



August 31, 2015

Ms. Anne Wallace
City of Knoxville
Office of Redevelopment
400 Main Street, Ste. 655
Knoxville, Tennessee 37901

Re: Limited Subsurface Investigation Report
Former State Supreme Court
617 Cumberland Avenue, Knoxville, Tennessee

Dear Ms. Wallace:

Quantum Environmental & Engineering Services, LLC (QE2) conducted a limited subsurface investigation at the Former State Supreme Court Building, located at 617 Cumberland Avenue, Knoxville, Tennessee, on August 10, 2015. The purpose of the investigation was to assess potential subsurface contamination from the Recognized Environmental Conditions (REC) listed in the June 18, 2015, Phase I Environmental Site Assessment (ESA) Report (QE2). A full description of the Site history is provided in the June 2015 Phase I ESA.

A. Subsurface Investigation

The June 2015 Phase I ESA listed potential RECs associated with the site and adjoining properties. Soil boring locations were chosen following review of the Phase I ESA. Soil boring locations are shown in Figure 1. Descriptions of the soil boring locations are listed below:

- Soil borings DP-1 and DP-2 were installed on the southeast portion of the property to assess the former fueling center located on the property and former offsite fueling centers located west of the site. DP-1 was advanced to rig refusal with no evidence of water in the soil boring. DP-2 was advanced to approximately 2 feet below the estimated elevation of the bottom of the former tank pit.
- Soil borings DP-3 and DP-4 were installed adjacent to the heating oil underground storage tank (UST) that services the building boiler system. Each boring was advanced to at least 2 feet below the estimated elevation of the bottom of the UST.
- Soil boring DP-5 was installed at the north/northeast corner of the site to assess potential contamination from a former fueling site northeast of the site (current Hilton location). This soil boring was advanced to rig refusal with no evidence of water in the soil boring.

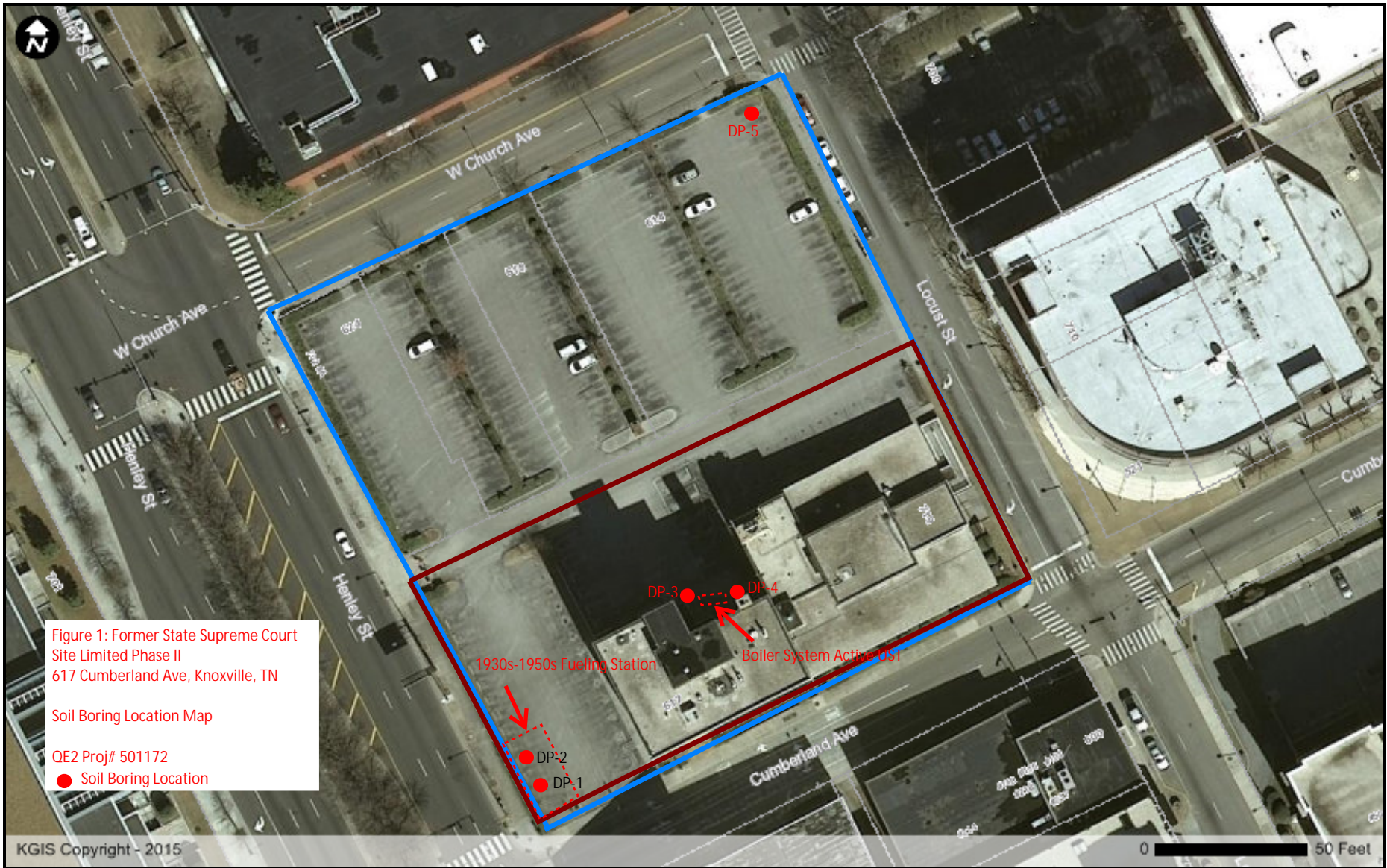


Figure 1: Former State Supreme Court Site Limited Phase II
 617 Cumberland Ave, Knoxville, TN

Soil Boring Location Map

QE2 Proj# 501172

● Soil Boring Location

KGIS Copyright - 2015

0 50 Feet

Site Plan aerial

KGIS - 606 Main St - Suite 150 - Knoxville, TN 37902 - www.kgis.org

Printed: 6/8/2015 at 11:11 AM

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The five soil borings (DP-1 through DP-5) were drilled with a track-mounted direct push drill rig on August 10, 2015. Soil borings DP-1 and DP-5 were advanced to refusal, 25 feet below ground surface (ft bgs) and 30 feet bgs, respectively, in an attempt to retrieve a groundwater sample; however, groundwater was not encountered in the boring. Soil boring lithology is described in Table 1. Soil samples from each boring were screened for volatile organic compounds using a photo-ionization detector (PID). Based on the screening results, one soil sample was collected from each boring location and analyzed for benzene, toluene, ethylbenzene, xylenes, methyl tert-butyl ether (MtBE), and naphthalene by EPA Method 8260, and for Extractable Petroleum Hydrocarbons (EPH, DP-3 and DP-4 only). Laboratory analysis was conducted by ESC Laboratory Sciences, Mount Juliet, Tennessee. Analytical results are summarized in Table 2 and the laboratory analytical report is provided in Attachment A.

Extractable Petroleum Hydrocarbon (EPH) concentrations of 79.5 parts per million (ppm) and 54.7 ppm were detected in the samples from boring DP-3 and DP-4. These results indicate minor petroleum contamination associated with the boiler UST. The EPH concentrations from DP-3 and DP-4 were below the Tennessee Department of Environment and Conservation (TDEC) Division of Solid Waste screening level for soil, indicating there is no regulatory problem at this time. All other soil sample results were below the laboratory detection limits and below TDEC Division of Underground Storage Tanks Commercial Worker Initial Screening Levels (ISLs). All soil borings were completely dry; therefore, a groundwater sample was not collected during this subsurface investigation. Each soil boring was abandoned with bentonite pellets to 0.5 ft bgs. The remaining void was filled with a concrete grout mixture to the ground surface.

Table 1
Soil Lithology Descriptions

Boring ID	Depth	Description
DP-1	0-5 ft	0-.1 ft Asphalt and gravel 1-5 ft: 50% recovery. Brownish red to red clay fill. Tight. No odor. Minor limestone gravel fragments. PID=0
	5-10 ft	5-7.5 ft: As above. Tight. PID = 0 7.5-10 ft: Red clay mottled with brown silt. No odor. PID=0
	10-15 ft	10-12.5 ft: As above but softer. PID=0 12.5-15 ft: Red clay. Slightly soft. Slightly moist. No odor. PID=0 *Sampled DP-1 from 12.5-15 ft
	15-20 ft	15-17.5 ft: Red silty clay. Slightly soft. Chert fragments at 16 ft. PID=0 17.5-20 ft: Red silty clay. Slightly soft. Minor Mn and chert fragments. PID=0
	20-25 ft	20-25 ft: Red clay. Tight. Minor LS fragments from 23-25. Rig refusal at 25 ft bgs. No moisture. PID = 0
DP-2	0-5 ft	0-1 ft: Asphalt and gravel. 1-5 ft: 60% recovery. Red clay fill. Tight. 2-in sand layer at 4 ft bgs. No odor. PID=0
	5-10 ft	5-7.5 ft: Red Clay. Tight. Minor chert fragments. No odor. PID=0 7.5-10: As above to 8.5 ft then red silty clay mottled with brown silt. No odor. PID=0
	10-15 ft	10-12.5 ft: Red silty clay mottled with brown silt. 2-in sand layer at 11 ft. Softer. No odor. PID=0 12.5-15 ft: Red silty clay. Tighter. Sand from 13.5-14 ft then red clay with chert. No odor. PID=0 *Sampled DP-2 from 12.5-15 ft.
DP-3	0-5 ft	0-1 ft: Asphalt and gravel. 1-5 ft: 30% recovery. Red clay fill. Minor silt with chert. Soft. No odor. PID=0
	5-10 ft	5-7.5 ft: 50% recovery. As above to 7 ft then dark brown clay. Moist at 7 ft. PID=0 7.5-10 ft: Continue moist to 8 ft. Red to brown clay mottled with tan silt. Tight. Slight petroleum odor. PID=8.
	10-15 ft	10-12 ft: As above minor staining. LS fragments. PID=30 12-14 ft: Black to brown silty clay. Slightly moist. Strong petroleum odor. Gravel throughout. PID=72

Boring ID	Depth	Description
		14-15 FT: Red clay. Tight. Slight odor. PID=15. *Sampled soil 12-14 ft
DP-4	0-5 ft	0-1 ft: Asphalt and gravel. 1-5 ft: 20% recovery. Red silty clay fill with minor gravel. No odor. PID=0
	5-10 ft	5-10 ft: 25% recovery. Red silty clay with chert fragments and minor sand. Softer. No odor. PID=2
	10-15 ft	10-13 ft: As above to 11 ft then tight red clay with LS fragments. Slight odor. PID=20 13-15 ft: As above. PID=35 *Sampled soil from 13-15 ft
DP-5	0-5 ft	0-2 ft: Asphalt to 0.5 ft then gravel to 3 ft. 3-5 ft: Red clay. Tight. Mn fragments. No odor. PID=0
	5-10 ft	5-7.5 ft: As above to 6 ft then brown to red silty clay. 4-in gravel layer at 7.5 ft. PID=0 7.5-10 ft: Brown to red silty clay to 8.5 ft then brown to tan mottled clay. Softer. No odor. PID=0
	10-15 ft	10-13 ft: Brown clay with gravel. PID=0 13-15 ft: Light brown sand to 14 ft then red to brown sandy clay. Brown silt last 2-in. PID=0`
	15-20 ft	15-18 ft: Brown silt. Slightly loose. No odor. PID=0 18-20 ft: Brown silt mottled with red clay. Slightly moist. No odor. PID=0
	20-25 ft	20-25 ft: Mottled brown to red silty clay. Minor sand throughout. Slightly moist. Tacky. PID=0
	25-30 ft	20-28 ft: As above. PID=0 28-30 ft: Tight red silty clay to 29.5 then light brown sand with chert. Slightly moist. No odor. PID=1.5. Rig refusal at 30 ft. No water in boring. Sampled DP-5 from 28-30 ft.

PID = photoionization detector

ft = feet

BGS = below ground surface

Table 2
Soil Sample Results (mg/kg)

Sample ID	Sample Depth (ft)	Benzene	Toluene	Ethyl-benzene	Xylenes	MtBE	Naphthalene	EPH
DP-1	12.5-15	<0.00500	<0.0250	<0.00500	<0.0150	<0.00500	<0.0250	NA
DP-2	12.5-15	<0.00500	<0.0250	<0.00500	<0.0150	<0.00500	<0.0250	NA
DP-3	12-14	<0.00500	<0.0250	<0.00500	<0.0150	<0.00500	<0.0250	79.5
DP-4	13-15	<0.00500	<0.0250	<0.00500	<0.0150	<0.00500	<0.0250	54.7
DP-5	13-15	<0.00500	<0.0250	<0.00500	<0.0150	<0.00500	<0.0250	NA
DUST Commercial Worker ISLs		3.80	62.2	1,310	88.0	364	403	100*

ISL = Initial Screening Level

EPH = Extractable Petroleum Hydrocarbon

* DSWM EPH screening level is 100 ppm

B. Conclusions

The subsurface investigation was limited to investigating the RECs listed in the June 2015 Phase I ESA. Based on the soil sample results of the limited subsurface investigation, the soil adjacent to the boiler system UST does contain petroleum compounds, although concentrations were below applicable cleanup levels. No evidence of water was observed at the drill rig refusal depth; therefore, a groundwater sample was not collected.

If you have any questions regarding the above subsurface sampling summary, please call me at 865-689-1395.

Sincerely,

Matthew Teglas, P.G.
 Senior Geologist

Attachments: Attachment A - Laboratory Analytical Report with Chain of Custody

c: File – 501172

ATTACHMENT A

LABORATORY ANALYTICAL REPORT WITH CHAIN OF CUSTODY

Company Name/Address:
Quantum Environmental & Eng. Services
 126 Dante Road
 Knoxville, TN 37918

Alternate billing information:

Analysis/Container/Preservative					

Chain of Custody
 Page 1 of 1

Prepared by:
ENVIRONMENTAL SCIENCE CORP.
 12065 Lebanon Road
 Mt. Juliet, TN 37122

Phone (615) 758-5858
 Phone (800) 767-5859
 FAX (615) 758-5859

Report to: **MATT TEGGLAS**

Email to: **MTEGLAS@QUANTUM-ENV.COM**

Project Description: **Former State Supreme Court**

City/State Collected: **Knoxville, TN**

Phone: **(865) 689-1395**
 FAX: **(865) 687-8977**

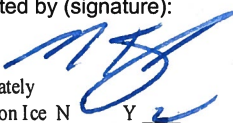
Client Project #: **SOIL 72**

ESC Key:

Collected by: **MATT TEGGLAS**

Site/Facility ID#:

P.O.#:

Collected by (signature): 
 Immediately Packed on Ice N Y

Rush? (Lab MUST Be Notified)
 ___ Same Day 200%
 ___ Next Day 100%
 ___ Two Day 50%
 ___ Three Day 25%

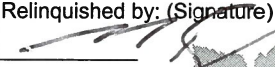
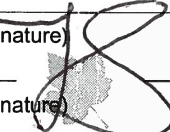
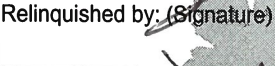
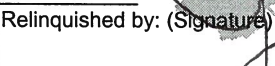
Date Results Needed:
 Email? ___ No X Yes
 FAX? X No ___ Yes

No. of Cntrs
BTEX, MTBE, NAPHTHALENE (BTEX)
EPH

CoCode: **ENVSYS** (lab use only)
 Template/Prelogin
 Shipped Via:

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	Remarks/Contaminant	Sample # (lab only)
DP-1	G	SS	12.5-15"	8-10-15	9:30	1		1781 926-01
DP-2	↓	↓	12.5-15"	↓	9:47	1		-02
DP-3	↓	↓	12-14"	↓	10:10	1		-03
DP-4	↓	↓	13-15"	↓	10:30	1		-04
DP-5	↓	↓	28-30"	↓	11:00	1		-05

*Matrix: **SS** - Soil/Solid **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other _____
 pH _____ Temp _____
 Remarks: _____ Flow _____ Other _____

Relinquished by: (Signature) 	Date: 8-10-15	Time: 14:30	Received by: (Signature) 	Samples returned via: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> Courier <input type="checkbox"/> _____	Condition: (lab use only) OK
Relinquished by: (Signature) 	Date:	Time:	Received by: (Signature)	Temp: 3.2 °C	Bottles Received: 5
Relinquished by: (Signature) 	Date: 8-10-15	Time: 17:00	Received for lab by: (Signature) Sherry Deann	Date: 8-11-15	Time: 7:00
				pH Checked:	NCF:



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Mt. Juliet, TN 37122
(615) 758-5858
1-800-767-5859
Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

Mr. Matt Teglas
Quantum Environmental & Eng. Services
126 Dante Road
Knoxville, TN 37918

Report Summary

Monday August 17, 2015

Report Number: L781926
Samples Received: 08/11/15
Client Project: 501172

Description: Former State Supreme Court

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:


Terrie Fudge , 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, IA Lab #364, EPA - TN002

Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

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REPORT OF ANALYSIS

August 17, 2015

Mr. Matt Teglas
Quantum Environmental & Eng. Servic
126 Dante Road
Knoxville, TN 37918

ESC Sample # : L781926-01

Date Received : August 11, 2015
Description : Former State Supreme Court

Site ID :

Sample ID : DP-1 12.5-15FT

Project # : 501172

Collected By : Matt Teglas
Collection Date : 08/10/15 09:30

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00500	mg/kg	8260B	08/12/15	5
Toluene	BDL	0.0250	mg/kg	8260B	08/12/15	5
Ethylbenzene	BDL	0.00500	mg/kg	8260B	08/12/15	5
Total Xylenes	BDL	0.0150	mg/kg	8260B	08/12/15	5
Methyl tert-butyl ether	BDL	0.00500	mg/kg	8260B	08/12/15	5
Naphthalene	BDL	0.0250	mg/kg	8260B	08/12/15	5
Surrogate Recovery						
Toluene-d8	104.		% Rec.	8260B	08/12/15	1
Dibromofluoromethane	100.		% Rec.	8260B	08/12/15	1
a,a,a-Trifluorotoluene	104.		% Rec.	8260B	08/12/15	1
4-Bromofluorobenzene	102.		% Rec.	8260B	08/12/15	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit (PQL)

Note:

The reported analytical results relate only to the sample submitted.

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REPORT OF ANALYSIS

August 17, 2015

Mr. Matt Teglas
Quantum Environmental & Eng. Servic
126 Dante Road
Knoxville, TN 37918

ESC Sample # : L781926-02

Date Received : August 11, 2015
Description : Former State Supreme Court

Site ID :

Sample ID : DP-2 12.5-15FT

Project # : 501172

Collected By : Matt Teglas
Collection Date : 08/10/15 09:47

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00500	mg/kg	8260B	08/12/15	5
Toluene	BDL	0.0250	mg/kg	8260B	08/12/15	5
Ethylbenzene	BDL	0.00500	mg/kg	8260B	08/12/15	5
Total Xylenes	BDL	0.0150	mg/kg	8260B	08/12/15	5
Methyl tert-butyl ether	BDL	0.00500	mg/kg	8260B	08/12/15	5
Naphthalene	BDL	0.0250	mg/kg	8260B	08/12/15	5
Surrogate Recovery						
Toluene-d8	104.		% Rec.	8260B	08/12/15	1
Dibromofluoromethane	101.		% Rec.	8260B	08/12/15	1
a,a,a-Trifluorotoluene	103.		% Rec.	8260B	08/12/15	1
4-Bromofluorobenzene	101.		% Rec.	8260B	08/12/15	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit (PQL)

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REPORT OF ANALYSIS

August 17, 2015

Mr. Matt Teglas
 Quantum Environmental & Eng. Servic
 126 Dante Road
 Knoxville, TN 37918

ESC Sample # : L781926-03

Date Received : August 11, 2015
 Description : Former State Supreme Court

Site ID :

Sample ID : DP-3 12-14FT

Project # : 501172

Collected By : Matt Teglas
 Collection Date : 08/10/15 10:10

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00500	mg/kg	8260B	08/14/15	5
Toluene	BDL	0.0250	mg/kg	8260B	08/14/15	5
Ethylbenzene	BDL	0.00500	mg/kg	8260B	08/14/15	5
Total Xylenes	BDL	0.0150	mg/kg	8260B	08/14/15	5
Methyl tert-butyl ether	BDL	0.00500	mg/kg	8260B	08/14/15	5
Naphthalene	BDL	0.0250	mg/kg	8260B	08/14/15	5
Surrogate Recovery						
Toluene-d8	98.8		% Rec.	8260B	08/14/15	1
Dibromofluoromethane	102.		% Rec.	8260B	08/14/15	1
a,a,a-Trifluorotoluene	102.		% Rec.	8260B	08/14/15	1
4-Bromofluorobenzene	106.		% Rec.	8260B	08/14/15	1
Extractable Petroleum Hydrocarb	79.5	4.00	mg/kg	EPH	08/13/15	1
Surrogate Recovery						
o-Terphenyl	82.2		% Rec.	EPH	08/13/15	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

August 17, 2015

Mr. Matt Teglas
 Quantum Environmental & Eng. Servic
 126 Dante Road
 Knoxville, TN 37918

ESC Sample # : L781926-04

Date Received : August 11, 2015
 Description : Former State Supreme Court

Site ID :

Sample ID : DP-4 13-15FT

Project # : 501172

Collected By : Matt Teglas
 Collection Date : 08/10/15 10:30

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00500	mg/kg	8260B	08/14/15	5
Toluene	BDL	0.0250	mg/kg	8260B	08/14/15	5
Ethylbenzene	BDL	0.00500	mg/kg	8260B	08/14/15	5
Total Xylenes	BDL	0.0150	mg/kg	8260B	08/14/15	5
Methyl tert-butyl ether	BDL	0.00500	mg/kg	8260B	08/14/15	5
Naphthalene	BDL	0.0250	mg/kg	8260B	08/14/15	5
Surrogate Recovery						
Toluene-d8	101.		% Rec.	8260B	08/14/15	1
Dibromofluoromethane	99.5		% Rec.	8260B	08/14/15	1
a,a,a-Trifluorotoluene	101.		% Rec.	8260B	08/14/15	1
4-Bromofluorobenzene	104.		% Rec.	8260B	08/14/15	1
Extractable Petroleum Hydrocarb	54.7	4.00	mg/kg	EPH	08/13/15	1
Surrogate Recovery						
o-Terphenyl	76.6		% Rec.	EPH	08/13/15	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit (PQL)

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REPORT OF ANALYSIS

August 17, 2015

Mr. Matt Teglas
 Quantum Environmental & Eng. Servic
 126 Dante Road
 Knoxville, TN 37918

ESC Sample # : L781926-05

Date Received : August 11, 2015
 Description : Former State Supreme Court

Site ID :

Sample ID : DP-5 28-30FT

Project # : 501172

Collected By : Matt Teglas
 Collection Date : 08/10/15 11:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00500	mg/kg	8260B	08/12/15	5
Toluene	BDL	0.0250	mg/kg	8260B	08/12/15	5
Ethylbenzene	BDL	0.00500	mg/kg	8260B	08/12/15	5
Total Xylenes	BDL	0.0150	mg/kg	8260B	08/12/15	5
Methyl tert-butyl ether	BDL	0.00500	mg/kg	8260B	08/12/15	5
Naphthalene	BDL	0.0250	mg/kg	8260B	08/12/15	5
Surrogate Recovery						
Toluene-d8	103.		% Rec.	8260B	08/12/15	1
Dibromofluoromethane	101.		% Rec.	8260B	08/12/15	1
a,a,a-Trifluorotoluene	102.		% Rec.	8260B	08/12/15	1
4-Bromofluorobenzene	101.		% Rec.	8260B	08/12/15	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit (PQL)

Note:

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