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May 28, 2014

Mr. Mike Beslow
On-Scene Coordinator
U.S. Environmental Protection Agency, Region V
77 West Jackson Boulevard
Chicago, IL 60604

Subject: Emergency Response (ER) – Whiting Refinery, Revision 0
Whiting, Lake County, Indiana
Contract No.: EP-S5-06-04
Technical Direction Document (TDD) No.: S05-0005-1403-009
Document Control No.: 2311-2A-BLWL
Work Order No.: 20405.012.005.2311.00

Dear Mr. Beslow:

Under TDD No. S05-0005-1403-009, the U.S. Environmental Protection Agency tasked the Weston Solutions, Inc. (WESTON®), Superfund Technical Assessment and Response Team (START) to provide oversight activities during an ER at the Whiting Refinery Site in Whiting, Lake County, IN (the Site).

This letter report discusses the Site description, Site history, specific ER activities, and multi-media sampling analytical results, and presents a summary of the ER activities. In addition, this letter report has four attachments. **Attachment A** contains the figures for this letter report. **Attachment B** provides a photographic log of Site conditions and ER activities. **Attachment C** contains tables summarizing the analytical results for multi-media samples collected during the ER. **Attachment D** provides the laboratory analytical results and data validation reports for samples collected during the ER.

SITE DESCRIPTION

The Site is located at 2815 Indianapolis Boulevard in Whiting, Lake County, IN (**Figure 1** in **Attachment A**). The Site coordinates are 41° 39’ 45.90” North latitude and 87° 29’ 00.56” West longitude. The Site is a BP refinery that was established in 1889 by Standard Oil of Indiana and occupies more than 1,400 acres. The refinery is currently capable of processing up to 405,000 barrels of crude oil per day and is the fifth largest oil refinery in the United States. The Site is located along the shores of Lake Michigan and the Indiana Harbor Ship Canal in a residential area; it is bordered to the north by Lake Michigan, to the west by residential properties, to the east by Arcelor Mittal, and to the south by the Lake George Canal and industrial properties. The Indiana Harbor Ship Canal connects to the West Branch Calumet River, which is located approximately 1.5 miles south of the Site. Approximately five churches and two schools are located within 1 mile of the Site.

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SITE HISTORY

On March 24, 2014, crude oil was released from a National Pollutant Discharge Elimination System (NPDES) permitted outfall (Outfall 002). The crude oil originated at the 12-pipe cooling system, which is located south of the railroad tracks that separate the refinery and wastewater treatment plant (WWTP), flowed to the WWTP, and into the #6 oil water separator. The crude oil was discovered by an electronic sensor in the #6 oil water separator at 1630 hours. The #6 oil water separator became oversaturated with oil and began discharging directly to Lake Michigan via Outfall 002 (**Figure 2** in **Attachment A)**. The facility's response contractor, Marine Spill Response Corporation (MSRC), was activated. With 100 personnel, MSRC immediately deployed 1,000 feet of boom around the outfall, and activated 12 vacuum trucks for oil removal activities at the #6 oil water separator and along the shoreline. BP reported the release to the National Response Center (NRC No. 1077610). EPA arrived on-site at 2100 hours and did not observe any visible discharge of oil from the outfall. Oil was observed in the water between the shoreline and the deployed boom. The United States Coast Guard (USCG) arrived on-site to provide support due to the impact to Lake Michigan.

On March 25, 2014, EPA requested that WESTON START mobilize to the Site to assess the Site-related environmental hazards.

EMERGENCY RESPONSE ACTIVITIES

ER activities were conducted on March 25-31, and April 3 and 8, 2014. On April 9, EPA formally honored a USCG request for oversight of the Site. **Attachment B** provides a photographic log of Site conditions and ER activities. A chronology of Site activities is presented as follows.

March 25, 2014

- WESTON START mobilized to the Site and began preparing for oversight, air monitoring, and sampling activities.
- MSRC continued maintaining boom operations and conducting vacuum truck operations at the #6 oil water separator and along the shoreline.
- BP industrial hygienists performed air monitoring using seven AreaRAEs and UltraRAEs (**Figure 3** in **Attachment A**). Volatile organic compound (VOC) readings ranged from 0 to 1 part per million (ppm) and benzene readings were non-detect.
- WESTON START performed air monitoring to cross-check the Site data, using an UltraRAE benzene air monitor. WESTON START also conducted perimeter air monitoring near the Site and the surrounding residential neighborhood for VOCs, carbon monoxide, hydrogen sulfide, lower explosive limit, and oxygen using a MultiRAE unit outfitted with a photoionization detector.

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March 26-27, 2014

- MSRC continued maintaining boom operations, based on USCG recommendations, and conducted vacuum truck operations at the #6 oil water separator and along the shoreline.
- Shoreline Cleanup and Assessment Technique (SCAT) teams were mobilized and began shoreline and submerged oil assessment operations.
- Ground crews began performing manual collection of tar balls/patties and oil-impacted sand and rocks along the shoreline.
- WESTON START continued oversight of ER activities, including boom maintenance and oil recovery operations. WESTON START also provided personnel for SCAT support.
- WESTON START collected one water sample (WCR-Water01-032714) from Outfall 002 (**Figure 4** in **Attachment A** and **Table 1** in **Attachment C**). The sample was analyzed by ALS Environmental (ALS) in Holland, MI, for VOCs, semivolatile organic compounds (SVOCs), and metals. WESTON START also collected one oil sample (WCR-Oil01-032714/USCG ID: 14-133-5) from the #6 oil water separator for fingerprint analysis at the USCG Marine Safety Laboratory (MSL) in New London, CT (**Table 1** in **Attachment C**).
- BP drafted a submerged Oil Sampling Plan.

March 28-29, 2014

- MSRC continued boom maintenance based on USCG recommendations and conducted vacuum truck operations at the #6 oil water separator and along the shoreline.
- SCAT teams continued shoreline and submerged oil assessment operations. The survey along segment "A" was completed (**Figure 3** in **Attachment A**).
- Ground crews continued manual collection of tar balls/patties and oil-impacted sand and rocks along the shoreline.
- WESTON START continued oversight of ER activities, including boom maintenance and oil recovery operations. WESTON START also provided personnel for SCAT support.
- WESTON START collected one oil sample (WCR-Oil02-032814) from the #6 oil water separator (**Figure 4** in **Attachment A** and **Table 1** in **Attachment C**). The sample was analyzed by ALS in Holland, MI, for VOCs, SVOCs, TPH-GRO, TPH-DRO, and TPH-ORO.

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March 29-31, 2014

- MSRC continued boom maintenance based on USCG recommendations and conducted vacuum truck operations at the #6 oil water separator and along the shoreline.
- SCAT teams continued shoreline and submerged oil assessment operations. The survey along segments "B through F" was completed (**Figure 3** in **Attachment A**). In addition, a total of 35 survey points were evaluated for the presence of oil and/or sheen. Results concluded that oil and/or sheen were not identified.
- Ground crews continued manual collection of tar balls/patties and oil-impacted sand and rocks along the shoreline.
- WESTON START continued oversight of ER activities, including boom maintenance and oil recovery operations. WESTON START also provided personnel for SCAT support.
- WESTON START collected one water sample (WCR-Water02-033114) from the Outfall 002 tap (**Figure 4** in **Attachment A** and **Table 1** in **Attachment C**). The sample was analyzed by ALS in Holland, MI, for VOCs, SVOCs, metals, oil and grease, total phenol, TOCs, and non-polar material. WESTON START also collected two samples (USCG ID: 14-133-2 and 14-133-3) of oiled hard boom; one sample (USCG ID: 14-133-1) of weather oil from segment F; and one sample (USCG ID: 14-133-4) of oiled absorbent boom for fingerprint analysis at the USCG MSL in New London, CT (**Table 1** in **Attachment C**).

April 3, 2014

- WESTON START met with the USCG in Willowbrook, IL, to package the samples for shipment to the USCG Laboratory in New London, CT.

April 8, 2014

- WESTON START collected one split soil sample (WCR-Soil01-040814) from the staged waste pile consisting of impacted soil, sand, and debris (**Figure 4** in **Attachment A** and **Table 1** in **Attachment C**). The sample was analyzed by ALS in Holland, MI, for dry and wet bulk density, volumetric moisture, TPH-GRO, TPH-DRO, and TPH-ORO.

MULTI-MEDIA SAMPLE ANALYTICAL RESULTS

Attachment D provides the laboratory analytical results and data validation reports for samples collected during the ER. WESTON START collected two water samples (WCR-Water01-032714 and WCR-Water02-033114), which were analyzed by ALS in Holland, MI, for a combination of VOCs, SVOCs, metals, oil and grease, total phenol, TOCs, and non-

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polar material analyses. The following chemicals were detected in the water samples (**Table 2** in **Attachment C**):

- WCR-Water01-032714:
  - Metals: aluminum (0.05 milligram per liter [mg/L]), barium (0.021 mg/L), calcium (36 mg/L), copper (0.01 mg/L), iron (0.088 mg/L), magnesium (13 mg/L), manganese (0.0083 mg/L), potassium (1.9 mg/L), sodium (13 mg/L), and zinc (0.034 mg/L).
- WCR-Water02-033114:
  - Metals: aluminum (0.032 mg/L), barium (0.021 mg/L), calcium (36 mg/L), copper (0.016 mg/L), magnesium (13 mg/L), potassium (1.8 mg/L), sodium (12 mg/L), and zinc (0.012 mg/L).
  - TOC: 2.2 mg/L.

WESTON START collected one oil sample (WCR-Oil02-032814) which was analyzed by ALS in Holland, MI, for VOCs, SVOCs, TPH-DRO, TPH-GRO, and TPH-ORO analysis. The following chemicals were detected (**Table 2** in **Attachment C**):

- VOCs: cyclohexane (2,500 milligram per kilogram [mg/kg]), ethylbenzene (380 mg/kg), isopropylbenzene (160 mg/kg), methylbenzene (380 mg/kg), methylcyclohexane (5,100 mg/kg), toluene (380 mg/kg), and xylenes (1,700 mg/kg).
- TPH-DRO: 210,000 mg/kg.
- TPH-GRO: 8,800 mg/kg.
- TPH-ORO: 140,000 mg/kg

WESTON START collected one split soil sample (WCR-Soil01-040814) which was analyzed by ALS in Holland, MI, for dry and wet bulk density, volumetric moisture, moisture, TPH-GRO, TPH-DRO, and TPH-ORO analysis. The following chemicals were detected (**Table 2** in **Attachment C**):

- TPH-DRO: 1,100 mg/kg.
- TPH-GRO: 57 mg/kg.
- TPH-ORO: 670 mg/kg.
- Dry Bulk Density: 68 pounds per cubic feet (lb/ft^3).
- Wet Bulk Density: 73 lb/ft^3.
- Volumetric Moisture: 8.1 percent (%).
- % Moisture: 16%.

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Five samples were submitted to the USCG MSL in New London, CT, for fingerprint (forensic oil) analysis. The fingerprint analysis was used to determine if a relationship exists between the samples collected. The results of the fingerprinting analysis (USCG MSL Report 14-133) are summarized as follows:

- Suspected source sample 14-133-5 (WCR-Oil01-032714) and spill sample 14-133-1 are derived from a common source of petroleum oil.
- Spill samples 14-133-2, 14-133-3, and 14-133-4 were deemed not useful for correlation analysis.

SUMMARY

The EPA requested WESTON START to mobilize to the Site on March 25, 2014, to assess site-related environmental hazards from an oil spill at the Site until demobilization on April 9, 2014. During the ER, WESTON START assisted EPA in providing oversight and collected five forensic samples, two water samples, one oil sample, and one soil sample. Results for the samples collected during the ER are as follows:

- Water: samples had detection of metals.
- Oil: sample had detections of VOCs, TPH-DRO, TPH-GRO, and TPH-ORO.
- Soil: sample had detections of TPH-DRO, TPH-GRO, and TPH-ORO.
- Forensic Oil: two samples (oil from oil water sample and weathered oil from shoreline segment "F") were derived from a common source of petroleum oil.

If you have any questions or comments regarding this report, please contact me at (312) 424-3314.

Very truly yours,
Weston Solutions, Inc.

Trenna J. Seilheimer
WESTON START Project Manager

Attachments:
A - Figures
B - Photographic Log
C – Multi-Media Analytical Results Summary Tables
D - Laboratory Analytical Results and Data Validation Reports for Multi-Media Samples
cc: WESTON START DCN File

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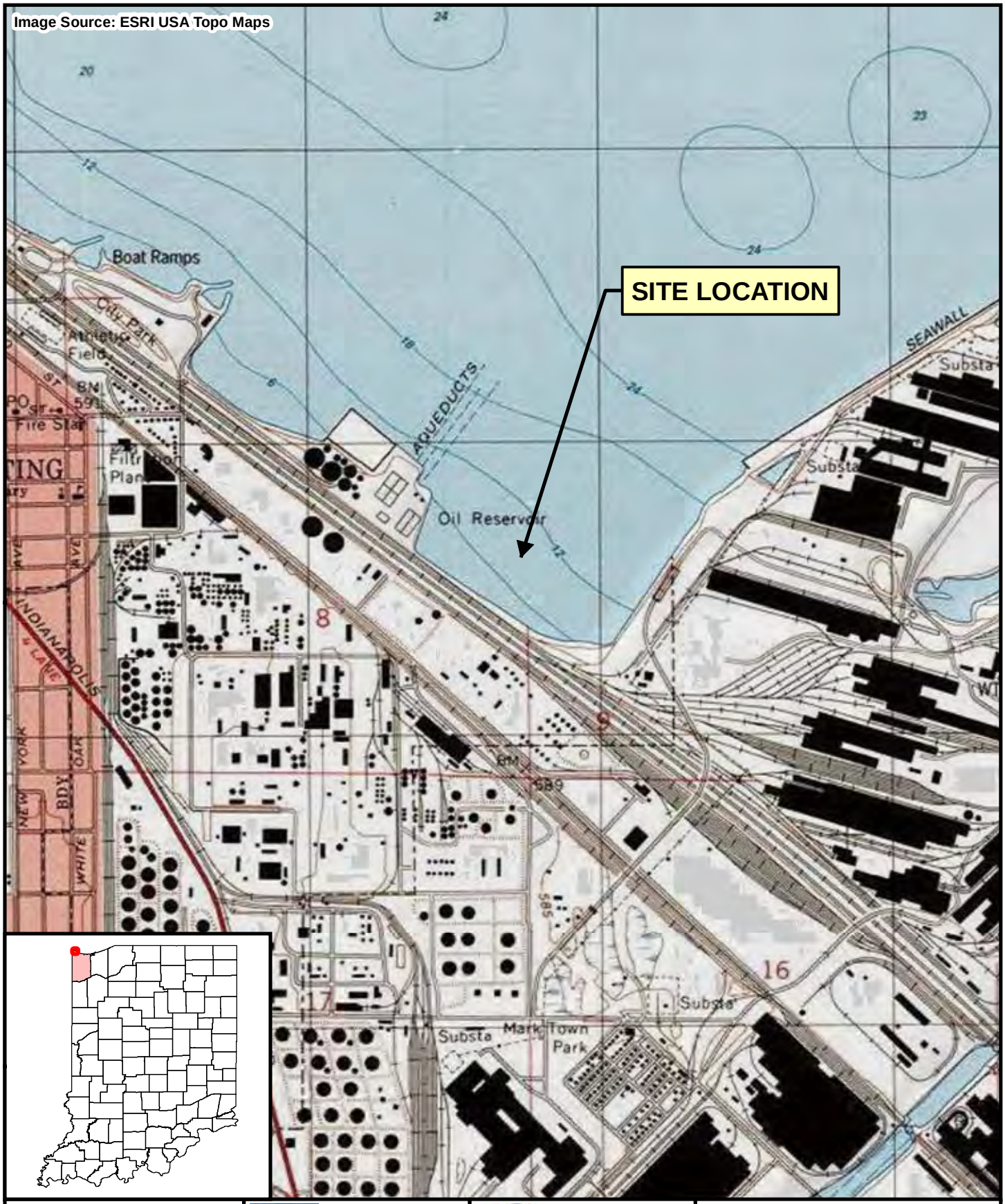
ATTACHMENT A
FIGURES



Legend

0 2,000 Feet

N

Prepared for:
U.S. EPA REGION V

Contract No.: EP-S5-06-04
TDD: S05-0005-1403-009
DCN: 2311-2A-BLWL

Prepared By:
WESTON SOLUTIONS, INC

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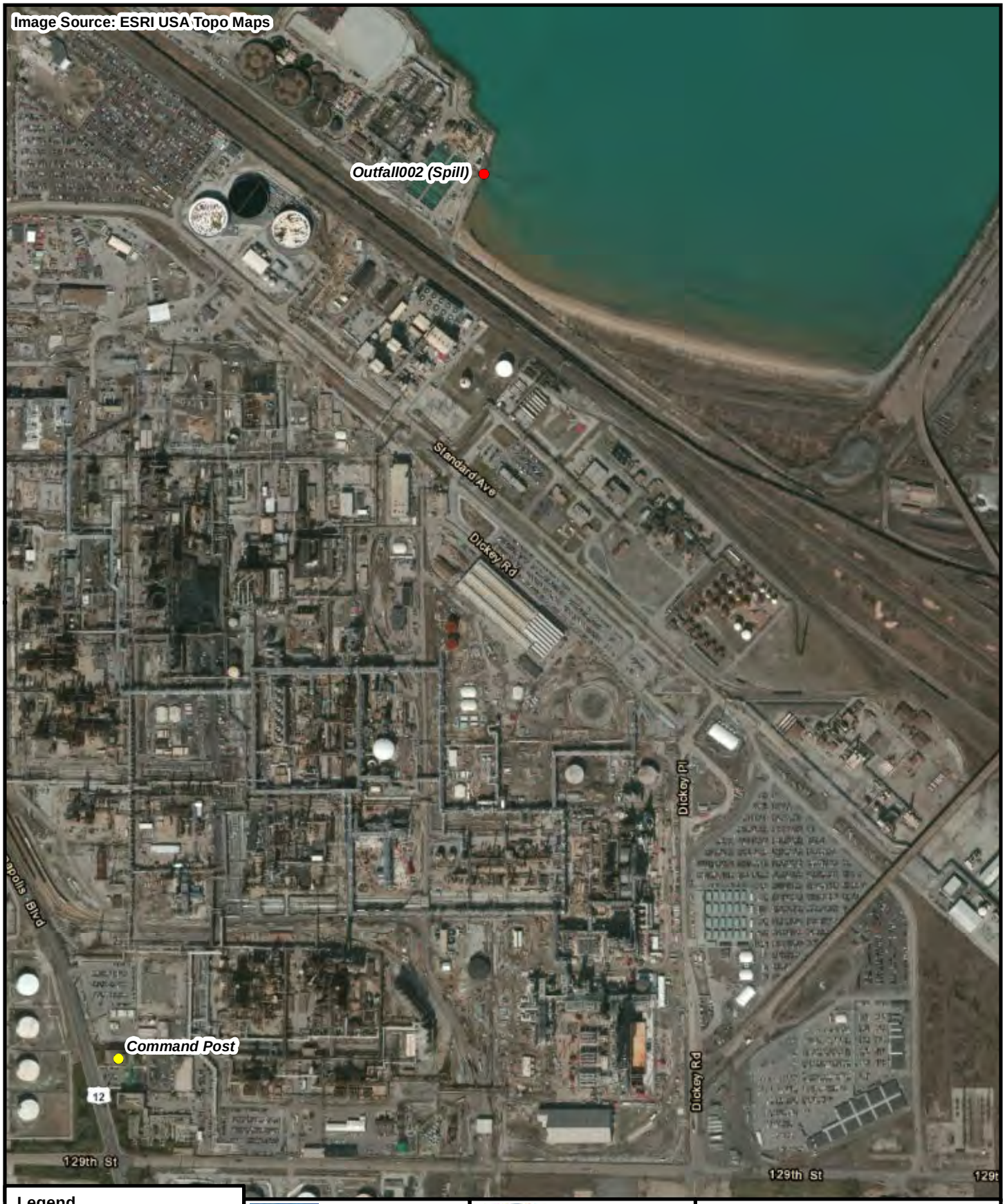
Figure 1
Site Location Map
Whiting Refinery ER
Whiting, Lake County, Indiana

File: D:\Whiting_Refinery_ER\mxd\F1_Site_Location.mxd, 5/19/2014 2:06:11 PM, wojdakon



Legend

- Command Post
- Outfall 002 (Spill)

0 1,000 Feet

N

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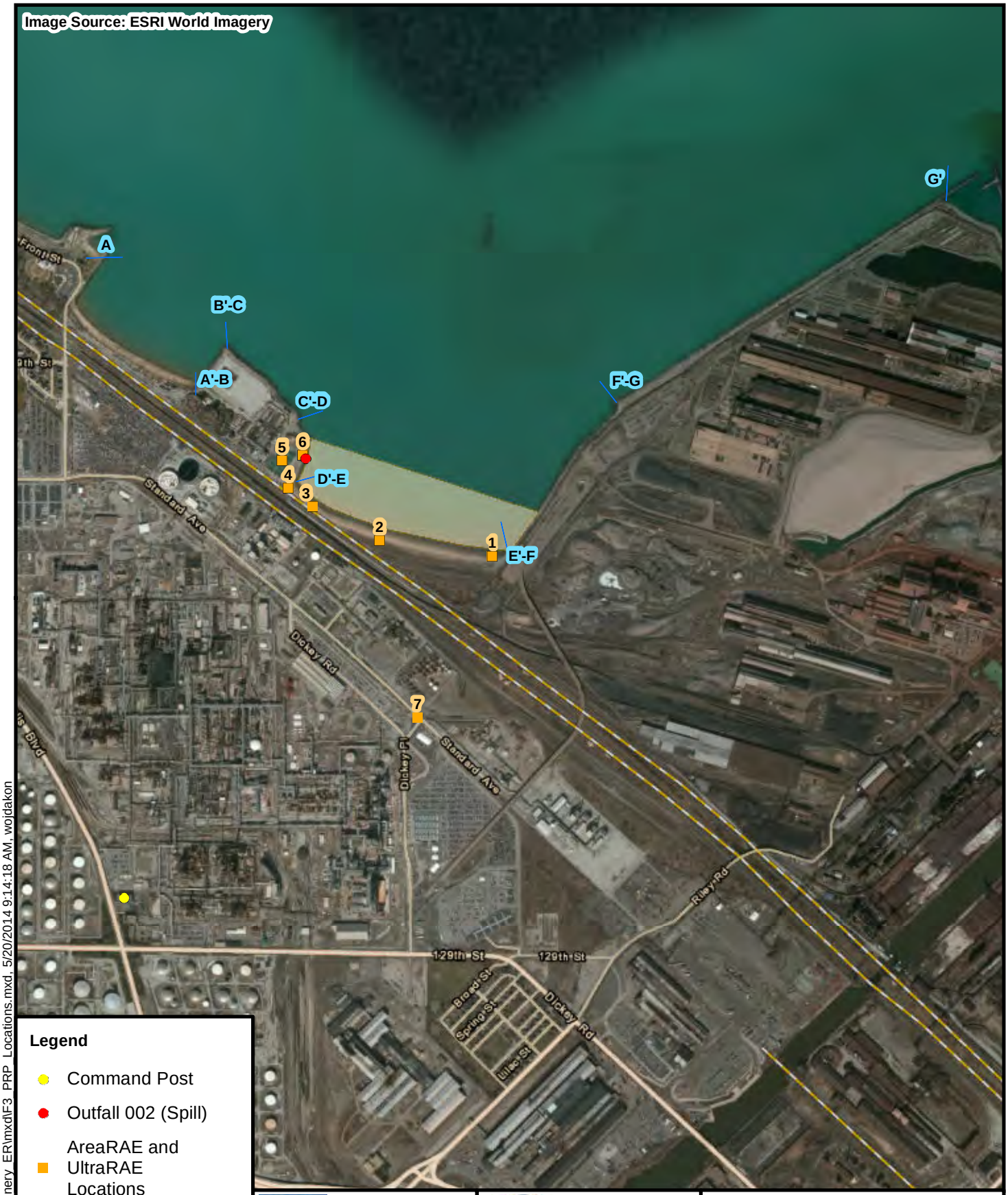
Figure 2
Site Features Map
Whiting Refinery ER
Whiting, Lake County, Indiana

File: D:\Whiting_Refinery_ER\mxd\F2_Site_Features.mxd, 5/20/2014 9:00:17 AM, wojdakon



Legend

- Command Post
- Outfall 002 (Spill)
- AreaRAE and UltraRAE Locations
- Segments
- Survey Grid

0 2,000 Feet

N

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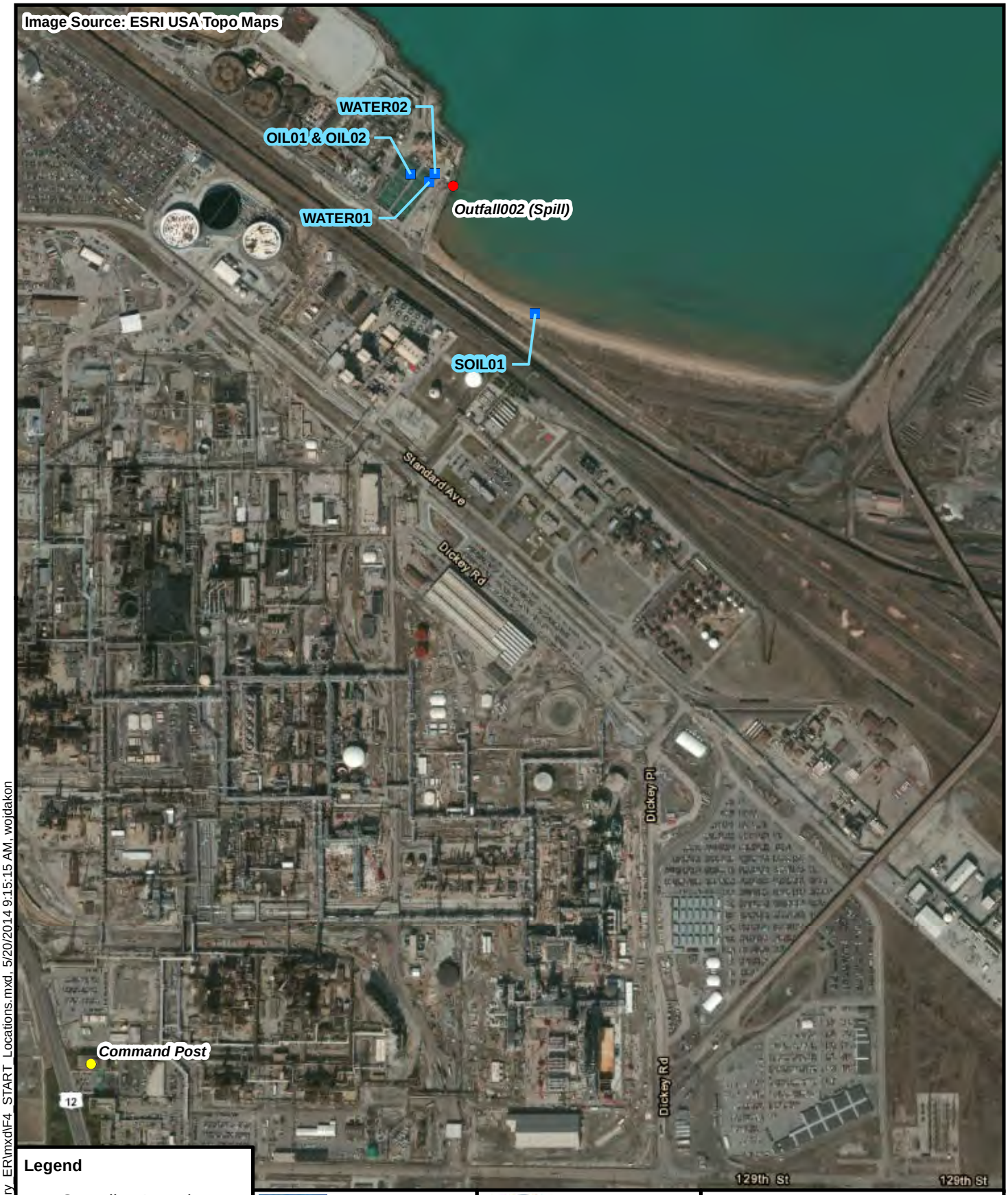
Figure 3
PRP Air Monitoring, Segment, and Survey Location Map
Whiting Refinery ER
Whiting, Lake County, Indiana

File: D:\Whiting_Refinery_ER\mxd\F3_PRP_Locations.mxd, 5/20/2014 9:14:18 AM, wojdakon



Legend

- Sampling Locations
- Command Post
- Outfall 002 (Spill)

0 1,000 Feet

N

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Figure 4
START Sampling Location Map
Whiting Refinery ER
Whiting, Lake County, Indiana

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ATTACHMENT B
PHOTOGRAPHIC LOG

Site: ER – Whiting Refinery
Photograph No.: 1 **Date:** 3/25/14
Direction: East **Photographer:** Jeff Bryniarski
Subject: Impacted shoreline

Site: ER – Whiting Refinery
Photograph No.: 2 **Date:** 3/25/14
Direction: North **Photographer:** Jeff Bryniarski
Subject: MSRC conducting vacuum truck operations at the #6 oil water separator

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Site: ER – Whiting Refinery
Photograph No.: 3 **Date:** 3/25/14
Direction: East **Photographer:** Jeff Bryniarski
Subject: MSRC maintaining boom along the shoreline

Site: ER – Whiting Refinery
Photograph No.: 4 **Date:** 3/26/14
Direction: Not Applicable (NA) **Photographer:** Sean Kane
Subject: SCAT observations along the shoreline

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Site: ER – Whiting Refinery
Photograph No.: 5 **Date:** 3/26/14
Direction: NA **Photographer:** Sean Kane
Subject: SCAT observations along the shoreline

Site: ER – Whiting Refinery
Photograph No.: 6 **Date:** 3/26/14
Direction: NA **Photographer:** Sean Kane
Subject: SCAT observations along the shoreline

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Site: ER – Whiting Refinery
Photograph No.: 7 **Date:** 3/26/14
Direction: North **Photographer:** Sean Kane
Subject: SCAT team conducting submerged oil assessment

Site: ER – Whiting Refinery
Photograph No.: 8 **Date:** 3/26/14
Direction: NA **Photographer:** Sean Kane
Subject: Oil-impacted hard boom

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Site: ER – Whiting Refinery
Photograph No.: 9 **Date:** 3/26/14
Direction: West **Photographer:** Sean Kane
Subject: Ground crews performing manual collection of tar balls/patties and oil-impacted sand and rocks along the shoreline

Site: ER – Whiting Refinery
Photograph No.: 10 **Date:** 3/26/14
Direction: West **Photographer:** Sean Kane
Subject: Oil-impacted sorbent boom

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Site: ER – Whiting Refinery
Photograph No.: 11 **Date:** 4/8/14
Direction: NA **Photographer:** Jeff Bryniarski
Subject: Staged waste pile consisting of soil, sand, and debris

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ATTACHMENT C
MULTI-MEDIA ANALYTICAL RESULTS SUMMARY TABLES

Table 1
Sampling Summary
ER-Whiting Refinery
Whiting, Lake County, Indiana

Sample ID No.	WCR-Water01-032714	WCR-Water02-033114	WCR-Oil02-032814	WCR-Soil01-040814	USCG ID: 14-133-1	USCG ID: 14-133-2	USCG ID: 14-133-3	USCG ID: 14-133-4	USCG ID: 14-133-5
Sample Description	Outfall 002	Outfall 002 Tap	#6 oil water separator	Split soil sample from staged waste pile	Weathered oil from shoreline segment "F"	Segment of oiled hard boom 1	Segment of oiled hard boom 2	Segment of oiled absorbent boom	#6 oil water separator (WCR-Oil01-032714)
Sample Type	Water	Water	Oil	Soil	Spill	Spill	Spill	Spill	Source
Sampling Date	3/27/2014	3/31/2014	3/28/2014	4/8/2014	3/31/2014	3/31/2014	3/31/2014	3/31/2014	3/27/2014
VOC	X	X	X						
SVOC	X	X	X						
Metals	X	X							
TPH-DRO			X	X					
TPH-GRO			X	X					
TPH-ORO			X	X					
Oil & Grease		X							
TOC		X							
Total Phenol		X							
Non-Polar Material		X							
Dry Bulk Density				X					
Wet Bulk Density				X					
Volumetric Moisture				X					
% Moisture				X					
Fingerprint - Forensic Oil					X	X	X	X	X

Notes:
DRO - Diesel range organic
GRO - Gasoline range organic
ID - Identification
ORO - Oil range organic
SVOC - Semivolatile organic compound
TOC - Total organic carbon
TPH - Total petroleum hydrocarbon
USCG - United States Coast Guard
VOC - Volatile organic compound

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Table 2
Oil, Soil, and Water Sample Analytical Results
ER-Whiting Refinery Site
Whiting, Lake County, Indiana

Location ID	WCR-Oil02	WCR-Soil01	WCR-Water01	WCR-Water02
Field Sample ID	WCR-Oil02-032814	WCR-Soil01-040814	WCR-Water01-032714	WCR-Water02-033114
Sample Type	Oil	Soil	Water	Water
Sample Date	3/28/2014	4/8/2014	3/27/2014	3/31/2014
Chemical Name	**Result**			
Other Parameters				
OIL AND GREASE (mg/L)	NA	NA	NA	5 U
TOTAL ORGANIC CARBON (mg/L)	NA	NA	NA	2.2
PHENOLICS, TOTAL (mg/L)	NA	NA	NA	0.01 U
Moisture (%)	NA	16	NA	NA
Moisture, by Volume (%)	NA	8.1	NA	NA
Density - Bulk, Dry (lbs/ft^3)	NA	68	NA	NA
Density - Bulk, Wet (lbs/ft^3)	NA	73	NA	NA
TPH (mg/kg)				
GRO (C6-C10)	8800	57	NA	NA
DRO (C10-C28)	210000	1100	NA	NA
ORO (C28-C40)	140000	670	NA	NA
TAL Metals (mg/L)				
ALUMINUM	NA	NA	0.05	0.032
ANTIMONY	NA	NA	0.005 U	0.005 U
ARSENIC	NA	NA	0.005 U	0.005 U
BARIUM	NA	NA	0.021	0.021
BERYLLIUM	NA	NA	0.002 U	0.002 U
CADMIUM	NA	NA	0.002 U	0.002 U
CALCIUM	NA	NA	36	36
CHROMIUM	NA	NA	0.005 U	0.005 U
COBALT	NA	NA	0.005 U	0.005 U
COPPER	NA	NA	0.01	0.016
IRON	NA	NA	0.088	0.08 U
LEAD	NA	NA	0.005 U	0.005 U
MAGNESIUM	NA	NA	13	13
MANGANESE	NA	NA	0.0083	0.005 U
MERCURY	NA	NA	0.0002 U	0.0002 U
NICKEL	NA	NA	0.005 U	0.005 U
POTASSIUM	NA	NA	1.9	1.8
SELENIUM	NA	NA	0.005 U	0.005 U
SILVER	NA	NA	0.005 U	0.005 U
SODIUM	NA	NA	13	12
THALLIUM	NA	NA	0.005 U	0.005 U
VANADIUM	NA	NA	0.005 U	0.005 U
ZINC	NA	NA	0.034	0.012
TCL VOC (Oil = mg/kg; Water = mg/L)				
1,1,1-TRICHLOROETHANE	40 U	NA	0.001 U	0.001 U
1,1,2,2-TETRACHLOROETHANE	40 U	NA	0.001 U	0.001 U
1,1,2-TRICHLOROETHANE	40 U	NA	0.001 U	0.001 U
1,1-DICHLOROETHANE	40 U	NA	0.001 U	0.001 U
1,1-DICHLOROETHYLENE	40 U	NA	0.001 U	0.001 U
1,2,4-TRICHLOROBENZENE	40 U	NA	0.001 U	0.001 U
1,2-DIBROMO-3-CHLOROPROPANE (DBCP)	40 U	NA	0.001 U	0.001 U
1,2-DIBROMOETHANE	40 U	NA	0.001 U	0.001 U
1,2-DICHLOROBENZENE	40 U	NA	0.001 U	0.001 U
1,2-DICHLOROETHANE	40 U	NA	0.001 U	0.001 U
1,2-DICHLOROPROPANE	40 U	NA	0.002 U	0.002 U
1,4-DICHLOROBENZENE	40 U	NA	0.002 U	0.002 U
2-BUTANONE	270 U	NA	0.005 U	0.005 U
4-METHYL-2-PENTANONE	40 U	NA	0.005 U	0.005 U
ACETONE	130 U	NA	0.02 U	0.02 U
BENZENE	40 U	NA	0.001 U	0.001 U
BROMODICHLOROMETHANE	40 U	NA	0.001 U	0.001 U
BROMOMETHANE	100 U	NA	0.001 U	0.001 U

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Table 2
Oil, Soil, and Water Sample Analytical Results
ER-Whiting Refinery Site
Whiting, Lake County, Indiana

Location ID	WCR-Oil02	WCR-Soil01	WCR-Water01	WCR-Water02
Field Sample ID	WCR-Oil02-032814	WCR-Soil01-040814	WCR-Water01-032714	WCR-Water02-033114
Sample Type	Oil	Soil	Water	Water
Sample Date	3/28/2014	4/8/2014	3/27/2014	3/31/2014
Chemical Name	**Result**			
CARBON DISULFIDE	40 U	NA	0.0025 U	0.0025 U
CARBON TETRACHLORIDE	40 U	NA	0.001 U	0.001 U
CFC-11	40 U	NA	0.001 U	0.001 U
CFC-12	40 U	NA	0.001 U	0.001 U
CHLORINATED FLUOROCARBON (FREON 113)	40 U	NA	0.001 U	0.001 U
CHLOROBENZENE	40 U	NA	0.001 U	0.001 U
CHLORODIBROMOMETHANE	40 U	NA	0.001 U	0.001 U
CHLOROETHANE	130 U	NA	0.001 U	0.001 U
CHLOROFORM	40 U	NA	0.001 U	0.001 U
CHLOROMETHANE	130 U	NA	0.001 U	0.001 U
CIS-1,2-DICHLOROETHENE	40 U	NA	0.001 U	0.001 U
CIS-1,3-DICHLOROPROPENE	40 U	NA	0.001 U	0.001 U
CYCLOHEXANE	2500	NA	0.005 U	0.005 U
DICHLOROMETHANE	40 U	NA	0.005 U	0.005 U
ETHYLBENZENE	380	NA	0.001 U	0.001 U
ISOPROPYLBENZENE	160	NA	0.001 U	0.001 U
M-DICHLOROBENZENE	40 U	NA	0.002 U	0.002 U
METHYL ACETATE	270 U	NA	0.002 U	0.002 U
METHYL N-BUTYL KETONE	40 U	NA	0.005 U	0.005 U
METHYL TERT-BUTYL ETHER	40 U	NA	0.005 U	0.005 U
METHYLBENZENE	380	NA	0.001 U	0.001 U
METHYLCYLOHEXANE	5100	NA	0.005 U	0.005 U
STYRENE (MONOMER)	40 U	NA	0.001 U	0.001 U
TETRACHLOROETHENE	40 U	NA	0.002 U	0.002 U
TRANS-1,2-DICHLOROETHENE	40 U	NA	0.001 U	0.001 U
TRANS-1,3-DICHLOROPROPENE	40 U	NA	0.001 U	0.001 U
TRIBOMOMETHANE	40 U	NA	0.001 U	0.001 U
TRICHLOROETHYLENE	40 U	NA	0.001 U	0.001 U
VINYL CHLORIDE	40 U	NA	0.001 U	0.001 U
XYLENES, TOTAL	1700	NA	0.003 U	0.003 U
TCL SVOC (Oil = mg/kg; Water = mg/L)				
1,1`-BIPHENYL	500 U	NA	0.005 U	0.005 U
1,2-BENZPHENANTHRACENE	500 U	NA	0.005 U	0.005 U
2,4,5-TRICHLOROPHENOL	500 U	NA	0.005 U	0.005 U
2,4,6-TRICHLOROPHENOL	500 U	NA	0.005 U	0.005 U
2,4-DICHLOROPHENOL	500 U	NA	0.01 U	0.01 U
2,4-DIMETHYLPHENOL	500 U	NA	0.005 U	0.005 U
2,4-DINITROPHENOL	500 U	NA	0.005 U	0.005 U
2,4-DINITROTOLUENE	500 U	NA	0.005 U	0.005 U
2,6-DINITROTOLUENE	500 U	NA	0.005 U	0.005 U
2-CHLORONAPHTHALENE	500 U	NA	0.005 U	0.005 U
2-CHLOROPHENOL	500 U	NA	0.005 U	0.005 U
2-METHYLNAPHTHALENE	500 U	NA	0.005 U	0.005 U
2-METHYLPHENOL	500 U	NA	0.005 U	0.005 U
2-NITROANILINE	500 U	NA	0.02 U	0.02 U
2-NITROPHENOL	500 U	NA	0.005 U	0.005 U
3,3'-DICHLOROBENZIDINE	500 U	NA	0.005 U	0.005 U
3,5,5-TRIMETHYL-2-CYCLOHEXENE-1-ONE	500 U	NA	0.005 U	0.005 U
3-NITROANILINE	500 U	NA	0.02 U	0.02 U
4,6-DINITRO-2-METHYLPHENOL	500 U	NA	0.02 U	0.02 U
4-BROMOPHENYL PHENYL ETHER	500 U	NA	0.005 U	0.005 U
4-CHLORO-3-METHYLPHENOL	500 U	NA	0.005 U	0.005 U
4-CHLOROPHENYL PHENYL ETHER	500 U	NA	0.005 U	0.005 U
4-METHYLPHENOL	500 U	NA	0.005 U	0.005 U
4-NITROPHENOL	500 U	NA	0.02 U	0.02 U

This document shall not be disclosed without the express written permission of the EPA.

Table 2
Oil, Soil, and Water Sample Analytical Results
ER-Whiting Refinery Site
Whiting, Lake County, Indiana

Location ID	WCR-Oil02	WCR-Soil01	WCR-Water01	WCR-Water02
Field Sample ID	WCR-Oil02-032814	WCR-Soil01-040814	WCR-Water01-032714	WCR-Water02-033114
Sample Type	Oil	Soil	Water	Water
Sample Date	3/28/2014	4/8/2014	3/27/2014	3/31/2014
Chemical Name	**Result**			
ACENAPHTHENE	500 U	NA	0.005 U	0.005 U
ACENAPHTHYLENE	500 U	NA	0.005 U	0.005 U
ACETOPHENONE	500 U	NA	0.001 U	0.001 U
ANTHRACENE	500 U	NA	0.005 U	0.005 U
ATRAZINE	500 U	NA	0.001 U	0.001 U
BENZALDEHYDE	500 U	NA	0.001 U	0.001 U
BENZO(A)ANTHRACENE	500 U	NA	0.005 U	0.005 U
BENZO(A)PYRENE	500 U	NA	0.005 U	0.005 U
BENZO(B)FLUORANTHENE	500 U	NA	0.005 U	0.005 U
BENZO(G,H,I)PERYLENE	500 U	NA	0.005 U	0.005 U
BENZO(K)FLUORANTHENE	500 U	NA	0.005 U	0.005 U
BENZYL BUTYL PHTHALATE	500 U	NA	0.005 U	0.005 U
BIS(2-CHLOROETHOXY)METHANE	500 U	NA	0.005 U	0.005 U
BIS(2-CHLOROETHYL)ETHER	500 U	NA	0.005 U	0.005 U
BIS(2-CHLOROISOPROPYL)ETHER	500 U	NA	0.005 U	0.005 U
BIS(2-ETHYLHEXYL)PHTHALATE	500 U	NA	0.005 U	0.005 U
CAPROLACTAM	500 U	NA	0.01 U	0.01 U
CARBAZOLE	500 U	NA	0.01 U	0.01 U
DIBENZO(A,H)ANTHRACENE	500 U	NA	0.005 U	0.005 U
DIBENZOFURAN	500 U	NA	0.005 U	0.005 U
DIETHYL PHTHALATE	500 U	NA	0.02 U	0.02 U
DIMETHYL PHTHALATE	500 U	NA	0.02 U	0.02 U
DI-N-BUTYL PHTHALATE	500 U	NA	0.005 U	0.005 U
DI-N-OCTYL PHTHALATE	500 U	NA	0.005 U	0.005 U
FLUORANTHENE	500 U	NA	0.005 U	0.005 U
FLUORENE	500 U	NA	0.005 U	0.005 U
HEXACHLORO-1,3-BUTADIENE	500 U	NA	0.005 U	0.005 U
HEXACHLOROBENZENE	500 U	NA	0.005 U	0.005 U
HEXACHLOROCYCLOPENTADIENE	500 U	NA	0.02 U	0.02 U
HEXACHLOROETHANE	500 U	NA	0.005 U	0.005 U
INDENO(1,2,3-CD)PYRENE	500 U	NA	0.005 U	0.005 U
NAPHTHALENE	500 U	NA	0.005 U	0.005 U
NITROBENZENE	500 U	NA	0.005 U	0.005 U
N-NITROSODI-N-PROPYLAMINE	500 U	NA	0.005 U	0.005 U
N-NITROSODIPHENYLAMINE	500 U	NA	0.005 U	0.005 U
P-CHLOROANILINE	500 U	NA	0.02 U	0.02 U
PENTACHLOROPHENOL	500 U	NA	0.02 U	0.02 U
PHENANTHRENE	500 U	NA	0.005 U	0.005 U
PHENOL	500 U	NA	0.005 U	0.005 U
P-NITROANILINE	500 U	NA	0.02 U	0.02 U
PYRENE	500 U	NA	0.005 U	0.005 U

Notes:
% - Percent
ID - Identification
lbs/ft^3 - Pounds per cubic feet
mg/kg - Milligram per kilogram
mg/L - Milligram per liter
NA - Not analyzed
SVOC - Semivolatile organic compound
TAL - Target analyte list
TCL - Target compound list
U - Not detected
VOC - Volatile organic compound

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ATTACHMENT D
LABORATORY ANALYTICAL RESULTS AND DATA VALIDATION REPORTS FOR MULTI-MEDIA SAMPLES

10-Apr-2014

Lisa Graczyk
Weston Solutions, Inc
20 North Wacker Drive
Suite 1210
Chicago, IL 60606

Re: **Whiting Crude Release** Work Order: **1404057**

Dear Lisa,

ALS Environmental received 2 samples on 01-Apr-2014 for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

Sample results are compliant with NELAP standard requirements and QC results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 45.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Electronically approved by: Tom Beamish

Tom Beamish
Senior Project Manager

Certificate No: MN 532786

ADDRESS 3352 128th Avenue Holland, Michigan 49424-9263 | PHONE (616) 399-6070 | FAX (616) 399-6185
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ALS Group USA, Corp

Date: 10-Apr-14

Client: Weston Solutions, Inc
Project: Whiting Crude Release
Work Order: **1404057**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1404057-01	WCR-Water01-032714	Water		03/27/14 17:10	04/01/14 10:00	☐
1404057-02	WCR-Oil02-032814	Oil		03/28/14 12:50	04/01/14 10:00	☐

ALS Group USA, Corp

Date: 10-Apr-14

Client: Weston Solutions, Inc
Project: Whiting Crude Release
WorkOrder: **1404057**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte is present at an estimated concentration between the MDL and Report Limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

Units Reported	Description
mg/Kg	Milligrams per Kilogram
mg/L	Milligrams per Liter

ALS Group USA, Corp

Date: 10-Apr-14

Client: Weston Solutions, Inc
Project: Whiting Crude Release
Work Order: 1404057

Case Narrative

Analytical Comments:

Batch 57294, Method DRO_8015_O, Sample 1404057-02A: One or more DRO surrogate recoveries are unavailable due to dilution below the calibration range.

ALS Group USA, Corp

Date: *10-Apr-14*

Client: Weston Solutions, Inc
Project: Whiting Crude Release
Sample ID: WCR-Water01-032714
Collection Date: 03/27/14 05:10 PM

Work Order: 1404057
Lab ID: 1404057-01
Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7470**		Prep: SW7470 / 4/4/14	Analyst: **LR**
Mercury	ND		0.00020	mg/L	1	04/07/14 02:44 PM
METALS BY ICP-MS			**SW6020A**		Prep: SW3005A / 4/3/14	Analyst: **ML**
Aluminum	**0.050**		**0.010**	**mg/L**	1	04/03/14 10:15 PM
Antimony	ND		0.0050	mg/L	1	04/03/14 10:15 PM
Arsenic	ND		0.0050	mg/L	1	04/03/14 10:15 PM
Barium	**0.021**		**0.0050**	**mg/L**	1	04/03/14 10:15 PM
Beryllium	ND		0.0020	mg/L	1	04/03/14 10:15 PM
Cadmium	ND		0.0020	mg/L	1	04/03/14 10:15 PM
Calcium	**36**		**0.50**	**mg/L**	1	04/03/14 10:15 PM
Chromium	ND		0.0050	mg/L	1	04/03/14 10:15 PM
Cobalt	ND		0.0050	mg/L	1	04/03/14 10:15 PM
Copper	**0.010**		**0.0050**	**mg/L**	1	04/03/14 10:15 PM
Iron	**0.088**		**0.080**	**mg/L**	1	04/03/14 10:15 PM
Lead	ND		0.0050	mg/L	1	04/03/14 10:15 PM
Magnesium	**13**		**0.20**	**mg/L**	1	04/03/14 10:15 PM
Manganese	**0.0083**		**0.0050**	**mg/L**	1	04/03/14 10:15 PM
Nickel	ND		0.0050	mg/L	1	04/03/14 10:15 PM
Potassium	**1.9**		**0.20**	**mg/L**	1	04/03/14 10:15 PM
Selenium	ND		0.0050	mg/L	1	04/03/14 10:15 PM
Silver	ND		0.0050	mg/L	1	04/03/14 10:15 PM
Sodium	**13**		**0.20**	**mg/L**	1	04/03/14 10:15 PM
Thallium	ND		0.0050	mg/L	1	04/03/14 10:15 PM
Vanadium	ND		0.0050	mg/L	1	04/03/14 10:15 PM
Zinc	**0.034**		**0.010**	**mg/L**	1	04/03/14 10:15 PM
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep: SW3510 / 4/2/14	Analyst: **RM**
1,1`-Biphenyl	ND		0.0050	mg/L	1	04/03/14 04:48 AM
2,4,5-Trichlorophenol	ND		0.0050	mg/L	1	04/03/14 04:48 AM
2,4,6-Trichlorophenol	ND		0.0050	mg/L	1	04/03/14 04:48 AM
2,4-Dichlorophenol	ND		0.010	mg/L	1	04/03/14 04:48 AM
2,4-Dimethylphenol	ND		0.0050	mg/L	1	04/03/14 04:48 AM
2,4-Dinitrophenol	ND		0.0050	mg/L	1	04/03/14 04:48 AM
2,4-Dinitrotoluene	ND		0.0050	mg/L	1	04/03/14 04:48 AM
2,6-Dinitrotoluene	ND		0.0050	mg/L	1	04/03/14 04:48 AM
2-Chloronaphthalene	ND		0.0050	mg/L	1	04/03/14 04:48 AM
2-Chlorophenol	ND		0.0050	mg/L	1	04/03/14 04:48 AM
2-Methylnaphthalene	ND		0.0050	mg/L	1	04/03/14 04:48 AM
2-Methylphenol	ND		0.0050	mg/L	1	04/03/14 04:48 AM
2-Nitroaniline	ND		0.020	mg/L	1	04/03/14 04:48 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *10-Apr-14*

Client: Weston Solutions, Inc
Project: Whiting Crude Release
Sample ID: WCR-Water01-032714
Collection Date: 03/27/14 05:10 PM

Work Order: 1404057
Lab ID: 1404057-01
Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
2-Nitrophenol	ND		0.0050	mg/L	1	04/03/14 04:48 AM
3,3´-Dichlorobenzidine	ND		0.0050	mg/L	1	04/03/14 04:48 AM
3-Nitroaniline	ND		0.020	mg/L	1	04/03/14 04:48 AM
4,6-Dinitro-2-methylphenol	ND		0.020	mg/L	1	04/03/14 04:48 AM
4-Bromophenyl phenyl ether	ND		0.0050	mg/L	1	04/03/14 04:48 AM
4-Chloro-3-methylphenol	ND		0.0050	mg/L	1	04/03/14 04:48 AM
4-Chloroaniline	ND		0.020	mg/L	1	04/03/14 04:48 AM
4-Chlorophenyl phenyl ether	ND		0.0050	mg/L	1	04/03/14 04:48 AM
4-Methylphenol	ND		0.0050	mg/L	1	04/03/14 04:48 AM
4-Nitroaniline	ND		0.020	mg/L	1	04/03/14 04:48 AM
4-Nitrophenol	ND		0.020	mg/L	1	04/03/14 04:48 AM
Acenaphthene	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Acenaphthylene	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Acetophenone	ND		0.0010	mg/L	1	04/03/14 04:48 AM
Anthracene	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Atrazine	ND		0.0010	mg/L	1	04/03/14 04:48 AM
Benzaldehyde	ND		0.0010	mg/L	1	04/03/14 04:48 AM
Benzo(a)anthracene	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Benzo(a)pyrene	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Benzo(b)fluoranthene	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Benzo(g,h,i)perylene	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Benzo(k)fluoranthene	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Bis(2-chloroethoxy)methane	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Bis(2-chloroethyl)ether	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Bis(2-chloroisopropyl)ether	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Bis(2-ethylhexyl)phthalate	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Butyl benzyl phthalate	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Caprolactam	ND		0.010	mg/L	1	04/03/14 04:48 AM
Carbazole	ND		0.010	mg/L	1	04/03/14 04:48 AM
Chrysene	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Dibenzo(a,h)anthracene	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Dibenzofuran	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Diethyl phthalate	ND		0.020	mg/L	1	04/03/14 04:48 AM
Dimethyl phthalate	ND		0.020	mg/L	1	04/03/14 04:48 AM
Di-n-butyl phthalate	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Di-n-octyl phthalate	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Fluoranthene	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Fluorene	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Hexachlorobenzene	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Hexachlorobutadiene	ND		0.0050	mg/L	1	04/03/14 04:48 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *10-Apr-14*

Client: Weston Solutions, Inc
Project: Whiting Crude Release
Sample ID: WCR-Water01-032714
Collection Date: 03/27/14 05:10 PM

Work Order: 1404057
Lab ID: 1404057-01
Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Hexachlorocyclopentadiene	ND		0.020	mg/L	1	04/03/14 04:48 AM
Hexachloroethane	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Indeno(1,2,3-cd)pyrene	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Isophorone	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Naphthalene	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Nitrobenzene	ND		0.0050	mg/L	1	04/03/14 04:48 AM
N-Nitrosodi-n-propylamine	ND		0.0050	mg/L	1	04/03/14 04:48 AM
N-Nitrosodiphenylamine	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Pentachlorophenol	ND		0.020	mg/L	1	04/03/14 04:48 AM
Phenanthrene	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Phenol	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Pyrene	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Surr: 2,4,6-Tribromophenol	*86.7*		*32-115*	*%REC*	1	04/03/14 04:48 AM
Surr: 2-Fluorobiphenyl	*72.5*		*32-100*	*%REC*	1	04/03/14 04:48 AM
Surr: 2-Fluorophenol	*39.6*		*22-59*	*%REC*	1	04/03/14 04:48 AM
Surr: 4-Terphenyl-d14	*90.2*		*23-112*	*%REC*	1	04/03/14 04:48 AM
Surr: Nitrobenzene-d5	*88.7*		*31-93*	*%REC*	1	04/03/14 04:48 AM
Surr: Phenol-d6	*22.3*		*13-36*	*%REC*	1	04/03/14 04:48 AM
VOLATILE ORGANIC COMPOUNDS			**SW8260**			Analyst: **BG**
1,1,1-Trichloroethane	ND		0.0010	mg/L	1	04/03/14 03:32 AM
1,1,2,2-Tetrachloroethane	ND		0.0010	mg/L	1	04/03/14 03:32 AM
1,1,2-Trichloroethane	ND		0.0010	mg/L	1	04/03/14 03:32 AM
1,1,2-Trichlorotrifluoroethane	ND		0.0010	mg/L	1	04/03/14 03:32 AM
1,1-Dichloroethane	ND		0.0010	mg/L	1	04/03/14 03:32 AM
1,1-Dichloroethene	ND		0.0010	mg/L	1	04/03/14 03:32 AM
1,2,4-Trichlorobenzene	ND		0.0010	mg/L	1	04/03/14 03:32 AM
1,2-Dibromo-3-chloropropane	ND		0.0010	mg/L	1	04/03/14 03:32 AM
1,2-Dibromoethane	ND		0.0010	mg/L	1	04/03/14 03:32 AM
1,2-Dichlorobenzene	ND		0.0010	mg/L	1	04/03/14 03:32 AM
1,2-Dichloroethane	ND		0.0010	mg/L	1	04/03/14 03:32 AM
1,2-Dichloropropane	ND		0.0020	mg/L	1	04/03/14 03:32 AM
1,3-Dichlorobenzene	ND		0.0020	mg/L	1	04/03/14 03:32 AM
1,4-Dichlorobenzene	ND		0.0020	mg/L	1	04/03/14 03:32 AM
2-Butanone	ND		0.0050	mg/L	1	04/03/14 03:32 AM
2-Hexanone	ND		0.0050	mg/L	1	04/03/14 03:32 AM
4-Methyl-2-pentanone	ND		0.0050	mg/L	1	04/03/14 03:32 AM
Acetone	ND		0.020	mg/L	1	04/03/14 03:32 AM
Benzene	ND		0.0010	mg/L	1	04/03/14 03:32 AM
Bromodichloromethane	ND		0.0010	mg/L	1	04/03/14 03:32 AM
Bromoform	ND		0.0010	mg/L	1	04/03/14 03:32 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *10-Apr-14*

Client: Weston Solutions, Inc
Project: Whiting Crude Release
Sample ID: WCR-Water01-032714
Collection Date: 03/27/14 05:10 PM

Work Order: 1404057
Lab ID: 1404057-01
Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Bromomethane	ND		0.0010	mg/L	1	04/03/14 03:32 AM
Carbon disulfide	ND		0.0025	mg/L	1	04/03/14 03:32 AM
Carbon tetrachloride	ND		0.0010	mg/L	1	04/03/14 03:32 AM
Chlorobenzene	ND		0.0010	mg/L	1	04/03/14 03:32 AM
Chloroethane	ND		0.0010	mg/L	1	04/03/14 03:32 AM
Chloroform	ND		0.0010	mg/L	1	04/03/14 03:32 AM
Chloromethane	ND		0.0010	mg/L	1	04/03/14 03:32 AM
cis-1,2-Dichloroethene	ND		0.0010	mg/L	1	04/03/14 03:32 AM
cis-1,3-Dichloropropene	ND		0.0010	mg/L	1	04/03/14 03:32 AM
Cyclohexane	ND		0.0050	mg/L	1	04/03/14 03:32 AM
Dibromochloromethane	ND		0.0010	mg/L	1	04/03/14 03:32 AM
Dichlorodifluoromethane	ND		0.0010	mg/L	1	04/03/14 03:32 AM
Ethylbenzene	ND		0.0010	mg/L	1	04/03/14 03:32 AM
Isopropylbenzene	ND		0.0010	mg/L	1	04/03/14 03:32 AM
Methyl acetate	ND		0.0020	mg/L	1	04/03/14 03:32 AM
Methyl tert-butyl ether	ND		0.0050	mg/L	1	04/03/14 03:32 AM
Methylcyclohexane	ND		0.0050	mg/L	1	04/03/14 03:32 AM
Methylene chloride	ND		0.0050	mg/L	1	04/03/14 03:32 AM
Styrene	ND		0.0010	mg/L	1	04/03/14 03:32 AM
Tetrachloroethene	ND		0.0020	mg/L	1	04/03/14 03:32 AM
Toluene	ND		0.0010	mg/L	1	04/03/14 03:32 AM
trans-1,2-Dichloroethene	ND		0.0010	mg/L	1	04/03/14 03:32 AM
trans-1,3-Dichloropropene	ND		0.0010	mg/L	1	04/03/14 03:32 AM
Trichloroethene	ND		0.0010	mg/L	1	04/03/14 03:32 AM
Trichlorofluoromethane	ND		0.0010	mg/L	1	04/03/14 03:32 AM
Vinyl chloride	ND		0.0010	mg/L	1	04/03/14 03:32 AM
Xylenes, Total	ND		0.0030	mg/L	1	04/03/14 03:32 AM
Surr: 1,2-Dichloroethane-d4	*102*		*70-120*	*%REC*	1	04/03/14 03:32 AM
Surr: 4-Bromofluorobenzene	*97.2*		*75-120*	*%REC*	1	04/03/14 03:32 AM
Surr: Dibromofluoromethane	*97.0*		*85-115*	*%REC*	1	04/03/14 03:32 AM
Surr: Toluene-d8	*98.6*		*85-120*	*%REC*	1	04/03/14 03:32 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *10-Apr-14*

Client: Weston Solutions, Inc
Project: Whiting Crude Release
Sample ID: WCR-Oil02-032814
Collection Date: 03/28/14 12:50 PM

Work Order: 1404057
Lab ID: 1404057-02
Matrix: OIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep: SW3580 / 4/4/14	Analyst: **IT**
DRO (C10-C28)	**210,000**		**1.0**	**mg/Kg**	5	04/04/14 01:28 PM
ORO (C28-C40)	**140,000**		**1.0**	**mg/Kg**	5	04/04/14 01:28 PM
Surr: 4-Terphenyl-d14	*16.1*	S	*39-115*	*%REC*	5	04/04/14 01:28 PM
GASOLINE RANGE ORGANICS BY GC-FID			**SW8015**		Prep: SW5035 / 4/2/14	Analyst: **IT**
GRO (C6-C10)	**8,800**		**170**	**mg/Kg**	1	04/02/14 11:09 PM
Surr: Toluene-d8	*91.4*		*50-150*	*%REC*	1	04/02/14 11:09 PM
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep: SW3580 / 4/4/14	Analyst: **RM**
1,1`-Biphenyl	ND		500	mg/Kg	5	04/09/14 01:06 AM
2,4,5-Trichlorophenol	ND		500	mg/Kg	5	04/09/14 01:06 AM
2,4,6-Trichlorophenol	ND		500	mg/Kg	5	04/09/14 01:06 AM
2,4-Dichlorophenol	ND		500	mg/Kg	5	04/09/14 01:06 AM
2,4-Dimethylphenol	ND		500	mg/Kg	5	04/09/14 01:06 AM
2,4-Dinitrophenol	ND		500	mg/Kg	5	04/09/14 01:06 AM
2,4-Dinitrotoluene	ND		500	mg/Kg	5	04/09/14 01:06 AM
2,6-Dinitrotoluene	ND		500	mg/Kg	5	04/09/14 01:06 AM
2-Chloronaphthalene	ND		500	mg/Kg	5	04/09/14 01:06 AM
2-Chlorophenol	ND		500	mg/Kg	5	04/09/14 01:06 AM
2-Methylnaphthalene	ND		500	mg/Kg	5	04/09/14 01:06 AM
2-Methylphenol	ND		500	mg/Kg	5	04/09/14 01:06 AM
2-Nitroaniline	ND		500	mg/Kg	5	04/09/14 01:06 AM
2-Nitrophenol	ND		500	mg/Kg	5	04/09/14 01:06 AM
3,3´-Dichlorobenzidine	ND		500	mg/Kg	5	04/09/14 01:06 AM
3-Nitroaniline	ND		500	mg/Kg	5	04/09/14 01:06 AM
4,6-Dinitro-2-methylphenol	ND		500	mg/Kg	5	04/09/14 01:06 AM
4-Bromophenyl phenyl ether	ND		500	mg/Kg	5	04/09/14 01:06 AM
4-Chloro-3-methylphenol	ND		500	mg/Kg	5	04/09/14 01:06 AM
4-Chloroaniline	ND		500	mg/Kg	5	04/09/14 01:06 AM
4-Chlorophenyl phenyl ether	ND		500	mg/Kg	5	04/09/14 01:06 AM
4-Methylphenol	ND		500	mg/Kg	5	04/09/14 01:06 AM
4-Nitroaniline	ND		500	mg/Kg	5	04/09/14 01:06 AM
4-Nitrophenol	ND		500	mg/Kg	5	04/09/14 01:06 AM
Acenaphthene	ND		500	mg/Kg	5	04/09/14 01:06 AM
Acenaphthylene	ND		500	mg/Kg	5	04/09/14 01:06 AM
Acetophenone	ND		500	mg/Kg	5	04/09/14 01:06 AM
Anthracene	ND		500	mg/Kg	5	04/09/14 01:06 AM
Atrazine	ND		500	mg/Kg	5	04/09/14 01:06 AM
Benzaldehyde	ND		500	mg/Kg	5	04/09/14 01:06 AM
Benzo(a)anthracene	ND		500	mg/Kg	5	04/09/14 01:06 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *10-Apr-14*

Client: Weston Solutions, Inc
Project: Whiting Crude Release
Work Order: 1404057
Sample ID: WCR-Oil02-032814
Lab ID: 1404057-02
Collection Date: 03/28/14 12:50 PM
Matrix: OIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Benzo(a)pyrene	ND		500	mg/Kg	5	04/09/14 01:06 AM
Benzo(b)fluoranthene	ND		500	mg/Kg	5	04/09/14 01:06 AM
Benzo(g,h,i)perylene	ND		500	mg/Kg	5	04/09/14 01:06 AM
Benzo(k)fluoranthene	ND		500	mg/Kg	5	04/09/14 01:06 AM
Bis(2-chloroethoxy)methane	ND		500	mg/Kg	5	04/09/14 01:06 AM
Bis(2-chloroethyl)ether	ND		500	mg/Kg	5	04/09/14 01:06 AM
Bis(2-chloroisopropyl)ether	ND		500	mg/Kg	5	04/09/14 01:06 AM
Bis(2-ethylhexyl)phthalate	ND		500	mg/Kg	5	04/09/14 01:06 AM
Butyl benzyl phthalate	ND		500	mg/Kg	5	04/09/14 01:06 AM
Caprolactam	ND		500	mg/Kg	5	04/09/14 01:06 AM
Carbazole	ND		500	mg/Kg	5	04/09/14 01:06 AM
Chrysene	ND		500	mg/Kg	5	04/09/14 01:06 AM
Dibenzo(a,h)anthracene	ND		500	mg/Kg	5	04/09/14 01:06 AM
Dibenzofuran	ND		500	mg/Kg	5	04/09/14 01:06 AM
Diethyl phthalate	ND		500	mg/Kg	5	04/09/14 01:06 AM
Dimethyl phthalate	ND		500	mg/Kg	5	04/09/14 01:06 AM
Di-n-butyl phthalate	ND		500	mg/Kg	5	04/09/14 01:06 AM
Di-n-octyl phthalate	ND		500	mg/Kg	5	04/09/14 01:06 AM
Fluoranthene	ND		500	mg/Kg	5	04/09/14 01:06 AM
Fluorene	ND		500	mg/Kg	5	04/09/14 01:06 AM
Hexachlorobenzene	ND		500	mg/Kg	5	04/09/14 01:06 AM
Hexachlorobutadiene	ND		500	mg/Kg	5	04/09/14 01:06 AM
Hexachlorocyclopentadiene	ND		500	mg/Kg	5	04/09/14 01:06 AM
Hexachloroethane	ND		500	mg/Kg	5	04/09/14 01:06 AM
Indeno(1,2,3-cd)pyrene	ND		500	mg/Kg	5	04/09/14 01:06 AM
Isophorone	ND		500	mg/Kg	5	04/09/14 01:06 AM
Naphthalene	ND		500	mg/Kg	5	04/09/14 01:06 AM
Nitrobenzene	ND		500	mg/Kg	5	04/09/14 01:06 AM
N-Nitrosodi-n-propylamine	ND		500	mg/Kg	5	04/09/14 01:06 AM
N-Nitrosodiphenylamine	ND		500	mg/Kg	5	04/09/14 01:06 AM
Pentachlorophenol	ND		500	mg/Kg	5	04/09/14 01:06 AM
Phenanthrene	ND		500	mg/Kg	5	04/09/14 01:06 AM
Phenol	ND		500	mg/Kg	5	04/09/14 01:06 AM
Pyrene	ND		500	mg/Kg	5	04/09/14 01:06 AM
Surr: 2,4,6-Tribromophenol	*0*		*0-0*	*%REC*	5	04/09/14 01:06 AM
Surr: 2-Fluorobiphenyl	*0*		*0-0*	*%REC*	5	04/09/14 01:06 AM
Surr: 2-Fluorophenol	*0*		*0-0*	*%REC*	5	04/09/14 01:06 AM
Surr: 4-Terphenyl-d14	*0*		*0-0*	*%REC*	5	04/09/14 01:06 AM
Surr: Nitrobenzene-d5	*0*		*0-0*	*%REC*	5	04/09/14 01:06 AM
Surr: Phenol-d6	*0*		*0-0*	*%REC*	5	04/09/14 01:06 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *10-Apr-14*

Client: Weston Solutions, Inc
Project: Whiting Crude Release
Sample ID: WCR-Oil02-032814
Collection Date: 03/28/14 12:50 PM

Work Order: 1404057
Lab ID: 1404057-02
Matrix: OIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS			**SW8260B**		Prep: SW5035 / 4/2/14	Analyst: **BG**
1,1,1-Trichloroethane	ND		40	mg/Kg	20	04/03/14 04:54 PM
1,1,2,2-Tetrachloroethane	ND		40	mg/Kg	20	04/03/14 04:54 PM
1,1,2-Trichloroethane	ND		40	mg/Kg	20	04/03/14 04:54 PM
1,1,2-Trichlorotrifluoroethane	ND		40	mg/Kg	20	04/03/14 04:54 PM
1,1-Dichloroethane	ND		40	mg/Kg	20	04/03/14 04:54 PM
1,1-Dichloroethene	ND		40	mg/Kg	20	04/03/14 04:54 PM
1,2,4-Trichlorobenzene	ND		40	mg/Kg	20	04/03/14 04:54 PM
1,2-Dibromo-3-chloropropane	ND		40	mg/Kg	20	04/03/14 04:54 PM
1,2-Dibromoethane	ND		40	mg/Kg	20	04/03/14 04:54 PM
1,2-Dichlorobenzene	ND		40	mg/Kg	20	04/03/14 04:54 PM
1,2-Dichloroethane	ND		40	mg/Kg	20	04/03/14 04:54 PM
1,2-Dichloropropane	ND		40	mg/Kg	20	04/03/14 04:54 PM
1,3-Dichlorobenzene	ND		40	mg/Kg	20	04/03/14 04:54 PM
1,4-Dichlorobenzene	ND		40	mg/Kg	20	04/03/14 04:54 PM
2-Butanone	ND		270	mg/Kg	20	04/03/14 04:54 PM
2-Hexanone	ND		40	mg/Kg	20	04/03/14 04:54 PM
4-Methyl-2-pentanone	ND		40	mg/Kg	20	04/03/14 04:54 PM
Acetone	ND		130	mg/Kg	20	04/03/14 04:54 PM
Benzene	ND		40	mg/Kg	20	04/03/14 04:54 PM
Bromodichloromethane	ND		40	mg/Kg	20	04/03/14 04:54 PM
Bromoform	ND		40	mg/Kg	20	04/03/14 04:54 PM
Bromomethane	ND		100	mg/Kg	20	04/03/14 04:54 PM
Carbon disulfide	ND		40	mg/Kg	20	04/03/14 04:54 PM
Carbon tetrachloride	ND		40	mg/Kg	20	04/03/14 04:54 PM
Chlorobenzene	ND		40	mg/Kg	20	04/03/14 04:54 PM
Chloroethane	ND		130	mg/Kg	20	04/03/14 04:54 PM
Chloroform	ND		40	mg/Kg	20	04/03/14 04:54 PM
Chloromethane	ND		130	mg/Kg	20	04/03/14 04:54 PM
cis-1,2-Dichloroethene	ND		40	mg/Kg	20	04/03/14 04:54 PM
cis-1,3-Dichloropropene	ND		40	mg/Kg	20	04/03/14 04:54 PM
Cyclohexane	**2,500**		**40**	**mg/Kg**	20	04/03/14 04:54 PM
Dibromochloromethane	ND		40	mg/Kg	20	04/03/14 04:54 PM
Dichlorodifluoromethane	ND		40	mg/Kg	20	04/03/14 04:54 PM
Ethylbenzene	**380**		**40**	**mg/Kg**	20	04/03/14 04:54 PM
Isopropylbenzene	**160**		**40**	**mg/Kg**	20	04/03/14 04:54 PM
Methyl acetate	ND		270	mg/Kg	20	04/03/14 04:54 PM
Methyl tert-butyl ether	ND		40	mg/Kg	20	04/03/14 04:54 PM
Methylcyclohexane	**5,100**		**40**	**mg/Kg**	20	04/03/14 04:54 PM
Methylene chloride	ND		40	mg/Kg	20	04/03/14 04:54 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *10-Apr-14*

Client: Weston Solutions, Inc
Project: Whiting Crude Release
Sample ID: WCR-Oil02-032814
Collection Date: 03/28/14 12:50 PM

Work Order: 1404057
Lab ID: 1404057-02
Matrix: OIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Styrene	ND		40	mg/Kg	20	04/03/14 04:54 PM
Tetrachloroethene	ND		40	mg/Kg	20	04/03/14 04:54 PM
Toluene	**380**		**40**	**mg/Kg**	20	04/03/14 04:54 PM
trans-1,2-Dichloroethene	ND		40	mg/Kg	20	04/03/14 04:54 PM
trans-1,3-Dichloropropene	ND		40	mg/Kg	20	04/03/14 04:54 PM
Trichloroethene	ND		40	mg/Kg	20	04/03/14 04:54 PM
Trichlorofluoromethane	ND		40	mg/Kg	20	04/03/14 04:54 PM
Vinyl chloride	ND		40	mg/Kg	20	04/03/14 04:54 PM
Xylenes, Total	**1,700**		**120**	**mg/Kg**	20	04/03/14 04:54 PM
Surr: 1,2-Dichloroethane-d4	*95.6*		*70-130*	*%REC*	20	04/03/14 04:54 PM
Surr: 4-Bromofluorobenzene	*112*		*70-130*	*%REC*	20	04/03/14 04:54 PM
Surr: Dibromofluoromethane	*92.2*		*70-130*	*%REC*	20	04/03/14 04:54 PM
Surr: Toluene-d8	*106*		*70-130*	*%REC*	20	04/03/14 04:54 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: 10-Apr-14

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57294** Instrument ID **GC8** Method: **SW8015M**

MBLK Sample ID: **MBLK-57294-57294** Units: **mg/Kg** Analysis Date: **04/04/14 12:28 PM**

Client ID: Run ID: **GC8_140404B** SeqNo: **2700677** Prep Date: **04/04/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	ND	1,000								
ORO (C28-C40)	ND	1,000								
Surr: 4-Terphenyl-d14	*410.3*	0	*500*	0	*82.1*	*39-115*	0			

LCS Sample ID: **LCS-57294-57294** Units: **mg/Kg** Analysis Date: **04/04/14 12:58 PM**

Client ID: Run ID: **GC8_140404B** SeqNo: **2700679** Prep Date: **04/04/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	44410	1,000	50000	0	88.8	49-124	0			
ORO (C28-C40)	45690	1,000	50000	0	91.4	60-130	0			
Surr: 4-Terphenyl-d14	*414.7*	0	*500*	0	*82.9*	*39-115*	0			

The following samples were analyzed in this batch: 1404057-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57147** Instrument ID **GC9** Method: **SW8015**

MBLK Sample ID: **MBLK-57147-57147** Units: **µg/Kg** Analysis Date: **04/02/14 06:28 PM**

Client ID: Run ID: **GC9_140402B** SeqNo: **2696853** Prep Date: **04/02/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	ND	2,500								
Surr: Toluene-d8	*4986*	0	*5000*	0	*99.7*	*50-150*	0			

LCS Sample ID: **LCS-57147-57147** Units: **µg/Kg** Analysis Date: **04/02/14 04:46 PM**

Client ID: Run ID: **GC9_140402B** SeqNo: **2696851** Prep Date: **04/02/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	607100	2,500	500000	0	121	70-130	0			
Surr: Toluene-d8	*4466*	0	*5000*	0	*89.3*	*50-150*	0			

MS Sample ID: **1404093-01A MS** Units: **µg/Kg** Analysis Date: **04/03/14 02:40 AM**

Client ID: Run ID: **GC9_140402B** SeqNo: **2696869** Prep Date: **04/02/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	518300	2,500	500000	0	104	70-130	0			
Surr: Toluene-d8	*4608*	0	*5000*	0	*92.2*	*50-150*	0			

MSD Sample ID: **1404093-01A MSD** Units: **µg/Kg** Analysis Date: **04/03/14 03:06 AM**

Client ID: Run ID: **GC9_140402B** SeqNo: **2696870** Prep Date: **04/02/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	526300	2,500	500000	0	105	70-130	518300	1.53	30	
Surr: Toluene-d8	*4426*	0	*5000*	0	*88.5*	*50-150*	4608	*4.03*	*30*	

The following samples were analyzed in this batch: 1404057-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57254** Instrument ID **HG1** Method: **SW7470**

MBLK Sample ID: **MBLK-57254-57254** Units: **mg/L** Analysis Date: **04/07/14 02:33 PM**

Client ID: Run ID: **HG1_140407A** SeqNo: **2701501** Prep Date: **04/04/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	ND	0.00020								

LCS Sample ID: **LCS-57254-57254** Units: **mg/L** Analysis Date: **04/07/14 02:35 PM**

Client ID: Run ID: **HG1_140407A** SeqNo: **2701502** Prep Date: **04/04/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00193	0.00020	0.002	0	96.5	80-120		0		

MS Sample ID: **1404057-01CMS** Units: **mg/L** Analysis Date: **04/07/14 02:47 PM**

Client ID: **WCR-Water01-032714** Run ID: **HG1_140407A** SeqNo: **2701509** Prep Date: **04/04/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.002061	0.00020	0.002	-0.000023	104	75-125		0		

MSD Sample ID: **1404057-01CMSD** Units: **mg/L** Analysis Date: **04/07/14 02:56 PM**

Client ID: **WCR-Water01-032714** Run ID: **HG1_140407A** SeqNo: **2701518** Prep Date: **04/04/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.002032	0.00020	0.002	-0.000023	103	75-125	0.002061	1.42	20	

The following samples were analyzed in this batch: 1404057-01C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57200** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK Sample ID: **MBLK-57200-57200** Units: **mg/L** Analysis Date: **04/03/14 08:04 PM**

Client ID: Run ID: **ICPMS1_140403A** SeqNo: **2699093** Prep Date: **04/03/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	ND	0.0050								
Arsenic	ND	0.0050								
Barium	ND	0.0050								
Beryllium	ND	0.0020								
Cadmium	ND	0.0020								
Calcium	0.1484	0.50								J
Chromium	ND	0.0050								
Cobalt	ND	0.0050								
Copper	ND	0.0050								
Iron	0.007899	0.080								J
Lead	ND	0.0050								
Magnesium	0.06565	0.20								J
Manganese	0.0001004	0.0050								J
Nickel	ND	0.0050								
Potassium	0.04607	0.20								J
Selenium	0.0007958	0.0050								J
Silver	ND	0.0050								
Sodium	0.1159	0.20								J
Thallium	ND	0.0050								
Vanadium	ND	0.0050								
Zinc	ND	0.010								

MBLK Sample ID: **MBLK-57200-57200** Units: **mg/L** Analysis Date: **04/04/14 02:36 PM**

Client ID: Run ID: **ICPMS1_140404A** SeqNo: **2699907** Prep Date: **04/03/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.001235	0.010								J

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57200** Instrument ID **ICPMS1** Method: **SW6020A**

LCS Sample ID: **LCS-57200-57200** Units: **mg/L** Analysis Date: **04/03/14 08:10 PM**

Client ID: Run ID: **ICPMS1_140403A** SeqNo: **2699095** Prep Date: **04/03/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.09506	0.0050	0.1	0	95.1	80-120	0			
Arsenic	0.09156	0.0050	0.1	0	91.6	80-120	0			
Barium	0.09358	0.0050	0.1	0	93.6	80-120	0			
Beryllium	0.09685	0.0020	0.1	0	96.8	80-120	0			
Cadmium	0.09503	0.0020	0.1	0	95	80-120	0			
Calcium	9.306	0.50	10	0	93.1	80-120	0			
Chromium	0.08929	0.0050	0.1	0	89.3	80-120	0			
Cobalt	0.08918	0.0050	0.1	0	89.2	80-120	0			
Copper	0.09183	0.0050	0.1	0	91.8	80-120	0			
Iron	9.333	0.080	10	0	93.3	80-120	0			
Lead	0.09142	0.0050	0.1	0	91.4	80-120	0			
Magnesium	9.143	0.20	10	0	91.4	80-120	0			
Manganese	0.09136	0.0050	0.1	0	91.4	80-120	0			
Nickel	0.08986	0.0050	0.1	0	89.9	80-120	0			
Potassium	9.125	0.20	10	0	91.2	80-120	0			
Selenium	0.09294	0.0050	0.1	0	92.9	80-120	0			
Silver	0.08769	0.0050	0.1	0	87.7	80-120	0			
Sodium	8.969	0.20	10	0	89.7	80-120	0			
Thallium	0.08869	0.0050	0.1	0	88.7	80-120	0			
Vanadium	0.092	0.0050	0.1	0	92	80-120	0			
Zinc	0.09559	0.010	0.1	0	95.6	80-120	0			

LCS Sample ID: **LCS-57200-57200** Units: **mg/L** Analysis Date: **04/04/14 02:43 PM**

Client ID: Run ID: **ICPMS1_140404A** SeqNo: **2699908** Prep Date: **04/03/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.09101	0.010	0.1	0	91	80-120	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57200** Instrument ID **ICPMS1** Method: **SW6020A**

MS Sample ID: **14031413-02AMS** Units: **mg/L** Analysis Date: **04/03/14 10:02 PM**

Client ID: Run ID: **ICPMS1_140403A** SeqNo: **2699121** Prep Date: **04/03/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	1.013	0.10	1	0.02451	98.8	75-125	0			
Antimony	0.9489	0.050	1	0.001837	94.7	75-125	0			
Arsenic	0.972	0.050	1	0.0005695	97.1	75-125	0			
Barium	1.216	0.050	1	0.2365	98	75-125	0			
Beryllium	0.934	0.020	1	0.0005091	93.3	75-125	0			
Cadmium	0.938	0.020	1	0.0005312	93.7	75-125	0			
Calcium	272.1	5.0	100	174	98.1	75-125	0			
Chromium	0.9486	0.050	1	0.001037	94.8	75-125	0			
Cobalt	0.9314	0.050	1	0.002633	92.9	75-125	0			
Copper	0.9348	0.050	1	0.005053	93	75-125	0			
Iron	100.4	0.80	100	4.785	95.6	75-125	0			
Lead	0.9469	0.050	1	0.00115	94.6	75-125	0			
Magnesium	116.8	2.0	100	14.24	103	75-125	0			
Manganese	1.464	0.050	1	0.5013	96.3	75-125	0			
Nickel	0.9391	0.050	1	0.005886	93.3	75-125	0			
Potassium	131.8	2.0	100	31.49	100	75-125	0			
Selenium	0.8987	0.050	1	-0.0003594	89.9	75-125	0			
Silver	0.8435	0.050	1	0.000274	84.3	75-125	0			
Thallium	0.9164	0.050	1	0.0008541	91.6	75-125	0			
Vanadium	1.011	0.050	1	0.002739	101	75-125	0			
Zinc	0.9719	0.10	1	0.01789	95.4	75-125	0			

MS Sample ID: **14031413-02AMS** Units: **mg/L** Analysis Date: **04/04/14 01:46 PM**

Client ID: Run ID: **ICPMS1_140404A** SeqNo: **2699899** Prep Date: **04/03/14** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	4286	20	100	4152	134	75-125	0			SO

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57200** Instrument ID **ICPMS1** Method: **SW6020A**

MSD Sample ID: **14031413-02AMSD** Units: **mg/L** Analysis Date: **04/03/14 10:09 PM**

Client ID: Run ID: **ICPMS1_140403A** SeqNo: **2699122** Prep Date: **04/03/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	1.043	0.10	1	0.02451	102	75-125	1.013	2.92	20	
Antimony	0.9415	0.050	1	0.001837	94	75-125	0.9489	0.783	20	
Arsenic	0.994	0.050	1	0.0005695	99.3	75-125	0.972	2.24	20	
Barium	1.237	0.050	1	0.2365	100	75-125	1.216	1.71	20	
Beryllium	0.9706	0.020	1	0.0005091	97	75-125	0.934	3.84	20	
Cadmium	0.9582	0.020	1	0.0005312	95.8	75-125	0.938	2.13	20	
Calcium	281.5	5.0	100	174	108	75-125	272.1	3.4	20	
Chromium	0.9404	0.050	1	0.001037	93.9	75-125	0.9486	0.868	20	
Cobalt	0.9253	0.050	1	0.002633	92.3	75-125	0.9314	0.657	20	
Copper	0.9245	0.050	1	0.005053	91.9	75-125	0.9348	1.11	20	
Iron	99.73	0.80	100	4.785	94.9	75-125	100.4	0.67	20	
Lead	0.9709	0.050	1	0.00115	97	75-125	0.9469	2.5	20	
Magnesium	121	2.0	100	14.24	107	75-125	116.8	3.53	20	
Manganese	1.451	0.050	1	0.5013	95	75-125	1.464	0.892	20	
Nickel	0.9255	0.050	1	0.005886	92	75-125	0.9391	1.46	20	
Potassium	135.4	2.0	100	31.49	104	75-125	131.8	2.69	20	
Selenium	0.9143	0.050	1	-0.0003594	91.5	75-125	0.8987	1.72	20	
Silver	0.8403	0.050	1	0.000274	84	75-125	0.8435	0.38	20	
Thallium	0.9444	0.050	1	0.0008541	94.4	75-125	0.9164	3.01	20	
Vanadium	0.9918	0.050	1	0.002739	98.9	75-125	1.011	1.92	20	
Zinc	0.9627	0.10	1	0.01789	94.5	75-125	0.9719	0.951	20	

MSD Sample ID: **14031413-02AMSD** Units: **mg/L** Analysis Date: **04/04/14 01:53 PM**

Client ID: Run ID: **ICPMS1_140404A** SeqNo: **2699900** Prep Date: **04/03/14** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	4173	20	100	4152	21	75-125	4286	2.67	20	SO

The following samples were analyzed in this batch: 1404057-01C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57129** Instrument ID **SVMS8** Method: **SW8270**

MBLK Sample ID: **SBLKW1-57129-57129** Units: **µg/L** Analysis Date: **04/02/14 05:37 PM**

Client ID: Run ID: **SVMS8_140402A** SeqNo: **2698065** Prep Date: **04/02/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1`-Biphenyl	ND	5.0								
2,4,5-Trichlorophenol	ND	5.0								
2,4,6-Trichlorophenol	ND	5.0								
2,4-Dichlorophenol	ND	10								
2,4-Dimethylphenol	ND	5.0								
2,4-Dinitrophenol	ND	5.0								
2,4-Dinitrotoluene	ND	5.0								
2,6-Dinitrotoluene	ND	5.0								
2-Chloronaphthalene	ND	5.0								
2-Chlorophenol	ND	5.0								
2-Methylnaphthalene	ND	5.0								
2-Methylphenol	ND	5.0								
2-Nitroaniline	ND	20								
2-Nitrophenol	ND	5.0								
3,3´-Dichlorobenzidine	ND	5.0								
3-Nitroaniline	ND	20								
4,6-Dinitro-2-methylphenol	ND	20								
4-Bromophenyl phenyl ether	ND	5.0								
4-Chloro-3-methylphenol	ND	5.0								
4-Chloroaniline	ND	20								
4-Chlorophenyl phenyl ether	ND	5.0								
4-Methylphenol	ND	5.0								
4-Nitroaniline	ND	20								
4-Nitrophenol	ND	20								
Acenaphthene	ND	5.0								
Acenaphthylene	ND	5.0								
Acetophenone	ND	1.0								
Anthracene	ND	5.0								
Atrazine	ND	1.0								
Benzaldehyde	ND	1.0								
Benzo(a)anthracene	ND	5.0								
Benzo(a)pyrene	ND	5.0								
Benzo(b)fluoranthene	ND	5.0								
Benzo(g,h,i)perylene	ND	5.0								
Benzo(k)fluoranthene	ND	5.0								
Bis(2-chloroethoxy)methane	ND	5.0								
Bis(2-chloroethyl)ether	ND	5.0								
Bis(2-chloroisopropyl)ether	ND	5.0								
Bis(2-ethylhexyl)phthalate	ND	5.0								
Butyl benzyl phthalate	ND	5.0								
Caprolactam	ND	10								
Carbazole	ND	10								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **57129** Instrument ID **SVMS8** Method: **SW8270**

Chrysene	ND	5.0					
Dibenzo(a,h)anthracene	ND	5.0					
Dibenzofuran	ND	5.0					
Diethyl phthalate	ND	20					
Dimethyl phthalate	ND	20					
Di-n-butyl phthalate	ND	5.0					
Di-n-octyl phthalate	ND	5.0					
Fluoranthene	ND	5.0					
Fluorene	ND	5.0					
Hexachlorobenzene	ND	5.0					
Hexachlorobutadiene	ND	5.0					
Hexachlorocyclopentadiene	ND	20					
Hexachloroethane	ND	5.0					
Indeno(1,2,3-cd)pyrene	ND	5.0					
Isophorone	ND	5.0					
Naphthalene	ND	5.0					
Nitrobenzene	ND	5.0					
N-Nitrosodi-n-propylamine	ND	5.0					
N-Nitrosodiphenylamine	ND	5.0					
Pentachlorophenol	ND	20					
Phenanthrene	ND	5.0					
Phenol	ND	5.0					
Pyrene	ND	5.0					
Surr: 2,4,6-Tribromophenol	*38.23*	0	*50*	0	*76.5*	*38-115*	0
Surr: 2-Fluorobiphenyl	*36.95*	0	*50*	0	*73.9*	*32-100*	0
Surr: 2-Fluorophenol	*21.7*	0	*50*	0	*43.4*	*22-59*	0
Surr: 4-Terphenyl-d14	*46*	0	*50*	0	*92*	*23-112*	0
Surr: Nitrobenzene-d5	*42.7*	0	*50*	0	*85.4*	*31-93*	0
Surr: Phenol-d6	*12.55*	0	*50*	0	*25.1*	*13-36*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57129** Instrument ID **SVMS8** Method: **SW8270**

LCS Sample ID: **SLCSW1-57129-57129** Units: **µg/L** Analysis Date: **04/02/14 05:58 PM**

Client ID: Run ID: **SVMS8_140402A** SeqNo: **2698067** Prep Date: **04/02/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2,4,5-Trichlorophenol	16.39	5.0	20	0	82	50-110	0			
2,4,6-Trichlorophenol	14.94	5.0	20	0	74.7	50-115	0			
2,4-Dichlorophenol	14.81	10	20	0	74	50-105	0			
2,4-Dimethylphenol	13.56	5.0	20	0	67.8	30-110	0			
2,4-Dinitrophenol	15.28	5.0	20	0	76.4	15-140	0			
2,4-Dinitrotoluene	15.68	5.0	20	0	78.4	50-120	0			
2,6-Dinitrotoluene	15.25	5.0	20	0	76.2	50-115	0			
2-Chloronaphthalene	14.35	5.0	20	0	71.8	50-105	0			
2-Chlorophenol	13.03	5.0	20	0	65.2	35-105	0			
2-Methylnaphthalene	14.13	5.0	20	0	70.6	45-105	0			
2-Methylphenol	11.14	5.0	20	0	55.7	40-110	0			
2-Nitroaniline	18.38	20	20	0	91.9	50-115	0			J
2-Nitrophenol	15.68	5.0	20	0	78.4	40-115	0			
3-Nitroaniline	15.97	20	20	0	79.8	20-125	0			J
4,6-Dinitro-2-methylphenol	17.45	20	20	0	87.2	40-130	0			J
4-Bromophenyl phenyl ether	16.58	5.0	20	0	82.9	50-115	0			
4-Chloro-3-methylphenol	14.89	5.0	20	0	74.4	45-110	0			
4-Chloroaniline	14.02	20	20	0	70.1	15-110	0			J
4-Chlorophenyl phenyl ether	15	5.0	20	0	75	50-110	0			
4-Methylphenol	10.27	5.0	20	0	51.4	30-110	0			
4-Nitroaniline	14.48	20	20	0	72.4	35-150	0			J
4-Nitrophenol	7.37	20	20	0	36.8	1-58	0			J
Acenaphthene	14.73	5.0	20	0	73.6	45-110	0			
Acenaphthylene	14.98	5.0	20	0	74.9	50-105	0			
Anthracene	17.08	5.0	20	0	85.4	55-110	0			
Benzo(a)anthracene	17.25	5.0	20	0	86.2	55-110	0			
Benzo(a)pyrene	17.36	5.0	20	0	86.8	55-110	0			
Benzo(b)fluoranthene	16.39	5.0	20	0	82	45-120	0			
Benzo(g,h,i)perylene	19.93	5.0	20	0	99.6	40-125	0			
Benzo(k)fluoranthene	16.47	5.0	20	0	82.4	45-125	0			
Bis(2-chloroethoxy)methane	14.88	5.0	20	0	74.4	45-105	0			
Bis(2-chloroethyl)ether	13.96	5.0	20	0	69.8	35-110	0			
Bis(2-chloroisopropyl)ether	17.54	5.0	20	0	87.7	25-130	0			
Bis(2-ethylhexyl)phthalate	18.44	5.0	20	0	92.2	40-125	0			
Butyl benzyl phthalate	17.71	5.0	20	0	88.6	45-115	0			
Carbazole	17.07	10	20	0	85.4	50-150	0			
Chrysene	17.21	5.0	20	0	86	55-110	0			
Dibenzo(a,h)anthracene	18.09	5.0	20	0	90.4	40-125	0			
Dibenzofuran	14.66	5.0	20	0	73.3	55-105	0			
Diethyl phthalate	16.49	20	20	0	82.4	40-120	0			J
Dimethyl phthalate	15.88	20	20	0	79.4	25-125	0			J
Di-n-butyl phthalate	17.25	5.0	20	0	86.2	55-115	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **57129** Instrument ID **SVMS8** Method: **SW8270**

Di-n-octyl phthalate	18.58	5.0	20	0	92.9	35-135	0	
Fluoranthene	16.38	5.0	20	0	81.9	55-115	0	
Fluorene	14.89	5.0	20	0	74.4	50-110	0	
Hexachlorobenzene	16.51	5.0	20	0	82.6	50-110	0	
Hexachlorobutadiene	14.61	5.0	20	0	73	25-105	0	
Hexachlorocyclopentadiene	9.15	20	20	0	45.8	25-105	0	J
Hexachloroethane	14.79	5.0	20	0	74	30-95	0	
Indeno(1,2,3-cd)pyrene	19.93	5.0	20	0	99.6	45-125	0	
Isophorone	16.29	5.0	20	0	81.4	50-110	0	
Naphthalene	13.37	5.0	20	0	66.8	40-100	0	
Nitrobenzene	14.42	5.0	20	0	72.1	45-110	0	
N-Nitrosodi-n-propylamine	17.09	5.0	20	0	85.4	35-130	0	
N-Nitrosodiphenylamine	16.17	5.0	20	0	80.8	50-110	0	
Pentachlorophenol	14.17	20	20	0	70.8	40-115	0	J
Phenanthrene	15.91	5.0	20	0	79.6	50-115	0	
Phenol	5.19	5.0	20	0	26	12-43	0	
Pyrene	16.31	5.0	20	0	81.6	50-130	0	
Surr: 2,4,6-Tribromophenol	*42.32*	0	*50*	0	*84.6*	*38-115*	0	
Surr: 2-Fluorobiphenyl	*34.72*	0	*50*	0	*69.4*	*32-100*	0	
Surr: 2-Fluorophenol	*20.01*	0	*50*	0	*40*	*22-59*	0	
Surr: 4-Terphenyl-d14	*44.77*	0	*50*	0	*89.5*	*23-112*	0	
Surr: Nitrobenzene-d5	*43.37*	0	*50*	0	*86.7*	*31-93*	0	
Surr: Phenol-d6	*12.84*	0	*50*	0	*25.7*	*13-36*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57129** Instrument ID **SVMS8** Method: **SW8270**

MS Sample ID: **14031375-01A MS** Units: **µg/L** Analysis Date: **04/02/14 07:40 PM**

Client ID: Run ID: **SVMS8_140402A** SeqNo: **2698073** Prep Date: **04/02/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2,4,5-Trichlorophenol	345.6	100	400	0	86.4	50-110	0			
2,4,6-Trichlorophenol	331.2	100	400	0	82.8	50-115	0			
2,4-Dichlorophenol	323.6	200	400	0	80.9	50-105	0			
2,4-Dimethylphenol	303.2	100	400	0	75.8	30-110	0			
2,4-Dinitrophenol	332.2	100	400	0	83	15-140	0			
2,4-Dinitrotoluene	324	100	400	0	81	50-120	0			
2,6-Dinitrotoluene	333.2	100	400	0	83.3	50-115	0			
2-Chloronaphthalene	322.4	100	400	0	80.6	50-105	0			
2-Chlorophenol	297.6	100	400	0	74.4	35-105	0			
2-Methylnaphthalene	310	100	400	0	77.5	45-105	0			
2-Methylphenol	263.2	100	400	0	65.8	40-110	0			
2-Nitroaniline	403.4	400	400	0	101	50-115	0			
2-Nitrophenol	359	100	400	0	89.8	40-115	0			
3-Nitroaniline	343	400	400	0	85.8	20-125	0			J
4,6-Dinitro-2-methylphenol	364	400	400	0	91	40-130	0			J
4-Bromophenyl phenyl ether	354.8	100	400	0	88.7	50-115	0			
4-Chloro-3-methylphenol	336.2	100	400	0	84	45-110	0			
4-Chloroaniline	308.4	400	400	0	77.1	15-110	0			J
4-Chlorophenyl phenyl ether	324.8	100	400	0	81.2	50-110	0			
4-Methylphenol	239.4	100	400	0	59.8	30-110	0			
4-Nitroaniline	284.6	400	400	0	71.2	35-150	0			J
4-Nitrophenol	145.8	400	400	0	36.4	1-58	0			J
Acenaphthene	329	100	400	0	82.2	45-110	0			
Acenaphthylene	334.8	100	400	0	83.7	50-105	0			
Anthracene	361.8	100	400	0	90.4	55-110	0			
Benzo(a)anthracene	355.8	100	400	0	89	55-110	0			
Benzo(a)pyrene	359.8	100	400	0	90	55-110	0			
Benzo(b)fluoranthene	340.4	100	400	0	85.1	45-120	0			
Benzo(g,h,i)perylene	403.8	100	400	0	101	40-125	0			
Benzo(k)fluoranthene	335	100	400	0	83.8	45-125	0			
Bis(2-chloroethoxy)methane	329.8	100	400	0	82.4	45-105	0			
Bis(2-chloroethyl)ether	307.6	100	400	0	76.9	35-110	0			
Bis(2-chloroisopropyl)ether	393.6	100	400	0	98.4	25-130	0			
Bis(2-ethylhexyl)phthalate	376.6	100	400	0	94.2	40-125	0			
Butyl benzyl phthalate	369	100	400	0	92.2	45-115	0			
Carbazole	346.8	200	400	0	86.7	50-150	0			
Chrysene	345.8	100	400	0	86.4	55-110	0			
Dibenzo(a,h)anthracene	365.4	100	400	0	91.4	40-125	0			
Dibenzofuran	319.2	100	400	0	79.8	55-105	0			
Diethyl phthalate	352.4	400	400	0	88.1	40-120	0			J
Dimethyl phthalate	338.4	400	400	0	84.6	25-125	0			J
Di-n-butyl phthalate	361.2	100	400	0	90.3	55-115	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57129** Instrument ID **SVMS8** Method: **SW8270**

Di-n-octyl phthalate	385.8	100	400	0	96.4	35-135	0	
Fluoranthene	339.2	100	400	0	84.8	55-115	0	
Fluorene	320.2	100	400	0	80	50-110	0	
Hexachlorobenzene	334.8	100	400	0	83.7	50-110	0	
Hexachlorobutadiene	326.4	100	400	0	81.6	25-105	0	
Hexachlorocyclopentadiene	227.4	400	400	0	56.8	25-105	0	J
Hexachloroethane	322.8	100	400	0	80.7	30-95	0	
Indeno(1,2,3-cd)pyrene	406.4	100	400	0	102	45-125	0	
Isophorone	372.6	100	400	0	93.2	50-110	0	
Naphthalene	292.6	100	400	0	73.2	40-100	0	
Nitrobenzene	337	100	400	0	84.2	45-110	0	
N-Nitrosodi-n-propylamine	396	100	400	0	99	35-130	0	
N-Nitrosodiphenylamine	342.2	100	400	0	85.6	50-110	0	
Pentachlorophenol	287	400	400	0	71.8	40-115	0	J
Phenanthrene	328.6	100	400	0	82.2	50-115	0	
Phenol	115.8	100	400	0	29	12-43	0	
Pyrene	334.4	100	400	0	83.6	50-130	0	
Surr: 2,4,6-Tribromophenol	*895.2*	0	*1000*	0	*89.5*	*38-115*	0	
Surr: 2-Fluorobiphenyl	*787.2*	0	*1000*	0	*78.7*	*32-100*	0	
Surr: 2-Fluorophenol	*457.8*	0	*1000*	0	*45.8*	*22-59*	0	
Surr: 4-Terphenyl-d14	*920.2*	0	*1000*	0	*92*	*23-112*	0	
Surr: Nitrobenzene-d5	*979.6*	0	*1000*	0	*98*	*31-93*	0	*S*
Surr: Phenol-d6	*280.2*	0	*1000*	0	*28*	*13-36*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57129** Instrument ID **SVMS8** Method: **SW8270**

MSD Sample ID: **14031375-01A MSD** Units: **µg/L** Analysis Date: **04/02/14 08:00 PM**

Client ID: Run ID: **SVMS8_140402A** SeqNo: **2698075** Prep Date: **04/02/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2,4,5-Trichlorophenol	327.8	100	400	0	82	50-110	345.6	5.29	30	
2,4,6-Trichlorophenol	320	100	400	0	80	50-115	331.2	3.44	30	
2,4-Dichlorophenol	299.2	200	400	0	74.8	50-105	323.6	7.84	30	
2,4-Dimethylphenol	281	100	400	0	70.2	30-110	303.2	7.6	30	
2,4-Dinitrophenol	326.6	100	400	0	81.6	15-140	332.2	1.7	30	
2,4-Dinitrotoluene	316	100	400	0	79	50-120	324	2.5	30	
2,6-Dinitrotoluene	316.8	100	400	0	79.2	50-115	333.2	5.05	30	
2-Chloronaphthalene	299.4	100	400	0	74.8	50-105	322.4	7.4	30	
2-Chlorophenol	275.8	100	400	0	69	35-105	297.6	7.6	30	
2-Methylnaphthalene	283.4	100	400	0	70.8	45-105	310	8.97	30	
2-Methylphenol	235.8	100	400	0	59	40-110	263.2	11	30	
2-Nitroaniline	388.4	400	400	0	97.1	50-115	403.4	0	30	J
2-Nitrophenol	323.6	100	400	0	80.9	40-115	359	10.4	30	
3-Nitroaniline	330.4	400	400	0	82.6	20-125	343	0	30	J
4,6-Dinitro-2-methylphenol	353.2	400	400	0	88.3	40-130	364	0	30	J
4-Bromophenyl phenyl ether	342.8	100	400	0	85.7	50-115	354.8	3.44	30	
4-Chloro-3-methylphenol	310.6	100	400	0	77.6	45-110	336.2	7.92	30	
4-Chloroaniline	270.4	400	400	0	67.6	15-110	308.4	0	30	J
4-Chlorophenyl phenyl ether	315.4	100	400	0	78.8	50-110	324.8	2.94	30	
4-Methylphenol	218.4	100	400	0	54.6	30-110	239.4	9.17	30	
4-Nitroaniline	300	400	400	0	75	35-150	284.6	0	30	J
4-Nitrophenol	138.2	400	400	0	34.6	1-58	145.8	0	0	J
Acenaphthene	314	100	400	0	78.5	45-110	329	4.67	30	
Acenaphthylene	314.2	100	400	0	78.6	50-105	334.8	6.35	30	
Anthracene	350.2	100	400	0	87.6	55-110	361.8	3.26	30	
Benzo(a)anthracene	350	100	400	0	87.5	55-110	355.8	1.64	30	
Benzo(a)pyrene	351	100	400	0	87.8	55-110	359.8	2.48	30	
Benzo(b)fluoranthene	323	100	400	0	80.8	45-120	340.4	5.25	30	
Benzo(g,h,i)perylene	393.2	100	400	0	98.3	40-125	403.8	2.66	30	
Benzo(k)fluoranthene	330	100	400	0	82.5	45-125	335	1.5	30	
Bis(2-chloroethoxy)methane	297.4	100	400	0	74.4	45-105	329.8	10.3	30	
Bis(2-chloroethyl)ether	284.2	100	400	0	71	35-110	307.6	7.91	30	
Bis(2-chloroisopropyl)ether	360.8	100	400	0	90.2	25-130	393.6	8.7	30	
Bis(2-ethylhexyl)phthalate	364	100	400	0	91	40-125	376.6	3.4	30	
Butyl benzyl phthalate	367.6	100	400	0	91.9	45-115	369	0.38	30	
Carbazole	346.6	200	400	0	86.6	50-150	346.8	0.0577	30	
Chrysene	343	100	400	0	85.8	55-110	345.8	0.813	30	
Dibenzo(a,h)anthracene	358	100	400	0	89.5	40-125	365.4	2.05	30	
Dibenzofuran	307.4	100	400	0	76.8	55-105	319.2	3.77	30	
Diethyl phthalate	344.2	400	400	0	86	40-120	352.4	0	30	J
Dimethyl phthalate	340.6	400	400	0	85.2	25-125	338.4	0	30	J
Di-n-butyl phthalate	352.6	100	400	0	88.2	55-115	361.2	2.41	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57129** Instrument ID **SVMS8** Method: **SW8270**

Di-n-octyl phthalate	371.6	100	400	0	92.9	35-135	385.8	3.75	30	
Fluoranthene	328.6	100	400	0	82.2	55-115	339.2	3.17	30	
Fluorene	309.6	100	400	0	77.4	50-110	320.2	3.37	30	
Hexachlorobenzene	347.8	100	400	0	87	50-110	334.8	3.81	30	
Hexachlorobutadiene	297	100	400	0	74.2	25-105	326.4	9.43	30	
Hexachlorocyclopentadiene	215	400	400	0	53.8	25-105	227.4	0	30	J
Hexachloroethane	293.4	100	400	0	73.4	30-95	322.8	9.54	30	
Indeno(1,2,3-cd)pyrene	408.6	100	400	0	102	45-125	406.4	0.54	30	
Isophorone	339.8	100	400	0	85	50-110	372.6	9.21	30	
Naphthalene	263.6	100	400	0	65.9	40-100	292.6	10.4	30	
Nitrobenzene	298	100	400	0	74.5	45-110	337	12.3	30	
N-Nitrosodi-n-propylamine	359.6	100	400	0	89.9	35-130	396	9.63	30	
N-Nitrosodiphenylamine	338.6	100	400	0	84.6	50-110	342.2	1.06	30	
Pentachlorophenol	284.2	400	400	0	71	40-115	287	0	30	J
Phenanthrene	328.2	100	400	0	82	50-115	328.6	0.122	30	
Phenol	106.2	100	400	0	26.6	12-43	115.8	8.65	30	
Pyrene	327.2	100	400	0	81.8	50-130	334.4	2.18	30	
Surr: 2,4,6-Tribromophenol	*859*	0	*1000*	0	*85.9*	*38-115*	895.2	*4.13*	*40*	
Surr: 2-Fluorobiphenyl	*727.2*	0	*1000*	0	*72.7*	*32-100*	787.2	*7.92*	*40*	
Surr: 2-Fluorophenol	*414.2*	0	*1000*	0	*41.4*	*22-59*	457.8	*10*	*40*	
Surr: 4-Terphenyl-d14	*900.4*	0	*1000*	0	*90*	*23-112*	920.2	*2.18*	*40*	
Surr: Nitrobenzene-d5	*874.2*	0	*1000*	0	*87.4*	*31-93*	979.6	*11.4*	*40*	
Surr: Phenol-d6	*262.6*	0	*1000*	0	*26.3*	*13-36*	280.2	*6.48*	*40*	

The following samples were analyzed in this batch: 1404057-01B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57139** Instrument ID **VMS9** Method: **SW8260B**

MBLK Sample ID: **MBLK-57139-57139** Units: **µg/Kg** Analysis Date: **04/02/14 02:03 PM**

Client ID: Run ID: **VMS9_140402A** SeqNo: **2697486** Prep Date: **04/02/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1,2-Trichlorotrifluoroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
4-Methyl-2-pentanone	ND	30								
Acetone	157	100								
Benzene	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dichlorodifluoromethane	ND	30								
Ethylbenzene	ND	30								
Isopropylbenzene	ND	30								
Methyl acetate	1466	200								
Methyl tert-butyl ether	ND	30								
Methylcyclohexane	ND	30								
Methylene chloride	ND	30								
Styrene	ND	30								
Tetrachloroethene	ND	30								
Toluene	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **57139** Instrument ID **VMS9** Method: **SW8260B**

trans-1,2-Dichloroethene	ND	30					
trans-1,3-Dichloropropene	ND	30					
Trichloroethene	ND	30					
Trichlorofluoromethane	ND	30					
Vinyl chloride	ND	30					
Xylenes, Total	ND	90					
Surr: 1,2-Dichloroethane-d4	*1066*	0	*1000*	0	*107*	*70-130*	0
Surr: 4-Bromofluorobenzene	*872.5*	0	*1000*	0	*87.2*	*70-130*	0
Surr: Dibromofluoromethane	*983*	0	*1000*	0	*98.3*	*70-130*	0
Surr: Toluene-d8	*1013*	0	*1000*	0	*101*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57139** Instrument ID **VMS9** Method: **SW8260B**

LCS Sample ID: **LCS-57139-57139** Units: **µg/Kg** Analysis Date: **04/02/14 12:26 PM**

Client ID: Run ID: **VMS9_140402A** SeqNo: **2697485** Prep Date: **04/02/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	1072	30	1000	0	107	70-135	0			
1,1,2,2-Tetrachloroethane	904.5	30	1000	0	90.4	55-130	0			
1,1,2-Trichloroethane	952	30	1000	0	95.2	60-125	0			
1,1-Dichloroethane	1128	30	1000	0	113	75-125	0			
1,1-Dichloroethene	1116	30	1000	0	112	65-135	0			
1,2,4-Trichlorobenzene	902.5	30	1000	0	90.2	65-130	0			
1,2-Dibromo-3-chloropropane	873	30	1000	0	87.3	40-135	0			
1,2-Dibromoethane	951	30	1000	0	95.1	75-125	0			
1,2-Dichlorobenzene	941.5	30	1000	0	94.2	75-120	0			
1,2-Dichloroethane	1091	30	1000	0	109	70-135	0			
1,2-Dichloropropane	1019	30	1000	0	102	70-120	0			
1,3-Dichlorobenzene	941.5	30	1000	0	94.2	70-125	0			
1,4-Dichlorobenzene	985.5	30	1000	0	98.6	70-125	0			
2-Butanone	1246	200	1000	0	125	30-160	0			
2-Hexanone	883.5	30	1000	0	88.4	45-145	0			
4-Methyl-2-pentanone	1278	30	1000	0	128	96-168	0			
Acetone	1380	100	1000	0	138	20-160	0			B
Benzene	1048	30	1000	0	105	75-125	0			
Bromodichloromethane	1014	30	1000	0	101	70-130	0			
Bromoform	879	30	1000	0	87.9	55-135	0			
Bromomethane	1664	75	1000	0	166	30-160	0			S
Carbon disulfide	1176	30	1000	0	118	45-160	0			
Carbon tetrachloride	909	30	1000	0	90.9	65-135	0			
Chlorobenzene	948	30	1000	0	94.8	75-125	0			
Chloroethane	1062	100	1000	0	106	40-155	0			
Chloroform	1080	30	1000	0	108	70-125	0			
Chloromethane	1012	100	1000	0	101	50-130	0			
cis-1,2-Dichloroethene	1156	30	1000	0	116	65-125	0			
cis-1,3-Dichloropropene	1023	30	1000	0	102	70-125	0			
Dibromochloromethane	820.5	30	1000	0	82	65-135	0			
Dichlorodifluoromethane	864.5	30	1000	0	86.4	35-135	0			
Ethylbenzene	1016	30	1000	0	102	75-125	0			
Isopropylbenzene	947.5	30	1000	0	94.8	75-130	0			
Methyl tert-butyl ether	1154	30	1000	0	115	75-125	0			
Methylene chloride	1214	30	1000	0	121	55-145	0			
Styrene	965.5	30	1000	0	96.6	75-125	0			
Tetrachloroethene	1102	30	1000	0	110	64-140	0			
Toluene	1014	30	1000	0	101	70-125	0			
trans-1,2-Dichloroethene	1133	30	1000	0	113	65-135	0			
trans-1,3-Dichloropropene	1077	30	1000	0	108	65-125	0			
Trichloroethene	961.5	30	1000	0	96.2	75-125	0			
Trichlorofluoromethane	1014	30	1000	0	101	25-185	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57139** Instrument ID **VMS9** Method: **SW8260B**

Vinyl chloride	991	30	1000	0	99.1	60-125	0
Xylenes, Total	3134	90	3000	0	104	75-125	0
Surr: 1,2-Dichloroethane-d4	*1049*	0	*1000*	0	*105*	*70-130*	0
Surr: 4-Bromofluorobenzene	*993.5*	0	*1000*	0	*99.4*	*70-130*	0
Surr: Dibromofluoromethane	*1016*	0	*1000*	0	*102*	*70-130*	0
Surr: Toluene-d8	*1046*	0	*1000*	0	*105*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57139** Instrument ID **VMS9** Method: **SW8260B**

MS Sample ID: **1404094-09A MS** Units: **µg/Kg** Analysis Date: **04/04/14 12:15 PM**

Client ID: Run ID: **VMS8_140403A** SeqNo: **2699063** Prep Date: **04/02/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	844	30	1000	0	84.4	70-135	0			
1,1,2,2-Tetrachloroethane	720.5	30	1000	0	72	55-130	0			
1,1,2-Trichloroethane	816.5	30	1000	0	81.6	60-125	0			
1,1-Dichloroethane	942.5	30	1000	0	94.2	75-125	0			
1,1-Dichloroethene	1112	30	1000	0	111	65-135	0			
1,2,4-Trichlorobenzene	480.5	30	1000	0	48	65-130	0			S
1,2-Dibromo-3-chloropropane	735	30	1000	0	73.5	40-135	0			
1,2-Dibromoethane	1062	30	1000	0	106	75-125	0			
1,2-Dichlorobenzene	708	30	1000	0	70.8	75-120	0			S
1,2-Dichloroethane	768	30	1000	0	76.8	70-135	0			
1,2-Dichloropropane	808	30	1000	0	80.8	70-120	0			
1,3-Dichlorobenzene	708.5	30	1000	0	70.8	70-125	0			
1,4-Dichlorobenzene	699.5	30	1000	0	70	70-125	0			S
2-Butanone	ND	200	1000	0	0	30-160	0			S
2-Hexanone	852.5	30	1000	0	85.2	45-145	0			
4-Methyl-2-pentanone	1032	30	1000	0	103	89-161	0			
Acetone	ND	100	1000	0	0	20-160	0			S
Benzene	960.5	30	1000	0	96	75-125	0			
Bromodichloromethane	683	30	1000	0	68.3	70-130	0			S
Bromoform	579	30	1000	0	57.9	55-135	0			
Bromomethane	730	75	1000	0	73	30-160	0			
Carbon disulfide	1380	30	1000	0	138	45-160	0			
Carbon tetrachloride	976.5	30	1000	0	97.6	65-135	0			
Chlorobenzene	866	30	1000	0	86.6	75-125	0			
Chloroethane	628	100	1000	0	62.8	40-155	0			
Chloroform	875	30	1000	0	87.5	70-125	0			
Chloromethane	750	100	1000	0	75	50-130	0			
cis-1,2-Dichloroethene	919	30	1000	0	91.9	65-125	0			
cis-1,3-Dichloropropene	755	30	1000	0	75.5	70-125	0			
Dibromochloromethane	643	30	1000	0	64.3	65-135	0			S
Dichlorodifluoromethane	596	30	1000	0	59.6	35-135	0			
Ethylbenzene	886	30	1000	0	88.6	75-125	0			
Isopropylbenzene	791	30	1000	0	79.1	75-130	0			
Methyl tert-butyl ether	931.5	30	1000	0	93.2	75-125	0			
Methylene chloride	1064	30	1000	0	106	55-145	0			
Styrene	827	30	1000	0	82.7	75-125	0			
Tetrachloroethene	951	30	1000	0	95.1	64-140	0			
Toluene	983.5	30	1000	0	98.4	70-125	0			
trans-1,2-Dichloroethene	1027	30	1000	0	103	65-135	0			
trans-1,3-Dichloropropene	824.5	30	1000	0	82.4	65-125	0			
Trichloroethene	837.5	30	1000	102	73.6	75-125	0			S
Trichlorofluoromethane	918.5	30	1000	0	91.8	25-185	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57139** Instrument ID **VMS9** Method: **SW8260B**

Vinyl chloride	784	30	1000	0	78.4	60-125	0
Xylenes, Total	2586	90	3000	0	86.2	75-125	0
Surr: 1,2-Dichloroethane-d4	*799.5*	0	*1000*	0	*80*	*70-130*	0
Surr: 4-Bromofluorobenzene	*955*	0	*1000*	0	*95.5*	*70-130*	0
Surr: Dibromofluoromethane	*921*	0	*1000*	0	*92.1*	*70-130*	0
Surr: Toluene-d8	*1033*	0	*1000*	0	*103*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57139** Instrument ID **VMS9** Method: **SW8260B**

MSD Sample ID: **1404094-09A MSD** Units: **µg/Kg** Analysis Date: **04/04/14 12:39 PM**

Client ID: Run ID: **VMS8_140403A** SeqNo: **2699068** Prep Date: **04/02/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	944.5	30	1000	0	94.4	70-135	844	11.2	30	
1,1,2,2-Tetrachloroethane	724	30	1000	0	72.4	55-130	720.5	0.485	30	
1,1,2-Trichloroethane	833.5	30	1000	0	83.4	60-125	816.5	2.06	30	
1,1-Dichloroethane	936.5	30	1000	0	93.6	75-125	942.5	0.639	30	
1,1-Dichloroethene	1081	30	1000	0	108	65-135	1112	2.78	30	
1,2,4-Trichlorobenzene	578.5	30	1000	0	57.8	65-130	480.5	18.5	30	S
1,2-Dibromo-3-chloropropane	781	30	1000	0	78.1	40-135	735	6.07	30	
1,2-Dibromoethane	1019	30	1000	0	102	75-125	1062	4.09	30	
1,2-Dichlorobenzene	726	30	1000	0	72.6	75-120	708	2.51	30	S
1,2-Dichloroethane	889.5	30	1000	0	89	70-135	768	14.7	30	
1,2-Dichloropropane	906.5	30	1000	0	90.6	70-120	808	11.5	30	
1,3-Dichlorobenzene	719.5	30	1000	0	72	70-125	708.5	1.54	30	
1,4-Dichlorobenzene	732	30	1000	0	73.2	70-125	699.5	4.54	30	
2-Butanone	ND	200	1000	0	0	30-160	0	0	30	S
2-Hexanone	865.5	30	1000	0	86.6	45-145	852.5	1.51	30	
4-Methyl-2-pentanone	1056	30	1000	0	106	89-161	1032	2.25	30	
Acetone	ND	100	1000	0	0	20-160	0	0	30	S
Benzene	1046	30	1000	0	105	75-125	960.5	8.52	30	
Bromodichloromethane	808.5	30	1000	0	80.8	70-130	683	16.8	30	
Bromoform	603	30	1000	0	60.3	55-135	579	4.06	30	
Bromomethane	801	75	1000	0	80.1	30-160	730	9.27	30	
Carbon disulfide	1300	30	1000	0	130	45-160	1380	6.04	30	
Carbon tetrachloride	1066	30	1000	0	107	65-135	976.5	8.76	30	
Chlorobenzene	853	30	1000	0	85.3	75-125	866	1.51	30	
Chloroethane	650	100	1000	0	65	40-155	628	3.44	30	
Chloroform	889.5	30	1000	0	89	70-125	875	1.64	30	
Chloromethane	774	100	1000	0	77.4	50-130	750	3.15	30	
cis-1,2-Dichloroethene	916.5	30	1000	0	91.6	65-125	919	0.272	30	
cis-1,3-Dichloropropene	895	30	1000	0	89.5	70-125	755	17	30	
Dibromochloromethane	690	30	1000	0	69	65-135	643	7.05	30	
Dichlorodifluoromethane	595	30	1000	0	59.5	35-135	596	0.168	30	
Ethylbenzene	845	30	1000	0	84.5	75-125	886	4.74	30	
Isopropylbenzene	771.5	30	1000	0	77.2	75-130	791	2.5	30	
Methyl tert-butyl ether	930.5	30	1000	0	93	75-125	931.5	0.107	30	
Methylene chloride	1127	30	1000	0	113	55-145	1064	5.8	30	
Styrene	831.5	30	1000	0	83.2	75-125	827	0.543	30	
Tetrachloroethene	885.5	30	1000	0	88.6	64-140	951	7.13	30	
Toluene	912.5	30	1000	0	91.2	70-125	983.5	7.49	30	
trans-1,2-Dichloroethene	992	30	1000	0	99.2	65-135	1027	3.47	30	
trans-1,3-Dichloropropene	842.5	30	1000	0	84.2	65-125	824.5	2.16	30	
Trichloroethene	947.5	30	1000	102	84.6	75-125	837.5	12.3	30	
Trichlorofluoromethane	867	30	1000	0	86.7	25-185	918.5	5.77	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57139** Instrument ID **VMS9** Method: **SW8260B**

Vinyl chloride	802	30	1000	0	80.2	60-125	784	2.27	30
Xylenes, Total	2508	90	3000	0	83.6	75-125	2586	3.02	30
Surr: 1,2-Dichloroethane-d4	*926*	0	*1000*	0	*92.6*	*70-130*	799.5	*14.7*	*30*
Surr: 4-Bromofluorobenzene	*959*	0	*1000*	0	*95.9*	*70-130*	955	*0.418*	*30*
Surr: Dibromofluoromethane	*1062*	0	*1000*	0	*106*	*70-130*	921	*14.3*	*30*
Surr: Toluene-d8	*981*	0	*1000*	0	*98.1*	*70-130*	1033	*5.16*	*30*

The following samples were analyzed in this batch: 1404057-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **R138303A** Instrument ID **VMS6** Method: **SW8260**

MBLK	Sample ID: **VBLKW2-140402-R138303A**	Units: **µg/L**	Analysis Date: **04/02/14 08:32 PM**
Client ID:	Run ID: **VMS6_140402A**	SeqNo: **2697650** Prep Date:	DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
1,1,2-Trichlorotrifluoroethane	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,2-Dibromo-3-chloropropane	ND	1.0								
1,2-Dibromoethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,2-Dichloroethane	ND	1.0								
1,2-Dichloropropane	ND	2.0								
1,3-Dichlorobenzene	ND	2.0								
1,4-Dichlorobenzene	ND	2.0								
2-Butanone	ND	5.0								
2-Hexanone	ND	5.0								
4-Methyl-2-pentanone	ND	5.0								
Acetone	ND	20								
Benzene	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	1.0								
Carbon disulfide	ND	2.5								
Carbon tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	1.0								
Chloroform	ND	1.0								
Chloromethane	ND	1.0								
cis-1,2-Dichloroethene	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
Cyclohexane	ND	5.0								
Dibromochloromethane	ND	1.0								
Dichlorodifluoromethane	ND	1.0								
Ethylbenzene	ND	1.0								
Isopropylbenzene	ND	1.0								
Methyl acetate	ND	2.0								
Methyl tert-butyl ether	ND	5.0								
Methylcyclohexane	ND	5.0								
Methylene chloride	ND	5.0								
Styrene	ND	1.0								
Tetrachloroethene	ND	2.0								
Toluene	ND	1.0								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **R138303A** Instrument ID **VMS6** Method: **SW8260**

trans-1,2-Dichloroethene	ND	1.0					
trans-1,3-Dichloropropene	ND	1.0					
Trichloroethene	ND	1.0					
Trichlorofluoromethane	ND	1.0					
Vinyl chloride	ND	1.0					
Xylenes, Total	ND	3.0					
Surr: 1,2-Dichloroethane-d4	*19.86*	0	*20*	0	*99.3*	*70-120*	0
Surr: 4-Bromofluorobenzene	*19.55*	0	*20*	0	*97.8*	*75-120*	0
Surr: Dibromofluoromethane	*19.55*	0	*20*	0	*97.8*	*85-115*	0
Surr: Toluene-d8	*19.85*	0	*20*	0	*99.2*	*85-120*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **R138303A** Instrument ID **VMS6** Method: **SW8260**

LCS Sample ID: **VLCSW1-140402-R138303A** Units: **µg/L** Analysis Date: **04/02/14 07:39 PM**

Client ID: Run ID: **VMS6_140402A** SeqNo: **2697649** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	21.31	1.0	20	0	107	65-130	0			
1,1,2,2-Tetrachloroethane	22.02	1.0	20	0	110	65-130	0			
1,1,2-Trichloroethane	21.38	1.0	20	0	107	75-125	0			
1,1-Dichloroethane	22.35	1.0	20	0	112	70-135	0			
1,1-Dichloroethene	23.38	1.0	20	0	117	70-130	0			
1,2,4-Trichlorobenzene	21.42	1.0	20	0	107	65-135	0			
1,2-Dibromo-3-chloropropane	18.2	1.0	20	0	91	50-130	0			
1,2-Dibromoethane	24.98	1.0	20	0	125	87-179	0			
1,2-Dichlorobenzene	21.6	1.0	20	0	108	70-120	0			
1,2-Dichloroethane	20.29	1.0	20	0	101	87-179	0			
1,2-Dichloropropane	20.71	2.0	20	0	104	75-125	0			
1,3-Dichlorobenzene	22.05	2.0	20	0	110	75-125	0			
1,4-Dichlorobenzene	20.86	2.0	20	0	104	75-125	0			
2-Butanone	24.84	5.0	20	0	124	30-150	0			
2-Hexanone	21.2	5.0	20	0	106	55-130	0			
4-Methyl-2-pentanone	27.37	5.0	20	0	137	77-178	0			
Acetone	22.07	20	20	0	110	40-140	0			
Benzene	22.24	1.0	20	0	111	80-120	0			
Bromodichloromethane	19.45	1.0	20	0	97.2	75-120	0			
Bromoform	16.43	1.0	20	0	82.2	70-130	0			
Bromomethane	26.92	1.0	20	0	135	30-145	0			
Carbon disulfide	24.25	2.5	20	0	121	35-165	0			
Carbon tetrachloride	20.35	1.0	20	0	102	65-140	0			
Chlorobenzene	21.69	1.0	20	0	108	80-120	0			
Chloroethane	21.25	1.0	20	0	106	60-135	0			
Chloroform	21.83	1.0	20	0	109	65-135	0			
Chloromethane	20.06	1.0	20	0	100	70-125	0			
cis-1,2-Dichloroethene	22.11	1.0	20	0	111	70-125	0			
cis-1,3-Dichloropropene	20.4	1.0	20	0	102	70-130	0			
Dibromochloromethane	16.95	1.0	20	0	84.8	60-135	0			
Dichlorodifluoromethane	15.58	1.0	20	0	77.9	30-155	0			
Ethylbenzene	23.1	1.0	20	0	116	75-125	0			
Isopropylbenzene	20.31	1.0	20	0	102	75-125	0			
Methyl tert-butyl ether	22.93	5.0	20	0	115	65-125	0			
Methylene chloride	21.89	5.0	20	0	109	55-140	0			
Styrene	20.03	1.0	20	0	100	65-135	0			
Tetrachloroethene	23.14	2.0	20	0	116	45-150	0			
Toluene	22.51	1.0	20	0	113	75-120	0			
trans-1,2-Dichloroethene	24.07	1.0	20	0	120	60-140	0			
trans-1,3-Dichloropropene	19.93	1.0	20	0	99.6	55-140	0			
Trichloroethene	22.7	1.0	20	0	114	70-125	0			
Trichlorofluoromethane	20.75	1.0	20	0	104	60-145	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **R138303A** Instrument ID **VMS6** Method: **SW8260**

Vinyl chloride	19.41	1.0	20	0	97	50-145	0
Xylenes, Total	62.02	3.0	60	0	103	75-130	0
Surr: 1,2-Dichloroethane-d4	*19.89*	0	*20*	0	*99.4*	*70-120*	0
Surr: 4-Bromofluorobenzene	*20.12*	0	*20*	0	*101*	*75-120*	0
Surr: Dibromofluoromethane	*21.02*	0	*20*	0	*105*	*85-115*	0
Surr: Toluene-d8	*20.32*	0	*20*	0	*102*	*85-120*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **R138303A** Instrument ID **VMS6** Method: **SW8260**

MS Sample ID: **1404077-02A MS** Units: **µg/L** Analysis Date: **04/03/14 05:43 AM**

Client ID: Run ID: **VMS6_140402A** SeqNo: **2697661** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	22.55	1.0	20	1.38	106	65-130	0			
1,1,2,2-Tetrachloroethane	20.72	1.0	20	0	104	65-130	0			
1,1,2-Trichloroethane	20.78	1.0	20	0	104	75-125	0			
1,1-Dichloroethane	25.31	1.0	20	1.85	117	70-135	0			
1,1-Dichloroethene	27.23	1.0	20	3.04	121	70-130	0			
1,2,4-Trichlorobenzene	20.59	1.0	20	0	103	65-135	0			
1,2-Dibromo-3-chloropropane	15.22	1.0	20	0	76.1	50-130	0			
1,2-Dibromoethane	24.63	1.0	20	0	123	81-158	0			
1,2-Dichlorobenzene	21.53	1.0	20	0	108	70-120	0			
1,2-Dichloroethane	20.6	1.0	20	0	103	70-130	0			
1,2-Dichloropropane	20.97	2.0	20	0	105	75-125	0			
1,3-Dichlorobenzene	22.19	2.0	20	0	111	75-125	0			
1,4-Dichlorobenzene	21.37	2.0	20	0	107	75-125	0			
2-Butanone	24.38	5.0	20	0	122	30-150	0			
2-Hexanone	20.24	5.0	20	0	101	55-130	0			
4-Methyl-2-pentanone	26.47	5.0	20	0	132	73-162	0			
Acetone	29.57	20	20	4.94	123	40-140	0			
Benzene	23.11	1.0	20	0	116	80-120	0			
Bromodichloromethane	17.87	1.0	20	0	89.4	75-120	0			
Bromoform	14.08	1.0	20	0	70.4	70-130	0			
Bromomethane	23.04	1.0	20	0	115	30-145	0			
Carbon disulfide	23.75	2.5	20	0	119	35-165	0			
Carbon tetrachloride	20.66	1.0	20	0	103	65-140	0			
Chlorobenzene	21.76	1.0	20	0	109	80-120	0			
Chloroethane	22.28	1.0	20	0	111	60-135	0			
Chloroform	21.87	1.0	20	0	109	65-135	0			
Chloromethane	18.71	1.0	20	0	93.6	70-125	0			
cis-1,2-Dichloroethene	65.17	1.0	20	40.72	122	70-125	0			
cis-1,3-Dichloropropene	18.76	1.0	20	0	93.8	70-130	0			
Dibromochloromethane	14.7	1.0	20	0	73.5	60-135	0			
Dichlorodifluoromethane	17.04	1.0	20	0	85.2	30-155	0			
Ethylbenzene	23.46	1.0	20	0	117	75-125	0			
Isopropylbenzene	20.82	1.0	20	0	104	75-125	0			
Methyl tert-butyl ether	21.42	5.0	20	0	107	65-125	0			
Methylene chloride	21.65	5.0	20	0	108	55-140	0			
Styrene	19.85	1.0	20	0	99.2	65-135	0			
Tetrachloroethene	27.45	2.0	20	2.07	127	45-150	0			
Toluene	22.88	1.0	20	0	114	75-120	0			
trans-1,2-Dichloroethene	27.04	1.0	20	1.79	126	60-140	0			
trans-1,3-Dichloropropene	17.61	1.0	20	0	88	55-140	0			
Trichloroethene	58.28	1.0	20	25.84	162	70-125	0			S
Trichlorofluoromethane	22.04	1.0	20	0	110	60-145	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **R138303A** Instrument ID **VMS6** Method: **SW8260**

Vinyl chloride	24.53	1.0	20	4.05	102	50-145	0
Xylenes, Total	62.47	3.0	60	0	104	75-130	0
Surr: 1,2-Dichloroethane-d4	*20.15*	0	*20*	0	*101*	*70-120*	0
Surr: 4-Bromofluorobenzene	*20.03*	0	*20*	0	*100*	*75-120*	0
Surr: Dibromofluoromethane	*20.21*	0	*20*	0	*101*	*85-115*	0
Surr: Toluene-d8	*20.05*	0	*20*	0	*100*	*85-120*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **R138303A** Instrument ID **VMS6** Method: **SW8260**

MSD Sample ID: **1404077-02A MSD** Units: **µg/L** Analysis Date: **04/03/14 06:09 AM**

Client ID: Run ID: **VMS6_140402A** SeqNo: **2697662** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	21.77	1.0	20	1.38	102	65-130	22.55	3.52	30	
1,1,2,2-Tetrachloroethane	20.91	1.0	20	0	105	65-130	20.72	0.913	30	
1,1,2-Trichloroethane	20.62	1.0	20	0	103	75-125	20.78	0.773	30	
1,1-Dichloroethane	24.76	1.0	20	1.85	115	70-135	25.31	2.2	30	
1,1-Dichloroethene	25.99	1.0	20	3.04	115	70-130	27.23	4.66	30	
1,2,4-Trichlorobenzene	20.9	1.0	20	0	104	65-135	20.59	1.49	30	
1,2-Dibromo-3-chloropropane	15.4	1.0	20	0	77	50-130	15.22	1.18	30	
1,2-Dibromoethane	24.23	1.0	20	0	121	81-158	24.63	1.64	30	
1,2-Dichlorobenzene	21.3	1.0	20	0	106	70-120	21.53	1.07	30	
1,2-Dichloroethane	20.32	1.0	20	0	102	70-130	20.6	1.37	30	
1,2-Dichloropropane	20.61	2.0	20	0	103	75-125	20.97	1.73	30	
1,3-Dichlorobenzene	21.65	2.0	20	0	108	75-125	22.19	2.46	30	
1,4-Dichlorobenzene	20.84	2.0	20	0	104	75-125	21.37	2.51	30	
2-Butanone	25.26	5.0	20	0	126	30-150	24.38	3.55	30	
2-Hexanone	21.02	5.0	20	0	105	55-130	20.24	3.78	30	
4-Methyl-2-pentanone	28.18	5.0	20	0	141	73-162	26.47	6.26	30	
Acetone	32.04	20	20	4.94	136	40-140	29.57	8.02	30	
Benzene	22.14	1.0	20	0	111	80-120	23.11	4.29	30	
Bromodichloromethane	17.61	1.0	20	0	88	75-120	17.87	1.47	30	
Bromoform	14.29	1.0	20	0	71.4	70-130	14.08	1.48	30	
Bromomethane	23.09	1.0	20	0	115	30-145	23.04	0.217	30	
Carbon disulfide	22.82	2.5	20	0	114	35-165	23.75	3.99	30	
Carbon tetrachloride	19.86	1.0	20	0	99.3	65-140	20.66	3.95	30	
Chlorobenzene	21.31	1.0	20	0	107	80-120	21.76	2.09	30	
Chloroethane	21.95	1.0	20	0	110	60-135	22.28	1.49	30	
Chloroform	21.87	1.0	20	0	109	65-135	21.87	0	30	
Chloromethane	21.47	1.0	20	0	107	70-125	18.71	13.7	30	
cis-1,2-Dichloroethene	64.52	1.0	20	40.72	119	70-125	65.17	1	30	
cis-1,3-Dichloropropene	18.56	1.0	20	0	92.8	70-130	18.76	1.07	30	
Dibromochloromethane	14.88	1.0	20	0	74.4	60-135	14.7	1.22	30	
Dichlorodifluoromethane	16.2	1.0	20	0	81	30-155	17.04	5.05	30	
Ethylbenzene	23.1	1.0	20	0	116	75-125	23.46	1.55	30	
Isopropylbenzene	20.63	1.0	20	0	103	75-125	20.82	0.917	30	
Methyl tert-butyl ether	21.9	5.0	20	0	110	65-125	21.42	2.22	30	
Methylene chloride	21.76	5.0	20	0	109	55-140	21.65	0.507	30	
Styrene	19.66	1.0	20	0	98.3	65-135	19.85	0.962	30	
Tetrachloroethene	26	2.0	20	2.07	120	45-150	27.45	5.43	30	
Toluene	22.33	1.0	20	0	112	75-120	22.88	2.43	30	
trans-1,2-Dichloroethene	26.24	1.0	20	1.79	122	60-140	27.04	3	30	
trans-1,3-Dichloropropene	17.73	1.0	20	0	88.6	55-140	17.61	0.679	30	
Trichloroethene	55.1	1.0	20	25.84	146	70-125	58.28	5.61	30	S
Trichlorofluoromethane	21.59	1.0	20	0	108	60-145	22.04	2.06	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **R138303A** Instrument ID **VMS6** Method: **SW8260**

Vinyl chloride	23.69	1.0	20	4.05	98.2	50-145	24.53	3.48	30
Xylenes, Total	60.97	3.0	60	0	102	75-130	62.47	2.43	30
Surr: 1,2-Dichloroethane-d4	*19.95*	0	*20*	0	*99.8*	*70-120*	20.15	*0.998*	*30*
Surr: 4-Bromofluorobenzene	*20.1*	0	*20*	0	*100*	*75-120*	20.03	*0.349*	*30*
Surr: Dibromofluoromethane	*20.19*	0	*20*	0	*101*	*85-115*	20.21	*0.099*	*30*
Surr: Toluene-d8	*19.71*	0	*20*	0	*98.6*	*85-120*	20.05	*1.71*	*30*

The following samples were analyzed in this batch: 1404057-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Chain of Custody Form

ALS Environmental

Page 1 of 2

COC ID: 123456

- ☐ Cincinnati, OH +1 513 733 5336
- ☐ Everett, WA +1 425 356 2600
- ☐ Fort Collins, CO +1 970 490 1511
- ■ Holland, MI +1 616 399 6070
- ☐ Houston, TX +1 281 530 5656
- ☐ Middletown, PA +1 717 944 5541
- ☐ Salt Lake City, UT +1 801 266 7700
- ☐ Spring City, PA +1 610 948 4903
- ☐ York, PA +1 717 505 5280

ALS Project Manager: [illegible] | Work Order #: 1404057

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	WHITING CRUDE RELEASE	A	VOC
Work Order		Project Number		B	SVOC
Company Name		Bill To Company		C	METALS
Send Report To		Invoice Attn.		D	TPH (DRO, GRO & ORO)
Address		Address		E	
				F	
City/State/Zip		City/State/Zip		G	
Phone		Phone		H	
Fax		Fax		I	
e-Mail Address		e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	WCR-WATER01-032714	3/27/14	17:10	W	1&2	5	X	X	X								
2	WCR-OIL02-032814	3/28/14	12:50	OIL	8	1	X	X		X							
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s): Please Print & Sign: JEFF BRYNIACSKI

Shipment Method: ____

Required Turnaround Time: ☒ STD 10 Wk Days ☐ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other ____

Results Due Date:

Relinquished by:	Date:	Time:	Received by:	Notes:
[signature]	3/31/14	12:50	[signature]	
Relinquished by: [signature]	Date: 3/31/14	Time: 1630	Received by (Laboratory): FedEx [signature] 4/1/14 1000	Cooler Temp: 3.4°C
Logged by (Laboratory): [signature]	Date: 4/1/14	Time: 1440	Checked by (Laboratory): [signature]	

QC Package: (Check Box Below)
- ☐ Level II: Standard QC
- ☐ Level III: Std QC + Raw Data
- ☐ Level IV: SW846 CLP-Like
- ☐ Other: ____

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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Sample Receipt Checklist

Client Name: **WESTON - CHI** Date/Time Received: **01-Apr-14 10:00**

Work Order: **1404057** Received by: **KRW**

Checklist completed by Keith Wierenga (eSignature) 01-Apr-14 (Date) Reviewed by: Tom Bramish (eSignature) 01-Apr-14 (Date)

Matrices: Water & Oil

Carrier name: FedEx

	Yes	No	Not Present
Shipping container/cooler in good condition?	☑	☐	☐
Custody seals intact on shipping container/cooler?	☐	☐	☑
Custody seals intact on sample bottles?	☐	☐	☑
Chain of custody present?	☑	☐	
Chain of custody signed when relinquished and received?	☑	☐	
Chain of custody agrees with sample labels?	☑	☐	
Samples in proper container/bottle?	☑	☐	
Sample containers intact?	☑	☐	
Sufficient sample volume for indicated test?	☑	☐	
All samples received within holding time?	☑	☐	
Container/Temp Blank temperature in compliance?	☑	☐	
Sample(s) received on ice?	☑	☐	

Temperature(s)/Thermometer(s): 3.4 C

Cooler(s)/Kit(s):

Date/Time sample(s) sent to storage: 4/1/2014 2:55:45 PM

	Yes	No	No VOA vials submitted
Water - VOA vials have zero headspace?	☐	☐	☑

	Yes	No	N/A
Water - pH acceptable upon receipt?	☑	☐	☐
pH adjusted?	☐	☑	☐

pH adjusted by: -

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

WHITING REFINERY EMERGENCY RESPONSE
WHITING, LAKE COUNTY, ILLINOIS
DATA VALIDATION REPORT

Date: April 15, 2014
Laboratory: ALS Environmental (ALS), Holland, Michigan
Laboratory Project #: 1404057
Data Validation Performed By: Lisa Graczyk, Weston Solutions, Inc. (WESTON®) Superfund Technical Assessment and Response Team (START)
Weston Analytical Work Order #/TDD #: 20405.016.005.2311.77/ S05-0005-1403-009

This data validation report has been prepared by WESTON START under the START III Region V contract. This report documents the data validation for one water and one oil sample collected for the Whiting Refinery Emergency Response Site that were analyzed for the following parameters and U.S. Environmental Protection Agency methods:

- Volatile Organic Compounds (VOC) by SW-846 Method 8260
- Semivolatile Organic Carbons (SVOC) by SW-846 Method 8270
- Metals by SW-846 Methods 6020A and 7471
- Total Petroleum Hydrocarbons (TPH) as Oil Range Organics (ORO), Diesel Range Organics (DRO), and Oil Range Organics (ORO) by SW-846 Method 8015

A level II data package was requested from ALS. The data validation was conducted in general accordance with the U.S. EPA "Contract Laboratory Program National Functional Guidance for Superfund Organic Methods Data Review" dated June 2008 and "Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review" dated January 2010. The Attachment contains the results summary sheets with the hand-written qualifiers applied during data validation.

Data Validation Report
Whiting Refinery Emergency Response Site
ALS Environmental
Laboratory Project #: 1404057

VOCs by SW-846 METHOD 8260

1. Samples

The following table summarizes the samples for which this data validation is being conducted.

Samples	Lab ID	Matrix	Date Collected	Date Analyzed
WCR-Water01-032714	1404057-01	Water	3/27/2014	4/3/2014
WCR-Oil02-032814	1404057-02	Oil	3/28/2014	4/3/2014

2. Holding Times

The samples were analyzed within the required holding time limit of 14 days from sample collection.

3. Blanks

Method blanks were analyzed with the VOC analyses and were free of VOCs above the reporting limits.

4. Surrogate Results

The surrogate recovery results were within the laboratory-established quality control (QC) limits.

5. Laboratory Control Sample (LCS) Results

The LCS recoveries were within laboratory QC limits.

6. Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Results

A site-specific MS and MSD were not analyzed with this work order. Therefore, matrix interferences could not be evaluated using the MS and MSD. For the MS and MSD that were analyzed, the recoveries and relative percent differences (RPD) were mostly within QC limits and were acceptable.

7. Overall Assessment

The VOC data are acceptable for use based on the information received.

Data Validation Report
Whiting Refinery Emergency Response Site
ALS Environmental
Laboratory Project #: 1404057

SVOCs by SW-846 METHOD 8270

1. Samples

The following table summarizes the samples for which this data validation is being conducted.

Samples	Lab ID	Matrix	Date Collected	Date Prepared	Date Analyzed
WCR-Water01-032714	1404057-01	Water	3/27/2014	4/2/2014	4/3/2014
WCR-Oil02-032814	1404057-02	Oil	3/28/2014	4/4/2014	4/9/2014

2. Holding Times

The samples were analyzed within the required holding time limit of 7 days from sample collection to extraction and 40 days from extraction to analysis.

3. Blanks

A method blank was analyzed with the SVOC analyses and was free of target compound contamination above the reporting limits.

4. Surrogate Results

For the water sample, the surrogate recoveries were within QC limits.

For the oil sample, several of the surrogates were diluted below the calibration range of the instrument and were not adequately recovered. No qualifications are warranted.

5. LCS Results

The percent recoveries for the LCS results were within the laboratory-established QC limits.

6. MS and MSD Results

A site-specific MS and MSD were not analyzed with this work order. Therefore, matrix interferences could not be evaluated using the MS and MSD. For the MS and MSD that were analyzed, the recoveries and RPDs were within QC limits.

7. Overall Assessment

The SVOC data are acceptable for use based on the information received.

Data Validation Report
Whiting Refinery Emergency Response Site
ALS Environmental
Laboratory Project #: 1404057

TPH AS ORO, DRO, AND ORO BY SW-846 METHOD 8015

1. Samples

The following table summarizes the samples for which this data validation is being conducted.

Samples	Lab ID	Matrix	Date Collected	Date Prepared	Date Analyzed
WCR-Oil02-032814	1404057-02	Oil	3/28/2014	4/2/2014 – 4/4/2014	4/2/2014 – 4/4/2014

2. Holding Times

The samples were analyzed within holding times for TPH analyses.

3. Blanks

Method blanks were analyzed with the TPH analyses and were free of target compound contamination above the reporting limits.

4. Surrogate Results

The surrogates were not recovered due to the high concentration of target analytes in the samples. No qualification was required.

5. LCS Results

The percent recoveries for the LCS results were within the laboratory-established QC limits.

6. Overall Assessment

The TPH data are acceptable for use based on the information received.

Data Validation Report
Whiting Refinery Emergency Response Site
ALS Environmental
Laboratory Project #: 1404057

TOTAL METALS BY SW-846 METHODS 6020A AND 7471

1. Samples

The following table summarizes the samples for which this data validation is being conducted.

Samples	Lab ID	Matrix	Date Collected	Date Analyzed
WCR-Water01-032714	1404057-01	Water	3/27/2014	4/3/2014 – 4/7/2014

2. Holding Times

The sample was analyzed within the required holding time limit of 28 days from sample collection to analysis for mercury and 180 days from sample collection to analysis for all other metals.

3. Blank Results

Method blanks were analyzed with the metals analysis. The blanks were free of target analyte contamination above the reporting limits. Some metals were detected below the reporting limits in the method blanks; however, the sample concentrations were either non-detect or much higher than the blank concentrations. No qualifications were required.

4. LCS Results

The LCS recoveries were within the laboratory-established QC limits.

5. MS and MSD Results

One site-specific MS and MSD were analyzed for mercury only. The percent recoveries and RPD were within QC limits. For the other metals, an MS and MSD were analyzed using a sample from another project. The recoveries and RPDs were within QC limits.

6. Overall Assessment

The metals data are acceptable for use based on the information received.

ATTACHMENT

ALS ENVIRONMENTAL
RESULTS SUMMARY

10-Apr-2014

Lisa Graczyk
Weston Solutions, Inc
20 North Wacker Drive
Suite 1210
Chicago, IL 60606

Re: **Whiting Crude Release** Work Order: **1404057**

Dear Lisa,

ALS Environmental received 2 samples on 01-Apr-2014 for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

Sample results are compliant with NELAP standard requirements and QC results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 45.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Electronically approved by: Tom Beamish

Tom Beamish
Senior Project Manager

Certificate No: MN 532786

ADDRESS 3352 128th Avenue Holland, Michigan 49424-9263 | PHONE (616) 399-6070 | FAX (616) 399-6185
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RIGHT SOLUTIONS RIGHT PARTNER

ALS Group USA, Corp

Date: 10-Apr-14

Client: Weston Solutions, Inc
Project: Whiting Crude Release
Work Order: **1404057**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1404057-01	WCR-Water01-032714	Water		03/27/14 17:10	04/01/14 10:00	☐
1404057-02	WCR-Oil02-032814	Oil		03/28/14 12:50	04/01/14 10:00	☐

ALS Group USA, Corp

Date: 10-Apr-14

Client: Weston Solutions, Inc
Project: Whiting Crude Release
WorkOrder: **1404057**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte is present at an estimated concentration between the MDL and Report Limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

Units Reported	Description
mg/Kg	Milligrams per Kilogram
mg/L	Milligrams per Liter

ALS Group USA, Corp

Date: 10-Apr-14

Client: Weston Solutions, Inc
Project: Whiting Crude Release
Work Order: 1404057

Case Narrative

Analytical Comments:

Batch 57294, Method DRO_8015_O, Sample 1404057-02A: One or more DRO surrogate recoveries are unavailable due to dilution below the calibration range.

ALS Group USA, Corp

Date: *10-Apr-14*

Client: Weston Solutions, Inc
Project: Whiting Crude Release
Sample ID: WCR-Water01-032714
Collection Date: 03/27/14 05:10 PM

Work Order: 1404057
Lab ID: 1404057-01
Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7470**		Prep: SW7470 / 4/4/14	Analyst: **LR**
Mercury	ND		0.00020	mg/L	1	04/07/14 02:44 PM
METALS BY ICP-MS			**SW6020A**		Prep: SW3005A / 4/3/14	Analyst: **ML**
Aluminum	**0.050**		**0.010**	**mg/L**	1	04/03/14 10:15 PM
Antimony	ND		0.0050	mg/L	1	04/03/14 10:15 PM
Arsenic	ND		0.0050	mg/L	1	04/03/14 10:15 PM
Barium	**0.021**		**0.0050**	**mg/L**	1	04/03/14 10:15 PM
Beryllium	ND		0.0020	mg/L	1	04/03/14 10:15 PM
Cadmium	ND		0.0020	mg/L	1	04/03/14 10:15 PM
Calcium	**36**		**0.50**	**mg/L**	1	04/03/14 10:15 PM
Chromium	ND		0.0050	mg/L	1	04/03/14 10:15 PM
Cobalt	ND		0.0050	mg/L	1	04/03/14 10:15 PM
Copper	**0.010**		**0.0050**	**mg/L**	1	04/03/14 10:15 PM
Iron	**0.088**		**0.080**	**mg/L**	1	04/03/14 10:15 PM
Lead	ND		0.0050	mg/L	1	04/03/14 10:15 PM
Magnesium	**13**		**0.20**	**mg/L**	1	04/03/14 10:15 PM
Manganese	**0.0083**		**0.0050**	**mg/L**	1	04/03/14 10:15 PM
Nickel	ND		0.0050	mg/L	1	04/03/14 10:15 PM
Potassium	**1.9**		**0.20**	**mg/L**	1	04/03/14 10:15 PM
Selenium	ND		0.0050	mg/L	1	04/03/14 10:15 PM
Silver	ND		0.0050	mg/L	1	04/03/14 10:15 PM
Sodium	**13**		**0.20**	**mg/L**	1	04/03/14 10:15 PM
Thallium	ND		0.0050	mg/L	1	04/03/14 10:15 PM
Vanadium	ND		0.0050	mg/L	1	04/03/14 10:15 PM
Zinc	**0.034**		**0.010**	**mg/L**	1	04/03/14 10:15 PM
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep: SW3510 / 4/2/14	Analyst: **RM**
1,1`-Biphenyl	ND		0.0050	mg/L	1	04/03/14 04:48 AM
2,4,5-Trichlorophenol	ND		0.0050	mg/L	1	04/03/14 04:48 AM
2,4,6-Trichlorophenol	ND		0.0050	mg/L	1	04/03/14 04:48 AM
2,4-Dichlorophenol	ND		0.010	mg/L	1	04/03/14 04:48 AM
2,4-Dimethylphenol	ND		0.0050	mg/L	1	04/03/14 04:48 AM
2,4-Dinitrophenol	ND		0.0050	mg/L	1	04/03/14 04:48 AM
2,4-Dinitrotoluene	ND		0.0050	mg/L	1	04/03/14 04:48 AM
2,6-Dinitrotoluene	ND		0.0050	mg/L	1	04/03/14 04:48 AM
2-Chloronaphthalene	ND		0.0050	mg/L	1	04/03/14 04:48 AM
2-Chlorophenol	ND		0.0050	mg/L	1	04/03/14 04:48 AM
2-Methylnaphthalene	ND		0.0050	mg/L	1	04/03/14 04:48 AM
2-Methylphenol	ND		0.0050	mg/L	1	04/03/14 04:48 AM
2-Nitroaniline	ND		0.020	mg/L	1	04/03/14 04:48 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *10-Apr-14*

Client: Weston Solutions, Inc
Project: Whiting Crude Release
Sample ID: WCR-Water01-032714
Collection Date: 03/27/14 05:10 PM

Work Order: 1404057
Lab ID: 1404057-01
Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
2-Nitrophenol	ND		0.0050	mg/L	1	04/03/14 04:48 AM
3,3´-Dichlorobenzidine	ND		0.0050	mg/L	1	04/03/14 04:48 AM
3-Nitroaniline	ND		0.020	mg/L	1	04/03/14 04:48 AM
4,6-Dinitro-2-methylphenol	ND		0.020	mg/L	1	04/03/14 04:48 AM
4-Bromophenyl phenyl ether	ND		0.0050	mg/L	1	04/03/14 04:48 AM
4-Chloro-3-methylphenol	ND		0.0050	mg/L	1	04/03/14 04:48 AM
4-Chloroaniline	ND		0.020	mg/L	1	04/03/14 04:48 AM
4-Chlorophenyl phenyl ether	ND		0.0050	mg/L	1	04/03/14 04:48 AM
4-Methylphenol	ND		0.0050	mg/L	1	04/03/14 04:48 AM
4-Nitroaniline	ND		0.020	mg/L	1	04/03/14 04:48 AM
4-Nitrophenol	ND		0.020	mg/L	1	04/03/14 04:48 AM
Acenaphthene	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Acenaphthylene	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Acetophenone	ND		0.0010	mg/L	1	04/03/14 04:48 AM
Anthracene	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Atrazine	ND		0.0010	mg/L	1	04/03/14 04:48 AM
Benzaldehyde	ND		0.0010	mg/L	1	04/03/14 04:48 AM
Benzo(a)anthracene	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Benzo(a)pyrene	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Benzo(b)fluoranthene	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Benzo(g,h,i)perylene	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Benzo(k)fluoranthene	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Bis(2-chloroethoxy)methane	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Bis(2-chloroethyl)ether	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Bis(2-chloroisopropyl)ether	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Bis(2-ethylhexyl)phthalate	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Butyl benzyl phthalate	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Caprolactam	ND		0.010	mg/L	1	04/03/14 04:48 AM
Carbazole	ND		0.010	mg/L	1	04/03/14 04:48 AM
Chrysene	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Dibenzo(a,h)anthracene	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Dibenzofuran	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Diethyl phthalate	ND		0.020	mg/L	1	04/03/14 04:48 AM
Dimethyl phthalate	ND		0.020	mg/L	1	04/03/14 04:48 AM
Di-n-butyl phthalate	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Di-n-octyl phthalate	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Fluoranthene	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Fluorene	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Hexachlorobenzene	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Hexachlorobutadiene	ND		0.0050	mg/L	1	04/03/14 04:48 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *10-Apr-14*

Client: Weston Solutions, Inc
Project: Whiting Crude Release
Sample ID: WCR-Water01-032714
Collection Date: 03/27/14 05:10 PM

Work Order: 1404057
Lab ID: 1404057-01
Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Hexachlorocyclopentadiene	ND		0.020	mg/L	1	04/03/14 04:48 AM
Hexachloroethane	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Indeno(1,2,3-cd)pyrene	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Isophorone	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Naphthalene	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Nitrobenzene	ND		0.0050	mg/L	1	04/03/14 04:48 AM
N-Nitrosodi-n-propylamine	ND		0.0050	mg/L	1	04/03/14 04:48 AM
N-Nitrosodiphenylamine	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Pentachlorophenol	ND		0.020	mg/L	1	04/03/14 04:48 AM
Phenanthrene	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Phenol	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Pyrene	ND		0.0050	mg/L	1	04/03/14 04:48 AM
Surr: 2,4,6-Tribromophenol	*86.7*		*32-115*	*%REC*	1	04/03/14 04:48 AM
Surr: 2-Fluorobiphenyl	*72.5*		*32-100*	*%REC*	1	04/03/14 04:48 AM
Surr: 2-Fluorophenol	*39.6*		*22-59*	*%REC*	1	04/03/14 04:48 AM
Surr: 4-Terphenyl-d14	*90.2*		*23-112*	*%REC*	1	04/03/14 04:48 AM
Surr: Nitrobenzene-d5	*88.7*		*31-93*	*%REC*	1	04/03/14 04:48 AM
Surr: Phenol-d6	*22.3*		*13-36*	*%REC*	1	04/03/14 04:48 AM
VOLATILE ORGANIC COMPOUNDS			**SW8260**			Analyst: **BG**
1,1,1-Trichloroethane	ND		0.0010	mg/L	1	04/03/14 03:32 AM
1,1,2,2-Tetrachloroethane	ND		0.0010	mg/L	1	04/03/14 03:32 AM
1,1,2-Trichloroethane	ND		0.0010	mg/L	1	04/03/14 03:32 AM
1,1,2-Trichlorotrifluoroethane	ND		0.0010	mg/L	1	04/03/14 03:32 AM
1,1-Dichloroethane	ND		0.0010	mg/L	1	04/03/14 03:32 AM
1,1-Dichloroethene	ND		0.0010	mg/L	1	04/03/14 03:32 AM
1,2,4-Trichlorobenzene	ND		0.0010	mg/L	1	04/03/14 03:32 AM
1,2-Dibromo-3-chloropropane	ND		0.0010	mg/L	1	04/03/14 03:32 AM
1,2-Dibromoethane	ND		0.0010	mg/L	1	04/03/14 03:32 AM
1,2-Dichlorobenzene	ND		0.0010	mg/L	1	04/03/14 03:32 AM
1,2-Dichloroethane	ND		0.0010	mg/L	1	04/03/14 03:32 AM
1,2-Dichloropropane	ND		0.0020	mg/L	1	04/03/14 03:32 AM
1,3-Dichlorobenzene	ND		0.0020	mg/L	1	04/03/14 03:32 AM
1,4-Dichlorobenzene	ND		0.0020	mg/L	1	04/03/14 03:32 AM
2-Butanone	ND		0.0050	mg/L	1	04/03/14 03:32 AM
2-Hexanone	ND		0.0050	mg/L	1	04/03/14 03:32 AM
4-Methyl-2-pentanone	ND		0.0050	mg/L	1	04/03/14 03:32 AM
Acetone	ND		0.020	mg/L	1	04/03/14 03:32 AM
Benzene	ND		0.0010	mg/L	1	04/03/14 03:32 AM
Bromodichloromethane	ND		0.0010	mg/L	1	04/03/14 03:32 AM
Bromoform	ND		0.0010	mg/L	1	04/03/14 03:32 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *10-Apr-14*

Client: Weston Solutions, Inc
Project: Whiting Crude Release
Sample ID: WCR-Water01-032714
Collection Date: 03/27/14 05:10 PM

Work Order: 1404057
Lab ID: 1404057-01
Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Bromomethane	ND		0.0010	mg/L	1	04/03/14 03:32 AM
Carbon disulfide	ND		0.0025	mg/L	1	04/03/14 03:32 AM
Carbon tetrachloride	ND		0.0010	mg/L	1	04/03/14 03:32 AM
Chlorobenzene	ND		0.0010	mg/L	1	04/03/14 03:32 AM
Chloroethane	ND		0.0010	mg/L	1	04/03/14 03:32 AM
Chloroform	ND		0.0010	mg/L	1	04/03/14 03:32 AM
Chloromethane	ND		0.0010	mg/L	1	04/03/14 03:32 AM
cis-1,2-Dichloroethene	ND		0.0010	mg/L	1	04/03/14 03:32 AM
cis-1,3-Dichloropropene	ND		0.0010	mg/L	1	04/03/14 03:32 AM
Cyclohexane	ND		0.0050	mg/L	1	04/03/14 03:32 AM
Dibromochloromethane	ND		0.0010	mg/L	1	04/03/14 03:32 AM
Dichlorodifluoromethane	ND		0.0010	mg/L	1	04/03/14 03:32 AM
Ethylbenzene	ND		0.0010	mg/L	1	04/03/14 03:32 AM
Isopropylbenzene	ND		0.0010	mg/L	1	04/03/14 03:32 AM
Methyl acetate	ND		0.0020	mg/L	1	04/03/14 03:32 AM
Methyl tert-butyl ether	ND		0.0050	mg/L	1	04/03/14 03:32 AM
Methylcyclohexane	ND		0.0050	mg/L	1	04/03/14 03:32 AM
Methylene chloride	ND		0.0050	mg/L	1	04/03/14 03:32 AM
Styrene	ND		0.0010	mg/L	1	04/03/14 03:32 AM
Tetrachloroethene	ND		0.0020	mg/L	1	04/03/14 03:32 AM
Toluene	ND		0.0010	mg/L	1	04/03/14 03:32 AM
trans-1,2-Dichloroethene	ND		0.0010	mg/L	1	04/03/14 03:32 AM
trans-1,3-Dichloropropene	ND		0.0010	mg/L	1	04/03/14 03:32 AM
Trichloroethene	ND		0.0010	mg/L	1	04/03/14 03:32 AM
Trichlorofluoromethane	ND		0.0010	mg/L	1	04/03/14 03:32 AM
Vinyl chloride	ND		0.0010	mg/L	1	04/03/14 03:32 AM
Xylenes, Total	ND		0.0030	mg/L	1	04/03/14 03:32 AM
Surr: 1,2-Dichloroethane-d4	*102*		*70-120*	*%REC*	1	04/03/14 03:32 AM
Surr: 4-Bromofluorobenzene	*97.2*		*75-120*	*%REC*	1	04/03/14 03:32 AM
Surr: Dibromofluoromethane	*97.0*		*85-115*	*%REC*	1	04/03/14 03:32 AM
Surr: Toluene-d8	*98.6*		*85-120*	*%REC*	1	04/03/14 03:32 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *10-Apr-14*

Client: Weston Solutions, Inc
Project: Whiting Crude Release
Sample ID: WCR-Oil02-032814
Collection Date: 03/28/14 12:50 PM

Work Order: 1404057
Lab ID: 1404057-02
Matrix: OIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep: SW3580 / 4/4/14	Analyst: **IT**
DRO (C10-C28)	**210,000**		**1.0**	**mg/Kg**	5	04/04/14 01:28 PM
ORO (C28-C40)	**140,000**		**1.0**	**mg/Kg**	5	04/04/14 01:28 PM
Surr: 4-Terphenyl-d14	*16.1*	S	*39-115*	*%REC*	5	04/04/14 01:28 PM
GASOLINE RANGE ORGANICS BY GC-FID			**SW8015**		Prep: SW5035 / 4/2/14	Analyst: **IT**
GRO (C6-C10)	**8,800**		**170**	**mg/Kg**	1	04/02/14 11:09 PM
Surr: Toluene-d8	*91.4*		*50-150*	*%REC*	1	04/02/14 11:09 PM
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep: SW3580 / 4/4/14	Analyst: **RM**
1,1`-Biphenyl	ND		500	mg/Kg	5	04/09/14 01:06 AM
2,4,5-Trichlorophenol	ND		500	mg/Kg	5	04/09/14 01:06 AM
2,4,6-Trichlorophenol	ND		500	mg/Kg	5	04/09/14 01:06 AM
2,4-Dichlorophenol	ND		500	mg/Kg	5	04/09/14 01:06 AM
2,4-Dimethylphenol	ND		500	mg/Kg	5	04/09/14 01:06 AM
2,4-Dinitrophenol	ND		500	mg/Kg	5	04/09/14 01:06 AM
2,4-Dinitrotoluene	ND		500	mg/Kg	5	04/09/14 01:06 AM
2,6-Dinitrotoluene	ND		500	mg/Kg	5	04/09/14 01:06 AM
2-Chloronaphthalene	ND		500	mg/Kg	5	04/09/14 01:06 AM
2-Chlorophenol	ND		500	mg/Kg	5	04/09/14 01:06 AM
2-Methylnaphthalene	ND		500	mg/Kg	5	04/09/14 01:06 AM
2-Methylphenol	ND		500	mg/Kg	5	04/09/14 01:06 AM
2-Nitroaniline	ND		500	mg/Kg	5	04/09/14 01:06 AM
2-Nitrophenol	ND		500	mg/Kg	5	04/09/14 01:06 AM
3,3´-Dichlorobenzidine	ND		500	mg/Kg	5	04/09/14 01:06 AM
3-Nitroaniline	ND		500	mg/Kg	5	04/09/14 01:06 AM
4,6-Dinitro-2-methylphenol	ND		500	mg/Kg	5	04/09/14 01:06 AM
4-Bromophenyl phenyl ether	ND		500	mg/Kg	5	04/09/14 01:06 AM
4-Chloro-3-methylphenol	ND		500	mg/Kg	5	04/09/14 01:06 AM
4-Chloroaniline	ND		500	mg/Kg	5	04/09/14 01:06 AM
4-Chlorophenyl phenyl ether	ND		500	mg/Kg	5	04/09/14 01:06 AM
4-Methylphenol	ND		500	mg/Kg	5	04/09/14 01:06 AM
4-Nitroaniline	ND		500	mg/Kg	5	04/09/14 01:06 AM
4-Nitrophenol	ND		500	mg/Kg	5	04/09/14 01:06 AM
Acenaphthene	ND		500	mg/Kg	5	04/09/14 01:06 AM
Acenaphthylene	ND		500	mg/Kg	5	04/09/14 01:06 AM
Acetophenone	ND		500	mg/Kg	5	04/09/14 01:06 AM
Anthracene	ND		500	mg/Kg	5	04/09/14 01:06 AM
Atrazine	ND		500	mg/Kg	5	04/09/14 01:06 AM
Benzaldehyde	ND		500	mg/Kg	5	04/09/14 01:06 AM
Benzo(a)anthracene	ND		500	mg/Kg	5	04/09/14 01:06 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *10-Apr-14*

Client: Weston Solutions, Inc
Project: Whiting Crude Release
Work Order: 1404057
Sample ID: WCR-Oil02-032814
Lab ID: 1404057-02
Collection Date: 03/28/14 12:50 PM
Matrix: OIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Benzo(a)pyrene	ND		500	mg/Kg	5	04/09/14 01:06 AM
Benzo(b)fluoranthene	ND		500	mg/Kg	5	04/09/14 01:06 AM
Benzo(g,h,i)perylene	ND		500	mg/Kg	5	04/09/14 01:06 AM
Benzo(k)fluoranthene	ND		500	mg/Kg	5	04/09/14 01:06 AM
Bis(2-chloroethoxy)methane	ND		500	mg/Kg	5	04/09/14 01:06 AM
Bis(2-chloroethyl)ether	ND		500	mg/Kg	5	04/09/14 01:06 AM
Bis(2-chloroisopropyl)ether	ND		500	mg/Kg	5	04/09/14 01:06 AM
Bis(2-ethylhexyl)phthalate	ND		500	mg/Kg	5	04/09/14 01:06 AM
Butyl benzyl phthalate	ND		500	mg/Kg	5	04/09/14 01:06 AM
Caprolactam	ND		500	mg/Kg	5	04/09/14 01:06 AM
Carbazole	ND		500	mg/Kg	5	04/09/14 01:06 AM
Chrysene	ND		500	mg/Kg	5	04/09/14 01:06 AM
Dibenzo(a,h)anthracene	ND		500	mg/Kg	5	04/09/14 01:06 AM
Dibenzofuran	ND		500	mg/Kg	5	04/09/14 01:06 AM
Diethyl phthalate	ND		500	mg/Kg	5	04/09/14 01:06 AM
Dimethyl phthalate	ND		500	mg/Kg	5	04/09/14 01:06 AM
Di-n-butyl phthalate	ND		500	mg/Kg	5	04/09/14 01:06 AM
Di-n-octyl phthalate	ND		500	mg/Kg	5	04/09/14 01:06 AM
Fluoranthene	ND		500	mg/Kg	5	04/09/14 01:06 AM
Fluorene	ND		500	mg/Kg	5	04/09/14 01:06 AM
Hexachlorobenzene	ND		500	mg/Kg	5	04/09/14 01:06 AM
Hexachlorobutadiene	ND		500	mg/Kg	5	04/09/14 01:06 AM
Hexachlorocyclopentadiene	ND		500	mg/Kg	5	04/09/14 01:06 AM
Hexachloroethane	ND		500	mg/Kg	5	04/09/14 01:06 AM
Indeno(1,2,3-cd)pyrene	ND		500	mg/Kg	5	04/09/14 01:06 AM
Isophorone	ND		500	mg/Kg	5	04/09/14 01:06 AM
Naphthalene	ND		500	mg/Kg	5	04/09/14 01:06 AM
Nitrobenzene	ND		500	mg/Kg	5	04/09/14 01:06 AM
N-Nitrosodi-n-propylamine	ND		500	mg/Kg	5	04/09/14 01:06 AM
N-Nitrosodiphenylamine	ND		500	mg/Kg	5	04/09/14 01:06 AM
Pentachlorophenol	ND		500	mg/Kg	5	04/09/14 01:06 AM
Phenanthrene	ND		500	mg/Kg	5	04/09/14 01:06 AM
Phenol	ND		500	mg/Kg	5	04/09/14 01:06 AM
Pyrene	ND		500	mg/Kg	5	04/09/14 01:06 AM
Surr: 2,4,6-Tribromophenol	*0*		*0-0*	*%REC*	5	04/09/14 01:06 AM
Surr: 2-Fluorobiphenyl	*0*		*0-0*	*%REC*	5	04/09/14 01:06 AM
Surr: 2-Fluorophenol	*0*		*0-0*	*%REC*	5	04/09/14 01:06 AM
Surr: 4-Terphenyl-d14	*0*		*0-0*	*%REC*	5	04/09/14 01:06 AM
Surr: Nitrobenzene-d5	*0*		*0-0*	*%REC*	5	04/09/14 01:06 AM
Surr: Phenol-d6	*0*		*0-0*	*%REC*	5	04/09/14 01:06 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *10-Apr-14*

Client: Weston Solutions, Inc
Project: Whiting Crude Release
Sample ID: WCR-Oil02-032814
Collection Date: 03/28/14 12:50 PM

Work Order: 1404057
Lab ID: 1404057-02
Matrix: OIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS			**SW8260B**		Prep: SW5035 / 4/2/14	Analyst: **BG**
1,1,1-Trichloroethane	ND		40	mg/Kg	20	04/03/14 04:54 PM
1,1,2,2-Tetrachloroethane	ND		40	mg/Kg	20	04/03/14 04:54 PM
1,1,2-Trichloroethane	ND		40	mg/Kg	20	04/03/14 04:54 PM
1,1,2-Trichlorotrifluoroethane	ND		40	mg/Kg	20	04/03/14 04:54 PM
1,1-Dichloroethane	ND		40	mg/Kg	20	04/03/14 04:54 PM
1,1-Dichloroethene	ND		40	mg/Kg	20	04/03/14 04:54 PM
1,2,4-Trichlorobenzene	ND		40	mg/Kg	20	04/03/14 04:54 PM
1,2-Dibromo-3-chloropropane	ND		40	mg/Kg	20	04/03/14 04:54 PM
1,2-Dibromoethane	ND		40	mg/Kg	20	04/03/14 04:54 PM
1,2-Dichlorobenzene	ND		40	mg/Kg	20	04/03/14 04:54 PM
1,2-Dichloroethane	ND		40	mg/Kg	20	04/03/14 04:54 PM
1,2-Dichloropropane	ND		40	mg/Kg	20	04/03/14 04:54 PM
1,3-Dichlorobenzene	ND		40	mg/Kg	20	04/03/14 04:54 PM
1,4-Dichlorobenzene	ND		40	mg/Kg	20	04/03/14 04:54 PM
2-Butanone	ND		270	mg/Kg	20	04/03/14 04:54 PM
2-Hexanone	ND		40	mg/Kg	20	04/03/14 04:54 PM
4-Methyl-2-pentanone	ND		40	mg/Kg	20	04/03/14 04:54 PM
Acetone	ND		130	mg/Kg	20	04/03/14 04:54 PM
Benzene	ND		40	mg/Kg	20	04/03/14 04:54 PM
Bromodichloromethane	ND		40	mg/Kg	20	04/03/14 04:54 PM
Bromoform	ND		40	mg/Kg	20	04/03/14 04:54 PM
Bromomethane	ND		100	mg/Kg	20	04/03/14 04:54 PM
Carbon disulfide	ND		40	mg/Kg	20	04/03/14 04:54 PM
Carbon tetrachloride	ND		40	mg/Kg	20	04/03/14 04:54 PM
Chlorobenzene	ND		40	mg/Kg	20	04/03/14 04:54 PM
Chloroethane	ND		130	mg/Kg	20	04/03/14 04:54 PM
Chloroform	ND		40	mg/Kg	20	04/03/14 04:54 PM
Chloromethane	ND		130	mg/Kg	20	04/03/14 04:54 PM
cis-1,2-Dichloroethene	ND		40	mg/Kg	20	04/03/14 04:54 PM
cis-1,3-Dichloropropene	ND		40	mg/Kg	20	04/03/14 04:54 PM
Cyclohexane	**2,500**		**40**	**mg/Kg**	20	04/03/14 04:54 PM
Dibromochloromethane	ND		40	mg/Kg	20	04/03/14 04:54 PM
Dichlorodifluoromethane	ND		40	mg/Kg	20	04/03/14 04:54 PM
Ethylbenzene	**380**		**40**	**mg/Kg**	20	04/03/14 04:54 PM
Isopropylbenzene	**160**		**40**	**mg/Kg**	20	04/03/14 04:54 PM
Methyl acetate	ND		270	mg/Kg	20	04/03/14 04:54 PM
Methyl tert-butyl ether	ND		40	mg/Kg	20	04/03/14 04:54 PM
Methylcyclohexane	**5,100**		**40**	**mg/Kg**	20	04/03/14 04:54 PM
Methylene chloride	ND		40	mg/Kg	20	04/03/14 04:54 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *10-Apr-14*

Client: Weston Solutions, Inc
Project: Whiting Crude Release
Sample ID: WCR-Oil02-032814
Collection Date: 03/28/14 12:50 PM

Work Order: 1404057
Lab ID: 1404057-02
Matrix: OIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Styrene	ND		40	mg/Kg	20	04/03/14 04:54 PM
Tetrachloroethene	ND		40	mg/Kg	20	04/03/14 04:54 PM
Toluene	**380**		**40**	**mg/Kg**	20	04/03/14 04:54 PM
trans-1,2-Dichloroethene	ND		40	mg/Kg	20	04/03/14 04:54 PM
trans-1,3-Dichloropropene	ND		40	mg/Kg	20	04/03/14 04:54 PM
Trichloroethene	ND		40	mg/Kg	20	04/03/14 04:54 PM
Trichlorofluoromethane	ND		40	mg/Kg	20	04/03/14 04:54 PM
Vinyl chloride	ND		40	mg/Kg	20	04/03/14 04:54 PM
Xylenes, Total	**1,700**		**120**	**mg/Kg**	20	04/03/14 04:54 PM
Surr: 1,2-Dichloroethane-d4	*95.6*		*70-130*	*%REC*	20	04/03/14 04:54 PM
Surr: 4-Bromofluorobenzene	*112*		*70-130*	*%REC*	20	04/03/14 04:54 PM
Surr: Dibromofluoromethane	*92.2*		*70-130*	*%REC*	20	04/03/14 04:54 PM
Surr: Toluene-d8	*106*		*70-130*	*%REC*	20	04/03/14 04:54 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: 10-Apr-14

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57294** Instrument ID **GC8** Method: **SW8015M**

MBLK Sample ID: **MBLK-57294-57294** Units: **mg/Kg** Analysis Date: **04/04/14 12:28 PM**

Client ID: Run ID: **GC8_140404B** SeqNo: **2700677** Prep Date: **04/04/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	ND	1,000								
ORO (C28-C40)	ND	1,000								
Surr: 4-Terphenyl-d14	*410.3*	0	*500*	0	*82.1*	*39-115*	0			

LCS Sample ID: **LCS-57294-57294** Units: **mg/Kg** Analysis Date: **04/04/14 12:58 PM**

Client ID: Run ID: **GC8_140404B** SeqNo: **2700679** Prep Date: **04/04/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	44410	1,000	50000	0	88.8	49-124	0			
ORO (C28-C40)	45690	1,000	50000	0	91.4	60-130	0			
Surr: 4-Terphenyl-d14	*414.7*	0	*500*	0	*82.9*	*39-115*	0			

The following samples were analyzed in this batch: 1404057-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57147** Instrument ID **GC9** Method: **SW8015**

MBLK Sample ID: **MBLK-57147-57147** Units: **µg/Kg** Analysis Date: **04/02/14 06:28 PM**

Client ID: Run ID: **GC9_140402B** SeqNo: **2696853** Prep Date: **04/02/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	ND	2,500								
Surr: Toluene-d8	*4986*	0	*5000*	0	*99.7*	*50-150*	0			

LCS Sample ID: **LCS-57147-57147** Units: **µg/Kg** Analysis Date: **04/02/14 04:46 PM**

Client ID: Run ID: **GC9_140402B** SeqNo: **2696851** Prep Date: **04/02/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	607100	2,500	500000	0	121	70-130	0			
Surr: Toluene-d8	*4466*	0	*5000*	0	*89.3*	*50-150*	0			

MS Sample ID: **1404093-01A MS** Units: **µg/Kg** Analysis Date: **04/03/14 02:40 AM**

Client ID: Run ID: **GC9_140402B** SeqNo: **2696869** Prep Date: **04/02/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	518300	2,500	500000	0	104	70-130	0			
Surr: Toluene-d8	*4608*	0	*5000*	0	*92.2*	*50-150*	0			

MSD Sample ID: **1404093-01A MSD** Units: **µg/Kg** Analysis Date: **04/03/14 03:06 AM**

Client ID: Run ID: **GC9_140402B** SeqNo: **2696870** Prep Date: **04/02/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	526300	2,500	500000	0	105	70-130	518300	1.53	30	
Surr: Toluene-d8	*4426*	0	*5000*	0	*88.5*	*50-150*	4608	*4.03*	*30*	

The following samples were analyzed in this batch: 1404057-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57254** Instrument ID **HG1** Method: **SW7470**

MBLK Sample ID: **MBLK-57254-57254** Units: **mg/L** Analysis Date: **04/07/14 02:33 PM**

Client ID: Run ID: **HG1_140407A** SeqNo: **2701501** Prep Date: **04/04/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	ND	0.00020								

LCS Sample ID: **LCS-57254-57254** Units: **mg/L** Analysis Date: **04/07/14 02:35 PM**

Client ID: Run ID: **HG1_140407A** SeqNo: **2701502** Prep Date: **04/04/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00193	0.00020	0.002	0	96.5	80-120		0		

MS Sample ID: **1404057-01CMS** Units: **mg/L** Analysis Date: **04/07/14 02:47 PM**

Client ID: **WCR-Water01-032714** Run ID: **HG1_140407A** SeqNo: **2701509** Prep Date: **04/04/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.002061	0.00020	0.002	-0.000023	104	75-125		0		

MSD Sample ID: **1404057-01CMSD** Units: **mg/L** Analysis Date: **04/07/14 02:56 PM**

Client ID: **WCR-Water01-032714** Run ID: **HG1_140407A** SeqNo: **2701518** Prep Date: **04/04/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.002032	0.00020	0.002	-0.000023	103	75-125	0.002061	1.42	20	

The following samples were analyzed in this batch: 1404057-01C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57200** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK Sample ID: **MBLK-57200-57200** Units: **mg/L** Analysis Date: **04/03/14 08:04 PM**

Client ID: Run ID: **ICPMS1_140403A** SeqNo: **2699093** Prep Date: **04/03/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	ND	0.0050								
Arsenic	ND	0.0050								
Barium	ND	0.0050								
Beryllium	ND	0.0020								
Cadmium	ND	0.0020								
Calcium	0.1484	0.50								J
Chromium	ND	0.0050								
Cobalt	ND	0.0050								
Copper	ND	0.0050								
Iron	0.007899	0.080								J
Lead	ND	0.0050								
Magnesium	0.06565	0.20								J
Manganese	0.0001004	0.0050								J
Nickel	ND	0.0050								
Potassium	0.04607	0.20								J
Selenium	0.0007958	0.0050								J
Silver	ND	0.0050								
Sodium	0.1159	0.20								J
Thallium	ND	0.0050								
Vanadium	ND	0.0050								
Zinc	ND	0.010								

MBLK Sample ID: **MBLK-57200-57200** Units: **mg/L** Analysis Date: **04/04/14 02:36 PM**

Client ID: Run ID: **ICPMS1_140404A** SeqNo: **2699907** Prep Date: **04/03/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.001235	0.010								J

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57200** Instrument ID **ICPMS1** Method: **SW6020A**

LCS Sample ID: **LCS-57200-57200** Units: **mg/L** Analysis Date: **04/03/14 08:10 PM**

Client ID: Run ID: **ICPMS1_140403A** SeqNo: **2699095** Prep Date: **04/03/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.09506	0.0050	0.1	0	95.1	80-120	0			
Arsenic	0.09156	0.0050	0.1	0	91.6	80-120	0			
Barium	0.09358	0.0050	0.1	0	93.6	80-120	0			
Beryllium	0.09685	0.0020	0.1	0	96.8	80-120	0			
Cadmium	0.09503	0.0020	0.1	0	95	80-120	0			
Calcium	9.306	0.50	10	0	93.1	80-120	0			
Chromium	0.08929	0.0050	0.1	0	89.3	80-120	0			
Cobalt	0.08918	0.0050	0.1	0	89.2	80-120	0			
Copper	0.09183	0.0050	0.1	0	91.8	80-120	0			
Iron	9.333	0.080	10	0	93.3	80-120	0			
Lead	0.09142	0.0050	0.1	0	91.4	80-120	0			
Magnesium	9.143	0.20	10	0	91.4	80-120	0			
Manganese	0.09136	0.0050	0.1	0	91.4	80-120	0			
Nickel	0.08986	0.0050	0.1	0	89.9	80-120	0			
Potassium	9.125	0.20	10	0	91.2	80-120	0			
Selenium	0.09294	0.0050	0.1	0	92.9	80-120	0			
Silver	0.08769	0.0050	0.1	0	87.7	80-120	0			
Sodium	8.969	0.20	10	0	89.7	80-120	0			
Thallium	0.08869	0.0050	0.1	0	88.7	80-120	0			
Vanadium	0.092	0.0050	0.1	0	92	80-120	0			
Zinc	0.09559	0.010	0.1	0	95.6	80-120	0			

LCS Sample ID: **LCS-57200-57200** Units: **mg/L** Analysis Date: **04/04/14 02:43 PM**

Client ID: Run ID: **ICPMS1_140404A** SeqNo: **2699908** Prep Date: **04/03/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.09101	0.010	0.1	0	91	80-120	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57200** Instrument ID **ICPMS1** Method: **SW6020A**

MS Sample ID: **14031413-02AMS** Units: **mg/L** Analysis Date: **04/03/14 10:02 PM**

Client ID: Run ID: **ICPMS1_140403A** SeqNo: **2699121** Prep Date: **04/03/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	1.013	0.10	1	0.02451	98.8	75-125	0			
Antimony	0.9489	0.050	1	0.001837	94.7	75-125	0			
Arsenic	0.972	0.050	1	0.0005695	97.1	75-125	0			
Barium	1.216	0.050	1	0.2365	98	75-125	0			
Beryllium	0.934	0.020	1	0.0005091	93.3	75-125	0			
Cadmium	0.938	0.020	1	0.0005312	93.7	75-125	0			
Calcium	272.1	5.0	100	174	98.1	75-125	0			
Chromium	0.9486	0.050	1	0.001037	94.8	75-125	0			
Cobalt	0.9314	0.050	1	0.002633	92.9	75-125	0			
Copper	0.9348	0.050	1	0.005053	93	75-125	0			
Iron	100.4	0.80	100	4.785	95.6	75-125	0			
Lead	0.9469	0.050	1	0.00115	94.6	75-125	0			
Magnesium	116.8	2.0	100	14.24	103	75-125	0			
Manganese	1.464	0.050	1	0.5013	96.3	75-125	0			
Nickel	0.9391	0.050	1	0.005886	93.3	75-125	0			
Potassium	131.8	2.0	100	31.49	100	75-125	0			
Selenium	0.8987	0.050	1	-0.0003594	89.9	75-125	0			
Silver	0.8435	0.050	1	0.000274	84.3	75-125	0			
Thallium	0.9164	0.050	1	0.0008541	91.6	75-125	0			
Vanadium	1.011	0.050	1	0.002739	101	75-125	0			
Zinc	0.9719	0.10	1	0.01789	95.4	75-125	0			

MS Sample ID: **14031413-02AMS** Units: **mg/L** Analysis Date: **04/04/14 01:46 PM**

Client ID: Run ID: **ICPMS1_140404A** SeqNo: **2699899** Prep Date: **04/03/14** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	4286	20	100	4152	134	75-125	0			SO

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57200** Instrument ID **ICPMS1** Method: **SW6020A**

MSD Sample ID: **14031413-02AMSD** Units: **mg/L** Analysis Date: **04/03/14 10:09 PM**

Client ID: Run ID: **ICPMS1_140403A** SeqNo: **2699122** Prep Date: **04/03/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	1.043	0.10	1	0.02451	102	75-125	1.013	2.92	20	
Antimony	0.9415	0.050	1	0.001837	94	75-125	0.9489	0.783	20	
Arsenic	0.994	0.050	1	0.0005695	99.3	75-125	0.972	2.24	20	
Barium	1.237	0.050	1	0.2365	100	75-125	1.216	1.71	20	
Beryllium	0.9706	0.020	1	0.0005091	97	75-125	0.934	3.84	20	
Cadmium	0.9582	0.020	1	0.0005312	95.8	75-125	0.938	2.13	20	
Calcium	281.5	5.0	100	174	108	75-125	272.1	3.4	20	
Chromium	0.9404	0.050	1	0.001037	93.9	75-125	0.9486	0.868	20	
Cobalt	0.9253	0.050	1	0.002633	92.3	75-125	0.9314	0.657	20	
Copper	0.9245	0.050	1	0.005053	91.9	75-125	0.9348	1.11	20	
Iron	99.73	0.80	100	4.785	94.9	75-125	100.4	0.67	20	
Lead	0.9709	0.050	1	0.00115	97	75-125	0.9469	2.5	20	
Magnesium	121	2.0	100	14.24	107	75-125	116.8	3.53	20	
Manganese	1.451	0.050	1	0.5013	95	75-125	1.464	0.892	20	
Nickel	0.9255	0.050	1	0.005886	92	75-125	0.9391	1.46	20	
Potassium	135.4	2.0	100	31.49	104	75-125	131.8	2.69	20	
Selenium	0.9143	0.050	1	-0.0003594	91.5	75-125	0.8987	1.72	20	
Silver	0.8403	0.050	1	0.000274	84	75-125	0.8435	0.38	20	
Thallium	0.9444	0.050	1	0.0008541	94.4	75-125	0.9164	3.01	20	
Vanadium	0.9918	0.050	1	0.002739	98.9	75-125	1.011	1.92	20	
Zinc	0.9627	0.10	1	0.01789	94.5	75-125	0.9719	0.951	20	

MSD Sample ID: **14031413-02AMSD** Units: **mg/L** Analysis Date: **04/04/14 01:53 PM**

Client ID: Run ID: **ICPMS1_140404A** SeqNo: **2699900** Prep Date: **04/03/14** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	4173	20	100	4152	21	75-125	4286	2.67	20	SO

The following samples were analyzed in this batch: 1404057-01C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57129** Instrument ID **SVMS8** Method: **SW8270**

MBLK Sample ID: **SBLKW1-57129-57129** Units: **µg/L** Analysis Date: **04/02/14 05:37 PM**

Client ID: Run ID: **SVMS8_140402A** SeqNo: **2698065** Prep Date: **04/02/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1`-Biphenyl	ND	5.0								
2,4,5-Trichlorophenol	ND	5.0								
2,4,6-Trichlorophenol	ND	5.0								
2,4-Dichlorophenol	ND	10								
2,4-Dimethylphenol	ND	5.0								
2,4-Dinitrophenol	ND	5.0								
2,4-Dinitrotoluene	ND	5.0								
2,6-Dinitrotoluene	ND	5.0								
2-Chloronaphthalene	ND	5.0								
2-Chlorophenol	ND	5.0								
2-Methylnaphthalene	ND	5.0								
2-Methylphenol	ND	5.0								
2-Nitroaniline	ND	20								
2-Nitrophenol	ND	5.0								
3,3´-Dichlorobenzidine	ND	5.0								
3-Nitroaniline	ND	20								
4,6-Dinitro-2-methylphenol	ND	20								
4-Bromophenyl phenyl ether	ND	5.0								
4-Chloro-3-methylphenol	ND	5.0								
4-Chloroaniline	ND	20								
4-Chlorophenyl phenyl ether	ND	5.0								
4-Methylphenol	ND	5.0								
4-Nitroaniline	ND	20								
4-Nitrophenol	ND	20								
Acenaphthene	ND	5.0								
Acenaphthylene	ND	5.0								
Acetophenone	ND	1.0								
Anthracene	ND	5.0								
Atrazine	ND	1.0								
Benzaldehyde	ND	1.0								
Benzo(a)anthracene	ND	5.0								
Benzo(a)pyrene	ND	5.0								
Benzo(b)fluoranthene	ND	5.0								
Benzo(g,h,i)perylene	ND	5.0								
Benzo(k)fluoranthene	ND	5.0								
Bis(2-chloroethoxy)methane	ND	5.0								
Bis(2-chloroethyl)ether	ND	5.0								
Bis(2-chloroisopropyl)ether	ND	5.0								
Bis(2-ethylhexyl)phthalate	ND	5.0								
Butyl benzyl phthalate	ND	5.0								
Caprolactam	ND	10								
Carbazole	ND	10								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **57129** Instrument ID **SVMS8** Method: **SW8270**

Chrysene	ND	5.0					
Dibenzo(a,h)anthracene	ND	5.0					
Dibenzofuran	ND	5.0					
Diethyl phthalate	ND	20					
Dimethyl phthalate	ND	20					
Di-n-butyl phthalate	ND	5.0					
Di-n-octyl phthalate	ND	5.0					
Fluoranthene	ND	5.0					
Fluorene	ND	5.0					
Hexachlorobenzene	ND	5.0					
Hexachlorobutadiene	ND	5.0					
Hexachlorocyclopentadiene	ND	20					
Hexachloroethane	ND	5.0					
Indeno(1,2,3-cd)pyrene	ND	5.0					
Isophorone	ND	5.0					
Naphthalene	ND	5.0					
Nitrobenzene	ND	5.0					
N-Nitrosodi-n-propylamine	ND	5.0					
N-Nitrosodiphenylamine	ND	5.0					
Pentachlorophenol	ND	20					
Phenanthrene	ND	5.0					
Phenol	ND	5.0					
Pyrene	ND	5.0					
Surr: 2,4,6-Tribromophenol	*38.23*	0	*50*	0	*76.5*	*38-115*	0
Surr: 2-Fluorobiphenyl	*36.95*	0	*50*	0	*73.9*	*32-100*	0
Surr: 2-Fluorophenol	*21.7*	0	*50*	0	*43.4*	*22-59*	0
Surr: 4-Terphenyl-d14	*46*	0	*50*	0	*92*	*23-112*	0
Surr: Nitrobenzene-d5	*42.7*	0	*50*	0	*85.4*	*31-93*	0
Surr: Phenol-d6	*12.55*	0	*50*	0	*25.1*	*13-36*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57129** Instrument ID **SVMS8** Method: **SW8270**

LCS Sample ID: **SLCSW1-57129-57129** Units: **µg/L** Analysis Date: **04/02/14 05:58 PM**

Client ID: Run ID: **SVMS8_140402A** SeqNo: **2698067** Prep Date: **04/02/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2,4,5-Trichlorophenol	16.39	5.0	20	0	82	50-110	0			
2,4,6-Trichlorophenol	14.94	5.0	20	0	74.7	50-115	0			
2,4-Dichlorophenol	14.81	10	20	0	74	50-105	0			
2,4-Dimethylphenol	13.56	5.0	20	0	67.8	30-110	0			
2,4-Dinitrophenol	15.28	5.0	20	0	76.4	15-140	0			
2,4-Dinitrotoluene	15.68	5.0	20	0	78.4	50-120	0			
2,6-Dinitrotoluene	15.25	5.0	20	0	76.2	50-115	0			
2-Chloronaphthalene	14.35	5.0	20	0	71.8	50-105	0			
2-Chlorophenol	13.03	5.0	20	0	65.2	35-105	0			
2-Methylnaphthalene	14.13	5.0	20	0	70.6	45-105	0			
2-Methylphenol	11.14	5.0	20	0	55.7	40-110	0			
2-Nitroaniline	18.38	20	20	0	91.9	50-115	0			J
2-Nitrophenol	15.68	5.0	20	0	78.4	40-115	0			
3-Nitroaniline	15.97	20	20	0	79.8	20-125	0			J
4,6-Dinitro-2-methylphenol	17.45	20	20	0	87.2	40-130	0			J
4-Bromophenyl phenyl ether	16.58	5.0	20	0	82.9	50-115	0			
4-Chloro-3-methylphenol	14.89	5.0	20	0	74.4	45-110	0			
4-Chloroaniline	14.02	20	20	0	70.1	15-110	0			J
4-Chlorophenyl phenyl ether	15	5.0	20	0	75	50-110	0			
4-Methylphenol	10.27	5.0	20	0	51.4	30-110	0			
4-Nitroaniline	14.48	20	20	0	72.4	35-150	0			J
4-Nitrophenol	7.37	20	20	0	36.8	1-58	0			J
Acenaphthene	14.73	5.0	20	0	73.6	45-110	0			
Acenaphthylene	14.98	5.0	20	0	74.9	50-105	0			
Anthracene	17.08	5.0	20	0	85.4	55-110	0			
Benzo(a)anthracene	17.25	5.0	20	0	86.2	55-110	0			
Benzo(a)pyrene	17.36	5.0	20	0	86.8	55-110	0			
Benzo(b)fluoranthene	16.39	5.0	20	0	82	45-120	0			
Benzo(g,h,i)perylene	19.93	5.0	20	0	99.6	40-125	0			
Benzo(k)fluoranthene	16.47	5.0	20	0	82.4	45-125	0			
Bis(2-chloroethoxy)methane	14.88	5.0	20	0	74.4	45-105	0			
Bis(2-chloroethyl)ether	13.96	5.0	20	0	69.8	35-110	0			
Bis(2-chloroisopropyl)ether	17.54	5.0	20	0	87.7	25-130	0			
Bis(2-ethylhexyl)phthalate	18.44	5.0	20	0	92.2	40-125	0			
Butyl benzyl phthalate	17.71	5.0	20	0	88.6	45-115	0			
Carbazole	17.07	10	20	0	85.4	50-150	0			
Chrysene	17.21	5.0	20	0	86	55-110	0			
Dibenzo(a,h)anthracene	18.09	5.0	20	0	90.4	40-125	0			
Dibenzofuran	14.66	5.0	20	0	73.3	55-105	0			
Diethyl phthalate	16.49	20	20	0	82.4	40-120	0			J
Dimethyl phthalate	15.88	20	20	0	79.4	25-125	0			J
Di-n-butyl phthalate	17.25	5.0	20	0	86.2	55-115	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **57129** Instrument ID **SVMS8** Method: **SW8270**

Di-n-octyl phthalate	18.58	5.0	20	0	92.9	35-135	0	
Fluoranthene	16.38	5.0	20	0	81.9	55-115	0	
Fluorene	14.89	5.0	20	0	74.4	50-110	0	
Hexachlorobenzene	16.51	5.0	20	0	82.6	50-110	0	
Hexachlorobutadiene	14.61	5.0	20	0	73	25-105	0	
Hexachlorocyclopentadiene	9.15	20	20	0	45.8	25-105	0	J
Hexachloroethane	14.79	5.0	20	0	74	30-95	0	
Indeno(1,2,3-cd)pyrene	19.93	5.0	20	0	99.6	45-125	0	
Isophorone	16.29	5.0	20	0	81.4	50-110	0	
Naphthalene	13.37	5.0	20	0	66.8	40-100	0	
Nitrobenzene	14.42	5.0	20	0	72.1	45-110	0	
N-Nitrosodi-n-propylamine	17.09	5.0	20	0	85.4	35-130	0	
N-Nitrosodiphenylamine	16.17	5.0	20	0	80.8	50-110	0	
Pentachlorophenol	14.17	20	20	0	70.8	40-115	0	J
Phenanthrene	15.91	5.0	20	0	79.6	50-115	0	
Phenol	5.19	5.0	20	0	26	12-43	0	
Pyrene	16.31	5.0	20	0	81.6	50-130	0	
Surr: 2,4,6-Tribromophenol	*42.32*	0	*50*	0	*84.6*	*38-115*	0	
Surr: 2-Fluorobiphenyl	*34.72*	0	*50*	0	*69.4*	*32-100*	0	
Surr: 2-Fluorophenol	*20.01*	0	*50*	0	*40*	*22-59*	0	
Surr: 4-Terphenyl-d14	*44.77*	0	*50*	0	*89.5*	*23-112*	0	
Surr: Nitrobenzene-d5	*43.37*	0	*50*	0	*86.7*	*31-93*	0	
Surr: Phenol-d6	*12.84*	0	*50*	0	*25.7*	*13-36*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57129** Instrument ID **SVMS8** Method: **SW8270**

MS Sample ID: **14031375-01A MS** Units: **µg/L** Analysis Date: **04/02/14 07:40 PM**

Client ID: Run ID: **SVMS8_140402A** SeqNo: **2698073** Prep Date: **04/02/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2,4,5-Trichlorophenol	345.6	100	400	0	86.4	50-110	0			
2,4,6-Trichlorophenol	331.2	100	400	0	82.8	50-115	0			
2,4-Dichlorophenol	323.6	200	400	0	80.9	50-105	0			
2,4-Dimethylphenol	303.2	100	400	0	75.8	30-110	0			
2,4-Dinitrophenol	332.2	100	400	0	83	15-140	0			
2,4-Dinitrotoluene	324	100	400	0	81	50-120	0			
2,6-Dinitrotoluene	333.2	100	400	0	83.3	50-115	0			
2-Chloronaphthalene	322.4	100	400	0	80.6	50-105	0			
2-Chlorophenol	297.6	100	400	0	74.4	35-105	0			
2-Methylnaphthalene	310	100	400	0	77.5	45-105	0			
2-Methylphenol	263.2	100	400	0	65.8	40-110	0			
2-Nitroaniline	403.4	400	400	0	101	50-115	0			
2-Nitrophenol	359	100	400	0	89.8	40-115	0			
3-Nitroaniline	343	400	400	0	85.8	20-125	0			J
4,6-Dinitro-2-methylphenol	364	400	400	0	91	40-130	0			J
4-Bromophenyl phenyl ether	354.8	100	400	0	88.7	50-115	0			
4-Chloro-3-methylphenol	336.2	100	400	0	84	45-110	0			
4-Chloroaniline	308.4	400	400	0	77.1	15-110	0			J
4-Chlorophenyl phenyl ether	324.8	100	400	0	81.2	50-110	0			
4-Methylphenol	239.4	100	400	0	59.8	30-110	0			
4-Nitroaniline	284.6	400	400	0	71.2	35-150	0			J
4-Nitrophenol	145.8	400	400	0	36.4	1-58	0			J
Acenaphthene	329	100	400	0	82.2	45-110	0			
Acenaphthylene	334.8	100	400	0	83.7	50-105	0			
Anthracene	361.8	100	400	0	90.4	55-110	0			
Benzo(a)anthracene	355.8	100	400	0	89	55-110	0			
Benzo(a)pyrene	359.8	100	400	0	90	55-110	0			
Benzo(b)fluoranthene	340.4	100	400	0	85.1	45-120	0			
Benzo(g,h,i)perylene	403.8	100	400	0	101	40-125	0			
Benzo(k)fluoranthene	335	100	400	0	83.8	45-125	0			
Bis(2-chloroethoxy)methane	329.8	100	400	0	82.4	45-105	0			
Bis(2-chloroethyl)ether	307.6	100	400	0	76.9	35-110	0			
Bis(2-chloroisopropyl)ether	393.6	100	400	0	98.4	25-130	0			
Bis(2-ethylhexyl)phthalate	376.6	100	400	0	94.2	40-125	0			
Butyl benzyl phthalate	369	100	400	0	92.2	45-115	0			
Carbazole	346.8	200	400	0	86.7	50-150	0			
Chrysene	345.8	100	400	0	86.4	55-110	0			
Dibenzo(a,h)anthracene	365.4	100	400	0	91.4	40-125	0			
Dibenzofuran	319.2	100	400	0	79.8	55-105	0			
Diethyl phthalate	352.4	400	400	0	88.1	40-120	0			J
Dimethyl phthalate	338.4	400	400	0	84.6	25-125	0			J
Di-n-butyl phthalate	361.2	100	400	0	90.3	55-115	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57129** Instrument ID **SVMS8** Method: **SW8270**

Di-n-octyl phthalate	385.8	100	400	0	96.4	35-135	0	
Fluoranthene	339.2	100	400	0	84.8	55-115	0	
Fluorene	320.2	100	400	0	80	50-110	0	
Hexachlorobenzene	334.8	100	400	0	83.7	50-110	0	
Hexachlorobutadiene	326.4	100	400	0	81.6	25-105	0	
Hexachlorocyclopentadiene	227.4	400	400	0	56.8	25-105	0	J
Hexachloroethane	322.8	100	400	0	80.7	30-95	0	
Indeno(1,2,3-cd)pyrene	406.4	100	400	0	102	45-125	0	
Isophorone	372.6	100	400	0	93.2	50-110	0	
Naphthalene	292.6	100	400	0	73.2	40-100	0	
Nitrobenzene	337	100	400	0	84.2	45-110	0	
N-Nitrosodi-n-propylamine	396	100	400	0	99	35-130	0	
N-Nitrosodiphenylamine	342.2	100	400	0	85.6	50-110	0	
Pentachlorophenol	287	400	400	0	71.8	40-115	0	J
Phenanthrene	328.6	100	400	0	82.2	50-115	0	
Phenol	115.8	100	400	0	29	12-43	0	
Pyrene	334.4	100	400	0	83.6	50-130	0	
Surr: 2,4,6-Tribromophenol	*895.2*	0	*1000*	0	*89.5*	*38-115*	0	
Surr: 2-Fluorobiphenyl	*787.2*	0	*1000*	0	*78.7*	*32-100*	0	
Surr: 2-Fluorophenol	*457.8*	0	*1000*	0	*45.8*	*22-59*	0	
Surr: 4-Terphenyl-d14	*920.2*	0	*1000*	0	*92*	*23-112*	0	
Surr: Nitrobenzene-d5	*979.6*	0	*1000*	0	*98*	*31-93*	0	*S*
Surr: Phenol-d6	*280.2*	0	*1000*	0	*28*	*13-36*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57129** Instrument ID **SVMS8** Method: **SW8270**

MSD Sample ID: **14031375-01A MSD** Units: **µg/L** Analysis Date: **04/02/14 08:00 PM**

Client ID: Run ID: **SVMS8_140402A** SeqNo: **2698075** Prep Date: **04/02/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2,4,5-Trichlorophenol	327.8	100	400	0	82	50-110	345.6	5.29	30	
2,4,6-Trichlorophenol	320	100	400	0	80	50-115	331.2	3.44	30	
2,4-Dichlorophenol	299.2	200	400	0	74.8	50-105	323.6	7.84	30	
2,4-Dimethylphenol	281	100	400	0	70.2	30-110	303.2	7.6	30	
2,4-Dinitrophenol	326.6	100	400	0	81.6	15-140	332.2	1.7	30	
2,4-Dinitrotoluene	316	100	400	0	79	50-120	324	2.5	30	
2,6-Dinitrotoluene	316.8	100	400	0	79.2	50-115	333.2	5.05	30	
2-Chloronaphthalene	299.4	100	400	0	74.8	50-105	322.4	7.4	30	
2-Chlorophenol	275.8	100	400	0	69	35-105	297.6	7.6	30	
2-Methylnaphthalene	283.4	100	400	0	70.8	45-105	310	8.97	30	
2-Methylphenol	235.8	100	400	0	59	40-110	263.2	11	30	
2-Nitroaniline	388.4	400	400	0	97.1	50-115	403.4	0	30	J
2-Nitrophenol	323.6	100	400	0	80.9	40-115	359	10.4	30	
3-Nitroaniline	330.4	400	400	0	82.6	20-125	343	0	30	J
4,6-Dinitro-2-methylphenol	353.2	400	400	0	88.3	40-130	364	0	30	J
4-Bromophenyl phenyl ether	342.8	100	400	0	85.7	50-115	354.8	3.44	30	
4-Chloro-3-methylphenol	310.6	100	400	0	77.6	45-110	336.2	7.92	30	
4-Chloroaniline	270.4	400	400	0	67.6	15-110	308.4	0	30	J
4-Chlorophenyl phenyl ether	315.4	100	400	0	78.8	50-110	324.8	2.94	30	
4-Methylphenol	218.4	100	400	0	54.6	30-110	239.4	9.17	30	
4-Nitroaniline	300	400	400	0	75	35-150	284.6	0	30	J
4-Nitrophenol	138.2	400	400	0	34.6	1-58	145.8	0	0	J
Acenaphthene	314	100	400	0	78.5	45-110	329	4.67	30	
Acenaphthylene	314.2	100	400	0	78.6	50-105	334.8	6.35	30	
Anthracene	350.2	100	400	0	87.6	55-110	361.8	3.26	30	
Benzo(a)anthracene	350	100	400	0	87.5	55-110	355.8	1.64	30	
Benzo(a)pyrene	351	100	400	0	87.8	55-110	359.8	2.48	30	
Benzo(b)fluoranthene	323	100	400	0	80.8	45-120	340.4	5.25	30	
Benzo(g,h,i)perylene	393.2	100	400	0	98.3	40-125	403.8	2.66	30	
Benzo(k)fluoranthene	330	100	400	0	82.5	45-125	335	1.5	30	
Bis(2-chloroethoxy)methane	297.4	100	400	0	74.4	45-105	329.8	10.3	30	
Bis(2-chloroethyl)ether	284.2	100	400	0	71	35-110	307.6	7.91	30	
Bis(2-chloroisopropyl)ether	360.8	100	400	0	90.2	25-130	393.6	8.7	30	
Bis(2-ethylhexyl)phthalate	364	100	400	0	91	40-125	376.6	3.4	30	
Butyl benzyl phthalate	367.6	100	400	0	91.9	45-115	369	0.38	30	
Carbazole	346.6	200	400	0	86.6	50-150	346.8	0.0577	30	
Chrysene	343	100	400	0	85.8	55-110	345.8	0.813	30	
Dibenzo(a,h)anthracene	358	100	400	0	89.5	40-125	365.4	2.05	30	
Dibenzofuran	307.4	100	400	0	76.8	55-105	319.2	3.77	30	
Diethyl phthalate	344.2	400	400	0	86	40-120	352.4	0	30	J
Dimethyl phthalate	340.6	400	400	0	85.2	25-125	338.4	0	30	J
Di-n-butyl phthalate	352.6	100	400	0	88.2	55-115	361.2	2.41	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57129** Instrument ID **SVMS8** Method: **SW8270**

Di-n-octyl phthalate	371.6	100	400	0	92.9	35-135	385.8	3.75	30	
Fluoranthene	328.6	100	400	0	82.2	55-115	339.2	3.17	30	
Fluorene	309.6	100	400	0	77.4	50-110	320.2	3.37	30	
Hexachlorobenzene	347.8	100	400	0	87	50-110	334.8	3.81	30	
Hexachlorobutadiene	297	100	400	0	74.2	25-105	326.4	9.43	30	
Hexachlorocyclopentadiene	215	400	400	0	53.8	25-105	227.4	0	30	J
Hexachloroethane	293.4	100	400	0	73.4	30-95	322.8	9.54	30	
Indeno(1,2,3-cd)pyrene	408.6	100	400	0	102	45-125	406.4	0.54	30	
Isophorone	339.8	100	400	0	85	50-110	372.6	9.21	30	
Naphthalene	263.6	100	400	0	65.9	40-100	292.6	10.4	30	
Nitrobenzene	298	100	400	0	74.5	45-110	337	12.3	30	
N-Nitrosodi-n-propylamine	359.6	100	400	0	89.9	35-130	396	9.63	30	
N-Nitrosodiphenylamine	338.6	100	400	0	84.6	50-110	342.2	1.06	30	
Pentachlorophenol	284.2	400	400	0	71	40-115	287	0	30	J
Phenanthrene	328.2	100	400	0	82	50-115	328.6	0.122	30	
Phenol	106.2	100	400	0	26.6	12-43	115.8	8.65	30	
Pyrene	327.2	100	400	0	81.8	50-130	334.4	2.18	30	
Surr: 2,4,6-Tribromophenol	*859*	0	*1000*	0	*85.9*	*38-115*	895.2	*4.13*	*40*	
Surr: 2-Fluorobiphenyl	*727.2*	0	*1000*	0	*72.7*	*32-100*	787.2	*7.92*	*40*	
Surr: 2-Fluorophenol	*414.2*	0	*1000*	0	*41.4*	*22-59*	457.8	*10*	*40*	
Surr: 4-Terphenyl-d14	*900.4*	0	*1000*	0	*90*	*23-112*	920.2	*2.18*	*40*	
Surr: Nitrobenzene-d5	*874.2*	0	*1000*	0	*87.4*	*31-93*	979.6	*11.4*	*40*	
Surr: Phenol-d6	*262.6*	0	*1000*	0	*26.3*	*13-36*	280.2	*6.48*	*40*	

The following samples were analyzed in this batch: 1404057-01B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57139** Instrument ID **VMS9** Method: **SW8260B**

MBLK Sample ID: **MBLK-57139-57139** Units: **µg/Kg** Analysis Date: **04/02/14 02:03 PM**

Client ID: Run ID: **VMS9_140402A** SeqNo: **2697486** Prep Date: **04/02/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	ND	30								
1,1,2,2-Tetrachloroethane	ND	30								
1,1,2-Trichloroethane	ND	30								
1,1,2-Trichlorotrifluoroethane	ND	30								
1,1-Dichloroethane	ND	30								
1,1-Dichloroethene	ND	30								
1,2,4-Trichlorobenzene	ND	30								
1,2-Dibromo-3-chloropropane	ND	30								
1,2-Dibromoethane	ND	30								
1,2-Dichlorobenzene	ND	30								
1,2-Dichloroethane	ND	30								
1,2-Dichloropropane	ND	30								
1,3-Dichlorobenzene	ND	30								
1,4-Dichlorobenzene	ND	30								
2-Butanone	ND	200								
2-Hexanone	ND	30								
4-Methyl-2-pentanone	ND	30								
Acetone	157	100								
Benzene	ND	30								
Bromodichloromethane	ND	30								
Bromoform	ND	30								
Bromomethane	ND	75								
Carbon disulfide	ND	30								
Carbon tetrachloride	ND	30								
Chlorobenzene	ND	30								
Chloroethane	ND	100								
Chloroform	ND	30								
Chloromethane	ND	100								
cis-1,2-Dichloroethene	ND	30								
cis-1,3-Dichloropropene	ND	30								
Cyclohexane	ND	30								
Dibromochloromethane	ND	30								
Dichlorodifluoromethane	ND	30								
Ethylbenzene	ND	30								
Isopropylbenzene	ND	30								
Methyl acetate	1466	200								
Methyl tert-butyl ether	ND	30								
Methylcyclohexane	ND	30								
Methylene chloride	ND	30								
Styrene	ND	30								
Tetrachloroethene	ND	30								
Toluene	ND	30								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **57139** Instrument ID **VMS9** Method: **SW8260B**

trans-1,2-Dichloroethene	ND	30					
trans-1,3-Dichloropropene	ND	30					
Trichloroethene	ND	30					
Trichlorofluoromethane	ND	30					
Vinyl chloride	ND	30					
Xylenes, Total	ND	90					
Surr: 1,2-Dichloroethane-d4	*1066*	0	*1000*	0	*107*	*70-130*	0
Surr: 4-Bromofluorobenzene	*872.5*	0	*1000*	0	*87.2*	*70-130*	0
Surr: Dibromofluoromethane	*983*	0	*1000*	0	*98.3*	*70-130*	0
Surr: Toluene-d8	*1013*	0	*1000*	0	*101*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57139** Instrument ID **VMS9** Method: **SW8260B**

LCS Sample ID: **LCS-57139-57139** Units: **µg/Kg** Analysis Date: **04/02/14 12:26 PM**

Client ID: Run ID: **VMS9_140402A** SeqNo: **2697485** Prep Date: **04/02/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	1072	30	1000	0	107	70-135	0			
1,1,2,2-Tetrachloroethane	904.5	30	1000	0	90.4	55-130	0			
1,1,2-Trichloroethane	952	30	1000	0	95.2	60-125	0			
1,1-Dichloroethane	1128	30	1000	0	113	75-125	0			
1,1-Dichloroethene	1116	30	1000	0	112	65-135	0			
1,2,4-Trichlorobenzene	902.5	30	1000	0	90.2	65-130	0			
1,2-Dibromo-3-chloropropane	873	30	1000	0	87.3	40-135	0			
1,2-Dibromoethane	951	30	1000	0	95.1	75-125	0			
1,2-Dichlorobenzene	941.5	30	1000	0	94.2	75-120	0			
1,2-Dichloroethane	1091	30	1000	0	109	70-135	0			
1,2-Dichloropropane	1019	30	1000	0	102	70-120	0			
1,3-Dichlorobenzene	941.5	30	1000	0	94.2	70-125	0			
1,4-Dichlorobenzene	985.5	30	1000	0	98.6	70-125	0			
2-Butanone	1246	200	1000	0	125	30-160	0			
2-Hexanone	883.5	30	1000	0	88.4	45-145	0			
4-Methyl-2-pentanone	1278	30	1000	0	128	96-168	0			
Acetone	1380	100	1000	0	138	20-160	0			B
Benzene	1048	30	1000	0	105	75-125	0			
Bromodichloromethane	1014	30	1000	0	101	70-130	0			
Bromoform	879	30	1000	0	87.9	55-135	0			
Bromomethane	1664	75	1000	0	166	30-160	0			S
Carbon disulfide	1176	30	1000	0	118	45-160	0			
Carbon tetrachloride	909	30	1000	0	90.9	65-135	0			
Chlorobenzene	948	30	1000	0	94.8	75-125	0			
Chloroethane	1062	100	1000	0	106	40-155	0			
Chloroform	1080	30	1000	0	108	70-125	0			
Chloromethane	1012	100	1000	0	101	50-130	0			
cis-1,2-Dichloroethene	1156	30	1000	0	116	65-125	0			
cis-1,3-Dichloropropene	1023	30	1000	0	102	70-125	0			
Dibromochloromethane	820.5	30	1000	0	82	65-135	0			
Dichlorodifluoromethane	864.5	30	1000	0	86.4	35-135	0			
Ethylbenzene	1016	30	1000	0	102	75-125	0			
Isopropylbenzene	947.5	30	1000	0	94.8	75-130	0			
Methyl tert-butyl ether	1154	30	1000	0	115	75-125	0			
Methylene chloride	1214	30	1000	0	121	55-145	0			
Styrene	965.5	30	1000	0	96.6	75-125	0			
Tetrachloroethene	1102	30	1000	0	110	64-140	0			
Toluene	1014	30	1000	0	101	70-125	0			
trans-1,2-Dichloroethene	1133	30	1000	0	113	65-135	0			
trans-1,3-Dichloropropene	1077	30	1000	0	108	65-125	0			
Trichloroethene	961.5	30	1000	0	96.2	75-125	0			
Trichlorofluoromethane	1014	30	1000	0	101	25-185	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57139** Instrument ID **VMS9** Method: **SW8260B**

Vinyl chloride	991	30	1000	0	99.1	60-125	0
Xylenes, Total	3134	90	3000	0	104	75-125	0
Surr: 1,2-Dichloroethane-d4	*1049*	0	*1000*	0	*105*	*70-130*	0
Surr: 4-Bromofluorobenzene	*993.5*	0	*1000*	0	*99.4*	*70-130*	0
Surr: Dibromofluoromethane	*1016*	0	*1000*	0	*102*	*70-130*	0
Surr: Toluene-d8	*1046*	0	*1000*	0	*105*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57139** Instrument ID **VMS9** Method: **SW8260B**

MS Sample ID: **1404094-09A MS** Units: **µg/Kg** Analysis Date: **04/04/14 12:15 PM**

Client ID: Run ID: **VMS8_140403A** SeqNo: **2699063** Prep Date: **04/02/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	844	30	1000	0	84.4	70-135	0			
1,1,2,2-Tetrachloroethane	720.5	30	1000	0	72	55-130	0			
1,1,2-Trichloroethane	816.5	30	1000	0	81.6	60-125	0			
1,1-Dichloroethane	942.5	30	1000	0	94.2	75-125	0			
1,1-Dichloroethene	1112	30	1000	0	111	65-135	0			
1,2,4-Trichlorobenzene	480.5	30	1000	0	48	65-130	0			S
1,2-Dibromo-3-chloropropane	735	30	1000	0	73.5	40-135	0			
1,2-Dibromoethane	1062	30	1000	0	106	75-125	0			
1,2-Dichlorobenzene	708	30	1000	0	70.8	75-120	0			S
1,2-Dichloroethane	768	30	1000	0	76.8	70-135	0			
1,2-Dichloropropane	808	30	1000	0	80.8	70-120	0			
1,3-Dichlorobenzene	708.5	30	1000	0	70.8	70-125	0			
1,4-Dichlorobenzene	699.5	30	1000	0	70	70-125	0			S
2-Butanone	ND	200	1000	0	0	30-160	0			S
2-Hexanone	852.5	30	1000	0	85.2	45-145	0			
4-Methyl-2-pentanone	1032	30	1000	0	103	89-161	0			
Acetone	ND	100	1000	0	0	20-160	0			S
Benzene	960.5	30	1000	0	96	75-125	0			
Bromodichloromethane	683	30	1000	0	68.3	70-130	0			S
Bromoform	579	30	1000	0	57.9	55-135	0			
Bromomethane	730	75	1000	0	73	30-160	0			
Carbon disulfide	1380	30	1000	0	138	45-160	0			
Carbon tetrachloride	976.5	30	1000	0	97.6	65-135	0			
Chlorobenzene	866	30	1000	0	86.6	75-125	0			
Chloroethane	628	100	1000	0	62.8	40-155	0			
Chloroform	875	30	1000	0	87.5	70-125	0			
Chloromethane	750	100	1000	0	75	50-130	0			
cis-1,2-Dichloroethene	919	30	1000	0	91.9	65-125	0			
cis-1,3-Dichloropropene	755	30	1000	0	75.5	70-125	0			
Dibromochloromethane	643	30	1000	0	64.3	65-135	0			S
Dichlorodifluoromethane	596	30	1000	0	59.6	35-135	0			
Ethylbenzene	886	30	1000	0	88.6	75-125	0			
Isopropylbenzene	791	30	1000	0	79.1	75-130	0			
Methyl tert-butyl ether	931.5	30	1000	0	93.2	75-125	0			
Methylene chloride	1064	30	1000	0	106	55-145	0			
Styrene	827	30	1000	0	82.7	75-125	0			
Tetrachloroethene	951	30	1000	0	95.1	64-140	0			
Toluene	983.5	30	1000	0	98.4	70-125	0			
trans-1,2-Dichloroethene	1027	30	1000	0	103	65-135	0			
trans-1,3-Dichloropropene	824.5	30	1000	0	82.4	65-125	0			
Trichloroethene	837.5	30	1000	102	73.6	75-125	0			S
Trichlorofluoromethane	918.5	30	1000	0	91.8	25-185	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57139** Instrument ID **VMS9** Method: **SW8260B**

Vinyl chloride	784	30	1000	0	78.4	60-125	0
Xylenes, Total	2586	90	3000	0	86.2	75-125	0
Surr: 1,2-Dichloroethane-d4	*799.5*	0	*1000*	0	*80*	*70-130*	0
Surr: 4-Bromofluorobenzene	*955*	0	*1000*	0	*95.5*	*70-130*	0
Surr: Dibromofluoromethane	*921*	0	*1000*	0	*92.1*	*70-130*	0
Surr: Toluene-d8	*1033*	0	*1000*	0	*103*	*70-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57139** Instrument ID **VMS9** Method: **SW8260B**

MSD Sample ID: **1404094-09A MSD** Units: **µg/Kg** Analysis Date: **04/04/14 12:39 PM**

Client ID: Run ID: **VMS8_140403A** SeqNo: **2699068** Prep Date: **04/02/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	944.5	30	1000	0	94.4	70-135	844	11.2	30	
1,1,2,2-Tetrachloroethane	724	30	1000	0	72.4	55-130	720.5	0.485	30	
1,1,2-Trichloroethane	833.5	30	1000	0	83.4	60-125	816.5	2.06	30	
1,1-Dichloroethane	936.5	30	1000	0	93.6	75-125	942.5	0.639	30	
1,1-Dichloroethene	1081	30	1000	0	108	65-135	1112	2.78	30	
1,2,4-Trichlorobenzene	578.5	30	1000	0	57.8	65-130	480.5	18.5	30	S
1,2-Dibromo-3-chloropropane	781	30	1000	0	78.1	40-135	735	6.07	30	
1,2-Dibromoethane	1019	30	1000	0	102	75-125	1062	4.09	30	
1,2-Dichlorobenzene	726	30	1000	0	72.6	75-120	708	2.51	30	S
1,2-Dichloroethane	889.5	30	1000	0	89	70-135	768	14.7	30	
1,2-Dichloropropane	906.5	30	1000	0	90.6	70-120	808	11.5	30	
1,3-Dichlorobenzene	719.5	30	1000	0	72	70-125	708.5	1.54	30	
1,4-Dichlorobenzene	732	30	1000	0	73.2	70-125	699.5	4.54	30	
2-Butanone	ND	200	1000	0	0	30-160	0	0	30	S
2-Hexanone	865.5	30	1000	0	86.6	45-145	852.5	1.51	30	
4-Methyl-2-pentanone	1056	30	1000	0	106	89-161	1032	2.25	30	
Acetone	ND	100	1000	0	0	20-160	0	0	30	S
Benzene	1046	30	1000	0	105	75-125	960.5	8.52	30	
Bromodichloromethane	808.5	30	1000	0	80.8	70-130	683	16.8	30	
Bromoform	603	30	1000	0	60.3	55-135	579	4.06	30	
Bromomethane	801	75	1000	0	80.1	30-160	730	9.27	30	
Carbon disulfide	1300	30	1000	0	130	45-160	1380	6.04	30	
Carbon tetrachloride	1066	30	1000	0	107	65-135	976.5	8.76	30	
Chlorobenzene	853	30	1000	0	85.3	75-125	866	1.51	30	
Chloroethane	650	100	1000	0	65	40-155	628	3.44	30	
Chloroform	889.5	30	1000	0	89	70-125	875	1.64	30	
Chloromethane	774	100	1000	0	77.4	50-130	750	3.15	30	
cis-1,2-Dichloroethene	916.5	30	1000	0	91.6	65-125	919	0.272	30	
cis-1,3-Dichloropropene	895	30	1000	0	89.5	70-125	755	17	30	
Dibromochloromethane	690	30	1000	0	69	65-135	643	7.05	30	
Dichlorodifluoromethane	595	30	1000	0	59.5	35-135	596	0.168	30	
Ethylbenzene	845	30	1000	0	84.5	75-125	886	4.74	30	
Isopropylbenzene	771.5	30	1000	0	77.2	75-130	791	2.5	30	
Methyl tert-butyl ether	930.5	30	1000	0	93	75-125	931.5	0.107	30	
Methylene chloride	1127	30	1000	0	113	55-145	1064	5.8	30	
Styrene	831.5	30	1000	0	83.2	75-125	827	0.543	30	
Tetrachloroethene	885.5	30	1000	0	88.6	64-140	951	7.13	30	
Toluene	912.5	30	1000	0	91.2	70-125	983.5	7.49	30	
trans-1,2-Dichloroethene	992	30	1000	0	99.2	65-135	1027	3.47	30	
trans-1,3-Dichloropropene	842.5	30	1000	0	84.2	65-125	824.5	2.16	30	
Trichloroethene	947.5	30	1000	102	84.6	75-125	837.5	12.3	30	
Trichlorofluoromethane	867	30	1000	0	86.7	25-185	918.5	5.77	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57139** Instrument ID **VMS9** Method: **SW8260B**

Vinyl chloride	802	30	1000	0	80.2	60-125	784	2.27	30
Xylenes, Total	2508	90	3000	0	83.6	75-125	2586	3.02	30
Surr: 1,2-Dichloroethane-d4	*926*	0	*1000*	0	*92.6*	*70-130*	799.5	*14.7*	*30*
Surr: 4-Bromofluorobenzene	*959*	0	*1000*	0	*95.9*	*70-130*	955	*0.418*	*30*
Surr: Dibromofluoromethane	*1062*	0	*1000*	0	*106*	*70-130*	921	*14.3*	*30*
Surr: Toluene-d8	*981*	0	*1000*	0	*98.1*	*70-130*	1033	*5.16*	*30*

The following samples were analyzed in this batch: 1404057-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **R138303A** Instrument ID **VMS6** Method: **SW8260**

MBLK	Sample ID: **VBLKW2-140402-R138303A**	Units: **µg/L**	Analysis Date: **04/02/14 08:32 PM**
Client ID:	Run ID: **VMS6_140402A**	SeqNo: **2697650** Prep Date:	DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
1,1,2-Trichlorotrifluoroethane	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,2-Dibromo-3-chloropropane	ND	1.0								
1,2-Dibromoethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,2-Dichloroethane	ND	1.0								
1,2-Dichloropropane	ND	2.0								
1,3-Dichlorobenzene	ND	2.0								
1,4-Dichlorobenzene	ND	2.0								
2-Butanone	ND	5.0								
2-Hexanone	ND	5.0								
4-Methyl-2-pentanone	ND	5.0								
Acetone	ND	20								
Benzene	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	1.0								
Carbon disulfide	ND	2.5								
Carbon tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	1.0								
Chloroform	ND	1.0								
Chloromethane	ND	1.0								
cis-1,2-Dichloroethene	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
Cyclohexane	ND	5.0								
Dibromochloromethane	ND	1.0								
Dichlorodifluoromethane	ND	1.0								
Ethylbenzene	ND	1.0								
Isopropylbenzene	ND	1.0								
Methyl acetate	ND	2.0								
Methyl tert-butyl ether	ND	5.0								
Methylcyclohexane	ND	5.0								
Methylene chloride	ND	5.0								
Styrene	ND	1.0								
Tetrachloroethene	ND	2.0								
Toluene	ND	1.0								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **R138303A** Instrument ID **VMS6** Method: **SW8260**

trans-1,2-Dichloroethene	ND	1.0					
trans-1,3-Dichloropropene	ND	1.0					
Trichloroethene	ND	1.0					
Trichlorofluoromethane	ND	1.0					
Vinyl chloride	ND	1.0					
Xylenes, Total	ND	3.0					
Surr: 1,2-Dichloroethane-d4	*19.86*	0	*20*	0	*99.3*	*70-120*	0
Surr: 4-Bromofluorobenzene	*19.55*	0	*20*	0	*97.8*	*75-120*	0
Surr: Dibromofluoromethane	*19.55*	0	*20*	0	*97.8*	*85-115*	0
Surr: Toluene-d8	*19.85*	0	*20*	0	*99.2*	*85-120*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **R138303A** Instrument ID **VMS6** Method: **SW8260**

LCS Sample ID: **VLCSW1-140402-R138303A** Units: **µg/L** Analysis Date: **04/02/14 07:39 PM**

Client ID: Run ID: **VMS6_140402A** SeqNo: **2697649** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	21.31	1.0	20	0	107	65-130	0			
1,1,2,2-Tetrachloroethane	22.02	1.0	20	0	110	65-130	0			
1,1,2-Trichloroethane	21.38	1.0	20	0	107	75-125	0			
1,1-Dichloroethane	22.35	1.0	20	0	112	70-135	0			
1,1-Dichloroethene	23.38	1.0	20	0	117	70-130	0			
1,2,4-Trichlorobenzene	21.42	1.0	20	0	107	65-135	0			
1,2-Dibromo-3-chloropropane	18.2	1.0	20	0	91	50-130	0			
1,2-Dibromoethane	24.98	1.0	20	0	125	87-179	0			
1,2-Dichlorobenzene	21.6	1.0	20	0	108	70-120	0			
1,2-Dichloroethane	20.29	1.0	20	0	101	87-179	0			
1,2-Dichloropropane	20.71	2.0	20	0	104	75-125	0			
1,3-Dichlorobenzene	22.05	2.0	20	0	110	75-125	0			
1,4-Dichlorobenzene	20.86	2.0	20	0	104	75-125	0			
2-Butanone	24.84	5.0	20	0	124	30-150	0			
2-Hexanone	21.2	5.0	20	0	106	55-130	0			
4-Methyl-2-pentanone	27.37	5.0	20	0	137	77-178	0			
Acetone	22.07	20	20	0	110	40-140	0			
Benzene	22.24	1.0	20	0	111	80-120	0			
Bromodichloromethane	19.45	1.0	20	0	97.2	75-120	0			
Bromoform	16.43	1.0	20	0	82.2	70-130	0			
Bromomethane	26.92	1.0	20	0	135	30-145	0			
Carbon disulfide	24.25	2.5	20	0	121	35-165	0			
Carbon tetrachloride	20.35	1.0	20	0	102	65-140	0			
Chlorobenzene	21.69	1.0	20	0	108	80-120	0			
Chloroethane	21.25	1.0	20	0	106	60-135	0			
Chloroform	21.83	1.0	20	0	109	65-135	0			
Chloromethane	20.06	1.0	20	0	100	70-125	0			
cis-1,2-Dichloroethene	22.11	1.0	20	0	111	70-125	0			
cis-1,3-Dichloropropene	20.4	1.0	20	0	102	70-130	0			
Dibromochloromethane	16.95	1.0	20	0	84.8	60-135	0			
Dichlorodifluoromethane	15.58	1.0	20	0	77.9	30-155	0			
Ethylbenzene	23.1	1.0	20	0	116	75-125	0			
Isopropylbenzene	20.31	1.0	20	0	102	75-125	0			
Methyl tert-butyl ether	22.93	5.0	20	0	115	65-125	0			
Methylene chloride	21.89	5.0	20	0	109	55-140	0			
Styrene	20.03	1.0	20	0	100	65-135	0			
Tetrachloroethene	23.14	2.0	20	0	116	45-150	0			
Toluene	22.51	1.0	20	0	113	75-120	0			
trans-1,2-Dichloroethene	24.07	1.0	20	0	120	60-140	0			
trans-1,3-Dichloropropene	19.93	1.0	20	0	99.6	55-140	0			
Trichloroethene	22.7	1.0	20	0	114	70-125	0			
Trichlorofluoromethane	20.75	1.0	20	0	104	60-145	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **R138303A** Instrument ID **VMS6** Method: **SW8260**

Vinyl chloride	19.41	1.0	20	0	97	50-145	0
Xylenes, Total	62.02	3.0	60	0	103	75-130	0
Surr: 1,2-Dichloroethane-d4	*19.89*	0	*20*	0	*99.4*	*70-120*	0
Surr: 4-Bromofluorobenzene	*20.12*	0	*20*	0	*101*	*75-120*	0
Surr: Dibromofluoromethane	*21.02*	0	*20*	0	*105*	*85-115*	0
Surr: Toluene-d8	*20.32*	0	*20*	0	*102*	*85-120*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **R138303A** Instrument ID **VMS6** Method: **SW8260**

MS Sample ID: **1404077-02A MS** Units: **µg/L** Analysis Date: **04/03/14 05:43 AM**

Client ID: Run ID: **VMS6_140402A** SeqNo: **2697661** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	22.55	1.0	20	1.38	106	65-130	0			
1,1,2,2-Tetrachloroethane	20.72	1.0	20	0	104	65-130	0			
1,1,2-Trichloroethane	20.78	1.0	20	0	104	75-125	0			
1,1-Dichloroethane	25.31	1.0	20	1.85	117	70-135	0			
1,1-Dichloroethene	27.23	1.0	20	3.04	121	70-130	0			
1,2,4-Trichlorobenzene	20.59	1.0	20	0	103	65-135	0			
1,2-Dibromo-3-chloropropane	15.22	1.0	20	0	76.1	50-130	0			
1,2-Dibromoethane	24.63	1.0	20	0	123	81-158	0			
1,2-Dichlorobenzene	21.53	1.0	20	0	108	70-120	0			
1,2-Dichloroethane	20.6	1.0	20	0	103	70-130	0			
1,2-Dichloropropane	20.97	2.0	20	0	105	75-125	0			
1,3-Dichlorobenzene	22.19	2.0	20	0	111	75-125	0			
1,4-Dichlorobenzene	21.37	2.0	20	0	107	75-125	0			
2-Butanone	24.38	5.0	20	0	122	30-150	0			
2-Hexanone	20.24	5.0	20	0	101	55-130	0			
4-Methyl-2-pentanone	26.47	5.0	20	0	132	73-162	0			
Acetone	29.57	20	20	4.94	123	40-140	0			
Benzene	23.11	1.0	20	0	116	80-120	0			
Bromodichloromethane	17.87	1.0	20	0	89.4	75-120	0			
Bromoform	14.08	1.0	20	0	70.4	70-130	0			
Bromomethane	23.04	1.0	20	0	115	30-145	0			
Carbon disulfide	23.75	2.5	20	0	119	35-165	0			
Carbon tetrachloride	20.66	1.0	20	0	103	65-140	0			
Chlorobenzene	21.76	1.0	20	0	109	80-120	0			
Chloroethane	22.28	1.0	20	0	111	60-135	0			
Chloroform	21.87	1.0	20	0	109	65-135	0			
Chloromethane	18.71	1.0	20	0	93.6	70-125	0			
cis-1,2-Dichloroethene	65.17	1.0	20	40.72	122	70-125	0			
cis-1,3-Dichloropropene	18.76	1.0	20	0	93.8	70-130	0			
Dibromochloromethane	14.7	1.0	20	0	73.5	60-135	0			
Dichlorodifluoromethane	17.04	1.0	20	0	85.2	30-155	0			
Ethylbenzene	23.46	1.0	20	0	117	75-125	0			
Isopropylbenzene	20.82	1.0	20	0	104	75-125	0			
Methyl tert-butyl ether	21.42	5.0	20	0	107	65-125	0			
Methylene chloride	21.65	5.0	20	0	108	55-140	0			
Styrene	19.85	1.0	20	0	99.2	65-135	0			
Tetrachloroethene	27.45	2.0	20	2.07	127	45-150	0			
Toluene	22.88	1.0	20	0	114	75-120	0			
trans-1,2-Dichloroethene	27.04	1.0	20	1.79	126	60-140	0			
trans-1,3-Dichloropropene	17.61	1.0	20	0	88	55-140	0			
Trichloroethene	58.28	1.0	20	25.84	162	70-125	0			S
Trichlorofluoromethane	22.04	1.0	20	0	110	60-145	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **R138303A** Instrument ID **VMS6** Method: **SW8260**

Vinyl chloride	24.53	1.0	20	4.05	102	50-145	0
Xylenes, Total	62.47	3.0	60	0	104	75-130	0
Surr: 1,2-Dichloroethane-d4	*20.15*	0	*20*	0	*101*	*70-120*	0
Surr: 4-Bromofluorobenzene	*20.03*	0	*20*	0	*100*	*75-120*	0
Surr: Dibromofluoromethane	*20.21*	0	*20*	0	*101*	*85-115*	0
Surr: Toluene-d8	*20.05*	0	*20*	0	*100*	*85-120*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **R138303A** Instrument ID **VMS6** Method: **SW8260**

MSD Sample ID: **1404077-02A MSD** Units: **µg/L** Analysis Date: **04/03/14 06:09 AM**

Client ID: Run ID: **VMS6_140402A** SeqNo: **2697662** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	21.77	1.0	20	1.38	102	65-130	22.55	3.52	30	
1,1,2,2-Tetrachloroethane	20.91	1.0	20	0	105	65-130	20.72	0.913	30	
1,1,2-Trichloroethane	20.62	1.0	20	0	103	75-125	20.78	0.773	30	
1,1-Dichloroethane	24.76	1.0	20	1.85	115	70-135	25.31	2.2	30	
1,1-Dichloroethene	25.99	1.0	20	3.04	115	70-130	27.23	4.66	30	
1,2,4-Trichlorobenzene	20.9	1.0	20	0	104	65-135	20.59	1.49	30	
1,2-Dibromo-3-chloropropane	15.4	1.0	20	0	77	50-130	15.22	1.18	30	
1,2-Dibromoethane	24.23	1.0	20	0	121	81-158	24.63	1.64	30	
1,2-Dichlorobenzene	21.3	1.0	20	0	106	70-120	21.53	1.07	30	
1,2-Dichloroethane	20.32	1.0	20	0	102	70-130	20.6	1.37	30	
1,2-Dichloropropane	20.61	2.0	20	0	103	75-125	20.97	1.73	30	
1,3-Dichlorobenzene	21.65	2.0	20	0	108	75-125	22.19	2.46	30	
1,4-Dichlorobenzene	20.84	2.0	20	0	104	75-125	21.37	2.51	30	
2-Butanone	25.26	5.0	20	0	126	30-150	24.38	3.55	30	
2-Hexanone	21.02	5.0	20	0	105	55-130	20.24	3.78	30	
4-Methyl-2-pentanone	28.18	5.0	20	0	141	73-162	26.47	6.26	30	
Acetone	32.04	20	20	4.94	136	40-140	29.57	8.02	30	
Benzene	22.14	1.0	20	0	111	80-120	23.11	4.29	30	
Bromodichloromethane	17.61	1.0	20	0	88	75-120	17.87	1.47	30	
Bromoform	14.29	1.0	20	0	71.4	70-130	14.08	1.48	30	
Bromomethane	23.09	1.0	20	0	115	30-145	23.04	0.217	30	
Carbon disulfide	22.82	2.5	20	0	114	35-165	23.75	3.99	30	
Carbon tetrachloride	19.86	1.0	20	0	99.3	65-140	20.66	3.95	30	
Chlorobenzene	21.31	1.0	20	0	107	80-120	21.76	2.09	30	
Chloroethane	21.95	1.0	20	0	110	60-135	22.28	1.49	30	
Chloroform	21.87	1.0	20	0	109	65-135	21.87	0	30	
Chloromethane	21.47	1.0	20	0	107	70-125	18.71	13.7	30	
cis-1,2-Dichloroethene	64.52	1.0	20	40.72	119	70-125	65.17	1	30	
cis-1,3-Dichloropropene	18.56	1.0	20	0	92.8	70-130	18.76	1.07	30	
Dibromochloromethane	14.88	1.0	20	0	74.4	60-135	14.7	1.22	30	
Dichlorodifluoromethane	16.2	1.0	20	0	81	30-155	17.04	5.05	30	
Ethylbenzene	23.1	1.0	20	0	116	75-125	23.46	1.55	30	
Isopropylbenzene	20.63	1.0	20	0	103	75-125	20.82	0.917	30	
Methyl tert-butyl ether	21.9	5.0	20	0	110	65-125	21.42	2.22	30	
Methylene chloride	21.76	5.0	20	0	109	55-140	21.65	0.507	30	
Styrene	19.66	1.0	20	0	98.3	65-135	19.85	0.962	30	
Tetrachloroethene	26	2.0	20	2.07	120	45-150	27.45	5.43	30	
Toluene	22.33	1.0	20	0	112	75-120	22.88	2.43	30	
trans-1,2-Dichloroethene	26.24	1.0	20	1.79	122	60-140	27.04	3	30	
trans-1,3-Dichloropropene	17.73	1.0	20	0	88.6	55-140	17.61	0.679	30	
Trichloroethene	55.1	1.0	20	25.84	146	70-125	58.28	5.61	30	S
Trichlorofluoromethane	21.59	1.0	20	0	108	60-145	22.04	2.06	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404057
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **R138303A** Instrument ID **VMS6** Method: **SW8260**

Vinyl chloride	23.69	1.0	20	4.05	98.2	50-145	24.53	3.48	30
Xylenes, Total	60.97	3.0	60	0	102	75-130	62.47	2.43	30
Surr: 1,2-Dichloroethane-d4	*19.95*	0	*20*	0	*99.8*	*70-120*	20.15	*0.998*	*30*
Surr: 4-Bromofluorobenzene	*20.1*	0	*20*	0	*100*	*75-120*	20.03	*0.349*	*30*
Surr: Dibromofluoromethane	*20.19*	0	*20*	0	*101*	*85-115*	20.21	*0.099*	*30*
Surr: Toluene-d8	*19.71*	0	*20*	0	*98.6*	*85-120*	20.05	*1.71*	*30*

The following samples were analyzed in this batch: 1404057-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Chain of Custody Form

ALS Environmental

Page 1 of 2

COC ID: 123456

- ☐ Cincinnati, OH +1 513 733 5336
- ☐ Everett, WA +1 425 356 2600
- ☐ Fort Collins, CO +1 970 490 1511
- ■ Holland, MI +1 616 399 6070
- ☐ Houston, TX +1 281 530 5656
- ☐ Middletown, PA +1 717 944 5541
- ☐ Salt Lake City, UT +1 801 266 7700
- ☐ Spring City, PA +1 610 948 4903
- ☐ York, PA +1 717 505 5280

ALS Project Manager: [illegible] | Work Order #: 1404057

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	WHITING CRUDE RELEASE	A	VOC
Work Order		Project Number		B	SVOC
Company Name		Bill To Company		C	METALS
Send Report To		Invoice Attn.		D	TPH (DRO, GRO & ORO)
Address		Address		E	
				F	
City/State/Zip		City/State/Zip		G	
Phone		Phone		H	
Fax		Fax		I	
e-Mail Address		e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	WCR-WATER01-032714	3/27/14	17:10	W	1&2	5	X	X	X								
2	WCR-OIL02-032814	3/28/14	12:50	OIL	8	1	X	X		X							
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s): Please Print & Sign: JEFF BRYNIACSKI

Shipment Method: ____

Required Turnaround Time: ☒ STD 10 Wk Days ☐ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other ____

Results Due Date:

Relinquished by:	Date:	Time:	Received by:	Notes:
[signature]	3/31/14	12:50	[signature]	
Relinquished by: [signature]	Date: 3/31/14	Time: 1630	Received by (Laboratory): FedEx [signature] 4/1/14 1000	Cooler Temp: 3.4°C
Logged by (Laboratory): [signature]	Date: 4/1/14	Time: 1440	Checked by (Laboratory): [signature]	

QC Package: (Check Box Below)
- ☐ Level II: Standard QC
- ☐ Level III: Std QC + Raw Data
- ☐ Level IV: SW846 CLP-Like
- ☐ Other: ____

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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Sample Receipt Checklist

Client Name: **WESTON - CHI** Date/Time Received: **01-Apr-14 10:00**

Work Order: **1404057** Received by: **KRW**

Checklist completed by Keith Wierenga (eSignature) 01-Apr-14 (Date) Reviewed by: Tom Bramish (eSignature) 01-Apr-14 (Date)

Matrices: Water & Oil

Carrier name: FedEx

	Yes	No	Not Present
Shipping container/cooler in good condition?	☑	☐	☐
Custody seals intact on shipping container/cooler?	☐	☐	☑
Custody seals intact on sample bottles?	☐	☐	☑
Chain of custody present?	☑	☐	
Chain of custody signed when relinquished and received?	☑	☐	
Chain of custody agrees with sample labels?	☑	☐	
Samples in proper container/bottle?	☑	☐	
Sample containers intact?	☑	☐	
Sufficient sample volume for indicated test?	☑	☐	
All samples received within holding time?	☑	☐	
Container/Temp Blank temperature in compliance?	☑	☐	
Sample(s) received on ice?	☑	☐	

Temperature(s)/Thermometer(s): 3.4 C

Cooler(s)/Kit(s):

Date/Time sample(s) sent to storage: 4/1/2014 2:55:45 PM

	Yes	No	No VOA vials submitted
Water - VOA vials have zero headspace?	☐	☐	☑

	Yes	No	N/A
Water - pH acceptable upon receipt?	☑	☐	☐
pH adjusted?	☐	☑	☐

pH adjusted by: -

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

10-Apr-2014

Lisa Graczyk
Weston Solutions, Inc
20 North Wacker Drive
Suite 1210
Chicago, IL 60606

Re: **Whiting Crude Release** Work Order: **1404058**

Dear Lisa,

ALS Environmental received 1 sample on 01-Apr-2014 for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

Sample results are compliant with NELAP standard requirements and QC results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 35.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Electronically approved by: Tom Beamish

Tom Beamish
Senior Project Manager

Certificate No: MN 532786

ADDRESS 3352 128th Avenue Holland, Michigan 49424-9263 | PHONE (616) 399-6070 | FAX (616) 399-6185
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ALS Group USA, Corp

Date: 10-Apr-14

Client: Weston Solutions, Inc
Project: Whiting Crude Release
Work Order: **1404058**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1404058-01	WCR-Water02-033114	Water		03/31/14 10:00	04/01/14 09:30	☐

ALS Group USA, Corp

Date: 10-Apr-14

Client: Weston Solutions, Inc
Project: Whiting Crude Release
WorkOrder: **1404058**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte is present at an estimated concentration between the MDL and Report Limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

Units Reported	Description
mg/L	Milligrams per Liter

ALS Group USA, Corp

Date: *10-Apr-14*

Client: Weston Solutions, Inc
Project: Whiting Crude Release
Sample ID: WCR-Water02-033114
Collection Date: 03/31/14 10:00 AM

Work Order: 1404058
Lab ID: 1404058-01
Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7470**		Prep: SW7470 / 4/4/14	Analyst: **LR**
Mercury	ND		0.00020	mg/L	1	04/07/14 02:58 PM
METALS BY ICP-MS			**SW6020A**		Prep: SW3005A / 4/3/14	Analyst: **ML**
Aluminum	**0.032**		**0.010**	**mg/L**	1	04/03/14 10:21 PM
Antimony	ND		0.0050	mg/L	1	04/03/14 10:21 PM
Arsenic	ND		0.0050	mg/L	1	04/03/14 10:21 PM
Barium	**0.021**		**0.0050**	**mg/L**	1	04/03/14 10:21 PM
Beryllium	ND		0.0020	mg/L	1	04/03/14 10:21 PM
Cadmium	ND		0.0020	mg/L	1	04/03/14 10:21 PM
Calcium	**36**		**0.50**	**mg/L**	1	04/03/14 10:21 PM
Chromium	ND		0.0050	mg/L	1	04/03/14 10:21 PM
Cobalt	ND		0.0050	mg/L	1	04/03/14 10:21 PM
Copper	**0.016**		**0.0050**	**mg/L**	1	04/03/14 10:21 PM
Iron	ND		0.080	mg/L	1	04/03/14 10:21 PM
Lead	ND		0.0050	mg/L	1	04/03/14 10:21 PM
Magnesium	**13**		**0.20**	**mg/L**	1	04/03/14 10:21 PM
Manganese	ND		0.0050	mg/L	1	04/03/14 10:21 PM
Nickel	ND		0.0050	mg/L	1	04/03/14 10:21 PM
Potassium	**1.8**		**0.20**	**mg/L**	1	04/03/14 10:21 PM
Selenium	ND		0.0050	mg/L	1	04/03/14 10:21 PM
Silver	ND		0.0050	mg/L	1	04/03/14 10:21 PM
Sodium	**12**		**0.20**	**mg/L**	1	04/03/14 10:21 PM
Thallium	ND		0.0050	mg/L	1	04/03/14 10:21 PM
Vanadium	ND		0.0050	mg/L	1	04/03/14 10:21 PM
Zinc	**0.012**		**0.010**	**mg/L**	1	04/03/14 10:21 PM
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep: SW3510 / 4/3/14	Analyst: **RM**
1,1`-Biphenyl	ND		0.0050	mg/L	1	04/04/14 07:16 PM
2,4,5-Trichlorophenol	ND		0.0050	mg/L	1	04/04/14 07:16 PM
2,4,6-Trichlorophenol	ND		0.0050	mg/L	1	04/04/14 07:16 PM
2,4-Dichlorophenol	ND		0.010	mg/L	1	04/04/14 07:16 PM
2,4-Dimethylphenol	ND		0.0050	mg/L	1	04/04/14 07:16 PM
2,4-Dinitrophenol	ND		0.0050	mg/L	1	04/04/14 07:16 PM
2,4-Dinitrotoluene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
2,6-Dinitrotoluene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
2-Chloronaphthalene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
2-Chlorophenol	ND		0.0050	mg/L	1	04/04/14 07:16 PM
2-Methylnaphthalene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
2-Methylphenol	ND		0.0050	mg/L	1	04/04/14 07:16 PM
2-Nitroaniline	ND		0.020	mg/L	1	04/04/14 07:16 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *10-Apr-14*

Client: Weston Solutions, Inc
Project: Whiting Crude Release
Sample ID: WCR-Water02-033114
Collection Date: 03/31/14 10:00 AM

Work Order: 1404058
Lab ID: 1404058-01
Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
2-Nitrophenol	ND		0.0050	mg/L	1	04/04/14 07:16 PM
3,3´-Dichlorobenzidine	ND		0.0050	mg/L	1	04/04/14 07:16 PM
3-Nitroaniline	ND		0.020	mg/L	1	04/04/14 07:16 PM
4,6-Dinitro-2-methylphenol	ND		0.020	mg/L	1	04/04/14 07:16 PM
4-Bromophenyl phenyl ether	ND		0.0050	mg/L	1	04/04/14 07:16 PM
4-Chloro-3-methylphenol	ND		0.0050	mg/L	1	04/04/14 07:16 PM
4-Chloroaniline	ND		0.020	mg/L	1	04/04/14 07:16 PM
4-Chlorophenyl phenyl ether	ND		0.0050	mg/L	1	04/04/14 07:16 PM
4-Methylphenol	ND		0.0050	mg/L	1	04/04/14 07:16 PM
4-Nitroaniline	ND		0.020	mg/L	1	04/04/14 07:16 PM
4-Nitrophenol	ND		0.020	mg/L	1	04/04/14 07:16 PM
Acenaphthene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Acenaphthylene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Acetophenone	ND		0.0010	mg/L	1	04/04/14 07:16 PM
Anthracene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Atrazine	ND		0.0010	mg/L	1	04/04/14 07:16 PM
Benzaldehyde	ND		0.0010	mg/L	1	04/04/14 07:16 PM
Benzo(a)anthracene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Benzo(a)pyrene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Benzo(b)fluoranthene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Benzo(g,h,i)perylene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Benzo(k)fluoranthene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Bis(2-chloroethoxy)methane	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Bis(2-chloroethyl)ether	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Bis(2-chloroisopropyl)ether	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Bis(2-ethylhexyl)phthalate	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Butyl benzyl phthalate	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Caprolactam	ND		0.010	mg/L	1	04/04/14 07:16 PM
Carbazole	ND		0.010	mg/L	1	04/04/14 07:16 PM
Chrysene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Dibenzo(a,h)anthracene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Dibenzofuran	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Diethyl phthalate	ND		0.020	mg/L	1	04/04/14 07:16 PM
Dimethyl phthalate	ND		0.020	mg/L	1	04/04/14 07:16 PM
Di-n-butyl phthalate	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Di-n-octyl phthalate	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Fluoranthene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Fluorene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Hexachlorobenzene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Hexachlorobutadiene	ND		0.0050	mg/L	1	04/04/14 07:16 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *10-Apr-14*

Client: Weston Solutions, Inc
Project: Whiting Crude Release
Sample ID: WCR-Water02-033114
Collection Date: 03/31/14 10:00 AM

Work Order: 1404058
Lab ID: 1404058-01
Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Hexachlorocyclopentadiene	ND		0.020	mg/L	1	04/04/14 07:16 PM
Hexachloroethane	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Indeno(1,2,3-cd)pyrene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Isophorone	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Naphthalene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Nitrobenzene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
N-Nitrosodi-n-propylamine	ND		0.0050	mg/L	1	04/04/14 07:16 PM
N-Nitrosodiphenylamine	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Pentachlorophenol	ND		0.020	mg/L	1	04/04/14 07:16 PM
Phenanthrene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Phenol	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Pyrene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Surr: 2,4,6-Tribromophenol	*78.6*		*32-115*	*%REC*	1	04/04/14 07:16 PM
Surr: 2-Fluorobiphenyl	*70.4*		*32-100*	*%REC*	1	04/04/14 07:16 PM
Surr: 2-Fluorophenol	*40.9*		*22-59*	*%REC*	1	04/04/14 07:16 PM
Surr: 4-Terphenyl-d14	*98.6*		*23-112*	*%REC*	1	04/04/14 07:16 PM
Surr: Nitrobenzene-d5	*77.8*		*31-93*	*%REC*	1	04/04/14 07:16 PM
Surr: Phenol-d6	*27.4*		*13-36*	*%REC*	1	04/04/14 07:16 PM
VOLATILE ORGANIC COMPOUNDS			**SW8260**			Analyst: **BG**
1,1,1-Trichloroethane	ND		0.0010	mg/L	1	04/03/14 03:58 AM
1,1,2,2-Tetrachloroethane	ND		0.0010	mg/L	1	04/03/14 03:58 AM
1,1,2-Trichloroethane	ND		0.0010	mg/L	1	04/03/14 03:58 AM
1,1,2-Trichlorotrifluoroethane	ND		0.0010	mg/L	1	04/03/14 03:58 AM
1,1-Dichloroethane	ND		0.0010	mg/L	1	04/03/14 03:58 AM
1,1-Dichloroethene	ND		0.0010	mg/L	1	04/03/14 03:58 AM
1,2,4-Trichlorobenzene	ND		0.0010	mg/L	1	04/03/14 03:58 AM
1,2-Dibromo-3-chloropropane	ND		0.0010	mg/L	1	04/03/14 03:58 AM
1,2-Dibromoethane	ND		0.0010	mg/L	1	04/03/14 03:58 AM
1,2-Dichlorobenzene	ND		0.0010	mg/L	1	04/03/14 03:58 AM
1,2-Dichloroethane	ND		0.0010	mg/L	1	04/03/14 03:58 AM
1,2-Dichloropropane	ND		0.0020	mg/L	1	04/03/14 03:58 AM
1,3-Dichlorobenzene	ND		0.0020	mg/L	1	04/03/14 03:58 AM
1,4-Dichlorobenzene	ND		0.0020	mg/L	1	04/03/14 03:58 AM
2-Butanone	ND		0.0050	mg/L	1	04/03/14 03:58 AM
2-Hexanone	ND		0.0050	mg/L	1	04/03/14 03:58 AM
4-Methyl-2-pentanone	ND		0.0050	mg/L	1	04/03/14 03:58 AM
Acetone	ND		0.020	mg/L	1	04/03/14 03:58 AM
Benzene	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Bromodichloromethane	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Bromoform	ND		0.0010	mg/L	1	04/03/14 03:58 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *10-Apr-14*

Client: Weston Solutions, Inc
Project: Whiting Crude Release
Work Order: 1404058
Sample ID: WCR-Water02-033114
Lab ID: 1404058-01
Collection Date: 03/31/14 10:00 AM
Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Bromomethane	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Carbon disulfide	ND		0.0025	mg/L	1	04/03/14 03:58 AM
Carbon tetrachloride	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Chlorobenzene	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Chloroethane	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Chloroform	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Chloromethane	ND		0.0010	mg/L	1	04/03/14 03:58 AM
cis-1,2-Dichloroethene	ND		0.0010	mg/L	1	04/03/14 03:58 AM
cis-1,3-Dichloropropene	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Cyclohexane	ND		0.0050	mg/L	1	04/03/14 03:58 AM
Dibromochloromethane	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Dichlorodifluoromethane	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Ethylbenzene	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Isopropylbenzene	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Methyl acetate	ND		0.0020	mg/L	1	04/03/14 03:58 AM
Methyl tert-butyl ether	ND		0.0050	mg/L	1	04/03/14 03:58 AM
Methylcyclohexane	ND		0.0050	mg/L	1	04/03/14 03:58 AM
Methylene chloride	ND		0.0050	mg/L	1	04/03/14 03:58 AM
Styrene	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Tetrachloroethene	ND		0.0020	mg/L	1	04/03/14 03:58 AM
Toluene	ND		0.0010	mg/L	1	04/03/14 03:58 AM
trans-1,2-Dichloroethene	ND		0.0010	mg/L	1	04/03/14 03:58 AM
trans-1,3-Dichloropropene	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Trichloroethene	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Trichlorofluoromethane	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Vinyl chloride	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Xylenes, Total	ND		0.0030	mg/L	1	04/03/14 03:58 AM
Surr: 1,2-Dichloroethane-d4	*102*		*70-120*	*%REC*	1	04/03/14 03:58 AM
Surr: 4-Bromofluorobenzene	*97.0*		*75-120*	*%REC*	1	04/03/14 03:58 AM
Surr: Dibromofluoromethane	*98.9*		*85-115*	*%REC*	1	04/03/14 03:58 AM
Surr: Toluene-d8	*98.9*		*85-120*	*%REC*	1	04/03/14 03:58 AM
NON-POLAR MATERIAL			**E1664**			Analyst: **ND**
Non-Polar Material	ND		5.0	mg/L	1	04/08/14 09:00 AM
OIL AND GREASE			**E1664A**			Analyst: **ND**
Oil and Grease	ND		5.0	mg/L	1	04/08/14 09:00 AM
PHENOLICS, TOTAL			**SW9066**		Prep: E420.x / 4/2/14	Analyst: **JB**
Phenolics, Total	ND		0.010	mg/L	1	04/03/14 11:34 AM
ORGANIC CARBON, TOTAL			**SW9060**			Analyst: **ED**

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *10-Apr-14*

Client: Weston Solutions, Inc
Project: Whiting Crude Release
Sample ID: WCR-Water02-033114
Collection Date: 03/31/14 10:00 AM

Work Order: 1404058
Lab ID: 1404058-01
Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Organic Carbon, Total	**2.2**		**0.50**	**mg/L**	1	04/03/14 12:23 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: 10-Apr-14

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57254** Instrument ID **HG1** Method: **SW7470**

MBLK Sample ID: **MBLK-57254-57254** Units: **mg/L** Analysis Date: **04/07/14 02:33 PM**

Client ID: Run ID: **HG1_140407A** SeqNo: **2701501** Prep Date: **04/04/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	ND	0.00020								

LCS Sample ID: **LCS-57254-57254** Units: **mg/L** Analysis Date: **04/07/14 02:35 PM**

Client ID: Run ID: **HG1_140407A** SeqNo: **2701502** Prep Date: **04/04/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00193	0.00020	0.002	0	96.5	80-120		0		

MS Sample ID: **1404057-01CMS** Units: **mg/L** Analysis Date: **04/07/14 02:47 PM**

Client ID: Run ID: **HG1_140407A** SeqNo: **2701509** Prep Date: **04/04/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.002061	0.00020	0.002	-0.000023	104	75-125		0		

MSD Sample ID: **1404057-01CMSD** Units: **mg/L** Analysis Date: **04/07/14 02:56 PM**

Client ID: Run ID: **HG1_140407A** SeqNo: **2701518** Prep Date: **04/04/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.002032	0.00020	0.002	-0.000023	103	75-125	0.002061	1.42	20	

The following samples were analyzed in this batch: 1404058-01D

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57200** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK Sample ID: **MBLK-57200-57200** Units: **mg/L** Analysis Date: **04/03/14 08:04 PM**

Client ID: Run ID: **ICPMS1_140403A** SeqNo: **2699093** Prep Date: **04/03/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	ND	0.0050								
Arsenic	ND	0.0050								
Barium	ND	0.0050								
Beryllium	ND	0.0020								
Cadmium	ND	0.0020								
Calcium	0.1484	0.50								J
Chromium	ND	0.0050								
Cobalt	ND	0.0050								
Copper	ND	0.0050								
Iron	0.007899	0.080								J
Lead	ND	0.0050								
Magnesium	0.06565	0.20								J
Manganese	0.0001004	0.0050								J
Nickel	ND	0.0050								
Potassium	0.04607	0.20								J
Selenium	0.0007958	0.0050								J
Silver	ND	0.0050								
Sodium	0.1159	0.20								J
Thallium	ND	0.0050								
Vanadium	ND	0.0050								
Zinc	ND	0.010								

MBLK Sample ID: **MBLK-57200-57200** Units: **mg/L** Analysis Date: **04/04/14 02:36 PM**

Client ID: Run ID: **ICPMS1_140404A** SeqNo: **2699907** Prep Date: **04/03/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.001235	0.010								J

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57200** Instrument ID **ICPMS1** Method: **SW6020A**

LCS Sample ID: **LCS-57200-57200** Units: **mg/L** Analysis Date: **04/03/14 08:10 PM**

Client ID: Run ID: **ICPMS1_140403A** SeqNo: **2699095** Prep Date: **04/03/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.09506	0.0050	0.1	0	95.1	80-120	0			
Arsenic	0.09156	0.0050	0.1	0	91.6	80-120	0			
Barium	0.09358	0.0050	0.1	0	93.6	80-120	0			
Beryllium	0.09685	0.0020	0.1	0	96.8	80-120	0			
Cadmium	0.09503	0.0020	0.1	0	95	80-120	0			
Calcium	9.306	0.50	10	0	93.1	80-120	0			
Chromium	0.08929	0.0050	0.1	0	89.3	80-120	0			
Cobalt	0.08918	0.0050	0.1	0	89.2	80-120	0			
Copper	0.09183	0.0050	0.1	0	91.8	80-120	0			
Iron	9.333	0.080	10	0	93.3	80-120	0			
Lead	0.09142	0.0050	0.1	0	91.4	80-120	0			
Magnesium	9.143	0.20	10	0	91.4	80-120	0			
Manganese	0.09136	0.0050	0.1	0	91.4	80-120	0			
Nickel	0.08986	0.0050	0.1	0	89.9	80-120	0			
Potassium	9.125	0.20	10	0	91.2	80-120	0			
Selenium	0.09294	0.0050	0.1	0	92.9	80-120	0			
Silver	0.08769	0.0050	0.1	0	87.7	80-120	0			
Sodium	8.969	0.20	10	0	89.7	80-120	0			
Thallium	0.08869	0.0050	0.1	0	88.7	80-120	0			
Vanadium	0.092	0.0050	0.1	0	92	80-120	0			
Zinc	0.09559	0.010	0.1	0	95.6	80-120	0			

LCS Sample ID: **LCS-57200-57200** Units: **mg/L** Analysis Date: **04/04/14 02:43 PM**

Client ID: Run ID: **ICPMS1_140404A** SeqNo: **2699908** Prep Date: **04/03/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.09101	0.010	0.1	0	91	80-120	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57200** Instrument ID **ICPMS1** Method: **SW6020A**

MS Sample ID: **14031413-02AMS** Units: **mg/L** Analysis Date: **04/03/14 10:02 PM**

Client ID: Run ID: **ICPMS1_140403A** SeqNo: **2699121** Prep Date: **04/03/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	1.013	0.10	1	0.02451	98.8	75-125	0			
Antimony	0.9489	0.050	1	0.001837	94.7	75-125	0			
Arsenic	0.972	0.050	1	0.0005695	97.1	75-125	0			
Barium	1.216	0.050	1	0.2365	98	75-125	0			
Beryllium	0.934	0.020	1	0.0005091	93.3	75-125	0			
Cadmium	0.938	0.020	1	0.0005312	93.7	75-125	0			
Calcium	272.1	5.0	100	174	98.1	75-125	0			
Chromium	0.9486	0.050	1	0.001037	94.8	75-125	0			
Cobalt	0.9314	0.050	1	0.002633	92.9	75-125	0			
Copper	0.9348	0.050	1	0.005053	93	75-125	0			
Iron	100.4	0.80	100	4.785	95.6	75-125	0			
Lead	0.9469	0.050	1	0.00115	94.6	75-125	0			
Magnesium	116.8	2.0	100	14.24	103	75-125	0			
Manganese	1.464	0.050	1	0.5013	96.3	75-125	0			
Nickel	0.9391	0.050	1	0.005886	93.3	75-125	0			
Potassium	131.8	2.0	100	31.49	100	75-125	0			
Selenium	0.8987	0.050	1	-0.0003594	89.9	75-125	0			
Silver	0.8435	0.050	1	0.000274	84.3	75-125	0			
Thallium	0.9164	0.050	1	0.0008541	91.6	75-125	0			
Vanadium	1.011	0.050	1	0.002739	101	75-125	0			
Zinc	0.9719	0.10	1	0.01789	95.4	75-125	0			

MS Sample ID: **14031413-02AMS** Units: **mg/L** Analysis Date: **04/04/14 01:46 PM**

Client ID: Run ID: **ICPMS1_140404A** SeqNo: **2699899** Prep Date: **04/03/14** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	4286	20	100	4152	134	75-125	0			SO

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57200** Instrument ID **ICPMS1** Method: **SW6020A**

MSD Sample ID: **14031413-02AMSD** Units: **mg/L** Analysis Date: **04/03/14 10:09 PM**

Client ID: Run ID: **ICPMS1_140403A** SeqNo: **2699122** Prep Date: **04/03/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	1.043	0.10	1	0.02451	102	75-125	1.013	2.92	20	
Antimony	0.9415	0.050	1	0.001837	94	75-125	0.9489	0.783	20	
Arsenic	0.994	0.050	1	0.0005695	99.3	75-125	0.972	2.24	20	
Barium	1.237	0.050	1	0.2365	100	75-125	1.216	1.71	20	
Beryllium	0.9706	0.020	1	0.0005091	97	75-125	0.934	3.84	20	
Cadmium	0.9582	0.020	1	0.0005312	95.8	75-125	0.938	2.13	20	
Calcium	281.5	5.0	100	174	108	75-125	272.1	3.4	20	
Chromium	0.9404	0.050	1	0.001037	93.9	75-125	0.9486	0.868	20	
Cobalt	0.9253	0.050	1	0.002633	92.3	75-125	0.9314	0.657	20	
Copper	0.9245	0.050	1	0.005053	91.9	75-125	0.9348	1.11	20	
Iron	99.73	0.80	100	4.785	94.9	75-125	100.4	0.67	20	
Lead	0.9709	0.050	1	0.00115	97	75-125	0.9469	2.5	20	
Magnesium	121	2.0	100	14.24	107	75-125	116.8	3.53	20	
Manganese	1.451	0.050	1	0.5013	95	75-125	1.464	0.892	20	
Nickel	0.9255	0.050	1	0.005886	92	75-125	0.9391	1.46	20	
Potassium	135.4	2.0	100	31.49	104	75-125	131.8	2.69	20	
Selenium	0.9143	0.050	1	-0.0003594	91.5	75-125	0.8987	1.72	20	
Silver	0.8403	0.050	1	0.000274	84	75-125	0.8435	0.38	20	
Thallium	0.9444	0.050	1	0.0008541	94.4	75-125	0.9164	3.01	20	
Vanadium	0.9918	0.050	1	0.002739	98.9	75-125	1.011	1.92	20	
Zinc	0.9627	0.10	1	0.01789	94.5	75-125	0.9719	0.951	20	

MSD Sample ID: **14031413-02AMSD** Units: **mg/L** Analysis Date: **04/04/14 01:53 PM**

Client ID: Run ID: **ICPMS1_140404A** SeqNo: **2699900** Prep Date: **04/03/14** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	4173	20	100	4152	21	75-125	4286	2.67	20	SO

The following samples were analyzed in this batch: 1404058-01D

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57176** Instrument ID **SVMS8** Method: **SW8270**

MBLK Sample ID: **SBLKW1-57176-57176** Units: **µg/L** Analysis Date: **04/04/14 11:02 AM**

Client ID: Run ID: **SVMS8_140404A** SeqNo: **2700280** Prep Date: **04/03/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1`-Biphenyl	ND	5.0								
2,4,5-Trichlorophenol	ND	5.0								
2,4,6-Trichlorophenol	ND	5.0								
2,4-Dichlorophenol	ND	10								
2,4-Dimethylphenol	ND	5.0								
2,4-Dinitrophenol	ND	5.0								
2,4-Dinitrotoluene	ND	5.0								
2,6-Dinitrotoluene	ND	5.0								
2-Chloronaphthalene	ND	5.0								
2-Chlorophenol	ND	5.0								
2-Methylnaphthalene	ND	5.0								
2-Methylphenol	ND	5.0								
2-Nitroaniline	ND	20								
2-Nitrophenol	ND	5.0								
3,3´-Dichlorobenzidine	ND	5.0								
3-Nitroaniline	ND	20								
4,6-Dinitro-2-methylphenol	ND	20								
4-Bromophenyl phenyl ether	ND	5.0								
4-Chloro-3-methylphenol	ND	5.0								
4-Chloroaniline	ND	20								
4-Chlorophenyl phenyl ether	ND	5.0								
4-Methylphenol	ND	5.0								
4-Nitroaniline	ND	20								
4-Nitrophenol	ND	20								
Acenaphthene	ND	5.0								
Acenaphthylene	ND	5.0								
Acetophenone	ND	1.0								
Anthracene	ND	5.0								
Atrazine	ND	1.0								
Benzaldehyde	ND	1.0								
Benzo(a)anthracene	ND	5.0								
Benzo(a)pyrene	ND	5.0								
Benzo(b)fluoranthene	ND	5.0								
Benzo(g,h,i)perylene	ND	5.0								
Benzo(k)fluoranthene	ND	5.0								
Bis(2-chloroethoxy)methane	ND	5.0								
Bis(2-chloroethyl)ether	ND	5.0								
Bis(2-chloroisopropyl)ether	ND	5.0								
Bis(2-ethylhexyl)phthalate	ND	5.0								
Butyl benzyl phthalate	ND	5.0								
Caprolactam	ND	10								
Carbazole	ND	10								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **57176** Instrument ID **SVMS8** Method: **SW8270**

Chrysene	ND	5.0					
Dibenzo(a,h)anthracene	ND	5.0					
Dibenzofuran	ND	5.0					
Diethyl phthalate	ND	20					
Dimethyl phthalate	ND	20					
Di-n-butyl phthalate	ND	5.0					
Di-n-octyl phthalate	ND	5.0					
Fluoranthene	ND	5.0					
Fluorene	ND	5.0					
Hexachlorobenzene	ND	5.0					
Hexachlorobutadiene	ND	5.0					
Hexachlorocyclopentadiene	ND	20					
Hexachloroethane	ND	5.0					
Indeno(1,2,3-cd)pyrene	ND	5.0					
Isophorone	ND	5.0					
Naphthalene	ND	5.0					
Nitrobenzene	ND	5.0					
N-Nitrosodi-n-propylamine	ND	5.0					
N-Nitrosodiphenylamine	ND	5.0					
Pentachlorophenol	ND	20					
Phenanthrene	ND	5.0					
Phenol	ND	5.0					
Pyrene	ND	5.0					
Surr: 2,4,6-Tribromophenol	*30.23*	0	*50*	0	*60.5*	*38-115*	0
Surr: 2-Fluorobiphenyl	*31.72*	0	*50*	0	*63.4*	*32-100*	0
Surr: 2-Fluorophenol	*19.15*	0	*50*	0	*38.3*	*22-59*	0
Surr: 4-Terphenyl-d14	*45.82*	0	*50*	0	*91.6*	*23-112*	0
Surr: Nitrobenzene-d5	*35.48*	0	*50*	0	*71*	*31-93*	0
Surr: Phenol-d6	*11.82*	0	*50*	0	*23.6*	*13-36*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57176** Instrument ID **SVMS8** Method: **SW8270**

LCS Sample ID: **SLCSW1-57176-57176** Units: **µg/L** Analysis Date: **04/04/14 11:23 AM**

Client ID: Run ID: **SVMS8_140404A** SeqNo: **2700281** Prep Date: **04/03/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2,4,5-Trichlorophenol	14.37	5.0	20	0	71.8	50-110	0			
2,4,6-Trichlorophenol	13.79	5.0	20	0	69	50-115	0			
2,4-Dichlorophenol	13.07	10	20	0	65.4	50-105	0			
2,4-Dimethylphenol	12.01	5.0	20	0	60	30-110	0			
2,4-Dinitrophenol	12.48	5.0	20	0	62.4	15-140	0			
2,4-Dinitrotoluene	15.08	5.0	20	0	75.4	50-120	0			
2,6-Dinitrotoluene	14.77	5.0	20	0	73.8	50-115	0			
2-Chloronaphthalene	14.49	5.0	20	0	72.4	50-105	0			
2-Chlorophenol	12.81	5.0	20	0	64	35-105	0			
2-Methylnaphthalene	13.81	5.0	20	0	69	45-105	0			
2-Methylphenol	11.55	5.0	20	0	57.8	40-110	0			
2-Nitroaniline	15.92	20	20	0	79.6	50-115	0			J
2-Nitrophenol	13.9	5.0	20	0	69.5	40-115	0			
3-Nitroaniline	14.59	20	20	0	73	20-125	0			J
4,6-Dinitro-2-methylphenol	14.74	20	20	0	73.7	40-130	0			J
4-Bromophenyl phenyl ether	15.89	5.0	20	0	79.4	50-115	0			
4-Chloro-3-methylphenol	13.72	5.0	20	0	68.6	45-110	0			
4-Chloroaniline	15.23	20	20	0	76.2	15-110	0			J
4-Chlorophenyl phenyl ether	14.5	5.0	20	0	72.5	50-110	0			
4-Methylphenol	9.9	5.0	20	0	49.5	30-110	0			
4-Nitroaniline	14.13	20	20	0	70.6	35-150	0			J
4-Nitrophenol	5.09	20	20	0	25.4	1-58	0			J
Acenaphthene	14.04	5.0	20	0	70.2	45-110	0			
Acenaphthylene	15.42	5.0	20	0	77.1	50-105	0			
Anthracene	16.78	5.0	20	0	83.9	55-110	0			
Benzo(a)anthracene	15.81	5.0	20	0	79	55-110	0			
Benzo(a)pyrene	16.25	5.0	20	0	81.2	55-110	0			
Benzo(b)fluoranthene	16.8	5.0	20	0	84	45-120	0			
Benzo(g,h,i)perylene	16.33	5.0	20	0	81.6	40-125	0			
Benzo(k)fluoranthene	16.98	5.0	20	0	84.9	45-125	0			
Bis(2-chloroethoxy)methane	14.59	5.0	20	0	73	45-105	0			
Bis(2-chloroethyl)ether	15.9	5.0	20	0	79.5	35-110	0			
Bis(2-chloroisopropyl)ether	16.54	5.0	20	0	82.7	25-130	0			
Bis(2-ethylhexyl)phthalate	15.67	5.0	20	0	78.4	40-125	0			
Butyl benzyl phthalate	15.7	5.0	20	0	78.5	45-115	0			
Carbazole	16.76	10	20	0	83.8	50-150	0			
Chrysene	16.62	5.0	20	0	83.1	55-110	0			
Dibenzo(a,h)anthracene	15.19	5.0	20	0	76	40-125	0			
Dibenzofuran	14.33	5.0	20	0	71.6	55-105	0			
Diethyl phthalate	16.12	20	20	0	80.6	40-120	0			J
Dimethyl phthalate	15.49	20	20	0	77.4	25-125	0			J
Di-n-butyl phthalate	16.73	5.0	20	0	83.6	55-115	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57176** Instrument ID **SVMS8** Method: **SW8270**

Di-n-octyl phthalate	15.68	5.0	20	0	78.4	35-135	0	
Fluoranthene	16.77	5.0	20	0	83.8	55-115	0	
Fluorene	14.9	5.0	20	0	74.5	50-110	0	
Hexachlorobenzene	15.32	5.0	20	0	76.6	50-110	0	
Hexachlorobutadiene	12.26	5.0	20	0	61.3	25-105	0	
Hexachlorocyclopentadiene	10.97	20	20	0	54.8	25-105	0	J
Hexachloroethane	12.73	5.0	20	0	63.6	30-95	0	
Indeno(1,2,3-cd)pyrene	18.13	5.0	20	0	90.6	45-125	0	
Isophorone	15.65	5.0	20	0	78.2	50-110	0	
Naphthalene	13.15	5.0	20	0	65.8	40-100	0	
Nitrobenzene	14.96	5.0	20	0	74.8	45-110	0	
N-Nitrosodi-n-propylamine	15.72	5.0	20	0	78.6	35-130	0	
N-Nitrosodiphenylamine	16.13	5.0	20	0	80.6	50-110	0	
Pentachlorophenol	13.13	20	20	0	65.6	40-115	0	J
Phenanthrene	15.83	5.0	20	0	79.2	50-115	0	
Phenol	5.19	5.0	20	0	26	12-43	0	
Pyrene	17.65	5.0	20	0	88.2	50-130	0	
Surr: 2,4,6-Tribromophenol	*37.35*	0	*50*	0	*74.7*	*38-115*	0	
Surr: 2-Fluorobiphenyl	*34.28*	0	*50*	0	*68.6*	*32-100*	0	
Surr: 2-Fluorophenol	*19.09*	0	*50*	0	*38.2*	*22-59*	0	
Surr: 4-Terphenyl-d14	*46.26*	0	*50*	0	*92.5*	*23-112*	0	
Surr: Nitrobenzene-d5	*41.24*	0	*50*	0	*82.5*	*31-93*	0	
Surr: Phenol-d6	*12.93*	0	*50*	0	*25.9*	*13-36*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57176** Instrument ID **SVMS8** Method: **SW8270**

MS Sample ID: **1404130-15B MS** Units: **µg/L** Analysis Date: **04/04/14 01:49 PM**

Client ID: Run ID: **SVMS8_140404A** SeqNo: **2700286** Prep Date: **04/03/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2,4,5-Trichlorophenol	159	50	200	0	79.5	50-110	0			
2,4,6-Trichlorophenol	157.7	50	200	0	78.8	50-115	0			
2,4-Dichlorophenol	144.9	100	200	0	72.4	50-105	0			
2,4-Dimethylphenol	155.7	50	200	0	77.8	30-110	0			
2,4-Dinitrophenol	16.1	50	200	0	8.05	15-140	0			JS
2,4-Dinitrotoluene	157.9	50	200	0	79	50-120	0			
2,6-Dinitrotoluene	151.9	50	200	0	76	50-115	0			
2-Chloronaphthalene	148.4	50	200	0	74.2	50-105	0			
2-Chlorophenol	146.9	50	200	0	73.4	35-105	0			
2-Methylnaphthalene	140.6	50	200	0	70.3	45-105	0			
2-Methylphenol	131.2	50	200	0	65.6	40-110	0			
2-Nitroaniline	171.6	200	200	0	85.8	50-115	0			J
2-Nitrophenol	140.1	50	200	0	70	40-115	0			
3-Nitroaniline	150.2	200	200	0	75.1	20-125	0			J
4,6-Dinitro-2-methylphenol	45.8	200	200	0	22.9	40-130	0			JS
4-Bromophenyl phenyl ether	162.6	50	200	0	81.3	50-115	0			
4-Chloro-3-methylphenol	157.2	50	200	0	78.6	45-110	0			
4-Chloroaniline	121.6	200	200	0	60.8	15-110	0			J
4-Chlorophenyl phenyl ether	150.4	50	200	0	75.2	50-110	0			
4-Methylphenol	116	50	200	0	58	30-110	0			
4-Nitroaniline	144.2	200	200	0	72.1	35-150	0			J
4-Nitrophenol	38.7	200	200	0	19.4	1-58	0			J
Acenaphthene	130.2	50	200	0	65.1	45-110	0			
Acenaphthylene	156.9	50	200	0	78.4	50-105	0			
Anthracene	171.4	50	200	0	85.7	55-110	0			
Benzo(a)anthracene	169.6	50	200	0	84.8	55-110	0			
Benzo(a)pyrene	179.6	50	200	0	89.8	55-110	0			
Benzo(b)fluoranthene	191.3	50	200	0	95.6	45-120	0			
Benzo(g,h,i)perylene	157.5	50	200	0	78.8	40-125	0			
Benzo(k)fluoranthene	189.2	50	200	0	94.6	45-125	0			
Bis(2-chloroethoxy)methane	147.6	50	200	0	73.8	45-105	0			
Bis(2-chloroethyl)ether	151.5	50	200	0	75.8	35-110	0			
Bis(2-chloroisopropyl)ether	154.4	50	200	0	77.2	25-130	0			
Bis(2-ethylhexyl)phthalate	195.7	50	200	0	97.8	40-125	0			
Butyl benzyl phthalate	197.1	50	200	0	98.6	45-115	0			
Carbazole	171.8	100	200	0	85.9	50-150	0			
Chrysene	163.2	50	200	0	81.6	55-110	0			
Dibenzo(a,h)anthracene	153.8	50	200	0	76.9	40-125	0			
Dibenzofuran	147.6	50	200	0	73.8	55-105	0			
Diethyl phthalate	164.6	200	200	0	82.3	40-120	0			J
Dimethyl phthalate	160.7	200	200	0	80.4	25-125	0			J
Di-n-butyl phthalate	179.7	50	200	0	89.8	55-115	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **57176** Instrument ID **SVMS8** Method: **SW8270**

Di-n-octyl phthalate	258.7	50	200	0	129	35-135	0	
Fluoranthene	173.7	50	200	0	86.8	55-115	0	
Fluorene	152.1	50	200	0	76	50-110	0	
Hexachlorobenzene	152.5	50	200	0	76.2	50-110	0	
Hexachlorobutadiene	128	50	200	0	64	25-105	0	
Hexachlorocyclopentadiene	67.1	200	200	0	33.6	25-105	0	J
Hexachloroethane	131.3	50	200	0	65.6	30-95	0	
Indeno(1,2,3-cd)pyrene	195.2	50	200	0	97.6	45-125	0	
Isophorone	159.6	50	200	0	79.8	50-110	0	
Naphthalene	134.5	50	200	0	67.2	40-100	0	
Nitrobenzene	153	50	200	0	76.5	45-110	0	
N-Nitrosodi-n-propylamine	162	50	200	0	81	35-130	0	
N-Nitrosodiphenylamine	162.5	50	200	0	81.2	50-110	0	
Pentachlorophenol	113.5	200	200	0	56.8	40-115	0	J
Phenanthrene	155.9	50	200	0	78	50-115	0	
Phenol	53.1	50	200	0	26.6	12-43	0	
Pyrene	211	50	200	0	106	50-130	0	
Surr: 2,4,6-Tribromophenol	*394.5*	0	*500*	0	*78.9*	*38-115*	0	
Surr: 2-Fluorobiphenyl	*347.5*	0	*500*	0	*69.5*	*32-100*	0	
Surr: 2-Fluorophenol	*210.2*	0	*500*	0	*42*	*22-59*	0	
Surr: 4-Terphenyl-d14	*555*	0	*500*	0	*111*	*23-112*	0	
Surr: Nitrobenzene-d5	*413.4*	0	*500*	0	*82.7*	*31-93*	0	
Surr: Phenol-d6	*135.5*	0	*500*	0	*27.1*	*13-36*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57176** Instrument ID **SVMS8** Method: **SW8270**

MSD Sample ID: **1404130-15B MSD** Units: **µg/L** Analysis Date: **04/04/14 02:09 PM**

Client ID: Run ID: **SVMS8_140404A** SeqNo: **2700287** Prep Date: **04/03/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2,4,5-Trichlorophenol	163.6	50	200	0	81.8	50-110	159	2.85	30	
2,4,6-Trichlorophenol	166	50	200	0	83	50-115	157.7	5.13	30	
2,4-Dichlorophenol	150.5	100	200	0	75.2	50-105	144.9	3.79	30	
2,4-Dimethylphenol	137.9	50	200	0	69	30-110	155.7	12.1	30	
2,4-Dinitrophenol	28.2	50	200	0	14.1	15-140	16.1	0	30	JS
2,4-Dinitrotoluene	160.6	50	200	0	80.3	50-120	157.9	1.7	30	
2,6-Dinitrotoluene	159.3	50	200	0	79.6	50-115	151.9	4.76	30	
2-Chloronaphthalene	152.6	50	200	0	76.3	50-105	148.4	2.79	30	
2-Chlorophenol	148.8	50	200	0	74.4	35-105	146.9	1.29	30	
2-Methylnaphthalene	145.5	50	200	0	72.8	45-105	140.6	3.43	30	
2-Methylphenol	135.5	50	200	0	67.8	40-110	131.2	3.22	30	
2-Nitroaniline	174.4	200	200	0	87.2	50-115	171.6	0	30	J
2-Nitrophenol	149.1	50	200	0	74.6	40-115	140.1	6.22	30	
3-Nitroaniline	166	200	200	0	83	20-125	150.2	0	30	J
4,6-Dinitro-2-methylphenol	60.7	200	200	0	30.4	40-130	45.8	0	30	JS
4-Bromophenyl phenyl ether	160.1	50	200	0	80	50-115	162.6	1.55	30	
4-Chloro-3-methylphenol	170.5	50	200	0	85.2	45-110	157.2	8.12	30	
4-Chloroaniline	154.7	200	200	0	77.4	15-110	121.6	0	30	J
4-Chlorophenyl phenyl ether	151.7	50	200	0	75.8	50-110	150.4	0.861	30	
4-Methylphenol	126.6	50	200	0	63.3	30-110	116	8.74	30	
4-Nitroaniline	157.8	200	200	0	78.9	35-150	144.2	0	30	J
4-Nitrophenol	50.4	200	200	0	25.2	1-58	38.7	0	0	J
Acenaphthene	133.9	50	200	0	67	45-110	130.2	2.8	30	
Acenaphthylene	158.5	50	200	0	79.2	50-105	156.9	1.01	30	
Anthracene	168.8	50	200	0	84.4	55-110	171.4	1.53	30	
Benzo(a)anthracene	170.7	50	200	0	85.4	55-110	169.6	0.646	30	
Benzo(a)pyrene	179.4	50	200	0	89.7	55-110	179.6	0.111	30	
Benzo(b)fluoranthene	192.7	50	200	0	96.4	45-120	191.3	0.729	30	
Benzo(g,h,i)perylene	152	50	200	0	76	40-125	157.5	3.55	30	
Benzo(k)fluoranthene	190.5	50	200	0	95.2	45-125	189.2	0.685	30	
Bis(2-chloroethoxy)methane	150.7	50	200	0	75.4	45-105	147.6	2.08	30	
Bis(2-chloroethyl)ether	157.6	50	200	0	78.8	35-110	151.5	3.95	30	
Bis(2-chloroisopropyl)ether	157.9	50	200	0	79	25-130	154.4	2.24	30	
Bis(2-ethylhexyl)phthalate	191.8	50	200	0	95.9	40-125	195.7	2.01	30	
Butyl benzyl phthalate	189.3	50	200	0	94.6	45-115	197.1	4.04	30	
Carbazole	175.1	100	200	0	87.6	50-150	171.8	1.9	30	
Chrysene	166.8	50	200	0	83.4	55-110	163.2	2.18	30	
Dibenzo(a,h)anthracene	149.1	50	200	0	74.6	40-125	153.8	3.1	30	
Dibenzofuran	149.8	50	200	0	74.9	55-105	147.6	1.48	30	
Diethyl phthalate	173	200	200	0	86.5	40-120	164.6	0	30	J
Dimethyl phthalate	165.4	200	200	0	82.7	25-125	160.7	0	30	J
Di-n-butyl phthalate	180	50	200	0	90	55-115	179.7	0.167	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57176** Instrument ID **SVMS8** Method: **SW8270**

Di-n-octyl phthalate	251.8	50	200	0	126	35-135	258.7	2.7	30	
Fluoranthene	174.7	50	200	0	87.4	55-115	173.7	0.574	30	
Fluorene	154.8	50	200	0	77.4	50-110	152.1	1.76	30	
Hexachlorobenzene	154.6	50	200	0	77.3	50-110	152.5	1.37	30	
Hexachlorobutadiene	132.1	50	200	0	66	25-105	128	3.15	30	
Hexachlorocyclopentadiene	63.3	200	200	0	31.6	25-105	67.1	0	30	J
Hexachloroethane	129.1	50	200	0	64.6	30-95	131.3	1.69	30	
Indeno(1,2,3-cd)pyrene	189.1	50	200	0	94.6	45-125	195.2	3.17	30	
Isophorone	165.1	50	200	0	82.6	50-110	159.6	3.39	30	
Naphthalene	138.2	50	200	0	69.1	40-100	134.5	2.71	30	
Nitrobenzene	160.2	50	200	0	80.1	45-110	153	4.6	30	
N-Nitrosodi-n-propylamine	168.4	50	200	0	84.2	35-130	162	3.87	30	
N-Nitrosodiphenylamine	164.2	50	200	0	82.1	50-110	162.5	1.04	30	
Pentachlorophenol	117.4	200	200	0	58.7	40-115	113.5	0	30	J
Phenanthrene	161.2	50	200	0	80.6	50-115	155.9	3.34	30	
Phenol	62.7	50	200	0	31.4	12-43	53.1	16.6	30	
Pyrene	199.9	50	200	0	100	50-130	211	5.4	30	
Surr: 2,4,6-Tribromophenol	*397.5*	0	*500*	0	*79.5*	*38-115*	394.5	*0.758*	*40*	
Surr: 2-Fluorobiphenyl	*349.2*	0	*500*	0	*69.8*	*32-100*	347.5	*0.488*	*40*	
Surr: 2-Fluorophenol	*235.1*	0	*500*	0	*47*	*22-59*	210.2	*11.2*	*40*	
Surr: 4-Terphenyl-d14	*528.4*	0	*500*	0	*106*	*23-112*	555	*4.91*	*40*	
Surr: Nitrobenzene-d5	*420.8*	0	*500*	0	*84.2*	*31-93*	413.4	*1.77*	*40*	
Surr: Phenol-d6	*159.6*	0	*500*	0	*31.9*	*13-36*	135.5	*16.3*	*40*	

The following samples were analyzed in this batch: 1404058-01B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **R138303A** Instrument ID **VMS6** Method: **SW8260**

MBLK	Sample ID: **VBLKW2-140402-R138303A**	Units: **µg/L**	Analysis Date: **04/02/14 08:32 PM**
Client ID:	Run ID: **VMS6_140402A**	SeqNo: **2697650** Prep Date:	DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
1,1,2-Trichlorotrifluoroethane	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,2-Dibromo-3-chloropropane	ND	1.0								
1,2-Dibromoethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,2-Dichloroethane	ND	1.0								
1,2-Dichloropropane	ND	2.0								
1,3-Dichlorobenzene	ND	2.0								
1,4-Dichlorobenzene	ND	2.0								
2-Butanone	ND	5.0								
2-Hexanone	ND	5.0								
4-Methyl-2-pentanone	ND	5.0								
Acetone	ND	20								
Benzene	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	1.0								
Carbon disulfide	ND	2.5								
Carbon tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	1.0								
Chloroform	ND	1.0								
Chloromethane	ND	1.0								
cis-1,2-Dichloroethene	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
Cyclohexane	ND	5.0								
Dibromochloromethane	ND	1.0								
Dichlorodifluoromethane	ND	1.0								
Ethylbenzene	ND	1.0								
Isopropylbenzene	ND	1.0								
Methyl acetate	ND	2.0								
Methyl tert-butyl ether	ND	5.0								
Methylcyclohexane	ND	5.0								
Methylene chloride	ND	5.0								
Styrene	ND	1.0								
Tetrachloroethene	ND	2.0								
Toluene	ND	1.0								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **R138303A** Instrument ID **VMS6** Method: **SW8260**

trans-1,2-Dichloroethene	ND	1.0					
trans-1,3-Dichloropropene	ND	1.0					
Trichloroethene	ND	1.0					
Trichlorofluoromethane	ND	1.0					
Vinyl chloride	ND	1.0					
Xylenes, Total	ND	3.0					
Surr: 1,2-Dichloroethane-d4	*19.86*	0	*20*	0	*99.3*	*70-120*	0
Surr: 4-Bromofluorobenzene	*19.55*	0	*20*	0	*97.8*	*75-120*	0
Surr: Dibromofluoromethane	*19.55*	0	*20*	0	*97.8*	*85-115*	0
Surr: Toluene-d8	*19.85*	0	*20*	0	*99.2*	*85-120*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **R138303A** Instrument ID **VMS6** Method: **SW8260**

LCS Sample ID: **VLCSW1-140402-R138303A** Units: **µg/L** Analysis Date: **04/02/14 07:39 PM**

Client ID: Run ID: **VMS6_140402A** SeqNo: **2697649** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	21.31	1.0	20	0	107	65-130	0			
1,1,2,2-Tetrachloroethane	22.02	1.0	20	0	110	65-130	0			
1,1,2-Trichloroethane	21.38	1.0	20	0	107	75-125	0			
1,1-Dichloroethane	22.35	1.0	20	0	112	70-135	0			
1,1-Dichloroethene	23.38	1.0	20	0	117	70-130	0			
1,2,4-Trichlorobenzene	21.42	1.0	20	0	107	65-135	0			
1,2-Dibromo-3-chloropropane	18.2	1.0	20	0	91	50-130	0			
1,2-Dibromoethane	24.98	1.0	20	0	125	87-179	0			
1,2-Dichlorobenzene	21.6	1.0	20	0	108	70-120	0			
1,2-Dichloroethane	20.29	1.0	20	0	101	87-179	0			
1,2-Dichloropropane	20.71	2.0	20	0	104	75-125	0			
1,3-Dichlorobenzene	22.05	2.0	20	0	110	75-125	0			
1,4-Dichlorobenzene	20.86	2.0	20	0	104	75-125	0			
2-Butanone	24.84	5.0	20	0	124	30-150	0			
2-Hexanone	21.2	5.0	20	0	106	55-130	0			
4-Methyl-2-pentanone	27.37	5.0	20	0	137	77-178	0			
Acetone	22.07	20	20	0	110	40-140	0			
Benzene	22.24	1.0	20	0	111	80-120	0			
Bromodichloromethane	19.45	1.0	20	0	97.2	75-120	0			
Bromoform	16.43	1.0	20	0	82.2	70-130	0			
Bromomethane	26.92	1.0	20	0	135	30-145	0			
Carbon disulfide	24.25	2.5	20	0	121	35-165	0			
Carbon tetrachloride	20.35	1.0	20	0	102	65-140	0			
Chlorobenzene	21.69	1.0	20	0	108	80-120	0			
Chloroethane	21.25	1.0	20	0	106	60-135	0			
Chloroform	21.83	1.0	20	0	109	65-135	0			
Chloromethane	20.06	1.0	20	0	100	70-125	0			
cis-1,2-Dichloroethene	22.11	1.0	20	0	111	70-125	0			
cis-1,3-Dichloropropene	20.4	1.0	20	0	102	70-130	0			
Dibromochloromethane	16.95	1.0	20	0	84.8	60-135	0			
Dichlorodifluoromethane	15.58	1.0	20	0	77.9	30-155	0			
Ethylbenzene	23.1	1.0	20	0	116	75-125	0			
Isopropylbenzene	20.31	1.0	20	0	102	75-125	0			
Methyl tert-butyl ether	22.93	5.0	20	0	115	65-125	0			
Methylene chloride	21.89	5.0	20	0	109	55-140	0			
Styrene	20.03	1.0	20	0	100	65-135	0			
Tetrachloroethene	23.14	2.0	20	0	116	45-150	0			
Toluene	22.51	1.0	20	0	113	75-120	0			
trans-1,2-Dichloroethene	24.07	1.0	20	0	120	60-140	0			
trans-1,3-Dichloropropene	19.93	1.0	20	0	99.6	55-140	0			
Trichloroethene	22.7	1.0	20	0	114	70-125	0			
Trichlorofluoromethane	20.75	1.0	20	0	104	60-145	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **R138303A** Instrument ID **VMS6** Method: **SW8260**

Vinyl chloride	19.41	1.0	20	0	97	50-145	0
Xylenes, Total	62.02	3.0	60	0	103	75-130	0
Surr: 1,2-Dichloroethane-d4	*19.89*	0	*20*	0	*99.4*	*70-120*	0
Surr: 4-Bromofluorobenzene	*20.12*	0	*20*	0	*101*	*75-120*	0
Surr: Dibromofluoromethane	*21.02*	0	*20*	0	*105*	*85-115*	0
Surr: Toluene-d8	*20.32*	0	*20*	0	*102*	*85-120*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **R138303A** Instrument ID **VMS6** Method: **SW8260**

MS Sample ID: **1404077-02A MS** Units: **µg/L** Analysis Date: **04/03/14 05:43 AM**

Client ID: Run ID: **VMS6_140402A** SeqNo: **2697661** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	22.55	1.0	20	1.38	106	65-130	0			
1,1,2,2-Tetrachloroethane	20.72	1.0	20	0	104	65-130	0			
1,1,2-Trichloroethane	20.78	1.0	20	0	104	75-125	0			
1,1-Dichloroethane	25.31	1.0	20	1.85	117	70-135	0			
1,1-Dichloroethene	27.23	1.0	20	3.04	121	70-130	0			
1,2,4-Trichlorobenzene	20.59	1.0	20	0	103	65-135	0			
1,2-Dibromo-3-chloropropane	15.22	1.0	20	0	76.1	50-130	0			
1,2-Dibromoethane	24.63	1.0	20	0	123	81-158	0			
1,2-Dichlorobenzene	21.53	1.0	20	0	108	70-120	0			
1,2-Dichloroethane	20.6	1.0	20	0	103	70-130	0			
1,2-Dichloropropane	20.97	2.0	20	0	105	75-125	0			
1,3-Dichlorobenzene	22.19	2.0	20	0	111	75-125	0			
1,4-Dichlorobenzene	21.37	2.0	20	0	107	75-125	0			
2-Butanone	24.38	5.0	20	0	122	30-150	0			
2-Hexanone	20.24	5.0	20	0	101	55-130	0			
4-Methyl-2-pentanone	26.47	5.0	20	0	132	73-162	0			
Acetone	29.57	20	20	4.94	123	40-140	0			
Benzene	23.11	1.0	20	0	116	80-120	0			
Bromodichloromethane	17.87	1.0	20	0	89.4	75-120	0			
Bromoform	14.08	1.0	20	0	70.4	70-130	0			
Bromomethane	23.04	1.0	20	0	115	30-145	0			
Carbon disulfide	23.75	2.5	20	0	119	35-165	0			
Carbon tetrachloride	20.66	1.0	20	0	103	65-140	0			
Chlorobenzene	21.76	1.0	20	0	109	80-120	0			
Chloroethane	22.28	1.0	20	0	111	60-135	0			
Chloroform	21.87	1.0	20	0	109	65-135	0			
Chloromethane	18.71	1.0	20	0	93.6	70-125	0			
cis-1,2-Dichloroethene	65.17	1.0	20	40.72	122	70-125	0			
cis-1,3-Dichloropropene	18.76	1.0	20	0	93.8	70-130	0			
Dibromochloromethane	14.7	1.0	20	0	73.5	60-135	0			
Dichlorodifluoromethane	17.04	1.0	20	0	85.2	30-155	0			
Ethylbenzene	23.46	1.0	20	0	117	75-125	0			
Isopropylbenzene	20.82	1.0	20	0	104	75-125	0			
Methyl tert-butyl ether	21.42	5.0	20	0	107	65-125	0			
Methylene chloride	21.65	5.0	20	0	108	55-140	0			
Styrene	19.85	1.0	20	0	99.2	65-135	0			
Tetrachloroethene	27.45	2.0	20	2.07	127	45-150	0			
Toluene	22.88	1.0	20	0	114	75-120	0			
trans-1,2-Dichloroethene	27.04	1.0	20	1.79	126	60-140	0			
trans-1,3-Dichloropropene	17.61	1.0	20	0	88	55-140	0			
Trichloroethene	58.28	1.0	20	25.84	162	70-125	0			S
Trichlorofluoromethane	22.04	1.0	20	0	110	60-145	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **R138303A** Instrument ID **VMS6** Method: **SW8260**

Vinyl chloride	24.53	1.0	20	4.05	102	50-145	0
Xylenes, Total	62.47	3.0	60	0	104	75-130	0
Surr: 1,2-Dichloroethane-d4	*20.15*	0	*20*	0	*101*	*70-120*	0
Surr: 4-Bromofluorobenzene	*20.03*	0	*20*	0	*100*	*75-120*	0
Surr: Dibromofluoromethane	*20.21*	0	*20*	0	*101*	*85-115*	0
Surr: Toluene-d8	*20.05*	0	*20*	0	*100*	*85-120*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **R138303A** Instrument ID **VMS6** Method: **SW8260**

MSD Sample ID: **1404077-02A MSD** Units: **µg/L** Analysis Date: **04/03/14 06:09 AM**

Client ID: Run ID: **VMS6_140402A** SeqNo: **2697662** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	21.77	1.0	20	1.38	102	65-130	22.55	3.52	30	
1,1,2,2-Tetrachloroethane	20.91	1.0	20	0	105	65-130	20.72	0.913	30	
1,1,2-Trichloroethane	20.62	1.0	20	0	103	75-125	20.78	0.773	30	
1,1-Dichloroethane	24.76	1.0	20	1.85	115	70-135	25.31	2.2	30	
1,1-Dichloroethene	25.99	1.0	20	3.04	115	70-130	27.23	4.66	30	
1,2,4-Trichlorobenzene	20.9	1.0	20	0	104	65-135	20.59	1.49	30	
1,2-Dibromo-3-chloropropane	15.4	1.0	20	0	77	50-130	15.22	1.18	30	
1,2-Dibromoethane	24.23	1.0	20	0	121	81-158	24.63	1.64	30	
1,2-Dichlorobenzene	21.3	1.0	20	0	106	70-120	21.53	1.07	30	
1,2-Dichloroethane	20.32	1.0	20	0	102	70-130	20.6	1.37	30	
1,2-Dichloropropane	20.61	2.0	20	0	103	75-125	20.97	1.73	30	
1,3-Dichlorobenzene	21.65	2.0	20	0	108	75-125	22.19	2.46	30	
1,4-Dichlorobenzene	20.84	2.0	20	0	104	75-125	21.37	2.51	30	
2-Butanone	25.26	5.0	20	0	126	30-150	24.38	3.55	30	
2-Hexanone	21.02	5.0	20	0	105	55-130	20.24	3.78	30	
4-Methyl-2-pentanone	28.18	5.0	20	0	141	73-162	26.47	6.26	30	
Acetone	32.04	20	20	4.94	136	40-140	29.57	8.02	30	
Benzene	22.14	1.0	20	0	111	80-120	23.11	4.29	30	
Bromodichloromethane	17.61	1.0	20	0	88	75-120	17.87	1.47	30	
Bromoform	14.29	1.0	20	0	71.4	70-130	14.08	1.48	30	
Bromomethane	23.09	1.0	20	0	115	30-145	23.04	0.217	30	
Carbon disulfide	22.82	2.5	20	0	114	35-165	23.75	3.99	30	
Carbon tetrachloride	19.86	1.0	20	0	99.3	65-140	20.66	3.95	30	
Chlorobenzene	21.31	1.0	20	0	107	80-120	21.76	2.09	30	
Chloroethane	21.95	1.0	20	0	110	60-135	22.28	1.49	30	
Chloroform	21.87	1.0	20	0	109	65-135	21.87	0	30	
Chloromethane	21.47	1.0	20	0	107	70-125	18.71	13.7	30	
cis-1,2-Dichloroethene	64.52	1.0	20	40.72	119	70-125	65.17	1	30	
cis-1,3-Dichloropropene	18.56	1.0	20	0	92.8	70-130	18.76	1.07	30	
Dibromochloromethane	14.88	1.0	20	0	74.4	60-135	14.7	1.22	30	
Dichlorodifluoromethane	16.2	1.0	20	0	81	30-155	17.04	5.05	30	
Ethylbenzene	23.1	1.0	20	0	116	75-125	23.46	1.55	30	
Isopropylbenzene	20.63	1.0	20	0	103	75-125	20.82	0.917	30	
Methyl tert-butyl ether	21.9	5.0	20	0	110	65-125	21.42	2.22	30	
Methylene chloride	21.76	5.0	20	0	109	55-140	21.65	0.507	30	
Styrene	19.66	1.0	20	0	98.3	65-135	19.85	0.962	30	
Tetrachloroethene	26	2.0	20	2.07	120	45-150	27.45	5.43	30	
Toluene	22.33	1.0	20	0	112	75-120	22.88	2.43	30	
trans-1,2-Dichloroethene	26.24	1.0	20	1.79	122	60-140	27.04	3	30	
trans-1,3-Dichloropropene	17.73	1.0	20	0	88.6	55-140	17.61	0.679	30	
Trichloroethene	55.1	1.0	20	25.84	146	70-125	58.28	5.61	30	S
Trichlorofluoromethane	21.59	1.0	20	0	108	60-145	22.04	2.06	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **R138303A** Instrument ID **VMS6** Method: **SW8260**

Vinyl chloride	23.69	1.0	20	4.05	98.2	50-145	24.53	3.48	30
Xylenes, Total	60.97	3.0	60	0	102	75-130	62.47	2.43	30
Surr: 1,2-Dichloroethane-d4	*19.95*	0	*20*	0	*99.8*	*70-120*	20.15	*0.998*	*30*
Surr: 4-Bromofluorobenzene	*20.1*	0	*20*	0	*100*	*75-120*	20.03	*0.349*	*30*
Surr: Dibromofluoromethane	*20.19*	0	*20*	0	*101*	*85-115*	20.21	*0.099*	*30*
Surr: Toluene-d8	*19.71*	0	*20*	0	*98.6*	*85-120*	20.05	*1.71*	*30*

The following samples were analyzed in this batch: 1404058-01C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57190** Instrument ID **LACHAT** Method: **SW9066**

MBLK Sample ID: **MBLK-57190-57190** Units: **mg/L** Analysis Date: **04/03/14 11:34 AM**
Client ID: Run ID: **LACHAT_140403A** SeqNo: **2697980** Prep Date: **04/02/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phenolics, Total	ND	0.010								

MBLK Sample ID: **MBLK-57190-57190** Units: **mg/L** Analysis Date: **04/03/14 11:34 AM**
Client ID: Run ID: **LACHAT_140403A** SeqNo: **2697995** Prep Date: **04/02/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phenolics, Total	ND	0.010								

LCS Sample ID: **LCS-57190-57190** Units: **mg/L** Analysis Date: **04/03/14 11:34 AM**
Client ID: Run ID: **LACHAT_140403A** SeqNo: **2697981** Prep Date: **04/02/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phenolics, Total	0.09553	0.010	0.1	0	95.5	75-110	0			

LCS Sample ID: **LCS-57190-57190** Units: **mg/L** Analysis Date: **04/03/14 11:34 AM**
Client ID: Run ID: **LACHAT_140403A** SeqNo: **2697996** Prep Date: **04/02/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phenolics, Total	0.09553	0.010	0.1	0	95.5	90-110	0			

MS Sample ID: **1404058-01A MS** Units: **mg/L** Analysis Date: **04/03/14 11:34 AM**
Client ID: **WCR-Water02-033114** Run ID: **LACHAT_140403A** SeqNo: **2697987** Prep Date: **04/02/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phenolics, Total	0.3004	0.033	0.3333	0.0005017	90	61-131	0			

MSD Sample ID: **1404058-01A MSD** Units: **mg/L** Analysis Date: **04/03/14 11:34 AM**
Client ID: **WCR-Water02-033114** Run ID: **LACHAT_140403A** SeqNo: **2697988** Prep Date: **04/02/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phenolics, Total	0.3165	0.033	0.3333	0.0005017	94.8	61-131	0.3004	5.23	15	

The following samples were analyzed in this batch: 1404058-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **R138335b** Instrument ID **TOC2** Method: **SW9060**

MBLK Sample ID: **WBLKW1-140402-R138335b** Units: **mg/L** Analysis Date: **04/02/14 10:53 PM**

Client ID: Run ID: **TOC2_140402A** SeqNo: **2698359** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	ND	0.50								

LCS Sample ID: **WLCSW1-140402-R138335b** Units: **mg/L** Analysis Date: **04/02/14 11:24 PM**

Client ID: Run ID: **TOC2_140402A** SeqNo: **2698361** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	5.306	0.50	5	0	106	80-120	0			

MS Sample ID: **1404058-01EMS** Units: **mg/L** Analysis Date: **04/03/14 01:25 PM**

Client ID: **WCR-Water02-033114** Run ID: **TOC2_140402A** SeqNo: **2698367** Prep Date: DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	7.876	2.0	5	2.38	110	75-125	0			

MSD Sample ID: **1404058-01EMSD** Units: **mg/L** Analysis Date: **04/03/14 01:57 PM**

Client ID: **WCR-Water02-033114** Run ID: **TOC2_140402A** SeqNo: **2698368** Prep Date: DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	7.84	2.0	5	2.38	109	75-125	7.876	0.458	20	

The following samples were analyzed in this batch: 1404058-01E

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **R138583** Instrument ID **O&G** Method: **E1664A**

MBLK Sample ID: **MB-R138583-R138583** Units: **mg/L** Analysis Date: **04/08/14 09:00 AM**

Client ID: Run ID: **O&G_140408A** SeqNo: **2703760** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Oil and Grease	ND	5.0								

LCS Sample ID: **LCS-R138583-R138583** Units: **mg/L** Analysis Date: **04/08/14 09:00 AM**

Client ID: Run ID: **O&G_140408A** SeqNo: **2703761** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Oil and Grease	35.8	5.0	40	0	89.5	78-114	0			

MS Sample ID: **1404349-02A MS** Units: **mg/L** Analysis Date: **04/08/14 09:00 AM**

Client ID: Run ID: **O&G_140408A** SeqNo: **2703781** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Oil and Grease	36.78	5.0	40	0.33	91.1	78-114	0			

DUP Sample ID: **1404349-04A DUP** Units: **mg/L** Analysis Date: **04/08/14 09:00 AM**

Client ID: Run ID: **O&G_140408A** SeqNo: **2703783** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Oil and Grease	ND	5.0	0	0	0	0-0	1.44	0	18	

The following samples were analyzed in this batch: 1404058-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **R138584** Instrument ID **O&G** Method: **E1664**

MBLK Sample ID: **MB-R138584-R138584** Units: **mg/L** Analysis Date: **04/08/14 09:00 AM**

Client ID: Run ID: **O&G_140408B** SeqNo: **2703786** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Non-Polar Material	ND	5.0								

LCS Sample ID: **LCS-R138584-R138584** Units: **mg/L** Analysis Date: **04/08/14 09:00 AM**

Client ID: Run ID: **O&G_140408B** SeqNo: **2703787** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Non-Polar Material	16.7	5.0	20	0	83.5	64-132		0		

MS Sample ID: **1404349-02A MS** Units: **mg/L** Analysis Date: **04/08/14 09:00 AM**

Client ID: Run ID: **O&G_140408B** SeqNo: **2703790** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Non-Polar Material	17.89	5.0	20	0.33	87.8	64-132		0		

The following samples were analyzed in this batch: 1404058-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

ALS Environmental

Cincinnati, OH +1 513 733 5336 | Fort Collins, CO +1 970 490 1511 | Everett, WA +1 425 356 2600 | Holland, MI +1 616 399 6070

Chain of Custody Form

Page 1 of 1

COC ID: 85373

Houston, TX +1 281 530 5656 | Spring City, PA +1 610 948 4903 | South Charleston, WV +1 304 356 3168 | Middletown, PA +1 717 944 5541 | Salt Lake City, UT +1 801 266 7700 | York, PA +1 717 505 5280

ALS Project Manager: TBS | ALS Work Order #: 1404058

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name		A	TOTAL ORGANIC CARBON
Work Order		Project Number		B	OIL & GREASE
Company Name	Weston Solutions, Inc	Bill To Company	Weston Solutions, Inc	C	NON-POLAR OIL & GREASE (TPH)
Send Report To	Lisa Graczyk	Invoice Attn	Lisa Graczyk	D	SVOCS (ACID/BASE NEUTRALS)
Address	20 North Wacker Drive Suite 1210	Address	20 North Wacker Drive Suite 1210	E	VOCS
				F	PHENOLS (4AAP)
City/State/Zip	Chicago, IL 60606	City/State/Zip	Chicago, IL 60606	G	MERCURY
Phone	(312) 424-3300	Phone	(312) 424-3300	H	METALS
Fax	(312) 424-3330	Fax	(312) 424-3330	I	
e-Mail Address		e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	WCR-WATER02-033114	3/31/14	10:00	W	MULTIPLE	9	X	X	X	X	X	X	X	X			
2	NO ADDITIONAL																
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: JEFF BRYNIARSKI

Shipment Method:

Required Turnaround Time: (Check Box) [X] Std 10 WK Days [ ] 5 WK Days [ ] 2 WK Days [ ] 24 Hour [ ] Other

Results Due Date:

Notes:

Relinquished by:	Date: 3/31/14	Time: 12:50	Received by:
Relinquished by:	Date: 3/31/14	Time: 1630	Received by (Laboratory): FedEx 4/1/14 0930
Logged by (Laboratory): KW	Date: 4/1/14	Time: 1440	Checked by (Laboratory): TBS

Cooler ID	Cooler Temp.
	3.4°C

QC Package: (Check One Box Below)
- [X] Level II Std QC
- [ ] Level III Std QC/Raw Data
- [ ] Level IV SW846/CLP
- [ ] Other
- [ ] TRRP Checklist
- [ ] TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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Sample Receipt Checklist

Client Name: **WESTON - CHI** Date/Time Received: **01-Apr-14 09:30**

Work Order: **1404058** Received by: **KRW**

Checklist completed by Keith Wierenga (eSignature) 01-Apr-14 (Date) Reviewed by: Tom Bramish (eSignature) 01-Apr-14 (Date)

Matrices: Water
Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Sample(s) received on ice?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	3.4 C		
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	4/1/2014 3:00:31 PM		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:	-		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

WHITING REFINERY EMERGENCY RESPONSE
WHITING, LAKE COUNTY, ILLINOIS
DATA VALIDATION REPORT

Date: April 15, 2014
Laboratory: ALS Environmental (ALS), Holland, Michigan
Laboratory Project #: 1404058
Data Validation Performed By: Lisa Graczyk, Weston Solutions, Inc. (WESTON®) Superfund Technical Assessment and Response Team (START)
Weston Analytical Work Order #/TDD #: 20405.016.005.2311.77/ S05-0005-1403-009

This data validation report has been prepared by WESTON START under the START III Region V contract. This report documents the data validation for one water sample collected for the Whiting Refinery Emergency Response Site that were analyzed for the following parameters and U.S. Environmental Protection Agency methods:

- Volatile Organic Compounds (VOC) by SW-846 Method 8260
- Semivolatile Organic Carbons (SVOC) by SW-846 Method 8270
- Metals by SW-846 Methods 6020A and 7470
- Non-Polar Oil & Grease by Method E1664
- Oil & Grease by Method E1664A
- Total Phenolics by SW-846 EPA Method 9066
- Total Organic Carbon (TOC) by SW-846 Method 9060

A level II data package was requested from ALS. The data validation was conducted in general accordance with the U.S. EPA "Contract Laboratory Program National Functional Guidance for Superfund Organic Methods Data Review" dated June 2008 and "Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review" dated January 2010. The Attachment contains the results summary sheets with the hand-written qualifiers applied during data validation.

Data Validation Report
Whiting Refinery Emergency Response Site
ALS Environmental
Laboratory Project #: 1404058

VOCs by SW-846 METHOD 8260

1. Samples

The following table summarizes the samples for which this data validation is being conducted.

Samples	Lab ID	Matrix	Date Collected	Date Analyzed
WCR-Water02-033114	1404058-01	Water	3/31/2014	4/3/2014

2. Holding Times

The sample was analyzed within the required holding time limit of 14 days from sample collection.

3. Blanks

A method blank was analyzed with the VOC analysis and was free of VOCs above the reporting limits.

4. Surrogate Results

The surrogate recovery results were within the laboratory-established quality control (QC) limits.

5. Laboratory Control Sample (LCS) Results

The LCS recoveries were within laboratory QC limits.

6. Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Results

A site-specific MS and MSD were not analyzed with this work order. Therefore, matrix interferences could not be evaluated using the MS and MSD. For the MS and MSD that were analyzed, the recoveries and relative percent differences (RPD) were mostly within QC limits and were acceptable.

7. Overall Assessment

The VOC data are acceptable for use based on the information received.

Data Validation Report
Whiting Refinery Emergency Response Site
ALS Environmental
Laboratory Project #: 1404058

SVOCs by SW-846 METHOD 8270

1. Samples

The following table summarizes the samples for which this data validation is being conducted.

Samples	Lab ID	Matrix	Date Collected	Date Prepared	Date Analyzed
WCR-Water02-033114	1404058-01	Water	3/31/2014	4/3/2014	4/4/2014

2. Holding Times

The sample was analyzed within the required holding time limit of 7 days from sample collection to extraction and 40 days from extraction to analysis.

3. Blanks

A method blank was analyzed with the SVOC analyses and was free of target compound contamination above the reporting limits.

4. Surrogate Results

The surrogate recoveries were within QC limits.

5. LCS Results

The percent recoveries for the LCS results were within the laboratory-established QC limits.

6. MS and MSD Results

A site-specific MS and MSD were not analyzed with this work order. Therefore, matrix interferences could not be evaluated using the MS and MSD. For the MS and MSD that were analyzed, the recoveries and RPDs were mostly within QC limits and were acceptable.

7. Overall Assessment

The SVOC data are acceptable for use based on the information received.

Data Validation Report
Whiting Refinery Emergency Response Site
ALS Environmental
Laboratory Project #: 1404058

TOTAL METALS BY SW-846 METHODS 6020A AND 7470

1. Samples

The following table summarizes the samples for which this data validation is being conducted.

Samples	Lab ID	Matrix	Date Collected	Date Analyzed
WCR-Water02-033114	1404058-01	Water	3/31/2014	4/3/2014 – 4/7/2014

2. Holding Times

The sample was analyzed within the required holding time limit of 28 days from sample collection to analysis for mercury and 180 days from sample collection to analysis for all other metals.

3. Blank Results

Method blanks were analyzed with the metals analysis. The blanks were free of target analyte contamination above the reporting limits. Some metals were detected below the reporting limits in the method blanks; however, the sample concentrations were either non-detect or much higher than the blank concentrations. No qualifications were required.

4. LCS Results

The LCS recoveries were within the laboratory-established QC limits.

5. MS and MSD Results

An MS and MSD were analyzed using a sample from another project. The recoveries and RPDs were within QC limits.

6. Overall Assessment

The metals data are acceptable for use based on the information received.

Data Validation Report
Whiting Refinery Emergency Response Site
ALS Environmental
Laboratory Project #: 1404058

GENERAL CHEMISTRY PARAMETERS (Non-Polar Oil & Grease by E1664, Oil & Grease by E1664A, Total Phenolics by 9066, and TOC by 9060)

1. Samples

The following table summarizes the samples for which this data validation is being conducted.

Samples	Lab ID	Matrix	Date Collected	Date Analyzed
WCR-Water02-033114	1404058-01	Water	3/31/2014	4/3/2014 – 4/8/2014

2. Holding Times

The sample was analyzed within the holding time limit of 28 days for the general chemistry parameters being analyzed.

3. Method Blanks

Method blanks were analyzed with the analyses and were free of target analyte contamination above the reporting limit.

4. LCS Results

The percent recoveries were within QC limits for the LCSs analyzed.

5. Laboratory Duplicate Results

Laboratory duplicate RPDs were within QC limits.

6. MS and MSD Results

The percent recoveries and RPDs were within QC limits for the MS and MSDs analyzed.

7. Overall Assessment

The general chemistry data are acceptable for use based on the information received.

ATTACHMENT

ALS ENVIRONMENTAL
RESULTS SUMMARY

10-Apr-2014

Lisa Graczyk
Weston Solutions, Inc
20 North Wacker Drive
Suite 1210
Chicago, IL 60606

Re: **Whiting Crude Release** Work Order: **1404058**

Dear Lisa,

ALS Environmental received 1 sample on 01-Apr-2014 for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

Sample results are compliant with NELAP standard requirements and QC results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 35.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Electronically approved by: Tom Beamish

Tom Beamish
Senior Project Manager

Certificate No: MN 532786

ADDRESS 3352 128th Avenue Holland, Michigan 49424-9263 | PHONE (616) 399-6070 | FAX (616) 399-6185
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ALS Group USA, Corp

Date: 10-Apr-14

Client: Weston Solutions, Inc
Project: Whiting Crude Release
Work Order: **1404058**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1404058-01	WCR-Water02-033114	Water		03/31/14 10:00	04/01/14 09:30	☐

ALS Group USA, Corp

Date: 10-Apr-14

Client: Weston Solutions, Inc
Project: Whiting Crude Release
WorkOrder: **1404058**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte is present at an estimated concentration between the MDL and Report Limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

Units Reported	Description
mg/L	Milligrams per Liter

ALS Group USA, Corp

Date: *10-Apr-14*

Client: Weston Solutions, Inc
Project: Whiting Crude Release
Sample ID: WCR-Water02-033114
Collection Date: 03/31/14 10:00 AM

Work Order: 1404058
Lab ID: 1404058-01
Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA			**SW7470**		Prep: SW7470 / 4/4/14	Analyst: **LR**
Mercury	ND		0.00020	mg/L	1	04/07/14 02:58 PM
METALS BY ICP-MS			**SW6020A**		Prep: SW3005A / 4/3/14	Analyst: **ML**
Aluminum	**0.032**		**0.010**	**mg/L**	1	04/03/14 10:21 PM
Antimony	ND		0.0050	mg/L	1	04/03/14 10:21 PM
Arsenic	ND		0.0050	mg/L	1	04/03/14 10:21 PM
Barium	**0.021**		**0.0050**	**mg/L**	1	04/03/14 10:21 PM
Beryllium	ND		0.0020	mg/L	1	04/03/14 10:21 PM
Cadmium	ND		0.0020	mg/L	1	04/03/14 10:21 PM
Calcium	**36**		**0.50**	**mg/L**	1	04/03/14 10:21 PM
Chromium	ND		0.0050	mg/L	1	04/03/14 10:21 PM
Cobalt	ND		0.0050	mg/L	1	04/03/14 10:21 PM
Copper	**0.016**		**0.0050**	**mg/L**	1	04/03/14 10:21 PM
Iron	ND		0.080	mg/L	1	04/03/14 10:21 PM
Lead	ND		0.0050	mg/L	1	04/03/14 10:21 PM
Magnesium	**13**		**0.20**	**mg/L**	1	04/03/14 10:21 PM
Manganese	ND		0.0050	mg/L	1	04/03/14 10:21 PM
Nickel	ND		0.0050	mg/L	1	04/03/14 10:21 PM
Potassium	**1.8**		**0.20**	**mg/L**	1	04/03/14 10:21 PM
Selenium	ND		0.0050	mg/L	1	04/03/14 10:21 PM
Silver	ND		0.0050	mg/L	1	04/03/14 10:21 PM
Sodium	**12**		**0.20**	**mg/L**	1	04/03/14 10:21 PM
Thallium	ND		0.0050	mg/L	1	04/03/14 10:21 PM
Vanadium	ND		0.0050	mg/L	1	04/03/14 10:21 PM
Zinc	**0.012**		**0.010**	**mg/L**	1	04/03/14 10:21 PM
SEMI-VOLATILE ORGANIC COMPOUNDS			**SW8270**		Prep: SW3510 / 4/3/14	Analyst: **RM**
1,1`-Biphenyl	ND		0.0050	mg/L	1	04/04/14 07:16 PM
2,4,5-Trichlorophenol	ND		0.0050	mg/L	1	04/04/14 07:16 PM
2,4,6-Trichlorophenol	ND		0.0050	mg/L	1	04/04/14 07:16 PM
2,4-Dichlorophenol	ND		0.010	mg/L	1	04/04/14 07:16 PM
2,4-Dimethylphenol	ND		0.0050	mg/L	1	04/04/14 07:16 PM
2,4-Dinitrophenol	ND		0.0050	mg/L	1	04/04/14 07:16 PM
2,4-Dinitrotoluene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
2,6-Dinitrotoluene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
2-Chloronaphthalene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
2-Chlorophenol	ND		0.0050	mg/L	1	04/04/14 07:16 PM
2-Methylnaphthalene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
2-Methylphenol	ND		0.0050	mg/L	1	04/04/14 07:16 PM
2-Nitroaniline	ND		0.020	mg/L	1	04/04/14 07:16 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *10-Apr-14*

Client: Weston Solutions, Inc
Project: Whiting Crude Release
Sample ID: WCR-Water02-033114
Collection Date: 03/31/14 10:00 AM

Work Order: 1404058
Lab ID: 1404058-01
Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
2-Nitrophenol	ND		0.0050	mg/L	1	04/04/14 07:16 PM
3,3´-Dichlorobenzidine	ND		0.0050	mg/L	1	04/04/14 07:16 PM
3-Nitroaniline	ND		0.020	mg/L	1	04/04/14 07:16 PM
4,6-Dinitro-2-methylphenol	ND		0.020	mg/L	1	04/04/14 07:16 PM
4-Bromophenyl phenyl ether	ND		0.0050	mg/L	1	04/04/14 07:16 PM
4-Chloro-3-methylphenol	ND		0.0050	mg/L	1	04/04/14 07:16 PM
4-Chloroaniline	ND		0.020	mg/L	1	04/04/14 07:16 PM
4-Chlorophenyl phenyl ether	ND		0.0050	mg/L	1	04/04/14 07:16 PM
4-Methylphenol	ND		0.0050	mg/L	1	04/04/14 07:16 PM
4-Nitroaniline	ND		0.020	mg/L	1	04/04/14 07:16 PM
4-Nitrophenol	ND		0.020	mg/L	1	04/04/14 07:16 PM
Acenaphthene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Acenaphthylene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Acetophenone	ND		0.0010	mg/L	1	04/04/14 07:16 PM
Anthracene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Atrazine	ND		0.0010	mg/L	1	04/04/14 07:16 PM
Benzaldehyde	ND		0.0010	mg/L	1	04/04/14 07:16 PM
Benzo(a)anthracene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Benzo(a)pyrene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Benzo(b)fluoranthene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Benzo(g,h,i)perylene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Benzo(k)fluoranthene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Bis(2-chloroethoxy)methane	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Bis(2-chloroethyl)ether	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Bis(2-chloroisopropyl)ether	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Bis(2-ethylhexyl)phthalate	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Butyl benzyl phthalate	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Caprolactam	ND		0.010	mg/L	1	04/04/14 07:16 PM
Carbazole	ND		0.010	mg/L	1	04/04/14 07:16 PM
Chrysene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Dibenzo(a,h)anthracene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Dibenzofuran	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Diethyl phthalate	ND		0.020	mg/L	1	04/04/14 07:16 PM
Dimethyl phthalate	ND		0.020	mg/L	1	04/04/14 07:16 PM
Di-n-butyl phthalate	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Di-n-octyl phthalate	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Fluoranthene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Fluorene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Hexachlorobenzene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Hexachlorobutadiene	ND		0.0050	mg/L	1	04/04/14 07:16 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *10-Apr-14*

Client: Weston Solutions, Inc
Project: Whiting Crude Release
Sample ID: WCR-Water02-033114
Collection Date: 03/31/14 10:00 AM

Work Order: 1404058
Lab ID: 1404058-01
Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Hexachlorocyclopentadiene	ND		0.020	mg/L	1	04/04/14 07:16 PM
Hexachloroethane	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Indeno(1,2,3-cd)pyrene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Isophorone	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Naphthalene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Nitrobenzene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
N-Nitrosodi-n-propylamine	ND		0.0050	mg/L	1	04/04/14 07:16 PM
N-Nitrosodiphenylamine	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Pentachlorophenol	ND		0.020	mg/L	1	04/04/14 07:16 PM
Phenanthrene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Phenol	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Pyrene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Surr: 2,4,6-Tribromophenol	*78.6*		*32-115*	*%REC*	1	04/04/14 07:16 PM
Surr: 2-Fluorobiphenyl	*70.4*		*32-100*	*%REC*	1	04/04/14 07:16 PM
Surr: 2-Fluorophenol	*40.9*		*22-59*	*%REC*	1	04/04/14 07:16 PM
Surr: 4-Terphenyl-d14	*98.6*		*23-112*	*%REC*	1	04/04/14 07:16 PM
Surr: Nitrobenzene-d5	*77.8*		*31-93*	*%REC*	1	04/04/14 07:16 PM
Surr: Phenol-d6	*27.4*		*13-36*	*%REC*	1	04/04/14 07:16 PM
VOLATILE ORGANIC COMPOUNDS			**SW8260**			Analyst: **BG**
1,1,1-Trichloroethane	ND		0.0010	mg/L	1	04/03/14 03:58 AM
1,1,2,2-Tetrachloroethane	ND		0.0010	mg/L	1	04/03/14 03:58 AM
1,1,2-Trichloroethane	ND		0.0010	mg/L	1	04/03/14 03:58 AM
1,1,2-Trichlorotrifluoroethane	ND		0.0010	mg/L	1	04/03/14 03:58 AM
1,1-Dichloroethane	ND		0.0010	mg/L	1	04/03/14 03:58 AM
1,1-Dichloroethene	ND		0.0010	mg/L	1	04/03/14 03:58 AM
1,2,4-Trichlorobenzene	ND		0.0010	mg/L	1	04/03/14 03:58 AM
1,2-Dibromo-3-chloropropane	ND		0.0010	mg/L	1	04/03/14 03:58 AM
1,2-Dibromoethane	ND		0.0010	mg/L	1	04/03/14 03:58 AM
1,2-Dichlorobenzene	ND		0.0010	mg/L	1	04/03/14 03:58 AM
1,2-Dichloroethane	ND		0.0010	mg/L	1	04/03/14 03:58 AM
1,2-Dichloropropane	ND		0.0020	mg/L	1	04/03/14 03:58 AM
1,3-Dichlorobenzene	ND		0.0020	mg/L	1	04/03/14 03:58 AM
1,4-Dichlorobenzene	ND		0.0020	mg/L	1	04/03/14 03:58 AM
2-Butanone	ND		0.0050	mg/L	1	04/03/14 03:58 AM
2-Hexanone	ND		0.0050	mg/L	1	04/03/14 03:58 AM
4-Methyl-2-pentanone	ND		0.0050	mg/L	1	04/03/14 03:58 AM
Acetone	ND		0.020	mg/L	1	04/03/14 03:58 AM
Benzene	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Bromodichloromethane	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Bromoform	ND		0.0010	mg/L	1	04/03/14 03:58 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *10-Apr-14*

Client: Weston Solutions, Inc
Project: Whiting Crude Release
Work Order: 1404058
Sample ID: WCR-Water02-033114
Lab ID: 1404058-01
Collection Date: 03/31/14 10:00 AM
Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Bromomethane	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Carbon disulfide	ND		0.0025	mg/L	1	04/03/14 03:58 AM
Carbon tetrachloride	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Chlorobenzene	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Chloroethane	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Chloroform	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Chloromethane	ND		0.0010	mg/L	1	04/03/14 03:58 AM
cis-1,2-Dichloroethene	ND		0.0010	mg/L	1	04/03/14 03:58 AM
cis-1,3-Dichloropropene	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Cyclohexane	ND		0.0050	mg/L	1	04/03/14 03:58 AM
Dibromochloromethane	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Dichlorodifluoromethane	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Ethylbenzene	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Isopropylbenzene	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Methyl acetate	ND		0.0020	mg/L	1	04/03/14 03:58 AM
Methyl tert-butyl ether	ND		0.0050	mg/L	1	04/03/14 03:58 AM
Methylcyclohexane	ND		0.0050	mg/L	1	04/03/14 03:58 AM
Methylene chloride	ND		0.0050	mg/L	1	04/03/14 03:58 AM
Styrene	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Tetrachloroethene	ND		0.0020	mg/L	1	04/03/14 03:58 AM
Toluene	ND		0.0010	mg/L	1	04/03/14 03:58 AM
trans-1,2-Dichloroethene	ND		0.0010	mg/L	1	04/03/14 03:58 AM
trans-1,3-Dichloropropene	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Trichloroethene	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Trichlorofluoromethane	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Vinyl chloride	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Xylenes, Total	ND		0.0030	mg/L	1	04/03/14 03:58 AM
Surr: 1,2-Dichloroethane-d4	*102*		*70-120*	*%REC*	1	04/03/14 03:58 AM
Surr: 4-Bromofluorobenzene	*97.0*		*75-120*	*%REC*	1	04/03/14 03:58 AM
Surr: Dibromofluoromethane	*98.9*		*85-115*	*%REC*	1	04/03/14 03:58 AM
Surr: Toluene-d8	*98.9*		*85-120*	*%REC*	1	04/03/14 03:58 AM
NON-POLAR MATERIAL			**E1664**			Analyst: **ND**
Non-Polar Material	ND		5.0	mg/L	1	04/08/14 09:00 AM
OIL AND GREASE			**E1664A**			Analyst: **ND**
Oil and Grease	ND		5.0	mg/L	1	04/08/14 09:00 AM
PHENOLICS, TOTAL			**SW9066**		Prep: E420.x / 4/2/14	Analyst: **JB**
Phenolics, Total	ND		0.010	mg/L	1	04/03/14 11:34 AM
ORGANIC CARBON, TOTAL			**SW9060**			Analyst: **ED**

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *10-Apr-14*

Client: Weston Solutions, Inc
Project: Whiting Crude Release
Sample ID: WCR-Water02-033114
Collection Date: 03/31/14 10:00 AM

Work Order: 1404058
Lab ID: 1404058-01
Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Organic Carbon, Total	**2.2**		**0.50**	**mg/L**	1	04/03/14 12:23 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: 10-Apr-14

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57254** Instrument ID **HG1** Method: **SW7470**

MBLK Sample ID: **MBLK-57254-57254** Units: **mg/L** Analysis Date: **04/07/14 02:33 PM**

Client ID: Run ID: **HG1_140407A** SeqNo: **2701501** Prep Date: **04/04/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	ND	0.00020								

LCS Sample ID: **LCS-57254-57254** Units: **mg/L** Analysis Date: **04/07/14 02:35 PM**

Client ID: Run ID: **HG1_140407A** SeqNo: **2701502** Prep Date: **04/04/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00193	0.00020	0.002	0	96.5	80-120		0		

MS Sample ID: **1404057-01CMS** Units: **mg/L** Analysis Date: **04/07/14 02:47 PM**

Client ID: Run ID: **HG1_140407A** SeqNo: **2701509** Prep Date: **04/04/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.002061	0.00020	0.002	-0.000023	104	75-125		0		

MSD Sample ID: **1404057-01CMSD** Units: **mg/L** Analysis Date: **04/07/14 02:56 PM**

Client ID: Run ID: **HG1_140407A** SeqNo: **2701518** Prep Date: **04/04/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.002032	0.00020	0.002	-0.000023	103	75-125	0.002061	1.42	20	

The following samples were analyzed in this batch: 1404058-01D

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57200** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK Sample ID: **MBLK-57200-57200** Units: **mg/L** Analysis Date: **04/03/14 08:04 PM**

Client ID: Run ID: **ICPMS1_140403A** SeqNo: **2699093** Prep Date: **04/03/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	ND	0.0050								
Arsenic	ND	0.0050								
Barium	ND	0.0050								
Beryllium	ND	0.0020								
Cadmium	ND	0.0020								
Calcium	0.1484	0.50								J
Chromium	ND	0.0050								
Cobalt	ND	0.0050								
Copper	ND	0.0050								
Iron	0.007899	0.080								J
Lead	ND	0.0050								
Magnesium	0.06565	0.20								J
Manganese	0.0001004	0.0050								J
Nickel	ND	0.0050								
Potassium	0.04607	0.20								J
Selenium	0.0007958	0.0050								J
Silver	ND	0.0050								
Sodium	0.1159	0.20								J
Thallium	ND	0.0050								
Vanadium	ND	0.0050								
Zinc	ND	0.010								

MBLK Sample ID: **MBLK-57200-57200** Units: **mg/L** Analysis Date: **04/04/14 02:36 PM**

Client ID: Run ID: **ICPMS1_140404A** SeqNo: **2699907** Prep Date: **04/03/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.001235	0.010								J

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57200** Instrument ID **ICPMS1** Method: **SW6020A**

LCS Sample ID: **LCS-57200-57200** Units: **mg/L** Analysis Date: **04/03/14 08:10 PM**

Client ID: Run ID: **ICPMS1_140403A** SeqNo: **2699095** Prep Date: **04/03/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.09506	0.0050	0.1	0	95.1	80-120	0			
Arsenic	0.09156	0.0050	0.1	0	91.6	80-120	0			
Barium	0.09358	0.0050	0.1	0	93.6	80-120	0			
Beryllium	0.09685	0.0020	0.1	0	96.8	80-120	0			
Cadmium	0.09503	0.0020	0.1	0	95	80-120	0			
Calcium	9.306	0.50	10	0	93.1	80-120	0			
Chromium	0.08929	0.0050	0.1	0	89.3	80-120	0			
Cobalt	0.08918	0.0050	0.1	0	89.2	80-120	0			
Copper	0.09183	0.0050	0.1	0	91.8	80-120	0			
Iron	9.333	0.080	10	0	93.3	80-120	0			
Lead	0.09142	0.0050	0.1	0	91.4	80-120	0			
Magnesium	9.143	0.20	10	0	91.4	80-120	0			
Manganese	0.09136	0.0050	0.1	0	91.4	80-120	0			
Nickel	0.08986	0.0050	0.1	0	89.9	80-120	0			
Potassium	9.125	0.20	10	0	91.2	80-120	0			
Selenium	0.09294	0.0050	0.1	0	92.9	80-120	0			
Silver	0.08769	0.0050	0.1	0	87.7	80-120	0			
Sodium	8.969	0.20	10	0	89.7	80-120	0			
Thallium	0.08869	0.0050	0.1	0	88.7	80-120	0			
Vanadium	0.092	0.0050	0.1	0	92	80-120	0			
Zinc	0.09559	0.010	0.1	0	95.6	80-120	0			

LCS Sample ID: **LCS-57200-57200** Units: **mg/L** Analysis Date: **04/04/14 02:43 PM**

Client ID: Run ID: **ICPMS1_140404A** SeqNo: **2699908** Prep Date: **04/03/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.09101	0.010	0.1	0	91	80-120	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57200** Instrument ID **ICPMS1** Method: **SW6020A**

MS Sample ID: **14031413-02AMS** Units: **mg/L** Analysis Date: **04/03/14 10:02 PM**

Client ID: Run ID: **ICPMS1_140403A** SeqNo: **2699121** Prep Date: **04/03/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	1.013	0.10	1	0.02451	98.8	75-125	0			
Antimony	0.9489	0.050	1	0.001837	94.7	75-125	0			
Arsenic	0.972	0.050	1	0.0005695	97.1	75-125	0			
Barium	1.216	0.050	1	0.2365	98	75-125	0			
Beryllium	0.934	0.020	1	0.0005091	93.3	75-125	0			
Cadmium	0.938	0.020	1	0.0005312	93.7	75-125	0			
Calcium	272.1	5.0	100	174	98.1	75-125	0			
Chromium	0.9486	0.050	1	0.001037	94.8	75-125	0			
Cobalt	0.9314	0.050	1	0.002633	92.9	75-125	0			
Copper	0.9348	0.050	1	0.005053	93	75-125	0			
Iron	100.4	0.80	100	4.785	95.6	75-125	0			
Lead	0.9469	0.050	1	0.00115	94.6	75-125	0			
Magnesium	116.8	2.0	100	14.24	103	75-125	0			
Manganese	1.464	0.050	1	0.5013	96.3	75-125	0			
Nickel	0.9391	0.050	1	0.005886	93.3	75-125	0			
Potassium	131.8	2.0	100	31.49	100	75-125	0			
Selenium	0.8987	0.050	1	-0.0003594	89.9	75-125	0			
Silver	0.8435	0.050	1	0.000274	84.3	75-125	0			
Thallium	0.9164	0.050	1	0.0008541	91.6	75-125	0			
Vanadium	1.011	0.050	1	0.002739	101	75-125	0			
Zinc	0.9719	0.10	1	0.01789	95.4	75-125	0			

MS Sample ID: **14031413-02AMS** Units: **mg/L** Analysis Date: **04/04/14 01:46 PM**

Client ID: Run ID: **ICPMS1_140404A** SeqNo: **2699899** Prep Date: **04/03/14** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	4286	20	100	4152	134	75-125	0			SO

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57200** Instrument ID **ICPMS1** Method: **SW6020A**

MSD Sample ID: **14031413-02AMSD** Units: **mg/L** Analysis Date: **04/03/14 10:09 PM**

Client ID: Run ID: **ICPMS1_140403A** SeqNo: **2699122** Prep Date: **04/03/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	1.043	0.10	1	0.02451	102	75-125	1.013	2.92	20	
Antimony	0.9415	0.050	1	0.001837	94	75-125	0.9489	0.783	20	
Arsenic	0.994	0.050	1	0.0005695	99.3	75-125	0.972	2.24	20	
Barium	1.237	0.050	1	0.2365	100	75-125	1.216	1.71	20	
Beryllium	0.9706	0.020	1	0.0005091	97	75-125	0.934	3.84	20	
Cadmium	0.9582	0.020	1	0.0005312	95.8	75-125	0.938	2.13	20	
Calcium	281.5	5.0	100	174	108	75-125	272.1	3.4	20	
Chromium	0.9404	0.050	1	0.001037	93.9	75-125	0.9486	0.868	20	
Cobalt	0.9253	0.050	1	0.002633	92.3	75-125	0.9314	0.657	20	
Copper	0.9245	0.050	1	0.005053	91.9	75-125	0.9348	1.11	20	
Iron	99.73	0.80	100	4.785	94.9	75-125	100.4	0.67	20	
Lead	0.9709	0.050	1	0.00115	97	75-125	0.9469	2.5	20	
Magnesium	121	2.0	100	14.24	107	75-125	116.8	3.53	20	
Manganese	1.451	0.050	1	0.5013	95	75-125	1.464	0.892	20	
Nickel	0.9255	0.050	1	0.005886	92	75-125	0.9391	1.46	20	
Potassium	135.4	2.0	100	31.49	104	75-125	131.8	2.69	20	
Selenium	0.9143	0.050	1	-0.0003594	91.5	75-125	0.8987	1.72	20	
Silver	0.8403	0.050	1	0.000274	84	75-125	0.8435	0.38	20	
Thallium	0.9444	0.050	1	0.0008541	94.4	75-125	0.9164	3.01	20	
Vanadium	0.9918	0.050	1	0.002739	98.9	75-125	1.011	1.92	20	
Zinc	0.9627	0.10	1	0.01789	94.5	75-125	0.9719	0.951	20	

MSD Sample ID: **14031413-02AMSD** Units: **mg/L** Analysis Date: **04/04/14 01:53 PM**

Client ID: Run ID: **ICPMS1_140404A** SeqNo: **2699900** Prep Date: **04/03/14** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	4173	20	100	4152	21	75-125	4286	2.67	20	SO

The following samples were analyzed in this batch: 1404058-01D

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57176** Instrument ID **SVMS8** Method: **SW8270**

MBLK Sample ID: **SBLKW1-57176-57176** Units: **µg/L** Analysis Date: **04/04/14 11:02 AM**

Client ID: Run ID: **SVMS8_140404A** SeqNo: **2700280** Prep Date: **04/03/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1`-Biphenyl	ND	5.0								
2,4,5-Trichlorophenol	ND	5.0								
2,4,6-Trichlorophenol	ND	5.0								
2,4-Dichlorophenol	ND	10								
2,4-Dimethylphenol	ND	5.0								
2,4-Dinitrophenol	ND	5.0								
2,4-Dinitrotoluene	ND	5.0								
2,6-Dinitrotoluene	ND	5.0								
2-Chloronaphthalene	ND	5.0								
2-Chlorophenol	ND	5.0								
2-Methylnaphthalene	ND	5.0								
2-Methylphenol	ND	5.0								
2-Nitroaniline	ND	20								
2-Nitrophenol	ND	5.0								
3,3´-Dichlorobenzidine	ND	5.0								
3-Nitroaniline	ND	20								
4,6-Dinitro-2-methylphenol	ND	20								
4-Bromophenyl phenyl ether	ND	5.0								
4-Chloro-3-methylphenol	ND	5.0								
4-Chloroaniline	ND	20								
4-Chlorophenyl phenyl ether	ND	5.0								
4-Methylphenol	ND	5.0								
4-Nitroaniline	ND	20								
4-Nitrophenol	ND	20								
Acenaphthene	ND	5.0								
Acenaphthylene	ND	5.0								
Acetophenone	ND	1.0								
Anthracene	ND	5.0								
Atrazine	ND	1.0								
Benzaldehyde	ND	1.0								
Benzo(a)anthracene	ND	5.0								
Benzo(a)pyrene	ND	5.0								
Benzo(b)fluoranthene	ND	5.0								
Benzo(g,h,i)perylene	ND	5.0								
Benzo(k)fluoranthene	ND	5.0								
Bis(2-chloroethoxy)methane	ND	5.0								
Bis(2-chloroethyl)ether	ND	5.0								
Bis(2-chloroisopropyl)ether	ND	5.0								
Bis(2-ethylhexyl)phthalate	ND	5.0								
Butyl benzyl phthalate	ND	5.0								
Caprolactam	ND	10								
Carbazole	ND	10								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **57176** Instrument ID **SVMS8** Method: **SW8270**

Chrysene	ND	5.0					
Dibenzo(a,h)anthracene	ND	5.0					
Dibenzofuran	ND	5.0					
Diethyl phthalate	ND	20					
Dimethyl phthalate	ND	20					
Di-n-butyl phthalate	ND	5.0					
Di-n-octyl phthalate	ND	5.0					
Fluoranthene	ND	5.0					
Fluorene	ND	5.0					
Hexachlorobenzene	ND	5.0					
Hexachlorobutadiene	ND	5.0					
Hexachlorocyclopentadiene	ND	20					
Hexachloroethane	ND	5.0					
Indeno(1,2,3-cd)pyrene	ND	5.0					
Isophorone	ND	5.0					
Naphthalene	ND	5.0					
Nitrobenzene	ND	5.0					
N-Nitrosodi-n-propylamine	ND	5.0					
N-Nitrosodiphenylamine	ND	5.0					
Pentachlorophenol	ND	20					
Phenanthrene	ND	5.0					
Phenol	ND	5.0					
Pyrene	ND	5.0					
Surr: 2,4,6-Tribromophenol	*30.23*	0	*50*	0	*60.5*	*38-115*	0
Surr: 2-Fluorobiphenyl	*31.72*	0	*50*	0	*63.4*	*32-100*	0
Surr: 2-Fluorophenol	*19.15*	0	*50*	0	*38.3*	*22-59*	0
Surr: 4-Terphenyl-d14	*45.82*	0	*50*	0	*91.6*	*23-112*	0
Surr: Nitrobenzene-d5	*35.48*	0	*50*	0	*71*	*31-93*	0
Surr: Phenol-d6	*11.82*	0	*50*	0	*23.6*	*13-36*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57176** Instrument ID **SVMS8** Method: **SW8270**

LCS Sample ID: **SLCSW1-57176-57176** Units: **µg/L** Analysis Date: **04/04/14 11:23 AM**

Client ID: Run ID: **SVMS8_140404A** SeqNo: **2700281** Prep Date: **04/03/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2,4,5-Trichlorophenol	14.37	5.0	20	0	71.8	50-110	0			
2,4,6-Trichlorophenol	13.79	5.0	20	0	69	50-115	0			
2,4-Dichlorophenol	13.07	10	20	0	65.4	50-105	0			
2,4-Dimethylphenol	12.01	5.0	20	0	60	30-110	0			
2,4-Dinitrophenol	12.48	5.0	20	0	62.4	15-140	0			
2,4-Dinitrotoluene	15.08	5.0	20	0	75.4	50-120	0			
2,6-Dinitrotoluene	14.77	5.0	20	0	73.8	50-115	0			
2-Chloronaphthalene	14.49	5.0	20	0	72.4	50-105	0			
2-Chlorophenol	12.81	5.0	20	0	64	35-105	0			
2-Methylnaphthalene	13.81	5.0	20	0	69	45-105	0			
2-Methylphenol	11.55	5.0	20	0	57.8	40-110	0			
2-Nitroaniline	15.92	20	20	0	79.6	50-115	0			J
2-Nitrophenol	13.9	5.0	20	0	69.5	40-115	0			
3-Nitroaniline	14.59	20	20	0	73	20-125	0			J
4,6-Dinitro-2-methylphenol	14.74	20	20	0	73.7	40-130	0			J
4-Bromophenyl phenyl ether	15.89	5.0	20	0	79.4	50-115	0			
4-Chloro-3-methylphenol	13.72	5.0	20	0	68.6	45-110	0			
4-Chloroaniline	15.23	20	20	0	76.2	15-110	0			J
4-Chlorophenyl phenyl ether	14.5	5.0	20	0	72.5	50-110	0			
4-Methylphenol	9.9	5.0	20	0	49.5	30-110	0			
4-Nitroaniline	14.13	20	20	0	70.6	35-150	0			J
4-Nitrophenol	5.09	20	20	0	25.4	1-58	0			J
Acenaphthene	14.04	5.0	20	0	70.2	45-110	0			
Acenaphthylene	15.42	5.0	20	0	77.1	50-105	0			
Anthracene	16.78	5.0	20	0	83.9	55-110	0			
Benzo(a)anthracene	15.81	5.0	20	0	79	55-110	0			
Benzo(a)pyrene	16.25	5.0	20	0	81.2	55-110	0			
Benzo(b)fluoranthene	16.8	5.0	20	0	84	45-120	0			
Benzo(g,h,i)perylene	16.33	5.0	20	0	81.6	40-125	0			
Benzo(k)fluoranthene	16.98	5.0	20	0	84.9	45-125	0			
Bis(2-chloroethoxy)methane	14.59	5.0	20	0	73	45-105	0			
Bis(2-chloroethyl)ether	15.9	5.0	20	0	79.5	35-110	0			
Bis(2-chloroisopropyl)ether	16.54	5.0	20	0	82.7	25-130	0			
Bis(2-ethylhexyl)phthalate	15.67	5.0	20	0	78.4	40-125	0			
Butyl benzyl phthalate	15.7	5.0	20	0	78.5	45-115	0			
Carbazole	16.76	10	20	0	83.8	50-150	0			
Chrysene	16.62	5.0	20	0	83.1	55-110	0			
Dibenzo(a,h)anthracene	15.19	5.0	20	0	76	40-125	0			
Dibenzofuran	14.33	5.0	20	0	71.6	55-105	0			
Diethyl phthalate	16.12	20	20	0	80.6	40-120	0			J
Dimethyl phthalate	15.49	20	20	0	77.4	25-125	0			J
Di-n-butyl phthalate	16.73	5.0	20	0	83.6	55-115	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57176** Instrument ID **SVMS8** Method: **SW8270**

Di-n-octyl phthalate	15.68	5.0	20	0	78.4	35-135	0	
Fluoranthene	16.77	5.0	20	0	83.8	55-115	0	
Fluorene	14.9	5.0	20	0	74.5	50-110	0	
Hexachlorobenzene	15.32	5.0	20	0	76.6	50-110	0	
Hexachlorobutadiene	12.26	5.0	20	0	61.3	25-105	0	
Hexachlorocyclopentadiene	10.97	20	20	0	54.8	25-105	0	J
Hexachloroethane	12.73	5.0	20	0	63.6	30-95	0	
Indeno(1,2,3-cd)pyrene	18.13	5.0	20	0	90.6	45-125	0	
Isophorone	15.65	5.0	20	0	78.2	50-110	0	
Naphthalene	13.15	5.0	20	0	65.8	40-100	0	
Nitrobenzene	14.96	5.0	20	0	74.8	45-110	0	
N-Nitrosodi-n-propylamine	15.72	5.0	20	0	78.6	35-130	0	
N-Nitrosodiphenylamine	16.13	5.0	20	0	80.6	50-110	0	
Pentachlorophenol	13.13	20	20	0	65.6	40-115	0	J
Phenanthrene	15.83	5.0	20	0	79.2	50-115	0	
Phenol	5.19	5.0	20	0	26	12-43	0	
Pyrene	17.65	5.0	20	0	88.2	50-130	0	
Surr: 2,4,6-Tribromophenol	*37.35*	0	*50*	0	*74.7*	*38-115*	0	
Surr: 2-Fluorobiphenyl	*34.28*	0	*50*	0	*68.6*	*32-100*	0	
Surr: 2-Fluorophenol	*19.09*	0	*50*	0	*38.2*	*22-59*	0	
Surr: 4-Terphenyl-d14	*46.26*	0	*50*	0	*92.5*	*23-112*	0	
Surr: Nitrobenzene-d5	*41.24*	0	*50*	0	*82.5*	*31-93*	0	
Surr: Phenol-d6	*12.93*	0	*50*	0	*25.9*	*13-36*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57176** Instrument ID **SVMS8** Method: **SW8270**

MS Sample ID: **1404130-15B MS** Units: **µg/L** Analysis Date: **04/04/14 01:49 PM**

Client ID: Run ID: **SVMS8_140404A** SeqNo: **2700286** Prep Date: **04/03/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2,4,5-Trichlorophenol	159	50	200	0	79.5	50-110	0			
2,4,6-Trichlorophenol	157.7	50	200	0	78.8	50-115	0			
2,4-Dichlorophenol	144.9	100	200	0	72.4	50-105	0			
2,4-Dimethylphenol	155.7	50	200	0	77.8	30-110	0			
2,4-Dinitrophenol	16.1	50	200	0	8.05	15-140	0			JS
2,4-Dinitrotoluene	157.9	50	200	0	79	50-120	0			
2,6-Dinitrotoluene	151.9	50	200	0	76	50-115	0			
2-Chloronaphthalene	148.4	50	200	0	74.2	50-105	0			
2-Chlorophenol	146.9	50	200	0	73.4	35-105	0			
2-Methylnaphthalene	140.6	50	200	0	70.3	45-105	0			
2-Methylphenol	131.2	50	200	0	65.6	40-110	0			
2-Nitroaniline	171.6	200	200	0	85.8	50-115	0			J
2-Nitrophenol	140.1	50	200	0	70	40-115	0			
3-Nitroaniline	150.2	200	200	0	75.1	20-125	0			J
4,6-Dinitro-2-methylphenol	45.8	200	200	0	22.9	40-130	0			JS
4-Bromophenyl phenyl ether	162.6	50	200	0	81.3	50-115	0			
4-Chloro-3-methylphenol	157.2	50	200	0	78.6	45-110	0			
4-Chloroaniline	121.6	200	200	0	60.8	15-110	0			J
4-Chlorophenyl phenyl ether	150.4	50	200	0	75.2	50-110	0			
4-Methylphenol	116	50	200	0	58	30-110	0			
4-Nitroaniline	144.2	200	200	0	72.1	35-150	0			J
4-Nitrophenol	38.7	200	200	0	19.4	1-58	0			J
Acenaphthene	130.2	50	200	0	65.1	45-110	0			
Acenaphthylene	156.9	50	200	0	78.4	50-105	0			
Anthracene	171.4	50	200	0	85.7	55-110	0			
Benzo(a)anthracene	169.6	50	200	0	84.8	55-110	0			
Benzo(a)pyrene	179.6	50	200	0	89.8	55-110	0			
Benzo(b)fluoranthene	191.3	50	200	0	95.6	45-120	0			
Benzo(g,h,i)perylene	157.5	50	200	0	78.8	40-125	0			
Benzo(k)fluoranthene	189.2	50	200	0	94.6	45-125	0			
Bis(2-chloroethoxy)methane	147.6	50	200	0	73.8	45-105	0			
Bis(2-chloroethyl)ether	151.5	50	200	0	75.8	35-110	0			
Bis(2-chloroisopropyl)ether	154.4	50	200	0	77.2	25-130	0			
Bis(2-ethylhexyl)phthalate	195.7	50	200	0	97.8	40-125	0			
Butyl benzyl phthalate	197.1	50	200	0	98.6	45-115	0			
Carbazole	171.8	100	200	0	85.9	50-150	0			
Chrysene	163.2	50	200	0	81.6	55-110	0			
Dibenzo(a,h)anthracene	153.8	50	200	0	76.9	40-125	0			
Dibenzofuran	147.6	50	200	0	73.8	55-105	0			
Diethyl phthalate	164.6	200	200	0	82.3	40-120	0			J
Dimethyl phthalate	160.7	200	200	0	80.4	25-125	0			J
Di-n-butyl phthalate	179.7	50	200	0	89.8	55-115	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **57176** Instrument ID **SVMS8** Method: **SW8270**

Di-n-octyl phthalate	258.7	50	200	0	129	35-135	0	
Fluoranthene	173.7	50	200	0	86.8	55-115	0	
Fluorene	152.1	50	200	0	76	50-110	0	
Hexachlorobenzene	152.5	50	200	0	76.2	50-110	0	
Hexachlorobutadiene	128	50	200	0	64	25-105	0	
Hexachlorocyclopentadiene	67.1	200	200	0	33.6	25-105	0	J
Hexachloroethane	131.3	50	200	0	65.6	30-95	0	
Indeno(1,2,3-cd)pyrene	195.2	50	200	0	97.6	45-125	0	
Isophorone	159.6	50	200	0	79.8	50-110	0	
Naphthalene	134.5	50	200	0	67.2	40-100	0	
Nitrobenzene	153	50	200	0	76.5	45-110	0	
N-Nitrosodi-n-propylamine	162	50	200	0	81	35-130	0	
N-Nitrosodiphenylamine	162.5	50	200	0	81.2	50-110	0	
Pentachlorophenol	113.5	200	200	0	56.8	40-115	0	J
Phenanthrene	155.9	50	200	0	78	50-115	0	
Phenol	53.1	50	200	0	26.6	12-43	0	
Pyrene	211	50	200	0	106	50-130	0	
Surr: 2,4,6-Tribromophenol	*394.5*	0	*500*	0	*78.9*	*38-115*	0	
Surr: 2-Fluorobiphenyl	*347.5*	0	*500*	0	*69.5*	*32-100*	0	
Surr: 2-Fluorophenol	*210.2*	0	*500*	0	*42*	*22-59*	0	
Surr: 4-Terphenyl-d14	*555*	0	*500*	0	*111*	*23-112*	0	
Surr: Nitrobenzene-d5	*413.4*	0	*500*	0	*82.7*	*31-93*	0	
Surr: Phenol-d6	*135.5*	0	*500*	0	*27.1*	*13-36*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57176** Instrument ID **SVMS8** Method: **SW8270**

MSD Sample ID: **1404130-15B MSD** Units: **µg/L** Analysis Date: **04/04/14 02:09 PM**

Client ID: Run ID: **SVMS8_140404A** SeqNo: **2700287** Prep Date: **04/03/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2,4,5-Trichlorophenol	163.6	50	200	0	81.8	50-110	159	2.85	30	
2,4,6-Trichlorophenol	166	50	200	0	83	50-115	157.7	5.13	30	
2,4-Dichlorophenol	150.5	100	200	0	75.2	50-105	144.9	3.79	30	
2,4-Dimethylphenol	137.9	50	200	0	69	30-110	155.7	12.1	30	
2,4-Dinitrophenol	28.2	50	200	0	14.1	15-140	16.1	0	30	JS
2,4-Dinitrotoluene	160.6	50	200	0	80.3	50-120	157.9	1.7	30	
2,6-Dinitrotoluene	159.3	50	200	0	79.6	50-115	151.9	4.76	30	
2-Chloronaphthalene	152.6	50	200	0	76.3	50-105	148.4	2.79	30	
2-Chlorophenol	148.8	50	200	0	74.4	35-105	146.9	1.29	30	
2-Methylnaphthalene	145.5	50	200	0	72.8	45-105	140.6	3.43	30	
2-Methylphenol	135.5	50	200	0	67.8	40-110	131.2	3.22	30	
2-Nitroaniline	174.4	200	200	0	87.2	50-115	171.6	0	30	J
2-Nitrophenol	149.1	50	200	0	74.6	40-115	140.1	6.22	30	
3-Nitroaniline	166	200	200	0	83	20-125	150.2	0	30	J
4,6-Dinitro-2-methylphenol	60.7	200	200	0	30.4	40-130	45.8	0	30	JS
4-Bromophenyl phenyl ether	160.1	50	200	0	80	50-115	162.6	1.55	30	
4-Chloro-3-methylphenol	170.5	50	200	0	85.2	45-110	157.2	8.12	30	
4-Chloroaniline	154.7	200	200	0	77.4	15-110	121.6	0	30	J
4-Chlorophenyl phenyl ether	151.7	50	200	0	75.8	50-110	150.4	0.861	30	
4-Methylphenol	126.6	50	200	0	63.3	30-110	116	8.74	30	
4-Nitroaniline	157.8	200	200	0	78.9	35-150	144.2	0	30	J
4-Nitrophenol	50.4	200	200	0	25.2	1-58	38.7	0	0	J
Acenaphthene	133.9	50	200	0	67	45-110	130.2	2.8	30	
Acenaphthylene	158.5	50	200	0	79.2	50-105	156.9	1.01	30	
Anthracene	168.8	50	200	0	84.4	55-110	171.4	1.53	30	
Benzo(a)anthracene	170.7	50	200	0	85.4	55-110	169.6	0.646	30	
Benzo(a)pyrene	179.4	50	200	0	89.7	55-110	179.6	0.111	30	
Benzo(b)fluoranthene	192.7	50	200	0	96.4	45-120	191.3	0.729	30	
Benzo(g,h,i)perylene	152	50	200	0	76	40-125	157.5	3.55	30	
Benzo(k)fluoranthene	190.5	50	200	0	95.2	45-125	189.2	0.685	30	
Bis(2-chloroethoxy)methane	150.7	50	200	0	75.4	45-105	147.6	2.08	30	
Bis(2-chloroethyl)ether	157.6	50	200	0	78.8	35-110	151.5	3.95	30	
Bis(2-chloroisopropyl)ether	157.9	50	200	0	79	25-130	154.4	2.24	30	
Bis(2-ethylhexyl)phthalate	191.8	50	200	0	95.9	40-125	195.7	2.01	30	
Butyl benzyl phthalate	189.3	50	200	0	94.6	45-115	197.1	4.04	30	
Carbazole	175.1	100	200	0	87.6	50-150	171.8	1.9	30	
Chrysene	166.8	50	200	0	83.4	55-110	163.2	2.18	30	
Dibenzo(a,h)anthracene	149.1	50	200	0	74.6	40-125	153.8	3.1	30	
Dibenzofuran	149.8	50	200	0	74.9	55-105	147.6	1.48	30	
Diethyl phthalate	173	200	200	0	86.5	40-120	164.6	0	30	J
Dimethyl phthalate	165.4	200	200	0	82.7	25-125	160.7	0	30	J
Di-n-butyl phthalate	180	50	200	0	90	55-115	179.7	0.167	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57176** Instrument ID **SVMS8** Method: **SW8270**

Di-n-octyl phthalate	251.8	50	200	0	126	35-135	258.7	2.7	30	
Fluoranthene	174.7	50	200	0	87.4	55-115	173.7	0.574	30	
Fluorene	154.8	50	200	0	77.4	50-110	152.1	1.76	30	
Hexachlorobenzene	154.6	50	200	0	77.3	50-110	152.5	1.37	30	
Hexachlorobutadiene	132.1	50	200	0	66	25-105	128	3.15	30	
Hexachlorocyclopentadiene	63.3	200	200	0	31.6	25-105	67.1	0	30	J
Hexachloroethane	129.1	50	200	0	64.6	30-95	131.3	1.69	30	
Indeno(1,2,3-cd)pyrene	189.1	50	200	0	94.6	45-125	195.2	3.17	30	
Isophorone	165.1	50	200	0	82.6	50-110	159.6	3.39	30	
Naphthalene	138.2	50	200	0	69.1	40-100	134.5	2.71	30	
Nitrobenzene	160.2	50	200	0	80.1	45-110	153	4.6	30	
N-Nitrosodi-n-propylamine	168.4	50	200	0	84.2	35-130	162	3.87	30	
N-Nitrosodiphenylamine	164.2	50	200	0	82.1	50-110	162.5	1.04	30	
Pentachlorophenol	117.4	200	200	0	58.7	40-115	113.5	0	30	J
Phenanthrene	161.2	50	200	0	80.6	50-115	155.9	3.34	30	
Phenol	62.7	50	200	0	31.4	12-43	53.1	16.6	30	
Pyrene	199.9	50	200	0	100	50-130	211	5.4	30	
Surr: 2,4,6-Tribromophenol	*397.5*	0	*500*	0	*79.5*	*38-115*	394.5	*0.758*	*40*	
Surr: 2-Fluorobiphenyl	*349.2*	0	*500*	0	*69.8*	*32-100*	347.5	*0.488*	*40*	
Surr: 2-Fluorophenol	*235.1*	0	*500*	0	*47*	*22-59*	210.2	*11.2*	*40*	
Surr: 4-Terphenyl-d14	*528.4*	0	*500*	0	*106*	*23-112*	555	*4.91*	*40*	
Surr: Nitrobenzene-d5	*420.8*	0	*500*	0	*84.2*	*31-93*	413.4	*1.77*	*40*	
Surr: Phenol-d6	*159.6*	0	*500*	0	*31.9*	*13-36*	135.5	*16.3*	*40*	

The following samples were analyzed in this batch: 1404058-01B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **R138303A** Instrument ID **VMS6** Method: **SW8260**

MBLK	Sample ID: **VBLKW2-140402-R138303A**	Units: **µg/L**	Analysis Date: **04/02/14 08:32 PM**
Client ID:	Run ID: **VMS6_140402A**	SeqNo: **2697650** Prep Date:	DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
1,1,2-Trichlorotrifluoroethane	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,2-Dibromo-3-chloropropane	ND	1.0								
1,2-Dibromoethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,2-Dichloroethane	ND	1.0								
1,2-Dichloropropane	ND	2.0								
1,3-Dichlorobenzene	ND	2.0								
1,4-Dichlorobenzene	ND	2.0								
2-Butanone	ND	5.0								
2-Hexanone	ND	5.0								
4-Methyl-2-pentanone	ND	5.0								
Acetone	ND	20								
Benzene	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	1.0								
Carbon disulfide	ND	2.5								
Carbon tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	1.0								
Chloroform	ND	1.0								
Chloromethane	ND	1.0								
cis-1,2-Dichloroethene	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
Cyclohexane	ND	5.0								
Dibromochloromethane	ND	1.0								
Dichlorodifluoromethane	ND	1.0								
Ethylbenzene	ND	1.0								
Isopropylbenzene	ND	1.0								
Methyl acetate	ND	2.0								
Methyl tert-butyl ether	ND	5.0								
Methylcyclohexane	ND	5.0								
Methylene chloride	ND	5.0								
Styrene	ND	1.0								
Tetrachloroethene	ND	2.0								
Toluene	ND	1.0								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **R138303A** Instrument ID **VMS6** Method: **SW8260**

trans-1,2-Dichloroethene	ND	1.0					
trans-1,3-Dichloropropene	ND	1.0					
Trichloroethene	ND	1.0					
Trichlorofluoromethane	ND	1.0					
Vinyl chloride	ND	1.0					
Xylenes, Total	ND	3.0					
Surr: 1,2-Dichloroethane-d4	*19.86*	0	*20*	0	*99.3*	*70-120*	0
Surr: 4-Bromofluorobenzene	*19.55*	0	*20*	0	*97.8*	*75-120*	0
Surr: Dibromofluoromethane	*19.55*	0	*20*	0	*97.8*	*85-115*	0
Surr: Toluene-d8	*19.85*	0	*20*	0	*99.2*	*85-120*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **R138303A** Instrument ID **VMS6** Method: **SW8260**

LCS Sample ID: **VLCSW1-140402-R138303A** Units: **µg/L** Analysis Date: **04/02/14 07:39 PM**

Client ID: Run ID: **VMS6_140402A** SeqNo: **2697649** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	21.31	1.0	20	0	107	65-130	0			
1,1,2,2-Tetrachloroethane	22.02	1.0	20	0	110	65-130	0			
1,1,2-Trichloroethane	21.38	1.0	20	0	107	75-125	0			
1,1-Dichloroethane	22.35	1.0	20	0	112	70-135	0			
1,1-Dichloroethene	23.38	1.0	20	0	117	70-130	0			
1,2,4-Trichlorobenzene	21.42	1.0	20	0	107	65-135	0			
1,2-Dibromo-3-chloropropane	18.2	1.0	20	0	91	50-130	0			
1,2-Dibromoethane	24.98	1.0	20	0	125	87-179	0			
1,2-Dichlorobenzene	21.6	1.0	20	0	108	70-120	0			
1,2-Dichloroethane	20.29	1.0	20	0	101	87-179	0			
1,2-Dichloropropane	20.71	2.0	20	0	104	75-125	0			
1,3-Dichlorobenzene	22.05	2.0	20	0	110	75-125	0			
1,4-Dichlorobenzene	20.86	2.0	20	0	104	75-125	0			
2-Butanone	24.84	5.0	20	0	124	30-150	0			
2-Hexanone	21.2	5.0	20	0	106	55-130	0			
4-Methyl-2-pentanone	27.37	5.0	20	0	137	77-178	0			
Acetone	22.07	20	20	0	110	40-140	0			
Benzene	22.24	1.0	20	0	111	80-120	0			
Bromodichloromethane	19.45	1.0	20	0	97.2	75-120	0			
Bromoform	16.43	1.0	20	0	82.2	70-130	0			
Bromomethane	26.92	1.0	20	0	135	30-145	0			
Carbon disulfide	24.25	2.5	20	0	121	35-165	0			
Carbon tetrachloride	20.35	1.0	20	0	102	65-140	0			
Chlorobenzene	21.69	1.0	20	0	108	80-120	0			
Chloroethane	21.25	1.0	20	0	106	60-135	0			
Chloroform	21.83	1.0	20	0	109	65-135	0			
Chloromethane	20.06	1.0	20	0	100	70-125	0			
cis-1,2-Dichloroethene	22.11	1.0	20	0	111	70-125	0			
cis-1,3-Dichloropropene	20.4	1.0	20	0	102	70-130	0			
Dibromochloromethane	16.95	1.0	20	0	84.8	60-135	0			
Dichlorodifluoromethane	15.58	1.0	20	0	77.9	30-155	0			
Ethylbenzene	23.1	1.0	20	0	116	75-125	0			
Isopropylbenzene	20.31	1.0	20	0	102	75-125	0			
Methyl tert-butyl ether	22.93	5.0	20	0	115	65-125	0			
Methylene chloride	21.89	5.0	20	0	109	55-140	0			
Styrene	20.03	1.0	20	0	100	65-135	0			
Tetrachloroethene	23.14	2.0	20	0	116	45-150	0			
Toluene	22.51	1.0	20	0	113	75-120	0			
trans-1,2-Dichloroethene	24.07	1.0	20	0	120	60-140	0			
trans-1,3-Dichloropropene	19.93	1.0	20	0	99.6	55-140	0			
Trichloroethene	22.7	1.0	20	0	114	70-125	0			
Trichlorofluoromethane	20.75	1.0	20	0	104	60-145	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **R138303A** Instrument ID **VMS6** Method: **SW8260**

Vinyl chloride	19.41	1.0	20	0	97	50-145	0
Xylenes, Total	62.02	3.0	60	0	103	75-130	0
Surr: 1,2-Dichloroethane-d4	*19.89*	0	*20*	0	*99.4*	*70-120*	0
Surr: 4-Bromofluorobenzene	*20.12*	0	*20*	0	*101*	*75-120*	0
Surr: Dibromofluoromethane	*21.02*	0	*20*	0	*105*	*85-115*	0
Surr: Toluene-d8	*20.32*	0	*20*	0	*102*	*85-120*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **R138303A** Instrument ID **VMS6** Method: **SW8260**

MS Sample ID: **1404077-02A MS** Units: **µg/L** Analysis Date: **04/03/14 05:43 AM**

Client ID: Run ID: **VMS6_140402A** SeqNo: **2697661** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	22.55	1.0	20	1.38	106	65-130	0			
1,1,2,2-Tetrachloroethane	20.72	1.0	20	0	104	65-130	0			
1,1,2-Trichloroethane	20.78	1.0	20	0	104	75-125	0			
1,1-Dichloroethane	25.31	1.0	20	1.85	117	70-135	0			
1,1-Dichloroethene	27.23	1.0	20	3.04	121	70-130	0			
1,2,4-Trichlorobenzene	20.59	1.0	20	0	103	65-135	0			
1,2-Dibromo-3-chloropropane	15.22	1.0	20	0	76.1	50-130	0			
1,2-Dibromoethane	24.63	1.0	20	0	123	81-158	0			
1,2-Dichlorobenzene	21.53	1.0	20	0	108	70-120	0			
1,2-Dichloroethane	20.6	1.0	20	0	103	70-130	0			
1,2-Dichloropropane	20.97	2.0	20	0	105	75-125	0			
1,3-Dichlorobenzene	22.19	2.0	20	0	111	75-125	0			
1,4-Dichlorobenzene	21.37	2.0	20	0	107	75-125	0			
2-Butanone	24.38	5.0	20	0	122	30-150	0			
2-Hexanone	20.24	5.0	20	0	101	55-130	0			
4-Methyl-2-pentanone	26.47	5.0	20	0	132	73-162	0			
Acetone	29.57	20	20	4.94	123	40-140	0			
Benzene	23.11	1.0	20	0	116	80-120	0			
Bromodichloromethane	17.87	1.0	20	0	89.4	75-120	0			
Bromoform	14.08	1.0	20	0	70.4	70-130	0			
Bromomethane	23.04	1.0	20	0	115	30-145	0			
Carbon disulfide	23.75	2.5	20	0	119	35-165	0			
Carbon tetrachloride	20.66	1.0	20	0	103	65-140	0			
Chlorobenzene	21.76	1.0	20	0	109	80-120	0			
Chloroethane	22.28	1.0	20	0	111	60-135	0			
Chloroform	21.87	1.0	20	0	109	65-135	0			
Chloromethane	18.71	1.0	20	0	93.6	70-125	0			
cis-1,2-Dichloroethene	65.17	1.0	20	40.72	122	70-125	0			
cis-1,3-Dichloropropene	18.76	1.0	20	0	93.8	70-130	0			
Dibromochloromethane	14.7	1.0	20	0	73.5	60-135	0			
Dichlorodifluoromethane	17.04	1.0	20	0	85.2	30-155	0			
Ethylbenzene	23.46	1.0	20	0	117	75-125	0			
Isopropylbenzene	20.82	1.0	20	0	104	75-125	0			
Methyl tert-butyl ether	21.42	5.0	20	0	107	65-125	0			
Methylene chloride	21.65	5.0	20	0	108	55-140	0			
Styrene	19.85	1.0	20	0	99.2	65-135	0			
Tetrachloroethene	27.45	2.0	20	2.07	127	45-150	0			
Toluene	22.88	1.0	20	0	114	75-120	0			
trans-1,2-Dichloroethene	27.04	1.0	20	1.79	126	60-140	0			
trans-1,3-Dichloropropene	17.61	1.0	20	0	88	55-140	0			
Trichloroethene	58.28	1.0	20	25.84	162	70-125	0			S
Trichlorofluoromethane	22.04	1.0	20	0	110	60-145	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **R138303A** Instrument ID **VMS6** Method: **SW8260**

Vinyl chloride	24.53	1.0	20	4.05	102	50-145	0
Xylenes, Total	62.47	3.0	60	0	104	75-130	0
Surr: 1,2-Dichloroethane-d4	*20.15*	0	*20*	0	*101*	*70-120*	0
Surr: 4-Bromofluorobenzene	*20.03*	0	*20*	0	*100*	*75-120*	0
Surr: Dibromofluoromethane	*20.21*	0	*20*	0	*101*	*85-115*	0
Surr: Toluene-d8	*20.05*	0	*20*	0	*100*	*85-120*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **R138303A** Instrument ID **VMS6** Method: **SW8260**

MSD Sample ID: **1404077-02A MSD** Units: **µg/L** Analysis Date: **04/03/14 06:09 AM**

Client ID: Run ID: **VMS6_140402A** SeqNo: **2697662** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	21.77	1.0	20	1.38	102	65-130	22.55	3.52	30	
1,1,2,2-Tetrachloroethane	20.91	1.0	20	0	105	65-130	20.72	0.913	30	
1,1,2-Trichloroethane	20.62	1.0	20	0	103	75-125	20.78	0.773	30	
1,1-Dichloroethane	24.76	1.0	20	1.85	115	70-135	25.31	2.2	30	
1,1-Dichloroethene	25.99	1.0	20	3.04	115	70-130	27.23	4.66	30	
1,2,4-Trichlorobenzene	20.9	1.0	20	0	104	65-135	20.59	1.49	30	
1,2-Dibromo-3-chloropropane	15.4	1.0	20	0	77	50-130	15.22	1.18	30	
1,2-Dibromoethane	24.23	1.0	20	0	121	81-158	24.63	1.64	30	
1,2-Dichlorobenzene	21.3	1.0	20	0	106	70-120	21.53	1.07	30	
1,2-Dichloroethane	20.32	1.0	20	0	102	70-130	20.6	1.37	30	
1,2-Dichloropropane	20.61	2.0	20	0	103	75-125	20.97	1.73	30	
1,3-Dichlorobenzene	21.65	2.0	20	0	108	75-125	22.19	2.46	30	
1,4-Dichlorobenzene	20.84	2.0	20	0	104	75-125	21.37	2.51	30	
2-Butanone	25.26	5.0	20	0	126	30-150	24.38	3.55	30	
2-Hexanone	21.02	5.0	20	0	105	55-130	20.24	3.78	30	
4-Methyl-2-pentanone	28.18	5.0	20	0	141	73-162	26.47	6.26	30	
Acetone	32.04	20	20	4.94	136	40-140	29.57	8.02	30	
Benzene	22.14	1.0	20	0	111	80-120	23.11	4.29	30	
Bromodichloromethane	17.61	1.0	20	0	88	75-120	17.87	1.47	30	
Bromoform	14.29	1.0	20	0	71.4	70-130	14.08	1.48	30	
Bromomethane	23.09	1.0	20	0	115	30-145	23.04	0.217	30	
Carbon disulfide	22.82	2.5	20	0	114	35-165	23.75	3.99	30	
Carbon tetrachloride	19.86	1.0	20	0	99.3	65-140	20.66	3.95	30	
Chlorobenzene	21.31	1.0	20	0	107	80-120	21.76	2.09	30	
Chloroethane	21.95	1.0	20	0	110	60-135	22.28	1.49	30	
Chloroform	21.87	1.0	20	0	109	65-135	21.87	0	30	
Chloromethane	21.47	1.0	20	0	107	70-125	18.71	13.7	30	
cis-1,2-Dichloroethene	64.52	1.0	20	40.72	119	70-125	65.17	1	30	
cis-1,3-Dichloropropene	18.56	1.0	20	0	92.8	70-130	18.76	1.07	30	
Dibromochloromethane	14.88	1.0	20	0	74.4	60-135	14.7	1.22	30	
Dichlorodifluoromethane	16.2	1.0	20	0	81	30-155	17.04	5.05	30	
Ethylbenzene	23.1	1.0	20	0	116	75-125	23.46	1.55	30	
Isopropylbenzene	20.63	1.0	20	0	103	75-125	20.82	0.917	30	
Methyl tert-butyl ether	21.9	5.0	20	0	110	65-125	21.42	2.22	30	
Methylene chloride	21.76	5.0	20	0	109	55-140	21.65	0.507	30	
Styrene	19.66	1.0	20	0	98.3	65-135	19.85	0.962	30	
Tetrachloroethene	26	2.0	20	2.07	120	45-150	27.45	5.43	30	
Toluene	22.33	1.0	20	0	112	75-120	22.88	2.43	30	
trans-1,2-Dichloroethene	26.24	1.0	20	1.79	122	60-140	27.04	3	30	
trans-1,3-Dichloropropene	17.73	1.0	20	0	88.6	55-140	17.61	0.679	30	
Trichloroethene	55.1	1.0	20	25.84	146	70-125	58.28	5.61	30	S
Trichlorofluoromethane	21.59	1.0	20	0	108	60-145	22.04	2.06	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **R138303A** Instrument ID **VMS6** Method: **SW8260**

Vinyl chloride	23.69	1.0	20	4.05	98.2	50-145	24.53	3.48	30
Xylenes, Total	60.97	3.0	60	0	102	75-130	62.47	2.43	30
Surr: 1,2-Dichloroethane-d4	*19.95*	0	*20*	0	*99.8*	*70-120*	20.15	*0.998*	*30*
Surr: 4-Bromofluorobenzene	*20.1*	0	*20*	0	*100*	*75-120*	20.03	*0.349*	*30*
Surr: Dibromofluoromethane	*20.19*	0	*20*	0	*101*	*85-115*	20.21	*0.099*	*30*
Surr: Toluene-d8	*19.71*	0	*20*	0	*98.6*	*85-120*	20.05	*1.71*	*30*

The following samples were analyzed in this batch: 1404058-01C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57190** Instrument ID **LACHAT** Method: **SW9066**

MBLK Sample ID: **MBLK-57190-57190** Units: **mg/L** Analysis Date: **04/03/14 11:34 AM**
Client ID: Run ID: **LACHAT_140403A** SeqNo: **2697980** Prep Date: **04/02/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phenolics, Total	ND	0.010								

MBLK Sample ID: **MBLK-57190-57190** Units: **mg/L** Analysis Date: **04/03/14 11:34 AM**
Client ID: Run ID: **LACHAT_140403A** SeqNo: **2697995** Prep Date: **04/02/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phenolics, Total	ND	0.010								

LCS Sample ID: **LCS-57190-57190** Units: **mg/L** Analysis Date: **04/03/14 11:34 AM**
Client ID: Run ID: **LACHAT_140403A** SeqNo: **2697981** Prep Date: **04/02/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phenolics, Total	0.09553	0.010	0.1	0	95.5	75-110	0			

LCS Sample ID: **LCS-57190-57190** Units: **mg/L** Analysis Date: **04/03/14 11:34 AM**
Client ID: Run ID: **LACHAT_140403A** SeqNo: **2697996** Prep Date: **04/02/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phenolics, Total	0.09553	0.010	0.1	0	95.5	90-110	0			

MS Sample ID: **1404058-01A MS** Units: **mg/L** Analysis Date: **04/03/14 11:34 AM**
Client ID: **WCR-Water02-033114** Run ID: **LACHAT_140403A** SeqNo: **2697987** Prep Date: **04/02/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phenolics, Total	0.3004	0.033	0.3333	0.0005017	90	61-131	0			

MSD Sample ID: **1404058-01A MSD** Units: **mg/L** Analysis Date: **04/03/14 11:34 AM**
Client ID: **WCR-Water02-033114** Run ID: **LACHAT_140403A** SeqNo: **2697988** Prep Date: **04/02/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phenolics, Total	0.3165	0.033	0.3333	0.0005017	94.8	61-131	0.3004	5.23	15	

The following samples were analyzed in this batch: 1404058-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **R138335b** Instrument ID **TOC2** Method: **SW9060**

MBLK Sample ID: **WBLKW1-140402-R138335b** Units: **mg/L** Analysis Date: **04/02/14 10:53 PM**

Client ID: Run ID: **TOC2_140402A** SeqNo: **2698359** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	ND	0.50								

LCS Sample ID: **WLCSW1-140402-R138335b** Units: **mg/L** Analysis Date: **04/02/14 11:24 PM**

Client ID: Run ID: **TOC2_140402A** SeqNo: **2698361** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	5.306	0.50	5	0	106	80-120	0			

MS Sample ID: **1404058-01EMS** Units: **mg/L** Analysis Date: **04/03/14 01:25 PM**

Client ID: **WCR-Water02-033114** Run ID: **TOC2_140402A** SeqNo: **2698367** Prep Date: DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	7.876	2.0	5	2.38	110	75-125	0			

MSD Sample ID: **1404058-01EMSD** Units: **mg/L** Analysis Date: **04/03/14 01:57 PM**

Client ID: **WCR-Water02-033114** Run ID: **TOC2_140402A** SeqNo: **2698368** Prep Date: DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	7.84	2.0	5	2.38	109	75-125	7.876	0.458	20	

The following samples were analyzed in this batch: 1404058-01E

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **R138583** Instrument ID **O&G** Method: **E1664A**

MBLK Sample ID: **MB-R138583-R138583** Units: **mg/L** Analysis Date: **04/08/14 09:00 AM**

Client ID: Run ID: **O&G_140408A** SeqNo: **2703760** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Oil and Grease	ND	5.0								

LCS Sample ID: **LCS-R138583-R138583** Units: **mg/L** Analysis Date: **04/08/14 09:00 AM**

Client ID: Run ID: **O&G_140408A** SeqNo: **2703761** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Oil and Grease	35.8	5.0	40	0	89.5	78-114	0			

MS Sample ID: **1404349-02A MS** Units: **mg/L** Analysis Date: **04/08/14 09:00 AM**

Client ID: Run ID: **O&G_140408A** SeqNo: **2703781** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Oil and Grease	36.78	5.0	40	0.33	91.1	78-114	0			

DUP Sample ID: **1404349-04A DUP** Units: **mg/L** Analysis Date: **04/08/14 09:00 AM**

Client ID: Run ID: **O&G_140408A** SeqNo: **2703783** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Oil and Grease	ND	5.0	0	0	0	0-0	1.44	0	18	

The following samples were analyzed in this batch: 1404058-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **R138584** Instrument ID **O&G** Method: **E1664**

MBLK Sample ID: **MB-R138584-R138584** Units: **mg/L** Analysis Date: **04/08/14 09:00 AM**

Client ID: Run ID: **O&G_140408B** SeqNo: **2703786** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Non-Polar Material	ND	5.0								

LCS Sample ID: **LCS-R138584-R138584** Units: **mg/L** Analysis Date: **04/08/14 09:00 AM**

Client ID: Run ID: **O&G_140408B** SeqNo: **2703787** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Non-Polar Material	16.7	5.0	20	0	83.5	64-132		0		

MS Sample ID: **1404349-02A MS** Units: **mg/L** Analysis Date: **04/08/14 09:00 AM**

Client ID: Run ID: **O&G_140408B** SeqNo: **2703790** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Non-Polar Material	17.89	5.0	20	0.33	87.8	64-132		0		

The following samples were analyzed in this batch: 1404058-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

ALS Environmental

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Chain of Custody Form

Page 1 of 1

COC ID: 85373

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ALS Project Manager: TBS | ALS Work Order #: 1404058

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name		A	TOTAL ORGANIC CARBON
Work Order		Project Number		B	OIL & GREASE
Company Name	Weston Solutions, Inc	Bill To Company	Weston Solutions, Inc	C	NON-POLAR OIL & GREASE (TPH)
Send Report To	Lisa Graczyk	Invoice Attn	Lisa Graczyk	D	SVOCS (ACID/BASE NEUTRALS)
Address	20 North Wacker Drive Suite 1210	Address	20 North Wacker Drive Suite 1210	E	VOCS
				F	PHENOLS (4AAP)
City/State/Zip	Chicago, IL 60606	City/State/Zip	Chicago, IL 60606	G	MERCURY
Phone	(312) 424-3300	Phone	(312) 424-3300	H	METALS
Fax	(312) 424-3330	Fax	(312) 424-3330	I	
e-Mail Address		e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	WCR-WATER02-033114	3/31/14	10:00	W	MULTIPLE	9	X	X	X	X	X	X	X	X			
2	NO ADDITIONAL																
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: JEFF BRYNIARSKI

Shipment Method:

Required Turnaround Time: (Check Box) [X] Std 10 WK Days [ ] 5 WK Days [ ] 2 WK Days [ ] 24 Hour [ ] Other

Results Due Date:

Notes:

Relinquished by:	Date: 3/31/14	Time: 12:50	Received by:
Relinquished by:	Date: 3/31/14	Time: 1630	Received by (Laboratory): FedEx 4/1/14 0930
Logged by (Laboratory): KW	Date: 4/1/14	Time: 1440	Checked by (Laboratory): TBS

Cooler ID	Cooler Temp.
	3.4°C

QC Package: (Check One Box Below)
- [X] Level II Std QC
- [ ] Level III Std QC/Raw Data
- [ ] Level IV SW846/CLP
- [ ] Other
- [ ] TRRP Checklist
- [ ] TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **WESTON - CHI** Date/Time Received: **01-Apr-14 09:30**

Work Order: **1404058** Received by: **KRW**

Checklist completed by Keith Wierenga (eSignature) 01-Apr-14 (Date) Reviewed by: Tom Bramish (eSignature) 01-Apr-14 (Date)

Matrices: Water
Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Sample(s) received on ice?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	3.4 C		
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	4/1/2014 3:00:31 PM		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:	-		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

17-Apr-2014

Lisa Graczyk
Weston Solutions, Inc
20 North Wacker Drive
Suite 1210
Chicago, IL 60606

Re: **Whiting Crude Release** Work Order: **1404532**

Dear Lisa,

ALS Environmental received 1 sample on 09-Apr-2014 for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

Sample results are compliant with NELAP standard requirements and QC results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 12.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Electronically approved by: Tom Beamish

Tom Beamish
Senior Project Manager

Certificate No: MN 532786

ADDRESS 3352 128th Avenue Holland, Michigan 49424-9263 | PHONE (616) 399-6070 | FAX (616) 399-6185
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ALS Group USA, Corp

Date: 17-Apr-14

Client: Weston Solutions, Inc
Project: Whiting Crude Release
Work Order: **1404532**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1404532-01	WCR-Soil01-040814	Soil		04/08/14 11:10	04/09/14 09:30	☐

ALS Group USA, Corp

Date: 17-Apr-14

Client: Weston Solutions, Inc
Project: Whiting Crude Release
WorkOrder: **1404532**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte is present at an estimated concentration between the MDL and Report Limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

Units Reported	Description
% of sample	Percent of Sample
lbs/ft3	Pounds per Cubic Foot
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group USA, Corp

Date: 17-Apr-14

Client: Weston Solutions, Inc
Project: Whiting Crude Release
Work Order: 1404532

Case Narrative

QC Comments:

Batch 57444, Method DRO_8015C_S, Sample 1404532-01A MS: The matrix spike recovery was outside of the control limit. However, the matrix spike duplicate recovery and the RPD between the MS and MSD were in control. No qualification is required.

ALS Group USA, Corp

Date: *17-Apr-14*

Client: Weston Solutions, Inc
Project: Whiting Crude Release
Sample ID: WCR-Soil01-040814
Collection Date: 04/08/14 11:10 AM

Work Order: 1404532
Lab ID: 1404532-01
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep: SW3541 / 4/11/14	Analyst: **IT**
DRO (C10-C28)	**1,100**		**49**	**mg/Kg-dry**	10	04/12/14 01:54 AM
ORO (C28-C40)	**670**		**49**	**mg/Kg-dry**	10	04/12/14 01:54 AM
Surr: 4-Terphenyl-d14	*93.6*		*39-115*	*%REC*	10	04/12/14 01:54 AM
GASOLINE RANGE ORGANICS BY GC-FID			**SW8015**		Prep: SW5035 / 4/11/14	Analyst: **IT**
GRO (C6-C10)	**57**		**3.0**	**mg/Kg-dry**	1	04/11/14 04:09 PM
Surr: Toluene-d8	*108*		*50-150*	*%REC*	1	04/11/14 04:09 PM
DENSITY - BULK			**D5057-90**			Analyst: **MB**
Density - Bulk, Dry	**68**			**lbs/ft3**	1	04/16/14 02:00 PM
Density - Bulk, Wet	**73**			**lbs/ft3**	1	04/16/14 02:00 PM
MOISTURE			**A2540 G**			Analyst: **AT**
Moisture	**16**		**0.050**	**% of sample**	1	04/10/14 02:36 PM
MOISTURE BY VOLUME			**A2540 G**			Analyst: **AT**
Moisture, by Volume	**8.1**			**% of sample**	1	04/14/14 06:02 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: 17-Apr-14

Client: Weston Solutions, Inc
Work Order: 1404532
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57444** Instrument ID **GC8** Method: **SW8015M**

MBLK Sample ID: **DBLKS1-57444-57444** Units: **mg/Kg** Analysis Date: **04/11/14 11:55 PM**

Client ID: Run ID: **GC8_140411A** SeqNo: **2710165** Prep Date: **04/11/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	ND	4.2								
ORO (C28-C40)	ND	4.2								
Surr: 4-Terphenyl-d14	*1.263*	0	*1.667*	0	*75.8*	*39-115*	0			

LCS Sample ID: **DLCSS1-57444-57444** Units: **mg/Kg** Analysis Date: **04/12/14 12:25 PM**

Client ID: Run ID: **GC8_140411A** SeqNo: **2710168** Prep Date: **04/11/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	157	4.2	166.7	0	94.2	49-124	0			
ORO (C28-C40)	161.3	4.2	166.7	0	96.8	60-130	0			
Surr: 4-Terphenyl-d14	*1.453*	0	*1.667*	0	*87.2*	*39-115*	0			

MS Sample ID: **1404532-01A MS** Units: **mg/Kg** Analysis Date: **04/12/14 12:54 PM**

Client ID: **WCR-Soil01-040814** Run ID: **GC8_140411A** SeqNo: **2710169** Prep Date: **04/11/14** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	1120	120	476.6	893	47.6	49-130	0			S
ORO (C28-C40)	969.5	120	476.6	561.7	85.6	60-130	0			
Surr: 4-Terphenyl-d14	*3.489*	0	*4.766*	0	*73.2*	*39-115*	0			

MSD Sample ID: **1404532-01A MSD** Units: **mg/Kg** Analysis Date: **04/12/14 01:24 AM**

Client ID: **WCR-Soil01-040814** Run ID: **GC8_140411A** SeqNo: **2710170** Prep Date: **04/11/14** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	1388	120	463.1	893	107	49-130	1120	21.4	30	
ORO (C28-C40)	1091	120	463.1	561.7	114	60-130	969.5	11.8	30	
Surr: 4-Terphenyl-d14	*3.603*	0	*4.631*	0	*77.8*	*39-115*	3.489	*3.21*	*30*	

The following samples were analyzed in this batch: 1404532-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404532
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57453** Instrument ID **GC9** Method: **SW8015**

MBLK Sample ID: **MBLK-57453-57453** Units: **µg/Kg** Analysis Date: **04/11/14 02:48 PM**

Client ID: Run ID: **GC9_140411A** SeqNo: **2708647** Prep Date: **04/11/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	ND	2,500								
Surr: Toluene-d8	*5222*	0	*5000*	0	*104*	*50-150*	0			

LCS Sample ID: **LCS-57453-57453** Units: **µg/Kg** Analysis Date: **04/11/14 02:21 PM**

Client ID: Run ID: **GC9_140411A** SeqNo: **2708645** Prep Date: **04/11/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	499100	2,500	500000	0	99.8	70-130	0			
Surr: Toluene-d8	*4442*	0	*5000*	0	*88.8*	*50-150*	0			

MS Sample ID: **1404555-22A MS** Units: **µg/Kg** Analysis Date: **04/11/14 09:41 PM**

Client ID: Run ID: **GC9_140411A** SeqNo: **2710400** Prep Date: **04/11/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	442600	2,500	500000	0	88.5	70-130	0			
Surr: Toluene-d8	*4364*	0	*5000*	0	*87.3*	*50-150*	0			

MSD Sample ID: **1404555-22A MSD** Units: **µg/Kg** Analysis Date: **04/11/14 10:07 PM**

Client ID: Run ID: **GC9_140411A** SeqNo: **2710401** Prep Date: **04/11/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	510000	2,500	500000	0	102	70-130	442600	14.2	30	
Surr: Toluene-d8	*5226*	0	*5000*	0	*105*	*50-150*	4364	*18*	*30*	

The following samples were analyzed in this batch: 1404532-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404532
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **R138766** Instrument ID **MOIST** Method: **A2540 G**

MBLK Sample ID: **WBLKS-R138766** Units: **% of sample** Analysis Date: **04/10/14 02:36 PM**

Client ID: Run ID: **MOIST_140410E** SeqNo: **2708414** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R138766** Units: **% of sample** Analysis Date: **04/10/14 02:36 PM**

Client ID: Run ID: **MOIST_140410E** SeqNo: **2708413** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	100	0.050	100	0	100	99.5-100.5	0			

DUP Sample ID: **1404513-03A DUP** Units: **% of sample** Analysis Date: **04/10/14 02:36 PM**

Client ID: Run ID: **MOIST_140410E** SeqNo: **2708395** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	12.61	0.050	0	0	0	0-0	13.14	4.12	20	

DUP Sample ID: **1404534-02B DUP** Units: **% of sample** Analysis Date: **04/10/14 02:36 PM**

Client ID: Run ID: **MOIST_140410E** SeqNo: **2708401** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	14.95	0.050	0	0	0	0-0	14.98	0.2	20	

The following samples were analyzed in this batch: 1404532-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404532
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **R138992** Instrument ID **WETCHEM** Method: **A2540 G**

DUP Sample ID: **1404532-01A DUP** Units: **% of sample** Analysis Date: **04/14/14 06:02 PM**

Client ID: **WCR-Soil01-040814** Run ID: **WETCHEM_140414R** SeqNo: **2714612** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture, by Volume	9.474	0	0	0	0		8.064	16.1	20	

The following samples were analyzed in this batch: 1404532-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

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Chain of Custody Form

Page 1 of 1

COC ID: 85375

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ALS Project Manager: TBB | ALS Work Order #: 1404532

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	WHITING CRUDE RELEASE	A	GRO, DRO, ORO
Work Order		Project Number		B	VOLUMETRIC MOISTURE
Company Name	Weston Solutions, Inc	Bill To Company	Weston Solutions, Inc	C	DRY BULK DENSITY
Send Report To	Lisa Graczyk	Invoice Attn	Lisa Graczyk	D	WET BULK DENSITY
Address	20 North Wacker Drive Suite 1210	Address	20 North Wacker Drive Suite 1210	E	
				F	
City/State/Zip	Chicago, IL 60606	City/State/Zip	Chicago, IL 60606	G	
Phone	(312) 424-3300	Phone	(312) 424-3300	H	
Fax	(312) 424-3330	Fax	(312) 424-3330	I	
e-Mail Address		e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	WCR-SOIL01-040814	4/8/14	11:10	SOIL	NONE	2	X	X	X	X							
2	NO ADDITIONAL																
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: JEFF BRYNIARSKI

Shipment Method: NA

Required Turnaround Time: (Check Box) ☒ Std 10 WK Days ☐ 5 WK Days ☐ 2 WK Days ☐ 24 Hour ☐ Other

Results Due Date:

Relinquished by:	Date: 4/8/14	Time: 12:17	Received by:
Relinquished by:	Date: 4/8/14	Time: 1600	Received by (Laboratory): FEDEX
Logged by (Laboratory): KR	Date: 4/9/14	Time: 1090	Checked by (Laboratory): TBB

Notes:

Cooler ID	Cooler Temp.
	24°C

QC Package: (Check One Box Below)
- ☒ Level II Std QC
- ☐ Level III Std QC/Raw Data
- ☐ Level IV SW846/CLP
- ☐ Other
- ☐ TRRP CheckList
- ☐ TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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From: (219) 405-5409
Pete Wesson
ALS Environmental
3352 128th Ave

HOLLAND, MI 49424

Origin ID: GRRA

FedEx Express

J14101402070326

Ship Date: 08APR14
ActWgt: 60.0 LB
CAD: 2264840/INET3490

Dims: 14 X 26 X 15 IN

Delivery Address Bar Code

Ref #
Invoice #
PO #
Dept #

SHIP TO: (616) 399-6070

BILL SENDER

Sample Receiving
ALS Environmental
3352 128TH AVE

HOLLAND, MI 49424

WED - 09 APR AA
STANDARD OVERNIGHT

TRK# 0201 7984 8398 9483

68 GRRA

49424
MI-US
GRR

522G1/78D9/F220

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.
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ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185

CUSTODY SEAL
Date: 4/8/14 Time: 1600
Name: [illegible]
Company: ALS

Seal Broken By:
Date:

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **WESTON - CHI** Date/Time Received: **09-Apr-14 09:30**

Work Order: **1404532** Received by: **KRW**

Checklist completed by Diane Shaw (eSignature) 10-Apr-14 (Date) Reviewed by: Tom Bramish (eSignature) 10-Apr-14 (Date)

Matrices: Soil

Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Sample(s) received on ice?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	2.4 c		
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	4/10/2014 2:18:34 PM		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:	-		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

WHITING REFINERY EMERGENCY RESPONSE
WHITING, LAKE COUNTY, ILLINOIS
DATA VALIDATION REPORT

Date: April 22, 2014
Laboratory: ALS Environmental (ALS), Holland, Michigan
Laboratory Project #: 1404532
Data Validation Performed By: Lisa Graczyk, Weston Solutions, Inc. (WESTON®) Superfund Technical Assessment and Response Team (START)
Weston Analytical Work Order #/TDD #: 20405.016.005.2311.77/ S05-0005-1403-009

This data validation report has been prepared by WESTON START under the START III Region V contract. This report documents the data validation for one soil sample collected for the Whiting Refinery Emergency Response Site that were analyzed for the following parameters and U.S. Environmental Protection Agency methods:

- Total Petroleum Hydrocarbons (TPH) as Oil Range Organics (ORO), Diesel Range Organics (DRO), and Oil Range Organics (ORO) by SW-846 Method 8015
- Dry Bulk Density and Wet Bulk Density by ASTM D5057-90
- Percent Moisture by Standard Method (SM) 2540
- Moisture by Volume by SM 2540

A level II data package was requested from ALS. The data validation was conducted in general accordance with the U.S. EPA "Contract Laboratory Program National Functional Guidance for Superfund Organic Methods Data Review" dated June 2008 and "Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review" dated January 2010. The Attachment contains the results summary sheets with the hand-written qualifiers applied during data validation.

Data Validation Report
Whiting Refinery Emergency Response Site
ALS Environmental
Laboratory Project #: 1404532

TPH AS ORO, DRO, AND ORO BY SW-846 METHOD 8015

1. Samples

The following table summarizes the samples for which this data validation is being conducted.

Samples	Lab ID	Matrix	Date Collected	Date Prepared	Date Analyzed
WCR-Soil01-040814	1404532-01	Soil	4/8/2014	4/11/2014	4/11/2014 – 4/12/2014

2. Holding Times

The samples were analyzed within holding times for TPH analyses.

3. Blanks

Method blanks were analyzed with the TPH analyses and were free of target compound contamination above the reporting limits.

4. Surrogate Results

The surrogate recoveries were within quality control (QC) limits.

5. Laboratory Control Sample (LCS) Results

The percent recoveries for the LCS results were within the laboratory-established QC limits.

6. Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Results

A site specific MS and MSD were analyzed. The percent recoveries and relative percent differences (RPD) were within QC limits except for as follows. For DRO, the MS recovery was 1.4 percent below the QC limit but the MSD was within QC limits. No qualification was applied for this minor discrepancy.

7. Overall Assessment

The TPH data are acceptable for use based on the information received.

GENERAL CHEMISTRY PARAMETERS (Dry Bulk Density and Wet Bulk Density by ASTM D5057-90, Percent Moisture by SM 2540, and Moisture by Volume by SM 2540)

1. Samples

The following table summarizes the samples for which this data validation is being conducted.

Samples	Lab ID	Matrix	Date Collected	Date Analyzed
WCR-Soil01-040814	1404532-01	Soil	4/8/2014	4/10/2014 – 4/16/2014

2. Holding Times

The samples were analyzed within an acceptable time frame.

3. Blank Results

A method blank was analyzed with the moisture analysis and moisture was not detected in the blank.

4. LCS Results

The LCS recoveries were within the laboratory-established QC limits.

5. Laboratory Duplicate Results

The laboratory duplicate RPDs were within QC limits.

6. Overall Assessment

The general chemistry data are acceptable for use based on the information received.

ATTACHMENT

ALS ENVIRONMENTAL
RESULTS SUMMARY

17-Apr-2014

Lisa Graczyk
Weston Solutions, Inc
20 North Wacker Drive
Suite 1210
Chicago, IL 60606

Re: **Whiting Crude Release** Work Order: **1404532**

Dear Lisa,

ALS Environmental received 1 sample on 09-Apr-2014 for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

Sample results are compliant with NELAP standard requirements and QC results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 12.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Electronically approved by: Tom Beamish

Tom Beamish
Senior Project Manager

Certificate No: MN 532786

ADDRESS 3352 128th Avenue Holland, Michigan 49424-9263 | PHONE (616) 399-6070 | FAX (616) 399-6185
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Environmental www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

ALS Group USA, Corp

Date: 17-Apr-14

Client: Weston Solutions, Inc
Project: Whiting Crude Release
Work Order: **1404532**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1404532-01	WCR-Soil01-040814	Soil		04/08/14 11:10	04/09/14 09:30	☐

ALS Group USA, Corp

Date: 17-Apr-14

Client: Weston Solutions, Inc
Project: Whiting Crude Release
WorkOrder: **1404532**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte is present at an estimated concentration between the MDL and Report Limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

Units Reported	Description
% of sample	Percent of Sample
lbs/ft3	Pounds per Cubic Foot
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group USA, Corp

Date: 17-Apr-14

Client: Weston Solutions, Inc
Project: Whiting Crude Release
Work Order: 1404532

Case Narrative

QC Comments:

Batch 57444, Method DRO_8015C_S, Sample 1404532-01A MS: The matrix spike recovery was outside of the control limit. However, the matrix spike duplicate recovery and the RPD between the MS and MSD were in control. No qualification is required.

ALS Group USA, Corp

Date: *17-Apr-14*

Client: Weston Solutions, Inc
Project: Whiting Crude Release
Sample ID: WCR-Soil01-040814
Collection Date: 04/08/14 11:10 AM

Work Order: 1404532
Lab ID: 1404532-01
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015M**		Prep: SW3541 / 4/11/14	Analyst: **IT**
DRO (C10-C28)	**1,100**		**49**	**mg/Kg-dry**	10	04/12/14 01:54 AM
ORO (C28-C40)	**670**		**49**	**mg/Kg-dry**	10	04/12/14 01:54 AM
Surr: 4-Terphenyl-d14	*93.6*		*39-115*	*%REC*	10	04/12/14 01:54 AM
GASOLINE RANGE ORGANICS BY GC-FID			**SW8015**		Prep: SW5035 / 4/11/14	Analyst: **IT**
GRO (C6-C10)	**57**		**3.0**	**mg/Kg-dry**	1	04/11/14 04:09 PM
Surr: Toluene-d8	*108*		*50-150*	*%REC*	1	04/11/14 04:09 PM
DENSITY - BULK			**D5057-90**			Analyst: **MB**
Density - Bulk, Dry	**68**			**lbs/ft3**	1	04/16/14 02:00 PM
Density - Bulk, Wet	**73**			**lbs/ft3**	1	04/16/14 02:00 PM
MOISTURE			**A2540 G**			Analyst: **AT**
Moisture	**16**		**0.050**	**% of sample**	1	04/10/14 02:36 PM
MOISTURE BY VOLUME			**A2540 G**			Analyst: **AT**
Moisture, by Volume	**8.1**			**% of sample**	1	04/14/14 06:02 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: 17-Apr-14

Client: Weston Solutions, Inc
Work Order: 1404532
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57444** Instrument ID **GC8** Method: **SW8015M**

MBLK Sample ID: **DBLKS1-57444-57444** Units: **mg/Kg** Analysis Date: **04/11/14 11:55 PM**

Client ID: Run ID: **GC8_140411A** SeqNo: **2710165** Prep Date: **04/11/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	ND	4.2								
ORO (C28-C40)	ND	4.2								
Surr: 4-Terphenyl-d14	*1.263*	0	*1.667*	0	*75.8*	*39-115*	0			

LCS Sample ID: **DLCSS1-57444-57444** Units: **mg/Kg** Analysis Date: **04/12/14 12:25 PM**

Client ID: Run ID: **GC8_140411A** SeqNo: **2710168** Prep Date: **04/11/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	157	4.2	166.7	0	94.2	49-124	0			
ORO (C28-C40)	161.3	4.2	166.7	0	96.8	60-130	0			
Surr: 4-Terphenyl-d14	*1.453*	0	*1.667*	0	*87.2*	*39-115*	0			

MS Sample ID: **1404532-01A MS** Units: **mg/Kg** Analysis Date: **04/12/14 12:54 PM**

Client ID: **WCR-Soil01-040814** Run ID: **GC8_140411A** SeqNo: **2710169** Prep Date: **04/11/14** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	1120	120	476.6	893	47.6	49-130	0			S
ORO (C28-C40)	969.5	120	476.6	561.7	85.6	60-130	0			
Surr: 4-Terphenyl-d14	*3.489*	0	*4.766*	0	*73.2*	*39-115*	0			

MSD Sample ID: **1404532-01A MSD** Units: **mg/Kg** Analysis Date: **04/12/14 01:24 AM**

Client ID: **WCR-Soil01-040814** Run ID: **GC8_140411A** SeqNo: **2710170** Prep Date: **04/11/14** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	1388	120	463.1	893	107	49-130	1120	21.4	30	
ORO (C28-C40)	1091	120	463.1	561.7	114	60-130	969.5	11.8	30	
Surr: 4-Terphenyl-d14	*3.603*	0	*4.631*	0	*77.8*	*39-115*	3.489	*3.21*	*30*	

The following samples were analyzed in this batch: 1404532-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404532
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57453** Instrument ID **GC9** Method: **SW8015**

MBLK Sample ID: **MBLK-57453-57453** Units: **µg/Kg** Analysis Date: **04/11/14 02:48 PM**

Client ID: Run ID: **GC9_140411A** SeqNo: **2708647** Prep Date: **04/11/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	ND	2,500								
Surr: Toluene-d8	*5222*	0	*5000*	0	*104*	*50-150*	0			

LCS Sample ID: **LCS-57453-57453** Units: **µg/Kg** Analysis Date: **04/11/14 02:21 PM**

Client ID: Run ID: **GC9_140411A** SeqNo: **2708645** Prep Date: **04/11/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	499100	2,500	500000	0	99.8	70-130	0			
Surr: Toluene-d8	*4442*	0	*5000*	0	*88.8*	*50-150*	0			

MS Sample ID: **1404555-22A MS** Units: **µg/Kg** Analysis Date: **04/11/14 09:41 PM**

Client ID: Run ID: **GC9_140411A** SeqNo: **2710400** Prep Date: **04/11/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	442600	2,500	500000	0	88.5	70-130	0			
Surr: Toluene-d8	*4364*	0	*5000*	0	*87.3*	*50-150*	0			

MSD Sample ID: **1404555-22A MSD** Units: **µg/Kg** Analysis Date: **04/11/14 10:07 PM**

Client ID: Run ID: **GC9_140411A** SeqNo: **2710401** Prep Date: **04/11/14** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	510000	2,500	500000	0	102	70-130	442600	14.2	30	
Surr: Toluene-d8	*5226*	0	*5000*	0	*105*	*50-150*	4364	*18*	*30*	

The following samples were analyzed in this batch: 1404532-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404532
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **R138766** Instrument ID **MOIST** Method: **A2540 G**

MBLK Sample ID: **WBLKS-R138766** Units: **% of sample** Analysis Date: **04/10/14 02:36 PM**

Client ID: Run ID: **MOIST_140410E** SeqNo: **2708414** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.050								

LCS Sample ID: **LCS-R138766** Units: **% of sample** Analysis Date: **04/10/14 02:36 PM**

Client ID: Run ID: **MOIST_140410E** SeqNo: **2708413** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	100	0.050	100	0	100	99.5-100.5	0			

DUP Sample ID: **1404513-03A DUP** Units: **% of sample** Analysis Date: **04/10/14 02:36 PM**

Client ID: Run ID: **MOIST_140410E** SeqNo: **2708395** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	12.61	0.050	0	0	0	0-0	13.14	4.12	20	

DUP Sample ID: **1404534-02B DUP** Units: **% of sample** Analysis Date: **04/10/14 02:36 PM**

Client ID: Run ID: **MOIST_140410E** SeqNo: **2708401** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	14.95	0.050	0	0	0	0-0	14.98	0.2	20	

The following samples were analyzed in this batch: 1404532-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404532
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **R138992** Instrument ID **WETCHEM** Method: **A2540 G**

DUP Sample ID: **1404532-01A DUP** Units: **% of sample** Analysis Date: **04/14/14 06:02 PM**

Client ID: **WCR-Soil01-040814** Run ID: **WETCHEM_140414R** SeqNo: **2714612** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture, by Volume	9.474	0	0	0	0		8.064	16.1	20	

The following samples were analyzed in this batch: 1404532-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

ALS Environmental

Cincinnati, OH +1 513 733 5336 | Fort Collins, CO +1 970 490 1511 | Everett, WA +1 425 356 2600 | Holland, MI +1 616 399 6070

Chain of Custody Form

Page 1 of 1

COC ID: 85375

Houston, TX +1 281 530 5656 | Spring City, PA +1 610 948 4903 | South Charleston, WV +1 304 356 3168 | Middletown, PA +1 717 944 5541 | Salt Lake City, UT +1 801 266 7700 | York, PA +1 717 505 5280

ALS Project Manager: TBB | ALS Work Order #: 1404532

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	WHITING CRUDE RELEASE	A	GRO, DRO, ORO
Work Order		Project Number		B	VOLUMETRIC MOISTURE
Company Name	Weston Solutions, Inc	Bill To Company	Weston Solutions, Inc	C	DRY BULK DENSITY
Send Report To	Lisa Graczyk	Invoice Attn	Lisa Graczyk	D	WET BULK DENSITY
Address	20 North Wacker Drive Suite 1210	Address	20 North Wacker Drive Suite 1210	E	
				F	
City/State/Zip	Chicago, IL 60606	City/State/Zip	Chicago, IL 60606	G	
Phone	(312) 424-3300	Phone	(312) 424-3300	H	
Fax	(312) 424-3330	Fax	(312) 424-3330	I	
e-Mail Address		e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	WCR-SOIL01-040814	4/8/14	11:10	SOIL	NONE	2	X	X	X	X							
2	NO ADDITIONAL																
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: JEFF BRYNIARSKI

Shipment Method: NA

Required Turnaround Time: (Check Box) ☒ Std 10 WK Days ☐ 5 WK Days ☐ 2 WK Days ☐ 24 Hour ☐ Other

Results Due Date:

Relinquished by:	Date: 4/8/14	Time: 12:17	Received by:
Relinquished by:	Date: 4/8/14	Time: 1600	Received by (Laboratory): FEDEX
Logged by (Laboratory): KR	Date: 4/9/14	Time: 1090	Checked by (Laboratory): TBB

Notes:

Cooler ID	Cooler Temp.
	24°C

QC Package: (Check One Box Below)
- ☒ Level II Std QC
- ☐ Level III Std QC/Raw Data
- ☐ Level IV SW846/CLP
- ☐ Other
- ☐ TRRP CheckList
- ☐ TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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From: (219) 405-5409
Pete Wesson
ALS Environmental
3352 128th Ave

HOLLAND, MI 49424

Origin ID: GRRA

FedEx Express

J14101402070326

Ship Date: 08APR14
ActWgt: 60.0 LB
CAD: 2264840/INET3490

Dims: 14 X 26 X 15 IN

Delivery Address Bar Code

Ref #
Invoice #
PO #
Dept #

SHIP TO: (616) 399-6070

BILL SENDER

Sample Receiving
ALS Environmental
3352 128TH AVE

HOLLAND, MI 49424

WED - 09 APR AA
STANDARD OVERNIGHT

TRK# 0201 7984 8398 9483

68 GRRA

49424
MI-US
GRR

522G1/78D9/F220

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.
Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185

CUSTODY SEAL
Date: 4/8/14 Time: 1600
Name: [illegible]
Company: ALS

Seal Broken By:
Date:

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **WESTON - CHI** Date/Time Received: **09-Apr-14 09:30**

Work Order: **1404532** Received by: **KRW**

Checklist completed by Diane Shaw (eSignature) 10-Apr-14 (Date) Reviewed by: Tom Bramish (eSignature) 10-Apr-14 (Date)

Matrices: Soil

Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Sample(s) received on ice?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	2.4 c		
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	4/10/2014 2:18:34 PM		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:	-		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

Oil Sample Analysis Report

Marine Safety Unit Chicago
Case / Activity Number 4822897

Marine Safety Laboratory
Case Number 14-133

U.S. Department of
Homeland Security

**United States
Coast Guard**

Manager
U.S. Coast Guard
Marine Safety Laboratory

1 Chelsea Street
New London, CT 06320
Phone: (860) 271-2704
Fax: (860) 271-2641

16450
09 Apr 2014

MEMORANDUM

From: K. Juaire
CG MSL

To: CG MSU Chicago

Subj: OIL SAMPLE ANALYSIS REPORT, MSL CASE NUMBER 14-133
UNIT CASE / ACTIVITY NUMBER 4822897

1. The laboratory analysis of this case has been completed and our report is forwarded. The technical data supporting the report (spectrograms and chromatograms) have been archived at our facility and are available upon request. We will maintain the oil samples in refrigerated storage pending final case disposition.

2. Questions concerning this report or the analytical methods used should be directed to the Supervisor of Analysis, Kristy Juaire.

#

Enclosure: (1) MSL Report 14-133

United States Coast Guard
Marine Safety Laboratory
Oil Sample Analysis Report
14-133

Requestor: Marine Safety Unit Chicago
Unit Case/Activity Number: 4822897
Received: 07-Apr-14 **Via:** Federal Express 7984 3038 8189

Number Of Samples: 5
Lab NO. of Spills: 1, 2, 3, and 4
Lab NO. of Suspects: 5
Lab NO. of Background: n/a

Analysis Methods:

- [x] GAS CHROMATOGRAPHY (GC)
- [x] GAS CHROMATOGRAPHY-MASS SPECTROMETRY (GC-MS)
- [ ] INFRARED SPECTROSCOPY (IR)

Laboratory's Conclusion (as explained below): MATCH

RESULTS:

1. Samples 14-133-1, 2, 3, and 4 were specified to be representative of spilled oil. Analysis indicates:
   A. Sample 14-133-1 contains moderately degraded heavy petroleum oil.
   B. Sample 14-133-2 contains petroleum oil hydrocarbons. The quantity is not sufficient for conclusive identification or comparison purposes based on the analysis conducted.
   C. Sample 14-133-3 contains heavy petroleum oil. This sample contains non-petroleum contamination that is overlapping important diagnostic ratios. As such, sample 14-133-3 is not useful for conclusive comparison purposes based on the analysis conducted.
   D. Sample 14-133-4 contains moderately to severely degraded heavy petroleum oil. The combination of the noted degradation and a significant amount of non-petroleum contamination preclude the use of this sample for comparison purposes based on the analysis conducted.

2. Suspected source sample 14-133-5 contains heavy petroleum oil with characteristics similar to those of spill sample 14-133-1. Differences are attributable to weathering of spilled oil.

CONCLUSIONS:

1. Suspected source sample 14-133-5 and spill sample 14-133-1 are derived from a common source of petroleum oil.

2. Samples 14-133-2, 3, and 4 are not useful for correlation analysis for reasons stated above.

SUPERVISOR OF ANALYSIS K. JUAIRE **DATE** 09-Apr-14

United States Coast Guard
Marine Safety Laboratory

Oil Spill Identification Analysis
Cost Recovery Documentation

Laboratory Case Number:	14-133
Requestor:	Marine Safety Unit Chicago
Unit Case/Activity Number:	4822897
Number of Samples:	7
Cost Per Sample Prepared:	$20.00
Total Costs of Sample Preparation:	$140.00
Number of Analyses:	16
Cost Per Sample Analyzed:	$86.00
Total Costs for Analysis:	$1,376.00
TOTAL COSTS:	$1,516.00

This documentation is provided for purposes of Phase IV - Documentation and Cost Recovery under the National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR Part 300)

Signature: _____ **Date:** 09 Apr 14

United States Coast Guard
Marine Safety Laboratory Sample
Check-In Log

MSL Case/Activity Number: 14-133

Requestor: Marine Safety Unit Chicago **Unit Case Number** 4822897

Federal Project Number: E14512 **Delivery Method:** Federal Express

Received Date: 07 Apr 14 **Delivery Number:** 7984 3038 8189

Priority: No **Rush:** No **Comparison** No

Lab Number 14-133	Sample Descriptions from Sample Jars	Spill	Source
1	4822897-008-JVT WEATHERED OIL FROM SHORELINE SEGMENT F 3/31/14	☑	☐
2	4822897-009-JVT SEGMENT OF OILED HARD BOOM 1 3/31/14	☑	☐
3	4822897-010-JVT SEGMENT OF OILED HARD BOOM 2 3/31/14	☑	☐
4	4822897-011-JVT SEGMENT OF OILED ABSORBENT BOOM 3/31/14	☑	☐
5	4822897-007-JVT #6 SEPERATOR SAMPLE 3/27/14	☐	☑
6		☐	☐
7		☐	☐
8		☐	☐
9		☐	☐
10		☐	☐

Remarks:

Samples checked in by: MST1 JOSHUA OROURKE **Date:** 07 Apr 14

Sample Custodian: MST1 ALEXANDER SHUNDA **Date:** 09APR14

Supervisor of Analysis: K. JUAIRE **Date:** 09APR14