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

December 16, 2015

#5B24095-BG1

NMOCD District I
Attn. Kellie Jones
1625 N. French Drive
Hobbs, New Mexico 88240

SUBJECT: FINAL CLOSURE REPORT FOR INCIDENT 1RP-3522 ATHA #001 SWD, UL M, SECTION 31, T21S, R36E, NMPM, LEA COUNTY, NEW MEXICO

Dear Ms. Jones:

On behalf of Key Energy Services, LLC (Key), Souder Miller & Associates (SMA) is pleased to submit the attached Final Closure Report summarizing the initial findings for the release site located on the Atha #001 SWD in Lea County, New Mexico. The purpose of the Final Report is to obtain approval from the New Mexico Oil Conservation Division (NMOCD) of remediation and closure of the open incident.

At the request of Key, SMA has assessed and delineated the produced water release associated with the ATHA #001 SWD well location. The release was initially reported to NMOCD by Key on January 24th, 2015 and is a result of 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

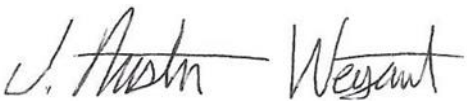
Name	Atha SWD				
Location	Incident Number	API Number	Section, Township, Range		
	1RP-3522	30-025-04861	N/S (Unit M)	Section 31	T 21S, R 36E NMPM
Estimated Date of Release	January 24, 2015				
Date Reported to NMOCD	January 27, 2015				
Reported by	Bobby Sisson, Key Energy Services, LLC				
Land Owner	Private Surface and Minerals				
Reported To	NM Oil Conservation Division (NMOCD)				
Source of Release	Human Error				
Released Material	Produced Water				
Released Volume	20 bbls Produced Water and 0 bbls Oil				
Recovered Volume	20 bbls Produced Water and 0 bbls Oil				
Net Release	0 bbl Produced Water and bbl Oil				
Nearest Waterway	Pecos River is over 50 miles west of the location.				
Depth to Groundwater	Estimated to be 195 feet				

Nearest Domestic Water Source	Greater than 1000 feet
NMOCD Ranking	0
SMA Response Dates	Initial: September 29, 2015 Mitigation Activities: November 2, 2015
Subcontractors	TCS
Disposal Facility	Lea Land, LLC
Estimated Yd^3 Contaminated Soil Excavated and Disposed	416

A copy of the C-141 Final is located in Appendix B. For questions or comments pertaining to the release or the attached Final Closure Report, please feel free to contact either of us.

Submitted by:

SOUDER, MILLER & ASSOCIATES



Austin Weyant
Project Scientist

Reviewed by:

Cynthia Gray, CHMM
Senior Scientist

FINAL CLOSURE REPORT FOR INCIDENT 1RP-3522

ATHA #001 SWD
API# 30-025-04861
UL M, SECTION 31, T21S R36E, NMPM
LEA COUNTY, NM

Prepared for:
Key Energy Services LLC
1301 McKinney St., Suite 1800
Houston, TX 77010

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

December 16, 2015
SMA Reference
5B23978 BG3

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1.0 Introduction

At the request of Key Energy Services LLC (Key), Souder, Miller & Associates (SMA) has prepared this report describing the assessment, initial delineation, and release mitigation of the Atha SWD #001. This report addresses the existing release and historic spills registered with NMOCD involving this site. The site is located in Section 31, T 21S, R 36 E NMPM, Lea County, New Mexico, on land owned by a private ranch. Figure 1 illustrates the vicinity and location of the site. Key Energy Service's ultimate goal is to complete the reclamation of this release to achieve final closure for open release NMOCD D1 1RP-3522 on the plugged and abandoned ATHA SWD #001 well site. The well has been plugged and abandoned as of 11/20/15 and all surface equipment removed. After NMOCD approves closure of this open release, reclamation activities at the location can be conducted.

2.0 Site Ranking and Land Jurisdiction

After evaluation of the site using aerial photography and topographic maps, depth to groundwater is estimated to be greater than 100 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. No wells were located within a one mile radius of the site. The physical location of this release is on private land and within the jurisdiction of NMOCD.

This release location has been assigned an NMOCD ranking of 0 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 5000 ppm total petroleum hydrocarbons (TPH). Table 1 illustrates site ranking rationale.

A large portion of the pad exhibited only natural background levels of NMOCD contaminants of concern. All of the impacted soils were found in the vicinity of the historic tank battery and receiving/load-out areas as depicted in Figure 2.

3.0 Assessment and Initial Results

On July 29, 2015, after receiving 811 clearance, SMA field personnel assessed the former Atha SWD #1 Tank Battery and pad using a gas powered auger, Photo Ionization Detector (PID), and a mobile chlorides titration kit. The pad area was found to be 450 feet long and 300 feet wide. Delineation samples were taken to depths of four feet below ground surface (bgs). Using field screening, three of the bottom hole samples were found to exhibit higher than recommended levels of Total Petroleum Hydrocarbons (TPH), an NMOCD contaminant of concern. Four of the samples collected exhibited high chloride levels which could potentially inhibit site revegetation efforts and/or be seen as a potential risk to groundwater by the NMOCD.

4.0 Soil Remediation Summary

SMA returned to the site on November 11, 2015 to begin excavation of affected soils, with approval from area utilities owners via 811 and the NMOCD. SMA guided the excavation activities continuously by collecting composite soil samples for field screening with a mobile titration unit (EPA 4500) and a calibrated PID. Samples were taken in the sidewalls of the excavation to ensure contaminated soils had been removed in the horizontal extent. Sample locations are noted on Figure 2 Site Details and Sample Location Map Excavation was conducted to three feet bsg in

the spill area to remove heavily impacted soils found in both the load-out and battery areas. An in-situ cap was constructed within the excavation after compaction was complete. The construction of the in-situ cap (Figure #3) was designed to prevent both capillary and leaching movement of the brine affected soils contained beneath. Starting at three and half feet bsg, a plastic liner was added as a capillary break between the affected soils and the caliche cap. The cap consists of two feet of contaminant-free caliche material placed, and compacted. This barrier will prevent leaching and formation of deep root systems into the cap itself. The plastic liner on the bottom of the caliche cap will effectively break the infiltration of precipitation through the compacted cap. Approximately 416 cubic yards of contaminated soil was removed and replaced by the cap and clean backfill material. An additional 18 inches of topsoil will be added during the final reclamation of the well and pad area. The contaminated soil was transported for disposal at Lea Land, near Carlsbad, NM.

5.0 Conclusions and Recommendations

NMOCD Guidelines for Remediation of Leaks, Spills, and Releases have established the following action levels for contaminants of concern with a site ranking of 0: 10 ppm (mg/kg) Benzene, 50 ppm total BTEX, and 5000 ppm TPH. The release consisted of produced water with no evidence of petroleum impacts found during the initial assessment and delineation.

Soil sample locations in the initial delineation are illustrated in Figure 2. A summary of laboratory analytical results is included in Table 4. Laboratory reports are included in Appendix A.
The initial sample analysis for this site show below the action levels for contaminants. No further remedial activities are recommended.

6.0 Closure and Limitations

The scope of our services consisted of the performance of a preliminary spill assessment, verification of release stabilization and mitigation, regulatory liaison, and preparation of this Final Closure Report. All work has been performed in accordance with generally accepted professional environmental consulting practices for oil and gas releases in the Permian Basin in New Mexico.

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

Submitted by:

SOUDER, MILLER & ASSOCIATES

J. Austin Weyant

Austin Weyant
Project Scientist

Reviewed by:

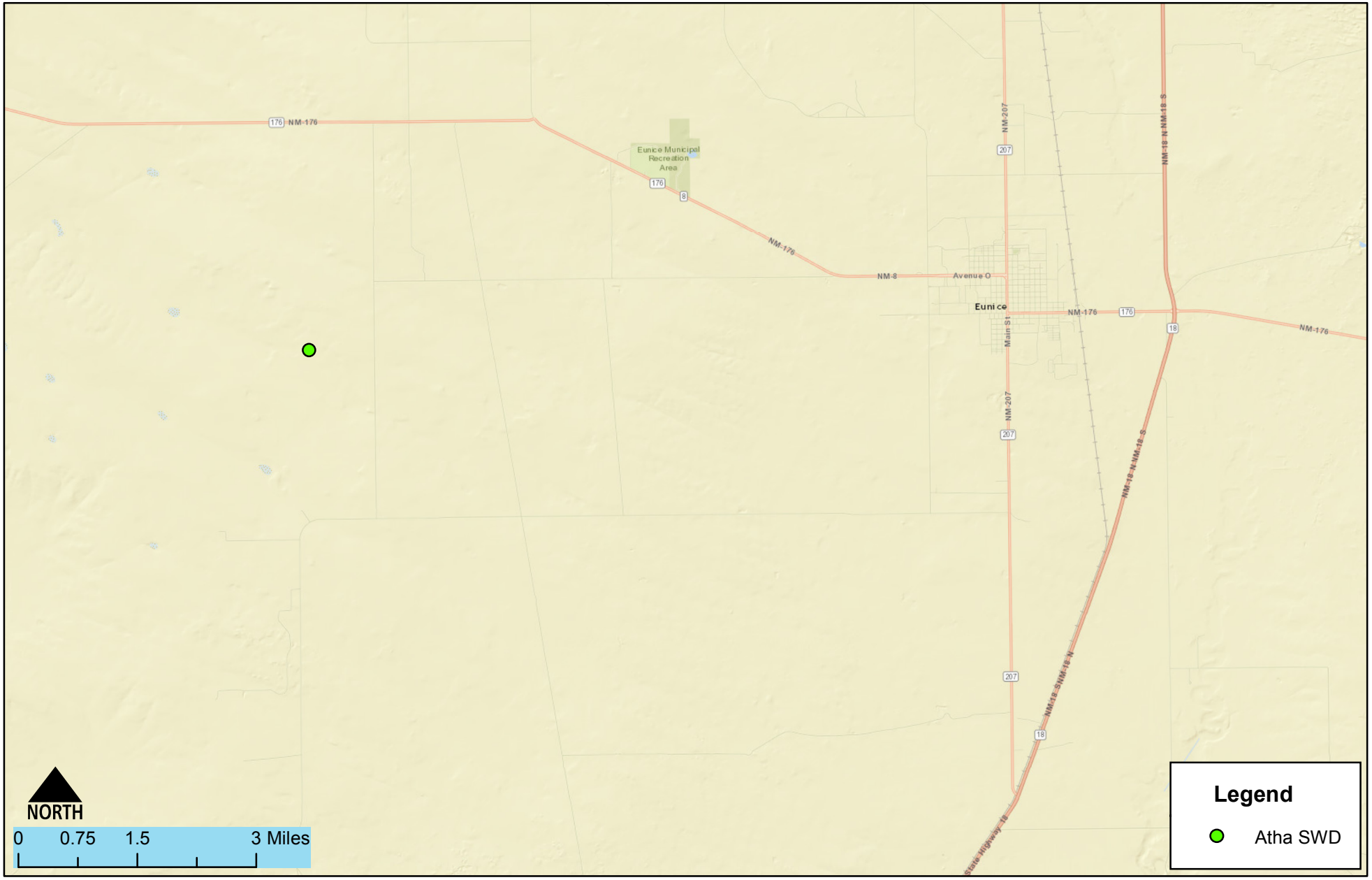
Cynthia Gray, CHMM
Senior Scientist

Figures:

Tables:

Appendices:

FIGURE 1
VICINITY MAP



Vicinity Map
Key Energy- Atha SWD
Eunice, New Mexico

Figure 1

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

Drawn Lucas Middleton
Checked
Approved

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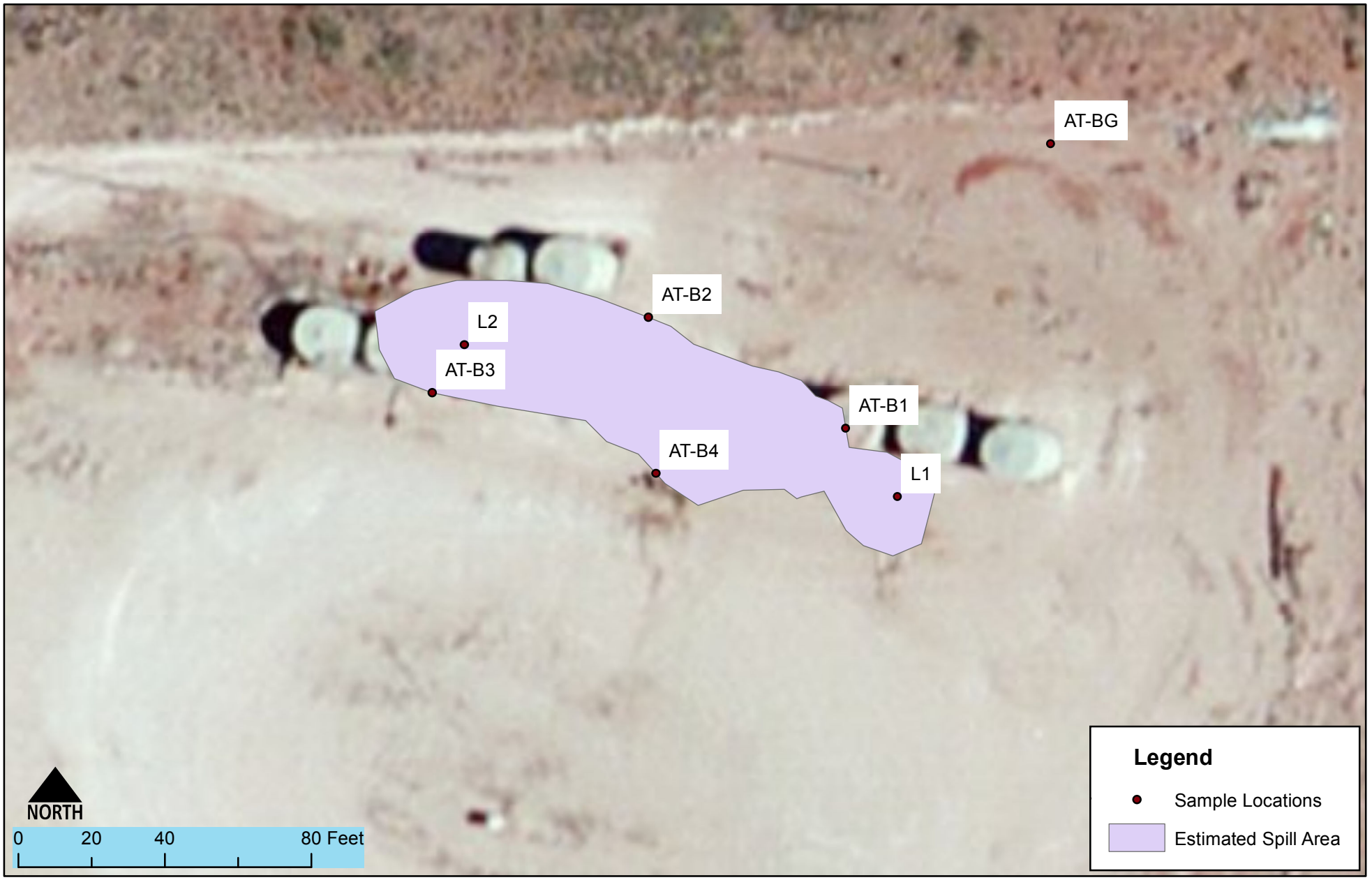
Date Saved: 9/1/2015

Document: C:\Users\lcm\Documents\GIS DATA\MAPS\AthaFigure 1.mxd

FIGURE 2

SITE DETAILS AND SAMPLE LOCATION MAP



Detailed Site and Sample Map
Key Energy- Atha SWD
Eunice, New Mexico

Figure 2

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

Drawn Lucas Middleton
Checked
Approved

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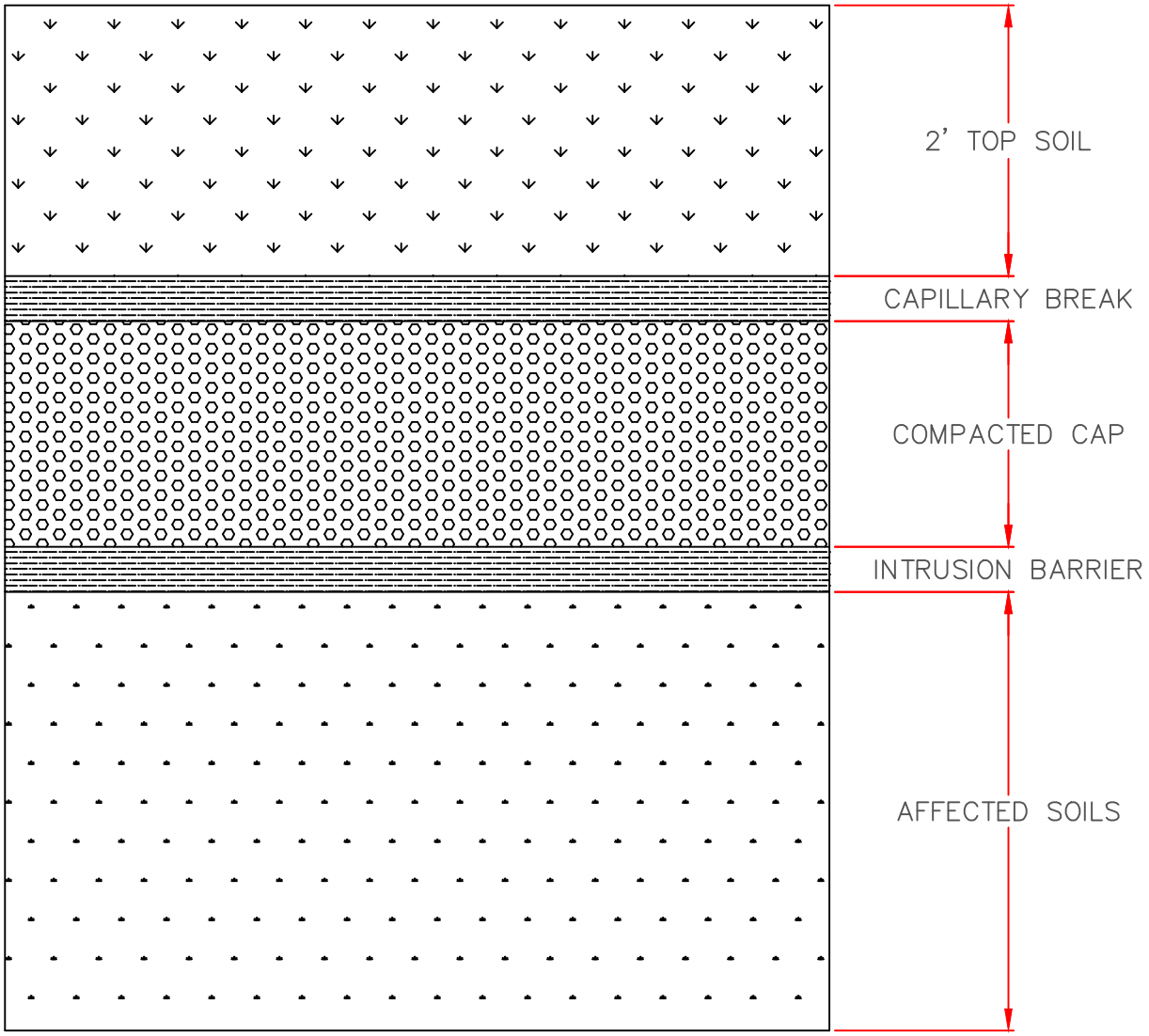
Date Saved: 12/14/2015

Document: C:\Users\lcm\Documents\GIS DATA\MAPS\AthaFigure 2 new .mxd

FIGURE 3
CAP CONSTRUCTION



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COG

IN-SITU CAP
AND BIOBARRIER DESIGN
Key Energy- Atha SWD

Designed	Drawn	Checked
LM	GJF	KT

Date: September 2015
Scale: Horiz: NA Vert: NA
Project No: 5B24095
Figure 3

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C:\Users\lcm\Documents\CAp design\5B23978 FEDERAL 17.dwg, LCM, 9/1/2015 3:15 PM

TABLE 1
RELEASE INFORMATION AND SITE RANKING

Table 1: Site Ranking

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 the unnamed wash to the west	
50' to 99' = 10			
>100' = 0	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 (An unnamed wash ~300' to the west); PRCC Mapping Tool	
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	No wells within a mile of location
Total Site Ranking	**0**		
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 FIELD SCREENING RESULTS FOR CHLORIDES

Table 2: Summary of Excavation Chloride Field Screening Results

FIELD SCREENING RESULTS SUMMARY					
Date	Time	Field Screening Reference	Sample Depth (Feet BGS)	Chlorides Results	Lab Sample Collected Y/N
11/6/2015	9:00	AT-B1	1.5'	280	Y
11/6/2015	9:00	AT-B2	1.5'	190	Y
11/6/2015	9:00	AT-B3	1.5'	205	Y
11/6/2015	9:00	AT-B4	1.5'	120	Y
11/6/2015	9:00	AT-BG	Surface	156	Y
11/6/2015	9:00	L1-4	4'	1854	Y
11/6/2015	9:00	L1-8	8'	138	Y
11/6/2015	9:00	L1-10	10'	143	Y
11/6/2015	9:00	L2-4	4'	2280	Y
11/6/2015	9:00	L2-8	8'	1350	Y
11/6/2015	9:00	L2-10	10'	166	Y
11/6/2015	9:00	L2-12	12'	189	Y

TABLE 3

SUMMARY OF LABORATORY ANALYSES

Table 3: Summary of Laboratory Analyses

Analytical Report- TC76404	Sample Number on Figure 2 Map	Sample Date	Description/depth	BTEX ppm	Benzene mg/Kg	GRO mg/Kg	DRO mg/Kg	MRO mg/Kg	Cl- mg/Kg
TC76404-3	AT-B1	11/6/2015	SIDEWALL	<3.6	<1.2	<4.5	61	84	74
TC76404-2	AT-B2	11/6/2015	SIDEWALL	<3.6	<1.2	<4.5	111	138	64
TC76404-1	AT-B3	11/6/2015	SIDEWALL	<3.6	<1.2	<4.5	<3.9	<3.9	185
TC76404-4	AT-B4	11/6/2015	SIDEWALL	<3.6	<1.2	<4.5	149	144	260
TC76404-5	AT-BG	11/6/2015	BACKGROUD	<3.6	<1.2	<4.5	1.7	0.936	7
TC76404-8	L1-4	11/6/2015	delineation 4'	<3.6	<1.2	<4.5	13.3	8.53	1,760
TC76404-6	L1-8	11/6/2015	delineation 8'	<3.6	<1.2	<4.5	1.52	1.15	8
TC76404-7	L1-10	11/6/2015	delineation 10'	<3.6	<1.2	<4.5	1.45	1.45	7
TC76404-9	L2-4	11/6/2015	delineation 4'	<3.6	<1.2	<4.5	26.8	22.7	2,130
TC76404-10	L2-8	11/6/2015	delineation 8'	<3.6	<1.2	<4.5	902	479	1,160
TC76404-11	L2-10	11/6/2015	delineation 10'	<3.6	<1.2	<4.5	1.45	1.07	BDL
TC76404-12	L2-12	11/6/2015	delineation 12'	<3.6	<1.2	<4.5	<3.9	1.06	BDL

APPENDIX A

LABORATORY ANALYTICAL REPORTS

Gulf Coast ACCUTEST LABORATORIES

11/19/15

Technical Report for

Key Energy

ATSWD

Accutest Job Number: TC76404

Sampling Date: 11/06/15

Report to:

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

ATTN: Ana Ramirez

Total number of pages in report: **72**

NELAP ACCREDITED TNI LABORATORY

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 (T104704220-15-21) 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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Sections: 1 2 3 4 5 6 7

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Sample Summary

Key Energy

ATSWD

Job No: TC76404

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
TC76404-1	11/06/15	15:00		11/11/15	SO	Solid	AT-B3
TC76404-2	11/06/15	14:00		11/11/15	SO	Solid	AT-B2
TC76404-3	11/06/15	14:00		11/11/15	SO	Solid	AT-B1
TC76404-4	11/06/15	14:00		11/11/15	SO	Solid	AT-B4
TC76404-5	11/06/15	14:00		11/11/15	SO	Solid	AT-BG
TC76404-6	11/06/15	14:00		11/11/15	SO	Solid	L1-8
TC76404-7	11/06/15	00:00		11/11/15	SO	Solid	L1-10
TC76404-8	11/06/15	00:00		11/11/15	SO	Solid	L1-4
TC76404-9	11/06/15	00:00		11/11/15	SO	Solid	L2-4
TC76404-10	11/06/15	00:00		11/11/15	SO	Solid	L2-8
TC76404-11	11/06/15	00:00		11/11/15	SO	Solid	L2-10
TC76404-12	11/06/15	00:00		11/11/15	SO	Solid	L2-12

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

Summary of Hits

Job Number: TC76404
Account: Key Energy
Project: ATSWD
Collected: 11/06/15

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
TC76404-1	**AT-B3**					
Chloride		185	5.8		mg/kg	EPA 300
TC76404-2	**AT-B2**					
TPH (C10-C28)		111	17	5.4	mg/kg	SW846 8015 M
TPH (> C28-C35)		138	17	3.2	mg/kg	SW846 8015 M
Chloride		64.0	5.0		mg/kg	EPA 300
TC76404-3	**AT-B1**					
TPH (C10-C28)		61.0	17	5.4	mg/kg	SW846 8015 M
TPH (> C28-C35)		84.0	17	3.2	mg/kg	SW846 8015 M
Chloride		73.6	5.1		mg/kg	EPA 300
TC76404-4	**AT-B4**					
TPH (C10-C28)		149	18	5.8	mg/kg	SW846 8015 M
TPH (> C28-C35)		144	18	3.5	mg/kg	SW846 8015 M
Chloride		260	14		mg/kg	EPA 300
TC76404-5	**AT-BG**					
TPH (C10-C28)		1.70 J	3.4	1.1	mg/kg	SW846 8015 M
TPH (> C28-C35)		0.936 J	3.4	0.64	mg/kg	SW846 8015 M
Chloride		7.2	2.6		mg/kg	EPA 300
TC76404-6	**L1-8**					
TPH (C10-C28)		1.52 J	3.4	1.1	mg/kg	SW846 8015 M
TPH (> C28-C35)		1.15 J	3.4	0.64	mg/kg	SW846 8015 M
Chloride		7.5	2.6		mg/kg	EPA 300
TC76404-7	**L1-10**					
TPH (C10-C28)		1.53 J	3.4	1.1	mg/kg	SW846 8015 M
TPH (> C28-C35)		1.45 J	3.4	0.64	mg/kg	SW846 8015 M
Chloride		7.1	2.6		mg/kg	EPA 300
TC76404-8	**L1-4**					
TPH (C10-C28)		13.3	4.0	1.3	mg/kg	SW846 8015 M
TPH (> C28-C35)		8.53	4.0	0.75	mg/kg	SW846 8015 M
Chloride		1760	61		mg/kg	EPA 300

Summary of Hits

Job Number: TC76404
Account: Key Energy
Project: ATSWD
Collected: 11/06/15

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
TC76404-9	**L2-4**					
TPH (C10-C28)		26.8	11	3.3	mg/kg	SW846 8015 M
TPH (> C28-C35)		22.7	11	2.0	mg/kg	SW846 8015 M
Chloride		2130	130		mg/kg	EPA 300
TC76404-10	**L2-8**					
TPH (C10-C28)		902	18	5.7	mg/kg	SW846 8015 M
TPH (> C28-C35)		479	18	3.4	mg/kg	SW846 8015 M
Chloride		1160	53		mg/kg	EPA 300
TC76404-11	**L2-10**					
TPH (C10-C28)		1.45 J	3.4	1.1	mg/kg	SW846 8015 M
TPH (> C28-C35)		1.07 J	3.4	0.64	mg/kg	SW846 8015 M
TC76404-12	**L2-12**					
TPH (> C28-C35)		1.06 J	3.4	0.64	mg/kg	SW846 8015 M

Gulf Coast ACCUTEST LABORATORIES

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	AT-B3		
Lab Sample ID:	TC76404-1	**Date Sampled:**	11/06/15
Matrix:	SO - Solid	**Date Received:**	11/11/15
Method:	SW846 8015	**Percent Solids:**	84.9
Project:	ATSWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	HH00206112.D	1	11/17/15	LT	n/a	n/a	GHH1318
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.14 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	6.6	4.5	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	87%		53-130%
98-08-8	aaa-Trifluorotoluene	96%		67-126%

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:	AT-B3		
Lab Sample ID:	TC76404-1	**Date Sampled:**	11/06/15
Matrix:	SO - Solid	**Date Received:**	11/11/15
Method:	SW846 8021B	**Percent Solids:**	84.9
Project:	ATSWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AA159707.D	1	11/18/15	LT	n/a	n/a	GAA870
Run #2							

	Initial Weight	Final Volume
Run #1	5.00 g	5.0 ml
Run #2		

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	4.7	1.2	ug/kg	
108-88-3	Toluene	ND	4.7	1.6	ug/kg	
100-41-4	Ethylbenzene	ND	4.7	1.2	ug/kg	
1330-20-7	Xylenes (total)	ND	14	3.6	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	90%		23-165%
98-08-8	aaa-Trifluorotoluene	108%		34-174%

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:	AT-B3		
Lab Sample ID:	TC76404-1	**Date Sampled:**	11/06/15
Matrix:	SO - Solid	**Date Received:**	11/11/15
Method:	SW846 8015 M SW846 3550B	**Percent Solids:**	84.9
Project:	ATSWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	IB241376.D	1	11/17/15	RV	11/17/15	OP38757	GIB2010
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C10-C28)	ND	3.9	1.2	mg/kg	
	TPH (> C28-C35)	ND	3.9	0.73	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	83%		41-123%

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:	AT-B3		
Lab Sample ID:	TC76404-1	**Date Sampled:**	11/06/15
Matrix:	SO - Solid	**Date Received:**	11/11/15
		Percent Solids:	84.9
Project:	ATSWD		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	185	5.8	mg/kg	2	11/16/15 11:46	ES	EPA 300
Solids, Percent	84.9		%	1	11/13/15	PA	SM 2540 G

RL = Reporting Limit

Report of Analysis

Client Sample ID: AT-B2
Lab Sample ID: TC76404-2
Matrix: SO - Solid
Method: SW846 8015
Project: ATSWD

Date Sampled: 11/06/15
Date Received: 11/11/15
Percent Solids: 97.4

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	HH00206131.D	1	11/17/15	LT	n/a	n/a	GHH1318
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.03 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	5.2	3.6	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	87%		53-130%
98-08-8	aaa-Trifluorotoluene	96%		67-126%

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: AT-B2
Lab Sample ID: TC76404-2
Matrix: SO - Solid
Method: SW846 8021B
Project: ATSWD

Date Sampled: 11/06/15
Date Received: 11/11/15
Percent Solids: 97.4

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AA159713.D	1	11/18/15	LT	n/a	n/a	GAA870
Run #2							

	Initial Weight	Final Volume
Run #1	5.26 g	5.0 ml
Run #2		

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	3.9	0.99	ug/kg	
108-88-3	Toluene	ND	3.9	1.3	ug/kg	
100-41-4	Ethylbenzene	ND	3.9	0.97	ug/kg	
1330-20-7	Xylenes (total)	ND	12	2.9	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	78%		23-165%
98-08-8	aaa-Trifluorotoluene	90%		34-174%

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: AT-B2
Lab Sample ID: TC76404-2
Matrix: SO - Solid
Method: SW846 8015 M SW846 3550B
Project: ATSWD

Date Sampled: 11/06/15
Date Received: 11/11/15
Percent Solids: 97.4

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	IB241368.D	5	11/17/15	RV	11/17/15	OP38757	GIB2010
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C10-C28)	111	17	5.4	mg/kg	
	TPH (> C28-C35)	138	17	3.2	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	113%		41-123%

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:	AT-B2		
Lab Sample ID:	TC76404-2	**Date Sampled:**	11/06/15
Matrix:	SO - Solid	**Date Received:**	11/11/15
		Percent Solids:	97.4
Project:	ATSWD		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	64.0	5.0	mg/kg	2	11/16/15 12:37	ES	EPA 300
Solids, Percent	97.4		%	1	11/13/15	PA	SM 2540 G

RL = Reporting Limit

Report of Analysis

Client Sample ID:	AT-B1		
Lab Sample ID:	TC76404-3	**Date Sampled:**	11/06/15
Matrix:	SO - Solid	**Date Received:**	11/11/15
Method:	SW846 8015	**Percent Solids:**	96.7
Project:	ATSWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	HH00206132.D	1	11/17/15	LT	n/a	n/a	GHH1318
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.03 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	5.3	3.6	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	91%		53-130%
98-08-8	aaa-Trifluorotoluene	99%		67-126%

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:	AT-B1		
Lab Sample ID:	TC76404-3	**Date Sampled:**	11/06/15
Matrix:	SO - Solid	**Date Received:**	11/11/15
Method:	SW846 8021B	**Percent Solids:**	96.7
Project:	ATSWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AA159706.D	1	11/18/15	LT	n/a	n/a	GAA870
Run #2							

	Initial Weight	Final Volume
Run #1	5.20 g	5.0 ml
Run #2		

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	4.0	1.0	ug/kg	
108-88-3	Toluene	ND	4.0	1.3	ug/kg	
100-41-4	Ethylbenzene	ND	4.0	0.99	ug/kg	
1330-20-7	Xylenes (total)	ND	12	3.0	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	93%		23-165%
98-08-8	aaa-Trifluorotoluene	99%		34-174%

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:	AT-B1		
Lab Sample ID:	TC76404-3	**Date Sampled:**	11/06/15
Matrix:	SO - Solid	**Date Received:**	11/11/15
Method:	SW846 8015 M SW846 3550B	**Percent Solids:**	96.7
Project:	ATSWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	IB241365.D	5	11/17/15	RV	11/17/15	OP38757	GIB2010
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C10-C28)	61.0	17	5.4	mg/kg	
	TPH (> C28-C35)	84.0	17	3.2	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	90%		41-123%

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:	AT-B1		
Lab Sample ID:	TC76404-3	**Date Sampled:**	11/06/15
Matrix:	SO - Solid	**Date Received:**	11/11/15
		Percent Solids:	96.7
Project:	ATSWD		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	73.6	5.1	mg/kg	2	11/16/15 12:54	ES	EPA 300
Solids, Percent	96.7		%	1	11/13/15	PA	SM 2540 G

RL = Reporting Limit

Report of Analysis

Client Sample ID: AT-B4
Lab Sample ID: TC76404-4
Matrix: SO - Solid
Method: SW846 8015
Project: ATSWD

Date Sampled: 11/06/15
Date Received: 11/11/15
Percent Solids: 90.0

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	HH00206133.D	1	11/17/15	LT	n/a	n/a	GHH1318
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.01 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	6.1	4.1	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	88%		53-130%
98-08-8	aaa-Trifluorotoluene	97%		67-126%

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:	AT-B4		
Lab Sample ID:	TC76404-4	**Date Sampled:**	11/06/15
Matrix:	SO - Solid	**Date Received:**	11/11/15
Method:	SW846 8021B	**Percent Solids:**	90.0
Project:	ATSWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AA159708.D	1	11/18/15	LT	n/a	n/a	GAA870
Run #2							

	Initial Weight	Final Volume
Run #1	5.06 g	5.0 ml
Run #2		

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	4.4	1.1	ug/kg	
108-88-3	Toluene	ND	4.4	1.5	ug/kg	
100-41-4	Ethylbenzene	ND	4.4	1.1	ug/kg	
1330-20-7	Xylenes (total)	ND	13	3.3	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	89%		23-165%
98-08-8	aaa-Trifluorotoluene	97%		34-174%

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:	AT-B4		
Lab Sample ID:	TC76404-4	**Date Sampled:**	11/06/15
Matrix:	SO - Solid	**Date Received:**	11/11/15
Method:	SW846 8015 M SW846 3550B	**Percent Solids:**	90.0
Project:	ATSWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	IB241366.D	5	11/17/15	RV	11/17/15	OP38757	GIB2010
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C10-C28)	149	18	5.8	mg/kg	
	TPH (> C28-C35)	144	18	3.5	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	79%		41-123%

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:	AT-B4		
Lab Sample ID:	TC76404-4	**Date Sampled:**	11/06/15
Matrix:	SO - Solid	**Date Received:**	11/11/15
		Percent Solids:	90.0
Project:	ATSWD		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	260	14	mg/kg	5	11/16/15 13:11	ES	EPA 300
Solids, Percent	90		%	1	11/13/15	PA	SM 2540 G

RL = Reporting Limit

Report of Analysis

Client Sample ID:	AT-BG		
Lab Sample ID:	TC76404-5	**Date Sampled:**	11/06/15
Matrix:	SO - Solid	**Date Received:**	11/11/15
Method:	SW846 8015	**Percent Solids:**	96.5
Project:	ATSWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	HH00206116.D	1	11/17/15	LT	n/a	n/a	GHH1318
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.00 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	5.4	3.6	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	92%		53-130%
98-08-8	aaa-Trifluorotoluene	103%		67-126%

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: AT-BG
Lab Sample ID: TC76404-5
Matrix: SO - Solid
Method: SW846 8015 M SW846 3550B
Project: ATSWD

Date Sampled: 11/06/15
Date Received: 11/11/15
Percent Solids: 96.5

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	IB241363.D	1	11/17/15	RV	11/17/15	OP38757	GIB2010
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C10-C28)	1.70	3.4	1.1	mg/kg	J
	TPH (> C28-C35)	0.936	3.4	0.64	mg/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	77%		41-123%

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:	AT-BG		
Lab Sample ID:	TC76404-5	**Date Sampled:**	11/06/15
Matrix:	SO - Solid	**Date Received:**	11/11/15
		Percent Solids:	96.5
Project:	ATSWD		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	7.2	2.6	mg/kg	1	11/16/15 13:28	ES	EPA 300
Solids, Percent	96.5		%	1	11/13/15	PA	SM 2540 G

RL = Reporting Limit

Report of Analysis

Client Sample ID: L1-8
Lab Sample ID: TC76404-6
Matrix: SO - Solid
Method: SW846 8015
Project: ATSWD

Date Sampled: 11/06/15
Date Received: 11/11/15
Percent Solids: 96.5

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	HH00206130.D	1	11/17/15	LT	n/a	n/a	GHH1318
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.03 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	5.3	3.6	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	89%		53-130%
98-08-8	aaa-Trifluorotoluene	97%		67-126%

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: L1-8
Lab Sample ID: TC76404-6
Matrix: SO - Solid
Method: SW846 8015 M SW846 3550B
Project: ATSWD

Date Sampled: 11/06/15
Date Received: 11/11/15
Percent Solids: 96.5

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	IB241377.D	1	11/17/15	RV	11/17/15	OP38757	GIB2010
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C10-C28)	1.52	3.4	1.1	mg/kg	J
	TPH (> C28-C35)	1.15	3.4	0.64	mg/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	97%		41-123%

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:	L1-8		
Lab Sample ID:	TC76404-6	**Date Sampled:**	11/06/15
Matrix:	SO - Solid	**Date Received:**	11/11/15
		Percent Solids:	96.5
Project:	ATSWD		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	7.5	2.6	mg/kg	1	11/16/15 13:45	ES	EPA 300
Solids, Percent	96.5		%	1	11/13/15	PA	SM 2540 G

RL = Reporting Limit

Report of Analysis

Client Sample ID: L1-10
Lab Sample ID: TC76404-7
Matrix: SO - Solid
Method: SW846 8015
Project: ATSWD

Date Sampled: 11/06/15
Date Received: 11/11/15
Percent Solids: 96.8

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	HH00206125.D	1	11/17/15	LT	n/a	n/a	GHH1318
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.02 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	5.3	3.6	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	90%		53-130%
98-08-8	aaa-Trifluorotoluene	100%		67-126%

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: L1-10
Lab Sample ID: TC76404-7
Matrix: SO - Solid
Method: SW846 8015 M SW846 3550B
Project: ATSWD

Date Sampled: 11/06/15
Date Received: 11/11/15
Percent Solids: 96.8

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	IB241378.D	1	11/17/15	RV	11/17/15	OP38757	GIB2010
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C10-C28)	1.53	3.4	1.1	mg/kg	J
	TPH (> C28-C35)	1.45	3.4	0.64	mg/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	90%		41-123%

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:	L1-10		
Lab Sample ID:	TC76404-7	**Date Sampled:**	11/06/15
Matrix:	SO - Solid	**Date Received:**	11/11/15
		Percent Solids:	96.8
Project:	ATSWD		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	7.1	2.6	mg/kg	1	11/16/15 14:36	ES	EPA 300
Solids, Percent	96.8		%	1	11/13/15	PA	SM 2540 G

RL = Reporting Limit

Report of Analysis

Client Sample ID:	L1-4		
Lab Sample ID:	TC76404-8	**Date Sampled:**	11/06/15
Matrix:	SO - Solid	**Date Received:**	11/11/15
Method:	SW846 8015	**Percent Solids:**	82.7
Project:	ATSWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	HH00206126.D	1	11/17/15	LT	n/a	n/a	GHH1318
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.11 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	7.0	4.7	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	90%		53-130%
98-08-8	aaa-Trifluorotoluene	98%		67-126%

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:	L1-4		
Lab Sample ID:	TC76404-8	**Date Sampled:**	11/06/15
Matrix:	SO - Solid	**Date Received:**	11/11/15
Method:	SW846 8015 M SW846 3550B	**Percent Solids:**	82.7
Project:	ATSWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	IB241379.D	1	11/17/15	RV	11/17/15	OP38757	GIB2010
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C10-C28)	13.3	4.0	1.3	mg/kg	
	TPH (> C28-C35)	8.53	4.0	0.75	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	77%		41-123%

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:	L1-4		
Lab Sample ID:	TC76404-8	**Date Sampled:**	11/06/15
Matrix:	SO - Solid	**Date Received:**	11/11/15
		Percent Solids:	82.7
Project:	ATSWD		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	1760	61	mg/kg	20	11/16/15 14:53	ES	EPA 300
Solids, Percent	82.7		%	1	11/13/15	PA	SM 2540 G

RL = Reporting Limit

Report of Analysis

Client Sample ID:	L2-4		
Lab Sample ID:	TC76404-9	**Date Sampled:**	11/06/15
Matrix:	SO - Solid	**Date Received:**	11/11/15
Method:	SW846 8015	**Percent Solids:**	94.8
Project:	ATSWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	HH00206127.D	1	11/17/15	LT	n/a	n/a	GHH1318
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.16 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	5.4	3.7	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	92%		53-130%
98-08-8	aaa-Trifluorotoluene	103%		67-126%

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:	L2-4		
Lab Sample ID:	TC76404-9	**Date Sampled:**	11/06/15
Matrix:	SO - Solid	**Date Received:**	11/11/15
Method:	SW846 8015 M SW846 3550B	**Percent Solids:**	94.8
Project:	ATSWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	IB241382.D	3	11/17/15	RV	11/17/15	OP38757	GIB2010
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C10-C28)	26.8	11	3.3	mg/kg	
	TPH (> C28-C35)	22.7	11	2.0	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	70%		41-123%

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:	L2-4		
Lab Sample ID:	TC76404-9	**Date Sampled:**	11/06/15
Matrix:	SO - Solid	**Date Received:**	11/11/15
		Percent Solids:	94.8
Project:	ATSWD		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	2130	130	mg/kg	50	11/16/15 15:10	ES	EPA 300
Solids, Percent	94.8		%	1	11/13/15	PA	SM 2540 G

RL = Reporting Limit

Report of Analysis

Client Sample ID: L2-8
Lab Sample ID: TC76404-10
Matrix: SO - Solid
Method: SW846 8015
Project: ATSWD

Date Sampled: 11/06/15
Date Received: 11/11/15
Percent Solids: 91.5

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	HH00206142.D	1	11/18/15	LT	n/a	n/a	GHH1319
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.18 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	5.7	3.9	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	100%		53-130%
98-08-8	aaa-Trifluorotoluene	103%		67-126%

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:	L2-8		
Lab Sample ID:	TC76404-10	**Date Sampled:**	11/06/15
Matrix:	SO - Solid	**Date Received:**	11/11/15
Method:	SW846 8015 M SW846 3550B	**Percent Solids:**	91.5
Project:	ATSWD		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	IB241383.D	5	11/17/15	RV	11/17/15	OP38757	GIB2010
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C10-C28)	902	18	5.7	mg/kg	
	TPH (> C28-C35)	479	18	3.4	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	73%		41-123%

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: L2-8
Lab Sample ID: TC76404-10
Matrix: SO - Solid
Project: ATSWD

Date Sampled: 11/06/15
Date Received: 11/11/15
Percent Solids: 91.5

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	1160	53	mg/kg	20	11/16/15 15:27	ES	EPA 300
Solids, Percent	91.5		%	1	11/13/15	PA	SM 2540 G

RL = Reporting Limit

Report of Analysis

Client Sample ID: L2-10
Lab Sample ID: TC76404-11
Matrix: SO - Solid
Method: SW846 8015
Project: ATSWD

Date Sampled: 11/06/15
Date Received: 11/11/15
Percent Solids: 97.0

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	HH00206128.D	1	11/17/15	LT	n/a	n/a	GHH1318
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.08 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	5.2	3.6	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	88%		53-130%
98-08-8	aaa-Trifluorotoluene	98%		67-126%

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: L2-10
Lab Sample ID: TC76404-11
Matrix: SO - Solid
Method: SW846 8015 M SW846 3550B
Project: ATSWD

Date Sampled: 11/06/15
Date Received: 11/11/15
Percent Solids: 97.0

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	IB241380.D	1	11/17/15	RV	11/17/15	OP38757	GIB2010
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C10-C28)	1.45	3.4	1.1	mg/kg	J
	TPH (> C28-C35)	1.07	3.4	0.64	mg/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	92%		41-123%

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:	L2-10		
Lab Sample ID:	TC76404-11	**Date Sampled:**	11/06/15
Matrix:	SO - Solid	**Date Received:**	11/11/15
		Percent Solids:	97.0
Project:	ATSWD		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	< 2.5	2.5	mg/kg	1	11/16/15 15:44	ES	EPA 300
Solids, Percent	97		%	1	11/13/15	PA	SM 2540 G

RL = Reporting Limit

Report of Analysis

Client Sample ID: L2-12
Lab Sample ID: TC76404-12
Matrix: SO - Solid
Method: SW846 8015
Project: ATSWD

Date Sampled: 11/06/15
Date Received: 11/11/15
Percent Solids: 97.2

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BB0020685.D	1	11/17/15	LT	n/a	n/a	GBB1083
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.16 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	5.1	3.5	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	103%		53-130%
98-08-8	aaa-Trifluorotoluene	112%		67-126%

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

Accutest Laboratories

Report of Analysis

Client Sample ID: L2-12
Lab Sample ID: TC76404-12
Matrix: SO - Solid
Method: SW846 8015 M SW846 3550B
Project: ATSWD

Date Sampled: 11/06/15
Date Received: 11/11/15
Percent Solids: 97.2

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	IB241381.D	1	11/17/15	RV	11/17/15	OP38757	GIB2010
Run #2							

	Initial Weight	Final Volume
Run #1	30.2 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C10-C28)	ND	3.4	1.1	mg/kg	
	TPH (> C28-C35)	1.06	3.4	0.64	mg/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	90%		41-123%

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

Accutest Laboratories

Report of Analysis

Client Sample ID:	L2-12		
Lab Sample ID:	TC76404-12	**Date Sampled:**	11/06/15
Matrix:	SO - Solid	**Date Received:**	11/11/15
		Percent Solids:	97.2
Project:	ATSWD		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	< 2.5	2.5	mg/kg	1	11/16/15 16:01	ES	EPA 300
Solids, Percent	97.2		%	1	11/13/15	PA	SM 2540 G

RL = Reporting Limit

Gulf Coast ACCUTEST LABORATORIES

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

Chain-of-Custody Record

Client: KEY ENERGY

Mailing Address: 6 DESTA DR SUITE 4300 MIDLAND, TX

Phone #:

email or Fax#: aramirez016@keyenergy.com

QA/QC Package: ☑ Standard ☐ Level 4 (Full Validation)

Accreditation ☐ NELAP ☐ Other

☐ EDD (Type)

Turn-Around Time: TC76404 ☑ Standard ☐ Rush

Project Name: ATHASCA

Project #:

Project Manager: ANA RAMIREZ

Sampler: SNA / AUSTIN WEYANT

On Ice: ☐ Yes ☐ No

Sample Temperature:

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No.	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO3,NO2,PO4,SO4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	VERIFIED BY:	TAGGED BY:	Air Bubbles (Y or N)
11/6	3:00PM	SOIL	AT-B3	4oz 1			X		X					X						
11/6	2:00PM	SOIL	AT-B2	4/0z 1			X		X					X						
11/6	2:00PM	SOIL	AT-B1	4oz 1			X		X					X						
11/6	2:00PM	SOIL	AT-B4	4oz 1			X		X					X						
11/6	2:00PM	SOIL	AT-B6	4oz 1					X					X						
11/6	2PM	SOIL	L1-8	4oz 1					X					X						
7			L1-10	4oz 1					X					X						
8			L1-4	4oz 1					X					X						
9			L2-4	4oz 1					X					X						
10			L2-8	4oz 1					X					X						
11			L2-10	4oz 1					X					X						
12			L2-12	4oz 1					X					X						

Date:	Time:	Relinquished by:	Received by:	Date	Time
11/9	3:00 PM	Austin Weyant	FedEx UPS	11/11/15	1010
11/11/15	1010	UPS	Brianca Henry	11/11/15	1010

Remarks: BILL TO KEY ENERGY
RESULTS TO austin.weyant@soudermiller.com

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

TC76404: Chain of Custody

Page 1 of 4

APPENDIX B
FORM C141 FINAL

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 Bobby Sisson
Address 1301 McKinney Street, Suite 1800, Houston, TX 77010	Telephone No. 806-401-4349
Facility Name Atha SWD	Facility Type SWD

Surface Owner Dasco & McCasland	Mineral Owner Dasco & McCasland	API No. 30-025-08816

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
C	6	22S	36E	660'	North Line	990'	West Line	Lea

Latitude 32° 25' 47.8" N Longitude 130° 18' 36.9" W

NATURE OF RELEASE

Type of Release Produced Water	Volume of Release 20 bbl	Volume Recovered 20 bbl
Source of Release 500 bbl tank	Date and Hour of Occurrence 01/24/2015 0500	Date and Hour of Discovery 01/24/2015 0500
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Randy Corbel	
By Whom?	Date and Hour	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse. n/a	

If a Watercourse was Impacted, Describe Fully.*

Not applicable.

Describe Cause of Problem and Remedial Action Taken.*

While unloading a vacuum truck, the automated shut of system failed and the tank overflowed. The truck driver picked up free fluids with his truck.

Describe Area Affected and Cleanup Action Taken.*

The pad area was found to be 450 ft long and 300 ft wide. Delineation samples were taken to depths of 4 ft below ground surface. Soil remediation was conducted. Samples were taken in the sidewalks to ensure soils had been removed in the horizontal extent. In a similar way, samples were taken to three ft bsg in the spill area to remove heavily impacted soils in load-out and battery areas. Approximately 416 cubic yards of contaminated soil was removed and replaced by the cap and clean backfill material. The sample analysis for this site show below the action level for contaminants.

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

Signature:	OIL CONSERVATION DIVISION
Printed Name: Bobby J. Sisson	Approved by Environmental Specialist:
Title: Area Director	Approval Date: 01/07/2016 Expiration Date: ///
E-mail Address: bsisson@keyenergy.com	Conditions of Approval: /// Attached ☐ 1RP 3522
Date: 12-18-15 Phone: 806 837-3019	

APPENDIX C
PHOTOS

Photo 1: Tank Battery prior to excavation 11/2/15

Photo 2: Excavation end of day 11/2/15

Photo 3: Tank Battery excavation depth before compaction 11/2/15

Photo 4: Spill pile hauled to Lea Land 11/2/15

Photo 5: L1- Delineation 11/6/15

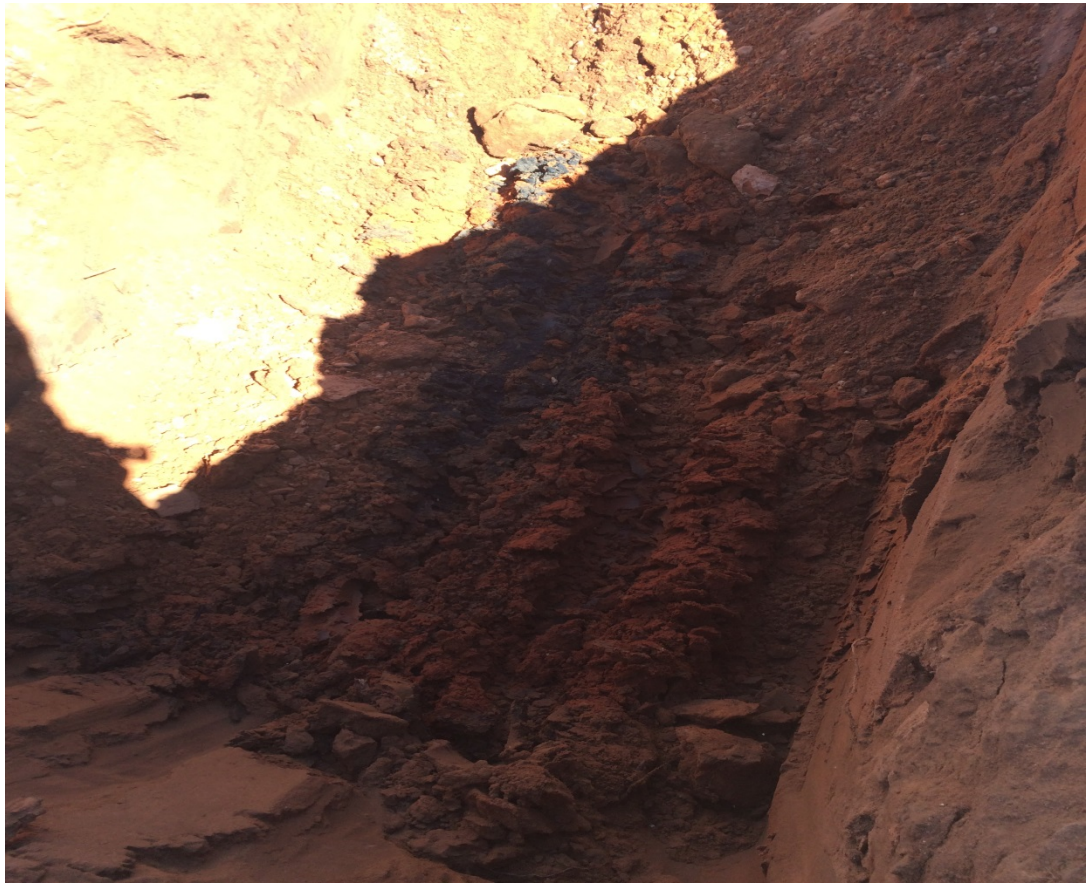

Photo 6: L2- Delineation 11/6/15

Photo 7: Cap installation 11/9/15

Photo 8: Cap installation 11/6/15