Mosier Unit Train Derailment
Mosier, OR
Preliminary Summary of Air Monitoring Results
June 4, 2016

Prepared by
Center for Toxicology and Environmental Health, L.L.C. (CTEH®)
On Behalf of UPRR
Introduction

On June 3, 2016, Center for Toxicology and Environmental Health, LLC (CTEH®) was contacted by Union Pacific Railroad (UPRR) to initiate real-time air monitoring and analytical air sampling in support of activities following a train derailment in Mosier, OR. This submittal summarizes real-time air monitoring data recorded on CTEH® instrumentation between June 3, 2016 21:12 and June 4, 2016 07:00.

Real-time Air Monitoring

CTEH® initiated real-time air monitoring efforts in the Community and Exclusion Zone at 21:12 on June 3, 2016. Manually-logged, real-time air monitoring was conducted for benzene, carbon monoxide, hydrogen sulfide (H₂S), hexane, oxygen (O₂), particulate matter (PM2.5 and PM10), xylene, toluene, atmospheric flammability as a percent of the lower explosive limit (%LEL), and total volatile organic compounds (VOCs) using handheld instruments such as the RAESystems® MultiRAE Plus photoionization detectors (PIDs; 10.6 eV) and electrochemical sensors, RAESystems® UltraRAE 3000 with a benzene-specific SEP tube, Gastec® pumps with chemical-specific colorimetric tubes, and SidePak™ Personal Aerosol Monitors AM510. All instrumentation was calibrated at least once per day or per manufacturer’s recommendations. Table 1 summarizes air monitoring data for manually-logged real-time readings in the Community and Exclusion Zone. Maps including the site location and real-time monitoring locations are included in Appendix A.

<table>
<thead>
<tr>
<th>Location</th>
<th>Analyte</th>
<th>Instrument</th>
<th>Number of Readings</th>
<th>Number of Detections</th>
<th>Concentration Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community</td>
<td>Benzene</td>
<td>UltraRAE 3000</td>
<td>13</td>
<td>0</td>
<td>&lt; 0.05 ppm</td>
</tr>
<tr>
<td></td>
<td>CO</td>
<td>MultiRAE Plus</td>
<td>16</td>
<td>0</td>
<td>&lt; 1.0 ppm</td>
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<tr>
<td></td>
<td>H₂S</td>
<td>MultiRAE Plus</td>
<td>17</td>
<td>0</td>
<td>&lt; 1.0 ppm</td>
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<tr>
<td></td>
<td>%LEL</td>
<td>MultiRAE Plus</td>
<td>15</td>
<td>0</td>
<td>&lt; 1.0 %</td>
</tr>
<tr>
<td></td>
<td>PM10</td>
<td>AM510</td>
<td>4</td>
<td>4</td>
<td>0.007 – 0.019 mg/m³</td>
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<tr>
<td></td>
<td>VOCs</td>
<td>MultiRAE Plus</td>
<td>18</td>
<td>0</td>
<td>&lt; 0.1 ppm</td>
</tr>
<tr>
<td>Exclusion Zone</td>
<td>Benzene</td>
<td>UltraRAE 3000</td>
<td>13</td>
<td>5</td>
<td>0.05 – 6.6 ppm</td>
</tr>
<tr>
<td></td>
<td>CO</td>
<td>MultiRAE Plus</td>
<td>11</td>
<td>0</td>
<td>&lt; 1.0 ppm</td>
</tr>
<tr>
<td></td>
<td>H₂S</td>
<td>MultiRAE Plus</td>
<td>10</td>
<td>0</td>
<td>&lt; 1.0 ppm</td>
</tr>
<tr>
<td></td>
<td>Hexane</td>
<td>Gastec Tube 102L</td>
<td>2</td>
<td>1</td>
<td>50 ppm</td>
</tr>
<tr>
<td></td>
<td>%LEL</td>
<td>MultiRAE Plus</td>
<td>11</td>
<td>0</td>
<td>&lt; 1.0 %</td>
</tr>
<tr>
<td></td>
<td>O₂</td>
<td>MultiRAE Plus</td>
<td>3</td>
<td>3</td>
<td>20.9 %</td>
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<tr>
<td></td>
<td>PM2.5</td>
<td>AM510</td>
<td>5</td>
<td>5</td>
<td>0.02 – 0.35 mg/m³</td>
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<tr>
<td></td>
<td>Toluene</td>
<td>Gastec Tube 122L</td>
<td>2</td>
<td>0</td>
<td>&lt; 0.5 ppm</td>
</tr>
<tr>
<td></td>
<td>VOC</td>
<td>MultiRAE Plus</td>
<td>12</td>
<td>3</td>
<td>1.80 – 55.00 ppm</td>
</tr>
<tr>
<td></td>
<td>Xylene</td>
<td>Gastec Tube 123</td>
<td>1</td>
<td>0</td>
<td>&lt; 1.0 ppm</td>
</tr>
</tbody>
</table>

1 Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.
2 If detections were not observed, analyte concentration is shown as less than the instrument detection limit.
Appendix A:

Incident Maps
Manually-Logged Real-time Readings - Benzene Detections

June 3, 2016 21:12 - June 4, 2016 07:00

Legend:

- Incident Site
- Benzene > 0.05 ppm
- UPRR Rail

PROJECTION SYSTEM: Transverse Mercator  
DATUM: North American 1983
Manually-Logged Real-time Readings - Hexane Detections
June 3, 2016 21:12 - June 4, 2016 07:00

Legend
- Incident Site
- Hexane = 50 ppm
- UPRR Rail

PROJECTION SYSTEM: DATUM: WGS 1984
LAST UPDATED: 6/7/2016 3:09:38 PM
Manually-Logged Real-time Readings - PM2.5 Detections

June 3, 2016 21:12 - June 4, 2016 07:00

Legend
- Incident Site
- PM2.5 < 0.351 mg/m³
- UPRR Rail

PROJECTION SYSTEM: DATUM: WGS 1984
LAST UPDATED: 6/7/2016 3:05:02 PM

Project: 108171
Client: UPRR
City: Mosier, OR
County: Wasco

PROJECTION SYSTEM: DATUM: WGS 1984
LAST UPDATED: 6/7/2016 3:05:02 PM
Manually-Logged Real-time Readings - PM10 Detections
June 3, 2016 21:12 - June 4, 2016 07:00

Legend
- Incident Site
- PM10 < 0.351 mg/m³
- UPRR Rail

LAST UPDATED: 6/7/2016 3:25:22 PM