



InterTech

July, 2012

OXY USA WTP LP

***LOGAN WASH 28-10 SALT WATER
DISPOSAL FACILITY
JULY 2012 LINE DIG***

Prepared For:



**760 Horizon Drive, Suite 101
Grand Junction, Colorado 81506**

Prepared By:



InterTech

**InterTech Environmental & Engineering, LLC
743 Horizon Court, Suite 102
Grand Junction, Colorado 81506**

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INTRODUCTION

On July 3, 2012, InterTech Environmental & Engineering, LLC (InterTech) was contacted by Sean Norris, Senior Regulatory Advisor of OXY USA WTP LP (OXY), to provide oversight and guidance on the removal of soils previously impacted by produced water during the replacement of a produced water line at the Logan Wash 28-10 Salt Water Disposal Facility, Facility Number 421296. InterTech was tasked with: 1) screening the soils in the trench to verify that the horizontal and lateral extent of the contamination was reached, and 2) to segregate the excavated soils into impacted and non-impacted stockpiles.

SOILS INVESTIGATION AND SAMPLING ACTIVITIES

The excavation and line replacement was completed in four (4) days. A rubber-tired backhoe was used to excavate approximately 58 linear feet of the pipe to an average width of 20 feet, including sloping, and a maximum depth of 15 feet. Soils were screened using a handheld Photoionization Detector (PID) as well as olfactory and visual observations. Soils with PID readings below 20 ppm, no discernable hydrocarbon odor and no suspect staining were stockpiled on site for later use as backfill. Soils with PID readings above 20 ppm and/or contained a hydrocarbon odor were considered to be impacted and were stored in a lined revetment for further characterization and disposal.

Once field screening indicated the extent of the impacted soils had been reached, using the guidelines described above, grab samples were collected from the bottom of the trench: NE Trench, Center Trench and SW Trench. Samples were also collected from the approximate 310 cubic yards of stockpiled soils. Due to the large amount of material within Stockpile 1, two (2) samples were collected: SW-Composite Stockpile and NE Composite Stockpile. Each stockpile sample was a composite, comprised of eight (8) to 10 aliquots.

ANALYTICAL RESULTS

Soil samples were collected in laboratory supplied containers and analyzed for limited constituents: Gasoline Range Organics (GRO); Diesel Range Organics (DRO); Benzene, Toluene, Ethyl-benzene, and Xylene (BTEX); Electrical Conductivity (EC); Sodium Adsorption Ration (SAR); Arsenic (AR); and pH. A summary of the results can be found in Appendix A and the ESC Lab Sciences report is in Appendix B.

EXCEPTIONS TO COGCC TABLE 910-1

Only one (1) constituent, arsenic, was reported above the established Colorado Oil and Gas Conservation Commission (COGCC) Table 910-1 regulatory standards. One (1) background soil sample was recovered and the corresponding analytical data is included as Appendix B.

CONCLUSION AND RECOMMENDATIONS

Analytical data from the samples collected from the bottom of the trench are below COGCC Table 910-1 standards. In addition, the composite samples from the two (2) stockpiles also show analytes below standards. Based on the analytical data, no further action is recommended for the trench. The stockpiled soils should be addressed in a manner in compliance with applicable regulations.



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APPENDIX A

Analytical Summary

**LOGAN WASH 28-10 SALT WATER DISPOSAL FACILITY
JULY 2012 LINE DIG**

PARAMETERS	COGCC	TRENCH BOTTOM			STOCKPILED MATERIALS			BACKGROUND
		NE TRENCH	CENTER TRENCH	SW TRENCH	NE-COMPOSITE STOCKPILE 1	SW-COMPOSITE STOCKPILE 1	STOCKPILE 2	BG (2-6")
GRO	500 mg/kg	U	U	U	U	U	U	U
DRO		3.4	2.7	1.7	13.0	4.0	21.0	21.0
Benzene	0.17 mg/kg	U	U	U	U	U	U	U
Toluene	85 mg/kg	U	U	U	0.0054	U	U	0.0026
Ethylbenzene	100 mg/kg	U	U	U	U	U	U	U
Xylene	175 mg/kg	0.0045	U	U	0.011	0.0037	0.0076	0.0032
Electrical Conductivity	<4 mmhos/cm	3.6	3.7	3.2	2.6	3.2	2.7	1.3
Sodium Adsorption Ratio	<12 ⁵	14.	10.	9.	16.	20.	17.	4.3
pH	6 - 9	8.0	7.8	7.8	8.1	8.3	8.3	7.9
Arsenic	0.39 mg/kg	4.3	4.3	6.9	5.8	6.0	6.6	8.5

Bolded concentrations exceed COGCC Table 910-1 Standards

U = ND (Not Detected)



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APPENDIX B

Analytical Data



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Sean Norris
OXY USA Inc - Grand Junction, CO
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

Report Summary

Friday July 27, 2012

Report Number: L586078

Samples Received: 07/20/12

Client Project:

Description: LW 28-10 Ling Dig

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

Mark W. Beasley , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197,
FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016,
NC - ENV375/DW21704/BIO041, ND - R-140, NJ - TN002, NJ NELAP - TN002,
SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612,
MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1,
TX - T104704245-11-3, OK - 9915, PA - 68-02979

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Note: The use of the preparatory EPA Method 3511 is not approved or endorsed by the CA ELAP.

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REPORT OF ANALYSIS

Sean Norris
OXY USA Inc - Grand Junction, CO
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

July 27, 2012

Date Received : July 20, 2012
Description : LW 28-10 Ling Dig
Sample ID : NE COMPOSITE STOCKPILE

ESC Sample # : L586078-01

Site ID :

Project # :

Collected By : M. Fought
Collection Date : 07/18/12 11:00

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
pH	8.1			su		9045D	07/25/12	1
Sodium Adsorption Ratio	16.					Calc.	07/25/12	1
Specific Conductance	2600			umhos/cm		9050AMo	07/23/12	1
Arsenic	5.8	0.32	1.0	mg/kg		6010B	07/26/12	1
TPH (GC/FID) Low Fraction	U	0.25	0.50	mg/kg		8015D/G	07/20/12	5
Surrogate Recovery (70-130) a,a,a-Trifluorotoluene(FID)	100.			% Rec.		602/801	07/20/12	5
Benzene	U	0.0017	0.0050	mg/kg	J5J3	8260B	07/21/12	5
Toluene	0.0054	0.0016	0.025	mg/kg	JJ5J3	8260B	07/21/12	5
Ethylbenzene	U	0.0019	0.0050	mg/kg	J5J3	8260B	07/21/12	5
Total Xylenes	0.011	0.0023	0.015	mg/kg	JJ3J5	8260B	07/21/12	5
Surrogate Recovery								
Toluene-d8	105.			% Rec.		8260B	07/21/12	5
Dibromofluoromethane	100.			% Rec.		8260B	07/21/12	5
a,a,a-Trifluorotoluene	109.			% Rec.		8260B	07/21/12	5
4-Bromofluorobenzene	93.9			% Rec.		8260B	07/21/12	5
TPH (GC/FID) High Fraction	13.	0.77	4.0	mg/kg		3546/DR	07/24/12	1
Surrogate recovery(%) o-Terphenyl	53.7			% Rec.		3546/DR	07/24/12	1

U = ND (Not Detected)

MDL = Minimum Detection Limit = LOD = TRRP SDL

RDL = Reported Detection Limit = LOQ = PQL = EQL = TRRP MQL

Note:

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L586078-01 (PH) - 8.1@23.2c



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Sean Norris
OXY USA Inc - Grand Junction, CO
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

July 27, 2012

Date Received : July 20, 2012
Description : LW 28-10 Ling Dig

Sample ID : NE TRENCH

Collected By : M. Fought
Collection Date : 07/18/12 13:36

ESC Sample # : L586078-02

Site ID :

Project # :

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
pH	8.0			su		9045D	07/25/12	1
Sodium Adsorption Ratio	14.					Calc.	07/25/12	1
Specific Conductance	3600			umhos/cm		9050AMo	07/23/12	1
Arsenic	4.3	0.32	1.0	mg/kg		6010B	07/25/12	1
TPH (GC/FID) Low Fraction	U	0.25	0.50	mg/kg		8015D/G	07/20/12	5
Surrogate Recovery (70-130) a,a,a-Trifluorotoluene(FID)	100.			% Rec.		602/801	07/20/12	5
Benzene	U	0.0017	0.0050	mg/kg		8260B	07/21/12	5
Toluene	U	0.0016	0.025	mg/kg		8260B	07/21/12	5
Ethylbenzene	U	0.0019	0.0050	mg/kg		8260B	07/21/12	5
Total Xylenes	0.0045	0.0023	0.015	mg/kg	J	8260B	07/21/12	5
Surrogate Recovery								
Toluene-d8	105.			% Rec.		8260B	07/21/12	5
Dibromofluoromethane	96.0			% Rec.		8260B	07/21/12	5
a,a,a-Trifluorotoluene	110.			% Rec.		8260B	07/21/12	5
4-Bromofluorobenzene	99.4			% Rec.		8260B	07/21/12	5
TPH (GC/FID) High Fraction	3.4	0.77	4.0	mg/kg	J	3546/DR	07/23/12	1
Surrogate recovery(%)								
o-Terphenyl	56.6			% Rec.		3546/DR	07/23/12	1

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July 27, 2012

Date Received : July 20, 2012
Description : LW 28-10 Ling Dig

Sample ID : STOCKPILE 2

Collected By : M. Fought
Collection Date : 07/18/12 11:18

ESC Sample # : L586078-03

Site ID :

Project # :

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
pH	8.3			su		9045D	07/25/12	1
Sodium Adsorption Ratio	17.					Calc.	07/25/12	1
Specific Conductance	2700			umhos/cm		9050AMo	07/25/12	1
Arsenic	6.6	0.32	1.0	mg/kg		6010B	07/24/12	1
TPH (GC/FID) Low Fraction	U	0.25	0.50	mg/kg		8015D/G	07/21/12	5
Surrogate Recovery (70-130) a,a,a-Trifluorotoluene(FID)	101.			% Rec.		602/801	07/21/12	5
Benzene	U	0.0017	0.0050	mg/kg		8260B	07/21/12	5
Toluene	U	0.0016	0.025	mg/kg		8260B	07/21/12	5
Ethylbenzene	U	0.0019	0.0050	mg/kg		8260B	07/21/12	5
Total Xylenes	0.0076	0.0023	0.015	mg/kg	J	8260B	07/21/12	5
Surrogate Recovery								
Toluene-d8	104.			% Rec.		8260B	07/21/12	5
Dibromofluoromethane	100.			% Rec.		8260B	07/21/12	5
a,a,a-Trifluorotoluene	105.			% Rec.		8260B	07/21/12	5
4-Bromofluorobenzene	108.			% Rec.		8260B	07/21/12	5
TPH (GC/FID) High Fraction	21.	0.77	4.0	mg/kg		3546/DR	07/24/12	1
Surrogate recovery(%)								
o-Terphenyl	57.6			% Rec.		3546/DR	07/24/12	1

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July 27, 2012

Date Received : July 20, 2012
Description : LW 28-10 Ling Dig

Sample ID : BG 2-6 INCHES

Collected By : M. Fought
Collection Date : 07/18/12 09:50

ESC Sample # : L586078-04

Site ID :

Project # :

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
pH	7.9			su		9045D	07/25/12	1
Sodium Adsorption Ratio	4.3					Calc.	07/25/12	1
Specific Conductance	1300			umhos/cm		9050AMo	07/25/12	1
Arsenic	8.5	0.32	1.0	mg/kg		6010B	07/26/12	1
TPH (GC/FID) Low Fraction	U	0.25	0.50	mg/kg		8015D/G	07/22/12	5
Surrogate Recovery (70-130) a,a,a-Trifluorotoluene(FID)	96.6			% Rec.		602/801	07/22/12	5
Benzene	U	0.0017	0.0050	mg/kg		8260B	07/21/12	5
Toluene	0.0026	0.0016	0.025	mg/kg	J	8260B	07/21/12	5
Ethylbenzene	U	0.0019	0.0050	mg/kg		8260B	07/21/12	5
Total Xylenes	0.0032	0.0023	0.015	mg/kg	J	8260B	07/21/12	5
Surrogate Recovery								
Toluene-d8	104.			% Rec.		8260B	07/21/12	5
Dibromofluoromethane	101.			% Rec.		8260B	07/21/12	5
a,a,a-Trifluorotoluene	103.			% Rec.		8260B	07/21/12	5
4-Bromofluorobenzene	118.			% Rec.		8260B	07/21/12	5
TPH (GC/FID) High Fraction	21.	0.77	4.0	mg/kg		3546/DR	07/24/12	1
Surrogate recovery(%) o-Terphenyl	68.4			% Rec.		3546/DR	07/24/12	1

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July 27, 2012

Date Received : July 20, 2012
Description : LW 28-10 Ling Dig

Sample ID : CENTRAL TRENCH

Collected By : M. Fought
Collection Date : 07/18/12 13:52

ESC Sample # : L586078-05

Site ID :

Project # :

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
pH	7.8			su		9045D	07/25/12	1
Sodium Adsorption Ratio	10.					Calc.	07/25/12	1
Specific Conductance	3700			umhos/cm		9050AMo	07/25/12	1
Arsenic	4.3	0.32	1.0	mg/kg		6010B	07/24/12	1
TPH (GC/FID) Low Fraction	U	0.25	0.50	mg/kg		8015D/G	07/22/12	5
Surrogate Recovery (70-130) a,a,a-Trifluorotoluene(FID)	96.9			% Rec.		602/801	07/22/12	5
Benzene	U	0.0017	0.0050	mg/kg		8260B	07/21/12	5
Toluene	U	0.0016	0.025	mg/kg		8260B	07/21/12	5
Ethylbenzene	U	0.0019	0.0050	mg/kg		8260B	07/21/12	5
Total Xylenes	U	0.0023	0.015	mg/kg		8260B	07/21/12	5
Surrogate Recovery								
Toluene-d8	104.			% Rec.		8260B	07/21/12	5
Dibromofluoromethane	97.4			% Rec.		8260B	07/21/12	5
a,a,a-Trifluorotoluene	104.			% Rec.		8260B	07/21/12	5
4-Bromofluorobenzene	114.			% Rec.		8260B	07/21/12	5
TPH (GC/FID) High Fraction	2.7	0.77	4.0	mg/kg	J	3546/DR	07/23/12	1
Surrogate recovery(%)								
o-Terphenyl	71.5			% Rec.		3546/DR	07/23/12	1

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REPORT OF ANALYSIS

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OXY USA Inc - Grand Junction, CO
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

July 27, 2012

Date Received : July 20, 2012
Description : LW 28-10 Ling Dig

Sample ID : SW TRENCH

Collected By : M. Fought
Collection Date : 07/18/12 14:13

ESC Sample # : L586078-06

Site ID :

Project # :

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
pH	7.8			su		9045D	07/25/12	1
Sodium Adsorption Ratio	9.0					Calc.	07/25/12	1
Specific Conductance	3200			umhos/cm		9050AMo	07/25/12	1
Arsenic	6.9	0.32	1.0	mg/kg		6010B	07/26/12	1
TPH (GC/FID) Low Fraction	U	0.25	0.50	mg/kg		8015D/G	07/22/12	5
Surrogate Recovery (70-130) a,a,a-Trifluorotoluene(FID)	97.0			% Rec.		602/801	07/22/12	5
Benzene	U	0.0017	0.0050	mg/kg		8260B	07/21/12	5
Toluene	U	0.0016	0.025	mg/kg		8260B	07/21/12	5
Ethylbenzene	U	0.0019	0.0050	mg/kg		8260B	07/21/12	5
Total Xylenes	U	0.0023	0.015	mg/kg		8260B	07/21/12	5
Surrogate Recovery								
Toluene-d8	103.			% Rec.		8260B	07/21/12	5
Dibromofluoromethane	97.8			% Rec.		8260B	07/21/12	5
a,a,a-Trifluorotoluene	106.			% Rec.		8260B	07/21/12	5
4-Bromofluorobenzene	112.			% Rec.		8260B	07/21/12	5
TPH (GC/FID) High Fraction	1.7	0.77	4.0	mg/kg	J	3546/DR	07/23/12	1
Surrogate recovery(%) o-Terphenyl	50.0			% Rec.		3546/DR	07/23/12	1

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REPORT OF ANALYSIS

Sean Norris
OXY USA Inc - Grand Junction, CO
760 Horizon Dr., Ste. 101
Grand Junction, CO 81506

July 27, 2012

Date Received : July 20, 2012
Description : LW 28-10 Ling Dig
Sample ID : SW COMPOSITE STOCKPILE

ESC Sample # : L586078-07

Site ID :

Project # :

Collected By : M. Fought
Collection Date : 07/18/12 10:45

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
pH	8.3			su		9045D	07/25/12	1
Sodium Adsorption Ratio	20.					Calc.	07/25/12	1
Specific Conductance	3200			umhos/cm		9050AMo	07/25/12	1
Arsenic	6.0	0.32	1.0	mg/kg		6010B	07/24/12	1
TPH (GC/FID) Low Fraction	U	0.25	0.50	mg/kg		8015D/G	07/22/12	5
Surrogate Recovery (70-130) a,a,a-Trifluorotoluene(FID)	97.9			% Rec.		602/801	07/22/12	5
Benzene	U	0.0017	0.0050	mg/kg		8260B	07/21/12	5
Toluene	U	0.0016	0.025	mg/kg		8260B	07/21/12	5
Ethylbenzene	U	0.0019	0.0050	mg/kg		8260B	07/21/12	5
Total Xylenes	0.0037	0.0023	0.015	mg/kg	J	8260B	07/21/12	5
Surrogate Recovery								
Toluene-d8	99.7			% Rec.		8260B	07/21/12	5
Dibromofluoromethane	95.3			% Rec.		8260B	07/21/12	5
a,a,a-Trifluorotoluene	105.			% Rec.		8260B	07/21/12	5
4-Bromofluorobenzene	110.			% Rec.		8260B	07/21/12	5
TPH (GC/FID) High Fraction	4.0	0.77	4.0	mg/kg	J	3546/DR	07/23/12	1
Surrogate recovery(%)								
o-Terphenyl	51.1			% Rec.		3546/DR	07/23/12	1

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L586078-07 (PH) - 8.3@22.4c

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L586078-01	WG603765	SAMP	Benzene	R2265813	J5J3
	WG603765	SAMP	Toluene	R2265813	JJ5J3
	WG603765	SAMP	Ethylbenzene	R2265813	J5J3
	WG603765	SAMP	Total Xylenes	R2265813	JJ3J5
L586078-02	WG603791	SAMP	TPH (GC/FID) High Fraction	R2268613	J
	WG603765	SAMP	Total Xylenes	R2265813	J
L586078-03	WG603770	SAMP	Total Xylenes	R2266273	J
L586078-04	WG603770	SAMP	Toluene	R2266273	J
	WG603770	SAMP	Total Xylenes	R2266273	J
L586078-05	WG603791	SAMP	TPH (GC/FID) High Fraction	R2268613	J
L586078-06	WG603791	SAMP	TPH (GC/FID) High Fraction	R2268613	J
L586078-07	WG603791	SAMP	TPH (GC/FID) High Fraction	R2268613	J
	WG603770	SAMP	Total Xylenes	R2266273	J

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
J	(EPA) - Estimated value below the lowest calibration point. Confidence correlates with concentration.
J3	The associated batch QC was outside the established quality control range for precision.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods, it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.

Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Difference.

Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromatography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.

TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

Summary of Remarks For Samples Printed
07/27/12 at 11:21:10

TSR Signing Reports: 134
R5 - Desired TAT

Log BTEX by 8260 unless otherwise noted

Sample: L586078-01 Account: OXYGJCO Received: 07/20/12 09:00 Due Date: 07/27/12 00:00 RPT Date: 07/27/12 11:20

Sample: L586078-02 Account: OXYGJCO Received: 07/20/12 09:00 Due Date: 07/27/12 00:00 RPT Date: 07/27/12 11:20

Sample: L586078-03 Account: OXYGJCO Received: 07/20/12 09:00 Due Date: 07/27/12 00:00 RPT Date: 07/27/12 11:20

Sample: L586078-04 Account: OXYGJCO Received: 07/20/12 09:00 Due Date: 07/27/12 00:00 RPT Date: 07/27/12 11:20

Sample: L586078-05 Account: OXYGJCO Received: 07/20/12 09:00 Due Date: 07/27/12 00:00 RPT Date: 07/27/12 11:20

Sample: L586078-06 Account: OXYGJCO Received: 07/20/12 09:00 Due Date: 07/27/12 00:00 RPT Date: 07/27/12 11:20

Sample: L586078-07 Account: OXYGJCO Received: 07/20/12 09:00 Due Date: 07/27/12 00:00 RPT Date: 07/27/12 11:20

I attest to the validity and authenticity of this sample. I am aware that tampering with or intentionally mislabeling the sample location, date or time is considered fraud and may be grounds for legal action.