Souder, Miller & Associates ♦ 201 S. Halagueno ♦ Carlsbad, NM 88221
(575) 689-7040

APPROVED
By Olivia Yu at 7:15 am, Mar 31, 2017

March 27, 2017

Ms. Olivia Yu
NMOCD District I
1625 N. French Drive
Hobbs, New Mexico 88240

SUBJECT: SOIL REMEDIATION WORK PLAN FOR INCIDENT 1RP-4548 STATE "S" BRINE AND WATER STATION (BW-028), LEA COUNTY, NEW MEXICO

Dear Ms. Yu:

On behalf of Key Energy Services (Key), Souder Miller & Associates (SMA) is pleased to submit the attached Work Plan summarizing the planned soil remediation of the release site located on the State "S" Brine And Water Station (BW-028) in Lea County, New Mexico. The purpose of the work plan is to obtain approval from the New Mexico Oil Conservation Division (NMOCD) for remediation of the release that occurred on December 21, 2016.

At the request of Key, SMA responded to assess and delineate the production fluids release associated with the State "S" Brine And Water Station (BW-028) location. The release was initially reported to NMOCD by Key Energy on January 9, 2017 and was a result of a human error. The table below summarizes information regarding the release. Results of the assessment and delineation follow in the attached report.

Table 1: Release information and Site Ranking

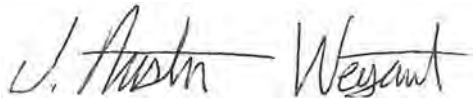
Name	State "S" Brine and Water Station (BW-028)				
Location	Incident Number	API Number	Section, Township, Range		
	1RP-4548	30-025-33547	SW/NE (Unit D)	Section 15	T 21S, R37 E NMPM
Estimated Date of Release	December 21, 2016				
Date Reported to NMOCD	January 9, 2017				
Reported by	Maren Coligan, Key Energy Services				
Land Owner	State of New Mexico				
Reported To	NM Oil Conservation Division (NMOCD)				
Source of Release	Well head				
Released Material	Produced Water				
Released Volume	10 bbls Produced Water				
Recovered Volume	0 bbls Produced Water				
Net Release	10 bbls Produced Water				
Nearest Waterway	46 miles West of the location				
Depth to Groundwater	Estimated to be 70 feet				

Nearest Domestic Water Source	Great than 1,000 feet
NMOCD Ranking	10
SMA Response Dates	Initial: 3/1/17 Delineation Activities
Estimated Volume Contaminated Soil Excavated and Disposed	60 cubic yards

A copy of the Initial C-141 Release Notification and Corrective Action form is located in Appendix B. For questions or comments pertaining to the release or the attached Work Plan, please feel free to contact either of us.

Submitted by:

SOUDER, MILLER & ASSOCIATES



Austin Weyant
Project Scientist

Reviewed by:

Cynthia Gray, CHMM
Senior Scientist

Encl.: Site Remediation Work Plan

SOIL REMEDIATION WORK PLAN FOR INCIDENT 1RP-4548

KEY ENERGY SERVICES, LLC

STATE "S" BRINE AND WATER STATION (BW-028)
API# 30-025-33547
SECTION 15, T21S R37E, NMPM
LEA COUNTY, NM

Prepared for:
Key Energy Services LLC
6 Desta Dr. Suite 4300
Midland, TX 79705

Prepared by:
Souder, Miller & Associates
201 S. Halagueno
Carlsbad, NM 88221
575-689-7040

March 27, 2017
SMA Reference
5E25856 BG

SMA
Souder, Miller & Associates
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1.0 Introduction

On behalf of Key Energy Services (Key), Souder Miller & Associates (SMA) has prepared this report that describes the assessment and initial delineation of the release associated with the State "S" Brine And Water Station (BW-028) in Lea County, New Mexico on land owned by the State of New Mexico. Figure 1 illustrates the vicinity and location of the site. This document includes the proposed Work Plan to address the release.

2.0 Site Ranking and Land Jurisdiction

The release site is located approximately 46 miles (> 1,000 feet) west of Salt Lake, in an area owned by State of New Mexico at an elevation of approximately 3,460 feet above sea level. After evaluation of the site using aerial photography and topographic maps and review of the New Mexico Office of the State Engineer's online Water Rights Reporting System, depth to groundwater is estimated to be less than 100 feet but greater than 50 feet below ground surface (bgs). Figure 1 depicts the site vicinity and Figure 2 depicts the site details and sample locations.

SMA searched the New Mexico State Engineer's Office online water well database for water wells in the vicinity of the release, and found one well approximately 300 feet from the release site. The database indicated the depth to water in the well is approximately 70 feet. The physical location of this release is within the jurisdiction of NMOCD.

This release location has been assigned an NMOCD ranking of 10 which requires a soil remediation standard of 10 parts per million (ppm) benzene, 50 ppm combined benzene, toluene, ethyl-benzene, and total xylenes (BTEX), and 1000 ppm total petroleum hydrocarbons (TPH). Table 1 illustrates site ranking rationale.

3.0 Assessment and Initial Results

The release site was initially sampled by Key Energy Services LLC in December, 2016. Samples were collected from five locations to a depth of approximately two feet, as shown on Figure 2. Analytical results are summarized in Table 3. The impacted surface was scraped into piles, comprising approximately 60 cubic yards of soil. On March 1, 2017, SMA personnel further assessed the impacted soils and release area onsite with a mobile chloride titration kit and collected soil samples for laboratory analysis.

Samples were collected by SMA from three locations to a depth of ten feet. Sample locations are noted on Figure 2. All samples were collected and processed according to NMOCD soil sampling procedures. The laboratory samples were sent under chain-of-custody protocols to SGS Accutest for analysis for Benzene and Total BTEX using EPA Method 8021B, DRO and GRO by EPA Method 8015D, and total Chlorides using EPA Method 300.0. Field screening results are summarized in Table 2, and laboratory analytical results are summarized in Table 3. Laboratory analytical results are included in Appendix A.

The affected area was found to be approximately 200 feet long and 130 feet wide (approximately 26,000 square feet). The release impact area was found to be across the pad around the wellhead and in the surrounding pasture. Soils were impacted to at least three feet below ground surface (bgs) in the pasture.

4.0 Soil Remediation Work Plan

On March 2, 2017, SMA supervised the excavation of the highly-impacted soils scraped up during the initial action, after approval from area utilities owners via New Mexico One-Call. SMA personnel guided excavation activities by collecting composite and discrete soil samples for field screening with a mobile titration unit (EPA 4500) and a calibrated PID. Highly impacted soils were hauled for disposal at Lea Land Landfill.

The delineation performed on March 1, 2017 sufficiently mapped the plume of impact in accordance with NMOCD COA guidance. Delineation results from 12/27/16 and 3/1/17 show that affected soil is present to at most three feet bgs.

In-situ remediation will be used to address remaining site contamination. The impacted area of the pasture will be excavated to a depth of three feet bgs, with excavated soils placed on a temporary liner onsite. The excavated area will be graded at a minimum of 2% slope to drain to a sump on the north side of the excavation. Small berms will be constructed on the north and east sides of the affected area to channel water to the sump. A geosynthetic clay liner (GCL) will be installed in the excavation, including the sump, overlain by a 40-mil plastic liner. The GCL and plastic liner will act as a cap above any impacted soil left in-place, ensuring no infiltration into any remaining impacted soils. A drainage layer will be placed on the plastic liner to allow leachate to flow to the drainage sump. Excavated soils will be amended with citric acid, phosphoric acid-based fertilizers and hay or another bulking agent, and re-emplaced on the drainage layer above the 40-mil plastic liner and GCL.

8000 gallons of fresh water (TDS <1,200 mg/l) will be pumped from a tank on-site and dispersed by an irrigation sprinkler on the affected area. The fresh water will mix with citric acid to flush chloride from the soil and carry it to the lined sump. Effluent from the sump will be immediately pumped to an above ground tank for proper disposal at the State S Brine Station. Calculations (included in Appendix C) indicate this initial water application should flush the chloride sufficiently to reach an average concentration of 746 ppm in soil. Additionally, natural precipitation events through the year will allow flushing of chloride and decrease the average predicted chloride concentration to less than 300 ppm. Samples at the base and sidewalls of the backfilled soils will be collected periodically and tested to confirm soils have been remediated to required chloride concentrations. After completion of soil remediation, the sump will be backfilled.

5.0 Re-vegetation Plan

Seeding of the location is recommended for June or July to coincide with the "rainy" season to achieve optimum results. Seed will be planted at one-quarter to pme-half inch deep using a disc type or similar rangeland drill sufficient to accommodate variations in seed sizes. If broadcast, seeding rates should be doubled. Seeding can be accomplished as early as May given all dirt work for the location is stabilized. Soil in this area will be tilled to reduce compaction.

Seed-bed preparation will be performed to provide a hospitable environment for germinating seed by breaking up impermeable soil layers that have formed and increasing void spaces for air and water. Ground shall be roughed-up prior to planting, by raking, harrowing or other methods.

Seed shall be broadcast with a "cyclone" hand seeder or similar broadcast seeder to facilitate an even spread. After seed is broadcast, ground shall be raked or dragged, to help bury it and improve soil contact and provide texture.

Mulch wil be placed to prevent loss of moisture and seed to wind. Mulching shall be accomplished using one of these following methods:

a) weed free straw (2 tons/ac;kg/ha)
b) wood residues (sawdust, wood chips, bark (2 tons/ac;kg/ha)
c) hydro-mulching (1,500 lb/ac;kg/ha)
d) composted manure (5 tons/ac;kg/ha)
e) excelsior blanket
f) straw jute
g) peanut hulls (2 tons/ac;kg/ha)

Livestock will be temporarily fenced-out of any seeded area, as they will otherwise greatly reduce possibility of successful re-vegetation. Probability of successful seeding will be considerably increased if fencing remains until reclamation is stable, and plants have grown well enough to withstand grazing. Stabilization would occur after a minimum of two full summer growing seasons after planting.

SMA will monitor the site in late August for Noxious Weeds, any species of concern will be treated chemically by a NMDA licensed applicator.

6.0 Conclusions and Recommendations

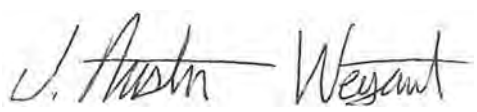
NMOCD Guidelines for Remediation of Leaks, Spills, and Releases have established the following action levels for constituents of concern for a site ranking of 10: 10 ppm (mg/kg) Benzene, 50 ppm total BTEX, and 1000 ppm TPH. The release consisted of produced water as confirmed during the initial assessment and delineation.

After the soil remediation work plan above is approved by NMOCD, SMA will begin the planned soil remediation activities on site.

If there are any questions regarding this report, please contact either Austin Weyant at 575-689-7040 or Cindy Gray at 505-325-7535.

Submitted by:

SOUDER, MILLER & ASSOCIATES



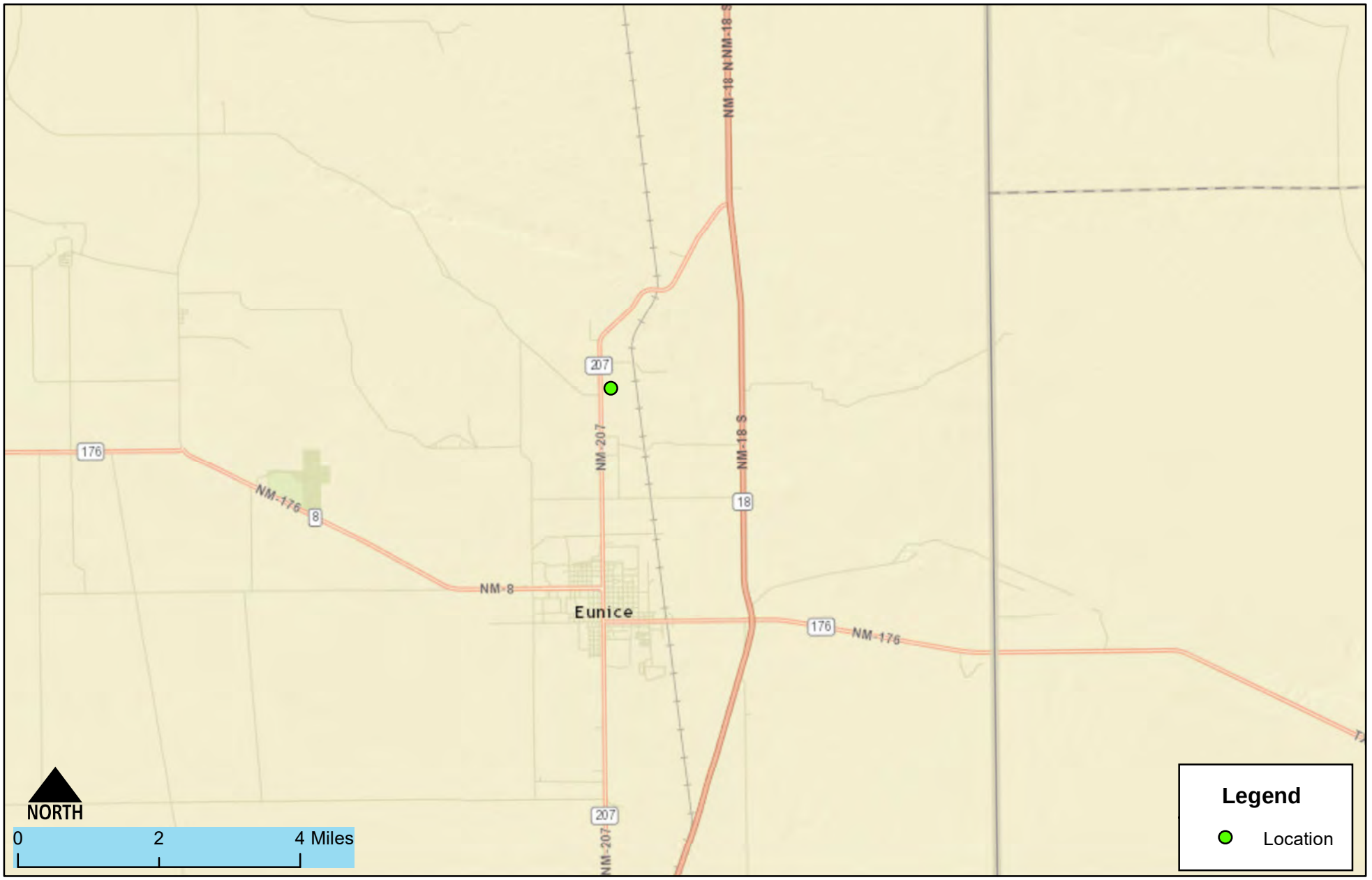
Austin Weyant
Project Scientist

Reviewed by:

Cynthia Gray, CHMM
Senior Scientist

FIGURE 1

VICINITY MAP



Vicinity Map
Key Energy- State S
Eunice, New Mexico

Figure 1

Revisions
By: Date: Descr:
By: Date: Descr:

Drawn Lucas Middleton
Checked
Approved

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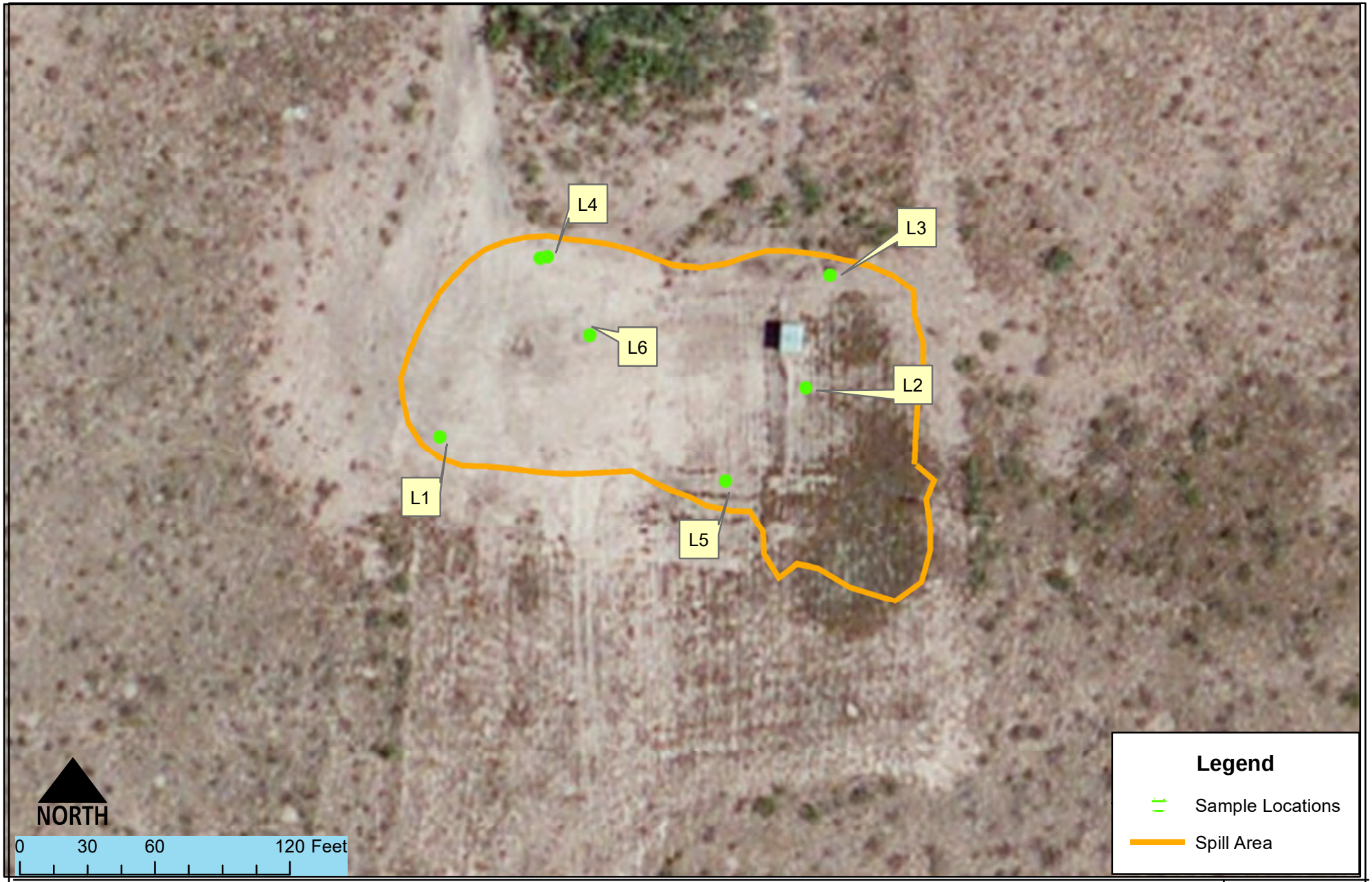
Date Saved: 4/12/2016

Document: C:\Users\lcm\Documents\GIS DATA\MAPS\key state .mxd

FIGURE 2A

SITE MAP



Detailed Site and Sample Map ~DRAFT~
Key State S 4548
UL D 21S 37E New Mexico

Figure 2

Revisions
By: Date: Descr:
By: Date: Descr:

Drawn Lucas Middleton
Checked
Approved

Date Saved: 3/27/2017

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FIGURE 2B

SITE MAP

INITIAL SAMPLING

State 1 Brine Station Sample Locations 12/27/2016. Eunice NM

Brine Spill 12/21/2016

Location sampled for Chloride (mg/Kg) (Method EPA 300)

SS # 1 (1 ft) - 317
SS # 2 (2 ft) - 624
SS # 3 (surface 0-6") - 643
SS # 4 Background (surface 0-6")
SS # 5 (surface 0-6") - 29
SS # 6 (1 ft) – 1,310
SS # 7 (surface 0-6") – 3,060
SS # 8 (1.5 ft) – 2,770
SS # 9 (surface) - 45
SS # 10 (1 ft) - 127
SS # 11 Stockpile 1 – 5,340
SS # 12 Stockpile 2 – 10,600

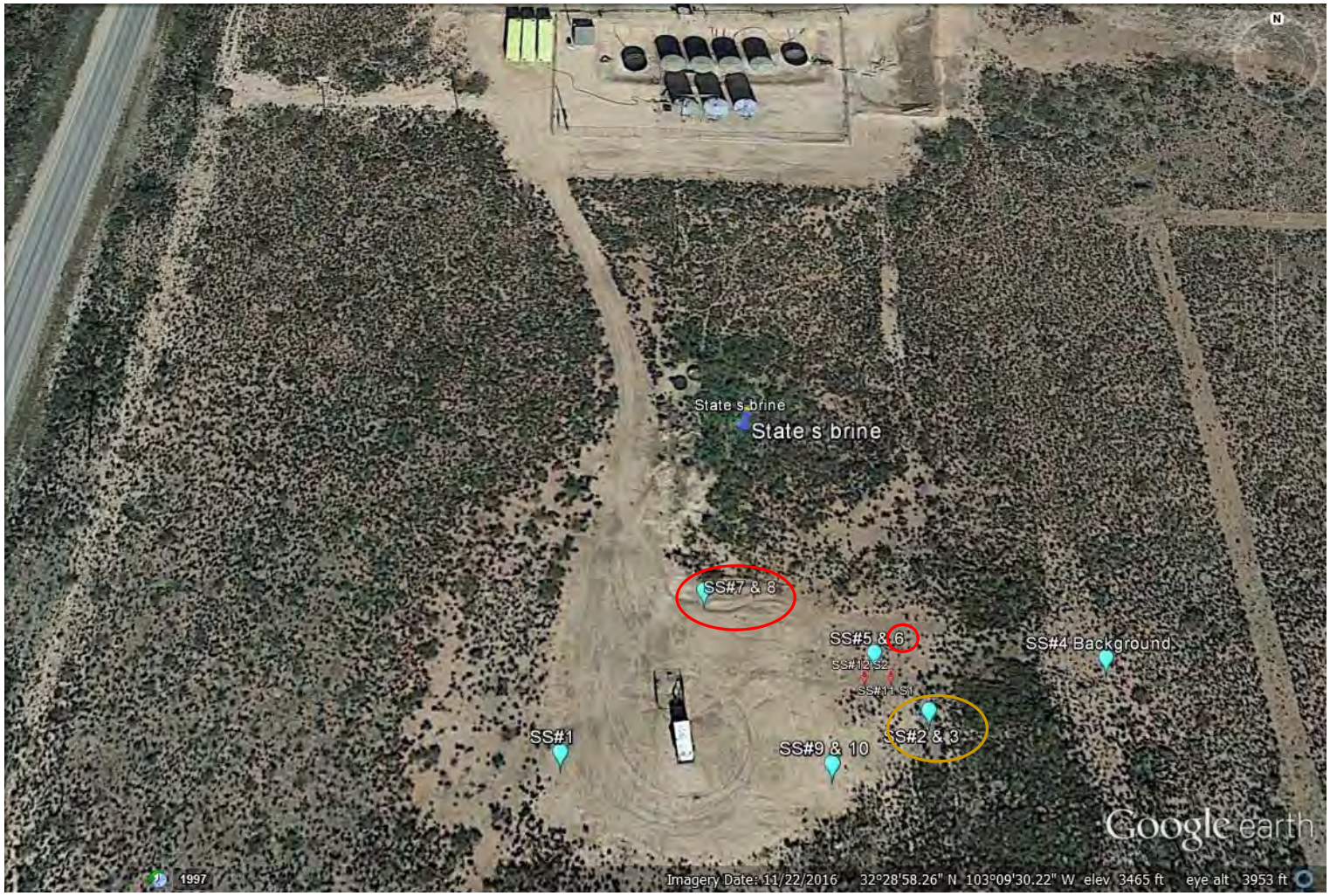
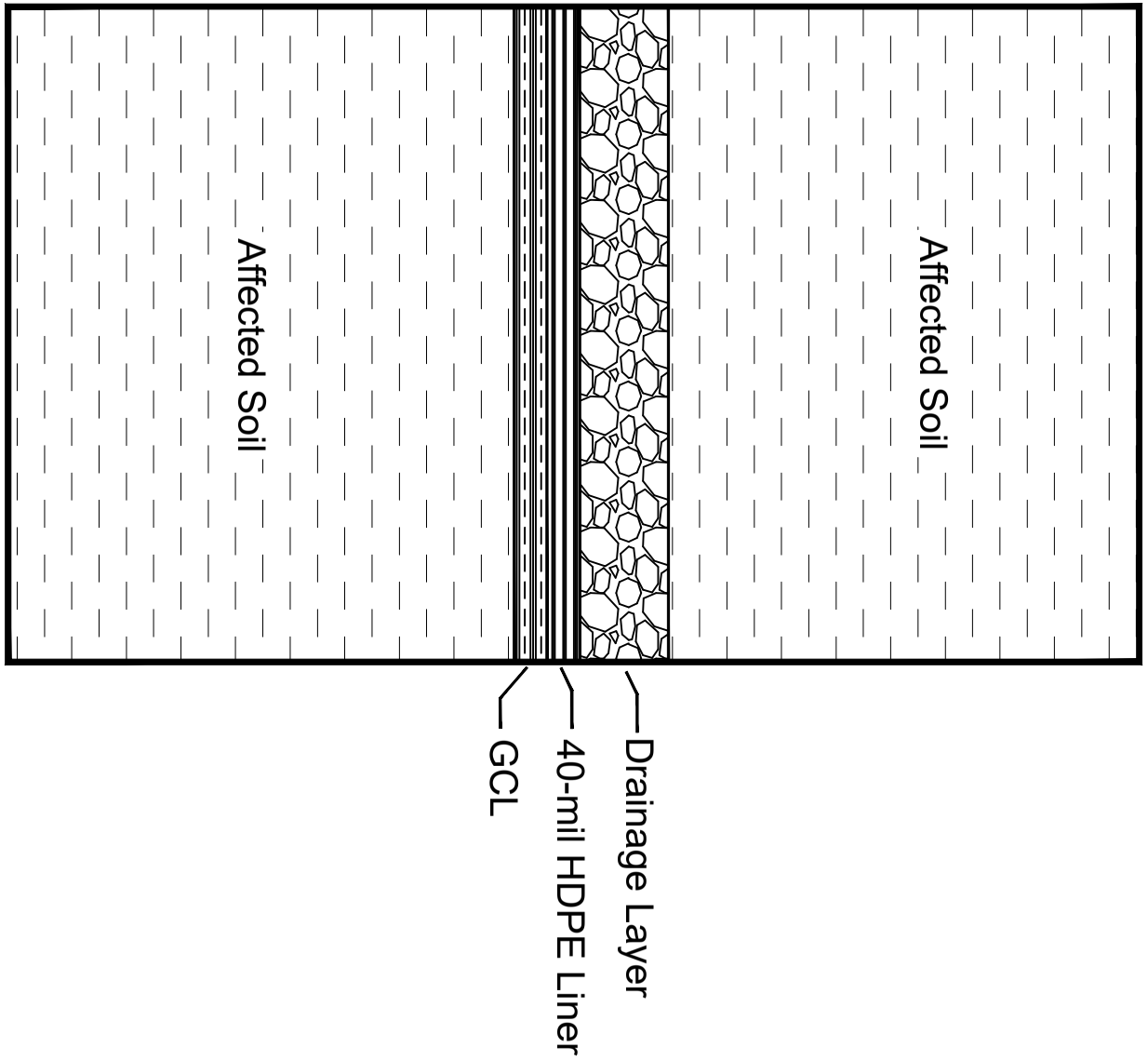


FIGURE 3
IN-SITU REMEDIATION DESIGN



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IN-SITU CAP & BIOBARRIER DESIGN
KEY STATION - STATE 1 BRINE STATION
EUNICE, LEA COUNTY, NEW MEXICO

Drawn	Checked	Approved
MAE	SAM	SAM

Date: MARCH, 2017

Scale: Horiz: NA
Vert: NA

Project No: 5B23978

Sheet: Figure 3

C:\Users\mae\Desktop\2017-03 In Situ Cap Drafting.dwg, 3/9/2017 1:10:43 PM mae

TABLE 1

RELEASE INFORMATION AND SITE RANKING

Key Energy LLC

Table 1: Site Ranking

Site Ranking Determination Table

Depth to Groundwater	NMOCD Numeric Rank for this Site	Source for Ranking	Notes
< 50 BGS = 20		USGS Topo Maps; Google Earth Elevation Difference from the site and	Monument Draw is 1 miles to the north east of the location. ; Site elevation is approximately 2500 feet above salt lake
50' to 99' = 10	10		
>100' = 0			
Ranking Criteria for Horizontal Distance to Nearest Surface Water	**NMOCD Numeric Rank for this Site**	**Source for Ranking**	**Notes**
< 200' = 20		USGS Topo Maps; Google Earth ; ArcMap	Salt Lake nearset surface water is 46 miles west of location
200' - 1000' = 10			
>1000' = 0	0		
Ranking Criteria for Horizontal Distance to a Water Well or Water Source	**NMOCD Numeric Rank for this Site**	**Source for Ranking**	**Notes**
<1000' from a water source? <200' from a private domestic water source? YES OR NO to BOTH. YES = 20, NO = 0	0	NM State Engineer Water Well Database	nearest well is 1080 feet west of location
	0		
Total Site Ranking	**10**		
Soil Remedation Standards	**0 to 9**	**10 to 19**	**>19**
Benzene	**10 PPM**	**10 PPM**	**10 PPM**
BTEX	**50 PPM**	**50 PPM**	**50 PPM**
TPH	**5000 PPM**	**1000 PPM**	**100 PPM**

TABLE 2

SUMMARY OF CHLORIDE FIELD SCREENING RESULTS

Table 2: Summary of Chloride Field Screening Results

State S 1RP-4548
Produced Water
12/21/2016

FIELD SCREENING RESULTS SUMMARY					
Date	Time	Field Screening Reference	Sample Depth (Feet BGS)	Chlorides Results	Lab Sample Collected Y/N
3/1/2017		L3-4	4	64	y
3/1/2017		L4-4	4	438	y
3/1/2017		L4-10	10	107	y
3/1/2017		L6-S	surface	12289	y

SMA Project #5B23978 BG14

TABLE 3

SUMMARY OF LABORATORY ANALYSES

Table 3: Summary of Laboratory Analyses

Analytical Report-	Sample Location Figure 2a	Sample Number on Figure 2b	Sample Date	Depth	BTEX	Benzene	Cl-
					ppm	mg/Kg	mg/Kg
TC96720-1	Location 1	SS #1	12/27/2016	1'	<6.7	<12	317
TC96720-3	Location 2	SS #3	12/27/2016	.5'	<6.2	<11	643
TC96720-2	2	SS #2	12/27/2016	2'	<7.5	<13	624
TC96720-5	Location 3	SS #5	12/27/2016	.5'	<6.6	<12	29
TC96720-6	3	SS #6	12/27/2016	1'	<7.9	<14	1310
TD128-1	3		3/1/2017	4'	N/A	N/A	<5.7
TC96720-7	Location 4	SS #7	12/27/2016	0.5'	<7.2	<13	3060
TC96720-8	4	SS #8	12/27/2016	1.5'	<7.5	<13	2770
TD128-2	4		3/1/2017	4'	N/A	N/A	911
TD128-3	4		3/1/2017	10'	N/A	N/A	156
TC96720-9	Location 5	SS #9	12/27/2016	.5'	<6.6	<12	45
TC96720-10	5	SS #10	12/27/2016	1'	<6.8	<12	127
TD128-4	Location 6		3/1/2017	.5'	<0.16	<0.055	13800
TC96720-11	Stockpile 1	SS #11	12/27/2016	Surface	<7.1	<13	5340
TC96720-12	Stockpile 2	SS #12	12/27/2016	Surface	<6.9	<12	10600
TC96720-4	Back ground	SS #13	12/27/2016	.5'	<5.7	<10	<2.7

APPENDIX A

LABORATORY ANALYTICAL REPORTS

SGS ACCUTEST IS PART OF SGS, THE WORLD'S LEADING INSPECTION, VERIFICATION, TESTING AND CERTIFICATION COMPANY.

e-Hardcopy 2.0
Automated Report

Technical Report for

Key Energy

State S 4548

SGS Accutest Job Number: TD128

Sampling Date: 03/01/17

Report to:

Key Energy

aramirez01@keyenergy.com

Total number of pages in report: **36**

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Richard Rodriguez
Laboratory Director

Client Service contact: Electa Brown 713-271-4700

Certifications: TX (T104704220-17-26) AR (14-016-0) AZ (AZ0769) FL (E87628) KS (E-10366) LA (85695/04004) NJ (TX010) OK (2014-172) VA (7654)

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SGS Accutest is the sole authority for authorizing edits or modifications to this document.
Unauthorized modification of this report is strictly prohibited.

Sections: 1 2 3 4 5 6 7 8

Table of Contents

Sample Summary

Key Energy

State S 4548

Job No: TD128

Sample Number	Collected Date	Time	By	Received	Matrix Code	Matrix Type	Client Sample ID
TD128-1	03/01/17	10:30		03/07/17	SO	Soil	L3-4
TD128-2	03/01/17	09:30		03/07/17	SO	Soil	L4-4
TD128-3	03/01/17	09:55		03/07/17	SO	Soil	L4-10
TD128-4	03/01/17	11:30		03/07/17	SO	Soil	L6-5

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

Summary of Hits

Job Number: TD128
Account: Key Energy
Project: State S 4548
Collected: 03/01/17

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
TD128-1	**L3-4**					
No hits reported in this sample.						
TD128-2	**L4-4**					
Chloride		911	54		mg/kg	EPA 300
TD128-3	**L4-10**					
Chloride		156	5.3		mg/kg	EPA 300
TD128-4	**L6-5**					
TPH-DRO (C10-C28) [a]		378	5.2	1.3	mg/kg	SW846 8015C
Chloride		13800	530		mg/kg	EPA 300

(a) Analysis performed at SGS Accutest, Lafayette, LA.

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	L3-4		
Lab Sample ID:	TD128-1	**Date Sampled:**	03/01/17
Matrix:	SO - Soil	**Date Received:**	03/07/17
		Percent Solids:	86.6
Project:	State S 4548		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	< 5.7	5.7	mg/kg	1	03/09/17 11:21	ES	EPA 300
Solids, Percent	86.6		%	1	03/08/17	PA	SM 2540 G

RL = Reporting Limit

Report of Analysis

Client Sample ID:	L4-4		
Lab Sample ID:	TD128-2	**Date Sampled:**	03/01/17
Matrix:	SO - Soil	**Date Received:**	03/07/17
		Percent Solids:	92.9
Project:	State S 4548		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	911	54	mg/kg	10	03/09/17 12:07	ES	EPA 300
Solids, Percent	92.9		%	1	03/08/17	PA	SM 2540 G

RL = Reporting Limit

Report of Analysis

Client Sample ID:	L4-10		
Lab Sample ID:	TD128-3	**Date Sampled:**	03/01/17
Matrix:	SO - Soil	**Date Received:**	03/07/17
		Percent Solids:	94.1
Project:	State S 4548		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	156	5.3	mg/kg	1	03/09/17 12:23	ES	EPA 300
Solids, Percent	94.1		%	1	03/08/17	PA	SM 2540 G

RL = Reporting Limit

Report of Analysis

Client Sample ID:	L6-5		
Lab Sample ID:	TD128-4	**Date Sampled:**	03/01/17
Matrix:	SO - Soil	**Date Received:**	03/07/17
Method:	SW846 8015C SW846 5035	**Percent Solids:**	93.6
Project:	State S 4548		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	LA263910.D	1	03/09/17	ALA	03/09/17 13:20	n/a	L:GLA1145
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.20 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	5.5	5.4	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	91%		63-139%
540-36-3	1,4-Difluorobenzene	97%		52-140%

(a) Analysis performed at SGS Accutest, Lafayette, LA.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	L6-5		
Lab Sample ID:	TD128-4	**Date Sampled:**	03/01/17
Matrix:	SO - Soil	**Date Received:**	03/07/17
Method:	SW846 8021B SW846 5035	**Percent Solids:**	93.6
Project:	State S 4548		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	LP028897.D	1	03/10/17	ALA	03/09/17 13:20	n/a	L:GLP967
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.20 g	5.0 ml	100 ul
Run #2			

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.055	0.011	mg/kg	
108-88-3	Toluene	ND	0.055	0.034	mg/kg	
100-41-4	Ethylbenzene	ND	0.055	0.0083	mg/kg	
1330-20-7	Xylenes (total)	ND	0.16	0.0060	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
540-36-3	1,4-Difluorobenzene	97%		80-115%
460-00-4	4-Bromofluorobenzene	109%		79-135%

(a) Analysis performed at SGS Accutest, Lafayette, LA.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	L6-5		
Lab Sample ID:	TD128-4	**Date Sampled:**	03/01/17
Matrix:	SO - Soil	**Date Received:**	03/07/17
Method:	SW846 8015C SW846 3546	**Percent Solids:**	93.6
Project:	State S 4548		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	S0027156.D	1	03/10/17	ALA	03/10/17	L:OP7772	L:GLG462
Run #2							

	Initial Weight	Final Volume
Run #1	20.4 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	378	5.2	1.3	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	100%		31-130%

(a) Analysis performed at SGS Accutest, Lafayette, LA.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	L6-5		
Lab Sample ID:	TD128-4	**Date Sampled:**	03/01/17
Matrix:	SO - Soil	**Date Received:**	03/07/17
		Percent Solids:	93.6
Project:	State S 4548		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	13800	530	mg/kg	100	03/09/17 12:38	ES	EPA 300
Solids, Percent	93.6		%	1	03/08/17	PA	SM 2540 G

RL = Reporting Limit

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

CHAIN OF CUSTODY

SGS ACCUTEST

PAGE ___ OF ___

10165 Harwin Dr, Ste 150 Houston, TX 77036
TEL. 713-271-4700 FAX: 713-271-4770
www.accutest.com

FED-EX Tracking # | Bottle Order Control #
SGS Accutest Quote # | SGS Accutest Job # TD128

Client / Reporting Information

Company Name: Key Energy
Street Address: 12400 W. Interstate 20 E
City: Odessa State: TX Zip: 79765
Project Contact: Ana Ramirez E-mail: aramirez@keyenergy.com
Phone #: 432-571-7203 Fax #:
Sampler(s) Name(s): Heather Patterson Phone #: 575-202-5343

Project Information

Project Name: State S 4548
Street:
City: State:
Project #:
Client Purchase Order #:
Project Manager:

Billing Information (if different from Report to)

Company Name:
Street Address:
City: State: Zip:
Attention:

Requested Analyses

SGS Accutest Sample #	Field ID / Point of Collection	Collection Date	Time	Sampled By	Matrix	# of bottles	Number of preserved Bottles	300 Anions Cl	BTEX 8021	TPH 8015B	Matrix Codes / LAB USE ONLY
1	LB - 4	3/1/17	10:30	HMP				X			
2	L4 - 4	3/1/17	9:30	HMP				X			
3	L4 - 10	3/1/17	9:55	HMP				X			
4	LC - 5	3/1/17	11:30	HMP				X	X	X	

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL- Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB-Field Blank

Number of preserved Bottles: HCl; HNO3; ZnAcNaOH; H2SO4; NONE; DI Water; MEOH; TSP; NaHSO4; ENCORE; OTHER

VERIFIED BY:

TAGGED BY:

Turnaround Time (Business days)

- [x] Standard
- [ ] 5 Day *RUSH*
- [ ] 4 Day *RUSH*
- [ ] 3 Day *RUSH*
- [ ] 2 Day *RUSH*
- [ ] 1 Day *EMERGENCY*

Emergency & Rush T/A data available VIA Lablink

Approved By (SGS Accutest PM): / Date:

Data Deliverable Information

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] FULT1 (Level 3+4)
- [ ] REDT1 (Level 3+4)
- [ ] Commercial "C"
- [ ] TRRP
- [ ] EDD Format
- [ ] Other _____

Commercial "A" = Results Only
Commercial "B" = Results + QC Summary
Commercial "C" = Results + QC & Surrogate Summary

Comments / Special Instructions

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1		1 UPS	2 UPS		2 1455 3/7/17
3		3	4		4
5		5	Custody Seal #	[ ] Intact [ ] Not Intact	Preserved where applicable [ ] On Ice [ ] Cooler Temp. 4c 9

TD128: Chain of Custody
Page 1 of 4

ACCUTEST

COOLER TEMP FORM

TC# TD128

Delivered by (circle one): FedEx/UPS ALGC Driver Client

Date: 3/7/17

Client: Kel Energy

Cooler Number: _____

Thermometer ID: IR-9 CF, °C: 0.0 Corrected Temp, °C: 14.9

SAMPLES CONTAINED IN COOLER

SHIPPED BY
5768876245
PAC N MAIL
910 W PIERCE ST
CARLSBAD NM 88220

14 LBS

1 OF 1

DWT: 18,14,12
AH

SHIP TO:
ACCUTEST GULF COAST
5763904757
SUITE 150
10165 HARWIN DR
HOUSTON TX 77036

TX 774 9-05

UPS GROUND
TRACKING #: 1Z A0F 784 03 9460 4106

BILLING: P/P

Trx Ref No.: PM PKG ID 260740
Trx Ref No.: FROM SOUDER MILLER & ASSOCIATES
XOL 17.01.28

NV4G 84.0A 01/2017

1Z A0F 784 03 9460 4106

DWS - ID

1455

1/2016

TD128: Chain of Custody
Page 2 of 4

SGS Accutest Sample Receipt Summary

Job Number: TD128 **Client:** KEY ENERGY **Project:** STATE 4548

Date / Time Received: 3/7/2017 2:55:00 PM **Delivery Method:** **Airbill #'s:**

No. Coolers: 1 **Therm ID:** IR9; **Temp Adjustment Factor:** 0;

Cooler Temps (Initial/Adjusted): #1: (16.9/16.9);

Cooler Security	Y	or	N		Y	or	N
1. Custody Seals Present:	☑		☐	3. COC Present:	☑		☐
2. Custody Seals Intact:	☑		☐	4. Smpl Dates/Time OK	☑		☐

Cooler Temperature	Y	or	N
1. Temp criteria achieved:	☑		☐
2. Cooler temp verification:			
3. Cooler media:	No Ice		

Quality Control Preservation	Y	or	N	N/A	WTB	STB
1. Trip Blank present / cooler:	☐		☐	☑	☐	☐
2. Trip Blank listed on COC:	☐		☐	☑		
3. Samples preserved properly:	☑		☐			
4. VOCs headspace free:	☐		☐	☑		

Sample Integrity - Documentation	Y	or	N
1. Sample labels present on bottles:	☑		☐
2. Container labeling complete:	☑		☐
3. Sample container label / COC agree:	☑		☐

Sample Integrity - Condition	Y	or	N
1. Sample recvd within HT:	☑		☐
2. All containers accounted for:	☑		☐
3. Condition of sample:	Intact		

Sample Integrity - Instructions	Y	or	N	N/A
1. Analysis requested is clear:	☑		☐	
2. Bottles received for unspecified tests	☐		☑	
3. Sufficient volume recvd for analysis:	☑		☐	
4. Compositing instructions clear:	☐		☐	☑
5. Filtering instructions clear:	☐		☐	☑

Comments Matris is soil.
Split off -4 into 2oz for metals

TD128: Chain of Custody
Page 3 of 4

Sample Receipt Log

Job #: TD128 **Date / Time Received:** 3/7/2017 2:55:00 PM 2:55:00 **Initials:** DS

Client: KEY ENERGY

Cooler #	Sample ID:	Vol	Bot #	Location	Pres	pH	Therm ID	Initial Temp	Therm CF	Corrected Temp
1	TD128-1	4oz	1	2-76	N/P	Note #2 - Preservative check not applicable.	IR9	16.9	0	16.9
1	TD128-2	4oz	1	2-76	N/P	Note #2 - Preservative check not applicable.	IR9	16.9	0	16.9
1	TD128-3	4oz	1	2-76	N/P	Note #2 - Preservative check not applicable.	IR9	16.9	0	16.9
	TD128-4	4oz	1	SUB	N/P	Note #2 - Preservative check not applicable.				
	TD128-4	2oz	2	2-76	N/P	Note #2 - Preservative check not applicable.				

General Chemistry

QC Data Summaries

Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: TD128
Account: KEYENTXO - Key Energy
Project: State S 4548

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Bromide	GP41114/GN80168	5.0	0.0	mg/kg	99.6	107	107.4	90-110%
Chloride	GP41114/GN80168	5.0	0.0	mg/kg	99.6	90.2	90.6	90-110%
Fluoride	GP41114/GN80168	5.0	0.0	mg/kg	99.6	106	106.4	90-110%
Nitrogen, Nitrate	GP41114/GN80168	5.0	0.0	mg/kg	99.6	90.4	90.4	90-110%
Nitrogen, Nitrite	GP41114/GN80168	5.0	0.0	mg/kg	99.6	90.1	90.5	90-110%
Sulfate	GP41114/GN80168	5.0	0.0	mg/kg	99.6	94.4	94.8	90-110%

Associated Samples:
Batch GP41114: TD128-1, TD128-2, TD128-3, TD128-4
(*) Outside of QC limits

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: TD128
Account: KEYENTXO - Key Energy
Project: State S 4548

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Bromide	GP41114/GN80168	TD128-1	mg/kg	0.0	0.0	0.0	0-20%
Chloride	GP41114/GN80168	TD128-1	mg/kg	5.3	9.9	60.5(a)	0-20%
Fluoride	GP41114/GN80168	TD128-1	mg/kg	3.5	3.9	10.8	0-20%
Nitrogen, Nitrate	GP41114/GN80168	TD128-1	mg/kg	0.0	0.0	0.0	0-20%
Nitrogen, Nitrite	GP41114/GN80168	TD128-1	mg/kg	0.0	0.0	0.0	0-20%
Solids, Percent	GN80115	TD116-1	%	87.4	88	0.7	0-5%
Sulfate	GP41114/GN80168	TD128-1	mg/kg	37.7	37.2	1.3	0-20%

Associated Samples:
Batch GN80115: TD128-1, TD128-2, TD128-3, TD128-4
Batch GP41114: TD128-1, TD128-2, TD128-3, TD128-4
(*) Outside of QC limits
(a) RPD acceptable due to low duplicate and sample concentrations.

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: TD128
Account: KEYENTXO - Key Energy
Project: State S 4548

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Bromide	GP41114/GN80168	TD128-1	mg/kg	0.0	229	239	104.3	80-120%
Chloride	GP41114/GN80168	TD128-1	mg/kg	5.3	229	246	105.1	80-120%
Fluoride	GP41114/GN80168	TD128-1	mg/kg	3.5	229	249	107.2	80-120%
Nitrogen, Nitrate	GP41114/GN80168	TD128-1	mg/kg	0.0	229	237	103.4	80-120%
Nitrogen, Nitrite	GP41114/GN80168	TD128-1	mg/kg	0.0	229	226	98.6	80-120%
Sulfate	GP41114/GN80168	TD128-1	mg/kg	37.7	229	275	103.6	80-120%

Associated Samples:
Batch GP41114: TD128-1, TD128-2, TD128-3, TD128-4
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits

Misc. Forms

Custody Documents and Other Forms

(SGS Accutest Lafayette)

Includes the following where applicable:

- Chain of Custody

SGS ACCUTEST

CHAIN OF CUSTODY

10165 Harwin Drive, Houston, TX 77036
TEL. 713-271-4700 FAX: 713-271-4770
www.sgs.com

FED-EX Tracking # | Bottle Order Control #
SGS Accutest Quote # | SGS Accutest Job: TD128

Client / Reporting Information
Company Name: SGS Accutest
Street Address: 10165 Harwin Drive
City: Houston State: TX Zip: 77036
Project Contact / E-mail: Trameshia.Brown@sgs.com
Phone #: 713-271-4700 Fax #:
Sampler(s) Name(s): Phone:

Project Information
Project Name: Stste S 4548
Street:
City: State:
Project #:
Client Purchase Order #:
Project Manager:

Billing Information (if different from Report to)
Company Name:
Street Address:
City: State: Zip:
Attention:

Requested Analysis (see TEST CODE sheet): B8015DRO ,V5035SPM ,V8015GRO ,V8021BTX ,

SGS Accutest Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Date	Time	Sampled by	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	B8015DRO ,V5035SPM ,V8015GRO ,V8021BTX	LAB USE ONLY
4	L6-5		3/1/17	11:30:00 AM		SO	1					x				X	

Matrix Codes: DW - Drinking Water, GW - Ground Water, WW - Water, SW - Surface Water, SO - Soil, SL- Sludge, SED-Sediment, OI - Oil, LIQ - Other Liquid, AIR - Air, SOL - Other Solid, WP - Wipe, FB-Field Blank, EB-Equipment Blank, RB- Rinse Blank, TB-Trip Blank

RUSH

Turnaround Time (Business days)
- [ ] Std. 10 Business Days
- [ ] 5 Day RUSH
- [ ] 3 Day EMERGENCY
- [ ] 2 Day EMERGENCY
- [ ] 1 Day EMERGENCY
- [x] other Due 3/10/2017

Emergency & Rush T/A data available VIA Lablink

Approved By (SGS Accutest PM): / Date:

Data Deliverable Information
- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] FULLT1 (Level 3+4)
- [ ] NJ Reduced
- [ ] Commercial "C"
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] State Forms
- [ ] EDD Format
- [x] Other COMMB

Commercial "A" = Results Only
Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions
RR122 (7A-3)
RR131 (V)

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1 S. Ames	1900 3-8-17	1 SGS TX Driver 3-9-17	2 TX Driver	3-9-17	2 [signature]
Relinquished by Sampler: 3 [signature]	3-9-17 1053	Received By: 3 [signature]	Relinquished By: 4	Date Time:	Received By: 4
Relinquished by: 5	Date Time:	Received By: 5	Custody Seal # CS [signature]	☑ Intact ☐ Not intact	Preserved where applicable ☒ On Ice ☑ Cooler Temp. 1.9 DV 418

TD128: Chain of Custody
Page 1 of 3
SGS Accutest Lafayette

Date / Time: 3/8/2017 2:46:55 PM
CSR: TRAMESHB
Job #: TD128
Client Project: Stste S 4548
Deliverable: COMMB
TAT: Due 3/10/2017

Sub Lab: Accutest Gulf Coast Louisiana
Address: 500 Ambassador Caffery Prkway
City: Scott
State: LA Zip: 70583
Contact: Sample Receiving
Phone: 800-304-5227

SGS Accutest Sample #	Client Sample Description	Analysis	Location	Sampled By	Date Sampled	Time Sampled	Aliquot
TD128-4	L6-5	B8015DRO ,V5035SPM ,V8015GRO ,V8021BTX ,	2-76 ,SUB ,		3/1/2017	11:30:00 AM	

Comments:

Sample Management Receipt: _____ Date: _____

TD128: Chain of Custody
Page 2 of 3

SGS Accutest Sample Receipt Summary

Job Number: TD128 **Client:** SGS ACCUTEST **Project:** STATE S 4548

Date / Time Received: 3/9/2017 10:15:00 AM **Delivery Method:** Accutest Courier **Airbill #'s:**

Cooler Temps (Initial/Adjusted): #1: (1.9/1.9);

Cooler Security	Y	or	N		Y	or	N
1. Custody Seals Present:	☑		☐	3. COC Present:	☑		☐
2. Custody Seals Intact:	☑		☐	4. Smpl Dates/Time OK	☑		☐

Cooler Temperature	Y	or	N
1. Temp criteria achieved:	☑		☐
2. Cooler temp verification:			
3. Cooler media:	Ice (direct contact)		
4. No. Coolers:	1		

Quality Control Preservation	Y	or	N	N/A
1. Trip Blank present / cooler:	☐		☐	☑
2. Trip Blank listed on COC:	☐		☐	☑
3. Samples preserved properly:	☑		☐	
4. VOCs headspace free:	☐		☐	☑

Sample Integrity - Documentation	Y	or	N
1. Sample labels present on bottles:	☑		☐
2. Container labeling complete:	☑		☐
3. Sample container label / COC agree:	☑		☐

Sample Integrity - Condition	Y	or	N
1. Sample recvd within HT:	☑		☐
2. All containers accounted for:	☑		☐
3. Condition of sample:	Intact		

Sample Integrity - Instructions	Y	or	N	N/A
1. Analysis requested is clear:	☑		☐	
2. Bottles received for unspecified tests	☐		☑	
3. Sufficient volume recvd for analysis:	☑		☐	
4. Compositing instructions clear:	☐		☐	☑
5. Filtering instructions clear:	☐		☐	☑

Comments

Received (Fraction 4) 4oz NP soil with analysis of GRO & 8021BTX expired before arrival.

GC Volatiles

QC Data Summaries

(SGS Accutest Lafayette)

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: TD128
Account: ALGC SGS Accutest Gulf Coast
Project: KEYENTXO: Stste S 4548

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GLA1145-MB2	LA263906.D	1	03/09/17	MB	n/a	n/a	GLA1145

The QC reported here applies to the following samples: **Method:** SW846 8015C

TD128-4

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	5.0	4.9	mg/kg	

CAS No.	Surrogate Recoveries		Limits
460-00-4	4-Bromofluorobenzene	93%	63-139%
540-36-3	1,4-Difluorobenzene	98%	52-140%

Method Blank Summary

Job Number: TD128
Account: ALGC SGS Accutest Gulf Coast
Project: KEYENTXO: Stste S 4548

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GLP967-MB3	LP028896.D	1	03/10/17	JF	n/a	n/a	GLP967

The QC reported here applies to the following samples: **Method:** SW846 8021B

TD128-4

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	50	9.7	ug/kg	
100-41-4	Ethylbenzene	ND	50	7.6	ug/kg	
108-88-3	Toluene	ND	50	31	ug/kg	
1330-20-7	Xylenes (total)	ND	150	5.5	ug/kg	

CAS No.	Surrogate Recoveries		Limits
540-36-3	1,4-Difluorobenzene	95%	80-115%
460-00-4	4-Bromofluorobenzene	106%	79-135%

Blank Spike/Blank Spike Duplicate Summary

Job Number: TD128
Account: ALGC SGS Accutest Gulf Coast
Project: KEYENTXO: Stste S 4548

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GLA1145-BS2	LA263902.D	1	03/09/17	MB	n/a	n/a	GLA1145
GLA1145-BSD2	LA263904.D	1	03/09/17	MB	n/a	n/a	GLA1145

The QC reported here applies to the following samples: **Method:** SW846 8015C

TD128-4

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	BSD mg/kg	BSD %	RPD	Limits Rec/RPD
	TPH-GRO (C6-C10)	50	55.8	112	53.4	107	4	79-121/6

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
460-00-4	4-Bromofluorobenzene	94%	95%	63-139%
540-36-3	1,4-Difluorobenzene	99%	100%	52-140%

* = Outside of Control Limits.

Blank Spike/Blank Spike Duplicate Summary

Job Number: TD128
Account: ALGC SGS Accutest Gulf Coast
Project: KEYENTXO: Stste S 4548

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GLP967-BS3	LP028894.D	1	03/10/17	JF	n/a	n/a	GLP967
GLP967-BSD3	LP028895.D	1	03/10/17	JF	n/a	n/a	GLP967

The QC reported here applies to the following samples: **Method:** SW846 8021B

TD128-4

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	BSD ug/kg	BSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	2500	2250	90	2320	93	3	80-120/8
100-41-4	Ethylbenzene	2500	2530	101	2630	105	4	84-121/8
108-88-3	Toluene	2500	2480	99	2560	102	3	83-122/8
1330-20-7	Xylenes (total)	7500	7620	102	7870	105	3	85-120/7

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
540-36-3	1,4-Difluorobenzene	98%	99%	80-115%
460-00-4	4-Bromofluorobenzene	104%	107%	79-135%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: TD128
Account: ALGC SGS Accutest Gulf Coast
Project: KEYENTXO: Stste S 4548

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TD128-4MS	LA263912.D	1	03/09/17	MB	n/a	n/a	GLA1145
TD128-4MSD	LA263914.D	1	03/09/17	MB	n/a	n/a	GLA1145
TD128-4	LA263910.D	1	03/09/17	MB	n/a	n/a	GLA1145

The QC reported here applies to the following samples: **Method:** SW846 8015C

TD128-4

CAS No.	Compound	TD128-4 mg/kg	Q	Spike mg/kg	MS mg/kg	MS %	Spike mg/kg	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-GRO (C6-C10)	ND		110	128	117	110	128	117	0	79-121/6

CAS No.	Surrogate Recoveries	MS	MSD	TD128-4	Limits
460-00-4	4-Bromofluorobenzene	94%	95%	91%	63-139%
540-36-3	1,4-Difluorobenzene	97%	108%	97%	52-140%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: TD128
Account: ALGC SGS Accutest Gulf Coast
Project: KEYENTXO: Stste S 4548

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TD128-4MS	LP028898.D	1	03/10/17	JF	n/a	n/a	GLP967
TD128-4MSD	LP028899.D	1	03/10/17	JF	n/a	n/a	GLP967
TD128-4	LP028897.D	1	03/10/17	JF	n/a	n/a	GLP967

The QC reported here applies to the following samples: **Method:** SW846 8021B

TD128-4

CAS No.	Compound	TD128-4 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND		5480	4880	89	5480	4860	89	0	80-120/8
100-41-4	Ethylbenzene	ND		5480	5390	98	5480	5380	98	0	84-121/8
108-88-3	Toluene	ND		5480	5250	96	5480	5250	96	0	83-122/8
1330-20-7	Xylenes (total)	ND		16400	16200	99	16400	16200	99	0	85-120/7

CAS No.	Surrogate Recoveries	MS	MSD	TD128-4	Limits
540-36-3	1,4-Difluorobenzene	99%	98%	97%	80-115%
460-00-4	4-Bromofluorobenzene	104%	103%	109%	79-135%

* = Outside of Control Limits.

GC Semi-volatiles

QC Data Summaries

(SGS Accutest Lafayette)

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: TD128
Account: ALGC SGS Accutest Gulf Coast
Project: KEYENTXO: Stste S 4548

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP7772-MB	S0027152.D	1	03/10/17	JT	03/10/17	OP7772	GLG462

The QC reported here applies to the following samples: **Method:** SW846 8015C

TD128-4

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	ND	5.0	1.2	mg/kg	

CAS No.	Surrogate Recoveries		Limits
84-15-1	o-Terphenyl	93%	31-130%

Blank Spike/Blank Spike Duplicate Summary

Job Number: TD128
Account: ALGC SGS Accutest Gulf Coast
Project: KEYENTXO: Stste S 4548

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP7772-BS	S0027153.D	1	03/10/17	JT	03/10/17	OP7772	GLG462
OP7772-BSD	S0027154.D	1	03/10/17	JT	03/10/17	OP7772	GLG462

The QC reported here applies to the following samples: **Method:** SW846 8015C

TD128-4

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	BSD mg/kg	BSD %	RPD	Limits Rec/RPD
	TPH-DRO (C10-C28)	150	159	106	144	96	10	60-115/46

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
84-15-1	o-Terphenyl	119%	110%	31-130%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: TD128
Account: ALGC SGS Accutest Gulf Coast
Project: KEYENTXO: Stste S 4548

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP7772-MS	S0027155.D	1	03/10/17	JT	03/10/17	OP7772	GLG462
TD128-4	S0027156.D	1	03/10/17	JT	03/10/17	OP7772	GLG462

The QC reported here applies to the following samples: **Method:** SW846 8015C

TD128-4

CAS No.	Compound	TD128-4 mg/kg	Q	Spike mg/kg	MS mg/kg	MS %	Limits
	TPH-DRO (C10-C28)	378		158	661	179* [a]	60-115

CAS No.	Surrogate Recoveries	MS	TD128-4	Limits
84-15-1	o-Terphenyl	118%	100%	31-130%

(a) Outside control limits due to high level in sample relative to spike amount.

* = Outside of Control Limits.

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e-Hardcopy 2.0
Automated Report

Technical Report for

Key Energy

State# S Brine Station

SGS Accutest Job Number: TC96720

Sampling Date: 12/27/16

Report to:

Key Energy
6 Desota Drvie Suite 4300
Midland, TX 79705
aramirez01@keyenergy.com

ATTN: Ana Ramirez

Total number of pages in report: **51**

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Richard Rodriguez
Laboratory Director

Client Service contact: Electa Brown 713-271-4700

Certifications: TX (T104704220-16-25) AR (14-016-0) AZ (AZ0769) FL (E87628) KS (E-10366) LA (85695/04004) NJ (TX010) OK (2014-172) VA (7654)

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Sample Summary

Key Energy

State# S Brine Station

Job No: TC96720

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
TC96720-1	12/27/16	12:42		12/28/16	SO	Soil	SS# 1 1FT
TC96720-2	12/27/16	12:48		12/28/16	SO	Soil	SS# 2 2FT
TC96720-3	12/27/16	12:51		12/28/16	SO	Soil	SS# 3 SURFACE
TC96720-4	12/27/16	12:56		12/28/16	SO	Soil	SS# 4 BACKGROUND
TC96720-5	12/27/16	13:00		12/28/16	SO	Soil	SS# 5 SURFACE
TC96720-6	12/27/16	13:05		12/28/16	SO	Soil	SS# 6 1FT
TC96720-7	12/27/16	13:10		12/28/16	SO	Soil	SS# 7 SURFACE
TC96720-8	12/27/16	13:15		12/28/16	SO	Soil	SS# 8 1.5FT
TC96720-9	12/27/16	13:18		12/28/16	SO	Soil	SS# 9 SURFACE
TC96720-10	12/27/16	13:25		12/28/16	SO	Soil	SS# 10 1FT
TC96720-11	12/27/16	13:30		12/28/16	SO	Soil	SS# 11 STOCKPILE 1
TC96720-12	12/27/16	13:32		12/28/16	SO	Soil	SS# 12 STOCKPILE 2

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

Summary of Hits

Job Number: TC96720
Account: Key Energy
Project: State# S Brine Station
Collected: 12/27/16

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
TC96720-1	**SS# 1 1FT**					
Chloride		317	14		mg/kg	EPA 300
TC96720-2	**SS# 2 2FT**					
Chloride		624	30		mg/kg	EPA 300
TC96720-3	**SS# 3 SURFACE**					
Chloride		643	27		mg/kg	EPA 300
TC96720-4	**SS# 4 BACKGROUND**					
No hits reported in this sample.						
TC96720-5	**SS# 5 SURFACE**					
Chloride		29.0	2.7		mg/kg	EPA 300
TC96720-6	**SS# 6 1FT**					
Chloride		1310	62		mg/kg	EPA 300
TC96720-7	**SS# 7 SURFACE**					
Chloride		3060	150		mg/kg	EPA 300
TC96720-8	**SS# 8 1.5FT**					
Chloride		2770	150		mg/kg	EPA 300
TC96720-9	**SS# 9 SURFACE**					
Chloride		45.2	2.8		mg/kg	EPA 300
TC96720-10	**SS# 10 1FT**					
Chloride		127	5.7		mg/kg	EPA 300
TC96720-11	**SS# 11 STOCKPILE 1**					
Chloride		5340	290		mg/kg	EPA 300

Summary of Hits

Job Number: TC96720
Account: Key Energy
Project: State# S Brine Station
Collected: 12/27/16

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
TC96720-12	**SS# 12 STOCKPILE 2**					
Chloride		10600	580		mg/kg	EPA 300

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	SS# 1 1FT		
Lab Sample ID:	TC96720-1	**Date Sampled:**	12/27/16
Matrix:	SO - Soil	**Date Received:**	12/28/16
Method:	SW846 8021B	**Percent Solids:**	88.6
Project:	State# S Brine Station		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	LP027043.D	1	12/30/16	ALA	n/a	n/a	L:GLP846
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.20 g	5.0 ml	100 ul
Run #2			

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	61	12	ug/kg	
108-88-3	Toluene	ND	61	38	ug/kg	
100-41-4	Ethylbenzene	ND	61	9.2	ug/kg	
1330-20-7	Xylenes (total)	ND	180	6.7	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
540-36-3	1,4-Difluorobenzene	99%		80-115%
460-00-4	4-Bromofluorobenzene	94%		79-135%

(a) Analysis performed at SGS Accutest, Lafayette, LA.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SS# 1 1FT		
Lab Sample ID:	TC96720-1	**Date Sampled:**	12/27/16
Matrix:	SO - Soil	**Date Received:**	12/28/16
		Percent Solids:	88.6
Project:	State# S Brine Station		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	317	14	mg/kg	5	01/04/17 02:00	ES	EPA 300
Solids, Percent	88.6		%	1	12/28/16	NM	SM 2540 G

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SS# 2 2FT		
Lab Sample ID:	TC96720-2	**Date Sampled:**	12/27/16
Matrix:	SO - Soil	**Date Received:**	12/28/16
Method:	SW846 8021B	**Percent Solids:**	83.8
Project:	State# S Brine Station		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	LP027056.D	1	12/30/16	ALA	n/a	n/a	L:GLP846
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.10 g	5.0 ml	100 ul
Run #2			

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	68	13	ug/kg	
108-88-3	Toluene	ND	68	42	ug/kg	
100-41-4	Ethylbenzene	ND	68	10	ug/kg	
1330-20-7	Xylenes (total)	ND	200	7.5	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
540-36-3	1,4-Difluorobenzene	100%		80-115%
460-00-4	4-Bromofluorobenzene	92%		79-135%

(a) Analysis performed at SGS Accutest, Lafayette, LA.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SS# 2 2FT		
Lab Sample ID:	TC96720-2	**Date Sampled:**	12/27/16
Matrix:	SO - Soil	**Date Received:**	12/28/16
		Percent Solids:	83.8
Project:	State# S Brine Station		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	624	30	mg/kg	10	01/04/17 02:47	ES	EPA 300
Solids, Percent	83.8		%	1	12/28/16	NM	SM 2540 G

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SS# 3 SURFACE		
Lab Sample ID:	TC96720-3	**Date Sampled:**	12/27/16
Matrix:	SO - Soil	**Date Received:**	12/28/16
Method:	SW846 8021B	**Percent Solids:**	93.1
Project:	State# S Brine Station		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	LP027057.D	1	12/30/16	ALA	n/a	n/a	L:GLP846
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.10 g	5.0 ml	100 ul
Run #2			

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	56	11	ug/kg	
108-88-3	Toluene	ND	56	35	ug/kg	
100-41-4	Ethylbenzene	ND	56	8.5	ug/kg	
1330-20-7	Xylenes (total)	ND	170	6.2	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
540-36-3	1,4-Difluorobenzene	100%		80-115%
460-00-4	4-Bromofluorobenzene	94%		79-135%

(a) Analysis performed at SGS Accutest, Lafayette, LA.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SS# 3 SURFACE		
Lab Sample ID:	TC96720-3	**Date Sampled:**	12/27/16
Matrix:	SO - Soil	**Date Received:**	12/28/16
		Percent Solids:	93.1
Project:	State# S Brine Station		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	643	27	mg/kg	10	01/04/17 03:02	ES	EPA 300
Solids, Percent	93.1		%	1	12/28/16	NM	SM 2540 G

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SS# 4 BACKGROUND		
Lab Sample ID:	TC96720-4	**Date Sampled:**	12/27/16
Matrix:	SO - Soil	**Date Received:**	12/28/16
Method:	SW846 8021B	**Percent Solids:**	93.4
Project:	State# S Brine Station		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	LP027058.D	1	12/30/16	ALA	n/a	n/a	L:GLP846
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.50 g	5.0 ml	100 ul
Run #2			

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	52	10	ug/kg	
108-88-3	Toluene	ND	52	32	ug/kg	
100-41-4	Ethylbenzene	ND	52	7.9	ug/kg	
1330-20-7	Xylenes (total)	ND	160	5.7	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
540-36-3	1,4-Difluorobenzene	101%		80-115%
460-00-4	4-Bromofluorobenzene	92%		79-135%

(a) Analysis performed at SGS Accutest, Lafayette, LA.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SS# 4 BACKGROUND		
Lab Sample ID:	TC96720-4	**Date Sampled:**	12/27/16
Matrix:	SO - Soil	**Date Received:**	12/28/16
		Percent Solids:	93.4
Project:	State# S Brine Station		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	< 2.7	2.7	mg/kg	1	01/04/17 03:18	ES	EPA 300
Solids, Percent	93.4		%	1	12/28/16	NM	SM 2540 G

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SS# 5 SURFACE		
Lab Sample ID:	TC96720-5	**Date Sampled:**	12/27/16
Matrix:	SO - Soil	**Date Received:**	12/28/16
Method:	SW846 8021B	**Percent Solids:**	90.2
Project:	State# S Brine Station		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	LP027059.D	1	12/31/16	ALA	n/a	n/a	L:GLP846
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.10 g	5.0 ml	100 ul
Run #2			

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	60	12	ug/kg	
108-88-3	Toluene	ND	60	37	ug/kg	
100-41-4	Ethylbenzene	ND	60	9.0	ug/kg	
1330-20-7	Xylenes (total)	ND	180	6.6	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
540-36-3	1,4-Difluorobenzene	102%		80-115%
460-00-4	4-Bromofluorobenzene	92%		79-135%

(a) Analysis performed at SGS Accutest, Lafayette, LA.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SS# 5 SURFACE		
Lab Sample ID:	TC96720-5	**Date Sampled:**	12/27/16
Matrix:	SO - Soil	**Date Received:**	12/28/16
		Percent Solids:	90.2
Project:	State# S Brine Station		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	29.0	2.7	mg/kg	1	01/04/17 03:33	ES	EPA 300
Solids, Percent	90.2		%	1	12/28/16	NM	SM 2540 G

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SS# 6 1FT		
Lab Sample ID:	TC96720-6	**Date Sampled:**	12/27/16
Matrix:	SO - Soil	**Date Received:**	12/28/16
Method:	SW846 8021B	**Percent Solids:**	80.8
Project:	State# S Brine Station		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	LP027060.D	1	12/31/16	ALA	n/a	n/a	L:GLP846
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.20 g	5.0 ml	100 ul
Run #2			

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	71	14	ug/kg	
108-88-3	Toluene	ND	71	44	ug/kg	
100-41-4	Ethylbenzene	ND	71	11	ug/kg	
1330-20-7	Xylenes (total)	ND	210	7.9	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
540-36-3	1,4-Difluorobenzene	100%		80-115%
460-00-4	4-Bromofluorobenzene	93%		79-135%

(a) Analysis performed at SGS Accutest, Lafayette, LA.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SS# 6 1FT		
Lab Sample ID:	TC96720-6	**Date Sampled:**	12/27/16
Matrix:	SO - Soil	**Date Received:**	12/28/16
		Percent Solids:	80.8
Project:	State# S Brine Station		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	1310	62	mg/kg	20	01/04/17 03:49	ES	EPA 300
Solids, Percent	80.8		%	1	12/28/16	NM	SM 2540 G

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SS# 7 SURFACE		
Lab Sample ID:	TC96720-7	**Date Sampled:**	12/27/16
Matrix:	SO - Soil	**Date Received:**	12/28/16
Method:	SW846 8021B	**Percent Solids:**	84.8
Project:	State# S Brine Station		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	LP027061.D	1	12/31/16	ALA	n/a	n/a	L:GLP846
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.20 g	5.0 ml	100 ul
Run #2			

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	66	13	ug/kg	
108-88-3	Toluene	ND	66	41	ug/kg	
100-41-4	Ethylbenzene	ND	66	9.9	ug/kg	
1330-20-7	Xylenes (total)	ND	200	7.2	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
540-36-3	1,4-Difluorobenzene	102%		80-115%
460-00-4	4-Bromofluorobenzene	93%		79-135%

(a) Analysis performed at SGS Accutest, Lafayette, LA.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SS# 7 SURFACE		
Lab Sample ID:	TC96720-7	**Date Sampled:**	12/27/16
Matrix:	SO - Soil	**Date Received:**	12/28/16
		Percent Solids:	84.8
Project:	State# S Brine Station		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	3060	150	mg/kg	50	01/04/17 04:04	ES	EPA 300
Solids, Percent	84.8		%	1	12/28/16	NM	SM 2540 G

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SS# 8 1.5FT		
Lab Sample ID:	TC96720-8	**Date Sampled:**	12/27/16
Matrix:	SO - Soil	**Date Received:**	12/28/16
Method:	SW846 8021B	**Percent Solids:**	83.6
Project:	State# S Brine Station		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	LP027062.D	1	12/31/16	ALA	n/a	n/a	L:GLP846
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.10 g	5.0 ml	100 ul
Run #2			

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	68	13	ug/kg	
108-88-3	Toluene	ND	68	42	ug/kg	
100-41-4	Ethylbenzene	ND	68	10	ug/kg	
1330-20-7	Xylenes (total)	ND	210	7.5	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
540-36-3	1,4-Difluorobenzene	99%		80-115%
460-00-4	4-Bromofluorobenzene	93%		79-135%

(a) Analysis performed at SGS Accutest, Lafayette, LA.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SS# 8 1.5FT		
Lab Sample ID:	TC96720-8	**Date Sampled:**	12/27/16
Matrix:	SO - Soil	**Date Received:**	12/28/16
		Percent Solids:	83.6
Project:	State# S Brine Station		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	2770	150	mg/kg	50	01/04/17 04:20	ES	EPA 300
Solids, Percent	83.6		%	1	12/28/16	NM	SM 2540 G

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SS# 9 SURFACE		
Lab Sample ID:	TC96720-9	**Date Sampled:**	12/27/16
Matrix:	SO - Soil	**Date Received:**	12/28/16
Method:	SW846 8021B	**Percent Solids:**	90.3
Project:	State# S Brine Station		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	LP027063.D	1	12/31/16	ALA	n/a	n/a	L:GLP846
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.10 g	5.0 ml	100 ul
Run #2			

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	60	12	ug/kg	
108-88-3	Toluene	ND	60	37	ug/kg	
100-41-4	Ethylbenzene	ND	60	9.0	ug/kg	
1330-20-7	Xylenes (total)	ND	180	6.6	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
540-36-3	1,4-Difluorobenzene	99%		80-115%
460-00-4	4-Bromofluorobenzene	93%		79-135%

(a) Analysis performed at SGS Accutest, Lafayette, LA.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SS# 9 SURFACE		
Lab Sample ID:	TC96720-9	**Date Sampled:**	12/27/16
Matrix:	SO - Soil	**Date Received:**	12/28/16
		Percent Solids:	90.3
Project:	State# S Brine Station		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	45.2	2.8	mg/kg	1	01/04/17 05:06	ES	EPA 300
Solids, Percent	90.3		%	1	12/28/16	NM	SM 2540 G

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SS# 10 1FT		
Lab Sample ID:	TC96720-10	**Date Sampled:**	12/27/16
Matrix:	SO - Soil	**Date Received:**	12/28/16
Method:	SW846 8021B	**Percent Solids:**	87.4
Project:	State# S Brine Station		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	LP027046.D	1	12/30/16	ALA	n/a	n/a	L:GLP846
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.20 g	5.0 ml	100 ul
Run #2			

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	62	12	ug/kg	
108-88-3	Toluene	ND	62	38	ug/kg	
100-41-4	Ethylbenzene	ND	62	9.4	ug/kg	
1330-20-7	Xylenes (total)	ND	190	6.8	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
540-36-3	1,4-Difluorobenzene	98%		80-115%
460-00-4	4-Bromofluorobenzene	94%		79-135%

(a) Analysis performed at SGS Accutest, Lafayette, LA.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SS# 10 1FT		
Lab Sample ID:	TC96720-10	**Date Sampled:**	12/27/16
Matrix:	SO - Soil	**Date Received:**	12/28/16
		Percent Solids:	87.4
Project:	State# S Brine Station		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	127	5.7	mg/kg	2	01/04/17 05:22	ES	EPA 300
Solids, Percent	87.4		%	1	12/28/16	NM	SM 2540 G

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SS# 11 STOCKPILE 1		
Lab Sample ID:	TC96720-11	**Date Sampled:**	12/27/16
Matrix:	SO - Soil	**Date Received:**	12/28/16
Method:	SW846 8021B	**Percent Solids:**	85.6
Project:	State# S Brine Station		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	LP027066.D	1	12/31/16	ALA	n/a	n/a	L:GLP846
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.20 g	5.0 ml	100 ul
Run #2			

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	65	13	ug/kg	
108-88-3	Toluene	ND	65	40	ug/kg	
100-41-4	Ethylbenzene	ND	65	9.8	ug/kg	
1330-20-7	Xylenes (total)	ND	190	7.1	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
540-36-3	1,4-Difluorobenzene	100%		80-115%
460-00-4	4-Bromofluorobenzene	93%		79-135%

(a) Analysis performed at SGS Accutest, Lafayette, LA.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SS# 11 STOCKPILE 1		
Lab Sample ID:	TC96720-11	**Date Sampled:**	12/27/16
Matrix:	SO - Soil	**Date Received:**	12/28/16
		Percent Solids:	85.6
Project:	State# S Brine Station		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	5340	290	mg/kg	100	01/04/17 06:08	ES	EPA 300
Solids, Percent	85.6		%	1	12/28/16	NM	SM 2540 G

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SS# 12 STOCKPILE 2		
Lab Sample ID:	TC96720-12	**Date Sampled:**	12/27/16
Matrix:	SO - Soil	**Date Received:**	12/28/16
Method:	SW846 8021B	**Percent Solids:**	86.1
Project:	State# S Brine Station		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	LP027051.D	1	12/30/16	ALA	n/a	n/a	L:GLP846
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.30 g	5.0 ml	100 ul
Run #2			

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	63	12	ug/kg	
108-88-3	Toluene	ND	63	39	ug/kg	
100-41-4	Ethylbenzene	ND	63	9.5	ug/kg	
1330-20-7	Xylenes (total)	ND	190	6.9	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
540-36-3	1,4-Difluorobenzene	100%		80-115%
460-00-4	4-Bromofluorobenzene	94%		79-135%

(a) Analysis performed at SGS Accutest, Lafayette, LA.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	SS# 12 STOCKPILE 2		
Lab Sample ID:	TC96720-12	**Date Sampled:**	12/27/16
Matrix:	SO - Soil	**Date Received:**	12/28/16
		Percent Solids:	86.1
Project:	State# S Brine Station		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	10600	580	mg/kg	200	01/04/17 06:55	ES	EPA 300
Solids, Percent	86.1		%	1	12/28/16	NM	SM 2540 G

RL = Reporting Limit

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

Note: Please run Volatiles first.

CHAIN OF CUSTODY

SGS ACCUTEST

10165 Harwin Dr, Ste 150 Houston, TX 77036
TEL. 713-271-4700 FAX: 713-271-4770
www.accutest.com

PAGE ___ OF ___

FED-EX Tracking #:
Bottle Order Control #:
SGS Accutest Quote #:
SGS Accutest Job #: TC96720

Client / Reporting Information

Company Name: Key Energy Services
Street Address: 6 Desta Dr
City: Midland State: TX Zip: 79705
Project Contact: E-mail: aramirez02@keyenergy.com
Phone #: 432-571-7203 Fax #:
Sampler(s) Name(s): Ana Ramirez Phone #:

Project Information

Project Name: State S Brine Station
Street:
City: Eunice State: NM
Project #:
Client Purchase Order #:
Project Manager:

Billing Information (if different from Report to)
Company Name:
Street Address:
City: State: Zip:
Attention:

Requested Analyses: Chlorides EPA 300

Matrix Codes: DW - Drinking Water, GW - Ground Water, WW - Water, SW - Surface Water, SO - Soil, SL- Sludge, SED-Sediment, OI - Oil, LIQ - Other Liquid, AIR - Air, SOL - Other Solid, WP - Wipe, FB-Field Blank

SGS Accutest Sample #	Field ID / Point of Collection	Date	Time	Sampled By	Matrix	# of bottles	HCl	NaOH	ZA/NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	TSP	NaHSO4	ENCORE	OTHER	Chlorides EPA 300	LAB USE ONLY
1	SS#1 1ft	12/27/16	12:42	AR	S	1												X	X	
2	SS#2 2ft	"	12:48	AR	S	1												X	X	
3	SS#3 surface	"	12:51	"	"	1												X	X	
4	SS#4 background	"	12:56	"	"	1												X	X	
5	SS#5 surface	"	1:00	"	"	1												X	X	
6	SS#6 1ft	"	1:05	"	"	1												X	X	
7	SS#7 surface	"	1:10	"	"	1												X	X	
8	SS#8 1.5ft	"	1:15	"	"	1												X	X	
9	SS#9 surface	"	1:18	"	"	1												X	X	
10	SS#10 1ft	"	1:25	"	"	1												X	X	
11	SS#11 Stockpile 1	"	1:30	"	"	1												X	X	
12	SS#12 Stockpile 2	"	1:32	"		1												X	X	

TAGGED BY:

Turnaround Time (Business days)

- ☐ Standard
- ☐ 5 Day *RUSH*
- ☐ 4 Day *RUSH*
- ☐ 3 Day *RUSH*
- ☐ 2 Day *RUSH*
- ☐ 1 Day *EMERGENCY*

Approved By (SGS Accutest PM): / Date:

Emergency & Rush T/A data available VIA Lablink

Data Deliverable Information

- ☐ Commercial "A" (Level 1)
- ☐ Commercial "B" (Level 2)
- ☐ FULT1 (Level 3+4)
- ☐ REDT1 (Level 3+4)
- ☐ Commercial "C"
- ☐ TRRP
- ☐ EDD Format
- ☐ Other ________

Commercial "A" = Results Only
Commercial "B" = Results + QC Summary
Commercial "C" = Results + QC & Surrogate Summary

Comments / Special Instructions

VERIFIED BY:

Form: SM021-0

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler:	Date Time:	Received By:	Date Time:	Relinquished By:	Date Time:	Received By:	Date Time:
1 Ana R	12/27/16	1 FedEx	12/28/16	2 FedEx	12/28/16 0950	2 [illegible signature]	12/28/16 0950
Relinquished by Sampler: 3	Date Time:	Received By: 3	Date Time:	Relinquished By: 4	Date Time:	Received By: 4	Date Time:
Relinquished by: 5	Date Time:	Received By: 5	Date Time:	Custody Seal # ☐ Intact ☐ Not intact	Preserved where applicable ☐	On Ice ☐	Cooler Temp.

TC96720: Chain of Custody

Page 1 of 4

SGS ACCUTEST

COOLER TEMP FORM

TC#________

Delivered by (circle one): FedEx/UPS ALGC Driver Client

Date: 12/28/16

Client: Key energy

Cooler Number: ________

Thermometer ID: IR-4 CF, °C -0- Corrected Temp, °C 1.4

SAMPLES CONTAINED IN COOLER

FedEx #-7851 5169 9022

Form: SM027-06 Rev 10/24/2016

SGS Accutest Sample Receipt Summary

Job Number: TC96720 **Client:** KEY ENERGY **Project:** STATE BRINE STATION

Date / Time Received: **Delivery Method:** **Airbill #'s:** 785151699622

No. Coolers: 1 **Therm ID:** IR-4; **Temp Adjustment Factor:** 0;

Cooler Temps (Initial/Adjusted): #1: (1.4/1.4);

Cooler Security	Y	or	N		Y	or	N
1. Custody Seals Present:	☑		☐	3. COC Present:	☑		☐
2. Custody Seals Intact:	☑		☐	4. Smpl Dates/Time OK	☑		☐

Cooler Temperature	Y	or	N
1. Temp criteria achieved:	☑		☐
2. Cooler temp verification:			
3. Cooler media:	Ice (Bag)		

Quality Control _Preservation	Y	or	N	N/A	WTB	STB
1. Trip Blank present / cooler:	☐		☐	☑	☐	☐
2. Trip Blank listed on COC:	☐		☐	☑		
3. Samples preserved properly:	☑		☐			
4. VOCs headspace free:	☐		☐	☑		

Sample Integrity - Documentation	Y	or	N
1. Sample labels present on bottles:	☑		☐
2. Container labeling complete:	☑		☐
3. Sample container label / COC agree:	☑		☐

Sample Integrity - Condition	Y	or	N
1. Sample recvd within HT:	☑		☐
2. All containers accounted for:	☑		☐
3. Condition of sample:	Intact		

Sample Integrity - Instructions	Y	or	N	N/A
1. Analysis requested is clear:	☑		☐	
2. Bottles received for unspecified tests	☐		☑	
3. Sufficient volume recvd for analysis:	☑		☐	
4. Compositing instructions clear:	☐		☐	☑
5. Filtering instructions clear:	☐		☐	☑

Comments

Sample Receipt Log

Job #: TC96720 **Date / Time Received:** 12/28/2016 9:50:00 AM **Initials:** bh

Client: KEY ENERGY

Cooler #	Sample ID:	Vol	Bot #	Location	Pres	pH	Therm ID	Initial Temp	Therm CF	Corrected Temp
1	TC96720-1	8oz	1	2-65	N/P	Note #2 - Preservative check not applicable.	IR-4	1.4	0	1.4
1	TC96720-2	8oz	1	2-65	N/P	Note #2 - Preservative check not applicable.	IR-4	1.4	0	1.4
1	TC96720-3	8oz	1	2-65	N/P	Note #2 - Preservative check not applicable.	IR-4	1.4	0	1.4
1	TC96720-4	8oz	1	2-65	N/P	Note #2 - Preservative check not applicable.	IR-4	1.4	0	1.4
1	TC96720-5	8oz	1	2-65	N/P	Note #2 - Preservative check not applicable.	IR-4	1.4	0	1.4
1	TC96720-6	8oz	1	2-65	N/P	Note #2 - Preservative check not applicable.	IR-4	1.4	0	1.4
1	TC96720-7	8oz	1	2-65	N/P	Note #2 - Preservative check not applicable.	IR-4	1.4	0	1.4
1	TC96720-8	8oz	1	2-65	N/P	Note #2 - Preservative check not applicable.	IR-4	1.4	0	1.4
1	TC96720-9	8oz	1	2-65	N/P	Note #2 - Preservative check not applicable.	IR-4	1.4	0	1.4
1	TC96720-10	8oz	1	2-65	N/P	Note #2 - Preservative check not applicable.	IR-4	1.4	0	1.4
1	TC96720-11	8oz	1	2-65	N/P	Note #2 - Preservative check not applicable.	IR-4	1.4	0	1.4
1	TC96720-12	4oz	1	2-65	N/P	Note #2 - Preservative check not applicable.	IR-4	1.4	0	1.4

General Chemistry

QC Data Summaries

Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: TC96720
Account: KEYETXM - Key Energy
Project: State# S Brine Station

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Chloride	GP40071/GN78595	2.5	0.0	mg/kg	49.8	48.3	97.0	90-110%
Chloride	GP40072/GN78595	2.5	0.0	mg/kg	49.8	45.2	90.8	90-110%

Associated Samples:
Batch GP40071: TC96720-1, TC96720-2, TC96720-3, TC96720-4, TC96720-5, TC96720-6, TC96720-7, TC96720-8, TC96720-9, TC96720-10
Batch GP40072: TC96720-11, TC96720-12
(*) Outside of QC limits

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: TC96720
Account: KEYETXM - Key Energy
Project: State# S Brine Station

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Chloride	GP40071/GN78595	TC96720-1	mg/kg	317	286	10.3	0-20%
Chloride	GP40072/GN78595	TC96720-11	mg/kg	5340	5560	4.0	0-20%
Solids, Percent	GN78463	TC96720-1	%	88.6	88.5	0.1	0-5%

Associated Samples:
Batch GN78463: TC96720-1, TC96720-2, TC96720-3, TC96720-4, TC96720-5, TC96720-6, TC96720-7, TC96720-8, TC96720-9, TC96720-10, TC96720-11, TC96720-12
Batch GP40071: TC96720-1, TC96720-2, TC96720-3, TC96720-4, TC96720-5, TC96720-6, TC96720-7, TC96720-8, TC96720-9, TC96720-10
Batch GP40072: TC96720-11, TC96720-12
(*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: TC96720
Account: KEYETXM - Key Energy
Project: State# S Brine Station

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Chloride	GP40071/GN78595	TC96720-1	mg/kg	317	56.5	306(a)	-19.5(b)	80-120%
Chloride	GP40072/GN78595	TC96720-11	mg/kg	5340	57.9	4800	-931.9(b)	80-120%

Associated Samples:
Batch GP40071: TC96720-1, TC96720-2, TC96720-3, TC96720-4, TC96720-5, TC96720-6, TC96720-7, TC96720-8, TC96720-9, TC96720-10
Batch GP40072: TC96720-11, TC96720-12
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(a) Outside control limits due to matrix interference and/or sample nonhomogeneity.
(b) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

Misc. Forms

Custody Documents and Other Forms

(SGS Accutest Lafayette)

Includes the following where applicable:

- Chain of Custody

CHAIN OF CUSTODY

SGS ACCUTEST

10165 Harwin Drive, Houston, TX 77036
TEL. 713-271-4700 FAX: 713-271-4770
www.sgs.com

FED-EX Tracking #: | Bottle Order Control #:
SGS Accutest Quote #: | SGS Accutest Job #: TC96720

Client / Reporting Information

Company Name: SGS Accutest
Street Address: 10165 Harwin Drive
City: Houston State: TX Zip: 77036
Project Contact: Tramesha.Brown@sgs.com E-mail:
Phone #: 713-271-4700 Fax #:
Sampler(s) Name(s): Phone:

Project Information

Project Name: State# S Brine Station
Street:
City: State:
Project #:
Client Purchase Order #:
Project Manager:

Billing Information (if different from Report to)

Company Name:
Street Address:
City: State: Zip:
Attention:

Requested Analysis (see TEST CODE sheet)

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL- Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB-Field Blank; EB-Equipment Blank; RB- Rinse Blank; TB-Trip Blank

SGS Accutest Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	Number of preserved Bottles: HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	V5035SPM ,V8021BTX ,	LAB USE ONLY
1	SS# 1 1FT		12/27/16	12:42:00 PM		SO	1					x				X	3
2	SS# 2 2FT		12/27/16	12:48:00 PM		SO	1					x				X	3
3	SS# 3 SURFACE		12/27/16	12:51:00 PM		SO	1					x				X	3
4	SS# 4 BACKGROUND		12/27/16	12:56:00 PM		SO	1					x				X	3
5	SS# 5 SURFACE		12/27/16	1:00:00 PM		SO	1					x				X	3
6	SS# 6 1FT		12/27/16	1:05:00 PM		SO	1					x				X	3
7	SS# 7 SURFACE		12/27/16	1:10:00 PM		SO	1					x				X	3
8	SS# 8 1.5FT		12/27/16	1:15:00 PM		SO	1					x				X	3
9	SS# 9 SURFACE		12/27/16	1:18:00 PM		SO	1					x				X	3
10	SS# 10 1FT		12/27/16	1:25:00 PM		SO	1					x				X	3
11	SS# 11 STOCKPILE 1		12/27/16	1:30:00 PM		SO	1					x				X	3
12	SS# 12 STOCKPILE 2		12/27/16	1:32:00 PM		SO	1					x				X	3

Turnaround Time (Business days)

- [ ] Std. 10 Business Days
- [ ] 5 Day RUSH
- [ ] 3 Day EMERGENCY
- [ ] 2 Day EMERGENCY
- [ ] 1 Day EMERGENCY
- [x] other Due 1/5/2017

Emergency & Rush T/A data available VIA Lablink

Approved By (SGS Accutest PM): / Date:

Data Deliverable Information

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] FULLT1 (Level 3+4)
- [ ] NJ Reduced
- [ ] Commercial "C"
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] State Forms
- [ ] EDD Format
- [x] Other COMMB

Commercial "A" = Results Only
Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions

MR-2 (VS)

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by Sampler	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1		12/28/16 1800	1 TX Driver Initials	2 TX Driver Initials		2 LA Driver Initials
3	LA Driver Initials	12/29/16 10:30	3 Mark Red	4		4
5			5	Custody Seal # Esloc	Intact / Not intact	Preserved where applicable: On Ice: 5 Cooler Temp: 2.4 IN 2.6 O

TC96720: Chain of Custody
Page 1 of 7
SGS Accutest Lafayette

Date / Time: 12/28/2016 3:16:56 PM
CSR: TRAMESHB
Job #: TC96720
Client Project: State# S Brine Station
Deliverable: COMMB
TAT: Due 1/5/2017

Sub Lab: Accutest Gulf Coast Louisiana
Address: 500 Ambassador Caffery Prkway
City: Scott
State: LA Zip: 70583
Contact: Sample Receiving
Phone: 800-304-5227

SGS Accutest Sample #	Client Sample Description	Analysis	Location	Sampled By	Date Sampled	Time Sampled	Aliquot
TC96720-1	SS# 1 1FT	V5035SPM ,V8021BTX ,	2-65 ,		12/27/2016	12:42:00 PM	
TC96720-2	SS# 2 2FT	V5035SPM ,V8021BTX ,	2-65 ,		12/27/2016	12:48:00 PM	
TC96720-3	SS# 3 SURFACE	V5035SPM ,V8021BTX ,	2-65 ,		12/27/2016	12:51:00 PM	
TC96720-4	SS# 4 BACKGROUND	V5035SPM ,V8021BTX ,	2-65 ,		12/27/2016	12:56:00 PM	
TC96720-5	SS# 5 SURFACE	V5035SPM ,V8021BTX ,	2-65 ,		12/27/2016	1:00:00 PM	
TC96720-6	SS# 6 1FT	V5035SPM ,V8021BTX ,	2-65 ,		12/27/2016	1:05:00 PM	
TC96720-7	SS# 7 SURFACE	V5035SPM ,V8021BTX ,	2-65 ,		12/27/2016	1:10:00 PM	
TC96720-8	SS# 8 1.5FT	V5035SPM ,V8021BTX ,	2-65 ,		12/27/2016	1:15:00 PM	
TC96720-9	SS# 9 SURFACE	V5035SPM ,V8021BTX ,	2-65 ,		12/27/2016	1:18:00 PM	
TC96720-10	SS# 10 1FT	V5035SPM ,V8021BTX ,	2-65 ,		12/27/2016	1:25:00 PM	
TC96720-11	SS# 11 STOCKPILE 1	V5035SPM ,V8021BTX ,	2-65 ,		12/27/2016	1:30:00 PM	
TC96720-12	SS# 12 STOCKPILE 2	V5035SPM ,V8021BTX ,	2-65 ,		12/27/2016	1:32:00 PM	

3 - 2-40ml vap
1-20ml vap MR-2 (VS)

Comments:

Sample Management Receipt: _____ Date: _____

TC96720: Chain of Custody
Page 3 of 7

BULK/SOIL
5035 PRESERVATION

Methanol ID: RV161106A4

Balance ID: VOA BAL1

C: Sampler incorrectly capped
P: Plunger not locked for shipment
F: Sampler not filled completely

SAMPLE #	PRESERVATIVE	SAMPLE WEIGHT (G)	VOLUME (ML)	DATE SAMPLED	TIME SAMPLED	DATE PRESERVED	TIME PRESERVED	DATE FROZEN	TIME FROZEN	INITIALS	COMMENTS
TC96654-1A	H2O/MeOH	5.28	5	NA	NA	12/28/16	7:46	12/28/16	14:00	XML	
1B	H2O/MeOH	5.20									
1C	H2O/MeOH	5.48					7:54				
2A	H2O/MeOH	5.07									
2B	H2O/MeOH	5.17					8:02				
2C	H2O/MeOH	5.03									
3A	H2O/MeOH	5.30					8:10				
3B	H2O/MeOH	5.20									
3C	H2O/MeOH	5.10					8:20				
4A	H2O/MeOH	5.11									
4B	H2O/MeOH	5.15									
4C	H2O/MeOH	5.28									
5A	H2O/MeOH	5.03									
5B	H2O/MeOH	5.06									
5C	H2O/MeOH	5.49					12:50				
TC96720-1A	H2O/MeOH	5.04		12/27/16	12:43						
1B	H2O/MeOH	5.11									
1C	H2O/MeOH	5.15			12:48		12:55				
2A	H2O/MeOH	5.12									
2B	H2O/MeOH	5.30									
2C	H2O/MeOH	5.13			12:57		13:00				
3A	H2O/MeOH	5.04									
3B	H2O/MeOH	5.11									
3C	H2O/MeOH	5.12									

MS008a-2

TC96720: Chain of Custody
Page 4 of 7

BULK/SOIL
5035 PRESERVATION

C: Sampler incorrectly capped
P: Plunger not locked for shipment
F: Sampler not filled completely

Methanol ID: RV161144 4

Balance ID: VOA BAL

SAMPLE #	PRESERVATIVE	SAMPLE WEIGHT (G)	VOLUME (ML)	DATE SAMPLED	TIME SAMPLED	DATE PRESERVED	TIME PRESERVED	DATE FROZEN	TIME FROZEN	INITIALS	COMMENTS
TC96720-4A	H2O/MeOH	5.17	5	12/27/16	12:56	12/28/16	13:04	12/28/16	14:00	XML	
4B	H2O/MeOH	5.14									
4C	H2O/MeOH	5.45									
5A	H2O/MeOH	5.19			1:00p		13:08				
5B	H2O/MeOH	5.30									
5C	H2O/MeOH	5.10									
6A	H2O/MeOH	5.50			1:05		13:12				
6B	H2O/MeOH	5.30									
6C	H2O/MeOH	5.16									
7A	H2O/MeOH	5.20			1:10		13:16				
7B	H2O/MeOH	5.03									
7C	H2O/MeOH	5.19									
8A	H2O/MeOH	5.41			1:15		13:20				
8B	H2O/MeOH	5.45									
8C	H2O/MeOH	5.07									
9A	H2O/MeOH	5.06			1:18		13:24				
9B	H2O/MeOH	5.37									
9C	H2O/MeOH	5.07									
10A	H2O/MeOH	5.38			1:25		13:28				
10B	H2O/MeOH	5.42									
10C	H2O/MeOH	5.18									
11A	H2O/MeOH	5.37			1:30p		13:32				
11B	H2O/MeOH	5.14									
11C	H2O/MeOH	5.19									

BULK/SOIL
5035 PRESERVATION

C: Sampler incorrectly capped
P: Plunger not locked for shipment
F: Sampler not filled completely

Methanol ID: RV161114A4
Balance ID: VOA BAL1

SAMPLE #	PRESERVATIVE	SAMPLE WEIGHT (G)	VOLUME (ML)	DATE SAMPLED	TIME SAMPLED	DATE PRESERVED	TIME PRESERVED	DATE FROZEN	TIME FROZEN	INITIALS	COMMENTS
TC96720-2A	H2O/MeOH	5.21	5	12/27/16	1:32	12/28/16	13:36	12/28/16	14:00	XM	
2B	H2O/MeOH	5.10	"	"	"	"	"	"	"	"	
2C	H2O/MeOH	5.30	"	"	"	"	"	"	"	"	
TC96722-1A	H2O/MeOH	5.13	"	"	10:40	"	13:40	"	"	"	
1B	H2O/MeOH	5.29	"	"	"	"	"	"	"	"	
1C	H2O/MeOH	5.12	"	"	"	"	"	"	"	"	
	H2O/MeOH										
	H2O/MeOH										
	H2O/MeOH										
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	H2O/MeOH										
	H2O/MeOH										
	H2O/MeOH										
	H2O/MeOH										

Accutest Laboratories Sample Receipt Summary

Job Number: TC96720 **Client:** SGS **Project:** STATE # S BRINE STATION

Date / Time Received: 12/29/2016 10:30:00 AM **Delivery Method:** Accutest Courier **Airbill #'s:**

Cooler Temps (Initial/Adjusted): #1: (2.4/2.4);

Cooler Security	Y	or	N		Y	or	N
1. Custody Seals Present:	☑		☐	3. COC Present:	☑		☐
2. Custody Seals Intact:	☑		☐	4. Smpl Dates/Time OK	☑		☐

Cooler Temperature	Y	or	N
1. Temp criteria achieved:	☑		☐
2. Thermometer ID:	DV260;		
3. Cooler media:	Ice (direct contact)		
4. No. Coolers:	1		

Quality Control Preservation	Y	or	N	N/A
1. Trip Blank present / cooler:	☐		☑	☐
2. Trip Blank listed on COC:	☐		☑	☐
3. Samples preserved properly:	☑		☐	
4. VOCs headspace free:	☐		☑	☐

Sample Integrity - Documentation	Y	or	N
1. Sample labels present on bottles:	☑		☐
2. Container labeling complete:	☑		☐
3. Sample container label / COC agree:	☑		☐

Sample Integrity - Condition	Y	or	N
1. Sample recvd within HT:	☑		☐
2. All containers accounted for:	☑		☐
3. Condition of sample:	Intact		

Sample Integrity - Instructions	Y	or	N	N/A
1. Analysis requested is clear:	☑		☐	
2. Bottles received for unspecified tests	☐		☑	
3. Sufficient volume recvd for analysis:	☑		☐	
4. Compositing instructions clear:	☐		☐	☑
5. Filtering instructions clear:	☐		☐	☑

Comments

GC Volatiles

QC Data Summaries

(SGS Accutest Lafayette)

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: TC96720
Account: ALGC SGS Accutest Gulf Coast
Project: KEYETXM: State# S Brine Station

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GLP846-MB3	LP027037.D	1	12/30/16	JF	n/a	n/a	GLP846

The QC reported here applies to the following samples: **Method:** SW846 8021B

TC96720-1, TC96720-2, TC96720-3, TC96720-4, TC96720-5, TC96720-6, TC96720-7, TC96720-8, TC96720-9, TC96720-10, TC96720-11, TC96720-12

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	50	9.7	ug/kg	
100-41-4	Ethylbenzene	ND	50	7.6	ug/kg	
108-88-3	Toluene	ND	50	31	ug/kg	
1330-20-7	Xylenes (total)	ND	150	5.5	ug/kg	

CAS No.	Surrogate Recoveries		Limits
540-36-3	1,4-Difluorobenzene	99%	80-115%
460-00-4	4-Bromofluorobenzene	95%	79-135%

Blank Spike Summary

Job Number: TC96720
Account: ALGC SGS Accutest Gulf Coast
Project: KEYETXM: State# S Brine Station

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GLP846-BS3	LP027036.D	1	12/30/16	JF	n/a	n/a	GLP846

The QC reported here applies to the following samples: **Method:** SW846 8021B

TC96720-1, TC96720-2, TC96720-3, TC96720-4, TC96720-5, TC96720-6, TC96720-7, TC96720-8, TC96720-9, TC96720-10, TC96720-11, TC96720-12

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
71-43-2	Benzene	2500	2660	106	80-120
100-41-4	Ethylbenzene	2500	2470	99	84-121
108-88-3	Toluene	2500	2550	102	83-122
1330-20-7	Xylenes (total)	7500	7390	99	85-120

CAS No.	Surrogate Recoveries	BSP	Limits
540-36-3	1,4-Difluorobenzene	99%	80-115%
460-00-4	4-Bromofluorobenzene	100%	79-135%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: TC96720
Account: ALGC SGS Accutest Gulf Coast
Project: KEYETXM: State# S Brine Station

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
LA29069-4MS	LP027052.D	1	12/30/16	JF	n/a	n/a	GLP846
LA29069-4MSD	LP027053.D	1	12/30/16	JF	n/a	n/a	GLP846
LA29069-4	LP027049.D	1	12/30/16	JF	n/a	n/a	GLP846

The QC reported here applies to the following samples: **Method:** SW846 8021B

TC96720-1, TC96720-2, TC96720-3, TC96720-4, TC96720-5, TC96720-6, TC96720-7, TC96720-8, TC96720-9, TC96720-10, TC96720-11, TC96720-12

CAS No.	Compound	LA29069-4 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	17.6		2550	2600	101	2550	2590	101	0	80-120/8
100-41-4	Ethylbenzene	ND		2550	2370	93	2550	2360	93	0	84-121/8
108-88-3	Toluene	ND		2550	2590	102	2550	2580	101	0	83-122/8
1330-20-7	Xylenes (total)	ND		7650	7140	93	7650	7130	93	0	85-120/7

CAS No.	Surrogate Recoveries	MS	MSD	LA29069-4	Limits
540-36-3	1,4-Difluorobenzene	100%	100%	100%	80-115%
460-00-4	4-Bromofluorobenzene	101%	101%	94%	79-135%

* = Outside of Control Limits.

APPENDIX B
FORM C141 INITIAL

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

State of New Mexico
Energy Minerals and Natural Resources

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

Form C-141
Revised August 8, 2011

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

Release Notification and Corrective Action

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company Key Energy Services, LLC	Contact Maren Coligan
Address: 1301 McKinney St. Suite 1800. Houston TX 77010	Telephone No. 713-651-4825
Facility Name: Key Energy Services State "S" Brine and Water Station (BW-028)	Facility Type: Brine and Fresh Water Station

Surface Owner: Millard Deck Trust	Mineral Owner: State Of New Mexico	API No. 30-025-33547

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
D	15	21S	37E	1340	North Line	330	West Line	Lea

Latitude N 32° 29' 02.2" **Longitude** W103° 09' 28.8"

NATURE OF RELEASE

Type of Release: Brine Water	Volume of Release: 10 bbls	Volume Recovered Approx. 0 bbls
Source of Release: Well	Date and Hour of Occurrence 12/21/2016 3:30 PM.	Date and Hour of Discovery 12/21/2016 3:30 PM.
Was Immediate Notice Given? ☐ Yes ☐ No ☒ Not Required	If YES, To Whom?	
By Whom?	Date and Hour:	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse. NA	

If a Watercourse was Impacted, Describe Fully.* NA

RECEIVED
By Olivia Yu at 12:09 pm, Jan 09, 2017

Describe Cause of Problem and Remedial Action Taken.*
A Key crew was working on the State S disposal well and during this process the well burped causing brine water to be pushed to the surface and onto the ground. The Key crew attempted to close the third party BOP with no success. The third party BOP would not close all the way. The well stopped flowing. It is estimated that 10 bbl. of brine water was spilled onto the location outside the containment area. The third party owner of the BOP was contacted to service the BOP. Affected top soil was removed and fully encapsulated until disposal well work has been completed and further remediation plan has been developed.

Describe Area Affected and Cleanup Action Taken.*
Release of brine water onto the ground around the well area and into a pasture next to the brine station, fluids soak into the ground, excavation of contaminated soils and initial soil sampling completed on 12/27/2016.

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

Signature: Maren A Coligan	OIL CONSERVATION DIVISION
Printed Name: Maren Coligan	Approved by Environmental Specialist:
Title: Environmental Director	Approval Date: 01/09/2017 Expiration Date:
E-mail Address: mcoligan@keyenergy.com	Conditions of Approval: Attached ☐
Date: 1/3/17 ~~12/29/2016~~ Phone: 713-651-4825	

* Attach Additional Sheets If Necessary

nOY1700943437 pOY1700944259 RP4548

Operator/Responsible Party,

The OCD has received the form C-141 you provided on _01/03/2017_ regarding an unauthorized release. The information contained on that form has been entered into our incident database and remediation case number __1R-_4548_ has been assigned. **Please refer to this case number in all future correspondence.**

It is the Division's obligation under both the Oil & Gas Act and Water Quality Act to provide for the protection of public health and the environment. Our regulations (19.15.29.11 NMAC) state the following,

> *The responsible person shall complete division-approved corrective action for releases that endanger public health or the environment. The responsible person shall address releases in accordance with a remediation plan submitted to and approved by the division or with an abatement plan submitted in accordance with 19.15.30 NMAC.* [emphasis added]

Release characterization is the first phase of corrective action unless the release is ongoing or is of limited volume and all impacts can be immediately addressed. Proper and cost-effective remediation typically cannot occur without adequate characterization of the impacts of any release. Furthermore, the Division has the ability to impose reasonable conditions upon the efforts it oversees. **As such, the Division is requiring a workplan for the characterization of impacts associated with this release be submitted to the OCD District _1_ office in __Hobbs____ on or before _02/09/2017_. If and when the release characterization workplan is approved, there will be an associated deadline for submittal of the resultant investigation report. Modest extensions of time to these deadlines may be granted, but only with acceptable justification.**

The goals of a characterization effort are: 1) determination of the lateral and vertical extents along with the magnitude of soil contamination. 2) determine if groundwater or surface waters have been impacted. 3) If groundwater or surface waters have been impacted, what are the extents and magnitude of that impact. 4) The characterization of any other adverse impacts that may have occurred (examples: impacts on vegetation, impacts on wildlife, air quality, loss of use of property, etc.). To meet these goals as quickly as possible, the following items must, at a minimum, be addressed in the release characterization workplan and subsequent reporting:

● Horizontal delineation of soil impacts in each of the four cardinal compass directions. Adsorbed soil contamination must be characterized for the following constituents using the associated laboratory methods: benzene, toluene, ethylbenzene, and total xylenes by either Method 8260 or 8021, total petroleum hydrocarbons by Method 8015 extended range (GRO+DRO+MRO; C_6 thru C_{36}), and for chloride by Method 300. This is not an exclusive list of potential contaminants. Analyzed parameters should be modified based on the nature of the released substance(s). Soil sampling must be both within the impacted area and beyond.

● Vertical delineation of soil impacts. Adsorbed soil contamination must be characterized for the following constituents using the associated laboratory methods: benzene, toluene, ethylbenzene, and total xylenes by either Method 8260 or 8021, total petroleum hydrocarbons by Method 8015 extended range (GRO+DRO+MRO; C_6 thru C_{36}), and for chloride by Method 300. As above, this is not an exclusive list of potential contaminants and can be modified. Vertical characterization samples should be taken at depth intervals no greater than five feet apart. Lithologic description of encountered soils must also be provided. At least ten vertical feet of soils with contaminant concentrations at or below these values must be demonstrated as existing above the water table.

● Nominal detection limits for field and laboratory analyses must be provided.

● Composite sampling is not generally allowed.

● Field screening and assessment techniques are acceptable (headspace, titration, EC [include algorithm for validation purposes], EM, etc.), but the sampling and assay procedures must be clearly defined. Copies of field notes are highly desirable. A statistically significant set of split samples must be submitted for confirmatory laboratory analysis, including the laterally farthest and vertically deepest sets of soil samples. Make sure there are at least two soil samples submitted

for laboratory analysis from each borehole or test pit (highest observed contamination and deepest depth investigated). Copies of the actual laboratory results must be provided including chain of custody documentation.

●Probable depth to shallowest protectable groundwater and lateral distance to nearest surface water. If there is an estimate of groundwater depth, the information used to arrive at that estimate must be provided. If there is a reasonable assumption that the depth to protectable water is 50 feet or less, the responsible party should anticipate the need for at least one groundwater monitoring well to be installed in the area of likely maximum contamination.

● If groundwater contamination is encountered, an additional investigation workplan may be required to determine the extents of that contamination. Groundwater and/or surface water samples, if any, must be analyzed by a competent laboratory for volatile organic hydrocarbons (typically Method 8260 full list), total dissolved solids, pH, major anions and cations including chloride and sulfate, dissolved iron, and dissolved manganese. The investigation workplan must provide the groundwater sampling method(s) and sample handling protocols. To the fullest extent possible, aqueous analyses must be undertaken using nominal method detection limits. As with the soil analyses, copies of the actual laboratory results must be provided including chain of custody documentation.

● Accurately scaled and well-drafted site maps must be provided providing the location of borings, test pits, monitoring wells, potentially impacted areas, and significant surface features including roads and site infrastructure that might limit either the release characterization or remedial efforts. Field sketches may be included in subsequent reporting, but should not be considered stand-alone documentation of the site's layout. Digital photographic documentation of the location and fieldwork is recommended, especially if unusual circumstances are encountered.

Nothing herein should be interpreted to preclude emergency response actions or to imply immediate remediation by removal cannot proceed as warranted. Nonetheless, characterization of impacts and confirmation of the effectiveness of remedial efforts must still be provided to the OCD before any release incident will be closed.

Jim Griswold
OCD Environmental Bureau Chief
1220 South St. Francis Drive
Santa Fe, New Mexico 87505
505-476-3465
jim.griswold@state.nm.us

APPENDIX C
CALCULATIONS

SUBJECT STATE S LEACHING REQUIREMENTS PROJECT PAGE 1/2

CLIENT KEY ENERGY DATE 3/23/17 BY JAW

CHECKED LMP BY

LEACHING REQ

$$LR = \frac{EC_{iw}}{EC_{dw}}$$

(iw) EC, OF THE WATER FROM NMOSE WELL @ STATE S 1.6 ms/cm

(dw) EC OF THE SOIL IMPACTED WEIGHTED AVE Cl^- 1400 ppm
BASED ON MASS LOAD OF 1.4 g/kg
USE SMA EC TO Cl^- ppm EQUATION

$Y = 1411.7(x) - 13251$

$1400 = 1411.7(x) - 13251 \quad x = .99$

$EC_{dw} = .99$ ROUND UP FOR SAFETY FACTOR OF 15%

$.99 \times 1.15 = EC_{dw}\ (1.14)$

$LR \frac{1.6_{iw}}{1.14_{iw}} = 1.4\%$

SOIL DATA
AVE STORAGE 1.9 INCH
Ksat 0.60 in/hr
dry bulk 1.5 g/cm3

$0.60\text{in} \times 1.4\% = .84\text{ in}$

$.84\text{in/acre} \times 27{,}154\text{gal/acre-in}$

$= 22{,}809\text{gal/acre} \times .34$ IMPACTED AREA/ACRE

$= \boxed{7755\text{ gal}}$

WATER STORAGE 1.9 inch FROM NRCS, ODG

0.60 in MAX IRRIGATION / 1.9 inch = 0.32

FIRST IRRIGATION DW = 1.14 @ 7753 gal

$1.14 - (1.14 \times 0.32) = 0.77$ EC

IF WE USE SMA EC CAL TO Cl⁻ PPM

$Y = 1411.7(X) - 132.51$ $Y = 746$ = 746 ppm Cl⁻

RAINFALL DATA FROM NOAA.GOV

AVERAGE EVENT 1.4 inch / day 0.1 MAX EC OF RAIN FROM (NOAA)

$LR = \frac{EC_{IW}}{EC_{DW}}$

RAIN EVENTS # 1 $\frac{0.1 \text{ ms/cm}}{0.77 \text{ ms/cm}} = 0.13$

$1.4 \text{ inch/day} - (1.4 \times 0.13) = 1.22 \text{ inch}$

1.9 WATER STORAGE/inch $1.22 \text{ inch} / 1.9 \text{ inch} = 0.64\%$

$0.77_{EC_{DW}} - (0.77 \times 0.64) =$ 0.28 ms/cm

$Y = 1411.7(0.28) - 132.51$ = 262 ppm Cl⁻

Lea County, New Mexico

SR—Simona-Upton association

Map Unit Setting

National map unit symbol: dmr3
Elevation: 3,000 to 4,400 feet
Mean annual precipitation: 10 to 16 inches
Mean annual air temperature: 58 to 62 degrees F
Frost-free period: 190 to 205 days
Farmland classification: Not prime farmland

Map Unit Composition

Simona and similar soils: 50 percent
Upton and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Simona

Setting

Landform: Ridges
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Calcareous eolian deposits derived from sedimentary rock

Typical profile

A - 0 to 8 inches: gravelly fine sandy loam
Bk - 8 to 16 inches: fine sandy loam
Bkm - 16 to 26 inches: cemented material

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 7 to 20 inches to petrocalcic
Natural drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 50 percent
Gypsum, maximum in profile: 1 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 2.0
Available water storage in profile: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: Shallow Sandy (R042XC002NM)
Hydric soil rating: No

Description of Upton

Setting

Landform: Ridges
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Calcareous eolian deposits derived from sedimentary rock

Typical profile

A - 0 to 8 inches: gravelly loam
Bkm - 8 to 18 inches: cemented material
BCk - 18 to 60 inches: very gravelly loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 7 to 20 inches to petrocalcic
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 75 percent
Gypsum, maximum in profile: 1 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 2.0
Available water storage in profile: Very low (about 0.9 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: Shallow (R042XC025NM)
Hydric soil rating: No

Minor Components

Stegall

Percent of map unit: 5 percent
Ecological site: Limy Upland 16-21" PZ (R077CY028TX)
Hydric soil rating: No

Kimbrough

Percent of map unit: 5 percent
Ecological site: Very Shallow 16-21" PZ (R077CY037TX)
Hydric soil rating: No

Slaughter

Percent of map unit: 4 percent
Ecological site: Limy Upland 16-21" PZ (R077CY028TX)
Hydric soil rating: No

Playas

Percent of map unit: 1 percent
Landform: Playa floors
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Lea County, New Mexico
Survey Area Data: Version 13, Sep 30, 2016

APPENDIX D
NMOSE WELL DATA

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

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

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

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

POD Number	POD Sub-basin	Code	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	Distance	Depth Well	Depth Water	Water Column
CP 00554			LE	2	2	16	21S	37E	672744	3595610*		302	80	70	10

Average Depth to Water: **70 feet**

Minimum Depth: **70 feet**

Maximum Depth: **70 feet**

Record Count: 1

UTMNAD83 Radius Search (in meters):

Easting (X): 673042 **Northing (Y):** 3595557.18 **Radius:** 1000

***UTM location was derived from PLSS - see Help**

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