03-Dec-2018

Tim Sullivan  
U.S. Steel - Gary Works  
1 North Broadway  
Mail Station 70  
Gary, IN  46402

Re:  **USS-Midwest Foaming Response**  
Work Order:  **18111844**

Dear Tim,

ALS Environmental received 1 sample on 30-Nov-2018 for the analyses presented in the following report. The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control 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 11.

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

ADDRESS: 3352 128th Avenue, Holland, MI, USA  
PHONE: +1 (616) 399-6070  FAX: +1 (616) 399-6185

Sincerely,

Amanda Grzybowski  
Electronically approved by: Amanda Grzybowski

Amanda Grzybowski  
Project Manager

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Report of Laboratory Analysis  
Certificate No: IN: C-MI-08  
ALS GROUP USA, CORP  Part of the ALS Laboratory Group  A Campbell Brothers Limited Company
**Work Order Sample Summary**

<table>
<thead>
<tr>
<th>Lab Samp ID</th>
<th>Client Sample ID</th>
<th>Matrix</th>
<th>Tag Number</th>
<th>Collection Date</th>
<th>Date Received</th>
<th>Hold</th>
</tr>
</thead>
<tbody>
<tr>
<td>18111844-01</td>
<td>Outfall 004 with Foaming</td>
<td>Aqueous</td>
<td></td>
<td>11/29/2018 12:35</td>
<td>11/30/2018 08:30</td>
<td></td>
</tr>
</tbody>
</table>
Batch R250367, Method GCFID_8015_W, Sample 18111844-01B: No diesel range organic compounds apparent in sample chromatograph.
### Analyses

<table>
<thead>
<tr>
<th>Analyses</th>
<th>Result</th>
<th>Qual</th>
<th>MDL</th>
<th>Report Limit</th>
<th>Units</th>
<th>Dilution Factor</th>
<th>Date Analyzed</th>
<th>Analyst</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ORGANIC COMPOUNDS BY GC-FID</strong></td>
<td>SW8015M</td>
<td></td>
<td>0</td>
<td>mg/L</td>
<td>1</td>
<td>11/30/2018</td>
<td></td>
<td>RP</td>
</tr>
<tr>
<td>Fingerprint</td>
<td>Complete</td>
<td></td>
<td>0</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ANIONIC SURFACTANTS AS MBAS</strong></td>
<td>A5540C-11</td>
<td></td>
<td>0.12</td>
<td>0.40 mg MBAS/L</td>
<td>1</td>
<td>11/30/2018 10:00</td>
<td></td>
<td>JSH</td>
</tr>
<tr>
<td>Anionic Surfactants as MBAS</td>
<td>U</td>
<td></td>
<td>0.12</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>OIL AND GREASE</strong></td>
<td>E1664A</td>
<td></td>
<td>2.5</td>
<td>5.0 mg/L</td>
<td>1</td>
<td>11/30/2018 10:30</td>
<td></td>
<td>BTG</td>
</tr>
<tr>
<td>Oil and Grease</td>
<td></td>
<td>J</td>
<td>0.97</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** See Qualifiers page for a list of qualifiers and their definitions.
### Compound List

**System Monitoring Compounds**

1. S  Nitrobenzene-d5  0.000  0  N.D.  ug/mL
2. S  2-Fluorobiphenyl   0.000  0  N.D.  ug/mL
3. S  2,4,6-Tribromophenol  0.000  0  N.D.  ug/mL
4. S  4-Terphenyl-d14    0.000  0  N.D.  ug/mL

**Spiked Amount** 50.000  Recovery = 0.00%

**Target Compounds**

5. H  DRO (C10-C20)   0.000  0  N.D.  ug/mL
6. H  ORO (C20-C34)   0.000  0  N.D.  ug/mL
7. H  DRO (C10-C28)   0.000  0  N.D.  ug/mL
8. H  ORO (C28-C40)   0.000  0  N.D.  ug/mL
9. H  ORO (C20-C40)   0.000  0  N.D.  ug/mL
10. H  ORO (C28-C35)  0.000  0  N.D.  ug/mL
11. H  ERO (C10-C36)  0.000  0  N.D.  ug/mL
12. H  ERO (C8-C36)   0.000  0  N.D.  ug/mL
13. H  DRO (C9-C20)   0.000  0  N.D.  ug/mL
14. H  ERO (C8-C40)   0.000  0  N.D.  ug/mL
15. H  DIESEL (IOWA)  0.000  0  N.D.  ug/mL
16. H  OIL (IOWA)     0.000  0  N.D.  ug/mL

*(f)=RT Delta > 1/2 Window  (m)=manual int.*
### Client:
U.S. Steel - Gary Works

### Project:
USS-Midwest Foaming Response

### WorkOrder:
18111844

---

<table>
<thead>
<tr>
<th>Qualifier</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>*</td>
<td>Value exceeds Regulatory Limit</td>
</tr>
<tr>
<td>**</td>
<td>Estimated Value</td>
</tr>
<tr>
<td>a</td>
<td>Analyte is non-accredited</td>
</tr>
<tr>
<td>B</td>
<td>Analyte detected in the associated Method Blank above the Reporting Limit</td>
</tr>
<tr>
<td>E</td>
<td>Value above quantitation range</td>
</tr>
<tr>
<td>H</td>
<td>Analyzed outside of Holding Time</td>
</tr>
<tr>
<td>Hr</td>
<td>BOD/CBOD - Sample was reset outside Hold Time, value should be considered estimated.</td>
</tr>
<tr>
<td>J</td>
<td>Analyte is present at an estimated concentration between the MDL and Report Limit</td>
</tr>
<tr>
<td>ND</td>
<td>Not Detected at the Reporting Limit</td>
</tr>
<tr>
<td>O</td>
<td>Sample amount is &gt; 4 times amount spiked</td>
</tr>
<tr>
<td>P</td>
<td>Dual Column results percent difference &gt; 40%</td>
</tr>
<tr>
<td>R</td>
<td>RPD above laboratory control limit</td>
</tr>
<tr>
<td>S</td>
<td>Spike Recovery outside laboratory control limits</td>
</tr>
<tr>
<td>U</td>
<td>Analyzed but not detected above the MDL</td>
</tr>
<tr>
<td>X</td>
<td>Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.</td>
</tr>
</tbody>
</table>

### 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

<table>
<thead>
<tr>
<th>Description</th>
<th>Units Reported</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milligrams Methylene Blue Active Substances per Liter</td>
<td>mg MBAS/L</td>
</tr>
<tr>
<td>Milligrams per Liter</td>
<td>mg/L</td>
</tr>
<tr>
<td>Batch ID: R250292</td>
<td>Instrument ID: WETCHEM</td>
</tr>
<tr>
<td>-------------------</td>
<td>------------------------</td>
</tr>
</tbody>
</table>

### QC BATCH REPORT

**Batch ID:** R250292  
**Instrument ID:** WETCHEM  
**Method:** A5540C-11

<table>
<thead>
<tr>
<th>Analyte</th>
<th>Result</th>
<th>PQL</th>
<th>SPK Val</th>
<th>SPK Ref Value</th>
<th>%REC</th>
<th>Control Limit</th>
<th>RPD Ref Value</th>
<th>%RPD</th>
<th>RPD Limit</th>
<th>Qual</th>
</tr>
</thead>
</table>

#### MBLK
- **Sample ID:** MBLK-R250292  
- Units: mg MBAS/L  
- **Analysis Date:** 11/30/2018 10:00 AM

- Anionic Surfactants as MBAS  
  - Result: 0.40

#### LCS
- **Sample ID:** LCS-R250292  
- Units: mg MBAS/L  
- **Analysis Date:** 11/30/2018 10:00 AM

- Anionic Surfactants as MBAS  
  - Result: 0.40

#### DUP
- **Sample ID:** 18111815-01B DUP  
- Units: mg MBAS/L  
- **Analysis Date:** 11/30/2018 10:00 AM

- Anionic Surfactants as MBAS  
  - Result: 0.40

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

The following samples were analyzed in this batch:

- 18111844-01A
**QC BATCH REPORT**

**Batch ID:** R250344  **Instrument ID:** O&G  **Method:** E1664A

### MBLK

- **Sample ID:** MBLK-R250344
- **Units:** mg/L
- **Analysis Date:** 11/30/2018 10:30 AM
- **Run ID:** O&G_181130A
- **Client ID:**
- **Prep Date:**
- **DF:** 1

<table>
<thead>
<tr>
<th>Analyte</th>
<th>Result</th>
<th>PQL</th>
<th>SPK Val</th>
<th>%REC</th>
<th>Control Limit</th>
<th>RPD Ref Value</th>
<th>%RPD</th>
<th>RPD Limit</th>
<th>Qual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil and Grease</td>
<td>2</td>
<td>5.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>J</td>
</tr>
</tbody>
</table>

### LCS

- **Sample ID:** LCS-R250344
- **Units:** mg/L
- **Analysis Date:** 11/30/2018 10:30 AM
- **Run ID:** O&G_181130A
- **Client ID:**
- **Prep Date:**
- **DF:** 1

<table>
<thead>
<tr>
<th>Analyte</th>
<th>Result</th>
<th>PQL</th>
<th>SPK Val</th>
<th>%REC</th>
<th>Control Limit</th>
<th>RPD Ref Value</th>
<th>%RPD</th>
<th>RPD Limit</th>
<th>Qual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil and Grease</td>
<td>35.4</td>
<td>5.0</td>
<td>40</td>
<td>0</td>
<td>88.5</td>
<td>78-114</td>
<td>0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### MS

- **Sample ID:** 18111576-01C MS
- **Units:** mg/L
- **Analysis Date:** 11/30/2018 10:30 AM
- **Run ID:** O&G_181130A
- **Client ID:**
- **Prep Date:**
- **DF:** 1

<table>
<thead>
<tr>
<th>Analyte</th>
<th>Result</th>
<th>PQL</th>
<th>SPK Val</th>
<th>%REC</th>
<th>Control Limit</th>
<th>RPD Ref Value</th>
<th>%RPD</th>
<th>RPD Limit</th>
<th>Qual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil and Grease</td>
<td>39.88</td>
<td>5.0</td>
<td>40</td>
<td>1.124</td>
<td>96.9</td>
<td>78-114</td>
<td>0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### DUP

- **Sample ID:** 18111576-02C DUP
- **Units:** mg/L
- **Analysis Date:** 11/30/2018 10:30 AM
- **Run ID:** O&G_181130A
- **Client ID:**
- **Prep Date:**
- **DF:** 1

<table>
<thead>
<tr>
<th>Analyte</th>
<th>Result</th>
<th>PQL</th>
<th>SPK Val</th>
<th>%REC</th>
<th>Control Limit</th>
<th>RPD Ref Value</th>
<th>%RPD</th>
<th>RPD Limit</th>
<th>Qual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil and Grease</td>
<td>0</td>
<td>5.0</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td>0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The following samples were analyzed in this batch: 18111844-01A

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**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.
**Chain of Custody Form**

**COC ID:** 29108

**ALS Project Manager:** [Name]

**ALS Work Order #:** 1811849

| No. | Sample Description    | Date   | Time  | Matrix | Pres. | # Bottles | A | B | C | D | E | F | G | H | I | J | Hold |
|-----|----------------------|--------|-------|--------|-------|-----------|---|---|---|---|---|---|---|---|---|-----|
| 1   | Outfall COH w/foaming| 11-29-18| 12:35 | AQ     | 1     | X         | X | X |   |   |   |   |   |   |   |   |

**Sample(s) Please Print Signature:**

**Shipment Method:**

**Turnaround Time in Business Days (BD):** 10 BD

**Results Due Date:** ASAP

**Notes:**

- **Upstream COH DO:** 9.8 @ 1235, 11-29-18
- **Outfall COH DO:** 10.2 @ 1235, 11-29-18
- **Artificial Inlet DO:** 11.5 @ 1245, 11-29-18

**Preservative Key:**

- 1-HCl
- 2-HNO3
- 3-H2SO4
- 4-NaOH
- 5-Na2S2O3
- 6-NaHSO4
- 7-Other
- 8-4°C
- 9-5035

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**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.

*Copyright 2012 by ALS Environmental.*
**Sample Receipt Checklist**

**Client Name:** USS-GARY  
**Work Order:** 18111844  
**Date/Time Received:** 30-Nov-18 00:00  
**Received by:** DS

**Checklist completed by:** Diane Shaw  
**Reviewed by:** Amanda Grybowski

<table>
<thead>
<tr>
<th>Matrices:</th>
<th>Aqueous</th>
<th></th>
<th>Matrices:</th>
<th>Aqueous</th>
<th></th>
<th>Matrices:</th>
<th>Aqueous</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Carrier name:</td>
<td>ALSHN</td>
<td></td>
<td>Carrier name:</td>
<td>ALSHN</td>
<td></td>
<td>Carrier name:</td>
<td>ALSHN</td>
<td></td>
</tr>
</tbody>
</table>

- **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):**  
  - 4.0/4.0 °C  
  - SR2

- **Cooler(s)/Kit(s):**

- **Date/Time sample(s) sent to storage:**  
  - 11/30/2018 8:37:29 AM

- **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:**

SRC Page 1 of 1