



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, IL 62084 Site No. (USEPA) ILD 080 012 305

2.0 Owner Information

Name Not applicable
 Mail Address _____
 City _____
 State _____ Zip Code _____
 Contact Name _____
 Contact Title _____
 Phone _____

3.0 Operator Information

Name Equilon Enterprises LLC d/b/a SOPUS
 Mail Address 17 Junction Drive, PMB #399
 City Glen Carbon
 State IL Zip Code 62034
 Contact Name Kevin Dyer
 Contact Title Principal Program Manager
 Phone 618-288-7237

4.0 Type of Submission (check applicable item and provide requested information, as applicable)

RFI Phase I Workplan/Report IEPA Permit Log No. B-43R
 RFI Phase II Workplan/Report Date of Last IEPA Letter on Project Jan 3, 2013
 CMP Report; Log No. of Last IEPA Letter on Project B-43R-CA-39
 Other (describe): Public Works Yard Soil Sampling Does this submittal include groundwater information: Yes No
 Date of Submittal March 13, 2013

5.0 Description of Submittal: (briefly describe what is being submitted and its purpose)

Report of soil sampling conducted at Roxana Public Works Yard

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

RCRA Corrective Action Certification and Soil Sampling Report dated March 13, 2013.

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.

For: Equilon Enterprises LLC d/b/a SOPUS

Date of Submission: Mar 13, 2013

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: [Signature] Date: 03/13/13

Title: 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.

Any person who knowingly makes a false, fictitious, or fraudulent material statement, orally or in writing, to the Illinois EPA commits a Class 4 felony. A second or subsequent offense after conviction is a Class 3 felony. (415 ILCS 5/44 (h))

Professional's Signature: [Signature] Date: 3/13/13

Professional's Name Robert Billman

Address 1001 Highlands Plaza Drive

City St Louis

State MO Zip Code 63110

Phone 314-429-0100



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 _____

Date: _____

Signature of Laboratory Responsible Officer

Mailing Address of Laboratory

Address _____

City _____

State _____ Zip Code _____

Name and Title of Laboratory Responsible Officer

For: _____

Date of Submission: Mar 13, 2013

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):

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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: _____ Date: _____

Title: Principal Program Manager

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Professional's Signature: _____ Date: _____

Professional's Name _____

Address _____

Professional's Seal:

City _____

State _____ Zip Code _____

Phone _____

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 Accutest Labs.

Date: 3-12-13

[Signature]
Signature of Laboratory Responsible Officer

Mailing Address of Laboratory

Address 495 Tech. Center w. Bldg 1

Reza Tard, V.P., Lab Director

City Fall River,

Name and Title of Laboratory Responsible Officer

State MA Zip Code 01752



March 13, 2013

Stephen F. Nightingale, P.E.
Manager, Permit Section
Bureau of Land
Illinois Environmental Protection Agency
1021 North Grand Avenue East
P.O. Box 19276
Springfield, IL 62794-9276

RE: 1191150002 – Madison County
Equilon Enterprises LLC d/b/a Shell Oil Products US
Log No. B-43R-CA-1; CA-3, CA-5, CA-6, CA-7, CA-8, CA-10, CA-11,
and PS11-032
Public Work Yard Soil Sampling
Roxana, Illinois

Dear Mr. Nightingale:

Shell Oil Products US (SOPUS) recently conducted soil investigation activities at the Public Works Yard in the Village of Roxana, Illinois (Village). This work was performed according to the *Supplemental Information to the Meeting on August 1, 2011 Scope of Work for Additional Soil Investigation*, which was submitted to the Illinois Environmental Protection Agency (IEPA) with the *Response to Agency Comments Provided in June 16, 2011 Letter* dated September 1, 2011.

Presented below is a discussion of the investigation activities and results.

The former benzene line trended east-west in the railroad right-of-way just south of the Public Works Yard. As such, five soil borings were advanced at approximately 100-foot intervals from Route 111 to the eastern edge of the Public Works Yard (GP-14 through GP-18 on **Figure 1**). These locations are on the north side of the former benzene line.

INVESTIGATION ACTIVITIES

This soil sampling investigation was performed in general accordance with the investigative procedures contained in the *Response to Agency Comments Provided in June 16, 2011 Letter* dated September 1, 2011. The field activities were conducted during December 2012 and January 2013. The following subsections provide a brief description of the data collection activities that were performed.



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PRE-FIELD ACTIVITIES AND BOREHOLE CLEARANCE

Field activities for this investigation were conducted on the Village of Roxana Public Works property, and on Illinois Department of Transportation (IDOT) right-of-way (**Figure 1**). The work in the Village was performed according to an access agreement between SOPUS and the Village, signed October 5, 2012. The work on IDOT property (location GP-14) was performed under an IDOT permit issued October 15, 2012.

Prior to the start of work, investigation locations were marked in the field and reviewed with Village representatives. A utility locate was performed using Illinois' Joint Utility Locating Information for Excavators (JULIE) service. Private utility locating services were also performed using ground penetrating radar (GPR) at each location.

Borehole clearance via an air-vacuum system (air-knife) was used to clear each location with respect to underground utility lines or other obstructions. The specific target depth for borehole clearance was determined to be 10 feet below ground surface (bgs) based upon a review of the subsurface utilities in the area.

Subsurface material observations were made during borehole clearance activities by advancing a hand auger prior to air-knifing to collect and classify the soil. These observations were noted on the soil boring logs.

SOIL SAMPLING

Soil sampling was performed by Roberts Environmental Drilling, Inc. (REDI) with an 8040DT Geoprobe® rig at five locations (GP-14 through GP-18) along the southern portion of the Public Works Yard from Route 111 to the eastern edge of the Public Works Yard (**Figure 1**).

Soil sampling was conducted via direct push, using a dual-tube sampling system. The dual-tube system consisted of a 5-foot long by 1.85-inch diameter clear acetate liner attached to 1-inch diameter inner rods. The acetate liner and inner rods were advanced simultaneously with the 3.5-inch diameter outer casing. Once a sample was collected within the acetate liner, the inner rods and acetate liner were retrieved while the outer casing remained in place. The acetate liner was replaced and inner rod returned to the



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sampling depth, at which point the process was repeated. The soil borings were advanced to depths ranging between 48 and 93 feet bgs.

The subsurface stratigraphy was continuously logged by a qualified field scientist in accordance with applicable ASTM standards and the Unified Soil Classification System (USCS). The field scientist noted soil attributes such as color, particle size, consistency, moisture content, structure, plasticity, odor (if noted/present), and organic content (if visible). Soil samples were screened in the field using a photoionization detector (PID) and observations were noted on the soil boring logs. Additional field screening was also conducted on selected soil samples in each boring using Oil-in-Soil Sudan IV® test kits¹ to provide additional information on residual hydrocarbons in the soil. The Sudan IV® test kits utilized a dye which stains residual hydrocarbons at concentrations greater than or equal to 500 parts per million (ppm). The observations of the Sudan IV® tests are also presented on the soil boring logs. The soil boring logs are included in **Attachment A**.

Four to seven discrete soil samples per boring were collected for analysis of volatile organic compounds (VOCs) based on field headspace readings and/or Sudan IV® field screening results. The soil samples for laboratory analysis were separate from those used for field screening and were not composited prior to placing the soil samples into laboratory supplied containers.

Upon completion of these soil borings, the boreholes were backfilled with bentonite grout through the outer casing and the ground surface was returned to its original condition.

HEALTH & SAFETY, DECONTAMINATION, & INVESTIGATION DERIVED WASTE

Field personnel (URS and subcontractors) primarily wore U.S. Environmental Protection Agency (USEPA) Level D personal protective equipment (PPE). Modified Level D PPE (e.g., including Tyvek and face shields) were used during decontamination efforts.

A PID with a 10.6 electron volt (eV) probe and combustible gas indicator (CGI) were used during the field activities to monitor air quality for health and safety purposes. An UltraRae 3000 gas monitor was used to specifically monitor for benzene. Field

¹ The Sudan IV® kits are a qualitative test for the presence of residual hydrocarbons and may not be a direct correlation to laboratory VOC results.



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instruments were calibrated prior to each use each day in accordance with the manufacturer's specifications. Health and safety related information was recorded in the field logbook and on appropriate field paperwork.

Prior to beginning site work, and at the start of each day, a daily safety meeting was held. The purpose of this meeting was to discuss the day's planned activities and to address any potential health and safety concerns. URS and subcontract employees attended these daily meetings.

Field personnel and equipment underwent decontamination procedures to ensure the health and safety of those present, to maintain sample integrity, and to minimize cross contamination between sampling locations.

Non-disposable/reusable sampling equipment (e.g., drilling sampling rod and shoe) was decontaminated between sample runs by washing with LiquiNox or similar and a distilled water rinse. Drilling equipment (e.g., drilling rods and casing) was decontaminated between sampling locations with a high-pressure hot water wash at a temporary decontamination pad at the Public Works Yard.

Investigation derived waste (IDW), including soil cuttings, PPE and expendable materials, and decontamination water were collected and disposed of properly. Expendable materials (e.g. disposal sampling equipment such as gloves) having a low probability of impact were collected in trash bags and disposed of as municipal waste. Soil cuttings from these borings and several other drilling locations performed concurrently in the Village were collected and placed directly in a labeled and covered roll-off container and managed by URS on behalf of SOPUS. Decontamination fluids generated were collected and staged at the Public Works Yard in 55-gallon steel drums prior to disposal.

Soil IDW was disposed at the Waste Management, Inc. Milam Recycling and Disposal Facility (Milam) in Fairmont City, Illinois. Decontamination fluids were disposed at the Heritage Environmental Services Facility in Indianapolis, Indiana.



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SAMPLE HANDLING, LABORATORY TESTING, DATA QUALITY REVIEW, AND DATA MANAGEMENT, ANALYSIS AND REPORTING

Sample containers were labeled with a sample ID number, site name, sampler initials, sample date and time, sample preservative, and the parameters that were to be analyzed. After samples were collected, the samples were logged on a Chain-of-Custody (COC) form, packed to prevent damage during shipment, and cooled to 4°C. The samples were then delivered, under the proper COC documentation, to Accutest Laboratories in Marlborough, Massachusetts. The soil samples collected were analyzed for VOCs via USEPA Methods 8260B and 8011.

Laboratory data were provided in electronic form. Analytical data were subjected to a Level III review for quality and completeness, in accordance with procedures outlined in the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review. Data qualifiers were added, as appropriate, and are included on the data tables and the laboratory result pages.

Soil results reported for the analyses performed were accepted for their intended use. Acceptable levels of accuracy and precision, based on matrix spike/matrix spike duplicate (MS/MSD), laboratory control sample (LCS), surrogate and field duplicate data were achieved for these sample delivery groups (SDGs) to meet the project objectives.

Field data and documentation collected as part of this supplemental scope of work became part of the project file. URS maintains the project file for the site, including relevant records, logs, field logbooks, subcontractor reports, data reviews, and the database management system.

INVESTIGATION RESULTS

The results of the investigation activities are described below.

Stratigraphy

The surface topography across the southern portion of the Public Works Yard generally slopes downward to the west with a total drop in elevation of approximately 4 feet from GP-18 to GP-14. The cross-section location can be viewed in **Figure 2** and a subsurface

cross-section for the southern portion of the Public Works Yard is shown in **Figure 3**. This cross section was primarily developed based on information collected during this soil investigation and supplemented with previously logged borings in the vicinity.

The stratigraphy beneath the investigation area consists of the following materials from top down:

- Fill – Primarily sand, gravel and silt; the fill typically extends to depths ranging from 1 to 2 feet bgs². The fill observed at GP-14 primarily consists of asphalt rubble with sand and gravel, and extends to a depth of about 14.5 feet bgs. This may be related to construction of the adjacent Route 111.
- Clay/Silt – Primarily silty clay and/or clayey silt; the clay/silt, where encountered, extends below the fill material to depths of about 3 to 8 feet bgs. Underlying the fill at GP-14 is low plastic clay to sandy clay extending to a depth of about 25.5 feet bgs.
- Sand –Typically coarsens with depth
 - Primarily fine to medium grained sand extends below the fill and/or clay/silt to depths of about 18 to 58 feet bgs. At GP-14, this material extends below the clay to the bottom of the borehole (about 48 feet bgs);
 - Primarily medium to coarse grained sand, where present, extends below the fine to medium grained sand to depths of about 63 to 81 feet bgs;
 - Primarily coarse grained sand with coarse gravel extends below the medium grained sands to the depths explored (about 68 to 93 feet bgs).

Discontinuous finer grained lenses of clay to sandy clay are present in borings GP-15, GP-16, GP-17 and GP-18. At GP-15, -16, and -17 this interval begins at depth of about 12 to 13 feet bgs. It is less than 1-foot thick. At GP-18, a thin clayey seam is present at a depth of approximately 22 feet bgs.

Groundwater was observed in the borings during drilling at depths between 30 to 35 feet bgs.

² As shown on Figure 3, the fill extends deeper at some locations, e.g., SVE-27.



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Sudan IV® Results

A “white” screening result indicates that residual hydrocarbons are not present within the soil or may be present at concentrations less than 500 ppm. A “pink” or “red” screening result indicates that residual hydrocarbons may be present within the soil at greater than 500 ppm. In general, the Sudan IV® field screening results correlated with the PID headspace screening and the laboratory analytical results for soils (e.g., positive correlation between Sudan test results and laboratory data in 16 of 21 samples).

Table 1 presents a comparison of field screening methods and laboratory results. The results of the Sudan IV® field screening are presented on the boring logs in **Attachment A**.

Soil Analytical Results

A tabular summary of the analytical detections for the soil samples collected during this investigation is presented in **Table 2**. Laboratory reports for these sample results are provided in **Attachment B**. Benzene, toluene, ethylbenzene and xylenes (BTEX) results are depicted on **Figure 4**.

In general, these VOC constituents are similar to those detected during previous investigation activities at the Public Works Yard. Benzene concentrations are depicted vertically on **Figure 3**. The highest concentrations were observed between depths of approximately 35 to 55 feet bgs (concentrations >100 mg/kg), coincident with the upper portion of the groundwater table. Concentrations decrease with depth below this. Notably, concentrations were much less at location GP-14, west of the Public Works yard (concentrations <5 mg/kg).

CONCLUSIONS

URS conducted a soil sampling investigation on behalf of SOPUS at the Public Works Yard in the Village of Roxana. The results of this soil investigation generally indicate the highest BTEX concentrations are located in the upper portion of the groundwater table, and decrease with depth. Concentrations also appear to decrease to the west of the Public Works yard (GP-14).



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If there are any questions on the information contained in this report please do not hesitate to contact us (314-429-0100) or Kevin Dyer (SOPUS) (618-288-7237).

Sincerely,

URS Corporation, on behalf of Shell Oil Products US

Wendy Pennington
Staff Engineer

Robert B. Billman
Senior Project Manager

Enclosures: **Table 1** Field Screening Methods Comparison Table
Table 2 Summary of Soil Analytical Results for Detected Constituents
Figure 1 Public Works Yard Soil Sampling Locations
Figure 2 Cross Section Key Map
Figure 3 Cross Section A-A' Public Works
Figure 4 Summary of BTEX Analytical Results
Attachment A Soil Boring Logs
Attachment B Data Review Sheets and Analytical Reports

cc: Jim Moore, IEPA
Kevin Dyer, SOPUS
Marty Reynolds, Village of Roxana
Shannon Haney, Greensfelder, Hemker & Gale (2 copies)

TABLE 1
Field Screening Methods Comparison Table
Publics Works Yard, Roxana, Illinois

Depth (ft bgs)	GP-14			GP-15			GP-16			GP-17			GP-18			
	Sudan (color)	PID (ppm)	VOC Results (mg/kg)	Sudan (color)	PID (ppm)	VOC Results (mg/kg)	Sudan (color)	PID (ppm)	VOC Results (mg/kg)	Sudan (color)	PID (ppm)	VOC Results (mg/kg)	Sudan (color)	PID (ppm)	VOC Results (mg/kg)	
1											4.4				0.7	
2											0.5				0.6	
3											0.6				0.7	
4											0.4				1	
5											0.8				0.2	
6											0.3				0.2	
7											0.7				0.1	
8											0.5				0.1	
9		55.9									0.3				0.7	
10											2.3				1.2	
11		4.5			677			0.4			1				2.1	
12																
13		7.5	0.00049	red	2,232			0.7			413.3				1.5	
14																
15		0.5			2,881			0.8		red	13,261	233	508		2.3	
16																
17		0.6			1,647			0.9			9457				2.8	
18																
19		0.3		red	8,027	80.6		6.1			570.2				2	
20																
21		0.2		red	4,622			6.3		pink	1,570			white	5.4	9.94
22																
23		0.2		white	245			11.6	0.0508		95.5				2.8	
24																
25		142.8		red	2,561			7.3			41.8				68.6	
26																
27	white	133.5			102.9			35.8			10.1				364	
28																
29	white	154.2		white	56	0.130		38.7			5.9				421.3	
30																
31		576			1,360			58.3		white	6.9				611.7	
32																
33	pink	1,157	3.66		1,192			69.3			4.9			red	15,000+	
34																
35	white	891			1,051			12.7			29.3				15,000+	
36																
37		617		red	15,000+	1,011 / 1,210		white	822.1		85.2			red	15,000+	467
38																
39	pink	846	8.00		15,000+			6,421			252.7				15,000+	
40																
41		100.3			7,661			white	15,000+		713.7				15,000+	
42											478					
43		20.7			10,691			white	15,000+		red	12,610		red	15,000+	
44																
45	white	24	0.212		15,000+			1,232		white	15,000+	1562			15,000+	
46																
47		23.7		white	15,000+	298		3,054			7,620				15,000+	
48																
49	Bottom of Boring				1,654			1,002			323.4				52.3	
50																
51					4,220			white	5,146	28.3	322.9				523.7	
52																
53					337.7			1,023			67.1			white	5,474	670
54																
55				red	1,124	934		892.3			504.6				1,971	
56																
57					398.3			red	1,299	1,013 / 1,146	white	5,086	180		4,317	
58																
59					3,658			1,098			90.5				340.4	
60																
61					1,994			1,150		white	582.2				414.3	
62																
63					1,593			413.2			537.7			white	463.5	74.0
64																
65					1,275			white	1,037		264.4	18.1			65.8	
66																
67					19.6			751			209.5				17.3	
68																
69				white	233.1			1,288			Bottom of Boring		Bottom of Boring			

TABLE 1
Field Screening Methods Comparison Table
Publics Works Yard, Roxana, Illinois

Depth (ft bgs)	GP-14			GP-15			GP-16			GP-17			GP-18			
	Sudan (color)	PID (ppm)	VOC Results (mg/kg)	Sudan (color)	PID (ppm)	VOC Results (mg/kg)	Sudan (color)	PID (ppm)	VOC Results (mg/kg)	Sudan (color)	PID (ppm)	VOC Results (mg/kg)	Sudan (color)	PID (ppm)	VOC Results (mg/kg)	
70																
71					78			602								
72																
73					132.6			561.4								
74				white		4.97										
75					132.6			927.2								
76																
77					46.3		white	1,574	11.0							
78																
79					82											
80																
81					143.6		white	15								
82																
83					48			10.8								
84																
85					4.1			6.2								
86																
87					3.8			12								
88																
89				white	18	0.483										
90																
91					4.1			15.3	0.0799							
92																
93					3.3			13								
94				Bottom of Boring			Bottom of Boring									
95																
96																
97																
98																

NOTES:

- 1) **Sudan** - White < 500 ppm; pink/red > 500 ppm
 - 2) **PID** - Organic vapor headspace measurements recorded using a MiniRae 3000 PID with a 10.6 eV lamp.
 - 3) **VOC results** - Value shown is the summation of the detected analytical VOC constituents for that particular sample.
- Yellow highlighting indicates a correlation between Sudan IV® field screening results and PID screening and/or VOC analytical results.
- Heavy blue line indicates the depth of groundwater at the time of drilling.

TABLE 2
Summary of Soil Analytical Results for Detected Constituents
Publics Works Yard, Roxana, Illinois

Location	Sample ID	Depth	Sample Date	Benzene			Ethylbenzene			Toluene			m,p-Xylenes			o-Xylenes			Acrylonitrile			n-Butylbenzene			sec-Butylbenzene			tert-Butylbenzene			Carbon disulfide			Chloroform			Cymene (p-Isopropyltoluene)					
				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	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						
GP-14	GP-14-13	13 ft	12/18/2012	0.00049	J		< 0.0023	U		< 0.0058	U		< 0.0023	U		< 0.0023	U		< 0.029	U		< 0.0058	U		< 0.0058	U		< 0.0058	U		< 0.0058	U		< 0.0023	U		< 0.0058	U				
	GP-14-33	33 ft	12/18/2012	3.57			< 0.24	U		< 0.61	U		< 0.24	U		< 0.24	U		< 3	U		0.0877	J		< 0.61	U		< 0.61	U		< 0.24	U		< 0.61	U		< 0.61	U				
	GP-14-39	39 ft	12/18/2012	3.75			0.111	J		< 0.61	U		0.441			< 0.24	U		< 3	U		0.754	J		0.143	J		< 0.61	U		< 0.24	U		< 0.24	U		0.101	J				
	GP-14-45	45 ft	12/18/2012	0.16			0.0032			0.0111			0.008			0.0026			< 0.024	U		0.0024	J		0.0016	J		0.0011	J		< 0.002	U		0.00049	J							
GP-15	GP-15-19	19 ft	12/18/2012	63.7			0.669			0.283	J		1.36			0.294	J		< 6.2	U		1.58			1.41			< 1.2	U		< 1.2	U		< 0.5	U		1.79					
	GP-15-29	29 ft	12/18/2012	0.126			0.00064	J		0.00099	J		0.0012	J		0.00039	J		< 0.028	U		< 0.0055	U		< 0.0055	U		< 0.0055	U		< 0.0055	U		< 0.0022	U		< 0.0055	U				
	GP-15-37	37 ft	12/18/2012	974			4.56	J		5.53	J		12.3			4.6	J		< 61	U		1.12	J		< 12	U		< 12	U		< 12	U		< 4.9	U		< 12	U				
	GP-15-37-DUP	37 ft	12/18/2012	1,150			5.28			6.76			15.7			6.08			< 2.8	U		0.864			0.228	J		< 0.55	U		< 0.55	U		< 0.22	U		0.154	J				
	GP-15-47	47 ft	12/18/2012	283			1.71			1.69	J		4.81			1.62			< 15	U		0.347	J		1.86	J		< 3	U		< 3	U		< 1.2	U		0.301	J				
	GP-15-55	55 ft	12/18/2012	184			111			12.5			290			63			< 25	U		13.9			3.12	J		2.29	J		< 5	U		< 2	U		2.31	J				
	GP-15-74	74 ft	12/21/2012	3.97			0.151	J		< 0.57	U		0.403			0.0966	J		< 2.8	U		0.0387	J		< 0.57	U		< 0.57	U		< 0.57	U		< 0.23	U		< 0.57	U				
GP-15-89	89 ft	12/21/2012	0.483			< 0.21	U		< 0.52	U		< 0.21	U		< 0.21	U		< 2.6	U		< 0.52	U		< 0.52	U		< 0.52	U		< 0.52	U		< 0.21	U		< 0.52	U					
GP-16	GP-16-23	23 ft	1/3/2013	0.0458			0.0022	J		0.0028	J		< 0.0026	U		< 0.0026	U		< 0.032	U		< 0.0065	U		< 0.0065	U		< 0.0065	U		< 0.0065	U		< 0.0065	U		< 0.0026	U		< 0.0065	U	
	GP-16-42	42 ft	1/3/2013	476			0.177	J		0.999			0.509			0.226	J		< 2.9	U		< 0.57	U		< 0.57	U		< 0.57	U		< 0.57	U		< 0.23	U		< 0.57	U				
	GP-16-51	51 ft	1/3/2013	25			0.298			0.141	J		0.706			0.189	J		< 2.6	U		0.141	J		0.0308	J		< 0.52	U		< 0.52	U		< 0.21	U		< 0.52	U				
	GP-16-57	57 ft	1/3/2013	431			33.1		J	76.8			62.1		J	11.4		J	24.5			27.9			4.96			1.69			< 0.52	U		< 0.21	U		3.09					
	GP-16-57-DUP	57 ft	1/3/2013	473			21.5		J	94.3			40		J	7.63		J	27.6			32.8			5.87			2.25			< 0.59	U		< 0.24	U		3.7					
	GP-16-77	77 ft	1/3/2013	2.18			0.814			0.608			1.72			0.297			< 2.4	U		0.4	J		0.0725	J		< 0.49	U		< 0.49	U		< 0.19	U		0.0518	J				
GP-16-91	91 ft	1/7/2013	0.0488			0.0045			0.004	J		0.0099			0.0029			< 0.024	U		< 0.0048	U		< 0.0048	U		< 0.0048	U		0.00095	J	J	0.00075	J		< 0.0048	U					
GP-17	GP-17-15	15 ft	1/7/2013	154		J	1.69			< 2.7	U		4.44			2.84			< 14	U		3.01			0.323	J		< 2.7	U		< 2.7	U		< 1.1	U		0.415	J				
	GP-17-15-DUP	15 ft	1/7/2013	391		J	3.04			< 7	U		7.57			4.76			< 35	U		4.67	J		< 7	U		< 7	U		< 7	U		< 2.8	U		< 7	U				
	GP-17-45	45 ft	1/7/2013	1,550			1.45	J		3.09	J		2.73			0.945	J		< 21	U		< 4.1	U		< 4.1	U		< 4.1	U		< 4.1	U		< 1.6	U		< 4.1	U				
	GP-17-57	57 ft	1/7/2013	178			0.569	J		< 5.9	U		< 2.4	U		< 2.4	U		< 30	U		< 5.9	U		< 5.9	U		< 5.9	U		< 5.9	U		< 2.4	U		< 5.9	U				
	GP-17-65	65 ft	1/7/2013	15.4			0.41			< 0.39	U		0.934			0.23			< 2	U		0.0559	J		< 0.39	U		< 0.39	U		< 0.39	U		< 0.16	U		< 0.39	U				
GP-18	GP-18-21	21 ft	1/8/2013	9.94			< 0.72	U		< 1.8	U		< 0.72	U		< 0.72	U		< 9	U		< 1.8	U		< 1.8	U		< 1.8	U		< 1.8	U		< 0.72	U		< 1.8	U				
	GP-18-37	37 ft	1/8/2013	453			1.13	J		< 5.1	U		2.52			0.798	J		< 25	U		< 5.1	U		< 5.1	U		< 5.1	U		< 5.1	U		< 2	U		< 5.1	U				
	GP-18-53	53 ft	1/8/2013	668			< 2.7	U		< 6.7	U		< 2.7	U		< 2.7	U		< 34	U		< 6.7	U		< 6.7	U		< 6.7	U		< 6.7	U		< 2.7	U		< 6.7	U				
	GP-18-63	63 ft	1/8/2013	67.8			0.243	J		< 2.6	U		1.41			< 1.1	U		< 13	U		< 2.6	U		< 2.6	U		< 2.6	U		< 2.6	U		< 1.1	U		< 2.6	U				

TABLE 2
Summary of Soil Analytical Results for Detected Constituents
Publics Works Yard, Roxana, Illinois

Location	Sample ID	Depth	Sample Date	1,1-Dichloroethane			1,2-Dichloroethane			2-Hexanone (Methyl N-Butyl Ketone)			Isopropylbenzene (Cumene)			Methyl tert-Butyl Ether (MTBE)			Naphthalene			n-Propylbenzene			1,2,4-Trimethylbenzene			1,3,5-Trimethylbenzene			Vinyl acetate		
				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	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals	Result (mg/kg)	Lab Quals	URS Quals
GP-14	GP-14-13	13 ft	12/18/2012	< 0.0023	U		< 0.0023	U		< 0.0058	U		< 0.0058	U		< 0.0023	U		< 0.0058	U		< 0.0058	U		< 0.0058	U		< 0.0058	U		< 0.0058	U	
	GP-14-33	33 ft	12/18/2012	< 0.24	U		< 0.24	U		< 0.61	U		< 0.61	U		< 0.24	U		< 0.61	U		< 0.61	U		< 0.61	U		< 0.61	U		< 0.61	U	
	GP-14-39	39 ft	12/18/2012	< 0.24	U		< 0.24	U		< 0.61	U		0.395	J		< 0.24	U		< 0.61	U		1.29			0.114	J		0.0692	J		0.629		
	GP-14-45	45 ft	12/18/2012	0.00036	J		< 0.002	U		< 0.0049	U		0.0061			< 0.002	U		< 0.0049	U		0.0136			0.00048	J		< 0.0049	U		< 0.0049	U	
GP-15	GP-15-19	19 ft	12/18/2012	< 0.5	U		< 0.5	U		< 1.2	U		1.13	J		< 0.5	U		0.823	J		0.548	J		4.28			2.73			< 1.2	U	
	GP-15-29	29 ft	12/18/2012	< 0.0022	U		< 0.0022	U		< 0.0055	U		< 0.0055	U		< 0.0022	U		< 0.0055	U		< 0.0055	U		0.00065	J		< 0.0055	U		< 0.0055	U	
	GP-15-37	37 ft	12/18/2012	< 4.9	U		< 4.9	U		< 12	U	UJ	< 12	U		< 4.9	U		< 12	U		< 12	U		7.32	J		2.2	J		< 12	U	
	GP-15-37-DUP	37 ft	12/18/2012	< 0.22	U		< 0.22	U		9.73			0.438	J		0.653			1.25			1.73			8.43			2.59			0.236	J	
	GP-15-47	47 ft	12/18/2012	< 1.2	U		< 1.2	U		< 3	U		< 3	U		< 1.2	U		< 3	U		< 3	U		2.21	J		0.721	J		< 3	U	
	GP-15-55	55 ft	12/18/2012	< 2	U		< 2	U		< 5	U		6.99			< 2	U		19.3			28.3			136			44.3			17.1		
	GP-15-74	74 ft	12/21/2012	< 0.23	U		< 0.23	U		< 0.57	U	UJ	< 0.57	U		< 0.23	U		< 0.57	U		< 0.57	U		0.232	J		0.0828	J		< 0.57	U	
	GP-15-89	89 ft	12/21/2012	< 0.21	U		< 0.21	U		< 0.52	U	UJ	< 0.52	U		< 0.21	U		< 0.52	U		< 0.52	U		< 0.52	U		< 0.52	U		< 0.52	U	
GP-16	GP-16-23	23 ft	1/3/2013	< 0.0026	U		< 0.0026	U		< 0.0065	U		< 0.0065	U		< 0.0026	U		< 0.0065	U		< 0.0065	U		< 0.0065	U		< 0.0065	U		< 0.0065	U	
	GP-16-42	42 ft	1/3/2013	< 0.23	U		< 0.23	U		< 0.57	U	UJ	< 0.57	U		< 0.23	U		< 0.57	U		< 0.57	U		0.292	J		< 0.57	U		< 0.57	U	
	GP-16-51	51 ft	1/3/2013	< 0.21	U		< 0.21	U		< 0.52	U	UJ	0.0508	J		< 0.21	U		0.23	J		0.214	J		0.975			0.293	J		< 0.52	U	
	GP-16-57	57 ft	1/3/2013	< 0.21	U		11.2		J	< 0.52	U	UJ	10.4		J	< 0.21	U		19.9			41.2			192			62			< 0.52	U	
	GP-16-57-DUP	57 ft	1/3/2013	< 0.24	U		< 0.24	U	UJ	19.1			12.7		J	< 0.24	U		24.8			58.8			244			77.7			< 0.59	U	
	GP-16-77	77 ft	1/3/2013	< 0.19	U		< 0.19	U		< 0.49	U	UJ	0.128	J		< 0.19	U		0.938			0.506			2.53			0.74			< 0.49	U	
	GP-16-91	91 ft	1/7/2013	< 0.0019	U		< 0.0019	U		< 0.0048	U		0.00039	J		< 0.0019	U		< 0.0048	U		0.0013	J		0.0047	J		0.0017	J		< 0.0048	U	
GP-17	GP-17-15	15 ft	1/7/2013	< 1.1	U		< 1.1	U		< 2.7	U	UJ	0.269	J		< 1.1	U		45.3			1.74	J		16.3			3			< 2.7	U	
	GP-17-15-DUP	15 ft	1/7/2013	< 2.8	U		< 2.8	U		< 7	U	UJ	< 7	U		< 2.8	U		64.5			2.69	J		25			4.96	J		< 7	U	
	GP-17-45	45 ft	1/7/2013	< 1.6	U		< 1.6	U		< 4.1	U	UJ	< 4.1	U		< 1.6	U		< 4.1	U		< 4.1	U		2.67	J		0.755	J		< 4.1	U	
	GP-17-57	57 ft	1/7/2013	< 2.4	U		< 2.4	U		< 5.9	U	UJ	< 5.9	U		< 2.4	U		< 5.9	U		< 5.9	U		1.06	J		< 5.9	U		< 5.9	U	
	GP-17-65	65 ft	1/7/2013	< 0.16	U		< 0.16	U		< 0.39	U	UJ	0.0402	J		< 0.16	U		< 0.39	U		0.173	J		0.675			0.19	J		< 0.39	U	
GP-18	GP-18-21	21 ft	1/8/2013	< 0.72	U		< 0.72	U		< 1.8	U	UJ	< 1.8	U		< 0.72	U		< 1.8	U		< 1.8	U		< 1.8	U		< 1.8	U		< 1.8	U	
	GP-18-37	37 ft	1/8/2013	< 2	U		< 2	U		< 5.1	U	UJ	0.368	J		< 2	U		< 5.1	U		< 5.1	U		6.98			1.78	J		< 5.1	U	
	GP-18-53	53 ft	1/8/2013	< 2.7	U		< 2.7	U		< 6.7	U	UJ	< 6.7	U		< 2.7	U		< 6.7	U		< 6.7	U		1.75	J		0.51	J		< 6.7	U	
	GP-18-63	63 ft	1/8/2013	< 1.1	U		< 1.1	U		< 2.6	U	UJ	0.296	J		< 1.1	U		< 2.6	U		0.785	J		2.69			0.731	J		< 2.6	U	

NOTES

1) Results shown as < #.## indicate that the analyte was not detected.

LAB QUALIFIERS

J = The analyte was positively identified below the RL and above the MDL. Concentration given is estimated.

U = The analyte was not detected.

URS QUALIFIERS

J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

UJ = The analyte was not detected above the given quantitation limit. However, the sample quantitation limit is approximate.

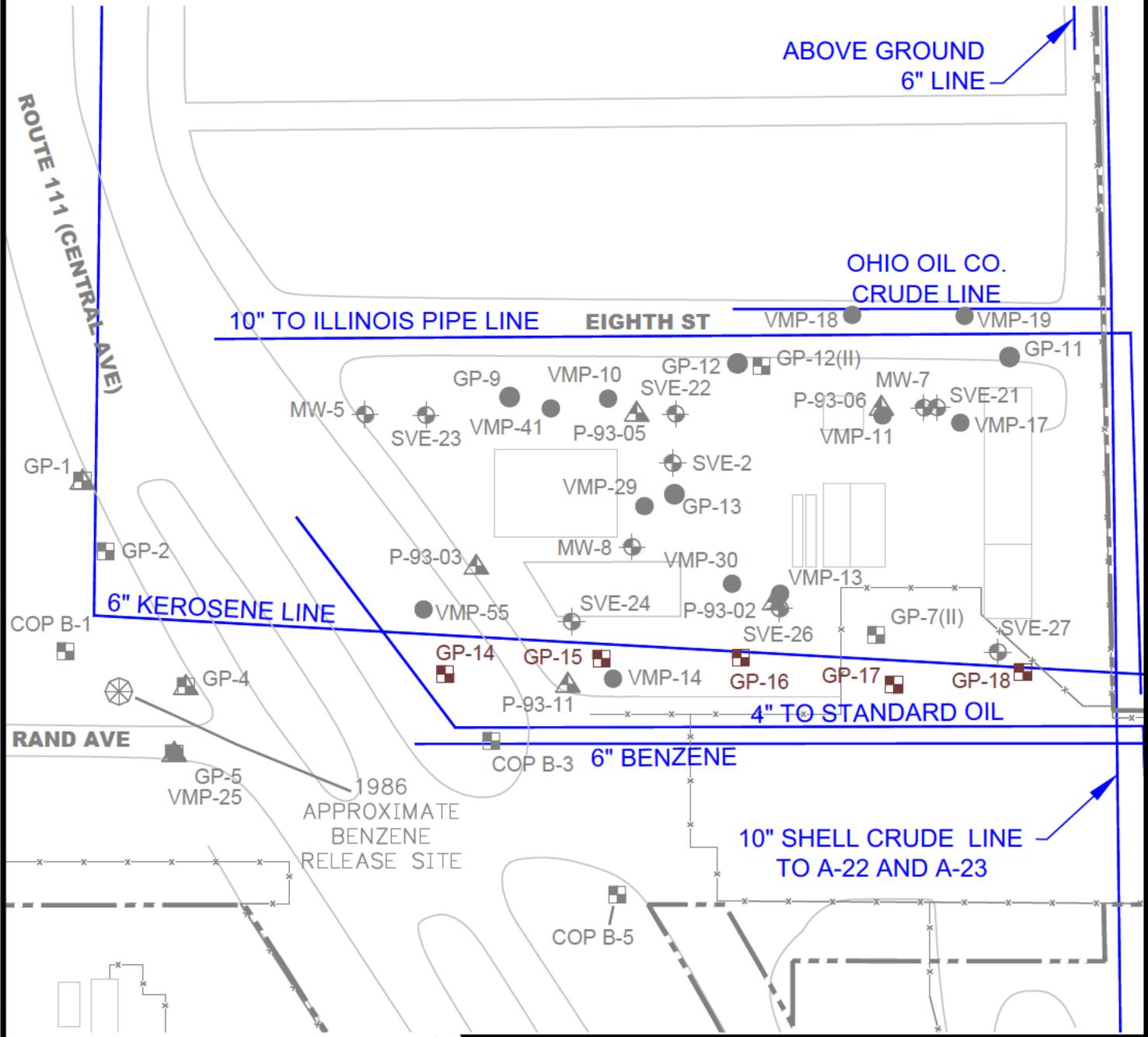
LEGEND

- SOIL BORING LOCATION
- CURRENT AND/OR FORMER PIPELINES
- ▲ GROUNDWATER PROFILING LOCATION
- ⊕ GROUNDWATER MONITORING WELL LOCATION
SOIL VAPOR EXTRACTION (SVE) WELL
- VAPOR MONITORING POINT LOCATION
- HISTORIC SOIL BORING/GROUNDWATER SAMPLE LOCATION

NOTES:

1. GRAYSCALE LOCATIONS REPRESENT PREVIOUS SAMPLE LOCATIONS OR EXISTING WELLS OR VAPOR POINTS.
2. PIPELINE INFORMATION IS A COMPILATION FROM SEVERAL DRAWINGS PROVIDED BY THE REFINERY IN 2009 AND IS NOT MEANT TO BE USED AS AN ACTUAL UTILITY PIPELINE LOCATION MAP.

File: P:\ENVIRONMENTAL\SHELL OIL PRODUCT US\SHELL OIL PRODUCTS US 2013\21562850 - ROXANA DRILLING\PUBLIC WORKS SOIL SAMPLING\DRAWINGS\FIG 1 PUBLIC WORKS SOIL SAMPLE LOCATIONS.DWG Last edited: FEB. 21, 13 4:10 p.m. by: david_deguire

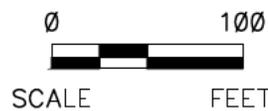
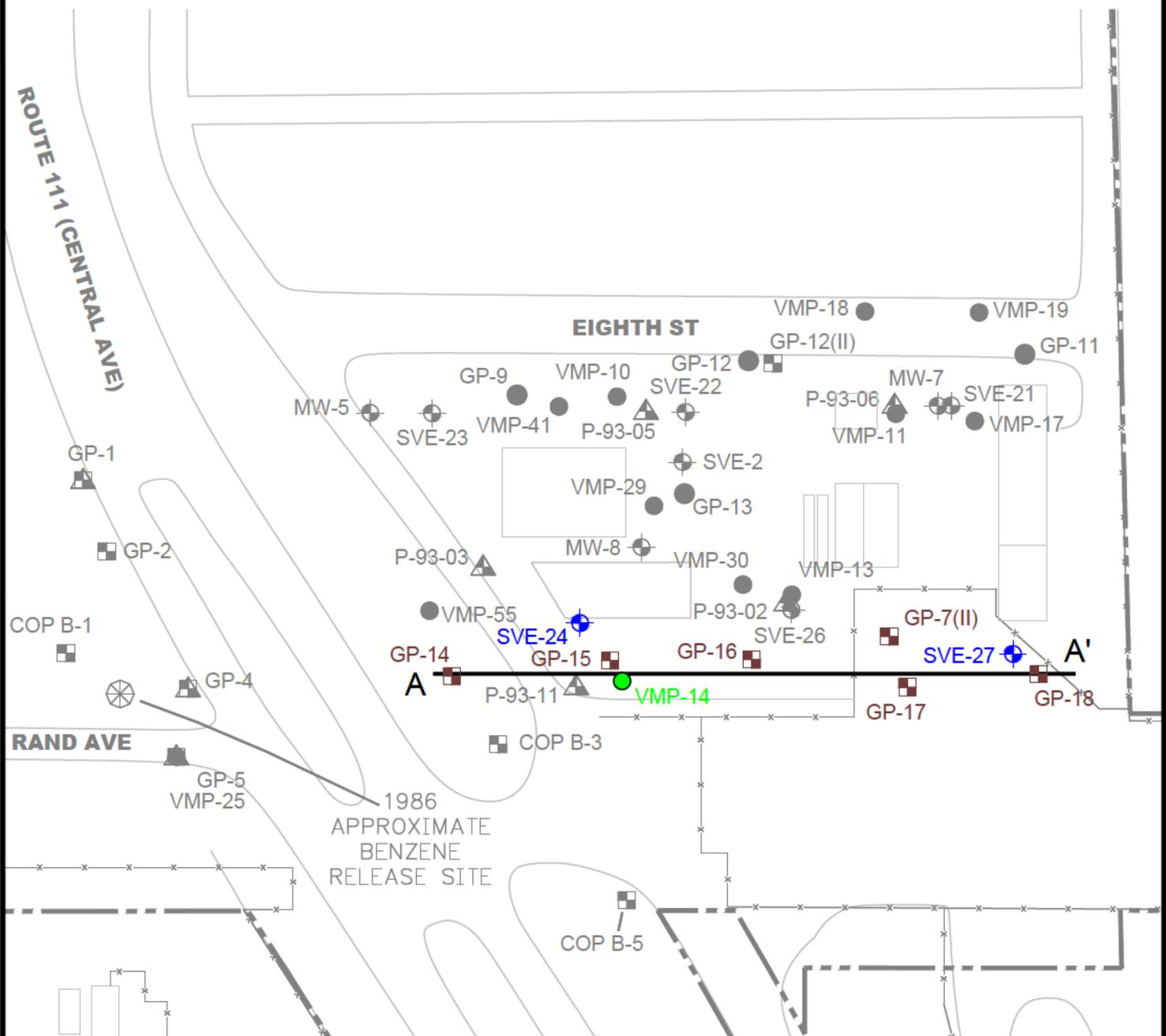


SHELL OIL PRODUCTS US ROXANA, ILLINOIS		PROJECT NO. 21562850
URS		
DRN. BY:wmp 2/12/13 DSGN. BY:b3 CHKD. BY:b3	Public Works Yard Soil Sampling Locations	FIG. NO. 1

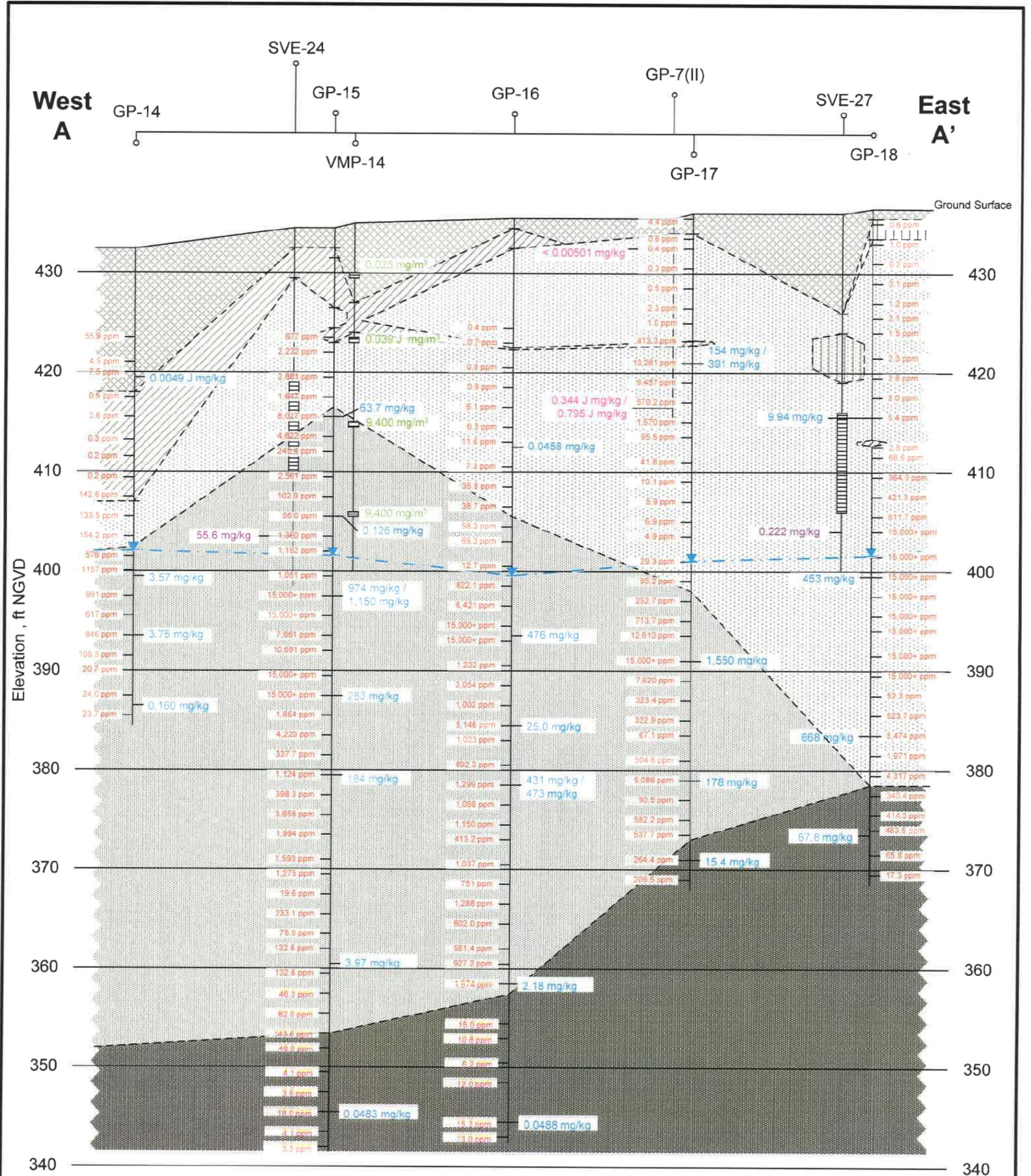
File: P:\ENVIRONMENTAL\SHELL OIL PRODUCT US\SHELL OIL PRODUCTS US 2013\21562850 - ROXANA DRILLING\PUBLIC WORKS\SOIL SAMPLING\DRAWINGS\FIG 2 CROSS SECTION KEY MAP.DWG Last modified: FEB. 21, 13 @ 4:30 p.m. by: david_dequire

LEGEND

- SOIL BORING LOCATION
- GROUNDWATER MONITORING WELL LOCATION
- SOIL VAPOR EXTRACTION (SVE) WELL USED FOR CROSS SECTION
- VAPOR MONITORING POINT LOCATION
- GROUNDWATER PROFILING LOCATION
- GROUNDWATER MONITORING WELL LOCATION
- SOIL VAPOR EXTRACTION (SVE) WELL
- VAPOR MONITORING POINT LOCATION
- SOIL BORING LOCATION

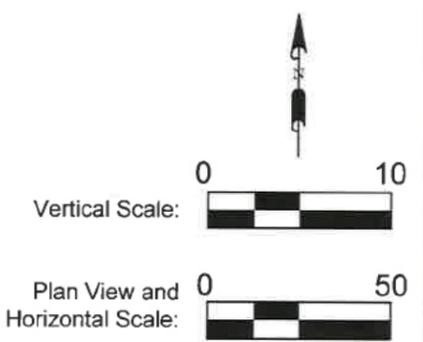


SHELL OIL PRODUCTS US ROXANA, ILLINOIS	PROJECT NO. 21562850	
URS		
DRN. BY:wmp 2/6/13 DSGN. BY:b3 CHKD. BY:b3	Cross Section Key Map	FIG. NO. 2



Legend:

- Fill projected between borings
- Clay projected between borings
- Silt projected between borings
- Fine to Medium Sand projected between borings
- Medium to Coarse Sand projected between borings
- Coarse Sand with coarse gravel projected between borings
- Stratum boundary - estimated
- Well Screen
- Soil Vapor Sampling Benzene Result (4Q12)
- SVE Well Installation Soil Sampling Benzene Result (3Q11)
- GP Soil Sampling Benzene Result ((4Q12/1Q13)
- GP Soil Sampling Benzene Result (2Q08)
- GP Soil Sampling Headspace Result (4Q12/1Q13)
- Potentiometric Surface - At Time of Drilling ((4Q12/1Q13)



Notes:
This cross section is generally based on interpretation of borings generated by URS during investigative activities between 2008 through 2013.

Actual geologic conditions may vary between the boring locations depicted.

Cross section trace line shows distance and direction each point was projected to construct this cross section.

SHELL OIL PRODUCTS US ROXANA, ILLINOIS		PROJECT NO. 21562850
DRN. BY: mpm 02/21/13 DSGN. BY: wmp CHKD. BY: b3	Cross Section A - A' Public Works	FIG. NO. 3

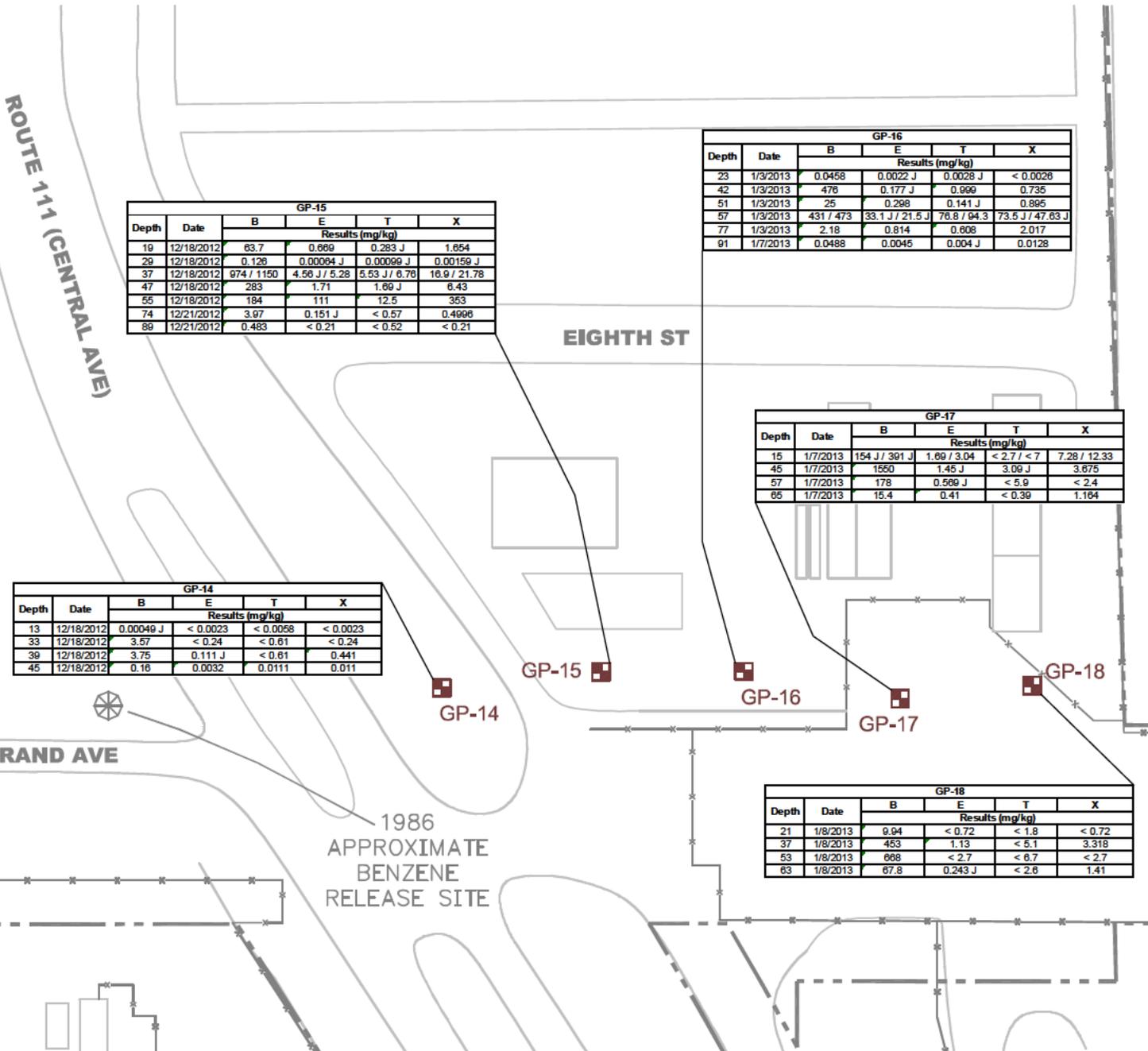
LEGEND

■ SOIL BORING LOCATION

NOTES:

1. B = BENZENE; E = ETHYLBENZENE; T = TOLUENE; X = XYLENES (TOTAL).
2. QUALIFIER DEFINITION:
J = RESULT IS ESTIMATED.

FILE: P:\ENVIRONMENTAL\SHELL_OIL_PRODUCT_US\SHELL_OIL_PRODUCTS_US_2013\21562850 - ROXANA DRILLING\PUBLIC WORKS SOIL SAMPLING\DRAWINGS\FIG 4 BTEX SUMMARY.DWG Last edited: FEB. 12. 13 @ 3:45 p.m. by: Wendy_Perrettington



GP-15					
Depth	Date	Results (mg/kg)			
		B	E	T	X
19	12/18/2012	63.7	0.699	0.283 J	1.654
29	12/18/2012	0.126	0.00064 J	0.00069 J	0.00159 J
37	12/18/2012	974 / 1150	4.56 J / 5.28	5.53 J / 6.78	16.9 / 21.78
47	12/18/2012	283	1.71	1.09 J	6.43
55	12/18/2012	184	111	12.5	353
74	12/21/2012	3.97	0.151 J	< 0.57	0.4096
89	12/21/2012	0.483	< 0.21	< 0.52	< 0.21

GP-16					
Depth	Date	Results (mg/kg)			
		B	E	T	X
23	1/3/2013	0.0458	0.0022 J	0.0028 J	< 0.0026
42	1/3/2013	476	0.177 J	0.999	0.735
51	1/3/2013	25	0.298	0.141 J	0.965
57	1/3/2013	431 / 473	33.1 J / 21.5 J	76.8 / 94.3	73.5 J / 47.63 J
77	1/3/2013	2.18	0.814	0.808	2.017
91	1/7/2013	0.0488	0.0045	0.004 J	0.0128

GP-17					
Depth	Date	Results (mg/kg)			
		B	E	T	X
15	1/7/2013	154 J / 391 J	1.69 / 3.04	< 2.7 / < 7	7.28 / 12.33
45	1/7/2013	1550	1.45 J	3.09 J	3.675
57	1/7/2013	178	0.569 J	< 5.9	< 2.4
65	1/7/2013	15.4	0.41	< 0.39	1.164

GP-14					
Depth	Date	Results (mg/kg)			
		B	E	T	X
13	12/18/2012	0.00049 J	< 0.0023	< 0.0056	< 0.0023
33	12/18/2012	3.57	< 0.24	< 0.61	< 0.24
39	12/18/2012	3.75	0.111 J	< 0.61	0.441
45	12/18/2012	0.16	0.0032	0.0111	0.011

GP-18					
Depth	Date	Results (mg/kg)			
		B	E	T	X
21	1/8/2013	9.94	< 0.72	< 1.8	< 0.72
37	1/8/2013	453	1.13	< 5.1	3.318
53	1/8/2013	698	< 2.7	< 6.7	< 2.7
63	1/8/2013	67.8	0.243 J	< 2.6	1.41

SHELL OIL PRODUCTS US ROXANA, ILLINOIS		PROJECT NO. 21562850
URS		
DRN. BY:wmp 2/12/13 DSGN. BY:b3 CHKD. BY:b3	Summary of BTEX Analytical Results	FIG. NO. 4



LOG OF BORING GP-14

Start ng Date: 2/ 8/ 2 Comp et on Date: 2/ 8/ 2 Cas ng E evat on: Not Insta ed Ground E evat on: 432 60	Quadrangle Sec:34 (SE /4 of NE /4) T:5N R:9W UTM (or State Plane) Coord N: (X):79 845 34 E: (Y):232 859 6
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DESCRIPTION

NOTES

Depth In feet	Inches Driven	Inches Recovered	Blow Counts	PID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
					[Symbol: Topsoil]	TOPSOIL		Topsoil	Air knifed to 11' bgs to clear utilities.
5					[Symbol: Fill]	FILL		Asphalt rubble (FILL) With sand and gravel	
10				55.9	[Symbol: Clay]			Stiff, moist, dark gray CLAY (FILL)	
	24	24		4.5	[Symbol: Clay]				
				7.5	[Symbol: Clay]				
15				0.5	[Symbol: Clay]			Stiff, moist, gray, low plastic CLAY (CL), with brown mottles	
	60	58		0.6	[Symbol: Clay]				
				0.3	[Symbol: Clay]				
20				0.2	[Symbol: Clay]			Becomes dark brown, mottles grade out	
	60	55		0.2	[Symbol: Clay]			Becomes sandy	

Sampled GP-14-13 for VOC at 0935

Completion Depth: 48.0 Ft bgs
 Project No.: 21562850.15000
 Project Name: Public Works Soil Sampling
 Drilling Contractor: Roberts Environmental Drilling Inc.
 Driller Name: P. Seymour
 Drilling Method: Direct Push
 Drill Rig Type: 8040 DT
 Logged by: E. Arthur, W. Pennington
 County: Madison
 Site ID No.: 1191150002
 Federal ID No.: ILD080012305

Water Depth: 30.5 ft., After ATD hrs.
 Water Depth: _____ ft., After _____ hrs.
 Water level at time of drilling
 Water level after drilling
 ATD At time of drilling
 NE None Encountered
 NA Not Applicable

Geoprobe
 Air Knife/Hand Auger Sampler
 Air Rotary
 Sonic
 Splitspoon Sampler
 Hollow Stem Auger-Soil samples not collected



USC based on field visual observations

URS (ENVIRON) LOG (EPA FORMAT) 21562850.15000 (ROXANA GP 2013).GPJ_URSSTLEV.GDT 2/15/13

LOG OF BORING GP-14

Start ng Date: 2/ 8/ 2 Comp et on Date: 2/ 8/ 2 Cas ng E evat on: Not Insta ed Ground E evat on: 432 60	Quadrangle Sec:34 (SE /4 of NE /4) T:5N R:9W UTM (or State Plane) Coord N: (X):79 845 34 E: (Y):232 859 6
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DESCRIPTION

NOTES

Depth In feet	Inches Driven	Inches Recovered	Blow Counts	PID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
	60	48		142.8				Same: Stiff, moist, dark brown, low plastic, Sandy CLAY (CL)	
				133.5				Medium dense, moist, brown and gray, fine to medium grained SAND (SP)	
								2.5" gray clay seam	Sudan field screening at 27 ft (white)
				154.2				Becomes brown	
30	60	50		576				Becomes wet, medium to coarse grained	Sudan field screening at 29 ft (white)
				1,157					
				891					Sudan field screening at 33 ft (pink) Sampled GP 14-33 for VOC at 0940
35	60	58		617			SP		Sudan field screening at 35 ft (white)
				846				Becomes gray brown	
40	60	51		100.3					Sudan field screening at 39 ft (pink) Sample GP 14-39 for VOC at 1005
				20.7					
45	60	59		24.0					Sudan field screening at 45 ft (white) Sampled GP-14-45 for VOC at 0945
				23.7					
								Bottom of boring at 48 ft. bgs	

Completion Depth: 48.0 Ft bgs
 Project No.: 21562850.15000
 Project Name: Public Works Soil Sampling
 Drilling Contractor: Roberts Environmental Drilling Inc.
 Driller Name: P. Seymour
 Drilling Method: Direct Push
 Drill Rig Type: 8040 DT
 Logged by: E. Arthur, W. Pennington
 County: Madison
 Site ID No.: 1191150002
 Federal ID No.: ILD080012305

Water Depth: 30.5 ft., After ATD hrs.
 Water Depth: _____ ft., After _____ hrs.
 Water level at time of drilling
 Water level after drilling
 ATD At time of drilling
 NE None Encountered
 NA Not Applicable

Geoprobe
 Air Knife/Hand Auger Sampler
 Air Rotary
 Sonic
 Splitspoon Sampler
 Hollow Stem Auger-
 Soil samples not collected



USC based on field visual observations

URS (ENVIRON) LOG (EPA FORMAT) 21562850.15000 (ROXANA GP 2013).GPJ_URSSTLEV.GDT 2/15/13

LOG OF BORING GP-15

Starting Date: 2/ 8/ 2 Completion Date: 2/2 / 2 Cas ng E evat on: Not Insta ed Ground E evat on: 434 80	Quadrangle Sec:34 (SE /4 of NE /4) T:5N R:9W UTM (or State Plane) Coord N: (X):79 855 66 E: (Y):232 964 39
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DESCRIPTION

NOTES

Depth In feet	Inches Driven	Inches Recovered	Blow Counts	PID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
5					●	▨	FILL	Sand and gravel (FILL)	Air knifed to 10' bgs to clear utilities.
						▨	CL	Clayey SAND (FILL)	
10					●	▨	CL	Soft, moist, brown Silty CLAY (CL)	Hydrocarbon odor 3-10 ft.
						▨	ML	Moist, dark gray Clayey SILT (ML)	
15					●	▨	SP	Moist, dark gray, fine grained SAND (SP)	
						▨	CL	Soft to medium stiff, moist, dark gray with brown, low plastic CLAY (CL), with sand Becomes sandy	
20	36	36		677	●	▨	SP	Medium dense, moist, gray, fine to medium grained SAND (SP)	Sudan field screening at 13 ft (red)
						▨	SP	Becomes brown, medium to coarse grained	
25	60	42		2,232	●	▨	CL	Soft to medium stiff, moist, dark gray with brown, low plastic CLAY (CL), with sand Becomes sandy	Sudan field screening at 19 ft (red) Sampled GP-15-19 for VOC at 1235
						▨	SP	Becomes brown, medium to coarse grained	
30	60	48		2,881	●	▨	CL	Soft to medium stiff, moist, dark gray with brown, low plastic CLAY (CL), with sand Becomes sandy	Sudan field screening at 21 ft (red)
						▨	SP	Becomes brown, medium to coarse grained	
35	60	48		1,647	●	▨	CL	Soft to medium stiff, moist, dark gray with brown, low plastic CLAY (CL), with sand Becomes sandy	Sudan field screening at 23 ft (white)
						▨	SP	Becomes brown, medium to coarse grained	
40	60	48		8,027	●	▨	CL	Soft to medium stiff, moist, dark gray with brown, low plastic CLAY (CL), with sand Becomes sandy	Sudan field screening at 23 ft (white)
						▨	SP	Becomes brown, medium to coarse grained	
45	60	48		4,622	●	▨	CL	Soft to medium stiff, moist, dark gray with brown, low plastic CLAY (CL), with sand Becomes sandy	Sudan field screening at 23 ft (white)
						▨	SP	Becomes brown, medium to coarse grained	
50	60	48		245.4	●	▨	CL	Soft to medium stiff, moist, dark gray with brown, low plastic CLAY (CL), with sand Becomes sandy	Sudan field screening at 23 ft (white)
						▨	SP	Becomes brown, medium to coarse grained	

Completion Depth: 93.0 Ft bgs
 Project No.: 21562850.15000
 Project Name: Public Works Soil Sampling
 Drilling Contractor: Roberts Environmental Drilling Inc.
 Driller Name: P. Seymour
 Drilling Method: Direct Push
 Drill Rig Type: 8040 DT
 Logged by: E. Arthur, W. Pennington
 County: Madison
 Site ID No.: 1191150002
 Federal ID No.: ILD080012305

Water Depth: 33 ft., After ATD hrs.
 Water Depth: _____ ft., After _____ hrs.
 Water level at time of drilling
 Water level after drilling
 ATD At time of drilling
 NE None Encountered
 NA Not Applicable

Geoprobe
 Air Knife/Hand Auger Sampler
 Air Rotary
 Sonic
 Splitspoon Sampler
 Hollow Stem Auger- Soil samples not collected



USC based on field visual observations

URS (ENVIRON) LOG (EPA FORMAT) 21562850.15000 (ROXANA GP 2013).GPJ_URSTILEV.GDT 2/15/13

LOG OF BORING GP-15

Start ng Date: 2/ 8/ 2 Comp et on Date: 2/2 / 2 Cas ng E evat on: Not Insta ed Ground E evat on: 434 80	Quadrangle Sec:34 (SE /4 of NE /4) T:5N R:9W UTM (or State Plane) Coord N: (X):79 855 66 E: (Y):232 964 39
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DESCRIPTION

NOTES

Depth In feet	Inches Driven	Inches Recovered	Blow Counts	PID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
	60	48		2,561				Same: Medium dense, moist, brown, medium to coarse grained SAND (SP)	Sudan field screening at 25 ft (red)
				102.9					
30				56.0				Becomes wet	Sudan field screening at 29 ft (white) Sampled GP-15-29 for VOC at 1240
	60	48		1,360					
				1,192				Becomes wet	Sudan field screening at 37 ft (red) Sampled GP-15-37 for VOC at 1230
35	60	52		1,051					
				15,000+			SP	Becomes medium dense to dense	Sudan field screening at 47 ft (white) Sampled GP-15-47 for VOC at 1410
				15,000+					
40	60	60		7,661				Becomes medium dense to dense	Sudan field screening at 47 ft (white) Sampled GP-15-47 for VOC at 1410
				10,691					
				15,000+				Becomes medium dense to dense	Sudan field screening at 47 ft (white) Sampled GP-15-47 for VOC at 1410
	60	52		15,000+					
				1,654					

Completion Depth: 93.0 Ft bgs
 Project No.: 21562850.15000
 Project Name: Public Works Soil Sampling
 Drilling Contractor: Roberts Environmental Drilling Inc.
 Driller Name: P. Seymour
 Drilling Method: Direct Push
 Drill Rig Type: 8040 DT
 Logged by: E. Arthur, W. Pennington
 County: Madison
 Site ID No.: 1191150002
 Federal ID No.: ILD080012305

Water Depth: 33 ft., After ATD hrs.
 Water Depth: _____ ft., After _____ hrs.
 Water level at time of drilling
 Water level after drilling
 ATD At time of drilling
 NE None Encountered
 NA Not Applicable

Geoprobe
 Air Knife/Hand Auger Sampler
 Air Rotary
 Sonic
 Splitspoon Sampler
 Hollow Stem Auger-
 Soil samples not collected



USC based on field visual observations

URS (ENVIRON) LOG (EPA FORMAT) 21562850.15000 (ROXANA GP 2013).GPJ_URSSTLEV.GDT 2/15/13

LOG OF BORING GP-15

Start ng Date: 2/ 8/ 2 Comp et on Date: 2/2 / 2 Cas ng E evat on: Not Insta ed Ground E evat on: 434 80	Quadrangle Sec:34 (SE /4 of NE /4) T:5N R:9W UTM (or State Plane) Coord N: (X):79 855 66 E: (Y):232 964 39
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DESCRIPTION

NOTES

Depth In feet	Inches Driven	Inches Recovered	Blow Counts	PID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
	60	54		4,220	◆	●		Same: Medium dense to dense, wet, brown, medium to coarse grained SAND (SP)	
				337.7	◆	●			
55	60	50		1,124	◆	●			Sudan field screening at 55 ft (red) Sampled GP-15-55 for VOC at 1415
				398.3	◆	●			
				3,658	◆	●			
60	60	42		1,994	◆	●	SP		
				1,593	◆	●			
				1,275	◆	●			
65	60	46		19.6	◆	●			Sampling to 68 ft bgs performed on 12/18/12. Sampling below 68 ft bgs performed on 12/21/12. Sudan field screening at 69 ft (white)
				233.1	◆	●			
				78.0	◆	●			
70	60	50		132.6	◆	●			
					◆	●			Sudan field screening at 74 ft (white) Sampled GP-15-74 for VOC at 0950

Completion Depth: 93.0 Ft bgs
 Project No.: 21562850.15000
 Project Name: Public Works Soil Sampling
 Drilling Contractor: Roberts Environmental Drilling Inc.
 Driller Name: P. Seymour
 Drilling Method: Direct Push
 Drill Rig Type: 8040 DT
 Logged by: E. Arthur, W. Pennington
 County: Madison
 Site ID No.: 1191150002
 Federal ID No.: ILD080012305

Water Depth: 33 ft., After ATD hrs.
 Water Depth: _____ ft., After _____ hrs.
 Water level at time of drilling
 Water level after drilling
 ATD At time of drilling
 NE None Encountered
 NA Not Applicable

Geoprobe
 Air Knife/Hand Auger Sampler
 Air Rotary
 Sonic
 Splitspoon Sampler
 Hollow Stem Auger-Soil samples not collected



USC based on field visual observations

URS (ENVIRON) LOG (EPA FORMAT) 21562850.15000 (ROXANA GP 2013).GPJ_URSSTLEV.GDT 2/15/13

**LOG OF BORING
GP-15**

Start ng Date: 2/ 8/ 2
 Completion Date: 2/2 / 2
 Cas ng E evat on: Not Insta ed
 Ground E evat on: 434 80
 Quadrangle Sec:34 (SE /4 of NE /4)
 T:5N R:9W
 UTM (or State Plane) Coord
 N: (X):79 855 66
 E: (Y):232 964 39

Depth In feet	Inches Driven	Inches Recovered	Blow Counts	PID (ppm)	Sampler Graphic	Symbol	USCS
60	54			132.6			SP
				46.3			
80	60	48		82.0			
				143.6			
				48.0			
85	60	50		4.1			
				3.8			
90	60	50		18.0			
				4.1			
				3.3			
95							

DESCRIPTION
 Same: Medium dense to dense, wet, brown, medium to coarse grained SAND (SP)
 Becomes coarse grained, trace coarse gravel
 Sudan field screening at 89 ft (white)
 Sampled GP-15-89 for VOC at 1055
 Bottom of boring at 93 ft bgs

NOTES

URS (ENVIRON) LOG (EPA FORMAT) 21562850.15000 (ROXANA GP 2013).GPJ_URSSTLEV.GDT 2/15/13

Completion Depth: 93.0 Ft bgs
 Project No.: 21562850.15000
 Project Name: Public Works Soil Sampling
 Drilling Contractor: Roberts Environmental Drilling Inc.
 Driller Name: P. Seymour
 Drilling Method: Direct Push
 Drill Rig Type: 8040 DT
 Logged by: E. Arthur, W. Pennington
 County: Madison
 Site ID No.: 1191150002
 Federal ID No.: ILD080012305

Water Depth: 33 ft., After ATD hrs.
 Water Depth: _____ ft., After _____ hrs.
 Water level at time of drilling
 Water level after drilling
 ATD At time of drilling
 NE None Encountered
 NA Not Applicable

Geoprobe
 Air Knife/Hand Auger Sampler
 Air Rotary
 Sonic
 Splitspoon Sampler
 Hollow Stem Auger-
 Soil samples not collected



USC based on field visual observations

LOG OF BORING GP-16

Start ng Date: /3/ 3 Comp et on Date: /7/ 3 Cas ng E evat on: Not Insta ed Ground E evat on: 435 60	Quadrangle Sec:34 (SE /4 of NE /4) T:5N R:9W UTM (or State Plane) Coord N: (X):79 856 28 E: (Y):2322057 92
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DESCRIPTION

NOTES

Depth In feet	Inches Driven	Inches Recovered	Blow Counts	PID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
							FILL	Sand and gravel (FILL)	Air knifed to 10' bgs to clear utilities.
							CL	Soft, dry to moist, light brown to brown, Silty CLAY (CL)	
5								Loose to medium dense, moist, light brown, SAND (SP)	
10								Becomes moist, brown	
	36	36		0.4					
				0.7				2" gray, low plastic clay seam	
15							SP		
	60	48		0.8					
				0.9					
20									
	60	50		6.1					
				6.3					
				11.6				Becomes medium grained	

Sampled GP-16-23 for VOC at 1035

Completion Depth: 93.0 Ft bgs
 Project No.: 21562850.15000
 Project Name: Public Works Soil Sampling
 Drilling Contractor: Roberts Environmental Drilling Inc.
 Driller Name: P. Seymour
 Drilling Method: Direct Push
 Drill Rig Type: 8040 DT
 Logged by: E. Arthur, W. Pennington
 County: Madison
 Site ID No.: 1191150002
 Federal ID No.: ILD080012305

Water Depth: 36 ft., After ATD hrs.
 Water Depth: _____ ft., After _____ hrs.
 Water level at time of drilling
 Water level after drilling
 ATD At time of drilling
 NE None Encountered
 NA Not Applicable

- Geoprobe
- Air Knife/Hand Auger Sampler
- Air Rotary
- Sonic
- Splitspoon Sampler
- Hollow Stem Auger-Soil samples not collected



USC based on field visual observations

URS (ENVIRON) LOG (EPA FORMAT) 21562850.15000 (ROXANA GP 2013).GPJ_URSSTLEV.GDT 2/15/13

LOG OF BORING GP-16

Starting Date: /3/ 3 Completion Date: /7/ 3 Cas ng E evat on: Not Insta ed Ground E evat on: 435 60	Quadrangle Sec:34 (SE /4 of NE /4) T:5N R:9W UTM (or State Plane) Coord N: (X):79 856 28 E: (Y):2322057 92
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Depth In feet	Inches Driven	Inches Recovered	Blow Counts	PID (ppm)	Sampler Graphic	Symbol	USCS
	60	54		7.3	▲	●	
				35.8	▲	●	
30	60	56		38.7	▲	●	
				58.3	▲	●	
				69.3	▲	●	
35	60	50		12.7	▲	●	
				822.1	▲	●	SP
				6,421	▲	●	
40	60	58		15,000+	▲	●	
				15,000+	▲	●	
45	60	42		1,232	▲	●	
				3,054	▲	●	
				1,002	▲	●	

DESCRIPTION	NOTES
Same: Loose to medium dense, moist, brown, medium grained SAND (SP)	
Becomes medium to coarse grained	
Becomes wet	▽
	Sudan field screening at 37 ft (white)
	Sudan field screening at 41 ft (white)
	Sampled GP-16-42 for VOC at 1255
	Sudan field screening at 43 ft (white)

Completion Depth: 93.0 Ft bgs
 Project No.: 21562850.15000
 Project Name: Public Works Soil Sampling
 Drilling Contractor: Roberts Environmental Drilling Inc.
 Driller Name: P. Seymour
 Drilling Method: Direct Push
 Drill Rig Type: 8040 DT
 Logged by: E. Arthur, W. Pennington
 County: Madison
 Site ID No.: 1191150002
 Federal ID No.: ILD080012305

Water Depth: 36 ft., After ATD hrs.
 Water Depth: _____ ft., After _____ hrs.
 Water level at time of drilling
 Water level after drilling
 ATD At time of drilling
 NE None Encountered
 NA Not Applicable

Geoprobe
 Air Knife/Hand Auger Sampler
 Air Rotary
 Sonic
 Splitspoon Sampler
 Hollow Stem Auger-Soil samples not collected



USC based on field visual observations

URS (ENVIRON) LOG (EPA FORMAT) 21562850.15000 (ROXANA GP 2013).GPJ_URSSTLEV.GDT 2/15/13

**LOG OF BORING
GP-16**

Starting Date: /3/ 3
 Completion Date: /7/ 3
 Cas ng E evat on: Not Insta ed
 Ground E evat on: 435 60

Quadrangle Sec:34 (SE /4 of NE /4)
 T:5N
 R:9W
 UTM (or State Plane) Coord
 N: (X):79 856 28
 E: (Y):2322057 92

Depth In feet	Inches Driven	Inches Recovered	Blow Counts	PID (ppm)	Sampler Graphic	Symbol	USCS
55	60	60		5,146			SP
				1,023			
60	60	36		892.3			
				1,299			
65	60	48		1,098			
				1,150			
70	60	52		413.2			
				1,037			
	60	36		751			
				1,288			
	60			602.0			
				561.4			

DESCRIPTION	NOTES
Same: Loose to medium dense, wet, brown, medium to coarse grained SAND (SP)	Sudan field screening at 51 ft (white) Sample GP-16-51 for VOC at 1430
	Sudan field screening at 57 ft (white) Sampled GP-16-57 for VOC at 1530
	Sudan field screening at 65 ft (white)

URS (ENVIRON) LOG (EPA FORMAT) 21562850.15000 (ROXANA GP 2013).GPJ_URSSTLEV.GDT 2/15/13

Completion Depth: 93.0 Ft bgs
 Project No.: 21562850.15000
 Project Name: Public Works Soil Sampling
 Drilling Contractor: Roberts Environmental Drilling Inc.
 Driller Name: P. Seymour
 Drilling Method: Direct Push
 Drill Rig Type: 8040 DT
 Logged by: E. Arthur, W. Pennington
 County: Madison
 Site ID No.: 1191150002
 Federal ID No.: ILD080012305

Water Depth: 36 ft., After ATD hrs.
 Water Depth: _____ ft., After _____ hrs.

Water level at time of drilling
 Water level after drilling
 ATD At time of drilling
 NE None Encountered
 NA Not Applicable

Geoprobe
 Air Knife/Hand Auger Sampler
 Air Rotary
 Sonic
 Splitspoon Sampler
 Hollow Stem Auger-
 Soil samples not collected

URS
 USC based on field visual observations

LOG OF BORING GP-16

Start ng Date: /3/ 3 Comp et on Date: /7/ 3 Cas ng E evat on: Not Insta ed Ground E evat on: 435 60	Quadrangle Sec:34 (SE /4 of NE /4) T:5N R:9W UTM (or State Plane) Coord N: (X):79 856 28 E: (Y):2322057 92
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DESCRIPTION

NOTES

Depth In feet	Inches Driven	Inches Recovered	Blow Counts	PID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
	60	39		927.2	▲	●		Same: Loose to medium dense, wet, brown, medium to coarse grained SAND (SP)	Sampling to 78 ft bgs performed on 1/3/13. Sampling below 78 ft bgs performed on 1/7/13. Sudan field screening at 77 ft (white) Sample GP-16-77 for VOC at 1605
				1,574	▲	●			
80	60	30		15.0	▲	●		Becomes loose, coarse grained, with coarse gravel Large piece of gravel in sample liner	Sudan field screening at 81 ft (white)
				10.8	▲	●			
85	60	30		6.2	▲	●	SP		
				12.0	▲	●			
90	60	48		15.3	▲	●			Sampled GP-16-91 for VOc at 1015
				13.0	▲	●			
95								Bottom of boring at 93 ft bgs	

Completion Depth: 93.0 Ft bgs
 Project No.: 21562850.15000
 Project Name: Public Works Soil Sampling
 Drilling Contractor: Roberts Environmental Drilling Inc.
 Driller Name: P. Seymour
 Drilling Method: Direct Push
 Drill Rig Type: 8040 DT
 Logged by: E. Arthur, W. Pennington
 County: Madison
 Site ID No.: 1191150002
 Federal ID No.: ILD080012305

Water Depth: 36 ft., After ATD hrs.
 Water Depth: _____ ft., After _____ hrs.
 Water level at time of drilling
 Water level after drilling
 ATD At time of drilling
 NE None Encountered
 NA Not Applicable

Geoprobe
 Air Knife/Hand Auger Sampler
 Air Rotary
 Sonic
 Splitspoon Sampler
 Hollow Stem Auger- Soil samples not collected



USC based on field visual observations

URS (ENVIRON) LOG (EPA FORMAT) 21562850.15000 (ROXANA GP 2013).GPJ_URSTILEV.GDT 2/15/13

LOG OF BORING GP-17

Starting Date: / / 3 Completion Date: / / 3 Cas ng E evat on: Not Insta ed Ground E evat on: 436 00	Quadrangle Sec:34 (SE /4 of NE /4) T:5N R:9W UTM (or State Plane) Coord N: (X):79 838 03 E: (Y):2322 6 08
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DESCRIPTION

NOTES

Depth In feet	Inches Driven	Inches Recovered	Blow Counts	PID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
				4.4			FILL	Dark brown Sand and Gravel with asphalt [FILL]	Air knifed to 10' bgs to clear utilities.
				0.5			FILL		
				0.6			SP	Loose to medium dense, moist, brown, fine to medium grained SAND (SP)	
5				0.4			SP		
				0.8			SP		
				0.3			SP		
				0.7			SP		
				0.5			SP		
				0.3			SP		
				2.3			SP		
10				1.0			CL	Soft, moist, gray, low plastic, Sandy CLAY (CL)	Yellow/green staining of acetate sample liners, zipper bags and nitrile gloves observed (13 to 17 ft bgs).
	36	36		413.3			CL	Medium dense, moist, brownish gray, fine to medium grained SAND (SP)	Sudan field screening at 15 ft (red) Sampled GP-17-15 for VOC at 1325 (Dup)
15				13,261			SP		
	60	54		9,457			SP		
				570.2			SP		
20				1,570			SP	Becomes gray	Sudan field screening at 21 ft (pink)
	60	48		95.5			SP		

Completion Depth: 68.0 Ft bgs
 Project No.: 21562850.15000
 Project Name: Public Works Soil Sampling
 Drilling Contractor: Roberts Environmental Drilling Inc.
 Driller Name: P. Seymour
 Drilling Method: Direct Push
 Drill Rig Type: 8040 DT
 Logged by: W. Pennington
 County: Madison
 Site ID No.: 1191150002
 Federal ID No.: ILD080012305

Water Depth: 35 ft., After ATD hrs.
 Water Depth: _____ ft., After _____ hrs.
 Water level at time of drilling
 Water level after drilling
 ATD At time of drilling
 NE None Encountered
 NA Not Applicable

Geoprobe
 Air Knife/Hand Auger Sampler
 Air Rotary
 Sonic
 Splitspoon Sampler
 Hollow Stem Auger-
 Soil samples not collected



USC based on field visual observations

URS (ENVIRON) LOG (EPA FORMAT) 21562850.15000 (ROXANA GP 2013).GPJ_URSTILEV.GDT 2/15/13

**LOG OF BORING
GP-17**

Depth In feet	Inches Driven	Inches Recovered	Blow Counts	PID (ppm)	Sampler Graphic	Symbol	USCS	LOG OF BORING GP-17	
								Start ng Date: / / 3	Quadrangle Sec:34 (SE /4 of NE /4)
								Comp et on Date: / / 3	T:5N R:9W
								Cas ng E evat on: Not Insta ed	UTM (or State Plane) Coord
								Ground E evat on: 436 00	N: (X):79 838 03 E: (Y):2322 6 08
DESCRIPTION								NOTES	
	60	54		41.8				Same: Medium dense, moist, grayish brown, fine to medium grained SAND (SP)	
				10.1					
30				5.9					
	60	54		6.9					
				4.9					
				29.3					
35				29.3				Becomes wet	
	60	48		85.2					
				85.2					
				252.7					
40				252.7					
	60	60		713.7					
				713.7					
				12,610					
45				15,000+					
	60	60		7,620					
				7,620					
				323.4					

Completion Depth: 68.0 Ft bgs
 Project No.: 21562850.15000
 Project Name: Public Works Soil Sampling
 Drilling Contractor: Roberts Environmental Drilling Inc.
 Driller Name: P. Seymour
 Drilling Method: Direct Push
 Drill Rig Type: 8040 DT
 Logged by: W. Pennington
 County: Madison
 Site ID No.: 1191150002
 Federal ID No.: ILD080012305

Water Depth: 35 ft., After ATD hrs.
 Water Depth: _____ ft., After _____ hrs.
 Water level at time of drilling
 Water level after drilling
 ATD At time of drilling
 NE None Encountered
 NA Not Applicable

Geoprobe
 Air Knife/Hand Auger Sampler
 Air Rotary
 Sonic
 Splitspoon Sampler
 Hollow Stem Auger-Soil samples not collected



USC based on field visual observations

URS (ENVIRON) LOG (EPA FORMAT) 21562850.15000 (ROXANA GP 2013).GPJ_URSSTLEV.GDT 2/15/13

LOG OF BORING GP-17

Start ng Date: /7/ 3 Comp et on Date: /7/ 3 Cas ng E evat on: Not Insta ed Ground E evat on: 436 00	Quadrangle Sec:34 (SE /4 of NE /4) T:5N R:9W UTM (or State Plane) Coord N: (X):79 838 03 E: (Y):2322 6 08
--	---

Depth In feet	Inches Driven	Inches Recovered	Blow Counts	PID (ppm)	Sampler Graphic	Symbol	USCS
	60	54		322.9	▲	●	
				67.1	◆	●	
55	60	57		504.6	▲	●	
				5,086	◆	●	
60	60	52		90.5	▲	●	SP
				582.2	◆	●	
				537.7	▲	●	
65	60	48		264.4	▲	●	
				209.5	◆	●	
70							

DESCRIPTION	NOTES
Same: Medium dense, wet, brown, medium to coarse grained SAND (SP)	
	Sudan field screening at 57 ft (white) Sampled GP-17-57 for VOC at 1420
	Sudan field screening at 61 ft (white)
Becomes coarse grained, trace coarse gravel	
	Sampled GP-17-65 for VOC at 1435
Bottom of boring at 68 ft bgs	

URS (ENVIRON) LOG (EPA FORMAT) 21562850.15000 (ROXANA GP 2013).GPJ_URSTILEV.GDT 2/15/13

Completion Depth: 68.0 Ft bgs
 Project No.: 21562850.15000
 Project Name: Public Works Soil Sampling
 Drilling Contractor: Roberts Environmental Drilling Inc.
 Driller Name: P. Seymour
 Drilling Method: Direct Push
 Drill Rig Type: 8040 DT
 Logged by: W. Pennington
 County: Madison
 Site ID No.: 1191150002
 Federal ID No.: ILD080012305

Water Depth: 35 ft., After ATD hrs.
 Water Depth: _____ ft., After _____ hrs.
 Water level at time of drilling
 Water level after drilling
 ATD At time of drilling
 NE None Encountered
 NA Not Applicable

Geoprobe
 Air Knife/Hand Auger Sampler
 Air Rotary
 Sonic
 Splitspoon Sampler
 Hollow Stem Auger- Soil samples not collected



USC based on field visual observations

LOG OF BORING GP-18

Start ng Date: /8/ 3 Comp et on Date: /8/ 3 Cas ng E evat on: Not Insta ed Ground E evat on: 436 80	Quadrangle Sec:34 (SE /4 of NE /4) T:5N R:9W UTM (or State Plane) Coord N: (X):79 846 8 E: (Y):2322247 67
--	---

DESCRIPTION

NOTES

Depth In feet	Inches Driven	Inches Recovered	Blow Counts	PID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
				0.7			FILL	Sand, Gravel, and Silt [FILL]	Air knifed to 10' bgs to clear utilities.
				0.6			ML	Soft, moist, brown SILT (ML), some clay, with organics	
				0.7					
				1.0				Loose to medium dense, moist, brown, fine to medium grained SAND (SP)	
5				0.2					
				0.2					
				0.1					
				0.1					
				0.7					
				1.2					
10				2.1					
	36	36		1.5			SP		
				2.3					
15				2.8					
	60	42		2.0					
				5.4					
20				2.8			CL	Soft, moist, gray, low plastic CLAY (CL)	
				2.8			SP	Loose to medium dense, moist, gray, medium grained SAND (SP)	

Sudan field screening at 21 ft (white)
 Sampled GP-18-21 for VOC at 0930

Completion Depth: **68.0 Ft bgs**
 Project No.: **21562850.15000**
 Project Name: **Public Works Soil Sampling**
 Drilling Contractor: **Roberts Environmental Drilling Inc.**
 Driller Name: **P. Seymour**
 Drilling Method: **Direct Push**
 Drill Rig Type: **8040 DT**
 Logged by: **W. Pennington**
 County: **Madison**
 Site ID No.: **1191150002**
 Federal ID No.: **ILD080012305**

Water Depth: 35 ft., After ATD hrs.
 Water Depth: _____ ft., After _____ hrs.
 Water level at time of drilling
 Water level after drilling
 ATD At time of drilling
 NE None Encountered
 NA Not Applicable

Geoprobe
 Air Knife/Hand Auger Sampler
 Air Rotary
 Sonic
 Splitspoon Sampler
 Hollow Stem Auger-Soil samples not collected



USC based on field visual observations

URS (ENVIRON) LOG (EPA FORMAT) 21562850.15000 (ROXANA GP 2013).GPJ_URSSTLEV.GDT 2/15/13

LOG OF BORING GP-18

Start ng Date: /8/ 3 Comp et on Date: /8/ 3 Cas ng E evat on: Not Insta ed Ground E evat on: 436 80	Quadrangle Sec:34 (SE /4 of NE /4) T:5N R:9W UTM (or State Plane) Coord N: (X):79 846 8 E: (Y):2322247 67
--	---

DESCRIPTION

NOTES

Depth In feet	Inches Driven	Inches Recovered	Blow Counts	PID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
	60	48		68.6	▲	●		Same: Loose to medium dense, moist, gray, medium grained SAND (SP)	
				364.0	▲	●		2" black banding	
30				421.3	▲	●			
	60	45		611.7	▲	●		Becomes dense, grayish brown	
				15,000+	▲	●			Sudan field screening at 33 ft (red)
35				15,000+	▲	●		Becomes wet	▽
	60	51		15,000+	▲	●	SP	Becomes fine to medium grained	Yellow/green staining of acetate sample liners, zipper bags and nitrile gloves observed (37 to 43 ft bgs) Sudan field screening at 37 ft (red) Sampled GP-18-37 for VOC at 1010
40				15,000+	▲	●			
	60	58		15,000+	▲	●		Becomes medium dense	Sudan field screening at 43 ft (red)
45				15,000+	▲	●			
	60	44		15,000+	▲	●			
				52.3	▲	●			

Completion Depth: 68.0 Ft bgs
 Project No.: 21562850.15000
 Project Name: Public Works Soil Sampling
 Drilling Contractor: Roberts Environmental Drilling Inc.
 Driller Name: P. Seymour
 Drilling Method: Direct Push
 Drill Rig Type: 8040 DT
 Logged by: W. Pennington
 County: Madison
 Site ID No.: 1191150002
 Federal ID No.: ILD080012305

Water Depth: 35 ft., After ATD hrs.
 Water Depth: _____ ft., After _____ hrs.
 Water level at time of drilling
 Water level after drilling
 ATD At time of drilling
 NE None Encountered
 NA Not Applicable

Geoprobe
 Air Knife/Hand Auger Sampler
 Air Rotary
 Sonic
 Splitspoon Sampler
 Hollow Stem Auger- Soil samples not collected



USC based on field visual observations

URS (ENVIRON) LOG (EPA FORMAT) 21562850.15000 (ROXANA GP 2013).GPJ_URSSTLEV.GDT 2/15/13

LOG OF BORING GP-18

Start ng Date: /8/ 3 Comp et on Date: /8/ 3 Cas ng E evat on: Not Insta ed Ground E evat on: 436 80	Quadrangle Sec:34 (SE /4 of NE /4) T:5N R:9W UTM (or State Plane) Coord N: (X):79 846 8 E: (Y):2322247 67
--	---

DESCRIPTION

NOTES

Depth In feet	Inches Driven	Inches Recovered	Blow Counts	PID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
	60	54		523.7	▲	●		Same: Medium dense, wet, grayish brown, fine to medium grained SAND (SP)	Sudan field screening at 53 ft (white) Sampled GP-18-53 for VOC at 1325
				5,474	▲	●			
55	60	48		1,971	▲	●		Becomes coarse grained	
				4,317	▲	●			
60	60	44		340.4	▲	●	SP	Becomes with coarse gravel	Sudan field screening at (white) Sampled GP-18-63 for VOC at 1405
				414.3	▲	●			
				463.5	▲	●			
65	60	30		65.8	▲	●			
				17.3	▲	●			
70								Bottom of boring at 68 ft bgs	

Completion Depth: 68.0 Ft bgs
 Project No.: 21562850.15000
 Project Name: Public Works Soil Sampling
 Drilling Contractor: Roberts Environmental Drilling Inc.
 Driller Name: P. Seymour
 Drilling Method: Direct Push
 Drill Rig Type: 8040 DT
 Logged by: W. Pennington
 County: Madison
 Site ID No.: 1191150002
 Federal ID No.: ILD080012305

Water Depth: 35 ft., After ATD hrs.
 Water Depth: _____ ft., After _____ hrs.
 Water level at time of drilling
 Water level after drilling
 ATD At time of drilling
 NE None Encountered
 NA Not Applicable

Geoprobe
 Air Knife/Hand Auger Sampler
 Air Rotary
 Sonic
 Splitspoon Sampler
 Hollow Stem Auger-
 Soil samples not collected



USC based on field visual observations

URS (ENVIRON) LOG (EPA FORMAT) 21562850.15000 (ROXANA GP 2013).GPJ_URSSTLEV.GDT 2/15/13

Roxana Drilling 2012 Data Review

Laboratory SDG: MC16999

Data Reviewer: Melissa Mansker

Peer Reviewer: Elizabeth Kunkel

Date Reviewed: 1/21/2013

Guidance: USEPA National Functional Guidelines for Superfund Organic Methods Data Review 2008

Sample Identification	Sample Identification
GP-14-13	BP-14-33
GP-14-39	GP-14-45
Trip Blank	GP-15-19
GP-15-29	GP-15-37
GP-15-47	GP-15-55
GP-15-37 Dup	

1.0 Data Package Completeness

Were all items delivered as specified in the QAPP and COC as appropriate?

Yes, however samples GP-15-29 Dup and GP-15-39 originally marked on the COC were not sent to the laboratory. The laboratory received labeled sample duplicate pair GP-15-37/GP-15-37 Dup not included on the COC. Samples were logged in correctly by sample tag identification. No qualification of data was required.

2.0 Laboratory Case Narrative \ Cooler Receipt Form

Were problems noted in the laboratory case narrative or cooler receipt form?

Yes, the laboratory case narrative indicated VOC LCS/LCSD recoveries were outside evaluation criteria. VOC MS/MSD recoveries and MS/MSD RPDs were outside of evaluation criteria. Internal standard area recoveries for LCS MSM1806-BS and sample GP-14-13 MS/MSD were outside criteria. Although not indicated in the laboratory case narrative, acetone was detected in the trip blank. The initial calibration verification recovery for acetone, acrolein, 2-butanone, and 2-hexanone exceeded 50 percent difference (%D). These issues are addressed further in the appropriate sections below.

The cooler receipt form indicated samples were received by the laboratory at 0.8°C which is outside temperature criteria 4°C ± 2°C. All samples were received in good condition; no qualification of data was required. Additionally, the laboratory issued a letter indicating that VOC samples, including trip blanks, were received headspace free, and that the cooler receipt form had been incorrectly marked as not applicable with regards to trip blanks and VOC headspace.

3.0 Holding Times

Were samples extracted/analyzed within applicable limits?

Yes

4.0 Blank Contamination

Were any analytes detected in the Method Blanks, Field Blanks or Trip Blanks?

Yes

Blank ID	Parameter	Analyte	Concentration
Trip Blank	VOCs	Acetone	16.3 ug/L

Analytical data that were reported non-detect or at concentrations greater than five times (5X) the associated blank concentration (10X for common laboratory contaminants) did not require qualification. No qualification of data was required.

5.0 Laboratory Control Sample

Were LCS recoveries within evaluation criteria?

No

LCS/LCSD ID	Parameter	Analyte	LCS/LCSD Recovery	RPD	LCS/LCSD/ RPD Criteria
MSG4896-BS	VOCs	Acrolein	36	NA	70-130
MSM1806-BS	VOCs	Acetone	64	NA	70-130
MSM1806-BS	VOCs	Chloromethane	132	NA	70-130
MSM1806-BS	VOCs	Dichlorodifluoromethane	160	NA	70-130
MSK2166-BS/BSD	VOCs	2-Butanone (MEK)	68/76	10	70-130/25
MSK2166-BS/BSD	VOCs	Dichlorodifluoromethane	142/128	10	70-130/25
MSG4900-BS/BSD	VOCs	Acrolein	69/124	5	70-130/25
MSG4900-BS/BSD	VOCs	Dichlorodifluoromethane	131/124	5	70-130/25
MSG4900-BS/BSD	VOCs	1,4-Dioxane	65/69	6	70-130/25
MST987-BS/BSD	VOCs	Acrolein	51/46	11	70-130/25
MST987-BS/BSD	VOCs	Acrylonitrile	382/418	9	70-130/25

Analytical data that required qualification based on LCS/LCSD data are included in the table below. Analytical data reported as non-detect and associated with LCS recoveries above evaluation criteria, indicating a possible high bias, did not require qualification. LCS/LCSD MST987-BS/BSD was associated with the trip blank. Trip blanks are quality control samples and are not qualified.

Sample ID	Parameter	Analyte	Qualification
GP-14-33	VOCs	Acrolein	UJ
GP-14-39	VOCs	Acrolein	UJ
GP-15-19	VOCs	Acrolein	UJ
GP-15-47	VOCs	Acrolein	UJ
GP-15-55	VOCs	Acrolein	UJ
GP-15-37 Dup	VOCs	Acrolein	UJ

Sample ID	Parameter	Analyte	Qualification
GP-14-13	VOCs	Acetone	UJ
GP-14-45	VOCs	Acetone	UJ
GP-15-29	VOCs	Acetone	UJ
GP-14-33	VOCs	2-Butanone (MEK)	UJ
GP-14-39	VOCs	2-Butanone (MEK)	UJ
GP-15-19	VOCs	2-Butanone (MEK)	UJ
GP-15-47	VOCs	2-Butanone (MEK)	UJ
GP-15-55	VOCs	2-Butanone (MEK)	UJ
GP-15-37 Dup	VOCs	2-Butanone (MEK)	UJ
GP-15-37	VOCs	Acrolein	UJ
GP-15-37	VOCs	1,4-Dioxane	UJ

6.0 Surrogate Recoveries

Were surrogate recoveries within evaluation criteria?

Yes

7.0 Matrix Spike and Matrix Spike Duplicate Recoveries

Were MS/MSD samples analyzed as part of this SDG?

Yes, although not requested, sample GP-14-13 was spiked and analyzed for VOCs.

Were MS/MSD recoveries within evaluation criteria?

No

MS/MSD ID	Parameter	Analyte	MS/MSD Recovery	RPD	MS/MSD/RP D Criteria
GP-14-13	VOCs	2-Butanone (MEK)	71/97	35	70-130/30
GP-14-13	VOCs	Chloromethane	125/134	10	70-130/30
GP-14-13	VOCs	Dichlorodifluoromethane	149/158	9	70-130/30
GP-14-13	VOCs	Hexachlorobutadiene	70/99	38	70-130/30
GP-14-13	VOCs	Naphthalene	65/71	12	70-130/30
GP-14-13	VOCs	1,2,3-Trichlorobenzene	59/72	24	70-130/30
GP-14-13	VOCs	1,2,4-Trichlorobenzene	64/79	25	70-130/30

USEPA National Functional Guidelines for Organic Data Review indicates that organic data does not require qualification based on MS/MSD data alone and LCS recoveries were within evaluation criteria with the exception of compounds listed and qualified as appropriate in Section 5.0 of this data review. No further qualification of the data was required.

8.0 Internal Standard (IS) Recoveries

Were internal standard area recoveries within evaluation criteria?

No

Sample ID	Parameter	Analyte	IS Area Recovery	IS Criteria
MSM1806-BS	VOCs	Tert butyl alcohol-d ₉	81702	19719-78874
MC16999-1MS	VOCs	Tert butyl alcohol-d ₉	82307	19719-78874
MC16999-1MSD	VOCs	Tert butyl alcohol-d ₉	84603	19719-78874

LCS MSM1806-BS and MS/MSD MC16999-1MS/MSD are quality control samples and are not qualified. Therefore no qualification of the data was required.

9.0 Laboratory Duplicate Results

Were laboratory duplicate samples collected as part of this SDG?

No

10.0 Field Duplicate Results

Were field duplicate samples collected as part of this SDG?

Yes

Field ID	Field Duplicate ID
GP-15-37	GP-15-37 Dup

Were field duplicates within evaluation criteria?

Yes

11.0 Sample Dilutions

For samples that were diluted and nondetect, were undiluted results also reported?

Not applicable; samples analyzed did not require dilution.

12.0 Additional Qualifications

Were additional qualifications applied?

Yes, samples GP-14-33, GP-14-39, GP-15-19, GP-15-47, GP-15-55, GP-15-37 Dup, and the trip blank were associated with the initial calibration verification recovery for acetone and acrolein that exceeded 50 percent difference (%D). Sample GP-15-37 was associated with the initial calibration verification recovery for acetone, acrolein, 2-butanone, and 2-hexanone that exceeded 50 percent difference (%D) for. The trip blank is a quality control sample and is not qualified. Acrolein was previously qualified in samples GP-14-33, GP-14-39, GP-15-19, GP-15-37, GP-15-47, GP-15-55 and GP-15-37 Dup due to LCS data in section 5.0 of this review. Analytes in samples associated with ICV %D greater than 50% were qualified as summarized in the following table.

Sample ID	Parameter	Analyte	Qualification
GP-14-33	VOCs	Acetone	UJ
GP-14-39	VOCs	Acetone	UJ
GP-15-19	VOCs	Acetone	UJ
GP-15-37	VOCs	Acetone	UJ
GP-15-37	VOCs	2-Butanone (MEK)	UJ
GP-15-37	VOCs	2-Hexanone	UJ
GP-15-47	VOCs	Acetone	UJ
GP-15-55	VOCs	Acetone	UJ
GP-15-37 Dup	VOCs	Acetone	UJ



01/04/13

Technical Report for

Shell Oil

URSMOSTL: Roxana Drilling, Roxana, IL

21562850.15000

Accutest Job Number: MC16999

Sampling Date: 12/18/12

Report to:

URS Corporation

elizabeth.kunkel@URS.com

ATTN: Elizabeth Kunkel

Total number of pages in report: 129



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

Reviewed on 1/21/2013
MM
Reza Fand
Reza Fand
Lab Director

Client Service contact: Jeremy Vienneau 508-481-6200

Certifications: MA (M-MA136, SW846 NELAC) CT (PH-0109) NH (250210) RI (00071) ME (MA00136) FL (E87579) NY (11791) NJ (MA926) PA (6801121) ND (R-188) CO MN (11546AA) NC (653) IL (002337) WI (399080220) ISO 17025:2005 (L2235)

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Test results relate only to samples analyzed.

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Sample Summary

Shell Oil

Job No: MC16999

URSMOSTL: Roxana Drilling, Roxana, IL
 Project No: 21562850.15000

Sample Number	Collected		Matrix Received	Code	Type	Client Sample ID
	Date	Time By				
MC16999-1	12/18/12	09:35 WPBS	12/19/12	SO	Soil	GP-14-13 ✓
MC16999-2	12/18/12	09:40 WPBS	12/19/12	SO	Soil	GP-14-33 ✓
MC16999-3	12/18/12	10:05 WPBS	12/19/12	SO	Soil	GP-14-39 ✓
MC16999-4	12/18/12	09:45 WPBS	12/19/12	SO	Soil	GP-14-45 ✓
MC16999-5	12/18/12	00:00 WPBS	12/19/12	AQ	Trip Blank Water	TRIP BLANK ✓
MC16999-6	12/18/12	12:35 WPBS	12/19/12	SO	Soil	GP-15-19 ✓
MC16999-7	12/18/12	12:40 WPBS	12/19/12	SO	Soil	GP-15-29 ✓
MC16999-8	12/18/12	12:40 WPBS	12/19/12	SO	Soil	GP-15-29 DUP
MC16999-9	12/18/12	12:30 WPBS	12/19/12	SO	Soil	GP-15-37 ✓
MC16999-10	12/18/12	14:10 WPBS	12/19/12	SO	Soil	GP-15-47 ✓
MC16999-11	12/18/12	14:15 WPBS	12/19/12	SO	Soil	GP-15-55 ✓
MC16999-12	12/18/12	12:30 WPBS	12/19/12	SO	Soil	GP-15-37 DUP

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



SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: Shell Oil

Job No MC16999

Site: URSMOSTL: Roxana Drilling, Roxana, IL

Report Date 1/4/2013 2:10:45 PM

10 Sample(s), 1 Trip Blank(s) are collected on 12/18/2012 and were received at Accutest on 12/19/2012 properly preserved, at 0.8 Deg. C and intact. These Samples received an Accutest job number of MC16999. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section of this report. 1-Chlorohexane was searched in the library search and reported only if detections were found.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

Volatiles by GCMS By Method SW846 8260B

Matrix: AQ	Batch ID: MST987
------------	------------------

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) MC17058-17MS, MC17058-17MSD were used as the QC samples indicated.
- BS/BSD Recovery(s) for Acrolein are outside control limits. Blank Spike meets program technical requirements.
- Matrix Spike Recovery(s) for 2-Chloroethyl vinyl ether, Carbon disulfide, Dichlorodifluoromethane are outside control limits. Outside control limits due to possible matrix interference. Refer to Blank Spike.
- Matrix Spike Duplicate Recovery(s) for 2-Chloroethyl vinyl ether are outside control limits. Outside control limits due to possible matrix interference. Refer to Blank Spike.
- MST987-BS/BSD for Acrylonitrile: Outside control limits. Associated samples are non-detect for this compound.
- MC17058-17MS/MSD for Acrylonitrile: Outside control limits. Associated samples are non-detect for this compound.
- Initial calibration verification MST983-ICV983 for acetone, acrolein exceeds 50% Difference. Acrolein is within criteria in continuing calibration check standard MST987-CC983.

Matrix: SO	Batch ID: MSG4896
------------	-------------------

- All samples were analyzed within the recommended method holding time.
- Sample(s) MC17145-1MS, MC17145-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- Blank Spike Recovery(s) for Acrolein are outside control limits. Blank Spike meets program technical requirements.
- MS/MSD Recovery(s) for Acrolein are outside control limits. Outside control limits due to possible matrix interference. Refer to Blank Spike.
- Initial calibration verification MSG4894-ICV4894 for acrolein exceeds 50% Difference. Acrolein is within criteria in continuing calibration check standard MSG4896-CC4894.

Matrix: SO	Batch ID: MSG4900
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- All samples were analyzed within the recommended method holding time.
- Sample(s) MC17098-24MS, MC17098-24MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- Blank Spike Recovery(s) for 1,4-Dioxane, Acrolein, Dichlorodifluoromethane are outside control limits. Blank Spike meets program technical requirements.
- BSD Recovery(s) for 1,4-Dioxane are outside control limits. Blank Spike meets program technical requirements.
- Matrix Spike Recovery(s) for 1,4-Dioxane, 2-Butanone (MEK), 2-Hexanone, Acetone, Acrolein, Vinyl chloride are outside control limits. Outside control limits due to possible matrix interference. Refer to Blank Spike.
- Matrix Spike Duplicate Recovery(s) for 2-Butanone (MEK), 2-Hexanone, Acetone, Acrolein, Vinyl chloride are outside control limits. Outside control limits due to possible matrix interference. Refer to Blank Spike.

Volatiles by GCMS By Method SW846 8260B

Matrix: SO	Batch ID: MSG4900
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- RPD(s) for MSD for 1,4-Dioxane are outside control limits for sample MC17098-24MSD. High RPD due to possible matrix interference and/or sample non-homogeneity.
- Initial calibration verification MSG4894-ICV4894 for acrolein exceeds 50% Difference. Acrolein is within criteria in continuing calibration check standard MSG4900-CC4894.
- Initial calibration verification MSG4894-ICV4894 for acetone, 2-butanone, 2-hexanone exceeds 50% Difference (response bias high). Associated sample is non-detect for these compounds.

Matrix: SO	Batch ID: MSK2166
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- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) MC16996-3MS, MC16996-3MSD were used as the QC samples indicated.
- Blank Spike Recovery(s) for 2-Butanone (MEK), Chloromethane, Dichlorodifluoromethane are outside control limits. Blank Spike meets program technical requirements.
- MS/MSD Recovery(s) for -Hexanone, 4-Methyl-2-pentanone (MIBK), Acetone, Vinyl chloride are outside control limits. Outside control limits due to possible matrix interference. Refer to Blank Spike.
- Initial calibration verification MSK2132-ICV2132 for acetone exceeds 50% Difference. Acetone is within criteria in continuing calibration check standard MSK2166-CC2132.

Matrix: SO	Batch ID: MSM1806
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- All samples were analyzed within the recommended method holding time.
- Sample(s) MC16999-1MS, MC16999-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- Blank Spike Recovery(s) for Acetone, Chloromethane, Dichlorodifluoromethane are outside control limits. Blank Spike meets program technical requirements.
- Matrix Spike Recovery(s) for 1,2,3-Trichlorobenzene, 1,2,4-Trichlorobenzene. Dichlorodifluoromethane, Naphthalene are outside control limits. Outside control limits due to possible matrix interference. Refer to Blank Spike.
- Matrix Spike Duplicate Recovery(s) for Chloromethane, Dichlorodifluoromethane are outside control limits. Outside control limits due to possible matrix interference. Refer to Blank Spike.
- RPD(s) for MSD for 2-Butanone (MEK), Hexachlorobutadiene are outside control limits for sample MC16999-1MSD. High RPD due to possible matrix interference and/or sample non-homogeneity.
- MSM1806-BS, MC16999-1MS, MC16999-1MSD for Tert Butyl Alcohol-D9: Outside control limits. Target analytes not associated with this internal standard.

Volatiles by GC By Method SW846 8011

Matrix: AQ	Batch ID: OP31513
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- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- Sample(s) MC17000-5MS, MC17000-5MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Matrix: SO	Batch ID: OP31493
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- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) MC16961-2MS, MC16961-2MSD were used as the QC samples indicated.

Wet Chemistry By Method SM21 2540 B MOD.

Matrix: SO	Batch ID: GN41358
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- Sample(s) MC17035-1DUP were used as the QC samples for Solids, Percent.

The Accutest Laboratories of New England certifies that all analysis were performed within method specification. It is further recommended that this report to be used in its entirety. The Accutest Laboratories of NE, Laboratory Director or assignee as verified by the signature on the cover page has authorized the release of this report(MC16999).



Elizabeth Kunkel
URS
St. Louis, MO

February 13, 2013

Accutest Job: MC16999

Ms. Elizabeth Kunkel,

On the report for SDG MC16999, the sample receipt confirmation was marked incorrectly by the lab. The SDG did have a trip blank that was received in the cooler, the trip blank was marked on the COC, and the vials that were sent for VOC analysis were received headspace free.

Sincerely,

A handwritten signature in blue ink, appearing to read 'J. Vienneau', is centered on a white rectangular background.

Jeremy M. Vienneau
Accutest Laboratories of New England, Inc.

Summary of Hits

Job Number: MC16999
 Account: Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL
 Collected: 12/18/12



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
MC16999-1	GP-14-13					
Benzene		0.00049 J	0.00058	0.00034	mg/kg	SW846 8260B
MC16999-2	GP-14-33					
Benzene		3.57	0.061	0.036	mg/kg	SW846 8260B
n-Butylbenzene		0.0877 J	0.61	0.022	mg/kg	SW846 8260B
MC16999-3	GP-14-39					
Benzene		3.75	0.061	0.036	mg/kg	SW846 8260B
n-Butylbenzene		0.754	0.61	0.022	mg/kg	SW846 8260B
sec-Butylbenzene		0.205 J	0.61	0.028	mg/kg	SW846 8260B
tert-Butylbenzene		0.143 J	0.61	0.11	mg/kg	SW846 8260B
Ethylbenzene		0.111 J	0.24	0.029	mg/kg	SW846 8260B
Isopropylbenzene		0.395 J	0.61	0.028	mg/kg	SW846 8260B
p-Isopropyltoluene		0.101 J	0.61	0.022	mg/kg	SW846 8260B
n-Propylbenzene		1.29	0.61	0.12	mg/kg	SW846 8260B
1,2,4-Trimethylbenzene		0.114 J	0.61	0.027	mg/kg	SW846 8260B
1,3,5-Trimethylbenzene		0.0692 J	0.61	0.026	mg/kg	SW846 8260B
Vinyl Acetate		0.629	0.61	0.068	mg/kg	SW846 8260B
m,p-Xylene		0.441	0.24	0.096	mg/kg	SW846 8260B
Xylene (total)		0.441	0.24	0.029	mg/kg	SW846 8260B
MC16999-4	GP-14-45					
Benzene		0.160	0.00049	0.00029	mg/kg	SW846 8260B
n-Butylbenzene		0.0024 J	0.0049	0.00018	mg/kg	SW846 8260B
sec-Butylbenzene		0.0016 J	0.0049	0.00022	mg/kg	SW846 8260B
tert-Butylbenzene		0.0011 J	0.0049	0.00086	mg/kg	SW846 8260B
Carbon disulfide		0.0011 J	0.0049	0.00016	mg/kg	SW846 8260B
1,1-Dichloroethane		0.00036 J	0.0020	0.00026	mg/kg	SW846 8260B
Ethylbenzene		0.0032	0.0020	0.00024	mg/kg	SW846 8260B
Isopropylbenzene		0.0061	0.0049	0.00022	mg/kg	SW846 8260B
p-Isopropyltoluene		0.00049 J	0.0049	0.00017	mg/kg	SW846 8260B
n-Propylbenzene		0.0136	0.0049	0.00099	mg/kg	SW846 8260B
Toluene		0.0111	0.0049	0.00083	mg/kg	SW846 8260B
1,2,4-Trimethylbenzene		0.00048 J	0.0049	0.00022	mg/kg	SW846 8260B
m,p-Xylene		0.0080	0.0020	0.00077	mg/kg	SW846 8260B
o-Xylene		0.0026	0.0020	0.00023	mg/kg	SW846 8260B
Xylene (total)		0.0105	0.0020	0.00023	mg/kg	SW846 8260B

Summary of Hits

Job Number: MC16999
 Account: Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL
 Collected: 12/18/12



Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
MC16999-5	TRIP BLANK					
Acetone		16.3	5.0	3.0	ug/l	SW846 8260B
MC16999-6	GP-15-19					
Benzene		63.7	0.12	0.073	mg/kg	SW846 8260B
n-Butylbenzene		1.58	1.2	0.046	mg/kg	SW846 8260B
sec-Butylbenzene		1.41	1.2	0.057	mg/kg	SW846 8260B
Ethylbenzene		0.669	0.50	0.060	mg/kg	SW846 8260B
Isopropylbenzene		1.13 J	1.2	0.057	mg/kg	SW846 8260B
p-Isopropyltoluene		1.79	1.2	0.044	mg/kg	SW846 8260B
Naphthalene		0.823 J	1.2	0.31	mg/kg	SW846 8260B
n-Propylbenzene		0.548 J	1.2	0.25	mg/kg	SW846 8260B
Toluene		0.283 J	1.2	0.21	mg/kg	SW846 8260B
1,2,4-Trimethylbenzene		4.28	1.2	0.056	mg/kg	SW846 8260B
1,3,5-Trimethylbenzene		2.73	1.2	0.053	mg/kg	SW846 8260B
m,p-Xylene		1.36	0.50	0.20	mg/kg	SW846 8260B
o-Xylene		0.294 J	0.50	0.060	mg/kg	SW846 8260B
Xylene (total)		1.66	0.50	0.060	mg/kg	SW846 8260B
MC16999-7	GP-15-29					
Benzene		0.126	0.00055	0.00033	mg/kg	SW846 8260B
Ethylbenzene		0.00064 J	0.0022	0.00027	mg/kg	SW846 8260B
Toluene		0.00099 J	0.0055	0.00094	mg/kg	SW846 8260B
1,2,4-Trimethylbenzene		0.00065 J	0.0055	0.00025	mg/kg	SW846 8260B
m,p-Xylene		0.0012 J	0.0022	0.00087	mg/kg	SW846 8260B
o-Xylene		0.00039 J	0.0022	0.00027	mg/kg	SW846 8260B
Xylene (total)		0.0016 J	0.0022	0.00027	mg/kg	SW846 8260B
MC16999-9	GP-15-37					
Benzene		974	1.2	0.72	mg/kg	SW846 8260B
n-Butylbenzene		1.12 J	12	0.45	mg/kg	SW846 8260B
Ethylbenzene		4.56 J	4.9	0.59	mg/kg	SW846 8260B
Toluene		5.53 J	12	2.1	mg/kg	SW846 8260B
1,2,4-Trimethylbenzene		7.32 J	12	0.55	mg/kg	SW846 8260B
1,3,5-Trimethylbenzene		2.20 J	12	0.52	mg/kg	SW846 8260B
m,p-Xylene		12.3	4.9	1.9	mg/kg	SW846 8260B
o-Xylene		4.60 J	4.9	0.59	mg/kg	SW846 8260B
Xylene (total)		16.9	4.9	0.59	mg/kg	SW846 8260B

Summary of Hits

Job Number: MC16999
 Account: Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL
 Collected: 12/18/12



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
MC16999-10	GP-15-47					
Benzene		283	0.59	0.35	mg/kg	SW846 8260B
n-Butylbenzene		0.347 J	3.0	0.11	mg/kg	SW846 8260B
sec-Butylbenzene		1.86 J	3.0	0.14	mg/kg	SW846 8260B
Ethylbenzene		1.71	1.2	0.14	mg/kg	SW846 8260B
p-Isopropyltoluene		0.301 J	3.0	0.11	mg/kg	SW846 8260B
Toluene		1.69 J	3.0	0.50	mg/kg	SW846 8260B
1,2,4-Trimethylbenzene		2.21 J	3.0	0.13	mg/kg	SW846 8260B
1,3,5-Trimethylbenzene		0.721 J	3.0	0.13	mg/kg	SW846 8260B
m,p-Xylene		4.81	1.2	0.47	mg/kg	SW846 8260B
o-Xylene		1.62	1.2	0.14	mg/kg	SW846 8260B
Xylene (total)		6.43	1.2	0.14	mg/kg	SW846 8260B
MC16999-11	GP-15-55					
Benzene		184	0.50	0.29	mg/kg	SW846 8260B
n-Butylbenzene		13.9	5.0	0.18	mg/kg	SW846 8260B
sec-Butylbenzene		3.12 J	5.0	0.23	mg/kg	SW846 8260B
tert-Butylbenzene		2.29 J	5.0	0.88	mg/kg	SW846 8260B
Ethylbenzene		111	2.0	0.24	mg/kg	SW846 8260B
Isopropylbenzene		6.99	5.0	0.23	mg/kg	SW846 8260B
p-Isopropyltoluene		2.31 J	5.0	0.18	mg/kg	SW846 8260B
Naphthalene		19.3	5.0	1.2	mg/kg	SW846 8260B
n-Propylbenzene		28.3	5.0	1.0	mg/kg	SW846 8260B
Toluene		12.5	5.0	0.85	mg/kg	SW846 8260B
1,2,4-Trimethylbenzene		136	5.0	0.22	mg/kg	SW846 8260B
1,3,5-Trimethylbenzene		44.3	5.0	0.21	mg/kg	SW846 8260B
Vinyl Acetate		17.1	5.0	0.56	mg/kg	SW846 8260B
m,p-Xylene		290	2.0	0.79	mg/kg	SW846 8260B
o-Xylene		63.0	2.0	0.24	mg/kg	SW846 8260B
Xylene (total)		353	2.0	0.24	mg/kg	SW846 8260B
MC16999-12	GP-15-37 DUP					
Benzene		1150	2.2	1.3	mg/kg	SW846 8260B
n-Butylbenzene		0.864	0.55	0.020	mg/kg	SW846 8260B
sec-Butylbenzene		0.228 J	0.55	0.025	mg/kg	SW846 8260B
Ethylbenzene		5.28	0.22	0.027	mg/kg	SW846 8260B
2-Hexanone		9.73	0.55	0.055	mg/kg	SW846 8260B
Isopropylbenzene		0.438 J	0.55	0.025	mg/kg	SW846 8260B
p-Isopropyltoluene		0.154 J	0.55	0.020	mg/kg	SW846 8260B
Methyl Tert Butyl Ether		0.653	0.22	0.032	mg/kg	SW846 8260B
Naphthalene		1.25	0.55	0.14	mg/kg	SW846 8260B
n-Propylbenzene		1.73	0.55	0.11	mg/kg	SW846 8260B

Summary of Hits

Job Number: MC16999
Account: Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL
Collected: 12/18/12



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Toluene		6.76	0.55	0.093	mg/kg	SW846 8260B
1,2,4-Trimethylbenzene		8.43	0.55	0.025	mg/kg	SW846 8260B
1,3,5-Trimethylbenzene		2.59	0.55	0.024	mg/kg	SW846 8260B
Vinyl Acetate		0.236 J	0.55	0.062	mg/kg	SW846 8260B
m,p-Xylene		15.7	0.22	0.087	mg/kg	SW846 8260B
o-Xylene		6.08	0.22	0.026	mg/kg	SW846 8260B
Xylene (total)		21.8	0.22	0.026	mg/kg	SW846 8260B



Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	GP-14-13	Date Sampled:	12/18/12
Lab Sample ID:	MC16999-1	Date Received:	12/19/12
Matrix:	SO - Soil	Percent Solids:	74.8
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M53169.D	1	12/28/12	AMY	n/a	n/a	MSM1806
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.80 g	5.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.0058	0.0015	mg/kg	WJ
107-02-8	Acrolein	ND	0.029	0.012	mg/kg	
107-13-1	Acrylonitrile	ND	0.029	0.0014	mg/kg	
71-43-2	Benzene	0.00049	0.00058	0.00034	mg/kg	J
108-86-1	Bromobenzene	ND	0.0058	0.00026	mg/kg	
74-97-5	Bromochloromethane	ND	0.0058	0.00043	mg/kg	
75-27-4	Bromodichloromethane	ND	0.0023	0.00024	mg/kg	
75-25-2	Bromoform	ND	0.0023	0.0023	mg/kg	
74-83-9	Bromomethane	ND	0.0023	0.00060	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.0058	0.0014	mg/kg	
104-51-8	n-Butylbenzene	ND	0.0058	0.00021	mg/kg	
135-98-8	sec-Butylbenzene	ND	0.0058	0.00026	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.0058	0.0010	mg/kg	
75-15-0	Carbon disulfide	ND	0.0058	0.00019	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.0023	0.00084	mg/kg	
108-90-7	Chlorobenzene	ND	0.0023	0.00032	mg/kg	
75-00-3	Chloroethane	ND	0.0058	0.0014	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.0058	0.0023	mg/kg	
67-66-3	Chloroform	ND	0.0023	0.00059	mg/kg	
74-87-3	Chloromethane	ND	0.0058	0.00053	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.0058	0.0013	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.0058	0.00026	mg/kg	
124-48-1	Dibromochloromethane	ND	0.0023	0.00034	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.0023	0.00025	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.0023	0.00026	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.0023	0.00024	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.0023	0.0013	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.0023	0.00031	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.0023	0.00033	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.0023	0.00042	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.0023	0.00035	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.0023	0.00033	mg/kg	

ND = Not detected MDL - Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	GP-14-13	Date Sampled:	12/18/12
Lab Sample ID:	MC16999-1	Date Received:	12/19/12
Matrix:	SO - Soil	Percent Solids:	74.8
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.0023	0.00043	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.0058	0.00027	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.0058	0.0010	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.0058	0.00030	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.0023	0.00020	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.0023	0.00057	mg/kg	
123-91-1	1,4-Dioxane	ND	0.029	0.029	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.0058	0.00078	mg/kg	
100-41-4	Ethylbenzene	ND	0.0023	0.00028	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.0058	0.00054	mg/kg	
591-78-6	2-Hexanone	ND	0.0058	0.00058	mg/kg	
98-82-8	Isopropylbenzene	ND	0.0058	0.00026	mg/kg	
99-87-6	p-Isopropyltoluene	ND	0.0058	0.00021	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.0023	0.00033	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.0058	0.00058	mg/kg	
74-95-3	Methylene bromide	ND	0.0058	0.00057	mg/kg	
75-09-2	Methylene chloride	ND	0.0023	0.0013	mg/kg	
91-20-3	Naphthalene	ND	0.0058	0.0014	mg/kg	
103-65-1	n-Propylbenzene	ND	0.0058	0.0012	mg/kg	
100-42-5	Styrene	ND	0.0058	0.00027	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.0058	0.0012	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.0023	0.00049	mg/kg	
127-18-4	Tetrachloroethene	ND	0.0023	0.00026	mg/kg	
108-88-3	Toluene	ND	0.0058	0.00098	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	0.0058	0.00027	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.0058	0.00026	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.0023	0.00036	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.0023	0.00085	mg/kg	
79-01-6	Trichloroethene	ND	0.0023	0.00024	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.0023	0.00035	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.0058	0.00034	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	0.0058	0.00026	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	0.0058	0.00025	mg/kg	
108-05-4	Vinyl Acetate	ND	0.0058	0.00064	mg/kg	
75-01-4	Vinyl chloride	ND	0.0023	0.00031	mg/kg	
	m,p-Xylene	ND	0.0023	0.00091	mg/kg	
95-47-6	o-Xylene	ND	0.0023	0.00028	mg/kg	
1330-20-7	Xylene (total)	ND	0.0023	0.00028	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

Client Sample ID: GP-14-13	Date Sampled: 12/18/12
Lab Sample ID: MC16999-1	Date Received: 12/19/12
Matrix: SO - Soil	Percent Solids: 74.8
Method: SW846 8260B	
Project: URSMOSTL: Roxana Drilling, Roxana, IL	

4.1
4

VOA Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluorometbane	88%		70-130%
2037-26-5	Toluene-D8	88%		70-130%
460-00-4	4-Bromofluorobenzene	82%		70-130%

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

Client Sample ID: GP-14-13 Lab Sample ID: MC16999-1 Matrix: SO - Soil Method: SW846 8011 SW846 3550B Project: URSMOSTL: Roxana Drilling, Roxana, IL	Date Sampled: 12/18/12 Date Received: 12/19/12 Percent Solids: 74.8
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Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK20278.D	1	12/28/12	AP	12/19/12	OP31493	GBK733
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.8 g	50.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.0033	0.0015	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0033	0.0013	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	126%		61-167%
460-00-4	Bromofluorobenzene (S)	97%		61-167%

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

4.1
4

Report of Analysis

Client Sample ID:	GP-14-33	Date Sampled:	12/18/12
Lab Sample ID:	MC16999-2	Date Received:	12/19/12
Matrix:	SO - Soil	Percent Solids:	88.0
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	K65937.D	1	12/21/12	GK	n/a	n/a	MSK2166
Run #2	G123187.D	1	12/26/12	JM	n/a	n/a	MSG4896

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	4.95 g	10.0 ml	100 ul
Run #2	4.95 g	10.0 ml	100 ul

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.61	0.15	mg/kg	UJ
107-02-8	Acrolein	ND ^a	3.0	1.2	mg/kg	UJ
107-13-1	Acrylonitrile	ND	3.0	0.15	mg/kg	
71-43-2	Benzene	3.57	0.061	0.036	mg/kg	
108-86-1	Bromobenzene	ND	0.61	0.027	mg/kg	
74-97-5	Bromochloromethane	ND	0.61	0.045	mg/kg	
75-27-4	Bromodichloromethane	ND	0.24	0.026	mg/kg	
75-25-2	Bromoform	ND	0.24	0.24	mg/kg	
74-83-9	Bromomethane	ND	0.24	0.063	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.61	0.15	mg/kg	UJ
104-51-8	n-Butylbenzene	0.0877	0.61	0.022	mg/kg	J
135-98-8	sec-Butylbenzene	ND	0.61	0.028	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.61	0.11	mg/kg	
75-15-0	Carbon disulfide	ND	0.61	0.020	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.24	0.088	mg/kg	
108-90-7	Chlorobenzene	ND	0.24	0.033	mg/kg	
75-00-3	Chloroethane	ND	0.61	0.15	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.61	0.24	mg/kg	
67-66-3	Chloroform	ND	0.24	0.063	mg/kg	
74-87-3	Chloromethane	ND	0.61	0.056	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.61	0.13	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.61	0.028	mg/kg	
124-48-1	Dibromochloromethane	ND	0.24	0.036	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.24	0.026	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.24	0.027	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.24	0.026	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.24	0.14	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.24	0.033	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.24	0.035	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.24	0.045	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.24	0.037	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.24	0.035	mg/kg	

ND = Not detected MDL - Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	GP-14-33	Date Sampled:	12/18/12
Lab Sample ID:	MC16999-2	Date Received:	12/19/12
Matrix:	SO - Soil	Percent Solids:	88.0
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.24	0.045	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.61	0.028	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.61	0.11	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.61	0.032	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.24	0.021	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.24	0.060	mg/kg	
123-91-1	1,4-Dioxane	ND	3.0	3.0	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.61	0.083	mg/kg	
100-41-4	Ethylbenzene	ND	0.24	0.029	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.61	0.057	mg/kg	
591-78-6	2-Hexanone	ND	0.61	0.061	mg/kg	
98-82-8	Isopropylbenzene	ND	0.61	0.028	mg/kg	
99-87-6	p-Isopropyltoluene	ND	0.61	0.022	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.24	0.035	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.61	0.061	mg/kg	
74-95-3	Methylene bromide	ND	0.61	0.060	mg/kg	
75-09-2	Methylene chloride	ND	0.24	0.14	mg/kg	
91-20-3	Naphthalene	ND	0.61	0.15	mg/kg	
103-65-1	n-Propylbenzene	ND	0.61	0.12	mg/kg	
100-42-5	Styrene	ND	0.61	0.028	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.61	0.12	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.24	0.052	mg/kg	
127-18-4	Tetrachloroethene	ND	0.24	0.028	mg/kg	
108-88-3	Toluene	ND	0.61	0.10	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	0.61	0.029	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.61	0.028	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.24	0.038	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.24	0.089	mg/kg	
79-01-6	Trichloroethene	ND	0.24	0.026	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.24	0.037	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.61	0.036	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	0.61	0.027	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	0.61	0.026	mg/kg	
108-05-4	Vinyl Acetate	ND	0.61	0.068	mg/kg	
75-01-4	Vinyl chloride	ND	0.24	0.033	mg/kg	
	m,p-Xylene	ND	0.24	0.096	mg/kg	
95-47-6	o-Xylene	ND	0.24	0.029	mg/kg	
1330-20-7	Xylene (total)	ND	0.24	0.029	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

Client Sample ID: GP-14-33 Lab Sample ID: MC16999-2 Matrix: SO - Soil Method: SW846 8260B Project: URSMOSTL: Roxana Drilling, Roxana, IL	Date Sampled: 12/18/12 Date Received: 12/19/12 Percent Solids: 88.0
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VOA Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	108%	100%	70-130%
2037-26-5	Toluene-D8	105%	96%	70-130%
460-00-4	4-Bromofluorobenzene	103%	91%	70-130%

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

(a) Result is from Run# 2

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:	GP-14-33	Date Sampled:	12/18/12
Lab Sample ID:	MC16999-2	Date Received:	12/19/12
Matrix:	SO - Soil	Percent Solids:	88.0
Method:	SW846 8011 SW846 3550B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK20279.D	1	12/28/12	AP	12/19/12	OP31493	GBK733
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.6 g	50.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.0028	0.0012	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0028	0.0011	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	133%		61-167%
460-00-4	Bromofluorobenzene (S)	101%		61-167%

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

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

Report of Analysis

Client Sample ID:	GP-14-39	Date Sampled:	12/18/12
Lab Sample ID:	MC16999-3	Date Received:	12/19/12
Matrix:	SO - Soil	Percent Solids:	85.3
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	K65938.D	1	12/21/12	GK	n/a	n/a	MSK2166
Run #2	G123188.D	1	12/26/12	JM	n/a	n/a	MSG4896

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.17 g	10.0 ml	100 ul
Run #2	5.17 g	10.0 ml	100 ul

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.61	0.15	mg/kg	UJ
107-02-8	Acrolein	ND ^a	3.0	1.2	mg/kg	UJ
107-13-1	Acrylonitrile	ND	3.0	0.15	mg/kg	
71-43-2	Benzene	3.75	0.061	0.036	mg/kg	
108-86-1	Bromobenzene	ND	0.61	0.027	mg/kg	
74-97-5	Bromochloromethane	ND	0.61	0.046	mg/kg	
75-27-4	Bromodichloromethane	ND	0.24	0.026	mg/kg	
75-25-2	Bromoform	ND	0.24	0.24	mg/kg	
74-83-9	Bromomethane	ND	0.24	0.063	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.61	0.15	mg/kg	UJ
104-51-8	n-Butylbenzene	0.754	0.61	0.022	mg/kg	
135-98-8	sec-Butylbenzene	0.205	0.61	0.028	mg/kg	J
98-06-6	tert-Butylbenzene	0.143	0.61	0.11	mg/kg	J
75-15-0	Carbon disulfide	ND	0.61	0.020	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.24	0.089	mg/kg	
108-90-7	Chlorobenzene	ND	0.24	0.034	mg/kg	
75-00-3	Chloroethane	ND	0.61	0.15	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.61	0.24	mg/kg	
67-66-3	Chloroform	ND	0.24	0.063	mg/kg	
74-87-3	Chloromethane	ND	0.61	0.057	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.61	0.13	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.61	0.028	mg/kg	
124-48-1	Dibromochloromethane	ND	0.24	0.036	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.24	0.026	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.24	0.028	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.24	0.026	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.24	0.14	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.24	0.033	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.24	0.035	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.24	0.045	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.24	0.037	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.24	0.035	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

Client Sample ID:	GP-14-39	Date Sampled:	12/18/12
Lab Sample ID:	MC16999-3	Date Received:	12/19/12
Matrix:	SO - Soil	Percent Solids:	85.3
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.24	0.045	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.61	0.028	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.61	0.11	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.61	0.032	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.24	0.021	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.24	0.061	mg/kg	
123-91-1	1,4-Dioxane	ND	3.0	3.0	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.61	0.083	mg/kg	
100-41-4	Ethylbenzene	0.111	0.24	0.029	mg/kg	J
87-68-3	Hexachlorobutadiene	ND	0.61	0.057	mg/kg	
591-78-6	2-Hexanone	ND	0.61	0.061	mg/kg	
98-82-8	Isopropylbenzene	0.395	0.61	0.028	mg/kg	J
99-87-6	p-Isopropyltoluene	0.101	0.61	0.022	mg/kg	J
1634-04-4	Methyl Tert Butyl Ether	ND	0.24	0.035	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.61	0.061	mg/kg	
74-95-3	Methylene bromide	ND	0.61	0.060	mg/kg	
75-09-2	Methylene chloride	ND	0.24	0.14	mg/kg	
91-20-3	Naphthalene	ND	0.61	0.15	mg/kg	
103-65-1	n-Propylbenzene	1.29	0.61	0.12	mg/kg	
100-42-5	Styrene	ND	0.61	0.029	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.61	0.12	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.24	0.052	mg/kg	
127-18-4	Tetrachloroethene	ND	0.24	0.028	mg/kg	
108-88-3	Toluene	ND	0.61	0.10	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	0.61	0.029	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.61	0.028	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.24	0.038	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.24	0.090	mg/kg	
79-01-6	Trichloroethene	ND	0.24	0.026	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.24	0.037	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.61	0.036	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	0.114	0.61	0.027	mg/kg	J
108-67-8	1,3,5-Trimethylbenzene	0.0692	0.61	0.026	mg/kg	J
108-05-4	Vinyl Acetate	0.629	0.61	0.068	mg/kg	
75-01-4	Vinyl chloride	ND	0.24	0.033	mg/kg	
	m,p-Xylene	0.441	0.24	0.096	mg/kg	
95-47-6	o-Xylene	ND	0.24	0.029	mg/kg	
1330-20-7	Xylene (total)	0.441	0.24	0.029	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

Client Sample ID: GP-14-39	Date Sampled: 12/18/12
Lab Sample ID: MC16999-3	Date Received: 12/19/12
Matrix: SO - Soil	Percent Solids: 85.3
Method: SW846 8260B	
Project: URSMOSTL: Roxana Drilling, Roxana, IL	

4.3
4

VOA Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	106%	92%	70-130%
2037-26-5	Toluene-D8	104%	88%	70-130%
460-00-4	4-Bromofluorobenzene	109%	83%	70-130%

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

(a) Result is from Run# 2

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

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

Report of Analysis

Client Sample ID: GP-14-39	Date Sampled: 12/18/12
Lab Sample ID: MC16999-3	Date Received: 12/19/12
Matrix: SO - Soil	Percent Solids: 85.3
Method: SW846 8011 SW846 3550B	
Project: URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK20280.D	1	12/28/12	AP	12/19/12	OP31493	GBK733
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.2 g	50.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.0029	0.0013	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0029	0.0011	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	123%		61-167%
460-00-4	Bromofluorobenzene (S)	92%		61-167%

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

4.3
4

Report of Analysis

Client Sample ID: GP-14-45	Date Sampled: 12/18/12
Lab Sample ID: MC16999-4	Date Received: 12/19/12
Matrix: SO - Soil	Percent Solids: 88.4
Method: SW846 8260B	
Project: URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M53170.D	1	12/28/12	AMY	n/a	n/a	MSM1806
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.79 g	5.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.0049	0.0012	mg/kg	UJ
107-02-8	Acrolein	ND	0.024	0.0098	mg/kg	
107-13-1	Acrylonitrile	ND	0.024	0.0012	mg/kg	
71-43-2	Benzene	0.160	0.00049	0.00029	mg/kg	
108-86-1	Bromobenzene	ND	0.0049	0.00022	mg/kg	
74-97-5	Bromochloromethane	ND	0.0049	0.00036	mg/kg	
75-27-4	Bromodichloromethane	ND	0.0020	0.00021	mg/kg	
75-25-2	Bromoform	ND	0.0020	0.0020	mg/kg	
74-83-9	Bromomethane	ND	0.0020	0.00051	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.0049	0.0012	mg/kg	
104-51-8	n-Butylbenzene	0.0024	0.0049	0.00018	mg/kg	J
135-98-8	sec-Butylbenzene	0.0016	0.0049	0.00022	mg/kg	J
98-06-6	tert-Butylbenzene	0.0011	0.0049	0.00086	mg/kg	J
75-15-0	Carbon disulfide	0.0011	0.0049	0.00016	mg/kg	J
56-23-5	Carbon tetrachloride	ND	0.0020	0.00071	mg/kg	
108-90-7	Chlorobenzene	ND	0.0020	0.00027	mg/kg	
75-00-3	Chloroethane	ND	0.0049	0.0012	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.0049	0.0020	mg/kg	
67-66-3	Chloroform	ND	0.0020	0.00050	mg/kg	
74-87-3	Chloromethane	ND	0.0049	0.00045	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.0049	0.0011	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.0049	0.00022	mg/kg	
124-48-1	Dibromochloromethane	ND	0.0020	0.00029	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.0020	0.00021	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.0020	0.00022	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.0020	0.00021	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.0020	0.0011	mg/kg	
75-34-3	1,1-Dichloroethane	0.00036	0.0020	0.00026	mg/kg	J
107-06-2	1,2-Dichloroethane	ND	0.0020	0.00028	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.0020	0.00036	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.0020	0.00029	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.0020	0.00028	mg/kg	

ND = Not detected MDL - Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	GP-14-45	Date Sampled:	12/18/12
Lab Sample ID:	MC16999-4	Date Received:	12/19/12
Matrix:	SO - Soil	Percent Solids:	88.4
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.0020	0.00036	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.0049	0.00023	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.0049	0.00085	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.0049	0.00026	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.0020	0.00017	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.0020	0.00048	mg/kg	
123-91-1	1,4-Dioxane	ND	0.024	0.024	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.0049	0.00067	mg/kg	
100-41-4	Ethylbenzene	0.0032	0.0020	0.00024	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.0049	0.00045	mg/kg	
591-78-6	2-Hexanone	ND	0.0049	0.00049	mg/kg	
98-82-8	Isopropylbenzene	0.0061	0.0049	0.00022	mg/kg	
99-87-6	p-Isopropyltoluene	0.00049	0.0049	0.00017	mg/kg	J
1634-04-4	Methyl Tert Butyl Ether	ND	0.0020	0.00028	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.0049	0.00049	mg/kg	
74-95-3	Methylene bromide	ND	0.0049	0.00048	mg/kg	
75-09-2	Methylene chloride	ND	0.0020	0.0011	mg/kg	
91-20-3	Naphthalene	ND	0.0049	0.0012	mg/kg	
103-65-1	n-Propylbenzene	0.0136	0.0049	0.00099	mg/kg	
100-42-5	Styrene	ND	0.0049	0.00023	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.0049	0.00098	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.0020	0.00042	mg/kg	
127-18-4	Tetrachloroethene	ND	0.0020	0.00022	mg/kg	
108-88-3	Toluene	0.0111	0.0049	0.00083	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	0.0049	0.00023	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.0049	0.00022	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.0020	0.00031	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.0020	0.00072	mg/kg	
79-01-6	Trichloroethene	ND	0.0020	0.00021	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.0020	0.00030	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.0049	0.00029	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	0.00048	0.0049	0.00022	mg/kg	J
108-67-8	1,3,5-Trimethylbenzene	ND	0.0049	0.00021	mg/kg	
108-05-4	Vinyl Acetate	ND	0.0049	0.00055	mg/kg	
75-01-4	Vinyl chloride	ND	0.0020	0.00027	mg/kg	
	m,p-Xylene	0.0080	0.0020	0.00077	mg/kg	
95-47-6	o-Xylene	0.0026	0.0020	0.00023	mg/kg	
1330-20-7	Xylene (total)	0.0105	0.0020	0.00023	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

Client Sample ID: GP-14-45		Date Sampled: 12/18/12
Lab Sample ID: MC16999-4		Date Received: 12/19/12
Matrix: SO - Soil		Percent Solids: 88.4
Method: SW846 8260B		
Project: URSMOSTL: Roxana Drilling, Roxana, IL		

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VOA Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	83%		70-130%
2037-26-5	Toluene-D8	88%		70-130%
460-00-4	4-Bromofluorobenzeue	88%		70-130%

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

Client Sample ID: GP-14-45	Date Sampled: 12/18/12
Lab Sample ID: MC16999-4	Date Received: 12/19/12
Matrix: SO - Soil	Percent Solids: 88.4
Method: SW846 8011 SW846 3550B	
Project: URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK20281.D	1	12/28/12	AP	12/19/12	OP31493	GBK733
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.3 g	50.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.0028	0.0012	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0028	0.0011	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	124%		61-167%
460-00-4	Bromofluorobenzene (S)	102%		61-167%

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

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Report of Analysis

Client Sample ID:	TRIP BLANK	Date Sampled:	12/18/12
Lab Sample ID:	MC16999-5	Date Received:	12/19/12
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	T28266.D	1	12/31/12	DFT	n/a	n/a	MST987
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	16.3	5.0	3.0	ug/l	
107-02-8	Acrolein	ND	25	10	ug/l	
107-13-1	Acrylonitrile	ND	5.0	3.2	ug/l	
71-43-2	Benzene	ND	0.50	0.24	ug/l	
108-86-1	Bromobenzene	ND	5.0	0.62	ug/l	
74-97-5	Bromochloromethane	ND	5.0	1.3	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.58	ug/l	
75-25-2	Bromoform	ND	1.0	0.78	ug/l	
74-83-9	Bromomethane	ND	2.0	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	2.4	ug/l	
104-51-8	n-Butylbenzene	ND	5.0	0.61	ug/l	
135-98-8	sec-Butylbenzene	ND	5.0	0.55	ug/l	
98-06-6	tert-Butylbenzene	ND	5.0	0.64	ug/l	
75-15-0	Carbon disulfide	ND	5.0	0.61	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.87	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.47	ug/l	
75-00-3	Chloroethane	ND	2.0	0.50	ug/l	
110-75-8	2-Chloroethyl vinyl ether	ND	5.0	1.3	ug/l	
67-66-3	Chloroform	ND	1.0	0.50	ug/l	
74-87-3	Chloromethane	ND	2.0	0.73	ug/l	
95-49-8	o-Chlorotoluene	ND	5.0	0.65	ug/l	
106-43-4	p-Chlorotoluene	ND	5.0	0.48	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.53	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.93	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.45	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.64	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.7	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.62	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.63	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	0.41	ug/l	
156-59-2	cis-1,2-Dichloroethene	ND	1.0	0.64	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	0.95	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

Client Sample ID:	TRIP BLANK	Date Sampled:	12/18/12
Lab Sample ID:	MC16999-5	Date Received:	12/19/12
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	2.0	0.72	ug/l	
142-28-9	1,3-Dichloropropane	ND	5.0	0.64	ug/l	
594-20-7	2,2-Dicbloropropane	ND	5.0	1.6	ug/l	
563-58-6	1,1-Dichloropropene	ND	5.0	0.91	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.45	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.20	ug/l	
123-91-1	1,4-Dioxane	ND	25	15	ug/l	
97-63-2	Ethyl methacrylate	ND	5.0	0.81	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.51	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.0	2.1	ug/l	
591-78-6	2-Hexanone	ND	5.0	2.0	ug/l	
98-82-8	Isopropylbenzene	ND	5.0	0.50	ug/l	
99-87-6	p-Isopropyltoluene	ND	5.0	0.57	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.41	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	2.9	ug/l	
74-95-3	Methylene bromide	ND	5.0	1.1	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.83	ug/l	
91-20-3	Naphthalene	ND	5.0	0.50	ug/l	
103-65-1	n-Propylbenzene	ND	5.0	0.58	ug/l	
100-42-5	Styrene	ND	5.0	0.45	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	5.0	0.57	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.60	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	0.42	ug/l	
108-88-3	Toluene	ND	1.0	0.51	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	1.3	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	1.3	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.85	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.50	ug/l	
79-01-6	Trichloroethene	ND	1.0	0.78	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.29	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.85	ng/l	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.35	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	0.47	ng/l	
108-05-4	Vinyl Acetate	ND	5.0	1.3	ng/l	
75-01-4	Vinyl chloride	ND	1.0	0.63	ug/l	
	m,p-Xylene	ND	1.0	0.73	ug/l	
95-47-6	o-Xylene	ND	1.0	0.58	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.58	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

Client Sample ID: TRIP BLANK Lab Sample ID: MC16999-5 Matrix: AQ - Trip Blank Water Method: SW846 8260B Project: URSMOSTL: Roxana Drilling, Roxana, IL	Date Sampled: 12/18/12 Date Received: 12/19/12 Percent Solids: n/a
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VOA Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	105%		70-130%
2037-26-5	Toluene-D8	119%		70-130%
460-00-4	4-Bromofluorobenzene	114%		70-130%

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

Client Sample ID: TRIP BLANK Lab Sample ID: MC16999-5 Matrix: AQ - Trip Blank Water Method: SW846 8011 SW846 8011 Project: URSMOSTL: Roxana Drilling, Roxana, IL	Date Sampled: 12/18/12 Date Received: 12/19/12 Percent Solids: n/a
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Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BB45038.D	1	12/21/12	CZ	12/21/12	OP31513	GBB2726
Run #2							

Run #	Initial Volume	Final Volume
Run #1	33.9 ml	2.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.015	0.013	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.015	0.011	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	105%		36-173%
460-00-4	Bromofluorobenzene (S)	100%		36-173%

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

4.5
4

Report of Analysis

Client Sample ID:	GP-15-19	Date Sampled:	12/18/12
Lab Sample ID:	MC16999-6	Date Received:	12/19/12
Matrix:	SO - Soil	Percent Solids:	95.8
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	K65940.D	1	12/21/12	GK	n/a	n/a	MSK2166
Run #2	G123189.D	1	12/26/12	JM	n/a	n/a	MSG4896

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	4.28 g	10.0 ml	50.0 ul
Run #2	4.28 g	10.0 ml	50.0 ul

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	1.2	0.31	mg/kg	WJ
107-02-8	Acrolein	ND ^a	6.2	2.5	mg/kg	WJ
107-13-1	Acrylonitrile	ND	6.2	0.31	mg/kg	
71-43-2	Benzene	63.7	0.12	0.073	mg/kg	
108-86-1	Bromobenzene	ND	1.2	0.055	mg/kg	
74-97-5	Bromochloromethane	ND	1.2	0.093	mg/kg	
75-27-4	Bromodichloromethane	ND	0.50	0.052	mg/kg	
75-25-2	Bromoform	ND	0.50	0.50	mg/kg	
74-83-9	Bromomethane	ND	0.50	0.13	mg/kg	
78-93-3	2-Butanone (MEK)	ND	1.2	0.31	mg/kg	WJ
104-51-8	n-Butylbenzene	1.58	1.2	0.046	mg/kg	
135-98-8	sec-Butylbenzene	1.41	1.2	0.057	mg/kg	
98-06-6	tert-Butylbenzene	ND	1.2	0.22	mg/kg	
75-15-0	Carbon disulfide	ND	1.2	0.041	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.50	0.18	mg/kg	
108-90-7	Chlorobenzene	ND	0.50	0.068	mg/kg	
75-00-3	Chloroethane	ND	1.2	0.31	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	1.2	0.50	mg/kg	
67-66-3	Chloroform	ND	0.50	0.13	mg/kg	
74-87-3	Chloromethane	ND	1.2	0.12	mg/kg	
95-49-8	o-Chlorotoluene	ND	1.2	0.27	mg/kg	
106-43-4	p-Chlorotoluene	ND	1.2	0.056	mg/kg	
124-48-1	Dibromochloromethane	ND	0.50	0.073	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.50	0.054	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.50	0.056	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.50	0.052	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.50	0.28	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.50	0.067	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.50	0.071	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.50	0.091	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.50	0.075	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.50	0.071	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

Client Sample ID:	GP-15-19	Date Sampled:	12/18/12
Lab Sample ID:	MC16999-6	Date Received:	12/19/12
Matrix:	SO - Soil	Percent Solids:	95.8
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.50	0.092	mg/kg	
142-28-9	1,3-Dichloropropane	ND	1.2	0.057	mg/kg	
594-20-7	2,2-Dichloropropane	ND	1.2	0.22	mg/kg	
563-58-6	1,1-Dichloropropene	ND	1.2	0.065	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.042	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.12	mg/kg	
123-91-1	1,4-Dioxane	ND	6.2	6.2	mg/kg	
97-63-2	Ethyl methacrylate	ND	1.2	0.17	mg/kg	
100-41-4	Ethylbenzene	0.669	0.50	0.060	mg/kg	
87-68-3	Hexachlorobutadiene	ND	1.2	0.12	mg/kg	
591-78-6	2-Hexanone	ND	1.2	0.12	mg/kg	
98-82-8	Isopropylbenzene	1.13	1.2	0.057	mg/kg	J
99-87-6	p-Isopropyltoluene	1.79	1.2	0.044	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.50	0.072	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	1.2	0.12	mg/kg	
74-95-3	Methylene bromide	ND	1.2	0.12	mg/kg	
75-09-2	Methylene chloride	ND	0.50	0.29	mg/kg	
91-20-3	Naphthalene	0.823	1.2	0.31	mg/kg	J
103-65-1	n-Propylbenzene	0.548	1.2	0.25	mg/kg	J
100-42-5	Styrene	ND	1.2	0.058	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.2	0.25	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	0.11	mg/kg	
127-18-4	Tetrachloroethene	ND	0.50	0.057	mg/kg	
108-88-3	Toluene	0.283	1.2	0.21	mg/kg	J
87-61-6	1,2,3-Trichlorobenzene	ND	1.2	0.059	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	1.2	0.057	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.50	0.078	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.50	0.18	mg/kg	
79-01-6	Trichloroethene	ND	0.50	0.053	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.50	0.075	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	1.2	0.073	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	4.28	1.2	0.056	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	2.73	1.2	0.053	mg/kg	
108-05-4	Vinyl Acetate	ND	1.2	0.14	mg/kg	
75-01-4	Vinyl chloride	ND	0.50	0.068	mg/kg	
	m,p-Xylene	1.36	0.50	0.20	mg/kg	
95-47-6	o-Xylene	0.294	0.50	0.060	mg/kg	J
1330-20-7	Xylene (total)	1.66	0.50	0.060	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

Client Sample ID: GP-15-19 Lab Sample ID: MC16999-6 Matrix: SO - Soil Method: SW846 8260B Project: URSMOSTL: Roxana Drilling, Roxana, IL	Date Sampled: 12/18/12 Date Received: 12/19/12 Percent Solids: 95.8
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VOA Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	108%	92%	70-130%
2037-26-5	Toluene-D8	111%	88%	70-130%
460-00-4	4-Bromofluorobenzene	119%	83%	70-130%

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

(a) Result is from Run# 2

ND = Not detected RL = Reporting Limit E = Indicates value exceeds calibration range	MDL - Method Detection Limit N = Indicates presumptive evidence of a compound	J = Indicates an estimated value B = Indicates analyte found in associated method blank
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Report of Analysis

Client Sample ID: GP-15-19	Date Sampled: 12/18/12
Lab Sample ID: MC16999-6	Date Received: 12/19/12
Matrix: SO - Soil	Percent Solids: 95.8
Method: SW846 8011 SW846 3550B	
Project: URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK20285.D	I	12/28/12	AP	12/19/12	OP31493	GBK733
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.4 g	50.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.0026	0.0011	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0026	0.00099	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	117%		61-167%
460-00-4	Bromofluorobenzene (S)	98%		61-167%

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

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Report of Analysis

Client Sample ID: GP-15-29	Date Sampled: 12/18/12
Lab Sample ID: MC16999-7	Date Received: 12/19/12
Matrix: SO - Soil	Percent Solids: 96.3
Method: SW846 8260B	
Project: URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M53171.D	1	12/28/12	AMY	n/a	n/a	MSM1806
Run #2							

Run #	Initial Weight	Final Volume
Run #1	4.68 g	5.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.0055	0.0014	mg/kg	UJ
107-02-8	Acrolein	ND	0.028	0.011	mg/kg	
107-13-1	Acrylonitrile	ND	0.028	0.0014	mg/kg	
71-43-2	Benzene	0.126	0.00055	0.00033	mg/kg	
108-86-1	Bromobenzene	ND	0.0055	0.00025	mg/kg	
74-97-5	Bromochloromethane	ND	0.0055	0.00041	mg/kg	
75-27-4	Bromodichloromethane	ND	0.0022	0.00023	mg/kg	
75-25-2	Bromoform	ND	0.0022	0.0022	mg/kg	
74-83-9	Bromomethane	ND	0.0022	0.00058	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.0055	0.0014	mg/kg	
104-51-8	n-Butylbenzene	ND	0.0055	0.00020	mg/kg	
135-98-8	sec-Butylbenzene	ND	0.0055	0.00025	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.0055	0.00098	mg/kg	
75-15-0	Carbon disulfide	ND	0.0055	0.00018	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.0022	0.00081	mg/kg	
108-90-7	Chlorobenzene	ND	0.0022	0.00031	mg/kg	
75-00-3	Chloroethane	ND	0.0055	0.0014	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.0055	0.0022	mg/kg	
67-66-3	Chloroform	ND	0.0022	0.00057	mg/kg	
74-87-3	Chloromethane	ND	0.0055	0.00051	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.0055	0.0012	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.0055	0.00025	mg/kg	
124-48-1	Dibromochloromethane	ND	0.0022	0.00033	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.0022	0.00024	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.0022	0.00025	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.0022	0.00023	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.0022	0.0013	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.0022	0.00030	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.0022	0.00032	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.0022	0.00041	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.0022	0.00033	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.0022	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

Client Sample ID: GP-15-29	Date Sampled: 12/18/12
Lab Sample ID: MC16999-7	Date Received: 12/19/12
Matrix: SO - Soil	Percent Solids: 96.3
Method: SW846 8260B	
Project: URSMOSTL: Roxana Drilling, Roxana, IL	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.0022	0.00041	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.0055	0.00026	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.0055	0.00096	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.0055	0.00029	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.0022	0.00019	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.0022	0.00055	mg/kg	
123-91-1	1,4-Dioxane	ND	0.028	0.028	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.0055	0.00076	mg/kg	
100-41-4	Ethylbenzene	0.00064	0.0022	0.00027	mg/kg	J
87-68-3	Hexachlorobutadiene	ND	0.0055	0.00052	mg/kg	
591-78-6	2-Hexanone	ND	0.0055	0.00055	mg/kg	
98-82-8	Isopropylbenzene	ND	0.0055	0.00025	mg/kg	
99-87-6	p-Isopropyltoluene	ND	0.0055	0.00020	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.0022	0.00032	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.0055	0.00055	mg/kg	
74-95-3	Methylene bromide	ND	0.0055	0.00055	mg/kg	
75-09-2	Methylene chloride	ND	0.0022	0.0013	mg/kg	
91-20-3	Naphthalene	ND	0.0055	0.0014	mg/kg	
103-65-1	n-Propylbenzene	ND	0.0055	0.0011	mg/kg	
100-42-5	Styrene	ND	0.0055	0.00026	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.0055	0.0011	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.0022	0.00047	mg/kg	
127-18-4	Tetrachloroethene	ND	0.0022	0.00025	mg/kg	
108-88-3	Toluene	0.00099	0.0055	0.00094	mg/kg	J
87-61-6	1,2,3-Trichlorobenzene	ND	0.0055	0.00026	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.0055	0.00025	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.0022	0.00035	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.0022	0.00081	mg/kg	
79-01-6	Trichloroethene	ND	0.0022	0.00023	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.0022	0.00034	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.0055	0.00032	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	0.00065	0.0055	0.00025	mg/kg	J
108-67-8	1,3,5-Trimethylbenzene	ND	0.0055	0.00024	mg/kg	
108-05-4	Vinyl Acetate	ND	0.0055	0.00062	mg/kg	
75-01-4	Vinyl chloride	ND	0.0022	0.00030	mg/kg	
	m,p-Xylene	0.0012	0.0022	0.00087	mg/kg	J
95-47-6	o-Xylene	0.00039	0.0022	0.00027	mg/kg	J
1330-20-7	Xylene (total)	0.0016	0.0022	0.00027	mg/kg	J

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: GP-15-29 Lab Sample ID: MC16999-7 Matrix: SO - Soil Method: SW846 8260B Project: URSMOSTL: Roxana Drilling, Roxana, IL	Date Sampled: 12/18/12 Date Received: 12/19/12 Percent Solids: 96.3
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VOA Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	85%		70-130%
2037-26-5	Toluene-D8	87%		70-130%
460-00-4	4-Bromofluorobenzene	82%		70-130%

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

Client Sample ID: GP-15-29	Date Sampled: 12/18/12
Lab Sample ID: MC16999-7	Date Received: 12/19/12
Matrix: SO - Soil	Percent Solids: 96.3
Method: SW846 8011 SW846 3550B	
Project: URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK20282.D	1	12/28/12	AP	12/19/12	OP31493	GBK733
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.1 g	50.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.0026	0.0012	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0026	0.0010	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	135%		61-167%
460-00-4	Bromofluorobenzene (S)	104%		61-167%

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

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Report of Analysis

Client Sample ID:	GP-15-37	Date Sampled:	12/18/12
Lab Sample ID:	MC16999-9	Date Received:	12/19/12
Matrix:	SO - Soil	Percent Solids:	87.6
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G123333.D	1	12/31/12	AMY	n/a	n/a	MSG4900
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	4.95 g	10.0 ml	5.0 ul
Run #2			

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	12	3.1	mg/kg	US
107-02-8	Acrolein	ND	61	24	mg/kg	US
107-13-1	Acrylonitrile	ND	61	3.1	mg/kg	
71-43-2	Benzene	974	1.2	0.72	mg/kg	
108-86-1	Bromobenzene	ND	12	0.55	mg/kg	
74-97-5	Bromochloromethane	ND	12	0.91	mg/kg	
75-27-4	Bromodichloromethane	ND	4.9	0.52	mg/kg	
75-25-2	Bromoform	ND	4.9	4.9	mg/kg	
74-83-9	Bromomethane	ND	4.9	1.3	mg/kg	
78-93-3	2-Butanone (MEK)	ND	12	3.1	mg/kg	US
104-51-8	n-Butylbenzene	1.12	12	0.45	mg/kg	J
135-98-8	sec-Butylbenzene	ND	12	0.56	mg/kg	
98-06-6	tert-Butylbenzene	ND	12	2.2	mg/kg	
75-15-0	Carbon disulfide	ND	12	0.40	mg/kg	
56-23-5	Carbon tetrachloride	ND	4.9	1.8	mg/kg	
108-90-7	Chlorobenzene	ND	4.9	0.67	mg/kg	
75-00-3	Chloroethane	ND	12	3.1	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	12	4.9	mg/kg	
67-66-3	Chloroform	ND	4.9	1.3	mg/kg	
74-87-3	Chloromethane	ND	12	1.1	mg/kg	
95-49-8	o-Chlorotoluene	ND	12	2.7	mg/kg	
106-43-4	p-Chlorotoluene	ND	12	0.55	mg/kg	
124-48-1	Dibromochloromethane	ND	4.9	0.72	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	4.9	0.53	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	4.9	0.55	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	4.9	0.52	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	4.9	2.8	mg/kg	
75-34-3	1,1-Dichloroethane	ND	4.9	0.66	mg/kg	
107-06-2	1,2-Dichloroethane	ND	4.9	0.70	mg/kg	
75-35-4	1,1-Dichloroethene	ND	4.9	0.90	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	4.9	0.74	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	4.9	0.70	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

Client Sample ID:	GP-15-37	Date Sampled:	12/18/12
Lab Sample ID:	MC16999-9	Date Received:	12/19/12
Matrix:	SO - Soil	Percent Solids:	87.6
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	4.9	0.91	mg/kg	
142-28-9	1,3-Dichloropropane	ND	12	0.57	mg/kg	
594-20-7	2,2-Dichloropropane	ND	12	2.1	mg/kg	
563-58-6	1,1-Dichloropropene	ND	12	0.64	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	4.9	0.42	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	4.9	1.2	mg/kg	
123-91-1	1,4-Dioxane	ND	61	61	mg/kg	UJ
97-63-2	Ethyl methacrylate	ND	12	1.7	mg/kg	
100-41-4	Ethylbenzene	4.56	4.9	0.59	mg/kg	J
87-68-3	Hexachlorobutadiene	ND	12	1.1	mg/kg	
591-78-6	2-Hexanone	ND	12	1.2	mg/kg	UJ
98-82-8	Isopropylbenzene	ND	12	0.56	mg/kg	
99-87-6	p-Isopropyltoluene	ND	12	0.44	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	4.9	0.71	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	12	1.2	mg/kg	
74-95-3	Methylene bromide	ND	12	1.2	mg/kg	
75-09-2	Methylene chloride	ND	4.9	2.8	mg/kg	
91-20-3	Naphthalene	ND	12	3.1	mg/kg	
103-65-1	n-Propylbenzene	ND	12	2.5	mg/kg	
100-42-5	Styrene	ND	12	0.57	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	12	2.4	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	4.9	1.0	mg/kg	
127-18-4	Tetrachloroethene	ND	4.9	0.56	mg/kg	
108-88-3	Toluene	5.53	12	2.1	mg/kg	J
87-61-6	1,2,3-Trichlorobenzene	ND	12	0.58	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	12	0.56	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	4.9	0.77	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	4.9	1.8	mg/kg	
79-01-6	Trichloroethene	ND	4.9	0.52	mg/kg	
75-69-4	Trichlorofluoromethane	ND	4.9	0.74	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	12	0.72	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	7.32	12	0.55	mg/kg	J
108-67-8	1,3,5-Trimethylbenzene	2.20	12	0.52	mg/kg	J
108-05-4	Vinyl Acetate	ND	12	1.4	mg/kg	
75-01-4	Vinyl chloride	ND	4.9	0.67	mg/kg	
	m,p-Xylene	12.3	4.9	1.9	mg/kg	
95-47-6	o-Xylene	4.60	4.9	0.59	mg/kg	J
1330-20-7	Xylene (total)	16.9	4.9	0.59	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

Client Sample ID: GP-15-37			
Lab Sample ID: MC16999-9		Date Sampled: 12/18/12	
Matrix: SO - Soil		Date Received: 12/19/12	
Method: SW846 8260B		Percent Solids: 87.6	
Project: URSMOSTL: Roxana Drilling, Roxana, IL			

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VOA Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	91%		70-130%
2037-26-5	Toluene-D8	80%		70-130%
460-00-4	4-Bromofluorobenzene	86%		70-130%

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

Client Sample ID: GP-15-37	Date Sampled: 12/18/12
Lab Sample ID: MC16999-9	Date Received: 12/19/12
Matrix: SO - Soil	Percent Solids: 87.6
Method: SW846 8011 SW846 3550B	
Project: URSMOSTL: Roxana Drilling, Roxana, IL	

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Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK20283.D	1	12/28/12	AP	12/19/12	OP31493	GBK733
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.2 g	50.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.0028	0.0013	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0028	0.0011	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	125%		61-167%
460-00-4	Bromofluorobenzene (S)	97%		61-167%

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

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

Report of Analysis

Client Sample ID:	GP-15-47	Date Sampled:	12/18/12
Lab Sample ID:	MC16999-10	Date Received:	12/19/12
Matrix:	SO - Soil	Percent Solids:	87.0
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	K65942.D	1	12/21/12	GK	n/a	n/a	MSK2166
Run #2	G123191.D	1	12/26/12	JM	n/a	n/a	MSG4896

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	11.1 g	10.0 ml	10.0 ul
Run #2	11.1 g	10.0 ml	5.0 ul

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	3.0	0.75	mg/kg	WJ
107-02-8	Acrolein	ND ^a	30	12	mg/kg	WJ
107-13-1	Acrylonitrile	ND	15	0.74	mg/kg	
71-43-2	Benzene	283 ^a	0.59	0.35	mg/kg	
108-86-1	Bromobenzene	ND	3.0	0.13	mg/kg	
74-97-5	Bromochloromethane	ND	3.0	0.22	mg/kg	
75-27-4	Bromodichloromethane	ND	1.2	0.13	mg/kg	
75-25-2	Bromoform	ND	1.2	1.2	mg/kg	
74-83-9	Bromomethane	ND	1.2	0.31	mg/kg	
78-93-3	2-Butanone (MEK)	ND	3.0	0.74	mg/kg	WJ
104-51-8	n-Butylbenzene	0.347	3.0	0.11	mg/kg	J
135-98-8	sec-Butylbenzene	1.86	3.0	0.14	mg/kg	J
98-06-6	tert-Butylbenzene	ND	3.0	0.52	mg/kg	
75-15-0	Carbon disulfide	ND	3.0	0.098	mg/kg	
56-23-5	Carbon tetrachloride	ND	1.2	0.43	mg/kg	
108-90-7	Chlorobenzene	ND	1.2	0.16	mg/kg	
75-00-3	Chloroethane	ND	3.0	0.75	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	3.0	1.2	mg/kg	
67-66-3	Chloroform	ND	1.2	0.31	mg/kg	
74-87-3	Chloromethane	ND	3.0	0.28	mg/kg	
95-49-8	o-Chlorotoluene	ND	3.0	0.66	mg/kg	
106-43-4	p-Chlorotoluene	ND	3.0	0.13	mg/kg	
124-48-1	Dibromochloromethane	ND	1.2	0.18	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	1.2	0.13	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	1.2	0.13	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	1.2	0.13	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	1.2	0.68	mg/kg	
75-34-3	1,1-Dichloroethane	ND	1.2	0.16	mg/kg	
107-06-2	1,2-Dichloroethane	ND	1.2	0.17	mg/kg	
75-35-4	1,1-Dichloroethene	ND	1.2	0.22	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	1.2	0.18	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	1.2	0.17	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

Client Sample ID:	GP-15-47	Date Sampled:	12/18/12
Lab Sample ID:	MC16999-10	Date Received:	12/19/12
Matrix:	SO - Soil	Percent Solids:	87.0
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	1.2	0.22	mg/kg	
142-28-9	1,3-Dichloropropane	ND	3.0	0.14	mg/kg	
594-20-7	2,2-Dichloropropane	ND	3.0	0.52	mg/kg	
563-58-6	1,1-Dichloropropene	ND	3.0	0.16	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	1.2	0.10	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	1.2	0.29	mg/kg	
123-91-1	1,4-Dioxane	ND	15	15	mg/kg	
97-63-2	Ethyl methacrylate	ND	3.0	0.40	mg/kg	
100-41-4	Ethylbenzene	1.71	1.2	0.14	mg/kg	
87-68-3	Hexachlorobutadiene	ND	3.0	0.28	mg/kg	
591-78-6	2-Hexanone	ND	3.0	0.30	mg/kg	
98-82-8	Isopropylbenzene	ND	3.0	0.14	mg/kg	
99-87-6	p-Isopropyltoluene	0.301	3.0	0.11	mg/kg	J
1634-04-4	Methyl Tert Butyl Ether	ND	1.2	0.17	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	3.0	0.30	mg/kg	
74-95-3	Methylene bromide	ND	3.0	0.29	mg/kg	
75-09-2	Methylene chloride	ND	1.2	0.69	mg/kg	
91-20-3	Naphthalene	ND	3.0	0.74	mg/kg	
103-65-1	n-Propylbenzene	ND	3.0	0.60	mg/kg	
100-42-5	Styrene	ND	3.0	0.14	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	3.0	0.59	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.2	0.25	mg/kg	
127-18-4	Tetrachloroethene	ND	1.2	0.14	mg/kg	
108-88-3	Toluene	1.69	3.0	0.50	mg/kg	J
87-61-6	1,2,3-Trichlorobenzene	ND	3.0	0.14	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	3.0	0.14	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	1.2	0.19	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	1.2	0.44	mg/kg	
79-01-6	Trichloroethene	ND	1.2	0.13	mg/kg	
75-69-4	Trichlorofluoromethane	ND	1.2	0.18	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	3.0	0.17	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	2.21	3.0	0.13	mg/kg	J
108-67-8	1,3,5-Trimethylbenzene	0.721	3.0	0.13	mg/kg	J
108-05-4	Vinyl Acetate	ND	3.0	0.33	mg/kg	
75-01-4	Vinyl chloride	ND	1.2	0.16	mg/kg	
	m,p-Xylene	4.81	1.2	0.47	mg/kg	
95-47-6	o-Xylene	1.62	1.2	0.14	mg/kg	
1330-20-7	Xylene (total)	6.43	1.2	0.14	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

Client Sample ID: GP-15-47 Lab Sample ID: MC16999-10 Matrix: SO - Soil Method: SW846 8260B Project: URSMOSTL: Roxana Drilling, Roxana, IL	Date Sampled: 12/18/12 Date Received: 12/19/12 Percent Solids: 87.0
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VOA Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	106%	93%	70-130%
2037-26-5	Toluene-D8	108%	89%	70-130%
460-00-4	4-Bromofluorobenzene	103%	86%	70-130%

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

(a) Result is from Run# 2

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 presmptive evidence of a compound

Report of Analysis

Client Sample ID: GP-15-47	Date Sampled: 12/18/12
Lab Sample ID: MC16999-10	Date Received: 12/19/12
Matrix: SO - Soil	Percent Solids: 87.0
Method: SW846 8011 SW846 3550B	
Project: URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK20287.D	1	12/28/12	AP	12/19/12	OP31493	GBK733
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.2 g	50.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.0029	0.0013	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0029	0.0011	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
460-00-4	Bromofluorobenzene (S)	129%		61-167%		
460-00-4	Bromofluorobenzene (S)	98%		61-167%		

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

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Report of Analysis

Client Sample ID: GP-15-55	Date Sampled: 12/18/12
Lab Sample ID: MC16999-11	Date Received: 12/19/12
Matrix: SO - Soil	Percent Solids: 86.5
Method: SW846 8260B	
Project: URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	K65941.D	1	12/21/12	GK	n/a	n/a	MSK2166
Run #2	G123190.D	1	12/26/12	JM	n/a	n/a	MSG4896

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	3.02 g	10.0 ml	20.0 ul
Run #2	3.02 g	10.0 ml	20.0 ul

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	1.3	mg/kg	WJ
107-02-8	Acrolein	ND ^a	25	10	mg/kg	WJ
107-13-1	Acrylonitrile	ND	25	1.2	mg/kg	
71-43-2	Benzene	184	0.50	0.29	mg/kg	
108-86-1	Bromobenzene	ND	5.0	0.22	mg/kg	
74-97-5	Bromochloromethane	ND	5.0	0.37	mg/kg	
75-27-4	Bromodichloromethane	ND	2.0	0.21	mg/kg	
75-25-2	Bromoform	ND	2.0	2.0	mg/kg	
74-83-9	Bromomethane	ND	2.0	0.52	mg/kg	
78-93-3	2-Butanone (MEK)	ND	5.0	1.2	mg/kg	WJ
104-51-8	n-Butylbenzene	13.9	5.0	0.18	mg/kg	
135-98-8	sec-Butylbenzene	3.12	5.0	0.23	mg/kg	J
98-06-6	tert-Butylbenzene	2.29	5.0	0.88	mg/kg	J
75-15-0	Carbon disulfide	ND	5.0	0.16	mg/kg	
56-23-5	Carbon tetrachloride	ND	2.0	0.72	mg/kg	
108-90-7	Chlorobenzene	ND	2.0	0.27	mg/kg	
75-00-3	Chloroethane	ND	5.0	1.3	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	5.0	2.0	mg/kg	
67-66-3	Chloroform	ND	2.0	0.51	mg/kg	
74-87-3	Chloromethane	ND	5.0	0.46	mg/kg	
95-49-8	o-Chlorotoluene	ND	5.0	1.1	mg/kg	
106-43-4	p-Chlorotoluene	ND	5.0	0.23	mg/kg	
124-48-1	Dibromochloromethane	ND	2.0	0.29	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	2.0	0.22	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	2.0	0.22	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	2.0	0.21	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.1	mg/kg	
75-34-3	1,1-Dichloroethane	ND	2.0	0.27	mg/kg	
107-06-2	1,2-Dichloroethane	ND	2.0	0.29	mg/kg	
75-35-4	1,1-Dichloroethene	ND	2.0	0.37	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	2.0	0.30	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	2.0	0.29	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

Client Sample ID:	GP-15-55	Date Sampled:	12/18/12
Lab Sample ID:	MC16999-11	Date Received:	12/19/12
Matrix:	SO - Soil	Percent Solids:	86.5
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

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VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	2.0	0.37	mg/kg	
142-28-9	1,3-Dichloropropane	ND	5.0	0.23	mg/kg	
594-20-7	2,2-Dichloropropane	ND	5.0	0.86	mg/kg	
563-58-6	1,1-Dichloropropene	ND	5.0	0.26	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	2.0	0.17	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	2.0	0.49	mg/kg	
123-91-1	1,4-Dioxane	ND	25	25	mg/kg	
97-63-2	Ethyl methacrylate	ND	5.0	0.68	mg/kg	
100-41-4	Ethylbenzene	111	2.0	0.24	mg/kg	
87-68-3	Hexachlorobutadiene	ND	5.0	0.46	mg/kg	
591-78-6	2-Hexanone	ND	5.0	0.50	mg/kg	
98-82-8	Isopropylbenzene	6.99	5.0	0.23	mg/kg	
99-87-6	p-Isopropyltoluene	2.31	5.0	0.18	mg/kg	J
1634-04-4	Methyl Tert Butyl Ether	ND	2.0	0.29	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	0.50	mg/kg	
74-95-3	Methylene bromide	ND	5.0	0.49	mg/kg	
75-09-2	Methylene chloride	ND	2.0	1.2	mg/kg	
91-20-3	Naphthalene	19.3	5.0	1.2	mg/kg	
103-65-1	n-Propylbenzene	28.3	5.0	1.0	mg/kg	
100-42-5	Styrene	ND	5.0	0.23	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	5.0	1.0	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	2.0	0.42	mg/kg	
127-18-4	Tetrachloroethene	ND	2.0	0.23	mg/kg	
108-88-3	Toluene	12.5	5.0	0.85	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	0.24	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	0.23	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	2.0	0.31	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	2.0	0.73	mg/kg	
79-01-6	Trichloroethene	ND	2.0	0.21	mg/kg	
75-69-4	Trichlorofluoromethane	ND	2.0	0.30	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.29	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	136	5.0	0.22	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	44.3	5.0	0.21	mg/kg	
108-05-4	Vinyl Acetate	17.1	5.0	0.56	mg/kg	
75-01-4	Vinyl chloride	ND	2.0	0.27	mg/kg	
	m,p-Xylene	290	2.0	0.79	mg/kg	
95-47-6	o-Xylene	63.0	2.0	0.24	mg/kg	
1330-20-7	Xylene (total)	353	2.0	0.24	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

Client Sample ID: GP-15-55 Lab Sample ID: MC16999-11 Matrix: SO - Soil Method: SW846 8260B Project: URSMOSTL: Roxana Drilling, Roxana, IL	Date Sampled: 12/18/12 Date Received: 12/19/12 Percent Solids: 86.5
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VOA Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	105%	90%	70-130%
2037-26-5	Toluene-D8	107%	87%	70-130%
460-00-4	4-Bromofluorobenzene	107%	85%	70-130%

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

(a) Result is from Run# 2

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

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

Report of Analysis

Client Sample ID: GP-15-55	Date Sampled: 12/18/12
Lab Sample ID: MC16999-11	Date Received: 12/19/12
Matrix: SO - Soil	Percent Solids: 86.5
Method: SW846 8011 SW846 3550B	
Project: URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK20288.D	1	12/28/12	AP	12/19/12	OP31493	GBK733
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.2 g	50.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.0029	0.0013	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0029	0.0011	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	128%		61-167%
460-00-4	Bromofluorobenzene (S)	96%		61-167%

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

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4

Report of Analysis

Client Sample ID:	GP-15-37 DUP	Date Sampled:	12/18/12
Lab Sample ID:	MC16999-12	Date Received:	12/19/12
Matrix:	SO - Soil	Percent Solids:	87.6
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	K65939.D	1	12/21/12	GK	n/a	n/a	MSK2166
Run #2	G123204.D	1	12/26/12	JM	n/a	n/a	MSG4896

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.54 g	10.0 ml	100 ul
Run #2	5.54 g	10.0 ml	2.5 ul

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.55	0.14	mg/kg	WJ
107-02-8	Acrolein	ND ^a	110	44	mg/kg	WJ
107-13-1	Acrylonitrile	ND	2.8	0.14	mg/kg	
71-43-2	Benzene	1150 ^a	2.2	1.3	mg/kg	
108-86-1	Bromobenzene	ND	0.55	0.025	mg/kg	
74-97-5	Bromochloromethane	ND	0.55	0.041	mg/kg	
75-27-4	Bromodichloromethane	ND	0.22	0.023	mg/kg	
75-25-2	Bromoform	ND	0.22	0.22	mg/kg	
74-83-9	Bromomethane	ND	0.22	0.057	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.55	0.14	mg/kg	WJ
104-51-8	n-Butylbenzene	0.864	0.55	0.020	mg/kg	
135-98-8	sec-Butylbenzene	0.228	0.55	0.025	mg/kg	J
98-06-6	tert-Butylbenzene	ND	0.55	0.097	mg/kg	
75-15-0	Carbon disulfide	ND	0.55	0.018	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.22	0.080	mg/kg	
108-90-7	Chlorobenzene	ND	0.22	0.030	mg/kg	
75-00-3	Chloroethane	ND	0.55	0.14	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.55	0.22	mg/kg	
67-66-3	Chloroform	ND	0.22	0.057	mg/kg	
74-87-3	Chloromethane	ND	0.55	0.051	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.55	0.12	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.55	0.025	mg/kg	
124-48-1	Dibromochloromethane	ND	0.22	0.033	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.22	0.024	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.22	0.025	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.22	0.023	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.22	0.13	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.22	0.030	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.22	0.032	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.22	0.040	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.22	0.033	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.22	0.032	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

Client Sample ID:	GP-15-37 DUP	Date Sampled:	12/18/12
Lab Sample ID:	MC16999-12	Date Received:	12/19/12
Matrix:	SO - Soil	Percent Solids:	87.6
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.22	0.041	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.55	0.025	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.55	0.096	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.55	0.029	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.22	0.019	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.22	0.055	mg/kg	
123-91-1	1,4-Dioxane	ND	2.8	2.8	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.55	0.075	mg/kg	
100-41-4	Ethylbenzene	5.28	0.22	0.027	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.55	0.051	mg/kg	
591-78-6	2-Hexanone	9.73	0.55	0.055	mg/kg	
98-82-8	Isopropylbenzene	0.438	0.55	0.025	mg/kg	J
99-87-6	p-Isopropyltoluene	0.154	0.55	0.020	mg/kg	J
1634-04-4	Methyl Tert Butyl Ether	0.653	0.22	0.032	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.55	0.055	mg/kg	
74-95-3	Methylene bromide	ND	0.55	0.054	mg/kg	
75-09-2	Methylene chloride	ND	0.22	0.13	mg/kg	
91-20-3	Naphthalene	1.25	0.55	0.14	mg/kg	
103-65-1	n-Propylbenzene	1.73	0.55	0.11	mg/kg	
100-42-5	Styrene	ND	0.55	0.026	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.55	0.11	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.22	0.047	mg/kg	
127-18-4	Tetrachloroethene	ND	0.22	0.025	mg/kg	
108-88-3	Toluene	6.76	0.55	0.093	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	0.55	0.026	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.55	0.025	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.22	0.035	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.22	0.081	mg/kg	
79-01-6	Trichloroethene	ND	0.22	0.023	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.22	0.033	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.55	0.032	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	8.43	0.55	0.025	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	2.59	0.55	0.024	mg/kg	
108-05-4	Vinyl Acetate	0.236	0.55	0.062	mg/kg	J
75-01-4	Vinyl chloride	ND	0.22	0.030	mg/kg	
	m,p-Xylene	15.7	0.22	0.087	mg/kg	
95-47-6	o-Xylene	6.08	0.22	0.026	mg/kg	
1330-20-7	Xylene (total)	21.8	0.22	0.026	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

Client Sample ID: GP-15-37 DUP Lab Sample ID: MC16999-12 Matrix: SO - Soil Method: SW846 8260B Project: URSMOSTL: Roxana Drilling, Roxana, IL	Date Sampled: 12/18/12 Date Received: 12/19/12 Percent Solids: 87.6
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4.11
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VOA Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	102%	91%	70-130%
2037-26-5	Toluene-D8	112%	85%	70-130%
460-00-4	4-Bromofluorobenzene	108%	83%	70-130%

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

(a) Result is from Run# 2

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

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

Report of Analysis

Client Sample ID: GP-15-37 DUP	
Lab Sample ID: MC16999-12	Date Sampled: 12/18/12
Matrix: SO - Soil	Date Received: 12/19/12
Method: SW846 8011 SW846 3550B	Percent Solids: 87.6
Project: URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK20286.D	1	12/28/12	AP	12/20/12	OP31493	GBK733
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.6 g	50.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropae	ND	0.0028	0.0012	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0028	0.0011	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
460-00-4	Bromofluorobenzene (S)	123%		61-167%		
460-00-4	Bromofluorobenzene (S)	97%		61-167%		

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

4.11
4

Misc. Forms



Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody
- Sample Tracking Chronicle
- Internal Chain of Custody

Accutest Laboratories of New England
495 Technology Center West, Building One
TEL: 508-481-6200 FAX: 508-481-7753
www.accutest.com

PROJECT INFORMATION
 PROJECT NO: MC16999
 PROJECT DATE: 12/18/12

Client / Reporting Information
 Client Name: URS
 Project Name: Roxana Drilling
 Contact: E. Kunkel
 Project Manager: D. Palmer
 Location: Roxana, IL

Action / Order #	Field ID / Point of Collection	Reference Value	Sample Data			Request for Test Results - Details												LAB USE ONLY
			Date	Time	Temp	TOC	DOC	DOC _{UL}	DOC _{SL}	DOC _{HL}	DOC _{ML}	DOC _{HL}	DOC _{ML}	DOC _{HL}	DOC _{ML}			
-1	GP-14-13		12/18/12	0135	50							X	X	X	X	X	X	
-2	GP-14-33			0140								X	X	X	X	X	X	
-3	GP-14-34			1005								X	X	X	X	X	X	
-4	GP-14-45			0146								X	X	X	X	X	X	
-5	Trip Blank											X	X	X	X	X	X	
-6	GP-15-19			1235								X	X	X	X	X	X	
-7	GP-15-21			1240								X	X	X	X	X	X	
-8	GP-15-24			1236								X	X	X	X	X	X	
-9	GP-15-37			1230								X	X	X	X	X	X	11C10A2 4L3
-10	GP-15-47			1415								X	X	X	X	X	X	
-11	GP-15-55			1415								X	X	X	X	X	X	
-12	GP-15-37Dup			1230								X	X	X	X	X	X	

Data Deliverable Information

Standard (Business Days) Approved By (Print Name, Title): _____
 Std. 5 Business Days (By Contract only)
 5 Day RUSH
 3 Day EMERGENCY
 2 Day EMERGENCY
 1 Day EMERGENCY

Commercial "A" (Level 1) NYASP Category A
 Commercial "B" (Level 2) NYASP Category B
 FULLT (Level 3a) State Forms
 CT HCP ESD Format
 NA MCP Other: _____

Comments / Special Instructions:
 12/18/12

Sample Custody must be documented below each time samples change possession, including courier delivery.

Received By: <i>[Signature]</i>	Date Time: 12/18/12 1500	Received By: Fed Ex	Received By: Fedex	Date Time: 12-19-12	Received By: <i>[Signature]</i>
Received By:	Date Time:	Received By:	Received By:	Date Time:	Received By:

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Client / Reporting Information Company Name: URS Street Address: _____ City: _____ State: _____ Zip: _____ Project Contact: E. Kunkel E-mail: _____ Phone #: _____ Sample(s) Name(s): W Penetration, 3.3' after Phone #: _____ Project Manager: D. Palmer		Project Information Project Name: Roxana Drilling City: Roxana, IL Company Name: URS Project: 21562850.15000 Street Address: _____ Client PO#: _____ City: _____ State: _____ Zip: _____ Attention: _____ PO#: _____		Requested Analysis (see TEST CODE sheet) Matrix Codes: DW - Drinking Water GW - Ground Water WQV - Wastewater SW - Surface Water SO - Soil SL - Sludge SED - Sediment OI - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB - Field Blank EB - Equipment Blank RB - Reseal Blank TB - Trip Blank LAB USE ONLY	
Collection Matrix: SO # of Bores: 4 Date: 12/18/12 Time: 0935 Samples by: WPK/MS		Number of preserved bottles MIC: _____ MPOD: _____ MPOA: _____ MPOE: _____ MPOF: _____ MPOG: _____ MPOH: _____ MPOI: _____ MPOJ: _____ MPOK: _____ MPOL: _____ MPOM: _____ MPON: _____ MPOO: _____ MPOP: _____ MPOQ: _____ MPOR: _____ MPOS: _____ MPOT: _____ MPOU: _____ MPOV: _____ MPOW: _____ MPOX: _____ MPOY: _____ MPOZ: _____		Comments / Special Instructions VOC 8260 VOC 8011 IL10A2 4L3	
Turnaround Time (Business days) <input checked="" type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> Std. 5 Business Days (By Contract only) <input type="checkbox"/> 3 Day RUSH <input type="checkbox"/> 3 Day EMERGENCY <input type="checkbox"/> 2 Day EMERGENCY <input type="checkbox"/> 1 Day EMERGENCY Emergency & Rush T/A data available VIA Lablink		Date Deliverable Information <input type="checkbox"/> Commercial "A" (Level 1) <input type="checkbox"/> NYASP Category A <input type="checkbox"/> Commercial "B" (Level 2) <input type="checkbox"/> NYASP Category B <input checked="" type="checkbox"/> FULLT1 (Level 3+4) <input type="checkbox"/> State Forms <input type="checkbox"/> CT RCP <input checked="" type="checkbox"/> EDD Format <input type="checkbox"/> MA MCP <input type="checkbox"/> Other _____ Commercial "A" = Results Only Commercial "B" = Results + QC Summary		Approved By (Accutest PM): _____ Date: _____	
Sample Custody must be documented below each time samples change possession, including courier delivery.					
Relinquished by Sample: WPK Relinquished by Sample: _____ Relinquished by: _____	Date Time: 12/18/12 1500 Date Time: _____ Date Time: _____	Received By: Fed Ex Received By: _____ Received By: _____	Relinquished By: FedEx Relinquished By: _____ Relinquished By: _____	Date Time: 12-19-12 Date Time: _____ Date Time: _____	Received By: [Signature] Received By: _____ Received By: _____
Custody Seal # <input type="checkbox"/> MACT Preserved where applicable <input type="checkbox"/> On Ice <input checked="" type="checkbox"/> Cooler Temp 0.8°C <input type="checkbox"/> No MACT					

5.1
5

Accutest Job Number: MC16999 Client: URS Immediate Client Services Action Required: Yes
 Date / Time Received: 12/19/2012 10:00 Delivery Method: FedEx
 Project: ROXANA DRILLING No. Coolers: 1 Airbill #'s: _____

<u>Cooler Security</u>		<u>Y</u>	<u>or</u>	<u>N</u>	<u>Y</u>	<u>or</u>	<u>N</u>
1. Custody Seals Present:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	4. Smpl Dates/Time OK:	<input checked="" type="checkbox"/>		<input type="checkbox"/>

<u>Cooler Temperature</u>		<u>Y</u>	<u>or</u>	<u>N</u>
1. Temp criteria achieved:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
2. Cooler temp verification:	<u>Infrared gun</u>			
3. Cooler media:	<u>Ice (bag)</u>			

<u>Quality Control Preservation</u>				<u>Y</u>	<u>N</u>	<u>N/A</u>
1. Trip Blank present / cooler:	<input type="checkbox"/>		<input type="checkbox"/>			
2. Trip Blank listed on COC:	<input type="checkbox"/>		<input type="checkbox"/>			
3. Samples preserved properly:	<input checked="" type="checkbox"/>		<input type="checkbox"/>			
4. VOCs headspace free:	<input type="checkbox"/>		<input type="checkbox"/>			<input checked="" type="checkbox"/>

<u>Sample Integrity - Documentation</u>		<u>Y</u>	<u>or</u>	<u>N</u>
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
2. Container labeling complete:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	

<u>Sample Integrity - Condition</u>		<u>Y</u>	<u>or</u>	<u>N</u>
1. Sample rec'd within HT:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
2. All containers accounted for:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
3. Condition of sample:	<u>Intact</u>			

<u>Sample Integrity - Instructions</u>				<u>Y</u>	<u>N</u>	<u>N/A</u>
1. Analysis requested is clear:	<input checked="" type="checkbox"/>		<input type="checkbox"/>			
2. Bottles received for unspecified tests:	<input type="checkbox"/>		<input checked="" type="checkbox"/>			
3. Sufficient volume rec'd for analysis:	<input checked="" type="checkbox"/>		<input type="checkbox"/>			
4. Compositing instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>			<input checked="" type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>			<input checked="" type="checkbox"/>

Comments

-8 was not received.
 -9 was not received, we received a set of samples with ID GP-15-37 with the time 12:30.
 -12 we received GP-15-37 DUP not listed on coc.

5.1
5



Sample Receipt Summary - Problem Resolution

Accutest Job Number: MC16999

CSR: Jeremy Vienneau

Response Date: 12/20/2012

Response: Client sent a revised COC with corrections. See email in file.

5.1
5

Accutest Laboratories
V 508 481 6200

495 Technology Center West, Bldg One
F 508 481 7753

Marlborough, MA
www/accutest.com

MC16999: Chain of Custody
Page 4 of 4

Internal Sample Tracking Chronicle

Shell Oil

Job No: MC16999

URSMOSTL: Roxana Drilling, Roxana, IL
 Project No: 21562850.15000

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Sample Number	Method	Analyzed	By	Prepped By	Test Codes
MC16999-1 Collected: 18-DEC-12 09:35 By: WPBS Received: 19-DEC-12 By: GP-14-13					
MC16999-1	SM21 2540 B MOD.	21-DEC-12	MA		%SOL
MC16999-1	SW846 8260B	28-DEC-12 14:25	AMY		V8260SL+
MC16999-1	SW846 8011	28-DEC-12 16:16	AP	19-DEC-12 BJ	V8011SL
MC16999-2 Collected: 18-DEC-12 09:40 By: WPBS Received: 19-DEC-12 By: GP-14-33					
MC16999-2	SM21 2540 B MOD.	21-DEC-12	MA		%SOL
MC16999-2	SW846 8260B	21-DEC-12 18:40	GK		V8260SL+
MC16999-2	SW846 8260B	26-DEC-12 11:22	JM		V8260SL+
MC16999-2	SW846 8011	28-DEC-12 16:40	AP	19-DEC-12 BJ	V8011SL
MC16999-3 Collected: 18-DEC-12 10:05 By: WPBS Received: 19-DEC-12 By: GP-14-39					
MC16999-3	SM21 2540 B MOD.	21-DEC-12	MA		%SOL
MC16999-3	SW846 8260B	21-DEC-12 19:07	GK		V8260SL+
MC16999-3	SW846 8260B	26-DEC-12 11:51	JM		V8260SL+
MC16999-3	SW846 8011	28-DEC-12 17:04	AP	19-DEC-12 BJ	V8011SL
MC16999-4 Collected: 18-DEC-12 09:45 By: WPBS Received: 19-DEC-12 By: GP-14-45					
MC16999-4	SM21 2540 B MOD.	21-DEC-12	MA		%SOL
MC16999-4	SW846 8260B	28-DEC-12 14:56	AMY		V8260SL+
MC16999-4	SW846 8011	28-DEC-12 17:29	AP	19-DEC-12 BJ	V8011SL
MC16999-5 Collected: 18-DEC-12 00:00 By: WPBS Received: 19-DEC-12 By: TRIP BLANK					
MC16999-5	SW846 8011	21-DEC-12 23:04	CZ	21-DEC-12 BJ	V8011SL
MC16999-5	SW846 8260B	31-DEC-12 23:46	DFT		V8260SL+
MC16999-6 Collected: 18-DEC-12 12:35 By: WPBS Received: 19-DEC-12 By: GP-15-19					
MC16999-6	SM21 2540 B MOD.	21-DEC-12	MA		%SOL

Internal Sample Tracking Chronicle

Shell Oil

Job No: MC16999

URSMOSTL: Roxana Drilling, Roxana, IL
 Project No: 21562850.15000

5.2
5

Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
MC16999-6	SW846 8260B	21-DEC-12 20:02	GK			V8260SL+
MC16999-6	SW846 8260B	26-DEC-12 12:20	JM			V8260SL+
MC16999-6	SW846 8011	28-DEC-12 19:06	AP	19-DEC-12	BJ	V8011SL
MC16999-7 Collected: 18-DEC-12 12:40 By: WPBS Received: 19-DEC-12 By: GP-15-29						
MC16999-7	SM21 2540 B MOD.	21-DEC-12	MA			%SOL
MC16999-7	SW846 8260B	28-DEC-12 15:27	AMY			V8260SL+
MC16999-7	SW846 8011	28-DEC-12 17:53	AP	19-DEC-12	BJ	V8011SL
MC16999-9 Collected: 18-DEC-12 12:30 By: WPBS Received: 19-DEC-12 By: GP-15-37						
MC16999-9	SM21 2540 B MOD.	21-DEC-12	MA			%SOL
MC16999-9	SW846 8011	28-DEC-12 18:17	AP	19-DEC-12	BJ	V8011SL
MC16999-9	SW846 8260B	31-DEC-12 12:57	AMY			V8260SL+
MC16999-10 Collected: 18-DEC-12 14:10 By: WPBS Received: 19-DEC-12 By: GP-15-47						
MC16999-10	SM21 2540 B MOD.	21-DEC-12	MA			%SOL
MC16999-10	SW846 8260B	21-DEC-12 20:56	GK			V8260SL+
MC16999-10	SW846 8260B	26-DEC-12 13:18	JM			V8260SL+
MC16999-10	SW846 8011	28-DEC-12 19:54	AP	19-DEC-12	BJ	V8011SL
MC16999-11 Collected: 18-DEC-12 14:15 By: WPBS Received: 19-DEC-12 By: GP-15-55						
MC16999-11	SM21 2540 B MOD.	21-DEC-12	MA			%SOL
MC16999-11	SW846 8260B	21-DEC-12 20:29	GK			V8260SL+
MC16999-11	SW846 8260B	26-DEC-12 12:49	JM			V8260SL+
MC16999-11	SW846 8011	28-DEC-12 20:19	AP	19-DEC-12	BJ	V8011SL
MC16999-12 Collected: 18-DEC-12 12:30 By: WPBS Received: 19-DEC-12 By: GP-15-37 DUP						
MC16999-12	SM21 2540 B MOD.	21-DEC-12	MA			%SOL
MC16999-12	SW846 8260B	21-DEC-12 19:34	GK			V8260SL+
MC16999-12	SW846 8260B	26-DEC-12 19:33	JM			V8260SL+

Internal Sample Tracking Chronicle

Shell Oil

Job No: MC16999

URSMOSTL: Roxana Drilling, Roxana, IL
Project No: 21562850.15000

5.2
5

Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
MC16999-12SW846	8011	28-DEC-12 19:30	AP	20-DEC-12	AJ	V8011SL

Accutest Internal Chain of Custody

Job Number: MC16999
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL
 Received: 12/19/12

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
MC16999-1.1	Walk In Ref #9	Nick Krasinski	12/19/12 18:04	Retrieve from Storage
MC16999-1.1	Nick Krasinski	Walk In Ref #9	12/19/12 18:04	Return to Storage
MC16999-1.1	Walk In Ref #9	Mehdi Abdolrahim	12/21/12 08:29	Retrieve from Storage
MC16999-1.1	Mehdi Abdolrahim	Walk In Ref #9	12/21/12 10:14	Return to Storage
MC16999-1.1	Walk In Ref #9	Amy Min Yang	12/28/12 15:42	Retrieve from Storage
MC16999-1.1	Amy Min Yang	Walk In Ref #9	12/31/12 15:51	Return to Storage
MC16999-1.2	VOC Ref #10	Amy Min Yang	12/28/12 13:19	Retrieve from Storage
MC16999-1.2	Amy Min Yang	GCMSM	12/28/12 13:19	Load on Instrument
MC16999-1.4	VOC Ref #10	Gary Krasinski	12/20/12 11:05	Retrieve from Storage
MC16999-1.4	Gary Krasinski	VOC Ref #10	12/21/12 07:26	Return to Storage
MC16999-2.1	Walk In Ref #9	Nick Krasinski	12/19/12 18:04	Retrieve from Storage
MC16999-2.1	Nick Krasinski	Walk In Ref #9	12/19/12 18:04	Return to Storage
MC16999-2.1	Walk In Ref #9	Mehdi Abdolrahim	12/21/12 08:29	Retrieve from Storage
MC16999-2.1	Mehdi Abdolrahim	Walk In Ref #9	12/21/12 10:14	Return to Storage
MC16999-2.4	VOC Ref #10	Gary Krasinski	12/20/12 11:05	Retrieve from Storage
MC16999-2.4	Gary Krasinski	VOC Ref #10	12/26/12 08:22	Return to Storage
MC16999-2.4	VOC Ref #10	Jaime Maslowski	12/26/12 10:17	Retrieve from Storage
MC16999-2.4	Jaime Maslowski	VOC Ref #10	12/27/12 09:37	Return to Storage
MC16999-3.1	Walk In Ref #9	Nick Krasinski	12/19/12 18:04	Retrieve from Storage
MC16999-3.1	Nick Krasinski	Walk In Ref #9	12/19/12 18:04	Return to Storage
MC16999-3.1	Walk In Ref #9	Mehdi Abdolrahim	12/21/12 08:29	Retrieve from Storage
MC16999-3.1	Mehdi Abdolrahim	Walk In Ref #9	12/21/12 10:14	Return to Storage
MC16999-3.4	VOC Ref #10	Gary Krasinski	12/20/12 11:05	Retrieve from Storage
MC16999-3.4	Gary Krasinski	VOC Ref #10	12/26/12 08:22	Return to Storage
MC16999-3.4	VOC Ref #10	Jaime Maslowski	12/26/12 10:17	Retrieve from Storage
MC16999-3.4	Jaime Maslowski	VOC Ref #10	12/27/12 09:37	Return to Storage
MC16999-4.1	Walk In Ref #9	Nick Krasinski	12/19/12 18:04	Retrieve from Storage
MC16999-4.1	Nick Krasinski	Walk In Ref #9	12/19/12 18:04	Return to Storage
MC16999-4.1	Walk In Ref #9	Mehdi Abdolrahim	12/21/12 08:29	Retrieve from Storage
MC16999-4.1	Mehdi Abdolrahim	Walk In Ref #9	12/21/12 10:14	Return to Storage
MC16999-4.2	VOC Ref #10	Amy Min Yang	12/28/12 13:19	Retrieve from Storage
MC16999-4.2	Amy Min Yang	GCMSM	12/28/12 13:19	Load on Instrument
MC16999-4.4	VOC Ref #10	Gary Krasinski	12/20/12 11:05	Retrieve from Storage
MC16999-4.4	Gary Krasinski	VOC Ref #10	12/21/12 07:26	Return to Storage

5.3
5

Accutest Internal Chain of Custody

Job Number: MC16999
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL
 Received: 12/19/12

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
MC16999-5.2	VOC Ref #4	Dana Tyron	12/31/12 12:50	Retrieve from Storage
MC16999-5.2	Dana Tyron	GCMST	12/31/12 12:50	Load on Instrument
MC16999-5.2	GCMST	Dana Tyron	01/02/13 10:26	Unload from Instrument
MC16999-5.2	Dana Tyron	VOC Ref #4	01/02/13 10:27	Return to Storage
MC16999-5.4	VOC Ref #4	Nick Krasinski	12/21/12 13:02	Retrieve from Storage
MC16999-5.4	Nick Krasinski		12/21/12 14:24	Depleted
MC16999-6.1	Walk In Ref #9	Nick Krasinski	12/19/12 18:04	Retrieve from Storage
MC16999-6.1	Nick Krasinski	Walk In Ref #9	12/19/12 18:04	Return to Storage
MC16999-6.1	Walk In Ref #9	Mehdi Abdolrahim	12/21/12 08:29	Retrieve from Storage
MC16999-6.1	Mehdi Abdolrahim	Walk In Ref #9	12/21/12 10:14	Return to Storage
MC16999-6.4	VOC Ref #10	Gary Krasinski	12/20/12 11:05	Retrieve from Storage
MC16999-6.4	Gary Krasinski	VOC Ref #10	12/26/12 08:22	Return to Storage
MC16999-6.4	VOC Ref #10	Jaime Maslowski	12/26/12 10:17	Retrieve from Storage
MC16999-6.4	Jaime Maslowski	VOC Ref #10	12/27/12 09:37	Return to Storage
MC16999-7.1	Walk In Ref #9	Nick Krasinski	12/19/12 18:04	Retrieve from Storage
MC16999-7.1	Nick Krasinski	Walk In Ref #9	12/19/12 18:04	Return to Storage
MC16999-7.1	Walk In Ref #9	Mehdi Abdolrahim	12/21/12 08:29	Retrieve from Storage
MC16999-7.1	Mehdi Abdolrahim	Walk In Ref #9	12/21/12 10:14	Return to Storage
MC16999-7.2	VOC Ref #10	Amy Min Yang	12/28/12 13:19	Retrieve from Storage
MC16999-7.2	Amy Min Yang	GCMSM	12/28/12 13:19	Load on Instrument
MC16999-7.4	VOC Ref #10	Gary Krasinski	12/20/12 11:05	Retrieve from Storage
MC16999-7.4	Gary Krasinski	VOC Ref #10	12/21/12 07:26	Return to Storage
MC16999-8.1	Walk In Ref #9	Nick Krasinski	12/19/12 18:04	Retrieve from Storage
MC16999-8.1	Nick Krasinski	Walk In Ref #9	12/19/12 18:04	Return to Storage
MC16999-8.1	Walk In Ref #9	Mehdi Abdolrahim	12/21/12 08:29	Retrieve from Storage
MC16999-8.1	Mehdi Abdolrahim	Walk In Ref #9	12/21/12 10:14	Return to Storage
MC16999-8.4	VOC Ref #10	Gary Krasinski	12/20/12 11:05	Retrieve from Storage
MC16999-8.4	Gary Krasinski	VOC Ref #10	12/26/12 11:06	Return to Storage
MC16999-9.4	VOC Ref #10	Amy Min Yang	12/31/12 11:49	Retrieve from Storage
MC16999-9.4	Amy Miu Yang	GCMSG	12/31/12 11:49	Load on Instrument
MC16999-9.4	GCMSG	Jaime Maslowski	01/02/13 10:04	Unload from Instrument
MC16999-9.4	Jaime Maslowski	VOC Ref #10	01/02/13 10:04	Return to Storage
MC16999-10.1	Walk In Ref #9	Nick Krasinski	12/19/12 18:04	Retrieve from Storage
MC16999-10.1	Nick Krasinski	Walk In Ref #9	12/19/12 18:04	Return to Storage

5.3
5

Accutest Internal Chain of Custody

Job Number: MC16999
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL
 Received: 12/19/12

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
MC16999-10.1	Walk In Ref #9	Mehdi Abdolrahim	12/21/12 08:29	Retrieve from Storage
MC16999-10.1	Mehdi Abdolrahim	Walk In Ref #9	12/21/12 10:14	Return to Storage
MC16999-10.4	VOC Ref #10	Gary Krasinski	12/20/12 11:05	Retrieve from Storage
MC16999-10.4	Gary Krasinski	Jaime Maslowski	12/26/12 10:16	Custody Transfer
MC16999-10.4	Jaime Maslowski	VOC Ref #10	12/27/12 09:37	Return to Storage
MC16999-11.1	Walk In Ref #9	Nick Krasinski	12/19/12 18:04	Retrieve from Storage
MC16999-11.1	Nick Krasinski	Walk In Ref #9	12/19/12 18:04	Return to Storage
MC16999-11.1	Walk In Ref #9	Mehdi Abdolrahim	12/21/12 08:29	Retrieve from Storage
MC16999-11.1	Mehdi Abdolrahim	Walk In Ref #9	12/21/12 10:14	Return to Storage
MC16999-11.4	VOC Ref #10	Gary Krasinski	12/20/12 11:05	Retrieve from Storage
MC16999-11.4	Gary Krasinski	VOC Ref #10	12/26/12 08:22	Return to Storage
MC16999-11.4	VOC Ref #10	Jaime Maslowski	12/26/12 10:17	Retrieve from Storage
MC16999-11.4	Jaime Maslowski	VOC Ref #10	12/27/12 09:37	Return to Storage
MC16999-12.1	Walk In Ref #9	Nick Krasinski	12/19/12 18:04	Retrieve from Storage
MC16999-12.1	Nick Krasinski	Walk In Ref #9	12/19/12 18:04	Return to Storage
MC16999-12.1	Walk In Ref #9	Mehdi Abdolrahim	12/21/12 08:29	Retrieve from Storage
MC16999-12.1	Mehdi Abdolrahim	Walk In Ref #9	12/21/12 10:14	Return to Storage
MC16999-12.4	VOC Ref #10	Gary Krasinski	12/21/12 11:48	Retrieve from Storage
MC16999-12.4	Gary Krasinski	Jaime Maslowski	12/26/12 10:16	Custody Transfer
MC16999-12.4	Jaime Maslowski	VOC Ref #10	12/27/12 09:37	Return to Storage

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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

Job Number: MC16999
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSK2166-MB	K65921.D	1	12/21/12	GK	n/a	n/a	MSK2166

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16999-2, MC16999-3, MC16999-6, MC16999-10, MC16999-11, MC16999-12

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	250	63	ug/kg	
107-13-1	Acrylonitrile	ND	1300	63	ug/kg	
71-43-2	Benzene	ND	25	15	ug/kg	
108-86-1	Bromobenzene	ND	250	11	ug/kg	
74-97-5	Bromochloromethane	ND	250	19	ug/kg	
75-27-4	Bromodichloromethane	ND	100	11	ug/kg	
75-25-2	Bromoform	ND	100	100	ug/kg	
74-83-9	Bromomethane	ND	100	26	ug/kg	
78-93-3	2-Butanone (MEK)	ND	250	63	ug/kg	
104-51-8	n-Butylbenzene	ND	250	9.2	ug/kg	
135-98-8	sec-Butylbenzene	ND	250	11	ug/kg	
98-06-6	tert-Butylbenzene	ND	250	44	ug/kg	
75-15-0	Carbon disulfide	ND	250	8.2	ug/kg	
56-23-5	Carbon tetrachloride	ND	100	36	ug/kg	
108-90-7	Chlorobenzene	ND	100	14	ug/kg	
75-00-3	Chloroethane	ND	250	63	ug/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	250	100	ug/kg	
67-66-3	Chloroform	ND	100	26	ug/kg	
74-87-3	Chloromethane	ND	250	23	ug/kg	
95-49-8	o-Chlorotoluene	ND	250	55	ug/kg	
106-43-4	p-Chlorotoluene	ND	250	11	ug/kg	
124-48-1	Dibromochloromethane	ND	100	15	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	100	11	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	100	11	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	100	11	ug/kg	
75-71-8	Dichlorodifluoromethane	ND	100	57	ug/kg	
75-34-3	1,1-Dichloroethane	ND	100	14	ug/kg	
107-06-2	1,2-Dichloroethane	ND	100	14	ug/kg	
75-35-4	1,1-Dichloroethene	ND	100	18	ug/kg	
156-59-2	cis-1,2-Dichloroethene	ND	100	15	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	100	14	ug/kg	
78-87-5	1,2-Dichloropropane	ND	100	19	ug/kg	
142-28-9	1,3-Dichloropropane	ND	250	12	ug/kg	
594-20-7	2,2-Dichloropropane	ND	250	43	ug/kg	
563-58-6	1,1-Dichloropropene	ND	250	13	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	100	8.5	ug/kg	

6.1.1

6

Method Blank Summary

Job Number: MC16999
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSK2166-MB	K65921.D	1	12/21/12	GK	n/a	n/a	MSK2166

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16999-2, MC16999-3, MC16999-6, MC16999-10, MC16999-11, MC16999-12

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-02-6	trans-1,3-Dichloropropene	ND	100	25	ug/kg	
123-91-1	1,4-Dioxane	ND	1300	1300	ug/kg	
97-63-2	Ethyl methacrylate	ND	250	34	ug/kg	
100-41-4	Ethylbenzene	ND	100	12	ug/kg	
87-68-3	Hexachlorobutadiene	ND	250	23	ug/kg	
591-78-6	2-Hexanone	ND	250	25	ug/kg	
98-82-8	Isopropylbenzene	ND	250	11	ug/kg	
99-87-6	p-Isopropyltoluene	ND	250	8.9	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	100	14	ug/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	250	25	ug/kg	
74-95-3	Methylene bromide	ND	250	25	ug/kg	
75-09-2	Methylene chloride	ND	100	58	ug/kg	
91-20-3	Naphthalene	ND	250	63	ug/kg	
103-65-1	n-Propylbenzene	ND	250	51	ug/kg	
100-42-5	Styrene	ND	250	12	ug/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	250	50	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	100	21	ug/kg	
127-18-4	Tetrachloroethene	ND	100	11	ug/kg	
108-88-3	Toluene	ND	250	42	ug/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	250	12	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	250	11	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	100	16	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	100	37	ug/kg	
79-01-6	Trichloroethene	ND	100	11	ug/kg	
75-69-4	Trichlorofluoromethane	ND	100	15	ug/kg	
96-18-4	1,2,3-Trichloropropane	ND	250	15	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	250	11	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	250	11	ug/kg	
108-05-4	Vinyl Acetate	ND	250	28	ug/kg	
75-01-4	Vinyl chloride	ND	100	14	ug/kg	
	m,p-Xylene	ND	100	39	ug/kg	
95-47-6	o-Xylene	ND	100	12	ug/kg	
1330-20-7	Xylene (total)	ND	100	12	ug/kg	

6.1.1



Method Blank Summary

Job Number: MC16999
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSK2166-MB	K65921.D	1	12/21/12	GK	n/a	n/a	MSK2166

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16999-2, MC16999-3, MC16999-6, MC16999-10, MC16999-11, MC16999-12

CAS No.	Surrogate Recoveries		Limits
1868-53-7	Dibromofluoromethane	110%	70-130%
2037-26-5	Toluene-D8	107%	70-130%
460-00-4	4-Bromofluorobenzene	103%	70-130%

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

6.1.1

6

Method Blank Summary

Job Number: MC16999
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4896-MB	G123186.D	1	12/26/12	JM	n/a	n/a	MSG4896

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16999-2, MC16999-3, MC16999-6, MC16999-10, MC16999-11, MC16999-12

CAS No.	Compound	Result	RL	MDL	Units	Q
107-02-8	Acrolein	ND	1300	500	ug/kg	
71-43-2	Benzene	ND	25	15	ug/kg	

CAS No.	Surrogate Recoveries		Limits
1868-53-7	Dihromofluoromethane	101%	70-130%
2037-26-5	Toluene-D8	97%	70-130%
460-00-4	4-Bromofluorobenzene	91%	70-130%

6.12
6

Method Blank Summary

Job Number: MC16999
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1806-MB	M53166.D	1	12/28/12	AMY	n/a	n/a	MSM1806

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16999-1, MC16999-4, MC16999-7

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	1.3	ug/kg	
107-02-8	Acrolein	ND	25	10	ug/kg	
107-13-1	Acrylonitrile	ND	25	1.3	ug/kg	
71-43-2	Benzene	ND	0.50	0.29	ug/kg	
108-86-1	Bromohenzene	ND	5.0	0.22	ug/kg	
74-97-5	Bromochloromethane	ND	5.0	0.37	ng/kg	
75-27-4	Bromodichloromethane	ND	2.0	0.21	ug/kg	
75-25-2	Bromoform	ND	2.0	2.0	ug/kg	
74-83-9	Bromomethane	ND	2.0	0.52	ug/kg	
78-93-3	2-Butanone (MEK)	ND	5.0	1.3	ug/kg	
104-51-8	n-Butylbenzene	ND	5.0	0.18	ug/kg	
135-98-8	sec-Butylbenzene	ND	5.0	0.23	ug/kg	
98-06-6	tert-Butylbenzene	ND	5.0	0.88	ug/kg	
75-15-0	Carbon disulfide	ND	5.0	0.16	ug/kg	
56-23-5	Carbon tetrachloride	ND	2.0	0.73	ug/kg	
108-90-7	Chlorobenzene	ND	2.0	0.28	ug/kg	
75-00-3	Chloroethane	ND	5.0	1.3	ug/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	5.0	2.0	ug/kg	
67-66-3	Chloroform	ND	2.0	0.52	ug/kg	
74-87-3	Chloromethane	ND	5.0	0.46	ug/kg	
95-49-8	o-Chlorotoluene	ND	5.0	1.1	ug/kg	
106-43-4	p-Chlorotoluene	ND	5.0	0.23	ug/kg	
124-48-1	Dibromochloromethane	ND	2.0	0.30	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	2.0	0.22	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	2.0	0.23	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	2.0	0.21	ug/kg	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.1	ug/kg	
75-34-3	1,1-Dichloroethane	ND	2.0	0.27	ug/kg	
107-06-2	1,2-Dichloroethane	ND	2.0	0.29	ug/kg	
75-35-4	1,1-Dichloroethene	ND	2.0	0.37	ug/kg	
156-59-2	cis-1,2-Dichloroethene	ND	2.0	0.30	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	2.0	0.29	ug/kg	
78-87-5	1,2-Dichloropropane	ND	2.0	0.37	ug/kg	
142-28-9	1,3-Dichloropropane	ND	5.0	0.23	ug/kg	
594-20-7	2,2-Dichloropropane	ND	5.0	0.87	ug/kg	
563-58-6	1,1-Dichloropropene	ND	5.0	0.26	ug/kg	

6.1.3



Method Blank Summary

Job Number: MC16999
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1806-MB	M53166.D	1	12/28/12	AMY	n/a	n/a	MSM1806

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16999-1, MC16999-4, MC16999-7

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	2.0	0.17	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	2.0	0.50	ug/kg	
123-91-1	1,4-Dioxane	ND	25	25	ug/kg	
97-63-2	Ethyl methacrylate	ND	5.0	0.68	ug/kg	
100-41-4	Ethylbenzene	ND	2.0	0.24	ug/kg	
87-68-3	Hexachlorobutadiene	ND	5.0	0.46	ug/kg	
591-78-6	2-Hexanone	ND	5.0	0.50	ug/kg	
98-82-8	Isopropylbenzene	ND	5.0	0.23	ug/kg	
99-87-6	p-Isopropyltoluene	ND	5.0	0.18	ug/kg	
1634-04-4	Methyl Teri Butyl Ether	ND	2.0	0.29	ug/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	0.50	ug/kg	
74-95-3	Methylene bromide	ND	5.0	0.49	ug/kg	
75-09-2	Methylene chloride	ND	2.0	1.2	ug/kg	
91-20-3	Naphthalene	ND	5.0	1.3	ug/kg	
103-65-1	n-Propylbenzene	ND	5.0	1.0	ug/kg	
100-42-5	Styrene	ND	5.0	0.23	ug/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	5.0	1.0	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	2.0	0.43	ug/kg	
127-18-4	Tetrachloroethene	ND	2.0	0.23	ug/kg	
108-88-3	Toluene	ND	5.0	0.85	ug/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	0.24	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	0.23	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	2.0	0.31	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	2.0	0.73	ug/kg	
79-01-6	Trichloroethene	ND	2.0	0.21	ug/kg	
75-69-4	Trichlorofluoromethane	ND	2.0	0.30	ug/kg	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.29	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.22	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	0.21	ug/kg	
108-05-4	Vinyl Acetate	ND	5.0	0.56	ug/kg	
75-01-4	Vinyl chloride	ND	2.0	0.27	ug/kg	
	m,p-Xylene	ND	2.0	0.79	ug/kg	
95-47-6	o-Xylene	ND	2.0	0.24	ug/kg	
1330-20-7	Xylene (total)	ND	2.0	0.24	ug/kg	

6.1.3
6

Method Blank Summary

Job Number: MC16999
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1806-MB	M53166.D	1	12/28/12	AMY	n/a	n/a	MSM1806

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16999-1, MC16999-4, MC16999-7

CAS No.	Surrogate Recoveries		Limits
1868-53-7	Dibromoflnoromethane	82%	70-130%
2037-26-5	Toluene-D8	88%	70-130%
460-00-4	4-Bromofluorobenzene	79%	70-130%

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

6.1.3
6

Method Blank Summary

Job Number: MC16999
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4900-MB	G123331.D	1	12/31/12	AMY	n/a	n/a	MSG4900

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16999-9

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	250	63	ug/kg	
107-02-8	Acrolein	ND	1300	500	ug/kg	
107-13-1	Acrylonitrile	ND	1300	63	ug/kg	
71-43-2	Benzene	ND	25	15	ug/kg	
108-86-1	Bromobenzene	ND	250	11	ug/kg	
74-97-5	Bromochloromethane	ND	250	19	ug/kg	
75-27-4	Bromodichloromethane	ND	100	11	ug/kg	
75-25-2	Bromoform	ND	100	100	ng/kg	
74-83-9	Bromomethane	ND	100	26	ug/kg	
78-93-3	2-Butanone (MEK)	ND	250	63	ng/kg	
104-51-8	n-Butylbenzene	ND	250	9.2	ug/kg	
135-98-8	sec-Butylbenzene	ND	250	11	ug/kg	
98-06-6	tert-Butylbenzene	ND	250	44	ug/kg	
75-15-0	Carbon disulfide	ND	250	8.2	ug/kg	
56-23-5	Carbon tetrachloride	ND	100	36	ug/kg	
108-90-7	Chlorobenzene	ND	100	14	ug/kg	
75-00-3	Chloroethane	ND	250	63	ug/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	250	100	ug/kg	
67-66-3	Chloroform	ND	100	26	ug/kg	
74-87-3	Chloromethane	ND	250	23	ug/kg	
95-49-8	o-Chlorotoluene	ND	250	55	ug/kg	
106-43-4	p-Chlorotoluene	ND	250	11	ug/kg	
124-48-1	Dibromochloromethane	ND	100	15	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	100	11	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	100	11	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	100	11	ug/kg	
75-71-8	Dichlorodifluoromethane	ND	100	57	ug/kg	
75-34-3	1,1-Dichloroethane	ND	100	14	ug/kg	
107-06-2	1,2-Dichloroethane	ND	100	14	ug/kg	
75-35-4	1,1-Dichloroethene	ND	100	18	ng/kg	
156-59-2	cis-1,2-Dichloroethene	ND	100	15	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	100	14	ug/kg	
78-87-5	1,2-Dichloropropane	ND	100	19	ug/kg	
142-28-9	1,3-Dichloropropane	ND	250	12	ug/kg	
594-20-7	2,2-Dichloropropane	ND	250	43	ug/kg	
563-58-6	1,1-Dichloropropene	ND	250	13	ug/kg	

6.1.4



Method Blank Summary

Job Number: MC16999
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4900-MB	G123331.D	1	12/31/12	AMY	n/a	n/a	MSG4900

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16999-9

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	100	8.5	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	100	25	ug/kg	
123-91-1	1,4-Dioxane	ND	1300	1300	ug/kg	
97-63-2	Ethyl methacrylate	ND	250	34	ug/kg	
100-41-4	Ethylbenzene	ND	100	12	ug/kg	
87-68-3	Hexachlorobutadiene	ND	250	23	ug/kg	
591-78-6	2-Hexanone	ND	250	25	ug/kg	
98-82-8	Isopropylbenzene	ND	250	11	ug/kg	
99-87-6	p-Isopropyltoluene	ND	250	8.9	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	100	14	ug/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	250	25	ug/kg	
74-95-3	Methylene bromide	ND	250	25	ug/kg	
75-09-2	Methylene chloride	ND	100	58	ug/kg	
91-20-3	Naphthalene	ND	250	63	ug/kg	
103-65-1	n-Propylbenzene	ND	250	51	ug/kg	
100-42-5	Styrene	ND	250	12	ug/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	250	50	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	100	21	ug/kg	
127-18-4	Tetrachloroethene	ND	100	11	ug/kg	
108-88-3	Toluene	ND	250	42	ug/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	250	12	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	250	11	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	100	16	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	100	37	ug/kg	
79-01-6	Trichloroethene	ND	100	11	ug/kg	
75-69-4	Trichlorofluoromethane	ND	100	15	ug/kg	
96-18-4	1,2,3-Trichloropropane	ND	250	15	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	250	11	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	250	11	ug/kg	
108-05-4	Vinyl Acetate	ND	250	28	ug/kg	
75-01-4	Vinyl chloride	ND	100	14	ug/kg	
	m,p-Xylene	ND	100	39	ug/kg	
95-47-6	o-Xylene	ND	100	12	ug/kg	
1330-20-7	Xylene (total)	ND	100	12	ug/kg	

6.1.4
6

Method Blank Summary

Job Number: MC16999
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4900-MB	G123331.D	1	12/31/12	AMY	n/a	n/a	MSG4900

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16999-9

6.1.4
6

CAS No.	Surrogate Recoveries		Limits
1868-53-7	Dibromofluoromethane	96%	70-130%
2037-26-5	Toluene-D8	90%	70-130%
460-00-4	4-Bromofluorobenzene	88%	70-130%

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

Method Blank Summary

Job Number: MC16999
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MST987-MB	T28265.D	1	12/31/12	DFT	n/a	n/a	MST987

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16999-5

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.0	ug/l	
107-02-8	Acrolein	ND	25	10	ug/l	
107-13-1	Acrylonitrile	ND	5.0	3.2	ug/l	
71-43-2	Benzene	ND	0.50	0.24	ug/l	
108-86-1	Bromobenzene	ND	5.0	0.62	ug/l	
74-97-5	Bromochloromethane	ND	5.0	1.3	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.58	ug/l	
75-25-2	Bromoform	ND	1.0	0.78	ug/l	
74-83-9	Bromomethane	ND	2.0	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	2.4	ug/l	
104-51-8	n-Butylbenzene	ND	5.0	0.61	ug/l	
135-98-8	sec-Butylbenzene	ND	5.0	0.55	ug/l	
98-06-6	tert-Butylbenzene	ND	5.0	0.64	ug/l	
75-15-0	Carbon disulfide	ND	5.0	0.61	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.87	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.47	ug/l	
75-00-3	Chloroethane	ND	2.0	0.50	ug/l	
110-75-8	2-Chloroethyl vinyl ether	ND	5.0	1.3	ug/l	
67-66-3	Chloroform	ND	1.0	0.50	ug/l	
74-87-3	Chloromethane	ND	2.0	0.73	ug/l	
95-49-8	o-Chlorotoluene	ND	5.0	0.65	ug/l	
106-43-4	p-Chlorotoluene	ND	5.0	0.48	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.53	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.93	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.45	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.64	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.7	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.62	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.63	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	0.41	ug/l	
156-59-2	cis-1,2-Dichloroethene	ND	1.0	0.64	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	0.95	ug/l	
78-87-5	1,2-Dichloropropane	ND	2.0	0.72	ug/l	
142-28-9	1,3-Dichloropropane	ND	5.0	0.64	ug/l	
594-20-7	2,2-Dichloropropane	ND	5.0	1.6	ug/l	
563-58-6	1,1-Dichloropropene	ND	5.0	0.91	ug/l	

6.1.5



Method Blank Summary

Job Number: MC16999
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MST987-MB	T28265.D	1	12/31/12	DFT	n/a	n/a	MST987

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16999-5

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.45	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.20	ug/l	
123-91-1	1,4-Dioxane	ND	25	15	ug/l	
97-63-2	Ethyl methacrylate	ND	5.0	0.81	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.51	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.0	2.1	ug/l	
591-78-6	2-Hexanone	ND	5.0	2.0	ug/l	
98-82-8	Isopropylbenzene	ND	5.0	0.50	ug/l	
99-87-6	p-Isopropyltoluene	ND	5.0	0.57	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.41	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	2.9	ug/l	
74-95-3	Methylene bromide	ND	5.0	1.1	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.83	ug/l	
91-20-3	Naphthalene	ND	5.0	0.50	ug/l	
103-65-1	n-Propylbenzene	ND	5.0	0.58	ug/l	
100-42-5	Styrene	ND	5.0	0.45	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	5.0	0.57	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.60	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	0.42	ug/l	
108-88-3	Toluene	ND	1.0	0.51	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	1.3	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	1.3	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.85	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.50	ug/l	
79-01-6	Trichloroethene	ND	1.0	0.78	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.29	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.85	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.35	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	0.47	ug/l	
108-05-4	Vinyl Acetate	ND	5.0	1.3	ug/l	
75-01-4	Vinyl chloride	ND	1.0	0.63	ug/l	
	m,p-Xylene	ND	1.0	0.73	ug/l	
95-47-6	o-Xylene	ND	1.0	0.58	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.58	ug/l	

6.1.5
6

Method Blank Summary

Job Number: MC16999
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MST987-MB	T28265.D	1	12/31/12	DFT	n/a	n/a	MST987

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16999-5

6.1.5
6

CAS No.	Surrogate Recoveries		Limits
1868-53-7	Dibromofluoromethane	104%	70-130%
2037-26-5	Toluene-D8	119%	70-130%
460-00-4	4-Bromofluorobenzene	116%	70-130%

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

Blank Spike Summary

Job Number: MC16999
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4896-BS	G123184.D	1	12/26/12	JM	n/a	n/a	MSG4896

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16999-2, MC16999-3, MC16999-6, MC16999-10, MC16999-11, MC16999-12

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
107-02-8	Acrolein	12500	4550	36* a	70-130
71-43-2	Benzene	2500	2390	96	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	101%	70-130%
2037-26-5	Toluene-D8	94%	70-130%
460-00-4	4-Bromofluorobenzene	88%	70-130%

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

* = Outside of Control Limits.

6.2.1
6

Blank Spike Summary

Job Number: MC16999
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1806-BS	M53164.D	1	12/28/12	AMY	n/a	n/a	MSM1806

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16999-1, MC16999-4, MC16999-7

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
67-64-1	Acetone	50	31.9	64* a	70-130
107-02-8	Acrolein	250	214	86	70-130
107-13-1	Acrylonitrile	50	47.0	94	70-130
71-43-2	Benzene	50	49.5	99	70-130
108-86-1	Bromobenzene	50	47.2	94	70-130
74-97-5	Bromochloromethane	50	46.9	94	70-130
75-27-4	Bromodichloromethane	50	48.0	96	70-130
75-25-2	Bromoform	50	46.7	93	70-130
74-83-9	Bromomethane	50	56.5	113	70-130
78-93-3	2-Butanone (MEK)	50	53.1	106	70-130
104-51-8	n-Butylbenzene	50	53.9	108	70-130
135-98-8	sec-Butylbenzene	50	50.9	102	70-130
98-06-6	tert-Butylbenzene	50	49.1	98	70-130
75-15-0	Carbon disulfide	50	61.5	123	70-130
56-23-5	Carbon tetrachloride	50	57.5	115	70-130
108-90-7	Chlorobenzene	50	46.8	94	70-130
75-00-3	Chloroethane	50	58.2	116	70-130
110-75-8	2-Chloroethyl vinyl ether	50	48.8	98	10-160
67-66-3	Chloroform	50	48.5	97	70-130
74-87-3	Chloromethane	50	66.0	132* a	70-130
95-49-8	o-Chlorotoluene	50	45.9	92	70-130
106-43-4	p-Chlorotoluene	50	47.9	96	70-130
124-48-1	Dibromochloromethane	50	46.2	92	70-130
95-50-1	1,2-Dichlorobenzene	50	44.3	89	70-130
541-73-1	1,3-Dichlorobenzene	50	46.3	93	70-130
106-46-7	1,4-Dichlorobenzene	50	47.3	95	70-130
75-71-8	Dichlorodifluoromethane	50	79.9	160* a	70-130
75-34-3	1,1-Dichloroethane	50	50.1	100	70-130
107-06-2	1,2-Dichloroethane	50	47.2	94	70-130
75-35-4	1,1-Dichloroethene	50	59.9	120	70-130
156-59-2	cis-1,2-Dichloroethene	50	47.8	96	70-130
156-60-5	trans-1,2-Dichloroethene	50	53.5	107	70-130
78-87-5	1,2-Dichloropropane	50	45.6	91	70-130
142-28-9	1,3-Dichloropropane	50	45.2	90	70-130
594-20-7	2,2-Dichloropropane	50	55.3	111	70-130
563-58-6	1,1-Dichloropropene	50	56.7	113	70-130

* = Outside of Control Limits.

6.2.2



Blank Spike Summary

Job Number: MC16999
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1806-BS	M53164.D	1	12/28/12	AMY	n/a	n/a	MSM1806

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16999-1, MC16999-4, MC16999-7

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
10061-01-5	cis-1,3-Dichloropropene	50	45.4	91	70-130
10061-02-6	trans-1,3-Dichloropropene	50	48.6	97	70-130
123-91-1	1,4-Dioxane	250	282	113	70-130
97-63-2	Ethyl methacrylate	50	50.3	101	76-141
100-41-4	Ethylbenzene	50	51.6	103	70-130
87-68-3	Hexachlorobutadiene	50	56.1	112	70-130
591-78-6	2-Hexanone	50	56.0	112	70-130
98-82-8	Isopropylbenzene	50	48.8	98	70-130
99-87-6	p-Isopropyltoluene	50	55.6	111	70-130
1634-04-4	Methyl Tert Butyl Ether	50	42.9	86	70-130
108-10-1	4-Methyl-2-pentanone (MIBK)	50	51.1	102	70-130
74-95-3	Methylene bromide	50	46.8	94	70-130
75-09-2	Methylene chloride	50	44.6	89	70-130
91-20-3	Naphthalene	50	56.7	113	70-130
103-65-1	n-Propylbenzene	50	49.1	98	70-130
100-42-5	Styrene	50	48.3	97	70-130
630-20-6	1,1,1,2-Tetrachloroethane	50	47.3	95	70-130
79-34-5	1,1,2,2-Tetrachloroethane	50	46.9	94	70-130
127-18-4	Tetrachloroethene	50	57.2	114	70-130
108-88-3	Toluene	50	52.9	106	70-130
87-61-6	1,2,3-Trichlorobenzene	50	49.7	99	70-130
120-82-1	1,2,4-Trichlorobenzene	50	50.7	101	70-130
71-55-6	1,1,1-Trichloroethane	50	54.2	108	70-130
79-00-5	1,1,2-Trichloroethane	50	45.5	91	70-130
79-01-6	Trichloroethene	50	53.3	107	70-130
75-69-4	Trichlorofluoromethane	50	63.9	128	70-130
96-18-4	1,2,3-Trichloropropane	50	48.7	97	70-130
95-63-6	1,2,4-Trimethylbenzene	50	49.9	100	70-130
108-67-8	1,3,5-Trimethylbenzene	50	50.4	101	70-130
108-05-4	Vinyl Acetate	50	50.2	100	70-130
75-01-4	Vinyl chloride	50	59.7	119	70-130
	m,p-Xylene	100	102	102	70-130
95-47-6	o-Xylene	50	48.5	97	70-130
1330-20-7	Xylene (total)	150	151	101	70-130

* = Outside of Control Limits.

Blank Spike Summary

Job Number: MC16999
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1806-BS	M53164.D	1	12/28/12	AMY	n/a	n/a	MSM1806

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16999-1, MC16999-4, MC16999-7

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	84%	70-130%
2037-26-5	Toluene-D8	88%	70-130%
460-00-4	4-Bromofluorobenzene	80%	70-130%

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

* = Outside of Control Limits.

6.2.2
G

Blank Spike/Blank Spike Duplicate Summary

Job Number: MC16999
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSK2166-BS	K65918.D	1	12/21/12	GK	n/a	n/a	MSK2166
MSK2166-BSD	K65919.D	1	12/21/12	GK	n/a	n/a	MSK2166

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16999-2, MC16999-3, MC16999-6, MC16999-10, MC16999-11, MC16999-12

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	BSD ug/kg	BSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	2500	1830	73	1790	72	2	70-130/25
107-13-1	Acrylonitrile	2500	2010	80	1970	79	2	70-130/25
71-43-2	Benzene	2500	2420	97	2360	94	3	70-130/25
108-86-1	Bromohenzene	2500	2630	105	2460	98	7	70-130/25
74-97-5	Bromochloromethane	2500	2340	94	2330	93	0	70-130/25
75-27-4	Bromodichloromethane	2500	2550	102	2480	99	3	70-130/25
75-25-2	Bromoform	2500	2390	96	2510	100	5	70-130/25
74-83-9	Bromomethane	2500	2390	96	2290	92	4	70-130/25
78-93-3	2-Butanone (MEK)	2500	1710	68* a	1890	76	10	70-130/25
104-51-8	n-Butylbenzene	2500	2900	116	2530	101	14	70-130/25
135-98-8	sec-Butylbenzene	2500	3080	123	2770	111	11	70-130/25
98-06-6	tert-Butylbenzene	2500	3140	126	2830	113	10	70-130/25
75-15-0	Carbon disulfide	2500	2480	99	2340	94	6	70-130/25
56-23-5	Carbon tetrachloride	2500	2650	106	2520	101	5	70-130/25
108-90-7	Chlorobenzene	2500	2770	111	2750	110	1	70-130/25
75-00-3	Chloroethane	2500	2450	98	2260	90	8	70-130/25
110-75-8	2-Chloroethyl vinyl ether	2500	1500	60	1510	60	1	10-160/25
67-66-3	Chloroform	2500	2420	97	2380	95	2	70-130/25
74-87-3	Chloromethane	2500	3510	140* a	3000	120	16	70-130/25
95-49-8	o-Chlorotoluene	2500	2940	118	2740	110	7	70-130/25
106-43-4	p-Chlorotoluene	2500	3100	124	2900	116	7	70-130/25
124-48-1	Dibromochloromethane	2500	2650	106	2650	106	0	70-130/25
95-50-1	1,2-Dichlorobenzene	2500	2750	110	2700	108	2	70-130/25
541-73-1	1,3-Dichlorobenzene	2500	2860	114	2790	112	2	70-130/25
106-46-7	1,4-Dichlorobenzene	2500	2580	103	2530	101	2	70-130/25
75-71-8	Dichlorodifluoromethane	2500	3540	142* a	3210	128	10	70-130/25
75-34-3	1,1-Dichloroethane	2500	2360	94	2290	92	3	70-130/25
107-06-2	1,2-Dichloroethane	2500	2470	99	2430	97	2	70-130/25
75-35-4	1,1-Dichloroethene	2500	2550	102	2440	98	4	70-130/25
156-59-2	cis-1,2-Dichloroethene	2500	2360	94	2310	92	2	70-130/25
156-60-5	trans-1,2-Dichloroethene	2500	2330	93	2250	90	3	70-130/25
78-87-5	1,2-Dichloropropane	2500	2320	93	2300	92	1	70-130/25
142-28-9	1,3-Dichloropropane	2500	2400	96	2420	97	1	70-130/25
594-20-7	2,2-Dichloropropane	2500	2460	98	2370	95	4	70-130/25
563-58-6	1,1-Dichloropropene	2500	2530	101	2430	97	4	70-130/25
10061-01-5	cis-1,3-Dichloropropene	2500	2380	95	2360	94	1	70-130/25

* = Outside of Control Limits.

6.3.1
6

Blank Spike/Blank Spike Duplicate Summary

Job Number: MC16999
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSK2166-BS	K65918.D	1	12/21/12	GK	n/a	n/a	MSK2166
MSK2166-BSD	K65919.D	1	12/21/12	GK	n/a	n/a	MSK2166

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16999-2, MC16999-3, MC16999-6, MC16999-10, MC16999-11, MC16999-12

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	BSD ug/kg	BSD %	RPD	Limits Rec/RPD
10061-02-6	trans-1,3-Dichloropropene	2500	2550	102	2520	101	1	70-130/25
123-91-1	1,4-Dioxane	12500	13000	104	13800	110	6	70-130/25
97-63-2	Ethyl methacrylate	2500	2230	89	2200	88	1	76-141/25
100-41-4	Ethylbenzene	2500	2670	107	2570	103	4	70-130/25
87-68-3	Hexachlorobutadiene	2500	2970	119	2800	112	6	70-130/25
591-78-6	2-Hexanone	2500	2010	80	2000	80	0	70-130/25
98-82-8	Isopropylbenzene	2500	3080	123	2840	114	8	70-130/25
99-87-6	p-Isopropyltoluene	2500	2940	118	2700	108	9	70-130/25
1634-04-4	Methyl Tert Butyl Ether	2500	2310	92	2300	92	0	70-130/25
108-10-1	4-Methyl-2-pentanone (MIBK)	2500	2000	80	1940	78	3	70-130/25
74-95-3	Methylene bromide	2500	2400	96	2330	93	3	70-130/25
75-09-2	Methylene chloride	2500	2440	98	2310	92	5	70-130/25
91-20-3	Naphthalene	2500	2580	103	2410	96	7	70-130/25
103-65-1	n-Propylbenzene	2500	3050	122	2790	112	9	70-130/25
100-42-5	Styrene	2500	2520	101	2530	101	0	70-130/25
630-20-6	1,1,1,2-Tetrachloroethane	2500	2690	108	2710	108	1	70-130/25
79-34-5	1,1,2,2-Tetrachloroethane	2500	2570	103	2500	100	3	70-130/25
127-18-4	Tetrachloroethene	2500	2500	100	2460	98	2	70-130/25
108-88-3	Toluene	2500	2490	100	2420	97	3	70-130/25
87-61-6	1,2,3-Trichlorobenzene	2500	2650	106	2540	102	4	70-130/25
120-82-1	1,2,4-Trichlorobenzene	2500	2670	107	2530	101	5	70-130/25
71-55-6	1,1,1-Trichloroethane	2500	2560	102	2460	98	4	70-130/25
79-00-5	1,1,2-Trichloroethane	2500	2350	94	2300	92	2	70-130/25
79-01-6	Trichloroethene	2500	2470	99	2390	96	3	70-130/25
75-69-4	Trichlorofluoromethane	2500	2650	106	2550	102	4	70-130/25
96-18-4	1,2,3-Trichloropropane	2500	2550	102	2410	96	6	70-130/25
95-63-6	1,2,4-Trimethylbenzene	2500	2830	113	2580	103	9	70-130/25
108-67-8	1,3,5-Trimethylbenzene	2500	2790	112	2590	104	7	70-130/25
108-05-4	Vinyl Acetate	2500	1970	79	1950	78	1	70-130/25
75-01-4	Vinyl chloride	2500	2490	100	2440	98	2	70-130/25
	m,p-Xylene	5000	5580	112	5480	110	2	70-130/25
95-47-6	o-Xylene	2500	2890	116	2820	113	2	70-130/25
1330-20-7	Xylene (total)	7500	8470	113	8300	111	2	70-130/25

* = Outside of Control Limits.

6.3.1
6

Blank Spike/Blank Spike Duplicate Summary

Job Number: MC16999
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSK2166-BS	K65918.D	1	12/21/12	GK	n/a	n/a	MSK2166
MSK2166-BSD	K65919.D	1	12/21/12	GK	n/a	n/a	MSK2166

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16999-2, MC16999-3, MC16999-6, MC16999-10, MC16999-11, MC16999-12

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
1868-53-7	Dibromofluoromethane	105%	105%	70-130%
2037-26-5	Toluene-D8	107%	104%	70-130%
460-00-4	4-Bromofluorobenzene	116%	108%	70-130%

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

* = Outside of Control Limits.

Blank Spike/Blank Spike Duplicate Summary

Job Number: MC16999
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4900-BS	G123328.D	1	12/31/12	AMY	n/a	n/a	MSG4900
MSG4900-BSD	G123329.D	1	12/31/12	AMY	n/a	n/a	MSG4900

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16999-9

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	BSD ug/kg	BSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	2500	3210	128	3060	122	5	70-130/25
107-02-8	Acrolein	12500	8590	69* a	8970	72	4	70-130/25
107-13-1	Acrylonitrile	2500	2360	94	2480	99	5	70-130/25
71-43-2	Benzene	2500	2570	103	2540	102	1	70-130/25
108-86-1	Bromobenzene	2500	2720	109	2720	109	0	70-130/25
74-97-5	Bromochloromethane	2500	2670	107	2720	109	2	70-130/25
75-27-4	Bromodichloromethane	2500	2720	109	2720	109	0	70-130/25
75-25-2	Bromoform	2500	2450	98	2510	100	2	70-130/25
74-83-9	Bromomethane	2500	2630	105	2660	106	1	70-130/25
78-93-3	2-Butanone (MEK)	2500	3000	120	2720	109	10	70-130/25
104-51-8	n-Butylbenzene	2500	2650	106	2640	106	0	70-130/25
135-98-8	sec-Butylbenzene	2500	2540	102	2540	102	0	70-130/25
98-06-6	tert-Butylbenzene	2500	2520	101	2520	101	0	70-130/25
75-15-0	Carbon disulfide	2500	2610	104	2590	104	1	70-130/25
56-23-5	Carbon tetrachloride	2500	2680	107	2600	104	3	70-130/25
108-90-7	Chlorobenzene	2500	2610	104	2580	103	1	70-130/25
75-00-3	Chloroethane	2500	2560	102	2550	102	0	70-130/25
110-75-8	2-Chloroethyl vinyl ether	2500	2080	83	2050	82	1	10-160/25
67-66-3	Chloroform	2500	2670	107	2650	106	1	70-130/25
74-87-3	Chloromethane	2500	2920	117	2940	118	1	70-130/25
95-49-8	o-Chlorotoluene	2500	2520	101	2500	100	1	70-130/25
106-43-4	p-Chlorotoluene	2500	2610	104	2600	104	0	70-130/25
124-48-1	Dibromochloromethane	2500	2650	106	2660	106	0	70-130/25
95-50-1	1,2-Dichlorobenzene	2500	2650	106	2610	104	2	70-130/25
541-73-1	1,3-Dichlorobenzene	2500	2610	104	2600	104	0	70-130/25
106-46-7	1,4-Dichlorobenzene	2500	2780	111	2760	110	1	70-130/25
75-71-8	Dichlorodifluoromethane	2500	3270	131* a	3110	124	5	70-130/25
75-34-3	1,1-Dichloroethane	2500	2700	108	2680	107	1	70-130/25
107-06-2	1,2-Dichloroethane	2500	2640	106	2650	106	0	70-130/25
75-35-4	1,1-Dichloroethene	2500	2650	106	2710	108	2	70-130/25
156-59-2	cis-1,2-Dichloroethene	2500	2630	105	2640	106	0	70-130/25
156-60-5	trans-1,2-Dichloroethene	2500	2650	106	2650	106	0	70-130/25
78-87-5	1,2-Dichloropropane	2500	2620	105	2630	105	0	70-130/25
142-28-9	1,3-Dichloropropane	2500	2550	102	2570	103	1	70-130/25
594-20-7	2,2-Dichloropropane	2500	2840	114	2830	113	0	70-130/25
563-58-6	1,1-Dichloropropene	2500	2580	103	2540	102	2	70-130/25

* = Outside of Control Limits.

6.3.2
G

Blank Spike/Blank Spike Duplicate Summary

Job Number: MC16999
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4900-BS	G123328.D	1	12/31/12	AMY	n/a	n/a	MSG4900
MSG4900-BSD	G123329.D	1	12/31/12	AMY	n/a	n/a	MSG4900

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16999-9

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	BSD ug/kg	BSD %	RPD	Limits Rec/RPD
10061-01-5	cis-1,3-Dichloropropene	2500	2600	104	2610	104	0	70-130/25
10061-02-6	trans-1,3-Dichloropropene	2500	2780	111	2770	111	0	70-130/25
123-91-1	1,4-Dioxane	12500	8110	65* a	8630	69* a	6	70-130/25
97-63-2	Ethyl methacrylate	2500	2480	99	2520	101	2	76-141/25
100-41-4	Ethylbenzene	2500	2660	106	2630	105	1	70-130/25
87-68-3	Hexachlorobutadiene	2500	2770	111	2830	113	2	70-130/25
591-78-6	2-Hexanone	2500	2710	108	2560	102	6	70-130/25
98-82-8	Isopropylbenzene	2500	2510	100	2490	100	1	70-130/25
99-87-6	p-Isopropyltoluene	2500	2750	110	2730	109	1	70-130/25
1634-04-4	Methyl Tert Butyl Ether	2500	2630	105	2640	106	0	70-130/25
108-10-1	4-Methyl-2-pentanone (MIBK)	2500	2250	90	2260	90	0	70-130/25
74-95-3	Methylene bromide	2500	2600	104	2600	104	0	70-130/25
75-09-2	Methylene chloride	2500	2740	110	2760	110	1	70-130/25
91-20-3	Naphthalene	2500	2650	106	2690	108	1	70-130/25
103-65-1	n-Propylbenzene	2500	2510	100	2480	99	1	70-130/25
100-42-5	Styrene	2500	2580	103	2580	103	0	70-130/25
630-20-6	1,1,1,2-Tetrachloroethane	2500	2670	107	2640	106	1	70-130/25
79-34-5	1,1,2,2-Tetrachloroethane	2500	2640	106	2660	106	1	70-130/25
127-18-4	Tetrachloroethene	2500	2680	107	2640	106	2	70-130/25
108-88-3	Toluene	2500	2630	105	2620	105	0	70-130/25
87-61-6	1,2,3-Trichlorobenzene	2500	2690	108	2690	108	0	70-130/25
120-82-1	1,2,4-Trichlorobenzene	2500	2700	108	2690	108	0	70-130/25
71-55-6	1,1,1-Trichloroethane	2500	2660	106	2660	106	0	70-130/25
79-00-5	1,1,2-Trichloroethane	2500	2670	107	2640	106	1	70-130/25
79-01-6	Trichloroethene	2500	2590	104	2560	102	1	70-130/25
75-69-4	Trichlorofluoromethane	2500	2710	108	2670	107	1	70-130/25
96-18-4	1,2,3-Trichloropropane	2500	2560	102	2570	103	0	70-130/25
95-63-6	1,2,4-Trimethylbenzene	2500	2600	104	2580	103	1	70-130/25
108-67-8	1,3,5-Trimethylbenzene	2500	2600	104	2570	103	1	70-130/25
108-05-4	Vinyl Acetate	2500	2910	116	2970	119	2	70-130/25
75-01-4	Vinyl chloride	2500	2760	110	2800	112	1	70-130/25
	m,p-Xylene	5000	5270	105	5220	104	1	70-130/25
95-47-6	o-Xylene	2500	2580	103	2570	103	0	70-130/25
1330-20-7	Xylene (total)	7500	7850	105	7790	104	1	70-130/25

* = Outside of Control Limits.

6.3.2



Blank Spike/Blank Spike Duplicate Summary

Job Number: MC16999
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4900-BS	G123328.D	1	12/31/12	AMY	n/a	n/a	MSG4900
MSG4900-BSD	G123329.D	1	12/31/12	AMY	n/a	n/a	MSG4900

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16999-9

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
1868-53-7	Dibromofluoromethane	101%	99%	70-130%
2037-26-5	Toluene-D8	95%	94%	70-130%
460-00-4	4-Bromofluorobenzene	91%	91%	70-130%

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

* = Outside of Control Limits.

6.3.2


Blank Spike/Blank Spike Duplicate Summary

Job Number: MC16999
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MST987-BS	T28262.D	1	12/31/12	DFT	n/a	n/a	MST987
MST987-BSD	T28263.D	1	12/31/12	DFT	n/a	n/a	MST987

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16999-5

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	BSD ug/l	BSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	50	36.1	72	36.6	73	1	70-130/25
107-02-8	Acrolein	250	127	51* a	114	46* a	11	70-130/25
107-13-1	Acrylonitrile	50	191	382* b	209	418* b	9	70-130/25
71-43-2	Benzene	50	46.9	94	47.8	96	2	70-130/25
108-86-1	Bromobenzene	50	49.0	98	50.2	100	2	70-130/25
74-97-5	Bromochloromethane	50	40.9	82	42.8	86	5	70-130/25
75-27-4	Bromodichloromethane	50	44.3	89	45.9	92	4	70-130/25
75-25-2	Bromoform	50	45.1	90	47.4	95	5	70-130/25
74-83-9	Bromomethane	50	44.3	89	45.5	91	3	70-130/25
78-93-3	2-Butanone (MEK)	50	39.8	80	41.6	83	4	70-130/25
104-51-8	n-Butylbenzene	50	46.6	93	46.4	93	0	70-130/25
135-98-8	sec-Butylbenzene	50	46.6	93	47.0	94	1	70-130/25
98-06-6	tert-Butylbenzene	50	45.2	90	46.0	92	2	70-130/25
75-15-0	Carbon disulfide	50	41.5	83	42.7	85	3	70-130/25
56-23-5	Carbon tetrachloride	50	44.4	89	45.6	91	3	70-130/25
108-90-7	Chlorobenzene	50	46.0	92	47.7	95	4	70-130/25
75-00-3	Chloroethane	50	39.7	79	42.6	85	7	70-130/25
110-75-8	2-Chloroethyl vinyl ether	50	37.4	75	38.1	76	2	70-130/25
67-66-3	Chloroform	50	39.0	78	39.8	80	2	70-130/25
74-87-3	Chloromethane	50	49.0	98	50.5	101	3	70-130/25
95-49-8	o-Chlorotoluene	50	45.3	91	46.2	92	2	70-130/25
106-43-4	p-Chlorotoluene	50	45.3	91	45.9	92	1	70-130/25
124-48-1	Dibromochloromethane	50	45.1	90	47.7	95	6	70-130/25
95-50-1	1,2-Dichlorobenzene	50	46.5	93	47.3	95	2	70-130/25
541-73-1	1,3-Dichlorobenzene	50	46.2	92	47.0	94	2	70-130/25
106-46-7	1,4-Dichlorobenzene	50	48.6	97	49.4	99	2	70-130/25
75-71-8	Dichlorodifluoromethane	50	56.1	112	57.8	116	3	70-130/25
75-34-3	1,1-Dichloroethane	50	43.5	87	44.6	89	2	70-130/25
107-06-2	1,2-Dichloroethane	50	42.6	85	43.7	87	3	70-130/25
75-35-4	1,1-Dichloroethene	50	43.5	87	44.1	88	1	70-130/25
156-59-2	cis-1,2-Dichloroethene	50	44.1	88	45.6	91	3	70-130/25
156-60-5	trans-1,2-Dichloroethene	50	45.3	91	46.6	93	3	70-130/25
78-87-5	1,2-Dichloropropane	50	41.0	82	42.0	84	2	70-130/25
142-28-9	1,3-Dichloropropane	50	44.3	89	46.2	92	4	70-130/25
594-20-7	2,2-Dichloropropane	50	36.6	73	37.2	74	2	70-130/25
563-58-6	1,1-Dichloropropene	50	45.0	90	45.6	91	1	70-130/25

* = Outside of Control Limits.



Blank Spike/Blank Spike Duplicate Summary

Job Number: MC16999
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MST987-BS	T28262.D	1	12/31/12	DFT	n/a	n/a	MST987
MST987-BSD	T28263.D	1	12/31/12	DFT	n/a	n/a	MST987

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16999-5

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	BSD ug/l	BSD %	RPD	Limits Rec/RPD
10061-01-5	cis-1,3-Dichloropropene	50	42.4	85	43.3	87	2	70-130/25
10061-02-6	trans-1,3-Dichloropropene	50	44.2	88	45.6	91	3	70-130/25
123-91-1	1,4-Dioxane	250	226	90	240	96	6	70-130/25
97-63-2	Ethyl methacrylate	50	44.9	90	46.5	93	4	77-137/25
100-41-4	Ethylbenzene	50	47.7	95	49.4	99	4	70-130/25
87-68-3	Hexachlorobutadiene	50	48.4	97	48.4	97	0	70-130/25
591-78-6	2-Hexanone	50	44.9	90	42.3	85	6	70-130/25
98-82-8	Isopropylbenzene	50	46.3	93	47.1	94	2	70-130/25
99-87-6	p-Isopropyltoluene	50	48.0	96	48.4	97	1	70-130/25
1634-04-4	Methyl Tert Butyl Ether	50	42.2	84	43.5	87	3	70-130/25
108-10-1	4-Methyl-2-pentanone (MIBK)	50	42.3	85	45.0	90	6	70-130/25
74-95-3	Methylene bromide	50	42.6	85	44.8	90	5	70-130/25
75-09-2	Methylene chloride	50	41.4	83	42.5	85	3	70-130/25
91-20-3	Naphthalene	50	49.6	99	51.1	102	3	70-130/25
103-65-1	n-Propylbenzene	50	45.1	90	45.8	92	2	70-130/25
100-42-5	Styrene	50	48.5	97	50.7	101	4	70-130/25
630-20-6	1,1,1,2-Tetrachloroethane	50	48.3	97	49.9	100	3	70-130/25
79-34-5	1,1,2,2-Tetrachloroethane	50	45.7	91	47.0	94	3	70-130/25
127-18-4	Tetrachloroethene	50	48.4	97	50.0	100	3	70-130/25
108-88-3	Tolnene	50	46.8	94	48.0	96	3	70-130/25
87-61-6	1,2,3-Trichlorobenzene	50	49.9	100	51.4	103	3	70-130/25
120-82-1	1,2,4-Trichlorobenzene	50	47.7	95	48.3	97	1	70-130/25
71-55-6	1,1,1-Tricloroethane	50	44.5	89	46.1	92	4	70-130/25
79-00-5	1,1,2-Trichloroethane	50	44.2	88	45.0	90	2	70-130/25
79-01-6	Trichloroethene	50	46.7	93	47.7	95	2	70-130/25
75-69-4	Trichlorofluoromethane	50	41.5	83	42.6	85	3	70-130/25
96-18-4	1,2,3-Trichloropropane	50	42.9	86	44.6	89	4	70-130/25
95-63-6	1,2,4-Trimethylbenzene	50	47.5	95	48.1	96	1	70-130/25
108-67-8	1,3,5-Trimethylbenzene	50	47.2	94	47.6	95	1	70-130/25
108-05-4	Vinyl Acetate	50	40.1	80	41.1	82	2	70-130/25
75-01-4	Vinyl chloride	50	44.2	88	45.6	91	3	70-130/25
	m,p-Xylene	100	95.6	96	99.0	99	3	70-130/25
95-47-6	o-Xylene	50	46.7	93	48.3	97	3	70-130/25
1330-20-7	Xylene (total)	150	142	95	147	98	3	70-130/25

* = Outside of Control Limits.

Blank Spike/Blank Spike Duplicate Summary

Job Number: MC16999
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MST987-BS	T28262.D	1	12/31/12	DFT	n/a	n/a	MST987
MST987-BSD	T28263.D	1	12/31/12	DFT	n/a	n/a	MST987

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16999-5

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
1868-53-7	Dibromofluoromethane	107%	108%	70-130%
2037-26-5	Toluene-D8	120%	119%	70-130%
460-00-4	4-Bromofluorobenzene	116%	114%	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.



Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16999
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16996-3MS	K65934.D	1	12/21/12	GK	n/a	n/a	MSK2166
MC16996-3MSD	K65935.D	1	12/21/12	GK	n/a	n/a	MSK2166
MC16996-3 ^a	K65933.D	1	12/21/12	GK	n/a	n/a	MSK2166

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16999-2, MC16999-3, MC16999-6, MC16999-10, MC16999-11, MC16999-12

CAS No.	Compound	MC16996-3 ug/kg	Spike Q	ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	ND	10800	7310	68* b	7460	69* b	2	70-130/30	
107-13-1	Acrylonitrile	ND	10800	8050	75	7790	72	3	70-130/30	
71-43-2	Benzene	ND	10800	10100	94	10300	96	2	70-130/30	
108-86-1	Bromobenzene	ND	10800	11000	102	11200	104	2	70-130/30	
74-97-5	Bromochloromethane	ND	10800	10200	95	10000	93	2	70-130/30	
75-27-4	Bromodichloromethane	ND	10800	10300	96	10700	99	4	70-130/30	
75-25-2	Bromoform	ND	10800	12200	113	12500	116	2	70-130/30	
74-83-9	Bromomethane	ND	10800	10900	101	10600	99	3	70-130/30	
78-93-3	2-Butanone (MEK)	ND	10800	8600	80	8740	81	2	70-130/30	
104-51-8	n-Butylbenzene	1360	10800	12200	101	12600	104	3	70-130/30	
135-98-8	sec-Butylbenzene	551	10800	12300	109	12900	115	5	70-130/30	
98-06-6	tert-Butylbenzene	ND	10800	12000	112	12500	116	4	70-130/30	
75-15-0	Carbon disulfide	ND	10800	10100	94	10000	93	1	70-130/30	
56-23-5	Carbon tetrachloride	ND	10800	11100	103	11300	105	2	70-130/30	
108-90-7	Chlorobenzene	ND	10800	12100	112	12600	117	4	70-130/30	
75-00-3	Chloroethane	ND	10800	9840	91	9860	92	0	70-130/30	
110-75-8	2-Chloroethyl vinyl ether	ND	10800	6420	60	6610	61	3	10-160/30	
67-66-3	Chloroform	ND	10800	10400	97	10300	96	1	70-130/30	
74-87-3	Chloromethane	ND	10800	13000	121	12900	120	1	70-130/30	
95-49-8	o-Chlorotoluene	ND	10800	11100	103	11500	107	4	70-130/30	
106-43-4	p-Chlorotoluene	ND	10800	11600	108	12000	112	3	70-130/30	
124-48-1	Dibromochloromethane	ND	10800	11900	111	12300	114	3	70-130/30	
95-50-1	1,2-Dichlorobenzene	ND	10800	11500	107	11700	109	2	70-130/30	
541-73-1	1,3-Dichlorobenzene	ND	10800	11600	108	12000	112	3	70-130/30	
106-46-7	1,4-Dichlorobenzene	ND	10800	10800	100	11100	103	3	70-130/30	
75-71-8	Dichlorodifluoromethane	ND	10800	12800	119	12500	116	2	70-130/30	
75-34-3	1,1-Dichloroethane	ND	10800	9870	92	9610	89	3	70-130/30	
107-06-2	1,2-Dichloroethane	ND	10800	10400	97	10600	99	2	70-130/30	
75-35-4	1,1-Dichloroethene	ND	10800	10500	98	10600	99	1	70-130/30	
156-59-2	cis-1,2-Dichloroethene	ND	10800	9790	91	9840	91	1	70-130/30	
156-60-5	trans-1,2-Dichloroethene	ND	10800	9700	90	9600	89	1	70-130/30	
78-87-5	1,2-Dichloropropane	ND	10800	9030	84	9520	88	5	70-130/30	
142-28-9	1,3-Dichloropropane	ND	10800	10500	98	11100	103	6	70-130/30	
594-20-7	2,2-Dichloropropane	ND	10800	9760	91	9570	89	2	70-130/30	
563-58-6	1,1-Dichloropropene	ND	10800	10100	94	10600	99	5	70-130/30	
10061-01-5	cis-1,3-Dichloropropene	ND	10800	9650	90	9900	92	3	70-130/30	

* = Outside of Control Limits.

6.4.1

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16999
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16996-3MS	K65934.D	1	12/21/12	GK	n/a	n/a	MSK2166
MC16996-3MSD	K65935.D	1	12/21/12	GK	n/a	n/a	MSK2166
MC16996-3 ^a	K65933.D	1	12/21/12	GK	n/a	n/a	MSK2166

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16999-2, MC16999-3, MC16999-6, MC16999-10, MC16999-11, MC16999-12

CAS No.	Compound	MC16996-3 ug/kg	Spike Q	ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
10061-02-6	trans-1,3-Dichloropropene	ND	10800	10100	94	10300	96	2	70-130/30	
123-91-1	1,4-Dioxane	ND	53800	44700	83	39800	74	12	70-130/30	
97-63-2	Ethyl methacrylate	ND	10800	10900	101	11100	103	2	41-160/30	
100-41-4	Ethylbenzene	ND	10800	11300	105	11800	110	4	70-130/30	
87-68-3	Hexachlorobutadiene	ND	10800	11900	111	12400	115	4	70-130/30	
591-78-6	2-Hexanone	ND	10800	9500	53* b	9760	55* b	3	70-130/30	
98-82-8	Isopropylbenzene	ND	10800	11700	109	12300	114	5	70-130/30	
99-87-6	p-Isopropyltoluene	131	10800	11700	108	12200	112	4	70-130/30	
1634-04-4	Methyl Tert Butyl Ether	ND	10800	10100	94	9720	90	4	70-130/30	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	10800	16000	149* b	16100	150* b	1	70-130/30	
74-95-3	Methylene bromide	ND	10800	9780	91	10000	93	2	70-130/30	
75-09-2	Methylene chloride	ND	10800	10200	95	10000	93	2	70-130/30	
91-20-3	Naphthalene	342	10800	11200	101	11300	102	1	70-130/30	
103-65-1	n-Propylbenzene	228	10800	11600	106	12000	109	3	70-130/30	
100-42-5	Styrene	ND	10800	10900	101	11400	106	4	70-130/30	
630-20-6	1,1,1,2-Tetrachloroethane	ND	10800	12000	112	12200	113	2	70-130/30	
79-34-5	1,1,2,2-Tetrachloroethane	ND	10800	10800	100	11000	102	2	70-130/30	
127-18-4	Tetrachloroethene	ND	10800	11100	103	11800	110	6	70-130/30	
108-88-3	Toluene	ND	10800	9990	93	10300	96	3	70-130/30	
87-61-6	1,2,3-Trichlorobenzene	ND	10800	10900	101	11300	105	4	70-130/30	
120-82-1	1,2,4-Trichlorobenzene	ND	10800	10700	99	11100	103	4	70-130/30	
71-55-6	1,1,1-Trichloroethane	ND	10800	11000	102	10800	100	2	70-130/30	
79-00-5	1,1,2-Trichloroethane	ND	10800	10500	98	10700	99	2	70-130/30	
79-01-6	Trichloroethene	ND	10800	9980	93	10400	97	4	70-130/30	
75-69-4	Trichlorofluoromethane	ND	10800	11000	102	11100	103	1	70-130/30	
96-18-4	1,2,3-Trichloropropane	ND	10800	9910	92	9980	93	1	70-130/30	
95-63-6	1,2,4-Trimethylbenzene	209	10800	10900	99	11500	105	5	70-130/30	
108-67-8	1,3,5-Trimethylbenzene	ND	10800	10700	99	11200	104	5	70-130/30	
108-05-4	Vinyl Acetate	ND	10800	8330	77	8330	77	0	70-130/30	
75-01-4	Vinyl chloride	ND	10800	16800	156* b	17300	161* b	3	70-130/30	
	m,p-Xylene	ND	21500	23700	110	25000	116	5	70-130/30	
95-47-6	o-Xylene	ND	10800	12400	115	12900	120	4	70-130/30	
1330-20-7	Xylene (total)	ND	32300	36200	112	37800	117	4	70-130/30	

* = Outside of Control Limits.

6.4.1


Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16999
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16996-3MS	K65934.D	1	12/21/12	GK	n/a	n/a	MSK2166
MC16996-3MSD	K65935.D	1	12/21/12	GK	n/a	n/a	MSK2166
MC16996-3 ^a	K65933.D	1	12/21/12	GK	n/a	n/a	MSK2166

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16999-2, MC16999-3, MC16999-6, MC16999-10, MC16999-11, MC16999-12

CAS No.	Surrogate Recoveries	MS	MSD	MC16996-3	Limits
1868-53-7	Dibromofluoromethane	106%	104%	109%	70-130%
2037-26-5	Toluene-D8	99%	102%	100%	70-130%
460-00-4	4-Bromoflnorobenzene	107%	110%	108%	70-130%

- (a) Elevated RL due to sample matrix.
- (b) Outside control limits due to possible matrix interference. Refer to Blank Spike.

6.4.1
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* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16999
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC17145-1MS	G123197.D	1	12/26/12	JM	n/a	n/a	MSG4896
MC17145-1MSD	G123198.D	1	12/26/12	JM	n/a	n/a	MSG4896
MC17145-1	G123196.D	1	12/26/12	JM	n/a	n/a	MSG4896

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16999-2, MC16999-3, MC16999-6, MC16999-10, MC16999-11, MC16999-12

CAS No.	Compound	MC17145-1 ug/kg	Spike Q ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
107-02-8	Acrolein	ND	15700	5450	35* a	5700	36* a	4	70-130/30
71-43-2	Benzene	ND	3130	3150	101	3080	98	2	70-130/30

CAS No.	Surrogate Recoveries	MS	MSD	MC17145-1	Limits
1868-53-7	Dibromofluoromethane	98%	98%	89%	70-130%
2037-26-5	Toluene-D8	95%	91%	87%	70-130%
460-00-4	4-Bromofluorobenzene	89%	86%	82%	70-130%

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

* = Outside of Control Limits.

6.4.2


Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16999
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16999-1MS	M53173.D	1	12/28/12	AMY	n/a	n/a	MSM1806
MC16999-1MSD	M53174.D	1	12/28/12	AMY	n/a	n/a	MSM1806
MC16999-1	M53169.D	1	12/28/12	AMY	n/a	n/a	MSM1806

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16999-1, MC16999-4, MC16999-7

CAS No.	Compound	MC16999-1 ug/kg	Spike Q	ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	ND		81	67.0	83	71.5	85	6	70-130/30
107-02-8	Acrolein	ND		405	369	91	331	79	11	70-130/30
107-13-1	Acrylonitrile	ND		81	74.6	92	76.6	91	3	70-130/30
71-43-2	Benzene	0.49	J	81	75.1	92	81.2	96	8	70-130/30
108-86-1	Bromobenzene	ND		81	67.3	83	71.0	85	5	70-130/30
74-97-5	Bromochloromethane	ND		81	74.0	91	78.2	93	6	70-130/30
75-27-4	Bromodichloromethane	ND		81	73.6	91	77.7	93	5	70-130/30
75-25-2	Bromoform	ND		81	70.6	87	71.4	85	1	70-130/30
74-83-9	Bromomethane	ND		81	87.3	108	92.5	110	6	70-130/30
78-93-3	2-Butanone (MEK)	ND		81	57.3	71	81.6	97	35* a	70-130/30
104-51-8	n-Butylbenzene	ND		81	61.9	76	82.6	99	29	70-130/30
135-98-8	sec-Butylbenzene	ND		81	60.2	74	79.1	94	27	70-130/30
98-06-6	tert-Butylbenzene	ND		81	60.4	75	77.3	92	25	70-130/30
75-15-0	Carbon disulfide	ND		81	93.6	116	101	121	8	70-130/30
56-23-5	Carbon tetrachloride	ND		81	84.1	104	93.2	111	10	70-130/30
108-90-7	Chlorobenzene	ND		81	67.5	83	73.3	88	8	70-130/30
75-00-3	Chloroethane	ND		81	89.2	110	96.8	116	8	70-130/30
110-75-8	2-Chloroethyl vinyl ether	ND		81	63.0	78	70.8	85	12	10-160/30
67-66-3	Chloroform	ND		81	75.3	93	80.7	96	7	70-130/30
74-87-3	Chloromethane	ND		81	101	125	112	134* b	10	70-130/30
95-49-8	o-Chlorotoluene	ND		81	62.0	77	71.2	85	14	70-130/30
106-43-4	p-Chlorotoluene	ND		81	64.0	79	73.0	87	13	70-130/30
124-48-1	Dibromochloromethane	ND		81	71.0	88	73.9	88	4	70-130/30
95-50-1	1,2-Dichlorobenzene	ND		81	57.4	71	64.0	76	11	70-130/30
541-73-1	1,3-Dichlorobenzene	ND		81	60.0	74	69.0	82	14	70-130/30
106-46-7	1,4-Dichlorobenzene	ND		81	61.8	76	70.0	84	12	70-130/30
75-71-8	Dichlorodifluoromethane	ND		81	121	149* b	132	158* b	9	70-130/30
75-34-3	1,1-Dichloroethane	ND		81	78.3	97	84.2	101	7	70-130/30
107-06-2	1,2-Dichloroethane	ND		81	72.9	90	76.1	91	4	70-130/30
75-35-4	1,1-Dichloroethene	ND		81	91.5	113	99.3	119	8	70-130/30
156-59-2	cis-1,2-Dichloroethene	ND		81	73.7	91	78.8	94	7	70-130/30
156-60-5	trans-1,2-Dichloroethene	ND		81	81.0	100	88.4	106	9	70-130/30
78-87-5	1,2-Dichloropropane	ND		81	70.4	87	73.9	88	5	70-130/30
142-28-9	1,3-Dichloropropane	ND		81	69.5	86	72.8	87	5	70-130/30
594-20-7	2,2-Dichloropropane	ND		81	83.8	103	91.7	109	9	70-130/30
563-58-6	1,1-Dichloropropene	ND		81	83.7	103	92.8	111	10	70-130/30

* = Outside of Control Limits.

6.4.3

6

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16999
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16999-1MS	M53173.D	1	12/28/12	AMY	n/a	n/a	MSM1806
MC16999-1MSD	M53174.D	1	12/28/12	AMY	n/a	n/a	MSM1806
MC16999-1	M53169.D	1	12/28/12	AMY	n/a	n/a	MSM1806

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16999-1, MC16999-4, MC16999-7

CAS No.	Compound	MC16999-1 ug/kg	Spike Q	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
10061-01-5	cis-1,3-Dichloropropene	ND	81	69.4	86	73.5	88	6	70-130/30
10061-02-6	trans-1,3-Dichloropropene	ND	81	76.0	94	78.3	93	3	70-130/30
123-91-1	1,4-Dioxane	ND	405	410	101	409	98	0	70-130/30
97-63-2	Ethyl methacrylate	ND	81	75.8	94	76.4	91	1	41-160/30
100-41-4	Ethylbenzene	ND	81	72.7	90	82.8	99	13	70-130/30
87-68-3	Hexachlorobutadiene	ND	81	56.7	70	83.0	99	38* a	70-130/30
591-78-6	2-Hexanone	ND	81	84.2	104	79.1	94	6	70-130/30
98-82-8	Isopropylbenzene	ND	81	65.4	81	78.1	93	18	70-130/30
99-87-6	p-Isopropyltoluene	ND	81	65.3	81	86.1	103	27	70-130/30
1634-04-4	Methyl Tert Butyl Ether	ND	81	69.7	86	75.1	90	7	70-130/30
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	81	81.5	101	82.4	98	1	70-130/30
74-95-3	Methylene bromide	ND	81	74.8	92	76.5	91	2	70-130/30
75-09-2	Methylene chloride	ND	81	69.8	86	74.3	89	6	70-130/30
91-20-3	Naphthalene	ND	81	52.7	65* b	59.5	71	12	70-130/30
103-65-1	n-Propylbenzene	ND	81	63.8	79	77.7	93	20	70-130/30
100-42-5	Styrene	ND	81	66.8	82	72.1	86	8	70-130/30
630-20-6	1,1,1,2-Tetrachloroethane	ND	81	70.5	87	75.9	91	7	70-130/30
79-34-5	1,1,2,2-Tetrachloroethane	ND	81	73.0	90	72.2	86	1	70-130/30
127-18-4	Tetrachloroethene	ND	81	80.1	99	92.1	110	14	70-130/30
108-88-3	Toluene	ND	81	78.4	97	84.5	101	7	70-130/30
87-61-6	1,2,3-Trichlorobenzene	ND	81	47.4	59* b	60.5	72	24	70-130/30
120-82-1	1,2,4-Trichlorobenzene	ND	81	51.9	64* b	66.5	79	25	70-130/30
71-55-6	1,1,1-Trichloroethane	ND	81	82.5	102	89.9	107	9	70-130/30
79-00-5	1,1,2-Trichloroethane	ND	81	71.5	88	73.5	88	3	70-130/30
79-01-6	Trichloroethene	ND	81	79.5	98	87.1	104	9	70-130/30
75-69-4	Trichlorofluoromethane	ND	81	96.6	119	107	128	10	70-130/30
96-18-4	1,2,3-Trichloropropane	ND	81	75.8	94	74.1	88	2	70-130/30
95-63-6	1,2,4-Trimethylbenzene	ND	81	63.5	78	77.5	93	20	70-130/30
108-67-8	1,3,5-Trimethylbenzene	ND	81	63.5	78	78.2	93	21	70-130/30
108-05-4	Vinyl Acetate	ND	81	89.0	110	84.7	101	5	70-130/30
75-01-4	Vinyl chloride	ND	81	91.3	113	101	121	10	70-130/30
	m,p-Xylene	ND	162	142	88	163	97	14	70-130/30
95-47-6	o-Xylene	ND	81	67.9	84	76.9	92	12	70-130/30
1330-20-7	Xylene (total)	ND	243	210	86	240	96	13	70-130/30

* = Outside of Control Limits.

6.4.3



Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16999
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC16999-1MS	M53173.D	1	12/28/12	AMY	n/a	n/a	MSM1806
MC16999-1MSD	M53174.D	1	12/28/12	AMY	n/a	n/a	MSM1806
MC16999-1	M53169.D	1	12/28/12	AMY	n/a	n/a	MSM1806

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16999-1, MC16999-4, MC16999-7

CAS No.	Surrogate Recoveries	MS	MSD	MC16999-1	Limits
1868-53-7	Dibromofluoromethane	86%	86%	88%	70-130%
2037-26-5	Tolnene-D8	89%	89%	88%	70-130%
460-00-4	4-Bromofluorobenzene	83%	81%	82%	70-130%

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

6.4.3



* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16999
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC17098-24MS	G123345.D	1	12/31/12	AMY	n/a	n/a	MSG4900
MC17098-24MSD	G123346.D	1	12/31/12	AMY	n/a	n/a	MSG4900
MC17098-24	G123337.D	1	12/31/12	AMY	n/a	n/a	MSG4900

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16999-9

CAS No.	Compound	MC17098-24 Spike		MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
		ug/kg	Q ug/kg						
67-64-1	Acetone	ND	3450	6940	201* a	7180	208* a	3	70-130/30
107-02-8	Acrolein	ND	17300	11100	64* a	11700	68* a	5	70-130/30
107-13-1	Acrylonitrile	ND	3450	3380	98	3390	98	0	70-130/30
71-43-2	Benzene	ND	3450	3410	99	3270	95	4	70-130/30
108-86-1	Bromobenzene	ND	3450	3580	104	3460	100	3	70-130/30
74-97-5	Bromochloromethane	ND	3450	3680	107	3610	105	2	70-130/30
75-27-4	Bromodichloromethane	ND	3450	3660	106	3520	102	4	70-130/30
75-25-2	Bromoform	ND	3450	3390	98	3430	99	1	70-130/30
74-83-9	Bromomethane	ND	3450	3530	102	3440	100	3	70-130/30
78-93-3	2-Butanone (MEK)	ND	3450	5630	163* a	5350	155* a	5	70-130/30
104-51-8	n-Butylbenzene	ND	3450	3270	95	3200	93	2	70-130/30
135-98-8	sec-Butylbenzene	ND	3450	3190	92	3070	89	4	70-130/30
98-06-6	tert-Butylbenzene	ND	3450	3220	93	3100	90	4	70-130/30
75-15-0	Carbon disulfide	ND	3450	3300	96	3210	93	3	70-130/30
56-23-5	Carbon tetrachloride	ND	3450	3240	94	3060	89	6	70-130/30
108-90-7	Chlorobenzene	ND	3450	3460	100	3380	98	2	70-130/30
75-00-3	Chloroethane	ND	3450	3330	96	3260	94	2	70-130/30
110-75-8	2-Chloroethyl vinyl ether	ND	3450	2750	80	2710	78	1	10-160/30
67-66-3	Chloroform	ND	3450	3550	103	3450	100	3	70-130/30
74-87-3	Chloromethane	ND	3450	4020	116	3850	112	4	70-130/30
95-49-8	o-Chlorotoluene	ND	3450	3230	94	3090	89	4	70-130/30
106-43-4	p-Chlorotoluene	ND	3450	3440	100	3290	95	4	70-130/30
124-48-1	Dibromochloromethane	ND	3450	3660	106	3620	105	1	70-130/30
95-50-1	1,2-Dichlorobenzene	ND	3450	3430	99	3350	97	2	70-130/30
541-73-1	1,3-Dichlorobenzene	ND	3450	3390	98	3320	96	2	70-130/30
106-46-7	1,4-Dichlorobenzene	ND	3450	3600	104	3500	101	3	70-130/30
75-71-8	Dichlorodifluoromethane	ND	3450	4190	121	3880	112	8	70-130/30
75-34-3	1,1-Dichloroethane	ND	3450	3540	103	3430	99	3	70-130/30
107-06-2	1,2-Dichloroethane	ND	3450	3630	105	3540	103	3	70-130/30
75-35-4	1,1-Dichloroethene	ND	3450	3540	103	3440	100	3	70-130/30
156-59-2	cis-1,2-Dichloroethene	ND	3450	3490	101	3410	99	2	70-130/30
156-60-5	trans-1,2-Dichloroethene	ND	3450	3480	101	3370	98	3	70-130/30
78-87-5	1,2-Dichloropropane	ND	3450	3470	101	3410	99	2	70-130/30
142-28-9	1,3-Dichloropropane	ND	3450	3520	102	3470	101	1	70-130/30
594-20-7	2,2-Dichloropropane	ND	3450	3440	100	3330	96	3	70-130/30
563-58-6	1,1-Dichloropropene	ND	3450	3280	95	3170	92	3	70-130/30

* = Outside of Control Limits.



Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16999
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC17098-24MS	G123345.D	1	12/31/12	AMY	n/a	n/a	MSG4900
MC17098-24MSD	G123346.D	1	12/31/12	AMY	n/a	n/a	MSG4900
MC17098-24	G123337.D	1	12/31/12	AMY	n/a	n/a	MSG4900

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16999-9

CAS No.	Compound	MC17098-24 Spike		MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
		ug/kg	Q ug/kg						
10061-01-5	cis-1,3-Dichloropropene	ND	3450	3510	102	3420	99	3	70-130/30
10061-02-6	trans-1,3-Dichloropropene	ND	3450	3770	109	3690	107	2	70-130/30
123-91-1	1,4-Dioxane	ND	17300	9950	58* a	13800	80	32* b	70-130/30
97-63-2	Ethyl methacrylate	ND	3450	3550	103	3510	102	1	41-160/30
100-41-4	Ethylbenzene	ND	3450	3470	101	3370	98	3	70-130/30
87-68-3	Hexachlorobutadiene	ND	3450	3290	95	3230	94	2	70-130/30
591-78-6	2-Hexanone	ND	3450	5660	164* a	5540	160* a	2	70-130/30
98-82-8	Isopropylbenzene	ND	3450	3230	94	3060	89	5	70-130/30
99-87-6	p-Isopropyltoluene	ND	3450	3530	102	3350	97	5	70-130/30
1634-04-4	Methyl Tert Butyl Ether	ND	3450	3700	107	3610	105	2	70-130/30
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	3450	3340	97	3300	96	1	70-130/30
74-95-3	Methylene bromide	ND	3450	3590	104	3530	102	2	70-130/30
75-09-2	Methylene chloride	ND	3450	3600	104	3590	104	0	70-130/30
91-20-3	Naphthalene	ND	3450	3660	106	3670	106	0	70-130/30
103-65-1	n-Propylbenzene	ND	3450	3200	93	3050	88	5	70-130/30
100-42-5	Styrene	ND	3450	3440	100	3360	97	2	70-130/30
630-20-6	1,1,1,2-Tetrachloroethane	ND	3450	3540	103	3420	99	3	70-130/30
79-34-5	1,1,2,2-Tetrachloroethane	ND	3450	3630	105	3550	103	2	70-130/30
127-18-4	Tetrachloroethene	ND	3450	3360	97	3310	96	1	70-130/30
108-88-3	Toluene	ND	3450	3500	101	3350	97	4	70-130/30
87-61-6	1,2,3-Trichlorobenzene	ND	3450	3510	102	3490	101	1	70-130/30
120-82-1	1,2,4-Trichlorobenzene	ND	3450	3460	100	3380	98	2	70-130/30
71-55-6	1,1,1-Trichloroethane	ND	3450	3220	93	3070	89	5	70-130/30
79-00-5	1,1,2-Trichloroethane	ND	3450	3590	104	3560	103	1	70-130/30
79-01-6	Trichloroethene	ND	3450	3440	100	3280	95	5	70-130/30
75-69-4	Trichlorofluoromethane	ND	3450	3350	97	3220	93	4	70-130/30
96-18-4	1,2,3-Trichloropropane	ND	3450	3630	105	3540	103	3	70-130/30
95-63-6	1,2,4-Trimethylbenzene	35.9	3450	3340	96	3220	92	4	70-130/30
108-67-8	1,3,5-Trimethylbenzene	ND	3450	3320	96	3200	93	4	70-130/30
108-05-4	Vinyl Acetate	ND	3450	3530	102	3300	96	7	70-130/30
75-01-4	Vinyl chloride	ND	3450	2250	65* a	2330	67* a	3	70-130/30
	m,p-Xylene	ND	6910	6850	99	6700	97	2	70-130/30
95-47-6	o-Xylene	ND	3450	3450	100	3330	96	4	70-130/30
1330-20-7	Xylene (total)	ND	10400	10300	99	10000	97	3	70-130/30

* = Outside of Control Limits.



Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16999
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC17098-24MS	G123345.D	1	12/31/12	AMY	n/a	n/a	MSG4900
MC17098-24MSD	G123346.D	1	12/31/12	AMY	n/a	n/a	MSG4900
MC17098-24	G123337.D	1	12/31/12	AMY	n/a	n/a	MSG4900

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16999-9

6.4.4


CAS No.	Surrogate Recoveries	MS	MSD	MC17098-24	Limits
1868-53-7	Dibromofluoromethane	93%	92%	90%	70-130%
2037-26-5	Toluene-D8	82%	81%	83%	70-130%
460-00-4	4-Bromofluorobenzene	87%	83%	87%	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

Job Number: MC16999
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC17058-17MS	T28268.D	5	01/01/13	DFT	n/a	n/a	MST987
MC17058-17MSD	T28269.D	5	01/01/13	DFT	n/a	n/a	MST987
MC17058-17	T28267.D	1	01/01/13	DFT	n/a	n/a	MST987

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16999-5

CAS No.	Compound	MC17058-17 Spike		MS	MS	MSD	MSD	RPD	Limits
		ug/l	Q ug/l	ug/l	%	ug/l	%		Rec/RPD
67-64-1	Acetone	ND	250	213	85	219	88	3	70-130/30
107-02-8	Acrolein	ND	1250	998	80	994	80	0	70-130/30
107-13-1	Acrylonitrile	ND	250	1090	436* a	1110	444* a	2	70-130/30
71-43-2	Benzene	ND	250	238	95	246	98	3	70-130/30
108-86-1	Bromobenzene	ND	250	247	99	254	102	3	70-130/30
74-97-5	Bromochloromethane	ND	250	211	84	219	88	4	70-130/30
75-27-4	Bromodichloromethane	ND	250	223	89	231	92	4	70-130/30
75-25-2	Bromoform	ND	250	224	90	233	93	4	70-130/30
74-83-9	Bromomethane	ND	250	216	86	224	90	4	70-130/30
78-93-3	2-Butanone (MEK)	ND	250	220	88	218	87	1	70-130/30
104-51-8	n-Butylbenzene	ND	250	227	91	241	96	6	70-130/30
135-98-8	sec-Butylbenzene	ND	250	239	96	251	100	5	70-130/30
98-06-6	tert-Butylbenzene	ND	250	235	94	246	98	5	70-130/30
75-15-0	Carbon disulfide	ND	250	168	67* b	177	71	5	70-130/30
56-23-5	Carbon tetrachloride	ND	250	222	89	232	93	4	70-130/30
108-90-7	Chlorobenzene	ND	250	248	99	254	102	2	70-130/30
75-00-3	Chloroethane	ND	250	192	77	211	84	9	70-130/30
110-75-8	2-Chloroethyl vinyl ether	ND	250	8.2	3* b	10.7	4* b	26	70-130/30
67-66-3	Chloroform	ND	250	199	80	205	82	3	70-130/30
74-87-3	Chloromethane	ND	250	190	76	203	81	7	70-130/30
95-49-8	o-Chlorotoluene	ND	250	239	96	251	100	5	70-130/30
106-43-4	p-Chlorotoluene	ND	250	230	92	243	97	5	70-130/30
124-48-1	Dibromochloromethane	ND	250	220	88	228	91	4	70-130/30
95-50-1	1,2-Dichlorobenzene	ND	250	244	98	253	101	4	70-130/30
541-73-1	1,3-Dichlorobenzene	ND	250	242	97	251	100	4	70-130/30
106-46-7	1,4-Dichlorobenzene	ND	250	239	96	250	100	4	70-130/30
75-71-8	Dichlorodifluoromethane	ND	250	170	68* b	178	71	5	70-130/30
75-34-3	1,1-Dichloroethane	ND	250	216	86	223	89	3	70-130/30
107-06-2	1,2-Dichloroethane	ND	250	221	88	229	92	4	70-130/30
75-35-4	1,1-Dichloroethene	ND	250	206	82	216	86	5	70-130/30
156-59-2	cis-1,2-Dichloroethene	2.9	250	231	91	238	94	3	70-130/30
156-60-5	trans-1,2-Dichloroethene	ND	250	227	91	237	95	4	70-130/30
78-87-5	1,2-Dichloropropane	ND	250	211	84	216	86	2	70-130/30
142-28-9	1,3-Dichloropropane	ND	250	231	92	236	94	2	70-130/30
594-20-7	2,2-Dichloropropane	ND	250	185	74	190	76	3	70-130/30
563-58-6	1,1-Dichloropropene	ND	250	223	89	234	94	5	70-130/30

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16999
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC17058-17MS	T28268.D	5	01/01/13	DFT	n/a	n/a	MST987
MC17058-17MSD	T28269.D	5	01/01/13	DFT	n/a	n/a	MST987
MC17058-17	T28267.D	1	01/01/13	DFT	n/a	n/a	MST987

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16999-5

CAS No.	Compound	MC17058-17 Spike		MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
		ug/l	Q ug/l						
10061-01-5	cis-1,3-Dichloropropene	ND	250	219	88	226	90	3	70-130/30
10061-02-6	trans-1,3-Dichloropropene	ND	250	215	86	222	89	3	70-130/30
123-91-1	1,4-Dioxane	ND	1250	1080	86	1090	87	1	70-130/30
97-63-2	Ethyl methacrylate	ND	250	234	94	239	96	2	72-139/30
100-41-4	Ethylbenzene	ND	250	246	98	253	101	3	70-130/30
87-68-3	Hexachlorobutadiene	ND	250	216	86	240	96	11	70-130/30
591-78-6	2-Hexanone	ND	250	227	91	243	97	7	70-130/30
98-82-8	Isopropylbenzene	ND	250	240	96	251	100	4	70-130/30
99-87-6	p-Isopropyltoluene	ND	250	226	90	239	96	6	70-130/30
1634-04-4	Methyl Tert Butyl Ether	ND	250	223	89	227	91	2	70-130/30
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	250	233	93	244	98	5	70-130/30
74-95-3	Methylene bromide	ND	250	224	90	230	92	3	70-130/30
75-09-2	Methylene chloride	ND	250	209	84	214	86	2	70-130/30
91-20-3	Naphthalene	ND	250	230	92	265	106	14	70-130/30
103-65-1	n-Propylbenzene	ND	250	235	94	248	99	5	70-130/30
100-42-5	Styrene	ND	250	255	102	265	106	4	70-130/30
630-20-6	1,1,1,2-Tetrachloroethane	ND	250	246	98	251	100	2	70-130/30
79-34-5	1,1,2,2-Tetrachloroethane	ND	250	231	92	240	96	4	70-130/30
127-18-4	Tetrachloroethene	4.4	250	248	97	258	101	4	70-130/30
108-88-3	Toluene	ND	250	238	95	246	98	3	70-130/30
87-61-6	1,2,3-Trichlorobenzene	ND	250	228	91	264	106	15	70-130/30
120-82-1	1,2,4-Trichlorobenzene	ND	250	225	90	248	99	10	70-130/30
71-55-6	1,1,1-Trichloroethane	ND	250	224	90	236	94	5	70-130/30
79-00-5	1,1,2-Trichloroethane	ND	250	232	93	236	94	2	70-130/30
79-01-6	Trichloroethene	43.6	250	276	93	291	99	5	70-130/30
75-69-4	Trichlorofluoromethane	ND	250	202	81	212	85	5	70-130/30
96-18-4	1,2,3-Trichloropropane	ND	250	216	86	225	90	4	70-130/30
95-63-6	1,2,4-Trimethylbenzene	ND	250	242	97	254	102	5	70-130/30
108-67-8	1,3,5-Trimethylbenzene	ND	250	240	96	251	100	4	70-130/30
108-05-4	Vinyl Acetate	ND	250	207	83	213	85	3	70-130/30
75-01-4	Vinyl chloride	ND	250	217	87	226	90	4	70-130/30
	m,p-Xylene	ND	500	503	101	518	104	3	70-130/30
95-47-6	o-Xylene	ND	250	250	100	258	103	3	70-130/30
1330-20-7	Xylene (total)	ND	750	753	100	775	103	3	70-130/30

* = Outside of Control Limits.



Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16999
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC17058-17MS	T28268.D	5	01/01/13	DFT	n/a	n/a	MST987
MC17058-17MSD	T28269.D	5	01/01/13	DFT	n/a	n/a	MST987
MC17058-17	T28267.D	1	01/01/13	DFT	n/a	n/a	MST987

The QC reported here applies to the following samples:

Method: SW846 8260B

MC16999-5

CAS No.	Surrogate Recoveries	MS	MSD	MC17058-17Limits
1868-53-7	Dibromofluoromethane	107%	106%	104% 70-130%
2037-26-5	Toluene-D8	120%	120%	121% 70-130%
460-00-4	4-Bromofluorobenzene	113%	115%	114% 70-130%

- (a) Outside control limits. Associated samples are non-detect for this compound.
- (b) Outside control limits due to possible matrix interference. Refer to Blank Spike.

* = Outside of Control Limits.

6.4.5


Volatile Internal Standard Area Summary

Job Number: MC16999
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	MSG4896-CC4894	Injection Date:	12/26/12
Lab File ID:	G123182.D	Injection Time:	08:58
Instrument ID:	GCMSC	Method:	SW846 8260B

	IS 1	RT	IS 2	RT	IS 3	RT	IS 4	RT	IS 5	RT
	AREA		AREA		AREA		AREA		AREA	
Check Std	196382	5.13	268051	6.27	130303	9.62	136210	12.25	53108	3.10
Upper Limit ^a	392764	5.63	536102	6.77	260606	10.12	272420	12.75	106216	3.60
Lower Limit ^b	98191	4.63	134026	5.77	65152	9.12	68105	11.75	26554	2.60

Lab	IS 1	RT	IS 2	RT	IS 3	RT	IS 4	RT	IS 5	RT
Sample ID	AREA		AREA		AREA		AREA		AREA	
MSG4896-BS	196915	5.13	272056	6.27	134789	9.62	142300	12.25	52111	3.10
MSG4896-MB	196304	5.13	264302	6.27	132871	9.62	135986	12.25	48586	3.10
MC16999-2	194846	5.13	264169	6.27	133807	9.62	133245	12.25	43949	3.10
MC16999-3	198935	5.13	271316	6.27	141634	9.63	139349	12.25	43848	3.10
MC16999-6	201784	5.13	278498	6.27	161618	9.63	143022	12.25	46970	3.09
MC16999-11	207854	5.13	285154	6.27	155202	9.63	147928	12.25	47654	3.09
MC16999-10	206994	5.13	284865	6.27	138705	9.62	139111	12.25	48015	3.09
MC17145-1	202534	5.13	274281	6.27	134807	9.62	138666	12.25	46563	3.10
MC17145-1MS	200478	5.13	271959	6.27	136482	9.62	142079	12.25	45801	3.10
MC17145-1MSD	200589	5.13	274164	6.27	134559	9.62	143783	12.25	48055	3.10
ZZZZZ	198613	5.13	270199	6.27	133714	9.62	136506	12.25	43526	3.10
ZZZZZ	200786	5.13	271545	6.27	135073	9.62	136843	12.25	47086	3.10
ZZZZZ	199342	5.13	269106	6.27	134875	9.62	135254	12.25	44472	3.10
ZZZZZ	199995	5.13	268546	6.27	133295	9.62	135150	12.25	47611	3.10
ZZZZZ	198998	5.13	270002	6.27	133962	9.62	137371	12.25	44805	3.10
MC16999-12	207056	5.13	282813	6.27	139063	9.62	137288	12.25	48962	3.09

- 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.

6.5.1


Volatile Internal Standard Area Summary

Job Number: MC16999
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	MSG4900-CC4894	Injection Date:	12/31/12
Lab File ID:	G123328.D	Injection Time:	10:33
Instrument ID:	GCMSC	Method:	SW846 8260B

	IS 1	RT	IS 2	RT	IS 3	RT	IS 4	RT	IS 5	RT
	AREA		AREA		AREA		AREA		AREA	
Check Std	213181	5.13	290699	6.27	143115	9.62	148665	12.25	40413	3.10
Upper Limit ^a	426362	5.63	581398	6.77	286230	10.12	297330	12.75	80826	3.60
Lower Limit ^b	106591	4.63	145350	5.77	71558	9.12	74333	11.75	20207	2.60

Lab	IS 1	RT	IS 2	RT	IS 3	RT	IS 4	RT	IS 5	RT
Sample ID	AREA		AREA		AREA		AREA		AREA	
MSG4900-BS	213181	5.13	290699	6.27	143115	9.62	148665	12.25	40413	3.10
MSG4900-BSD	207210	5.13	284536	6.27	140865	9.62	146846	12.25	39777	3.10
MSG4900-MB	203671	5.13	280929	6.27	138154	9.62	136865	12.25	36576	3.10
ZZZZZZ	205188	5.13	281630	6.27	139519	9.62	144044	12.25	41274	3.10
MC16999-9	211127	5.13	292179	6.27	141213	9.62	141176	12.25	35477	3.09
ZZZZZZ	210255	5.13	300707	6.27	180917	9.63	158460	12.25	30901	3.09
MC17098-24	210411	5.13	287215	6.27	139956	9.62	141781	12.25	29876	3.09
ZZZZZZ	209836	5.13	290836	6.27	144417	9.62	147392	12.25	28961	3.09
ZZZZZZ	210113	5.13	285991	6.27	140202	9.62	141518	12.25	32765	3.09
ZZZZZZ	206303	5.13	280862	6.27	139489	9.62	143315	12.25	36438	3.09
ZZZZZZ	202290	5.13	274747	6.27	136314	9.62	140563	12.25	36843	3.10
ZZZZZZ	207157	5.13	282318	6.27	142210	9.62	143271	12.25	35577	3.09
ZZZZZZ	206878	5.13	281199	6.27	146869	9.63	153174	12.26	36677	3.09
ZZZZZZ	206884	5.13	281365	6.27	141564	9.62	140931	12.25	38188	3.09
MC17098-24MS	207099	5.13	282078	6.27	140365	9.62	146733	12.25	38591	3.09
MC17098-24MSD	207963	5.13	284320	6.27	140410	9.62	150079	12.25	38477	3.09

- 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.

6.5.2

Volatile Internal Standard Area Summary

Job Number: MC16999
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	MSK2166-CC2132	Injection Date:	12/21/12
Lab File ID:	K65917.D	Injection Time:	09:31
Instrument ID:	GCMSK	Method:	SW846 8260B

	IS 1	RT	IS 2	RT	IS 3	RT	IS 4	RT	IS 5	RT
	AREA		AREA		AREA		AREA		AREA	
Check Std	126267	8.82	196197	9.67	93091	12.93	95974	15.49	28934	6.42
Upper Limit ^a	252534	9.32	392394	10.17	186182	13.43	191948	15.99	57868	6.92
Lower Limit ^b	63134	8.32	98099	9.17	46546	12.43	47987	14.99	14467	5.92

Lab Sample ID	IS 1	RT	IS 2	RT	IS 3	RT	IS 4	RT	IS 5	RT
	AREA		AREA		AREA		AREA		AREA	
MSK2166-BS	122897	8.82	190867	9.67	91205	12.93	95387	15.49	28316	6.42
MSK2166-BSD	122955	8.82	191701	9.67	90439	12.93	99353	15.49	27783	6.43
MSK2166-MB	121587	8.82	193471	9.67	86756	12.93	101100	15.49	26332	6.43
ZZZZZZ	123092	8.82	193325	9.67	80880	12.93	99359	15.49	25508	6.43
ZZZZZZ	119733	8.82	192604	9.67	82823	12.93	103611	15.49	22212	6.42
ZZZZZZ	119556	8.82	191488	9.67	79865	12.93	99104	15.49	21136	6.41
ZZZZZZ	118368	8.82	185189	9.67	79560	12.93	97293	15.49	21243	6.42
ZZZZZZ	115157	8.82	182900	9.67	77982	12.93	97961	15.49	18881	6.41
ZZZZZZ	113891	8.82	182059	9.67	76227	12.93	94855	15.49	23247	6.41
ZZZZZZ	115000	8.82	180748	9.67	75635	12.93	94050	15.49	21670	6.42
ZZZZZZ	116667	8.82	184775	9.67	80846	12.93	98692	15.49	22853	6.44
ZZZZZZ	119975	8.82	188128	9.67	83501	12.93	95615	15.49	24369	6.42
ZZZZZZ	115302	8.82	184839	9.67	80202	12.93	97527	15.49	25020	6.41
MC16996-3	123013	8.82	191711	9.67	82887	12.93	100131	15.49	21960	6.41
MC16996-3MS	118908	8.82	188308	9.67	85159	12.93	99900	15.49	21305	6.41
MC16996-3MSD	127041	8.82	192321	9.67	85671	12.93	101509	15.49	22268	6.42
ZZZZZZ	132236	8.82	201147	9.67	82771	12.93	102076	15.49	20361	6.41
MC16999-2	125603	8.82	197970	9.67	90222	12.93	106229	15.49	22654	6.41
MC16999-3	129683	8.82	197287	9.67	90051	12.93	103404	15.49	21396	6.42
MC16999-12	133195	8.82	184188	9.67	88610	12.93	103931	15.49	25499	6.42
MC16999-6	131536	8.82	198400	9.67	88417	12.93	103841	15.49	26747	6.41
MC16999-11	128911	8.82	194873	9.67	90859	12.93	106262	15.49	26800	6.41
MC16999-10	135568	8.82	196748	9.67	93546	12.93	109272	15.49	24487	6.40

- 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.

6.5.3
6

Volatile Internal Standard Area Summary

Job Number: MC16999
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	MSM1806-CC1800	Injection Date:	12/28/12
Lab File ID:	M53163.D	Injection Time:	11:22
Instrument ID:	GCMSM	Method:	SW846 8260B

	IS 1	RT	IS 2	RT	IS 3	RT	IS 4	RT	IS 5	RT
	AREA		AREA		AREA		AREA		AREA	
Check Std	173299	9.36	235211	10.24	117006	13.52	132416	16.08	39437	6.87
Upper Limit ^a	346598	9.86	470422	10.74	234012	14.02	264832	16.58	78874	7.37
Lower Limit ^b	86650	8.86	117606	9.74	58503	13.02	66208	15.58	19719	6.37

Lab Sample ID	IS 1	RT	IS 2	RT	IS 3	RT	IS 4	RT	IS 5	RT
	AREA		AREA		AREA		AREA		AREA	
MSM1806-BS	163710	9.36	224497	10.24	112617	13.52	132252	16.08	81702 ^c	6.86
MSM1805-BS1	163710	9.36	224497	10.24	112617	13.52	132252	16.08	81702 ^c	6.86
MSM1805-MB1	172436	9.36	232442	10.24	111084	13.52	135750	16.08	35961	6.86
MSM1806-MB	172436	9.36	232442	10.24	111084	13.52	135750	16.08	35961	6.86
MC17156-6MSD	168026	9.36	228465	10.24	115455	13.52	132327	16.08	83142 ^c	6.85
MC16999-1	167958	9.36	231649	10.24	113379	13.52	135295	16.08	57519	6.86
MC16999-4	173461	9.36	240025	10.24	117213	13.52	136771	16.08	63208	6.86
MC16999-7	173436	9.36	237714	10.24	114587	13.52	137263	16.08	69045	6.86
ZZZZZZ	176636	9.36	237205	10.24	116669	13.52	133355	16.08	56739	6.86
MC16999-1MS	170605	9.36	236104	10.24	118568	13.52	136432	16.08	82307 ^c	6.86
MC16999-1MSD	169923	9.36	236090	10.24	118380	13.52	138227	16.08	84603 ^c	6.85
ZZZZZZ	173399	9.36	240001	10.24	117301	13.52	143276	16.08	81175 ^c	6.86
ZZZZZZ	176917	9.36	241780	10.24	119429	13.52	144025	16.08	72631	6.86
ZZZZZZ	178397	9.36	244621	10.24	120908	13.52	143132	16.08	67801	6.86
ZZZZZZ	177909	9.36	241965	10.24	116211	13.52	139479	16.08	40154	6.86
ZZZZZZ	180126	9.36	242757	10.24	117501	13.52	141621	16.08	37284	6.86
ZZZZZZ	179902	9.36	246525	10.24	119062	13.52	142481	16.08	39089	6.86
ZZZZZZ	178502	9.36	242991	10.24	118836	13.52	141267	16.08	41213	6.86
ZZZZZZ	172725	9.36	236177	10.24	112464	13.52	133633	16.08	38616	6.86
ZZZZZZ	172828	9.36	234544	10.24	113041	13.52	133102	16.08	40116	6.86
ZZZZZZ	163814	9.36	223200	10.24	109309	13.52	134368	16.08	79213 ^c	6.86

- 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.
 (c) Outside control limits. Target analytes not associated with this internal standard.

6.5.4
G

Volatile Internal Standard Area Summary

Job Number: MC16999
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	MST987-CC983	Injection Date:	12/31/12
Lab File ID:	T28261.D	Injection Time:	21:33
Instrument ID:	GCMST	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	437157	8.68	686511	9.57	383003	12.87	333112	15.47	81716	6.22
Upper Limit ^a	874314	9.18	1373022	10.07	766006	13.37	666224	15.97	163432	6.72
Lower Limit ^b	218579	8.18	343256	9.07	191502	12.37	166556	14.97	40858	5.72

Lab Sample ID	IS 1		IS 2		IS 3		IS 4		IS 5	
	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
MST987-BS	494114	8.68	779018	9.57	435195	12.87	372135	15.47	93358	6.22
MST987-BSD	487892	8.68	774639	9.57	426084	12.87	370503	15.47	93039	6.22
MST987-MB	415184	8.69	639619	9.57	335840	12.88	284466	15.47	84895	6.23
MC16999-5	409313	8.69	635153	9.57	332180	12.88	283997	15.47	84702	6.22
MC17058-17	398391	8.69	608842	9.57	322576	12.88	273228	15.47	78138	6.23
MC17058-17MS	456236	8.69	720617	9.57	398471	12.87	349335	15.47	86488	6.23
MC17058-17MSD	455468	8.69	715169	9.57	397533	12.88	344646	15.47	85535	6.23
ZZZZZZ	423226	8.68	646978	9.57	343139	12.88	294092	15.47	84973	6.22
ZZZZZZ	430933	8.69	659910	9.57	353852	12.88	296437	15.47	87701	6.22
ZZZZZZ	426628	8.69	656021	9.57	344368	12.88	293148	15.47	88419	6.23
ZZZZZZ	411765	8.68	629430	9.57	329297	12.88	282248	15.47	84549	6.22
ZZZZZZ	409443	8.69	625850	9.57	361632	12.88	294529	15.47	78644	6.23
ZZZZZZ	431901	8.69	653187	9.57	375790	12.88	307122	15.47	82474	6.23
ZZZZZZ	430240	8.69	659635	9.57	348176	12.88	297188	15.47	86113	6.22
ZZZZZZ	395165	8.69	609945	9.57	328405	12.88	275004	15.47	77930	6.23
ZZZZZZ	429142	8.69	658699	9.57	354424	12.88	297113	15.47	89473	6.22
ZZZZZZ	440599	8.68	677359	9.57	361647	12.88	303894	15.47	92490	6.22
ZZZZZZ	419485	8.69	649193	9.57	341875	12.88	288957	15.47	87973	6.23
ZZZZZZ	398860	8.68	613221	9.57	325187	12.88	271799	15.47	84685	6.22
ZZZZZZ	432560	8.69	664670	9.57	353494	12.88	299269	15.47	90068	6.23
ZZZZZZ	458165	8.69	709021	9.57	367955	12.88	343336	15.47	90940	6.23
ZZZZZZ	408524	8.68	626375	9.57	334569	12.88	279617	15.47	87411	6.23

- 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.

6.5.5



Volatile Surrogate Recovery Summary

Job Number: MC16999
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, 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
MC16999-5	T28266.D	105.0	119.0	114.0
MC17058-17MS	T28268.D	107.0	120.0	113.0
MC17058-17MSD	T28269.D	106.0	120.0	115.0
MST987-BS	T28262.D	107.0	120.0	116.0
MST987-BSD	T28263.D	108.0	119.0	114.0
MST987-MB	T28265.D	104.0	119.0	116.0

Surrogate Compounds	Recovery Limits
S1 = Dibromofluoromethane	70-130%
S2 = Toluene-D8	70-130%
S3 = 4-Bromofluorobenzene	70-130%

6.6.1



Volatile Surrogate Recovery Summary

Job Number: MC16999
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, 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
MC16999-1	M53169.D	88.0	88.0	82.0
MC16999-2	G123187.D	100.0	96.0	91.0
MC16999-2	K65937.D	108.0	105.0	103.0
MC16999-3	G123188.D	92.0	88.0	83.0
MC16999-3	K65938.D	106.0	104.0	109.0
MC16999-4	M53170.D	83.0	88.0	88.0
MC16999-6	G123189.D	92.0	88.0	83.0
MC16999-6	K65940.D	108.0	111.0	119.0
MC16999-7	M53171.D	85.0	87.0	82.0
MC16999-9	G123333.D	91.0	80.0	86.0
MC16999-10	G123191.D	93.0	89.0	86.0
MC16999-10	K65942.D	106.0	108.0	103.0
MC16999-11	G123190.D	90.0	87.0	85.0
MC16999-11	K65941.D	105.0	107.0	107.0
MC16999-12	G123204.D	91.0	85.0	83.0
MC16999-12	K65939.D	102.0	112.0	108.0
MC16996-3MS	K65934.D	106.0	99.0	107.0
MC16996-3MSD	K65935.D	104.0	102.0	110.0
MC16999-1MS	M53173.D	86.0	89.0	83.0
MC16999-1MSD	M53174.D	86.0	89.0	81.0
MC17098-24MS	G123345.D	93.0	82.0	87.0
MC17098-24MSD	G123346.D	92.0	81.0	83.0
MC17145-1MS	G123197.D	98.0	95.0	89.0
MC17145-1MSD	G123198.D	98.0	91.0	86.0
MSG4896-BS	G123184.D	101.0	94.0	88.0
MSG4896-MB	G123186.D	101.0	97.0	91.0
MSG4900-BS	G123328.D	101.0	95.0	91.0
MSG4900-BSD	G123329.D	99.0	94.0	91.0
MSG4900-MB	G123331.D	96.0	90.0	88.0
MSK2166-BS	K65918.D	105.0	107.0	116.0
MSK2166-BSD	K65919.D	105.0	104.0	108.0
MSK2166-MB	K65921.D	110.0	107.0	103.0
MSM1806-BS	M53164.D	84.0	88.0	80.0
MSM1806-MB	M53166.D	82.0	88.0	79.0

Surrogate Compounds	Recovery Limits
S1 = Dibromofluoromethane	70-130%
S2 = Toluene-D8	70-130%

6.6.2



Volatile Surrogate Recovery Summary

Job Number: MC16999

Account: SHELLWIC Shell Oil

Project: URSMOSTL: Roxana Drilling, Roxana, IL

Method: SW846 8260B

Matrix: SO

Samples and QC shown here apply to the above method

Surrogate Compounds	Recovery Limits
S3 = 4-Bromofluorobenzene	70-130%

6.6.2



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

Job Number: MC16999
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31493-MB	BK20274.D	1	12/28/12	AP	12/19/12	OP31493	GBK733

The QC reported here applies to the following samples:

Method: SW846 8011

MC16999-1, MC16999-2, MC16999-3, MC16999-4, MC16999-6, MC16999-7, MC16999-9, MC16999-10, MC16999-11, MC16999-12

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	2.5	1.1	ug/kg	
106-93-4	1,2-Dibromoethane	ND	2.5	0.96	ug/kg	

CAS No.	Surrogate Recoveries	Limits
460-00-4	Bromofluorobenzene (S)	126% 61-167%
460-00-4	Bromofluorobenzene (S)	96% 61-167%

7.1.1
7

Method Blank Summary

Job Number: MC16999
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31513-MB	BB45031A.D1		12/21/12	CZ	12/21/12	OP31513	GBB2726

The QC reported here applies to the following samples:

Method: SW846 8011

MC16999-5

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.015	0.013	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.015	0.010	ug/l	

CAS No.	Surrogate Recoveries		Limits
460-00-4	Bromofluorobenzene (S)	101%	36-173%
460-00-4	Bromofluorobenzene (S)	94%	36-173%

7.1.2

7

Blank Spike Summary

Job Number: MC16999
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31493-BS	BK20275.D	1	12/28/12	AP	12/19/12	OP31493	GBK733

The QC reported here applies to the following samples:

Method: SW846 8011

MC16999-1, MC16999-2, MC16999-3, MC16999-4, MC16999-6, MC16999-7, MC16999-9, MC16999-10, MC16999-11, MC16999-12

7.2.1
7

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
96-12-8	1,2-Dibromo-3-chloropropane	32.6	35.8	110	59-142
106-93-4	1,2-Dibromoethane	32.6	37.6	115	56-140

CAS No.	Surrogate Recoveries	BSP	Limits
460-00-4	Bromofluorobenzene (S)	114%	61-167%
460-00-4	Bromofluorobenzene (S)	85%	61-167%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: MC16999
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31513-BS	BB45032A.D1		12/21/12	CZ	12/21/12	OP31513	GBB2726

The QC reported here applies to the following samples:

Method: SW846 8011

MC16999-5

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
96-12-8	1,2-Dibromo-3-chloropropane	0.071	0.061	86	60-140
106-93-4	1,2-Dibromoethane	0.071	0.063	89	60-140

CAS No.	Surrogate Recoveries	BSP	Limits
460-00-4	Bromofluorobenzene (S)	103%	36-173%
460-00-4	Bromofluorobenzene (S)	96%	36-173%

7.2.2
7

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16999
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31493-MS	BK20289.D	1	12/28/12	AP	12/19/12	OP31493	GBK733
OP31493-MSD	BK20290.D	1	12/28/12	AP	12/19/12	OP31493	GBK733
MC16961-2	BK20292.D	1	12/28/12	AP	12/19/12	OP31493	GBK733

The QC reported here applies to the following samples:

Method: SW846 8011

MC16999-1, MC16999-2, MC16999-3, MC16999-4, MC16999-6, MC16999-7, MC16999-9, MC16999-10, MC16999-11, MC16999-12

CAS No.	Compound	MC16961-2 ug/kg	Spike Q	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
96-12-8	1,2-Dibromo-3-chloropropane	ND	67.7	77.2	114	79.9	116	3	40-156/27
106-93-4	1,2-Dibromoethane	ND	67.7	85.7	127	88.0	128	3	48-141/27

CAS No.	Surrogate Recoveries	MS	MSD	MC16961-2	Limits
460-00-4	Bromofluorobenzene (S)	116%	130%	131%	61-167%
460-00-4	Bromofluorobenzene (S)	98%	102%	108%	61-167%

7.3.1
7

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC16999
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31513-MS	BB45033A.D1		12/21/12	CZ	12/21/12	OP31513	GBB2726
OP31513-MSD	BB45034A.D1		12/21/12	CZ	12/21/12	OP31513	GBB2726
MC17000-5	BB45035A.D1		12/21/12	CZ	12/21/12	OP31513	GBB2726

The QC reported here applies to the following samples:

Method: SW846 8011

MC16999-5

CAS No.	Compound	MC17000-5 ug/l	Spike Q	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.0698	0.059	85	0.063	90	7	64-141/29
106-93-4	1,2-Dibromoethane	ND	0.0698	0.063	90	0.065	93	3	63-163/27

CAS No.	Surrogate Recoveries	MS	MSD	MC17000-5	Limits
460-00-4	Bromofluorobenzene (S)	99%	104%	99%	36-173%
460-00-4	Bromofluorobenzene (S)	95%	100%	95%	36-173%

7.3.2
7

* = Outside of Control Limits.

Volatile Surrogate Recovery Summary

Job Number: MC16999
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Method: SW846 8011 Matrix: AQ

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 ^a	S1 ^b
MC16999-5	BB45038.D	105.0	100.0
OP31513-BS	BB45032A.D	103.0	96.0
OP31513-MB	BB45031A.D	101.0	94.0
OP31513-MS	BB45033A.D	99.0	95.0
OP31513-MSD	BB45034A.D	104.0	100.0

Surrogate Compounds Recovery Limits

S1 = Bromofluorobenzene (S) 36-173%

- (a) Recovery from GC signal #1
- (b) Recovery from GC signal #2

7.4.1
7

Volatile Surrogate Recovery Summary

Job Number: MC16999
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Method: SW846 8011	Matrix: SO
--------------------	------------

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 ^a	S1 ^b
MC16999-1	BK20278.D	126.0	97.0
MC16999-2	BK20279.D	133.0	101.0
MC16999-3	BK20280.D	123.0	92.0
MC16999-4	BK20281.D	124.0	102.0
MC16999-6	BK20285.D	117.0	98.0
MC16999-7	BK20282.D	135.0	104.0
MC16999-9	BK20283.D	125.0	97.0
MC16999-10	BK20287.D	129.0	98.0
MC16999-11	BK20288.D	128.0	96.0
MC16999-12	BK20286.D	123.0	97.0
OP31493-BS	BK20275.D	114.0	85.0
OP31493-MB	BK20274.D	126.0	96.0
OP31493-MS	BK20289.D	116.0	98.0
OP31493-MSD	BK20290.D	130.0	102.0

Surrogate Compounds	Recovery Limits
S1 = Bromofluorobenzene (S)	61-167%

- (a) Recovery from GC signal #1
- (b) Recovery from GC signal #2

7.4.2
7

GC Surrogate Retention Time Summary

Job Number: MC16999
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	GBB2726-ICC2726	Injection Date:	12/21/12
Lab File ID:	BB45025.D	Injection Time:	17:14
Instrument ID:	GCBB	Method:	SW846 8011

	S1 ^a RT	S1 ^b RT
Check Std	3.38	3.62

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 ^a RT	S1 ^b RT
ZZZZZZ	BB45029A.D	12/21/12	19:02	3.38	3.62
ZZZZZZ	BB45029B.D	12/21/12	19:02	3.38	3.62
OP31512-MB	BB45031.D	12/21/12	19:56	3.38	3.62
OP31513-MB	BB45031A.D	12/21/12	19:56	3.38	3.62
OP31512-BS	BB45032.D	12/21/12	20:23	3.38	3.62
OP31513-BS	BB45032A.D	12/21/12	20:23	3.38	3.62
OP31512-MS	BB45033.D	12/21/12	20:50	3.38	3.62
OP31513-MS	BB45033A.D	12/21/12	20:50	3.38	3.62
OP31512-MSD	BB45034.D	12/21/12	21:17	3.38	3.62
OP31513-MSD	BB45034A.D	12/21/12	21:17	3.38	3.62
MC16984-9	BB45035.D	12/21/12	21:44	3.38	3.62
MC17000-5	BB45035A.D	12/21/12	21:44	3.38	3.62
ZZZZZZ	BB45036.D	12/21/12	22:10	3.38	3.62
ZZZZZZ	BB45037.D	12/21/12	22:37	3.38	3.62
MC16999-5	BB45038.D	12/21/12	23:04	3.38	3.62
GBB2726-ECC272	BB45039.D	12/22/12	06:22	3.38	3.61

**Surrogate
Compounds**

S1 = Bromoflnorobenzene (S)

- (a) Retention time from GC signal #1
- (b) Retention time from GC signal #2

7.5.1
7

GC Surrogate Retention Time Summary

Job Number: MC16999
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	GBK733-CC720	Injection Date:	12/28/12
Lab File ID:	BK20273.D	Injection Time:	14:13
Instrument ID:	GCBK	Method:	SW846 8011

	SI ^a RT	SI ^b RT
Check Std	4.78	4.45

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	SI ^a RT	SI ^b RT
OP31493-MB	BK20274.D	12/28/12	14:39	4.78	4.45
OP31493-BS	BK20275.D	12/28/12	15:03	4.78	4.45
ZZZZZZ	BK20276.D	12/28/12	15:28	4.78	4.45
ZZZZZZ	BK20277.D	12/28/12	15:52	4.78	4.45
MC16999-1	BK20278.D	12/28/12	16:16	4.78	4.45
MC16999-2	BK20279.D	12/28/12	16:40	4.78	4.45
MC16999-3	BK20280.D	12/28/12	17:04	4.78	4.45
MC16999-4	BK20281.D	12/28/12	17:29	4.78	4.45
MC16999-7	BK20282.D	12/28/12	17:53	4.78	4.45
MC16999-9	BK20283.D	12/28/12	18:17	4.78	4.45

**Surrogate
Compounds**

SI = Bromofluorobenzene (S)

- (a) Retention time from GC signal #1
- (b) Retention time from GC signal #2

7.5.2
7

GC Surrogate Retention Time Summary

Job Number: MC16999
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	GBK733-CC720	Injection Date:	12/28/12
Lab File ID:	BK20284.D	Injection Time:	18:41
Instrument ID:	GCBK	Method:	SW846 8011

	S1 ^a RT	S1 ^b RT
Check Std	4.78	4.45

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 ^a RT	S1 ^b RT
MC16999-6	BK20285.D	12/28/12	19:06	4.77	4.45
MC16999-12	BK20286.D	12/28/12	19:30	4.78	4.45
MC16999-10	BK20287.D	12/28/12	19:54	4.78	4.45
MC16999-11	BK20288.D	12/28/12	20:19	4.78	4.45
OP31493-MS	BK20289.D	12/28/12	20:44	4.78	4.45
OP31493-MSD	BK20290.D	12/28/12	21:08	4.78	4.45
ZZZZZZ	BK20291.D	12/28/12	21:32	4.78	4.45
MC16961-2	BK20292.D	12/28/12	21:56	4.78	4.45
ZZZZZZ	BK20293.D	12/28/12	22:21	4.78	4.45
ZZZZZZ	BK20294.D	12/28/12	22:45	4.78	4.45
GBK733-ECC720	BK20295.D	12/28/12	23:09	4.78	4.45

Surrogate
Compounds

S1 = Bromofluorobenzene (S)

- (a) Retention time from GC signal #1
- (b) Retention time from GC signal #2

7.5.3
7

General Chemistry

QC Data Summaries



Includes the following where applicable:

- Percent Solids Raw Data Summary

Percent Solids Raw Data Summary

Job Number: MC16999
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample: MC16999-1 Analyzed: 21-DEC-12 by MA Method: SM21 2540 B MOD.
ClientID: GP-14-13

Wet Weight (Total) 27.652 g
Tare Weight 19.996 g
Dry Weight (Total) 25.721 g
Solids, Percent 74.8 %

Sample: MC16999-2 Analyzed: 21-DEC-12 by MA Method: SM2I 2540 B MOD.
ClientID: GP-14-33

Wet Weight (Total) 34.954 g
Tare Weight 25.657 g
Dry Weight (Total) 33.838 g
Solids, Percent 88 %

Sample: MC16999-3 Analyzed: 21-DEC-12 by MA Method: SM21 2540 B MOD.
ClientID: GP-14-39

Wet Weight (Total) 27.476 g
Tare Weight 19.31 g
Dry Weight (Total) 26.279 g
Solids, Percent 85.3 %

Sample: MC16999-4 Analyzed: 21-DEC-12 by MA Method: SM21 2540 B MOD.
ClientID: GP-14-45

Wet Weight (Total) 30.087 g
Tare Weight 22.526 g
Dry Weight (Total) 29.21 g
Solids, Percent 88.4 %

Sample: MC16999-6 Analyzed: 21-DEC-12 by MA Method: SM21 2540 B MOD.
ClientID: GP-15-19

Wet Weight (Total) 37.364 g
Tare Weight 28.607 g
Dry Weight (Total) 36.994 g
Solids, Percent 95.8 %

Sample: MC16999-7 Analyzed: 21-DEC-12 by MA Method: SM21 2540 B MOD.
ClientID: GP-15-29

Wet Weight (Total) 26.24 g
Tare Weight 18.885 g
Dry Weight (Total) 25.97 g
Solids, Percent 96.3 %

8.1
8

Percent Solids Raw Data Summary

Job Number: MC16999
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample: MC16999-9 Analyzed: 21-DEC-12 by MA Method: SM21 2540 B MOD.
ClientID: GP-15-37

Wet Weight (Total) 30.532 g
Tare Weight 21.083 g
Dry Weight (Total) 29.359 g
Solids, Percent 87.6 %

Sample: MC16999-10 Analyzed: 21-DEC-12 by MA Method: SM21 2540 B MOD.
ClientID: GP-15-47

Wet Weight (Total) 30.436 g
Tare Weight 21.937 g
Dry Weight (Total) 29.335 g
Solids, Percent 87 %

Sample: MC16999-11 Analyzed: 21-DEC-12 by MA Method: SM21 2540 B MOD.
ClientID: GP-15-55

Wet Weight (Total) 39.284 g
Tare Weight 30.993 g
Dry Weight (Total) 38.165 g
Solids, Percent 86.5 %

Sample: MC16999-I2 Analyzed: 21-DEC-12 by MA Method: SM21 2540 B MOD.
ClientID: GP-15-37 DUP

Wet Weight (Total) 30.532 g
Tare Weight 21.083 g
Dry Weight (Total) 29.359 g
Solids, Percent 87.6 %

8.1
8

Roxana Drilling 2012 Data Review

Laboratory SDG: MC17144

Data Reviewer: Melissa Mansker

Peer Reviewer: Elizabeth Kunkel

Date Reviewed: 1/24/2013

Guidance: USEPA National Functional Guidelines for Superfund Organic Methods Data Review 2008

Sample Identification	Sample Identification
GP-15-74	GP-15-89
Trip Blank	

1.0 Data Package Completeness

Were all items delivered as specified in the QAPP and COC as appropriate?

Yes

2.0 Laboratory Case Narrative \ Cooler Receipt Form

Were problems noted in the laboratory case narrative or cooler receipt form?

Yes, the laboratory case narrative indicated VOC LCS recoveries were outside evaluation criteria. VOC MS/MSD recoveries were outside of evaluation criteria in sample GP15-89. The initial calibration verification recovery for acetone, acrolein, 2-butanone, and 2-hexanone exceeded 50 percent difference (%D). These issues are addressed further in the appropriate sections below.

The cooler receipt form did not indicate any problems.

3.0 Holding Times

Were samples extracted/analyzed within applicable limits?

Yes

4.0 Blank Contamination

Were any analytes detected in the Method Blanks, Field Blanks or Trip Blanks?

No

5.0 Laboratory Control Sample

Were LCS recoveries within evaluation criteria?

No

LCS/ LCSD ID	Parameter	Analyte	LCS/LCSD Recovery	RPD	LCS/LCSD/ RPD Criteria
MSG4899-BS	VOCs	Dichlorodifluoromethane	132	NA	70-130
MSH1970-BS	VOCs	Acetone	142	NA	70-130
MSH1970-BS	VOCs	Carbon tetrachloride	138	NA	70-130
MSH1970-BS	VOCs	Dichlorodifluoromethane	131	NA	70-130
MSH1970-BS	VOCs	2,2-Dichloropropane	140	NA	70-130

Analytical data reported as non-detect and associated with LCS recoveries above evaluation criteria, indicating a possible high bias, did not require qualification. LCS/LCSD MSH1970-BS was associated with the trip blank. Trip blanks are quality control samples and are not qualified. No qualification of data was required.

6.0 Surrogate Recoveries

Were surrogate recoveries within evaluation criteria?

Yes

7.0 Matrix Spike and Matrix Spike Duplicate Recoveries

Were MS/MSD samples analyzed as part of this SDG?

Yes, although not requested, sample GP-15-89 was spiked and analyzed for VOCs.

Were MS/MSD recoveries within evaluation criteria?

No

MS/MSD ID	Parameter	Analyte	MS/MSD Recovery	RPD	MS/MSD/RP D Criteria
GP-15-89	VOCs	Acetone	152/150	2	70-130/30
GP-15-89	VOCs	Acrolein	67/69	3	70-130/30
GP-15-89	VOCs	2-Butanone (MEK)	131/122	8	70-130/30
GP-15-89	VOCs	Dichlorodifluoromethane	139/137	2	70-130/30

USEPA National Functional Guidelines for Organic Data Review indicates that organic data does not require qualification based on MS/MSD data alone and LCS recoveries were within evaluation criteria with the exception of compounds listed and qualified as appropriate in Section 5.0 of this data review. No further qualification of the data was required.

8.0 Internal Standard (IS) Recoveries

Were internal standard area recoveries within evaluation criteria?

Yes

9.0 Laboratory Duplicate Results

Were laboratory duplicate samples collected as part of this SDG?

No

10.0 Field Duplicate Results

Were field duplicate samples collected as part of this SDG?

No

11.0 Sample Dilutions

For samples that were diluted and nondetect, were undiluted results also reported?

Not applicable; samples analyzed did not require dilution.

12.0 Additional Qualifications

Were additional qualifications applied?

Yes, samples GP-15-74 and GP-15-89 were associated with the initial calibration verification recovery for acetone, acrolein, 2-butanone, and 2-hexanone that exceeded 50 percent difference (%D). Analytes in samples associated with ICV %D greater than 50% were qualified as summarized in the following table.

Sample ID	Parameter	Analyte	Qualification
GP-15-74	VOCs	Acetone	UJ
GP-15-74	VOCs	Acrolein	UJ
GP-15-74	VOCs	2-Butanone (MEK)	UJ
GP-15-74	VOCs	2-Hexanone	UJ
GP-15-89	VOCs	Acetone	UJ
GP-15-89	VOCs	Acrolein	UJ
GP-15-89	VOCs	2-Butanone (MEK)	UJ
GP-15-89	VOCs	2-Hexanone	UJ



01/02/13

Technical Report for

Shell Oil

URSMOSTL: Roxana Drilling, Roxana, IL

21562735.15000

Accutest Job Number: MC17144

Sampling Date: 12/21/12

Report to:

URS Corporation

elizabeth.kunkel@URS.com

ATTN: Elizabeth Kunkel

*Reviewed on
1/24/13
NM*

Total number of pages in report: **60**



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

Reza Fard
Reza Fard
Lab Director

Client Service contact: Jeremy Vienneau 508-481-6200

Certifications: MA (M-MA136.SW846 NELAC) CT (PH-0109) NH (250210) RI (00071) ME (MA00136) FL (E87579) NY (11791) NJ (MA926) PA (6801121) ND (R-188) CO MN (11546AA) NC (653) IL (002337) WI (399080220) ISO 17025:2005 (L2235)

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Test results relate only to samples analyzed.

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Sample Summary

Shell Oil

Job No: MC17144

URSMOSTL: Roxana Drilling, Roxana, IL
 Project No: 21562735.15000

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
MCI7144-1	12/21/12	09:05	WPBS 12/24/12	SO	Soil	GP-15-74 ✓
MCI7144-2	12/21/12	10:55	WPBS 12/24/12	SO	Soil	GP-15-89 ✓
MCI7144-3	12/21/12	00:00	WPBS 12/24/12	AQ	Trip Blank Water	TRIP BLANK ✓

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



SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: Shell Oil

Job No MC17144

Site: URSMOSTL: Roxana Drilling, Roxana, IL

Report Date 1/2/2013 1:04:32 PM

2 Sample(s), 1 Trip Blank(s) collected on 12/21/2012 and were received at Accutest on 12/24/2012 properly preserved, at 2.8 Deg. C and intact. These Samples received an Accutest job number of MC17144. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section of this report. 1-Chlorohexane was searched in the library search and reported only if detections were found.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

Volatiles by GCMS By Method SW846 8260B

Matrix AQ	Batch ID: MSH1970
------------------	--------------------------

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Blank Spike Recovery(s) for 2,2-Dichloropropane, Acetone, Carbon tetrachloride, Dichlorodifluoromethane are outside control limits. Blank Spike meets program technical requirements.
- Matrix Spike Recovery(s) for Acrolein, Carbon tetrachloride, 2-Chloroethyl vinyl ether, Dichlorodifluoromethane, 2,2-Dichloropropane, 1,1,1-Trichloroethane, Trichlorofluoromethane are outside control limits. Outside control limits. Outside control limits due to possible matrix interference. Refer to Blank Spike.
- Sample(s) MC17020-1MS, MC17020-1MSD were used as the QC samples indicated.
- Calibration check standard MSH1970-CC1910 for acetone exceeds 50% Difference (response bias high). Associated sample is non-detect for this compound.
- Matrix Spike Duplicate Recovery(s) for Acrolein, Carbon tetrachloride, 2-Chloroethyl vinyl ether, Dichlorodifluoromethane, 2,2-Dichloropropane are outside control limits. Outside control limits. Blank Spike meets program technical requirements. Outside control limits due to possible matrix interference. Refer to Blank Spike.

Matrix SO	Batch ID: MSG4899
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- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) MC17144-2MS, MC17144-2MSD were used as the QC samples indicated.
- Blank Spike Recovery(s) for Dichlorodifluoromethane are outside control limits. Blank Spike meets program technical requirements.
- Matrix Spike Recovery(s) for 2-Butanone (MEK), Acetone, Acrolein, Dichlorodifluoromethane are outside control limits. Outside control limits due to possible matrix interference. Refer to Blank Spike.
- Matrix Spike Duplicate Recovery(s) for Acetone, Acrolein, Dichlorodifluoromethane are outside control limits. Outside control limits due to possible matrix interference. Refer to Blank Spike.
- Initial calibration verification MSG4894-ICV4894 for acrolein, acetone, 2-butanone, 2-hexanone exceeds 50% Difference. These compounds are within criteria in continuing calibration check standard MSG4899-CC4894.

Volatiles by GC By Method SW846 8011

Matrix AQ	Batch ID: OP31568
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- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) MC17000-15MS, MC17000-15MSD were used as the QC samples indicated.

Matrix SO	Batch ID: OP31554
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- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) MC17144-1MS, MC17144-1MSD were used as the QC samples indicated.

Wet Chemistry By Method SM21 2540 B MOD.

Matrix SO	Batch ID: GN41386
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- Sample(s) MC17144-1DUP were used as the QC samples for Solids, Percent.

The Accutest Laboratories of New England certifies that all analysis were performed within method specification. It is further recommended that this report to be used in its entirety. The Accutest Laboratories of NE, Laboratory Director or assignee as verified by the signature on the cover page has authorized the release of this report(MC17144).

Summary of Hits

Job Number: MC17144
Account: Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL
Collected: 12/21/12



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
MC17144-1	GP-15-74					
Benzene		3.97	0.057	0.034	mg/kg	SW846 8260B
n-Butylbenzene		0.0387 J	0.57	0.021	mg/kg	SW846 8260B
Ethylbenzene		0.151 J	0.23	0.027	mg/kg	SW846 8260B
1,2,4-Trimethylbenzene		0.232 J	0.57	0.025	mg/kg	SW846 8260B
1,3,5-Trimethylbenzene		0.0828 J	0.57	0.024	mg/kg	SW846 8260B
m,p-Xylene		0.403	0.23	0.090	mg/kg	SW846 8260B
o-Xylene		0.0966 J	0.23	0.027	mg/kg	SW846 8260B
Xylene (total)		0.500	0.23	0.027	mg/kg	SW846 8260B
MC17144-2	GP-15-89					
Benzene		0.483	0.052	0.031	mg/kg	SW846 8260B
MC17144-3	TRIP BLANK					

No hits reported in this sample.

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	GP-15-74	Date Sampled:	12/21/12
Lab Sample ID:	MC17144-1	Date Received:	12/24/12
Matrix:	SO - Soil	Percent Solids:	89.0
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G123288.D	1	12/28/12	JM	n/a	n/a	MSG4899
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.22 g	10.0 ml	100 ul
Run #2			

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.57	0.14	mg/kg	UJ
107-02-8	Acrolein	ND	2.8	1.1	mg/kg	UJ
107-13-1	Acrylonitrile	ND	2.8	0.14	mg/kg	
71-43-2	Benzene	3.97	0.057	0.034	mg/kg	
108-86-1	Bromobenzene	ND	0.57	0.025	mg/kg	
74-97-5	Bromochloromethane	ND	0.57	0.043	mg/kg	
75-27-4	Bromodichloromethane	ND	0.23	0.024	mg/kg	
75-25-2	Bromoform	ND	0.23	0.23	mg/kg	
74-83-9	Bromomethane	ND	0.23	0.059	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.57	0.14	mg/kg	UJ
104-51-8	n-Butylbenzene	0.0387	0.57	0.021	mg/kg	J
135-98-8	sec-Butylbenzene	ND	0.57	0.026	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.57	0.10	mg/kg	
75-15-0	Carbon disulfide	ND	0.57	0.019	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.23	0.083	mg/kg	
108-90-7	Chlorobenzene	ND	0.23	0.031	mg/kg	
75-00-3	Chloroethane	ND	0.57	0.14	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.57	0.23	mg/kg	
67-66-3	Chloroform	ND	0.23	0.059	mg/kg	
74-87-3	Chloromethane	ND	0.57	0.053	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.57	0.13	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.57	0.026	mg/kg	
124-48-1	Dibromochloromethane	ND	0.23	0.034	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.23	0.025	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.23	0.026	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.23	0.024	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.23	0.13	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.23	0.031	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.23	0.033	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.23	0.042	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.23	0.034	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.23	0.033	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

Client Sample ID:	GP-15-74	Date Sampled:	12/21/12
Lab Sample ID:	MC17144-1	Date Received:	12/24/12
Matrix:	SO - Soil	Percent Solids:	89.0
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.23	0.042	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.57	0.026	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.57	0.099	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.57	0.030	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.23	0.019	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.23	0.056	mg/kg	
123-91-1	1,4-Dioxane	ND	2.8	2.8	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.57	0.078	mg/kg	
100-41-4	Ethylbenzene	0.151	0.23	0.027	mg/kg	J
87-68-3	Hexachlorobutadiene	ND	0.57	0.053	mg/kg	
591-78-6	2-Hexanone	ND	0.57	0.057	mg/kg	UJ
98-82-8	Isopropylbenzene	ND	0.57	0.026	mg/kg	
99-87-6	p-Isopropyltoluene	ND	0.57	0.020	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.23	0.033	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.57	0.057	mg/kg	
74-95-3	Methylene bromide	ND	0.57	0.056	mg/kg	
75-09-2	Methylene chloride	ND	0.23	0.13	mg/kg	
91-20-3	Naphthalene	ND	0.57	0.14	mg/kg	
103-65-1	n-Propylbenzene	ND	0.57	0.12	mg/kg	
100-42-5	Styrene	ND	0.57	0.027	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.57	0.11	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.23	0.048	mg/kg	
127-18-4	Tetrachloroethene	ND	0.23	0.026	mg/kg	
108-88-3	Toluene	ND	0.57	0.097	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	0.57	0.027	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.57	0.026	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.23	0.036	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.23	0.084	mg/kg	
79-01-6	Trichloroethene	ND	0.23	0.024	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.23	0.035	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.57	0.033	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	0.232	0.57	0.025	mg/kg	J
108-67-8	1,3,5-Trimethylbenzene	0.0828	0.57	0.024	mg/kg	J
108-05-4	Vinyl Acetate	ND	0.57	0.064	mg/kg	
75-01-4	Vinyl chloride	ND	0.23	0.031	mg/kg	
	m,p-Xylene	0.403	0.23	0.090	mg/kg	
95-47-6	o-Xylene	0.0966	0.23	0.027	mg/kg	J
1330-20-7	Xylene (total)	0.500	0.23	0.027	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

Client Sample ID: GP-15-74 Lab Sample ID: MC17144-1 Matrix: SO - Soil Method: SW846 8260B Project: URSMOSTL: Roxana Drilling, Roxana, IL	Date Sampled: 12/21/12 Date Received: 12/24/12 Percent Solids: 89.0
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4.1
4

VOA Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	88%		70-130%
2037-26-5	Toluene-D8	86%		70-130%
460-00-4	4-Bromofluorobenzene	82%		70-130%

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

Client Sample ID: GP-15-74	Date Sampled: 12/21/12
Lab Sample ID: MC17144-1	Date Received: 12/24/12
Matrix: SO - Soil	Percent Solids: 89.0
Method: SW846 8011 SW846 8011	
Project: URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK20244.D	1	12/27/12	AP	12/26/12	OP31554	GBK729
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.4 g	50.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.0028	0.0012	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0028	0.0011	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
460-00-4	Bromofluorobenzene (S)	156%		61-167%		
460-00-4	Bromofluorobenzene (S)	137%		61-167%		

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

4.1


Report of Analysis

Client Sample ID: GP-15-89	Date Sampled: 12/21/12
Lab Sample ID: MC17144-2	Date Received: 12/24/12
Matrix: SO - Soil	Percent Solids: 91.1
Method: SW846 8260B	
Project: URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G123289.D	1	12/28/12	JM	n/a	n/a	MSG4899
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.52 g	10.0 ml	100 ul
Run #2			

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.52	0.13	mg/kg	
107-02-8	Acrolein	ND	2.6	1.0	mg/kg	UJ
107-13-1	Acrylonitrile	ND	2.6	0.13	mg/kg	UJ
71-43-2	Benzene	0.483	0.052	0.031	mg/kg	
108-86-1	Bromobenzene	ND	0.52	0.023	mg/kg	
74-97-5	Bromochloromethane	ND	0.52	0.039	mg/kg	
75-27-4	Bromodichloromethane	ND	0.21	0.022	mg/kg	
75-25-2	Bromoform	ND	0.21	0.21	mg/kg	
74-83-9	Bromomethane	ND	0.21	0.054	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.52	0.13	mg/kg	UJ
104-51-8	n-Butylbenzene	ND	0.52	0.019	mg/kg	
135-98-8	sec-Butylbenzene	ND	0.52	0.024	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.52	0.092	mg/kg	
75-15-0	Carbon disulfide	ND	0.52	0.017	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.21	0.076	mg/kg	
108-90-7	Chlorobenzene	ND	0.21	0.029	mg/kg	
75-00-3	Chloroethane	ND	0.52	0.13	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.52	0.21	mg/kg	
67-66-3	Chloroform	ND	0.21	0.054	mg/kg	
74-87-3	Chloromethane	ND	0.52	0.048	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.52	0.12	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.52	0.024	mg/kg	
124-48-1	Dibromochloromethane	ND	0.21	0.031	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.21	0.023	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.21	0.024	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.21	0.022	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.21	0.12	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.21	0.028	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.21	0.030	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.21	0.038	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.21	0.031	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.21	0.030	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

Client Sample ID: GP-15-89	Date Sampled: 12/21/12
Lab Sample ID: MC17144-2	Date Received: 12/24/12
Matrix: SO - Soil	Percent Solids: 91.1
Method: SW846 8260B	
Project: URSMOSTL: Roxana Drilling, Roxana, IL	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.21	0.039	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.52	0.024	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.52	0.090	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.52	0.027	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.21	0.018	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.21	0.052	mg/kg	
123-91-1	1,4-Dioxane	ND	2.6	2.6	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.52	0.071	mg/kg	
100-41-4	Ethylbenzene	ND	0.21	0.025	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.52	0.048	mg/kg	
591-78-6	2-Hexanone	ND	0.52	0.052	mg/kg	uJ
98-82-8	Isopropylbenzene	ND	0.52	0.024	mg/kg	
99-87-6	p-Isopropyltoluene	ND	0.52	0.019	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.21	0.030	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.52	0.052	mg/kg	
74-95-3	Methylene bromide	ND	0.52	0.051	mg/kg	
75-09-2	Methylene chloride	ND	0.21	0.12	mg/kg	
91-20-3	Naphthalene	ND	0.52	0.13	mg/kg	
103-65-1	n-Propylbenzene	ND	0.52	0.11	mg/kg	
100-42-5	Styrene	ND	0.52	0.024	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.52	0.10	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.21	0.044	mg/kg	
127-18-4	Tetrachloroethene	ND	0.21	0.024	mg/kg	
108-88-3	Toluene	ND	0.52	0.089	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	0.52	0.025	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.52	0.024	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.21	0.033	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.21	0.077	mg/kg	
79-01-6	Trichloroethene	ND	0.21	0.022	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.21	0.032	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.52	0.030	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	0.52	0.023	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	0.52	0.022	mg/kg	
108-05-4	Vinyl Acetate	ND	0.52	0.058	mg/kg	
75-01-4	Vinyl chloride	ND	0.21	0.028	mg/kg	
	m,p-Xylene	ND	0.21	0.082	mg/kg	
95-47-6	o-Xylene	ND	0.21	0.025	mg/kg	
1330-20-7	Xylene (total)	ND	0.21	0.025	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

Client Sample ID: GP-15-89 Lab Sample ID: MC17144-2 Matrix: SO - Soil Method: SW846 8260B Project: URSMOSTL: Roxana Drilling, Roxana, IL	Date Sampled: 12/21/12 Date Received: 12/24/12 Percent Solids: 91.1
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4.2
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VOA Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	85%		70-130%
2037-26-5	Toluene-D8	84%		70-130%
460-00-4	4-Bromofluorobenzene	79%		70-130%

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

Client Sample ID: GP-15-89	Date Sampled: 12/21/12
Lab Sample ID: MC17144-2	Date Received: 12/24/12
Matrix: SO - Soil	Percent Solids: 91.1
Method: SW846 8011 SW846 8011	
Project: URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK20245.D	1	12/27/12	AP	12/26/12	OP31554	GBK729
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.2 g	50.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.0027	0.0012	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0027	0.0010	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	160%		61-167%
460-00-4	Bromofluorobenzene (S)	146%		61-167%

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

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Report of Analysis

Page 1 of 3

Client Sample ID:	TRIP BLANK	Date Sampled:	12/21/12
Lab Sample ID:	MC17144-3	Date Received:	12/24/12
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	H59607.D	1	12/28/12	JP	n/a	n/a	MSH1970
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	5.0	3.0	ug/l	
107-02-8	Acrolein	ND	25	10	ug/l	
107-13-1	Acrylonitrile	ND	5.0	3.2	ug/l	
71-43-2	Benzene	ND	0.50	0.24	ug/l	
108-86-1	Bromobenzene	ND	5.0	0.62	ug/l	
74-97-5	Bromochloromethane	ND	5.0	1.3	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.58	ug/l	
75-25-2	Bromoform	ND	1.0	0.78	ug/l	
74-83-9	Bromomethane	ND	2.0	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	2.4	ug/l	
104-51-8	n-Butylbenzene	ND	5.0	0.61	ug/l	
135-98-8	sec-Butylbenzene	ND	5.0	0.55	ug/l	
98-06-6	tert-Butylbenzene	ND	5.0	0.64	ug/l	
75-15-0	Carbon disulfide	ND	5.0	0.61	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.87	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.47	ug/l	
75-00-3	Chloroethane	ND	2.0	0.50	ug/l	
110-75-8	2-Chloroethyl vinyl ether	ND	5.0	1.3	ug/l	
67-66-3	Chloroform	ND	1.0	0.50	ug/l	
74-87-3	Chloromethane	ND	2.0	0.73	ng/l	
95-49-8	o-Chlorotoluene	ND	5.0	0.65	ug/l	
106-43-4	p-Chlorotoluene	ND	5.0	0.48	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.53	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.93	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.45	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.64	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.7	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.62	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.63	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	0.41	ug/l	
156-59-2	cis-1,2-Dichloroethene	ND	1.0	0.64	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	0.95	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

Client Sample ID:	TRIP BLANK	Date Sampled:	12/21/12
Lab Sample ID:	MCI7144-3	Date Received:	12/24/12
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	2.0	0.72	ug/l	
142-28-9	1,3-Dichloropropane	ND	5.0	0.64	ug/l	
594-20-7	2,2-Dichloropropane	ND	5.0	1.6	ug/l	
563-58-6	1,1-Dichloropropene	ND	5.0	0.91	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.45	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.20	ng/l	
123-91-1	1,4-Dioxane	ND	25	15	ug/l	
97-63-2	Ethyl methacrylate	ND	5.0	0.81	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.51	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.0	2.1	ug/l	
591-78-6	2-Hexanone	ND	5.0	2.0	ug/l	
98-82-8	Isopropylbenzene	ND	5.0	0.50	ug/l	
99-87-6	p-Isopropyltoluene	ND	5.0	0.57	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.41	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	2.9	ug/l	
74-95-3	Methylene bromide	ND	5.0	1.1	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.83	ug/l	
91-20-3	Naphthalene	ND	5.0	0.50	ug/l	
103-65-1	n-Propylbenzene	ND	5.0	0.58	ug/l	
100-42-5	Styrene	ND	5.0	0.45	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	5.0	0.57	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.60	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	0.42	ug/l	
108-88-3	Toluene	ND	1.0	0.51	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	1.3	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	1.3	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.85	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.50	ug/l	
79-01-6	Trichloroethene	ND	1.0	0.78	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.29	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.85	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.35	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	0.47	ug/l	
108-05-4	Vinyl Acetate	ND	5.0	1.3	ug/l	
75-01-4	Vinyl chloride	ND	1.0	0.63	ug/l	
	m,p-Xylene	ND	1.0	0.73	ug/l	
95-47-6	o-Xylene	ND	1.0	0.58	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.58	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

Client Sample ID: TRIP BLANK Lab Sample ID: MC17144-3 Matrix: AQ - Trip Blank Water Method: SW846 8260B Project: URSMOSTL: Roxana Drilling, Roxana, IL	Date Sampled: 12/21/12 Date Received: 12/24/12 Percent Solids: n/a
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4.3
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VOA Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	102%		70-130%
2037-26-5	Toluene-D8	98%		70-130%
460-00-4	4-Bromofluorobenzene	108%		70-130%

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

Client Sample ID: TRIP BLANK	Date Sampled: 12/21/12
Lab Sample ID: MC17144-3	Date Received: 12/24/12
Matrix: AQ - Trip Blank Water	Percent Solids: n/a
Method: SW846 8011 SW846 8011	
Project: URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	YZ77607.D	1	12/28/12	CZ	12/27/12	OP31568	GYZ7000
Run #2							

Run #	Initial Volume	Final Volume
Run #1	35.2 ml	2.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.015	0.013	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.015	0.010	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	96%		36-173%
460-00-4	Bromofluorobenzene (S)	92%		36-173%

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

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Misc. Forms



Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody
- Sample Tracking Chronicle
- Internal Chain of Custody

Field ID Tracking # _____ Sample Order Control # _____
 Accutest Quote # _____ Accutest Job # **MC17144**

Client / Reporting Information		Project Information										Requested Analysis (see TEST CODE sheet)										Matrix Codes
Company Name URS		Project Name Roxana Drilling										VOC 8260 VOC 801 VOC 801										DI - Drinking Water GW - Ground Water WW - Wastewater SW - Surface Water SO - Soil SL - Sludge SED - Sediment CR - Oil LO - Other Liquid AIR - Air SO - Other Solid WP - Wipe FB - Field Blank EB - Equipment Blank RB - Rinse Blank TB - Trip Blank
Street Address		Billing Information (If different from Report to) Company Name URS																				
City State Zip		Street Address																				
Project Contact E. Kunkel E-mail _____ Phone # _____ Fax # _____		Client PO# 21562850.15000 City _____ State _____ Zip _____																				
Signatory (Name) Wanda Remington Brian Smith Phone # _____		Project Manager D. Palmer Attention _____ PO# _____																				
Field ID / Point of Collection		MECHANISM		Collection		Sampled by		# of Tests		# of Containers		Number of Green or BOTTLES										LAB USE ONLY
-1 GP-15-74				Date Time 12/21/12 09:50		WJ/B		30		4		<input checked="" type="checkbox"/> VOC 8260 <input checked="" type="checkbox"/> VOC 801 <input checked="" type="checkbox"/> VOC 801										
-2 GP-15-87				↓		↓		↓		↓												
-3 Trip Blank				↓		↓		↓		↓												

12C 5F3
10P2

Data Deliverable Information			Comments / Special Instructions		
Turnaround Time (Business days) <input type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> Std. 5 Business Days (By Contract only) <input type="checkbox"/> 5 Day RUSH <input checked="" type="checkbox"/> 3 Day EMERGENCY Due 12/28 <input type="checkbox"/> 2 Day EMERGENCY <input type="checkbox"/> 1 Day EMERGENCY Emergency & Rush 1/4 data available VIA Lablink	Approved By (Accutest PM) / Date: <div style="font-size: 2em; font-weight: bold; text-align: center;">RUSH!</div>	Commercial "A" (Level 1) <input type="checkbox"/> Commercial "B" (Level 2) <input checked="" type="checkbox"/> FULLY1 (Level 3+4) <input type="checkbox"/> CT RCP <input type="checkbox"/> MA MCP Commercial "A" = Results Only Commercial "B" = Results + QC Summary	<input type="checkbox"/> NYASP Category A <input type="checkbox"/> NYASP Category B <input type="checkbox"/> State Forms <input checked="" type="checkbox"/> EDD Format <input type="checkbox"/> Other _____		

Sample Custody must be documented below each time samples change possession, including courier delivery.							
Relinquished by Sampler W. J. B.	Date Time 12/21/12 1300	Received By Fed Ex	Relinquished By Fed Ex	Date Time 9:30	Received By Amly	Date Time 12-24-12	Received By
Relinquished by Sampler	Date Time	Received By	Relinquished By	Date Time	Received By	Date Time	Received By
Relinquished by	Date Time	Received By	Custody Seal #	<input type="checkbox"/> Track	Preserved where applicable	On Ice	Cooler Temp 28

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Accutest Laboratories Sample Receipt Summary

Accutest Job Number: MC17144 Client: URS Immediate Client Services Action Required: No
 Date / Time Received: 12/24/2012 Delivery Method: Client Service Action Required at Login: No
 Project: ROXANA DRILLING 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 w/in 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

Accutest Laboratories
V 508 481 6200

495 Technology Center West Bldg One
F 508 481 7753

Marlborough, MA
www.accutest.com

5.1
5

Internal Sample Tracking Chronicle

Shell Oil

Job No: MC17144

URSMOSTL: Roxana Drilling, Roxana, IL
 Project No: 21562735.15000

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Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
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MC17144-1 Collected: 21-DEC-12 09:05 By: WPBS Received: 24-DEC-12 By: GP-15-74

MC17144-1	SM21 2540 B MOD.	26-DEC-12	MA			%SOL
MC17144-1	SW846 8011	27-DEC-12 11:46	AP	26-DEC-12	CA	V8011SL
MC17144-1	SW846 8260B	28-DEC-12 12:30	JM			V8260SL+

MC17144-2 Collected: 21-DEC-12 10:55 By: WPBS Received: 24-DEC-12 By: GP-15-89

MC17144-2	SM21 2540 B MOD.	26-DEC-12	MA			%SOL
MC17144-2	SW846 8011	27-DEC-12 12:10	AP	26-DEC-12	CA	V8011SL
MC17144-2	SW846 8260B	28-DEC-12 12:59	JM			V8260SL+

MC17144-3 Collected: 21-DEC-12 00:00 By: WPBS Received: 24-DEC-12 By: TRIP BLANK

MC17144-3	SW846 8011	28-DEC-12 12:31	CZ	27-DEC-12	FC	V8011SL
MC17144-3	SW846 8260B	28-DEC-12 13:51	JP			V8260SL+

Accutest Internal Chain of Custody

Job Number: MC17144
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL
 Received: 12/24/12

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
MC17144-1.1	Walk In Ref #9	Mehdi Abdolrahim	12/26/12 08:00	Retrieve from Storage
MC17144-1.1	Mehdi Abdolrahim	Walk In Ref #9	12/26/12 08:45	Return to Storage
MC17144-1.1	Walk In Ref #9	Corey Aldoupolis	12/26/12 17:46	Retrieve from Storage
MC17144-1.1	Corey Aldoupolis	Walk In Ref #9	12/26/12 20:29	Return to Storage
MC17144-1.4	VOC Ref #10	Gary Krasinski	12/26/12 11:51	Retrieve from Storage
MC17144-1.4	Gary Krasinski	VOC Ref #10	12/28/12 12:41	Return to Storage
MC17144-1.4	VOC Ref #10	Jaime Maslowski	12/28/12 12:44	Retrieve from Storage
MC17144-1.4	Jaime Maslowski	VOC Ref #10	01/02/13 10:04	Return to Storage
MC17144-2.1	Walk In Ref #9	Mehdi Abdolrahim	12/26/12 08:00	Retrieve from Storage
MC17144-2.1	Mehdi Abdolrahim	Walk In Ref #9	12/26/12 08:45	Return to Storage
MC17144-2.1	Walk In Ref #9	Corey Aldoupolis	12/26/12 17:46	Retrieve from Storage
MC17144-2.1	Corey Aldoupolis	Walk In Ref #9	12/26/12 20:29	Return to Storage
MC17144-2.4	VOC Ref #10	Gary Krasinski	12/26/12 11:51	Retrieve from Storage
MC17144-2.4	Gary Krasinski	VOC Ref #10	12/28/12 12:41	Return to Storage
MC17144-2.4	VOC Ref #10	Jaime Maslowski	12/28/12 12:44	Retrieve from Storage
MC17144-2.4	Jaime Maslowski	VOC Ref #10	01/02/13 10:04	Return to Storage
MC17144-3.4	VOC Ref #5	Nick Krasinski	12/27/12 19:32	Retrieve from Storage

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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

Job Number: MC17144
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4899-MB	G123287.D	1	12/28/12	JM	n/a	n/a	MSG4899

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17144-1, MC17144-2

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	250	63	ug/kg	
107-02-8	Acrolein	ND	1300	500	ug/kg	
107-13-1	Acrylonitrile	ND	1300	63	ug/kg	
71-43-2	Benzene	ND	25	15	ug/kg	
108-86-1	Bromobenzene	ND	250	11	ug/kg	
74-97-5	Bromochloromethane	ND	250	19	ug/kg	
75-27-4	Bromodichloromethane	ND	100	11	ug/kg	
75-25-2	Bromoform	ND	100	100	ug/kg	
74-83-9	Bromomethane	ND	100	26	ug/kg	
78-93-3	2-Butanone (MEK)	ND	250	63	ug/kg	
104-51-8	n-Butylbenzene	ND	250	9.2	ug/kg	
135-98-8	sec-Butylbenzene	ND	250	11	ug/kg	
98-06-6	tert-Butylbenzene	ND	250	44	ug/kg	
75-15-0	Carbon disulfide	ND	250	8.2	ug/kg	
56-23-5	Carbon tetrachloride	ND	100	36	ug/kg	
108-90-7	Chlorobenzene	ND	100	14	ug/kg	
75-00-3	Chloroethane	ND	250	63	ug/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	250	100	ug/kg	
67-66-3	Chloroform	ND	100	26	ug/kg	
74-87-3	Chloromethane	ND	250	23	ug/kg	
95-49-8	o-Chlorotoluene	ND	250	55	ug/kg	
106-43-4	p-Chlorotoluene	ND	250	11	ug/kg	
124-48-1	Dibromochloromethane	ND	100	15	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	100	11	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	100	11	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	100	11	ug/kg	
75-71-8	Dichlorodifluoromethane	ND	100	57	ug/kg	
75-34-3	1,1-Dichloroethane	ND	100	14	ug/kg	
107-06-2	1,2-Dichloroethane	ND	100	14	ug/kg	
75-35-4	1,1-Dichloroethene	ND	100	18	ug/kg	
156-59-2	cis-1,2-Dichloroethene	ND	100	15	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	100	14	ug/kg	
78-87-5	1,2-Dichloropropane	ND	100	19	ug/kg	
142-28-9	1,3-Dichloropropane	ND	250	12	ug/kg	
594-20-7	2,2-Dichloropropane	ND	250	43	ug/kg	
563-58-6	1,1-Dichloropropene	ND	250	13	ug/kg	

6.1.1



Method Blank Summary

Job Number: MC17144
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4899-MB	G123287.D	1	12/28/12	JM	n/a	n/a	MSG4899

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17144-1, MC17144-2

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	100	8.5	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	100	25	ug/kg	
123-91-1	1,4-Dioxane	ND	1300	1300	ug/kg	
97-63-2	Ethyl methacrylate	ND	250	34	ug/kg	
100-41-4	Ethylbenzene	ND	100	12	ug/kg	
87-68-3	Hexachlorobutadiene	ND	250	23	ug/kg	
591-78-6	2-Hexanone	ND	250	25	ug/kg	
98-82-8	Isopropylbenzene	ND	250	11	ug/kg	
99-87-6	p-Isopropyltoluene	ND	250	8.9	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	100	14	ug/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	250	25	ug/kg	
74-95-3	Methylene bromide	ND	250	25	ug/kg	
75-09-2	Methylene chloride	ND	100	58	ug/kg	
91-20-3	Naphthalene	ND	250	63	ug/kg	
103-65-1	n-Propylbenzene	ND	250	51	ug/kg	
100-42-5	Styrene	ND	250	12	ug/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	250	50	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	100	21	ug/kg	
127-18-4	Tetrachloroethene	ND	100	11	ug/kg	
108-88-3	Toluene	ND	250	42	ug/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	250	12	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	250	11	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	100	16	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	100	37	ug/kg	
79-01-6	Trichloroethene	ND	100	11	ug/kg	
75-69-4	Trichlorofluoromethane	ND	100	15	ug/kg	
96-18-4	1,2,3-Trichloropropane	ND	250	15	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	250	11	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	250	11	ug/kg	
108-05-4	Vinyl Acetate	ND	250	28	ug/kg	
75-01-4	Vinyl chloride	ND	100	14	ug/kg	
	m,p-Xylene	ND	100	39	ug/kg	
95-47-6	o-Xylene	ND	100	12	ug/kg	
1330-20-7	Xylene (total)	ND	100	12	ug/kg	

6.1.1



Method Blank Summary

Job Number: MC17144
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4899-MB	G123287.D	1	12/28/12	JM	n/a	n/a	MSG4899

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17144-1, MC17144-2

6.1.1
6

CAS No.	Surrogate Recoveries		Limits
1868-53-7	Dibromofluoromethane	94%	70-130%
2037-26-5	Toluene-D8	90%	70-130%
460-00-4	4-Bromofluorobenzene	85%	70-130%

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

Method Blank Summary

Job Number: MC17144
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSH1970-MB	H59606.D	1	12/28/12	JP	n/a	n/a	MSH1970

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17144-3

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.0	3.0	ug/l	
107-02-8	Acrolein	ND	25	10	ug/l	
107-13-1	Acrylonitrile	ND	5.0	3.2	ug/l	
71-43-2	Benzene	ND	0.50	0.24	ug/l	
108-86-1	Bromobenzene	ND	5.0	0.62	ug/l	
74-97-5	Bromochloromethane	ND	5.0	1.3	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.58	ug/l	
75-25-2	Bromoform	ND	1.0	0.78	ug/l	
74-83-9	Bromomethane	ND	2.0	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	2.4	ug/l	
104-51-8	n-Butylbenzene	ND	5.0	0.61	ug/l	
135-98-8	sec-Butylbenzene	ND	5.0	0.55	ug/l	
98-06-6	tert-Butylbenzene	ND	5.0	0.64	ug/l	
75-15-0	Carbon disulfide	ND	5.0	0.61	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.87	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.47	ug/l	
75-00-3	Chloroethane	ND	2.0	0.50	ug/l	
110-75-8	2-Chloroethyl vinyl ether	ND	5.0	1.3	ug/l	
67-66-3	Chloroform	ND	1.0	0.50	ug/l	
74-87-3	Chloromethane	ND	2.0	0.73	ug/l	
95-49-8	o-Chlorotoluene	ND	5.0	0.65	ug/l	
106-43-4	p-Chlorotoluene	ND	5.0	0.48	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.53	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.93	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.45	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.64	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.7	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.62	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.63	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	0.41	ug/l	
156-59-2	cis-1,2-Dichloroethene	ND	1.0	0.64	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	0.95	ug/l	
78-87-5	1,2-Dichloropropane	ND	2.0	0.72	ug/l	
142-28-9	1,3-Dichloropropane	ND	5.0	0.64	ug/l	
594-20-7	2,2-Dichloropropane	ND	5.0	1.6	ug/l	
563-58-6	1,1-Dichloropropene	ND	5.0	0.91	ug/l	

6.1.2



Method Blank Summary

Job Number: MC17144
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSH1970-MB	H59606.D	1	12/28/12	JP	n/a	n/a	MSH1970

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17144-3

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.45	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.20	ug/l	
123-91-1	1,4-Dioxane	ND	25	15	ug/l	
97-63-2	Ethyl methacrylate	ND	5.0	0.81	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.51	ug/l	
87-68-3	Hexachlorohutadiene	ND	5.0	2.1	ug/l	
591-78-6	2-Hexanone	ND	5.0	2.0	ug/l	
98-82-8	Isopropylhenzene	ND	5.0	0.50	ug/l	
99-87-6	p-Isopropyltoluene	ND	5.0	0.57	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.41	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	2.9	ug/l	
74-95-3	Methylene bromide	ND	5.0	1.1	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.83	ug/l	
91-20-3	Naphthalene	ND	5.0	0.50	ug/l	
103-65-1	n-Propylbenzene	ND	5.0	0.58	ug/l	
100-42-5	Styrene	ND	5.0	0.45	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	5.0	0.57	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.60	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	0.42	ug/l	
108-88-3	Toluene	ND	1.0	0.51	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	1.3	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	1.3	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.85	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.50	ug/l	
79-01-6	Trichloroethene	ND	1.0	0.78	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.29	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.85	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.35	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	0.47	ug/l	
108-05-4	Vinyl Acetate	ND	5.0	1.3	ug/l	
75-01-4	Vinyl chloride	ND	1.0	0.63	ug/l	
	m,p-Xylene	ND	1.0	0.73	ug/l	
95-47-6	o-Xylene	ND	1.0	0.58	ng/l	
1330-20-7	Xylene (total)	ND	1.0	0.58	ug/l	

6.1.2



Method Blank Summary

Job Number: MC17144
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSH1970-MB	H59606.D	1	12/28/12	JP	n/a	n/a	MSH1970

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17144-3

6.1.2



CAS No.	Surrogate Recoveries		Limits
1868-53-7	Dibromofluoromethane	101%	70-130%
2037-26-5	Toluene-D8	99%	70-130%
460-00-4	4-Bromofluorobenzene	108%	70-130%

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

Blank Spike Summary

Job Number: MC17144
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4899-BS	G123284.D	1	12/28/12	JM	n/a	n/a	MSG4899

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17144-1, MC17144-2

CAS No.	Compound	Spikc ug/kg	BSP ug/kg	BSP %	Limits
67-64-1	Acetone	2500	3250	130	70-130
107-02-8	Acrolein	12500	10000	80	70-130
107-13-1	Acrylonitrile	2500	2300	92	70-130
71-43-2	Benzene	2500	2510	100	70-130
108-86-1	Bromobenzene	2500	2600	104	70-130
74-97-5	Bromochloromethane	2500	2570	103	70-130
75-27-4	Bromodichloromethane	2500	2600	104	70-130
75-25-2	Bromoform	2500	2280	91	70-130
74-83-9	Bromomethane	2500	2640	106	70-130
78-93-3	2-Butanone (MEK)	2500	2840	114	70-130
104-51-8	n-Butylbenzene	2500	2610	104	70-130
135-98-8	sec-Butylbenzene	2500	2500	100	70-130
98-06-6	tert-Butylbenzene	2500	2150	86	70-130
75-15-0	Carbon disulfide	2500	2660	106	70-130
56-23-5	Carbon tetrachloride	2500	2670	107	70-130
108-90-7	Chlorobenzene	2500	2580	103	70-130
75-00-3	Chloroethane	2500	2670	107	70-130
110-75-8	2-Chloroethyl vinyl ether	2500	2250	90	10-160
67-66-3	Chloroform	2500	2590	104	70-130
74-87-3	Chloromethane	2500	2970	119	70-130
95-49-8	o-Chlorotoluene	2500	2470	99	70-130
106-43-4	p-Chlorotoluene	2500	2530	101	70-130
124-48-1	Dibromochloromethane	2500	2530	101	70-130
95-50-1	1,2-Dichlorobenzene	2500	2490	100	70-130
541-73-1	1,3-Dichlorobenzene	2500	2550	102	70-130
106-46-7	1,4-Dichlorobenzene	2500	2660	106	70-130
75-71-8	Dichlorodifluoromethane	2500	3300	132* a	70-130
75-34-3	1,1-Dichloroethane	2500	2630	105	70-130
107-06-2	1,2-Dichloroethane	2500	2490	100	70-130
75-35-4	1,1-Dichloroethene	2500	2700	108	70-130
156-59-2	cis-1,2-Dichloroethene	2500	2600	104	70-130
156-60-5	trans-1,2-Dichloroethene	2500	2640	106	70-130
78-87-5	1,2-Dichloropropane	2500	2530	101	70-130
142-28-9	1,3-Dichloropropane	2500	2470	99	70-130
594-20-7	2,2-Dichloropropane	2500	3010	120	70-130
563-58-6	1,1-Dichloropropene	2500	2580	103	70-130

* = Outside of Control Limits.

6.2.1
6

Blank Spike Summary

Job Number: MC17144
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4899-BS	G123284.D	1	12/28/12	JM	n/a	n/a	MSG4899

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17144-1, MC17144-2

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
10061-01-5	cis-1,3-Dichloropropene	2500	2500	100	70-130
10061-02-6	trans-1,3-Dichloropropene	2500	2590	104	70-130
123-91-1	1,4-Dioxane	12500	11400	91	70-130
97-63-2	Ethyl methacrylate	2500	2320	93	76-141
100-41-4	Ethylbenzene	2500	2640	106	70-130
87-68-3	Hexachlorobutadiene	2500	2650	106	70-130
591-78-6	2-Hexanone	2500	2640	106	70-130
98-82-8	Isopropylbenzene	2500	2490	100	70-130
99-87-6	p-Isopropyltoluene	2500	2730	109	70-130
1634-04-4	Methyl Tert Butyl Ether	2500	2440	98	70-130
108-10-1	4-Methyl-2-pentanone (MIBK)	2500	2200	88	70-130
74-95-3	Methylene bromide	2500	2450	98	70-130
75-09-2	Methylene chloride	2500	2650	106	70-130
91-20-3	Naphthalene	2500	2320	93	70-130
103-65-1	n-Propylbenzene	2500	2490	100	70-130
100-42-5	Styrene	2500	2490	100	70-130
630-20-6	1,1,1,2-Tetrachloroethane	2500	2550	102	70-130
79-34-5	1,1,2,2-Tetrachloroethane	2500	2450	98	70-130
127-18-4	Tetrachloroethene	2500	2690	108	70-130
108-88-3	Toluene	2500	2580	103	70-130
87-61-6	1,2,3-Trichlorobenzene	2500	2450	98	70-130
120-82-1	1,2,4-Trichlorobenzene	2500	2550	102	70-130
71-55-6	1,1,1-Trichloroethane	2500	2740	110	70-130
79-00-5	1,1,2-Trichloroethane	2500	2450	98	70-130
79-01-6	Trichloroethene	2500	2590	104	70-130
75-69-4	Trichlorofluoromethane	2500	2700	108	70-130
96-18-4	1,2,3-Trichloropropane	2500	2390	96	70-130
95-63-6	1,2,4-Trimethylbenzene	2500	2540	102	70-130
108-67-8	1,3,5-Trimethylbenzene	2500	2540	102	70-130
108-05-4	Vinyl Acetate	2500	2730	109	70-130
75-01-4	Vinyl chloride	2500	2280	91	70-130
	m,p-Xylene	5000	5210	104	70-130
95-47-6	o-Xylene	2500	2570	103	70-130
1330-20-7	Xylene (total)	7500	7770	104	70-130

* = Outside of Control Limits.

6.2.1



Blank Spike Summary

Job Number: MC17144
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4899-BS	G123284.D	1	12/28/12	JM	n/a	n/a	MSG4899

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17144-1, MC17144-2

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	95%	70-130%
2037-26-5	Toluene-D8	92%	70-130%
460-00-4	4-Bromofluorobenzene	85%	70-130%

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

* = Outside of Control Limits.

6.2.1
6

Blank Spike Summary

Job Number: MC17144
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSH1970-BS	H59605.D	1	12/28/12	JP	n/a	n/a	MSH1970

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17144-3

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
67-64-1	Acetone	50	70.8	142* a	70-130
107-02-8	Acrolein	250	202	81	70-130
107-13-1	Acrylonitrile	50	39.1	78	70-130
71-43-2	Benzene	50	45.7	91	70-130
108-86-1	Bromobenzene	50	48.7	97	70-130
74-97-5	Bromochloromethane	50	49.1	98	70-130
75-27-4	Bromodichloromethane	50	58.2	116	70-130
75-25-2	Bromoform	50	59.9	120	70-130
74-83-9	Bromomethane	50	48.0	96	70-130
78-93-3	2-Butanone (MEK)	50	57.2	114	70-130
104-51-8	n-Butylbenzene	50	51.2	102	70-130
135-98-8	sec-Butylbenzene	50	52.9	106	70-130
98-06-6	tert-Butylbenzene	50	56.5	113	70-130
75-15-0	Carbon disulfide	50	50.1	100	70-130
56-23-5	Carbon tetrachloride	50	69.1	138* a	70-130
108-90-7	Chlorobenzene	50	48.8	98	70-130
75-00-3	Chloroethane	50	46.7	93	70-130
110-75-8	2-Chloroethyl vinyl ether	50	62.6	125	70-130
67-66-3	Chloroform	50	53.8	108	70-130
74-87-3	Chloromethane	50	57.3	115	70-130
95-49-8	o-Chlorotoluene	50	52.0	104	70-130
106-43-4	p-Chlorotoluene	50	54.9	110	70-130
124-48-1	Dibromochloromethane	50	51.8	104	70-130
95-50-1	1,2-Dichlorobenzene	50	52.1	104	70-130
541-73-1	1,3-Dichlorobenzene	50	52.2	104	70-130
106-46-7	1,4-Dichlorobenzene	50	47.8	96	70-130
75-71-8	Dichlorodifluoromethane	50	65.5	131* a	70-130
75-34-3	1,1-Dichloroethane	50	49.6	99	70-130
107-06-2	1,2-Dichloroethane	50	57.9	116	70-130
75-35-4	1,1-Dichloroethene	50	51.6	103	70-130
156-59-2	cis-1,2-Dichloroethene	50	47.0	94	70-130
156-60-5	trans-1,2-Dichloroethene	50	46.5	93	70-130
78-87-5	1,2-Dichloropropane	50	44.0	88	70-130
142-28-9	1,3-Dichloropropane	50	45.4	91	70-130
594-20-7	2,2-Dichloropropane	50	70.1	140* a	70-130
563-58-6	1,1-Dichloropropene	50	51.8	104	70-130

* = Outside of Control Limits.

6.2.2



Blank Spike Summary

Job Number: MC17144
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSH1970-BS	H59605.D	1	12/28/12	JP	n/a	n/a	MSH1970

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17144-3

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
10061-01-5	cis-1,3-Dichloropropene	50	48.1	96	70-130
10061-02-6	trans-1,3-Dichloropropene	50	54.6	109	70-130
123-91-1	1,4-Dioxane	250	218	87	70-130
97-63-2	Ethyl methacrylate	50	49.0	98	77-137
100-41-4	Ethylbenzene	50	47.9	96	70-130
87-68-3	Hexachlorobutadiene	50	51.8	104	70-130
591-78-6	2-Hexanone	50	55.8	112	70-130
98-82-8	Isopropylbenzene	50	53.3	107	70-130
99-87-6	p-Isopropyltoluene	50	51.1	102	70-130
1634-04-4	Methyl Tert Butyl Ether	50	51.0	102	70-130
108-10-1	4-Methyl-2-pentanone (MIBK)	50	43.8	88	70-130
74-95-3	Methylene bromide	50	48.6	97	70-130
75-09-2	Methylene chloride	50	48.0	96	70-130
91-20-3	Naphthalene	50	40.0	80	70-130
103-65-1	n-Propylbenzene	50	52.7	105	70-130
100-42-5	Styrene	50	49.3	99	70-130
630-20-6	1,1,1,2-Tetrachloroethane	50	61.1	122	70-130
79-34-5	1,1,2,2-Tetrachloroethane	50	47.5	95	70-130
127-18-4	Tetrachloroethene	50	46.8	94	70-130
108-88-3	Toluene	50	46.4	93	70-130
87-61-6	1,2,3-Trichlorobenzene	50	43.1	86	70-130
120-82-1	1,2,4-Trichlorobenzene	50	45.2	90	70-130
71-55-6	1,1,1-Trichloroethane	50	61.0	122	70-130
79-00-5	1,1,2-Trichloroethane	50	46.3	93	70-130
79-01-6	Trichloroethene	50	48.9	98	70-130
75-69-4	Trichlorofluoromethane	50	59.5	119	70-130
96-18-4	1,2,3-Trichloropropane	50	52.2	104	70-130
95-63-6	1,2,4-Trimethylbenzene	50	49.3	99	70-130
108-67-8	1,3,5-Trimethylbenzene	50	48.9	98	70-130
108-05-4	Vinyl Acetate	50	47.8	96	70-130
75-01-4	Vinyl chloride	50	51.1	102	70-130
	m,p-Xylene	100	97.3	97	70-130
95-47-6	o-Xylene	50	50.3	101	70-130
1330-20-7	Xylene (total)	150	148	99	70-130

* = Outside of Control Limits.

6.2.2


Blank Spike Summary

Job Number: MC17144
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSH1970-BS	H59605.D	1	12/28/12	JP	n/a	n/a	MSH1970

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17144-3

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	110%	70-130%
2037-26-5	Toluene-D8	98%	70-130%
460-00-4	4-Bromofluorobenzene	105%	70-130%

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

* = Outside of Control Limits.

6.2.2



Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC17144
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC17144-2MS	G123290.D	1	12/28/12	JM	n/a	n/a	MSG4899
MC17144-2MSD	G123291.D	1	12/28/12	JM	n/a	n/a	MSG4899
MC17144-2	G123289.D	1	12/28/12	JM	n/a	n/a	MSG4899

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17144-1, MC17144-2

CAS No.	Compound	MC17144-2 ug/kg	Spike Q ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	ND	5220	7940	152* a	7800	150* a	2	70-130/30
107-02-8	Acrolein	ND	26100	17500	67* a	18000	69* a	3	70-130/30
107-13-1	Acrylonitrile	ND	5220	4430	85	4440	85	0	70-130/30
71-43-2	Benzene	483	5220	5260	92	5290	92	1	70-130/30
108-86-1	Bromobenzene	ND	5220	5010	96	5010	96	0	70-130/30
74-97-5	Bromochloromethane	ND	5220	4940	95	4870	93	1	70-130/30
75-27-4	Bromodichloromethane	ND	5220	4990	96	5020	96	1	70-130/30
75-25-2	Bromoform	ND	5220	4350	83	4270	82	2	70-130/30
74-83-9	Bromomethane	ND	5220	4960	95	5010	96	1	70-130/30
78-93-3	2-Butanone (MEK)	ND	5220	6850	131* a	6340	122	8	70-130/30
104-51-8	n-Butylbenzene	ND	5220	4970	95	5030	96	1	70-130/30
135-98-8	sec-Butylbenzene	ND	5220	4780	92	4830	93	1	70-130/30
98-06-6	tert-Butylbenzene	ND	5220	3940	76	4100	79	4	70-130/30
75-15-0	Carbon disulfide	ND	5220	5010	96	4990	96	0	70-130/30
56-23-5	Carbon tetrachloride	ND	5220	5080	97	5150	99	1	70-130/30
108-90-7	Chlorobenzene	ND	5220	4850	93	4780	92	1	70-130/30
75-00-3	Chloroethane	ND	5220	4900	94	4950	95	1	70-130/30
110-75-8	2-Chloroethyl vinyl ether	ND	5220	4290	82	4230	81	1	10-160/30
67-66-3	Chloroform	ND	5220	4950	95	4970	95	0	70-130/30
74-87-3	Chloromethane	ND	5220	5730	110	5750	110	0	70-130/30
95-49-8	o-Chlorotoluene	ND	5220	4620	89	4730	91	2	70-130/30
106-43-4	p-Chlorotoluene	ND	5220	4930	95	4860	93	1	70-130/30
124-48-1	Dibromochloromethane	ND	5220	4880	94	4810	92	1	70-130/30
95-50-1	1,2-Dichlorobenzene	ND	5220	4800	92	4800	92	0	70-130/30
541-73-1	1,3-Dichlorobenzene	ND	5220	4840	93	4900	94	1	70-130/30
106-46-7	1,4-Dichlorobenzene	ND	5220	5080	97	5140	99	1	70-130/30
75-71-8	Dichlorodifluoromethane	ND	5220	7270	139* a	7160	137* a	2	70-130/30
75-34-3	1,1-Dichloroethane	ND	5220	4990	96	5010	96	0	70-130/30
107-06-2	1,2-Dichloroethane	ND	5220	4900	94	4900	94	0	70-130/30
75-35-4	1,1-Dichloroethene	ND	5220	5140	99	5150	99	0	70-130/30
156-59-2	cis-1,2-Dichloroethene	ND	5220	4960	95	4940	95	0	70-130/30
156-60-5	trans-1,2-Dichloroethene	ND	5220	5000	96	5010	96	0	70-130/30
78-87-5	1,2-Dichloropropane	ND	5220	4910	94	4930	95	0	70-130/30
142-28-9	1,3-Dichloropropane	ND	5220	4770	91	4650	89	3	70-130/30
594-20-7	2,2-Dichloropropane	ND	5220	5500	105	5650	108	3	70-130/30
563-58-6	1,1-Dichloropropene	ND	5220	4900	94	4960	95	1	70-130/30

* = Outside of Control Limits.

6.3.1



Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC17144
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC17144-2MS	G123290.D	1	12/28/12	JM	n/a	n/a	MSG4899
MC17144-2MSD	G123291.D	1	12/28/12	JM	n/a	n/a	MSG4899
MC17144-2	G123289.D	1	12/28/12	JM	n/a	n/a	MSG4899

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17144-1, MC17144-2

CAS No.	Compound	MC17144-2 ug/kg	Spike Q ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
10061-01-5	cis-1,3-Dichloropropene	ND	5220	4830	93	4800	92	1	70-130/30
10061-02-6	trans-1,3-Dichloropropene	ND	5220	5000	96	5020	96	0	70-130/30
123-91-1	1,4-Dioxane	ND	26100	22700	87	23100	89	2	70-130/30
97-63-2	Ethyl methacrylate	ND	5220	4530	87	4540	87	0	41-160/30
100-41-4	Ethylbenzene	ND	5220	4980	95	4910	94	1	70-130/30
87-68-3	Hexachlorobutadiene	ND	5220	5050	97	5180	99	3	70-130/30
591-78-6	2-Hexanone	ND	5220	5840	112	5420	104	7	70-130/30
98-82-8	Isopropylbenzene	ND	5220	4760	91	4780	92	0	70-130/30
99-87-6	p-Isopropyltoluene	ND	5220	5160	99	5240	100	2	70-130/30
1634-04-4	Methyl Tert Butyl Ether	ND	5220	4790	92	4790	92	0	70-130/30
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5220	4360	84	4280	82	2	70-130/30
74-95-3	Methylene bromide	ND	5220	4760	91	4810	92	1	70-130/30
75-09-2	Methylene chloride	ND	5220	5050	97	5120	98	1	70-130/30
91-20-3	Naphthalene	ND	5220	4550	87	4600	88	1	70-130/30
103-65-1	n-Propylbenzene	ND	5220	4750	91	4760	91	0	70-130/30
100-42-5	Styrene	ND	5220	4760	91	4750	91	0	70-130/30
630-20-6	1,1,1,2-Tetrachloroethane	ND	5220	4890	94	4790	92	2	70-130/30
79-34-5	1,1,2,2-Tetrachloroethane	ND	5220	4820	92	4770	91	1	70-130/30
127-18-4	Tetrachloroethene	ND	5220	5070	97	4990	96	2	70-130/30
108-88-3	Toluene	ND	5220	4950	95	4960	95	0	70-130/30
87-61-6	1,2,3-Trichlorobenzene	ND	5220	4610	88	4780	92	4	70-130/30
120-82-1	1,2,4-Trichlorobenzene	ND	5220	4840	93	4950	95	2	70-130/30
71-55-6	1,1,1-Trichloroethane	ND	5220	5070	97	5160	99	2	70-130/30
79-00-5	1,1,2-Trichloroethane	ND	5220	4820	92	4860	93	1	70-130/30
79-01-6	Trichloroethene	ND	5220	4900	94	4900	94	0	70-130/30
75-69-4	Trichlorofluoromethane	ND	5220	5190	100	5290	101	2	70-130/30
96-18-4	1,2,3-Trichloropropane	ND	5220	4730	91	4700	90	1	70-130/30
95-63-6	1,2,4-Trimethylbenzene	ND	5220	4890	94	4900	94	0	70-130/30
108-67-8	1,3,5-Trimethylbenzene	ND	5220	4840	93	4870	93	1	70-130/30
108-05-4	Vinyl Acetate	ND	5220	5340	102	5250	101	2	70-130/30
75-01-4	Vinyl chloride	ND	5220	5460	105	5360	103	2	70-130/30
	m,p-Xylene	ND	10400	9770	94	9650	93	1	70-130/30
95-47-6	o-Xylene	ND	5220	4840	93	4780	92	1	70-130/30
1330-20-7	Xylene (total)	ND	15600	14600	93	14400	92	1	70-130/30

* = Outside of Control Limits.

6.3.1



Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC17144
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC17144-2MS	G123290.D	1	12/28/12	JM	n/a	n/a	MSG4899
MC17144-2MSD	G123291.D	1	12/28/12	JM	n/a	n/a	MSG4899
MC17144-2	G123289.D	1	12/28/12	JM	n/a	n/a	MSG4899

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17144-1, MC17144-2

CAS No.	Surrogate Recoveries	MS	MSD	MC17144-2	Limits
1868-53-7	Dibromofluoromethane	94%	94%	85%	70-130%
2037-26-5	Toluene-D8	91%	92%	84%	70-130%
460-00-4	4-Bromofluorobenzene	87%	87%	79%	70-130%

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

* = Outside of Control Limits.

6.3.1
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Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC17144
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC17020-IMS	H59620.D	5	12/28/12	JP	n/a	n/a	MSH1970
MC17020-1MSD	H59621.D	5	12/28/12	JP	n/a	n/a	MSH1970
MC17020-1	H59619.D	1	12/28/12	JP	n/a	n/a	MSH1970

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17144-3

CAS No.	Compound	MC17020-1 ug/l	Spike Q ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	ND	250	201	80	201	80	0	70-130/30
107-02-8	Acrolein	ND	1250	815	65* a	817	65* a	0	70-130/30
107-13-1	Acrylonitrile	ND	250	185	74	186	74	1	70-130/30
71-43-2	Benzene	18.0	250	253	94	248	92	2	70-130/30
108-86-1	Bromobenzene	ND	250	252	101	252	101	0	70-130/30
74-97-5	Bromochloromethane	ND	250	255	102	252	101	1	70-130/30
75-27-4	Bromodichloromethane	ND	250	309	124	302	121	2	70-130/30
75-25-2	Bromoform	ND	250	289	116	282	113	2	70-130/30
74-83-9	Bromomethane	ND	250	254	102	240	96	6	70-130/30
78-93-3	2-Butanone (MEK)	ND	250	218	87	213	85	2	70-130/30
104-51-8	n-Butylbenzene	ND	250	255	102	247	99	3	70-130/30
135-98-8	sec-Butylbenzene	ND	250	262	105	258	103	2	70-130/30
98-06-6	tert-Bntylbenzene	ND	250	286	114	278	111	3	70-130/30
75-15-0	Carbon disulfide	ND	250	232	93	219	88	6	70-130/30
56-23-5	Carbon tetrachloride	ND	250	370	148* a	353	141* a	5	70-130/30
108-90-7	Chlorobenzene	ND	250	254	102	245	98	4	70-130/30
75-00-3	Chloroethane	ND	250	236	94	224	90	5	70-130/30
110-75-8	2-Chloroethyl vinyl ether	ND	250	77.6	31* a	75.2	30* a	3	70-130/30
67-66-3	Chloroform	ND	250	291	116	283	113	3	70-130/30
74-87-3	Chloromethane	ND	250	302	121	294	118	3	70-130/30
95-49-8	o-Chlorotoluene	ND	250	270	108	263	105	3	70-130/30
106-43-4	p-Chlorotolnene	ND	250	282	113	276	110	2	70-130/30
124-48-1	Dibromochloromethane	ND	250	259	104	256	102	1	70-130/30
95-50-1	1,2-Dichlorobenzene	ND	250	263	105	256	102	3	70-130/30
541-73-1	1,3-Dichlorobeuzene	ND	250	267	107	262	105	2	70-130/30
106-46-7	1,4-Dichlorobenzene	ND	250	243	97	238	95	2	70-130/30
75-71-8	Dichlorodifluoromethane	ND	250	367	147* a	352	141* a	4	70-130/30
75-34-3	1,1-Dichloroethane	ND	250	260	104	255	102	2	70-130/30
107-06-2	1,2-Dichloroethane	ND	250	313	125	305	122	3	70-130/30
75-35-4	1,1-Dichloroethene	ND	250	264	106	251	100	5	70-130/30
156-59-2	cis-1,2-Dichloroethene	ND	250	241	96	241	96	0	70-130/30
156-60-5	trans-1,2-Dichloroethene	ND	250	246	98	241	96	2	70-130/30
78-87-5	1,2-Dichloropropane	ND	250	225	90	222	89	1	70-130/30
142-28-9	1,3-Dichloropropane	ND	250	231	92	228	91	1	70-130/30
594-20-7	2,2-Dichloropropane	ND	250	364	146* a	345	138* a	5	70-130/30
563-58-6	1,1-Dichloropropene	ND	250	272	109	263	105	3	70-130/30

* = Outside of Control Limits.



Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC17144
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC17020-IMS	H59620.D	5	12/28/12	JP	n/a	n/a	MSH1970
MC17020-1MSD	H59621.D	5	12/28/12	JP	n/a	n/a	MSH1970
MC17020-1	H59619.D	1	12/28/12	JP	n/a	n/a	MSH1970

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17144-3

CAS No.	Compound	MC17020-1 ug/l	Spike Q	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
10061-01-5	cis-1,3-Dichloropropene	ND	250	246	98	244	98	1	70-130/30
10061-02-6	trans-1,3-Dichloropropene	ND	250	279	112	277	111	1	70-130/30
123-91-1	1,4-Dioxane	ND	1250	1040	83	1080	86	4	70-130/30
97-63-2	Ethyl methacrylate	ND	250	238	95	238	95	0	72-139/30
100-41-4	Ethylbenzene	3.5	250	255	101	247	97	3	70-130/30
87-68-3	Hexachlorobutadiene	ND	250	259	104	247	99	5	70-130/30
591-78-6	2-Hexanone	ND	250	211	84	209	84	1	70-130/30
98-82-8	Isopropylbenzene	ND	250	273	109	266	106	3	70-130/30
99-87-6	p-Isopropyltoluene	ND	250	256	102	249	100	3	70-130/30
1634-04-4	Methyl Tert Butyl Ether	ND	250	255	102	254	102	0	70-130/30
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	250	205	82	211	84	3	70-130/30
74-95-3	Methylene bromide	ND	250	260	104	252	101	3	70-130/30
75-09-2	Methylene chloride	ND	250	246	98	239	96	3	70-130/30
91-20-3	Naphthalene	ND	250	182	73	188	75	3	70-130/30
103-65-1	n-Propylbenzene	1.0	250	271	108	263	105	3	70-130/30
100-42-5	Styrene	ND	250	235	94	232	93	1	70-130/30
630-20-6	1,1,1,2-Tetrachloroethane	ND	250	318	127	305	122	4	70-130/30
79-34-5	1,1,2,2-Tetrachloroethane	ND	250	231	92	231	92	0	70-130/30
127-18-4	Tetrachloroethene	ND	250	244	98	235	94	4	70-130/30
108-88-3	Toluene	ND	250	239	96	238	95	0	70-130/30
87-61-6	1,2,3-Trichlorobenzene	ND	250	199	80	200	80	1	70-130/30
120-82-1	1,2,4-Trichlorobenzene	ND	250	215	86	214	86	0	70-130/30
71-55-6	1,1,1-Trichloroethane	ND	250	329	132* a	315	126	4	70-130/30
79-00-5	1,1,2-Trichloroethane	ND	250	234	94	231	92	1	70-130/30
79-01-6	Trichloroethene	ND	250	263	105	254	102	3	70-130/30
75-69-4	Trichlorofluoromethane	ND	250	328	131* a	307	123	7	70-130/30
96-18-4	1,2,3-Trichloropropane	ND	250	254	102	255	102	0	70-130/30
95-63-6	1,2,4-Trimethylbenzene	ND	250	252	101	246	98	2	70-130/30
108-67-8	1,3,5-Trimethylbenzene	1.0	250	250	100	243	97	3	70-130/30
108-05-4	Vinyl Acetate	ND	250	225	90	230	92	2	70-130/30
75-01-4	Vinyl chloride	ND	250	260	104	261	104	0	70-130/30
	m,p-Xylene	2.8	500	500	99	489	97	2	70-130/30
95-47-6	o-Xylene	0.69	250	267	107	257	103	4	70-130/30
1330-20-7	Xylene (total)	3.5	750	767	102	746	99	3	70-130/30

* = Outside of Control Limits.



Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC17144
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC17020-1MS	H59620.D	5	12/28/12	JP	n/a	n/a	MSH1970
MC17020-1MSD	H59621.D	5	12/28/12	JP	n/a	n/a	MSH1970
MC17020-1	H59619.D	1	12/28/12	JP	n/a	n/a	MSH1970

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17144-3

CAS No.	Surrogate Recoveries	MS	MSD	MC17020-1	Limits
1868-53-7	Dibromofluoromethane	110%	111%	103%	70-130%
2037-26-5	Toluene-D8	98%	98%	95%	70-130%
460-00-4	4-Bromofluorobenzene	104%	104%	106%	70-130%

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

* = Outside of Control Limits.



Volatile Internal Standard Area Summary

Job Number: MC17144
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	MSG4899-CC4894	Injection Date:	12/28/12
Lab File ID:	GI23284.D	Injection Time:	10:35
Instrument ID:	GCMSCG	Method:	SW846 8260B

	IS 1	RT	IS 2	RT	IS 3	RT	IS 4	RT	IS 5	RT
	AREA		AREA		AREA		AREA		AREA	
Check Std	202910	5.13	275283	6.27	134694	9.62	139460	12.25	39087	3.10
Upper Limit ^a	405820	5.63	550566	6.77	269388	10.12	278920	12.75	78174	3.60
Lower Limit ^b	101455	4.63	137642	5.77	67347	9.12	69730	11.75	19544	2.60

Lab	IS 1	RT	IS 2	RT	IS 3	RT	IS 4	RT	IS 5	RT
Sample ID	AREA		AREA		AREA		AREA		AREA	
MSG4899-BS	202910	5.13	275283	6.27	134694	9.62	139460	12.25	39087	3.10
MSG4899-MB	205785	5.13	279234	6.27	138418	9.62	137838	12.25	40781	3.10
MC17144-1	208396	5.13	282436	6.27	140111	9.62	139426	12.25	40450	3.10
MC17144-2	208500	5.13	282755	6.27	137045	9.62	137918	12.25	40126	3.10
MC17144-2MS	214030	5.13	288961	6.27	142363	9.62	146838	12.25	41315	3.10
MC17144-2MSD	213352	5.13	287774	6.27	144483	9.62	146255	12.25	41712	3.10
ZZZZZZ	216841	5.13	296487	6.27	150394	9.62	149987	12.25	46092	3.09
ZZZZZZ	214643	5.13	291395	6.27	141697	9.62	146676	12.25	41452	3.10
ZZZZZZ	215281	5.13	292814	6.27	185534	9.53	57315*	12.14	45679	3.10
ZZZZZZ	217632	5.13	291945	6.27	145172	9.62	149716	12.25	49336	3.10
ZZZZZZ	214166	5.13	292428	6.27	141531	9.62	146595	12.25	43434	3.10
ZZZZZZ	211569	5.13	284178	6.27	138871	9.62	143074	12.25	44349	3.10
ZZZZZZ	200412	5.13	272396	6.27	134732	9.62	134323	12.25	40083	3.10
ZZZZZZ	208699	5.13	282124	6.27	147760	9.63	145413	12.25	45282	3.10
ZZZZZZ	206368	5.13	282616	6.27	136837	9.62	139375	12.25	43369	3.10
ZZZZZZ	207379	5.13	279233	6.27	139831	9.62	139696	12.25	41306	3.10
ZZZZZZ	210592	5.13	284266	6.27	140494	9.62	143104	12.25	44254	3.10
ZZZZZZ	210035	5.13	283203	6.27	138206	9.62	141834	12.25	40394	3.10
ZZZZZZ	210505	5.13	283507	6.27	144587	9.62	144649	12.25	44741	3.10

- 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.

6.4.1
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Volatile Internal Standard Area Summary

Job Number: MC17144
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	MSH1970-CC1910	Injection Date:	12/28/12
Lab File ID:	H59604.D	Injection Time:	12:30
Instrument ID:	GCMESH	Method:	SW846 8260B

	IS 1	RT	IS 2	RT	IS 3	RT	IS 4	RT	IS 5	RT
	AREA		AREA		AREA		AREA		AREA	
Check Std	201191	8.70	289825	9.57	134477	12.83	156794	15.39	40590	6.27
Upper Limit ^a	402382	9.20	579650	10.07	268954	13.33	313588	15.89	81180	6.77
Lower Limit ^b	100596	8.20	144913	9.07	67239	12.33	78397	14.89	20295	5.77

Lab Sample ID	IS 1	RT	IS 2	RT	IS 3	RT	IS 4	RT	IS 5	RT
	AREA		AREA		AREA		AREA		AREA	
MSH1970-BS	208358	8.70	300827	9.57	140395	12.83	163212	15.40	43640	6.28
MSH1970-MB	190618	8.71	264331	9.57	114103	12.83	127125	15.40	38139	6.29
MC17144-3	184080	8.71	254128	9.57	109782	12.83	123605	15.40	34085	6.28
ZZZZZZ	174769	8.71	240548	9.57	105476	12.83	118945	15.40	35570	6.29
ZZZZZZ	177716	8.71	274169	9.57	108334	12.83	120099	15.40	36612	6.29
ZZZZZZ	183243	8.71	285070	9.57	111564	12.83	126162	15.40	36473	6.29
ZZZZZZ	180210	8.71	263822	9.58	107520	12.83	119958	15.40	35297	6.29
ZZZZZZ	176897	8.70	255930	9.57	107955	12.83	122744	15.40	37088	6.29
ZZZZZZ	164833	8.70	242455	9.57	100139	12.83	115196	15.40	33658	6.27
ZZZZZZ	164677	8.71	227929	9.58	100240	12.83	114729	15.40	30642	6.28
ZZZZZZ	174717	8.71	239452	9.57	105967	12.83	119876	15.40	34990	6.28
ZZZZZZ	171660	8.71	234883	9.57	104067	12.83	118853	15.40	32717	6.28
ZZZZZZ	157724	8.70	215058	9.57	95347	12.83	110249	15.40	29323	6.28
MC17020-1	166370	8.71	235317	9.57	101714	12.83	115771	15.40	32654	6.29
MC17020-1MS	183231	8.70	263497	9.57	124753	12.83	147767	15.40	35414	6.27
MC17020-1MSD	192765	8.70	276475	9.57	130996	12.83	152631	15.39	38242	6.27
ZZZZZZ	167495	8.71	229325	9.57	101220	12.83	115124	15.40	33609	6.27
ZZZZZZ	173432	8.70	253356	9.57	106204	12.83	127430	15.40	36954	6.29
ZZZZZZ	187679	8.70	263710	9.57	109941	12.83	140045	15.40	44272	6.28
ZZZZZZ	183152	8.70	247240	9.57	105741	12.83	126180	15.40	39439	6.30

- 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.

6.4.2
6

Volatile Surrogate Recovery Summary

Job Number: MC17144
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, 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
MC17144-3	H59607.D	102.0	98.0	108.0
MC17020-1MS	H59620.D	110.0	98.0	104.0
MC17020-1MSD	H59621.D	111.0	98.0	104.0
MSH1970-BS	H59605.D	110.0	98.0	105.0
MSH1970-MB	H59606.D	101.0	99.0	108.0

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

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

6.5.1



Volatile Surrogate Recovery Summary

Job Number: MC17144
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, 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
MC17144-1	G123288.D	88.0	86.0	82.0
MC17144-2	G123289.D	85.0	84.0	79.0
MC17144-2MS	G123290.D	94.0	91.0	87.0
MC17144-2MSD	G123291.D	94.0	92.0	87.0
MSG4899-BS	G123284.D	95.0	92.0	85.0
MSG4899-MB	G123287.D	94.0	90.0	85.0

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

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

6.5.2



GC Volatiles

QC Data Summaries

Includes the following where applicable:

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

7

Method Blank Summary

Job Number: MC17144
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31554-MB	BK20240.D	1	12/27/12	AP	12/26/12	OP31554	GBK729

The QC reported here applies to the following samples:

Method: SW846 8011

MC17144-1, MC17144-2

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	2.5	1.1	ug/kg	
106-93-4	1,2-Dibromoethane	ND	2.5	0.96	ug/kg	

CAS No.	Surrogate Recoveries	Limits
460-00-4	Bromofluorobenzene (S)	149% 61-167%
460-00-4	Bromofluorobenzene (S)	125% 61-167%

7.1.1
7

Method Blank Summary

Job Number: MC17144
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31568-MB	YZ77605.D	1	12/28/12	CZ	12/27/12	OP31568	GYZ7000

The QC reported here applies to the following samples:

Method: SW846 8011

MC17144-3

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.015	0.013	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.015	0.010	ug/l	

CAS No.	Surrogate Recoveries		Limits
460-00-4	Bromofluorobenzene (S)	89%	36-173%
460-00-4	Bromofluorobenzene (S)	89%	36-173%

7.1.2
7

Blank Spike Summary

Job Number: MC17144
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31554-BS	BK20241.D	1	12/27/12	AP	12/26/12	OP31554	GBK729

The QC reported here applies to the following samples:

Method: SW846 8011

MC17144-1, MC17144-2

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
96-12-8	1,2-Dibromo-3-chloropropane	33.1	40.4	122	59-142
106-93-4	1,2-Dibromoethane	33.1	39.9	121	56-140

CAS No.	Surrogate Recoveries	BSP	Limits
460-00-4	Bromofluorobenzene (S)	160%	61-167%
460-00-4	Bromofluorobenzene (S)	145%	61-167%

7.2.1

7

* = Outside of Control Limits.

Blank Spike Summary

Job Number: MC17144
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31568-BS	YZ77606.D	1	12/28/12	CZ	12/27/12	OP31568	GYZ7000

The QC reported here applies to the following samples:

Method: SW846 8011

MC17144-3

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
96-12-8	1,2-Dibromo-3-chloropropane	0.071	0.061	86	60-140
106-93-4	1,2-Dibromoethane	0.071	0.062	87	60-140

CAS No.	Surrogate Recoveries	BSP	Limits
460-00-4	Bromofluorobenzene (S)	99%	36-173%
460-00-4	Bromofluorobenzene (S)	93%	36-173%

7.2.2



* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC17144
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31554-MS	BK20242.D	1	12/27/12	AP	12/26/12	OP31554	GBK729
OP31554-MSD	BK20243.D	1	12/27/12	AP	12/26/12	OP31554	GBK729
MC17144-1	BK20244.D	1	12/27/12	AP	12/26/12	OP31554	GBK729

The QC reported here applies to the following samples:

Method: SW846 8011

MC17144-1, MC17144-2

CAS No.	Compound	MC17144-1 ug/kg	Spike Q ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
96-12-8	1,2-Dibromo-3-chloropropane	ND	107	136	127	137	123	1	40-156/27
106-93-4	1,2-Dibromoethane	ND	107	134	125	142	127	6	48-141/27

CAS No.	Surrogate Recoveries	MS	MSD	MC17144-1	Limits
460-00-4	Bromofluorobenzene (S)	146%	146%	156%	61-167%
460-00-4	Bromofluorobenzene (S)	132%	132%	137%	61-167%

7.3.1
7

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC17144
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31568-MS	YZ77609.D	1	12/28/12	CZ	12/27/12	OP31568	GYZ7000
OP31568-MSD	YZ77610.D	1	12/28/12	CZ	12/27/12	OP31568	GYZ7000
MC17000-15	YZ77608.D	1	12/28/12	CZ	12/27/12	OP31568	GYZ7000

The QC reported here applies to the following samples:

Method: SW846 8011

MC17144-3

CAS No.	Compound	MC17000-15 Spike		MS	MS	MSD	MSD	RPD	Limits Rec/RPD
		ug/l	Q ug/l	ug/l	%	ug/l	%		
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.071	0.061	86	0.062	87	2	64-141/29
106-93-4	1,2-Dibromoethane	ND	0.071	0.058	82	0.058	82	0	63-163/27

CAS No.	Surrogate Recoveries	MS	MSD	MC17000-15 Limits	
460-00-4	Bromofluorobenzene (S)	97%	97%	93%	36-173%
460-00-4	Bromoflnorobenzene (S)	94%	95%	92%	36-173%

7.3.2

7

* = Outside of Control Limits.

Volatile Surrogate Recovery Summary

Job Number: MC17144
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Method: SW846 8011 Matrix: AQ

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 ^a	S1 ^b
MC17144-3	YZ77607.D	96.0	92.0
OP31568-BS	YZ77606.D	99.0	93.0
OP31568-MB	YZ77605.D	89.0	89.0
OP31568-MS	YZ77609.D	97.0	94.0
OP31568-MSD	YZ77610.D	97.0	95.0

Surrogate Compounds Recovery Limits

S1 = Bromofluorobenzene (S) 36-173%

- (a) Recovery from GC signal #1
- (b) Recovery from GC signal #2

7.4.1
7

Volatile Surrogate Recovery Summary

Job Number: MC17144
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Method: SW846 8011 Matrix: SO

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 ^a	S1 ^b
MC17144-1	BK20244.D	156.0	137.0
MC17144-2	BK20245.D	160.0	146.0
OP31554-BS	BK20241.D	160.0	145.0
OP31554-MB	BK20240.D	149.0	125.0
OP31554-MS	BK20242.D	146.0	132.0
OP31554-MSD	BK20243.D	146.0	132.0

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

S1 = Bromofluorohenzene (S) 61-167%

(a) Recovery from GC signal #1

(h) Recovery from GC signal #2

7.4.2

7

GC Surrogate Retention Time Summary

Job Number: MC17144
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	GBK729-CC720	Injection Date:	12/27/12
Lab File ID:	BK20239.D	Injection Time:	09:41
Instrument ID:	GCBK	Method:	SW846 8011

	S1 ^a	S1 ^b
	RT	RT
Check Std	4.77	4.44

Lab	Lab	Date	Time	S1 ^a	S1 ^b
Sample ID	File ID	Analyzed	Analyzed	RT	RT
OP31554-MB	BK20240.D	12/27/12	10:08	4.77	4.45
OP31554-BS	BK20241.D	12/27/12	10:33	4.77	4.44
OP31554-MS	BK20242.D	12/27/12	10:57	4.77	4.44
OP31554-MSD	BK20243.D	12/27/12	11:21	4.78	4.45
MC17144-1	BK20244.D	12/27/12	11:46	4.78	4.45
MC17144-2	BK20245.D	12/27/12	12:10	4.78	4.45
GBK729-ECC720	BK20246.D	12/27/12	12:34	4.77	4.45

**Surrogate
Compounds**

S1 = Bromofluorobenzene (S)

- (a) Retention time from GC signal #1
- (b) Retention time from GC signal #2

7.5.1
7

GC Surrogate Retention Time Summary

Job Number: MC17144
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	GYZ7000-ICC7000	Injection Date:	12/28/12
Lab File ID:	YZ77599.D	Injection Time:	09:11
Instrument ID:	GCYZ	Method:	SW846 8011

	S1 ^a RT	S1 ^b RT
Check Std	3.57	3.85

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 ^a RT	S1 ^b RT
ZZZZZZ	YZ77603A.D	12/28/12	10:51	3.57	3.85
OP31568-MB	YZ77605.D	12/28/12	11:41	3.57	3.85
OP31568-BS	YZ77606.D	12/28/12	12:06	3.57	3.85
MC17144-3	YZ77607.D	12/28/12	12:31	3.57	3.85
MC17000-15	YZ77608.D	12/28/12	12:56	3.57	3.85
OP31568-MS	YZ77609.D	12/28/12	13:21	3.57	3.85
OP31568-MSD	YZ77610.D	12/28/12	13:46	3.57	3.85
GYZ7000-ECC7000	YZ77611.D	12/28/12	14:11	3.57	3.85

**Surrogate
Compounds**

S1 = Bromofluorobenzene (S)

- (a) Retention time from GC signal #1
- (b) Retention time from GC signal #2

7.5.2
7

General Chemistry

QC Data Summaries



Includes the following where applicable:

- Percent Solids Raw Data Summary

Percent Solids Raw Data Summary

Job Number: MC17144
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample: MC17144-1 Analyzed: 26-DEC-12 by MA Method: SM21 2540 B MOD.
ClientID: GP-15-74

Wet Weight (Total)	35.311	g
Tare Weight	27.653	g
Dry Weight (Total)	34.468	g
Solids, Percent	89	%

Sample: MC17144-2 Analyzed: 26-DEC-12 by MA Method: SM21 2540 B MOD.
ClientID: GP-15-89

Wet Weight (Total)	30.813	g
Tare Weight	20.501	g
Dry Weight (Total)	29.896	g
Solids, Percent	91.1	%

8.1
8

Roxana Drilling 2013 Data Review

Laboratory SDG: MC17324

Data Reviewer: Melissa Mansker

Peer Reviewer: Elizabeth Kunkel

Date Reviewed: 1/24/2013

Guidance: USEPA National Functional Guidelines for Superfund Organic Methods Data Review 2008

Sample Identification	Sample Identification
GP-16-23	GP-16-42
GP-16-51	GP-16-57
GP-16-57-Dup	GP-16-77
Trip Blank	

1.0 Data Package Completeness

Were all items delivered as specified in the QAPP and COC as appropriate?

Yes

2.0 Laboratory Case Narrative \ Cooler Receipt Form

Were problems noted in the laboratory case narrative or cooler receipt form?

Yes, the laboratory case narrative indicated VOC LCS/LCSD recoveries were outside evaluation criteria. VOC MS/MSD recoveries and MS/MSD RPDs were outside of evaluation criteria. Internal standard area recoveries for method blank MSM1813-MB and sample duplicate pair GP-16-57/GP-16-57-Dup were outside criteria. Although not indicated in the laboratory case narrative, methylene chloride was detected in the method blank. 1,2-Dichloroethane and 2-hexanone were qualified due to field duplicate RPDs outside evaluation criteria for the field duplicate pair GP-16-57/GP-16-57-Dup. The initial calibration verification recovery for acetone, acrolein, 2-butanone, and 2-hexanone exceeded 50 percent difference (%D). Continuing calibration verification recovery for 1,4-dioxane exceeded 50 percent difference (%D). Professional judgment was used to qualify the common lab contaminant acetone in samples GP-16-51 and GP-16-77. These issues are addressed further in the appropriate sections below.

The cooler receipt form indicated samples were received by the laboratory at 1.0°C which is outside temperature criteria 4°C ± 2°C. All samples were received in good condition; no qualification of data was required.

3.0 Holding Times

Were samples extracted/analyzed within applicable limits?

Yes

4.0 Blank Contamination

Were any analytes detected in the Method Blanks, Field Blanks or Trip Blanks?

Yes

Blank ID	Parameter	Analyte	Concentration
MSM1813-MB	VOCs	Methylene chloride	1.9 ug/L

Analytical data that were reported non-detect or at concentrations greater than five times (5X) the associated blank concentration (10X for common laboratory contaminants) did not require qualification. No qualification of data was required.

5.0 Laboratory Control Sample

Were LCS recoveries within evaluation criteria?

No

LCS/LCSD ID	Parameter	Analyte	LCS/LCSD Recovery	RPD	LCS/LCSD/ RPD Criteria
MSG4905-BS	VOCs	Acetone	146	NA	70-130
MSG4905-BS	VOCs	2-Butanone (MEK)	137	NA	70-130
MSG4905-BS	VOCs	Dichlorodifluoromethane	147	NA	70-130
MSM1813-BS/BSD	VOCs	Chloromethane	133/139	4	70-130/25
MSM1813-BS/BSD	VOCs	Dichlorodifluoromethane	145/164	12	70-130/25
MSM1813-BS/BSD	VOCs	Trichlorofluoromethane	126/132	4	70-130/25
MSV612-BS/BSD	VOCs	Acetone	137/119	14	70-130/25
MSV612-BS/BSD	VOCs	2-Chloroethyl vinyl ether	42/43	3	70-130/25
MSV612-BS/BSD	VOCs	Dichlorodifluoromethane	163/172	6	70-130/25
MSV612-BS/BSD	VOCs	2,2-Dichloropropane	140/143	11	70-130/25

Analytical data reported as non-detect and associated with LCS recoveries above evaluation criteria, indicating a possible high bias, did not require qualification. LCS/LCSD MSV612-BS/BSD was associated with the trip blank. Trip blanks are quality control samples and are not qualified. No qualification of data was required.

6.0 Surrogate Recoveries

Were surrogate recoveries within evaluation criteria?

Yes

7.0 Matrix Spike and Matrix Spike Duplicate Recoveries

Were MS/MSD samples analyzed as part of this SDG?

Yes, sample GP-16-23 was spiked and analyzed for VOCs and VOCs by 8011. Although not requested, sample GP-16-51 was spiked and analyzed for VOCs, and sample GP-16-57 was spiked and analyzed for VOCs by 8011.

Were MS/MSD recoveries within evaluation criteria?

No

MS/MSD ID	Parameter	Analyte	MS/MSD Recovery	RPD	MS/MSD/ RPD Criteria
GP-16-51	VOCs	Benzene	52/42	2	70-130/30
GP-16-51	VOCs	Dichlorodifluoromethane	149/143	4	70-130/30
GP-16-51	VOCs	1,4-Dioxane	63/69	9	70-130/30
GP-16-23	VOCs	Acetone	323/174	129	70-130/30
GP-16-23	VOCs	Benzene	2993/742	161	70-130/30
GP-16-23	VOCs	Bromoform	65/86	62	70-130/30
GP-16-23	VOCs	Carbon disulfide	137/113	101	70-130/30
GP-16-23	VOCs	Chloroethane	131/109	100	70-130/30
GP-16-23	VOCs	2-Chloroethyl vinyl ether	162/93	126	70-130/30
GP-16-23	VOCs	Chloromethane	160/131	102	70-130/30
GP-16-23	VOCs	p-Chlorotoluene	93/69	108	70-130/30
GP-16-23	VOCs	1,2-Dichlorobenzene	58/53	93	70-130/30
GP-16-23	VOCs	1,3-Dichlorobenzene	75/60	103	70-130/30
GP-16-23	VOCs	1,4-Dichlorobenzene	73/60	101	70-130/30
GP-16-23	VOCs	Dichlorodifluoromethane	195/155	104	70-130/30
GP-16-23	VOCs	1,1-Dichloroethene	134/110	102	70-130/30
GP-16-23	VOCs	1,4-Dioxane	136/141	83	70-130/30
GP-16-23	VOCs	2-Hexanone	114/144	66	70-130/30
GP-16-23	VOCs	4-Methyl-2-pentanone (MIBK)	115/131	76	70-130/30
GP-16-23	VOCs	Naphthalene	37/46	67	70-130/30
GP-16-23	VOCs	1,2,3-Trichlorobenzene	32/38	71	70-130/30
GP-16-23	VOCs	1,2,4-Trichlorobenzene	45/44	88	70-130/30
GP-16-23	VOCs	Trichlorofluoromethane	145/117	103	70-130/30
GP-16-23	VOCs	Vinyl acetate	152/94	121	70-130/30
GP-16-23	VOCs	Vinyl chloride	145/114	104	70-130/30

MS/MSD RPDs alone were outside criteria for 48 out of 62 reported analytes in sample GP-16-23. MS/MSD RPDs outside evaluation criteria are not individually listed for analytes with MS/MSD recoveries within evaluation criteria. USEPA National Functional Guidelines for Organic Data Review indicates that organic data does not require qualification based on MS/MSD data alone and LCS recoveries were within evaluation criteria with the exception of compounds listed and qualified as appropriate in Section 5.0 of this data review. No further qualification of the data was required.

8.0 Internal Standard (IS) Recoveries

Were internal standard area recoveries within evaluation criteria?

No

Sample ID	Parameter	Analyte	IS Area Recovery	IS Criteria
GP-16-57-Original Analysis	VOCs	Chlorobenzene-d ₅	490123	70043-280172
GP-16-57-Dup-Original Analysis	VOCs	Chlorobenzene-d ₅	928453	70043-280172
MSM1813-MB	VOCs	Tert butyl alcohol-d ₉	41352	41932-167726

Analytical data that required qualification based on internal standard data are included in the following table. Analytical data reported as non-detect and associated with internal

standard recoveries above evaluation criteria, indicating a possible high bias, did not require qualification. Method blank MSM1813-MB is a quality control sample and is not qualified.

Sample ID	Parameter	Analyte	Qualification
GP-16-57	VOCs	Ethylbenzene	J
GP-16-57	VOCs	Isopropylbenzene	J
GP-16-57	VOCs	m,p-Xylene	J
GP-16-57	VOCs	o-Xylene	J
GP-16-57	VOCs	Xylene (total)	J
GP-16-57-Dup	VOCs	Ethylbenzene	J
GP-16-57-Dup	VOCs	2-Hexanone	J
GP-16-57-Dup	VOCs	Isopropylbenzene	J
GP-16-57-Dup	VOCs	m,p-Xylene	J
GP-16-57-Dup	VOCs	o-Xylene	J
GP-16-57-Dup	VOCs	Xylene (total)	J

9.0 Laboratory Duplicate Results

Were laboratory duplicate samples collected as part of this SDG?

No

10.0 Field Duplicate Results

Were field duplicate samples collected as part of this SDG?

Yes

Field ID	Field Duplicate ID
GP-16-57	GP-16-57-Dup

Were field duplicates within evaluation criteria?

No

Field ID	Field Duplicate ID	Parameter	Analyte	RPD	Qualification
GP-16-57	GP-16-57-Dup	VOCs	1,2-Dichloroethane	200	J/UJ
GP-16-57	GP-16-57-Dup	VOCs	2-Hexanone	200	UJ/J

11.0 Sample Dilutions

For samples that were diluted and nondetect, were undiluted results also reported?

Not applicable; samples analyzed did not require dilution.

12.0 Additional Qualifications

Were additional qualifications applied?

Yes, professional judgment was used to qualify the common laboratory contaminant acetone reported at concentrations less than two times (2X) the reporting limit (RL).

Field ID	Analyte	New RL	Qualification	Comments
GP-16-51	Acetone	-	U	Professional Judgment
GP-16-77	Acetone	0.544 mg/kg	U	Professional Judgment

Additionally, samples GP-16-42, GP-16-51, GP-16-77 and sample duplicate pair GP-16-57/GP-16-57-Dup were associated with the initial calibration verification recovery for acetone, acrolein, 2-butanone, and 2-hexanone that exceeded 50 percent difference (%D). Sample GP-16-23 was associated with continuing calibration verification recovery for 1,4-dioxane that exceeded 50 percent difference (%D). 2-Hexanone in sample duplicate pair GP-16-57/GP-16-57-Dup was previously qualified due to field duplicate data. No further qualification of data was required. Analytes in samples associated with ICV %D greater than 50% were qualified as summarized in the following table.

Sample ID	Parameter	Analyte	Qualification
GP-16-23	VOCs	1,4-Dioxane	UJ
GP-16-42	VOCs	Acetone	UJ
GP-16-42	VOCs	Acrolein	UJ
GP-16-42	VOCs	2-Butanone (MEK)	UJ
GP-16-42	VOCs	2-Hexanone	UJ
GP-16-51	VOCs	Acetone	UJ
GP-16-51	VOCs	Acrolein	UJ
GP-16-51	VOCs	2-Butanone (MEK)	UJ
GP-16-51	VOCs	2-Hexanone	UJ
GP-16-57	VOCs	Acetone	UJ
GP-16-57	VOCs	Acrolein	UJ
GP-16-57	VOCs	2-Butanone (MEK)	UJ
GP-16-57-Dup	VOCs	Acetone	UJ
GP-16-57-Dup	VOCs	Acrolein	UJ
GP-16-57-Dup	VOCs	2-Butanone (MEK)	UJ
GP-16-77	VOCs	Acetone	UJ
GP-16-77	VOCs	Acrolein	UJ
GP-16-77	VOCs	2-Butanone (MEK)	UJ
GP-16-77	VOCs	2-Hexanone	UJ



02/14/13

Technical Report for

Shell Oil

URSMOSTL: Roxana Drilling, Roxana, IL

21562850.15000

Accutest Job Number: MC17324

Sampling Date: 01/03/13

Report to:

URS Corporation

elizabeth.kunkel@URS.com

ATTN: Elizabeth Kunkel

Total number of pages in report: 97

*Reviewed on
1/24/2013*



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

Reza Fand
Reza Fand
Lab Director

Client Service contact: Jeremy Vienneau 508-481-6200

Certifications: MA (M-MA136, SW846 NELAC) CT (PH-0109) NH (250210) RI (00071) ME (MA00136) FL (E87579) NY (11791) NJ (MA926) PA (6801121) ND (R-188) CO MN (11546AA) NC (653) IL (002337) WI (399080220) ISO 17025:2005 (L2235)

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Test results relate only to samples analyzed.

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Sample Summary

Shell Oil

Job No: MC17324

URSMOSTL: Roxana Drilling, Roxana, IL
 Project No: 21562850.15000

Sample Number	Collected		Matrix Code	Received	Type	Client Sample ID
	Date	Time By				
MC17324-1	01/03/13	10:35 WPJS	SO	01/05/13	Soil	GP-16-23 ✓
MC17324-1D	01/03/13	10:35 WPJS	SO	01/05/13	Soil Dup/MSD	GP-16-23 ✓
MC17324-1S	01/03/13	10:35 WPJS	SO	01/05/13	Soil Matrix Spike	GP-16-23 ✓
MC17324-2	01/03/13	12:55 WPJS	SO	01/05/13	Soil	GP-16-42 ✓
MC17324-3	01/03/13	14:30 WPJS	SO	01/05/13	Soil	GP-16-51 ✓
MC17324-4	01/03/13	15:30 WPJS	SO	01/05/13	Soil	GP-16-57 ✓
MC17324-5	01/03/13	15:30 WPJS	SO	01/05/13	Soil	GP-16-57-DUP ✓
MC17324-6	01/03/13	16:05 WPJS	SO	01/05/13	Soil	GP-16-77 ✓
MC17324-7	01/03/13	00:00 WPJS	AQ	01/05/13	Trip Blank Water	TRIP BLANK ✓

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



SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: Shell Oil

Job No MC17324

Site: URSMOSTL: Roxana Drilling, Roxana, IL

Report Date 1/21/2013 4:35:28 PM

6 Sample(s) and 1 Trip Blank(s) were collected on 01/03/2013 and were received at Accutest on 01/05/2013 properly preserved, at 1 Deg. C and intact. These Samples received an Accutest job number of MC17324. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section of this report. 1-Chlorohexane was searched in the library search and reported only if detections were found.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

Volatiles by GCMS By Method SW846 8260B

Matrix AQ	Batch ID: MSV612
------------------	-------------------------

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) MC17371-4MS, MC17371-4MSD were used as the QC samples indicated.
- Blank Spike Recovery(s) for 2,2-Dichloropropane, 2-Chloroethyl vinyl ether, Acetone, Dichlorodifluoromethane are outside control limits. Blank Spike meets program technical requirements.
- Blank Spike Duplicate Recovery(s) for 2,2-Dichloropropane, 2-Chloroethyl vinyl ether, Dichlorodifluoromethane are outside control limits. Blank Spike meets program technical requirements.
- MS/MSD Recovery(s) for 2,2-Dichloropropane, 2-Chloroethyl vinyl ether, Dichlorodifluoromethane are outside control limits. Outside control limits due to possible matrix interference. Refer to Blank Spike.
- RPD(s) for MSD for 1,2,3-Trichlorobenzene are outside control limits for sample MC17371-4MSD. High RPD due to possible matrix interference and/or sample non-homogeneity.

Matrix SO	Batch ID: MSG4905
------------------	--------------------------

- All samples were analyzed within the recommended method holding time.
- Sample(s) MC17324-3MS, MC17324-3MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- Blank Spike Recovery(s) for 2-Butanone (MEK), Acetone, Dichlorodifluoromethane are outside control limits. Blank Spike meets program technical requirements.
- MS/MSD Recovery(s) for 1,4-Dioxane, Dichlorodifluoromethane are outside control limits. Outside control limits due to possible matrix interference. Refer to Blank Spike.
- MS/MSD Recovery(s) for Benzene are outside control limits. Outside control limits due to high level in sample relative to spike amount.
- Initial calibration verification MSG4894-ICV4894 for acrolein, acetone, 2-butanone, 2-hexanone exceeds 50% Difference. These compounds are within criteria in continuing calibration check standard MSG4905-CC4894.
- MC17324-4,5 has internal standard outside control limits. Outside control limits due to possible matrix interference. Confirmed by reanalysis.

Matrix SO	Batch ID: MSG4906
------------------	--------------------------

- All samples were analyzed within the recommended method holding time.
- Sample(s) MC17363-1MS, MC17363-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Matrix SO	Batch ID: MSM1813
------------------	--------------------------

- All samples were analyzed within the recommended method holding time.
- Sample(s) MC17324-1MS, MC17324-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Volatiles by GCMS By Method SW846 8260B

Matrix	SO	Batch ID:	MSM1813
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- Blank Spike Recovery(s) for Chloromethane, Dichlorodifluoromethane are outside control limits. Blank Spike meets program technical requirements.
- Blank Spike Duplicate Recovery(s) for Chloromethane, Dichlorodifluoromethane, Trichlorofluoromethane are outside control limits. Blank Spike meets program technical requirements.
- Matrix Spike Recovery(s) for 1,1-Dichloroethene, 1,2,3-Trichlorobenzene, 1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,4-Dioxane, 2-Chloroethyl vinyl ether, Acetone, Bromoform, Carbon disulfide, Chloroethane, Chloromethane, Dichlorodifluoromethane, Naphthalene, Trichlorofluoromethane, Vinyl Acetate, Vinyl chloride are outside control limits. Outside control limits due to possible matrix interference. Refer to Blank Spike.
- Matrix Spike Duplicate Recovery(s) for Acetone, Chloromethane, Dichlorodifluoromethane, 1,2,3-Trichlorobenzene, 1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 1,4-Dioxane, 2-Hexanone, 4-Methyl-2-pentanone (MIBK), Naphthalene, p-Chlorotoluene are outside control limits. Outside control limits due to possible matrix interference. Refer to Blank Spike.
- RPD(s) for MSD for Benzene, Bromobenzene are outside control limits. High recovery/RPD due to possible nonhomogeneity between sample bottles.
- RPD(s) for MSD for all compounds except of Benzene, Bromobenzene are outside control limits. High RPD due to possible matrix interference and/or sample non-homogeneity.
- Continuing calibration check standard MSM1813-CC1800 for 1,4-dioxane exceeds 50% Difference (response bias high). Associated sample non-detect for this compound.

Volatiles by GC By Method SW846 8011

Matrix	AQ	Batch ID:	OP31638
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- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- Sample(s) MC17327-4MS, MC17327-4MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Matrix	SO	Batch ID:	OP31636
--------	----	-----------	---------

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- Sample(s) MC17324-1MS, MC17324-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Wet Chemistry By Method SM21 2540 B MOD.

Matrix	SO	Batch ID:	GN41472
--------	----	-----------	---------

- Sample(s) MC17324-1DUP were used as the QC samples for Solids, Percent.

The Accutest Laboratories of New England certifies that all analysis were performed within method specification. It is further recommended that this report to be used in its entirety. The Accutest Laboratories of NE, Laboratory Director or assignee as verified by the signature on the cover page has authorized the release of this report(MC17324).

Summary of Hits

Job Number: MC17324
Account: Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL
Collected: 01/03/13



Lab Sample ID	Client Sample ID	Result/ Analyte	Qual	RL	MDL	Units	Method
MC17324-1	GP-16-23						
		Benzene	0.0458	0.00065	0.00038	mg/kg	SW846 8260B
		Ethylbenzene	0.0022 J	0.0026	0.00031	mg/kg	SW846 8260B
		Toluene	0.0028 J	0.0065	0.0011	mg/kg	SW846 8260B
		Xylene (total)	0.00078 J	0.0026	0.00031	mg/kg	SW846 8260B
MC17324-2	GP-16-42						
		Benzene	476	1.1	0.67	mg/kg	SW846 8260B
		Ethylbenzene	0.177 J	0.23	0.028	mg/kg	SW846 8260B
		Toluene	0.999	0.57	0.097	mg/kg	SW846 8260B
		1,2,4-Trimethylbenzene	0.292 J	0.57	0.026	mg/kg	SW846 8260B
		m,p-Xylene	0.509	0.23	0.090	mg/kg	SW846 8260B
		o-Xylene	0.226 J	0.23	0.027	mg/kg	SW846 8260B
		Xylene (total)	0.735	0.23	0.027	mg/kg	SW846 8260B
MC17324-3	GP-16-51						
		Acetone	0.490 J	0.52	0.13	mg/kg	SW846 8260B
		Benzene	25.0	0.052	0.031	mg/kg	SW846 8260B
		n-Butylbenzene	0.141 J	0.52	0.019	mg/kg	SW846 8260B
		sec-Butylbenzene	0.0308 J	0.52	0.024	mg/kg	SW846 8260B
		Ethylbenzene	0.298	0.21	0.025	mg/kg	SW846 8260B
		Isopropylbenzene	0.0508 J	0.52	0.024	mg/kg	SW846 8260B
		Naphthalene	0.230 J	0.52	0.13	mg/kg	SW846 8260B
		n-Propylbenzene	0.214 J	0.52	0.11	mg/kg	SW846 8260B
		Toluene	0.141 J	0.52	0.088	mg/kg	SW846 8260B
		1,2,4-Trimethylbenzene	0.975	0.52	0.023	mg/kg	SW846 8260B
		1,3,5-Trimethylbenzene	0.293 J	0.52	0.022	mg/kg	SW846 8260B
		m,p-Xylene	0.706	0.21	0.082	mg/kg	SW846 8260B
		o-Xylene	0.189 J	0.21	0.025	mg/kg	SW846 8260B
		Xylene (total)	0.895	0.21	0.025	mg/kg	SW846 8260B
MC17324-4	GP-16-57						
		Acrylonitrile	24.5	2.6	0.13	mg/kg	SW846 8260B
		Benzene	431	1.0	0.61	mg/kg	SW846 8260B
		n-Butylbenzene	27.9	0.52	0.019	mg/kg	SW846 8260B
		sec-Butylbenzene	4.96	0.52	0.024	mg/kg	SW846 8260B
		tert-Butylbenzene	1.69	0.52	0.091	mg/kg	SW846 8260B
		1,2-Dichloroethane	11.2	0.21	0.030	mg/kg	SW846 8260B
		Ethylbenzene	33.1	0.21	0.025	mg/kg	SW846 8260B
		Isopropylbenzene	10.4	0.52	0.024	mg/kg	SW846 8260B
		p-Isopropyltoluene	3.09	0.52	0.018	mg/kg	SW846 8260B

Summary of Hits

Job Number: MC17324
 Account: Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL
 Collected: 01/03/13



Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Naphthalene		19.9	0.52	0.13	mg/kg	SW846 8260B
n-Propylbenzene		41.2	0.52	0.10	mg/kg	SW846 8260B
Toluene		76.8	10	1.8	mg/kg	SW846 8260B
1,2,4-Trimethylbenzene		192	10	0.46	mg/kg	SW846 8260B
1,3,5-Trimethylbenzene		62.0	10	0.44	mg/kg	SW846 8260B
m,p-Xylene		62.1	0.21	0.081	mg/kg	SW846 8260B
o-Xylene		11.4	0.21	0.025	mg/kg	SW846 8260B
Xylene (total)		73.5	0.21	0.025	mg/kg	SW846 8260B
MC17324-5 GP-16-57-DUP						
Acrylonitrile		27.6	2.9	0.15	mg/kg	SW846 8260B
Benzene		473	1.2	0.69	mg/kg	SW846 8260B
n-Butylbenzene		32.8	0.59	0.022	mg/kg	SW846 8260B
sec-Butylbenzene		5.87	0.59	0.027	mg/kg	SW846 8260B
tert-Butylbenzene		2.25	0.59	0.10	mg/kg	SW846 8260B
Ethylbenzene		21.5	0.24	0.028	mg/kg	SW846 8260B
2-Hexanone		19.1	0.59	0.059	mg/kg	SW846 8260B
Isopropylbenzene		12.7	0.59	0.027	mg/kg	SW846 8260B
p-Isopropyltoluene		3.70	0.59	0.021	mg/kg	SW846 8260B
Naphthalene		24.8	0.59	0.15	mg/kg	SW846 8260B
n-Propylbenzene		58.8	12	2.4	mg/kg	SW846 8260B
Toluene		94.3	12	2.0	mg/kg	SW846 8260B
1,2,4-Trimethylbenzene		244	12	0.53	mg/kg	SW846 8260B
1,3,5-Trimethylbenzene		77.7	12	0.50	mg/kg	SW846 8260B
m,p-Xylene		40.0	0.24	0.093	mg/kg	SW846 8260B
o-Xylene		7.63	0.24	0.028	mg/kg	SW846 8260B
Xylene (total)		47.6	0.24	0.028	mg/kg	SW846 8260B
MC17324-6 GP-16-77						
Acetone		0.544	0.49	0.12	mg/kg	SW846 8260B
Benzene		2.18	0.049	0.029	mg/kg	SW846 8260B
n-Butylbenzene		0.400 J	0.49	0.018	mg/kg	SW846 8260B
sec-Butylbenzene		0.0725 J	0.49	0.022	mg/kg	SW846 8260B
Ethylbenzene		0.814	0.19	0.023	mg/kg	SW846 8260B
Isopropylbenzene		0.128 J	0.49	0.022	mg/kg	SW846 8260B
p-Isopropyltoluene		0.0518 J	0.49	0.017	mg/kg	SW846 8260B
Naphthalene		0.938	0.49	0.12	mg/kg	SW846 8260B
n-Propylbenzene		0.506	0.49	0.099	mg/kg	SW846 8260B
Toluene		0.608	0.49	0.082	mg/kg	SW846 8260B
1,2,4-Trimethylbenzene		2.53	0.49	0.022	mg/kg	SW846 8260B
1,3,5-Trimethylbenzene		0.740	0.49	0.021	mg/kg	SW846 8260B
m,p-Xylene		1.72	0.19	0.077	mg/kg	SW846 8260B
o-Xylene		0.297	0.19	0.023	mg/kg	SW846 8260B

Summary of Hits

Job Number: MC17324
Account: Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL
Collected: 01/03/13



Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Xylene (total)		2.02	0.19	0.023	mg/kg	SW846 8260B

MC17324-7 TRIP BLANK

No hits reported in this sample.

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID: GP-16-23	Date Sampled: 01/03/13
Lab Sample ID: MC17324-1	Date Received: 01/05/13
Matrix: SO - Soil	Percent Solids: 80.7
Method: SW846 8260B	
Project: URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M53337.D	1	01/09/13	AMY	n/a	n/a	MSM1813
Run #2							

Run #	Initial Weight	Final Volume
Run #1	4.80 g	5.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.0065	0.0016	mg/kg	
107-02-8	Acrolein	ND	0.032	0.013	mg/kg	
107-13-1	Acrylonitrile	ND	0.032	0.0016	mg/kg	
71-43-2	Benzene	0.0458	0.00065	0.00038	mg/kg	
108-86-1	Bromobenzene	ND	0.0065	0.00029	mg/kg	
74-97-5	Bromochloromethane	ND	0.0065	0.00048	mg/kg	
75-27-4	Bromodichloromethane	ND	0.0026	0.00027	mg/kg	
75-25-2	Bromoform	ND	0.0026	0.0026	mg/kg	
74-83-9	Bromomethane	ND	0.0026	0.00067	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.0065	0.0016	mg/kg	
104-51-8	n-Butylbenzene	ND	0.0065	0.00024	mg/kg	
135-98-8	sec-Butylbenzene	ND	0.0065	0.00030	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.0065	0.0011	mg/kg	
75-15-0	Carbon disulfide	ND	0.0065	0.00021	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.0026	0.00094	mg/kg	
108-90-7	Chlorobenzene	ND	0.0026	0.00036	mg/kg	
75-00-3	Chloroethane	ND	0.0065	0.0016	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.0065	0.0026	mg/kg	
67-66-3	Chloroform	ND	0.0026	0.00067	mg/kg	
74-87-3	Chloromethane	ND	0.0065	0.00060	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.0065	0.0014	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.0065	0.00029	mg/kg	
124-48-1	Dibromochloromethane	ND	0.0026	0.00038	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.0026	0.00028	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.0026	0.00029	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.0026	0.00027	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.0026	0.0015	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.0026	0.00035	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.0026	0.00037	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.0026	0.00047	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.0026	0.00039	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.0026	0.00037	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

Client Sample ID:	GP-16-23	Date Sampled:	01/03/13
Lab Sample ID:	MC17324-1	Date Received:	01/05/13
Matrix:	SO - Soil	Percent Solids:	80.7
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.0026	0.00048	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.0065	0.00030	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.0065	0.0011	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.0065	0.00034	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.0026	0.00022	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.0026	0.00064	mg/kg	
123-91-1	1,4-Dioxane	ND	0.032	0.032	mg/kg	WJ
97-63-2	Ethyl methacrylate	ND	0.0065	0.00088	mg/kg	
100-41-4	Ethylbenzene	0.0022	0.0026	0.00031	mg/kg	J
87-68-3	Hexachlorobutadiene	ND	0.0065	0.00060	mg/kg	
591-78-6	2-Hexanone	ND	0.0065	0.00065	mg/kg	
98-82-8	Isopropylbenzene	ND	0.0065	0.00029	mg/kg	
99-87-6	p-Isopropyltoluene	ND	0.0065	0.00023	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.0026	0.00037	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.0065	0.00065	mg/kg	
74-95-3	Methylene bromide	ND	0.0065	0.00064	mg/kg	
75-09-2	Methylene chloride	ND	0.0026	0.0015	mg/kg	
91-20-3	Naphthalene	ND	0.0065	0.0016	mg/kg	
103-65-1	n-Propylbenzene	ND	0.0065	0.0013	mg/kg	
100-42-5	Styrene	ND	0.0065	0.00030	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.0065	0.0013	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.0026	0.00055	mg/kg	
127-18-4	Tetrachloroethene	ND	0.0026	0.00030	mg/kg	
108-88-3	Toluene	0.0028	0.0065	0.0011	mg/kg	J
87-61-6	1,2,3-Trichlorobenzene	ND	0.0065	0.00031	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.0065	0.00030	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.0026	0.00041	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.0026	0.00095	mg/kg	
79-01-6	Trichloroethene	ND	0.0026	0.00027	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.0026	0.00039	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.0065	0.00038	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	0.0065	0.00029	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	0.0065	0.00028	mg/kg	
108-05-4	Vinyl Acetate	ND	0.0065	0.00072	mg/kg	
75-01-4	Vinyl chloride	ND	0.0026	0.00035	mg/kg	
	m,p-Xylene	ND	0.0026	0.0010	mg/kg	
95-47-6	o-Xylene	ND	0.0026	0.00031	mg/kg	
1330-20-7	Xylene (total)	0.00078	0.0026	0.00031	mg/kg	J

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

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

Report of Analysis

Client Sample ID: GP-16-23		Date Sampled: 01/03/13
Lab Sample ID: MC17324-1		Date Received: 01/05/13
Matrix: SO - Soil		Percent Solids: 80.7
Method: SW846 8260B		
Project: URSMOSTL: Roxana Drilling, Roxana, IL		

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VOA Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	85%		70-130%
2037-26-5	Tolnene-D8	89%		70-130%
460-00-4	4-Bromofluorobenzene	81%		70-130%

CAS No.	Tentatively Identified Compounds	R.T.	Est. Cone.	Units	Q
	Total TIC, Volatile		0	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

Client Sample ID:	GP-16-23	Date Sampled:	01/03/13
Lab Sample ID:	MC17324-1	Date Received:	01/05/13
Matrix:	SO - Soil	Percent Solids:	80.7
Method:	SW846 8011 SW846 3550B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK20537.D	1	01/08/13	AP	01/07/13	OP31636	GBK742
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.1 g	50.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.0031	0.0014	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0031	0.0012	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	130%		61-167%
460-00-4	Bromofluorobenzene (S)	123%		61-167%

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

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4

Report of Analysis

Client Sample ID:	GP-16-42	Date Sampled:	01/03/13
Lab Sample ID:	MC17324-2	Date Received:	01/05/13
Matrix:	SO - Soil	Percent Solids:	84.2
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G123497.D	1	01/08/13	JM	n/a	n/a	MSG4905
Run #2	G123516.D	1	01/09/13	JM	n/a	n/a	MSG4906

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.66 g	10.0 ml	100 ul
Run #2	5.66 g	10.0 ml	5.0 ul

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.57	0.14	mg/kg	
107-02-8	Acrolein	ND	2.9	1.1	mg/kg	u J
107-13-1	Acrylonitrile	ND	2.9	0.14	mg/kg	u J
71-43-2	Benzene	476 ^a	1.1	0.67	mg/kg	
108-86-1	Bromobenzene	ND	0.57	0.025	mg/kg	
74-97-5	Bromochloromethane	ND	0.57	0.043	mg/kg	
75-27-4	Bromodichloromethane	ND	0.23	0.024	mg/kg	
75-25-2	Bromoform	ND	0.23	0.23	mg/kg	
74-83-9	Bromomethane	ND	0.23	0.059	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.57	0.14	mg/kg	u J
104-51-8	n-Butylbenzene	ND	0.57	0.021	mg/kg	
135-98-8	sec-Butylbenzene	ND	0.57	0.026	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.57	0.10	mg/kg	
75-15-0	Carbon disulfide	ND	0.57	0.019	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.23	0.083	mg/kg	
108-90-7	Chlorobenzene	ND	0.23	0.031	mg/kg	
75-00-3	Chloroethane	ND	0.57	0.14	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.57	0.23	mg/kg	
67-66-3	Chloroform	ND	0.23	0.059	mg/kg	
74-87-3	Chloromethane	ND	0.57	0.053	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.57	0.13	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.57	0.026	mg/kg	
124-48-1	Dibromochloromethane	ND	0.23	0.034	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.23	0.025	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.23	0.026	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.23	0.024	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.23	0.13	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.23	0.031	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.23	0.033	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.23	0.042	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.23	0.034	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.23	0.033	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

Client Sample ID:	GP-16-42	Date Sampled:	01/03/13
Lab Sample ID:	MC17324-2	Date Received:	01/05/13
Matrix:	SO - Soil	Percent Solids:	84.2
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.23	0.043	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.57	0.026	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.57	0.099	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.57	0.030	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.23	0.020	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.23	0.057	mg/kg	
123-91-1	1,4-Dioxane	ND	2.9	2.9	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.57	0.078	mg/kg	
100-41-4	Ethylbenzene	0.177	0.23	0.028	mg/kg	J
87-68-3	Hexachlorobutadiene	ND	0.57	0.053	mg/kg	
591-78-6	2-Hexanone	ND	0.57	0.057	mg/kg	WJ
98-82-8	Isopropylbenzene	ND	0.57	0.026	mg/kg	
99-87-6	p-Isopropyltoluene	ND	0.57	0.020	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.23	0.033	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.57	0.057	mg/kg	
74-95-3	Methylene bromide	ND	0.57	0.056	mg/kg	
75-09-2	Methylene chloride	ND	0.23	0.13	mg/kg	
91-20-3	Naphthalene	ND	0.57	0.14	mg/kg	
103-65-1	n-Propylbenzene	ND	0.57	0.12	mg/kg	
100-42-5	Styrene	ND	0.57	0.027	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.57	0.11	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.23	0.049	mg/kg	
127-18-4	Tetrachloroethene	ND	0.23	0.026	mg/kg	
108-88-3	Toluene	0.999	0.57	0.097	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	0.57	0.027	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.57	0.026	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.23	0.036	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.23	0.084	mg/kg	
79-01-6	Trichloroethene	ND	0.23	0.024	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.23	0.035	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.57	0.033	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	0.292	0.57	0.026	mg/kg	J
108-67-8	1,3,5-Trimethylbenzene	ND	0.57	0.024	mg/kg	
108-05-4	Vinyl Acetate	ND	0.57	0.064	mg/kg	
75-01-4	Vinyl chloride	ND	0.23	0.031	mg/kg	
	m,p-Xylene	0.509	0.23	0.090	mg/kg	
95-47-6	o-Xylene	0.226	0.23	0.027	mg/kg	J
1330-20-7	Xylene (total)	0.735	0.23	0.027	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

Client Sample ID: GP-16-42 Lab Sample ID: MC17324-2 Matrix: SO - Soil Method: SW846 8260B Project: URSMOSTL: Roxana Drilling, Roxana, IL	Date Sampled: 01/03/13 Date Received: 01/05/13 Percent Solids: 84.2
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VOA Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	88%	87%	70-130%
2037-26-5	Toluene-D8	81%	83%	70-130%
460-00-4	4-Bromofluorobenzene	81%	82%	70-130%

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

(a) Result is from Run# 2

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

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

Report of Analysis

Client Sample ID: GP-16-42		Date Sampled: 01/03/13
Lab Sample ID: MCI7324-2		Date Received: 01/05/13
Matrix: SO - Soil		Percent Solids: 84.2
Method: SW846 8011 SW846 3550B		
Project: URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK20538.D	1	01/08/13	AP	01/07/13	OP31636	GBK742
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.3 g	50.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.0029	0.0013	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0029	0.0011	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	136%		61-167%
460-00-4	Bromofluorobenzene (S)	128%		61-167%

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

4.2
4

Report of Analysis

Client Sample ID: GP-16-51	Date Sampled: 01/03/13
Lab Sample ID: MC17324-3	Date Received: 01/05/13
Matrix: SO - Soil	Percent Solids: 90.8
Method: SW846 8260B	
Project: URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G123498.D	1	01/08/13	JM	n/a	n/a	MSG4905
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.59 g	10.0 ml	100 ul
Run #2			

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	0.490 u	0.52	0.13	mg/kg	J u5
107-02-8	Acrolein	ND	2.6	1.0	mg/kg	u5
107-13-1	Acrylonitrile	ND	2.6	0.13	mg/kg	
71-43-2	Benzene	25.0	0.052	0.031	mg/kg	
108-86-1	Bromobenzene	ND	0.52	0.023	mg/kg	
74-97-5	Bromochloromethane	ND	0.52	0.039	mg/kg	
75-27-4	Bromodichloromethane	ND	0.21	0.022	mg/kg	
75-25-2	Bromoform	ND	0.21	0.21	mg/kg	
74-83-9	Bromomethane	ND	0.21	0.054	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.52	0.13	mg/kg	u5
104-51-8	n-Butylbenzene	0.141	0.52	0.019	mg/kg	J
135-98-8	sec-Butylbenzene	0.0308	0.52	0.024	mg/kg	J
98-06-6	tert-Butylbenzene	ND	0.52	0.091	mg/kg	
75-15-0	Carbon disulfide	ND	0.52	0.017	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.21	0.075	mg/kg	
108-90-7	Chlorobenzene	ND	0.21	0.028	mg/kg	
75-00-3	Chloroethane	ND	0.52	0.13	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.52	0.21	mg/kg	
67-66-3	Chloroform	ND	0.21	0.053	mg/kg	
74-87-3	Chloromethane	ND	0.52	0.048	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.52	0.11	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.52	0.023	mg/kg	
124-48-1	Dibromochloromethane	ND	0.21	0.031	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.21	0.022	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.21	0.023	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.21	0.022	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.21	0.12	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.21	0.028	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.21	0.030	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.21	0.038	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.21	0.031	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.21	0.030	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

Client Sample ID:	GP-16-51	Date Sampled:	01/03/13
Lab Sample ID:	MC17324-3	Date Received:	01/05/13
Matrix:	SO - Soil	Percent Solids:	90.8
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.21	0.039	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.52	0.024	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.52	0.090	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.52	0.027	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.21	0.018	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.21	0.051	mg/kg	
123-91-1	1,4-Dioxane	ND	2.6	2.6	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.52	0.071	mg/kg	
100-41-4	Ethylbenzene	0.298	0.21	0.025	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.52	0.048	mg/kg	
591-78-6	2-Hexanone	ND	0.52	0.052	mg/kg	
98-82-8	Isopropylbenzene	0.0508	0.52	0.024	mg/kg	J
99-87-6	p-Isopropyltoluene	ND	0.52	0.018	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.21	0.030	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.52	0.052	mg/kg	
74-95-3	Methylene bromide	ND	0.52	0.051	mg/kg	
75-09-2	Methylene chloride	ND	0.21	0.12	mg/kg	
91-20-3	Naphthalene	0.230	0.52	0.13	mg/kg	J
103-65-1	n-Propylbenzene	0.214	0.52	0.11	mg/kg	J
100-42-5	Styrene	ND	0.52	0.024	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.52	0.10	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.21	0.044	mg/kg	
127-18-4	Tetrachloroethene	ND	0.21	0.024	mg/kg	
108-88-3	Toluene	0.141	0.52	0.088	mg/kg	J
87-61-6	1,2,3-Trichlorobenzene	ND	0.52	0.025	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.52	0.024	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.21	0.033	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.21	0.076	mg/kg	
79-01-6	Trichloroethene	ND	0.21	0.022	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.21	0.031	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.52	0.030	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	0.975	0.52	0.023	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	0.293	0.52	0.022	mg/kg	J
108-05-4	Vinyl Acetate	ND	0.52	0.058	mg/kg	
75-01-4	Vinyl chloride	ND	0.21	0.028	mg/kg	
	m,p-Xylene	0.706	0.21	0.082	mg/kg	
95-47-6	o-Xylene	0.189	0.21	0.025	mg/kg	J
1330-20-7	Xylene (total)	0.895	0.21	0.025	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

Client Sample ID: GP-16-51 Lab Sample ID: MC17324-3 Matrix: SO - Soil Method: SW846 8260B Project: URSMOSTL: Roxana Drilling, Roxana, IL	Date Sampled: 01/03/13 Date Received: 01/05/13 Percent Solids: 90.8
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4.3
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VOA Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	95%		70-130%
2037-26-5	Toluene-D8	91%		70-130%
460-00-4	4-Bromofluorobenzene	88%		70-130%

CAS No.	Tentatively Identified Compounds	R.T.	Est. Cone.	Units	Q
	Total TIC, Volatile		0	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

Client Sample ID: GP-16-51 Lab Sample ID: MC17324-3 Matrix: SO - Soil Method: SW846 8011 SW846 3550B Project: URSMOSTL: Roxana Drilling, Roxana, IL	Date Sampled: 01/03/13 Date Received: 01/05/13 Percent Solids: 90.8
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Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK20539.D	1	01/08/13	AP	01/07/13	OP31636	GBK742
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.2 g	50.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.0027	0.0012	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0027	0.0011	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	132%		61-167%
460-00-4	Bromofluorobenzene (S)	124%		61-167%

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

4.3
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Report of Analysis

Client Sample ID: GP-16-57	Date Sampled: 01/03/13
Lab Sample ID: MC17324-4	Date Received: 01/05/13
Matrix: SO - Soil	Percent Solids: 87.1
Method: SW846 8260B	
Project: URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G123499.D	1	01/08/13	JM	n/a	n/a	MSG4905
Run #2	G123517.D	1	01/09/13	JM	n/a	n/a	MSG4906

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.99 g	10.0 ml	100 ul
Run #2	5.99 g	10.0 ml	5.0 ul

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.52	0.13	mg/kg	u J
107-02-8	Acrolein	ND	2.6	1.0	mg/kg	u J
107-13-1	Acrylonitrile	24.5	2.6	0.13	mg/kg	
71-43-2	Benzene	431 ^a	1.0	0.61	mg/kg	
108-86-1	Bromobenzene	ND	0.52	0.023	mg/kg	
74-97-5	Bromochloromethane	ND	0.52	0.039	mg/kg	
75-27-4	Bromodichloromethane	ND	0.21	0.022	mg/kg	
75-25-2	Bromoform	ND	0.21	0.21	mg/kg	
74-83-9	Bromomethane	ND	0.21	0.054	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.52	0.13	mg/kg	u J
104-51-8	n-Butylbenzene	27.9	0.52	0.019	mg/kg	
135-98-8	sec-Butylbenzene	4.96	0.52	0.024	mg/kg	
98-06-6	tert-Butylbenzene	1.69	0.52	0.091	mg/kg	
75-15-0	Carbon disulfide	ND	0.52	0.017	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.21	0.075	mg/kg	
108-90-7	Chlorobenzene	ND	0.21	0.028	mg/kg	
75-00-3	Chloroethane	ND	0.52	0.13	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.52	0.21	mg/kg	
67-66-3	Chloroform	ND	0.21	0.053	mg/kg	
74-87-3	Chloromethane	ND	0.52	0.048	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.52	0.11	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.52	0.023	mg/kg	
124-48-1	Dibromochloromethane	ND	0.21	0.030	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.21	0.022	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.21	0.023	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.21	0.022	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.21	0.12	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.21	0.028	mg/kg	
107-06-2	1,2-Dichloroethane	11.2	0.21	0.030	mg/kg	J
75-35-4	1,1-Dichloroethene	ND	0.21	0.038	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.21	0.031	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.21	0.030	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

Client Sample ID:	GP-16-57	Date Sampled:	01/03/13
Lab Sample ID:	MC17324-4	Date Received:	01/05/13
Matrix:	SO - Soil	Percent Solids:	87.1
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.21	0.038	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.52	0.024	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.52	0.090	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.52	0.027	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.21	0.018	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.21	0.051	mg/kg	
123-91-1	1,4-Dioxane	ND	2.6	2.6	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.52	0.070	mg/kg	
100-41-4	Ethylbenzene	33.1	0.21	0.025	mg/kg	J
87-68-3	Hexachlorobutadiene	ND	0.52	0.048	mg/kg	
591-78-6	2-Hexanone	ND	0.52	0.052	mg/kg	WJ
98-82-8	Isopropylbenzene	10.4	0.52	0.024	mg/kg	J
99-87-6	p-Isopropyltoluene	3.09	0.52	0.018	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.21	0.030	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.52	0.052	mg/kg	
74-95-3	Methylene bromide	ND	0.52	0.051	mg/kg	
75-09-2	Methylene chloride	ND	0.21	0.12	mg/kg	
91-20-3	Naphthalene	19.9	0.52	0.13	mg/kg	
103-65-1	n-Propylbenzene	41.2	0.52	0.10	mg/kg	
100-42-5	Styrene	ND	0.52	0.024	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.52	0.10	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.21	0.044	mg/kg	
127-18-4	Tetrachloroethene	ND	0.21	0.024	mg/kg	
108-88-3	Toluene	76.8 ^a	10	1.8	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	0.52	0.024	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.52	0.024	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.21	0.033	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.21	0.076	mg/kg	
79-01-6	Trichloroethene	ND	0.21	0.022	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.21	0.031	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.52	0.030	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	192 ^a	10	0.46	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	62.0 ^a	10	0.44	mg/kg	
108-05-4	Vinyl Acetate	ND	0.52	0.058	mg/kg	
75-01-4	Vinyl chloride	ND	0.21	0.028	mg/kg	
	m,p-Xylene	62.1	0.21	0.081	mg/kg	J
95-47-6	o-Xylene	11.4	0.21	0.025	mg/kg	J
1330-20-7	Xylene (total)	73.5	0.21	0.025	mg/kg	J

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

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

Report of Analysis

Client Sample ID: GP-16-57 Lab Sample ID: MC17324-4 Matrix: SO - Soil Method: SW846 8260B Project: URSMOSTL: Roxana Drilling, Roxana, IL	Date Sampled: 01/03/13 Date Received: 01/05/13 Percent Solids: 87.1
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VOA Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	86%	88%	70-130%
2037-26-5	Toluene-D8	88%	85%	70-130%
460-00-4	4-Bromofluorobenzene	98%	86%	70-130%

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

(a) Result is from Run# 2

ND = Not detected RL = Reporting Limit E = Indicates value exceeds calibration range	MDL - Method Detection Limit J = Indicates an estimated value B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound
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Report of Analysis

Client Sample ID: GP-16-57 Lab Sample ID: MC17324-4 Matrix: SO - Soil Method: SW846 8011 SW846 3550B Project: URSMOSTL: Roxana Drilling, Roxana, IL	Date Sampled: 01/03/13 Date Received: 01/05/13 Percent Solids: 87.1
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Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK20540.D	1	01/08/13	AP	01/07/13	OP31636	GBK742
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.9 g	50.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.0028	0.0012	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0028	0.0011	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
460-00-4	Bromofluorobenzene (S)	122%		61-167%		
460-00-4	Bromofluorobenzene (S)	110%		61-167%		

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

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Report of Analysis

Page 1 of 3

Client Sample ID: GP-16-57-DUP	Date Sampled: 01/03/13
Lab Sample ID: MC17324-5	Date Received: 01/05/13
Matrix: SO - Soil	Percent Solids: 85.6
Method: SW846 8260B	
Project: URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G123500.D	1	01/08/13	JM	n/a	n/a	MSG4905
Run #2	G123518.D	1	01/09/13	JM	n/a	n/a	MSG4906

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.34 g	10.0 ml	100 ul
Run #2	5.34 g	10.0 ml	5.0 ul

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.59	0.15	mg/kg	u5
107-02-8	Acrolein	ND	2.9	1.2	mg/kg	u5
107-13-1	Acrylonitrile	27.6	2.9	0.15	mg/kg	
71-43-2	Benzene	473 ^a	1.2	0.69	mg/kg	
108-86-1	Bromobenzene	ND	0.59	0.026	mg/kg	
74-97-5	Bromochloromethane	ND	0.59	0.044	mg/kg	
75-27-4	Bromodichloromethane	ND	0.24	0.025	mg/kg	
75-25-2	Bromoform	ND	0.24	0.24	mg/kg	
74-83-9	Bromomethane	ND	0.24	0.061	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.59	0.15	mg/kg	u5
104-51-8	n-Butylbenzene	32.8	0.59	0.022	mg/kg	
135-98-8	sec-Butylbenzene	5.87	0.59	0.027	mg/kg	
98-06-6	tert-Butylbenzene	2.25	0.59	0.10	mg/kg	
75-15-0	Carbon disulfide	ND	0.59	0.019	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.24	0.086	mg/kg	
108-90-7	Chlorobenzene	ND	0.24	0.032	mg/kg	
75-00-3	Chloroethane	ND	0.59	0.15	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.59	0.24	mg/kg	
67-66-3	Chloroform	ND	0.24	0.061	mg/kg	
74-87-3	Chloromethane	ND	0.59	0.055	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.59	0.13	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.59	0.027	mg/kg	
124-48-1	Dibromochloromethane	ND	0.24	0.035	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.24	0.025	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.24	0.027	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.24	0.025	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.24	0.13	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.24	0.032	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.24	0.034	mg/kg	u5
75-35-4	1,1-Dichloroethene	ND	0.24	0.043	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.24	0.035	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.24	0.034	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

Client Sample ID:	GP-16-57-DUP	Date Sampled:	01/03/13
Lab Sample ID:	MC17324-5	Date Received:	01/05/13
Matrix:	SO - Soil	Percent Solids:	85.6
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.24	0.044	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.59	0.027	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.59	0.10	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.59	0.031	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.24	0.020	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.24	0.058	mg/kg	
123-91-1	1,4-Dioxane	ND	2.9	2.9	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.59	0.080	mg/kg	
100-41-4	Ethylbenzene	21.5	0.24	0.028	mg/kg	J
87-68-3	Hexachlorobutadiene	ND	0.59	0.055	mg/kg	
591-78-6	2-Hexanone	19.1	0.59	0.059	mg/kg	J
98-82-8	Isopropylbenzene	12.7	0.59	0.027	mg/kg	J
99-87-6	p-Isopropyltoluene	3.70	0.59	0.021	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.24	0.034	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.59	0.059	mg/kg	
74-95-3	Methylene bromide	ND	0.59	0.058	mg/kg	
75-09-2	Methylene chloride	ND	0.24	0.14	mg/kg	
91-20-3	Naphthalene	24.8	0.59	0.15	mg/kg	
103-65-1	n-Propylbenzene	58.8 ^a	12	2.4	mg/kg	
100-42-5	Styrene	ND	0.59	0.028	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.59	0.12	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.24	0.050	mg/kg	
127-18-4	Tetrachloroethene	ND	0.24	0.027	mg/kg	
108-88-3	Tolnene	94.3 ^a	12	2.0	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	0.59	0.028	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.59	0.027	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.24	0.037	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.24	0.087	mg/kg	
79-01-6	Trichloroethene	ND	0.24	0.025	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.24	0.036	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.59	0.034	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	244 ^a	12	0.53	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	77.7 ^a	12	0.50	mg/kg	
108-05-4	Vinyl Acetate	ND	0.59	0.066	mg/kg	
75-01-4	Vinyl chloride	ND	0.24	0.032	mg/kg	
	m,p-Xylene	40.0	0.24	0.093	mg/kg	J
95-47-6	o-Xylene	7.63	0.24	0.028	mg/kg	J
1330-20-7	Xylene (total)	47.6	0.24	0.028	mg/kg	J

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

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

Report of Analysis

Client Sample ID: GP-16-57-DUP Lab Sample ID: MC17324-5 Matrix: SO - Soil Method: SW846 8260B Project: URSMOSTL: Roxana Drilling, Roxana, IL	Date Sampled: 01/03/13 Date Received: 01/05/13 Percent Solids: 85.6
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VOA Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	90%	87%	70-130%
2037-26-5	Toluene-D8	93%	84%	70-130%
460-00-4	4-Bromofluorobenzene	101%	83%	70-130%

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

(a) Result is from Run# 2

ND = Not detected RL = Reporting Limit E = Indicates value exceeds calibration range	MDL - Method Detection Limit B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound	J = Indicates an estimated value
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Report of Analysis

Client Sample ID:	GP-16-57-DUP	Date Sampled:	01/03/13
Lab Sample ID:	MC17324-5	Date Received:	01/05/13
Matrix:	SO - Soil	Percent Solids:	85.6
Method:	SW846 8011 SW846 3550B		
Project:	URSMOSTL: Roxaua Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK20541.D	1	01/09/13	AP	01/07/13	OP31636	GBK742
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.2 g	50.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.0029	0.0013	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0029	0.0011	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
460-00-4	Bromofluorobenzene (S)	115%		61-167%		
460-00-4	Bromofluorobenzene (S)	112%		61-167%		

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

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Report of Analysis

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Client Sample ID: GP-16-77	Date Sampled: 01/03/13
Lab Sample ID: MC17324-6	Date Received: 01/05/13
Matrix: SO - Soil	Percent Solids: 89.4
Method: SW846 8260B	
Project: URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G123501.D	1	01/08/13	JM	n/a	n/a	MSG4905
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	6.13 g	10.0 ml	100 ul
Run #2			

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	0.544 u	0.49	0.12	mg/kg	u J
107-02-8	Acrolein	ND	2.4	0.97	mg/kg	u J
107-13-1	Acrylonitrile	ND	2.4	0.12	mg/kg	
71-43-2	Benzene	2.18	0.049	0.029	mg/kg	
108-86-1	Bromobenzene	ND	0.49	0.022	mg/kg	
74-97-5	Bromochloromethane	ND	0.49	0.036	mg/kg	
75-27-4	Bromodichloromethane	ND	0.19	0.021	mg/kg	
75-25-2	Bromoform	ND	0.19	0.19	mg/kg	
74-83-9	Bromomethane	ND	0.19	0.050	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.49	0.12	mg/kg	u J
104-51-8	n-Butylbenzene	0.400	0.49	0.018	mg/kg	J
135-98-8	sec-Butylbenzene	0.0725	0.49	0.022	mg/kg	J
98-06-6	tert-Butylbenzene	ND	0.49	0.086	mg/kg	
75-15-0	Carbon disulfide	ND	0.49	0.016	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.19	0.071	mg/kg	
108-90-7	Chlorobenzene	ND	0.19	0.027	mg/kg	
75-00-3	Chloroethane	ND	0.49	0.12	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.49	0.19	mg/kg	
67-66-3	Chloroform	ND	0.19	0.050	mg/kg	
74-87-3	Chloromethane	ND	0.49	0.045	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.49	0.11	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.49	0.022	mg/kg	
124-48-1	Dibromochloromethane	ND	0.19	0.029	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.19	0.021	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.19	0.022	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.19	0.020	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.19	0.11	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.19	0.026	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.19	0.028	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.19	0.036	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.19	0.029	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.19	0.028	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

Client Sample ID:	GP-16-77	Date Sampled:	01/03/13
Lab Sample ID:	MC17324-6	Date Received:	01/05/13
Matrix:	SO - Soil	Percent Solids:	89.4
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.19	0.036	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.49	0.022	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.49	0.084	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.49	0.026	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.19	0.017	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.19	0.048	mg/kg	
123-91-1	1,4-Dioxane	ND	2.4	2.4	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.49	0.066	mg/kg	
100-41-4	Ethylbenzene	0.814	0.19	0.023	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.49	0.045	mg/kg	
591-78-6	2-Hexanone	ND	0.49	0.049	mg/kg	WJ
98-82-8	Isopropylbenzene	0.128	0.49	0.022	mg/kg	J
99-87-6	p-Isopropyltoluene	0.0518	0.49	0.017	mg/kg	J
1634-04-4	Methyl Tert Butyl Ether	ND	0.19	0.028	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.49	0.049	mg/kg	
74-95-3	Methylene bromide	ND	0.49	0.048	mg/kg	
75-09-2	Methylene chloride	ND	0.19	0.11	mg/kg	
91-20-3	Naphthalene	0.938	0.49	0.12	mg/kg	
103-65-1	n-Propylbenzene	0.506	0.49	0.099	mg/kg	
100-42-5	Styrene	ND	0.49	0.023	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.49	0.097	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.19	0.041	mg/kg	
127-18-4	Tetrachloroethene	ND	0.19	0.022	mg/kg	
108-88-3	Toluene	0.608	0.49	0.082	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	0.49	0.023	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.49	0.022	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.19	0.031	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.19	0.071	mg/kg	
79-01-6	Trichloroethene	ND	0.19	0.021	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.19	0.030	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.49	0.028	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	2.53	0.49	0.022	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	0.740	0.49	0.021	mg/kg	
108-05-4	Vinyl Acetate	ND	0.49	0.054	mg/kg	
75-01-4	Vinyl chloride	ND	0.19	0.026	mg/kg	
	m,p-Xylene	1.72	0.19	0.077	mg/kg	
95-47-6	o-Xylene	0.297	0.19	0.023	mg/kg	
1330-20-7	Xylene (total)	2.02	0.19	0.023	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

Client Sample ID:	GP-16-77	Date Sampled:	01/03/13
Lab Sample ID:	MC17324-6	Date Received:	01/05/13
Matrix:	SO - Soil	Percent Solids:	89.4
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

4.6
4

VOA Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	87%		70-130%
2037-26-5	Toluene-D8	85%		70-130%
460-00-4	4-Bromofluorobenzene	82%		70-130%

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

Client Sample ID: GP-16-77 Lab Sample ID: MC17324-6 Matrix: SO - Soil Method: SW846 8011 SW846 3550B Project: URSMOSTL: Roxana Drilling, Roxana, IL	Date Sampled: 01/03/13 Date Received: 01/05/13 Percent Solids: 89.4
--	--

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK20542.D	1	01/09/13	AP	01/07/13	OP31636	GBK742
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.4 g	50.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.0028	0.0012	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0028	0.0011	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	119%		61-167%
460-00-4	Bromofluorobenzene (S)	124%		61-167%

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

4.6
4

Report of Analysis

Client Sample ID:	TRIP BLANK	Date Sampled:	01/03/13
Lab Sample ID:	MC17324-7	Date Received:	01/05/13
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #1	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	V15130.D	1	01/10/13	AMY	n/a	n/a	MSV612
Run #2							

Run #1	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	5.0	3.0	ug/l	
107-02-8	Acrolein	ND	25	10	ug/l	
107-13-1	Acrylonitrile	ND	5.0	3.2	ug/l	
71-43-2	Benzene	ND	0.50	0.24	ug/l	
108-86-1	Bromobenzene	ND	5.0	0.62	ug/l	
74-97-5	Bromochloromethane	ND	5.0	1.3	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.58	ug/l	
75-25-2	Bromoform	ND	1.0	0.78	ug/l	
74-83-9	Bromomethane	ND	2.0	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	2.4	ug/l	
104-51-8	n-Butylbenzene	ND	5.0	0.61	ug/l	
135-98-8	sec-Butylbenzene	ND	5.0	0.55	ug/l	
98-06-6	tert-Butylbenzene	ND	5.0	0.64	ug/l	
75-15-0	Carbon disulfide	ND	5.0	0.61	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.87	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.47	ug/l	
75-00-3	Chloroethane	ND	2.0	0.50	ug/l	
110-75-8	2-Chloroethyl vinyl ether	ND	5.0	1.3	ug/l	
67-66-3	Chloroform	ND	1.0	0.50	ug/l	
74-87-3	Chloromethane	ND	2.0	0.73	ug/l	
95-49-8	o-Chlorotoluene	ND	5.0	0.65	ug/l	
106-43-4	p-Chlorotoluene	ND	5.0	0.48	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.53	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.93	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.45	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.64	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.7	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.62	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.63	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	0.41	ug/l	
156-59-2	cis-1,2-Dichloroethene	ND	1.0	0.64	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	0.95	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

Client Sample ID:	TRIP BLANK	Date Sampled:	01/03/13
Lab Sample ID:	MC17324-7	Date Received:	01/05/13
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	2.0	0.72	ug/l	
142-28-9	1,3-Dichloropropane	ND	5.0	0.64	ug/l	
594-20-7	2,2-Dichloropropane	ND	5.0	1.6	ug/l	
563-58-6	1,1-Dichloropropene	ND	5.0	0.91	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.45	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.20	ug/l	
123-91-1	1,4-Dioxane	ND	25	15	ug/l	
97-63-2	Ethyl methacrylate	ND	5.0	0.81	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.51	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.0	2.1	ug/l	
591-78-6	2-Hexanone	ND	5.0	2.0	ug/l	
98-82-8	Isopropylbenzene	ND	5.0	0.50	ug/l	
99-87-6	p-Isopropyltoluene	ND	5.0	0.57	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.41	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	2.9	ug/l	
74-95-3	Methylene bromide	ND	5.0	1.1	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.83	ug/l	
91-20-3	Naphthalene	ND	5.0	0.50	ug/l	
103-65-1	n-Propylbenzene	ND	5.0	0.58	ug/l	
100-42-5	Styrene	ND	5.0	0.45	ng/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	5.0	0.57	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.60	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	0.42	ug/l	
108-88-3	Toluene	ND	1.0	0.51	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	1.3	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	1.3	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.85	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.50	ug/l	
79-01-6	Trichloroethene	ND	1.0	0.78	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.29	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.85	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.35	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	0.47	ug/l	
108-05-4	Vinyl Acetate	ND	5.0	1.3	ug/l	
75-01-4	Vinyl chloride	ND	1.0	0.63	ug/l	
	m,p-Xylene	ND	1.0	0.73	ug/l	
95-47-6	o-Xylene	ND	1.0	0.58	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.58	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

Client Sample ID: TRIP BLANK Lab Sample ID: MC17324-7 Matrix: AQ - Trip Blank Water Method: SW846 8260B Project: URSMOSTL: Roxana Drilling, Roxana, IL	Date Sampled: 01/03/13 Date Received: 01/05/13 Percent Solids: n/a
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4.7
4

VOA Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	100%		70-130%
2037-26-5	Toluene-D8	103%		70-130%
460-00-4	4-Bromofluorobenzene	97%		70-130%

CAS No.	Tentatively Identified Compounds	R.T.	Est. Cone.	Units	Q
	Total TIC, Volatile		0	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

Client Sample ID: TRIP BLANK Lab Sample ID: MC17324-7 Matrix: AQ - Trip Blank Water Method: SW846 8011 SW846 8011 Project: URSMOSTL: Roxana Drilling, Roxana, IL	Date Sampled: 01/03/13 Date Received: 01/05/13 Percent Solids: n/a
---	---

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BK20511.D	I	01/08/13	AP	01/07/13	OP31638	GBK741
Run #2							

Run #	Initial Volume	Final Volume
Run #1	34.8 ml	2.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.015	0.013	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.015	0.010	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	128%		36-173%
460-00-4	Bromofluorobenzene (S)	112%		36-173%

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

4.7
4

Misc. Forms



Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody
- Sample Tracking Chronicle
- Internal Chain of Custody



Accutest Laboratories Sample Receipt Summary

Accutest Job Number: MC17324

Client: URS

Immediate Client Services Action Required: No

Date / Time Received: 1/5/2013

Delivery Method:

Client Service Action Required at LogIn: No

Project: ROXANA DRILLING

No. Coolers: 1

Airbill #'s:

<u>Cooler Security</u>	<u>Y</u>	<u>or</u>	<u>N</u>		<u>Y</u>	<u>or</u>	<u>N</u>
1. Custody Seals Present:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	4. SmpI Dates/Time OK	<input checked="" type="checkbox"/>		<input type="checkbox"/>

<u>Cooler Temperature</u>	<u>Y</u>	<u>or</u>	<u>N</u>
1. Temp criteria achieved:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Cooler temp verification:			Infrared gun
3. Cooler media:			Ice (bag)

<u>Quality Control Preservatio</u>	<u>Y</u>	<u>or</u>	<u>N</u>	<u>N/A</u>
1. Trip Blank present / cooler:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
2. Trip Blank listed on COC:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
3. Samples preserved properly:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
4. VOCs headspace free:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>

<u>Sample Integrity - Documentation</u>	<u>Y</u>	<u>or</u>	<u>N</u>
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Container labeling complete:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>		<input type="checkbox"/>

<u>Sample Integrity - Condition</u>	<u>Y</u>	<u>or</u>	<u>N</u>
1. Sample recvd within HT:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. All containers accounted for:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Condition of sample:			Intact

<u>Sample Integrity - Instructions</u>	<u>Y</u>	<u>or</u>	<u>N</u>	<u>N/A</u>
1. Analysis requested is clear:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
2. Bottles received for unspecified tests	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
3. Sufficient volume recvd for analysis:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
4. Compositing instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>

Comments

Accutest Laboratories
V 508 481 6200

495 Technology Center West Bldg One
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Marlborough, MA
www.accutest.com

MC17324: Chain of Custody

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5.1
5

Internal Sample Tracking Chronicle

Shell Oil

Job No: MC17324

URSMOSTL: Roxana Drilling, Roxana, IL
 Project No: 21562850.15000

5.2
5

Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
MC17324-1 Collected: 03-JAN-13 10:35 By: WPJS Received: 05-JAN-13 By: GP-16-23						
MC17324-1	SM21 2540 B MOD.	08-JAN-13	HS			%SOL
MC17324-1	SW846 8011	08-JAN-13 22:37	AP	07-JAN-13	FC	V8011SL
MC17324-1	SW846 8260B	09-JAN-13 16:38	AMY			V8260SL+
MC17324-2 Collected: 03-JAN-13 12:55 By: WPJS Received: 05-JAN-13 By: GP-16-42						
MC17324-2	SM21 2540 B MOD.	08-JAN-13	HS			%SOL
MC17324-2	SW846 8260B	08-JAN-13 12:13	JM			V8260SL+
MC17324-2	SW846 8011	08-JAN-13 23:02	AP	07-JAN-13	FC	V8011SL
MC17324-2	SW846 8260B	09-JAN-13 11:12	JM			V8260SL+
MC17324-3 Collected: 03-JAN-13 14:30 By: WPJS Received: 05-JAN-13 By: GP-16-51						
MC17324-3	SM21 2540 B MOD.	08-JAN-13	HS			%SOL
MC17324-3	SW846 8260B	08-JAN-13 12:42	JM			V8260SL+
MC17324-3	SW846 8011	08-JAN-13 23:26	AP	07-JAN-13	FC	V8011SL
MC17324-4 Collected: 03-JAN-13 15:30 By: WPJS Received: 05-JAN-13 By: GP-16-57						
MC17324-4	SM21 2540 B MOD.	08-JAN-13	HS			%SOL
MC17324-4	SW846 8260B	08-JAN-13 13:10	JM			V8260SL+
MC17324-4	SW846 8011	08-JAN-13 23:51	AP	07-JAN-13	FC	V8011SL
MC17324-4	SW846 8260B	09-JAN-13 11:41	JM			V8260SL+
MC17324-5 Collected: 03-JAN-13 15:30 By: WPJS Received: 05-JAN-13 By: GP-16-57-DUP						
MC17324-5	SM21 2540 B MOD.	08-JAN-13	HS			%SOL
MC17324-5	SW846 8260B	08-JAN-13 13:39	JM			V8260SL+
MC17324-5	SW846 8011	09-JAN-13 00:15	AP	07-JAN-13	FC	V8011SL
MC17324-5	SW846 8260B	09-JAN-13 12:10	JM			V8260SL+

Internal Sample Tracking Chronicle

Shell Oil

Job No: MC17324

URSMOSTL: Roxana Drilling, Roxana, IL
 Project No: 21562850.15000

5.2
 5

Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
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MC17324-6 Collected: 03-JAN-13 16:05 By: WPJS Received: 05-JAN-13 By: GP-16-77

MC17324-6 SM21 2540 B MOD.	08-JAN-13	HS				%SOL
MC17324-6 SW846 8260B	08-JAN-13 14:09	JM				V8260SL+
MC17324-6 SW846 8011	09-JAN-13 00:39	AP	07-JAN-13	FC		V8011SL

MC17324-7 Collected: 03-JAN-13 00:00 By: WPJS Received: 05-JAN-13 By: TRIP BLANK

MC17324-7 SW846 8011	08-JAN-13 02:36	AP	07-JAN-13	BJ		V8011SL
MC17324-7 SW846 8260B	10-JAN-13 12:38	AMY				V8260SL+

Accutest Internal Chain of Custody

Job Number: MC17324
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL
 Received: 01/05/13

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
MC17324-1.1	Walk In Ref #9	Bijan Jafari	01/07/13 11:29	Retrieve from Storage
MC17324-1.1	Bijan Jafari	Walk In Ref #9	01/07/13 13:49	Return to Storage
MC17324-1.1	Walk In Ref #9	Hamid Siamak	01/08/13 10:43	Retrieve from Storage
MC17324-1.1	Hamid Siamak	Walk In Ref #9	01/08/13 14:45	Return to Storage
MC17324-1.2	Walk In Ref #9	Bijan Jafari	01/07/13 11:29	Retrieve from Storage
MC17324-1.2	Bijan Jafari	Walk In Ref #9	01/07/13 13:49	Return to Storage
MC17324-1.3	Walk In Ref #9	Bijan Jafari	01/07/13 11:29	Retrieve from Storage
MC17324-1.3	Bijan Jafari	Walk In Ref #9	01/07/13 13:49	Return to Storage
MC17324-1.4	VOC Ref #10	Amy Min Yang	01/09/13 14:47	Retrieve from Storage
MC17324-1.4	Amy Min Yang	GCMSM	01/09/13 14:47	Load on Instrument
MC17324-1.4	GCMSM	Amy Min Yang	01/15/13 12:38	Unload from Instrument
MC17324-1.4	Amy Min Yang	Freezer #6	01/15/13 12:38	Return to Storage
MC17324-1.5	VOC Ref #10	Amy Min Yang	01/09/13 11:39	Retrieve from Storage
MC17324-1.5	Amy Min Yang	GCMSM	01/09/13 11:39	Load on Instrument
MC17324-1.5	GCMSM	Amy Min Yang	01/15/13 12:38	Unload from Instrument
MC17324-1.5	Amy Min Yang	Freezer #6	01/15/13 12:38	Return to Storage
MC17324-1.6	VOC Ref #10	Amy Min Yang	01/09/13 11:39	Retrieve from Storage
MC17324-1.6	Amy Min Yang	GCMSM	01/09/13 11:39	Load on Instrument
MC17324-1.6	GCMSM	Amy Min Yang	01/15/13 12:38	Unload from Instrument
MC17324-1.6	Amy Min Yang	Freezer #6	01/15/13 12:38	Return to Storage
MC17324-1.7	VOC Ref #10	Amy Min Yang	01/09/13 11:39	Retrieve from Storage
MC17324-1.7	Amy Min Yang	GCMSM	01/09/13 11:39	Load on Instrument
MC17324-1.7	GCMSM	Amy Min Yang	01/15/13 12:38	Unload from Instrument
MC17324-1.7	Amy Min Yang	Freezer #6	01/15/13 12:38	Return to Storage
MC17324-1.9	VOC Ref #10	Amy Min Yang	01/09/13 15:16	Retrieve from Storage
MC17324-1.9	Amy Min Yang	GCMSM	01/09/13 15:16	Load on Instrument
MC17324-1.9	GCMSM	Amy Min Yang	01/15/13 12:38	Unload from Instrument
MC17324-1.9	Amy Min Yang	Freezer #6	01/15/13 12:38	Return to Storage
MC17324-1.12	VOC Ref #10	Jaime Maslowski	01/08/13 09:22	Retrieve from Storage
MC17324-1.12	Jaime Maslowski	VOC Ref #10	01/09/13 08:05	Return to Storage
MC17324-2.1	Walk In Ref #9	Bijan Jafari	01/07/13 11:29	Retrieve from Storage
MC17324-2.1	Bijau Jafari	Walk In Ref #9	01/07/13 13:49	Return to Storage
MC17324-2.1	Walk In Ref #9	Hamid Siamak	01/08/13 10:43	Retrieve from Storage
MC17324-2.1	Hamid Siamak	Walk In Ref #9	01/08/13 14:45	Return to Storage



Accutest Internal Chain of Custody

Job Number: MC17324
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL
 Received: 01/05/13

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
MC17324-2.4	VOC Ref #10	Jaime Maslowski	01/08/13 09:22	Retrieve from Storage
MC17324-2.4	Jaime Maslowski	VOC Ref #10	01/10/13 10:09	Return to Storage
MC17324-3.1	Walk In Ref #9	Bijan Jafari	01/07/13 11:29	Retrieve from Storage
MC17324-3.1	Bijan Jafari	Walk In Ref #9	01/07/13 13:49	Return to Storage
MC17324-3.1	Walk In Ref #9	Hamid Siamak	01/08/13 10:43	Retrieve from Storage
MC17324-3.1	Hamid Siamak	Walk In Ref #9	01/08/13 14:45	Return to Storage
MC17324-3.4	VOC Ref #10	Jaime Maslowski	01/08/13 09:22	Retrieve from Storage
MC17324-3.4	Jaime Maslowski	VOC Ref #10	01/09/13 08:05	Return to Storage
MC17324-4.1	Walk In Ref #9	Bijan Jafari	01/07/13 11:29	Retrieve from Storage
MC17324-4.1	Bijan Jafari	Walk In Ref #9	01/07/13 13:49	Return to Storage
MC17324-4.1	Walk In Ref #9	Hamid Siamak	01/08/13 10:43	Retrieve from Storage
MC17324-4.1	Hamid Siamak	Walk In Ref #9	01/08/13 14:45	Return to Storage
MC17324-4.4	VOC Ref #10	Jaime Maslowski	01/08/13 09:22	Retrieve from Storage
MC17324-4.4	Jaime Maslowski	VOC Ref #10	01/10/13 10:09	Return to Storage
MC17324-5.1	Walk In Ref #9	Bijan Jafari	01/07/13 11:29	Retrieve from Storage
MC17324-5.1	Bijan Jafari	Walk In Ref #9	01/07/13 13:49	Return to Storage
MC17324-5.1	Walk In Ref #9	Hamid Siamak	01/08/13 10:43	Retrieve from Storage
MC17324-5.1	Hamid Siamak	Walk In Ref #9	01/08/13 14:45	Return to Storage
MC17324-5.4	VOC Ref #10	Jaime Maslowski	01/08/13 09:22	Retrieve from Storage
MC17324-5.4	Jaime Maslowski	VOC Ref #10	01/10/13 10:09	Return to Storage
MC17324-6.1	Walk In Ref #9	Bijan Jafari	01/07/13 11:29	Retrieve from Storage
MC17324-6.1	Bijan Jafari	Walk In Ref #9	01/07/13 13:49	Return to Storage
MC17324-6.1	Walk In Ref #9	Hamid Siamak	01/08/13 10:43	Retrieve from Storage
MC17324-6.1	Hamid Siamak	Walk In Ref #9	01/08/13 14:45	Return to Storage
MC17324-6.4	VOC Ref #10	Jaime Maslowski	01/08/13 09:22	Retrieve from Storage
MC17324-6.4	Jaime Maslowski	VOC Ref #10	01/09/13 08:05	Return to Storage
MC17324-7.1	VOC Ref #1	Bijan Jafari	01/07/13 13:50	Retrieve from Storage
MC17324-7.1	Bijan Jafari		01/17/13 19:07	Depleted
MC17324-7.3	VOC Ref #1	Amy Min Yang	01/10/13 11:54	Retrieve from Storage
MC17324-7.3	Amy Min Yang	GCMSV	01/10/13 11:54	Load on Instrument
MC17324-7.3	GCMSV	Amy Min Yang	01/11/13 09:22	Unload from Instrument
MC17324-7.3	Amy Min Yang	VOC Ref #1	01/11/13 09:22	Return to Storage

5.3
5

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

Job Number: MC17324
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4905-MB	G123493.D	1	01/08/13	JM	n/a	n/a	MSG4905

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17324-2, MC17324-3, MC17324-4, MC17324-5, MC17324-6

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	250	63	ug/kg	
107-02-8	Acrolein	ND	1300	500	ug/kg	
107-13-1	Acrylonitrile	ND	1300	63	ug/kg	
71-43-2	Benzene	ND	25	15	ug/kg	
108-86-1	Bromobenzene	ND	250	11	ug/kg	
74-97-5	Bromochloromethane	ND	250	19	ug/kg	
75-27-4	Bromodichloromethane	ND	100	11	ug/kg	
75-25-2	Bromoform	ND	100	100	ug/kg	
74-83-9	Bromomethane	ND	100	26	ug/kg	
78-93-3	2-Butanone (MEK)	ND	250	63	ug/kg	
104-51-8	n-Butylbenzene	ND	250	9.2	ug/kg	
135-98-8	sec-Butylbenzene	ND	250	11	ug/kg	
98-06-6	tert-Butylbenzene	ND	250	44	ug/kg	
75-15-0	Carbon disulfide	ND	250	8.2	ug/kg	
56-23-5	Carbon tetrachloride	ND	100	36	ug/kg	
108-90-7	Chlorobenzene	ND	100	14	ug/kg	
75-00-3	Chloroethane	ND	250	63	ug/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	250	100	ug/kg	
67-66-3	Chloroform	ND	100	26	ug/kg	
74-87-3	Chloromethane	ND	250	23	ug/kg	
95-49-8	o-Chlorotoluene	ND	250	55	ug/kg	
106-43-4	p-Chlorotoluene	ND	250	11	ug/kg	
124-48-1	Dibromochloromethane	ND	100	15	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	100	11	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	100	11	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	100	11	ug/kg	
75-71-8	Dichlorodifluoromethane	ND	100	57	ug/kg	
75-34-3	1,1-Dichloroethane	ND	100	14	ug/kg	
107-06-2	1,2-Dichloroethane	ND	100	14	ug/kg	
75-35-4	1,1-Dichloroethene	ND	100	18	ug/kg	
156-59-2	cis-1,2-Dichloroethene	ND	100	15	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	100	14	ug/kg	
78-87-5	1,2-Dichloropropane	ND	100	19	ug/kg	
142-28-9	1,3-Dichloropropane	ND	250	12	ug/kg	
594-20-7	2,2-Dichloropropane	ND	250	43	ug/kg	
563-58-6	1,1-Dichloropropene	ND	250	13	ug/kg	

6.1.1
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Method Blank Summary

Job Number: MC17324
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4905-MB	G123493.D	1	01/08/13	JM	n/a	n/a	MSG4905

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17324-2, MC17324-3, MC17324-4, MC17324-5, MC17324-6

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	100	8.5	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	100	25	ug/kg	
123-91-1	1,4-Dioxane	ND	1300	1300	ug/kg	
97-63-2	Ethyl methacrylate	ND	250	34	ug/kg	
100-41-4	Ethylbenzene	ND	100	12	ug/kg	
87-68-3	Hexachlorobutadiene	ND	250	23	ug/kg	
591-78-6	2-Hexanone	ND	250	25	ug/kg	
98-82-8	Isopropylbenzene	ND	250	11	ug/kg	
99-87-6	p-Isopropyltoluene	ND	250	8.9	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	100	14	ug/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	250	25	ug/kg	
74-95-3	Methylene bromide	ND	250	25	ug/kg	
75-09-2	Methylene chloride	ND	100	58	ug/kg	
91-20-3	Naphthalene	ND	250	63	ug/kg	
103-65-1	n-Propylbenzene	ND	250	51	ng/kg	
100-42-5	Styrene	ND	250	12	ug/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	250	50	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	100	21	ug/kg	
127-18-4	Tetrachloroethene	ND	100	11	ng/kg	
108-88-3	Toluene	ND	250	42	ug/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	250	12	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	250	11	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	100	16	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	100	37	ug/kg	
79-01-6	Trichloroethene	ND	100	11	ug/kg	
75-69-4	Trichlorofluoromethane	ND	100	15	ug/kg	
96-18-4	1,2,3-Trichloropropane	ND	250	15	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	250	11	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	250	11	ug/kg	
108-05-4	Vinyl Acetate	ND	250	28	ug/kg	
75-01-4	Vinyl chloride	ND	100	14	ug/kg	
	m,p-Xylene	ND	100	39	ug/kg	
95-47-6	o-Xylene	ND	100	12	ug/kg	
1330-20-7	Xylene (total)	ND	100	12	ug/kg	

6.1.1



Method Blank Summary

Job Number: MC17324
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4905-MB	G123493.D	1	01/08/13	JM	n/a	n/a	MSG4905

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17324-2, MC17324-3, MC17324-4, MC17324-5, MC17324-6

6.1.1
6

CAS No.	Surrogate Recoveries		Limits
1868-53-7	Dibromofluoromethane	97%	70-130%
2037-26-5	Toluene-D8	94%	70-130%
460-00-4	4-Bromofluorobenzene	92%	70-130%

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

Method Blank Summary

Job Number: MC17324
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4906-MB	G123514.D	1	01/09/13	JM	n/a	n/a	MSG4906

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17324-2, MC17324-4, MC17324-5

6.1.2



CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	25	15	ug/kg	
103-65-1	n-Propylbenzene	ND	250	51	ug/kg	
108-88-3	Toluene	ND	250	42	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	250	11	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	250	11	ug/kg	

CAS No.	Surrogate Recoveries	Result	Limits
1868-53-7	Dibromofluoromethane	97%	70-130%
2037-26-5	Toluene-D8	93%	70-130%
460-00-4	4-Bromofluorobenzene	89%	70-130%

Method Blank Summary

Job Number: MC17324
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1813-MB	M53326.D	1	01/09/13	AMY	n/a	n/a	MSM1813

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17324-1

6.13
6

CAS No.	Surrogate Recoveries		Limits
1868-53-7	Dibromofluoromethane	81%	70-130%
2037-26-5	Toluene-D8	88%	70-130%
460-00-4	4-Bromofluorobenzene	80%	70-130%

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

Method Blank Summary

Job Number: MC17324
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSV612-MB	V15129.D	1	01/10/13	AMY	n/a	n/a	MSV612

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17324-7

6.1.4
6

CAS No.	Surrogate Recoveries		Limits
1868-53-7	Dibromofluoromethane	97%	70-130%
2037-26-5	Toluene-D8	101%	70-130%
460-00-4	4-Bromofluorobenzene	94%	70-130%

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

Blank Spike Summary

Job Number: MC17324
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4905-BS	G123490.D	1	01/08/13	JM	n/a	n/a	MSG4905

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17324-2, MC17324-3, MC17324-4, MC17324-5, MC17324-6

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	99%	70-130%
2037-26-5	Toluene-D8	93%	70-130%
460-00-4	4-Bromofluorobenzene	90%	70-130%

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

6.2.1



* = Outside of Control Limits.

Blank Spike/Blank Spike Duplicate Summary

Job Number: MC17324
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4906-BS	G123511.D	1	01/09/13	JM	n/a	n/a	MSG4906
MSG4906-BSD	G123512.D	1	01/09/13	JM	n/a	n/a	MSG4906

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17324-2, MC17324-4, MC17324-5

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	BSD ug/kg	BSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	2500	2390	96	2380	95	0	70-130/25
103-65-1	n-Propylbenzene	2500	2310	92	2280	91	1	70-130/25
108-88-3	Toluene	2500	2420	97	2400	96	1	70-130/25
95-63-6	1,2,4-Trimethylbenzene	2500	2360	94	2330	93	1	70-130/25
108-67-8	1,3,5-Trimethylbenzene	2500	2360	94	2320	93	2	70-130/25

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
1868-53-7	Dibromofluoromethane	93%	92%	70-130%
2037-26-5	Toluene-D8	87%	86%	70-130%
460-00-4	4-Bromofluorobenzene	84%	84%	70-130%

* = Outside of Control Limits.



Blank Spike/Blank Spike Duplicate Summary

Job Number: MC17324
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1813-BS	M53323.D	1	01/09/13	AMY	n/a	n/a	MSM1813
MSM1813-BSD	M53324.D	1	01/09/13	AMY	n/a	n/a	MSM1813

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17324-1

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
1868-53-7	Dibromofluoromethane	86%	85%	70-130%
2037-26-5	Toluene-D8	88%	90%	70-130%
460-00-4	4-Bromofluorobenzene	79%	81%	70-130%

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

* = Outside of Control Limits.

6.3.2
6

Blank Spike/Blank Spike Duplicate Summary

Job Number: MC17324
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSV612-BS	V15125.D	1	01/10/13	AMY	n/a	n/a	MSV612
MSV612-BSD	V15126.D	1	01/10/13	AMY	n/a	n/a	MSV612

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17324-7

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
1868-53-7	Dibromofluoromethane	102%	101%	70-130%
2037-26-5	Toluene-D8	103%	103%	70-130%
460-00-4	4-Bromofluorobenzene	95%	94%	70-130%

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

* = Outside of Control Limits.

6.3.3


Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC17324
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC17324-3MS	G123507.D	1	01/08/13	JM	n/a	n/a	MSG4905
MC17324-3MSD	G123508.D	1	01/08/13	JM	n/a	n/a	MSG4905
MC17324-3	G123498.D	1	01/08/13	JM	n/a	n/a	MSG4905

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17324-2, MC17324-3, MC17324-4, MC17324-5, MC17324-6

CAS No.	Surrogate Recoveries	MS	MSD	MC17324-3	Limits
1868-53-7	Dibromofluoromethane	92%	90%	95%	70-130%
2037-26-5	Toluene-D8	86%	84%	91%	70-130%
460-00-4	4-Bromofluorobenzene	86%	83%	88%	70-130%

- (a) Outside control limits due to high level in sample relative to spike amount.
- (b) Outside control limits due to possible matrix interference. Refer to Blank Spike.

* = Outside of Control Limits.

6.4.1

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC17324
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC17324-1MS	M53334.D	1	01/09/13	AMY	n/a	n/a	MSM1813
MC17324-1MSD	M53335.D	1	01/09/13	AMY	n/a	n/a	MSM1813
MC17324-1	M53337.D	1	01/09/13	AMY	n/a	n/a	MSM1813

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17324-1

CAS No.	Surrogate Recoveries	MS	MSD	MC17324-1	Limits
1868-53-7	Dilromofluoromethane	89%	85%	85%	70-130%
2037-26-5	Toluene-D8	87%	88%	89%	70-130%
460-00-4	4-Bromofluorobenzene	93%	85%	81%	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.
- (c) High recovery/RPD due to possible nonhomogeneity between sample bottles.

* = Outside of Control Limits.

6.4.2



Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC17324
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC17363-1MS	G123527.D	1	01/09/13	JM	n/a	n/a	MSG4906
MC17363-1MSD	G123528.D	1	01/09/13	JM	n/a	n/a	MSG4906
MC17363-1	G123515.D	1	01/09/13	JM	n/a	n/a	MSG4906

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17324-2, MC17324-4, MC17324-5

CAS No.	Compound	MC17363-1 ug/kg	Spike Q	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND	1460	1480	101	1470	100	1	70-130/30
103-65-1	n-Propylbenzene	ND	1460	1400	96	1400	96	0	70-130/30
108-88-3	Toluene	ND	1460	1500	102	1490	102	1	70-130/30
95-63-6	1,2,4-Trimethylbenzene	ND	1460	1440	98	1460	100	1	70-130/30
108-67-8	1,3,5-Trimethylbenzene	ND	1460	1440	98	1440	98	0	70-130/30

CAS No.	Surrogate Recoveries	MS	MSD	MC17363-1	Limits
1868-53-7	Dibromofluoromethane	85%	85%	87%	70-130%
2037-26-5	Toluene-D8	81%	81%	82%	70-130%
460-00-4	4-Bromofluorobenzene	83%	84%	81%	70-130%

* = Outside of Control Limits.

6.4.3



Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC17324
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC17371-4MS	V15141.D	1	01/10/13	AMY	n/a	n/a	MSV612
MC17371-4MSD	V15142.D	1	01/10/13	AMY	n/a	n/a	MSV612
MC17371-4	V15135.D	1	01/10/13	AMY	n/a	n/a	MSV612

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17324-7

CAS No.	Surrogate Recoveries	MS	MSD	MC17371-4	Limits
1868-53-7	Dibromofluoromethane	103%	104%	99%	70-130%
2037-26-5	Toluene-D8	104%	104%	102%	70-130%
460-00-4	4-Bromofluorobenzene	94%	95%	94%	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.

6.4.4
 6

Volatile Internal Standard Area Summary

Job Number: MC17324
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	MSM1813-CC1800	Injection Date:	01/09/13
Lab File ID:	M53323.D	Injection Time:	09:20
Instrument ID:	GCMSM	Method:	SW846 8260B

Lab Sample ID	IS 1 AREA	IS 1 RT	IS 2 AREA	IS 2 RT	IS 3 AREA	IS 3 RT	IS 4 AREA	IS 4 RT	IS 5 AREA	IS 5 RT
ZZZZZZ	161771	9.36	219633	10.24	108760	13.52	133357	16.08	35162*	6.86
ZZZZZZ	159912	9.36	218443	10.24	108521	13.52	133239	16.08	38552*	6.86
ZZZZZZ	161644	9.36	222851	10.24	108511	13.52	133006	16.08	38611*	6.86
ZZZZZZ	161353	9.36	217667	10.24	106582	13.52	132243	16.08	37369*	6.86
ZZZZZZ	156016	9.35	213582	10.24	105726	13.52	129655	16.08	38384*	6.85

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.
- (c) Outside control limits. Target analytes not associated with this internal standard.

6.5.3



Volatile Internal Standard Area Summary

Job Number: MC17324
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	MSV612-CC595	Injection Date:	01/10/13
Lab File ID:	V15124.D	Injection Time:	09:41
Instrument ID:	GCMSV	Method:	SW846 8260B

Lab Sample ID	IS 1 AREA	IS 1 RT	IS 2 AREA	IS 2 RT	IS 3 AREA	IS 3 RT	IS 4 AREA	IS 4 RT	IS 5 AREA	IS 5 RT
ZZZZZZ	248964	6.49	429352	7.68	226603	11.05	187041	13.29	49328	3.45
ZZZZZZ	249445	6.48	432300	7.68	229251	11.05	190544	13.29	53637	3.45
ZZZZZZ	254762	6.48	436748	7.68	230557	11.05	190173	13.29	45682	3.45
ZZZZZZ	251171	6.49	430853	7.68	231046	11.05	189685	13.29	50339	3.45
ZZZZZZ	253056	6.49	437192	7.68	232387	11.05	191906	13.29	50107	3.45
ZZZZZZ	252866	6.49	434793	7.68	232522	11.05	195016	13.29	52452	3.45
ZZZZZZ	261381	6.48	446440	7.68	236649	11.05	194986	13.29	49857	3.44
ZZZZZZ	265100	6.49	454862	7.69	243492	11.05	199398	13.29	55938	3.45

- 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.

6.5.4
6

Volatile Surrogate Recovery Summary

Job Number: MC17324
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, 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
MC17324-7	V15130.D	100.0	103.0	97.0
MC17371-4MS	V15141.D	103.0	104.0	94.0
MC17371-4MSD	V15142.D	104.0	104.0	95.0
MSV612-BS	V15125.D	102.0	103.0	95.0
MSV612-BSD	V15126.D	101.0	103.0	94.0
MSV612-MB	V15129.D	97.0	101.0	94.0

Surrogate Compounds **Recovery Limits**

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

6.6.1



GC Volatiles

QC Data Summaries

Includes the following where applicable:

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

7

Method Blank Summary

Job Number: MC17324
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31638-MB	BK20506.D	1	01/08/13	AP	01/07/13	OP31638	GBK741

The QC reported here applies to the following samples:

Method: SW846 8011

MC17324-7

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.015	0.013	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.015	0.010	ug/l	

CAS No.	Surrogate Recoveries		Limits
460-00-4	Bromofluorobenzene (S)	95%	36-173%
460-00-4	Bromofluorobenzene (S)	96%	36-173%

7.1.1
7

Method Blank Summary

Job Number: MC17324
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31636-MB	BB45224.D	1	01/09/13	CZ	01/07/13	OP31636	GBB2739

The QC reported here applies to the following samples:

Method: SW846 8011

MC17324-1, MC17324-2, MC17324-3, MC17324-4, MC17324-5, MC17324-6

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	2.5	1.1	ug/kg	
106-93-4	1,2-Dibromoethane	ND	2.5	0.96	ug/kg	

CAS No.	Surrogate Recoveries	Limits
460-00-4	Bromofluorobenzene (S)	122% 61-167%
460-00-4	Bromofluorobenzene (S)	122% 61-167%

7.1.2
7

Blank Spike Summary

Job Number: MC17324
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31638-BS	BK20507.D	1	01/08/13	AP	01/07/13	OP31638	GBK741

The QC reported here applies to the following samples:

Method: SW846 8011

MC17324-7

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
96-12-8	1,2-Dibromo-3-chloropropane	0.071	0.046	65	60-140
106-93-4	1,2-Dibromoethane	0.071	0.068	96	60-140

CAS No.	Surrogate Recoveries	BSP	Limits
460-00-4	Bromofluorobenzene (S)	92%	36-173%
460-00-4	Bromofluorobenzene (S)	97%	36-173%

7.2.1
7

* = Outside of Control Limits.

Blank Spike Summary

Job Number: MC17324
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31636-BS	BK20534.D	1	01/08/13	AP	01/07/13	OP31636	GBK742

The QC reported here applies to the following samples:

Method: SW846 8011

MC17324-1, MC17324-2, MC17324-3, MC17324-4, MC17324-5, MC17324-6

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
96-12-8	1,2-Dibromo-3-chloropropane	33.3	39.6	119	59-142
106-93-4	1,2-Dibromoethane	33.3	40.2	121	56-140

CAS No.	Surrogate Recoveries	BSP	Limits
460-00-4	Bromofluorobenzene (S)	121%	61-167%
460-00-4	Bromofluorobenzene (S)	126%	61-167%

7.2.2
7

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC17324
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31638-MS	BK20508.D	1	01/08/13	AP	01/07/13	OP31638	GBK741
OP31638-MSD	BK20509.D	1	01/08/13	AP	01/07/13	OP31638	GBK741
MC17327-4	BK20510.D	1	01/08/13	AP	01/07/13	OP31638	GBK741

The QC reported here applies to the following samples:

Method: SW846 8011

MC17324-7

CAS No.	Compound	MC17327-4 ug/l	Spike Q	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.071	0.068	96	0.063	89	8	64-141/29
106-93-4	1,2-Dibromoethane	ND	0.071	0.072	101	0.070	99	3	63-163/27

CAS No.	Surrogate Recoveries	MS	MSD	MC17327-4	Limits
460-00-4	Bromofluorobenzene (S)	97%	95%	95%	36-173%
460-00-4	Bromofluorobenzene (S)	98%	96%	101%	36-173%

7.3.1
7

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC17324
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31636-MS	BK20535.D	1	01/08/13	AP	01/07/13	OP31636	GBK742
OP31636-MSD	BK20536.D	1	01/08/13	AP	01/07/13	OP31636	GBK742
MC17324-1	BK20537.D	1	01/08/13	AP	01/07/13	OP31636	GBK742

The QC reported here applies to the following samples:

Method: SW846 8011

MC17324-1, MC17324-2, MC17324-3, MC17324-4, MC17324-5, MC17324-6

CAS No.	Compound	MC17324-1 ug/kg	Spike Q	ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
96-12-8	1,2-Dibromo-3-chloropropane	ND	41.1	50.1	122	51.3	125	2	40-156/27	
106-93-4	1,2-Dibromoethane	ND	41.1	48.2	117	49.5	121	3	48-141/27	

CAS No.	Surrogate Recoveries	MS	MSD	MC17324-1	Limits
460-00-4	Bromofluorobenzene (S)	127%	130%	130%	61-167%
460-00-4	Bromofluorobenzene (S)	124%	126%	123%	61-167%

7.3.2
7

* = Outside of Control Limits.

Volatile Surrogate Recovery Summary

Job Number: MC17324
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Method: SW846 8011	Matrix: AQ
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Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 ^a	S1 ^b
MC17324-7	BK20511.D	128.0	112.0
OP31638-BS	BK20507.D	92.0	97.0
OP31638-MB	BK20506.D	95.0	96.0
OP31638-MS	BK20508.D	97.0	98.0
OP31638-MSD	BK20509.D	95.0	96.0

Surrogate Compounds Recovery Limits

S1 = Bromofluorobenzene (S) 36-173%

(a) Recovery from GC signal #2

(b) Recovery from GC signal #1

7.4.1
7

Volatile Surrogate Recovery Summary

Job Number: MC17324
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Method: SW846 8011 Matrix: SO

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	SI ^a	SI ^b
MC17324-1	BK20537.D	130.0	123.0
MC17324-2	BK20538.D	136.0	128.0
MC17324-3	BK20539.D	132.0	124.0
MC17324-4	BK20540.D	122.0	110.0
MC17324-5	BK20541.D	115.0	112.0
MC17324-6	BK20542.D	119.0	124.0
OP31636-BS	BK20534.D	121.0	126.0
OP31636-MB	BB45224.D	122.0	122.0
OP31636-MS	BK20535.D	127.0	124.0
OP31636-MSD	BK20536.D	130.0	126.0

Surrogate Compounds Recovery Limits

S1 = Bromofluorobenzene (S) 61-167%

- (a) Recovery from GC signal #2
- (b) Recovery from GC signal #1

7.4.2
7

GC Surrogate Retention Time Summary

Job Number: MC17324
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	GBB2739-ICC2739	Injection Date:	01/08/13
Lab File ID:	BB45218.D	Injection Time:	23:03
Instrument ID:	GCBB	Method:	SW846 8011

	S1 ^a RT	S1 ^b RT
Check Std	3.55	3.31

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 ^a RT	S1 ^b RT
OP31636-MB	BB45224.D	01/09/13	01:45	3.55	3.31
ZZZZZZ	BB45225.D	01/09/13	02:12	3.56	3.31
ZZZZZZ	BB45226.D	01/09/13	02:38	3.56	3.31
ZZZZZZ	BB45227.D	01/09/13	03:05	3.56	3.31
ZZZZZZ	BB45228.D	01/09/13	03:32	3.56	3.31
ZZZZZZ	BB45229.D	01/09/13	03:59	3.57	3.32
ZZZZZZ	BB45230.D	01/09/13	04:25	3.56	3.31
ZZZZZZ	BB45231.D	01/09/13	04:52	3.56	3.32
ZZZZZZ	BB45232.D	01/09/13	05:19	3.56	3.32
GBB2739-ECC2739	BB45233.D	01/09/13	05:46	3.56	3.31

Surrogate
Compounds

S1 = Bromofluorobenzene (S)

- (a) Retention time from GC signal #2
- (b) Retention time from GC signal #1

7.5.1
7

GC Surrogate Retention Time Summary

Job Number: MC17324
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	GBK741-ICC741	Injection Date:	01/07/13
Lab File ID:	BK20497.D	Injection Time:	20:53
Instrument ID:	GCBK	Method:	SW846 8011

	S1 ^a RT	S1 ^b RT
Check Std	4.45	4.78

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 ^a RT	S1 ^b RT
ZZZZZZ	BK20500A.D	01/07/13	22:06	4.46	4.78
OP31628-MB	BK20502.D	01/07/13	22:55	4.45	4.78
ZZZZZZ	BK20503.D	01/07/13	23:20	0.00	0.00
ZZZZZZ	BK20504.D	01/07/13	23:44	0.00	0.00
ZZZZZZ	BK20505.D	01/08/13	00:09	0.00	0.00
OP31638-MB	BK20506.D	01/08/13	00:33	4.45	4.78
OP31638-BS	BK20507.D	01/08/13	00:58	4.45	4.78
OP31638-MS	BK20508.D	01/08/13	01:22	4.45	4.78
OP31638-MSD	BK20509.D	01/08/13	01:47	4.45	4.78
MC17327-4	BK20510.D	01/08/13	02:11	4.45	4.78
MC17324-7	BK20511.D	01/08/13	02:36	4.45	4.78
GBK741-ECC741	BK20512.D	01/08/13	03:00	4.46	4.78

**Surrogate
Compounds**

S1 = Bromofluorobenzene (S)

- (a) Retention time from GC signal #2
- (b) Retention time from GC signal #1

7.5.2
7

GC Surrogate Retention Time Summary

Job Number: MC17324
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	GBK742-ICC742	Injection Date:	01/08/13
Lab File ID:	BK20527.D	Injection Time:	18:32
Instrument ID:	GCBK	Method:	SW846 8011

	S1 ^a RT	S1 ^b RT
Check Std	4.43	4.69

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 ^a RT	S1 ^b RT
OP31636-BS	BK20534.D	01/08/13	21:23	4.43	4.69
OP31636-MS	BK20535.D	01/08/13	21:48	4.43	4.69
OP31636-MSD	BK20536.D	01/08/13	22:12	4.43	4.69
MC17324-1	BK20537.D	01/08/13	22:37	4.43	4.69
MC17324-2	BK20538.D	01/08/13	23:02	4.43	4.69
MC17324-3	BK20539.D	01/08/13	23:26	4.43	4.69
MC17324-4	BK20540.D	01/08/13	23:51	4.42	4.69
MC17324-5	BK20541.D	01/09/13	00:15	4.42	4.69
MC17324-6	BK20542.D	01/09/13	00:39	4.43	4.69

**Surrogate
Compounds**

S1 = Bromofluorobenzene (S)

- (a) Retention time from GC signal #2
- (b) Retention time from GC signal #1

7.5.3
7

General Chemistry

QC Data Summaries

Includes the following where applicable:

- Percent Solids Raw Data Summary



Percent Solids Raw Data Summary

Job Number: MC17324
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample: MC17324-1 Analyzed: 08-JAN-13 by HS Method: SM21 2540 B MOD.
ClientID: GP-16-23

Wet Weight (Total) 29.552 g
Tare Weight 23.418 g
Dry Weight (Total) 28.369 g
Solids, Percent 80.7 %

Sample: MC17324-2 Analyzed: 08-JAN-13 by HS Method: SM21 2540 B MOD.
ClientID: GP-16-42

Wet Weight (Total) 30.944 g
Tare Weight 20.002 g
Dry Weight (Total) 29.214 g
Solids, Percent 84.2 %

Sample: MC17324-3 Analyzed: 08-JAN-13 by HS Method: SM21 2540 B MOD.
ClientID: GP-16-51

Wet Weight (Total) 28.248 g
Tare Weight 20.266 g
Dry Weight (Total) 27.51 g
Solids, Percent 90.8 %

Sample: MC17324-4 Analyzed: 08-JAN-13 by HS Method: SM21 2540 B MOD.
ClientID: GP-16-57

Wet Weight (Total) 34.247 g
Tare Weight 24.711 g
Dry Weight (Total) 33.019 g
Solids, Percent 87.1 %

Sample: MC17324-5 Analyzed: 08-JAN-13 by HS Method: SM21 2540 B MOD.
ClientID: GP-16-57-DUP

Wet Weight (Total) 30.912 g
Tare Weight 23.909 g
Dry Weight (Total) 29.907 g
Solids, Percent 85.6 %

Sample: MC17324-6 Analyzed: 08-JAN-13 by HS Method: SM21 2540 B MOD.
ClientID: GP-16-77

Wet Weight (Total) 32.609 g
Tare Weight 21.712 g
Dry Weight (Total) 31.449 g
Solids, Percent 89.4 %

8.1
8

Roxana Drilling 2013 Data Review

Laboratory SDG: MC17401

Data Reviewer: Melissa Mansker

Peer Reviewer: Elizabeth Kunkel

Date Reviewed: 1/28/2013

Guidance: USEPA National Functional Guidelines for Superfund Organic Methods Data Review 2008

Sample Identification	Sample Identification
GP-16-91	GP-17-15
GP-17-15-Dup	GP-17-45
GP-17-57	GP-17-65
Trip Blank	GP-18-21
GP-18-37	GP-18-53
GP-18-63	

1.0 Data Package Completeness

Were all items delivered as specified in the QAPP and COC as appropriate?

Yes

2.0 Laboratory Case Narrative \ Cooler Receipt Form

Were problems noted in the laboratory case narrative or cooler receipt form?

Yes, the laboratory case narrative indicated VOC LCS/LCSD recoveries were outside evaluation criteria. VOC MS/MSD recoveries were outside of evaluation criteria. Internal standard area recovery for tert butyl alcohol-d₉ in LCS MSM1816-BS was outside criteria. Although not indicated in the laboratory case narrative, methylene chloride was detected in the method blank. Benzene was qualified due to field duplicate RPD outside evaluation criteria for the field duplicate pair GP-17-15/GP-17-15-Dup. The initial calibration verification recovery for acetone, acrolein, 2-butanone, and 2-hexanone exceeded 50 percent difference (%D). These issues are addressed further in the appropriate sections below.

The cooler receipt form indicated samples were received by the laboratory at 1.1°C which is outside temperature criteria 4°C ± 2°C. All samples were received in good condition; no qualification of data was required.

3.0 Holding Times

Were samples extracted/analyzed within applicable limits?

Yes

4.0 Blank Contamination

Were any analytes detected in the Method Blanks, Field Blanks or Trip Blanks?

Yes

Blank ID	Parameter	Analyte	Concentration
MSM1816-MB	VOCs	Methylene chloride	2.2 ug/L

Analytical data that required qualification based on blank contamination are included in the table below. Analytical data that were reported non-detect or at concentrations greater than five times (5X) the associated blank concentration (10X for common laboratory contaminants) did not require qualification.

Sample ID	Parameter	Analyte	New RL	Qualification
GP-16-91	VOCs	Methylene chloride	-	U

5.0 Laboratory Control Sample

Were LCS recoveries within evaluation criteria?

No

LCS/LCSD ID	Parameter	Analyte	LCS/LCSD Recovery	RPD	LCS/LCSD/ RPD Criteria
MSG4908-BS	VOCs	Acetone	158	NA	70-130
MSG4908-BS	VOCs	Acrolein	60	NA	70-130
MSG4908-BS	VOCs	2-Butanone (MEK)	137	NA	70-130
MSG4908-BS	VOCs	Dichlorodifluoromethane	139	NA	70-130
MSG4908-BS	VOCs	2-Hexanone	134	NA	70-130
MSM1816-BS	VOCs	Carbon disulfide	131	NA	70-130
MSM1816-BS	VOCs	Chloromethane	143	NA	70-130
MSM1816-BS	VOCs	Dichlorofluoromethane	157	NA	70-130
MSM1816-BS	VOCs	1,1-Dichloroethene	132	NA	70-130
MSM1816-BS	VOCs	Trichlorofluoromethane	135	NA	70-130
MSV612-BS/BSD	VOCs	Acetone	137/119	14	70-130/25
MSV612-BS/BSD	VOCs	2-Chloroethyl vinyl ether	42/43	3	70-130/25
MSV612-BS/BSD	VOCs	Dichlorodifluoromethane	163/172	6	70-130/25
MSV612-BS/BSD	VOCs	2,2-Dichloropropane	140/143	2	70-130/25

Analytical data that required qualification based on LCS/LCSD data are included in the table below. Analytical data reported as non-detect and associated with LCS recoveries above evaluation criteria, indicating a possible high bias, did not require qualification. LCS/LCSD MSV612-BS/BSD was associated with the trip blank. Trip blanks are quality control samples and are not qualified.

Sample ID	Parameter	Analyte	Qualification
GP-17-15	VOCs	Acrolein	UJ
GP-17-15-Dup	VOCs	Acrolein	UJ
GP-17-45	VOCs	Acrolein	UJ
GP-17-57	VOCs	Acrolein	UJ
GP-17-65	VOCs	Acrolein	UJ
GP-18-21	VOCs	Acrolein	UJ

Sample ID	Parameter	Analyte	Qualification
GP-18-37	VOCs	Acrolein	UJ
GP-18-53	VOCs	Acrolein	UJ
GP-18-63	VOCs	Acrolein	UJ
GP-16-91	VOCs	Carbon disulfide	J

6.0 Surrogate Recoveries

Were surrogate recoveries within evaluation criteria?

Yes

7.0 Matrix Spike and Matrix Spike Duplicate Recoveries

Were MS/MSD samples analyzed as part of this SDG?

Yes, sample GP-18-21 was spiked and analyzed for VOCs and VOCs by 8011. Although not requested, sample GP-16-51 was spiked and analyzed for VOCs, and sample GP-16-57 was spiked and analyzed for VOCs by 8011.

Were MS/MSD recoveries within evaluation criteria?

No

MS/MSD ID	Parameter	Analyte	MS/MSD Recovery	RPD	MS/MSD/ RPD Criteria
GP-18-21	VOCs	Dichlorodifluoromethane	147/142	3	70-130/30
GP-18-21	VOCs	1,4-Dioxane	66/75	13	70-130/30
GP-18-21	VOCs	Hexachlorobutadiene	137/136	1	70-130/30
GP-18-21	VOCs	1,2,3-Trichlorobenzene	61/63	3	70-130/30

USEPA National Functional Guidelines for Organic Data Review indicates that organic data does not require qualification based on MS/MSD data alone and LCS recoveries were within evaluation criteria with the exception of compounds listed and qualified as appropriate in Section 5.0 of this data review. No further qualification of the data was required.

8.0 Internal Standard (IS) Recoveries

Were internal standard area recoveries within evaluation criteria?

No

Sample ID	Parameter	Analyte	IS Area Recovery	IS Criteria
MSM1816-BS	VOCs	Tert butyl alcohol-d ₉	380229	90823-363290

Analytical data reported as non-detect and associated with internal standard recoveries above evaluation criteria, indicating a possible high bias, did not require qualification. LCS MSM1816-BS is a quality control sample and is not qualified. No qualification of the data associated with the LCS was required.

9.0 Laboratory Duplicate Results

Were laboratory duplicate samples collected as part of this SDG?

No

10.0 Field Duplicate Results

Were field duplicate samples collected as part of this SDG?

Yes

Field ID	Field Duplicate ID
GP-17-15	GP-17-15-Dup

Were field duplicates within evaluation criteria?

No

Field ID	Field Duplicate ID	Parameter	Analyte	RPD	Qualification
GP-17-15	GP-17-15-Dup	VOCs	Benzene	87	J/J

11.0 Sample Dilutions

For samples that were diluted and nondetect, were undiluted results also reported?

Not applicable; samples analyzed did not require dilution.

12.0 Additional Qualifications

Were additional qualifications applied?

Yes, field duplicate pair GP-17-15/GP-17-15-Dup and samples GP-17-45, GP-17-57, GP-17-65, GP-18-21, GP-18-37, GP-18-53, and GP-18-63 were associated with the initial calibration verification recovery for acetone, acrolein, 2-butanone, and 2-hexanone that exceeded 50 percent difference (%D). Acrolein was previously qualified in field duplicate pair GP-17-15/GP-17-15-Dup and samples GP-17-45, GP-17-57, GP-17-65, GP-18-21, GP-18-37, GP-18-53, and GP-18-63 in Section 5.0 of the review due to LCS/LCSD data. No further qualification of acrolein was required. Analytes in samples associated with ICV %D greater than 50% were qualified as summarized in the following table.

Sample ID	Parameter	Analyte	Qualification
GP-17-15	VOCs	Acetone	UJ
GP-17-15	VOCs	2-Butanone (MEK)	UJ
GP-17-15	VOCs	2-Hexanone	UJ
GP-17-15-Dup	VOCs	Acetone	UJ
GP-17-15-Dup	VOCs	2-Butanone (MEK)	UJ
GP-15-17-Dup	VOCs	2-Hexanone	UJ
GP-17-45	VOCs	Acetone	UJ
GP-17-45	VOCs	2-Butanone (MEK)	UJ
GP-17-45	VOCs	2-Hexanone	UJ
GP-17-57	VOCs	Acetone	UJ
GP-17-57	VOCs	2-Butanone (MEK)	UJ
GP-17-57	VOCs	2-Hexanone	UJ
GP-17-65	VOCs	Acetone	UJ
GP-17-65	VOCs	2-Buanone (MEK)	UJ
GP-17-65	VOCs	2-Hexanone	UJ

Sample ID	Parameter	Analyte	Qualification
GP-18-21	VOCs	Acetone	UJ
GP-18-21	VOCs	2-Butanone (MEK)	UJ
GP-18-21	VOCs	2-Hexanone	UJ
GP-18-37	VOCs	Acetone	UJ
GP-18-37	VOCs	2-Butanone (MEK)	UJ
GP-18-37	VOCs	2-Hexanone	UJ
GP-18-53	VOCs	Acetone	UJ
GP-18-53	VOCs	2-Butanone (MEK)	UJ
GP-18-53	VOCs	2-Hexanone	UJ
GP-18-63	VOCs	Acetone	UJ
GP-18-63	VOCs	2-Butanone (MEK)	UJ
GP-18-63	VOCs	2-Hexanone	UJ



02/15/13



Technical Report for

Shell Oil

URSMOSTL: Roxana Drilling, Roxana, IL

21562850.15000

Accutest Job Number: MC17401

Sampling Dates: 01/07/13 - 01/08/13

Report to:

URS Corporation

elizabeth.kunkel@URS.com

ATTN: Elizabeth Kunkel

Total number of pages in report: **114**

*Reviewed on
1/28/2013*



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

Reza Fard
Reza Fard
Lab Director

Client Service contact: Jeremy Vienneau 508-481-6200

Certifications: MA (M-MA136,SW846 NELAC) CT (PH-0109) NH (250210) RI (00071) ME (MA00136) FL (E87579) NY (11791) NJ (MA926) PA (6801121) ND (R-188) CO MN (11546AA) NC (653) IL (002337) WI (399080220) ISO 17025:2005 (L2235)

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Test results relate only to samples analyzed.

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Sample Summary

Shell Oil

Job No: MC17401

URSMOSTL: Roxana Drilling, Roxana, IL
 Project No: 21562850.15000

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
MC17401-1	01/07/13	10:15 WPJS	01/09/13	SO	Soil	GP-16-91 ✓
MC17401-2	01/07/13	13:25 WPJS	01/09/13	SO	Soil	GP-17-15 ✓
MC17401-3	01/07/13	13:25 WPJS	01/09/13	SO	Soil	GP-17-15 DUP ✓
MC17401-4	01/07/13	13:55 WPJS	01/09/13	SO	Soil	GP-17-45 ✓
MC17401-5	01/07/13	14:20 WPJS	01/09/13	SO	Soil	GP-17-57 ✓
MC17401-6	01/07/13	14:35 WPJS	01/09/13	SO	Soil	GP-17-65 ✓
MC17401-7	01/07/13	00:00 WPJS	01/09/13	AQ	Trip Blank Water	TRIP BLANK ✓
MC17401-8	01/08/13	09:30 WPJS	01/09/13	SO	Soil	GP-18-21 ✓
MC17401-8D	01/08/13	09:30 WPJS	01/09/13	SO	Soil Dup/MSD	GP-18-21 ✓
MC17401-8S	01/08/13	09:30 WPJS	01/09/13	SO	Soil Matrix Spike	GP-18-21 ✓
MC17401-9	01/08/13	10:10 WPJS	01/09/13	SO	Soil	GP-18-37 ✓
MC17401-10	01/08/13	13:25 WPJS	01/09/13	SO	Soil	GP-18-53 ✓
MC17401-11	01/08/13	14:05 WPJS	01/09/13	SO	Soil	GP-18-63 ✓

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



SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: Shell Oil

Job No MC17401

Site: URSMOSTL: Roxana Drilling, Roxana, IL

Report Date 1/23/2013 4:42:53 PM

10 Sample and 1 Trip Blank were collected on between 01/07/2013 and 01/08/2013 and were received at Accutest on 01/09/2013 properly preserved, at 1.1 Deg. C and intact. These Samples received an Accutest job number of MC17401. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section of this report. 1-Chlorohexane was searched in the library search and reported only if detections were found.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

Volatiles by GCMS By Method SW846 8260B

Matrix AQ	Batch ID: MSV612
-----------	------------------

- All samples were analyzed within the recommended method holding time.
- Sample(s) MC17371-4MS, MC17371-4MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- Blank Spike Recovery(s) for 2,2-Dichloropropane, 2-Chloroethyl vinyl ether, Acetone, Dichlorodifluoromethane are outside control limits.
- MS/MSD Recovery(s) for 2,2-Dichloropropane, 2-Chloroethyl vinyl ether, Dichlorodifluoromethane are outside control limits. Outside control limits due to possible matrix interference. Refer to Blank Spike.
- RPD(s) for MSD for 1,2,3-Trichlorobenzene are outside control limits for sample MC17371-4MSD. High RPD due to possible matrix interference and/or sample non-homogeneity.
- Blank Spike Duplicate Recovery(s) for 2,2-Dichloropropane, 2-Chloroethyl vinyl ether, Dichlorodifluoromethane are outside control limits. Blank Spike meets program technical requirements.

Matrix SO	Batch ID: MSG4908
-----------	-------------------

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) MC17401-8MS, MC17401-8MSD were used as the QC samples indicated.
- Blank Spike Recovery(s) for 2-Butanone (MEK), 2-Hexanone, Acetone, Acrolein, Dichlorodifluoromethane are outside control limits. Blank Spike meets program technical requirements.
- Matrix Spike Recovery(s) for 1,2,3-Trichlorobenzene, 1,4-Dioxane, Dichlorodifluoromethane, Hexachlorobutadiene are outside control limits. Outside control limits due to possible matrix interference. Refer to Blank Spike.
- Matrix Spike Duplicate Recovery(s) for 1,2,3-Trichlorobenzene, Dichlorodifluoromethane, Hexachlorobutadiene are outside control limits. Outside control limits due to possible matrix interference. Refer to Blank Spike.
- Initial calibration verification MSG4894-ICV4894 for acrolein, acetone, 2-butanone, 2-hexanone exceeds 50% Difference. These compounds are within criteria in continuing calibration check standard MSG4908-CC4894.

Matrix SO	Batch ID: MSG4909
-----------	-------------------

- All samples were analyzed within the recommended method holding time.
- Sample(s) MC17458-2MS, MC17458-2MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Matrix SO	Batch ID: MSM1816
-----------	-------------------

- All samples were analyzed within the recommended method holding time.
- Sample(s) MC17422-6MS, MC17422-6MSD were used as the QC samples indicated.
- Sample(s) MC17401-1 have compound(s) reported with a "B" qualifier, indicating analyte is found in the associated method blank.
- Blank Spike Recovery(s) for 1,1-Dichloroethene, Carbon disulfide, Chloromethane, Dichlorodifluoromethane, Trichlorofluoromethane are outside control limits. Blank Spike meets program technical requirements.

Volatiles by GCMS By Method SW846 8260B

Matrix SO	Batch ID: MSM1816
------------------	--------------------------

- Matrix Spike Recovery(s) for 1,1,1,2-Tetrachloroethane, 1,1,2,2-Tetrachloroethane, 1,2,3-Trichlorobenzene, 1,2,3-Trichloropropane, 1,2,4-Trichlorobenzene, 1,2,4-Trimethylbenzene, 1,2-Dichlorobenzene, 1,3,5-Trimethylbenzene, 1,3-Dichlorobenzene, 1,3-Dichloropropane, 1,4-Dichlorobenzene, 1,4-Dioxane, Acetone, Bromobenzene, Bromoform, Chlorobenzene, Chloromethane, cis-1,3-Dichloropropene, Dibromochloromethane, Dichlorodifluoromethane, Ethylbenzene, Hexachlorobutadiene, m,p-Xylene, n-Butylbenzene, n-Propylbenzene, Naphthalene, o-Chlorotoluene, o-Xylene, p-Chlorotoluene, p-Isopropyltoluene, Styrene, trans-1,3-Dichloropropene, Xylene (total) are outside control limits. Outside control limits due to possible matrix interference. Refer to Blank Spike.
- Matrix Spike Duplicate Recovery(s) for 1,1,1,2-Tetrachloroethane, 1,1,2,2-Tetrachloroethane, 1,1,2-Trichloroethane, 1,2,3-Trichlorobenzene, 1,2,3-Trichloropropane, 1,2,4-Trimethylbenzene, 1,2-Dichlorobenzene, 1,3,5-Trimethylbenzene, 1,3-Dichlorobenzene, 1,3-Dichloropropane, 1,4-Dichlorobenzene, 2-Hexanone, Acetone, Bromobenzene, Bromoform, Chlorobenzene, cis-1,3-Dichloropropene, Dibromochloromethane, Dichlorodifluoromethane, Ethylbenzene, Hexachlorobutadiene, Isopropylbenzene, o,p-Xylene, n-Butylbenzene, n-Propylbenzene, Naphthalene, o-Chlorotoluene, o-Xylene, p-Chlorotoluene, p-Isopropyltoluene, sec-Butylbenzene, Styrene, tert-Butylbenzene, trans-1,3-Dichloropropene, Xylene (total), 1,2,4-Trichlorobenzene are outside control limits. Outside control limits due to possible matrix interference. Refer to Blank Spike.
- RPD(s) for MSD for 1,2,4-Trichlorobenzene are outside control limits for sample MC17422-6MSD. High RPD due to possible matrix interference and/or sample non-homogeneity.
- MSM1816-BS for Tert Butyl Alcohol-D9: Outside control limits. Target analytes not associated with this internal standard.

Volatiles by GC By Method SW846 8011

Matrix AQ	Batch ID: OP31715
------------------	--------------------------

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) MC17451-5MS, MC17451-5MSD were used as the QC samples indicated.
- RPD(s) for MSD for 1,2-Dibromoethane are outside control limits for sample OP31715-MSD1. High RPD due to possible matrix interference and/or sample non-homogeneity.

Matrix SO	Batch ID: OP31685
------------------	--------------------------

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) MC17401-8MS, MC17401-8MSD were used as the QC samples indicated.

Wet Chemistry By Method SM21 2540 B MOD.

Matrix SO	Batch ID: GN41499
------------------	--------------------------

- Sample(s) MC17401-8DUP were used as the QC samples for Solids, Percent.

The Accutest Laboratories of New England certifies that all analysis were performed within method specification. It is further recommended that this report to be used in its entirety. The Accutest Laboratories of NE, Laboratory Director or assignee as verified by the signature on the cover page has authorized the release of this report(MC17401).

Summary of Hits

Job Number: MC17401
Account: Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL
Collected: 01/07/13 thru 01/08/13



Lab Sample ID	Client Sample ID	Result/ Analyte Qual	RL	MDL	Units	Method
MC17401-1	GP-16-91					
Benzene		0.0488	0.00048	0.00028	mg/kg	SW846 8260B
Carbon disulfide		0.00095 J	0.0048	0.00016	mg/kg	SW846 8260B
Chloroform		0.00075 J	0.0019	0.00049	mg/kg	SW846 8260B
Ethylbenzene		0.0045	0.0019	0.00023	mg/kg	SW846 8260B
Isopropylbenzene		0.00039 J	0.0048	0.00022	mg/kg	SW846 8260B
Methylene chloride		0.0011 JB	0.0019	0.0011	mg/kg	SW846 8260B
n-Propylbenzene		0.0013 J	0.0048	0.00097	mg/kg	SW846 8260B
Toluene		0.0040 J	0.0048	0.00081	mg/kg	SW846 8260B
1,2,4-Trimethylbenzene		0.0047 J	0.0048	0.00021	mg/kg	SW846 8260B
1,3,5-Trimethylbenzene		0.0017 J	0.0048	0.00020	mg/kg	SW846 8260B
m,p-Xylene		0.0099	0.0019	0.00075	mg/kg	SW846 8260B
o-Xylene		0.0029	0.0019	0.00023	mg/kg	SW846 8260B
Xylene (total)		0.0128	0.0019	0.00023	mg/kg	SW846 8260B
MC17401-2	GP-17-15					
Benzene		154	0.27	0.16	mg/kg	SW846 8260B
n-Butylbenzene		3.01	2.7	0.10	mg/kg	SW846 8260B
sec-Butylbenzene		0.323 J	2.7	0.13	mg/kg	SW846 8260B
Ethylbenzene		1.69	1.1	0.13	mg/kg	SW846 8260B
Isopropylbenzene		0.269 J	2.7	0.12	mg/kg	SW846 8260B
p-Isopropyltoluene		0.415 J	2.7	0.097	mg/kg	SW846 8260B
Naphthalene		45.3	2.7	0.68	mg/kg	SW846 8260B
n-Propylbenzene		1.74 J	2.7	0.55	mg/kg	SW846 8260B
1,2,4-Trimethylbenzene		16.3	2.7	0.12	mg/kg	SW846 8260B
1,3,5-Trimethylbenzene		3.00	2.7	0.12	mg/kg	SW846 8260B
m,p-Xylene		4.44	1.1	0.43	mg/kg	SW846 8260B
o-Xylene		2.84	1.1	0.13	mg/kg	SW846 8260B
Xylene (total)		7.28	1.1	0.13	mg/kg	SW846 8260B
MC17401-3	GP-17-15 DUP					
Benzene		391	0.70	0.42	mg/kg	SW846 8260B
n-Butylbenzene		4.67 J	7.0	0.26	mg/kg	SW846 8260B
Ethylbenzene		3.04	2.8	0.34	mg/kg	SW846 8260B
Naphthalene		64.5	7.0	1.8	mg/kg	SW846 8260B
n-Propylbenzene		2.69 J	7.0	1.4	mg/kg	SW846 8260B
1,2,4-Trimethylbenzene		25.0	7.0	0.32	mg/kg	SW846 8260B
1,3,5-Trimethylbenzene		4.96 J	7.0	0.30	mg/kg	SW846 8260B
m,p-Xylene		7.57	2.8	1.1	mg/kg	SW846 8260B
o-Xylene		4.76	2.8	0.34	mg/kg	SW846 8260B
Xylene (total)		12.3	2.8	0.34	mg/kg	SW846 8260B

Summary of Hits

Job Number: MC17401
 Account: Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL
 Collected: 01/07/13 thru 01/08/13



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
MC17401-4	GP-17-45					
Benzene		1550	6.2	3.6	mg/kg	SW846 8260B
Ethylbenzene		1.45 J	1.6	0.20	mg/kg	SW846 8260B
Toluene		3.09 J	4.1	0.70	mg/kg	SW846 8260B
1,2,4-Trimethylbenzene		2.67 J	4.1	0.18	mg/kg	SW846 8260B
1,3,5-Trimethylbenzene		0.755 J	4.1	0.18	mg/kg	SW846 8260B
m,p-Xylene		2.73	1.6	0.65	mg/kg	SW846 8260B
o-Xylene		0.945 J	1.6	0.20	mg/kg	SW846 8260B
Xylene (total)		3.68	1.6	0.20	mg/kg	SW846 8260B
MC17401-5	GP-17-57					
Benzene		178	0.59	0.35	mg/kg	SW846 8260B
Ethylbenzene		0.569 J	2.4	0.29	mg/kg	SW846 8260B
1,2,4-Trimethylbenzene		1.06 J	5.9	0.27	mg/kg	SW846 8260B
MC17401-6	GP-17-65					
Benzene		15.4	0.039	0.023	mg/kg	SW846 8260B
n-Butylbenzene		0.0559 J	0.39	0.014	mg/kg	SW846 8260B
Ethylbenzene		0.410	0.16	0.019	mg/kg	SW846 8260B
Isopropylbenzene		0.0402 J	0.39	0.018	mg/kg	SW846 8260B
n-Propylbenzene		0.173 J	0.39	0.079	mg/kg	SW846 8260B
1,2,4-Trimethylbenzene		0.675	0.39	0.017	mg/kg	SW846 8260B
1,3,5-Trimethylbenzene		0.190 J	0.39	0.017	mg/kg	SW846 8260B
m,p-Xylene		0.934	0.16	0.062	mg/kg	SW846 8260B
o-Xylene		0.230	0.16	0.019	mg/kg	SW846 8260B
Xylene (total)		1.16	0.16	0.019	mg/kg	SW846 8260B
MC17401-7	TRIP BLANK					
No hits reported in this sample.						
MC17401-8	GP-18-21					
Benzene		9.94	0.18	0.11	mg/kg	SW846 8260B
MC17401-9	GP-18-37					
Benzene		453	1.0	0.60	mg/kg	SW846 8260B
Ethylbenzene		1.13 J	2.0	0.25	mg/kg	SW846 8260B
Isopropylbenzene		0.368 J	5.1	0.23	mg/kg	SW846 8260B
1,2,4-Trimethylbenzene		6.98	5.1	0.23	mg/kg	SW846 8260B
1,3,5-Trimethylbenzene		1.78 J	5.1	0.22	mg/kg	SW846 8260B

Summary of Hits

Job Number: MC17401
 Account: Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL
 Collected: 01/07/13 thru 01/08/13



Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
m,p-Xylene		2.52	2.0	0.80	mg/kg	SW846 8260B
o-Xylene		0.798 J	2.0	0.24	mg/kg	SW846 8260B
Xylene (total)		3.32	2.0	0.24	mg/kg	SW846 8260B
MC17401-10 GP-18-53						
Benzene		668	1.3	0.79	mg/kg	SW846 8260B
1,2,4-Trimethylbenzene		1.75 J	6.7	0.30	mg/kg	SW846 8260B
1,3,5-Trimethylbenzene		0.510 J	6.7	0.29	mg/kg	SW846 8260B
MC17401-11 GP-18-63						
Benzene		67.8	0.26	0.15	mg/kg	SW846 8260B
Ethylbenzene		0.243 J	1.1	0.13	mg/kg	SW846 8260B
Isopropylbenzene		0.296 J	2.6	0.12	mg/kg	SW846 8260B
n-Propylbenzene		0.785 J	2.6	0.53	mg/kg	SW846 8260B
1,2,4-Trimethylbenzene		2.69	2.6	0.12	mg/kg	SW846 8260B
1,3,5-Trimethylbenzene		0.731 J	2.6	0.11	mg/kg	SW846 8260B
m,p-Xylene		1.41	1.1	0.41	mg/kg	SW846 8260B
Xylene (total)		1.41	1.1	0.13	mg/kg	SW846 8260B

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID: GP-16-91	Date Sampled: 01/07/13
Lab Sample ID: MC17401-1	Date Received: 01/09/13
Matrix: SO - Soil	Percent Solids: 87.9
Method: SW846 8260B	
Project: URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M53434.D	1	01/15/13	AMY	n/a	n/a	MSM1816
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.96 g	5.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.0048	0.0012	mg/kg	
107-02-8	Acrolein	ND	0.024	0.0095	mg/kg	
107-13-1	Acrylonitrile	ND	0.024	0.0012	mg/kg	
71-43-2	Benzene	0.0488	0.00048	0.00028	mg/kg	
108-86-1	Bromobenzene	ND	0.0048	0.00021	mg/kg	
74-97-5	Bromochloromethane	ND	0.0048	0.00036	mg/kg	
75-27-4	Bromodichloromethane	ND	0.0019	0.00020	mg/kg	
75-25-2	Bromoform	ND	0.0019	0.0019	mg/kg	
74-83-9	Bromomethane	ND	0.0019	0.00050	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.0048	0.0012	mg/kg	
104-51-8	n-Butylbenzene	ND	0.0048	0.00018	mg/kg	
135-98-8	sec-Butylbenzene	ND	0.0048	0.00022	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.0048	0.00084	mg/kg	
75-15-0	Carbon disulfide	0.00095	0.0048	0.00016	mg/kg	J J
56-23-5	Carbon tetrachloride	ND	0.0019	0.00069	mg/kg	
108-90-7	Chlorobenzene	ND	0.0019	0.00026	mg/kg	
75-00-3	Chloroethane	ND	0.0048	0.0012	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.0048	0.0019	mg/kg	
67-66-3	Chloroform	0.00075	0.0019	0.00049	mg/kg	J
74-87-3	Chloromethane	ND	0.0048	0.00044	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.0048	0.0011	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.0048	0.00022	mg/kg	
124-48-1	Dibromochloromethane	ND	0.0019	0.00028	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.0019	0.00021	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.0019	0.00022	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.0019	0.00020	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.0019	0.0011	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.0019	0.00026	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.0019	0.00027	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.0019	0.00035	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.0019	0.00029	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.0019	0.00027	mg/kg	

ND = Not detected MDL - Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	GP-16-91	Date Sampled:	01/07/13
Lab Sample ID:	MC17401-1	Date Received:	01/09/13
Matrix:	SO - Soil	Percent Solids:	87.9
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.0019	0.00036	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.0048	0.00022	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.0048	0.00083	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.0048	0.00025	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.0019	0.00016	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.0019	0.00047	mg/kg	
123-91-1	1,4-Dioxane	ND	0.024	0.024	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.0048	0.00065	mg/kg	
100-41-4	Ethylbenzene	0.0045	0.0019	0.00023	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.0048	0.00044	mg/kg	
591-78-6	2-Hexanone	ND	0.0048	0.00048	mg/kg	
98-82-8	Isopropylbenzene	0.00039	0.0048	0.00022	mg/kg	J
99-87-6	p-Isopropyltoluene	ND	0.0048	0.00017	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.0019	0.00027	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.0048	0.00048	mg/kg	
74-95-3	Methylene bromide	ND	0.0048	0.00047	mg/kg	
75-09-2	Methylene chloride	0.0011 u	0.0019	0.0011	mg/kg	JB u
91-20-3	Naphthalene	ND	0.0048	0.0012	mg/kg	
103-65-1	n-Propylbenzene	0.0013	0.0048	0.00097	mg/kg	J
100-42-5	Styrene	ND	0.0048	0.00022	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.0048	0.00095	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.0019	0.00041	mg/kg	
127-18-4	Tetrachloroethene	ND	0.0019	0.00022	mg/kg	
108-88-3	Toluene	0.0040	0.0048	0.00081	mg/kg	J
87-61-6	1,2,3-Trichlorobenzene	ND	0.0048	0.00023	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.0048	0.00022	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.0019	0.00030	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.0019	0.00070	mg/kg	
79-01-6	Trichloroethene	ND	0.0019	0.00020	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.0019	0.00029	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.0048	0.00028	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	0.0047	0.0048	0.00021	mg/kg	J
108-67-8	1,3,5-Trimethylbenzene	0.0017	0.0048	0.00020	mg/kg	J
108-05-4	Vinyl Acetate	ND	0.0048	0.00053	mg/kg	
75-01-4	Vinyl chloride	ND	0.0019	0.00026	mg/kg	
	m,p-Xylene	0.0099	0.0019	0.00075	mg/kg	
95-47-6	o-Xylene	0.0029	0.0019	0.00023	mg/kg	
1330-20-7	Xylene (total)	0.0128	0.0019	0.00023	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

Client Sample ID: GP-16-91 Lab Sample ID: MC17401-1 Matrix: SO - Soil Method: SW846 8260B Project: URSMOSTL: Roxana Drilling, Roxana, IL	Date Sampled: 01/07/13 Date Received: 01/09/13 Percent Solids: 87.9
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4.1
4

VOA Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	100%		70-130%
2037-26-5	Toluene-D8	109%		70-130%
460-00-4	4-Bromofluorobenzene	97%		70-130%

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

ND = Not detected RL = Reporting Limit E = Indicates value exceeds calibration range	MDL - Method Detection Limit	J = Indicates an estimated value B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound
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Report of Analysis

Client Sample ID: GP-16-91	Date Sampled: 01/07/13
Lab Sample ID: MC17401-1	Date Received: 01/09/13
Matrix: SO - Soil	Percent Solids: 87.9
Method: SW846 8011 SW846 3550B	
Project: URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	YZ77811.D	1	01/14/13	CZ	01/12/13	OP31685	GYZ7014
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.7 g	50.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.0028	0.0012	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0028	0.0011	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	101%		61-167%
460-00-4	Bromofluorobenzene (S)	114%		61-167%

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

4.1
4

Report of Analysis

Client Sample ID: GP-17-15	Date Sampled: 01/07/13
Lab Sample ID: MC17401-2	Date Received: 01/09/13
Matrix: SO - Soil	Percent Solids: 90.6
Method: SW846 8260B	
Project: URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G123587.D	1	01/11/13	JM	n/a	n/a	MSG4908
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	11.2 g	10.0 ml	10.0 ml
Run #2			

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	2.7	0.69	mg/kg	WJ
107-02-8	Acrolein	ND	14	5.5	mg/kg	WJ
107-13-1	Acrylonitrile	ND	14	0.68	mg/kg	
71-43-2	Benzene	154	0.27	0.16	mg/kg	J
108-86-1	Bromobenzene	ND	2.7	0.12	mg/kg	
74-97-5	Bromochloromethane	ND	2.7	0.20	mg/kg	
75-27-4	Bromodichloromethane	ND	1.1	0.12	mg/kg	
75-25-2	Bromoform	ND	1.1	1.1	mg/kg	
74-83-9	Bromomethane	ND	1.1	0.28	mg/kg	
78-93-3	2-Butanone (MEK)	ND	2.7	0.68	mg/kg	WJ
104-51-8	n-Butylbenzene	3.01	2.7	0.10	mg/kg	
135-98-8	sec-Butylbenzene	0.323	2.7	0.13	mg/kg	J
98-06-6	tert-Butylbenzene	ND	2.7	0.48	mg/kg	
75-15-0	Carbon disulfide	ND	2.7	0.090	mg/kg	
56-23-5	Carbon tetrachloride	ND	1.1	0.40	mg/kg	
108-90-7	Chlorobenzene	ND	1.1	0.15	mg/kg	
75-00-3	Chloroethane	ND	2.7	0.69	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	2.7	1.1	mg/kg	
67-66-3	Chloroform	ND	1.1	0.28	mg/kg	
74-87-3	Chloromethane	ND	2.7	0.25	mg/kg	
95-49-8	o-Chlorotoluene	ND	2.7	0.60	mg/kg	
106-43-4	p-Chlorotoluene	ND	2.7	0.12	mg/kg	
124-48-1	Dibromochloromethane	ND	1.1	0.16	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	1.1	0.12	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	1.1	0.12	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	1.1	0.11	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	1.1	0.62	mg/kg	
75-34-3	1,1-Dichloroethane	ND	1.1	0.15	mg/kg	
107-06-2	1,2-Dichloroethane	ND	1.1	0.16	mg/kg	
75-35-4	1,1-Dichloroethene	ND	1.1	0.20	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	1.1	0.16	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	1.1	0.16	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

Client Sample ID:	GP-17-15	Date Sampled:	01/07/13
Lab Sample ID:	MC17401-2	Date Received:	01/09/13
Matrix:	SO - Soil	Percent Solids:	90.6
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	1.1	0.20	mg/kg	
142-28-9	1,3-Dichloropropane	ND	2.7	0.13	mg/kg	
594-20-7	2,2-Dichloropropane	ND	2.7	0.47	mg/kg	
563-58-6	1,1-Dichloropropene	ND	2.7	0.14	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	1.1	0.093	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	1.1	0.27	mg/kg	
123-91-1	1,4-Dioxane	ND	14	14	mg/kg	
97-63-2	Ethyl methacrylate	ND	2.7	0.37	mg/kg	
100-41-4	Ethylbenzene	1.69	1.1	0.13	mg/kg	
87-68-3	Hexachlorobutadiene	ND	2.7	0.25	mg/kg	
591-78-6	2-Hexanone	ND	2.7	0.27	mg/kg	<i>uJ</i>
98-82-8	Isopropylbenzene	0.269	2.7	0.12	mg/kg	J
99-87-6	p-Isopropyltoluene	0.415	2.7	0.097	mg/kg	J
1634-04-4	Methyl Tert Butyl Ether	ND	1.1	0.16	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	2.7	0.27	mg/kg	
74-95-3	Methylene bromide	ND	2.7	0.27	mg/kg	
75-09-2	Methylene chloride	ND	1.1	0.63	mg/kg	
91-20-3	Naphthalene	45.3	2.7	0.68	mg/kg	
103-65-1	n-Propylbenzene	1.74	2.7	0.55	mg/kg	J
100-42-5	Styrene	ND	2.7	0.13	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	2.7	0.55	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.1	0.23	mg/kg	
127-18-4	Tetrachloroethene	ND	1.1	0.12	mg/kg	
108-88-3	Toluene	ND	2.7	0.46	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	2.7	0.13	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	2.7	0.12	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	1.1	0.17	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	1.1	0.40	mg/kg	
79-01-6	Trichloroethene	ND	1.1	0.12	mg/kg	
75-69-4	Trichlorofluoromethane	ND	1.1	0.17	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	2.7	0.16	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	16.3	2.7	0.12	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	3.00	2.7	0.12	mg/kg	
108-05-4	Vinyl Acetate	ND	2.7	0.30	mg/kg	
75-01-4	Vinyl chloride	ND	1.1	0.15	mg/kg	
	m,p-Xylene	4.44	1.1	0.43	mg/kg	
95-47-6	o-Xylene	2.84	1.1	0.13	mg/kg	
1330-20-7	Xylene (total)	7.28	1.1	0.13	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

Client Sample ID: GP-17-15 Lab Sample ID: MC17401-2 Matrix: SO - Soil Method: SW846 8260B Project: URSMOSTL: Roxana Drilling, Roxana, IL	Date Sampled: 01/07/13 Date Received: 01/09/13 Percent Solids: 90.6
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4.2
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VOA Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	103%		70-130%
2037-26-5	Toluene-D8	98%		70-130%
460-00-4	4-Bromofluorobenzene	93%		70-130%

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

Client Sample ID: GP-17-15	Date Sampled: 01/07/13
Lab Sample ID: MC17401-2	Date Received: 01/09/13
Matrix: SO - Soil	Percent Solids: 90.6
Method: SW846 8011 SW846 3550B	
Project: URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	YZ77812.D	1	01/14/13	CZ	01/12/13	OP31685	GYZ7014
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.5 g	50.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.0027	0.0012	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0027	0.0010	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	72%		61-167%
460-00-4	Bromofluorobenzene (S)	100%		61-167%

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

4.2
4

Report of Analysis

Client Sample ID:	GP-17-15 DUP	Date Sampled:	01/07/13
Lab Sample ID:	MC17401-3	Date Received:	01/09/13
Matrix:	SO - Soil	Percent Solids:	81.2
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G123588.D	1	01/11/13	JM	n/a	n/a	MSG4908
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	4.76 g	10.0 ml	10.0 ul
Run #2			

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetoue	ND	7.0	1.8	mg/kg	UJ
107-02-8	Acrolein	ND	35	14	mg/kg	UJ
107-13-1	Acrylonitrile	ND	35	1.8	mg/kg	
71-43-2	Benzene	391	0.70	0.42	mg/kg	J
108-86-1	Bromobenzene	ND	7.0	0.31	mg/kg	
74-97-5	Bromochloromethane	ND	7.0	0.53	mg/kg	
75-27-4	Bromodichloromethane	ND	2.8	0.30	mg/kg	
75-25-2	Bromoform	ND	2.8	2.8	mg/kg	
74-83-9	Bromomethane	ND	2.8	0.73	mg/kg	
78-93-3	2-Butanone (MEK)	ND	7.0	1.8	mg/kg	UJ
104-51-8	n-Butylbenzene	4.67	7.0	0.26	mg/kg	J
135-98-8	sec-Butylbenzene	ND	7.0	0.32	mg/kg	
98-06-6	tert-Butylbenzene	ND	7.0	1.2	mg/kg	
75-15-0	Carbon disulfide	ND	7.0	0.23	mg/kg	
56-23-5	Carbon tetrachloride	ND	2.8	1.0	mg/kg	
108-90-7	Chlorobenzene	ND	2.8	0.39	mg/kg	
75-00-3	Chloroethane	ND	7.0	1.8	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	7.0	2.8	mg/kg	
67-66-3	Chloroform	ND	2.8	0.73	mg/kg	
74-87-3	Chloromethane	ND	7.0	0.65	mg/kg	
95-49-8	o-Chlorotoluene	ND	7.0	1.6	mg/kg	
106-43-4	p-Chlorotoluene	ND	7.0	0.32	mg/kg	
124-48-1	Dibromochloromethane	ND	2.8	0.42	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	2.8	0.30	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	2.8	0.32	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	2.8	0.30	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	2.8	1.6	mg/kg	
75-34-3	1,1-Dichloroethane	ND	2.8	0.38	mg/kg	
107-06-2	1,2-Dichloroethane	ND	2.8	0.41	mg/kg	
75-35-4	1,1-Dichloroethene	ND	2.8	0.52	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	2.8	0.42	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	2.8	0.40	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

Client Sample ID:	GP-17-15 DUP	Date Sampled:	01/07/13
Lab Sample ID:	MC17401-3	Date Received:	01/09/13
Matrix:	SO - Soil	Percent Solids:	81.2
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	2.8	0.52	mg/kg	
142-28-9	1,3-Dichloropropane	ND	7.0	0.33	mg/kg	
594-20-7	2,2-Dichloropropane	ND	7.0	1.2	mg/kg	
563-58-6	1,1-Dichloropropane	ND	7.0	0.37	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	2.8	0.24	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	2.8	0.70	mg/kg	
123-91-1	1,4-Dioxane	ND	35	35	mg/kg	
97-63-2	Ethyl methacrylate	ND	7.0	0.96	mg/kg	
100-41-4	Ethylbenzene	3.04	2.8	0.34	mg/kg	
87-68-3	Hexachlorobutadiene	ND	7.0	0.66	mg/kg	
591-78-6	2-Hexanone	ND	7.0	0.70	mg/kg	UJ
98-82-8	Isopropylbenzene	ND	7.0	0.32	mg/kg	
99-87-6	p-Isopropyltoluene	ND	7.0	0.25	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	2.8	0.41	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	7.0	0.70	mg/kg	
74-95-3	Methylene bromide	ND	7.0	0.70	mg/kg	
75-09-2	Methylene chloride	ND	2.8	1.6	mg/kg	
91-20-3	Naphthalene	64.5	7.0	1.8	mg/kg	
103-65-1	n-Propylbenzene	2.69	7.0	1.4	mg/kg	J
100-42-5	Styrene	ND	7.0	0.33	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	7.0	1.4	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	2.8	0.60	mg/kg	
127-18-4	Tetrachloroethene	ND	2.8	0.32	mg/kg	
108-88-3	Toluene	ND	7.0	1.2	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	7.0	0.33	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	7.0	0.32	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	2.8	0.44	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	2.8	1.0	mg/kg	
79-01-6	Trichloroethene	ND	2.8	0.30	mg/kg	
75-69-4	Trichlorofluoromethane	ND	2.8	0.43	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	7.0	0.41	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	25.0	7.0	0.32	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	4.96	7.0	0.30	mg/kg	J
108-05-4	Vinyl Acetate	ND	7.0	0.79	mg/kg	
75-01-4	Vinyl chloride	ND	2.8	0.38	mg/kg	
	m,p-Xylene	7.57	2.8	1.1	mg/kg	
95-47-6	o-Xylene	4.76	2.8	0.34	mg/kg	
1330-20-7	Xylene (total)	12.3	2.8	0.34	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

Client Sample ID: GP-17-15 DUP Lab Sample ID: MC17401-3 Matrix: SO - Soil Method: SW846 8260B Project: URSMOSTL: Roxana Drilling, Roxana, IL	Date Sampled: 01/07/13 Date Received: 01/09/13 Percent Solids: 81.2
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VOA Special List

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

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

Client Sample ID: GP-17-15 DUP	Date Sampled: 01/07/13
Lab Sample ID: MC17401-3	Date Received: 01/09/13
Matrix: SO - Soil	Percent Solids: 81.2
Method: SW846 8011 SW846 3550B	
Project: URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	YZ77813.D	1	01/14/13	CZ	01/12/13	OP31685	GYZ7014
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.4 g	50.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.0030	0.0014	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0030	0.0012	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	85%		61-167%
460-00-4	Bromofluorobenzene (S)	110%		61-167%

ND = Not detected MDL - Method Detection Limit J = Indicates an estimated value
 RL = Reporting Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

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4

Report of Analysis

Client Sample ID: GP-17-45	Date Sampled: 01/07/13
Lab Sample ID: MC17401-4	Date Received: 01/09/13
Matrix: SO - Soil	Percent Solids: 83.2
Method: SW846 8260B	
Project: URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G123592.D	1	01/11/13	JM	n/a	n/a	MSG4908
Run #2	G123609.D	1	01/14/13	JM	n/a	n/a	MSG4909

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.32 g	10.0 ml	15.0 ul
Run #2	5.32 g	10.0 ml	1.0 ul

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	4.1	1.0	mg/kg	WJ
107-02-8	Acrolein	ND	21	8.2	mg/kg	WJ
107-13-1	Acrylonitrile	ND	21	1.0	mg/kg	
71-43-2	Benzene	1550 ^a	6.2	3.6	mg/kg	
108-86-1	Bromobenzene	ND	4.1	0.18	mg/kg	
74-97-5	Bromochloromethane	ND	4.1	0.31	mg/kg	
75-27-4	Bromodichloromethane	ND	1.6	0.17	mg/kg	
75-25-2	Bromoform	ND	1.6	1.6	mg/kg	
74-83-9	Bromomethane	ND	1.6	0.43	mg/kg	
78-93-3	2-Butanone (MEK)	ND	4.1	1.0	mg/kg	WJ
104-51-8	n-Butylbenzene	ND	4.1	0.15	mg/kg	
135-98-8	sec-Butylbenzene	ND	4.1	0.19	mg/kg	
98-06-6	tert-Butylbenzene	ND	4.1	0.72	mg/kg	
75-15-0	Carbon disulfide	ND	4.1	0.13	mg/kg	
56-23-5	Carbon tetrachloride	ND	1.6	0.60	mg/kg	
108-90-7	Chlorobenzene	ND	1.6	0.23	mg/kg	
75-00-3	Chloroethane	ND	4.1	1.0	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	4.1	1.6	mg/kg	
67-66-3	Chloroform	ND	1.6	0.42	mg/kg	
74-87-3	Chloromethane	ND	4.1	0.38	mg/kg	
95-49-8	o-Chlorotoluene	ND	4.1	0.91	mg/kg	
106-43-4	p-Chlorotoluene	ND	4.1	0.19	mg/kg	
124-48-1	Dibromochloromethane	ND	1.6	0.24	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	1.6	0.18	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	1.6	0.19	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	1.6	0.17	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	1.6	0.93	mg/kg	
75-34-3	1,1-Dichloroethane	ND	1.6	0.22	mg/kg	
107-06-2	1,2-Dichloroethane	ND	1.6	0.24	mg/kg	
75-35-4	1,1-Dichloroethene	ND	1.6	0.30	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	1.6	0.25	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	1.6	0.24	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

Client Sample ID:	GP-17-45	Date Sampled:	01/07/13
Lab Sample ID:	MC17401-4	Date Received:	01/09/13
Matrix:	SO - Soil	Percent Solids:	83.2
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	1.6	0.31	mg/kg	
142-28-9	1,3-Dichloropropane	ND	4.1	0.19	mg/kg	
594-20-7	2,2-Dichloropropane	ND	4.1	0.71	mg/kg	
563-58-6	1,1-Dichloropropene	ND	4.1	0.22	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	1.6	0.14	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	1.6	0.41	mg/kg	
123-91-1	1,4-Dioxane	ND	21	21	mg/kg	
97-63-2	Ethyl methacrylate	ND	4.1	0.56	mg/kg	
100-41-4	Ethylbenzene	1.45	1.6	0.20	mg/kg	J
87-68-3	Hexachlorobutadiene	ND	4.1	0.38	mg/kg	
591-78-6	2-Hexanone	ND	4.1	0.41	mg/kg	WJ
98-82-8	Isopropylbenzene	ND	4.1	0.19	mg/kg	
99-87-6	p-Isopropyltoluene	ND	4.1	0.15	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	1.6	0.24	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	4.1	0.41	mg/kg	
74-95-3	Methylene bromide	ND	4.1	0.40	mg/kg	
75-09-2	Methylene chloride	ND	1.6	0.95	mg/kg	
91-20-3	Naphthalene	ND	4.1	1.0	mg/kg	
103-65-1	n-Propylbenzene	ND	4.1	0.83	mg/kg	
100-42-5	Styrene	ND	4.1	0.19	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	4.1	0.82	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.6	0.35	mg/kg	
127-18-4	Tetrachloroethene	ND	1.6	0.19	mg/kg	
108-88-3	Toluene	3.09	4.1	0.70	mg/kg	J
87-61-6	1,2,3-Trichlorobenzene	ND	4.1	0.19	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	4.1	0.19	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	1.6	0.26	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	1.6	0.60	mg/kg	
79-01-6	Trichloroethene	ND	1.6	0.17	mg/kg	
75-69-4	Trichlorofluoromethane	ND	1.6	0.25	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	4.1	0.24	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	2.67	4.1	0.18	mg/kg	J
108-67-8	1,3,5-Trimethylbenzene	0.755	4.1	0.18	mg/kg	J
108-05-4	Vinyl Acetate	ND	4.1	0.46	mg/kg	
75-01-4	Vinyl chloride	ND	1.6	0.22	mg/kg	
	m,p-Xylene	2.73	1.6	0.65	mg/kg	
95-47-6	o-Xylene	0.945	1.6	0.20	mg/kg	J
1330-20-7	Xylene (total)	3.68	1.6	0.20	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

Client Sample ID: GP-17-45 Lab Sample ID: MCI7401-4 Matrix: SO - Soil Method: SW846 8260B Project: URSMOSTL: Roxana Drilling, Roxana, IL	Date Sampled: 01/07/13 Date Received: 01/09/13 Percent Solids: 83.2
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4.4
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VOA Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	102%	92%	70-130%
2037-26-5	Toluene-D8	95%	88%	70-130%
460-00-4	4-Bromofluorobenzene	93%	83%	70-130%

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

(a) Result is from Run# 2

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

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

Report of Analysis

Client Sample ID: GP-17-45	Date Sampled: 01/07/13
Lab Sample ID: MC17401-4	Date Received: 01/09/13
Matrix: SO - Soil	Percent Solids: 83.2
Method: SW846 8011 SW846 3550B	
Project: URSMOSTL: Roxana Drilling, Roxana, IL	

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4

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	YZ77814.D	1	01/14/13	CZ	01/12/13	OP31685	GYZ7014
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.6 g	50.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.0029	0.0013	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0029	0.0011	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	103%		61-167%
460-00-4	Bromofluorobenzene (S)	124%		61-167%

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

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

Report of Analysis

Client Sample ID: GP-17-57	Date Sampled: 01/07/13
Lab Sample ID: MC17401-5	Date Received: 01/09/13
Matrix: SO - Soil	Percent Solids: 79.6
Method: SW846 8260B	
Project: URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G123589.D	1	01/11/13	JM	n/a	n/a	MSG4908
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.94 g	10.0 ml	10.0 ul
Run #2			

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.9	1.5	mg/kg	WJ
107-02-8	Acrolein	ND	30	12	mg/kg	WJ
107-13-1	Acrylonitrile	ND	30	1.5	mg/kg	
71-43-2	Benzene	178	0.59	0.35	mg/kg	
108-86-1	Bromobenzene	ND	5.9	0.26	mg/kg	
74-97-5	Bromochloromethane	ND	5.9	0.44	mg/kg	
75-27-4	Bromodichloromethane	ND	2.4	0.25	mg/kg	
75-25-2	Bromoform	ND	2.4	2.4	mg/kg	
74-83-9	Bromomethane	ND	2.4	0.62	mg/kg	
78-93-3	2-Butanone (MEK)	ND	5.9	1.5	mg/kg	WJ
104-51-8	n-Butylbenzene	ND	5.9	0.22	mg/kg	
135-98-8	sec-Butylbenzene	ND	5.9	0.27	mg/kg	
98-06-6	tert-Butylbenzene	ND	5.9	1.0	mg/kg	
75-15-0	Carbon disulfide	ND	5.9	0.19	mg/kg	
56-23-5	Carbon tetrachloride	ND	2.4	0.86	mg/kg	
108-90-7	Chlorobenzene	ND	2.4	0.33	mg/kg	
75-00-3	Chloroethane	ND	5.9	1.5	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	5.9	2.4	mg/kg	
67-66-3	Chloroform	ND	2.4	0.61	mg/kg	
74-87-3	Chloromethane	ND	5.9	0.55	mg/kg	
95-49-8	o-Chlorotoluene	ND	5.9	1.3	mg/kg	
106-43-4	p-Chlorotoluene	ND	5.9	0.27	mg/kg	
124-48-1	Dibromochloromethane	ND	2.4	0.35	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	2.4	0.26	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	2.4	0.27	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	2.4	0.25	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	2.4	1.3	mg/kg	
75-34-3	1,1-Dichloroethane	ND	2.4	0.32	mg/kg	
107-06-2	1,2-Dichloroethane	ND	2.4	0.34	mg/kg	
75-35-4	1,1-Dichloroethene	ND	2.4	0.44	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	2.4	0.36	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	2.4	0.34	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

Client Sample ID:	GP-17-57	Date Sampled:	01/07/13
Lab Sample ID:	MC17401-5	Date Received:	01/09/13
Matrix:	SO - Soil	Percent Solids:	79.6
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	2.4	0.44	mg/kg	
142-28-9	1,3-Dichloropropane	ND	5.9	0.27	mg/kg	
594-20-7	2,2-Dichloropropane	ND	5.9	1.0	mg/kg	
563-58-6	1,1-Dichloropropene	ND	5.9	0.31	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	2.4	0.20	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	2.4	0.59	mg/kg	
123-91-1	1,4-Dioxane	ND	30	30	mg/kg	
97-63-2	Ethyl methacrylate	ND	5.9	0.81	mg/kg	
100-41-4	Ethylbenzene	0.569	2.4	0.29	mg/kg	J
87-68-3	Hexachlorobutadiene	ND	5.9	0.55	mg/kg	
591-78-6	2-Hexanone	ND	5.9	0.59	mg/kg	WJ
98-82-8	Isopropylbenzene	ND	5.9	0.27	mg/kg	
99-87-6	p-Isopropyltoluene	ND	5.9	0.21	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	2.4	0.34	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.9	0.59	mg/kg	
74-95-3	Methylene bromide	ND	5.9	0.58	mg/kg	
75-09-2	Methylene chloride	ND	2.4	1.4	mg/kg	
91-20-3	Naphthalene	ND	5.9	1.5	mg/kg	
103-65-1	n-Propylbenzene	ND	5.9	1.2	mg/kg	
100-42-5	Styrene	ND	5.9	0.28	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	5.9	1.2	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	2.4	0.50	mg/kg	
127-18-4	Tetrachloroethene	ND	2.4	0.27	mg/kg	
108-88-3	Toluene	ND	5.9	1.0	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	5.9	0.28	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	5.9	0.27	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	2.4	0.37	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	2.4	0.87	mg/kg	
79-01-6	Trichloroethene	ND	2.4	0.25	mg/kg	
75-69-4	Trichlorofluoromethane	ND	2.4	0.36	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	5.9	0.35	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	1.06	5.9	0.27	mg/kg	J
108-67-8	1,3,5-Trimethylbenzene	ND	5.9	0.25	mg/kg	
108-05-4	Vinyl Acetate	ND	5.9	0.66	mg/kg	
75-01-4	Vinyl chloride	ND	2.4	0.32	mg/kg	
	m,p-Xylene	ND	2.4	0.93	mg/kg	
95-47-6	o-Xylene	ND	2.4	0.28	mg/kg	
1330-20-7	Xylene (total)	ND	2.4	0.28	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

Client Sample ID: GP-17-57	Date Sampled: 01/07/13
Lab Sample ID: MC17401-5	Date Received: 01/09/13
Matrix: SO - Soil	Percent Solids: 79.6
Method: SW846 8260B	
Project: URSMOSTL: Roxana Drilling, Roxana, IL	

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VOA Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	101%		70-130%
2037-26-5	Toluene-D8	96%		70-130%
460-00-4	4-Bromofluorobenzene	93%		70-130%

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

Client Sample ID:	GP-17-57	Date Sampled:	01/07/13
Lab Sample ID:	MC17401-5	Date Received:	01/09/13
Matrix:	SO - Soil	Percent Solids:	79.6
Method:	SW846 8011 SW846 3550B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

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Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	YZ77815.D	1	01/14/13	CZ	01/12/13	OP31685	GYZ7014
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.4 g	50.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.0031	0.0014	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0031	0.0012	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	103%		61-167%
460-00-4	Bromofluorobenzene (S)	129%		61-167%

ND = Not detected	MDL - Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	GP-17-65	Date Sampled:	01/07/13
Lab Sample ID:	MC17401-6	Date Received:	01/09/13
Matrix:	SO - Soil	Percent Solids:	84.4
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G123584.D	1	01/11/13	JM	n/a	n/a	MSG4908
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	8.61 g	10.0 ml	100 ul
Run #2			

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	0.39	0.098	mg/kg	UT
107-02-8	Acrolein	ND	2.0	0.78	mg/kg	UT
107-13-1	Acrylonitrile	ND	2.0	0.098	mg/kg	
71-43-2	Benzene	15.4	0.039	0.023	mg/kg	
108-86-1	Bromobenzene	ND	0.39	0.017	mg/kg	
74-97-5	Bromochloromethane	ND	0.39	0.029	mg/kg	
75-27-4	Bromodichloromethane	ND	0.16	0.016	mg/kg	
75-25-2	Bromoform	ND	0.16	0.16	mg/kg	
74-83-9	Bromomethane	ND	0.16	0.041	mg/kg	
78-93-3	2-Butanone (MEK)	ND	0.39	0.098	mg/kg	UT
104-51-8	n-Butylbenzene	0.0559	0.39	0.014	mg/kg	J
135-98-8	sec-Butylbenzene	ND	0.39	0.018	mg/kg	
98-06-6	tert-Butylbenzene	ND	0.39	0.069	mg/kg	
75-15-0	Carbon disulfide	ND	0.39	0.013	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.16	0.057	mg/kg	
108-90-7	Chlorobenzene	ND	0.16	0.021	mg/kg	
75-00-3	Chloroethane	ND	0.39	0.098	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	0.39	0.16	mg/kg	
67-66-3	Chloroform	ND	0.16	0.040	mg/kg	
74-87-3	Chloromethane	ND	0.39	0.036	mg/kg	
95-49-8	o-Chlorotoluene	ND	0.39	0.086	mg/kg	
106-43-4	p-Chlorotoluene	ND	0.39	0.018	mg/kg	
124-48-1	Dibromochloromethane	ND	0.16	0.023	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.16	0.017	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.16	0.018	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.16	0.016	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.16	0.089	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.16	0.021	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.16	0.022	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.16	0.029	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.16	0.023	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.16	0.022	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

Client Sample ID:	GP-17-65	Date Sampled:	01/07/13
Lab Sample ID:	MC17401-6	Date Received:	01/09/13
Matrix:	SO - Soil	Percent Solids:	84.4
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

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VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.16	0.029	mg/kg	
142-28-9	1,3-Dichloropropane	ND	0.39	0.018	mg/kg	
594-20-7	2,2-Dichloropropane	ND	0.39	0.068	mg/kg	
563-58-6	1,1-Dichloropropene	ND	0.39	0.021	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.16	0.013	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.16	0.039	mg/kg	
123-91-1	1,4-Dioxane	ND	2.0	2.0	mg/kg	
97-63-2	Ethyl methacrylate	ND	0.39	0.053	mg/kg	
100-41-4	Ethylbenzene	0.410	0.16	0.019	mg/kg	
87-68-3	Hexachlorobutadiene	ND	0.39	0.036	mg/kg	
591-78-6	2-Hexanone	ND	0.39	0.039	mg/kg	us
98-82-8	Isopropylbenzene	0.0402	0.39	0.018	mg/kg	J
99-87-6	p-Isopropyltoluene	ND	0.39	0.014	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.16	0.022	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	0.39	0.039	mg/kg	
74-95-3	Methylene bromide	ND	0.39	0.039	mg/kg	
75-09-2	Methylene chloride	ND	0.16	0.091	mg/kg	
91-20-3	Naphthalene	ND	0.39	0.098	mg/kg	
103-65-1	n-Propylbenzene	0.173	0.39	0.079	mg/kg	J
100-42-5	Styrene	ND	0.39	0.018	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	0.39	0.078	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.16	0.033	mg/kg	
127-18-4	Tetrachloroethene	ND	0.16	0.018	mg/kg	
108-88-3	Toluene	ND	0.39	0.066	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	0.39	0.019	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	0.39	0.018	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.16	0.025	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.16	0.057	mg/kg	
79-01-6	Trichloroethene	ND	0.16	0.017	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.16	0.024	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	0.39	0.023	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	0.675	0.39	0.017	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	0.190	0.39	0.017	mg/kg	J
108-05-4	Vinyl Acetate	ND	0.39	0.044	mg/kg	
75-01-4	Vinyl chloride	ND	0.16	0.021	mg/kg	
	m,p-Xylene	0.934	0.16	0.062	mg/kg	
95-47-6	o-Xylene	0.230	0.16	0.019	mg/kg	
1330-20-7	Xylene (total)	1.16	0.16	0.019	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

Client Sample ID: GP-17-65	Date Sampled: 01/07/13
Lab Sample ID: MC17401-6	Date Received: 01/09/13
Matrix: SO - Soil	Percent Solids: 84.4
Method: SW846 8260B	
Project: URSMOSTL: Roxana Drilling, Roxana, IL	

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VOA Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	98%		70-130%
2037-26-5	Toluene-D8	94%		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	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

Client Sample ID: GP-17-65	Date Sampled: 01/07/13
Lab Sample ID: MC17401-6	Date Received: 01/09/13
Matrix: SO - Soil	Percent Solids: 84.4
Method: SW846 8011 SW846 3550B	
Project: URSMOSTL: Roxana Drilling, Roxana, IL	

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Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	YZ77817.D	1	01/14/13	CZ	01/12/13	OP31685	GYZ7014
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.5 g	50.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.0029	0.0013	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0029	0.0011	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	91%		61-167%
460-00-4	Bromofluorobenzene (S)	110%		61-167%

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

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

Report of Analysis

Client Sample ID:	TRIP BLANK	Date Sampled:	01/07/13
Lab Sample ID:	MC17401-7	Date Received:	01/09/13
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	V15133.D	1	01/10/13	AMY	n/a	n/a	MSV612
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	5.0	3.0	ug/l	
107-02-8	Acrolein	ND	25	10	ug/l	
107-13-1	Acrylonitrile	ND	5.0	3.2	ug/l	
71-43-2	Benzene	ND	0.50	0.24	ug/l	
108-86-1	Bromobenzene	ND	5.0	0.62	ug/l	
74-97-5	Bromochloromethane	ND	5.0	1.3	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.58	ug/l	
75-25-2	Bromoform	ND	1.0	0.78	ug/l	
74-83-9	Bromomethane	ND	2.0	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	2.4	ug/l	
104-51-8	n-Butylbenzene	ND	5.0	0.61	ug/l	
135-98-8	sec-Butylbenzene	ND	5.0	0.55	ug/l	
98-06-6	tert-Butylbenzene	ND	5.0	0.64	ug/l	
75-15-0	Carbon disulfide	ND	5.0	0.61	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.87	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.47	ug/l	
75-00-3	Chloroethane	ND	2.0	0.50	ug/l	
110-75-8	2-Chloroethyl vinyl ether	ND	5.0	1.3	ug/l	
67-66-3	Chloroform	ND	1.0	0.50	ug/l	
74-87-3	Chloromethane	ND	2.0	0.73	ug/l	
95-49-8	o-Chlorotoluene	ND	5.0	0.65	ug/l	
106-43-4	p-Chlorotoluene	ND	5.0	0.48	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.53	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.93	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.45	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.64	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.7	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.62	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.63	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	0.41	ug/l	
156-59-2	cis-1,2-Dichloroethene	ND	1.0	0.64	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	0.95	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

Client Sample ID:	TRIP BLANK	Date Sampled:	01/07/13
Lab Sample ID:	MC17401-7	Date Received:	01/09/13
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

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VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	2.0	0.72	ug/l	
142-28-9	1,3-Dichloropropane	ND	5.0	0.64	ug/l	
594-20-7	2,2-Dichloropropane	ND	5.0	1.6	ug/l	
563-58-6	1,1-Dichloropropene	ND	5.0	0.91	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	0.45	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	0.20	ug/l	
123-91-1	1,4-Dioxane	ND	25	15	ug/l	
97-63-2	Ethyl methacrylate	ND	5.0	0.81	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.51	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.0	2.1	ug/l	
591-78-6	2-Hexanone	ND	5.0	2.0	ug/l	
98-82-8	Isopropylbenzene	ND	5.0	0.50	ug/l	
99-87-6	p-Isopropyltoluene	ND	5.0	0.57	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.41	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	2.9	ug/l	
74-95-3	Methylene bromide	ND	5.0	1.1	ug/l	
75-09-2	Methylene chloride	ND	2.0	0.83	ug/l	
91-20-3	Naphthalene	ND	5.0	0.50	ug/l	
103-65-1	n-Propylbenzene	ND	5.0	0.58	ug/l	
100-42-5	Styrene	ND	5.0	0.45	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	5.0	0.57	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.60	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	0.42	ug/l	
108-88-3	Toluene	ND	1.0	0.51	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	1.3	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	1.3	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.85	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.50	ug/l	
79-01-6	Trichloroethene	ND	1.0	0.78	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	0.29	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.85	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.35	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	0.47	ug/l	
108-05-4	Vinyl Acetate	ND	5.0	1.3	ug/l	
75-01-4	Vinyl chloride	ND	1.0	0.63	ug/l	
	m,p-Xylene	ND	1.0	0.73	ug/l	
95-47-6	o-Xylene	ND	1.0	0.58	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.58	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

Client Sample ID: TRIP BLANK Lab Sample ID: MC17401-7 Matrix: AQ - Trip Blank Water Method: SW846 8260B Project: URSMOSTL: Roxana Drilling, Roxana, IL	Date Sampled: 01/07/13 Date Received: 01/09/13 Percent Solids: n/a
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VOA Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	98%		70-130%
2037-26-5	Toluene-D8	101%		70-130%
460-00-4	4-Bromofluorobenzene	94%		70-130%

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

Client Sample ID: TRIP BLANK Lab Sample ID: MC17401-7 Matrix: AQ - Trip Blank Water Method: SW846 8011 SW846 8011 Project: URSMOSTL: Roxana Drilling, Roxana, IL	Date Sampled: 01/07/13 Date Received: 01/09/13 Percent Solids: n/a
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Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	YZ77933.D	1	01/19/13	CZ	01/17/13	OP31715	GYZ7020
Run #2							

Run #	Initial Volume	Final Volume
Run #1	35.9 ml	2.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.015	0.013	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.015	0.010	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	118%		36-173%
460-00-4	Bromofluorobenzene (S)	120%		36-173%

ND = Not detected MDL - Method Detection Limit J = Indicates an estimated value
 RL = Reporting Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

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Report of Analysis

Client Sample ID: GP-18-21	Date Sampled: 01/08/13
Lab Sample ID: MC17401-8	Date Received: 01/09/13
Matrix: SO - Soil	Percent Solids: 87.8
Method: SW846 8260B	
Project: URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G123585.D	1	01/11/13	JM	n/a	n/a	MSG4908
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	1.62 g	10.0 ml	100 ul
Run #2			

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	1.8	0.45	mg/kg	UJ
107-02-8	Acrolein	ND	9.0	3.6	mg/kg	UJ
107-13-1	Acrylonitrile	ND	9.0	0.45	mg/kg	
71-43-2	Benzene	9.94	0.18	0.11	mg/kg	
108-86-1	Bromobenzene	ND	1.8	0.080	mg/kg	
74-97-5	Bromochloromethane	ND	1.8	0.13	mg/kg	
75-27-4	Bromodichloromethane	ND	0.72	0.076	mg/kg	
75-25-2	Bromoform	ND	0.72	0.72	mg/kg	
74-83-9	Bromomethane	ND	0.72	0.19	mg/kg	
78-93-3	2-Butanone (MEK)	ND	1.8	0.45	mg/kg	UJ
104-51-8	n-Butylbenzene	ND	1.8	0.066	mg/kg	
135-98-8	sec-Butylbenzene	ND	1.8	0.082	mg/kg	
98-06-6	tert-Butylbenzene	ND	1.8	0.32	mg/kg	
75-15-0	Carbon disulfide	ND	1.8	0.059	mg/kg	
56-23-5	Carbon tetrachloride	ND	0.72	0.26	mg/kg	
108-90-7	Chlorobenzene	ND	0.72	0.099	mg/kg	
75-00-3	Chloroethane	ND	1.8	0.45	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	1.8	0.72	mg/kg	
67-66-3	Chloroform	ND	0.72	0.18	mg/kg	
74-87-3	Chloromethane	ND	1.8	0.17	mg/kg	
95-49-8	o-Chlorotoluene	ND	1.8	0.40	mg/kg	
106-43-4	p-Chlorotoluene	ND	1.8	0.081	mg/kg	
124-48-1	Dibromochloromethane	ND	0.72	0.11	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	0.72	0.077	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	0.72	0.081	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	0.72	0.076	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	0.72	0.41	mg/kg	
75-34-3	1,1-Dichloroethane	ND	0.72	0.097	mg/kg	
107-06-2	1,2-Dichloroethane	ND	0.72	0.10	mg/kg	
75-35-4	1,1-Dichloroethene	ND	0.72	0.13	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	0.72	0.11	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	0.72	0.10	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

Client Sample ID:	GP-18-21	Date Sampled:	01/08/13
Lab Sample ID:	MC17401-8	Date Received:	01/09/13
Matrix:	SO - Soil	Percent Solids:	87.8
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	0.72	0.13	mg/kg	
142-28-9	1,3-Dichloropropane	ND	1.8	0.083	mg/kg	
594-20-7	2,2-Dichloropropane	ND	1.8	0.31	mg/kg	
563-58-6	1,1-Dichloropropene	ND	1.8	0.094	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	0.72	0.061	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	0.72	0.18	mg/kg	
123-91-1	1,4-Dioxane	ND	9.0	9.0	mg/kg	
97-63-2	Ethyl methacrylate	ND	1.8	0.24	mg/kg	
100-41-4	Ethylbenzene	ND	0.72	0.087	mg/kg	
87-68-3	Hexachlorobutadiene	ND	1.8	0.17	mg/kg	
591-78-6	2-Hexanone	ND	1.8	0.18	mg/kg	u.T
98-82-8	Isopropylbenzene	ND	1.8	0.082	mg/kg	
99-87-6	p-Isopropyltoluene	ND	1.8	0.064	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	0.72	0.10	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	1.8	0.18	mg/kg	
74-95-3	Methylene bromide	ND	1.8	0.18	mg/kg	
75-09-2	Methylene chloride	ND	0.72	0.42	mg/kg	
91-20-3	Naphthalene	ND	1.8	0.45	mg/kg	
103-65-1	n-Propylbenzene	ND	1.8	0.36	mg/kg	
100-42-5	Styrene	ND	1.8	0.084	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.8	0.36	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.72	0.15	mg/kg	
127-18-4	Tetrachloroethene	ND	0.72	0.082	mg/kg	
108-88-3	Tolene	ND	1.8	0.30	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	1.8	0.085	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	1.8	0.082	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	0.72	0.11	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	0.72	0.26	mg/kg	
79-01-6	Trichloroethene	ND	0.72	0.076	mg/kg	
75-69-4	Trichlorofluoromethane	ND	0.72	0.11	mg/kg	
96-18-4	1,2,3-Tricloropropane	ND	1.8	0.10	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	1.8	0.080	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	1.8	0.077	mg/kg	
108-05-4	Vinyl Acetate	ND	1.8	0.20	mg/kg	
75-01-4	Vinyl chloride	ND	0.72	0.098	mg/kg	
	m,p-Xylene	ND	0.72	0.28	mg/kg	
95-47-6	o-Xylene	ND	0.72	0.086	mg/kg	
1330-20-7	Xylene (total)	ND	0.72	0.086	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

Client Sample ID: GP-18-21 Lab Sample ID: MC17401-8 Matrix: SO - Soil Method: SW846 8260B Project: URSMOSTL: Roxana Drilling, Roxana, IL	Date Sampled: 01/08/13 Date Received: 01/09/13 Percent Solids: 87.8
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4.8
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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	96%		70-130%

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

Client Sample ID:	GP-18-21	Date Sampled:	01/08/13
Lab Sample ID:	MC17401-8	Date Received:	01/09/13
Matrix:	SO - Soil	Percent Solids:	87.8
Method:	SW846 8011 SW846 3550B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	YZ77810.D	1	01/14/13	CZ	01/12/13	OP31685	GYZ7014
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.1 g	50.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.0028	0.0013	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0028	0.0011	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	119%		61-167%
460-00-4	Bromofluorobenzene (S)	131%		61-167%

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

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4

Report of Analysis

Client Sample ID:	GP-18-37	Date Sampled:	01/08/13
Lab Sample ID:	MC17401-9	Date Received:	01/09/13
Matrix:	SO - Soil	Percent Solids:	91.8
Method:	SW846 8260B		
Project:	URSMOSTL: Roxana Drilling, Roxana, IL		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G123590.D	1	01/11/13	JM	n/a	n/a	MSG4908
Run #2	G123607.D	1	01/14/13	JM	n/a	n/a	MSG4909

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.59 g	10.0 ml	10.0 ul
Run #2	5.59 g	10.0 ml	5.0 ul

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	5.1	1.3	mg/kg	WJ
107-02-8	Acrolein	ND	25	10	mg/kg	WJ
107-13-1	Acrylonitrile	ND	25	1.3	mg/kg	
71-43-2	Benzene	453 ^a	1.0	0.60	mg/kg	
108-86-1	Brouobenzene	ND	5.1	0.23	mg/kg	
74-97-5	Bromochloromethane	ND	5.1	0.38	mg/kg	
75-27-4	Bromodichloromethane	ND	2.0	0.22	mg/kg	
75-25-2	Bromoform	ND	2.0	2.0	mg/kg	
74-83-9	Bromomethane	ND	2.0	0.53	mg/kg	
78-93-3	2-Butanone (MEK)	ND	5.1	1.3	mg/kg	WJ
104-51-8	n-Butylbenzene	ND	5.1	0.19	mg/kg	
135-98-8	sec-Butylbenzene	ND	5.1	0.23	mg/kg	
98-06-6	tert-Butylbenzene	ND	5.1	0.90	mg/kg	
75-15-0	Carbon disulfide	ND	5.1	0.17	mg/kg	
56-23-5	Carbon tetrachloride	ND	2.0	0.74	mg/kg	
108-90-7	Chlorobenzene	ND	2.0	0.28	mg/kg	
75-00-3	Chloroethane	ND	5.1	1.3	mg/kg	
110-75-8	2-Chloroethyl vinyl ether	ND	5.1	2.0	mg/kg	
67-66-3	Chloroform	ND	2.0	0.53	mg/kg	
74-87-3	Chloromethane	ND	5.1	0.47	mg/kg	
95-49-8	o-Chlorotoluene	ND	5.1	1.1	mg/kg	
106-43-4	p-Chlorotoluene	ND	5.1	0.23	mg/kg	
124-48-1	Dibromochloromethane	ND	2.0	0.30	mg/kg	
95-50-1	1,2-Dichlorobenzene	ND	2.0	0.22	mg/kg	
541-73-1	1,3-Dichlorobenzene	ND	2.0	0.23	mg/kg	
106-46-7	1,4-Dichlorobenzene	ND	2.0	0.21	mg/kg	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.2	mg/kg	
75-34-3	1,1-Dichloroethane	ND	2.0	0.28	mg/kg	
107-06-2	1,2-Dichloroethane	ND	2.0	0.29	mg/kg	
75-35-4	1,1-Dichloroethene	ND	2.0	0.37	mg/kg	
156-59-2	cis-1,2-Dichloroethene	ND	2.0	0.31	mg/kg	
156-60-5	trans-1,2-Dichloroethene	ND	2.0	0.29	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

Client Sample ID: GP-18-37	Date Sampled: 01/08/13
Lab Sample ID: MC17401-9	Date Received: 01/09/13
Matrix: SO - Soil	Percent Solids: 91.8
Method: SW846 8260B	
Project: URSMOSTL: Roxana Drilling, Roxana, IL	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
78-87-5	1,2-Dichloropropane	ND	2.0	0.38	mg/kg	
142-28-9	1,3-Dichloropropane	ND	5.1	0.24	mg/kg	
594-20-7	2,2-Dichloropropane	ND	5.1	0.88	mg/kg	
563-58-6	1,1-Dichloropropene	ND	5.1	0.27	mg/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	2.0	0.17	mg/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	2.0	0.51	mg/kg	
123-91-1	1,4-Dioxane	ND	25	25	mg/kg	
97-63-2	Ethyl methacrylate	ND	5.1	0.69	mg/kg	
100-41-4	Ethylbenzene	1.13	2.0	0.25	mg/kg	J
87-68-3	Hexachlorobutadiene	ND	5.1	0.47	mg/kg	
591-78-6	2-Hexanone	ND	5.1	0.51	mg/kg	UJ
98-82-8	Isopropylbenzene	0.368	5.1	0.23	mg/kg	J
99-87-6	p-Isopropyltoluene	ND	5.1	0.18	mg/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	2.0	0.29	mg/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.1	0.51	mg/kg	
74-95-3	Methylene bromide	ND	5.1	0.50	mg/kg	
75-09-2	Methylene chloride	ND	2.0	1.2	mg/kg	
91-20-3	Naphthalene	ND	5.1	1.3	mg/kg	
103-65-1	n-Propylbenzene	ND	5.1	1.0	mg/kg	
100-42-5	Styrene	ND	5.1	0.24	mg/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	5.1	1.0	mg/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	2.0	0.43	mg/kg	
127-18-4	Tetrachloroethene	ND	2.0	0.23	mg/kg	
108-88-3	Toluene	ND	5.1	0.86	mg/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	5.1	0.24	mg/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	5.1	0.23	mg/kg	
71-55-6	1,1,1-Trichloroethane	ND	2.0	0.32	mg/kg	
79-00-5	1,1,2-Trichloroethane	ND	2.0	0.75	mg/kg	
79-01-6	Trichloroethene	ND	2.0	0.22	mg/kg	
75-69-4	Trichlorofluoromethane	ND	2.0	0.31	mg/kg	
96-18-4	1,2,3-Trichloropropane	ND	5.1	0.30	mg/kg	
95-63-6	1,2,4-Trimethylbenzene	6.98	5.1	0.23	mg/kg	
108-67-8	1,3,5-Trimethylbenzene	1.78	5.1	0.22	mg/kg	J
108-05-4	Vinyl Acetate	ND	5.1	0.57	mg/kg	
75-01-4	Vinyl chloride	ND	2.0	0.28	mg/kg	
	m,p-Xylene	2.52	2.0	0.80	mg/kg	
95-47-6	o-Xylene	0.798	2.0	0.24	mg/kg	J
1330-20-7	Xylene (total)	3.32	2.0	0.24	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

Client Sample ID: GP-18-37	Date Sampled: 01/08/13
Lab Sample ID: MC17401-9	Date Received: 01/09/13
Matrix: SO - Soil	Percent Solids: 91.8
Method: SW846 8260B	
Project: URSMOSTL: Roxana Drilling, Roxana, IL	

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VOA Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	103%	94%	70-130%
2037-26-5	Toluene-D8	96%	91%	70-130%
460-00-4	4-Bromofluorobenzene	93%	87%	70-130%

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

(a) Result is from Run# 2

ND = Not detected	MDL - Method Detection Limit	J = Indicates an estimated value
RL = Reporting Limit		B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range		N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: GP-18-37 Lab Sample ID: MC17401-9 Matrix: SO - Soil Method: SW846 8011 SW846 3550B Project: URSMOSTL: Roxana Drilling, Roxana, IL	Date Sampled: 01/08/13 Date Received: 01/09/13 Percent Solids: 91.8
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Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	YZ77818.D	1	01/14/13	CZ	01/12/13	OP31685	GYZ7014
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.3 g	50.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.0027	0.0012	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0027	0.0010	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	103%		61-167%
460-00-4	Bromofluorobenzene (S)	118%		61-167%

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 presmptive evidence of a compound

4.9

Report of Analysis

Client Sample ID: GP-18-53 Lab Sample ID: MC17401-10 Matrix: SO - Soil Method: SW846 8260B Project: URSMOSTL: Roxana Drilling, Roxana, IL	Date Sampled: 01/08/13 Date Received: 01/09/13 Percent Solids: 75.0
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VOA Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	99%	99%	70-130%
2037-26-5	Toluene-D8	95%	93%	70-130%
460-00-4	4-Bromofluorobenzene	92%	92%	70-130%

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

(a) Result is from Run# 2

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

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

Report of Analysis

Client Sample ID: GP-18-53			
Lab Sample ID: MC17401-10		Date Sampled: 01/08/13	
Matrix: SO - Soil		Date Received: 01/09/13	
Method: SW846 8011 SW846 3550B		Percent Solids: 75.0	
Project: URSMOSTL: Roxana Drilling, Roxana, IL			

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	YZ77819.D	1	01/14/13	CZ	01/12/13	OP31685	GYZ7014
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.2 g	50.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.0033	0.0015	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0033	0.0013	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
460-00-4	Bromofluorobenzene (S)	109%		61-167%		
460-00-4	Bromofluorobenzene (S)	135%		61-167%		

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

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Report of Analysis

Client Sample ID: GP-18-63 Lab Sample ID: MC17401-11 Matrix: SO - Soil Method: SW846 8260B Project: URSMOSTL: Roxana Drilling, Roxana, IL	Date Sampled: 01/08/13 Date Received: 01/09/13 Percent Solids: 87.3
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VOA Special List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	101%		70-130%
2037-26-5	Toluene-D8	97%		70-130%
460-00-4	4-Bromofluorobenzene	94%		70-130%

CAS No.	Tentatively Identified Compounds	R. T.	Est. Conc.	Units	Q
	Total TIC, Volatile		0	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 1 of 1

Client Sample ID: GP-18-63	Date Sampled: 01/08/13
Lab Sample ID: MC17401-11	Date Received: 01/09/13
Matrix: SO - Soil	Percent Solids: 87.3
Method: SW846 8011 SW846 3550B	
Project: URSMOSTL: Roxana Drilling, Roxana, IL	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	YZ77820.D	1	01/14/13	CZ	01/12/13	OP31685	GYZ7014
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.3 g	50.0 ml
Run #2		

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.0028	0.0013	mg/kg	
106-93-4	1,2-Dibromoethane	ND	0.0028	0.0011	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	Bromofluorobenzene (S)	117%		61-167%
460-00-4	Bromofluorobenzene (S)	142%		61-167%

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



Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody
- Sample Tracking Chronicle
- Internal Chain of Custody

Internal Sample Tracking Chronicle

Shell Oil

Job No: MC17401

URSMOSTL: Roxana Drilling, Roxana, IL
 Project No: 21562850.15000

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Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
MC17401-1 Collected: 07-JAN-13 10:15 By: WPJS Received: 09-JAN-13 By: GP-16-91						
MC17401-1	SM21 2540 B MOD.	11-JAN-13	HS			%SOL
MC17401-1	SW846 8011	14-JAN-13 20:01	CZ	12-JAN-13	CC	V8011SL
MC17401-1	SW846 8260B	15-JAN-13 14:27	AMY			V8260SL+
MC17401-2 Collected: 07-JAN-13 13:25 By: WPJS Received: 09-JAN-13 By: GP-17-15						
MC17401-2	SM21 2540 B MOD.	11-JAN-13	HS			%SOL
MC17401-2	SW846 8260B	11-JAN-13 13:32	JM			V8260SL+
MC17401-2	SW846 8011	14-JAN-13 20:26	CZ	12-JAN-13	CC	V8011SL
MC17401-3 Collected: 07-JAN-13 13:25 By: WPJS Received: 09-JAN-13 By: GP-17-15 DUP						
MC17401-3	SM21 2540 B MOD.	11-JAN-13	HS			%SOL
MC17401-3	SW846 8260B	11-JAN-13 14:01	JM			V8260SL+
MC17401-3	SW846 8011	14-JAN-13 20:51	CZ	12-JAN-13	CC	V8011SL
MC17401-4 Collected: 07-JAN-13 13:55 By: WPJS Received: 09-JAN-13 By: GP-17-45						
MC17401-4	SM21 2540 B MOD.	11-JAN-13	HS			%SOL
MC17401-4	SW846 8260B	11-JAN-13 15:58	JM			V8260SL+
MC17401-4	SW846 8260B	14-JAN-13 12:25	JM			V8260SL+
MC17401-4	SW846 8011	14-JAN-13 21:17	CZ	12-JAN-13	CC	V8011SL
MC17401-5 Collected: 07-JAN-13 14:20 By: WPJS Received: 09-JAN-13 By: GP-17-57						
MC17401-5	SM21 2540 B MOD.	11-JAN-13	HS			%SOL
MC17401-5	SW846 8260B	11-JAN-13 14:30	JM			V8260SL+
MC17401-5	SW846 8011	14-JAN-13 21:43	CZ	12-JAN-13	CC	V8011SL
MC17401-6 Collected: 07-JAN-13 14:35 By: WPJS Received: 09-JAN-13 By: GP-17-65						
MC17401-6	SM21 2540 B MOD.	11-JAN-13	HS			%SOL

Accutest Internal Chain of Custody

Job Number: MC17401
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL
 Received: 01/09/13

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
MC17401-7.4	Bijan Jafari		01/17/13 19:07	Depleted
MC17401-8.1	Walk In Ref #9	Hamid Siamak	01/11/13 08:42	Retrieve from Storage
MC17401-8.1	Hamid Siamak	Walk In Ref #9	01/11/13 09:38	Return to Storage
MC17401-8.1	Walk In Ref #9	Chris Cataldo	01/12/13 12:42	Retrieve from Storage
MC17401-8.1	Chris Cataldo	Walk In Ref #9	01/12/13 15:30	Return to Storage
MC17401-8.2	Walk In Ref #9	Chris Cataldo	01/12/13 12:42	Retrieve from Storage
MC17401-8.2	Chris Cataldo	Walk In Ref #9	01/12/13 15:30	Return to Storage
MC17401-9.1	Walk In Ref #9	Hamid Siamak	01/11/13 08:42	Retrieve from Storage
MC17401-9.1	Hamid Siamak	Walk In Ref #9	01/11/13 09:38	Return to Storage
MC17401-9.1	Walk In Ref #9	Chris Cataldo	01/12/13 12:42	Retrieve from Storage
MC17401-9.1	Chris Cataldo	Walk In Ref #9	01/12/13 15:30	Return to Storage
MC17401-9.4	VOC Ref #10	Jaime Maslowski	01/14/13 11:10	Retrieve from Storage
MC17401-9.4	Jaime Maslowski	VOC Ref #10	01/15/13 10:16	Return to Storage
MC17401-10.1	Walk In Ref #9	Hamid Siamak	01/11/13 08:42	Retrieve from Storage
MC17401-10.1	Hamid Siamak	Walk In Ref #9	01/11/13 09:38	Return to Storage
MC17401-10.1	Walk In Ref #9	Chris Cataldo	01/12/13 12:42	Retrieve from Storage
MC17401-10.1	Chris Cataldo	Walk In Ref #9	01/12/13 15:30	Return to Storage
MC17401-10.4	VOC Ref #10	Jaime Maslowski	01/14/13 11:10	Retrieve from Storage
MC17401-10.4	Jaime Maslowski	VOC Ref #10	01/15/13 10:16	Return to Storage
MC17401-11.1	Walk In Ref #9	Hamid Siamak	01/11/13 08:42	Retrieve from Storage
MC17401-11.1	Hamid Siamak	Walk In Ref #9	01/11/13 09:38	Return to Storage
MC17401-11.1	Walk In Ref #9	Chris Cataldo	01/12/13 12:42	Retrieve from Storage
MC17401-11.1	Chris Cataldo	Walk In Ref #9	01/12/13 15:30	Return to Storage

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5

GC/MS Volatiles

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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

Job Number: MC17401
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSV612-MB	V15129.D	1	01/10/13	AMY	n/a	n/a	MSV612

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17401-7

CAS No.	Surrogate Recoveries		Limits
1868-53-7	Dibromofluoromethane	97%	70-130%
2037-26-5	Toluene-D8	101%	70-130%
460-00-4	4-Bromofluorobenzene	94%	70-130%

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

6.1.1
6

Method Blank Summary

Job Number: MC17401
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4908-MB	G123581.D	1	01/11/13	JM	n/a	n/a	MSG4908

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17401-2, MC17401-3, MC17401-4, MC17401-5, MC17401-6, MC17401-8, MC17401-9, MC17401-10, MC17401-11

6.1.2
G

CAS No.	Surrogate Recoveries		Limits
1868-53-7	Dibromofluoromethane	104%	70-130%
2037-26-5	Toluene-D8	99%	70-130%
460-00-4	4-Bromofluorobenzene	93%	70-130%

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

Method Blank Summary

Job Number: MC17401
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4909-MB	G123606.D	1	01/14/13	JM	n/a	n/a	MSG4909

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17401-4, MC17401-9, MC17401-10

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	25	15	ug/kg	

CAS No.	Surrogate Recoveries		Limits
1868-53-7	Dibromofluoromethane	101%	70-130%
2037-26-5	Tolnene-D8	98%	70-130%
460-00-4	4-Bromofluorobenzene	91%	70-130%

6.1.3
6

Method Blank Summary

Job Number: MC17401
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1816-MB	M53431.D	1	01/15/13	AMY	n/a	n/a	MSM1816

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17401-1

6.1.4
G

CAS No.	Compound	Result	RL	MDL	Units	Q
10061-01-5	cis-1,3-Dichloropropene	ND	2.0	0.17	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	2.0	0.50	ug/kg	
123-91-1	1,4-Dioxane	ND	25	25	ug/kg	
97-63-2	Ethyl methacrylate	ND	5.0	0.68	ug/kg	
100-41-4	Ethylbenzene	ND	2.0	0.24	ug/kg	
87-68-3	Hexachlorobutadiene	ND	5.0	0.46	ug/kg	
591-78-6	2-Hexanone	ND	5.0	0.50	ug/kg	
98-82-8	Isopropylbenzene	ND	5.0	0.23	ug/kg	
99-87-6	p-Isopropyltoluene	ND	5.0	0.18	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	2.0	0.29	ug/kg	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	0.50	ug/kg	
74-95-3	Methylene bromide	ND	5.0	0.49	ug/kg	
75-09-2	Methylene chloride	2.2	2.0	1.2	ug/kg	
91-20-3	Naphthalene	ND	5.0	1.3	ug/kg	
103-65-1	n-Propylbenzene	ND	5.0	1.0	ug/kg	
100-42-5	Styrene	ND	5.0	0.23	ug/kg	
630-20-6	1,1,1,2-Tetrachloroethane	ND	5.0	1.0	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	2.0	0.43	ug/kg	
127-18-4	Tetrachloroethene	ND	2.0	0.23	ug/kg	
108-88-3	Toluene	ND	5.0	0.85	ug/kg	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	0.24	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	0.23	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	2.0	0.31	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	2.0	0.73	ug/kg	
79-01-6	Trichloroethene	ND	2.0	0.21	ug/kg	
75-69-4	Trichlorofluoromethane	ND	2.0	0.30	ug/kg	
96-18-4	1,2,3-Trichloropropane	ND	5.0	0.29	ug/kg	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	0.22	ug/kg	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	0.21	ug/kg	
108-05-4	Vinyl Acetate	ND	5.0	0.56	ug/kg	
75-01-4	Vinyl chloride	ND	2.0	0.27	ug/kg	
	m,p-Xylene	ND	2.0	0.79	ug/kg	
95-47-6	o-Xylene	ND	2.0	0.24	ug/kg	
1330-20-7	Xylene (total)	ND	2.0	0.24	ug/kg	

Method Blank Summary

Job Number: MC17401
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1816-MB	M53431.D	1	01/15/13	AMY	n/a	n/a	MSM1816

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17401-1

6.1.4
6

CAS No.	Surrogate Recoveries		Limits
1868-53-7	Dibromofluoromethane	100%	70-130%
2037-26-5	Toluene-D8	107%	70-130%
460-00-4	4-Bromofluorobenzene	97%	70-130%

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

Blank Spike Summary

Page 3 of 3

Job Number: MC17401
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4908-BS	G123578.D	1	01/11/13	JM	n/a	n/a	MSG4908

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17401-2, MC17401-3, MC17401-4, MC17401-5, MC17401-6, MC17401-8, MC17401-9, MC17401-10, MC17401-11

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	105%	70-130%
2037-26-5	Toluene-D8	101%	70-130%
460-00-4	4-Bromofluorobenzene	96%	70-130%

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

* = Outside of Control Limits.

Blank Spike Summary

Job Number: MC17401
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSM1816-BS	M53432.D	1	01/15/13	AMY	n/a	n/a	MSM1816

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17401-1

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	104%	70-130%
2037-26-5	Toluene-D8	109%	70-130%
460-00-4	4-Bromofluorobenzene	97%	70-130%

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

* = Outside of Control Limits.

Blank Spike/Blank Spike Duplicate Summary

Job Number: MC17401
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSV612-BS	V15125.D	1	01/10/13	AMY	n/a	n/a	MSV612
MSV612-BSD	V15126.D	1	01/10/13	AMY	n/a	n/a	MSV612

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17401-7

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
1868-53-7	Dibromofluoromethane	102%	101%	70-130%
2037-26-5	Tolnene-D8	103%	103%	70-130%
460-00-4	4-Bromofluorobenzene	95%	94%	70-130%

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

* = Outside of Control Limits.

6.3.1
6

Blank Spike/Blank Spike Duplicate Summary

Job Number: MC17401
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MSG4909-BS	G123603.D	1	01/14/13	JM	n/a	n/a	MSG4909
MSG4909-BSD	G123604.D	1	01/14/13	JM	n/a	n/a	MSG4909

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17401-4, MC17401-9, MC17401-10

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	BSD ug/kg	BSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	2500	2470	99	2440	98	1	70-130/25

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
1868-53-7	Dibromofluoromethane	102%	101%	70-130%
2037-26-5	Toluene-D8	98%	96%	70-130%
460-00-4	4-Bromofluorobenzene	91%	89%	70-130%

* = Outside of Control Limits.



Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC17401
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC17371-4MS	V15141.D	1	01/10/13	AMY	n/a	n/a	MSV612
MC17371-4MSD	V15142.D	1	01/10/13	AMY	n/a	n/a	MSV612
MC17371-4	V15135.D	1	01/10/13	AMY	n/a	n/a	MSV612

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17401-7

CAS No.	Surrogate Recoveries	MS	MSD	MC17371-4	Limits
1868-53-7	Dibromofluoromethane	103%	104%	99%	70-130%
2037-26-5	Toluene-D8	104%	104%	102%	70-130%
460-00-4	4-Bromofluorobenzene	94%	95%	94%	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

Job Number: MC17401
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Table with 8 columns: Sample, File ID, DF, Analyzed, By, Prep Date, Prep Batch, Analytical Batch. It lists sample details for MC17401-8MS, MC17401-8MSD, and MC17401-8.

The QC reported here applies to the following samples: Method: SW846 8260B

MC17401-2, MC17401-3, MC17401-4, MC17401-5, MC17401-6, MC17401-8, MC17401-9, MC17401-10, MC17401-11

Main data table with columns: CAS No., Compound, MC17401-8 ug/kg, Spike Q, MS ug/kg, MS %, MSD ug/kg, MSD %, RPD, Limits Rec/RPD. Lists various compounds like Acetone, Acrolein, Acrylonitrile, Benzene, etc.

* = Outside of Control Limits.

6.4.2
6

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC17401
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC17401-8MS	G123593.D	1	01/11/13	JM	n/a	n/a	MSG4908
MC17401-8MSD	G123594.D	1	01/11/13	JM	n/a	n/a	MSG4908
MC17401-8	G123585.D	1	01/11/13	JM	n/a	n/a	MSG4908

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17401-2, MC17401-3, MC17401-4, MC17401-5, MC17401-6, MC17401-8, MC17401-9, MC17401-10, MC17401-11

6.4.2



CAS No.	Surrogate Recoveries	MS	MSD	MC17401-8	Limits
1868-53-7	Dibromofluoromethane	100%	97%	100%	70-130%
2037-26-5	Toluene-D8	96%	93%	100%	70-130%
460-00-4	4-Bromofluorobenzene	92%	88%	96%	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

Job Number: MC17401
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC17458-2MS	G123615.D	1	01/14/13	JM	n/a	n/a	MSG4909
MC17458-2MSD	G123616.D	1	01/14/13	JM	n/a	n/a	MSG4909
MC17458-2	G123610.D	1	01/14/13	JM	n/a	n/a	MSG4909

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17401-4, MC17401-9, MC17401-10

CAS No.	Compound	MC17458-2 ug/kg	Spike Q	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND	3040	2950	97	2930	96	1	70-130/30

CAS No.	Surrogate Recoveries	MS	MSD	MC17458-2	Limits
1868-53-7	Dibromofluoromethane	96%	97%	93%	70-130%
2037-26-5	Toluene-D8	93%	92%	90%	70-130%
460-00-4	4-Bromofluorobenzene	84%	88%	83%	70-130%

* = Outside of Control Limits.



Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC17401
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
MC17422-6MS	M53437.D	1	01/15/13	AMY	n/a	n/a	MSM1816
MC17422-6MSD	M53438.D	1	01/15/13	AMY	n/a	n/a	MSM1816
MC17422-6	M53436.D	1	01/15/13	AMY	n/a	n/a	MSM1816

The QC reported here applies to the following samples:

Method: SW846 8260B

MC17401-1

CAS No.	Surrogate Recoveries	MS	MSD	MC17422-6	Limits
1868-53-7	Dibromofluoromethane	102%	102%	103%	70-130%
2037-26-5	Toluene-D8	109%	112%	107%	70-130%
460-00-4	4-Bromofluorobenzene	104%	102%	103%	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.

6.4.4
6

Volatile Internal Standard Area Summary

Job Number: MC17401
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	MSG4908-CC4894	Injection Date:	01/11/13
Lab File ID:	G123577.D	Injection Time:	08:30
Instrument ID:	GCMSCG	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	204314	5.13	279853	6.27	137196	9.62	142175	12.25	36793	3.09
Upper Limit ^a	408628	5.63	559706	6.77	274392	10.12	284350	12.75	73586	3.59
Lower Limit ^b	102157	4.63	139927	5.77	68598	9.12	71088	11.75	18397	2.59

Lab Sample ID	IS 1 AREA	RT	IS 2 AREA	RT	IS 3 AREA	RT	IS 4 AREA	RT	IS 5 AREA	RT
MSG4908-BS	203363	5.13	278803	6.27	137556	9.62	141234	12.25	33900	3.09
MSG4908-MB	198065	5.13	269100	6.27	134892	9.62	136699	12.25	38424	3.10
ZZZZZ	198602	5.13	271694	6.27	133522	9.62	136943	12.25	36690	3.09
ZZZZZ	199453	5.13	272836	6.27	134418	9.62	135419	12.25	36139	3.09
MC17401-6	199967	5.13	276343	6.27	136200	9.62	137516	12.25	35288	3.09
MC17401-8	201117	5.13	268397	6.27	132994	9.62	131534	12.25	36858	3.09
MC17401-11	202047	5.13	278982	6.27	135987	9.62	135682	12.25	36191	3.09
MC17401-2	204847	5.13	282186	6.27	138145	9.62	141184	12.25	38412	3.09
MC17401-3	206029	5.13	283755	6.27	136479	9.62	139837	12.25	36285	3.09
MC17401-5	203953	5.13	283004	6.27	137301	9.62	137816	12.25	37055	3.09
MC17401-9	199556	5.13	279526	6.27	135048	9.62	137816	12.25	36878	3.09
MC17401-10	204906	5.13	285088	6.27	135975	9.62	137731	12.25	38354	3.09
MC17401-4	202935	5.13	286643	6.27	136002	9.62	137177	12.25	41670	3.09
MC17401-8MS	202758	5.13	279190	6.27	136267	9.62	139913	12.25	39461	3.10
MC17401-8MSD	203780	5.13	281936	6.27	136127	9.62	140320	12.25	39858	3.10
ZZZZZ	203555	5.13	275820	6.27	150926	9.63	140827	12.25	34969	3.09
ZZZZZ	211585	5.13	293149	6.27	197883	9.62	152150	12.25	38008	3.09
ZZZZZ	205144	5.13	285585	6.27	237707	9.65	173778	12.26	38047	3.09

- 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.

6.5.1
6

Volatile Internal Standard Area Summary

Job Number: MC17401
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std: MSG4909-CC4894	Injection Date: 01/14/13
Lab File ID: G123602.D	Injection Time: 09:04
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	199287	5.13	275905	6.27	135677	9.62	141069	12.25	51056	3.10
Upper Limit ^a	398574	5.63	551810	6.77	271354	10.12	282138	12.75	102112	3.60
Lower Limit ^b	99644	4.63	137953	5.77	67839	9.12	70535	11.75	25528	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
MSG4909-BS	204860	5.13	280158	6.27	140211	9.62	144730	12.25	50394	3.10
MSG4909-BSD	202769	5.13	278432	6.27	140177	9.62	144567	12.25	47368	3.10
MSG4909-MB	202920	5.13	278045	6.27	137295	9.62	139437	12.25	45304	3.10
MC17401-9	204460	5.14	279670	6.27	136935	9.62	136782	12.25	42982	3.09
MC17401-10	200752	5.13	281266	6.27	137987	9.62	134950	12.25	42346	3.09
MC17401-4	205071	5.13	282330	6.27	137624	9.62	136762	12.25	43489	3.09
MC17458-2	203093	5.13	274410	6.27	136386	9.62	138465	12.25	42201	3.09
ZZZZZZ	200870	5.13	275332	6.27	135807	9.62	137739	12.25	41547	3.09
ZZZZZZ	199669	5.13	274699	6.27	135163	9.62	136178	12.25	42186	3.09
ZZZZZZ	202239	5.13	270755	6.27	135406	9.62	136846	12.25	40407	3.09
ZZZZZZ	199154	5.13	272796	6.27	136880	9.62	137580	12.25	39025	3.09
MC17458-2MS	203112	5.13	276749	6.27	137300	9.62	145016	12.25	38102	3.09
MC17458-2MSD	202409	5.13	280937	6.27	136577	9.62	142086	12.25	38071	3.09
ZZZZZZ	201352	5.13	277517	6.27	135711	9.62	140904	12.25	41337	3.09
ZZZZZZ	200344	5.13	273792	6.27	134877	9.62	139868	12.25	39051	3.10
ZZZZZZ	201055	5.13	274589	6.27	134213	9.62	140339	12.25	36664	3.09
ZZZZZZ	202841	5.13	278051	6.27	137687	9.62	140745	12.25	36747	3.09
ZZZZZZ	202433	5.13	276624	6.27	135094	9.62	139629	12.25	37236	3.09
ZZZZZZ	202341	5.13	276650	6.27	135703	9.62	137606	12.25	46514	3.09

- 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.

6.5.2



Volatile Internal Standard Area Summary

Job Number: MC17401
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	MSV612-CC595	Injection Date:	01/10/13
Lab File ID:	V15124.D	Injection Time:	09:41
Instrument ID:	GCMSV	Method:	SW846 8260B

Lab Sample ID	IS 1 AREA	IS 1 RT	IS 2 AREA	IS 2 RT	IS 3 AREA	IS 3 RT	IS 4 AREA	IS 4 RT	IS 5 AREA	IS 5 RT
ZZZZZZ	248964	6.49	429352	7.68	226603	11.05	187041	13.29	49328	3.45
ZZZZZZ	249445	6.48	432300	7.68	229251	11.05	190544	13.29	53637	3.45
ZZZZZZ	254762	6.48	436748	7.68	230557	11.05	190173	13.29	45682	3.45
ZZZZZZ	251171	6.49	430853	7.68	231046	11.05	189685	13.29	50339	3.45
ZZZZZZ	253056	6.49	437192	7.68	232387	11.05	191906	13.29	50107	3.45
ZZZZZZ	252866	6.49	434793	7.68	232522	11.05	195016	13.29	52452	3.45
ZZZZZZ	261381	6.48	446440	7.68	236649	11.05	194986	13.29	49857	3.44
ZZZZZZ	265100	6.49	454862	7.69	243492	11.05	199398	13.29	55938	3.45

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

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

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

6.5.4



Volatile Surrogate Recovery Summary

Job Number: MC17401
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, 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
MC17401-7	V15133.D	98.0	101.0	94.0
MC17371-4MS	V15141.D	103.0	104.0	94.0
MC17371-4MSD	V15142.D	104.0	104.0	95.0
MSV612-BS	V15125.D	102.0	103.0	95.0
MSV612-BSD	V15126.D	101.0	103.0	94.0
MSV612-MB	V15129.D	97.0	101.0	94.0

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

Job Number: MC17401
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, 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
MC17401-1	M53434.D	100.0	109.0	97.0
MC17401-2	G123587.D	103.0	98.0	93.0
MC17401-3	G123588.D	101.0	97.0	92.0
MC17401-4	G123609.D	92.0	88.0	83.0
MC17401-4	G123592.D	102.0	95.0	93.0
MC17401-5	G123589.D	101.0	96.0	93.0
MC17401-6	G123584.D	98.0	94.0	89.0
MC17401-8	G123585.D	100.0	100.0	96.0
MC17401-9	G123607.D	94.0	91.0	87.0
MC17401-9	G123590.D	103.0	96.0	93.0
MC17401-10	G123608.D	99.0	93.0	92.0
MC17401-10	G123591.D	99.0	95.0	92.0
MC17401-11	G123586.D	101.0	97.0	94.0
MC17401-8MS	G123593.D	100.0	96.0	92.0
MC17401-8MSD	G123594.D	97.0	93.0	88.0
MC17422-6MS	M53437.D	102.0	109.0	104.0
MC17422-6MSD	M53438.D	102.0	112.0	102.0
MC17458-2MS	G123615.D	96.0	93.0	84.0
MC17458-2MSD	G123616.D	97.0	92.0	88.0
MSG4908-BS	G123578.D	105.0	101.0	96.0
MSG4908-MB	G123581.D	104.0	99.0	93.0
MSG4909-BS	G123603.D	102.0	98.0	91.0
MSG4909-BSD	G123604.D	101.0	96.0	89.0
MSG4909-MB	G123606.D	101.0	98.0	91.0
MSM1816-BS	M53432.D	104.0	109.0	97.0
MSM1816-MB	M53431.D	100.0	107.0	97.0

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

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

Job Number: MC17401
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31685-MB	YZ77806.D	1	01/14/13	CZ	01/12/13	OP31685	GYZ7014

The QC reported here applies to the following samples: Method: SW846 8011

MC17401-1, MC17401-2, MC17401-3, MC17401-4, MC17401-5, MC17401-6, MC17401-8, MC17401-9, MC17401-10, MC17401-11

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	2.5	1.1	ug/kg	
106-93-4	1,2-Dibromoethane	ND	2.5	0.96	ug/kg	

CAS No.	Surrogate Recoveries	Limits
460-00-4	Bromofluorobenzene (S)	107% 61-167%
460-00-4	Bromofluorobenzene (S)	103% 61-167%

7.1.1
7

Method Blank Summary

Job Number: MC17401
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31715-MB	YZ77925.D	1	01/19/13	CZ	01/17/13	OP31715	GYZ7020

The QC reported here applies to the following samples:

Method: SW846 8011

MC17401-7

CAS No.	Compound	Result	RL	MDL	Units	Q
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.015	0.013	ug/l	
106-93-4	1,2-Dibromoethane	ND	0.015	0.010	ug/l	

CAS No.	Surrogate Recoveries	Limits
460-00-4	Bromofluorobenzene (S)	120% 36-173%
460-00-4	Bromofluorobenzene (S)	111% 36-173%

7.1.2
7

Blank Spike Summary

Job Number: MC17401
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31685-BS	YZ77807.D	1	01/14/13	CZ	01/12/13	OP31685	GYZ7014

The QC reported here applies to the following samples:

Method: SW846 8011

MC17401-1, MC17401-2, MC17401-3, MC17401-4, MC17401-5, MC17401-6, MC17401-8, MC17401-9, MC17401-10, MC17401-11

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
96-12-8	1,2-Dibromo-3-chloropropane	33.2	37.5	113	59-142
106-93-4	1,2-Dibromoethane	33.2	41.7	126	56-140

CAS No.	Surrogate Recoveries	BSP	Limits
460-00-4	Bromofluorobenzene (S)	111%	61-167%
460-00-4	Bromofluorobenzene (S)	109%	61-167%

7.2.1
7

* = Outside of Control Limits.

Blank Spike Summary

Job Number: MC17401
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31715-BS	YZ77926.D	1	01/19/13	CZ	01/17/13	OP31715	GYZ7020

The QC reported here applies to the following samples:

Method: SW846 8011

MC17401-7

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
96-12-8	1,2-Dibromo-3-chloropropane	0.071	0.081	114	60-140
106-93-4	1,2-Dibromoethane	0.071	0.066	93	60-140

CAS No.	Surrogate Recoveries	BSP	Limits
460-00-4	Bromofluorobenzene (S)	121%	36-173%
460-00-4	Bromofluorobenzene (S)	114%	36-173%

7.2.2
7

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC17401
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31685-MS	YZ77808.D	1	01/14/13	CZ	01/12/13	OP31685	GYZ7014
OP31685-MSD	YZ77809.D	1	01/14/13	CZ	01/12/13	OP31685	GYZ7014
MC17401-8	YZ77810.D	1	01/14/13	CZ	01/12/13	OP31685	GYZ7014

The QC reported here applies to the following samples:

Method: SW846 8011

MC17401-1, MC17401-2, MC17401-3, MC17401-4, MC17401-5, MC17401-6, MC17401-8, MC17401-9, MC17401-10, MC17401-11

CAS No.	Compound	MC17401-8 ug/kg	Spike Q	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
96-12-8	1,2-Dibromo-3-chloropropane	ND	37.2	41.9	112	45.8	121	9	40-156/27
106-93-4	1,2-Dibromoethane	ND	37.2	46.7	125	49.0	130	5	48-141/27

CAS No.	Surrogate Recoveries	MS	MSD	MC17401-8	Limits
460-00-4	Bromofluorobenzene (S)	114%	110%	119%	61-167%
460-00-4	Bromofluorobenzene (S)	114%	116%	131%	61-167%

7.3.1
7

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: MC17401
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP31715-MS1	YZ77927.D	1	01/19/13	CZ	01/17/13	OP31715	GYZ7020
OP31715-MSD1	YZ77928.D	1	01/19/13	CZ	01/17/13	OP31715	GYZ7020
MC17451-5	YZ77929.D	1	01/19/13	CZ	01/17/13	OP31715	GYZ7020

The QC reported here applies to the following samples:

Method: SW846 8011

MC17401-7

CAS No.	Compound	MC17451-5 ug/l	Spike Q	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.0683	0.068	100	0.052	78	27	64-141/29
106-93-4	1,2-Dibromoethane	ND	0.0683	0.060	88	0.044	66	31* ^a	63-163/27

CAS No.	Surrogate Recoveries	MS	MSD	MC17451-5	Limits
460-00-4	Bromofluorobenzene (S)	107%	84%	123%	36-173%
460-00-4	Bromofluorobenzene (S)	108%	84%	121%	36-173%

(a) High RPD due to possible matrix interference and/or sample non-homogeneity.

7.3.2
7

* = Outside of Control Limits.

Volatile Surrogate Recovery Summary

Job Number: MC17401
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Method: SW846 8011	Matrix: AQ
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Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 ^a	S1 ^b
MC17401-7	YZ77933.D	118.0	120.0
OP31715-BS	YZ77926.D	121.0	114.0
OP31715-MB	YZ77925.D	120.0	111.0
OP31715-MS1	YZ77927.D	107.0	108.0
OP31715-MSD1	YZ77928.D	84.0	84.0

Surrogate Compounds	Recovery Limits
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S1 = Bromofluorobenzene (S) 36-173%

- (a) Recovery from GC signal #2
- (b) Recovery from GC signal #1

7.4.1
7

Volatile Surrogate Recovery Summary

Job Number: MC17401
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Method: SW846 8011 Matrix: SO

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 ^a	S1 ^b
MC17401-1	YZ77811.D	101.0	114.0
MC17401-2	YZ77812.D	72.0	100.0
MC17401-3	YZ77813.D	85.0	110.0
MC17401-4	YZ77814.D	103.0	124.0
MC17401-5	YZ77815.D	103.0	129.0
MC17401-6	YZ77817.D	91.0	110.0
MC17401-8	YZ77810.D	119.0	131.0
MC17401-9	YZ77818.D	103.0	118.0
MC17401-10	YZ77819.D	109.0	135.0
MC17401-11	YZ77820.D	117.0	142.0
OP31685-BS	YZ77807.D	111.0	109.0
OP31685-MB	YZ77806.D	107.0	103.0
OP31685-MS	YZ77808.D	114.0	114.0
OP31685-MSD	YZ77809.D	110.0	116.0

Surrogate Compounds Recovery Limits

S1 = Bromofluorobenzene (S) 61-167%

- (a) Recovery from GC signal #2
- (b) Recovery from GC signal #1

7.4.2
7

GC Surrogate Retention Time Summary

Job Number: MC17401
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	GYZ7014-ICC7014	Injection Date:	01/14/13
Lab File ID:	YZ77800.D	Injection Time:	15:23
Instrument ID:	GCYZ	Method:	SW846 8011

	S1 ^a RT	S1 ^b RT
Check Std	3.76	3.48

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 ^a RT	S1 ^b RT
OP31685-MB	YZ77806.D	01/14/13	17:54	3.76	3.49
OP31685-BS	YZ77807.D	01/14/13	18:20	3.76	3.48
OP31685-MS	YZ77808.D	01/14/13	18:45	3.76	3.49
OP31685-MSD	YZ77809.D	01/14/13	19:10	3.76	3.48
MC17401-8	YZ77810.D	01/14/13	19:35	3.76	3.48
MC17401-1	YZ77811.D	01/14/13	20:01	3.76	3.48
MC17401-2	YZ77812.D	01/14/13	20:26	3.76	3.48
MC17401-3	YZ77813.D	01/14/13	20:51	3.76	3.48
MC17401-4	YZ77814.D	01/14/13	21:17	3.76	3.48
MC17401-5	YZ77815.D	01/14/13	21:43	3.76	3.48

**Surrogate
Compounds**

S1 = Bromofluorobenzene (S)

- (a) Retention time from GC signal #2
- (b) Retention time from GC signal #1

7.5.1
7

GC Surrogate Retention Time Summary

Job Number: MC17401
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	GYZ7014-CC7014	Injection Date:	01/14/13
Lab File ID:	YZ77816.D	Injection Time:	22:08
Instrument ID:	GCYZ	Method:	SW846 8011

S1 ^a	S1 ^b
RT	RT

Check Std	3.76	3.48
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Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	S1 ^a RT	S1 ^b RT
MC17401-6	YZ77817.D	01/14/13	22:33	3.76	3.48
MC17401-9	YZ77818.D	01/14/13	22:59	3.76	3.48
MC17401-10	YZ77819.D	01/14/13	23:24	3.76	3.48
MC17401-11	YZ77820.D	01/14/13	23:49	3.76	3.48
GYZ7014-ECC7014	YZ77821.D	01/15/13	00:14	3.76	3.48

Surrogate Compounds

S1 = Bromofluorobenzene (S)

- (a) Retention time from GC signal #2
- (b) Retention time from GC signal #1

7.5.2
7

GC Surrogate Retention Time Summary

Job Number: MC17401
 Account: SHELLWIC Shell Oil
 Project: URSMOSTL: Roxana Drilling, Roxana, IL

Check Std:	GYZ7020-CC7019	Injection Date:	01/19/13
Lab File ID:	YZ77924A.D	Injection Time:	00:23
Instrument ID:	GCYZ	Method:	SW846 8011

	SI ^a RT	SI ^b RT
Check Std	3.76	3.48

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	SI ^a RT	SI ^b RT
OP31715-MB	YZ77925.D	01/19/13	00:48	3.76	3.48
OP31715-BS	YZ77926.D	01/19/13	01:13	3.76	3.48
OP31715-MS1	YZ77927.D	01/19/13	01:39	3.76	3.48
OP31715-MSD1	YZ77928.D	01/19/13	02:04	3.76	3.48
MC17451-5	YZ77929.D	01/19/13	02:29	3.76	3.48
OP31715-MS2	YZ77930.D	01/19/13	02:54	3.76	3.48
OP31715-MSD2	YZ77931.D	01/19/13	03:19	3.76	3.48
MC17505-7	YZ77932.D	01/19/13	03:45	3.76	3.48
MC17401-7	YZ77933.D	01/19/13	04:10	3.76	3.48
ZZZZZ	YZ77934.D	01/19/13	04:35	3.76	3.48

Surrogate
Compounds

SI = Bromofluorobenzene (S)

- (a) Retention time from GC signal #2
- (b) Retention time from GC signal #1

7.5.3
7

General Chemistry

QC Data Summaries



Includes the following where applicable:

- Percent Solids Raw Data Summary

Percent Solids Raw Data Summary

Job Number: MC17401
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample: MC17401-1 Analyzed: 11-JAN-13 by HS Method: SM21 2540 B MOD.
ClientID: GP-16-91

Wet Weight (Total) 34.868 g
Tare Weight 24.706 g
Dry Weight (Total) 33.642 g
Solids, Percent 87.9 %

Sample: MC17401-2 Analyzed: 11-JAN-13 by HS Method: SM21 2540 B MOD.
ClientID: GP-17-15

Wet Weight (Total) 27.806 g
Tare Weight 19.589 g
Dry Weight (Total) 27.033 g
Solids, Percent 90.6 %

Sample: MC17401-3 Analyzed: 11-JAN-13 by HS Method: SM21 2540 B MOD.
ClientID: GP-17-15 DUP

Wet Weight (Total) 27.485 g
Tare Weight 20.614 g
Dry Weight (Total) 26.191 g
Solids, Percent 81.2 %

Sample: MC17401-4 Analyzed: 11-JAN-13 by HS Method: SM21 2540 B MOD.
ClientID: GP-17-45

Wet Weight (Total) 30.77 g
Tare Weight 21.713 g
Dry Weight (Total) 29.248 g
Solids, Percent 83.2 %

Sample: MC17401-5 Analyzed: 11-JAN-13 by HS Method: SM21 2540 B MOD.
ClientID: GP-17-57

Wet Weight (Total) 32.032 g
Tare Weight 21.191 g
Dry Weight (Total) 29.816 g
Solids, Percent 79.6 %

Sample: MC17401-6 Analyzed: 11-JAN-13 by HS Method: SM21 2540 B MOD.
ClientID: GP-17-65

Wet Weight (Total) 29.296 g
Tare Weight 19.695 g
Dry Weight (Total) 27.794 g
Solids, Percent 84.4 %

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1

Percent Solids Raw Data Summary

Job Number: MC17401
Account: SHELLWIC Shell Oil
Project: URSMOSTL: Roxana Drilling, Roxana, IL

Sample: MC17401-8 Analyzed: 11-JAN-13 by HS Method: SM21 2540 B MOD.
ClientID: GP-18-21

Wet Weight (Total) 31.321 g
Tare Weight 21.153 g
Dry Weight (Total) 30.08 g
Solids, Percent 87.8 %

Sample: MC17401-9 Analyzed: 11-JAN-13 by HS Method: SM21 2540 B MOD.
ClientID: GP-18-37

Wet Weight (Total) 31.57 g
Tare Weight 18.639 g
Dry Weight (Total) 30.511 g
Solids, Percent 91.8 %

Sample: MC17401-10 Analyzed: 11-JAN-13 by HS Method: SM21 2540 B MOD.
ClientID: GP-18-53

Wet Weight (Total) 39.416 g
Tare Weight 28.019 g
Dry Weight (Total) 36.571 g
Solids, Percent 75 %

Sample: MC17401-11 Analyzed: 11-JAN-13 by HS Method: SM21 2540 B MOD.
ClientID: GP-18-63

Wet Weight (Total) 36.296 g
Tare Weight 21.059 g
Dry Weight (Total) 34.365 g
Solids, Percent 87.3 %

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8