surrogate: 1-Chlorooctadecane			89.4 %	37.6-147		9061915	MS	19-Jun-19	8015B	
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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

 TRC
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705

 Project: WILLOW 17 STATE
 Project Number: NONE GIVEN
 Project Manager: JARED STOFFEL
 Fax To:

 Reported:
 24-Jul-19 15:51

FL - 5-8'
H902116-04 (Soil)

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

Chloride	640		16.0	mg/kg	4	9062002	AC	20-Jun-19	4500-CI-B	
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* = Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

 TRC
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705

 Project: WILLOW 17 STATE
 Project Number: NONE GIVEN
 Project Manager: JARED STOFFEL
 Fax To:

 Reported:
 24-Jul-19 15:51

FL - 6-6'
H902116-05 (Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
---------	--------	-----	-----------------	-------	----------	-------	---------	----------	--------	-------

Cardinal Laboratories
Inorganic Compounds

Chloride	656		16.0	mg/kg	4	9062002	AC	20-Jun-19	4500-CI-B	
-----------------	------------	--	------	-------	---	---------	----	-----------	-----------	--

Cardinal Laboratories

*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

 TRC
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705

 Project: WILLOW 17 STATE
 Project Number: NONE GIVEN
 Project Manager: JARED STOFFEL
 Fax To:

 Reported:
 24-Jul-19 15:51

Inorganic Compounds - Quality Control
Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 9062002 - 1:4 DI Water										
Blank (9062002-BLK1)										
Prepared & Analyzed: 20-Jun-19										
Chloride	ND	16.0	mg/kg							
LCS (9062002-BS1)										
Prepared & Analyzed: 20-Jun-19										
Chloride	400	16.0	mg/kg	400		100	80-120			
LCS Dup (9062002-BSD1)										
Prepared & Analyzed: 20-Jun-19										
Chloride	400	16.0	mg/kg	400		100	80-120	0.00	20	

Cardinal Laboratories

* = Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

 TRC
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705

 Project: WILLOW 17 STATE
 Project Number: NONE GIVEN
 Project Manager: JARED STOFFEL
 Fax To:

 Reported:
 24-Jul-19 15:51

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch 9062003 - Volatiles
Blank (9062003-BLK1)

Prepared & Analyzed: 20-Jun-19

Benzene	ND	0.050	mg/kg							
Toluene	ND	0.050	mg/kg							
Ethylbenzene	ND	0.050	mg/kg							
Total Xylenes	ND	0.150	mg/kg							
Total BTEX	ND	0.300	mg/kg							
<i>Surrogate: 4-Bromofluorobenzene (PID)</i>	<i>0.105</i>		<i>mg/kg</i>	<i>0.100</i>		<i>105</i>	<i>73.3-129</i>			

LCS (9062003-BS1)

Prepared & Analyzed: 20-Jun-19

Benzene	1.53	0.050	mg/kg	2.00		76.7	72.2-131			
Toluene	1.82	0.050	mg/kg	2.00		90.8	71.7-126			
Ethylbenzene	1.75	0.050	mg/kg	2.00		87.7	68.9-126			
Total Xylenes	5.37	0.150	mg/kg	6.00		89.5	71.4-125			
<i>Surrogate: 4-Bromofluorobenzene (PID)</i>	<i>0.103</i>		<i>mg/kg</i>	<i>0.100</i>		<i>103</i>	<i>73.3-129</i>			

LCS Dup (9062003-BSD1)

Prepared & Analyzed: 20-Jun-19

Benzene	1.78	0.050	mg/kg	2.00		88.8	72.2-131	14.6	6.91	QR-02
Toluene	1.75	0.050	mg/kg	2.00		87.7	71.7-126	3.49	7.12	
Ethylbenzene	1.71	0.050	mg/kg	2.00		85.4	68.9-126	2.61	7.88	
Total Xylenes	5.23	0.150	mg/kg	6.00		87.1	71.4-125	2.72	7.46	
<i>Surrogate: 4-Bromofluorobenzene (PID)</i>	<i>0.102</i>		<i>mg/kg</i>	<i>0.100</i>		<i>102</i>	<i>73.3-129</i>			

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*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

 TRC
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705

 Project: WILLOW 17 STATE
 Project Number: NONE GIVEN
 Project Manager: JARED STOFFEL
 Fax To:

 Reported:
 24-Jul-19 15:51

Petroleum Hydrocarbons by GC FID - Quality Control
Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch 9061915 - General Prep - Organics
Blank (9061915-BLK1)

Prepared & Analyzed: 19-Jun-19

GRO C6-C10	ND	10.0	mg/kg							
DRO >C10-C28	ND	10.0	mg/kg							
EXT DRO >C28-C36	ND	10.0	mg/kg							
<i>Surrogate: 1-Chlorooctane</i>	42.3		mg/kg	50.0		84.5	41-142			
<i>Surrogate: 1-Chlorooctadecane</i>	43.0		mg/kg	50.0		86.1	37.6-147			

LCS (9061915-BS1)

Prepared & Analyzed: 19-Jun-19

GRO C6-C10	194	10.0	mg/kg	200		97.0	76.5-133			
DRO >C10-C28	183	10.0	mg/kg	200		91.4	72.9-138			
Total TPH C6-C28	377	10.0	mg/kg	400		94.2	78-132			
<i>Surrogate: 1-Chlorooctane</i>	45.2		mg/kg	50.0		90.4	41-142			
<i>Surrogate: 1-Chlorooctadecane</i>	45.1		mg/kg	50.0		90.1	37.6-147			

LCS Dup (9061915-BSD1)

Prepared & Analyzed: 19-Jun-19

GRO C6-C10	204	10.0	mg/kg	200		102	76.5-133	5.17	20.6	
DRO >C10-C28	189	10.0	mg/kg	200		94.6	72.9-138	3.53	20.6	
Total TPH C6-C28	394	10.0	mg/kg	400		98.4	78-132	4.38	18	
<i>Surrogate: 1-Chlorooctane</i>	48.0		mg/kg	50.0		95.9	41-142			
<i>Surrogate: 1-Chlorooctadecane</i>	46.2		mg/kg	50.0		92.3	37.6-147			

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Celey D. Keene, Lab Director/Quality Manager

Notes and Definitions

- QR-02 The RPD result exceeded the QC control limits; however, both percent recoveries were acceptable. Sample results for the QC batch were accepted based on percent recoveries and completeness of QC data.
- 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

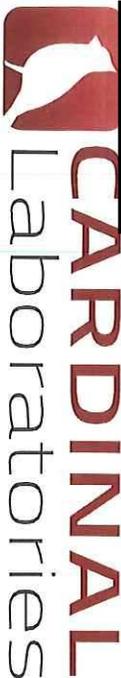
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Celey D. Keene, Lab Director/Quality Manager



RUSH 111
 Verbal on C1- PL2
 CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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

BILL TO

ANALYSIS REQUEST

Company Name: <u>TRC</u>		P.O. #:	
Project Manager: <u>Jared Stohel</u>		Company: <u>COG</u>	
Address: <u>1610 N. D. Suite 105</u>		Attn:	
City: <u>Midland</u> State: <u>TX</u> Zip:		Address:	
Phone #:	Fax #:	City:	
Project #:	Project Owner:	State:	Zip:
Project Name:		Phone #:	
Project Location: <u>W: Hwy 17 State</u>		Fax #:	
Sampler Name: <u>Kyle Schmeidt</u>			
FOR LAB USE ONLY			
Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	
		# CONTAINERS	
		GROUNDWATER	
		WASTEWATER	
		SOIL	
		OIL	
		SLUDGE	
		OTHER :	
		ACID/BASE:	
		ICE / COOL	
		OTHER :	
		DATE	
		TIME	

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Relinquished By: <u>[Signature]</u>	Date: <u>8-19-19</u>	Received By: <u>[Signature]</u>	Checked By: <u>[Signature]</u>
Time: <u>11:20</u>			
Delivered By: (Circle One)		Sample Condition	
Sampler - UPS - Bus - Other: <u>4.1e #97</u>		Cool <input checked="" type="checkbox"/> Intact <input checked="" type="checkbox"/>	Checked By: <u>YS</u>
		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
		Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
REMARKS: <u>US held @ trc solutions.com</u> <u>8cooper @ trcsolutions.com</u> <u>Kschmeidt @ trcsolutions.com</u>			
Phone Result: <input type="checkbox"/> Yes <input type="checkbox"/> No	Add'l Phone #:		
Fax Result: <input type="checkbox"/> Yes <input type="checkbox"/> No	Add'l Fax #:		



June 21, 2019

JARED STOFFEL

TRC

10 DESTA DR. SUITE 150 E

MIDLAND, TX 79705

RE: WILLOW 17 STATE

Enclosed are the results of analyses for samples received by the laboratory on 06/20/19 16:35.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-18-11. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

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

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

Accreditation applies to public drinking water matrices.

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

Sincerely,

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

Celey D. Keene

Lab Director/Quality Manager

Analytical Results For:

 TRC
 JARED STOFFEL
 10 DESTA DR. SUITE 150 E
 MIDLAND TX, 79705
 Fax To:

Received:	06/20/2019	Sampling Date:	06/20/2019
Reported:	06/21/2019	Sampling Type:	Soil
Project Name:	WILLOW 17 STATE	Sampling Condition:	** (See Notes)
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	COG- MALAGA NM		

Sample ID: FL - 8-3.5 (H902135-01)

Chloride, SM4500CI-B		mg/kg		Analyzed By: JH					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	480	16.0	06/21/2019	ND	416	104	400	3.92	

Sample ID: FL - 4-9 (H902135-02)

Chloride, SM4500CI-B		mg/kg		Analyzed By: JH					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	560	16.0	06/21/2019	ND	416	104	400	3.92	

Sample ID: FL - 5-8.5 (H902135-03)

Chloride, SM4500CI-B		mg/kg		Analyzed By: JH					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	560	16.0	06/21/2019	ND	416	104	400	0.00	

Sample ID: FL - 6-6.5 (H902135-04)

Chloride, SM4500CI-B		mg/kg		Analyzed By: JH					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	592	16.0	06/21/2019	ND	416	104	400	0.00	

Cardinal Laboratories

*=Accredited Analyte

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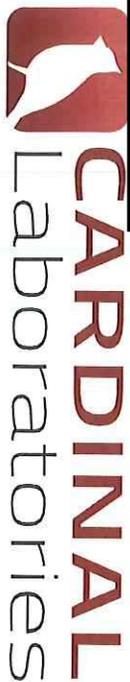
Celey D. Keene, Lab Director/Quality Manager

Notes and Definitions

- ND Analyte NOT DETECTED at or above the reporting limit
- RPD Relative Percent Difference
- ** Samples not received at proper temperature of 6°C or below.
- *** Insufficient time to reach temperature.
- Chloride by SM4500Cl-B does not require samples be received at or below 6°C
Samples reported on an as received basis (wet) unless otherwise noted on report



Celey D. Keene, Lab Director/Quality Manager



CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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

Company Name: TRC		P.O. #:		BILL TO		ANALYSIS REQUEST					
Project Manager: Daved Stoffel		Company: COG									
Address: 10 Disha Drive Suite 105		Attn:									
City: Midland State: TX Zip:		Address:									
Phone #: _____ Fax #: _____		City:									
Project #: _____		State:									
Project Name: _____		Phone #:									
Project Location: Willow 12 State		Zip:									
Sampler Name: Kyle Schmidt		Fax #:									
FOR LAB USE ONLY		PRESERV		SAMPLING							
Lab I.D. _____		Sample I.D. _____									
		(G)RAB OR (C)OMP.									
		# CONTAINERS									
		GROUNDWATER									
		WASTEWATER									
		SOIL									
		OIL									
		SLUDGE									
		OTHER:									
		ACID/BASE:									
		ICE / COOL									
		OTHER:									
		DATE		TIME							
H902135		FL-8-3.5		6-20-19		11:23					
2		FL-4-9		6-20-19		1:45					
3		FL-5-8.5		6-20-19		1:50					
4		FL-6-6.5		6-20-19		1:55					

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Reinquished By: _____ Date: **6-20-19** Received By: _____
 Reinquished By: _____ Date: **16:35** Received By: _____

Delivered By: (Circle One) UPS Bus Other: **37.1e #97**

Sample Condition: Cool Intact Yes No Yes No No

CHECKED BY: _____ (Initials) **TC**

REMARKS: **37.1e @ hresolutions.com**
Beooper @ hresolutions.com
Kschmidt @ hresolutions.com
Rushx verbal on CI-

Appendix B: Photographic Documentation

Photographic Documentation

Photograph No. 1

Date:
10/31/2018

Direction:
West

Description:
View of the initial response to the release.



Photograph No. 2

Date:
1/3/2019

Direction:
West

Description:
View of the impacted area.



Photographic Documentation

Photograph No. 3

Date:

6/11/2019

Direction:

Northwest

Description:

View of excavated area.



Photograph No. 4

Date:

6/12/2018

Direction:

West

Description:

View of excavated area.



Photographic Documentation

Photograph No. 5

Date:
6/18/2019

Direction:
North

Description:
View of
excavated area.



Photograph No. 6

Date:
7/14/2019

Direction:
West

Description:
View of the
remediated area.



**Appendix C: Release Notification and Corrective Action
(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 Department

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

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

Incident ID	
District RP	
Facility ID	
Application ID	

Release Notification

Responsible Party

Responsible Party	OGRID
Contact Name	Contact Telephone
Contact email	Incident # (assigned by OCD)
Contact mailing address	

Location of Release Source

Latitude _____ Longitude _____
(NAD 83 in decimal degrees to 5 decimal places)

Site Name	Site Type
Date Release Discovered	API# (if applicable)

Unit Letter	Section	Township	Range	County

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)

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

Cause of Release

Incident ID	
District RP	
Facility ID	
Application ID	

Was this a major release as defined by 19.15.29.7(A) NMAC? <input type="checkbox"/> Yes <input type="checkbox"/> No	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)?	

Initial Response

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

<input type="checkbox"/> The source of the release has been stopped. <input type="checkbox"/> The impacted area has been secured to protect human health and the environment. <input type="checkbox"/> Released materials have been contained via the use of berms or dikes, absorbent pads, or other containment devices. <input type="checkbox"/> All free liquids and recoverable materials have been removed and managed appropriately.
If all the actions described above have <u>not</u> been undertaken, explain why:
Per 19.15.29.8 B. (4) NMAC the responsible party may commence remediation immediately after discovery of a release. If remediation has begun, please attach a narrative of actions to date. If remedial efforts have been successfully completed or if the release occurred within a lined containment area (see 19.15.29.11(A)(5)(a) NMAC), please attach all information needed for closure evaluation.
I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.
Printed Name: _____ Title: _____ Signature: <u>Delann Opreat</u> Date: _____ email: _____ Telephone: _____
<u>OCD Only</u> Received by: _____ Date: _____

Incident ID	
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?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Are the lateral extents of the release within 300 feet of a continuously flowing watercourse or any other significant watercourse?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Are the lateral extents of the release within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark)?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Are the lateral extents of the release within 300 feet of an occupied permanent residence, school, hospital, institution, or church?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Are the lateral extents of the release within 500 horizontal feet of a spring or a private domestic fresh water well used by less than five households for domestic or stock watering purposes?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Are the lateral extents of the release within 1000 feet of any other fresh water well or spring?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Are the lateral extents of the release within incorporated municipal boundaries or within a defined municipal fresh water well field?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Are the lateral extents of the release within 300 feet of a wetland?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Are the lateral extents of the release overlying a subsurface mine?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Are the lateral extents of the release overlying an unstable area such as karst geology?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Are the lateral extents of the release within a 100-year floodplain?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Did the release impact areas not on an exploration, development, production, or storage site?	<input type="checkbox"/> Yes <input type="checkbox"/> No

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

<p><u>Characterization Report Checklist:</u> <i>Each of the following items must be included in the report.</i></p> <ul style="list-style-type: none"> <input type="checkbox"/> Scaled site map showing impacted area, surface features, subsurface features, delineation points, and monitoring wells. <input type="checkbox"/> Field data <input type="checkbox"/> Data table of soil contaminant concentration data <input type="checkbox"/> Depth to water determination <input type="checkbox"/> Determination of water sources and significant watercourses within ½-mile of the lateral extents of the release <input type="checkbox"/> Boring or excavation logs <input type="checkbox"/> Photographs including date and GIS information <input type="checkbox"/> Topographic/Aerial maps <input type="checkbox"/> 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.

Incident ID	
District RP	
Facility ID	
Application ID	

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

Printed Name: _____ Title: _____

Signature:  _____ Date: _____

email: _____ Telephone: _____

OCD Only

Received by: _____ Date: _____

Incident ID	
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.*

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

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations. The responsible party acknowledges they must substantially restore, reclaim, and re-vegetate the impacted surface area to the conditions that existed prior to the release or their final land use in accordance with 19.15.29.13 NMAC including notification to the OCD when reclamation and re-vegetation are complete.

Printed Name: _____ Title: _____
 Signature:  _____ Date: _____
 email: _____ Telephone: _____

OCD Only

Received by: _____ Date: _____

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

Closure Approved by: _____ Date: _____

Printed Name: _____ Title: _____

Appendix D: Depth to Groundwater Data

