State of New Mexico Energy Minerals and Natural Resources

Form C-141 Revised August 8, 2011

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

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

			Rel	ease Notific	ation	and Co	orrective A	ction				
					(OPERA'	FOR		🛛 Initia	al Report		Final Repor
Name of Co	ompany Ta	arga Midstrea	am Servi	ces, L.P.	C	ontact Ro	ger Roger Ho	olland	-			
Address	P.(O. Box 1909	, Eunice,	New Mexico 88	231 T	elephone l	No. (575) 394	4-2534				
Facility Nat	ne Irv	in Boyd 9" I	Pipeline I	Leak	Fa	acility Typ	e 9" Natura	al Gas P	Pipeline			
Surface Ow	ner Irv	vin Boyd		Mineral O	wner	Chevron			API No	. Near 3	30-025-	10425
				LOCA	TION	OF REI	LEASE					
Unit Letter K	Section 23	Township 22S	Range 37E	Feet from the 2,000		outh Line outh	Feet from the 1,900		Vest Line Vest	County	LEA	
			La	titude <u>N32°22'</u> 3	32.54"	Longitud	e <u>103° 08' 11.</u>	56"				
				NAT	URE C	OF RELI	EASE					
Type of Relea	ase					Volume of			Volume R	ecovered		
Natural Gas/I						Unknown			None			
Source of Rel							our of Occurrenc	e	Date and l	Hour of Dis	-	10.0010
Steel Pipeline Was Immedia						Unknown If YES, To	Whom?			. F	ebruary	13, 2012
was inniedia	ale Notice C		Yes 🛛	No 🗌 Not Rec		11 1 1 5, 10	winoin:					
By Whom?						Date and H	our					
Was a Water	course Read	hed?	Yes 🛛	No		If YES, Vo	lume Impacting t	he Wate	rcourse.			
If a Watercou		. 1	1 12 11 1	6								
	replaced wi	th poly pipe. S	Soil was en	n Taken.* Corrosio xcavated at both lo lexico.								
around north 1	leak (50' x ' walls and di	75') and aroun	d south le	en.* North and So ak (40' x 40'). On M bottom of the exce	March 12	, 2012, Lars	son & Associates,	Inc., co	llected 5-sp	pot composi	te soil sa	amples
regulations all public health should their or	l operators a or the envir perations ha ment. In ad	are required to onment. The ave failed to a ddition, NMO	o report an acceptanc dequately CD accep	is true and comple d/or file certain rel e of a C-141 report investigate and ren tance of a C-141 re	lease noti t by the N mediate c	fications an MOCD ma ontaminatio	d perform correct rked as "Final Re on that pose a thre	tive action eport" do eat to gro	ons for rele bes not relie ound water,	ases which a eve the oper- surface wat	may end ator of li ter, hum	langer iability aan health
Signature:	ha	500	in				OIL CONS	SERV	ATION	DIVISIO	N	
Printed Name	Chu	och Te	j)sm	4	Ap	proved by 1	Environmental Sp	ecialist:				
Title: Fi	=18 5	Supervi	SOF		Ар	proval Date		E	xpiration E)ate:		
			-	250VTCC5.CO		nditions of	Approval:			Attached		
Date: Apr	il 11, 2012		Pho	ne: 432-788-0	AI	1						

* Attach Additional Sheets If Necessary

FINAL REPORT Irvin Boyd 9 – Inch Pipeline Release 1RP-04-12-2802

Lea County, New Mexico

LAI Project No. 12-0118-01

January 2013

Prepared for:

Targa Midstream Services, LLC 6 Desta Drive, Suite 3300 Midland, Texas 79705

Prepared by:

Larson & Associates, Inc. 507 North Marienfeld, Suite 200 Midland, Texas 79701

Mark J. Larson Certified Professional Geologist No. 10490

1.0 EXECUTIVE SUMMARY

This report is submitted on behalf of Targa Midstream Services, LLC (Targa) to the New Mexico Oil Conservation Division (OCD) District 1 to present the analysis of soil samples collected from the excavation activity resulting from remediation of natural gas liquid (NGL) releases on a 9 inch pipeline segment referred to as the "Boyd 9"" (Site). The Site is located in Unit K (NE/4, SW/4), Section 23, Township 22 South, Range 37 East in Lea County, New Mexico.

In February 2012, Targa personnel discovered 2 releases on the north to south trending steel pipeline. The releases are separated by approximately 40 feet and were repaired by replacing the steel pipeline with approximately 200 feet of polyethylene pipe. Targa submitted the initial C-141 report to the OCD District 1 on April 11, 2012. The OCD assigned the release remediation project (RP) number 1RP-04-12-2802. The geodetic position is north 32° 22' 32.54" and west 103° 08' 11.56".

Between February 28, 2012 and March 12, 2012, Environmental Plus, Inc. (EPI) excavated soil at the north and south releases to approximately 15 feet below ground surface (bgs). Approximately 1,372 cubic yards of soil was disposed at Sundance Disposal located east of Eunice, New Mexico.

On March 12, 2012, Larson & Associates, Inc. (LAI) personnel collected initial soil samples from the bottom and sidewalls of the north and south excavations. A backhoe was used to collect samples from the bottom of the north excavation at approximately 15, 20 and 25 feet below ground surface (bgs). Samples were collected from the bottom of south excavation at approximately 15, 20, 25 and 30 feet bgs. The sidewall samples were collected at approximately 10 feet bgs. The samples were delivered under preservation and chain of custody to Xenco Laboratories, located in Odessa, Texas. The laboratory analyzed the samples for benzene, toluene, ethylbenzene, xylene (BTEX), total petroleum hydrocarbons (TPH) and chloride by methods SW-8021B, SW-8015 and E300, respectively.

Remediation action levels were calculated for benzene, BTEX and TPH using criteria established by the OCD (*Guidelines for Remediation of Leaks, Spills and Releases, August 13,* 1993) assuming the following:

Ranking Criteria	Result	Ranking Score
Depth-to-Groundwater	50 – 99 feet	10
Wellhead Protection Area	No	0
Distance to Surface Water Body	>1000 Horizontal Feet	0
	Total Score:	10

The nearest water well is an out-of-service windmill located approximately 2,400 feet northwest of the release. Depth to groundwater in this well is approximately 60 feet bgs. The nearest surface water (Monument Draw) is located approximately 5,400 feet east of the release. The following RRAL were calculated for 1RP-04-12-2802:

Benzene:	10 mg/kg
BTEX:	50 mg/kg
TPH:	1,000 mg/kg

Benzene, BTEX and TPH were less than the method detection limits. Chloride in the north excavation sidewall samples ranged from 1,410 milligrams per kilogram (mg/kg) in the north sidewall to 8,290 mg/kg in the east sidewall. Chloride concentrations in the bottom samples of the north excavation were 7,680 mg/kg (15 feet), 1,700 mg/kg (20 feet) and 223 mg/kg (25 feet). Chloride concentrations in the south excavation sidewall samples ranged from 1,480 mg/kg in the west sidewall to 13,800 mg/kg in the east sidewall. Chloride concentrations in the bottom samples from the south excavation were 3,220 mg/kg (15 feet), 1,310 mg/kg (20 feet), 546 mg/kg (25 feet) and 249 mg/kg (30 feet).

On June 15, 2012, the OCD District 1 approved closure for the excavations by installing a polyethylene liner in the bottom of the excavation and filling with clean soil. The closure approval was not accepted by the landowner and Targa voluntarily excavated additional soil.

Between June 16, 2012 and August 9, 2012, Environmental Plus, Inc. (EPI) excavated soil at the north and south releases to approximately 30 feet below ground surface (bgs). Approximately 5,580 cubic yards of soil was removed for a total of 6,952 cubic yards disposed at Sundance Disposal located east of Eunice, New Mexico.

On June 27, 2012, Larson & Associates, Inc. (LAI) personnel collected preliminary samples from the bottom and sidewalls of the excavation. Chloride concentrations in the sidewall samples ranged from 69.8 mg/kg in the north sidewall (4 feet) to 8,330 mg/kg in the west sidewall (15 feet). Chloride concentrations in two samples from the bottom of the excavation were 9,060 and 556 mg/kg at 25 and 30 feet, respectively. Additional soil was excavated to further reduce the chloride concentrations.

On August 9, 2012, Larson & Associates, Inc. (LAI) personnel collected confirmation soil samples from the bottom and sidewalls of the excavation site. Samples were collected from the bottom of the excavation at approximately 30 feet below ground surface (bgs). Samples were collected from the sidewalls at approximately 8 and 16 feet bgs. Trace Analysis Laboratories, located in Midland, Texas, analyzed the samples for chloride by method E300.

Chloride concentrations in the excavation sidewall samples ranged from 1,210 milligrams per kilogram (mg/kg) from the south sidewall to 4,600 mg/kg in the west sidewall at eight feet bgs. The chloride concentration in the bottom sample of the excavation was 146 mg/kg (30 feet).

Targa requests permission to fill the excavation with clean soil. The surface will be seeded to a seed blend recommended for the area. A final report will be submitted to the OCD upon completion of the excavation backfilling.

2.0 INTRODUCTION

Larson & Associates, Inc. (LAI) submits this report to the New Mexico Oil Conservation Division (OCD) on behalf of Targa Midstream Services, LLC (Targa) to present the analysis of soil samples collected from the Boyd 9 inch pipeline release (Site). Two natural gas releases were discovered due to external corrosion of the 9 inch steel pipeline which transfers natural gas to the Eunice Plant located northwest of the Site. Targa discovered the two releases in February 2012 and replaced the steel pipe with approximately 200 feet of polyethylene pipe. The initial C-141 report was submitted to the OCD District 1 in Hobbs, New Mexico, on April 11, 2012. The Site is located in Unit K (NE/4, SW/4), Section 23, Township 22 South, Range 37 east, in Lea County, New Mexico. The geodetic position is north 32° 22' 32.54" and west 103° 08' 11.56". Figure 1 presents a location and topographic map. Figure 2 presents an aerial photograph. Appendix E presents the initial C-141 report.

2.1 Setting

The Site is located about 4 miles southeast of Eunice, New Mexico. The surface elevation is approximately 3,330 feet above mean sea level (MSL) and slopes gently to the southeast. The soil is designated "Simona fine sandy loam, 0 to 3 percent slopes" with color from pale brown to grayish brown and fine sandy loam with fragments of hard caliche. The "c" layer is comprised of white caliche that is indurated to strongly cemented. The surrounding area is used for range, wildlife and recreation. The nearest surface water feature is Monument Draw which is located about 1 mile (5,400 feet) east of the Site.

According to the *Geologic Map of New Mexico* and the *Geologic Atlas of Texas, Hobbs Sheet* the surface geology is comprised of Holocene to mid-Pleistocene age wind-blown sand. This material covers the eastern flank of the Pecos River valley and derived principally from reworking the underlying Tertiary-aged Ogallala formation of the Southern High Plains. The Ogallala formation is comprised of fluvial sand, silt, clay and localized gravel, with indistinct to massive crossbeds. The Ogallala sand is generally fine- to medium-grained quartz, and is known to contain arsenic, barium and other heavy metals.

In the Eunice area, the Ogallala formation consists mainly of unconsolidated to poorly consolidated, very fine to medium-grained quartz sand and gravel, with minor amount of silt and clay. An upper-most unit, the Blackwater Draw formation, consists of reddish brown, very fine to fine grained eolian sand with minor amounts of clay and caliche. Locally the "c" horizon of the Simona fine sandy loam, 0 to 3 percent slopes, is called the caprock caliche. The caprock is a hard, erosion resistant, pedogenic calcrete that is typically five to ten feet thick but may exceed 20 feet in some areas. The Ogallala formation is underlain by the Chile formation (Triassic).

The nearest water well is an out-of-service windmill located approximately 2,400 feet northwest of the Site. According to records from the New Mexico Office of the State Engineer (OSE) depth to groundwater ranges between approximately 55 and 65 feet below ground surface (bgs).

3.0 REMEDIATION

3.1 Initial Remediation

Between February 28 and March 12, 2012, Environmental Plus, Inc. (EPI) excavated approximately 1,372 cubic yards of soil which was disposed at the Sundance Services (Parabo) disposal facility (NM - 01 - 0003) located east of Eunice, New Mexico.

On March 12, 2012, LAI personnel collected bottom and sidewall samples from the excavations. The samples were analyzed for benzene, toluene, ethylbenzene, xylene (BTEX), total petroleum hydrocarbon (TPH) and chloride by Xenco Laboratories located in Odessa, Texas. BTEX and TPH were not detected above laboratory method detection limits and therefore the vertical extent of chloride was delineated below 250 milligrams per kilogram (mg/kg).

On June 15, 2012, the OCD District 1 approved closure with the installation of a polyethylene liner in the bottom of the excavation. However, installation of a liner was not acceptable to the landowner therefore Targa voluntarily performed additional soil excavation. Appendix A presents the initial report cover page with OCD approval.

3.2 Additional Remediation

Between June 16, 2012 and August 9, 2012, EPI expanded the excavation laterally and deepened to approximately 30 feet bgs. Approximately 5,580 cubic yards of additional soil was excavated and disposed at Sundance Disposal (NM-01-003), located east of Eunice, New Mexico.

On June 27, 2012, Larson & Associates, Inc. (LAI) personnel collected preliminary samples from the bottom and sidewalls of the excavation. A backhoe was used to collect samples from 2 locations in the bottom of the excavation (north and south) at approximately 25 - 30 feet bgs. Samples were collected from the sidewalls between approximately 4 and 15 feet bgs. A stainless steel trowel was used to transfer the samples to 4 ounce laboratory containers which were filled to near zero headspace. The samples were delivered under preservation and chain of custody to Trace Analysis Laboratories, located in Midland, Texas. The laboratory analyzed the samples for chloride by method E300. Table 1 presents analytical data summary. Appendix B presents the laboratory reports. Appendix C presents photographs.

Chloride concentrations in the sidewall samples ranged from 69.8 mg/kg for the north sidewall at four feet bgs. to 8,330 mg/kg in the west sidewall at fifteen feet bgs. The chloride concentration in the two bottom samples of the excavation were 9,060 and 556 mg/kg (25 - 30 feet).

On August 9, 2012, Larson & Associates, Inc. (LAI) personnel collected the final soil samples from the bottom and sidewalls of the excavation site. Samples were collected from the bottom of the excavation at approximately 30 bgs and from the sidewalls at approximately 8 and 16 feet bgs. The sample containers were delivered under preservation and chain of custody to Trace Analysis, Inc., in Midland, Texas, and analyzed for chloride by method E300.

Chloride concentrations in the final sidewall samples ranged from 1,210 mg/kg (south sidewall) to 4,600 mg/kg (west sidewall) at approximately 8 feet bgs. The chloride concentration in the bottom sample near the center of the excavation was 146 mg/kg (30 feet).

3.3 Aerial Photographs

LAI personnel reviewed an aerial photograph that was taken on February 4, 1968. The photograph shows oil and gas production equipment and visual evidence of spills in the vicinity of the Site. This evidence suggests that the chloride in soil may be the result of past releases from historical oil and gas operations. This is further supported by Targa's pipeline which conveys natural gas. No other releases have occurred on this pipeline within ¼ mile of the release site which supports the finding that that

releases were caused by external corrosion due to elevated chloride in soil from historical oil and gas production operations. According to Targa operations personnel the release points on the pipeline were from external corrosion which suggests an external source impacting the pipeline. Figure Appendix D presents the aerial photographs.

4.0 CONCLUSIONS

- The remediation action levels are 10 mg/kg (benzene), 50 mg/kg (BTEX) and 1,000 mg/kg (TPH);
- Benzene, BTEX and TPH were below the method detection limits in all soil samples;
- Chloride was delineated vertically to 250 mg/kg in the bottom of the excavation;

5.0 **RECOMMENDATIONS**

Targa requests permission to fill the excavation with clean soil. The surface will be seeded to a seed blend recommended for the area. A final report, including final C-141, will be submitted to the OCD upon completion of the excavation backfilling.

Table 1 Soil Sample Analytical Data Summary Targa Midstream Services, L.P., Boyd 9" Pipeline Release Unit K (NE/4, SW/4), Section 23, Township 22 South, Range 37 East Lea County, New Mexico

Location	Sample	Date	Depth	Status	Chloride	Benzene	втех	GRO	DRO	lio	Total TPH
			Feet BGS		(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)
Bottom	North	03/12/2012	15	Excavated	7,680	<0.00116	<0.00116	<17.5	<17.5	<17.5	<17.5
			20	Excavated	1,700	I	ł	ł	ł	ı	I
			25	Excavated	223	I	:	I	1	1	:
Bottom	South	03/12/2012	15	Excavated	3,220	<0.001	<0.001	<15.5	<15.5	<15.5	<15.5
			20	Excavated	1,310	I	I	I	I	1	I
			25	Excavated	546	ł	ł	I	1	I	I
đ			30	Excavated	249	1	I	I	1	I	I
Bottom	1	6/27/2012	15	Excavated	9060	1	1	I	ł	1	I
	2	6/27/2012	20	Excavated	556	ł	I	1	1	ł	ł
Bottom	1	8/9/2012	30	Insitu	146	1	I	I	:	1	:
Sidewall	North (South)	03/12/2012	10	Excavated	2.050	<0.001	<0.001	<16.7	<16.7	<16.7	<16.7
	North (West)	03/12/2012	10	Excavated	4 110	<0 00098	<0 000998	<17.4	<17.4	<17.4	<17.4
	North (North)	03/12/2012	10	Excavated	1 410	<0.001	<0.001	<16 G	<16 Q	/16.0	16.0
	North (East)	03/12/2012	10	Excavated	8,290	<0.001	<0.001	<16.5	<16.5	<16.5	<16.5
Sidewall	South (South)	03/12/2012	10	Excavated	2,950	<0.001	<0.001	<17.8	<17.8	<17.8	<17.8
	South (West)	03/12/2012	10	Excavated	1,480	<0.000992	<0.000992	<15.9	<15.9	<15.9	<15.9
	South (East)	03/12/2012	10	Excavated	13,800	<0.001	<0.001	<18.8	<18.8	<18.8	<18.8
Sidewall	NW-1	6/27/2012	4	Excavated	496	ł	1	1	I	1	1
	NW-1	6/27/2012	9	Excavated	853	I	I	I	I	1	ł
	NW-1	6/27/2012	10	Excavated	1850	I	1	1	I	1	1
	NW-2	6/27/2012	4	Excavated	69.8	;	I	I	1	1	I
	NW-2	6/27/2012	8	Excavated	1850	I	I	1	I	1	I

Page 1 of 3

Table 1 Soil Sample Analytical Data Summary Targa Midstream Services, L.P., Boyd 9" Pipeline Release Unit K (NE/4, SW/4), Section 23, Township 22 South, Range 37 East Lea County, New Mexico

Location	Sample	Date	Depth	Status	Chloride	Benzene	втех	GRO	DRO	Oil	Total TPH
			Feet BGS		(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)
	NW-2	6/27/2012	15	Excavated	3570	I	1	1	1	1	1
Sidewall	SW-1	6/27/2012	4	Excavated	664	:	1	1	:	1	:
	SW-1	6/27/2012	10	Excavated	1510	I	I	I	I	I	ı
Sidewall	EW-1	6/27/2012	9	Excavated	6880		1	1	1	1	:
	EW-1	6/27/2012	10	Excavated	6620	ł	ł	I	ł	ł	1
	EW-2	6/27/2012	4	Excavated	1050	I	I	I	I	I	I
	EW-2	6/27/2012	9	Excavated	720	I	I	I	I	I	I
	EW-2	6/27/2012	10	Excavated	1340	I	I	I	1	I	1
Sidewall	WW-1	6/27/2012	4	Excavated	99.5	I	1	I	I	1	1
	WW-1	6/27/2012	∞	Excavated	4190	I	ı	I	1	I	I
	WW-1	6/27/2012	15	Excavated	8330	I	ı	I	1	I	1
	WW-2	6/27/2012	4	Excavated	1850	I	ı	1	1	I	I
	WW-2	6/27/2012	∞	Excavated	4460	I	I	I	1	I	I
	WW-2	6/27/2012	12	Excavated	6710	ı	1	I	1	I	1
Sidewall	N-1	8/9/2012	80	Insitu	1270	ł	1	I	I	I	1
	N-1	8/9/2012	16	Insitu	1830	I	I	I	I	I	I
	N-2	8/9/2012	∞	Insitu	1290	I	I	I	ł	I	I
	N-2	8/9/2012	16	Insitu	1820	I	ł	I	I	I	I
Sidewall	S1	8/9/2012	80	Insitu	1210	1	I	I	I	ı	1
	S1	8/9/2012	16	Insitu	1380	I	I	I	ł	I	I
	S2	8/9/2012	80	Insitu	1940	1	I	I	I	ı	ı
	S2	8/9/2012	16	Insitu	1220	I	1	I	I	I	I

Page 2 of 3

Table 1 Soil Sample Analytical Data Summary Targa Midstream Services, L.P., Boyd 9" Pipeline Release Unit K (NE/4, SW/4), Section 23, Township 22 South, Range 37 East Lea County, New Mexico

Location	Sample	Date	Depth	Status	Chloride	Benzene	BTEX	GRO	DRO	Oil	Total TPH
			Feet BGS		(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)
Sidewall	E1	8/9/2012	80	Insitu	4070	1	;	;	:	:	:
	E1	8/9/2012	16	Insitu	6920	I	1	I	I	1	1
	E2	8/9/2012	80	Insitu	4130	ï	I	ı	ı	I	I
	E2	8/9/2012	16	Insitu	5850	I	I	ı	1	1	I
Sidewall	W1	8/9/2012	80	Insitu	3520	1	;	1	1	1	1
	W2	8/9/2012	80	Insitu	4600	I	1	I	I	I	1
	W2	8/9/2012	16	Insitu	3670	I	I	I	I	1	1
Notor. All com	Notes: All sumales analysind by Vouse Laborateries has Odossa Tayas and Trace Analysis Midland Tayas	Vouce Labora	torior Inc. Od	Tower and	d Twood Analy	Landland	Tourse				

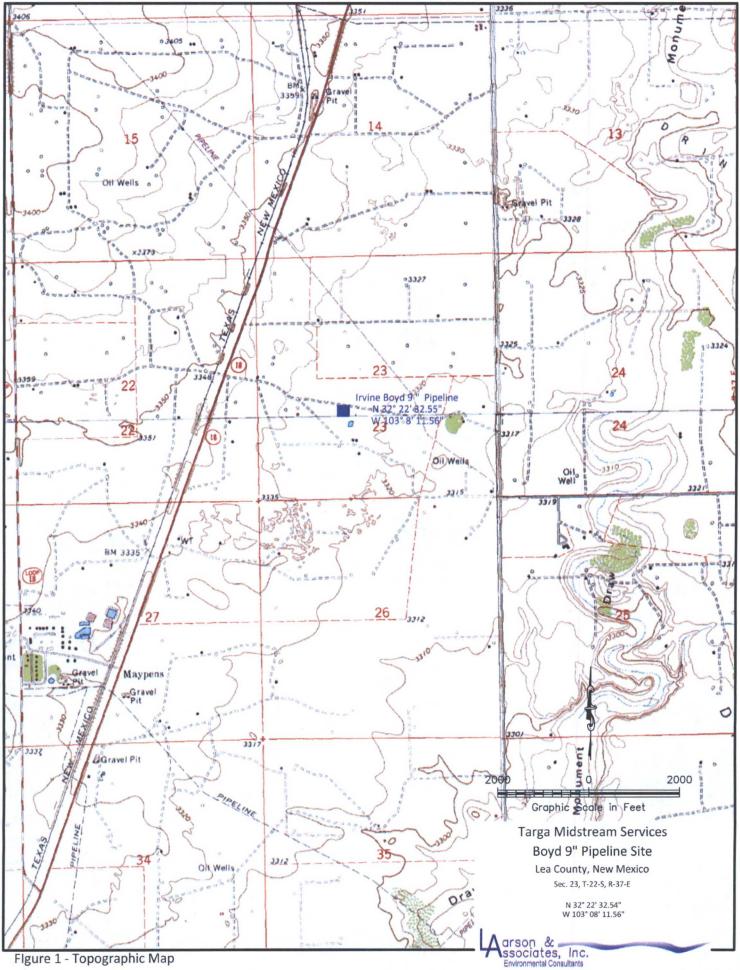
Notes: All samples analyzed by Xenco Laboratories, Inc., Odessa, Texas and Trace Analysis, Midland, Texas

Samples analyzed via EPA method SW-8021B (BTEX), SW-8015M (TPH) and E-300 (chloride).

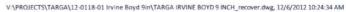
Depth measurements are in feet below ground surface (bgs).

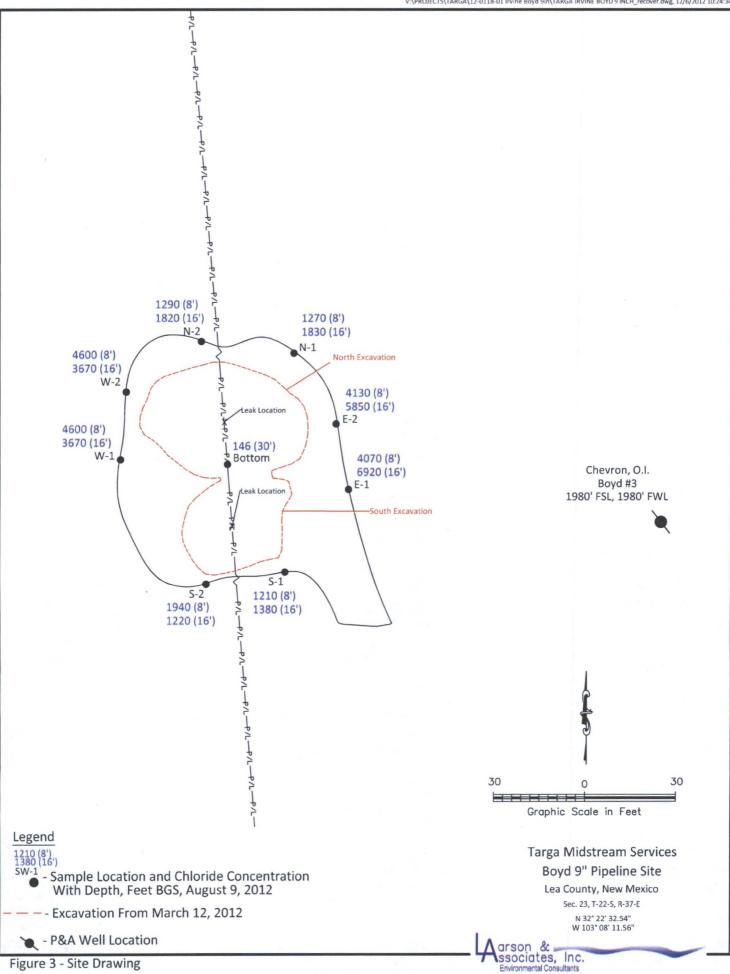
All concentrations are in milligrams per kilogram (mg/Kg) equivalent to parts per million (ppm).

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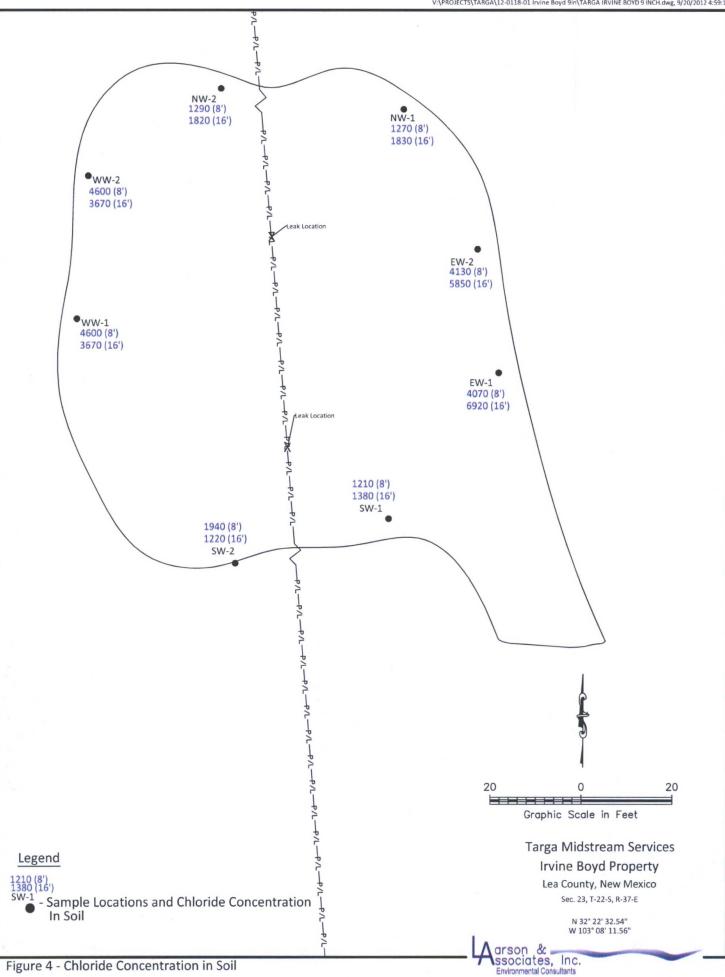


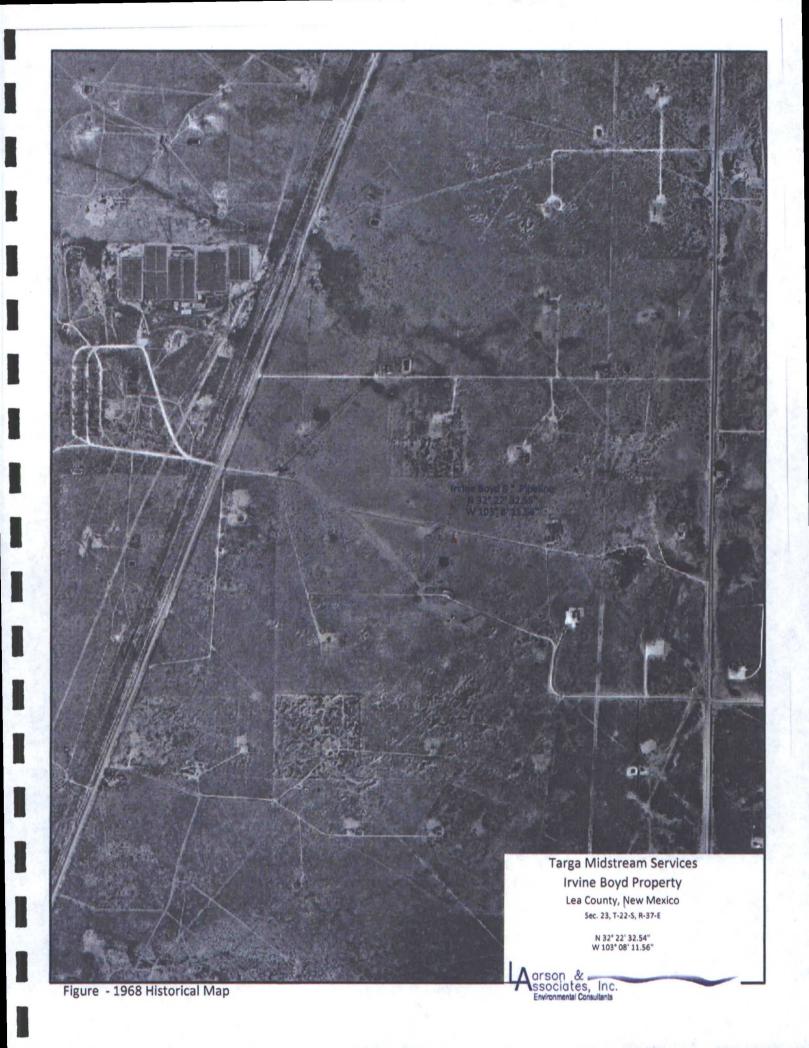






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REMEDIATION REPORT

Boyd 9 Inch Pipeline Release 1RP-04-12-2802

Lea County, New Mexico

LAI Project No. 12-0118-01

June 14, 20112

Prepared for:

Targa Midstream Services, L.P. 6 Desta Drive, Suite 3300 Midland, Texas 79705

Prepared by:

Larson & Associates, Inc. 507 North Marienfeld, Suite 200 Micher Profession 19701 CATE NUMA 10490 AIPO Mennasuation

Certified Professional Geologist No. 10490

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apprece Env. NMOCD 5

Analytical Report 438637

for Larson & Associates

Project Manager: Mark Larson

Boyd 9"

12-0118-01

22-MAR-12

Collected By: Client



Celebrating 20 Years of commitment to excellence in Environmental Testing Services



12600 West I-20 East Odessa, Texas 79765

Xenco-Houston (EPA Lab code: TX00122): Texas (T104704215-10-6-TX), Arizona (AZ0765), Arkansas (08-039-0), Connecticut (PH-0102), Florida (E871002) Illinois (002082), Indiana (C-TX-02), Iowa (392), Kansas (E-10380), Kentucky (45), Louisiana (03054) New Hampshire (297408), New Jersey (TX007), New York (11763), Oklahoma (9218), Pennsylvania (68-03610) Rhode Island (LAO00312), USDA (S-44102)

Xenco-Atlanta (EPA Lab Code: GA00046): Florida (E87429), North Carolina (483), South Carolina (98015), Utah (AALI1), West Virginia (362), Kentucky (85) Louisiana (04176), USDA (P330-07-00105)

Xenco-Miami (EPA Lab code: FL01152): Florida (E86678), Maryland (330)
Xenco-Tampa Mobile (EPA Lab code: FL01212): Florida (E84900)
Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400-TX)
Xenco-Dallas (EPA Lab code: TX01468): Texas (T104704295-TX)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)
Xenco-Tucson (EPA Lab code: AZ000989): Arizona (AZ0758)



22-MAR-12

Project Manager: Mark Larson Larson & Associates P.O. Box 50685 Midland, TX 79710

Reference: XENCO Report No: **438637 Boyd 9''** Project Address: Lea County, NM

Mark Larson:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number 438637. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. Estimation of data uncertainty for this report is found in the quality control section of this report unless otherwise noted. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 438637 will be filed for 60 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

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

Respectfully,

Brent Barron II Odessa Laboratory Manager

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Sample Cross Reference 438637



Larson & Associates, Midland, TX

Boyd 9"

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
North Bottom 15'	S	03-12-12 14:20		438637-001
North Bottom 20'	S	03-12-12 14:40		438637-002
North Bottom 25'	S	03-12-12 15:05		438637-003
North South 10'	S	03-12-12 14:45		438637-004
North West 10'	S	03-12-12 15:00		438637-005
North North 10'	S	03-12-12 15:15		438637-006
North East 10'	S	03-12-12 15:25		438637-007
South Bottom 15'	S	03-12-12 15:30		438637-008
South Bottom 20'	S	03-12-12 15:45		438637-009
South Bottom 25'	S	03-12-12 15:50		438637-010
South Bottom 30'	S	03-12-12 16:02		438637-011
South South 10'	S	03-12-12 15:42		438637-012
South West 10'	S	03-12-12 16:12		438637-013
South East 10'	S	03-12-12 16:14		438637-014



Client Name: Larson & Associates Project Name: Boyd 9"



 Project ID:
 12-0118-01

 Work Order Number:
 438637

Report Date: 22-MAR-12 Date Received: 03/13/2012

Sample receipt non conformances and comments: None

Sample receipt non conformances and comments per sample:

None

Analytical non nonformances and comments:

Batch: LBA-883586 BTEX by EPA 8021B SW8021BM

Batch 883586, Benzene, Toluene, m_p-Xylenes, o-Xylene recovered below QC limits in the Matrix Spike. Ethylbenzene recovered below QC limits in the Matrix Spike and Matrix Spike Duplicate.

Samples affected are: 438637-009, -004, -005, -014, -006, -008, -007, -012, -013. The Laboratory Control Sample for Toluene, Benzene, Ethylbenzene, m_p-Xylenes, o-Xylene is within laboratory Control Limits

Batch: LBA-883636 TPH By SW8015 Mod SW8015MOD NM

Batch 883636, C6-C12 Gasoline Range Hydrocarbons recovered below QC limits in the Matrix Spike and Matrix Spike Duplicate. Samples affected are: 438637-009, -004, -005, -014, -006, -008, -007, -012, -013. The Laboratory Control Sample for C6-C12 Gasoline Range Hydrocarbons is within laboratory Control Limits

SW8015MOD NM

Batch 883636, o-Terphenyl recovered below QC limits Data not confirmed by re-analysis. Samples affected are: 619206-1-BKS,438637-013. Matrix interference is suspected in sample QC failures.

CASE NARRATIVE



Client Name: Larson & Associates Project Name: Boyd 9"



 Project ID:
 12-0118-01

 Work Order Number:
 438637

Report Date: 22-MAR-12 Date Received: 03/13/2012

Batch: LBA-883686 BTEX by EPA 8021B SW8021BM

Batch 883686, 4-Bromofluorobenzene recovered above QC limits . Matrix interferences is suspected; data not confirmed by re-analysis Samples affected are: 438791-001 SD.

SW8021BM

Batch 883686, Benzene, Ethylbenzene, Toluene, m_p-Xylenes, o-Xylene recovered below QC limits in the Matrix Spike and Matrix Spike Duplicate. Samples affected are: 438637-001.

The Laboratory Control Sample for Toluene, Benzene, Ethylbenzene, m_p-Xylenes , o-Xylene is within laboratory Control Limits

XENCO Laboratories Project Id: 12-0118-01

Contact: Mark Larson

Certificate of Analysis Summary 438637 Larson & Associates, Midland, TX Project Name: Boyd 9"



Date Received in Lab: Tue Mar-13-12 03:50 pm Report Date: 22-MAR-12

					Project Manager:	Brent Barron II	
	Lab Id:	438637-001	438637-002	438637-003	438637-004	438637-005	438637-006
Analysis Requested	Field Id: Depth:	North Bottom 15'	North Bottom 20'	North Bottom 25'	North South 10'	North West 10'	North North 10'
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sampled:	Mar-12-12 14:20	Mar-12-12 14:40	Mar-12-12 15:05	Mar-12-12 14:45	Mar-12-12 15:00	Mar-12-12 15:15
Anions by E300	Extracted:						
	Analyzed:	Mar-14-12 18:13	Mar-20-12 10:48	Mar-20-12 10:48	Mar-14-12 18:13	Mar-14-12 18:13	Mar-14-12 18:13
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		7680 97.7	1700 23.0	223 4.61	2050 23.4	4110 48.9	1410 23.6
BTEX by EPA 8021B	Extracted:	Mar-15-12 11:29			Mar-14-12 14:43	Mar-14-12 14:43	Mar-14-12 14:43
	Analyzed:	Mar-15-12 13:20			Mar-14-12 17:12	Mar-14-12 17:34	Mar-14-12 18:20
	Units/RL:	mg/kg RL			mg/kg RL	mg/kg RL	mg/kg RL
Benzene		ND 0.00116			ND 0.00101	ND 0.000998	ND 0.00100
Toluene		ND 0.00231			ND 0.00202	ND 0.00200	ND 0.00200
Ethylbenzene		ND 0.00116			ND 0.00101	ND 0.000998	ND 0.00100
m_p-Xylenes		ND 0.00231			ND 0.00202	ND 0.00200	ND 0.00200
o-Xylene		ND 0.00116			ND 0.00101	ND 0.000998	ND 0.00100
Total Xylenes		ND 0.00116			ND 0.00101	ND 0.000998	ND 0.00100
Total BTEX		ND 0.00116			ND 0.00101	ND 0.000998	ND 0.00100
Percent Moisture	Extracted:						
	Analyzed:	Mar-14-12 09:00	Mar-20-12 08:05	Mar-20-12 08:05	Mar-14-12 09:00	Mar-14-12 09:00	Mar-14-12 09:00
	Units/RL:	% RL	% RL	% RL	% RL	% RL	% RL
Percent Moisture		14.0 1.00	8.54 1.00	8.99 1.00	10.3 1.00	14.1 1.00	11.1 1.00
TPH By SW8015 Mod	Extracted:	Mar-14-12 10:15			Mar-14-12 11:30	Mar-14-12 11:30	Mar-14-12 11:30
	Analyzed:	Mar-15-12 03:53			Mar-14-12 17:13	Mar-14-12 17:38	Mar-14-12 18:03
	Units/RL:	mg/kg RL			mg/kg RL	mg/kg RL	mg/kg RL
C6-C12 Gasoline Range Hydrocarbons		ND 17.5			ND 16.7	ND 17.4	ND 16.9
C12-C28 Diesel Range Hydrocarbons		ND 17.5			ND 16.7	ND 17.4	ND 16.9
C28-C35 Oil Range Hydrocarbons		ND 17.5			ND 16.7	ND 17.4	ND 16.9
Total TPH		ND 17.5			ND 16.7	ND 17.4	ND 16.9

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Odessa Laboratory Manager Brent Barron II

	0	5
	2	5
1		

Project Id: 12-0118-01

Certificate of Analysis Summary 438637 Larson & Associates, Midland, TX



Project Name: Boyd 9" Date Received in Lab: Tue Mar-13-12 03:50 pm

16.2 45.4 0.00100 1.00 16.2 16.2 16.2 0.00200 0.00100 0.00200 0.00100 0.00100 0.00100 RL RL RL RL Mar-14-12 11:30 Mar-14-12 14:43 Mar-14-12 19:50 Mar-14-12 18:13 Mar-14-12 09:00 Mar-14-12 19:41 Mar-12-12 15:42 South South 10' 438637-012 SOIL QN QN QN R QN R QN 7.59 QN QN QN QN 2950 mg/kg mg/kg mg/kg % 5.53 RL 1.00 RL Mar-20-12 10:48 Mar-20-12 08:05 Mar-12-12 16:02 South Bottom 30' 438637-011 Brent Barron II SOIL 22-MAR-12 249 24.0 mg/kg % RL 10.7 Report Date: 1.00 Project Manager: RL Mar-12-12 15:50 Mar-20-12 10:48 Mar-20-12 08:05 South Bottom 25' 438637-010 SOIL 21.2 546 mg/kg % 0.00100 17.8 20.0 0.00201 0.00100 0.00100 0.00100 1.00 17.8 17.8 17.8 0.00201 0.00100 RL RL RL RL Mar-14-12 14:43 Mar-14-12 09:00 Mar-14-12 11:30 Mar-14-12 19:16 Mar-12-12 15:45 Mar-14-12 18:13 Mar-14-12 19:28 South Bottom 20' 438637-009 QN QN QN R QN SOIL an an an an 15.8 R QN 1310 mg/kg mg/kg mg/kg % 15.5 15.5 15.5 15.5 43.5 0.00100 0.00200 0.00100 0.00200 0.00100 0.00100 0.00100 1.00 RL RL RL RL Mar-14-12 18:13 Mar-14-12 14:43 Mar-14-12 19:05 Mar-14-12 09:00 Mar-14-12 11:30 Mar-12-12 15:30 Mar-14-12 18:51 South Bottom 15' 438637-008 SOIL QN QN QZ R QN QN QN QN QN QN QN 3.52 3220 mg/kg mg/kg mg/kg % 16.5 16.5 16.5 16.5 184 0.00100 0.00200 0.00100 0.00200 0.00100 0.00100 0.00100 1.00 RL RL RL RL Mar-14-12 18:13 Mar-14-12 14:43 Mar-14-12 18:42 Mar-14-12 09:00 Mar-14-12 11:30 Mar-14-12 18:27 Mar-12-12 15:25 North East 10' 438637-007 mg/kg ND SOIL QN QN Q QZ Q 8290 QN QN QN QN QN 8.91 mg/kg mg/kg % Lab Id: Depth: Matrix: Units/RL: Analyzed: Field Id: Analyzed: Analyzed: Units/RL: Units/RL: Analyzed: Sampled: Extracted: Extracted: Extracted: Extracted: Units/RL: TPH By SW8015 Mod **BTEX by EPA 8021B** C6-C12 Gasoline Range Hydrocarbons Percent Moisture C12-C28 Diesel Range Hydrocarbons Anions by E300 Project Location: Lea County, NM Analysis Requested C28-C35 Oil Range Hydrocarbons Contact: Mark Larson Percent Moisture Ethylbenzene m p-Xylenes Total Xylenes Total BTEX Total TPH o-Xylene Chloride Benzene Toluene

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Odessa Laboratory Manager Brent Barron II

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Project Id: 12-0118-01 Contact: Mark Larson

Certificate of Analysis Summary 438637 Larson & Associates, Midland, TX





Date Received in Lab: Tue Mar-13-12 03:50 pm Report Date: 22-MAR-12

				Project Manager:	Brent Barron II
	Lab Id:	438637-013	438637-014		
Aundrate Damastad	Field Id:	South West 10'	South East 10'		
naisanhay sisting	Depth:				
	Matrix:	SOIL	SOIL		
	Sampled:	Mar-12-12 16:12	Mar-12-12 16:14		
Anions by E300	Extracted:				
	Analyzed:	Mar-14-12 18:13	Mar-15-12 16:27		
	Units/RL:	mg/kg RL	mg/kg RL		
Chloride		1480 17.8	13800 211		
BTEX by EPA 8021B	Extracted:	Mar-14-12 14:43	Mar-14-12 14:43		
	Analyzed:	Mar-14-12 20:13	Mar-14-12 20:36		
	Units/RL:	mg/kg RL	mg/kg RL		
Benzene		ND 0.000992			
Toluene		ND 0.00198	ND 0.00200		
Ethylbenzene		ND 0.000992	ND 0.00100		
m_p-Xylenes		ND 0.00198	ND 0.00200		
o-Xylene		ND 0.000992	ND 0.00100		
Total Xylenes		ND 0.000992	· ND 0.00100		
Total BTEX		ND 0.000992	ND 0.00100		
Percent Moisture	Extracted:				
	Analyzed:	Mar-14-12 09:00	Mar-14-12 09:00		
	Units/RL:	% RL	% RL		
Percent Moisture		5.58 1.00	20.5 1.00		
TPH By SW8015 Mod	Extracted:	Mar-14-12 11:30	Mar-14-12 11:30		
	Analyzed:	Mar-14-12 20:07	Mar-14-12 20:34		
	Units/RL:	mg/kg RL	mg/kg RL		
C6-C12 Gasoline Range Hydrocarbons		ND 15.9	ND 18.8		
C12-C28 Diesel Range Hydrocarbons		ND 15.9	ND 18.8		
C28-C35 Oil Range Hydrocarbons		ND 15.9	ND 18.8		
Total TPH		ND 15.9	ND 18.8		

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Odessa Laboratory Manager Brent Barron II

John

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Flagging Criteria

- X In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD.
- **B** A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
- **D** The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.
- E The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.

F RPD exceeded lab control limits.

J The target analyte was positively identified below the quantitation limit and above the detection limit.

U Analyte was not detected.

- L The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.
- H The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.
- K Sample analyzed outside of recommended hold time.
- JN A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

LOD Limit of Detection

LOQ Limit of Quantitation

* Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

MDL Method Detection Limit SDL Sample Detection Limit

PQL Practical Quantitation Limit MQL Method Quantitation Limit

DL Method Detection Limit

NC Non-Calculable

- + NELAC certification not offered for this compound.
- * (Next to analyte name or method description) = Outside XENCO's scope of NELAC accreditation

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 Phone
 Fax

 (281) 240-4200
 (281) 240-4280

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 (214) 351-9139

 (210) 509-3334
 (210) 509-3335

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 (432) 563-1800
 (432) 563-1713

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 (770) 449-5477

 (602) 437-0330
 (770) 449-5477



Project Name: Boyd 9"

Ork Orders : 438637, Lab Batch #: 883586	Sample: 438637-004 / SMP	Bate		D: 12-0118-0	1	
Units: mg/kg	Date Analyzed: 03/14/12 17:12		RROGATE R		STUDY	
	by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flag
	Analytes	0.0001	0.0200		00.100	_
1,4-Difluorobenzene 4-Bromofluorobenzene		0.0281	0.0300	94	80-120 80-120	
					80-120	_
Lab Batch #: 883636	Sample: 438637-004 / SMP	Batc		14		
Units: mg/kg	Date Analyzed: 03/14/12 17:13	su	RROGATE R	ECOVERY	STUDY	
	y SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flag
1-Chlorooctane		87.9	99.8	88	70-135	
o-Terphenyl		35.7	49.9	72	70-135	
Lab Batch #: 883586	Sample: 438637-005 / SMP	Batc	h: 1 Matrix	: Soil		
Units: mg/kg	Date Analyzed: 03/14/12 17:34		RROGATE R		STUDY	
	by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flag
1	Analytes		1. A.	[D]		
1,4-Difluorobenzene		0.0243	0.0300	81	80-120	
4-Bromofluorobenzene		0.0270	0.0300	90	80-120	
Lab Batch #: 883636	Sample: 438637-005 / SMP	Batc	h: 1 Matrix	:Soil		
Units: mg/kg	Date Analyzed: 03/14/12 17:38	SU	RROGATE R	ECOVERY S	STUDY	
	y SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
	Analytes	04.0	00.5		70.125	
1-Chlorooctane		86.8	99.5	87	70-135	
o-Terphenyl		35.2	49.8	71	70-135	_
Lab Batch #: 883636	Sample: 438637-006 / SMP	Batc				
Units: mg/kg	Date Analyzed: 03/14/12 18:03	SU	RROGATE R	ECOVERYS	STUDY	
	y SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	xnary tes	90.5	100	91	70-135	
1-Cinorooctane		90.5	100	91	10-155	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution



Project Name: Boyd 9"

Work Orders : 438637, Lab Batch #: 883586	, Sample: 438637-006 / SMP	Batel		D: 12-0118-0)1	
Units: mg/kg	Date Analyzed: 03/14/12 18:20		RROGATE RI		STUDY	
	K by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
	Analytes					
1,4-Difluorobenzene		0.0272	0.0300	91	80-120	
4-Bromofluorobenzene		0.0296	0.0300	99	80-120	
Lab Batch #: 883636	Sample: 438637-007 / SMP	Batcl				
Units: mg/kg	Date Analyzed: 03/14/12 18:27	SU	RROGATE RI	ECOVERY	STUDY	
ТРН І	By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane		89.5	100	90	70-135	
o-Terphenyl		36.3	50.0	73	70-135	
Lab Batch #: 883586	Sample: 438637-007 / SMP	Batch	h: 1 Matrix:	Soil	1	
Units: mg/kg	Date Analyzed: 03/14/12 18:42	1.1.2 Mail 101	RROGATE RE		STUDY	
ВТЕХ	K by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene		0.0276	0.0300	92	80-120	
4-Bromofluorobenzene		0.0322	0.0300	107	80-120	
Lab Batch #: 883636	Sample: 438637-008 / SMP	Batch	h: 1 Matrix:	Soil		
Units: mg/kg	Date Analyzed: 03/14/12 18:51	SUI	RROGATE RE	ECOVERY	STUDY	
ТРН Н	By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	Analy tes	90.1	99.5	91	70-135	
o-Terphenyl		36.3	49.8	73	70-135	
Lab Batch #: 883586	Sample: 438637-008 / SMP	Batch				
Units: mg/kg	Date Analyzed: 03/14/12 19:05		RROGATE RE		STUDY	
	Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene		0.0281	0.0300	94	80-120	
4-Bromofluorobenzene		0.0311	0.0300	104	80-120	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.



Project Name: Boyd 9"

ork Orders : 438637 Lab Batch #: 883636	, Sample: 438637-009 / SMP	Batc		D: 12-0118-0 c: Soil	1	
Units: mg/kg	Date Analyzed: 03/14/12 19:16	SU	RROGATE R	ECOVERY S	STUDY	
TPH	By SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flag
	Analytes	м		[D]		
1-Chlorooctane		89.0	99.9	89	70-135	
o-Terphenyl		36.0	50.0	72	70-135	
Lab Batch #: 883586	Sample: 438637-009 / SMP	Bate		14 C		
Units: mg/kg	Date Analyzed: 03/14/12 19:28	SU	RROGATE R	ECOVERY S	STUDY	
BTEX	X by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flag
1,4-Difluorobenzene		0.0278	0.0300	93	80-120	
4-Bromofluorobenzene		0.0304	0.0300	101	80-120	
Lab Batch #: 883636	Sample: 438637-012 / SMP	Bate	h: 1 Matrix	:Soil		
Units: mg/kg	Date Analyzed: 03/14/12 19:41		RROGATE R	ECOVERY S	STUDY	
TPH	By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flag
1-Chlorooctane		90.7	100	91	70-135	
o-Terphenyl		36.8	50.0	74	70-135	
Lab Batch #: 883586	Sample: 438637-012 / SMP	Bate	h: 1 Matrix	:Soil		
Units: mg/kg	Date Analyzed: 03/14/12 19:50	SU	RROGATE R	ECOVERY S	STUDY	
BTEX	X by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flag
1,4-Difluorobenzene	Analytes	0.0282	0.0300	94	80-120	
4-Bromofluorobenzene		0.0322	0.0300	107	80-120	
Lab Batch #: 883636	Sample: 438637-013 / SMP	Bate				
Units: mg/kg	Date Analyzed: 03/14/12 20:07		RROGATE R		STUDY	
	By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flag
1-Chlorooctane		86.0	100	86	70-135	
o-Terphenyl		34.7	50.1	69	70-135	*

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution



Project Name: Boyd 9"

Vork Orders: 438637 Lab Batch #: 883586	, Sample: 438637-013 / SMP	Batc	5	D: 12-0118-0)1	
Units: mg/kg	Date Analyzed: 03/14/12 20:13		RROGATE R		STUDY	
BTEX	K by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flags
	Analytes			[D]	15	
1,4-Difluorobenzene		0.0283	0.0300	94	80-120	
4-Bromofluorobenzene		0.0315	0.0300	105	80-120	
Lab Batch #: 883636	Sample: 438637-014 / SMP	Bate	h: 1 Matrix	:Soil		
Units: mg/kg	Date Analyzed: 03/14/12 20:34	SU	RROGATE RI	ECOVERY	STUDY	
ТРН І	By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane		89.6	99.8	90	70-135	
o-Terphenyl		36.5	49.9	73	70-135	
Lab Batch #: 883586	Sample: 438637-014 / SMP	Bate	h: 1 Matrix	Soil		
Units: mg/kg	Date Analyzed: 03/14/12 20:36	SU	RROGATE RI	ECOVERY	STUDY	
ВТЕХ	K by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene		0.0280	0.0300	93	80-120	
4-Bromofluorobenzene		0.0340	0.0300	113	80-120	
Lab Batch #: 883615	Sample: 438637-001 / SMP	Batcl	h: 1 Matrix:	Soil		
Units: mg/kg	Date Analyzed: 03/15/12 03:53	SU	RROGATE RI	ECOVERY	STUDY	
ТРН І	By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane		89.8	100	90	70-135	
o-Terphenyl		42.8	50.1	85	70-135	
Lab Batch #: 883686	Sample: 438637-001 / SMP	Batel	h: 1 Matrix:	Soil	1	
Units: mg/kg	Date Analyzed: 03/15/12 13:20		RROGATE RE		STUDY	
	X by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene		0.0281	0.0300	94	80-120	
4-Bromofluorobenzene		0.0316	0.0300	105	80-120	-

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution



Project Name: Boyd 9"

Vork Orders : 438637				D: 12-0118-0)1	
Lab Batch #: 883615 Units: mg/kg	Sample: 619195-1-BLK / E Date Analyzed: 03/14/12 16:12		h: 1 Matrix: RROGATE RE		STUDY	
	By SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	Analytes	90.5	100	90	70-135	
o-Terphenyl		89.5	50.0	85	70-135	
					70-155	
Lab Batch #: 883586 Units: mg/kg	Sample: 619197-1-BLK / E Date Analyzed: 03/14/12 16:49		h: ¹ Matrix: RROGATE RE		STUDY	
	X by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	T Minuty too	0.0278	0.0300	93	80-120	
4-Bromofluorobenzene		0.0304	0.0300	101	80-120	
Lab Batch #: 883636	Sample: 619206-1-BLK / B	LK Bate	h: 1 Matrix:	Solid		
Units: mg/kg	Date Analyzed: 03/14/12 16:49	SU	RROGATE RE	ECOVERY	STUDY	
TPH]	By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane		88.0	100	88	70-135	
o-Terphenyl		35.9	50.0	72	70-135	
Lab Batch #: 883686	Sample: 619262-1-BLK / B	LK Bate	h: 1 Matrix:	Solid		
Units: mg/kg	Date Analyzed: 03/15/12 12:35	SU	RROGATE RE	COVERY	STUDY	
BTEX	X by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene		0.0275	0.0300	92	80-120	
4-Bromofluorobenzene		0.0295	0.0300	98	80-120	
Lab Batch #: 883615	Sample: 619195-1-BKS / B	KS Batel	h: 1 Matrix:	Solid		
Units: mg/kg	Date Analyzed: 03/14/12 15:10	SU	RROGATE RE	COVERY	STUDY	
TPH 1	By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	v	101	100	101	70-135	
o-Terphenyl		38.7	50.0	77	70-135	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution



Project Name: Boyd 9"

Vork Orders: 438637 Lab Batch #: 883586	, Sample: 619197-1-BKS / B	VS Detail		D: 12-0118-0)1	
Units: mg/kg	Date Analyzed: 03/14/12 15:18		RROGATE R		STUDY	
	K by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1.4.810	Analytes					
1,4-Difluorobenzene		0.0294	0.0300	98	80-120	
4-Bromofluorobenzene		0.0325	0.0300	108	80-120	
Lab Batch #: 883636	Sample: 619206-1-BKS / B					
Units: mg/kg	Date Analyzed: 03/14/12 16:00	SU	RROGATE R	ECOVERY	STUDY	
ТРН І	By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane		102	100	102	70-135	
o-Terphenyl		33.5	50.0	67	70-135	*
Lab Batch #: 883686	Sample: 619262-1-BKS / B	KS Batel	h: 1 Matrix	· Solid		
Units: mg/kg	Date Analyzed: 03/15/12 11:03		RROGATE R		STUDY	
ВТЕХ	X by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	•	0.0296	0.0300	99	80-120	
4-Bromofluorobenzene		0.0322	0.0300	107	80-120	
Lab Batch #: 883615	Sample: 619195-1-BSD / B	SD Batcl	h: 1 Matrix	:Solid		
Units: mg/kg	Date Analyzed: 03/14/12 15:41	SU	RROGATE R	ECOVERY	STUDY	
ТРН І	By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	1 KARGER J CCO					
		94.3	100	94	70-135	
o-Terphenyl		94.3 38.9	100	94 78	70-135	
o-Terphenyl	Sample: 619197-1-BSD / B	38.9	50.0	78		
o-Terphenyl Lab Batch #: 883586 Units: mg/kg	Sample: 619197-1-BSD / B Date Analyzed: 03/14/12 15:41	38.9 SD Batcl	50.0	78 : Solid	70-135	
Lab Batch #: 883586 Units: mg/kg	Date Analyzed: 03/14/12 15:41	38.9 SD Batcl	50.0 n: 1 Matrix	78 : Solid	70-135	Flags
Lab Batch #: 883586 Units: mg/kg	Date Analyzed: 03/14/12 15:41	38.9 SD Batcl SU Amount Found	50.0 h: 1 Matrix RROGATE R True Amount	78 : Solid ECOVERY S Recovery %R	70-135 STUDY Control Limits	Flags

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution



Project Name: Boyd 9"

Vork Orders : 438637 Lab Batch #: 883636	7, Sample: 619206-1-BSD / BS	SD Bate		I D: 12-0118-0 x: Solid	1	
Units: mg/kg	Date Analyzed: 03/14/12 16:24		RROGATE R		STUDY	
ТРН	By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane		88.1	100	88	70-135	
o-Terphenyl		36.3	50.0	73	70-135	
Lab Batch #: 883686	Sample: 619262-1-BSD / BS	SD Bate	h: 1 Matrix	x: Solid		
Units: mg/kg	Date Analyzed: 03/15/12 11:26	SU	RROGATE R	ECOVERY	STUDY	
BTE	X by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene		0.0292	0.0300	97	80-120	
4-Bromofluorobenzene		0.0315	0.0300	105	80-120	
Lab Batch #: 883586	Sample: 438637-006 S / MS	Batc	h: 1 Matrix	x:Soil		
Units: mg/kg	Date Analyzed: 03/14/12 21:21	SU	RROGATE R	ECOVERY	STUDY	
BTE	X by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1.4-Difluorobenzene	Analytes	0.0258	0.0300	86	80-120	
4-Bromofluorobenzene		0.0299	0.0300	100	80-120	
Lab Batch #: 883636	Sample: 438675-001 S / MS	Batc	h: 1 Matrix	r Soil		
Units: mg/kg	Date Analyzed: 03/15/12 02:14		RROGATE R		STUDY	
	By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane		88.6	99.5	89	70-135	
o-Terphenyl		36.5	49.8	73	70-135	
Lab Batch #: 883615	Sample: 438609-003 S / MS	Batc	h: 1 Matrix	:Soil	-	13.1
Units: mg/kg	Date Analyzed: 03/15/12 04:29	SU	RROGATE R	ECOVERY	STUDY	11.1
ТРН	By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane		89.4	99.9	89	70-135	1.4
o-Terphenyl		35.8	50.0	72	70-135	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution



Project Name: Boyd 9"

Vork Orders : 438637	7, Sample: 438791-001 S / MS	S Detel		D: 12-0118-0	1	
Lab Batch #: 883686 Units: mg/kg	Sample: 438/91-001 S / MS Date Analyzed: 03/15/12 17:31		RROGATE RE		STUDY	
	X by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1.4 Diffuenchampone	Analytes	0.0297	0.0200		90.120	
1,4-Difluorobenzene 4-Bromofluorobenzene		0.0287	0.0300	96 120	80-120 80-120	
					80-120	
Lab Batch #: 883586	Sample: 438637-006 SD / M			-	0001/001/	
Units: mg/kg	Date Analyzed: 03/14/12 21:44	SU.	RROGATE RE	ECOVERY	STUDY	
ΒΤΕΧ	X by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	A khana j vez	0.0257	0.0300	86	80-120	
4-Bromofluorobenzene		0.0307	0.0300	102	80-120	
Lab Batch #: 883636	Sample: 438675-001 SD / M	MSD Batcl	h: 1 Matrix:	Soil	1	
Units: mg/kg	Date Analyzed: 03/15/12 02:41		RROGATE RE		STUDY	
трн і	By SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R	Control Limits %R	Flags
	Analytes			[D]		
1-Chlorooctane		106	99.9	106	70-135	
o-Terphenyl		37.4	50.0	75	70-135	
Lab Batch #: 883615	Sample: 438609-003 SD / M					
Units: mg/kg	Date Analyzed: 03/15/12 05:03	SU	RROGATE RE	ECOVERY	STUDY	
трн і	By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane		95.7	99.8	96	70-135	
o-Terphenyl		37.0	49.9	74	70-135	
Lab Batch #: 883686	Sample: 438791-001 SD / M	MSD Batcl	h: 1 Matrix:	Soil	1	
Units: mg/kg	Date Analyzed: 03/15/12 17:53		RROGATE RE		STUDY	
	X by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene		0.0275	0.0300	92	80-120	
4-Bromofluorobenzene		0.0365	0.0300	122	80-120	*

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

All results are based on MDL and validated for QC purposes.

XENCO Laboratories

BS / BSD Recoveries



Project Name: Boyd 9"

Work Order #: 438637 Analyst: ASA Lab Batch ID: 883586

Sample: 619197-1-BKS

Date Prepared: 03/14/2012 Batch #: 1

Project ID: 12-0118-01 Date Analyzed: 03/14/2012 Matrix: Solid

Units: mg/kg		BLANH	K/BLANK S	PIKE / B	LANK S	BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY	ICATE F	RECOVE	RY STUD	Y	
BTEX by EPA 8021B	Blank Sample Result	Spike Added	Blank Spike Result	Blank Spike %R	Spike Added	Blank Spike Dunlicate	Blk. Spk Dup. %R	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes	[[B]	[C]	[a]	[E]	Result [F]	[6]	,			
Benzene	<0.00100	0.100	0.0979	98	0.100	0.0970	67	-	70-130	35	
Toluene	<0.00200	0.100	0.0971	26	0.100	0.0970	67	0	70-130	35	
Ethylbenzene	<0.00100	0.100	0.0972	76	0.100	0.0973	67	0	71-129	35	
m_p-Xylenes	<0.00200	0.200	0.203	102	0.200	0.203	102	0	70-135	35	
o-Xylene	<0.00100	0.100	0.0990	66	0.100	0.0991	66	0	71-133	35	
Analyst: ASA	Da	te Prepare	Date Prepared: 03/15/2012	2			Date An	alyzed: 0	Date Analyzed: 03/15/2012		

Lab Batch ID: 883686 Sample: 619262-1-BKS	-BKS	Batcl	Batch #: 1					Matrix: Solid	olid		
Units: mg/kg		BLAN	BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY	PIKE / B	S YNK S	PIKE DUPL	ICATE]	RECOVE	RY STUD	Y	
BTEX by EPA 8021B	Blank Sample Result	Spike Added	Blank Spike Result	Blank Spike %R	Spike Added	Blank Spike Dunlicate	Blk. Spk Dup. %R	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes	Ξ	[B]	[C]	[ŋ]	[E]	Result [F]	[G]				
Benzene	<0.00100	0.100	0.0961	96	0.100	0.0959	96	0	70-130	35	
Toluene	<0.00200	0.100	0.0955	96	0.100	0.0962	96	1	70-130	35	
Ethylbenzene	<0.00100	0.100	0.0957	96	0.100	0.0963	96	-	71-129	35	
m_p-Xylenes	<0.00200	0.200	0.201	101	0.200	0.201	101	0	70-135	35	

35

71-133

0

98

0.0979

0.100

98

0.0979

0.100

<0.00100

o-Xylene

Relative Percent Difference RPD = 200*([C-F)/(C+F)| Blank Spike Recovery [D] = 100*(C)/[B] Blank Spike Duplicate Recovery [G] = 100*(F)/[E] All results are based on MDL and Validated for QC Purposes

XENCO Laboratories

BS / BSD Recoveries



Flag

Project Name: Boyd 9"

Limits Limits %RPD Limits %RPD Control Control Control %RPD 20 20 20 **BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY BLANK / BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY Project ID:** 12-0118-01 Date Analyzed: 03/14/2012 Control Limits %R Control Limits %R Control Limits %R 75-125 Date Analyzed: 03/15/2012 75-125 Date Analyzed: 03/20/2012 75-125 Matrix: Solid Matrix: Solid Matrix: Solid RPD % RPD % RPD % 8 Blk. Spk Blk. Spk Blk. Spk Dup. %R [G] Dup. %R Dup. %R [G] 102 98 98 Spike Duplicate Result [F] Spike Duplicate Duplicate Result [F] Result [F] Spike Blank Blank Blank 19.6 19.6 20.4 Spike Added Spike Spike 20.0 20.0 20.0 E Ξ Ξ Blank Spike %R [D] Blank Spike %R [D] Blank Spike %R [D] 98 66 95 Date Prepared: 03/20/2012 Date Prepared: 03/14/2012 Date Prepared: 03/15/2012 Blank Spike Result Blank Spike Result [C] Blank Spike Result 19.8 18.9 19.5 C Batch #: 1 Batch #: 1 Batch #: 1 Spike Spike Added Spike 20.0 20.0 20.0 **B** [**B**] B Sample Result [A] Blank Sample Result Sample Result [A] < 0.840< 0.840Blank < 0.840 Blank Sample: 883802-1-BKS Sample: 884044-1-BKS Sample: 883576-1-BKS Anions by E300 Anions by E300 Anions by E300 Work Order #: 438637 Lab Batch ID: 883576 Lab Batch ID: 884044 Lab Batch ID: 883802 Units: mg/kg Units: mg/kg Units: mg/kg Analyst: BRB Analyst: BRB Analyst: BRB Analytes Analytes Analytes Chloride Chloride Chloride

Flag

Relative Percent Difference RPD = 200*[(C-F)/(C+F)] Blank Spike Recovery [D] = 100*(C)/[B] Blank Spike Duplicate Recovery [G] = 100*(F)/[E] All results are based on MDL and Validated for QC Purposes Final 1.001

Flag

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XENCO Laboratories

BS / BSD Recoveries



Project Name: Boyd 9"

Work Order #: 438637 Analyst: BRB Lab Batch ID: 883615 Sample: 619195-1-BKS Units: mg/kg TDH B., SW8015 Mod Blan

Date Prepared: 03/14/2012

Batch #: 1

Project ID: 12-0118-01 Date Analyzed: 03/14/2012 Matrix: Solid

Units: mg/kg		BLAN	BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY	PIKE / B	LANK S	PIKE DUPL	ICATE 1	RECOVE	CRY STUD	Y	
TPH By SW8015 Mod	Blank Sample Result [A]	Spike Added	Blank Spike Result	Blank Spike %R	Spike Added	Blank Spike Duplicate	Blk. Spk Dup. %R	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes		[B]	[c]	[0]	[E]	Result [F]	[6]		-		
C6-C12 Gasoline Range Hydrocarbons	<15.0	1000	822	82	1000	793	79	4	70-135	35	
C12-C28 Diesel Range Hydrocarbons	<15.0	1000	1100	110	1000	1090	109	1	70-135	35	
Analyst: BRB	Da	te Prepar	Date Prepared: 03/14/2012	2			Date AI	nalyzed: 0	Date Analyzed: 03/14/2012		
Lab Batch ID: 883636 Sample: 619206-1-BKS	3KS	Batch #:	1 #: 1					Matrix: Solid	solid		
Units: mg/kg		BLAN	BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY	PIKE / B	LANK S	PIKE DUPL	ICATE 1	RECOVE	ERY STUD	Y	

Units: mg/kg		BLAN	V /BLANK S	PIKE / B	LANKS	3LANK / BLANK SPIKE / BLANK SPIKE DUPLICATE		RECOVE	RECOVERY STUDY	Y	
TPH By SW8015 Mod	Blank Sample Result [A]	Spike Added	Blank Spike Result	Blank Spike %R	Spike Added	Blank Spike Duplicate	Blk. Spk Dup. %R	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes		[B]	[C]	[D]	[E]	Result [F]	[G]				
C6-C12 Gasoline Range Hydrocarbons	<15.0	1000	810	81	1000	823	82	2	70-135	35	
C12-C28 Diesel Range Hydrocarbons	<15.0	1000	959	96	1000	941	94	2	70-135	35	

Relative Percent Difference RPD = 200*[(C-F)/(C+F)] Blank Spike Recovery [D] = 100*(C)/[B] Blank Spike Duplicate Recovery [G] = 100*(F)/[E] All results are based on MDL and Validated for QC Purposes Final 1.001

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Form 3 - MS Recoveries

Project Name: Boyd 9"



Work Order #: 438637							
Lab Batch #: 883576				Pr	oject ID:	12-0118-01	Í.
Date Analyzed: 03/14/2012	Date I	Prepared: 03/1	4/2012	A	analyst: B	RB	
QC- Sample ID: 438611-012 S		Batch #: 1		1	Matrix: S	oil	
Reporting Units: mg/kg		MATH	RIX / MA	TRIX SPIKE	RECO	VERY STU	DY
Inorganic Anions by EPA 300		Parent Sample Result [A]	Spike Added	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
Chloride		48.6	[B]	163	109	75-125	
		40.0	105	105	109	15-125	
Lab Batch #: 883576 Date Analyzed: 03/14/2012	Date I	Prepared: 03/1	4/2012	Δ	nalyst: B	RB	
QC- Sample ID: 438637-001 S	Date	Batch #: 1			Matrix: S		
Reporting Units: mg/kg			RIX / MA	TRIX SPIKE			DY
Inorganic Anions by EPA 300		Parent Sample Result	Spike Added	Spiked Sample Result [C]		Control Limits %R	Flag
Analytes		[A]	[B]				
Chloride		7680	2330	9890	95	75-125	
Lab Batch #: 883802							
Date Analyzed: 03/15/2012	Date I	Prepared: 03/1	5/2012	A	nalyst: B	RB	
QC- Sample ID: 438795-001 S		Batch #: 1			Matrix: Se	oil	
Reporting Units: mg/kg		MATE	RIX / MA	TRIX SPIKE	RECO	VERY STU	DY
Inorganic Anions by EPA 300 Analytes		Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
Chloride		2330	1060	3320	93	75-125	
Lab Batch #: 884044							
Date Analyzed: 03/20/2012	Date F	Prepared: 03/2	0/2012	A	nalyst: B	RB	
QC- Sample ID: 439008-001 S		Batch #: 1			Matrix: Se	oil	
Reporting Units: mg/kg		MATE	RIX / MA	TRIX SPIKE	RECO	VERY STU	DY
Inorganic Anions by EPA 300		Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
Analytes							
Chloride		159	213	374	101	75-125	

Matrix Spike Percent Recovery $[D] = 100^{\circ}(C-A)/B$ Relative Percent Difference $[E] = 200^{\circ}(C-A)/(C+B)$ All Results are based on MDL and Validated for QC Purposes

BRL - Below Reporting Limit

Form 3 - MS / MSD Recoveries

Project Name: Boyd 9"

Lab Batch ID: 883586 Work Order #: 438637

Date Analyzed: 03/14/2012 Reporting Units: mg/kg

Batch #: QC- Sample ID: 438637-006 S Date Prepared: 03/14/20

Matrix: Soil -

Project ID: 12-0118-01

101		(E DUPLICATE RECOVERY STUDY
INTRE YATINA DOLL		UPLICATE
•	ASA	IKED
Daten T.	Analyst:	MATRIX SP
	4/2012	MATRIX SPIKE / MATRIX SPIKE

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result C	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00101	0.101	0.0684	68	0.0998	0.0706	71	3	70-130	35	X
Toluene	<0.00201	0.101	0.0678	67	0.0998	0.0718	72	9	70-130	35	x
Ethylbenzene	<0.00101	0.101	0.0648	64	0.0998	0.0702	70	8	71-129	35	x
m_p-Xylenes	<0.00201	0.201	0.139	69	0.200	0.144	72	4	70-135	35	х
o-Xylene	<0.00101	0.101	0.0677	67	0.0998	0.0709	71	5	71-133	35	Х
Lab Batch ID: 883686 Q	QC- Sample ID: 438791-001 S	438791-	001 S	Bat	Batch #:	1 Matrix: Soil	: Soil				

Reporting Units: mg/kg		M	MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY	E / MATI	RIX SPII	KE DUPLICA'	TE RECO	OVERY S	STUDY		
BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Spiked Result Sample [C] %R	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00101	0.101	0.0654	65	0.100	0.0639	64	2	70-130	35	X
Toluene	<0.00201	0.101	0.0661	65	0.100	0.0647	65	2	70-130	35	X
Ethylbenzene	<0.00101	0.101	0.0671	99	0.100	0.0665	67	-	71-129	35	X
m_p-Xylenes	<0.00201	0.201	0.138	69	0.200	0.135	68	2	70-135	35	Х
o-Xvlene	<0.00101	0.101	0.0648	64	0.100	0.0630	63		71-133	35	X

Analyst: ASA

Date Prepared: 03/15/2012

Date Analyzed: 03/15/2012

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

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not ApplicableN = See Narrative, EQL = Estimated Quantitation Limit

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

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aboratorie

Form 3 - MS / MSD Recoveries



Work Order #: 438637

Date Analyzed: 03/15/2012 Lab Batch ID: 883615 Reporting Units: mg/kg

Batch #:

Matrix: Soil -

Project ID: 12-0118-01

QC- Sample ID: 438609-003 S Date Prepared: 03/14/2012

BRB Analyst:

Reporting Units: mg/kg		M	MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY	C/MAT	RIX SPII	KE DUPLICAT	FE RECO	VERY S	TUDY		
TPH By SW8015 Mod Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Spiked Result Sample ICI %R	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
C6-C12 Gasoline Range Hydrocarbons	26.1	1110	807	70	1110	817	71	-	70-135	35	
C12-C28 Diesel Range Hydrocarbons	299	1110	1310	91	1110	1380	67	5	70-135	35	
Lab Batch ID: 883636	QC- Sample ID: 438675-001 S	438675	-001 S	Bai	Batch #:	1 Matrix: Soil	: Soil				

Analyst: BRB

Date Prepared: 03/14/2012

Control Limits %RPD 35 35 Control Limits %R 70-135 70-135 MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY RPD % 2 0 Spiked Dup. %R 69 94 Duplicate Spiked Sample Result [F] 1170 815 Spike 1130 1130 Ε Sample %R [D] Spiked 68 94 Spiked Sample Result [C] 1170 L6L Spike Added [B] 1120 1120 Parent Sample Result 36.9 [Y] 113 TPH By SW8015 Mod C6-C12 Gasoline Range Hydrocarbons C12-C28 Diesel Range Hydrocarbons Analytes Date Analyzed: 03/15/2012 Reporting Units: mg/kg

Flag

×

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

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

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not ApplicableN = See Narrative, EQL = Estimated Quantitation Limit

Final 1.001

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Sample Duplicate Recovery



Project	Name:	Boyd	9"
---------	-------	------	----

Work Order #: 438637						
Lab Batch #: 883576				Project I	D: 12-0118-	01
Date Analyzed: 03/14/2012 18:13	Date Prepar	ed: 03/14/2012	2 Ana	lyst: BRB		
QC- Sample ID: 438637-001 D	Batch	n #: 1	Mat	trix: Soil		
Reporting Units: mg/kg		SAMPLE /	/ SAMPLE	DUPLIC	ATE REC	OVERY
Anions by E300 Analyte		Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Chloride		7680	7650	0	20	
Lab Batch #: 883802						
Date Analyzed: 03/15/2012 16:27	Date Prepar	ed: 03/15/2012	Ana	lyst: BRB		
QC- Sample ID: 438795-001 D	Batch	n#: 1	Mat	trix: Soil		
Reporting Units: mg/kg		SAMPLE /	SAMPLE	DUPLIC.	ATE RECO	OVERY
Anions by E300		Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Analyte						
Chloride		2330	2330	0	20	
Lab Batch #: 884044						
Date Analyzed: 03/20/2012 10:48		ed: 03/20/2012		lyst:BRB		
QC- Sample ID: 439008-001 D	Batch			trix: Soil		
Reporting Units: mg/kg		SAMPLE /	SAMPLE	DUPLIC	ATE RECO	OVERY
Anions by E300 Analyte		Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Chloride		159	152	5	20	
Lab Batch #: 883599				-		
Date Analyzed: 03/14/2012 09:00	Date Prepar	ed: 03/14/2012	Ana	lyst: BRB		
QC- Sample ID: 438636-001 D	Batch	#: 1	Mat	trix: Soil		
Reporting Units: %		SAMPLE /	SAMPLE	DUPLIC.	ATE RECO	OVERY
Percent Moisture Analyte		Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Percent Moisture		10.1	11.2	10	20	

Spike Relative Difference RPD 200 * | (B-A)/(B+A) | All Results are based on MDL and validated for QC purposes. BRL - Below Reporting Limit



Sample Duplicate Recovery



Work Order #: 438637

Project Name: Boyd 9"

Lab Batch #:	884001
Date Analyzed:	03/20/2012 08:03

Lab Batch #: 884001 Date Analyzed: 03/20/2012 08:05 QC- Sample ID: 438985-001 D	Date Prepared: 03/20/2012 Batch #: 1	2 Ana	Project I alyst: BRB atrix: Soil	D: 12-0118-	01
Reporting Units: %	SAMPLE	/ SAMPLE	DUPLIC	ATE REC	OVERY
Percent Moisture Analyte	Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag

4.28

4.42

3

20

Percent Moisture

Spike Relative Difference RPD 200 * | (B-A)/(B+A) | All Results are based on MDL and validated for QC purposes. BRL - Below Reporting Limit

CHAIN-OF-CUSTODY PAGE 1 OF 1 AB WORK ORDER #: 4386577 Lan County, NIT/10049"	22/22/22/22	7.14	04 55 54 40 5 5 5 5 40 5 5 5 5 4 5 5 5 1 6 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Sol		2	>	>	>	2	>	>	>	2	>	2	2	>				RECEIVING TEMP: L. U C THERM #	ED
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A CISON & SSOCIOTES, Inc. Environmental Consultants Data Reported to:	TRRP report?	TIME ZONE:	THIN ZUIRDIAN	Sample I.D.	North Bottom 15	North hot ion 2.0'	NLAHA Kattern 25'	North-Sudind'	Northan cot 10'	Northy-Nert is 0	NotirEat 10'	Sauth Bottom 15'	Suith hottomized	South hothem 25'	Sendin hollowed	South-Southed	Sutto-Nest 10	South East 101		TOTAL	RELIVIANSHED BYRGIgnature)	RELINQUISHED BY:(Signature)	RELINQUISHED BY:(Signature)

Final 1.001



1

XENCO Laboratories

Atlanta, Boca Raton, Corpus Christi, Dallas Houston, Miami, Odessa, Philadelphia Phoenix, San Antonio, Tampa Document Title: Sample Receipt Checklist Document No.: SYS-SRC Revision/Date: No. 01, 5/27/2010 Effective Date: 6/1/2010 Page 1 of 1

Prelogin / Nonconformance Report - Sample Log-In

Client: LW	son + Assoc.	
Date/Time: 3	113/12 3:50	
Lab ID # :	438637	
Initials: At	t	

Sample Receipt Checklist

1. Samples on ice?	Blue	Water	No	
2. Shipping container in good condition?	Yes) No	None	
3. Custody seals intact on shipping container (cooler) and bottles?	Yes	No	(N/A)	
4. Chain of Custody present?	Yes) No		
5. Sample instructions complete on chain of custody?	Yes	No		
6. Any missing / extra samples?	Yes	No		
7. Chain of custody signed when relinquished / received?	Yes	No		
8. Chain of custody agrees with sample label(s)?	Yes	No		
9. Container labels legible and intact?	Yes	No		
10. Sample matrix / properties agree with chain of custody?	Yes) No		
11. Samples in proper container / bottle?	Yes	No		
12. Samples properly preserved?	Yes	No	N/A	
13. Sample container intact?	(Yes) No		
14. Sufficient sample amount for indicated test(s)?	Yes	No		
15. All samples received within sufficient hold time?	Yes	No		
16. Subcontract of sample(s)?	Yes	No	(N/A)	
17. VOC sample have zero head space?	Yes	No	N/A	
18. Cooler 1 No. Cooler 2 No. Cooler 3 No.	Cooler	4 No.	Cooler 5 No.	
Ibs () °C Ibs °C Ibs	°C	lbs °C	lbs	°C

Nonconformance Documentation

Contact: _____ Contacted by: ____ Date/Time: _____ Regarding: _____ Corrective Action Taken: _____ Corrective Action Taken: _____ Check all that apply: □Cooling process has begun shortly after sampling event and out of temperature

condition acceptable by NELAC 5.5.8.3.1.a.1.

Client understands and would like to proceed with analysis

Final 1.001



6701 Aberdeen Avenue, Suite 9 200 East Sunset Road, Suite E 5002 Basin Street, Suite A1 (BioAquatic) 2501 Mayes Rd., Suite 100

El Paso, Texas 79922 Texas 79703 Midland Carroliton. Texas 75006

432-689-6301 972-242 -7750 E-Mail: lab@traceanalysis.com WEB: www.traceanalysis.com

915-585-3443

Certifications

HUB NCTRCA DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025 WBE

Analytical and Quality Control Report

Coty Woolf Larson and Associates, Inc.

P. O. Box 50685 Midland, TX, 79710 Report Date: July 11, 2012

FAX 915-585-4944

FAX 432 .689 .6313

Work Order: 12062838

Project Name: Boyd 9 Project Number: 12-0118-01

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
302298	NW-1 (4')	soil	2012-06-27	09:00	2012-06-28
302299	NW-1 (6')	soil	2012-06-27	00:00	2012-06-28
302300	NW-1 (10')	soil	2012-06-27	00:00	2012-06-28
302301	NW-2 (4')	soil	2012-06-27	00:00	2012-06-28
302302	NW-2 (8')	soil	2012-06-27	00:00	2012-06-28
302303	NW-2 (15')	soil	2012-06-27	00:00	2012-06-28
302304	SW-1 (4')	soil	2012-06-27	00:00	2012-06-28
302305	SW-1 (10')	soil	2012-06-27	00:00	2012-06-28
302306	EW-2 (10')	soil	2012-06-27	00:00	2012-06-28
302307	EW-1 (6')	soil	2012-06-27	00:00	2012-06-28
302308	EW-2 (4')	soil	2012-06-27	00:00	2012-06-28
302309	EW-2 (6')	soil	2012-06-27	00:00	2012-06-28
302310	EW-1 (10')	soil	2012-06-27	00:00	2012-06-28
302311	WW-1 (4')	soil	2012-06-27	00:00	2012-06-28
302312	WW-1 (8')	soil	2012-06-27	00:00	2012-06-28
302313	WW-1 (15')	soil	2012-06-27	00:00	2012-06-28
302314	WW-2 (4')	soil	2012-06-27	00:00	2012-06-28
302315	WW-2 (8')	soil	2012-06-27	00:00	2012-06-28

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
302316	WW-2 (12')	soil	2012-06-27	00:00	2012-06-28
302317	Bottom-1	soil	2012-06-27	00:00	2012-06-28
302318	Bottom-2	soil	2012-06-27	00:00	2012-06-28

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

This report consists of a total of 21 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Michael april

Dr. Blair Leftwich, Director Dr. Michael Abel, Project Manager

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QC Batch 92893 - CCV (1)																	•			•]
QC Batch 92893 - CCV (2)													•								 		1
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Case Narrative

Samples for project Boyd 9 were received by TraceAnalysis, Inc. on 2012-06-28 and assigned to work order 12062838. Samples for work order 12062838 were received intact at a temperature of 16.9 C.

Samples were analyzed for the following tests using their respective methods.

		Prep	Prep	QC	Analysis
Test	Method	Batch	Date	Batch	Date
Chloride (IC)	E 300.0	78674	2012-07-05 at 08:58	92890	2012-07-05 at 15:26
Chloride (IC)	E 300.0	78674	2012-07-05 at 08:58	92891	2012-07-05 at 15:27
Chloride (IC)	E 300.0	78674	2012-07-05 at $08:58$	92893	2012-07-06 at 15:29
Chloride (IC)	E 300.0	78674	2012-07-05 at $08{:}58$	92894	2012-07-06 at 15:30

Results for these samples are reported on a wet weight basis unless data package indicates otherwise.

A matrix spike (MS) and matrix spike duplicate (MSD) sample is chosen at random from each preparation batch. The MS and MSD will indicate if a site specific matrix problem is occurring, however, it may not pertain to the samples for work order 12062838 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

All other exceptions associated with this report have been footnoted on the appropriate analytical page to assist in general data comprehension. Please contact the laboratory directly if there are any questions regarding this project.

Report Date: July 11, 2012 12-0118-01

Work Order: 12062838 Boyd 9 Page Number: 6 of 21

Analytical Report

Sample: 302298 - NW-1 (4')

Chloride		Qs		496	mg/Kg	g 1	10.0
Parameter		Flag	Cert	RL Result		s Dilution	RL
Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (IC) 92890 78674		Date Anal	l Method: lyzed: reparation:	E 300.0 2012-07-05 2012-07-05	Prep Method: Analyzed By: Prepared By:	AR

Sample: 302299 - NW-1 (6')

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (IC) 92890 78674		Analytical Date Anal Sample Pr		E 300.0 2012-07-05 2012-07-05	Prep Metho Analyzed E Prepared E	By: AR
				RI			
Parameter		Flag	Cert	Result	t Unit	ts Dilution	RL
Chloride		Qs		853	B mg/K	lg 10	10.0

Sample: 302300 - NW-1 (10')

Chloride		Qs		1850) mg	g/Kg	10	10.0
Parameter		Flag	Cert	RL Result		Jnits	Dilution	RL
Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (IC) 92890 78674		Date Anal	l Method: lyzed: reparation:	E 300.0 2012-07-05 2012-07-05		Prep Method: Analyzed By: Prepared By:	1

Report Date 12-0118-01	e: July 11, 2012		Work Order Boy			Page Number:	7 of 21
Sample: 30	2301 - NW-2 (4	4')					
Laboratory:	Midland						
Analysis:	Chloride (IC)		Analytical Meth	od: E 300	0.0	Prep Method:	N/A
QC Batch:	92890		Date Analyzed:		07-05	Analyzed By:	AR
Prep Batch:	78674		Sample Preparat	ion: 2012-	07-05	Prepared By:	AR
				RL			
Parameter		Flag	Cert I	Result	Units	Dilution	RL
Chloride		Qs		69.8	mg/Kg	1	10.0
Sample: 30	2302 - NW-2 (8	8')					
Laboratory:	Midland	,					
Analysis:	Chloride (IC)		Analytical Meth	od: E 300	0.0	Prep Method:	N/A
QC Batch:	92890		Date Analyzed:		07-05	Analyzed By:	AR
Prep Batch:	78674		Sample Preparat			Prepared By:	AR
				RL			
Parameter		Flag	Cert I	Result	Units	Dilution	RL
Chloride		Qs		1850	m mg/Kg	10	10.0
Sample: 30	2303 - NW-2 (1	15')					
Laboratory:	Midland						
Analysis:	Chloride (IC)		Analytical Methe			Prep Method:	N/A
QC Batch:	92891		Date Analyzed:	2012-	07-05	Analyzed By:	AR
Prep Batch:	78674		Sample Preparat	ion: 2012-	07-05	Prepared By:	AR
				RL			
Parameter		Flag		Result	Units	Dilution	RL
Chloride				3570	mg/Kg	10	10.0

Sample: 302304 - SW-1 (4')

Laboratory:	Midland				
Analysis:	Chloride (IC)	Analytical Method:	E 300.0	Prep Method:	N/A
QC Batch:	92891	Date Analyzed:	2012-07-05	Analyzed By:	AR
Prep Batch:	78674	Sample Preparation:	2012-07-05	Prepared By:	AR

Report Date: July 11, 2012 12-0118-01		Work	Corder: 12062838 Boyd 9	3	Page Number: 8 of 2			
Parameter	Flag	Cert	RL Result	Units	Dilution	RL		
Chloride	Qs		664	mg/Kg	10	10.0		

Sample: 302305 - SW-1 (10')

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (IC) 92891 78674		Analytical Date Anal Sample Pr		E 300.0 2012-07-05 2012-07-05	Prep Method: Analyzed By: Prepared By:	AR
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Chloride		Qs		1510	mg/Kg	10	10.0

Sample: 302306 - EW-2 (10')

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (IC) 92891 78674		Analytical Date Anal Sample Pr		E 300.0 2012-07-05 2012-07-05		Prep Method: Analyzed By: Prepared By:	,
				RI				
Parameter		Flag	Cert	Result	t I	Units	Dilution	RL
Chloride		Qs		1340) m	g/Kg	10	10.0

Sample: 302307 - EW-1 (6')

Chloride		Qs		6880	mg/Kg	10	10.0
Parameter		Flag	Cert	Result	Units	Dilution	RL
				RL			
Prep Batch:	78674		Sample Pr	reparation:	2012-07-05	Prepared By:	AR
QC Batch:	92891		Date Anal	U	2012-07-05	Analyzed By:	
Analysis:	Chloride (IC)		Analytical	l Method:	E 300.0	Prep Method:	,
Laboratory:	Midland						

Report Date 12-0118-01	e: July 11, 2012		Wor	rk Order: 1206 Boyd 9	Page Number: 9	9 of 21	
Sample: 30	2308 - EW-2 (4	4')					
Laboratory:	Midland						
Analysis:	Chloride (IC)		Analytic	al Method:	E 300.0	Prep Method:	N/A
QC Batch:	92893		Date Ana		2012-07-06	Analyzed By:	AR
Prep Batch:	78674		Sample I	Preparation:	2012-07-05	Prepared By:	AR
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Chloride		Qs		1050	mg/Kg	10	10.0
Sample: 30 Laboratory: Analysis: QC Batch: Prep Batch:	2309 - EW-2 (6 Midland Chloride (IC) 92893 78674	3')	Date Ana	alyzed:	E 300.0 2012-07-06 2012-07-05	Prep Method: Analyzed By: Prepared By:	N/A AR AR
			C i	RL	TT		DI
Parameter		Flag	Cert	Result	Units	Dilution 10	RL 10.0
Chloride		Qs		720	mg/Kg	10	10.0
Sample: 30	2310 - EW-1 (1	10')					
28 C)					
Laboratory:	Midland						
Analysis:	Chloride (IC)				E 300.0	Prep Method:	N/A
QC Batch:	92893		Date Ana		2012-07-06	Analyzed By:	AR
Prep Batch:	78674		Sample I	Preparation:	2012-07-05	Prepared By:	AR
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL

Sample: 302311 - WW-1 (4')

Laboratory:	Midland				
Analysis:	Chloride (IC)	Analytical Method:	E 300.0	Prep Method:	N/A
QC Batch:	92893	Date Analyzed:	2012-07-06	Analyzed By:	AR
Prep Batch:	78674	Sample Preparation:	2012-07-05	Prepared By:	AR

Report Date: July 11, 2012 12-0118-01		Work	Page Number: 10 of 21			
Parameter	Flag	Cert	RL Result	Units	Dilution	RL
	Tag	Oert			Dilution	
Chloride	Qs		99.5	mg/Kg	1	10.0

Sample: 302312 - WW-1 (8')

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (IC) 92893 78674		Analytical Date Anal Sample Pr		E 300.0 2012-07-06 2012-07-05	Prep Method: Analyzed By: Prepared By:	AR
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Chloride		Qs		4190	mg/Kg	10	10.0

Sample: 302313 - WW-1 (15')

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (IC) 92894 78674	Chloride (IC) 92894		Analytical Method: Date Analyzed: Sample Preparation:			Prep Method: Analyzed By: Prepared By:	AR
				RL				
Parameter		Flag	Cert	Result	t Ui	nits	Dilution	RL
Chloride		Qs		8330) mg/	Kg	10	10.0

Sample: 302314 - WW-2 (4')

Laboratory:	Midland						
Analysis:	Chloride (IC)		Analytical	Method:	E 300.0	Prep Method	N/A
QC Batch:	92894		Date Anal	yzed:	2012-07-06	Analyzed By:	AR
Prep Batch:	78674		Sample P	reparation:	2012-07-05	Prepared By:	AR
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
Chloride		Qs		1850	mg/Kg	10	10.0

Report Date: July 11, 2 12-0118-01	2012	Work Order: 120628 Boyd 9	38	Page Number: 1	Page Number: 11 of 2		
Sample: 302315 - WV	W-2 (8')						
Laboratory: Midland							
Analysis: Chloride ((IC)	Analytical Method: E	300.0	Prep Method:	N/A		
QC Batch: 92894		5	12-07-06	Analyzed By:	AR		
Prep Batch: 78674		Sample Preparation: 20	12-07-05	Prepared By:	AR		
		RL					
Parameter	Flag	Cert Result	Units	Dilution	RL		
Chloride	Qs	4460	mg/Kg	10	10.0		
Sample: 302316 - WV	<i>N</i> -2 (12')						
Laboratory: Midland							
Analysis: Chloride (IC)		300.0	Prep Method:	N/A		
QC Batch: 92894			12-07-06	Analyzed By:	AR		
Prep Batch: 78674		Sample Preparation: 20	12-07-05	Prepared By:	AR		
		RL					
Parameter	Flag	Cert Result	Units	Dilution	RL		
C11 1 1 1	Qs	6710	mg/Kg	10	10.0		
Chloride			mg/ ng	10	10.0		
Chloride			ing/itg	10	10.0		
Chloride			mg/ ng	10	10.0		
	tom-1		nig/ Kg	10	10.0		
Sample: 302317 - Bot	ttom-1						
Sample: 302317 - Bot Laboratory: Midland Analysis: Chloride (Analytical Method: E	300.0	Prep Method:			
Sample: 302317 - Bot Laboratory: Midland Analysis: Chloride (QC Batch: 92894		Analytical Method: E Date Analyzed: 20	300.0 12-07-06	Prep Method: Analyzed By:	N/A AR		
Sample: 302317 - Bot Laboratory: Midland Analysis: Chloride (QC Batch: 92894		Analytical Method: E Date Analyzed: 20	300.0	Prep Method:	N/A		
Sample: 302317 - Bot Laboratory: Midland Analysis: Chloride (QC Batch: 92894	IC)	Analytical Method: E Date Analyzed: 20 Sample Preparation: 20 RL	300.0 12-07-06	Prep Method: Analyzed By: Prepared By:	N/A AR AR		
Sample: 302317 - Bot Laboratory: Midland Analysis: Chloride (QC Batch: 92894		Analytical Method: E Date Analyzed: 20 Sample Preparation: 20	300.0 12-07-06	Prep Method: Analyzed By:	N/A AR		

Sample: 302318 - Bottom-2

Laboratory:	Midland				
Analysis:	Chloride (IC)	Analytical Method:	E 300.0	Prep Method:	N/A
QC Batch:	92894	Date Analyzed:	2012-07-06	Analyzed By:	AR
Prep Batch:	78674	Sample Preparation:	2012-07-05	Prepared By:	AR

Report Date: July 11, 2012 12-0118-01		Work	Order: 12062838 Boyd 9	Page Number: 12 of 2		
Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	Qs		556	mg/Kg	1	10.0

Report Date: July 11, 2012 Work Order: 12062838 Page Number: 13 of 21 12-0118-01 Boyd 9 Method Blanks Method Blank (1) QC Batch: 92890 QC Batch: 92890 Date Analyzed: Analyzed By: AR 2012-07-05 Prep Batch: 78674 QC Preparation: 2012-07-05 Prepared By: AR MDL Parameter Flag Cert Result Units RL Chloride 1.26 mg/Kg 10 Method Blank (1) QC Batch: 92891 QC Batch: 92891 Date Analyzed: 2012-07-05 Analyzed By: AR Prep Batch: 78674 QC Preparation: 2012-07-05 Prepared By: AR MDL Parameter Flag Cert Result Units RL Chloride 1.31 mg/Kg 10 Method Blank (1) QC Batch: 92893 QC Batch: 92893 Date Analyzed: 2012-07-06 Analyzed By: AR Prep Batch: 78674 QC Preparation: 2012-07-05 Prepared By: AR MDL Flag Units RL Parameter Cert Result Chloride 1.29 mg/Kg 10 Method Blank (1) QC Batch: 92894 Date Analyzed: 2012-07-06 Analyzed By: AR QC Batch: 92894

QC Preparation: 2012-07-05

Prep Batch: 78674

Prepared By: AR

Report Date: July 11, 2012 12-0118-01		Work Order: 120 Boyd 9	Page Number: 14 of 21		
Parameter	Flag	Cert	MDL Result	Units	RL
Chloride			< 0.0460	m mg/Kg	10

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Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

Danam		F	C	LCS Result	Units	Dil.	Spike Amount		atrix sult	Rec.	Rec. Limit
Param Chloride		г	С	264	mg/Kg		250		.0460	106	90 - 110
Percent recovery is bas	d on the spike	e resu	ilt. RPL) is based (on the s	pike and sj	ріке априс	ate rest	uit.		
Percent recovery is bas	d on the spike	e rest	llt. RPL		on the s	Spike and s	Matrix	ate rest	Rec.		RPI
Percent recovery is bas Param	d on the spike F	e resu C			Dil.			Rec.		RPD	RPD Limi

Laboratory Control Spike (LCS-1)

Prep Batch: 78674 QC Preparation: 2012-07-05 Prepared By: Al	ared By: AR

			LCS			Spike	Matrix		Rec.
Param	F	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit
Chloride			268	$\mathrm{mg/Kg}$	1	250	< 0.0460	107	90 - 110

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

			LCSD			Spike	Matrix		Rec.		RPD
Param	F	С	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			267	mg/Kg	1	250	< 0.0460	107	90 - 110	0	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch:	92893	Date Analyzed:	2012-07-06	Analyzed By:	AR
Prep Batch:	78674	QC Preparation:	2012-07-05	Prepared By:	AR

Report Date: July 11, 2012 12-0118-01				Work Or	rder: 120 Boyd 9	062838	×		Page N	amber:	16 of 2
				LCS			Spike	Ma	atrix		Rec.
Param		F	C 1	Result	Units	Dil.	Amount	Re	sult R	ec.	Limit
Chloride				266	mg/Kg	1	250	<0.	0460 1	06	90 - 110
Percent recovery is based on th	ne spik	e resu	lt. RPD	is based of	on the s	pike and sp	oike duplica	te resi	ult.		
			LCSD			Spike	Matrix		Rec.		RPI
Param	F	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limi
Chloride			268	mg/Kg	1	250	< 0.0460	107	90 - 110	1	20
Laboratory Control Spike QC Batch: 92894 Prep Batch: 78674	(LCS-	1)		e Analyzed Preparatic		2-07-06 2-07-05				yzed B ared B	
Param		F	C I	LCS Result	Units	Dil.	Spike Amount	Re		ec.	Rec. Limit
Chloride				262	mg/Kg	1	250	<0.	0460 1	05	90 - 11
Percent recovery is based on th	ne spike	e resu	lt. RPD	is based of	on the s	oike and sp	oike duplica	te resu	ılt.		
			LCSD			Spike	Matrix		Rec.		RPI
Param	F	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limi
			263	mg/Kg	1	250	< 0.0460	105	90 - 110	0	20
	ne spike	e resu	lt. RPD	is based o	on the sp	oike and sp	oike duplica	te resi	110.		
QC Batch: 92890			: 302298 Date	e Analyzed	l: 201	oike and sp 2-07-05 2-07-05	bike duplica	te rest	Anal	yzed By ared By	
Percent recovery is based on th Matrix Spike (MS-1) Spi QC Batch: 92890			: 302298 Date	e Analyzed Preparatic	l: 201	2-07-05			Anal Prep	yzed By ared By	y: AR
Percent recovery is based on th Matrix Spike (MS-1) Spi QC Batch: 92890 Prep Batch: 78674		ample	: 302298 Date QC I	e Analyzed Preparatic MS	d: 201 on: 201	2-07-05 2-07-05	Spike	М	Anal; Prepa atrix	ared By	y: AR Rec.
Percent recovery is based on the Matrix Spike (MS-1) Spice S	iked Sa	ample F	: 302298 Date	e Analyzed Preparatic MS Result	d: 201 on: 201 Units	2-07-05 2-07-05 Dil.	Spike Amount	M. Re	Anal Prepa atrix esult R	ared By ec.	y: AR Rec. Limit
Percent recovery is based on the Matrix Spike (MS-1) Spice S	iked Sa	mple F Q8	: 302298 Date QC I C	e Analyzed Preparatio MS Result 3760 is based o	d: 201 on: 201 Units mg/Kg	2-07-05 2-07-05 Dil. 5 10	Spike Amount 2750	M. Re	Anal Prepa atrix esult R 523 1	ared By ec.	y: AR Rec. Limit 90 - 11
Percent recovery is based on th Matrix Spike (MS-1) Spi QC Batch: 92890	iked Sa	F Q# e resu	: 302298 Date QC I C Ilt. RPD MSD	e Analyzed Preparatio MS Result 3760 is based o	d: 201: 201: Units mg/Kg on the sp	2-07-05 2-07-05 <u>Dil.</u> g 10 pike and sp	Spike Amount 2750 bike duplica	M. Re	Anal, Prepa atrix esult R 523 1 ilt.	ared By ec.	y: AR

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Report Date: July 11, 2012 12-0118-01	2				rder: 120 Boyd 9	62838		Page Number: 17 of 2				
Matrix Spike (MS-1)	Spiked Sa	mple: 3	302303									
QC Batch: 92891			Date	Analyzed	l: 2012	2-07-05			Anal	yzed By	y: AR	
Prep Batch: 78674			QC F	Preparatio	on: 2012	2-07-05			Prep	ared By	: AR	
				MS			Spike	Ma	atrix		Rec.	
Param		F	\mathbf{C}	Result	Units	Dil.	Amount	Re	sult R	ec.	Limit	
Chloride	Qs	Qs		7370	mg/Kg	10	2750	35	570 1	38	90 - 110	
Percent recovery is based of	n the spike	result	. RPD	is based o	on the sp	ike and spi	ike duplica	te resu	lt.	11 2 M		
			MSD			Spike	Matrix		Rec.		RPD	
Param	F	С	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit	
Chloride	Qs Qs		7380	mg/Kg	g 10	2750	3570	138	90 - 110	0	20	
QC Batch: 92893 Prep Batch: 78674				Analyzed Preparatic MS		2-07-06 2-07-05	Spike	Me		yzed By ared By		
Param		F	С	Result	Units	Dil.	Amount			ec.	Limit	
Chloride	Qs	Qs	0	4150	mg/Kg		2750				90 - 110	
Chionae			DDD								00 110	
Percent recovery is based or	n the spike	result	. RPD	is based (on the sp.	ike and sp.	ike duplica	te resu	lt.			
Percent recovery is based of	n the spike	result		is based (on the sp			te resu			RPD	
	n the spike F	result C	MSD Result			Spike Amount	ike duplica Matrix Result	te resu Rec.	It. Rec. Limit	RPD	RPD Limit	
Param Chloride	F Q8 Q8	С	MSD Result 4160	Units mg/Kg	Dil. g 10	Spike Amount 2750	Matrix Result 1050	Rec. 113	Rec. Limit 90 - 110	RPD 0		
Param Chloride Percent recovery is based of Matrix Spike (MS-1) QC Batch: 92894	F Q8 Q8	C result	MSD Result 4160 . RPD 302313 Date	Units mg/Kg is based of Analyzed	Dil. g 10 on the spi d: 2012	Spike Amount 2750	Matrix Result 1050	Rec. 113	Rec. Limit 90 - 110 lt. Anal		Limit 20	
•	$\frac{F}{\frac{Q^8 - Q^8}{P}}$ n the spike	C result	MSD Result 4160 . RPD 302313 Date	Units mg/Kg is based o Analyzed Preparatio	Dil. g 10 on the spi d: 2012	Spike Amount 2750 ike and spi 2-07-06	Matrix Result 1050 ike duplica	Rec. 113 te resu	Rec. Limit 90 - 110 lt. Anal Prep.	0 yzed By	Limit 20 7: AR 7: AR	
Param Chloride Percent recovery is based of Matrix Spike (MS-1) QC Batch: 92894 Prep Batch: 78674	$\frac{F}{\frac{Q^8 - Q^8}{P}}$ n the spike	C result	MSD Result 4160 302313 Date QC F	Units mg/Kg is based o Analyzed Preparatic MS	Dil. g 10 on the spi d: 2012 on: 2012	Spike Amount 2750 ike and spi e-07-06 2-07-05	Matrix Result 1050 ike duplica Spike	Rec. 113 te resu Ma	Rec. Limit 90 - 110 lt. Anal Prep.	0 yzed By ared By	Limit 20 7: AR 7: AR 7: AR Rec.	
Param Chloride Percent recovery is based of Matrix Spike (MS-1) QC Batch: 92894	$\frac{F}{\frac{Q^8 - Q^8}{P}}$ n the spike	C result	MSD Result 4160 . RPD 302313 Date QC F	Units mg/Kg is based o Analyzed Preparatio	Dil. g 10 on the spi d: 2012	Spike Amount 2750 ike and spi e-07-06 -07-05 Dil.	Matrix Result 1050 ike duplica	Rec. 113 te resu Ma Re	Rec. Limit 90 - 110 lt. Anal Prep. sutrix sult R	0 yzed By ared By ec.	Limit 20 7: AR 7: AR	

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

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				MSD			Spike	Matrix		Rec.		RPD	
Param		F	\mathbf{C}	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit	
Chloride	Qs	Qs		11700	mg/Kg	10	2750	8330	122	90 - 110	0	20	

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

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Calibration Standards

Standard (CCV-1)

QC Batch:	92890			Date A	analyzed: 2	2012-07-05		Analy	zed By: AR
					CCVs	CCVs	CCVs	Percent	
					True	Found	Percent	Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride				mg/Kg	25.0	27.1	108	90 - 110	2012-07-05

Standard (CCV-2)

QC Batch:	92890			Date A	analyzed: 2	2012-07-05		Analy	zed By: AR
					CCVs	CCVs	CCVs	Percent	
					True	Found	Percent	Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride				mg/Kg	25.0	26.2	105	90 - 110	2012-07-05

Standard (CCV-1)

QC Batch:	92891			Date A	analyzed:	2012-07-05		Analy	zed By: AR
					CCVs	CCVs	CCVs	Percent	
					True	Found	Percent	Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride				mg/Kg	25.0	26.2	105	90 - 110	2012-07-05

Standard (CCV-2)

QC Batch:	92891			Date A	nalyzed: 2	2012-07-05		Analy	zed By: AR
					CCVs	CCVs	CCVs	Percent	Dete
D		171	C	TT	True	Found	Percent	Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride				mg/Kg	25.0	26.5	106	90 - 110	2012-07-05

Report Date: July 11, 201 12-0118-01	2	1	Work Order: Boyd			Page Nu	mber: 20 of 2
Standard (CCV-1)							
QC Batch: 92893		Date A	analyzed: 2	2012-07-06		Analy	zed By: AR
			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride		mg/Kg	25.0	26.5	106	90 - 110	2012-07-00
Standard (CCV-2)							
QC Batch: 92893		Date A	analyzed: 2	2012-07-06		Analy	zed By: AR
			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride		mg/Kg	25.0	26.0	104	90 - 110	2012-07-0
Standard (CCV-1) QC Batch: 92894		Date A	analyzed: 2	2012-07-06		Analy	zed By: AR
			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride	Cert	mg/Kg	25.0	26.0	104	90 - 110	2012-07-0
			20.0	20.0	101	00 110	2012 01 0
Standard (CCV-2)							
QC Batch: 92894		Date A	analyzed: 2	2012-07-06		Analy	zed By: AR
			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
			a	0	Descuence	Limits	Analyzed
Param Flag	Cert	Units	Conc.	Conc.	Recovery	Linnes	Analyzeu

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Appendix

Report Definitions

Name	Definition
MDL	Method Detection Limit
MQL	Minimum Quantitation Limit
SDL	Sample Detection Limit

Laboratory Certifications

	Certifying	Certification	Laboratory
\mathbf{C}	Authority	Number	Location
-	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis

Standard Flags

F Description

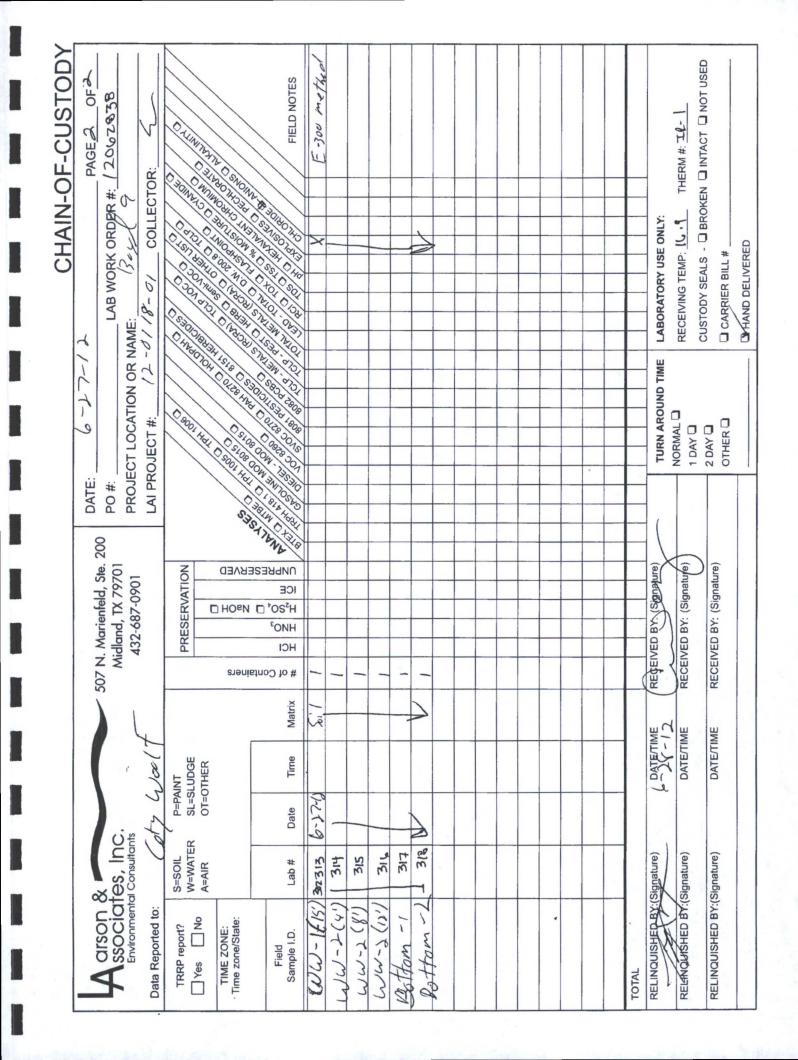
- B Analyte detected in the corresponding method blank above the method detection limit
- H Analyzed out of hold time
- J Estimated concentration
- Jb The analyte is positively identified and the value is approximated between the SDL and MQL. Sample contains less then ten times the concentration found in the method blank. The result should be considered non-detect to the SDL.
- Je Estimated concentration exceeding calibration range.
- Qc Calibration check outside of laboratory limits.
- Qr RPD outside of laboratory limits
- Qs Spike recovery outside of laboratory limits.
- Qsr Surrogate recovery outside of laboratory limits.
- U The analyte is not detected above the SDL

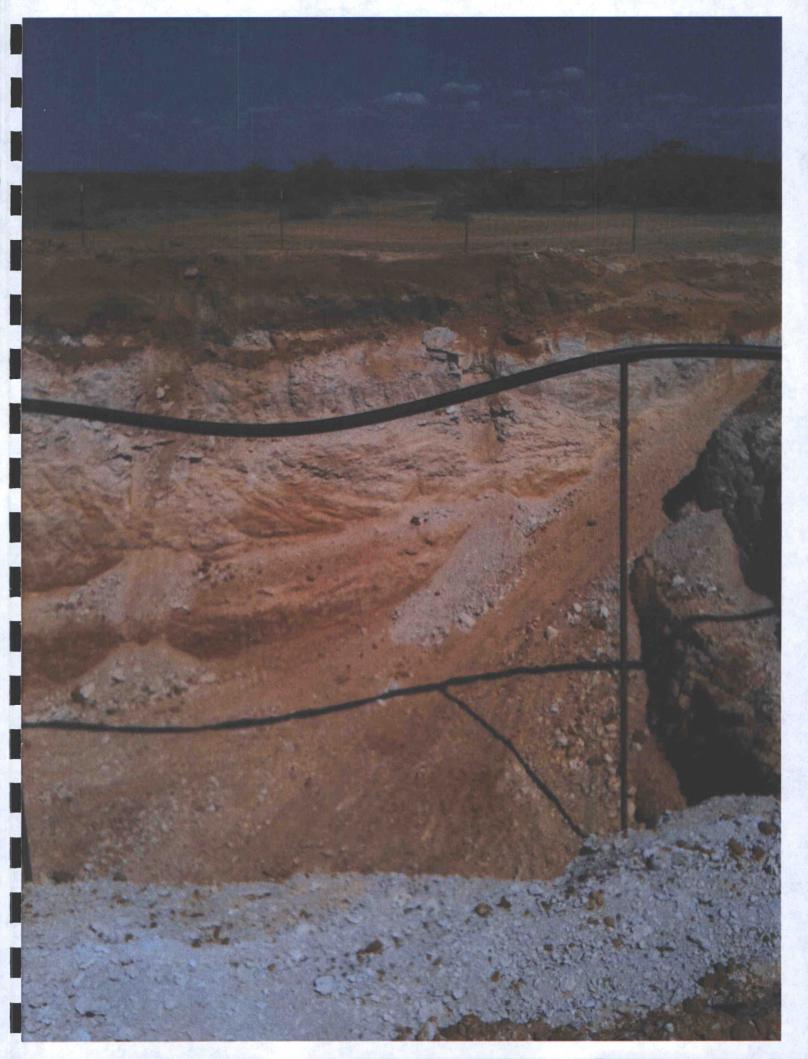
Attachments

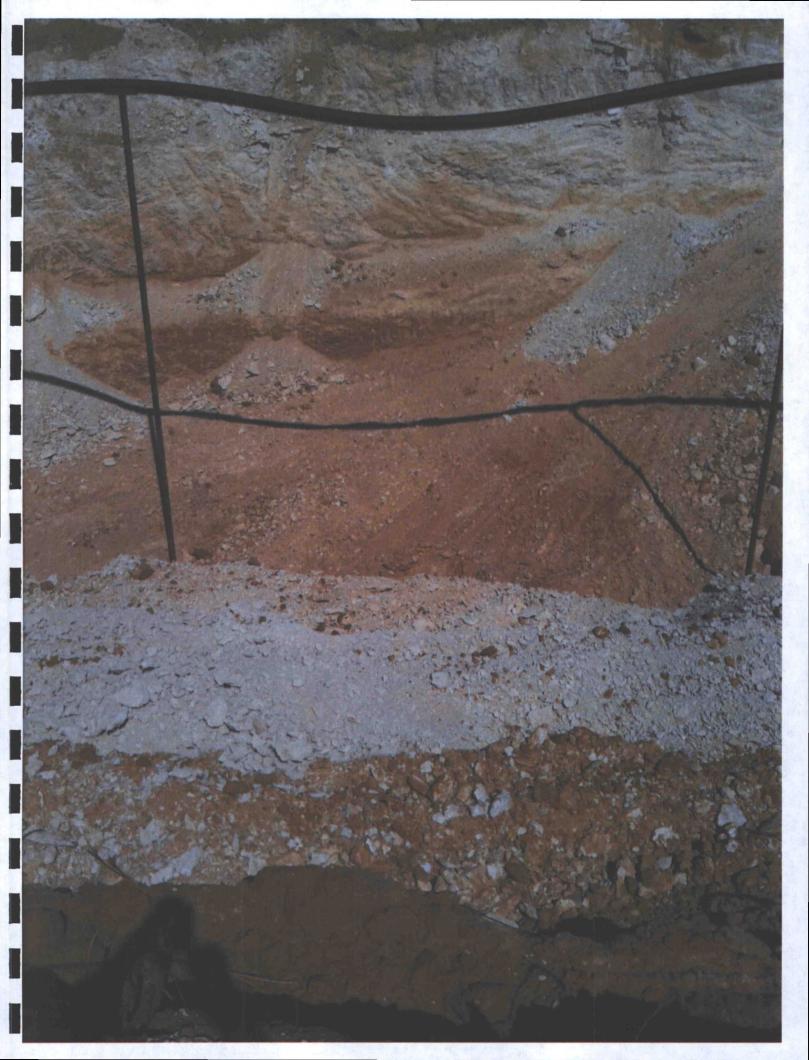
The scanned attachments will follow this page. Please note, each attachment may consist of more than one page.

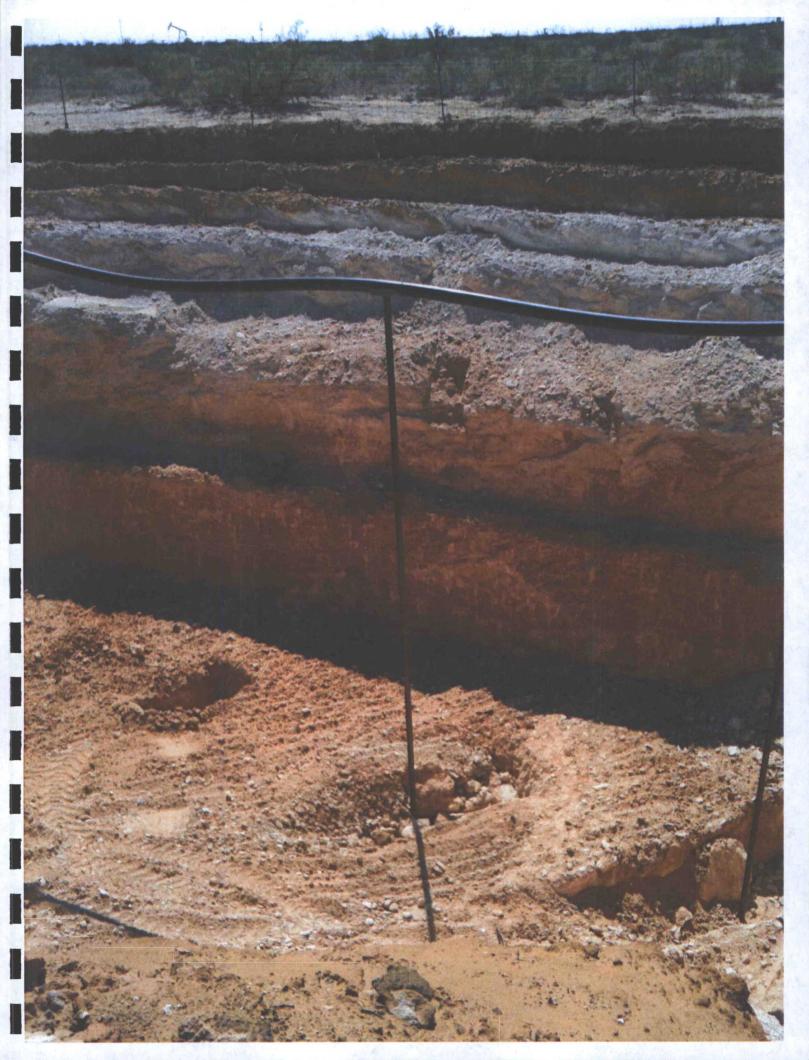
CHAIN-OF-CUSTODY

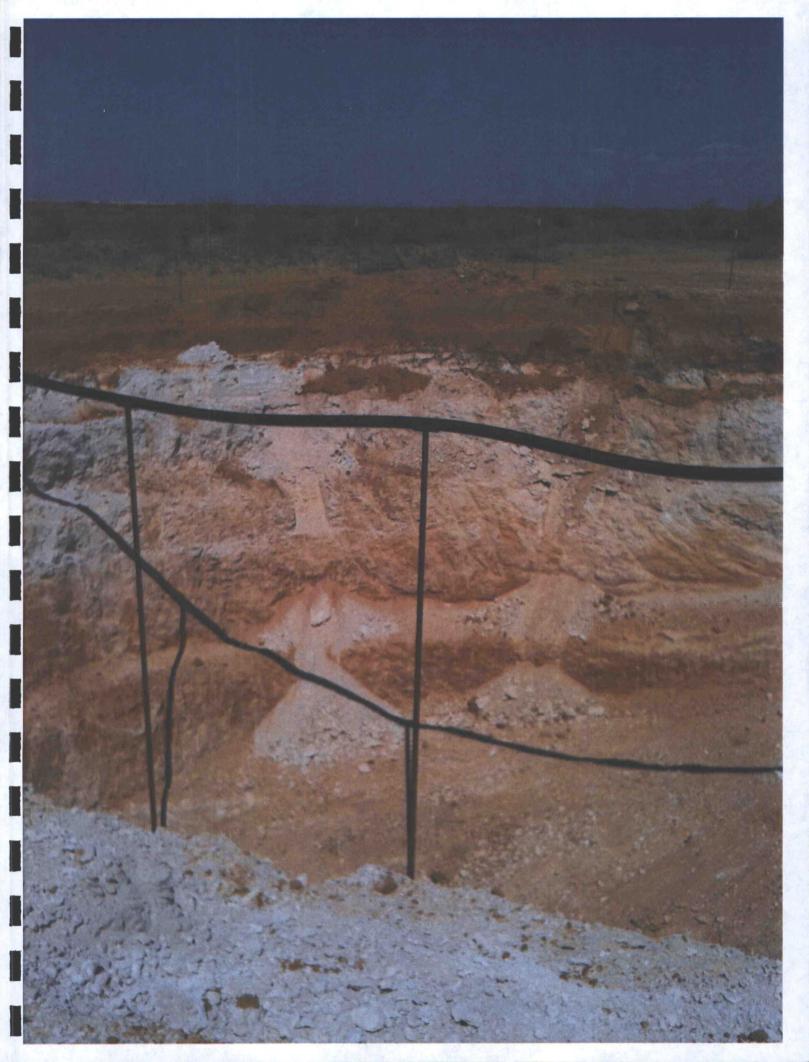
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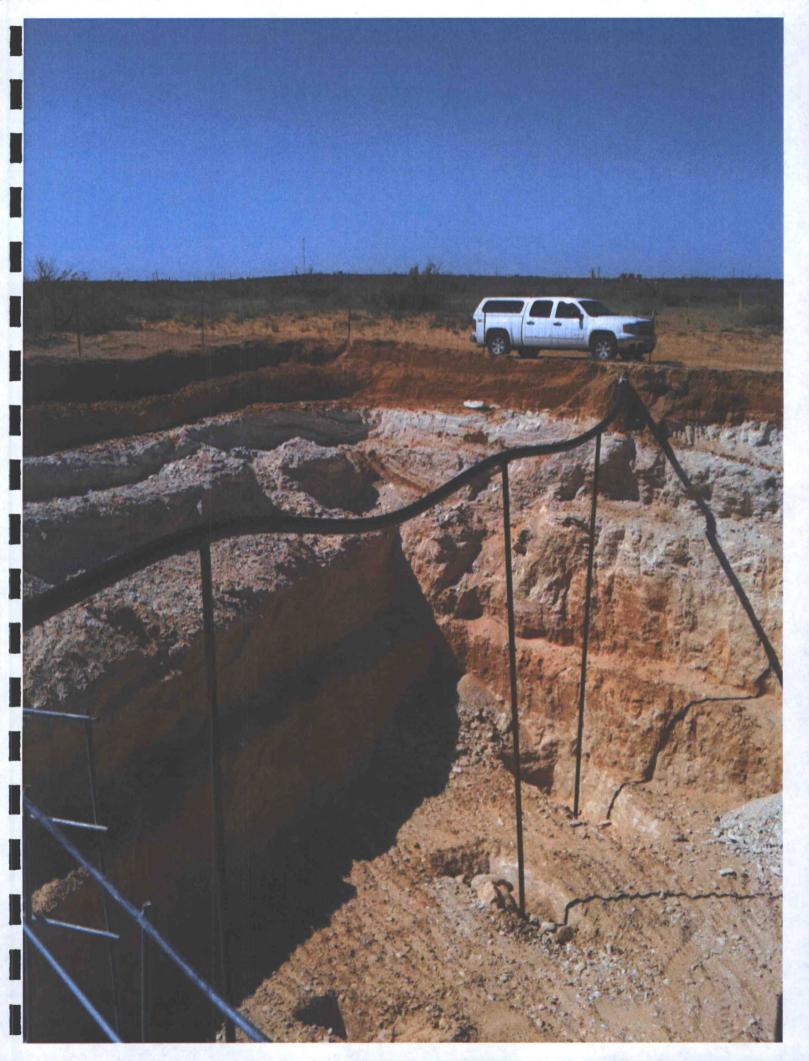


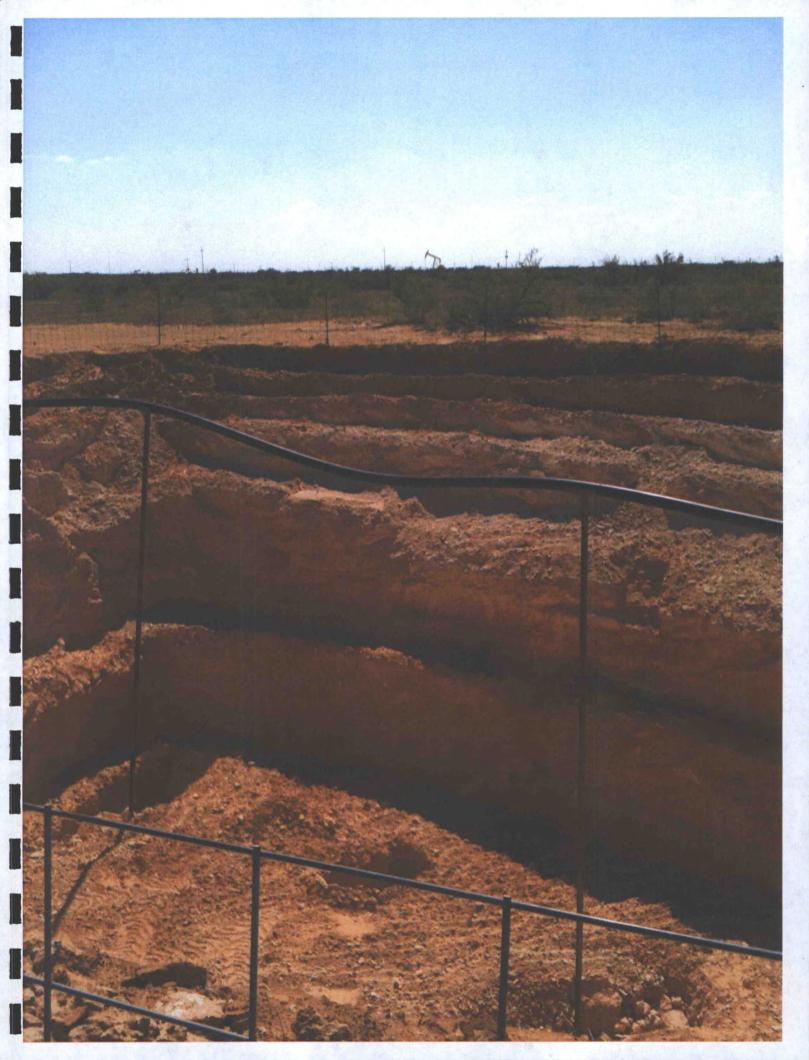


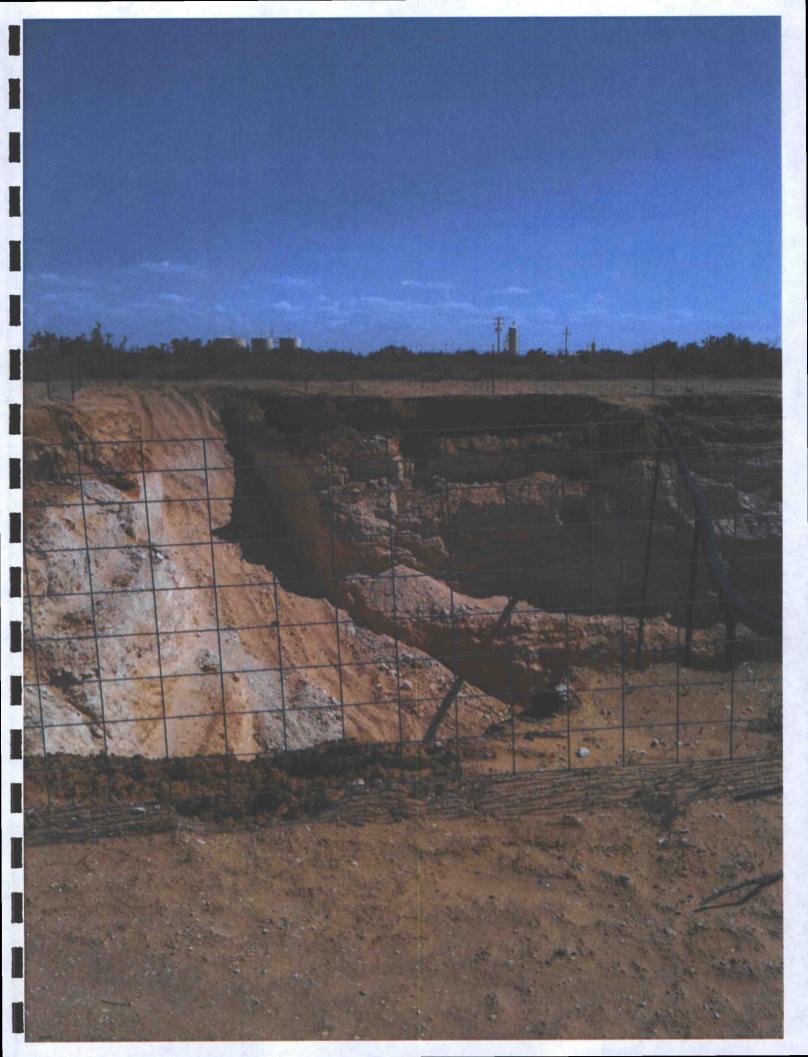


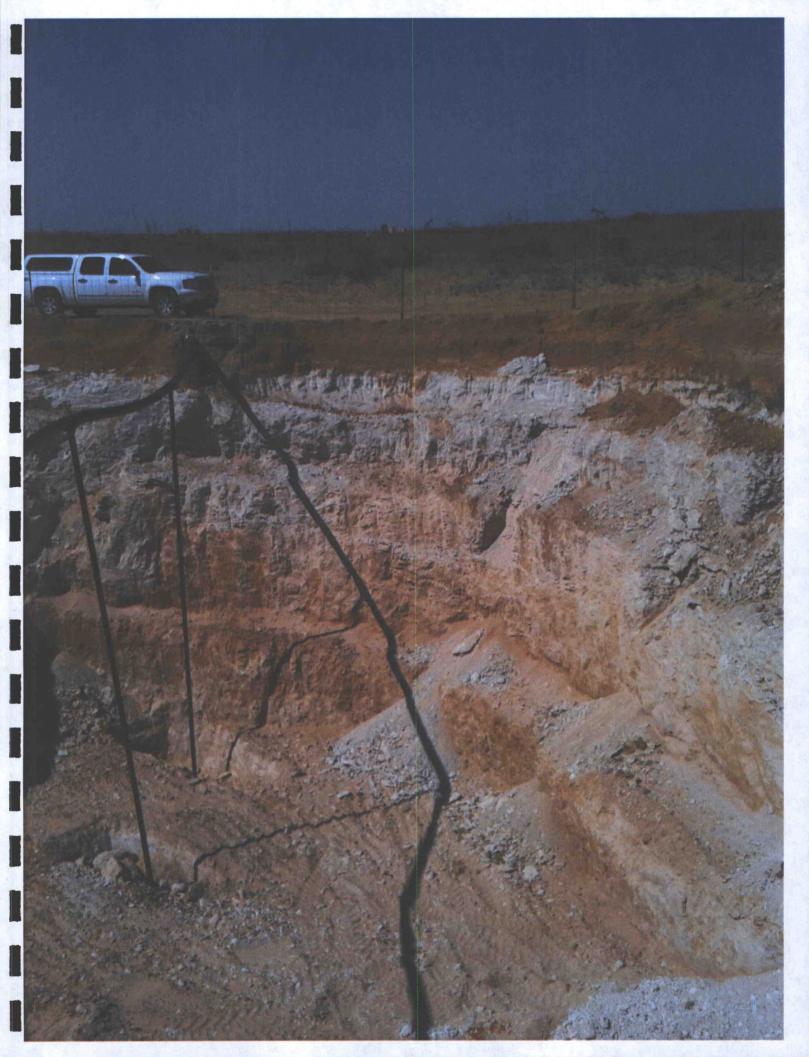


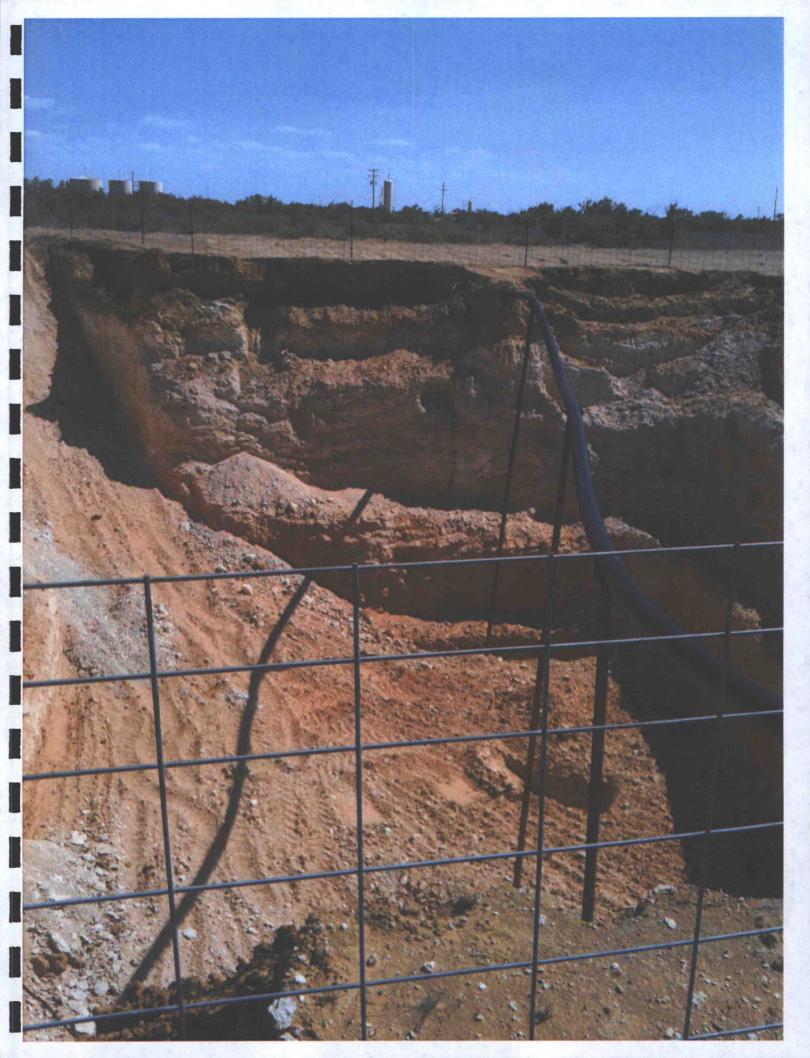


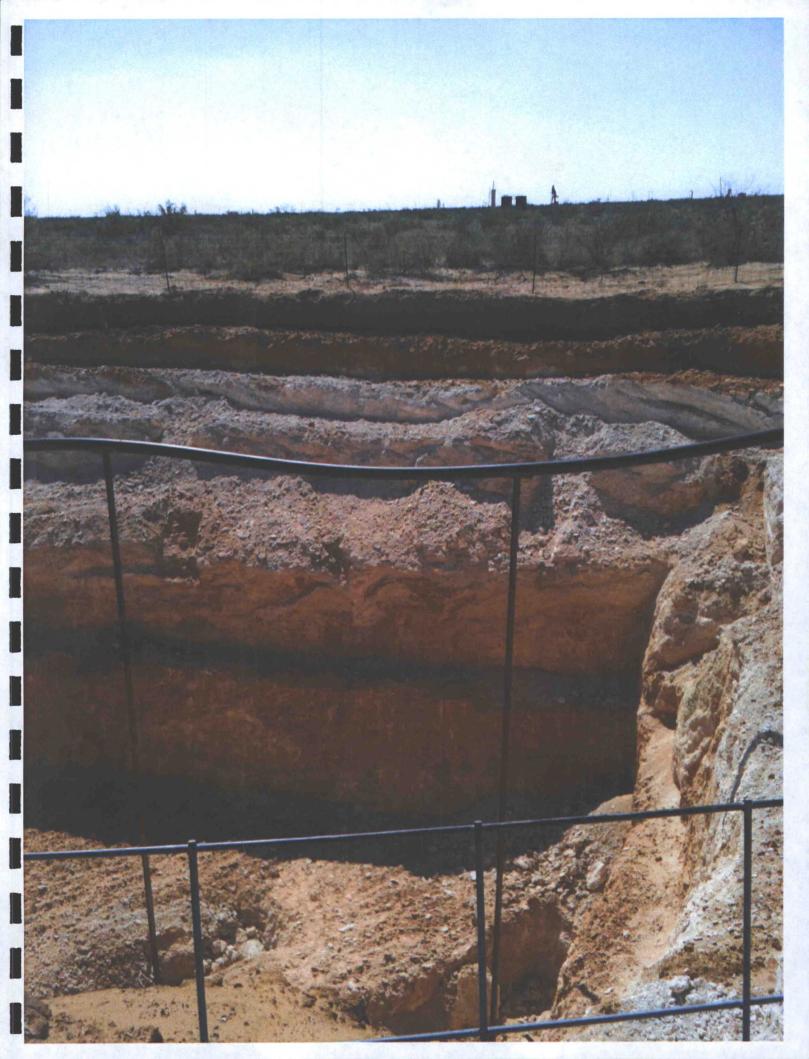


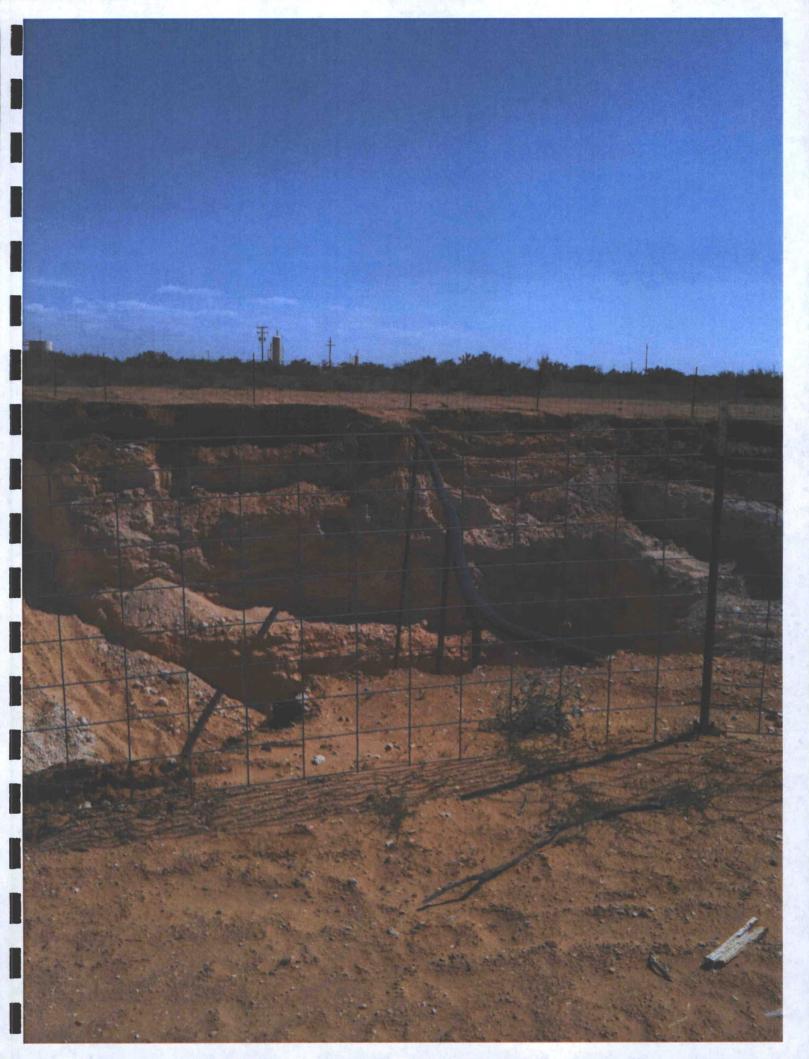












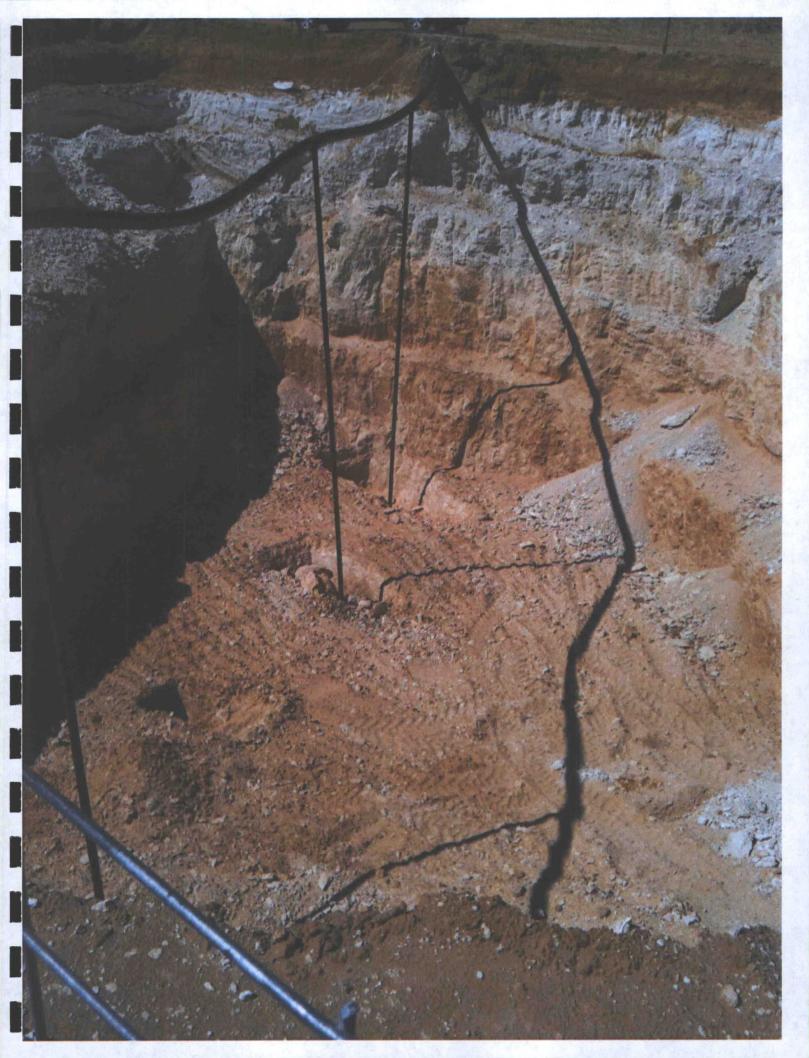




Figure - 1997 Historical Map