

May 23, 2017

Ms. Joyce Munie, P.E.
Manager, Permit Section
Illinois Environmental Protection Agency
Bureau of Land
1021 North Grand Avenue East
Springfield, Illinois 62794

Submittal of Corrected Information
Soil Vapor Sampling and SVE Monitoring – 2nd Quarter 2014
Roxana, Illinois
1191150002 – Madison County
Equilon Enterprises LLC d/b/a Shell Oil Products US
Log No. B-43R

Dear Ms. Munie:

On behalf of Shell Oil Products US (SOPUS), AECOM Technical Services, Inc. (AECOM) hereby submits the enclosed addendum to the above-referenced report (the Report).

AECOM collects a variety of samples for SOPUS as part of the work performed in connection with the above-referenced site including the samples referenced and utilized in the Report. AECOM contracts with independent laboratories to analyze the samples collected. As noted in SOPUS' initial disclosure letter and our subsequent communications, Accutest Laboratories (Accutest) issued revised laboratory analyses in response to an internal evaluation performed of its process. Please note, the majority of the corrected analyses were issued only to include a revised footnote and the numeric value of the analytical results reported remained unchanged. If any numeric values of analytical results presented in the Report were updated by Accutest, the updated results are presented as part of the information included in the Report addendum. Moreover, based upon our evaluation of the Report and the revised information received from Accutest, the conclusion(s) of the Report as originally issued are unaffected.

The information provided within and the format of this addendum is as discussed during our meeting with IEPA on March 23, 2017. This addendum includes the following information:

- IEPA LPC form
- Data Review Addendum Table (summarizing changed information)
- Revised analytical results table
- Revised laboratory reports (on CD)



If you have any questions during your review, please contact Kevin Dyer, SOPUS Senior Principal Program Manager, at kevin.dyer@shell.com (618/288-7237), or Bob Billman at bob.billman@aecom.com (314/743-4108).

Sincerely,

AECOM, on behalf of Shell Oil Products US

A handwritten signature in blue ink that reads "Robert B. Billman".

Robert Billman, PG
Senior Project Manager

A handwritten signature in blue ink that reads "Robert E. Mooshegian".

Robert E. Mooshegian, CHMM
Senior Program Manager

Enclosures: 2 copies

cc: Kevin Dyer, SOPUS
Eric Petersen, Phillips 66
Shannon Haney, Greensfelder, Hemker & Gale P.C.
Repositories – Village Hall, Roxana Public Library, website
Project File



Illinois Environmental Protection Agency

Bureau of Land • 1021 North Grand Avenue East • P.O. Box 19276 • Springfield • Illinois • 62794-9276

ILLINOIS EPA RCRA CORRECTIVE ACTION CERTIFICATION

This certification must accompany any document submitted to Illinois EPA in accordance with the corrective action requirements set forth in a facility's RCRA permit. The original and two copies of all documents submitted must be provided.

1.0 FACILITY IDENTIFICATION

Name: WRB Refining LP Wood River Refinery County: Madison
Street Address: 900 South Central Ave. Site No. (IEPA): 1191150002
City: Roxana Site No. (USEPA): ILD 080 012 305

2.0 OWNER INFORMATION

Name: Not Applicable

Mailing Address: _____

Contact Name: _____

Contact Title: _____

Phone No.: _____

3.0 OPERATOR INFORMATION

Equilon Enterprises LLC dba Shell Oil Products US (SOPUS)

17 Junction Drive, PMB #399

Glen Carbon, IL 62034

Kevin Dyer

Senior Principal Program Manager

618-288-7237

4.0 TYPE OF SUBMISSION (check applicable item and provide requested information, as applicable)

- ☐ RFI Phase I Workplan/Report
☐ RFI Phase II Workplan/Report
☐ CMP Report; Phase _____
☒ Other (describe):

Multiple Document Addenda (see attached report list)
Date of Submittal May 2017

IEPA Permit Log No. B-43R

Date of Last IEPA Letter

on Project January 18, 2017

Log No. of Last IEPA

Letter on Project B-43R-CA-59, -60, -69

Does this submittal include groundwater information: ☒ Yes ☐ No

5.0 DESCRIPTION OF SUBMITTAL: (briefly describe what is being submitted and its purpose)

Addenda to multiple documents. List of documents is provided on the Attachment 1. Addenda being issued due to revised laboratory reports.

6.0 DOCUMENTS SUBMITTED (identify all documents in submittal, including cover letter; give dates of all documents)

Cover letter, RCRA Corrective Action Certification. Addenda to multiple documents identified on the attached list.

7.0 CERTIFICATION STATEMENT - (This statement is part of the overall certification being provided by the owner/operator, professional and laboratory in Items 7.1, 7.2 and 7.3 below). The activities described in the subject submittals have been carried out in accordance with procedures approved by Illinois EPA. I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

7.1 OWNER/OPERATOR CERTIFICATION (Must be completed for all submittals. Certification and signature requirements are set forth in 35 IAC 702.126.) All submittals pertaining to the corrective action requirements set forth in a RCRA Permit must be signed by the person designated below (or by a duly authorized representative of that person):

1. For a Corporation, by a principal executive officer of at least the level of vice-president.
2. For a Partnership or Sole Proprietorship, by a general partner or the proprietor, respectively.
3. For a Governmental Entity, by either a principal executive officer or a ranking elected official.

A person is a duly authorized representative only if:

1. the authorization is made in writing by a person described above; and
2. the written authorization is provided with this submittal (a copy of a previously submitted authorization can be used).

Owner Signature: _____

(Date)

Title: _____

Operator Signature: Kevin Edger

5/17/18
(Date)

Title: Senior Principal Program Manager

7.2 PROFESSIONAL CERTIFICATION (if necessary) - Work carried out in this submittal or the regulations may also be subject to other laws governing professional services, such as the Illinois Professional Land Surveyor Act of 1989, the Professional Engineering Practice Act of 1989, the Professional Geologist Licensing Act, and the Structural Engineering Licensing Act of 1989. No one is relieved from compliance with these laws and the regulations adopted pursuant to these laws. All work that falls within the scope and definitions of these laws must be performed in compliance with them. The Illinois EPA may refer any discovered violation of these laws to the appropriate regulating authority.

Professional's Signature: Robert B. Billman

5/17/17
Date

Professional's Name: Robert B. Billman

Professional's Address: AECOM Technical Services, Inc.

1001 Highlands Plaza Drive West, Suite 300

St. Louis, MO 63110

Professional's Phone No.: 314-429-0100

Professional's Seal:



7.3 LABORATORY CERTIFICATION (if necessary) - The sample collection, handling, preservation, preparation and analysis efforts for which this laboratory was responsible were carried out in accordance with procedures approved by Illinois EPA.

Name of Laboratory: See Attachment 2

Signature of Laboratory Responsible Officer _____ Date _____

Mailing Address of Laboratory: _____

Name and Title of Laboratory Responsible Officer _____

Attachment 1
List of Documents

Submittal	Date of Submittal
Roxana 3Q12 Groundwater Monitoring Report	10/15/2012
Roxana 4Q12 Groundwater Monitoring Report	1/15/2013
Roxana 4Q13 Soil Vapor Report	1/31/2014
Roxana 1Q14 Soil Vapor Report	4/30/2014
Roxana 2Q14 Soil Vapor Report	7/30/2014
Roxana 3Q14 Soil Vapor Report	10/30/2014
Roxana 2Q15 Soil Vapor Report	7/29/2015
GWP-28 Installation Plan	11/27/2012
Public Work Yard Soil Sampling Report	3/13/2013
GW Monitoring Well and Vapor Monitoring Point Installation Report	4/3/2013
April 30, 2013-Groundwater Profile Delineation Report	4/30/2013
Addendum to Monitoring Well & Vapor Monitoring Point Installation Report - Supplemental Investigation Activities	5/22/2013
SVE Expansion-Construction Completion Rpt Addendum 2	1/9/2014
SVE System Construction Completion Rpt Addendum 3	3/4/2015

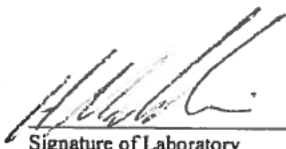
Note: Highlighted row represents subject Addendum

ATTACHMENT 2

LABORATORY CERTIFICATION

Revisions to previously reported laboratory data were required following a laboratory quality review. These revisions were performed in accordance with industry standards for testing laboratories accredited by the National Environmental Laboratory Accreditation Conference (NELAC). I certify the information contained in the revised and reissued laboratory reports are, to the best of my knowledge and belief, true, accurate and complete.

Name of Laboratory: SGS Accutest


Signature of Laboratory
Responsible Officer

5.17.17
Date

Mailing Address of Laboratory:

HASSAN (BND) MADADIAN
Name and Title of Laboratory Responsible Officer

50 D'Angelo Drive

LAB Director

495 Technology Center West, Building 1

Marlboro, MA 01752

LEGAL REVIEWED
BY: MD
DATE: 5.17.17

Laboratory Report (Sample Delivery Group[SDG])			
mc12669	mc23880	mc17144	mc18856
mc12784	mc26889	mc17324	mc18890
mc12833	mc27073	mc17401	mc18895
mc12905	mc23933	mc16336	mc18752
mc12941	mc32497	mc16445	mc24546
mc12942	mc32521	mc16475	mc32549
mc13051	mc38153	mc16587	mc32591
mc15232	mc38192	mc16644	mc32628
mc15892	mc14777	mc16798	mc32660
mc16960	mc14814	mc16889	mc32763
mc23682	mc16999	mc17501	mc33045

May 16, 2017

Analytical Method	Sample ID	Lab Sample ID	Sample Date	Analyte	Original Result	Corrected Result	Laboratory Qualifier	Units	Laboratory Footnote	AECOM Qualifier
SW846 8260B	VMP56-082813(38-38.5')	MC23933-4	08/28/2013	Acetone	ND	ND		mg/kg	Ana: Initial Calibration outside of acceptance criteria. Sample result may be biased low.	UJ
SW846 8260B	VMP56-082813(38-38.5')	MC23933-4	08/28/2013	Benzene	104	114.0		mg/kg		
SW846 8260B	VMP56-082813-D(38-38.5')	MC23933-5	08/28/2013	Acetone	ND	ND		mg/kg	Ana: Initial Calibration outside of acceptance criteria. Sample result may be biased low.	UJ
SW846 8260B	VMP56-082813-D(38-38.5')	MC23933-5	08/28/2013	Benzene	102	114.0		mg/kg		

LABORATORY QUALIFIERS:

ND = Not detected.

AECOM QUALIFIERS:

UJ = Estimated nondetect.

Location	Sample ID	Depth	Sample Date	Hydrocarbons			VOCs																	
				TPH-GRO (VOA)			1,1,1,2-Tetrachloroethane			1,1,1-Trichloroethane (Methyl chloroform)			1,1,2,2-Tetrachloroethane			1,1,2-Trichloroethane			1,1-Dichloroethane			1,1-Dichloroethene		
							3.4			2			3.3			0.02			23			0.06		
				Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals
VMP-56	VMP56-082813(24-25')	24 - 25 ft	8/28/2013	3.95	J		< 0.0071	U		< 0.0028	U		< 0.0028	U		< 0.0028	U		< 0.0028	U		< 0.0028	U	
VMP-56	VMP56-082813(38-38.5')	38 - 38.5 ft	8/28/2013	29000			< 37	U		< 15	U		< 15	U		< 15	U		< 15	U		< 15	U	
VMP-56	VMP56-082813(9-11')	9 - 11 ft	8/28/2013	< 11	U		< 0.0078	U		< 0.0031	U		< 0.0031	U		< 0.0031	U		< 0.0031	U		< 0.0031	U	
VMP-56	VMP56-082813-D(38-38.5')	38 - 38.5 ft	8/28/2013	44700		J	< 31	U		< 12	U		< 12	U		< 12	U		< 12	U		< 12	U	

				VOCs																				
Location	Sample ID	Depth	Sample Date	1,1-Dichloropropene			1,2,3-Trichlorobenzene			1,2,3-Trichloropropane			1,2,4-Trichlorobenzene			1,2,4-Trimethylbenzene			1,2-Dibromo-3-chloropropane (DBCP)			1,2-Dibromoethane		
										0.0001			5						0.002			0.0004		
				Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals
VMP-56	VMP56-082813(24-25')	24 - 25 ft	8/28/2013	< 0.0071	U		< 0.0071	U		< 0.0071	U		< 0.0071	U		< 0.0071	U		< 0.0071	U		< 0.0028	U	
VMP-56	VMP56-082813(38-38.5')	38 - 38.5 ft	8/28/2013	< 37	U		< 37	U		< 37	U		< 37	U		1010			< 37	U		< 15	U	
VMP-56	VMP56-082813(9-11')	9 - 11 ft	8/28/2013	< 0.0078	U		< 0.0078	U		< 0.0078	U		< 0.0078	U		< 0.0078	U		< 0.0078	U		< 0.0031	U	
VMP-56	VMP56-082813-D(38-38.5')	38 - 38.5 ft	8/28/2013	< 31	U		< 31	U		< 31	U		< 31	U		879			< 31	U		< 12	U	

				VOCs																				
Location	Sample ID	Depth	Sample Date	1,2-Dichlorobenzene			1,2-Dichloroethane			1,2-Dichloropropane			1,3,5-Trimethylbenzene			1,3-Dichlorobenzene			1,3-Dichloropropane			1,4-Dichlorobenzene		
				17			0.02			0.03			10						0.83			2		
				Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals
VMP-56	VMP56-082813(24-25')	24 - 25 ft	8/28/2013	< 0.0028	U		< 0.0028	U		< 0.0028	U		< 0.0071	U		< 0.0028	U		< 0.0071	U		< 0.0028	U	
VMP-56	VMP56-082813(38-38.5')	38 - 38.5 ft	8/28/2013	< 15	U		< 15	U		< 15	U		257			< 15	U		< 37	U		< 15	U	
VMP-56	VMP56-082813(9-11')	9 - 11 ft	8/28/2013	< 0.0031	U		< 0.0031	U		< 0.0031	U		< 0.0078	U		< 0.0031	U		< 0.0078	U		< 0.0031	U	
VMP-56	VMP56-082813-D(38-38.5')	38 - 38.5 ft	8/28/2013	< 12	U		< 12	U		< 12	U		232			< 12	U		< 31	U		< 12	U	

				VOCs																				
Location	Sample ID	Depth	Sample Date	1,4-Dioxane			2,2-Dichloropropane			2-Butanone			2-Chloroethyl vinyl ether			2-Chlorotoluene			2-Hexanone (Methyl N-Butyl Ketone)			4-Chlorotoluene		
										17						4								
				Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals
VMP-56	VMP56-082813(24-25')	24 - 25 ft	8/28/2013	< 0.035	U		< 0.0071	U		< 0.0071	U		< 0.0071	U		< 0.0071	U		< 0.0071	U		< 0.0071	U	
VMP-56	VMP56-082813(38-38.5')	38 - 38.5 ft	8/28/2013	< 190	U		< 37	U		< 37	U		< 37	U		< 37	U		< 37	U		< 37	U	
VMP-56	VMP56-082813(9-11')	9 - 11 ft	8/28/2013	< 0.039	U		< 0.0078	U		< 0.0078	U		< 0.0078	U		< 0.0078	U		< 0.0078	U		< 0.0078	U	
VMP-56	VMP56-082813-D(38-38.5')	38 - 38.5 ft	8/28/2013	< 150	U		< 31	U		< 31	U		< 31	U		< 31	U		< 31	U		< 31	U	

				VOCs																				
Location	Sample ID	Depth	Sample Date	4-Methyl-2-pentanone (Methyl Isobutyl Ketone)			Acetone			Acrolein			Acrylonitrile			Benzene			Bromobenzene			Bromochloromethane		
							25									0.03			2.2					
				Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals
VMP-56	VMP56-082813(24-25')	24 - 25 ft	8/28/2013	< 0.0071	U		< 0.014	U		< 0.035	U	UJ	< 0.035	U		< 0.00071	U		< 0.0071	U		< 0.0071	U	
VMP-56	VMP56-082813(38-38.5')	38 - 38.5 ft	8/28/2013	< 37	U		< 75	U	UJ	< 190	U		< 190	U		114			< 37	U		< 37	U	
VMP-56	VMP56-082813(9-11')	9 - 11 ft	8/28/2013	< 0.0078	U		< 0.016	U		< 0.039	U	UJ	< 0.039	U		< 0.00078	U		< 0.0078	U		< 0.0078	U	
VMP-56	VMP56-082813-D(38-38.5')	38 - 38.5 ft	8/28/2013	< 31	U		< 61	U	UJ	< 150	U		< 150	U		114			< 31	U		< 31	U	

				VOCs																				
Location	Sample ID	Depth	Sample Date	Bromodichloromethane			Bromoform			Bromomethane			Carbon disulfide			Carbon tetrachloride			Chlorobenzene			Chlorodibromomethane		
				0.6			0.8			0.2			32			0.07			1			0.4		
				Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals
VMP-56	VMP56-082813(24-25')	24 - 25 ft	8/28/2013	< 0.0028	U		< 0.0028	U		< 0.0028	U		< 0.0071	U		< 0.0028	U		< 0.0028	U		< 0.0028	U	
VMP-56	VMP56-082813(38-38.5')	38 - 38.5 ft	8/28/2013	< 15	U		< 15	U		< 15	U		< 37	U		< 15	U		< 15	U		< 15	U	
VMP-56	VMP56-082813(9-11')	9 - 11 ft	8/28/2013	< 0.0031	U		< 0.0031	U		< 0.0031	U		< 0.0078	U		< 0.0031	U		< 0.0031	U		< 0.0031	U	
VMP-56	VMP56-082813-D(38-38.5')	38 - 38.5 ft	8/28/2013	< 12	U		< 12	U		< 12	U		< 31	U		< 12	U		< 12	U		< 12	U	

				VOCs																				
Location	Sample ID	Depth	Sample Date	Chloroethane			Chloroform			Chloromethane			cis-1,2-Dichloroethene			cis-1,3-Dichloropropene			Cymene (p-Isopropyltoluene)			Dibromomethane		
							0.6						0.4			0.004						0.34		
				Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals
VMP-56	VMP56-082813(24-25')	24 - 25 ft	8/28/2013	< 0.0071	U		< 0.0028	U		< 0.0071	U		< 0.0028	U		< 0.0028	U		< 0.0071	U		< 0.0071	U	
VMP-56	VMP56-082813(38-38.5')	38 - 38.5 ft	8/28/2013	< 37	U		< 15	U		< 37	U	UJ	< 15	U		< 15	U		9.59	J		< 37	U	
VMP-56	VMP56-082813(9-11')	9 - 11 ft	8/28/2013	< 0.0078	U		< 0.0031	U		< 0.0078	U		< 0.0031	U		< 0.0031	U		< 0.0078	U		< 0.0078	U	
VMP-56	VMP56-082813-D(38-38.5')	38 - 38.5 ft	8/28/2013	< 31	U		< 12	U		< 31	U	UJ	< 12	U		< 12	U		8.94	J		< 31	U	

				VOCs																				
Location	Sample ID	Depth	Sample Date	Dichlorodifluoromethane			Dichloromethane (Methylene chloride)			Ethyl methacrylate			Ethylbenzene			Hexachlorobutadiene			Isopropylbenzene (Cumene)			m,p-Xylenes		
							0.02						13			2.2			91			150		
				Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals
VMP-56	VMP56-082813(24-25')	24 - 25 ft	8/28/2013	< 0.0028	U		< 0.0028	U		< 0.0071	U		< 0.0028	U		< 0.0071	U		< 0.0071	U		< 0.0028	U	
VMP-56	VMP56-082813(38-38.5')	38 - 38.5 ft	8/28/2013	< 15	U	UJ	< 15	U		< 37	U		876			< 37	U		55.7			2240		
VMP-56	VMP56-082813(9-11')	9 - 11 ft	8/28/2013	< 0.0031	U		< 0.0031	U		< 0.0078	U		< 0.0031	U		< 0.0078	U		< 0.0078	U		< 0.0031	U	
VMP-56	VMP56-082813-D(38-38.5')	38 - 38.5 ft	8/28/2013	< 12	U	UJ	< 12	U		< 31	U		766			< 31	U		50.7			1910		

				VOCs																				
Location	Sample ID	Depth	Sample Date	Methyl tert-Butyl Ether (MTBE)			Naphthalene			n-Butylbenzene			n-Propylbenzene			o-Xylenes			sec-Butylbenzene			Styrene		
				0.32			12									190						4		
				Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals
VMP-56	VMP56-082813(24-25')	24 - 25 ft	8/28/2013	< 0.0028	U		< 0.0071	U		< 0.0071	U		< 0.0071	U		< 0.0028	U		< 0.0071	U		< 0.0071	U	
VMP-56	VMP56-082813(38-38.5')	38 - 38.5 ft	8/28/2013	< 15	U		131			81.6			170			919			14.3	J		< 37	U	
VMP-56	VMP56-082813(9-11')	9 - 11 ft	8/28/2013	< 0.0031	U		< 0.0078	U		< 0.0078	U		< 0.0078	U		< 0.0031	U		< 0.0078	U		< 0.0078	U	
VMP-56	VMP56-082813-D(38-38.5')	38 - 38.5 ft	8/28/2013	< 12	U		114			79.1			156			782			13.6	J		< 31	U	

				VOCs																				
Location	Sample ID	Depth	Sample Date	tert-Butylbenzene			Tetrachloroethene			Toluene			trans-1,2-Dichloroethene			trans-1,3-Dichloropropene			Trichloroethene			Trichlorofluoromethane		
							0.06			12			0.7						0.06			34		
				Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals
VMP-56	VMP56-082813(24-25')	24 - 25 ft	8/28/2013	< 0.0071	U		< 0.0028	U		< 0.0071	U		< 0.0028	U		< 0.0028	U		< 0.0028	U		< 0.0028	U	
VMP-56	VMP56-082813(38-38.5')	38 - 38.5 ft	8/28/2013	< 37	U		< 15	U		1980			< 15	U		< 15	U		< 15	U		< 15	U	
VMP-56	VMP56-082813(9-11')	9 - 11 ft	8/28/2013	< 0.0078	U		< 0.0031	U		< 0.0078	U		< 0.0031	U		< 0.0031	U		< 0.0031	U		< 0.0031	U	
VMP-56	VMP56-082813-D(38-38.5')	38 - 38.5 ft	8/28/2013	< 31	U		< 12	U		1820			< 12	U		< 12	U		< 12	U		< 12	U	

SUMMARY OF SOIL ANALYTICAL DATA - VMP-56

Location	Sample ID	Depth	Sample Date	VOCs								
				Vinyl acetate			Vinyl chloride			Xylenes (total)		
				170			0.01			150		
				Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals
VMP-56	VMP56-082813(24-25')	24 - 25 ft	8/28/2013	< 0.0071	U	UJ	< 0.0028	U		< 0.0028	U	
VMP-56	VMP56-082813(38-38.5')	38 - 38.5 ft	8/28/2013	< 37	U	UJ	< 15	U		3160		
VMP-56	VMP56-082813(9-11')	9 - 11 ft	8/28/2013	< 0.0078	U	UJ	< 0.0031	U		< 0.0031	U	
VMP-56	VMP56-082813-D(38-38.5')	38 - 38.5 ft	8/28/2013	< 31	U	UJ	< 12	U		2700		

Notes:

Lab Qualifiers

J = Estimated value; results between the MDL and RL

U = Compound analyzed for but not detected above the RL

JN = Tentatively identified compound (TIC); estimated concentration

B = Indicates analyte found in associated method blank

URS Qualifiers

J = Estimated detect

UJ = Estimated non-detect

U= Non-detect (e.g. method blank contamination)

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



e-Hardcopy 2.0
Automated Report

Technical Report for

Shell Oil

URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

21562850.06000

SGS Accutest Job Number: MC23933

Sampling Date: 08/28/13

Report to:

AECOM, INC.

Melissa.mansker@aecom.com

ATTN: Melissa Mansker

Total number of pages in report: 126



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

H. (Brad) Madadian
Lab Director

Client Service contact: Jeremy Vienneau 508-481-6200

Certifications: MA (M-MA136,SW846 NELAC) CT (PH-0109) NH (250210) RI (00071) FL (E87579) NY (11791) NJ (MA926) PA (6801121) ND (R-188) CO (MA00136) MN (11546AA) NC (653) IL (002337) WI (399080220) DoD ELAP (L-A-B L2235)

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Test results relate only to samples analyzed.



ACCUTEST

October 5, 2016

Elizabeth Kunkel
AECOM, INC.
1001 Highlands Plaza Drive West Suite 300
St. Louis, MO 63110
Elizabeth.Kunkel@URS.com; bob.billman@urs.com

RE: SGS Accutest Job # MC23933

Dear Elizabeth Kunkel,

As you are aware, SGS Accutest Inc. - Marlborough has been conducting an extensive review of data associated with some historical Gas Chromatography-Mass Spectroscopy volatiles analyses. As a result of this review it was determined that some revisions of the original test report for this job were needed. These corrections have been incorporated into the revised report.

Please be assured that corrective actions have been put in place to address this matter and prevent a recurrence.

We apologize for any inconvenience that this issue may have caused. Please don't hesitate to contact us if we can be of further assistance.

Sincerely,

H. (Brad) Madadian

Regional Laboratory Director
SGS Accutest Inc. - Marlborough

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

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Sample Summary

Shell Oil

Job No: MC23933

URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL
Project No: 21562850.06000

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
MC23933-1	08/28/13	00:00 MCJC	08/29/13	AQ	Trip Blank Water	TB-082813-HCL
MC23933-2	08/28/13	13:50 MCJC	08/29/13	SO	Soil	VMP56-082813(9-11')
MC23933-2D	08/28/13	13:50 MCJC	08/29/13	SO	Soil Dup/MSD	VMP56-082813(9-11')
MC23933-2S	08/28/13	13:50 MCJC	08/29/13	SO	Soil Matrix Spike	VMP56-082813(9-11')
MC23933-3	08/28/13	14:40 MCJC	08/29/13	SO	Soil	VMP56-082813(24-25')
MC23933-4	08/28/13	14:55 MCJC	08/29/13	SO	Soil	VMP56-082813(38-38.5')
MC23933-5	08/28/13	14:55 MCJC	08/29/13	SO	Soil	VMP56-082813-D(38-38.5')
MC23933-6	08/28/13	14:10 MCJC	08/29/13	AQ	Equipment Blank	VMP56-082813-EB(30.5-33')

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

SAMPLE DELIVERY GROUP CASE NARRATIVE

2

Client: She O

Job No MC23933

Site: URSMOSTL: A r Sparge P ot Test, 900 South Centra Ave, IL

Report Date 0/5/20 6 :38:29 PM

5 Samp e(s) and Tr p B ank were co ected on 08/28/20 3 and were rece ved at SGS Accutest New Eng and on 08/29/20 3 properly preserved, at 2 2 Deg C and ntact These Samp es rece ved a job number of MC23933 A st ng of the Laboratory Samp e ID, C ent Samp e ID and dates of co ect on are presented n the Resu ts Summary Sect on of th s report

Except as noted be ow, a method spec f ed ca brat ons and qua ty contro performance cr ter a were met for th s job For more nformat on, p ease refer to QC summary pages

Volatiles by GCMS By Method SW846 8260B

Matrix: AQ

Batch ID: MSV864

- A samp es were ana yzed w th n the recommended method ho d ng t me
- A method b anks for th s batch meet method spec f c cr ter a
- Samp e(s) MC23720-6MS, MC23720-6MSD were used as the QC samp es nd cated
- Matr x Sp ke Recovery(s) for 2-Butanone (MEK), 2-Ch oroethy v ny ether, Acetone are outs de contro m ts Outs de contro m ts due to poss b e matr x nterference Refer to B ank Sp ke
- Matr x Sp ke Dup cate Recove y(s) for 2-Butanone (MEK), 2-Ch oroethy v ny ether, 2-Hexanone, Acetone are outs de contro m ts Outs de contro m ts due to poss b e matr x nterference Refer to B ank Sp ke

Matrix: SO

Batch ID: MSG5 00

- A samp es were ana yzed w th n the recommended method ho d ng t me
- A method b anks for th s batch meet method spec f c cr ter a
- Samp e(s) MC23888- MS, MC23888- MSD were used as the QC samp es nd cated
- B ank Sp ke Recovery(s) for Acetone, V ny Acetate are outs de contro m ts B ank Sp ke meets program techn ca requ rements
- Matr x Sp ke Recovery(s) for Bromoform, V ny Acetate, V ny ch or de are outs de contro m ts Outs de contro m ts due to poss b e matr x nterference Refer to B ank Sp ke
- Matr x Sp ke Dup cate Recove y(s) for Acetone, Bromoform, V ny Acetate are outs de contro m ts Outs de contro m ts due to poss b e matr x nterference Refer to B ank Sp ke
- RPD(s) for MSD for ,4-D oxane are outs de contro m ts for samp e MC23888- MSD H gh RPD due to poss b e matr x nterference and/or samp e non-homogene ty
- Cont nu ng Ca brat on MSG5 00-CC5092 for V ny Acetate exceeded 30% D fference (response b ased ow) Samp e resu t may be b ased ow
- In t a ca brat on ver f cat on stdanard MSG5092-ICV5092 for acro e n and Cont nu ng Ca brat on standard MSG5 00-CC5092 for bromoform exceeded 30% D fference (response b ased h gh) Assoc ated samp es are non-detect for these compounds
- In t a ca brat on ver f cat on stdanard MSG5092-ICV5092 for Acetone exceeded 30% D fference (response b ased ow) Samp e resu t may be b ased ow
- MSG5 00-BS for Bromoform: Outs de contro m ts Assoc ated samp es are non-detect for th s compound

Matrix: SO

Batch ID: MSM203

- A samp es were ana yzed w th n the recommended method ho d ng t me
- Samp e(s) MC23933-2MS, MC23933-2MSD were used as the QC samp es nd cated
- A method b anks for th s batch meet method spec f c cr ter a
- B ank Sp ke Recovery(s) for Acro e n, Bromoform are outs de contro m ts B ank Sp ke meets program techn ca requ rements
- Matr x Sp ke Recovery(s) for 2-Butanone (MEK), 2-Ch oroethy v ny ether, Acetone, Hexach orobutad ene, V ny Acetate, V ny ch or de are outs de contro m ts Outs de contro m ts due to poss b e matr x nterference Refer to B ank Sp ke
- Matr x Sp ke Dup cate Recove y(s) for ,2-D bromo-3-ch oropropane, ,4-D oxane, 2-Ch oroethy v ny ether, 4-Methy -2-pentanone (MIBK), Bromoform, V ny Acetate are outs de contro m ts Outs de contro m ts due to poss b e matr x nterference Refer to B ank Sp ke

Wednesday, October 05, 2016

Page 1 of 2

Volatiles by GCMS By Method SW846 8260B

Matrix: SO

Batch ID: MSM203

- In the calibration verification standard MSM2022-ICV2022 for acetone exceeded 30% Difference (response based high) Associated samples are non-detect for these compounds
- MSM203 -BSD Recovery(s) for Acetone, Vinyl Acetate are outside control limits Blank Spike meets program technical requirements

Volatiles by GC By Method SW846 8015

Matrix: AQ

Batch ID: GWX330

- All samples were analyzed within the recommended method holding time
- Sample(s) MC238 0- MS, MC238 0- MSD were used as the QC samples indicated
- Sample(s) MC23933-6 have compound(s) reported with a "B" qualifier, indicating analytes found in the associated method blank

Matrix: SO

Batch ID: GWX3300

- All samples were analyzed within the recommended method holding time
- All method blanks for this batch meet method specification
- Sample(s) MC23933-2MS, MC23933-2MSD were used as the QC samples indicated
- MC23933-5 for 2,3,4-Trifluorotoluene: Outside control limits due to possible matrix interference

Wet Chemistry By Method SM21 2540 B MOD.

Matrix: SO

Batch ID: GN44 57

- Sample(s) MC23933-2DUP were used as the QC samples for Solids, Percent

SGS Accutest New England certifies that all analyses were performed within method specification. It is further recommended that this report be used in its entirety. The Laboratory Director for SGS Accutest New England or assignee as verified by the signature on the cover page has authorized the release of this report (MC23933)

Summary of Hits

Job Number: MC23933
 Account: Shell Oil
 Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL
 Collected: 08/28/13



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
---------------	------------------	-----------------	----	-----	-------	--------

MC23933-1 TB-082813-HCL

No hits reported in this sample.

MC23933-2 VMP56-082813(9-11')

No hits reported in this sample.

MC23933-3 VMP56-082813(24-25')

TPH-GRO (VOA)	3.95 J	15	3.3	mg/kg	SW846 8015
---------------	--------	----	-----	-------	------------

MC23933-4 VMP56-082813(38-38.5')

Benzene	114	3.7	1.8	mg/kg	SW846 8260B
n-Butylbenzene	81.6	37	1.3	mg/kg	SW846 8260B
sec-Butylbenzene	14.3 J	37	1.2	mg/kg	SW846 8260B
Ethylbenzene	876	15	1.3	mg/kg	SW846 8260B
Isopropylbenzene	55.7	37	2.1	mg/kg	SW846 8260B
p-Isopropyltoluene	9.59 J	37	1.2	mg/kg	SW846 8260B
Naphthalene	131	37	5.9	mg/kg	SW846 8260B
n-Propylbenzene	170	37	1.8	mg/kg	SW846 8260B
Toluene	1980	37	1.8	mg/kg	SW846 8260B
1,2,4-Trimethylbenzene	1010	37	1.5	mg/kg	SW846 8260B
1,3,5-Trimethylbenzene	257	37	0.97	mg/kg	SW846 8260B
m,p-Xylene	2240	15	2.1	mg/kg	SW846 8260B
o-Xylene	919	15	1.5	mg/kg	SW846 8260B
Xylene (total)	3160	15	1.5	mg/kg	SW846 8260B
TPH-GRO (VOA)	29000	620	140	mg/kg	SW846 8015

MC23933-5 VMP56-082813-D(38-38.5')

Benzene	114	3.1	1.5	mg/kg	SW846 8260B
n-Butylbenzene	79.1	31	1.1	mg/kg	SW846 8260B
sec-Butylbenzene	13.6 J	31	0.97	mg/kg	SW846 8260B
Ethylbenzene	766	12	1.1	mg/kg	SW846 8260B
Isopropylbenzene	50.7	31	1.7	mg/kg	SW846 8260B
p-Isopropyltoluene	8.94 J	31	0.98	mg/kg	SW846 8260B
Naphthalene	114	31	4.8	mg/kg	SW846 8260B
n-Propylbenzene	156	31	1.5	mg/kg	SW846 8260B
Toluene	1820	31	1.5	mg/kg	SW846 8260B
1,2,4-Trimethylbenzene	879	31	1.3	mg/kg	SW846 8260B
1,3,5-Trimethylbenzene	232	31	0.79	mg/kg	SW846 8260B
m,p-Xylene	1910	12	1.7	mg/kg	SW846 8260B
o-Xylene	782	12	1.3	mg/kg	SW846 8260B

Summary of Hits

Job Number: MC23933
Account: Shell Oil
Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL
Collected: 08/28/13



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Xylene (total)		2700	12	1.3	mg/kg	SW846 8260B
TPH-GRO (VOA)		44700	630	140	mg/kg	SW846 8015
MC23933-6 VMP56-082813-EB(30.5-33')						
Toluene		0.57 J	1.0	0.46	ug/l	SW846 8260B
TPH-GRO (VOA)		0.0185 JB	0.10	0.013	mg/l	SW846 8015

Sample Results

Report of Analysis

Report of Analysis

Page 1 of 3

Client Sample ID:	TB-082813-HCL	Date Sampled:	08/28/13
Lab Sample ID:	MC23933-1	Date Received:	08/29/13
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	V22444.D	1	08/29/13	AMY	n/a	n/a	MSV864
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	2.8	ug/l	
107-02-8	Acrolein	ND	25	6.3	ug/l	
107-13-1	Acrylonitrile	ND	5.0	3.5	ug/l	
71-43-2	Benzene	ND	0.50	0.45	ug/l	
108-86-1	Bromobenzene	ND	5.0	0.44	ug/l	
74-97-5	Bromochloromethane	ND	5.0	0.64	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.33	ug/l	
75-25-2	Bromoform	ND	1.0	0.42	ug/l	
74-83-9	Bromomethane	ND	2.0	1.5	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	1.6	ug/l	
104-51-8	n-Butylbenzene	ND	5.0	0.54	ug/l	
135-98-8	sec-Butylbenzene	ND	5.0	0.58	ug/l	
98-06-6	tert-Butylbenzene	ND	5.0	0.87	ug/l	
75-15-0	Carbon disulfide	ND	5.0	0.59	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.62	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.48	ug/l	
75-00-3	Chloroethane	ND	2.0	0.84	ug/l	
110-75-8	2-Chloroethyl vinyl ether	ND	5.0	1.1	ug/l	
67-66-3	Chloroform	ND	1.0	0.50	ug/l	
74-87-3	Chloromethane	ND	2.0	1.4	ug/l	
95-49-8	o-Chlorotoluene	ND	5.0	0.55	ug/l	
106-43-4	p-Chlorotoluene	ND	5.0	0.48	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	1.7	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.33	ug/l	
106-93-4	1,2-Dibromoethane	ND	2.0	0.38	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.35	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.30	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.26	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.2	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.37	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.35	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	0.67	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 2 of 3

Client Sample ID:	TB-082813-HCL	Date Sampled:	08/28/13
Lab Sample ID:	MC23933-1	Date Received:	08/29/13
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
156-59-2	cis-1,2-Dichloroethene	ND	1.0	0.54	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	0.54	ug/l	
78-87-5	1,2-Dichloropropane	ND	2.0	0.45	ug/l	
142-28-9	1,3-Dichloropropane	ND	5.0	0.97	ug/l	
594-20-7	2,2-Dichloropropane	ND	5.0	1.3	ug/l	
563-58-6	1,1-Dichloropropene	ND	5.0	0.63	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.22	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.29	ug/l	
123-91-1	1,4-Dioxane	ND	25	16	ug/l	
97-63-2	Ethyl methacrylate	ND	5.0	0.81	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.38	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.0	1.3	ug/l	
591-78-6	2-Hexanone	ND	5.0	2.3	ug/l	
98-82-8	Isopropylbenzene	ND	5.0	0.64	ug/l	
99-87-6	p-Isopropyltoluene	ND	5.0	0.55	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.43	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	1.3	ug/l	
74-95-3	Methylene bromide	ND	5.0	0.43	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.41	ug/l	
91-20-3	Naphthalene	ND	5.0	0.79	ug/l	
103-65-1	n-Propylbenzene	ND	5.0	0.59	ug/l	
100-42-5	Styrene	ND	5.0	0.49	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	0.46	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.42	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	0.61	ug/l	
108-88-3	Toluene	ND	1.0	0.46	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	0.76	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	0.45	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.94	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.49	ug/l	
79-01-6	Trichloroethene	ND	1.0	0.45	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.61	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.70	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.47	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	1.1	ug/l	
108-05-4	Vinyl Acetate	ND	5.0	1.3	ug/l	
75-01-4	Vinyl chloride	ND	1.0	0.61	ug/l	
	m,p-Xylene	ND	1.0	0.70	ug/l	
95-47-6	o-Xylene	ND	1.0	0.41	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.41	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID:	TB-082813-HCL	Date Sampled:	08/28/13
Lab Sample ID:	MC23933-1	Date Received:	08/29/13
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL		

VOA Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	100%		70-130%
2037-26-5	Toluene-D8	100%		70-130%
460-00-4	4-Bromofluorobenzene	100%		70-130%

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

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

Report of Analysis

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Client Sample ID:	VMP56-082813(9-11')	Date Sampled:	08/28/13
Lab Sample ID:	MC23933-2	Date Received:	08/29/13
Matrix:	SO - Soil	Percent Solids:	95.4
Method:	SW846 8260B		
Project:	URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M58882.D	1	08/30/13	KD	n/a	n/a	MSM2031
Run #2							

Run #	Initial Weight	Final Volume
Run #1	3.37 g	5.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.016	0.0061	mg/kg	
107-02-8	Acrolein	ND	0.039	0.0058	mg/kg	
107-13-1	Acrylonitrile	ND	0.039	0.0021	mg/kg	
71-43-2	Benzene	ND	0.00078	0.00038	mg/kg	
108-86-1	Bromobenzene	ND	0.0078	0.00043	mg/kg	
74-97-5	Bromochloromethane	ND	0.0078	0.00090	mg/kg	
75-27-4	Bromodichloromethane	ND	0.0031	0.00056	mg/kg	
75-25-2	Bromoform	ND	0.0031	0.00045	mg/kg	
74-83-9	Bromomethane	ND	0.0031	0.0015	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.0078	0.0048	mg/kg	
104-51-8	n-Butylbenzene	ND	0.0078	0.00027	mg/kg	
135-98-8	sec-Butylbenzene	ND	0.0078	0.00025	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.0078	0.00055	mg/kg	
75-15-0	Carbon disulfide	ND	0.0078	0.00024	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.0031	0.0018	mg/kg	
108-90-7	Chlorobenzene	ND	0.0031	0.00042	mg/kg	
75-00-3	Chloroethane	ND	0.0078	0.00093	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.0078	0.0074	mg/kg	
67-66-3	Chloroform	ND	0.0031	0.00045	mg/kg	
74-87-3	Chloromethane	ND	0.0078	0.0019	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.0078	0.00064	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.0078	0.00069	mg/kg	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.0078	0.0031	mg/kg	
124-48-1	Dibromochloromethane	ND	0.0031	0.00066	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0031	0.00088	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.0031	0.00032	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.0031	0.00035	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.0031	0.00032	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.0031	0.0017	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.0031	0.00052	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.0031	0.00084	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.0031	0.00081	mg/kg	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID:	VMP56-082813(9-11')	Date Sampled:	08/28/13
Lab Sample ID:	MC23933-2	Date Received:	08/29/13
Matrix:	SO - Soil	Percent Solids:	95.4
Method:	SW846 8260B		
Project:	URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
156-59-2	cis-1,2-Dichloroethene	ND	0.0031	0.00079	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.0031	0.00069	mg/kg	
78-87-5	1,2-Dichloropropane	ND	0.0031	0.00066	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.0078	0.00069	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.0078	0.0010	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.0078	0.00036	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.0031	0.00045	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.0031	0.00045	mg/kg	
123-91-1	1,4-Dioxane	ND	0.039	0.032	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.0078	0.0051	mg/kg	
100-41-4	Ethylbenzene	ND	0.0031	0.00028	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.0078	0.00088	mg/kg	
591-78-6	2-Hexanone	ND	0.0078	0.0038	mg/kg	
98-82-8	Isopropylbenzene	ND	0.0078	0.00043	mg/kg	
99-87-6	p-Isopropyltoluene	ND	0.0078	0.00025	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.0031	0.00062	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.0078	0.0029	mg/kg	
74-95-3	Methylene bromide	ND	0.0078	0.00054	mg/kg	
75-09-2	Methylene chloride	ND	0.0031	0.0024	mg/kg	
91-20-3	Naphthalene	ND	0.0078	0.0012	mg/kg	
103-65-1	n-Propylbenzene	ND	0.0078	0.00038	mg/kg	
100-42-5	Styrene	ND	0.0078	0.00032	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.0078	0.00060	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.0031	0.00046	mg/kg	
127-18-4	Tetrachloroethene	ND	0.0031	0.00069	mg/kg	
108-88-3	Toluene	ND	0.0078	0.00038	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	0.0078	0.00067	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.0078	0.00056	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.0031	0.00028	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.0031	0.00054	mg/kg	
79-01-6	Trichloroethene	ND	0.0031	0.00074	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.0031	0.0016	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.0078	0.00060	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	0.0078	0.00032	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	0.0078	0.00020	mg/kg	
108-05-4	Vinyl Acetate	ND	0.0078	0.0019	mg/kg	
75-01-4	Vinyl chloride	ND	0.0031	0.00089	mg/kg	
	m,p-Xylene	ND	0.0031	0.00044	mg/kg	
95-47-6	o-Xylene	ND	0.0031	0.00032	mg/kg	
1330-20-7	Xylene (total)	ND	0.0031	0.00032	mg/kg	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID:	VMP56-082813(9-11')	Date Sampled:	08/28/13
Lab Sample ID:	MC23933-2	Date Received:	08/29/13
Matrix:	SO - Soil	Percent Solids:	95.4
Method:	SW846 8260B		
Project:	URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL		

VOA Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	84%		70-130%
2037-26-5	Toluene-D8	84%		70-130%
460-00-4	4-Bromofluorobenzene	91%		70-130%

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

Report of Analysis

Page 1 of 1

Client Sample ID:	VMP56-082813(9-11')	Date Sampled:	08/28/13
Lab Sample ID:	MC23933-2	Date Received:	08/29/13
Matrix:	SO - Soil	Percent Solids:	95.4
Method:	SW846 8015		
Project:	URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	WX68891.D	1	08/30/13	TB	n/a	n/a	GWX3300
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	4.98 g	10.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (VOA)	ND	11	2.4	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
	2,3,4-Trifluorotoluene	104%		61-116%

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

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

Report of Analysis

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Client Sample ID:	VMP56-082813(24-25')	Date Sampled:	08/28/13
Lab Sample ID:	MC23933-3	Date Received:	08/29/13
Matrix:	SO - Soil	Percent Solids:	78.2
Method:	SW846 8260B		
Project:	URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M58883.D	1	08/30/13	KD	n/a	n/a	MSM2031
Run #2							

Run #	Initial Weight	Final Volume
Run #1	4.53 g	5.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.014	0.0055	mg/kg	
107-02-8	Acrolein	ND	0.035	0.0053	mg/kg	
107-13-1	Acrylonitrile	ND	0.035	0.0019	mg/kg	
71-43-2	Benzene	ND	0.00071	0.00035	mg/kg	
108-86-1	Bromobenzene	ND	0.0071	0.00039	mg/kg	
74-97-5	Bromochloromethane	ND	0.0071	0.00082	mg/kg	
75-27-4	Bromodichloromethane	ND	0.0028	0.00051	mg/kg	
75-25-2	Bromoform	ND	0.0028	0.00041	mg/kg	
74-83-9	Bromomethane	ND	0.0028	0.0014	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.0071	0.0044	mg/kg	
104-51-8	n-Butylbenzene	ND	0.0071	0.00024	mg/kg	
135-98-8	sec-Butylbenzene	ND	0.0071	0.00022	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.0071	0.00050	mg/kg	
75-15-0	Carbon disulfide	ND	0.0071	0.00021	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.0028	0.0016	mg/kg	
108-90-7	Chlorobenzene	ND	0.0028	0.00038	mg/kg	
75-00-3	Chloroethane	ND	0.0071	0.00085	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.0071	0.0067	mg/kg	
67-66-3	Chloroform	ND	0.0028	0.00041	mg/kg	
74-87-3	Chloromethane	ND	0.0071	0.0017	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.0071	0.00058	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.0071	0.00062	mg/kg	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.0071	0.0029	mg/kg	
124-48-1	Dibromochloromethane	ND	0.0028	0.00060	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0028	0.00080	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.0028	0.00029	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.0028	0.00031	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.0028	0.00029	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.0028	0.0016	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.0028	0.00047	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.0028	0.00077	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.0028	0.00074	mg/kg	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID:	VMP56-082813(24-25')	Date Sampled:	08/28/13
Lab Sample ID:	MC23933-3	Date Received:	08/29/13
Matrix:	SO - Soil	Percent Solids:	78.2
Method:	SW846 8260B		
Project:	URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
156-59-2	cis-1,2-Dichloroethene	ND	0.0028	0.00072	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.0028	0.00063	mg/kg	
78-87-5	1,2-Dichloropropane	ND	0.0028	0.00060	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.0071	0.00063	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.0071	0.00093	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.0071	0.00033	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.0028	0.00041	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.0028	0.00041	mg/kg	
123-91-1	1,4-Dioxane	ND	0.035	0.029	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.0071	0.0047	mg/kg	
100-41-4	Ethylbenzene	ND	0.0028	0.00025	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.0071	0.00080	mg/kg	
591-78-6	2-Hexanone	ND	0.0071	0.0034	mg/kg	
98-82-8	Isopropylbenzene	ND	0.0071	0.00039	mg/kg	
99-87-6	p-Isopropyltoluene	ND	0.0071	0.00022	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.0028	0.00056	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.0071	0.0026	mg/kg	
74-95-3	Methylene bromide	ND	0.0071	0.00049	mg/kg	
75-09-2	Methylene chloride	ND	0.0028	0.0022	mg/kg	
91-20-3	Naphthalene	ND	0.0071	0.0011	mg/kg	
103-65-1	n-Propylbenzene	ND	0.0071	0.00034	mg/kg	
100-42-5	Styrene	ND	0.0071	0.00029	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.0071	0.00054	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.0028	0.00042	mg/kg	
127-18-4	Tetrachloroethene	ND	0.0028	0.00062	mg/kg	
108-88-3	Toluene	ND	0.0071	0.00034	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	0.0071	0.00061	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.0071	0.00051	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.0028	0.00025	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.0028	0.00049	mg/kg	
79-01-6	Trichloroethene	ND	0.0028	0.00067	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.0028	0.0015	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.0071	0.00054	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	0.0071	0.00029	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	0.0071	0.00018	mg/kg	
108-05-4	Vinyl Acetate	ND	0.0071	0.0018	mg/kg	
75-01-4	Vinyl chloride	ND	0.0028	0.00080	mg/kg	
	m,p-Xylene	ND	0.0028	0.00040	mg/kg	
95-47-6	o-Xylene	ND	0.0028	0.00029	mg/kg	
1330-20-7	Xylene (total)	ND	0.0028	0.00029	mg/kg	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID:	VMP56-082813(24-25')	Date Sampled:	08/28/13
Lab Sample ID:	MC23933-3	Date Received:	08/29/13
Matrix:	SO - Soil	Percent Solids:	78.2
Method:	SW846 8260B		
Project:	URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL		

VOA Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	82%		70-130%
2037-26-5	Toluene-D8	84%		70-130%
460-00-4	4-Bromofluorobenzene	92%		70-130%

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

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

Report of Analysis

Page 1 of 1

Client Sample ID:	VMP56-082813(24-25')	Date Sampled:	08/28/13
Lab Sample ID:	MC23933-3	Date Received:	08/29/13
Matrix:	SO - Soil	Percent Solids:	78.2
Method:	SW846 8015		
Project:	URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	WX68894.D	1	08/30/13	TB	n/a	n/a	GWX3300
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	4.63 g	10.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (VOA)	3.95	15	3.3	mg/kg	J
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
	2,3,4-Trifluorotoluene	106%		61-116%		

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

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

Report of Analysis

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Client Sample ID:	VMP56-082813(38-38.5')	Date Sampled:	08/28/13
Lab Sample ID:	MC23933-4	Date Received:	08/29/13
Matrix:	SO - Soil	Percent Solids:	81.3
Method:	SW846 8260B		
Project:	URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G131027.D	1	08/30/13	JM	n/a	n/a	MSG5100
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	4.46 g	10.0 ml	2.0 ul
Run #2			

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone ^a	ND	75	29	mg/kg	
107-02-8	Acrolein	ND	190	28	mg/kg	
107-13-1	Acrylonitrile	ND	190	10	mg/kg	
71-43-2	Benzene	114	3.7	1.8	mg/kg	
108-86-1	Bromobenzene	ND	37	2.1	mg/kg	
74-97-5	Bromochloromethane	ND	37	4.3	mg/kg	
75-27-4	Bromodichloromethane	ND	15	2.7	mg/kg	
75-25-2	Bromoform	ND	15	2.2	mg/kg	
74-83-9	Bromomethane	ND	15	7.3	mg/kg	
78-93-3	2-Butanone (MEK)	ND	37	23	mg/kg	
104-51-8	n-Butylbenzene	81.6	37	1.3	mg/kg	
135-98-8	sec-Butylbenzene	14.3	37	1.2	mg/kg	J
98-06-6	tert-Butylbenzene	ND	37	2.7	mg/kg	
75-15-0	Carbon disulfide	ND	37	1.1	mg/kg	
56-23-5	Carbon tetrachloride	ND	15	8.7	mg/kg	
108-90-7	Chlorobenzene	ND	15	2.0	mg/kg	
75-00-3	Chloroethane	ND	37	4.5	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	37	35	mg/kg	
67-66-3	Chloroform	ND	15	2.2	mg/kg	
74-87-3	Chloromethane	ND	37	9.1	mg/kg	
95-49-8	o-Chlorotoluene	ND	37	3.1	mg/kg	
106-43-4	p-Chlorotoluene	ND	37	3.3	mg/kg	
96-12-8	1,2-Dibromo-3-chloropropane	ND	37	15	mg/kg	
124-48-1	Dibromochloromethane	ND	15	3.2	mg/kg	
106-93-4	1,2-Dibromoethane	ND	15	4.2	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	15	1.6	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	15	1.7	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	15	1.5	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	15	8.3	mg/kg	
75-34-3	1,1-Dichloroethane	ND	15	2.5	mg/kg	
107-06-2	1,2-Dichloroethane	ND	15	4.1	mg/kg	
75-35-4	1,1-Dichloroethene	ND	15	3.9	mg/kg	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID:	VMP56-082813(38-38.5')	Date Sampled:	08/28/13
Lab Sample ID:	MC23933-4	Date Received:	08/29/13
Matrix:	SO - Soil	Percent Solids:	81.3
Method:	SW846 8260B		
Project:	URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
156-59-2	cis-1,2-Dichloroethene	ND	15	3.8	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	15	3.3	mg/kg	
78-87-5	1,2-Dichloropropane	ND	15	3.2	mg/kg	
142-28-9	1,3-Dichloropropane	ND	37	3.3	mg/kg	
594-20-7	2,2-Dichloropropane	ND	37	4.9	mg/kg	
563-58-6	1,1-Dichloropropene	ND	37	1.7	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	15	2.2	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	15	2.2	mg/kg	
123-91-1	1,4-Dioxane	ND	190	160	mg/kg	
97-63-2	Ethyl methacrylate	ND	37	25	mg/kg	
100-41-4	Ethylbenzene	876	15	1.3	mg/kg	
87-68-3	Hexachlorobutadiene	ND	37	4.2	mg/kg	
591-78-6	2-Hexanone	ND	37	18	mg/kg	
98-82-8	Isopropylbenzene	55.7	37	2.1	mg/kg	
99-87-6	p-Isopropyltoluene	9.59	37	1.2	mg/kg	J
1634-04-4	Methyl Tert Butyl Ether	ND	15	3.0	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	37	14	mg/kg	
74-95-3	Methylene bromide	ND	37	2.6	mg/kg	
75-09-2	Methylene chloride	ND	15	12	mg/kg	
91-20-3	Naphthalene	131	37	5.9	mg/kg	
103-65-1	n-Propylbenzene	170	37	1.8	mg/kg	
100-42-5	Styrene	ND	37	1.5	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	37	2.9	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	15	2.2	mg/kg	
127-18-4	Tetrachloroethene	ND	15	3.3	mg/kg	
108-88-3	Toluene	1980	37	1.8	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	37	3.2	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	37	2.7	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	15	1.3	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	15	2.6	mg/kg	
79-01-6	Trichloroethene	ND	15	3.5	mg/kg	
75-69-4	Trichlorofluoromethane	ND	15	7.8	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	37	2.9	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	1010	37	1.5	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	257	37	0.97	mg/kg	
108-05-4	Vinyl Acetate ^b	ND	37	9.3	mg/kg	
75-01-4	Vinyl chloride	ND	15	4.3	mg/kg	
	m,p-Xylene	2240	15	2.1	mg/kg	
95-47-6	o-Xylene	919	15	1.5	mg/kg	
1330-20-7	Xylene (total)	3160	15	1.5	mg/kg	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID:	VMP56-082813(38-38.5')	Date Sampled:	08/28/13
Lab Sample ID:	MC23933-4	Date Received:	08/29/13
Matrix:	SO - Soil	Percent Solids:	81.3
Method:	SW846 8260B		
Project:	URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL		

VOA Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	92%		70-130%
2037-26-5	Toluene-D8	101%		70-130%
460-00-4	4-Bromofluorobenzene	97%		70-130%

- (a) Initial Calibration outside of acceptance criteria. Sample result may be biased low.
(b) Continuing Calibration outside of acceptance criteria. Sample result may be biased low.

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

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

Report of Analysis

Page 1 of 1

Client Sample ID:	VMP56-082813(38-38.5')	Date Sampled:	08/28/13
Lab Sample ID:	MC23933-4	Date Received:	08/29/13
Matrix:	SO - Soil	Percent Solids:	81.3
Method:	SW846 8015		
Project:	URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	WX68895.D	1	08/30/13	TB	n/a	n/a	GWX3300
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.50 g	10.0 ml	2.0 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (VOA)	29000	620	140	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
	2,3,4-Trifluorotoluene	115%		61-116%		

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

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

Report of Analysis

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Client Sample ID:	VMP56-082813-D(38-38.5')	Date Sampled:	08/28/13
Lab Sample ID:	MC23933-5	Date Received:	08/29/13
Matrix:	SO - Soil	Percent Solids:	79.4
Method:	SW846 8260B		
Project:	URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G131028.D	1	08/30/13	JM	n/a	n/a	MSG5100
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.74 g	10.0 ml	2.0 ul
Run #2			

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone ^a	ND	61	24	mg/kg	
107-02-8	Acrolein	ND	150	23	mg/kg	
107-13-1	Acrylonitrile	ND	150	8.2	mg/kg	
71-43-2	Benzene	114	3.1	1.5	mg/kg	
108-86-1	Bromobenzene	ND	31	1.7	mg/kg	
74-97-5	Bromochloromethane	ND	31	3.6	mg/kg	
75-27-4	Bromodichloromethane	ND	12	2.2	mg/kg	
75-25-2	Bromoform	ND	12	1.8	mg/kg	
74-83-9	Bromomethane	ND	12	6.0	mg/kg	
78-93-3	2-Butanone (MEK)	ND	31	19	mg/kg	
104-51-8	n-Butylbenzene	79.1	31	1.1	mg/kg	
135-98-8	sec-Butylbenzene	13.6	31	0.97	mg/kg	J
98-06-6	tert-Butylbenzene	ND	31	2.2	mg/kg	
75-15-0	Carbon disulfide	ND	31	0.93	mg/kg	
56-23-5	Carbon tetrachloride	ND	12	7.1	mg/kg	
108-90-7	Chlorobenzene	ND	12	1.7	mg/kg	
75-00-3	Chloroethane	ND	31	3.7	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	31	29	mg/kg	
67-66-3	Chloroform	ND	12	1.8	mg/kg	
74-87-3	Chloromethane	ND	31	7.5	mg/kg	
95-49-8	o-Chlorotoluene	ND	31	2.5	mg/kg	
106-43-4	p-Chlorotoluene	ND	31	2.7	mg/kg	
96-12-8	1,2-Dibromo-3-chloropropane	ND	31	12	mg/kg	
124-48-1	Dibromochloromethane	ND	12	2.6	mg/kg	
106-93-4	1,2-Dibromoethane	ND	12	3.5	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	12	1.3	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	12	1.4	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	12	1.2	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	12	6.8	mg/kg	
75-34-3	1,1-Dichloroethane	ND	12	2.0	mg/kg	
107-06-2	1,2-Dichloroethane	ND	12	3.3	mg/kg	
75-35-4	1,1-Dichloroethene	ND	12	3.2	mg/kg	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 2 of 3

Client Sample ID:	VMP56-082813-D(38-38.5')	Date Sampled:	08/28/13
Lab Sample ID:	MC23933-5	Date Received:	08/29/13
Matrix:	SO - Soil	Percent Solids:	79.4
Method:	SW846 8260B		
Project:	URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
156-59-2	cis-1,2-Dichloroethene	ND	12	3.1	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	12	2.7	mg/kg	
78-87-5	1,2-Dichloropropane	ND	12	2.6	mg/kg	
142-28-9	1,3-Dichloropropane	ND	31	2.7	mg/kg	
594-20-7	2,2-Dichloropropane	ND	31	4.0	mg/kg	
563-58-6	1,1-Dichloropropene	ND	31	1.4	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	12	1.8	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	12	1.8	mg/kg	
123-91-1	1,4-Dioxane	ND	150	130	mg/kg	
97-63-2	Ethyl methacrylate	ND	31	20	mg/kg	
100-41-4	Ethylbenzene	766	12	1.1	mg/kg	
87-68-3	Hexachlorobutadiene	ND	31	3.5	mg/kg	
591-78-6	2-Hexanone	ND	31	15	mg/kg	
98-82-8	Isopropylbenzene	50.7	31	1.7	mg/kg	
99-87-6	p-Isopropyltoluene	8.94	31	0.98	mg/kg	J
1634-04-4	Methyl Tert Butyl Ether	ND	12	2.4	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	31	11	mg/kg	
74-95-3	Methylene bromide	ND	31	2.1	mg/kg	
75-09-2	Methylene chloride	ND	12	9.5	mg/kg	
91-20-3	Naphthalene	114	31	4.8	mg/kg	
103-65-1	n-Propylbenzene	156	31	1.5	mg/kg	
100-42-5	Styrene	ND	31	1.3	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	31	2.4	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	12	1.8	mg/kg	
127-18-4	Tetrachloroethene	ND	12	2.7	mg/kg	
108-88-3	Toluene	1820	31	1.5	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	31	2.6	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	31	2.2	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	12	1.1	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	12	2.1	mg/kg	
79-01-6	Trichloroethene	ND	12	2.9	mg/kg	
75-69-4	Trichlorofluoromethane	ND	12	6.4	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	31	2.4	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	879	31	1.3	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	232	31	0.79	mg/kg	
108-05-4	Vinyl Acetate ^b	ND	31	7.7	mg/kg	
75-01-4	Vinyl chloride	ND	12	3.5	mg/kg	
	m,p-Xylene	1910	12	1.7	mg/kg	
95-47-6	o-Xylene	782	12	1.3	mg/kg	
1330-20-7	Xylene (total)	2700	12	1.3	mg/kg	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID:	VMP56-082813-D(38-38.5')	Date Sampled:	08/28/13
Lab Sample ID:	MC23933-5	Date Received:	08/29/13
Matrix:	SO - Soil	Percent Solids:	79.4
Method:	SW846 8260B		
Project:	URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL		

VOA Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	96%		70-130%
2037-26-5	Toluene-D8	106%		70-130%
460-00-4	4-Bromofluorobenzene	103%		70-130%

- (a) Initial Calibration outside of acceptance criteria. Sample result may be biased low.
(b) Continuing Calibration outside of acceptance criteria. Sample result may be biased low.

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

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

Report of Analysis

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Client Sample ID:	VMP56-082813-D(38-38.5')	Date Sampled:	08/28/13
Lab Sample ID:	MC23933-5	Date Received:	08/29/13
Matrix:	SO - Soil	Percent Solids:	79.4
Method:	SW846 8015		
Project:	URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	WX68896.D	1	08/30/13	TB	n/a	n/a	GWX3300
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.56 g	10.0 ml	2.0 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (VOA)	44700	630	140	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
	2,3,4-Trifluorotoluene	124% ^a		61-116%		

(a) Outside control limits due to possible matrix interference.

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

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

Report of Analysis

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Client Sample ID:	VMP56-082813-EB(30.5-33')	Date Sampled:	08/28/13
Lab Sample ID:	MC23933-6	Date Received:	08/29/13
Matrix:	AQ - Equipment Blank	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	V22445.D	1	08/29/13	AMY	n/a	n/a	MSV864
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	2.8	ug/l	
107-02-8	Acrolein	ND	25	6.3	ug/l	
107-13-1	Acrylonitrile	ND	5.0	3.5	ug/l	
71-43-2	Benzene	ND	0.50	0.45	ug/l	
108-86-1	Bromobenzene	ND	5.0	0.44	ug/l	
74-97-5	Bromochloromethane	ND	5.0	0.64	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.33	ug/l	
75-25-2	Bromoform	ND	1.0	0.42	ug/l	
74-83-9	Bromomethane	ND	2.0	1.5	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	1.6	ug/l	
104-51-8	n-Butylbenzene	ND	5.0	0.54	ug/l	
135-98-8	sec-Butylbenzene	ND	5.0	0.58	ug/l	
98-06-6	tert-Butylbenzene	ND	5.0	0.87	ug/l	
75-15-0	Carbon disulfide	ND	5.0	0.59	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.62	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.48	ug/l	
75-00-3	Chloroethane	ND	2.0	0.84	ug/l	
110-75-8	2-Chloroethyl vinyl ether	ND	5.0	1.1	ug/l	
67-66-3	Chloroform	ND	1.0	0.50	ug/l	
74-87-3	Chloromethane	ND	2.0	1.4	ug/l	
95-49-8	o-Chlorotoluene	ND	5.0	0.55	ug/l	
106-43-4	p-Chlorotoluene	ND	5.0	0.48	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	1.7	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.33	ug/l	
106-93-4	1,2-Dibromoethane	ND	2.0	0.38	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.35	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.30	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.26	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.2	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.37	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.35	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	0.67	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID:	VMP56-082813-EB(30.5-33')	Date Sampled:	08/28/13
Lab Sample ID:	MC23933-6	Date Received:	08/29/13
Matrix:	AQ - Equipment Blank	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
156-59-2	cis-1,2-Dichloroethene	ND	1.0	0.54	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	0.54	ug/l	
78-87-5	1,2-Dichloropropane	ND	2.0	0.45	ug/l	
142-28-9	1,3-Dichloropropane	ND	5.0	0.97	ug/l	
594-20-7	2,2-Dichloropropane	ND	5.0	1.3	ug/l	
563-58-6	1,1-Dichloropropene	ND	5.0	0.63	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.22	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.29	ug/l	
123-91-1	1,4-Dioxane	ND	25	16	ug/l	
97-63-2	Ethyl methacrylate	ND	5.0	0.81	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.38	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.0	1.3	ug/l	
591-78-6	2-Hexanone	ND	5.0	2.3	ug/l	
98-82-8	Isopropylbenzene	ND	5.0	0.64	ug/l	
99-87-6	p-Isopropyltoluene	ND	5.0	0.55	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.43	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	1.3	ug/l	
74-95-3	Methylene bromide	ND	5.0	0.43	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.41	ug/l	
91-20-3	Naphthalene	ND	5.0	0.79	ug/l	
103-65-1	n-Propylbenzene	ND	5.0	0.59	ug/l	
100-42-5	Styrene	ND	5.0	0.49	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	0.46	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.42	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	0.61	ug/l	
108-88-3	Toluene	0.57	1.0	0.46	ug/l	J
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	0.76	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	0.45	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.94	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.49	ug/l	
79-01-6	Trichloroethene	ND	1.0	0.45	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.61	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.70	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.47	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	1.1	ug/l	
108-05-4	Vinyl Acetate	ND	5.0	1.3	ug/l	
75-01-4	Vinyl chloride	ND	1.0	0.61	ug/l	
	m,p-Xylene	ND	1.0	0.70	ug/l	
95-47-6	o-Xylene	ND	1.0	0.41	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.41	ug/l	

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 3 of 3

Client Sample ID:	VMP56-082813-EB(30.5-33')	Date Sampled:	08/28/13
Lab Sample ID:	MC23933-6	Date Received:	08/29/13
Matrix:	AQ - Equipment Blank	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL		

VOA Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	102%		70-130%
2037-26-5	Toluene-D8	100%		70-130%
460-00-4	4-Bromofluorobenzene	101%		70-130%

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

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

Report of Analysis

Page 1 of 1

Client Sample ID:	VMP56-082813-EB(30.5-33')	Date Sampled:	08/28/13
Lab Sample ID:	MC23933-6	Date Received:	08/29/13
Matrix:	AQ - Equipment Blank	Percent Solids:	n/a
Method:	SW846 8015		
Project:	URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	WX68890.D	1	08/30/13	TB	n/a	n/a	GWX3301
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (VOA)	0.0185	0.10	0.013	mg/l	JB
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
	2,3,4-Trifluorotoluene	107%		60-135%		

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

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

Misc. Forms

5

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody
- REPROC Form: Reprocessed/Corrected Data
- Sample Tracking Chronicle
- Internal Chain of Custody

LAB (LOCATION)
☐ XENCO
☐ CALSCEM
☒ OTHER: **Accutest Labs: 405 Technology Ctr W
Marlborough, MA 01752 (508-481-6200)**
☐ SPL
 Lab Vendor # _____

Shell Oil Products Chain Of Custody Record

URS

Please Check Appropriate Box:
☒ ENV. SERVICES
☐ MOTIVA RETAIL
☐ SHELL RETAIL
☐ MOTIVA SDACH
☐ CONSULTANT
☐ LURES
☐ SHELL PIPELINE
☐ OTHER _____

Print Bill To Contact Name: Bob Billman
INCIDENT # (ENV SERVICES): 9 7 2 1 6 6 4 0
PO # _____ **SAP #** _____
DATE: 8/28/13 **PAGE:** 1 of 1

LABORATORY COMPANY: URS CORPORATION
ADDRESS: 1001 HIGHLANDS PLAZA DRIVE WEST - SUITE 300; ST. LOUIS, MO 63110
PRODUCT CONTACT (Personality or PDF Report to): Elizabeth Kunkel elizabeth.kunkel@urs.com
TELEPHONE: 314-429-0100 **FAX:** 314-429-0462 **BE TO Contact E-MAIL:** elizabeth.kunkel@urs.com & bob.billman@urs.com
TURNAROUND TIME (CALENDAR DAYS): ☐ STANDARD (10 DAY) ☐ 5 DAYS ☐ 3 DAYS ☐ 2 DAYS ☒ 24 HOURS ☐ RESULTS NEEDED ON WEEKEND
☐ LA - RWQCB REPORT FORMAT ☐ UST AGENCY: _____
DELIVERABLES: ☐ LEVEL 1 ☒ LEVEL 2 ☐ LEVEL 3 ☒ LEVEL 4 ☐ OTHER (SPECIFY) EDD
TEMPERATURE ON RECEIPT C° Cooler #1 _____ Cooler #2 _____ Cooler #3 _____
SPECIAL INSTRUCTIONS OR NOTES:
 * Please include "J" values on Reports.
 * Please provide sample receipt upon login.
☒ SHELL CONTRACT RATE APPLIES
☐ STATE REIMBURSEMENT RATE APPLIES
☐ EDD NOT NEEDED
☐ RECEIPT VERIFICATION REQUESTED
☐ PROVIDE LEDD DISK
***RUSH: 24 HOUR TURN AROUND TIME**

SHIP DELIVERABLE TO (Name, Company, Office Location): _____ **PHONE NO.:** _____ **E-MAIL:** _____ **CONSULTANT PROJECT NO.:** Air Sparge Pilot Test 21562850.06000

SAMPLER NAME(S) (Print): Michael Corbett, John Carrow **LAB USE ONLY:** mc23933

REQUESTED ANALYSIS

LAB USE ONLY	Field Sample Identification	SAMPLING		MATRIX	PRESERVATIVE						NO. OF CONT.	VOC 8260B	TPH-GRO	Percent Moisture	PID (ppm)	FIELD NOTES:	
		DATE	TIME		HCL	HNO3	H2O2/HCL	NONE	OTHER								
-1	TB-082813-HCL	8/28/2013		WATER	2						2	X					
-2	VMP56-082813 (9-11')	8/28/2013	1350	SOLID				1	5	6	6	X	X	X		1	
-2 ^S	VMP56-082813-MS (9-11')	8/28/2013	1350	SOLID				1	5	6	6	X	X	X		1	
-2 ^S	VMP56-082813-MSD (9-11')	8/28/2013	1350	SOLID				1	5	6	6	X	X	X		1	
-3	VMP56-082813 (24-25')	8/28/2013	1440	SOLID				1	5	6	6	X	X	X		2.8	
-4	VMP56-082813 (38-38.5')	8/28/2013	1455	SOLID				1	5	6	6	X	X	X		749	
-5	VMP56-082813-D (38-38.5')	8/28/2013	1455	SOLID				1	5	6	6	X	X	X		749	2F, 10F2, 4G1
-6	VMP56-082813-EB (30.5-33')	8/28/2013	1410	WATER	4						4	X	X				

RUSH!

Relinquished by (Signature): *[Signature]* **Received by (Signature):** *[Signature]* **FEDEX**
Date: 8/28/13 **Time:** 1800
Relinquished by (Signature): FX **Received by (Signature):** *[Signature]*
Date: 8/29/13 **Time:** 9:30 22
Relinquished by (Signature): _____ **Received by (Signature):** _____
Date: _____ **Time:** _____

05/08 Revision

MC23933: Chain of Custody
 Page 1 of 2

Accutest Laboratories Sample Receipt Summary

Accutest Job Number: MC23933 Client: URS Immediate Client Services Action Required: No
 Date / Time Received: 8/29/2013 Delivery Method: Client Service Action Required at Login: No
 Project: 900 SOUTH CENTRAL No. Coolers: 1 Airbill #'s:

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

Cooler Temperature Y or N
 1. Temp criteria achieved: ☒ ☐
 2. Cooler temp verification: Infrared gun
 3. Cooler media: Ice (bag)

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

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

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

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

Comments

Initial Calibration Summary

Page 1 of 1

Job Number: MC23933

Sample:

MSG5092-ICC5092

Account: SHELLWIC Shell Oil

Lab FileID:

G130658.D

Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Response Factor Report MSG

Method : O:\msg\1\methods\g130820sx.m (RTE Integrator)
Title : SW-846 Method 8260
Last Update : Fri Oct 02 12:22:05 2015
Response via : Initial Calibration

Calibration Files

2 =G130655.D 5 =G130656.D 50 =G130658.D 100 =G130659.D
200 =G130660.D 400 =G130661.D 0.5 =G130654.D 25 =G130657.D
= =

Compound	2	5	50	100	200	400	0.5	25	Avg	%RSD
----------	---	---	----	-----	-----	-----	-----	----	-----	------

1) I 1,4-difluorobenzene -----ISTD-----
2) benzene
2.086 1.927 1.797 1.715 1.667 1.604 2.575 1.776 1.893 16.61
---- Linear regression ---- Coefficient = 0.9995
Response Ratio = 0.09845 + 1.60564 *A

(#) = Out of Range ### Number of calibration levels exceeded format ###

g130820sx.m Wed Oct 07 18:35:02 2015

5.2

5

Initial Calibration Verification

Page 1 of 1

Job Number: MC23933

Sample: MSG5092-ICV5092

Account: SHELLWIC Shell Oil

Lab FileID: G130664.D

Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Evaluate Continuing Calibration Report

Data File : O:\msg\1\data backup\g130820\g130664.d Vial: 13
Acq On : 20 Aug 2013 5:13 pm Operator: jaimem
Sample : icv5092-50 Inst : MSG
Misc : MS29686,MSG5092,10,,100,10,1 Multiplr: 1.00
MS Integration Params: RTEINT.P

Method : O:\msg\1\methods\g130820sx.m (RTE Integrator)
Title : SW-846 Method 8260
Last Update : Wed Oct 14 12:43:07 2015
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 200%

Compound		AvgRF	CCRF	%Dev	Area%	Dev (min)	R.T.
1 I	1,4-difluorobenzene	1.000	1.000	0.0	102	0.00	6.19
----- Amount Calc. %Drift -----							
2 M	benzene	50.000	51.080	-2.2	97	0.00	5.89

(#) = Out of Range SPCC's out = 0 CCC's out = 0
G130658.D g130820sx.m Wed Oct 14 12:44:39 2015

5.2

5

Continuing Calibration Summary

Page 1 of 1

Job Number: MC23933

Sample: MSG5100-CC5092

Account: SHELLWIC Shell Oil

Lab FileID: G131022.D

Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Evaluate Continuing Calibration Report

Data File : O:\msg\1\data backup\g130830\g131022.d Vial: 2
Acq On : 30 Aug 2013 8:25 am Operator: jaimem
Sample : cc5092-50 Inst : MSG
Misc : MS29778,MSG5100,10,,100,10,1 Multiplr: 1.00
MS Integration Params: RTEINT.P

Method : O:\msg\1\methods\g130820sx.m (RTE Integrator)
Title : SW-846 Method 8260
Last Update : Wed Oct 14 12:43:07 2015
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 200%

Compound		AvgRF	CCRF	%Dev	Area%	Dev (min)	R.T.
1 I	1,4-difluorobenzene	1.000	1.000	0.0	75	0.00	6.20
----- Amount Calc. %Drift -----							
2 M	benzene	50.000	48.424	3.2	67	0.00	5.89

(#) = Out of Range SPCC's out = 0 CCC's out = 0
G130658.D g130820sx.m Fri Oct 16 14:56:16 2015

5.2

5

Data Path : O:\msg\1\data backup\gl30820\
Data File : gl30654.d
Acq On : 20 Aug 2013 12:31 pm
Operator : jaimem
Sample : ic5092-0.5
Misc : MS29686,MSG5092,10,,100,10,1
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Oct 07 17:13:41 2015
Quant Method : O:\msg\1\methods\gl30820sx.m
Quant Title : SW-846 Method 8260
QLast Update : Fri Oct 02 12:22:05 2015
Response via : Initial Calibration

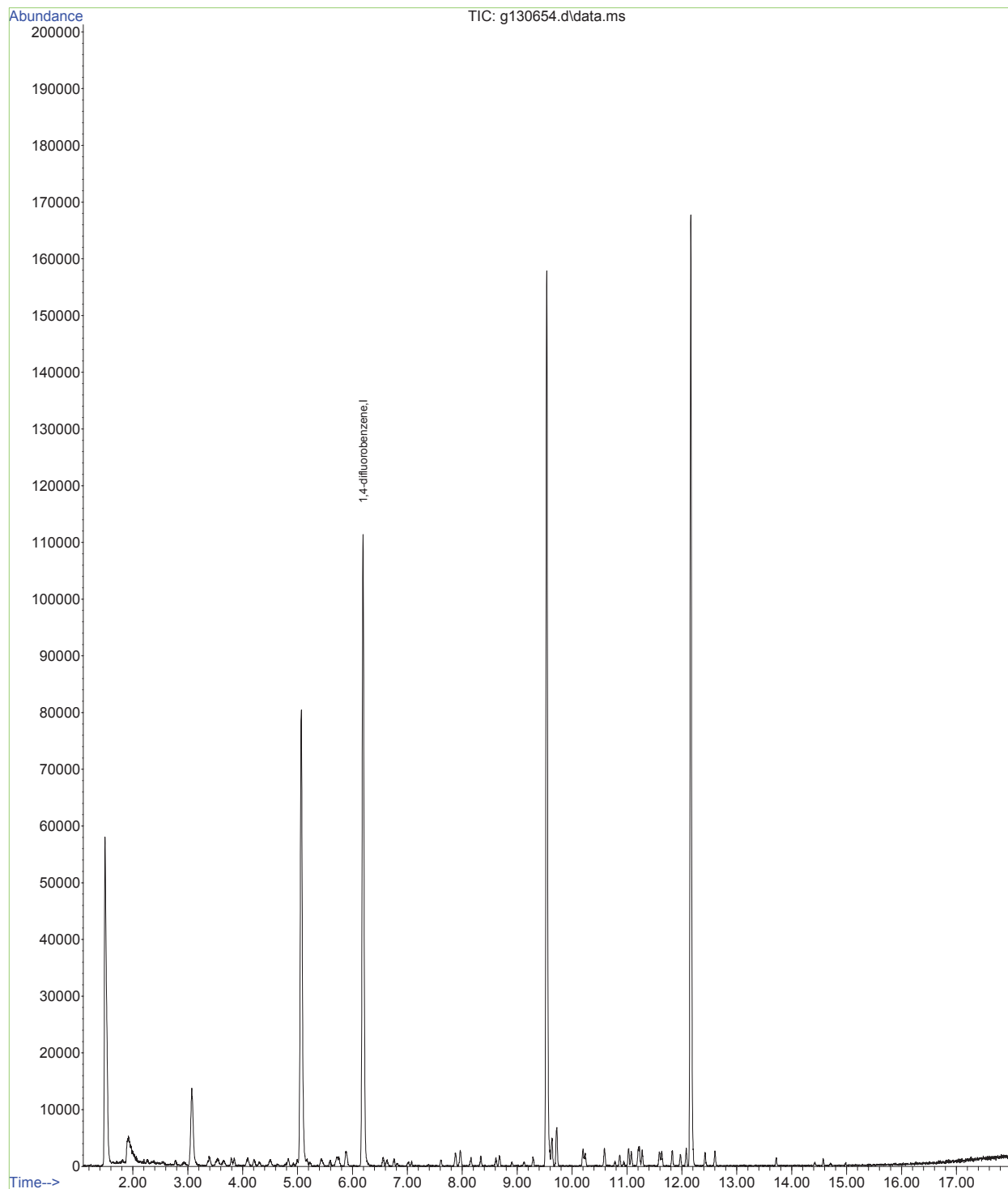
Compound	R.T.	QIon	Response	Conc Units	Dev(Min)

Internal Standards					
1) 1,4-difluorobenzene	6.195	114	118495	50.00 ppb	0.00
Target Compounds					
2) benzene	5.893	78	3051	Below Cal	Qvalue 98

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data Path : O:\msg\1\data backup\g130820\
Data File : g130654.d
Acq On : 20 Aug 2013 12:31 pm
Operator : jaimem
Sample : ic5092-0.5
Misc : MS29686,MSG5092,10,,100,10,1
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Oct 07 17:13:41 2015
Quant Method : O:\msg\1\methods\g130820sx.m
Quant Title : SW-846 Method 8260
QLast Update : Fri Oct 02 12:22:05 2015
Response via : Initial Calibration



Data Path : O:\msg\1\data backup\gl30820\
Data File : gl30655.d
Acq On : 20 Aug 2013 1:00 pm
Operator : jaimem
Sample : ic5092-2
Misc : MS29686,MSG5092,10,,100,10,1
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Oct 14 12:41:45 2015
Quant Method : O:\msg\1\methods\gl30820sx.m
Quant Title : SW-846 Method 8260
QLast Update : Fri Oct 02 12:22:05 2015
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)

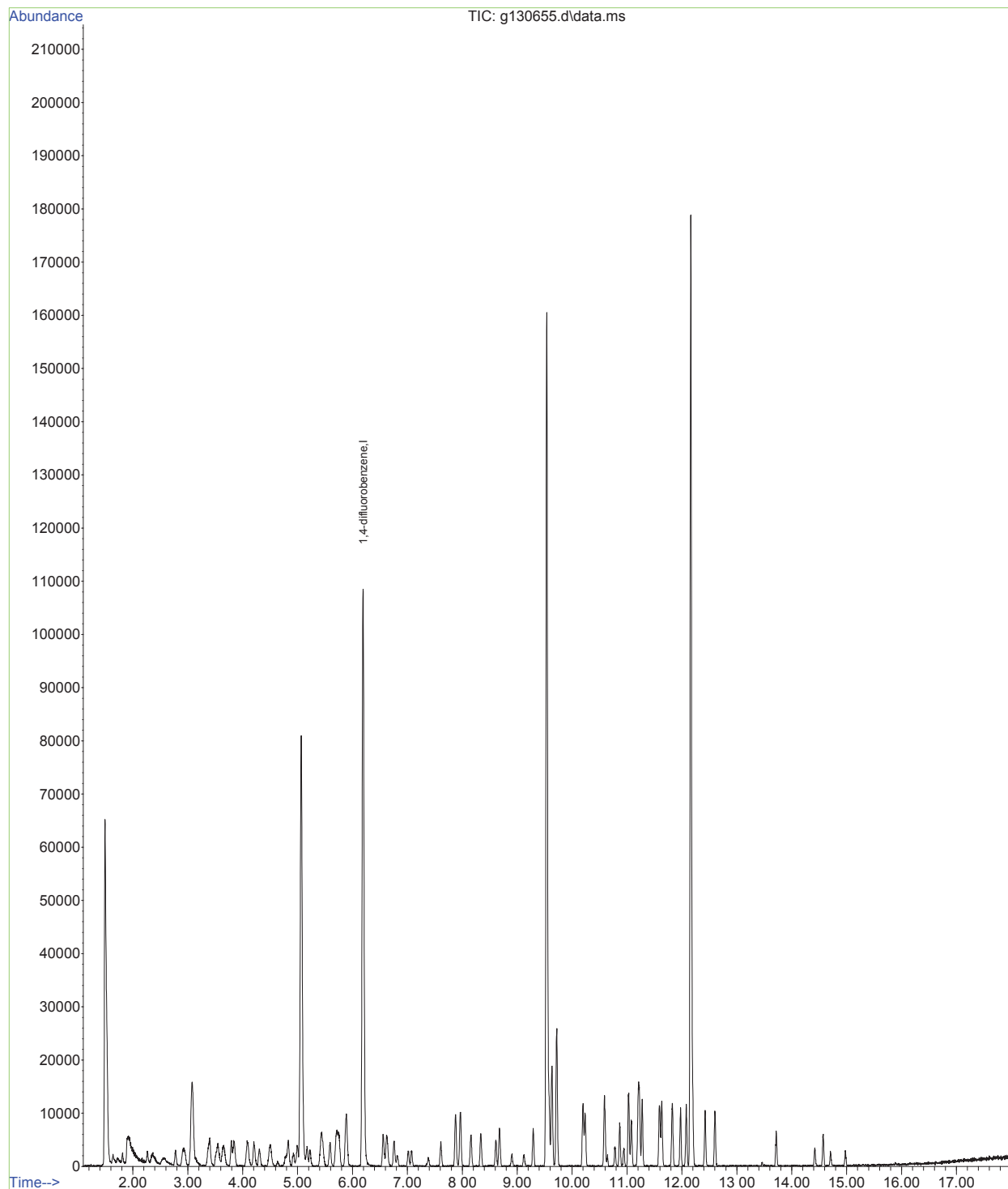
Internal Standards					
1) 1,4-difluorobenzene	6.195	114	118467	50.00 ppb	0.00

Target Compounds					
2) benzene	5.894	78	9887m	Below Cal	Qvalue

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data Path : O:\msg\1\data backup\g130820\
Data File : g130655.d
Acq On : 20 Aug 2013 1:00 pm
Operator : jaimem
Sample : ic5092-2
Misc : MS29686,MSG5092,10,,100,10,1
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Oct 14 12:41:45 2015
Quant Method : O:\msg\1\methods\g130820sx.m
Quant Title : SW-846 Method 8260
QLast Update : Fri Oct 02 12:22:05 2015
Response via : Initial Calibration



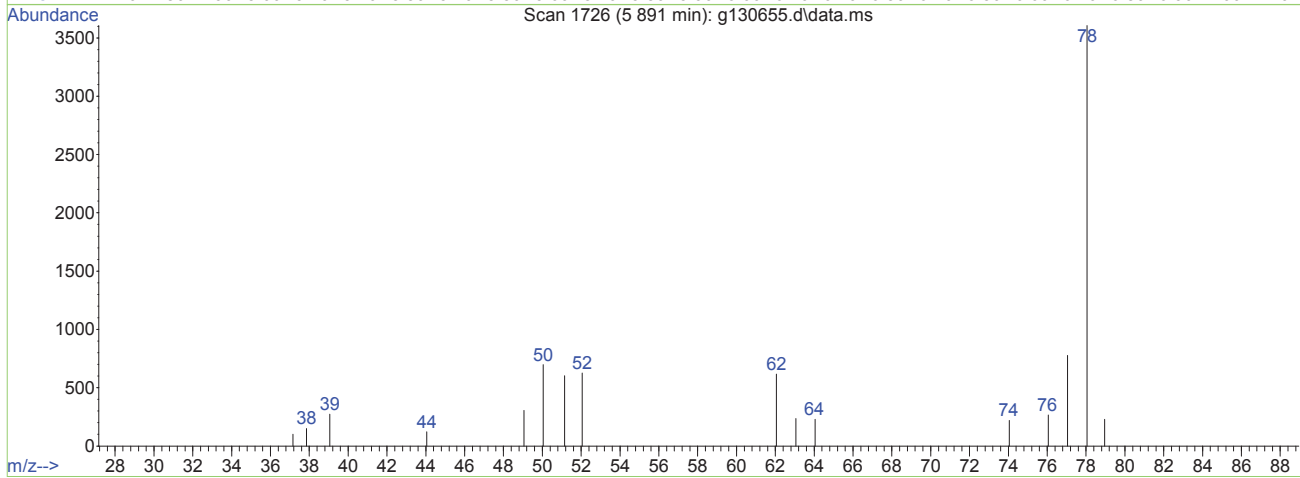
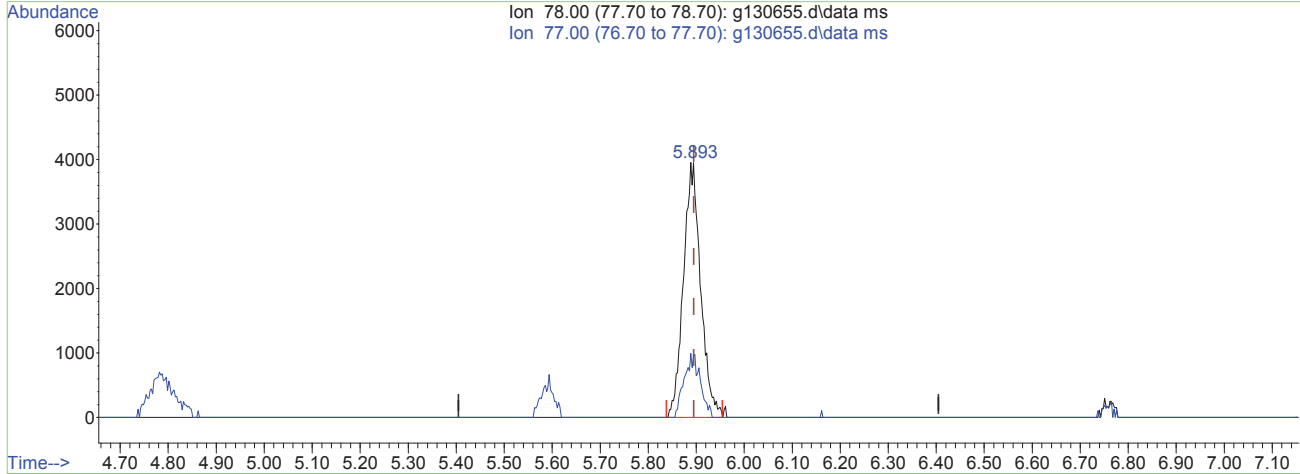
g130820sx.m Wed Oct 14 12:42:28 2015

Page: 2

Quantitation Report (Qedit)

Data Path : O:\msg\1\data backup\g130820\
 Data File : g130655.d
 Acq On : 20 Aug 2013 1:00 pm
 Operator : jaimem
 Sample : ic5092-2
 Misc : MS29686,MSG5092,10,,100,10,1
 ALS Vial : 4 Sample Multiplier: 1

Quant Time: Oct 14 12:41:25 2015
 Quant Method : O:\msg\1\methods\g130820sx.m
 Quant Title : SW-846 Method 8260
 QLast Update : Fri Oct 02 12:22:05 2015
 Response via : Initial Calibration



TIC: g130655.d\data.ms

(2) benzene (M)

5.893min (-0.002) -0.48ppb

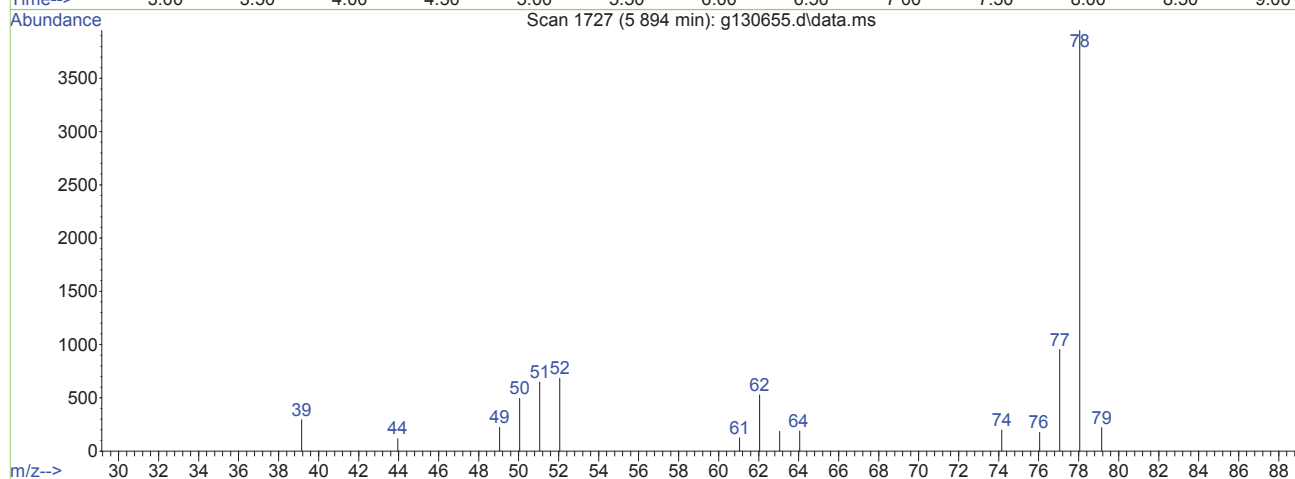
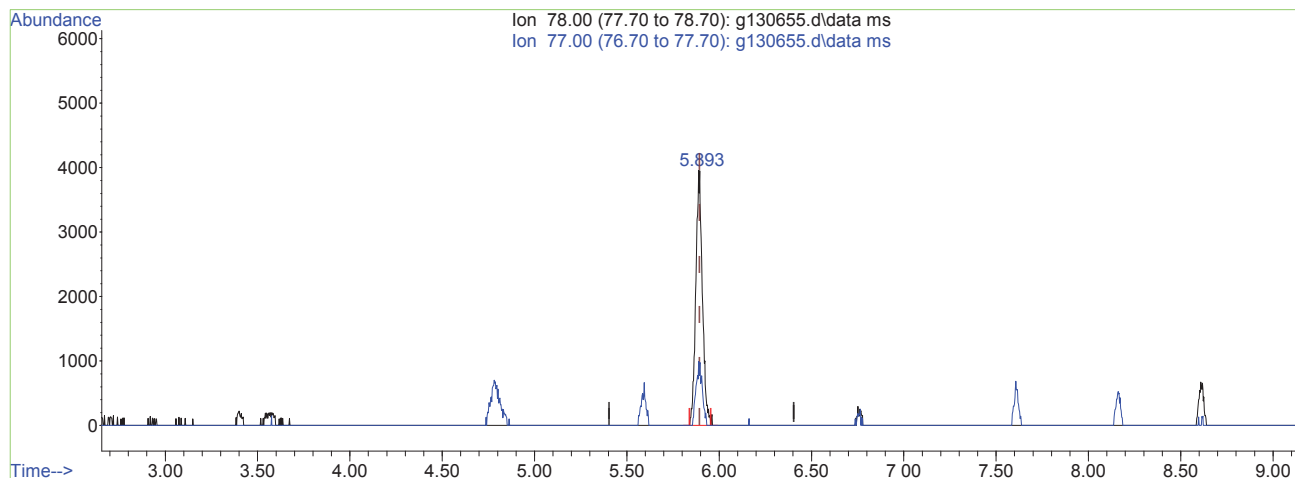
response 9840

Ion	Exp%	Act%
78.00	100	100
77.00	24.00	21.51
0.00	0.00	0.00
0.00	0.00	0.00

Quantitation Report (Qedit)

Data Path : O:\msg\1\data backup\g130820\
 Data File : g130655.d
 Acq On : 20 Aug 2013 1:00 pm
 Operator : jaimem
 Sample : ic5092-2
 Misc : MS29686,MSG5092,10,,100,10,1
 ALS Vial : 4 Sample Multiplier: 1

Quant Time: Oct 14 12:41:25 2015
 Quant Method : O:\msg\1\methods\g130820sx.m
 Quant Title : SW-846 Method 8260
 QLast Update : Fri Oct 02 12:22:05 2015
 Response via : Initial Calibration



TIC: g130655.d\data.ms

(2) benzene (M)

5.894min (-0.001) -0.47ppb m

response 9887

Ion	Exp%	Act%
78.00	100	100
77.00	24.00	24.13
0.00	0.00	0.00
0.00	0.00	0.00

Data Path : O:\msg\1\data backup\gl30820\
Data File : gl30656.d
Acq On : 20 Aug 2013 1:29 pm
Operator : jaimem
Sample : ic5092-5
Misc : MS29686,MSG5092,10,,100,10,1
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Oct 07 18:27:42 2015
Quant Method : O:\msg\1\methods\gl30820sx.m
Quant Title : SW-846 Method 8260
QLast Update : Fri Oct 02 12:22:05 2015
Response via : Initial Calibration

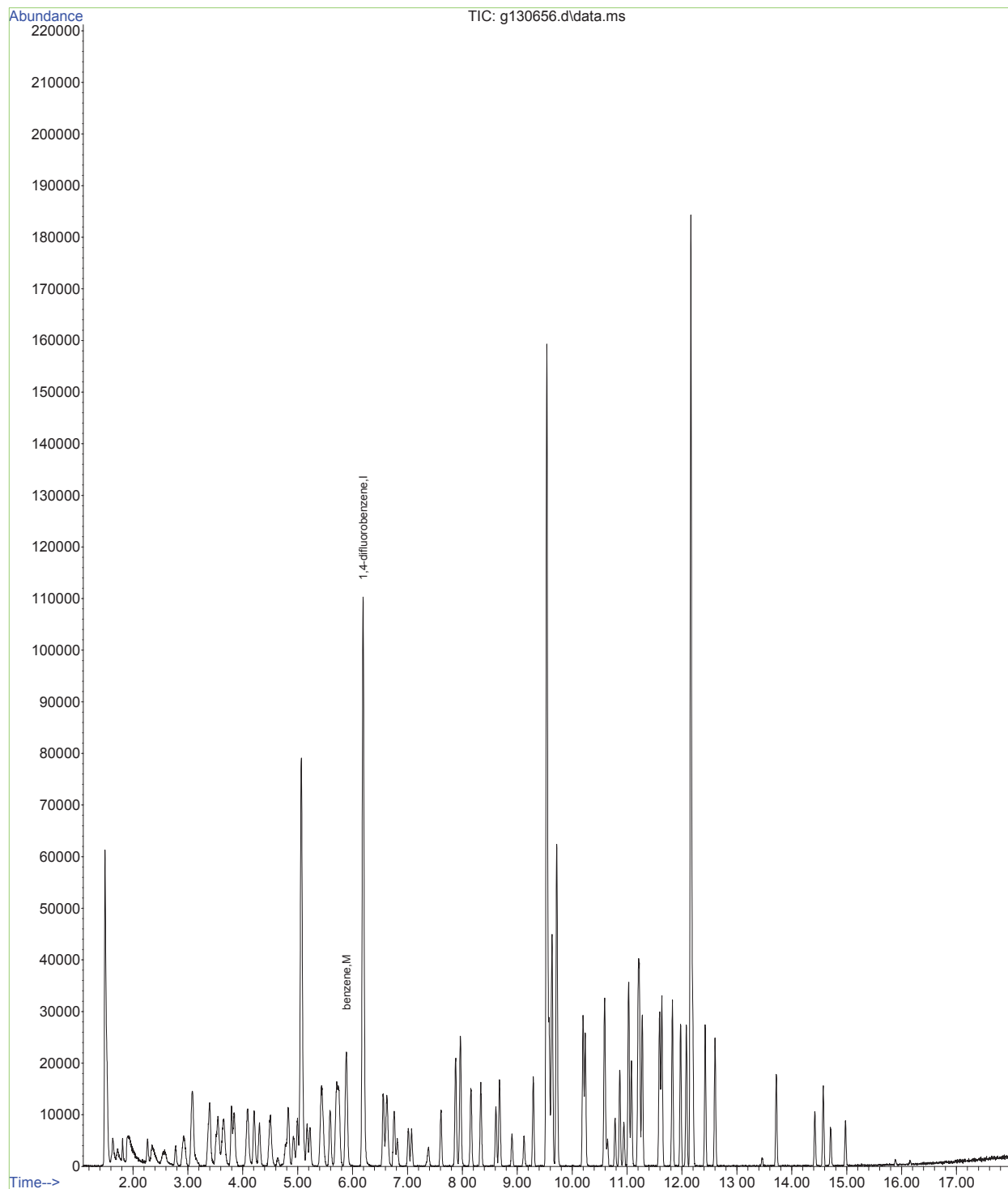
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

Internal Standards						
1) 1,4-difluorobenzene	6.195	114	117570	50.00	ppb	0.00
Target Compounds						
2) benzene	5.893	78	22654	2.93	ppb	Qvalue 96

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data Path : O:\msg\1\data backup\g130820\
Data File : g130656.d
Acq On : 20 Aug 2013 1:29 pm
Operator : jaimem
Sample : ic5092-5
Misc : MS29686,MSG5092,10,,100,10,1
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Oct 07 18:27:42 2015
Quant Method : O:\msg\1\methods\g130820sx.m
Quant Title : SW-846 Method 8260
QLast Update : Fri Oct 02 12:22:05 2015
Response via : Initial Calibration



g130820sx.m Wed Oct 07 18:28:16 2015

Page: 2

Data Path : O:\msg\1\data backup\gl30820\
Data File : gl30657.d
Acq On : 20 Aug 2013 1:56 pm
Operator : jaimem
Sample : ic5092-25
Misc : MS29686,MSG5092,10,,100,10,1
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Oct 07 18:28:03 2015
Quant Method : O:\msg\1\methods\gl30820sx.m
Quant Title : SW-846 Method 8260
QLast Update : Fri Oct 02 12:22:05 2015
Response via : Initial Calibration

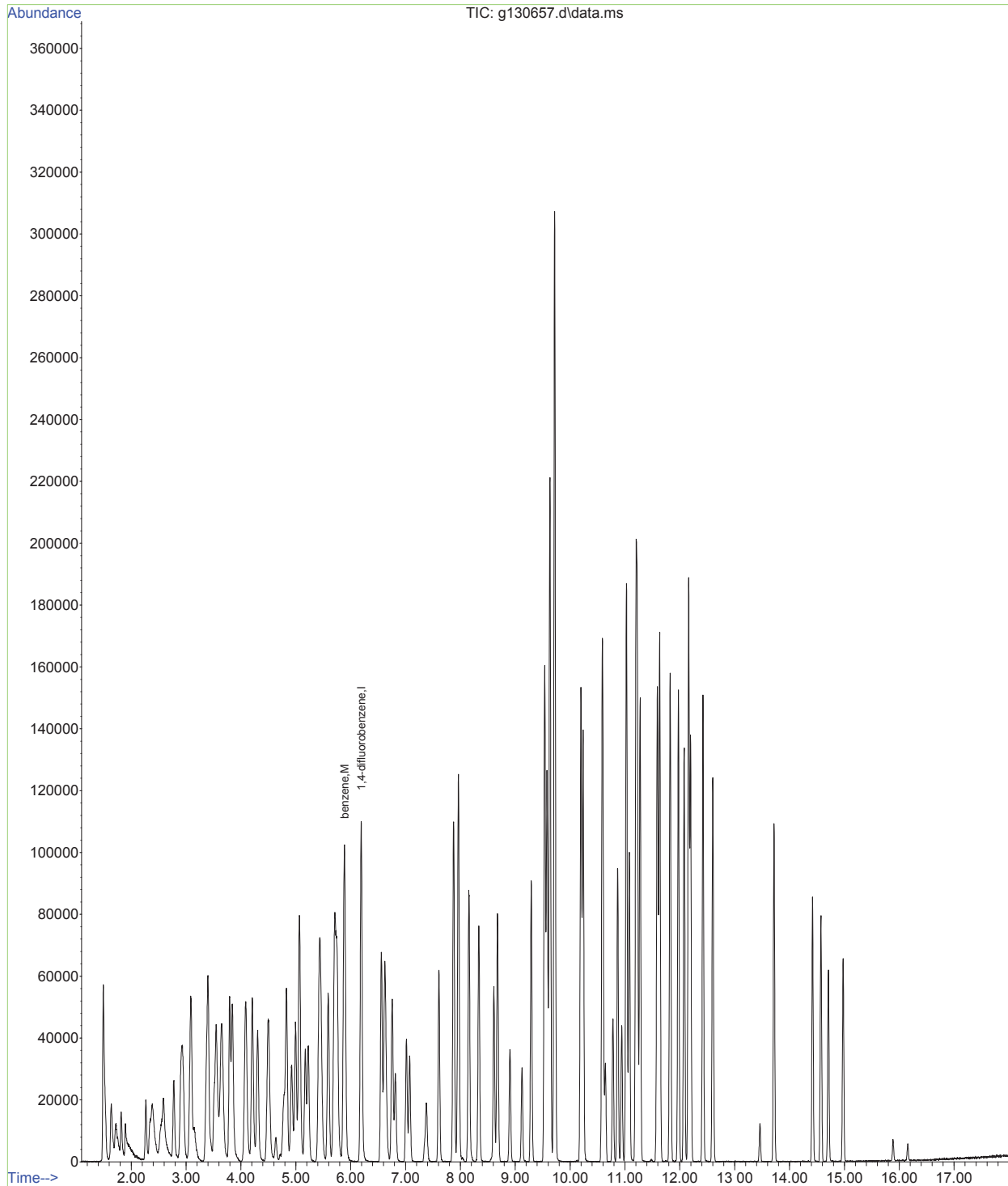
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

Internal Standards						
1) 1,4-difluorobenzene	6.195	114	117275	50.00	ppb	0.00
Target Compounds						
2) benzene	5.895	78	104159	24.59	ppb	Qvalue 98

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data Path : O:\msg\1\data backup\g130820\
Data File : g130657.d
Acq On : 20 Aug 2013 1:56 pm
Operator : jaimem
Sample : ic5092-25
Misc : MS29686,MSG5092,10,,100,10,1
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Oct 07 18:28:03 2015
Quant Method : O:\msg\1\methods\g130820sx.m
Quant Title : SW-846 Method 8260
QLast Update : Fri Oct 02 12:22:05 2015
Response via : Initial Calibration



g130820sx.m Wed Oct 07 18:29:17 2015

Page: 2

Data Path : O:\msg\1\data backup\gl30820\
Data File : gl30658.d
Acq On : 20 Aug 2013 2:24 pm
Operator : jaimem
Sample : icc5092-50
Misc : MS29686,MSG5092,10,,100,10,1
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Oct 07 18:29:05 2015
Quant Method : O:\msg\1\methods\gl30820sx.m
Quant Title : SW-846 Method 8260
QLast Update : Fri Oct 02 12:22:05 2015
Response via : Initial Calibration

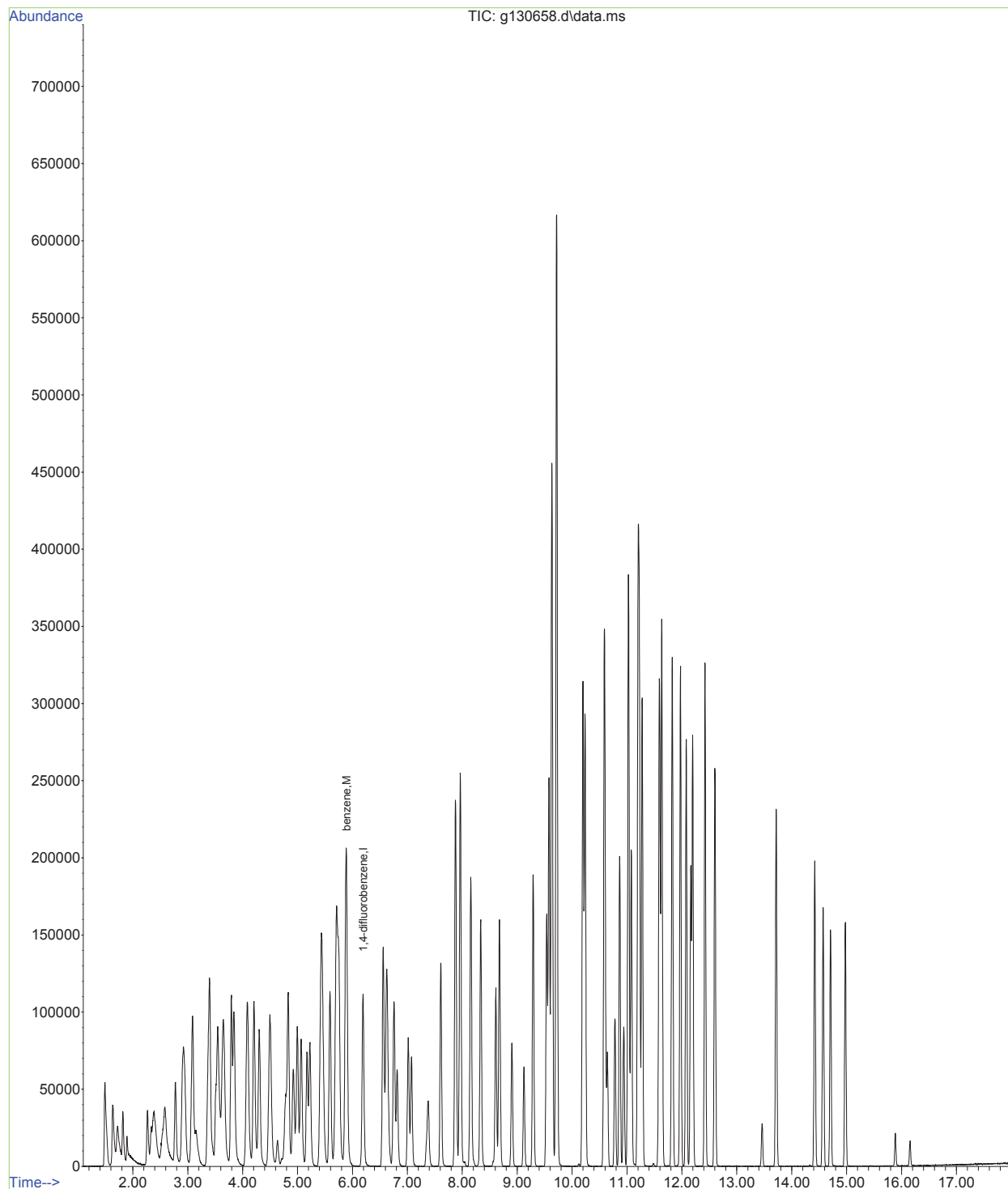
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

Internal Standards						
1) 1,4-difluorobenzene	6.194	114	118097	50.00	ppb	0.00
Target Compounds						
2) benzene	5.894	78	212166	52.88	ppb	Qvalue 96

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data Path : O:\msg\1\data backup\g130820\
Data File : g130658.d
Acq On : 20 Aug 2013 2:24 pm
Operator : jaimem
Sample : icc5092-50
Misc : MS29686,MSG5092,10,,100,10,1
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Oct 07 18:29:05 2015
Quant Method : O:\msg\1\methods\g130820sx.m
Quant Title : SW-846 Method 8260
QLast Update : Fri Oct 02 12:22:05 2015
Response via : Initial Calibration



g130820sx.m Wed Oct 07 18:29:39 2015

Page: 2

Data Path : O:\msg\1\data backup\gl30820\
Data File : gl30659.d
Acq On : 20 Aug 2013 2:52 pm
Operator : jaimem
Sample : ic5092-100
Misc : MS29686,MSG5092,10,,100,10,1
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Oct 07 18:29:26 2015
Quant Method : O:\msg\1\methods\gl30820sx.m
Quant Title : SW-846 Method 8260
QLast Update : Fri Oct 02 12:22:05 2015
Response via : Initial Calibration

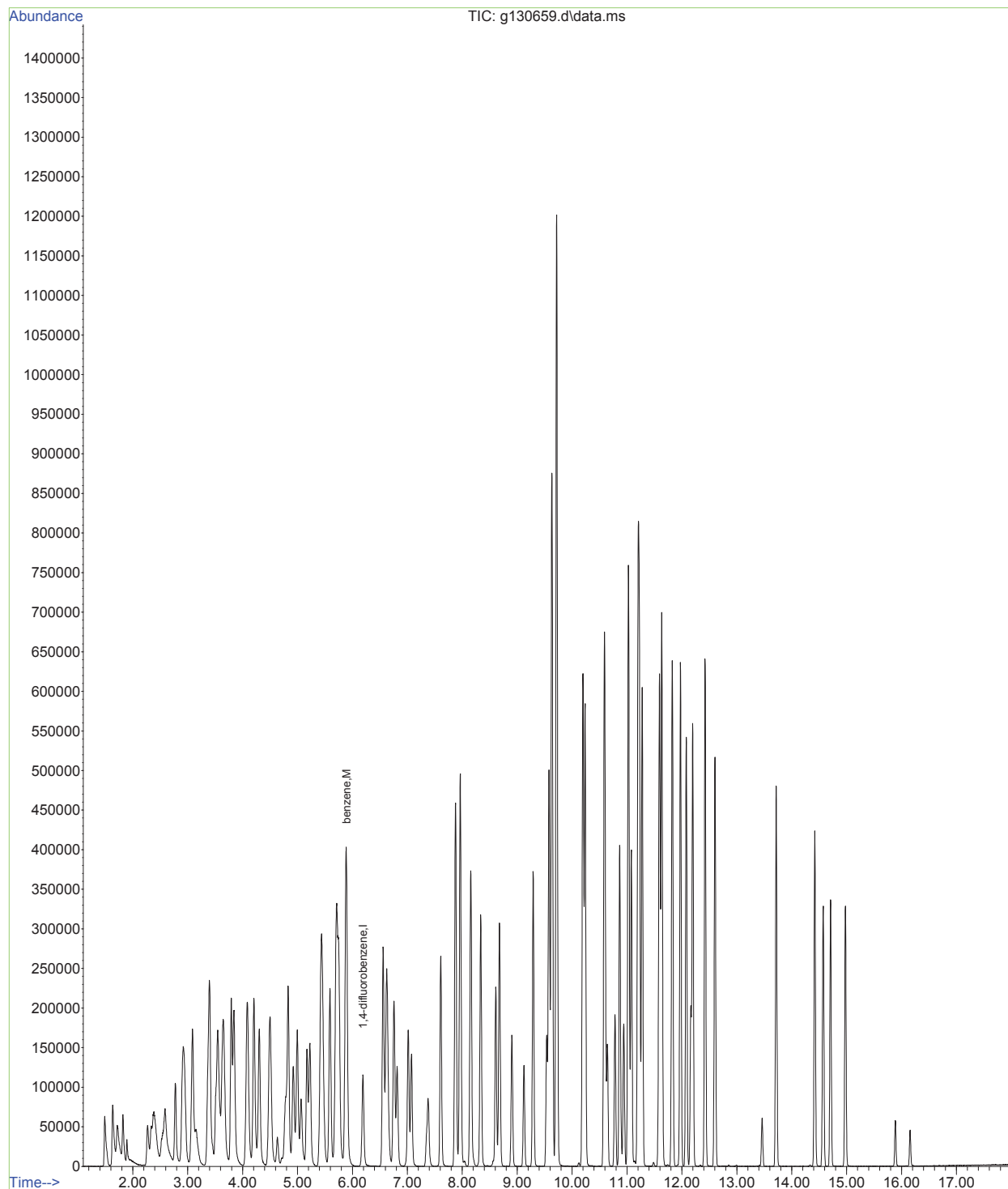
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

Internal Standards						
1) 1,4-difluorobenzene	6.194	114	120192	50.00	ppb	0.00
Target Compounds						
2) benzene	5.894	78	412329	103.76	ppb	Qvalue 97

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data Path : O:\msg\1\data backup\g130820\
Data File : g130659.d
Acq On : 20 Aug 2013 2:52 pm
Operator : jaimem
Sample : ic5092-100
Misc : MS29686,MSG5092,10,,100,10,1
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Oct 07 18:29:26 2015
Quant Method : O:\msg\1\methods\g130820sx.m
Quant Title : SW-846 Method 8260
QLast Update : Fri Oct 02 12:22:05 2015
Response via : Initial Calibration



Data Path : O:\msg\1\data backup\gl30820\
Data File : gl30660.d
Acq On : 20 Aug 2013 3:21 pm
Operator : jaimem
Sample : ic5092-200
Misc : MS29686,MSG5092,10,,100,10,1
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Oct 07 18:29:46 2015
Quant Method : O:\msg\1\methods\gl30820sx.m
Quant Title : SW-846 Method 8260
QLast Update : Fri Oct 02 12:22:05 2015
Response via : Initial Calibration

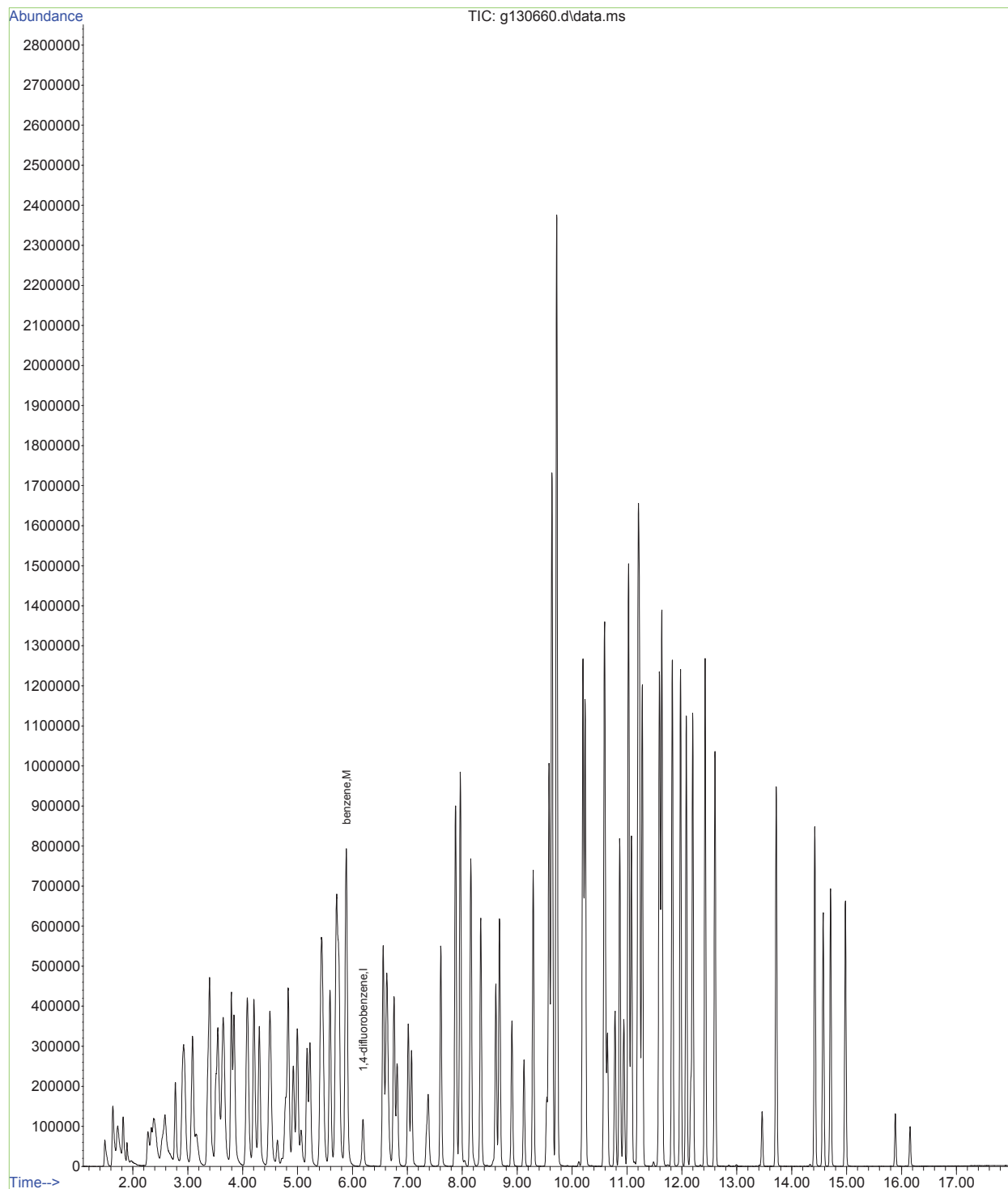
Compound	R.T.	QIon	Response	Conc Units	Dev(Min)

Internal Standards					
1) 1,4-difluorobenzene	6.195	114	122887	50.00 ppb	0.00
Target Compounds					
2) benzene	5.895	78	819471	204.59 ppb	Qvalue 98

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data Path : O:\msg\1\data backup\g130820\
Data File : g130660.d
Acq On : 20 Aug 2013 3:21 pm
Operator : jaimem
Sample : ic5092-200
Misc : MS29686,MSG5092,10,,100,10,1
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Oct 07 18:29:46 2015
Quant Method : O:\msg\1\methods\g130820sx.m
Quant Title : SW-846 Method 8260
QLast Update : Fri Oct 02 12:22:05 2015
Response via : Initial Calibration



g130820sx.m Wed Oct 07 18:30:18 2015

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Data Path : O:\msg\1\data backup\gl30820\
Data File : gl30661.d
Acq On : 20 Aug 2013 3:49 pm
Operator : jaimem
Sample : ic5092-400
Misc : MS29686,MSG5092,10,,100,10,1
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Oct 07 18:30:06 2015
Quant Method : O:\msg\1\methods\gl30820sx.m
Quant Title : SW-846 Method 8260
QLast Update : Fri Oct 02 12:22:05 2015
Response via : Initial Calibration

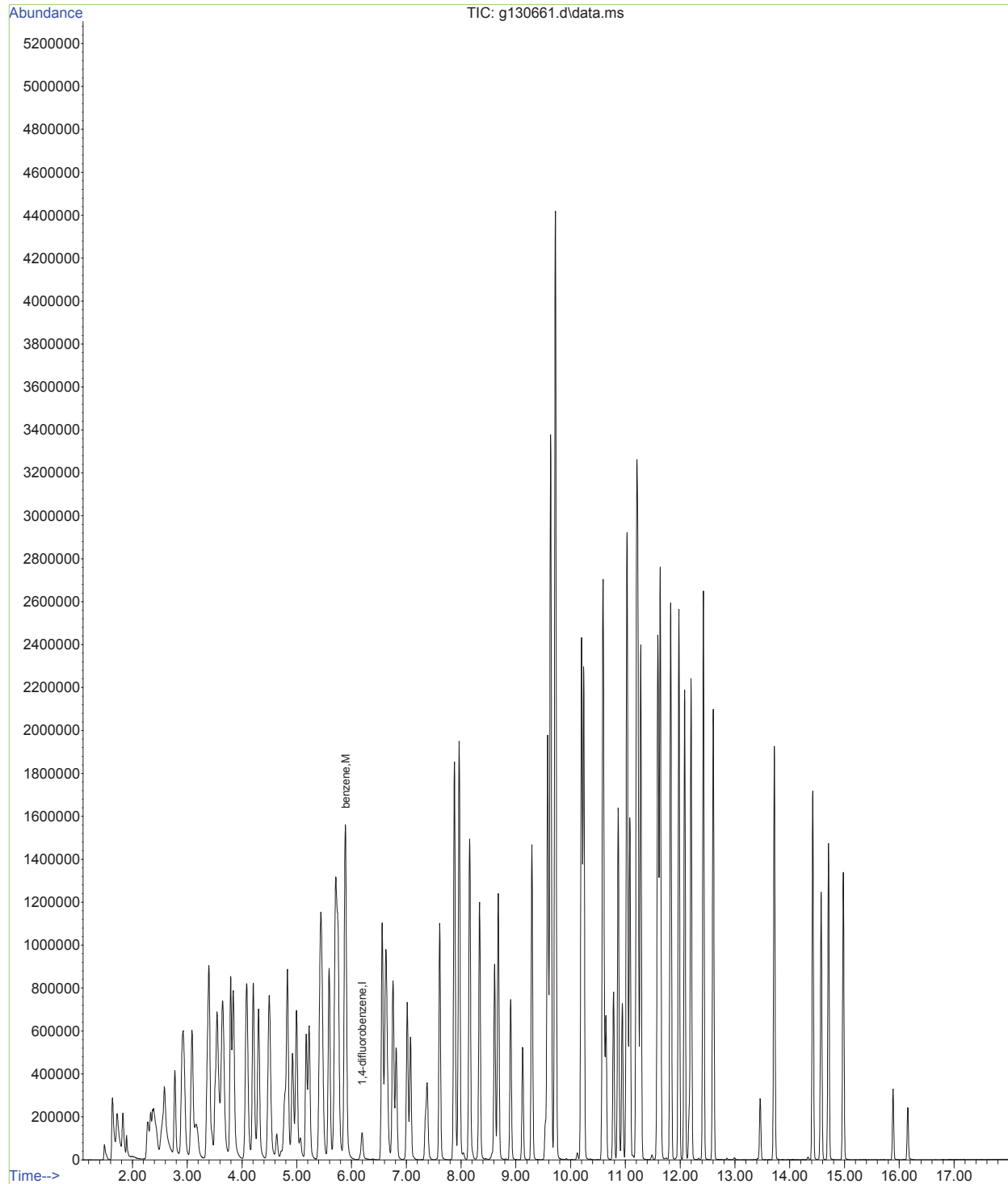
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

Internal Standards						
1) 1,4-difluorobenzene	6.195	114	126723	50.00	ppb	0.00
Target Compounds						
2) benzene	5.895	78	1625886	396.47	ppb	Qvalue 98

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data Path : O:\msg\1\data backup\g130820\
Data File : g130661.d
Acq On : 20 Aug 2013 3:49 pm
Operator : jaimem
Sample : ic5092-400
Misc : MS29686,MSG5092,10,,100,10,1
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Oct 07 18:30:06 2015
Quant Method : O:\msg\1\methods\g130820sx.m
Quant Title : SW-846 Method 8260
QLast Update : Fri Oct 02 12:22:05 2015
Response via : Initial Calibration



Data Path : O:\msg\1\data backup\gl30820\
Data File : gl30664.d
Acq On : 20 Aug 2013 5:13 pm
Operator : jaimem
Sample : bs
Misc : MS29686,MSG5092,10,,100,10,1
ALS Vial : 13 Sample Multiplier: 1

Quant Time: Oct 14 12:44:05 2015
Quant Method : O:\msg\1\methods\gl30820sx.m
Quant Title : SW-846 Method 8260
QLast Update : Wed Oct 14 12:43:07 2015
Response via : Initial Calibration

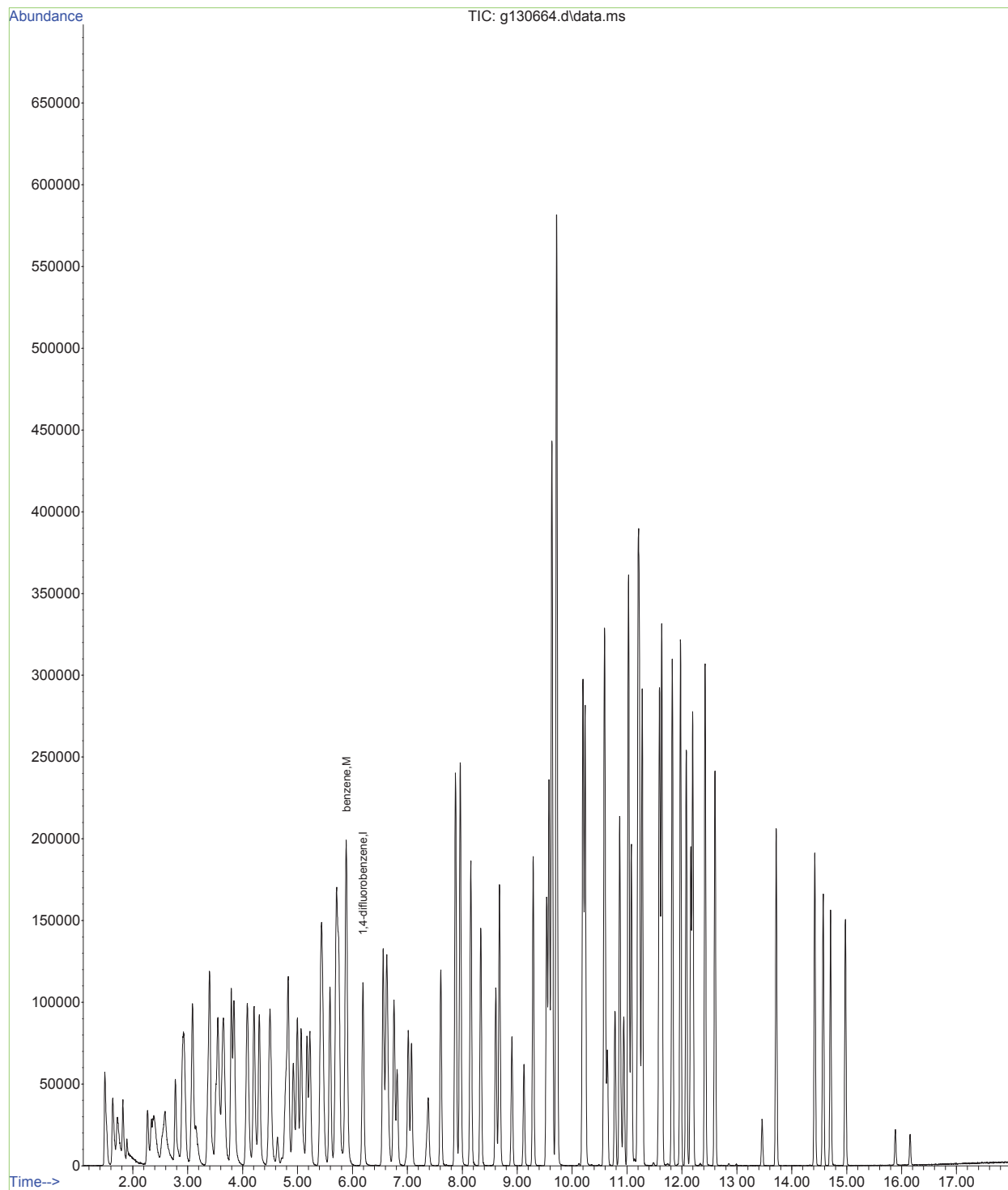
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

Internal Standards						
1) 1,4-difluorobenzene	6.195	114	120819	50.00	ppb	0.00
Target Compounds						
2) benzene	5.894	78	205207	51.08	ppb	Qvalue 98

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data Path : O:\msg\1\data backup\g130820\
Data File : g130664.d
Acq On : 20 Aug 2013 5:13 pm
Operator : jaimem
Sample : bs
Misc : MS29686,MSG5092,10,,100,10,1
ALS Vial : 13 Sample Multiplier: 1

Quant Time: Oct 14 12:44:05 2015
Quant Method : O:\msg\1\methods\g130820sx.m
Quant Title : SW-846 Method 8260
QLast Update : Wed Oct 14 12:43:07 2015
Response via : Initial Calibration



g130820sx.m Wed Oct 14 12:49:52 2015

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Quantitation Report (QT Reviewed)

Data Path : O:\msg\1\data backup\g130830\
Data File : g131022.d
Acq On : 30 Aug 2013 8:25 am
Operator : jaimem
Sample : cc5092-50
Misc : MS29778,MSG5100,10,,100,10,1
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Oct 16 14:54:59 2015
Quant Method : O:\msg\1\methods\g130820sx.m
Quant Title : SW-846 Method 8260
QLast Update : Wed Oct 14 12:43:07 2015
Response via : Initial Calibration

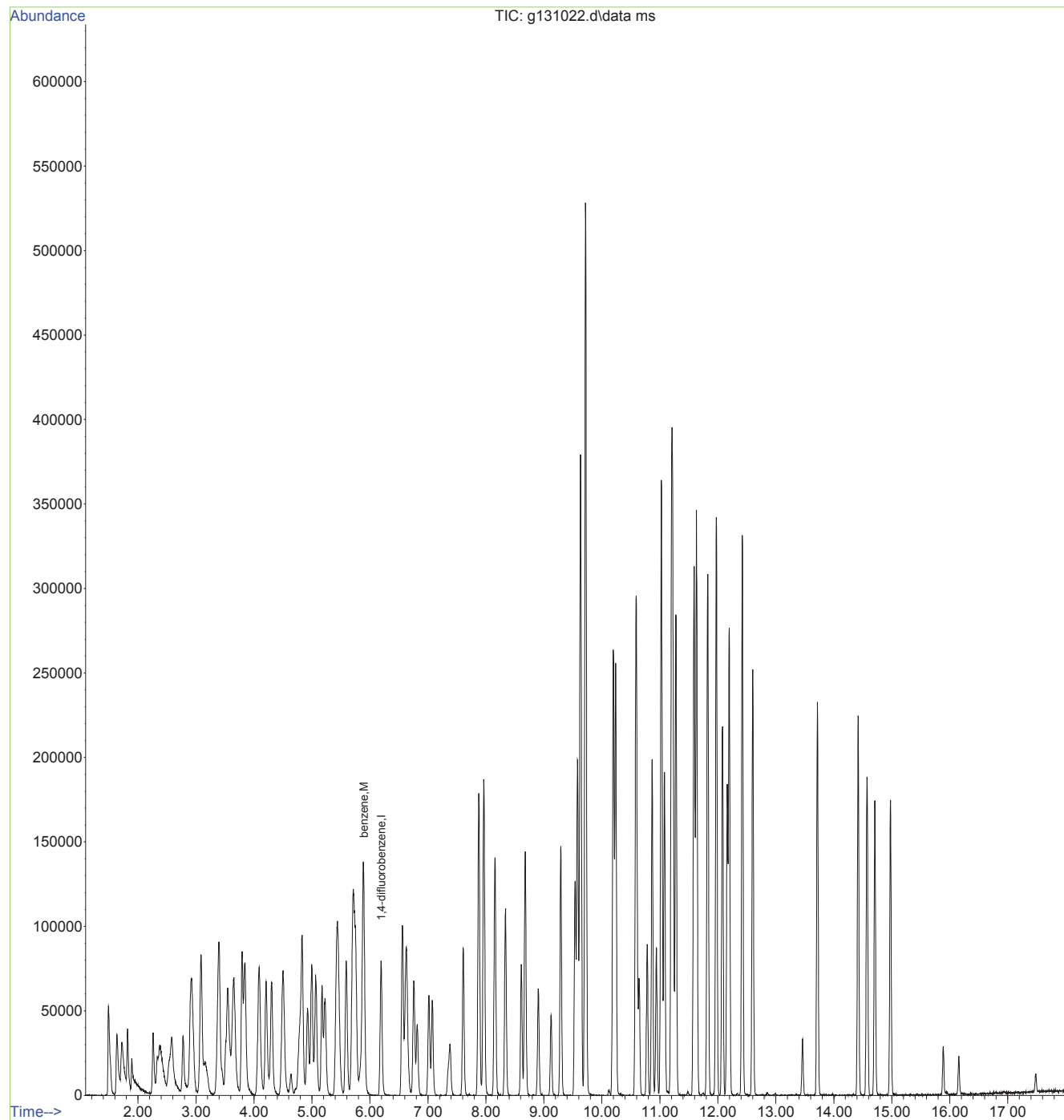
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

Internal Standards						
1) 1,4-difluorobenzene	6.195	114	88553	50.00	ppb	0.00
Target Compounds						Qvalue
2) benzene	5.894	78	142648	48.42	ppb	98

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data Path : O:\msg\1\data backup\g130830\
Data File : g131022.d
Acq On : 30 Aug 2013 8:25 am
Operator : jaimem
Sample : cc5092-50
Misc : MS29778,MSG5100,10,,100,10,1
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Oct 16 14:54:59 2015
Quant Method : O:\msg\1\methods\g130820sx.m
Quant Title : SW-846 Method 8260
QLast Update : Wed Oct 14 12:43:07 2015
Response via : Initial Calibration



g130820sx.m Fri Oct 16 14:56:18 2015

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Quantitation Report (QT Reviewed)

Data Path : O:\msg\1\data backup\g130830\
 Data File : g131027.d
 Acq On : 30 Aug 2013 10:48 am
 Operator : jaimem
 Sample : mc23933-4
 Misc : MS29790,MSG5100,4.46,,2,10,1
 ALS Vial : 7 Sample Multiplier: 1

Quant Time: Oct 16 13:55:05 2015
 Quant Method : O:\msg\1\methods\g130820sx.m
 Quant Title : SW-846 Method 8260
 QLast Update : Wed Oct 14 12:43:07 2015
 Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

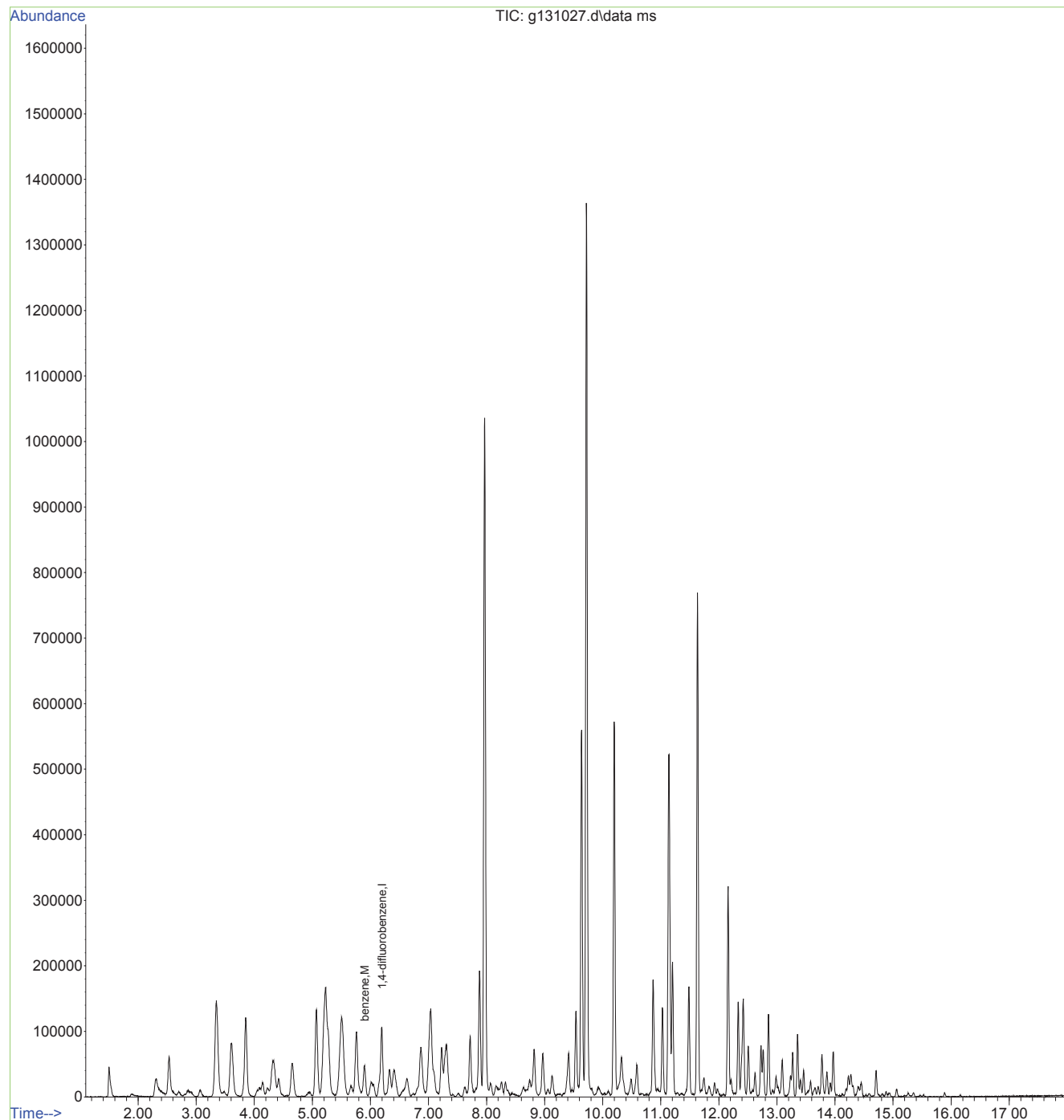
Internal Standards						
1) 1,4-difluorobenzene	6.201	114	93054	50.00	ppb	0.00
Target Compounds						
2) benzene	5.898	78	48257	15.30	ppb	Qvalue 97

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

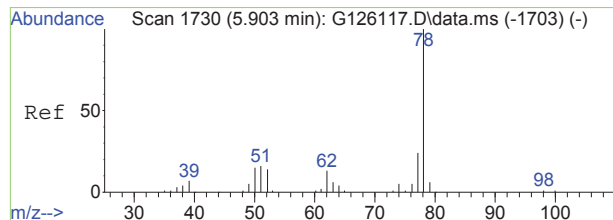
Data Path : O:\msg\1\data backup\g130830\
 Data File : g131027.d
 Acq On : 30 Aug 2013 10:48 am
 Operator : jaimem
 Sample : mc23933-4
 Misc : MS29790,MSG5100,4.46,,2,10,1
 ALS Vial : 7 Sample Multiplier: 1

Quant Time: Oct 16 13:55:05 2015
 Quant Method : O:\msg\1\methods\g130820sx.m
 Quant Title : SW-846 Method 8260
 QLast Update : Wed Oct 14 12:43:07 2015
 Response via : Initial Calibration



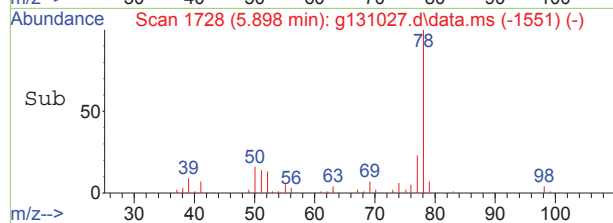
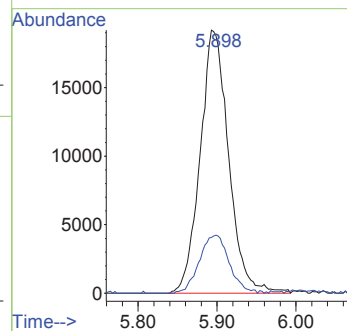
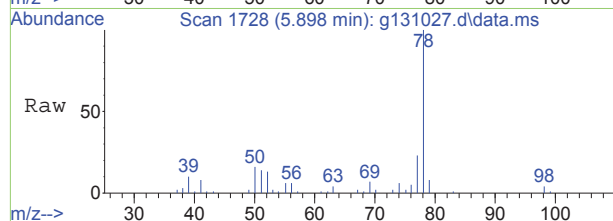
g130820sx.m Fri Jan 08 17:29:48 2016

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#2
benzene
Concen: 15.30 ppb
RT: 5.898 min Scan# 1728
Delta R.T. 0.003 min
Lab File: g131027.d
Acq: 30 Aug 2013 10:48 am

Tgt Ion: 78 Resp: 48257
Ion Ratio Lower Upper
78 100
77 22.6 0.0 54.0



Quantitation Report (QT Reviewed)

Data Path : O:\msg\1\data backup\g130830\
 Data File : g131028.d
 Acq On : 30 Aug 2013 11:17 am
 Operator : jaimem
 Sample : mc23933-5
 Misc : MS29790,MSG5100,5.74,,2,10,1
 ALS Vial : 8 Sample Multiplier: 1

Quant Time: Oct 16 13:55:07 2015
 Quant Method : O:\msg\1\methods\g130820sx.m
 Quant Title : SW-846 Method 8260
 QLast Update : Wed Oct 14 12:43:07 2015
 Response via : Initial Calibration

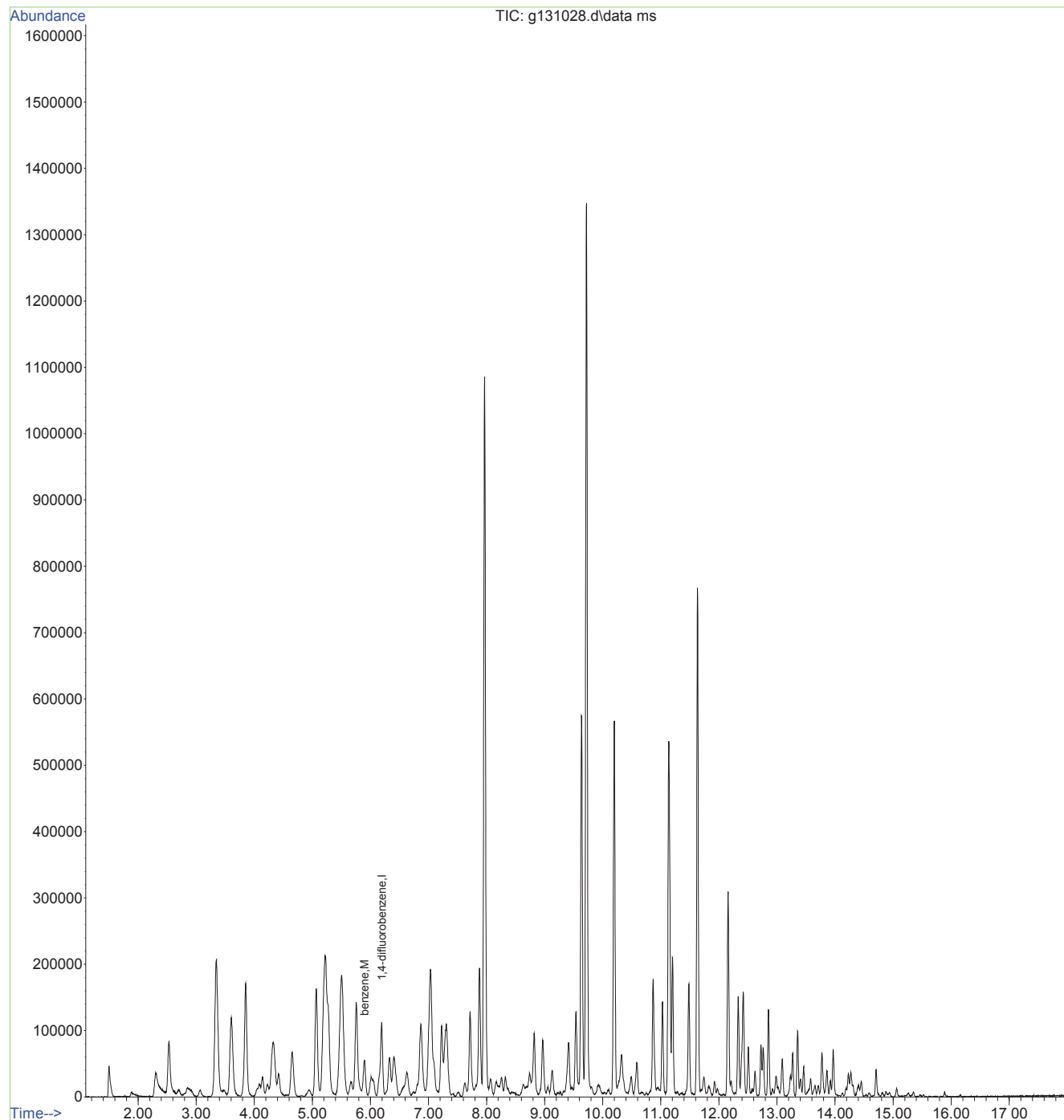
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

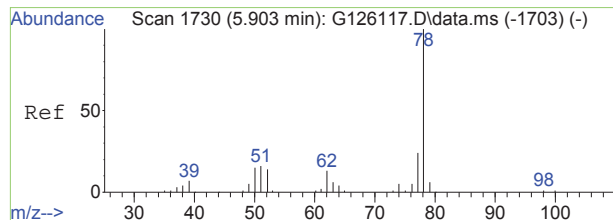
Internal Standards						
1) 1,4-difluorobenzene	6.198	114	87670	50.00	ppb	0.00
Target Compounds						
2) benzene	5.898	78	54790	18.52	ppb	Qvalue 100

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data Path : O:\msg\1\data backup\g130830\
Data File : g131028.d
Acq On : 30 Aug 2013 11:17 am
Operator : jaimem
Sample : mc23933-5
Misc : MS29790,MSG5100,5.74,,2,10,1
ALS Vial : 8 Sample Multiplier: 1

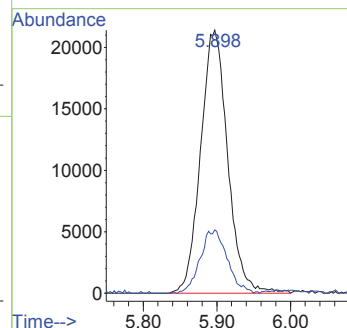
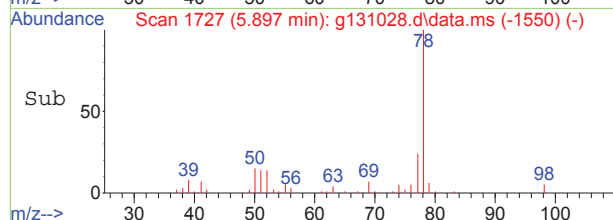
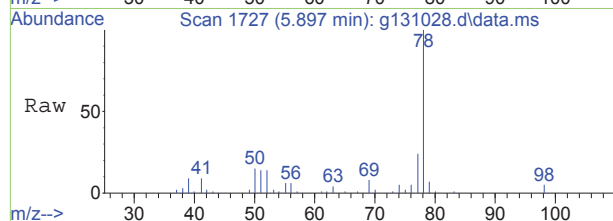
Quant Time: Oct 16 13:55:07 2015
Quant Method : O:\msg\1\methods\g130820sx.m
Quant Title : SW-846 Method 8260
QLast Update : Wed Oct 14 12:43:07 2015
Response via : Initial Calibration





#2
benzene
Concen: 18.52 ppb
RT: 5.898 min Scan# 1727
Delta R.T. 0.003 min
Lab File: g131028.d
Acq: 30 Aug 2013 11:17 am

Tgt Ion	Ratio	Lower	Upper
78	100		
77	24.0	0.0	54.0



Quantitation Report (QT Reviewed)

Data Path : O:\msg\1\data backup\g130830\
 Data File : g131023.d
 Acq On : 30 Aug 2013 8:54 am
 Operator : jaimem
 Sample : bs
 Misc : MS29778,MSG5100,10,,100,10,1
 ALS Vial : 3 Sample Multiplier: 1

Quant Time: Oct 16 14:55:01 2015
 Quant Method : O:\msg\1\methods\g130820sx.m
 Quant Title : SW-846 Method 8260
 QLast Update : Wed Oct 14 12:43:07 2015
 Response via : Initial Calibration

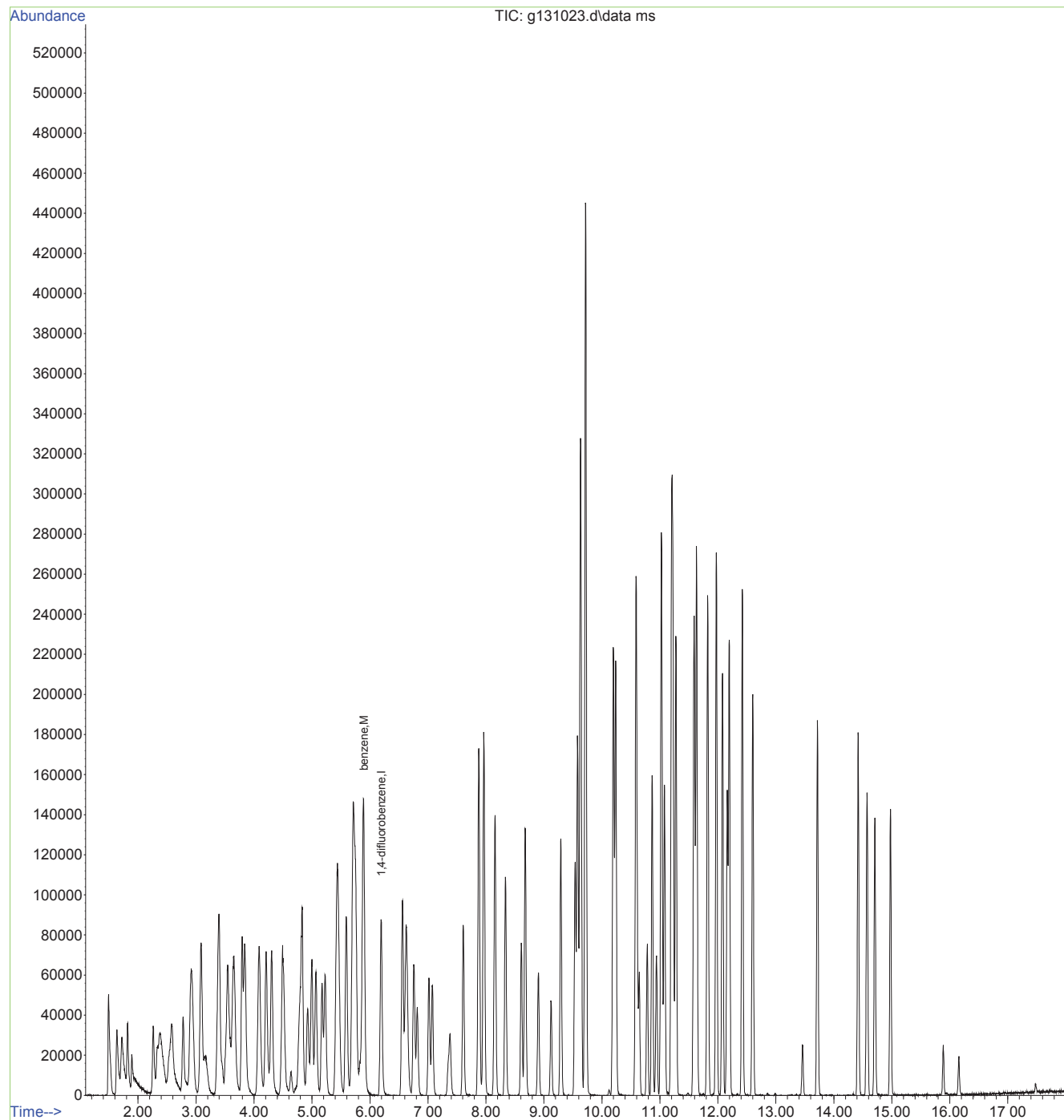
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

Internal Standards						
1) 1,4-difluorobenzene	6.195	114	99635	50.00	ppb	0.00
Target Compounds						
2) benzene	5.895	78	153236	46.21	ppb	Qvalue 96

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data Path : O:\msg\1\data backup\g130830\
Data File : g131023.d
Acq On : 30 Aug 2013 8:54 am
Operator : jaimem
Sample : bs
Misc : MS29778,MSG5100,10,,100,10,1
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Oct 16 14:55:01 2015
Quant Method : O:\msg\1\methods\g130820sx.m
Quant Title : SW-846 Method 8260
QLast Update : Wed Oct 14 12:43:07 2015
Response via : Initial Calibration



g130820sx.m Fri Oct 16 14:56:52 2015

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Quantitation Report (QT Reviewed)

Data Path : O:\msg\1\data backup\g130830\
 Data File : g131025.d
 Acq On : 30 Aug 2013 9:50 am
 Operator : jaimem
 Sample : mb
 Misc : MS29790,MSG5100,10,,100,10,1
 ALS Vial : 5 Sample Multiplier: 1

Quant Time: Oct 16 14:55:03 2015
 Quant Method : O:\msg\1\methods\g130820sx.m
 Quant Title : SW-846 Method 8260
 QLast Update : Wed Oct 14 12:43:07 2015
 Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

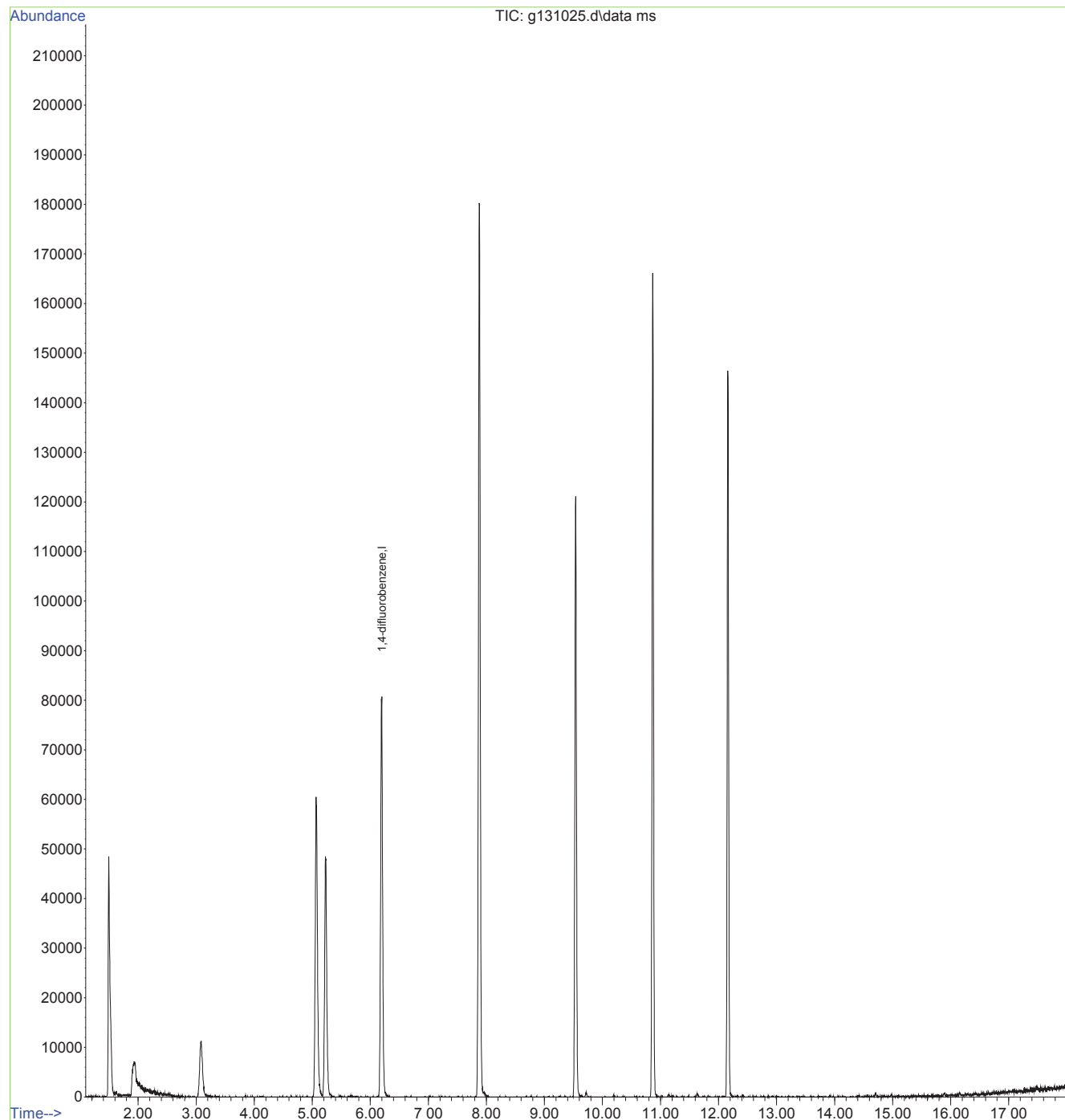
Internal Standards						
1) 1,4-difluorobenzene	6.197	114	92082	50.00	ppb	0.00

Target Compounds	Qvalue

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data Path : O:\msg\1\data backup\g130830\
Data File : g131025.d
Acq On : 30 Aug 2013 9:50 am
Operator : jaimem
Sample : mb
Misc : MS29790,MSG5100,10,,100,10,1
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Oct 16 14:55:03 2015
Quant Method : O:\msg\1\methods\g130820sx.m
Quant Title : SW-846 Method 8260
QLast Update : Wed Oct 14 12:43:07 2015
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : O:\msg\1\data backup\g130830\
 Data File : g131029.d
 Acq On : 30 Aug 2013 11:45 am
 Operator : jaimem
 Sample : mc23888-1ms
 Misc : MS29790,MSG5100,10.152,,100,10,1
 ALS Vial : 9 Sample Multiplier: 1

Quant Time: Oct 16 14:55:09 2015
 Quant Method : O:\msg\1\methods\g130820sx.m
 Quant Title : SW-846 Method 8260
 QLast Update : Wed Oct 14 12:43:07 2015
 Response via : Initial Calibration

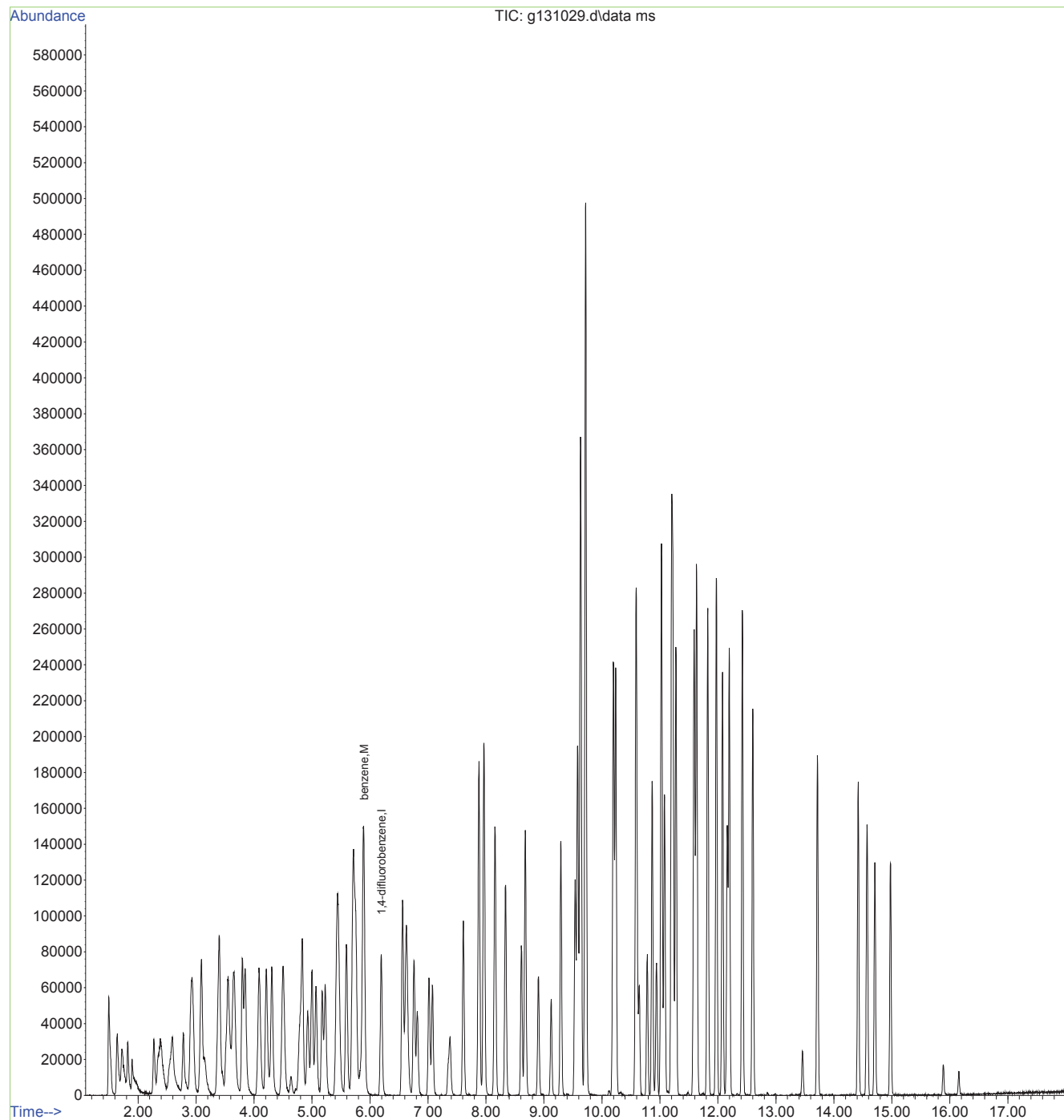
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

Internal Standards						
1) 1,4-difluorobenzene	6.197	114	85694	50.00	ppb	0.00
Target Compounds						Qvalue
2) benzene	5.896	78	154034	54.08	ppb	99

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data Path : O:\msg\1\data backup\g130830\
Data File : g131029.d
Acq On : 30 Aug 2013 11:45 am
Operator : jaimem
Sample : mc23888-1ms
Misc : MS29790,MSG5100,10.152,,100,10,1
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Oct 16 14:55:09 2015
Quant Method : O:\msg\1\methods\g130820sx.m
Quant Title : SW-846 Method 8260
QLast Update : Wed Oct 14 12:43:07 2015
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : O:\msg\1\data backup\g130830\
 Data File : g131030.d
 Acq On : 30 Aug 2013 12:14 pm
 Operator : jaimem
 Sample : mc23888-1msd
 Misc : MS29790,MSG5100,10.152,,100,10,1
 ALS Vial : 10 Sample Multiplier: 1

Quant Time: Oct 16 14:55:11 2015
 Quant Method : O:\msg\1\methods\g130820sx.m
 Quant Title : SW-846 Method 8260
 QLast Update : Wed Oct 14 12:43:07 2015
 Response via : Initial Calibration

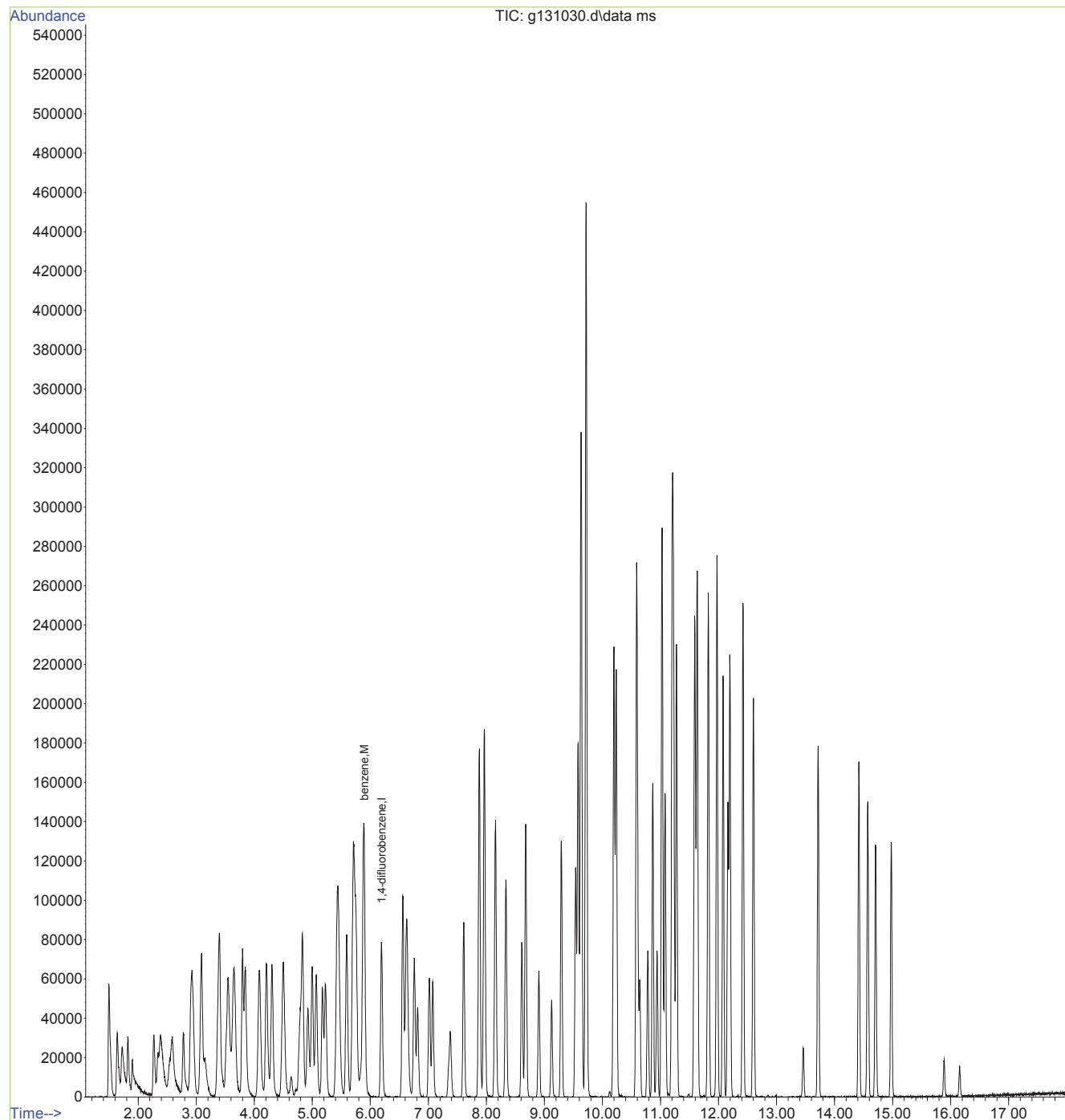
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)

Internal Standards						
1) 1,4-difluorobenzene	6.196	114	86578	50.00	ppb	0.00
Target Compounds						Qvalue
2) benzene	5.895	78	144258	50.10	ppb	100

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data Path : O:\msg\1\data backup\g130830\
Data File : g131030.d
Acq On : 30 Aug 2013 12:14 pm
Operator : jaimem
Sample : mc23888-1msd
Misc : MS29790,MSG5100,10.152,,100,10,1
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Oct 16 14:55:11 2015
Quant Method : O:\msg\1\methods\g130820sx.m
Quant Title : SW-846 Method 8260
QLast Update : Wed Oct 14 12:43:07 2015
Response via : Initial Calibration



g130820sx.m Fri Oct 16 14:59:56 2015

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Internal Sample Tracking Chronicle

Shell Oil

Job No: MC23933

URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL
 Project No: 21562850.06000

Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
MC23933-1 Collected: 28-AUG-13 00:00 By: MCJC Received: 29-AUG-13 By: TB-082813-HCL						
MC23933-1	SW846 8260B	29-AUG-13 14:26	AMY			V8260SL +
MC23933-2 Collected: 28-AUG-13 13:50 By: MCJC Received: 29-AUG-13 By: VMP56-082813(9-11')						
MC23933-2	SM21 2540 B MOD.	29-AUG-13	BF			%SOL
MC23933-2	SW846 8260B	30-AUG-13 11:00	KD			V8260SL +
MC23933-2	SW846 8015	30-AUG-13 11:51	TB			V8015GRO
MC23933-3 Collected: 28-AUG-13 14:40 By: MCJC Received: 29-AUG-13 By: VMP56-082813(24-25')						
MC23933-3	SM21 2540 B MOD.	29-AUG-13	BF			%SOL
MC23933-3	SW846 8260B	30-AUG-13 11:30	KD			V8260SL +
MC23933-3	SW846 8015	30-AUG-13 13:43	TB			V8015GRO
MC23933-4 Collected: 28-AUG-13 14:55 By: MCJC Received: 29-AUG-13 By: VMP56-082813(38-38.5')						
MC23933-4	SM21 2540 B MOD.	29-AUG-13	BF			%SOL
MC23933-4	SW846 8260B	30-AUG-13 10:48	JM			V8260SL +
MC23933-4	SW846 8015	30-AUG-13 14:21	TB			V8015GRO
MC23933-5 Collected: 28-AUG-13 14:55 By: MCJC Received: 29-AUG-13 By: VMP56-082813-D(38-38.5')						
MC23933-5	SM21 2540 B MOD.	29-AUG-13	BF			%SOL
MC23933-5	SW846 8260B	30-AUG-13 11:17	JM			V8260SL +
MC23933-5	SW846 8015	30-AUG-13 14:59	TB			V8015GRO
MC23933-6 Collected: 28-AUG-13 14:10 By: MCJC Received: 29-AUG-13 By: VMP56-082813-EB(30.5-33')						
MC23933-6	SW846 8260B	29-AUG-13 14:52	AMY			V8260SL +
MC23933-6	SW846 8015	30-AUG-13 11:14	TB			V8015GRO

SGS Accutest Internal Chain of Custody

Page 1 of 3

Job Number: MC23933
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL
 Received: 08/29/13

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
MC23933-1.1	VOC Ref #4	Amy Min Yang	08/29/13 13:32	Retrieve from Storage
MC23933-1.1	Amy Min Yang	GCMSV	08/29/13 13:32	Load on Instrument
MC23933-1.1	GCMSV	Amy Min Yang	08/30/13 15:23	Unload from Instrument
MC23933-1.1	Amy Min Yang	VOC Ref #4	08/30/13 15:23	Return to Storage
MC23933-1.1	Scott Parsick		01/08/14 17:05	Disposed
MC23933-2.1	Walk In Ref #5	Bijan Firowznin	08/29/13 15:29	Retrieve from Storage
MC23933-2.1	Bijan Firowznin	Walk In Ref #5	08/29/13 16:09	Return to Storage
MC23933-2.1	Scott Parsick		01/08/14 17:05	Disposed
MC23933-2.4	VOC Ref #10	Krysten Dufort	08/30/13 09:13	Retrieve from Storage
MC23933-2.4	Krysten Dufort	GCMSM	08/30/13 09:14	Load on Instrument
MC23933-2.4	GCMSM	Krysten Dufort	09/03/13 10:08	Unload from Instrument
MC23933-2.4	Krysten Dufort	VOC Ref #10	09/03/13 10:08	Return to Storage
MC23933-2.4	Scott Parsick		01/08/14 17:05	Disposed
MC23933-2.5	VOC Ref #10	Krysten Dufort	08/30/13 09:13	Retrieve from Storage
MC23933-2.5	Krysten Dufort	GCMSM	08/30/13 09:14	Load on Instrument
MC23933-2.5	GCMSM	Krysten Dufort	09/03/13 10:08	Unload from Instrument
MC23933-2.5	Krysten Dufort	VOC Ref #10	09/03/13 10:08	Return to Storage
MC23933-2.5	Scott Parsick		01/08/14 17:05	Disposed
MC23933-2.6	VOC Ref #10	Krysten Dufort	08/30/13 09:13	Retrieve from Storage
MC23933-2.6	Krysten Dufort	GCMSM	08/30/13 09:14	Load on Instrument
MC23933-2.6	GCMSM	Krysten Dufort	09/03/13 10:08	Unload from Instrument
MC23933-2.6	Krysten Dufort	VOC Ref #10	09/03/13 10:08	Return to Storage
MC23933-2.6	Scott Parsick		01/08/14 17:05	Disposed
MC23933-2.14	VOC Ref #10	Todd Bahosh	08/30/13 09:18	Retrieve from Storage
MC23933-2.14	Todd Bahosh	GCWX	08/30/13 09:18	Load on Instrument
MC23933-2.14	GCWX	Todd Bahosh	09/03/13 11:08	Unload from Instrument
MC23933-2.14	Todd Bahosh	VOC Ref #10	09/03/13 11:08	Return to Storage
MC23933-2.14	Scott Parsick		01/08/14 17:05	Disposed
MC23933-2.17	VOC Ref #10	Jaime Maslowski	08/29/13 15:13	Retrieve from Storage
MC23933-2.17	Jaime Maslowski	VOC Ref #10	08/30/13 09:02	Return to Storage
MC23933-2.17	Scott Parsick		01/08/14 17:05	Disposed
MC23933-3.1	Walk In Ref #5	Bijan Firowznin	08/29/13 15:29	Retrieve from Storage
MC23933-3.1	Bijan Firowznin	Walk In Ref #5	08/29/13 16:09	Return to Storage
MC23933-3.1	Scott Parsick		01/08/14 17:05	Disposed
MC23933-3.2	VOC Ref #10	Krysten Dufort	08/30/13 11:04	Retrieve from Storage
MC23933-3.2	Krysten Dufort	GCMSM	08/30/13 11:04	Load on Instrument

5.4

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SGS Accutest Internal Chain of Custody

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Job Number: MC23933
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL
 Received: 08/29/13

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
MC23933-3.2	GCMSM	Krysten Dufort	09/03/13 10:08	Unload from Instrument
MC23933-3.2	Krysten Dufort	VOC Ref #10	09/03/13 10:08	Return to Storage
MC23933-3.2	Scott Parsick		01/08/14 17:05	Disposed
MC23933-3.5	VOC Ref #10	Todd Bahosh	08/30/13 09:18	Retrieve from Storage
MC23933-3.5	Todd Bahosh	GCWX	08/30/13 09:18	Load on Instrument
MC23933-3.5	GCWX	Todd Bahosh	09/03/13 11:08	Unload from Instrument
MC23933-3.5	Todd Bahosh	VOC Ref #10	09/03/13 11:08	Return to Storage
MC23933-3.5	Scott Parsick		01/08/14 17:05	Disposed
MC23933-3.6	VOC Ref #10	Jaime Maslowski	08/29/13 15:13	Retrieve from Storage
MC23933-3.6	Jaime Maslowski	VOC Ref #10	08/30/13 09:02	Return to Storage
MC23933-3.6	VOC Ref #10	Jaime Maslowski	08/30/13 09:03	Retrieve from Storage
MC23933-3.6	Jaime Maslowski	VOC Ref #10	09/03/13 12:33	Return to Storage
MC23933-3.6	Scott Parsick		01/08/14 17:05	Disposed
MC23933-4.1	Walk In Ref #5	Bijan Firowznin	08/29/13 15:29	Retrieve from Storage
MC23933-4.1	Bijan Firowznin	Walk In Ref #5	08/29/13 16:09	Return to Storage
MC23933-4.1	Scott Parsick		01/08/14 17:05	Disposed
MC23933-4.5	VOC Ref #10	Todd Bahosh	08/30/13 09:18	Retrieve from Storage
MC23933-4.5	Todd Bahosh	GCWX	08/30/13 09:18	Load on Instrument
MC23933-4.5	GCWX	Todd Bahosh	09/03/13 11:08	Unload from Instrument
MC23933-4.5	Todd Bahosh	VOC Ref #10	09/03/13 11:08	Return to Storage
MC23933-4.5	Scott Parsick		01/08/14 17:05	Disposed
MC23933-4.6	VOC Ref #10	Jaime Maslowski	08/29/13 15:13	Retrieve from Storage
MC23933-4.6	Jaime Maslowski	VOC Ref #10	08/30/13 09:02	Return to Storage
MC23933-4.6	VOC Ref #10	Jaime Maslowski	08/30/13 09:03	Retrieve from Storage
MC23933-4.6	Jaime Maslowski	VOC Ref #10	09/03/13 12:33	Return to Storage
MC23933-4.6	Scott Parsick		01/08/14 17:05	Disposed
MC23933-5.1	Walk In Ref #5	Bijan Firowznin	08/29/13 15:29	Retrieve from Storage
MC23933-5.1	Bijan Firowznin	Walk In Ref #5	08/29/13 16:09	Return to Storage
MC23933-5.1	Scott Parsick		01/08/14 17:05	Disposed
MC23933-5.4	VOC Ref #10	Todd Bahosh	08/30/13 09:18	Retrieve from Storage
MC23933-5.4	Todd Bahosh	GCWX	08/30/13 09:18	Load on Instrument
MC23933-5.4	GCWX	Todd Bahosh	09/03/13 11:08	Unload from Instrument
MC23933-5.4	Todd Bahosh	VOC Ref #10	09/03/13 11:08	Return to Storage
MC23933-5.4	Scott Parsick		01/08/14 17:05	Disposed
MC23933-5.5	VOC Ref #10	Jaime Maslowski	08/29/13 15:13	Retrieve from Storage
MC23933-5.5	Jaime Maslowski	VOC Ref #10	08/30/13 09:02	Return to Storage

5.4

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SGS Accutest Internal Chain of Custody

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Job Number: MC23933
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL
 Received: 08/29/13

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
MC23933-5.5	VOC Ref #10	Jaime Maslowski	08/30/13 09:03	Retrieve from Storage
MC23933-5.5	Jaime Maslowski	VOC Ref #10	09/03/13 12:33	Return to Storage
MC23933-5.5	Scott Parsick		01/08/14 17:05	Disposed
MC23933-6.1	VOC Ref #4	Amy Min Yang	08/29/13 13:32	Retrieve from Storage
MC23933-6.1	Amy Min Yang	GCMSV	08/29/13 13:32	Load on Instrument
MC23933-6.1	GCMSV	Amy Min Yang	08/30/13 15:23	Unload from Instrument
MC23933-6.1	Amy Min Yang	VOC Ref #4	08/30/13 15:23	Return to Storage
MC23933-6.1	Scott Parsick		01/08/14 17:05	Disposed
MC23933-6.4	VOC Ref #4	Todd Bahosh	08/30/13 09:16	Retrieve from Storage
MC23933-6.4	Todd Bahosh	GCWX	08/30/13 09:17	Load on Instrument
MC23933-6.4	GCWX	Todd Bahosh	09/03/13 11:07	Unload from Instrument
MC23933-6.4	Todd Bahosh	VOC Ref #4	09/03/13 11:07	Return to Storage
MC23933-6.4	Scott Parsick		01/08/14 17:05	Disposed

5.4

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GC/MS Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Internal Standard Area Summaries
- Surrogate Recovery Summaries

Method Blank Summary

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Job Number: MC23933

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSV864-MB	V22443.D	1	08/29/13	AMY	n/a	n/a	MSV864

The QC reported here applies to the following samples:

Method: SW846 8260B

MC23933-1, MC23933-6

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	2.8	ug/l	
107-02-8	Acrolein	ND	25	6.3	ug/l	
107-13-1	Acrylonitrile	ND	5.0	3.5	ug/l	
71-43-2	Benzene	ND	0.50	0.45	ug/l	
108-86-1	Bromobenzene	ND	5.0	0.44	ug/l	
74-97-5	Bromochloromethane	ND	5.0	0.64	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.33	ug/l	
75-25-2	Bromoform	ND	1.0	0.42	ug/l	
74-83-9	Bromomethane	ND	2.0	1.5	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	1.6	ug/l	
104-51-8	n-Butylbenzene	ND	5.0	0.54	ug/l	
135-98-8	sec-Butylbenzene	ND	5.0	0.58	ug/l	
98-06-6	tert-Butylbenzene	ND	5.0	0.87	ug/l	
75-15-0	Carbon disulfide	ND	5.0	0.59	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.62	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.48	ug/l	
75-00-3	Chloroethane	ND	2.0	0.84	ug/l	
110-75-8	2-Chloroethyl vinyl ether	ND	5.0	1.1	ug/l	
67-66-3	Chloroform	ND	1.0	0.50	ug/l	
74-87-3	Chloromethane	ND	2.0	1.4	ug/l	
95-49-8	o-Chlorotoluene	ND	5.0	0.55	ug/l	
106-43-4	p-Chlorotoluene	ND	5.0	0.48	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	1.7	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.33	ug/l	
106-93-4	1,2-Dibromoethane	ND	2.0	0.38	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.35	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.30	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.26	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.2	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.37	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.35	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	0.67	ug/l	
156-59-2	cis-1,2-Dichloroethene	ND	1.0	0.54	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	0.54	ug/l	
78-87-5	1,2-Dichloropropane	ND	2.0	0.45	ug/l	
142-28-9	1,3-Dichloropropane	ND	5.0	0.97	ug/l	

6.1.1

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Method Blank Summary

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Job Number: MC23933

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSV864-MB	V22443.D	1	08/29/13	AMY	n/a	n/a	MSV864

The QC reported here applies to the following samples:

Method: SW846 8260B

MC23933-1, MC23933-6

CAS No.	Compound	Result	RL	MDL	Units	Q
594-20-7	2,2-Dichloropropane	ND	5.0	1.3	ug/l	
563-58-6	1,1-Dichloropropene	ND	5.0	0.63	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.22	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.29	ug/l	
123-91-1	1,4-Dioxane	ND	25	16	ug/l	
97-63-2	Ethyl methacrylate	ND	5.0	0.81	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.38	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.0	1.3	ug/l	
591-78-6	2-Hexanone	ND	5.0	2.3	ug/l	
98-82-8	Isopropylbenzene	ND	5.0	0.64	ug/l	
99-87-6	p-Isopropyltoluene	ND	5.0	0.55	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.43	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	1.3	ug/l	
74-95-3	Methylene bromide	ND	5.0	0.43	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.41	ug/l	
91-20-3	Naphthalene	ND	5.0	0.79	ug/l	
103-65-1	n-Propylbenzene	ND	5.0	0.59	ug/l	
100-42-5	Styrene	ND	5.0	0.49	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	0.46	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.42	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	0.61	ug/l	
108-88-3	Toluene	ND	1.0	0.46	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	0.76	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	0.45	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.94	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.49	ug/l	
79-01-6	Trichloroethene	ND	1.0	0.45	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.61	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.70	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	0.47	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	1.1	ug/l	
108-05-4	Vinyl Acetate	ND	5.0	1.3	ug/l	
75-01-4	Vinyl chloride	ND	1.0	0.61	ug/l	
	m,p-Xylene	ND	1.0	0.70	ug/l	
95-47-6	o-Xylene	ND	1.0	0.41	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.41	ug/l	

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Job Number: MC23933

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSV864-MB	V22443.D	1	08/29/13	AMY	n/a	n/a	MSV864

The QC reported here applies to the following samples:

Method: SW846 8260B

MC23933-1, MC23933-6

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	97% 70-130%
2037-26-5	Toluene-D8	99% 70-130%
460-00-4	4-Bromofluorobenzene	100% 70-130%

CAS No.	Tentatively Identified Compounds	R.T.	Est. Conc.	Units	Q
	Total TIC, Volatile		0	ug/l	

Method Blank Summary

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Job Number: MC23933

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG5100-MB	G131025.D	1	08/30/13	JM	n/a	n/a	MSG5100

The QC reported here applies to the following samples:

Method: SW846 8260B

MC23933-4, MC23933-5

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	500	190	ug/kg	
107-02-8	Acrolein	ND	1300	190	ug/kg	
107-13-1	Acrylonitrile	ND	1300	67	ug/kg	
71-43-2	Benzene	ND	25	12	ug/kg	
108-86-1	Bromobenzene	ND	250	14	ug/kg	
74-97-5	Bromochloromethane	ND	250	29	ug/kg	
75-27-4	Bromodichloromethane	ND	100	18	ug/kg	
75-25-2	Bromoform	ND	100	15	ug/kg	
74-83-9	Bromomethane	ND	100	49	ug/kg	
78-93-3	2-Butanone (MEK)	ND	250	150	ug/kg	
104-51-8	n-Butylbenzene	ND	250	8.6	ug/kg	
135-98-8	sec-Butylbenzene	ND	250	7.9	ug/kg	
98-06-6	tert-Butylbenzene	ND	250	18	ug/kg	
75-15-0	Carbon disulfide	ND	250	7.6	ug/kg	
56-23-5	Carbon tetrachloride	ND	100	58	ug/kg	
108-90-7	Chlorobenzene	ND	100	13	ug/kg	
75-00-3	Chloroethane	ND	250	30	ug/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	250	240	ug/kg	
67-66-3	Chloroform	ND	100	14	ug/kg	
74-87-3	Chloromethane	ND	250	61	ug/kg	
95-49-8	o-Chlorotoluene	ND	250	20	ug/kg	
106-43-4	p-Chlorotoluene	ND	250	22	ug/kg	
96-12-8	1,2-Dibromo-3-chloropropane	ND	250	100	ug/kg	
124-48-1	Dibromochloromethane	ND	100	21	ug/kg	
106-93-4	1,2-Dibromoethane	ND	100	28	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	100	10	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	100	11	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	100	10	ug/kg	
75-71-8	Dichlorodifluoromethane	ND	100	56	ug/kg	
75-34-3	1,1-Dichloroethane	ND	100	17	ug/kg	
107-06-2	1,2-Dichloroethane	ND	100	27	ug/kg	
75-35-4	1,1-Dichloroethene	ND	100	26	ug/kg	
156-59-2	cis-1,2-Dichloroethene	ND	100	25	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	100	22	ug/kg	
78-87-5	1,2-Dichloropropane	ND	100	21	ug/kg	
142-28-9	1,3-Dichloropropane	ND	250	22	ug/kg	

Method Blank Summary

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Job Number: MC23933

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG5100-MB	G131025.D	1	08/30/13	JM	n/a	n/a	MSG5100

The QC reported here applies to the following samples:

Method: SW846 8260B

MC23933-4, MC23933-5

CAS No.	Compound	Result	RL	MDL	Units	Q
594-20-7	2,2-Dichloropropane	ND	250	33	ug/kg	
563-58-6	1,1-Dichloropropene	ND	250	12	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	100	14	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	100	15	ug/kg	
123-91-1	1,4-Dioxane	ND	1300	1000	ug/kg	
97-63-2	Ethyl methacrylate	ND	250	170	ug/kg	
100-41-4	Ethylbenzene	ND	100	8.9	ug/kg	
87-68-3	Hexachlorobutadiene	ND	250	28	ug/kg	
591-78-6	2-Hexanone	ND	250	120	ug/kg	
98-82-8	Isopropylbenzene	ND	250	14	ug/kg	
99-87-6	p-Isopropyltoluene	ND	250	8.0	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	100	20	ug/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	250	92	ug/kg	
74-95-3	Methylene bromide	ND	250	18	ug/kg	
75-09-2	Methylene chloride	ND	100	77	ug/kg	
91-20-3	Naphthalene	ND	250	39	ug/kg	
103-65-1	n-Propylbenzene	ND	250	12	ug/kg	
100-42-5	Styrene	ND	250	10	ug/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	250	19	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	100	15	ug/kg	
127-18-4	Tetrachloroethene	ND	100	22	ug/kg	
108-88-3	Toluene	ND	250	12	ug/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	250	22	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	250	18	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	100	9.0	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	100	17	ug/kg	
79-01-6	Trichloroethene	ND	100	24	ug/kg	
75-69-4	Trichlorofluoromethane	ND	100	52	ug/kg	
96-18-4	1,2,3-Trichloropropane	ND	250	19	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	250	10	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	250	6.5	ug/kg	
108-05-4	Vinyl Acetate	ND	250	63	ug/kg	
75-01-4	Vinyl chloride	ND	100	28	ug/kg	
	m,p-Xylene	ND	100	14	ug/kg	
95-47-6	o-Xylene	ND	100	10	ug/kg	
1330-20-7	Xylene (total)	ND	100	10	ug/kg	

6.1.2

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Method Blank Summary

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Job Number: MC23933

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG5100-MB	G131025.D	1	08/30/13	JM	n/a	n/a	MSG5100

The QC reported here applies to the following samples:

Method: SW846 8260B

MC23933-4, MC23933-5

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	93% 70-130%
2037-26-5	Toluene-D8	102% 70-130%
460-00-4	4-Bromofluorobenzene	96% 70-130%

CAS No.	Tentatively Identified Compounds	R.T.	Est. Conc.	Units	Q
	Total TIC, Volatile		0	ug/kg	

6.1.2
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Method Blank Summary

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Job Number: MC23933

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM2031-MB	M58881.D	1	08/30/13	KD	n/a	n/a	MSM2031

The QC reported here applies to the following samples:

Method: SW846 8260B

MC23933-2, MC23933-3

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	3.9	ug/kg	
107-02-8	Acrolein	ND	25	3.8	ug/kg	
107-13-1	Acrylonitrile	ND	25	1.3	ug/kg	
71-43-2	Benzene	ND	0.50	0.25	ug/kg	
108-86-1	Bromobenzene	ND	5.0	0.27	ug/kg	
74-97-5	Bromochloromethane	ND	5.0	0.58	ug/kg	
75-27-4	Bromodichloromethane	ND	2.0	0.36	ug/kg	
75-25-2	Bromoform	ND	2.0	0.29	ug/kg	
74-83-9	Bromomethane	ND	2.0	0.97	ug/kg	
78-93-3	2-Butanone (MEK)	ND	5.0	3.1	ug/kg	
104-51-8	n-Butylbenzene	ND	5.0	0.17	ug/kg	
135-98-8	sec-Butylbenzene	ND	5.0	0.16	ug/kg	
98-06-6	tert-Butylbenzene	ND	5.0	0.36	ug/kg	
75-15-0	Carbon disulfide	ND	5.0	0.15	ug/kg	
56-23-5	Carbon tetrachloride	ND	2.0	1.2	ug/kg	
108-90-7	Chlorobenzene	ND	2.0	0.27	ug/kg	
75-00-3	Chloroethane	ND	5.0	0.60	ug/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	5.0	4.7	ug/kg	
67-66-3	Chloroform	ND	2.0	0.29	ug/kg	
74-87-3	Chloromethane	ND	5.0	1.2	ug/kg	
95-49-8	o-Chlorotoluene	ND	5.0	0.41	ug/kg	
106-43-4	p-Chlorotoluene	ND	5.0	0.44	ug/kg	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	2.0	ug/kg	
124-48-1	Dibromochloromethane	ND	2.0	0.43	ug/kg	
106-93-4	1,2-Dibromoethane	ND	2.0	0.57	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	2.0	0.21	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	2.0	0.22	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	2.0	0.20	ug/kg	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.1	ug/kg	
75-34-3	1,1-Dichloroethane	ND	2.0	0.33	ug/kg	
107-06-2	1,2-Dichloroethane	ND	2.0	0.54	ug/kg	
75-35-4	1,1-Dichloroethene	ND	2.0	0.52	ug/kg	
156-59-2	cis-1,2-Dichloroethene	ND	2.0	0.51	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	2.0	0.45	ug/kg	
78-87-5	1,2-Dichloropropane	ND	2.0	0.42	ug/kg	
142-28-9	1,3-Dichloropropane	ND	5.0	0.45	ug/kg	

Method Blank Summary

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Job Number: MC23933

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM2031-MB	M58881.D	1	08/30/13	KD	n/a	n/a	MSM2031

The QC reported here applies to the following samples:

Method: SW846 8260B

MC23933-2, MC23933-3

CAS No.	Compound	Result	RL	MDL	Units	Q
594-20-7	2,2-Dichloropropane	ND	5.0	0.66	ug/kg	
563-58-6	1,1-Dichloropropene	ND	5.0	0.23	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	2.0	0.29	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	2.0	0.29	ug/kg	
123-91-1	1,4-Dioxane	ND	25	21	ug/kg	
97-63-2	Ethyl methacrylate	ND	5.0	3.3	ug/kg	
100-41-4	Ethylbenzene	ND	2.0	0.18	ug/kg	
87-68-3	Hexachlorobutadiene	ND	5.0	0.57	ug/kg	
591-78-6	2-Hexanone	ND	5.0	2.4	ug/kg	
98-82-8	Isopropylbenzene	ND	5.0	0.28	ug/kg	
99-87-6	p-Isopropyltoluene	ND	5.0	0.16	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	2.0	0.40	ug/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	1.8	ug/kg	
74-95-3	Methylene bromide	ND	5.0	0.35	ug/kg	
75-09-2	Methylene chloride	ND	2.0	1.5	ug/kg	
91-20-3	Naphthalene	ND	5.0	0.79	ug/kg	
103-65-1	n-Propylbenzene	ND	5.0	0.24	ug/kg	
100-42-5	Styrene	ND	5.0	0.21	ug/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	5.0	0.39	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	2.0	0.29	ug/kg	
127-18-4	Tetrachloroethene	ND	2.0	0.44	ug/kg	
108-88-3	Toluene	ND	5.0	0.24	ug/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	0.43	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	0.36	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	2.0	0.18	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	2.0	0.35	ug/kg	
79-01-6	Trichloroethene	ND	2.0	0.47	ug/kg	
75-69-4	Trichlorofluoromethane	ND	2.0	1.0	ug/kg	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.39	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.21	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	0.13	ug/kg	
108-05-4	Vinyl Acetate	ND	5.0	1.3	ug/kg	
75-01-4	Vinyl chloride	ND	2.0	0.57	ug/kg	
	m,p-Xylene	ND	2.0	0.29	ug/kg	
95-47-6	o-Xylene	ND	2.0	0.20	ug/kg	
1330-20-7	Xylene (total)	ND	2.0	0.20	ug/kg	

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Job Number: MC23933

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM2031-MB	M58881.D	1	08/30/13	KD	n/a	n/a	MSM2031

The QC reported here applies to the following samples:

Method: SW846 8260B

MC23933-2, MC23933-3

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	81% 70-130%
2037-26-5	Toluene-D8	84% 70-130%
460-00-4	4-Bromofluorobenzene	89% 70-130%

CAS No.	Tentatively Identified Compounds	R.T.	Est. Conc.	Units	Q
	Total TIC, Volatile		0	ug/kg	

6.1.3

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Blank Spike Summary

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Job Number: MC23933

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSV864-BS	V22440.D	1	08/29/13	AMY	n/a	n/a	MSV864

The QC reported here applies to the following samples:

Method: SW846 8260B

MC23933-1, MC23933-6

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
67-64-1	Acetone	50	54.8	110	70-130
107-02-8	Acrolein	250	261	104	70-130
107-13-1	Acrylonitrile	50	52.4	105	70-130
71-43-2	Benzene	50	47.7	95	70-130
108-86-1	Bromobenzene	50	54.5	109	70-130
74-97-5	Bromochloromethane	50	48.8	98	70-130
75-27-4	Bromodichloromethane	50	49.1	98	70-130
75-25-2	Bromoform	50	48.2	96	70-130
74-83-9	Bromomethane	50	43.7	87	70-130
78-93-3	2-Butanone (MEK)	50	53.3	107	70-130
104-51-8	n-Butylbenzene	50	52.9	106	70-130
135-98-8	sec-Butylbenzene	50	56.8	114	70-130
98-06-6	tert-Butylbenzene	50	54.2	108	70-130
75-15-0	Carbon disulfide	50	48.7	97	70-130
56-23-5	Carbon tetrachloride	50	49.1	98	70-130
108-90-7	Chlorobenzene	50	48.9	98	70-130
75-00-3	Chloroethane	50	45.6	91	70-130
110-75-8	2-Chloroethyl vinyl ether	50	52.3	105	70-130
67-66-3	Chloroform	50	45.5	91	70-130
74-87-3	Chloromethane	50	41.7	83	70-130
95-49-8	o-Chlorotoluene	50	54.6	109	70-130
106-43-4	p-Chlorotoluene	50	53.7	107	70-130
96-12-8	1,2-Dibromo-3-chloropropane	50	51.7	103	70-130
124-48-1	Dibromochloromethane	50	54.7	109	70-130
106-93-4	1,2-Dibromoethane	50	53.7	107	70-130
95-50-1	1,2-Dichlorobenzene	50	51.7	103	70-130
541-73-1	1,3-Dichlorobenzene	50	52.3	105	70-130
106-46-7	1,4-Dichlorobenzene	50	49.5	99	70-130
75-71-8	Dichlorodifluoromethane	50	49.2	98	70-130
75-34-3	1,1-Dichloroethane	50	49.0	98	70-130
107-06-2	1,2-Dichloroethane	50	45.5	91	70-130
75-35-4	1,1-Dichloroethene	50	47.7	95	70-130
156-59-2	cis-1,2-Dichloroethene	50	50.9	102	70-130
156-60-5	trans-1,2-Dichloroethene	50	48.2	96	70-130
78-87-5	1,2-Dichloropropane	50	49.1	98	70-130
142-28-9	1,3-Dichloropropane	50	52.8	106	70-130

* = Outside of Control Limits.

Blank Spike Summary

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Job Number: MC23933

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSV864-BS	V22440.D	1	08/29/13	AMY	n/a	n/a	MSV864

The QC reported here applies to the following samples:

Method: SW846 8260B

MC23933-1, MC23933-6

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
594-20-7	2,2-Dichloropropane	50	50.8	102	70-130
563-58-6	1,1-Dichloropropene	50	51.0	102	70-130
10061-01-5	cis-1,3-Dichloropropene	50	49.2	98	70-130
10061-02-6	trans-1,3-Dichloropropene	50	48.0	96	70-130
123-91-1	1,4-Dioxane	250	274	110	70-130
97-63-2	Ethyl methacrylate	50	50.7	101	77-137
100-41-4	Ethylbenzene	50	51.5	103	70-130
87-68-3	Hexachlorobutadiene	50	55.5	111	70-130
591-78-6	2-Hexanone	50	53.9	108	70-130
98-82-8	Isopropylbenzene	50	56.1	112	70-130
99-87-6	p-Isopropyltoluene	50	55.4	111	70-130
1634-04-4	Methyl Tert Butyl Ether	50	53.3	107	70-130
108-10-1	4-Methyl-2-pentanone (MIBK)	50	51.2	102	70-130
74-95-3	Methylene bromide	50	49.3	99	70-130
75-09-2	Methylene chloride	50	46.7	93	70-130
91-20-3	Naphthalene	50	57.6	115	70-130
103-65-1	n-Propylbenzene	50	54.6	109	70-130
100-42-5	Styrene	50	52.8	106	70-130
630-20-6	1,1,1,2-Tetrachloroethane	50	51.1	102	70-130
79-34-5	1,1,2,2-Tetrachloroethane	50	52.0	104	70-130
127-18-4	Tetrachloroethene	50	52.8	106	70-130
108-88-3	Toluene	50	53.0	106	70-130
87-61-6	1,2,3-Trichlorobenzene	50	57.7	115	70-130
120-82-1	1,2,4-Trichlorobenzene	50	54.8	110	70-130
71-55-6	1,1,1-Trichloroethane	50	46.3	93	70-130
79-00-5	1,1,2-Trichloroethane	50	50.4	101	70-130
79-01-6	Trichloroethene	50	47.0	94	70-130
75-69-4	Trichlorofluoromethane	50	47.8	96	70-130
96-18-4	1,2,3-Trichloropropane	50	56.0	112	70-130
95-63-6	1,2,4-Trimethylbenzene	50	51.7	103	70-130
108-67-8	1,3,5-Trimethylbenzene	50	52.3	105	70-130
108-05-4	Vinyl Acetate	50	51.6	103	70-130
75-01-4	Vinyl chloride	50	42.9	86	70-130
	m,p-Xylene	100	108	108	70-130
95-47-6	o-Xylene	50	51.5	103	70-130
1330-20-7	Xylene (total)	150	159	106	70-130

* = Outside of Control Limits.

Blank Spike Summary

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Job Number: MC23933

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSV864-BS	V22440.D	1	08/29/13	AMY	n/a	n/a	MSV864

The QC reported here applies to the following samples:

Method: SW846 8260B

MC23933-1, MC23933-6

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	91%	70-130%
2037-26-5	Toluene-D8	100%	70-130%
460-00-4	4-Bromofluorobenzene	99%	70-130%

* = Outside of Control Limits.

Blank Spike Summary

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Job Number: MC23933

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG5100-BS	G131023.D	1	08/30/13	JM	n/a	n/a	MSG5100

The QC reported here applies to the following samples:

Method: SW846 8260B

MC23933-4, MC23933-5

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
67-64-1	Acetone	2500	1650	66* a	70-130
107-02-8	Acrolein	12500	12200	98	70-130
107-13-1	Acrylonitrile	2500	2170	87	70-130
71-43-2	Benzene	2500	2310	92	70-130
108-86-1	Bromobenzene	2500	2550	102	70-130
74-97-5	Bromochloromethane	2500	2550	102	70-130
75-27-4	Bromodichloromethane	2500	2130	85	70-130
75-25-2	Bromoform	2500	3440	138* b	70-130
74-83-9	Bromomethane	2500	3120	125	70-130
78-93-3	2-Butanone (MEK)	2500	2280	91	70-130
104-51-8	n-Butylbenzene	2500	2480	99	70-130
135-98-8	sec-Butylbenzene	2500	2460	98	70-130
98-06-6	tert-Butylbenzene	2500	2380	95	70-130
75-15-0	Carbon disulfide	2500	2420	97	70-130
56-23-5	Carbon tetrachloride	2500	2790	112	70-130
108-90-7	Chlorobenzene	2500	2530	101	70-130
75-00-3	Chloroethane	2500	3120	125	70-130
110-75-8	2-Chloroethyl vinyl ether	2500	2920	117	10-160
67-66-3	Chloroform	2500	2270	91	70-130
74-87-3	Chloromethane	2500	3200	128	70-130
95-49-8	o-Chlorotoluene	2500	2260	90	70-130
106-43-4	p-Chlorotoluene	2500	2310	92	70-130
96-12-8	1,2-Dibromo-3-chloropropane	2500	2650	106	70-130
124-48-1	Dibromochloromethane	2500	2850	114	70-130
106-93-4	1,2-Dibromoethane	2500	2650	106	70-130
95-50-1	1,2-Dichlorobenzene	2500	2490	100	70-130
541-73-1	1,3-Dichlorobenzene	2500	2440	98	70-130
106-46-7	1,4-Dichlorobenzene	2500	2520	101	70-130
75-71-8	Dichlorodifluoromethane	2500	2340	94	70-130
75-34-3	1,1-Dichloroethane	2500	2400	96	70-130
107-06-2	1,2-Dichloroethane	2500	2170	87	70-130
75-35-4	1,1-Dichloroethene	2500	2720	109	70-130
156-59-2	cis-1,2-Dichloroethene	2500	2350	94	70-130
156-60-5	trans-1,2-Dichloroethene	2500	2370	95	70-130
78-87-5	1,2-Dichloropropane	2500	1790	72	70-130
142-28-9	1,3-Dichloropropane	2500	2400	96	70-130

* = Outside of Control Limits.

Blank Spike Summary

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Job Number: MC23933

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG5100-BS	G131023.D	1	08/30/13	JM	n/a	n/a	MSG5100

The QC reported here applies to the following samples:

Method: SW846 8260B

MC23933-4, MC23933-5

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
594-20-7	2,2-Dichloropropane	2500	2820	113	70-130
563-58-6	1,1-Dichloropropene	2500	2470	99	70-130
10061-01-5	cis-1,3-Dichloropropene	2500	2050	82	70-130
10061-02-6	trans-1,3-Dichloropropene	2500	2310	92	70-130
123-91-1	1,4-Dioxane	12500	12000	96	70-130
97-63-2	Ethyl methacrylate	2500	2340	94	76-141
100-41-4	Ethylbenzene	2500	2610	104	70-130
87-68-3	Hexachlorobutadiene	2500	3160	126	70-130
591-78-6	2-Hexanone	2500	2330	93	70-130
98-82-8	Isopropylbenzene	2500	2380	95	70-130
99-87-6	p-Isopropyltoluene	2500	2760	110	70-130
1634-04-4	Methyl Tert Butyl Ether	2500	2380	95	70-130
108-10-1	4-Methyl-2-pentanone (MIBK)	2500	2180	87	70-130
74-95-3	Methylene bromide	2500	2260	90	70-130
75-09-2	Methylene chloride	2500	2190	88	70-130
91-20-3	Naphthalene	2500	2780	111	70-130
103-65-1	n-Propylbenzene	2500	2270	91	70-130
100-42-5	Styrene	2500	2800	112	70-130
630-20-6	1,1,1,2-Tetrachloroethane	2500	2810	112	70-130
79-34-5	1,1,2,2-Tetrachloroethane	2500	2300	92	70-130
127-18-4	Tetrachloroethene	2500	3020	121	70-130
108-88-3	Toluene	2500	2200	88	70-130
87-61-6	1,2,3-Trichlorobenzene	2500	3100	124	70-130
120-82-1	1,2,4-Trichlorobenzene	2500	2940	118	70-130
71-55-6	1,1,1-Trichloroethane	2500	2670	107	70-130
79-00-5	1,1,2-Trichloroethane	2500	2020	81	70-130
79-01-6	Trichloroethene	2500	1970	79	70-130
75-69-4	Trichlorofluoromethane	2500	2770	111	70-130
96-18-4	1,2,3-Trichloropropane	2500	2320	93	70-130
95-63-6	1,2,4-Trimethylbenzene	2500	2480	99	70-130
108-67-8	1,3,5-Trimethylbenzene	2500	2480	99	70-130
108-05-4	Vinyl Acetate	2500	1710	68* a	70-130
75-01-4	Vinyl chloride	2500	2780	111	70-130
	m,p-Xylene	5000	5360	107	70-130
95-47-6	o-Xylene	2500	2670	107	70-130
1330-20-7	Xylene (total)	7500	8030	107	70-130

* = Outside of Control Limits.

Blank Spike Summary

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Job Number: MC23933

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG5100-BS	G131023.D	1	08/30/13	JM	n/a	n/a	MSG5100

The QC reported here applies to the following samples:

Method: SW846 8260B

MC23933-4, MC23933-5

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	99%	70-130%
2037-26-5	Toluene-D8	91%	70-130%
460-00-4	4-Bromofluorobenzene	94%	70-130%

- (a) Outside control limits. Blank Spike meets program technical requirements.
(b) Outside control limits. Associated samples are non-detect for this compound.

* = Outside of Control Limits.

Blank Spike/Blank Spike Duplicate Summary

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Job Number: MC23933

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM2031-BS	M58878.D	1	08/30/13	KD	n/a	n/a	MSM2031
MSM2031-BSD	M58879.D	1	08/30/13	KD	n/a	n/a	MSM2031

The QC reported here applies to the following samples:

Method: SW846 8260B

MC23933-2, MC23933-3

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	BSD ug/kg	BSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	50	53.8	108	54.1	108	1	70-130/25
107-02-8	Acrolein	250	343	137* a	370	148* a	8	70-130/25
107-13-1	Acrylonitrile	50	48.7	97	45.3	91	7	70-130/25
71-43-2	Benzene	50	50.5	101	46.0	92	9	70-130/25
108-86-1	Bromobenzene	50	54.3	109	50.7	101	7	70-130/25
74-97-5	Bromochloromethane	50	59.3	119	54.8	110	8	70-130/25
75-27-4	Bromodichloromethane	50	53.0	106	49.5	99	7	70-130/25
75-25-2	Bromoform	50	65.9	132* a	63.1	126	4	70-130/25
74-83-9	Bromomethane	50	50.7	101	48.0	96	5	70-130/25
78-93-3	2-Butanone (MEK)	50	41.0	82	39.6	79	3	70-130/25
104-51-8	n-Butylbenzene	50	48.9	98	47.0	94	4	70-130/25
135-98-8	sec-Butylbenzene	50	50.4	101	47.5	95	6	70-130/25
98-06-6	tert-Butylbenzene	50	48.8	98	46.4	93	5	70-130/25
75-15-0	Carbon disulfide	50	53.8	108	50.1	100	7	70-130/25
56-23-5	Carbon tetrachloride	50	57.8	116	54.6	109	6	70-130/25
108-90-7	Chlorobenzene	50	57.0	114	52.8	106	8	70-130/25
75-00-3	Chloroethane	50	52.4	105	48.6	97	8	70-130/25
110-75-8	2-Chloroethyl vinyl ether	50	35.2	70	31.4	63	11	10-160/25
67-66-3	Chloroform	50	52.8	106	49.7	99	6	70-130/25
74-87-3	Chloromethane	50	54.5	109	52.0	104	5	70-130/25
95-49-8	o-Chlorotoluene	50	48.8	98	45.1	90	8	70-130/25
106-43-4	p-Chlorotoluene	50	49.6	99	47.9	96	3	70-130/25
96-12-8	1,2-Dibromo-3-chloropropane	50	50.0	100	51.4	103	3	70-130/25
124-48-1	Dibromochloromethane	50	62.0	124	58.3	117	6	70-130/25
106-93-4	1,2-Dibromoethane	50	58.0	116	54.4	109	6	70-130/25
95-50-1	1,2-Dichlorobenzene	50	51.1	102	48.8	98	5	70-130/25
541-73-1	1,3-Dichlorobenzene	50	51.5	103	48.5	97	6	70-130/25
106-46-7	1,4-Dichlorobenzene	50	52.7	105	50.4	101	4	70-130/25
75-71-8	Dichlorodifluoromethane	50	57.0	114	53.2	106	7	70-130/25
75-34-3	1,1-Dichloroethane	50	54.8	110	50.8	102	8	70-130/25
107-06-2	1,2-Dichloroethane	50	49.5	99	45.6	91	8	70-130/25
75-35-4	1,1-Dichloroethene	50	55.0	110	51.2	102	7	70-130/25
156-59-2	cis-1,2-Dichloroethene	50	50.9	102	47.0	94	8	70-130/25
156-60-5	trans-1,2-Dichloroethene	50	54.2	108	48.6	97	11	70-130/25
78-87-5	1,2-Dichloropropane	50	50.4	101	46.3	93	8	70-130/25
142-28-9	1,3-Dichloropropane	50	54.5	109	49.6	99	9	70-130/25

* = Outside of Control Limits.

Blank Spike/Blank Spike Duplicate Summary

Page 2 of 3

Job Number: MC23933

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM2031-BS	M58878.D	1	08/30/13	KD	n/a	n/a	MSM2031
MSM2031-BSD	M58879.D	1	08/30/13	KD	n/a	n/a	MSM2031

The QC reported here applies to the following samples:

Method: SW846 8260B

MC23933-2, MC23933-3

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	BSD ug/kg	BSD %	RPD	Limits Rec/RPD
594-20-7	2,2-Dichloropropane	50	53.1	106	49.6	99	7	70-130/25
563-58-6	1,1-Dichloropropene	50	52.2	104	48.2	96	8	70-130/25
10061-01-5	cis-1,3-Dichloropropene	50	50.6	101	46.0	92	10	70-130/25
10061-02-6	trans-1,3-Dichloropropene	50	53.9	108	50.6	101	6	70-130/25
123-91-1	1,4-Dioxane	250	259	104	268	107	3	70-130/25
97-63-2	Ethyl methacrylate	50	49.1	98	46.2	92	6	76-141/25
100-41-4	Ethylbenzene	50	56.3	113	53.0	106	6	70-130/25
87-68-3	Hexachlorobutadiene	50	49.5	99	49.1	98	1	70-130/25
591-78-6	2-Hexanone	50	41.5	83	41.9	84	1	70-130/25
98-82-8	Isopropylbenzene	50	50.5	101	47.7	95	6	70-130/25
99-87-6	p-Isopropyltoluene	50	53.7	107	51.5	103	4	70-130/25
1634-04-4	Methyl Tert Butyl Ether	50	48.7	97	45.5	91	7	70-130/25
108-10-1	4-Methyl-2-pentanone (MIBK)	50	47.0	94	45.3	91	4	70-130/25
74-95-3	Methylene bromide	50	56.8	114	53.1	106	7	70-130/25
75-09-2	Methylene chloride	50	51.3	103	48.0	96	7	70-130/25
91-20-3	Naphthalene	50	53.1	106	52.9	106	0	70-130/25
103-65-1	n-Propylbenzene	50	48.5	97	45.5	91	6	70-130/25
100-42-5	Styrene	50	56.8	114	55.0	110	3	70-130/25
630-20-6	1,1,1,2-Tetrachloroethane	50	60.6	121	56.8	114	6	70-130/25
79-34-5	1,1,2,2-Tetrachloroethane	50	48.7	97	46.9	94	4	70-130/25
127-18-4	Tetrachloroethene	50	62.2	124	59.7	119	4	70-130/25
108-88-3	Toluene	50	53.6	107	49.6	99	8	70-130/25
87-61-6	1,2,3-Trichlorobenzene	50	51.1	102	51.8	104	1	70-130/25
120-82-1	1,2,4-Trichlorobenzene	50	50.9	102	51.3	103	1	70-130/25
71-55-6	1,1,1-Trichloroethane	50	55.2	110	51.6	103	7	70-130/25
79-00-5	1,1,2-Trichloroethane	50	52.3	105	48.8	98	7	70-130/25
79-01-6	Trichloroethene	50	50.8	102	47.4	95	7	70-130/25
75-69-4	Trichlorofluoromethane	50	51.7	103	48.4	97	7	70-130/25
96-18-4	1,2,3-Trichloropropane	50	50.3	101	48.5	97	4	70-130/25
95-63-6	1,2,4-Trimethylbenzene	50	51.4	103	48.2	96	6	70-130/25
108-67-8	1,3,5-Trimethylbenzene	50	50.9	102	47.6	95	7	70-130/25
108-05-4	Vinyl Acetate	50	38.5	77	32.0	64* a	18	70-130/25
75-01-4	Vinyl chloride	50	37.8	76	34.9	70	8	70-130/25
	m,p-Xylene	100	113	113	105	105	7	70-130/25
95-47-6	o-Xylene	50	55.6	111	52.0	104	7	70-130/25
1330-20-7	Xylene (total)	150	168	112	157	105	7	70-130/25

* = Outside of Control Limits.

Blank Spike/Blank Spike Duplicate Summary

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Job Number: MC23933

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM2031-BS	M58878.D	1	08/30/13	KD	n/a	n/a	MSM2031
MSM2031-BSD	M58879.D	1	08/30/13	KD	n/a	n/a	MSM2031

The QC reported here applies to the following samples:

Method: SW846 8260B

MC23933-2, MC23933-3

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
1868-53-7	Dibromofluoromethane	80%	81%	70-130%
2037-26-5	Toluene-D8	82%	83%	70-130%
460-00-4	4-Bromofluorobenzene	83%	84%	70-130%

(a) Outside control limits. Blank Spike meets program technical requirements.

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 3

Job Number: MC23933

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC23720-6MS	V22454.D	1	08/29/13	AMY	n/a	n/a	MSV864
MC23720-6MSD	V22455.D	1	08/29/13	AMY	n/a	n/a	MSV864
MC23720-6	V22451.D	1	08/29/13	AMY	n/a	n/a	MSV864

The QC reported here applies to the following samples:

Method: SW846 8260B

MC23933-1, MC23933-6

CAS No.	Compound	MC23720-6 ug/l	Spike Q	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	ND	50	23.7	47* a	50	24.1	48* a	2	70-130/30
107-02-8	Acrolein	ND	250	256	102	250	259	104	1	70-130/30
107-13-1	Acrylonitrile	ND	50	52.1	104	50	52.8	106	1	70-130/30
71-43-2	Benzene	6.3	50	53.9	95	50	55.1	98	2	70-130/30
108-86-1	Bromobenzene	ND	50	53.3	107	50	54.7	109	3	70-130/30
74-97-5	Bromochloromethane	ND	50	48.7	97	50	49.6	99	2	70-130/30
75-27-4	Bromodichloromethane	ND	50	51.6	103	50	52.4	105	2	70-130/30
75-25-2	Bromoform	ND	50	46.3	93	50	46.8	94	1	70-130/30
74-83-9	Bromomethane	ND	50	46.0	92	50	47.0	94	2	70-130/30
78-93-3	2-Butanone (MEK)	ND	50	32.8	66* a	50	34.7	69* a	6	70-130/30
104-51-8	n-Butylbenzene	ND	50	52.1	104	50	54.5	109	5	70-130/30
135-98-8	sec-Butylbenzene	ND	50	55.9	112	50	58.1	116	4	70-130/30
98-06-6	tert-Butylbenzene	ND	50	55.3	111	50	57.2	114	3	70-130/30
75-15-0	Carbon disulfide	ND	50	48.1	96	50	51.5	103	7	70-130/30
56-23-5	Carbon tetrachloride	ND	50	52.5	105	50	54.7	109	4	70-130/30
108-90-7	Chlorobenzene	ND	50	48.3	97	50	49.2	98	2	70-130/30
75-00-3	Chloroethane	ND	50	49.1	98	50	50.5	101	3	70-130/30
110-75-8	2-Chloroethyl vinyl ether	ND	50	ND	0* a	50	ND	0* a	nc	70-130/30
67-66-3	Chloroform	ND	50	47.6	95	50	49.3	99	4	70-130/30
74-87-3	Chloromethane	ND	50	46.7	93	50	47.5	95	2	70-130/30
95-49-8	o-Chlorotoluene	ND	50	55.0	110	50	56.8	114	3	70-130/30
106-43-4	p-Chlorotoluene	ND	50	54.5	109	50	55.9	112	3	70-130/30
96-12-8	1,2-Dibromo-3-chloropropane	ND	50	48.7	97	50	51.8	104	6	70-130/30
124-48-1	Dibromochloromethane	ND	50	53.6	107	50	54.1	108	1	70-130/30
106-93-4	1,2-Dibromoethane	ND	50	52.2	104	50	52.0	104	0	70-130/30
95-50-1	1,2-Dichlorobenzene	ND	50	50.7	101	50	52.3	105	3	70-130/30
541-73-1	1,3-Dichlorobenzene	ND	50	51.8	104	50	52.6	105	2	70-130/30
106-46-7	1,4-Dichlorobenzene	ND	50	49.1	98	50	50.1	100	2	70-130/30
75-71-8	Dichlorodifluoromethane	ND	50	52.1	104	50	57.2	114	9	70-130/30
75-34-3	1,1-Dichloroethane	ND	50	51.5	103	50	52.7	105	2	70-130/30
107-06-2	1,2-Dichloroethane	ND	50	49.5	99	50	49.2	98	1	70-130/30
75-35-4	1,1-Dichloroethene	ND	50	47.5	95	50	50.3	101	6	70-130/30
156-59-2	cis-1,2-Dichloroethene	ND	50	50.7	101	50	52.3	105	3	70-130/30
156-60-5	trans-1,2-Dichloroethene	ND	50	48.1	96	50	50.7	101	5	70-130/30
78-87-5	1,2-Dichloropropane	ND	50	50.7	101	50	51.6	103	2	70-130/30
142-28-9	1,3-Dichloropropane	ND	50	51.8	104	50	51.7	103	0	70-130/30

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Page 2 of 3

Job Number: MC23933

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC23720-6MS	V22454.D	1	08/29/13	AMY	n/a	n/a	MSV864
MC23720-6MSD	V22455.D	1	08/29/13	AMY	n/a	n/a	MSV864
MC23720-6	V22451.D	1	08/29/13	AMY	n/a	n/a	MSV864

The QC reported here applies to the following samples:

Method: SW846 8260B

MC23933-1, MC23933-6

CAS No.	Compound	MC23720-6 ug/l	Spike Q	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
594-20-7	2,2-Dichloropropane	ND	50	49.4	99	50	51.2	102	4	70-130/30
563-58-6	1,1-Dichloropropene	ND	50	52.4	105	50	54.1	108	3	70-130/30
10061-01-5	cis-1,3-Dichloropropene	ND	50	48.5	97	50	49.0	98	1	70-130/30
10061-02-6	trans-1,3-Dichloropropene	ND	50	48.3	97	50	48.9	98	1	70-130/30
123-91-1	1,4-Dioxane	ND	250	252	101	250	258	103	2	70-130/30
97-63-2	Ethyl methacrylate	ND	50	50.6	101	50	50.7	101	0	72-139/30
100-41-4	Ethylbenzene	ND	50	51.7	103	50	52.6	105	2	70-130/30
87-68-3	Hexachlorobutadiene	ND	50	51.3	103	50	55.2	110	7	70-130/30
591-78-6	2-Hexanone	ND	50	35.1	70	50	34.7	69* a	1	70-130/30
98-82-8	Isopropylbenzene	ND	50	55.3	111	50	57.0	114	3	70-130/30
99-87-6	p-Isopropyltoluene	ND	50	54.5	109	50	56.8	114	4	70-130/30
1634-04-4	Methyl Tert Butyl Ether	1.3	50	54.7	107	50	55.7	109	2	70-130/30
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	50	51.4	103	50	49.8	100	3	70-130/30
74-95-3	Methylene bromide	ND	50	51.3	103	50	51.4	103	0	70-130/30
75-09-2	Methylene chloride	ND	50	46.9	94	50	48.2	96	3	70-130/30
91-20-3	Naphthalene	ND	50	55.3	111	50	56.9	114	3	70-130/30
103-65-1	n-Propylbenzene	ND	50	54.7	109	50	56.7	113	4	70-130/30
100-42-5	Styrene	ND	50	52.3	105	50	53.0	106	1	70-130/30
630-20-6	1,1,1,2-Tetrachloroethane	ND	50	50.7	101	50	51.8	104	2	70-130/30
79-34-5	1,1,2,2-Tetrachloroethane	ND	50	51.1	102	50	51.4	103	1	70-130/30
127-18-4	Tetrachloroethene	ND	50	51.7	103	50	52.9	106	2	70-130/30
108-88-3	Toluene	ND	50	54.4	109	50	55.1	110	1	70-130/30
87-61-6	1,2,3-Trichlorobenzene	ND	50	46.1	92	50	54.8	110	17	70-130/30
120-82-1	1,2,4-Trichlorobenzene	ND	50	49.4	99	50	53.2	106	7	70-130/30
71-55-6	1,1,1-Trichloroethane	ND	50	48.8	98	50	51.0	102	4	70-130/30
79-00-5	1,1,2-Trichloroethane	ND	50	51.1	102	50	50.5	101	1	70-130/30
79-01-6	Trichloroethene	ND	50	48.1	96	50	49.1	98	2	70-130/30
75-69-4	Trichlorofluoromethane	ND	50	53.5	107	50	56.3	113	5	70-130/30
96-18-4	1,2,3-Trichloropropane	ND	50	55.5	111	50	56.3	113	1	70-130/30
95-63-6	1,2,4-Trimethylbenzene	ND	50	52.9	106	50	53.7	107	2	70-130/30
108-67-8	1,3,5-Trimethylbenzene	ND	50	53.0	106	50	54.4	109	3	70-130/30
108-05-4	Vinyl Acetate	ND	50	52.3	105	50	52.6	105	1	70-130/30
75-01-4	Vinyl chloride	ND	50	45.3	91	50	46.7	93	3	70-130/30
	m,p-Xylene	ND	100	107	107	100	108	108	1	70-130/30
95-47-6	o-Xylene	ND	50	51.3	103	50	52.1	104	2	70-130/30
1330-20-7	Xylene (total)	ND	150	158	105	150	161	107	2	70-130/30

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Page 3 of 3

Job Number: MC23933

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC23720-6MS	V22454.D	1	08/29/13	AMY	n/a	n/a	MSV864
MC23720-6MSD	V22455.D	1	08/29/13	AMY	n/a	n/a	MSV864
MC23720-6	V22451.D	1	08/29/13	AMY	n/a	n/a	MSV864

The QC reported here applies to the following samples:

Method: SW846 8260B

MC23933-1, MC23933-6

CAS No.	Surrogate Recoveries	MS	MSD	MC23720-6	Limits
1868-53-7	Dibromofluoromethane	94%	95%	108%	70-130%
2037-26-5	Toluene-D8	103%	101%	104%	70-130%
460-00-4	4-Bromofluorobenzene	100%	101%	104%	70-130%

(a) Outside control limits due to possible matrix interference. Refer to Blank Spike.

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 3

Job Number: MC23933

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC23888-1MS	G131029.D	1	08/30/13	JM	n/a	n/a	MSG5100
MC23888-1MSD	G131030.D	1	08/30/13	JM	n/a	n/a	MSG5100
MC23888-1	G131031.D	1	08/30/13	JM	n/a	n/a	MSG5100

The QC reported here applies to the following samples:

Method: SW846 8260B

MC23933-4, MC23933-5

CAS No.	Compound	MC23888-1 ug/kg	Spike Q	Spike ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	ND		2910	2060	71	2910	1650	57* a	22	70-130/30
107-02-8	Acrolein	ND		14500	14800	102	14500	14900	103	1	70-130/30
107-13-1	Acrylonitrile	ND		2910	2550	88	2910	2430	84	5	70-130/30
71-43-2	Benzene	ND		2910	3140	108	2910	2910	100	8	70-130/30
108-86-1	Bromobenzene	ND		2910	3220	111	2910	3020	104	6	70-130/30
74-97-5	Bromochloromethane	ND		2910	3340	115	2910	3030	104	10	70-130/30
75-27-4	Bromodichloromethane	ND		2910	3200	110	2910	2950	102	8	70-130/30
75-25-2	Bromoform	ND		2910	4130	142* a	2910	4060	140* a	2	70-130/30
74-83-9	Bromomethane	ND		2910	3360	116	2910	3360	116	0	70-130/30
78-93-3	2-Butanone (MEK)	ND		2910	2420	83	2910	2370	82	2	70-130/30
104-51-8	n-Butylbenzene	ND		2910	3130	108	2910	2990	103	5	70-130/30
135-98-8	sec-Butylbenzene	ND		2910	3080	106	2910	2950	102	4	70-130/30
98-06-6	tert-Butylbenzene	ND		2910	3060	105	2910	2930	101	4	70-130/30
75-15-0	Carbon disulfide	ND		2910	3040	105	2910	2750	95	10	70-130/30
56-23-5	Carbon tetrachloride	ND		2910	3630	125	2910	3450	119	5	70-130/30
108-90-7	Chlorobenzene	ND		2910	3190	110	2910	3000	103	6	70-130/30
75-00-3	Chloroethane	ND		2910	3190	110	2910	3250	112	2	70-130/30
110-75-8	2-Chloroethyl vinyl ether	ND		2910	3920	135	2910	3630	125	8	10-160/30
67-66-3	Chloroform	ND		2910	3020	104	2910	2710	93	11	70-130/30
74-87-3	Chloromethane	ND		2910	3180	109	2910	3160	109	1	70-130/30
95-49-8	o-Chlorotoluene	ND		2910	2860	98	2910	2700	93	6	70-130/30
106-43-4	p-Chlorotoluene	ND		2910	2930	101	2910	2810	97	4	70-130/30
96-12-8	1,2-Dibromo-3-chloropropane	ND		2910	3170	109	2910	3240	111	2	70-130/30
124-48-1	Dibromochloromethane	ND		2910	3580	123	2910	3400	117	5	70-130/30
106-93-4	1,2-Dibromoethane	ND		2910	3330	115	2910	3150	108	6	70-130/30
95-50-1	1,2-Dichlorobenzene	ND		2910	3090	106	2910	2960	102	4	70-130/30
541-73-1	1,3-Dichlorobenzene	ND		2910	3090	106	2910	2950	102	5	70-130/30
106-46-7	1,4-Dichlorobenzene	ND		2910	3130	108	2910	3030	104	3	70-130/30
75-71-8	Dichlorodifluoromethane	ND		2910	3130	108	2910	2880	99	8	70-130/30
75-34-3	1,1-Dichloroethane	ND		2910	2920	100	2910	2680	92	9	70-130/30
107-06-2	1,2-Dichloroethane	ND		2910	3040	105	2910	2820	97	8	70-130/30
75-35-4	1,1-Dichloroethene	ND		2910	3320	114	2910	2970	102	11	70-130/30
156-59-2	cis-1,2-Dichloroethene	ND		2910	2850	98	2910	2590	89	10	70-130/30
156-60-5	trans-1,2-Dichloroethene	ND		2910	2880	99	2910	2600	89	10	70-130/30
78-87-5	1,2-Dichloropropane	ND		2910	2690	93	2910	2510	86	7	70-130/30
142-28-9	1,3-Dichloropropane	ND		2910	3040	105	2910	2870	99	6	70-130/30

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Page 2 of 3

Job Number: MC23933

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC23888-1MS	G131029.D	1	08/30/13	JM	n/a	n/a	MSG5100
MC23888-1MSD	G131030.D	1	08/30/13	JM	n/a	n/a	MSG5100
MC23888-1	G131031.D	1	08/30/13	JM	n/a	n/a	MSG5100

The QC reported here applies to the following samples:

Method: SW846 8260B

MC23933-4, MC23933-5

CAS No.	Compound	MC23888-1 ug/kg	Spike Q	Spike ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
594-20-7	2,2-Dichloropropane	ND		2910	3290	113	2910	3080	106	7	70-130/30
563-58-6	1,1-Dichloropropene	ND		2910	3130	108	2910	2880	99	8	70-130/30
10061-01-5	cis-1,3-Dichloropropene	ND		2910	3090	106	2910	2820	97	9	70-130/30
10061-02-6	trans-1,3-Dichloropropene	ND		2910	3440	118	2910	3160	109	8	70-130/30
123-91-1	1,4-Dioxane	ND		14500	11000	76	14500	16500	114	40* b	70-130/30
97-63-2	Ethyl methacrylate	ND		2910	3410	117	2910	3240	111	5	41-160/30
100-41-4	Ethylbenzene	ND		2910	3300	114	2910	3140	108	5	70-130/30
87-68-3	Hexachlorobutadiene	ND		2910	3700	127	2910	3750	129	1	70-130/30
591-78-6	2-Hexanone	ND		2910	2780	96	2910	2770	95	0	70-130/30
98-82-8	Isopropylbenzene	ND		2910	3060	105	2910	2950	102	4	70-130/30
99-87-6	p-Isopropyltoluene	ND		2910	3460	119	2910	3360	116	3	70-130/30
1634-04-4	Methyl Tert Butyl Ether	ND		2910	2940	101	2910	2720	94	8	70-130/30
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		2910	3180	109	2910	3010	104	5	70-130/30
74-95-3	Methylene bromide	ND		2910	3440	118	2910	3140	108	9	70-130/30
75-09-2	Methylene chloride	ND		2910	2810	97	2910	2510	86	11	70-130/30
91-20-3	Naphthalene	ND		2910	3110	107	2910	3110	107	0	70-130/30
103-65-1	n-Propylbenzene	ND		2910	2900	100	2910	2760	95	5	70-130/30
100-42-5	Styrene	ND		2910	3470	119	2910	3290	113	5	70-130/30
630-20-6	1,1,1,2-Tetrachloroethane	ND		2910	3590	124	2910	3360	116	7	70-130/30
79-34-5	1,1,2,2-Tetrachloroethane	ND		2910	2800	96	2910	2730	94	3	70-130/30
127-18-4	Tetrachloroethene	ND		2910	3700	127	2910	3580	123	3	70-130/30
108-88-3	Toluene	ND		2910	3270	113	2910	3070	106	6	70-130/30
87-61-6	1,2,3-Trichlorobenzene	ND		2910	3400	117	2910	3380	116	1	70-130/30
120-82-1	1,2,4-Trichlorobenzene	ND		2910	3360	116	2910	3270	113	3	70-130/30
71-55-6	1,1,1-Trichloroethane	ND		2910	3340	115	2910	3110	107	7	70-130/30
79-00-5	1,1,2-Trichloroethane	ND		2910	2960	102	2910	2740	94	8	70-130/30
79-01-6	Trichloroethene	ND		2910	2900	100	2910	2720	94	6	70-130/30
75-69-4	Trichlorofluoromethane	ND		2910	3150	108	2910	2960	102	6	70-130/30
96-18-4	1,2,3-Trichloropropane	ND		2910	2890	99	2910	2870	99	1	70-130/30
95-63-6	1,2,4-Trimethylbenzene	ND		2910	3130	108	2910	2970	102	5	70-130/30
108-67-8	1,3,5-Trimethylbenzene	ND		2910	3120	107	2910	3000	103	4	70-130/30
108-05-4	Vinyl Acetate	ND		2910	2010	69* a	2910	1860	64* a	8	70-130/30
75-01-4	Vinyl chloride	ND		2910	3940	136* a	2910	3500	120	12	70-130/30
	m,p-Xylene	ND		5810	6730	116	5810	6400	110	5	70-130/30
95-47-6	o-Xylene	ND		2910	3350	115	2910	3140	108	6	70-130/30
1330-20-7	Xylene (total)	ND		8720	10100	116	8720	9540	109	6	70-130/30

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Page 3 of 3

Job Number: MC23933

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC23888-1MS	G131029.D	1	08/30/13	JM	n/a	n/a	MSG5100
MC23888-1MSD	G131030.D	1	08/30/13	JM	n/a	n/a	MSG5100
MC23888-1	G131031.D	1	08/30/13	JM	n/a	n/a	MSG5100

The QC reported here applies to the following samples:

Method: SW846 8260B

MC23933-4, MC23933-5

CAS No.	Surrogate Recoveries	MS	MSD	MC23888-1	Limits
1868-53-7	Dibromofluoromethane	106%	96%	95%	70-130%
2037-26-5	Toluene-D8	112%	106%	105%	70-130%
460-00-4	4-Bromofluorobenzene	102%	97%	99%	70-130%

- (a) Outside control limits due to possible matrix interference. Refer to Blank Spike.
(b) High RPD due to possible matrix interference and/or sample non-homogeneity.

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 3

Job Number: MC23933

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC23933-2MS	M58884.D	1	08/30/13	KD	n/a	n/a	MSM2031
MC23933-2MSD	M58885.D	1	08/30/13	KD	n/a	n/a	MSM2031
MC23933-2	M58882.D	1	08/30/13	KD	n/a	n/a	MSM2031

The QC reported here applies to the following samples:

Method: SW846 8260B

MC23933-2, MC23933-3

CAS No.	Compound	MC23933-2 ug/kg	Spike Q	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	ND	55.9	36.3	65* a	54.9	44.2	80	20	70-130/30
107-02-8	Acrolein	ND	279	262	94	275	292	106	11	70-130/30
107-13-1	Acrylonitrile	ND	55.9	57.1	102	54.9	67.4	123	17	70-130/30
71-43-2	Benzene	ND	55.9	45.0	81	54.9	54.2	99	19	70-130/30
108-86-1	Bromobenzene	ND	55.9	48.5	87	54.9	56.1	102	15	70-130/30
74-97-5	Bromochloromethane	ND	55.9	56.5	101	54.9	67.3	123	17	70-130/30
75-27-4	Bromodichloromethane	ND	55.9	48.8	87	54.9	58.2	106	18	70-130/30
75-25-2	Bromoform	ND	55.9	71.0	127	54.9	82.9	151* a	15	70-130/30
74-83-9	Bromomethane	ND	55.9	48.2	86	54.9	56.7	103	16	70-130/30
78-93-3	2-Butanone (MEK)	ND	55.9	38.0	68* a	54.9	47.9	87	23	70-130/30
104-51-8	n-Butylbenzene	ND	55.9	40.3	72	54.9	46.1	84	13	70-130/30
135-98-8	sec-Butylbenzene	ND	55.9	41.5	74	54.9	48.6	88	16	70-130/30
98-06-6	tert-Butylbenzene	ND	55.9	41.1	74	54.9	47.5	86	14	70-130/30
75-15-0	Carbon disulfide	ND	55.9	50.5	90	54.9	60.2	110	18	70-130/30
56-23-5	Carbon tetrachloride	ND	55.9	55.0	98	54.9	65.6	119	18	70-130/30
108-90-7	Chlorobenzene	ND	55.9	50.3	90	54.9	58.6	107	15	70-130/30
75-00-3	Chloroethane	ND	55.9	48.4	87	54.9	58.2	106	18	70-130/30
110-75-8	2-Chloroethyl vinyl ether	ND	55.9	ND	0* a	54.9	ND	0* a	nc	10-160/30
67-66-3	Chloroform	ND	55.9	48.8	87	54.9	58.4	106	18	70-130/30
74-87-3	Chloromethane	ND	55.9	50.9	91	54.9	61.0	111	18	70-130/30
95-49-8	o-Chlorotoluene	ND	55.9	41.7	75	54.9	48.0	87	14	70-130/30
106-43-4	p-Chlorotoluene	ND	55.9	43.1	77	54.9	50.0	91	15	70-130/30
96-12-8	1,2-Dibromo-3-chloropropane	ND	55.9	69.2	124	54.9	82.0	149* a	17	70-130/30
124-48-1	Dibromochloromethane	ND	55.9	59.8	107	54.9	70.7	129	17	70-130/30
106-93-4	1,2-Dibromoethane	ND	55.9	60.3	108	54.9	71.0	129	16	70-130/30
95-50-1	1,2-Dichlorobenzene	ND	55.9	43.8	78	54.9	52.0	95	17	70-130/30
541-73-1	1,3-Dichlorobenzene	ND	55.9	42.5	76	54.9	50.9	93	18	70-130/30
106-46-7	1,4-Dichlorobenzene	ND	55.9	44.1	79	54.9	52.4	95	17	70-130/30
75-71-8	Dichlorodifluoromethane	ND	55.9	53.8	96	54.9	56.3	102	5	70-130/30
75-34-3	1,1-Dichloroethane	ND	55.9	49.9	89	54.9	59.6	108	18	70-130/30
107-06-2	1,2-Dichloroethane	ND	55.9	47.7	85	54.9	56.9	104	18	70-130/30
75-35-4	1,1-Dichloroethene	ND	55.9	52.5	94	54.9	63.1	115	18	70-130/30
156-59-2	cis-1,2-Dichloroethene	ND	55.9	46.2	83	54.9	54.8	100	17	70-130/30
156-60-5	trans-1,2-Dichloroethene	ND	55.9	47.5	85	54.9	55.3	101	15	70-130/30
78-87-5	1,2-Dichloropropane	ND	55.9	45.2	81	54.9	54.9	100	19	70-130/30
142-28-9	1,3-Dichloropropane	ND	55.9	53.2	95	54.9	61.7	112	15	70-130/30

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

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Job Number: MC23933

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC23933-2MS	M58884.D	1	08/30/13	KD	n/a	n/a	MSM2031
MC23933-2MSD	M58885.D	1	08/30/13	KD	n/a	n/a	MSM2031
MC23933-2	M58882.D	1	08/30/13	KD	n/a	n/a	MSM2031

The QC reported here applies to the following samples:

Method: SW846 8260B

MC23933-2, MC23933-3

CAS No.	Compound	MC23933-2 ug/kg	Spike Q	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD	
594-20-7	2,2-Dichloropropane	ND		55.9	50.6	91	54.9	58.1	106	14	70-130/30
563-58-6	1,1-Dichloropropene	ND		55.9	47.1	84	54.9	56.4	103	18	70-130/30
10061-01-5	cis-1,3-Dichloropropene	ND		55.9	45.7	82	54.9	54.8	100	18	70-130/30
10061-02-6	trans-1,3-Dichloropropene	ND		55.9	50.8	91	54.9	61.5	112	19	70-130/30
123-91-1	1,4-Dioxane	ND		279	353	126	275	478	174* a	30	70-130/30
97-63-2	Ethyl methacrylate	ND		55.9	53.1	95	54.9	64.0	116	19	41-160/30
100-41-4	Ethylbenzene	ND		55.9	50.0	89	54.9	58.5	106	16	70-130/30
87-68-3	Hexachlorobutadiene	ND		55.9	38.0	68* a	54.9	45.1	82	17	70-130/30
591-78-6	2-Hexanone	ND		55.9	49.3	88	54.9	57.5	105	15	70-130/30
98-82-8	Isopropylbenzene	ND		55.9	43.9	79	54.9	51.0	93	15	70-130/30
99-87-6	p-Isopropyltoluene	ND		55.9	44.8	80	54.9	52.2	95	15	70-130/30
1634-04-4	Methyl Tert Butyl Ether	ND		55.9	49.3	88	54.9	58.2	106	17	70-130/30
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		55.9	60.6	108	54.9	72.8	133* a	18	70-130/30
74-95-3	Methylene bromide	ND		55.9	56.2	101	54.9	68.1	124	19	70-130/30
75-09-2	Methylene chloride	ND		55.9	47.2	84	54.9	53.4	97	12	70-130/30
91-20-3	Naphthalene	ND		55.9	51.8	93	54.9	66.9	122	25	70-130/30
103-65-1	n-Propylbenzene	ND		55.9	41.9	75	54.9	48.2	88	14	70-130/30
100-42-5	Styrene	ND		55.9	50.5	90	54.9	60.8	111	19	70-130/30
630-20-6	1,1,1,2-Tetrachloroethane	ND		55.9	55.1	99	54.9	65.4	119	17	70-130/30
79-34-5	1,1,2,2-Tetrachloroethane	ND		55.9	54.6	98	54.9	63.2	115	15	70-130/30
127-18-4	Tetrachloroethene	ND		55.9	58.1	104	54.9	67.0	122	14	70-130/30
108-88-3	Toluene	ND		55.9	47.5	85	54.9	57.7	105	19	70-130/30
87-61-6	1,2,3-Trichlorobenzene	ND		55.9	38.9	70	54.9	48.8	89	23	70-130/30
120-82-1	1,2,4-Trichlorobenzene	ND		55.9	39.0	70	54.9	47.0	86	19	70-130/30
71-55-6	1,1,1-Trichloroethane	ND		55.9	52.3	94	54.9	61.3	112	16	70-130/30
79-00-5	1,1,2-Trichloroethane	ND		55.9	52.5	94	54.9	64.0	116	20	70-130/30
79-01-6	Trichloroethene	ND		55.9	45.8	82	54.9	54.6	99	18	70-130/30
75-69-4	Trichlorofluoromethane	ND		55.9	49.6	89	54.9	57.0	104	14	70-130/30
96-18-4	1,2,3-Trichloropropane	ND		55.9	58.8	105	54.9	68.2	124	15	70-130/30
95-63-6	1,2,4-Trimethylbenzene	ND		55.9	42.7	76	54.9	50.2	91	16	70-130/30
108-67-8	1,3,5-Trimethylbenzene	ND		55.9	42.7	76	54.9	50.0	91	16	70-130/30
108-05-4	Vinyl Acetate	ND		55.9	29.9	54* a	54.9	31.7	58* a	6	70-130/30
75-01-4	Vinyl chloride	ND		55.9	34.4	62* a	54.9	41.3	75	18	70-130/30
	m,p-Xylene	ND		112	100	89	110	116	106	15	70-130/30
95-47-6	o-Xylene	ND		55.9	49.2	88	54.9	57.8	105	16	70-130/30
1330-20-7	Xylene (total)	ND		168	149	89	165	174	106	15	70-130/30

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Page 3 of 3

Job Number: MC23933

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC23933-2MS	M58884.D	1	08/30/13	KD	n/a	n/a	MSM2031
MC23933-2MSD	M58885.D	1	08/30/13	KD	n/a	n/a	MSM2031
MC23933-2	M58882.D	1	08/30/13	KD	n/a	n/a	MSM2031

The QC reported here applies to the following samples:

Method: SW846 8260B

MC23933-2, MC23933-3

CAS No.	Surrogate Recoveries	MS	MSD	MC23933-2	Limits
1868-53-7	Dibromofluoromethane	82%	81%	84%	70-130%
2037-26-5	Toluene-D8	84%	84%	84%	70-130%
460-00-4	4-Bromofluorobenzene	84%	81%	91%	70-130%

(a) Outside control limits due to possible matrix interference. Refer to Blank Spike.

* = Outside of Control Limits.

Volatile Internal Standard Area Summary

Page 1 of 1

Job Number: MC23933
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Check Std:	MSG5100-CC5092	Injection Date:	08/30/13
Lab File ID:	G131022.D	Injection Time:	08:25
Instrument ID:	GCMSG	Method:	SW846 8260B

	IS 1 AREA	RT	IS 2 AREA	RT	IS 3 AREA	RT	IS 4 AREA	RT	IS 5 AREA	RT
Check Std	67870	5.07	88553	6.20	47013	9.54	53523	12.16	23916	3.10
Upper Limit ^a	135740	5.57	177106	6.70	94026	10.04	107046	12.66	47832	3.60
Lower Limit ^b	33935	4.57	44277	5.70	23507	9.04	26762	11.66	11958	2.60

Lab Sample ID	IS 1 AREA	RT	IS 2 AREA	RT	IS 3 AREA	RT	IS 4 AREA	RT	IS 5 AREA	RT
MSG5100-BS	61616	5.07	99635	6.20	42392	9.54	46388	12.16	22869	3.10
MSG5100-MB	61870	5.07	92082	6.20	44036	9.54	46351	12.16	24495	3.09
MC23933-4	62083	5.08	93054	6.20	46140	9.54	48140	12.16	20288	3.08
MC23933-5	59837	5.07	87670	6.20	44376	9.54	45048	12.16	18810	3.07
MC23888-1MS	57728	5.07	85694	6.20	42837	9.54	45977	12.16	18184	3.08
MC23888-1MSD	59840	5.07	86578	6.20	42533	9.54	44917	12.16	20183	3.08
MC23888-1	58602	5.07	85017	6.20	41245	9.54	42295	12.16	19139	3.08
ZZZZZZ	56247	5.07	82690	6.20	39969	9.54	39963	12.16	16778	3.08
ZZZZZZ	58741	5.07	85503	6.20	43297	9.54	44651	12.16	18612	3.08
ZZZZZZ	58639	5.07	85868	6.20	41740	9.54	44203	12.16	18407	3.08
ZZZZZZ	57327	5.07	82494	6.20	50554	9.55	45896	12.16	17536	3.09
ZZZZZZ	57942	5.07	83372	6.20	39809	9.54	42348	12.16	18214	3.09
ZZZZZZ	53072	5.07	76903	6.20	36471	9.54	38809	12.16	16504	3.08
ZZZZZZ	53883	5.07	77906	6.20	36846	9.54	40356	12.16	17762	3.09
ZZZZZZ	52133	5.07	73903	6.20	35342	9.54	38652	12.16	15224	3.08
ZZZZZZ	50891	5.07	72133	6.20	34716	9.54	37131	12.16	16439	3.09
ZZZZZZ	50439	5.07	72064	6.20	34528	9.54	37027	12.16	14887	3.09
ZZZZZZ	52366	5.07	72256	6.20	34882	9.54	37520	12.16	15560	3.09
ZZZZZZ	51284	5.07	72348	6.20	34531	9.54	38110	12.16	16249	3.09
ZZZZZZ	50802	5.07	73281	6.20	34089	9.54	37780	12.16	15320	3.09
ZZZZZZ	48600	5.07	68822	6.20	32354	9.54	34773	12.16	15009	3.09
ZZZZZZ	49496	5.08	69203	6.20	34334	9.54	36072	12.16	14347	3.08

IS 1 = Pentafluorobenzene
IS 2 = 1,4-Difluorobenzene
IS 3 = Chlorobenzene-D5
IS 4 = 1,4-Dichlorobenzene-d4
IS 5 = Tert Butyl Alcohol-D9

(a) Upper Limit = +100% of check standard area; Retention time +0.5 minutes.
(b) Lower Limit = -50% of check standard area; Retention time -0.5 minutes.

Volatile Internal Standard Area Summary

Page 1 of 1

Job Number: MC23933
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Check Std:	MSM2031-CC2022	Injection Date:	08/30/13
Lab File ID:	M58877.D	Injection Time:	08:33
Instrument ID:	GCMSM	Method:	SW846 8260B

	IS 1		IS 2		IS 3		IS 4		IS 5	
	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
Check Std	395633	9.35	674718	10.23	297135	13.51	338447	16.07	161324	6.84
Upper Limit ^a	791266	9.85	1349436	10.73	594270	14.01	676894	16.57	322648	7.34
Lower Limit ^b	197817	8.85	337359	9.73	148568	13.01	169224	15.57	80662	6.34

Lab	IS 1		IS 2		IS 3		IS 4		IS 5	
Sample ID	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
MSM2031-BS	411577	9.36	689357	10.24	305690	13.51	343353	16.07	168325	6.84
MSM2031-BSD	411892	9.36	689550	10.23	304395	13.51	341734	16.07	176773	6.84
MSM2031-MB	371685	9.35	634945	10.23	265430	13.51	278724	16.07	149660	6.84
MC23933-2	375739	9.35	634649	10.23	270739	13.51	281237	16.07	274116	6.84
MC23933-3	387972	9.36	652528	10.23	276976	13.51	286740	16.07	251225	6.84
MC23933-2MS	398239	9.36	675104	10.24	299826	13.51	341912	16.07	290021	6.84
MC23933-2MSD	412970	9.35	689804	10.23	316962	13.51	363684	16.07	282238	6.84
ZZZZZZ	396675	9.36	660562	10.23	274261	13.51	285996	16.07	168831	6.85
ZZZZZZ	382760	9.35	652122	10.23	277185	13.51	289662	16.07	274455	6.84
ZZZZZZ	381734	9.35	636983	10.23	265639	13.51	279104	16.07	160821	6.84
ZZZZZZ	383526	9.36	643223	10.23	272511	13.51	282800	16.07	141806	6.85
ZZZZZZ	337897	9.36	580791	10.23	227938	13.51	190169	16.07	257952	6.84
ZZZZZZ	321177	9.36	541777	10.24	218619	13.51	208676	16.07	214409	6.85
ZZZZZZ	397642	9.35	664309	10.23	277015	13.51	285226	16.07	125307	6.84

IS 1 = Pentafluorobenzene
IS 2 = 1,4-Difluorobenzene
IS 3 = Chlorobenzene-D5
IS 4 = 1,4-Dichlorobenzene-d4
IS 5 = Tert Butyl Alcohol-D9

(a) Upper Limit = +100% of check standard area; Retention time +0.5 minutes.

(b) Lower Limit = -50% of check standard area; Retention time -0.5 minutes.

Volatile Internal Standard Area Summary

Page 1 of 1

Job Number: MC23933
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Check Std:	MSV864-CC864	Injection Date:	08/29/13
Lab File ID:	V22438.D	Injection Time:	11:47
Instrument ID:	GCMSV	Method:	SW846 8260B

	IS 1		IS 2		IS 3		IS 4		IS 5	
	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
Check Std	557083	6.57	793086	7.75	421655	11.08	432490	13.29	168803	3.51
Upper Limit ^a	1114166	7.07	1586172	8.25	843310	11.58	864980	13.79	337606	4.01
Lower Limit ^b	278542	6.07	396543	7.25	210828	10.58	216245	12.79	84402	3.01

Lab	IS 1		IS 2		IS 3		IS 4		IS 5	
Sample ID	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
MSV864-BS	553789	6.57	789450	7.75	416000	11.08	428149	13.29	161096	3.51
MSV864-MB	473919	6.57	706680	7.75	378628	11.08	370025	13.29	139370	3.51
MC23933-1	446174	6.57	679204	7.75	368126	11.08	355647	13.29	132543	3.51
MC23933-6	431838	6.57	656373	7.75	357352	11.08	346250	13.29	130592	3.50
ZZZZZZ	414899	6.57	633755	7.75	348969	11.08	333845	13.29	126519	3.51
ZZZZZZ	416508	6.57	620844	7.75	346912	11.08	353932	13.29	117934	3.51
ZZZZZZ	372891	6.56	575149	7.75	321242	11.08	308254	13.29	112270	3.50
ZZZZZZ	353931	6.57	550068	7.75	310021	11.08	296615	13.29	108147	3.50
MC23720-6	352096	6.57	551045	7.75	315592	11.08	294081	13.29	105697	3.50
ZZZZZZ	376551	6.57	559424	7.75	324163	11.08	322378	13.29	120338	3.51
ZZZZZZ	432680	6.57	612633	7.75	340951	11.08	348061	13.29	137308	3.51
MC23720-6MS	473252	6.56	671638	7.75	367679	11.08	378336	13.29	134064	3.50
MC23720-6MSD	481090	6.57	691398	7.75	375949	11.08	383341	13.29	138378	3.51
ZZZZZZ	457729	6.57	651424	7.75	367140	11.08	356365	13.29	123001	3.51
ZZZZZZ	440551	6.56	632822	7.75	364098	11.08	346714	13.29	117815	3.50
ZZZZZZ	393614	6.57	610795	7.75	345661	11.08	326205	13.29	109486	3.50
ZZZZZZ	373249	6.57	577152	7.75	322651	11.08	306278	13.29	103295	3.50
ZZZZZZ	365583	6.56	559772	7.75	315413	11.08	299581	13.29	97475	3.50
ZZZZZZ	356800	6.57	552488	7.75	324210	11.08	298366	13.29	94045	3.50
ZZZZZZ	339856	6.57	534012	7.75	306326	11.08	286888	13.29	89163	3.51
ZZZZZZ	393606	6.56	547037	7.75	311148	11.08	301034	13.29	89596	3.50

IS 1 = Pentafluorobenzene
IS 2 = 1,4-Difluorobenzene
IS 3 = Chlorobenzene-D5
IS 4 = 1,4-Dichlorobenzene-d4
IS 5 = Tert Butyl Alcohol-D9

(a) Upper Limit = +100% of check standard area; Retention time +0.5 minutes.
(b) Lower Limit = -50% of check standard area; Retention time -0.5 minutes.

Volatile Surrogate Recovery Summary

Page 1 of 1

Job Number: MC23933

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Method: SW846 8260B

Matrix: AQ

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3
MC23933-1	V22444.D	100	100	100
MC23933-6	V22445.D	102	100	101
MC23720-6MS	V22454.D	94	103	100
MC23720-6MSD	V22455.D	95	101	101
MSV864-BS	V22440.D	91	100	99
MSV864-MB	V22443.D	97	99	100

Surrogate Compounds	Recovery Limits
------------------------	--------------------

S1 = Dibromofluoromethane	70-130%
S2 = Toluene-D8	70-130%
S3 = 4-Bromofluorobenzene	70-130%

6.6.1

6

Volatile Surrogate Recovery Summary

Page 1 of 1

Job Number: MC23933

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Method: SW846 8260B

Matrix: SO

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3
MC23933-2	M58882.D	84	84	91
MC23933-3	M58883.D	82	84	92
MC23933-4	G131027.D	92	101	97
MC23933-5	G131028.D	96	106	103
MC23888-1MS	G131029.D	106	112	102
MC23888-1MSD	G131030.D	96	106	97
MC23933-2MS	M58884.D	82	84	84
MC23933-2MSD	M58885.D	81	84	81
MSG5100-BS	G131023.D	99	91	94
MSG5100-MB	G131025.D	93	102	96
MSM2031-BS	M58878.D	80	82	83
MSM2031-BSD	M58879.D	81	83	84
MSM2031-MB	M58881.D	81	84	89

Surrogate Compounds

Recovery Limits

S1 = Dibromofluoromethane

70-130%

S2 = Toluene-D8

70-130%

S3 = 4-Bromofluorobenzene

70-130%

6.6.2

6

GC Volatiles

QC Data Summaries

7

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Surrogate Recovery Summaries
- GC Surrogate Retention Time Summaries

Method Blank Summary

Page 1 of 1

Job Number: MC23933

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GWX3301-MB	WX68888.D	1	08/30/13	TB	n/a	n/a	GWX3301

The QC reported here applies to the following samples:

Method: SW846 8015

MC23933-6

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (VOA)	0.0176	0.10	0.013	mg/l	J

CAS No.	Surrogate Recoveries	Limits
	2,3,4-Trifluorotoluene	106% 60-135%

7.1.1

7

Method Blank Summary

Page 1 of 1

Job Number: MC23933

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GWX3300-MB	WX68888A.D	1	08/30/13	TB	n/a	n/a	GWX3300

The QC reported here applies to the following samples:

Method: SW846 8015

MC23933-2, MC23933-3, MC23933-4, MC23933-5

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (VOA)	ND	5.0	1.1	mg/kg	

CAS No.	Surrogate Recoveries	Limits
	2,3,4-Trifluorotoluene	106% 61-116%

7.1.2

7

Blank Spike Summary

Page 1 of 1

Job Number: MC23933

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GWX3300-BSP	WX68889A.D	1	08/30/13	TB	n/a	n/a	GWX3300

The QC reported here applies to the following samples:

Method: SW846 8015

MC23933-2, MC23933-3, MC23933-4, MC23933-5

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-GRO (VOA)	20	20.7	104	66-126

CAS No.	Surrogate Recoveries	BSP	Limits
	2,3,4-Trifluorotoluene	108%	61-116%

* = Outside of Control Limits.

Blank Spike Summary

Page 1 of 1

Job Number: MC23933

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GWX3301-BSP	WX68889.D	1	08/30/13	TB	n/a	n/a	GWX3301

The QC reported here applies to the following samples:

Method: SW846 8015

MC23933-6

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
	TPH-GRO (VOA)	0.4	0.413	103	68-134

CAS No.	Surrogate Recoveries	BSP	Limits
	2,3,4-Trifluorotoluene	108%	60-135%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: MC23933

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC23933-2MS	WX68892.D	1	08/30/13	TB	n/a	n/a	GWX3300
MC23933-2MSD	WX68893.D	1	08/30/13	TB	n/a	n/a	GWX3300
MC23933-2	WX68891.D	1	08/30/13	TB	n/a	n/a	GWX3300

The QC reported here applies to the following samples:

Method: SW846 8015

MC23933-2, MC23933-3, MC23933-4, MC23933-5

CAS No.	Compound	MC23933-2 mg/kg	Spike Q	MS mg/kg	MS %	Spike mg/kg	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-GRO (VOA)	ND	43.1	41.8	97	43.1	43.1	100	3	41-150/20

CAS No.	Surrogate Recoveries	MS	MSD	MC23933-2	Limits
	2,3,4-Trifluorotoluene	108%	107%	104%	61-116%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: MC23933

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC23810-1MS	WX68898.D	1	08/30/13	TB	n/a	n/a	GWX3301
MC23810-1MSD	WX68899.D	1	08/30/13	TB	n/a	n/a	GWX3301
MC23810-1	WX68900.D	1	08/30/13	TB	n/a	n/a	GWX3301

The QC reported here applies to the following samples:

Method: SW846 8015

MC23933-6

CAS No.	Compound	MC23810-1 mg/l	Spike Q	MS mg/l	MS %	Spike mg/l	MSD mg/l	MSD %	RPD	Limits Rec/RPD
	TPH-GRO (VOA)	0.0500	0.4	0.479	107	0.4	0.498	112	4	72-131/20

CAS No.	Surrogate Recoveries	MS	MSD	MC23810-1	Limits
	2,3,4-Trifluorotoluene	120%	119%	107%	60-135%

* = Outside of Control Limits.

Volatile Surrogate Recovery Summary

Page 1 of 1

Job Number: MC23933

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Method: SW846 8015

Matrix: AQ

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 ^a
MC23933-6	WX68890.D	107
GWX3301-BSP	WX68889.D	108
GWX3301-MB	WX68888.D	106
MC23810-1MS	WX68898.D	120
MC23810-1MSD	WX68899.D	119

Surrogate Compounds	Recovery Limits
------------------------	--------------------

S1 = 2,3,4-Trifluorotoluene	60-135%
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(a) Recovery from GC signal #1

7.4.1

7

Volatile Surrogate Recovery Summary

Page 1 of 1

Job Number: MC23933

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Method: SW846 8015

Matrix: SO

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 ^a
MC23933-2	WX68891.D	104
MC23933-3	WX68894.D	106
MC23933-4	WX68895.D	115
MC23933-5	WX68896.D	124* ^b
GWX3300-BSP	WX68889A.D	108
GWX3300-MB	WX68888A.D	106
MC23933-2MS	WX68892.D	108
MC23933-2MSD	WX68893.D	107

Surrogate Compounds	Recovery Limits
------------------------	--------------------

S1 = 2,3,4-Trifluorotoluene	61-116%
-----------------------------	---------

(a) Recovery from GC signal #1

(b) Outside control limits due to possible matrix interference.

7.4.2

7

GC Surrogate Retention Time Summary

Page 1 of 1

Job Number: MC23933

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Check Std:	GWX3300-CC3210	Injection Date:	08/30/13
Lab File ID:	WX68887A.D	Injection Time:	09:22
Instrument ID:	GCWX	Method:	SW846 8015

S1 ^a
RT

Check Std	19.96
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Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 ^a RT
GWX3300-MB	WX68888A.D	08/30/13	09:59	19.96
GWX3301-MB	WX68888.D	08/30/13	09:59	19.96
GWX3300-BSP	WX68889A.D	08/30/13	10:37	19.96
GWX3301-BSP	WX68889.D	08/30/13	10:37	19.96
MC23933-6	WX68890.D	08/30/13	11:14	19.96
MC23933-2	WX68891.D	08/30/13	11:51	19.96
MC23933-2MS	WX68892.D	08/30/13	12:29	19.96
MC23933-2MSD	WX68893.D	08/30/13	13:06	19.96
MC23933-3	WX68894.D	08/30/13	13:43	19.96
MC23933-4	WX68895.D	08/30/13	14:21	19.96
MC23933-5	WX68896.D	08/30/13	14:59	19.96

Surrogate Compounds

S1 = 2,3,4-Trifluorotoluene

(a) Retention time from GC signal #1

7.5.1

7

GC Surrogate Retention Time Summary

Page 1 of 1

Job Number: MC23933

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Check Std:	GWX3301-CC3210	Injection Date:	08/30/13
Lab File ID:	WX68887.D	Injection Time:	09:22
Instrument ID:	GCWX	Method:	SW846 8015

S1 ^a
RT

Check Std	19.96
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Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 ^a RT
GWX3300-MB	WX68888A.D	08/30/13	09:59	19.96
GWX3301-MB	WX68888.D	08/30/13	09:59	19.96
GWX3300-BSP	WX68889A.D	08/30/13	10:37	19.96
GWX3301-BSP	WX68889.D	08/30/13	10:37	19.96
MC23933-6	WX68890.D	08/30/13	11:14	19.96
MC23933-2	WX68891.D	08/30/13	11:51	19.96
MC23933-2MS	WX68892.D	08/30/13	12:29	19.96
MC23933-2MSD	WX68893.D	08/30/13	13:06	19.96
MC23933-3	WX68894.D	08/30/13	13:43	19.96
MC23933-4	WX68895.D	08/30/13	14:21	19.96
MC23933-5	WX68896.D	08/30/13	14:59	19.96

Surrogate Compounds

S1 = 2,3,4-Trifluorotoluene

(a) Retention time from GC signal #1

7.5.2

7

GC Surrogate Retention Time Summary

Page 1 of 1

Job Number: MC23933

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Check Std:	GWX3300-CC3210	Injection Date:	08/30/13
Lab File ID:	WX68897A.D	Injection Time:	15:36
Instrument ID:	GCWX	Method:	SW846 8015

S1 ^a
RT

Check Std	19.96
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Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 ^a RT
MC23810-1MS	WX68898.D	08/30/13	16:13	19.96
MC23810-1MSD	WX68899.D	08/30/13	16:51	19.96
MC23810-1	WX68900.D	08/30/13	17:28	19.96
ZZZZZZ	WX68901.D	08/30/13	18:06	19.96
ZZZZZZ	WX68902.D	08/30/13	18:43	19.96
ZZZZZZ	WX68903.D	08/30/13	19:20	19.96
ZZZZZZ	WX68904.D	08/30/13	19:58	19.96
ZZZZZZ	WX68905.D	08/30/13	20:35	19.96
ZZZZZZ	WX68906.D	08/30/13	21:12	19.96
ZZZZZZ	WX68907.D	08/30/13	21:50	19.96

Surrogate Compounds

S1 = 2,3,4-Trifluorotoluene

(a) Retention time from GC signal #1

7.5.3
7

GC Surrogate Retention Time Summary

Page 1 of 1

Job Number: MC23933

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Check Std:	GWX3301-CC3210	Injection Date:	08/30/13
Lab File ID:	WX68897.D	Injection Time:	15:36
Instrument ID:	GCWX	Method:	SW846 8015

S1 ^a
RT

Check Std	19.96
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Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 ^a RT
MC23810-1MS	WX68898.D	08/30/13	16:13	19.96
MC23810-1MSD	WX68899.D	08/30/13	16:51	19.96
MC23810-1	WX68900.D	08/30/13	17:28	19.96
ZZZZZZ	WX68901.D	08/30/13	18:06	19.96
ZZZZZZ	WX68902.D	08/30/13	18:43	19.96
ZZZZZZ	WX68903.D	08/30/13	19:20	19.96
ZZZZZZ	WX68904.D	08/30/13	19:58	19.96
ZZZZZZ	WX68905.D	08/30/13	20:35	19.96
ZZZZZZ	WX68906.D	08/30/13	21:12	19.96
ZZZZZZ	WX68907.D	08/30/13	21:50	19.96

Surrogate
Compounds

S1 = 2,3,4-Trifluorotoluene

(a) Retention time from GC signal #1

7.5.4
7

General Chemistry

QC Data Summaries



Includes the following where applicable:

- Percent Solids Raw Data Summary

Percent Solids Raw Data Summary

Page 1 of 1

Job Number: MC23933

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Air Sparge Pilot Test, 900 South Central Ave, IL

Sample: MC23933-2 Analyzed: 29-AUG-13 by BF Method: SM21 2540 B MOD.
ClientID: VMP56-082813(9-11')

Wet Weight (Total)	41.814	g
Tare Weight	27.029	g
Dry Weight (Total)	41.128	g
Solids, Percent	95.4	%

Sample: MC23933-3 Analyzed: 29-AUG-13 by BF Method: SM21 2540 B MOD.
ClientID: VMP56-082813(24-25')

Wet Weight (Total)	44.822	g
Tare Weight	17.086	g
Dry Weight (Total)	38.766	g
Solids, Percent	78.2	%

Sample: MC23933-4 Analyzed: 29-AUG-13 by BF Method: SM21 2540 B MOD.
ClientID: VMP56-082813(38-38.5')

Wet Weight (Total)	35.511	g
Tare Weight	19.435	g
Dry Weight (Total)	32.503	g
Solids, Percent	81.3	%

Sample: MC23933-5 Analyzed: 29-AUG-13 by BF Method: SM21 2540 B MOD.
ClientID: VMP56-082813-D(38-38.5')

Wet Weight (Total)	35.822	g
Tare Weight	20.003	g
Dry Weight (Total)	32.57	g
Solids, Percent	79.4	%

8.1

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