



January 10, 2019

Mr. Jacob Evans  
Noble Energy, Inc.  
2115 117<sup>th</sup> Avenue  
Greeley, Colorado 80631

**Soil and Groundwater Assessment Report  
Gemini B #31-11, 12, 13, 14, 25  
Flow Line Release  
40.348614 / -104.597099  
SE1/4 SW1/4 SEC.31 T5N R64W 6PM  
Weld County, Colorado  
Spill ID 458290**

Dear Mr. Evans,

Eagle Environmental Consulting, Inc. (EAGLE) is pleased to present this Soil and Groundwater Assessment Report for the above referenced site.

## **1.0 SITE BACKGROUND**

EAGLE was requested by Noble Energy, Inc. (Noble) to perform subsurface assessment activities at the site in response to potential soil and groundwater impacts associated with an unintentional release from a produced water line associated with the Gemini B #31-11, 12, 13, 14, 25 facility. On October 17, 2018, EAGLE advanced seven (7) soil borings to determine if petroleum hydrocarbon impacts existed above Colorado Oil and Gas Conservation Commission (COGCC) Table 910-1 regulatory limits beneath and around the unintentional release location.

The following narrative details soil and groundwater assessment activities completed at the site.

## **2.0 SITE DESCRIPTION**

The Gemini B #31-11, 12, 13, 14, 25 site is located within the southeast quarter of the southwest quarter of Section 31, Township 5 north, Range 64 west of the 6<sup>th</sup> Prime Meridian. The unintentional release location along the produced water line was located at latitude: 40.348614 and longitude: -104.597099. A topographic site location map is presented as Figure 1. An aerial site location map is presented as Figure 2.

### **2.1 Site Hydrogeology**

The soil lithology observed beneath the release location consists of medium-stiff, sandy silt from the surface to approximately 5 feet below ground surface (bgs), underlain by stiff, clay/silty clay from approximately 5 feet bgs to 25 feet bgs. Groundwater was observed at approximately 9.5 to 13 feet bgs during assessment activities. A detailed description of the subsurface lithology beneath the site is presented within the boring logs included in Attachment A.

### **3.0 SOIL BORING ADVANCEMENT/MONITORING WELL INSTALLATION ACTIVITIES**

To assess potential dissolved BTEX impacts associated with the flow line release, six (6) initial monitoring wells (MW-01 through MW-06) were proposed for installation. Following approval, EAGLE scheduled soil boring advancement and monitoring well installation activities. Based on field observations and analytical results, additional monitoring wells (MW-07 and MW-08) were installed to further delineate groundwater impacts at the site.

#### **3.1 Field Work Preparation and Planning**

The Utility Notification Center of Colorado (UNCC) was called at least 48 hours in advance of drilling activities to confirm that no unmarked utilities or other obstacles were present within the proposed drilling locations. Tier II facility owners were also contacted to confirm the necessary buried utility notifications were completed.

#### **3.2 Soil Boring Advancement/Monitoring Well Completion Activities**

On October 17, 2018 and December 17, 2018, eight (8) soil borings (MW-01 through MW-08) were advanced around the flow line release area. Following advancement activities, each soil boring (MW-01 through MW-08) was completed as a 1-inch, groundwater monitoring well to assess whether any dissolved petroleum hydrocarbon impacts existed beneath the site. Soil boring advancement activities were completed by EAGLE using a 7822DT Series Geoprobe track rig.

Each location was logged in the field according to soil description, soil classification, moisture content, staining, and volatile organic compound (VOC) concentrations. Monitoring wells, MW-01 through MW-08, were each completed with 1-inch, schedule 40, poly vinyl chloride (PVC) pipe to a total depth of approximately 20 to 25 feet bgs. In monitoring wells MW-01, MW-03, MW-05, and MW-06, twenty (20) feet of 0.010 slot, 1-inch, PVC screen was placed at the bottom of the boring, followed by approximately 5 feet of PVC riser. Monitoring wells MW-02, and MW-04 were completed with fifteen (15) feet of 0.010 slot, 1-inch, PVC screen at the bottom of the boring, followed by approximately 5 feet of PVC riser. Monitoring wells MW-07 and MW-08 were completed with 12.5 feet of 0.010 slot, 1-inch, PVC screen, followed by approximately 7.5 feet of PVC riser. The well annulus was backfilled with 10/20 silica sand to approximately 1 foot above the screen section, following by a hydrated bentonite seal to the surface. Each monitoring well (MW-01 through MW-08) was completed as an approximately 3-foot PVC stickup.

Spatial locations of each monitoring well were recorded using a Trimble GeoXT 600 series instrument. Soil boring logs/monitoring well completion diagrams are included in Attachment A. Monitoring well locations are presented in Figure 3. A geological cross section is included as Figure 4.

#### **3.3 Additional Soil Assessment Activities**

On October 17, 2018, October 25, 2018, and December 17, 2018, EAGLE advanced three (3) additional soil borings (SS-01, SB-01, and SB-02, respectively) to assess adsorbed petroleum hydrocarbon impacts at the site. Utilizing a 3-inch stainless steel hand auger, EAGLE collected a soil sample (SS-01@4-5') within the separator containment. Soil boring SB-01 was advanced to approximately ten (10) feet bgs utilizing a 3-inch stainless steel hand auger. Soil boring SB-02 was completed by EAGLE using a 7822DT Series Geoprobe track rig.

### 3.4 Soil Sampling Procedures

During direct push, soil boring advancement activities, soil samples were collected continuously within 5-foot, plastic sample liners. The samples within the plastic liners were separated in 2.5-foot intervals for soil identification and analysis. A portion from each interval was placed in a sealable plastic bag, for VOC headspace analysis utilizing a field calibrated photoionization detector (PID). Another portion of the soil sample was placed in a 2-ounce glass jar and packed in an iced cooler.

Based on PID reading and field observations, select soil samples from each boring (MW-01 through MW-08, SS-01, SB-01, and SB-02) were submitted to Origins Laboratory, Inc. (Origins) located in Denver, Colorado for laboratory analysis. Each soil sample was analyzed for benzene, toluene, ethylbenzene, total xylenes (BTEX), naphthalene, total petroleum hydrocarbons – gasoline range organics (TPH-GRO), and total petroleum hydrocarbons – diesel range organics (TPH-DRO), following modified Environmental Protection Agency (EPA) Methods 8260c and 8015. The samples were transported in an iced cooler under standard chain-of-custody procedures to Origins, and were received within Quality Assurance/Quality Control (QA/QC) parameters.

### 3.5 Soil Analytical Results

Based on laboratory analytical results:

- Soil samples MW-03@7.5-10', MW-08@5-7.5', and SB-01@7.5-10', contained concentrations of benzene (87.2 milligrams per kilogram (mg/kg), 39.6 mg/kg, and 1.92 mg/kg, respectively) exceeding the COGCC Table 910-1 regulatory limit of 0.17 mg/kg.
- Soil samples MW-03@7.5-10' and SB-01@7.5-10' contained concentrations of toluene (533 mg/kg and 244 mg/kg) and total xylenes (749 mg/kg and 342 mg/kg) exceeding the applicable COGCC Table 910-1 regulatory limits of 85 mg/kg and 175 mg/kg, respectively.
- Soil samples MW-03@7.5-10', MW-06@10-12.5', MW-08@5-7.5', and SB-01@7.5-10' contained concentrations of total petroleum hydrocarbons (TPH) (14,890 mg/kg, 990 mg/kg, 9,700 mg/kg, and 1,640 mg/kg, respectively) exceeding the COGCC Table 910-1 regulatory limit of 500 mg/kg.
- The soil samples collected from monitoring wells MW-01, MW-02, MW-05, and soil boring SB-02 did not contain concentrations of BTEX, naphthalene, or TPH exceeding applicable COGCC Table 910-1 regulatory limits.
- The soil sample collected within the separator containment (SS-01) did not contain concentrations of BTEX, naphthalene, or TPH exceeding applicable COGCC Table 910-1 regulatory limits.

Soil analytical results are summarized in Table 1 and presented in Figure 3. The soil laboratory analytical reports are included in Attachment B.

### 3.6 Groundwater Sampling Procedures

Groundwater samples were collected from monitoring wells MW-01 through MW-06 on October 19, 2018, and MW-01 through MW-08 on January 3, 2019. Prior to groundwater sample collection, depth to groundwater data was collected using a decontaminated interface probe capable of measuring the depth to groundwater or light non-aqueous phase liquid (LNAPL) to an accuracy of 0.01 feet.

Groundwater elevation data was collected from all monitoring wells on January 3, 2019. Relative groundwater elevations within each monitoring well ranged from 82.92 (MW-05) to 86.64 (MW-07). The groundwater flow direction beneath the site on January 3, 2019 was predominantly to the northeast, with an average hydraulic gradient of 0.042 feet per foot (ft./ft.) across the site (measured from MW-07 to MW-05). Groundwater elevation data is summarized in Table 2 and presented in Figure 5.

Each monitoring well was purged a minimum of three well volumes prior to groundwater sample collection. Groundwater samples were collected from each monitoring well in 40 milliliter (mL) amber vials and submitted for laboratory analysis of BTEX following EPA Method 8260C. The samples were transported in an iced cooler under standard chain-of-custody (COC) procedures to Origins and were received within the required holding time.

### 3.7 Groundwater Analytical Results

#### 3.7.1 *October 19, 2018 Groundwater Analytical Results*

Based on laboratory analytical results:

- The groundwater samples collected from monitoring wells MW-03, MW-04, and MW-06 contained concentrations of benzene (11,100 micrograms per liter ( $\mu\text{g/L}$ ), 3,290  $\mu\text{g/L}$ , and 5.26  $\mu\text{g/L}$ ) exceeding the COGCC Table 910-1 regulatory limit of 5  $\mu\text{g/L}$ .
- The groundwater samples collected from monitoring wells MW-03 and MW-04 contained concentrations of toluene (8,470  $\mu\text{g/L}$  and 7,610  $\mu\text{g/L}$ , respectively) and total xylenes (7,610  $\mu\text{g/L}$  and 5,360  $\mu\text{g/L}$ , respectively) exceeding the applicable COGCC Table 910-1 regulatory limits of 560  $\mu\text{g/L}$  and 1,400  $\mu\text{g/L}$ .
- The groundwater samples collected from monitoring wells MW-01, MW-02, and MW-05 did not contain concentrations of BTEX exceeding applicable COGCC Table 910-1 regulatory limits.

#### 3.7.2 *January 3, 2019 Groundwater Analytical Results*

Based on laboratory analytical results:

- The groundwater samples collected from monitoring wells MW-03, MW-04, MW-05, and MW-08 (8,880  $\mu\text{g/L}$ , 3,250  $\mu\text{g/L}$ , 11.2  $\mu\text{g/L}$ , and 720  $\mu\text{g/L}$ ) contained concentrations of benzene exceeding the COGCC Table 910-1 regulatory limit of 5  $\mu\text{g/L}$ .
- The groundwater samples collected from monitoring wells MW-03, MW-04, and MW-08 contained concentrations of toluene (668  $\mu\text{g/L}$ , 2,540  $\mu\text{g/L}$  and 891  $\mu\text{g/L}$ , respectively) exceeding the COGCC Table 910-1 regulatory limit of 560  $\mu\text{g/L}$ .

- The groundwater samples collected from monitoring wells MW-03 and MW-04 contained concentrations of total xylenes (1,930 µg/L and 3,930 µg/L, respectively) exceeding the COGCC Table 910-1 regulatory limit of 1,400 µg/L.
- The groundwater samples collected from monitoring wells MW-01, MW-02, MW-06, and MW-07 did not contain concentrations of BTEX exceeding applicable COGCC Table 910-1 regulatory limits.

Groundwater analytical results from October 19, 2018 and January 3, 2019 are summarized in Table 3 and presented in Figure 6. The groundwater laboratory analytical reports are included in Attachment B.

#### **4.0 AIR SPARGE/SOIL VAPOR REMEDIAL WELL INSTALLATION AND TESTING**

To aid in the evaluation of remedial options at the site, EAGLE installed pilot test air sparge (AS) and soil vapor extraction (SVE) wells at the site on December 17, 2018. Pilot test and monitoring well locations are presented in Figure 3.

##### **4.1 Air Sparge/Soil Vapor Extraction Pilot Test Well Installation/Sampling Activities**

On December 17, 2018, EAGLE installed pilot test remedial wells AS-01 and SVE-01 adjacent to monitoring wells MW-03 and MW-08. Both remedial wells were advanced utilizing a 7822DT Series Geoprobe track rig.

The air sparge well (AS-01) was installed to a total depth of approximately 20 feet bgs. AS pilot test well AS-01 well was constructed with an approximate 2.5-foot section of 1-inch diameter, polyvinyl chloride (PVC), 0.020-inch factory slotted screen at the bottom, followed by approximately 17.5 feet of PVC riser placed above the screened portion, extending to the ground surface. The remedial well annulus was completed with 10/20 silica sand, from the bottom of the soil boring, to approximately 1-foot above the screened section. A hydrated bentonite/grout seal was placed above the sand to the ground surface.

The soil vapor extraction well (SVE-01) was installed to a total depth of approximately eleven (11) feet bgs. SVE pilot test SVE-01 was constructed with a 5-foot section of 2-inch, PVC, 0.020-inch factory slotted screen at the bottom, followed by 6 feet of PVC riser placed above the screened section extending to the ground surface. The remedial well annulus was completed with 10/20 silica sand, from the bottom of the soil boring, to the top of the screened section. A hydrated bentonite/grout seal was placed above the sand to the ground surface. Remedial well locations are presented in Figure 3. Well completion diagrams are included as Attachment A.

During pilot test well installation activities, soil samples were collected continuously within 5-foot, plastic sample liners. The samples within the plastic liners were separated in intervals for soil identification and analysis. A portion from each interval was placed in a sealable plastic bag, for VOC headspace analysis utilizing a field calibrated PID. Another portion of the soil sample was placed in a 2-ounce glass jar and packed in an iced cooler.

Based on PID readings and sample locations, one soil sample from each location (AS-01@10-12.5' and SVE-01@5-7.5') was submitted to Origins under standard COC procedures. Each soil sample was analyzed for BTEX, naphthalene, TPH-GRO, and TPH-DRO following modified EPA Methods 8260c and 8015.

## 4.2 AS/SVE Soil Analytical Results

Based on soil analytical results:

- The soil sample collected from SVE-01 (SVE-01@5-7.5') contained concentrations of benzene (0.264 mg/kg) and TPH (505 mg/kg) exceeding the applicable COGCC Table 910-1 regulatory limits of 0.17 mg/kg and 500 mg/kg.
- The soil sample collected from AS-01 (AS-01@10-12.5') did not contain concentrations of BTEX, naphthalene, or TPH exceeding applicable COGCC Table 910-1 regulatory limits.

Pilot test well soil analytical results are summarized in Table 1 and presented in Figure 3. The laboratory analytical report is included in Attachment B.

## 4.3 AS/SVE Pilot Testing Summary

On January 3, 2019, EAGLE mobilized to site with a mobile AS/SVE unit to complete AS/SVE pilot testing activities. The mobile AS/SVE unit consisted of a Tuthill 15-horsepower (HP) positive displacement blower and a 7.5-HP Elmo Rietschle DTR-140 claw air compressor. Additional instrumentation including Dwyer magnehelic gauges, TSI VelociCalc 8360 flow meter, Heron interface probe, and Rae Systems MiniRAE 3000 PID were utilized in data collection.

Baseline parameter data (depth to water (DTW) and VOC concentrations) were collected from monitoring wells, MW-02, MW-03, MW-04, MW-05, MW-07, and MW-08 before, after, and during AS/SVE pilot testing activities, to monitor the effective radius of influence (ROI) the pilot testing had on the subsurface beneath the site. Monitoring and pilot test well locations are presented in Figure 2.

Following the collection of baseline parameter data, three separate pilot tests: SVE only, AS only, and a combined AS/SVE, were completed on test wells SVE-01 and AS-01. The SVE only and AS only pilot testing activities were completed to determine the optimal applied vacuums/pressures to evaluate during the AS/SVE combined pilot test.

### 4.3.1 SVE Only Pilot Test – SVE-01

Prior to starting SVE pilot testing activities, the distance from each monitoring well (MW-02, MW-03, MW-04, MW-05, MW-07, and MW-08) to the test well was recorded. During SVE only pilot testing activities the applied vacuum was increased every 30 minutes until the SVE blower was maxed out or groundwater was drawn into the knockout tank. During each increase in applied vacuum, soil vacuum influence and VOC concentrations were measured at observation wells MW-02, MW-03, MW-04, MW-05, MW-07, and MW-08, every 30 minutes using magnehelic gauges and a PID to evaluate the vacuum radius of influence (ROI) on the subsurface formation. Flow, velocity, temperature, and VOC concentrations were also recorded every 30 minutes from the effluent stack using a TSI VelociCalc 8360 and a PID.

An initial vacuum of 30 inches of water ("H<sub>2</sub>O) was applied to test well SVE-01 for approximately 30 minutes, with an initial flow rate of 417.88 standard cubic feet per minute (scfm) measured at the effluent stack. The initial temperature and VOC concentration recorded at the effluent stack was 51.5 degrees Fahrenheit (°F) and 0.0 ppm-v, respectively. The applied vacuum was increased by 10-20 "H<sub>2</sub>O every 30 minutes, reaching a maximum applied vacuum of approximately 100 "H<sub>2</sub>O. At approximately 100 "H<sub>2</sub>O vacuum, groundwater was not being drawn into the knockout tank.

At applied vacuums of approximately 40 “H<sub>2</sub>O, 60 “H<sub>2</sub>O, 80 “H<sub>2</sub>O, and 100 “H<sub>2</sub>O, a decrease in VOC concentrations was not observed. At the maximum applied vacuum of 100 “H<sub>2</sub>O, temperature and VOC concentrations recorded at the effluent stack were 58.3 °F and 0.2 ppm-v, respectively. The flow rate at the effluent stack of the SVE blower was approximately 382.71 scfm. Soil vacuum influence was not observed within the network of monitoring wells (MW-02, MW-03, MW-04, MW-05, MW-07, and MW-08) throughout the SVE only pilot test.

#### **4.3.2 AS Only Pilot Test – AS-01**

Prior to starting the AS only pilot test, the distance from each monitoring well (MW-02, MW-03, MW-04, MW-05, MW-07, and MW-08) to the test well was recorded. Initial injection pressures within AS-01 were increased over time, to determine the pressure required to overcome the hydraulic head within the test well and generate air flow into the subsurface formation. Once the breakthrough pressure was determined (approximately 12 pounds per square inch (psi)), pressure and air flow rates were monitored every 30 minutes to determine the most effective rate air could be injected into the formation. Magnehelic gauges and a PID were utilized to observe and record pressure ROI and VOC concentration readings in monitoring wells MW-02, MW-03, MW-04, MW-05, MW-07, and MW-08 every 30 minutes.

An initial pressure of 20 psi was applied to test well AS-01, with an initial flow rate of 0 scfm. The compressor was maxed at 20 psi with flow rate changes of 0.2 scfm, 0.5 scfm, and 1.0 scfm observed as the air flow created limited, preferential pathways within the subsurface. Low pressure ROI readings were observed in monitoring wells MW-02 (38 feet away), MW-03 (16 feet away), MW-07 (28 feet away), and MW-08 (35 feet away). However, relative increases in VOC concentrations were not observed in monitoring wells MW-02, MW-03, MW-04, MW-05, MW-07, and MW-08.

#### **4.3.3 AS/SVE Combined Pilot Test – SVE-01 & AS-01**

Following SVE and AS only pilot testing, the AS and SVE units were combined to determine if SVE would be able to create enough vacuum to recover vapors generated during sparging activities. During the combined pilot test, soil vacuum/pressure ROI and VOC concentrations were measured at monitoring wells MW-02, MW-03, MW-04, MW-05, MW-07, and MW-08 every 30 minutes using magnahelic gauges and a PID.

An applied vacuum of 80-100 “H<sub>2</sub>O, pressure of 20 psi, and flow rate of 1-3.5 scfm was applied to pilot test wells SVE-01 and AS-01, respectively, for approximately 2.25 hours. Vacuum readings/decreased VOC concentrations were not observed in MW-02, MW-04, MW-05, MW-07, and MW-08. A slight decrease in VOC concentrations were observed in monitoring wells MW-03 and MW-08, though vacuum readings were not observed in either well.

During the combined AS/SVE pilot test, an effluent stack vapor sample was collected. Based on analytical results, and field observations in monitoring wells MW-02, MW-03, MW-04, MW-05, MW-07, and MW-08, the SVE system was not effective in recovering subsurface hydrocarbon petroleum vapors.

Final DTW, DO, pressure/vacuum readings, and VOC concentrations were collected approximately 30 minutes following the completion of the combined AS/SVE pilot test. Based on data collected from monitoring wells MW-02, MW-03, MW-04, MW-05, MW-07, and MW-08, as well as analytical results from the effluent stack vapor sample, AS/SVE technology does not appear to be an effective remedial approach for the site. Data collected during AS only, SVE only and AS/SVE combined pilot testing activities completed on January 3, 2019, is included in Attachment C. The effluent stack vapor analytical report is included in Attachment B.

## 5.0 CONCLUSIONS

Based on the information presented in this report, EAGLE concludes the following:

- On October 17, 2018 and December 17, 2018, EAGLE installed a total of eight (8) groundwater monitoring wells (MW-01 through MW-08) at the site to investigate adsorbed and dissolved phase petroleum hydrocarbon impacts associated with a previous unintentional produced water release at the Gemini B #31-11, 12, 13, 14, 25 tank battery.
- On October 17, 2018, October 25, 2018, and December 17, 2018, EAGLE advanced three (3) soil borings (SS-01, SB-01, and SB-02) to assess adsorbed petroleum hydrocarbon impacts adjacent to the release location and the adjacent off-site property.
- Soil samples MW-03@7.5-10', MW-08@5-7.5', and SB-01@7.5-10', contained concentrations of benzene exceeding the applicable COGCC Table 910-1 regulatory limit.
- Soil samples MW-03@7.5-10' and SB-01@7.5-10' contained concentrations of toluene and total xylenes exceeding applicable COGCC Table 910-1 regulatory limits.
- Soil samples MW-03@7.5-10', MW-06@10-12.5', MW-08@5-7.5', and SB-01@7.5-10' contained concentrations of TPH exceeding the applicable COGCC Table 910-1 regulatory limit.
- The soil samples collected from monitoring wells MW-01, MW-02, MW-05, and soil boring SB-02 did not contain concentrations of BTEX, naphthalene, or TPH exceeding applicable COGCC Table 910-1 regulatory limits.
- The soil sample collected within the separator containment (SS-01) did not contain concentrations of BTEX, naphthalene, or TPH exceeding applicable COGCC Table 910-1 regulatory limits.
- Groundwater samples were collected from monitoring well MW-01 through MW-06 on October 19, 2018.
- The groundwater samples collected from monitoring wells MW-03, MW-04, and MW-06 on October 19, 2018 contained concentrations of benzene exceeding the applicable COGCC Table 910-1 regulatory limit.
- The groundwater samples collected from monitoring wells MW-03 and MW-04 on October 19, 2018 contained concentrations of toluene and total xylenes exceeding their respective COGCC Table 910-1 regulatory limits.
- The groundwater samples collected from monitoring wells MW-01, MW-02, and MW-05 on October 19, 2018 did not contain concentrations of BTEX exceeding applicable COGCC Table 910-1 regulatory limits.
- EAGLE installed pilot test AS/SVE remedial wells AS-01 and SVE-01 on December 17, 2018 and completed AS/SVE pilot testing activities on January 3, 2019. Based on field observations and effluent laboratory analytical results, AS/SVE remedial technology does not appear to be an effective remedial approach for the site.
- The soil sample collected from SVE-01@5-7.5' contained concentrations of benzene and TPH exceeding their respective COGCC Table 910-1 regulatory limits.

- The soil sample collected from pilot test remedial well AS-01 (AS-01@10-12.5') did not contain concentrations of BTEX, naphthalene, or TPH exceeding applicable COGCC Table 910-1 regulatory limits.
- Groundwater samples and groundwater elevation data were collected from monitoring well MW-01 through MW-08 on January 3, 2019.
- The groundwater samples collected from monitoring wells MW-03, MW-04, MW-05, and MW-08 on January 3, 2019 contained concentrations of benzene exceeding the COGCC Table 910-1 regulatory limit.
- The groundwater samples collected from monitoring wells MW-03, MW-04, and MW-08 on January 3, 2019 contained concentrations of toluene exceeding the COGCC Table 910-1 regulatory limit.
- The groundwater samples collected from monitoring wells MW-03 and MW-04 on January 3, 2019 contained concentrations of total xylenes exceeding the COGCC Table 910-1 regulatory limit.
- The groundwater samples collected from monitoring wells MW-01, MW-02, MW-06, and MW-07 on January 3, 2019 did not contain concentrations of BTEX exceeding applicable COGCC Table 910-1 regulatory limits.
- The predominant groundwater flow direction at the site during the 1<sup>st</sup> quarter 2019 sampling event was northeast with an average hydraulic gradient of 0.042 ft./ft.

## 6.0 RECOMMENDATIONS

Based on the information presented in this report, EAGLE recommends the following:

- Complete source excavation activities to remove adsorbed petroleum hydrocarbon impacts observed at the site.
- Complete in-situ & ex-situ groundwater remediation during source excavation activities.
- Continue quarterly groundwater sampling at the site to monitor dissolved BTEX concentrations.

EAGLE sincerely appreciates the opportunity to provide our services. If you have any questions or require further information, please contact us at (303) 433-0479.

Sincerely,

**EAGLE ENVIRONMENTAL CONSULTING, INC.**



Andrew Newberry  
Project Geologist



Robin Lockwood  
Project Scientist

## **FIGURES**

**Figure 1: Topographic Site Location Map**

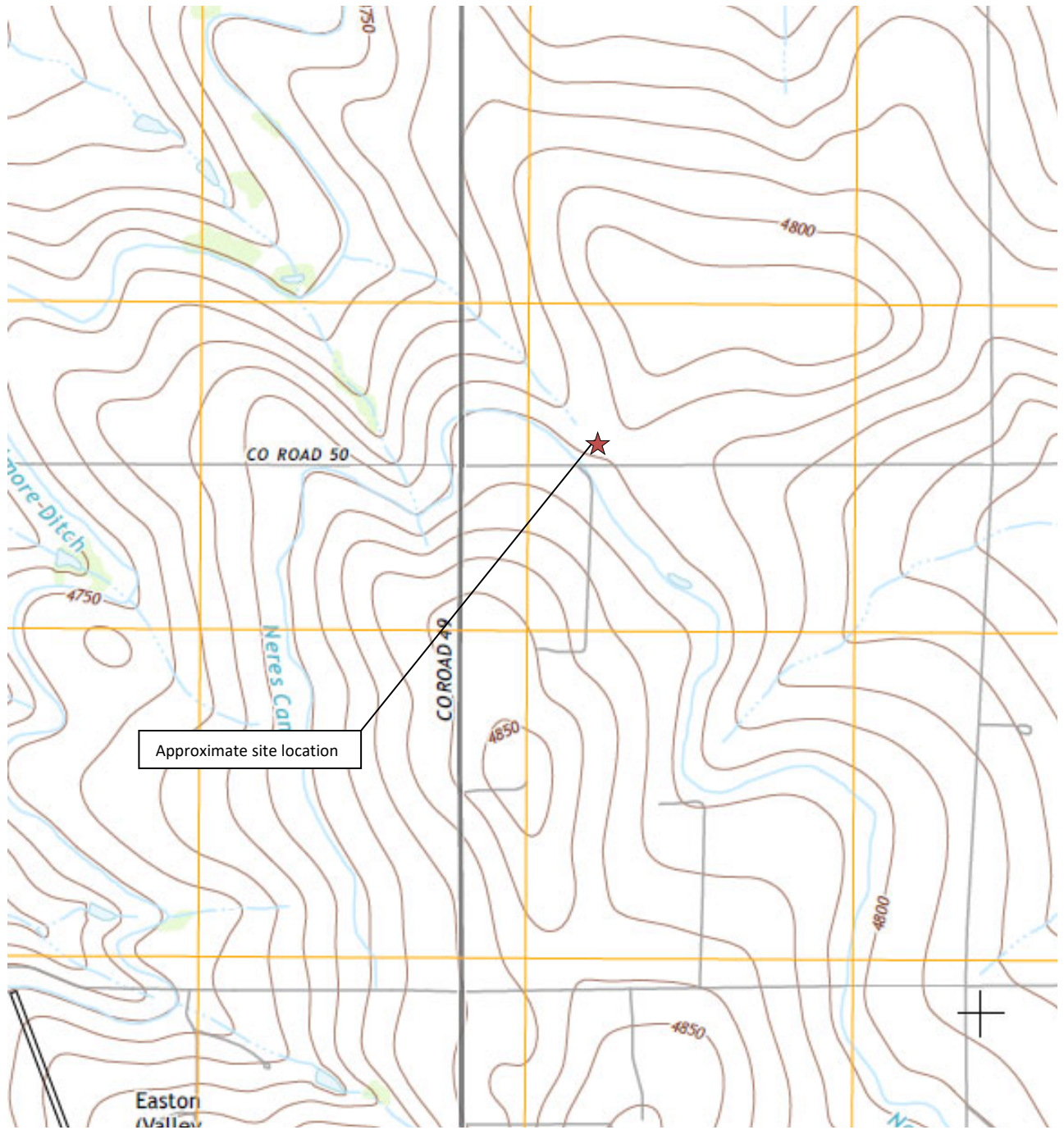
**Figure 2: Aerial Site Location Map**

**Figure 3: Soil Analytical Map**

**Figure 4: Geologic Cross-Section (A-A')**

**Figure 5: Groundwater Elevation Map**

**Figure 6: Groundwater Analytical Map (10/19/18 & 01/03/19)**



Approximate site location



**Topographic Site Location Map**  
 Gemini B #31-11, 12, 13, 14, 25  
 Flow Line Release  
 40.348614 / -104.597099  
 SE¼ SW¼ SEC.31 T5N R64W 6PM  
 Weld County, Colorado  
 Spill ID 458290



**EAGLE**  
 ENVIRONMENTAL  
 CONSULTING, INC.

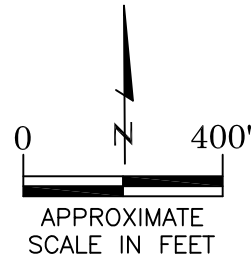
Source: USGS 7.5 Minute Topographic Map, Valley View School, CO Quadrangle 2013

**Figure 1**



**LEGEND**

- GEMINI B #31-11, 12, 13, 14, 25 TANK BATTERY
- GEMINI B #31-11 WELL HEAD
- GEMINI B #31-12 WELL HEAD
- GEMINI B #31-13 WELL HEAD
- GEMINI B #31-14 WELL HEAD
- GEMINI B #31-25 WELL HEAD



AERIAL SITE LOCATION MAP  
 GEMINI B #31-11, 12, 13, 14, 25  
 FLOW LINE RELEASE  
 40.348614 / -104.597099  
 SE1/4 SW1/4 SEC.31 T5N R64W 6PM  
 WELD COUNTY, COLORADO  
 SPILL ID 458290

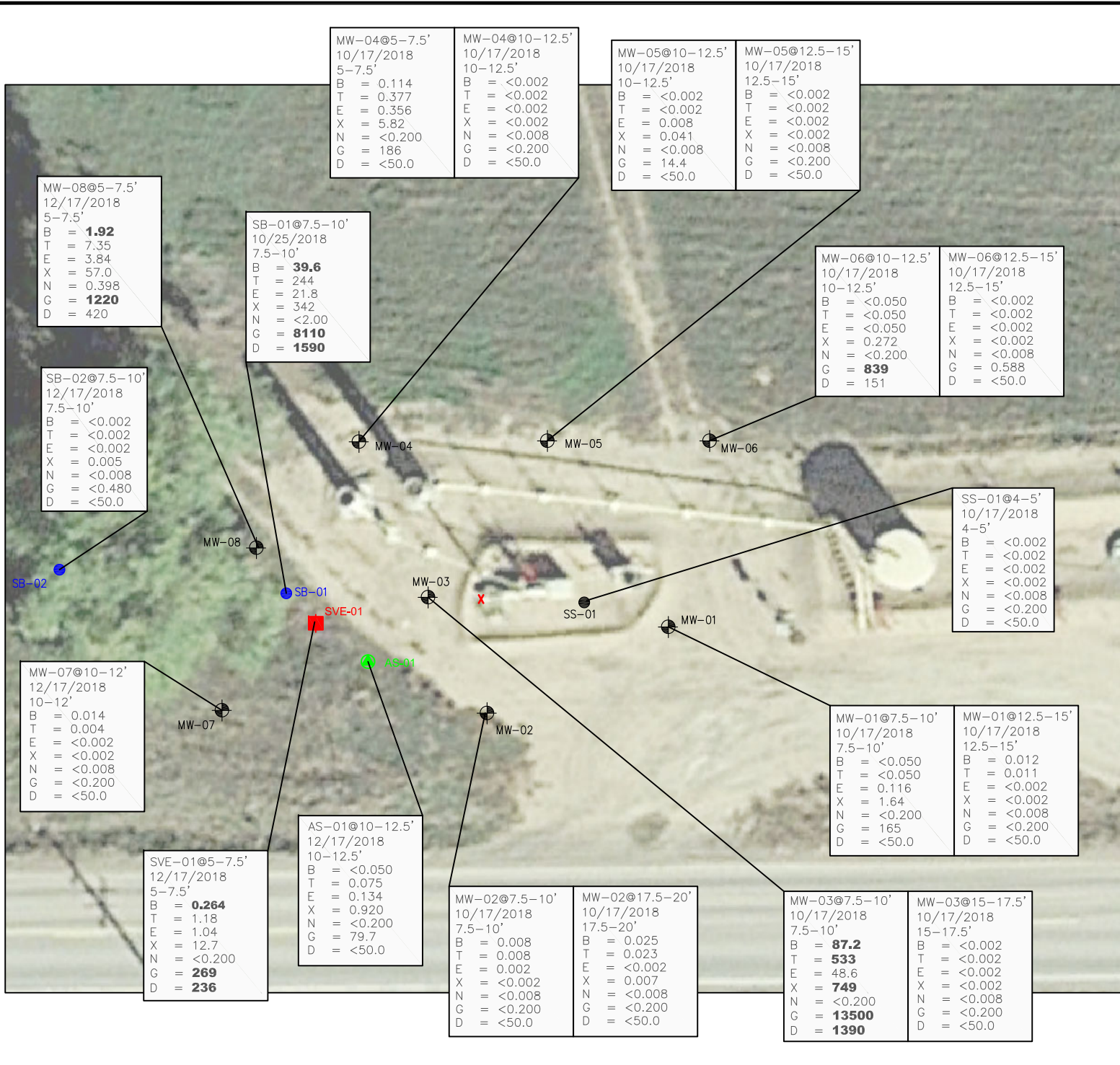
DATE: 01/09/19

FIG. NO.  
2

DRAWN BY:  
ar



**EAGLE**  
 ENVIRONMENTAL  
 CONSULTING, INC.  
 4101 INCA STREET, DENVER, CO 80211  
 Ph: 303-433-0479 • F: 303-325-5449



**LEGEND**

- X APPROXIMATE RELEASE LOCATION
- APPROXIMATE MONITORING WELL LOCATIONS
- APPROXIMATE SOIL BORING LOCATIONS
- APPROXIMATE SOIL SAMPLE LOCATION
- APPROXIMATE SOIL VAPOR EXTRACTION (SVE) PILOT TEST WELL LOCATION
- APPROXIMATE AIR SPARGE (AS) PILOT TEST WELL LOCATION

**PARAMETERS**

SOIL SAMPLE LOCATION	
DATE	
DEPTH (FEET)	
B	= BENZENE (mg/kg)
T	= TOLUENE (mg/kg)
E	= ETHYLBENZENE (mg/kg)
X	= TOTAL XYLENES (mg/kg)
N	= NAPHTHALENE (mg/kg)
G	= TPH-GRO (mg/kg)
D	= TPH-DRO (mg/kg)

mg/kg = MILLIGRAMS PER KILOGRAM

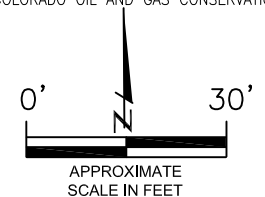
TPH-GRO = TOTAL PETROLEUM HYDROCARBONS - GASOLINE RANGE ORGANICS

TPH-DRO = TOTAL PETROLEUM HYDROCARBONS - DIESEL RANGE ORGANICS

NOTE: VALUES PRESENTED WITH A LESS THAN SYMBOL (<) DID NOT CONTAIN CONCENTRATIONS AT OR ABOVE LABORATORY DETECTION LIMITS

VALUES PRESENTED IN **BOLD** TYPEFACE CONTAIN CONCENTRATIONS EXCEEDING COGCC TABLE 910-1 REGULATORY LIMITS.

COGCC - COLORADO OIL AND GAS CONSERVATION COMMISSION

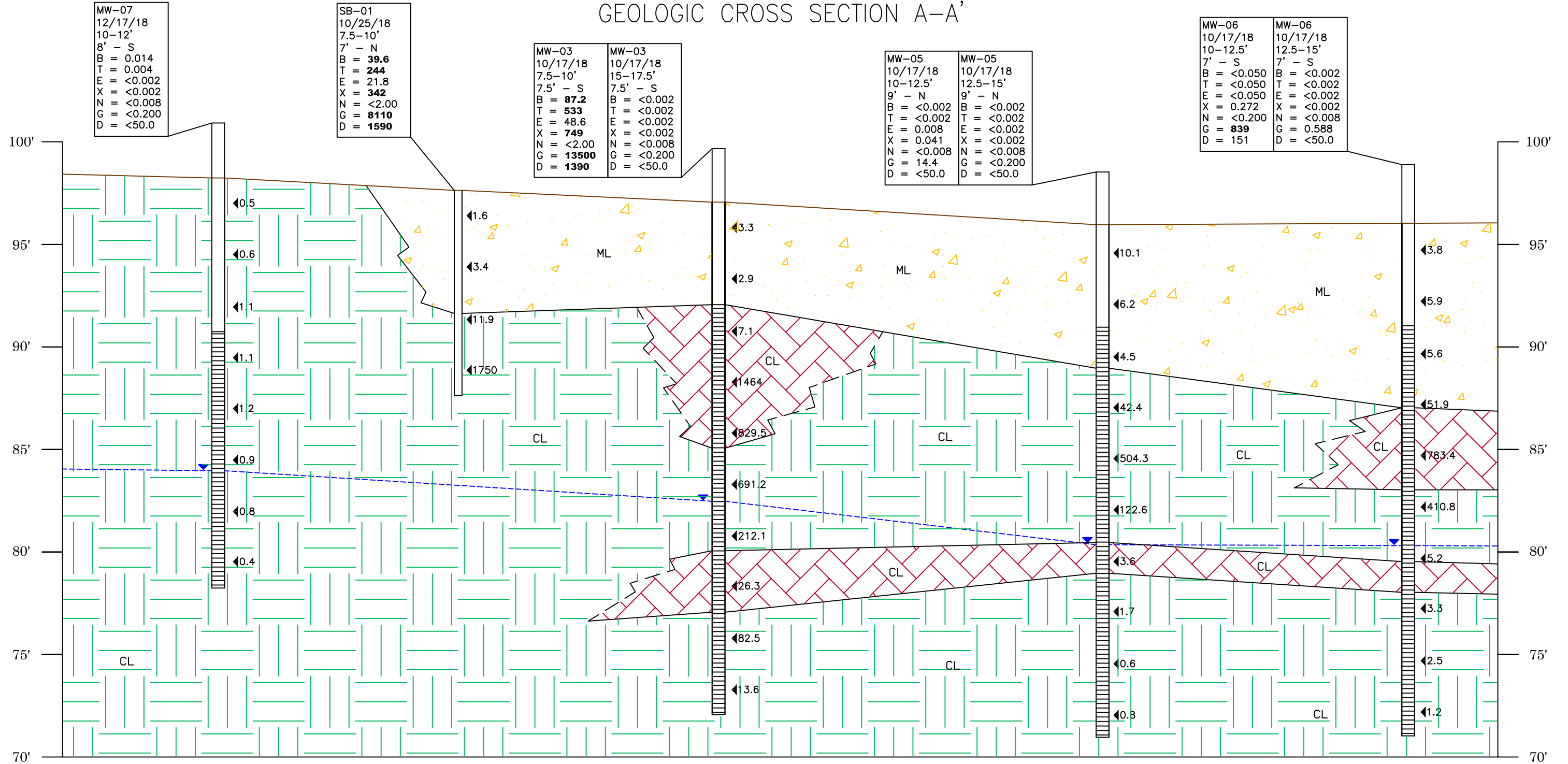


SOIL ANALYTICAL MAP  
 GEMINI B #31-11, 12, 13, 14, 25  
 FLOW LINE RELEASE  
 40.348614 / -104.597099  
 SE1/4 SW1/4 SEC.31 T5N R64W 6PM  
 WELD COUNTY, COLORADO  
 SPILL ID 458290

DATE:  
01/09/19  
 DRAWN BY:  
AMN  
 FIG. NO. 3

**EAGLE ENVIRONMENTAL CONSULTING, INC.**  
 4101 INCA STREET, DENVER, CO 80211  
 Ph: 303-433-0479 • F: 303-325-5449

# GEOLOGIC CROSS SECTION A-A'



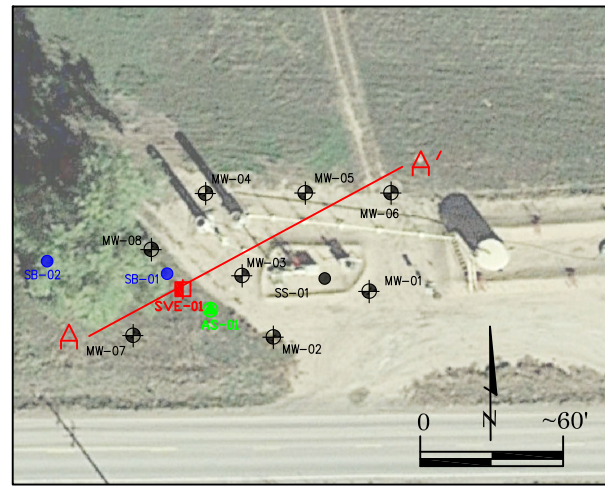
MW-07	12/17/18
10-12'	8' - S
B = 0.014	T = 0.004
E = <0.002	X = <0.002
N = <0.008	G = <0.200
D = <50.0	

SB-01	10/25/18
7.5-10'	7' - N
B = 39.6	T = 244
E = 21.8	X = 342
N = <2.00	G = 8110
D = 1590	

MW-03	MW-03
10/17/18	10/17/18
7.5-10'	15-17.5'
7.5' - S	7.5' - S
B = 87.2	B = <0.002
T = 533	T = <0.002
E = 48.6	E = <0.002
X = 749	X = <0.002
N = <2.00	N = <0.008
G = 13500	G = <0.200
D = 1390	D = <50.0

MW-05	MW-05
10/17/18	10/17/18
10-12.5'	12.5-15'
9' - N	9' - N
B = <0.002	B = <0.002
T = <0.002	T = <0.002
E = 0.008	E = <0.002
X = 0.041	X = <0.002
N = <0.008	N = <0.008
G = 14.4	G = <0.200
D = <50.0	D = <50.0

MW-06	MW-06
10/17/18	10/17/18
10-12.5'	12.5-15'
7' - S	7' - S
B = <0.050	B = <0.002
T = <0.050	T = <0.002
E = <0.050	E = <0.002
X = 0.272	X = <0.002
N = <0.200	N = <0.008
G = 839	G = 0.588
D = 151	D = <50.0



### LEGEND

- SANDY SILT
- CLAY
- SILTY CLAY
- GROUND SURFACE
- OBSERVED CONTACT
- INFERRED CONTACT
- OBSERVED GROUNDWATER (01/03/19)
- LINE OF CROSS SECTION

### PARAMETERS

SAMPLE LOCATION  
DATE  
DEPTH (FEET)  
DISTANCE - DIRECTION (FROM A-A')

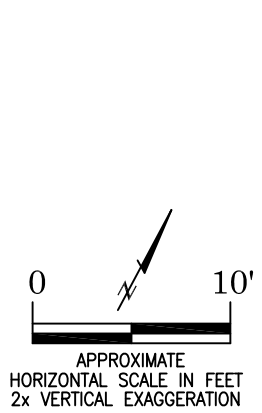
B = BENZENE (mg/kg)  
T = TOLUENE (mg/kg)  
E = ETHYLBENZENE (mg/kg)  
X = TOTAL XYLENES (mg/kg)  
N = NAPHTHALENE (mg/kg)  
G = TPH-GRO (mg/kg)  
D = TPH-DRO (mg/kg)

STICK UP COMPLETION  
PVC RISER  
◀PID (ppm-v)  
SLOTTED SCREEN

ppm-v = PARTS PER MILLION BY VOLUME

mg/kg = MILLIGRAMS PER KILOGRAM  
TPH-GRO = TOTAL PETROLEUM HYDROCARBONS - GASOLINE RANGE ORGANICS  
TPH-DRO = TOTAL PETROLEUM HYDROCARBONS - DIESEL RANGE ORGANICS

NOTE: VALUES PRESENTED WITH A LESS THAN SYMBOL (<) DID NOT CONTAIN CONCENTRATIONS AT OR ABOVE THE LABORATORY REPORTING LIMIT



**GEOLOGIC CROSS SECTION (A-A')**  
GEMINI B #31-11, 12, 13, 14, 25  
FLOW LINE RELEASE  
40.348614/-104.597099  
SE1/4 SW1/4 SEC.31 T5N R64W 6PM  
WELD COUNTY, COLORADO  
SPILL ID 458290

**EAGLE ENVIRONMENTAL CONSULTING, INC.**  
4101 INCA STREET, DENVER, CO 80211  
Ph: 303-433-0479 • F: 303-325-5449

FIG. NO. 4      DATE: 01/03/19      DRAWN BY: ar



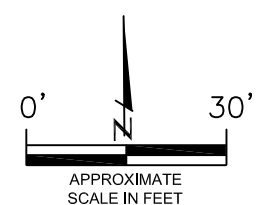
**LEGEND**

- X APPROXIMATE RELEASE LOCATION
- APPROXIMATE MONITORING WELL LOCATIONS
- (92.26) GROUNDWATER ELEVATION (FT.)
- INFERRED GROUNDWATER ELEVATION CONTOUR (FT.)
- APPROXIMATE GROUNDWATER FLOW DIRECTION

FT. = FEET

**NOTE:**

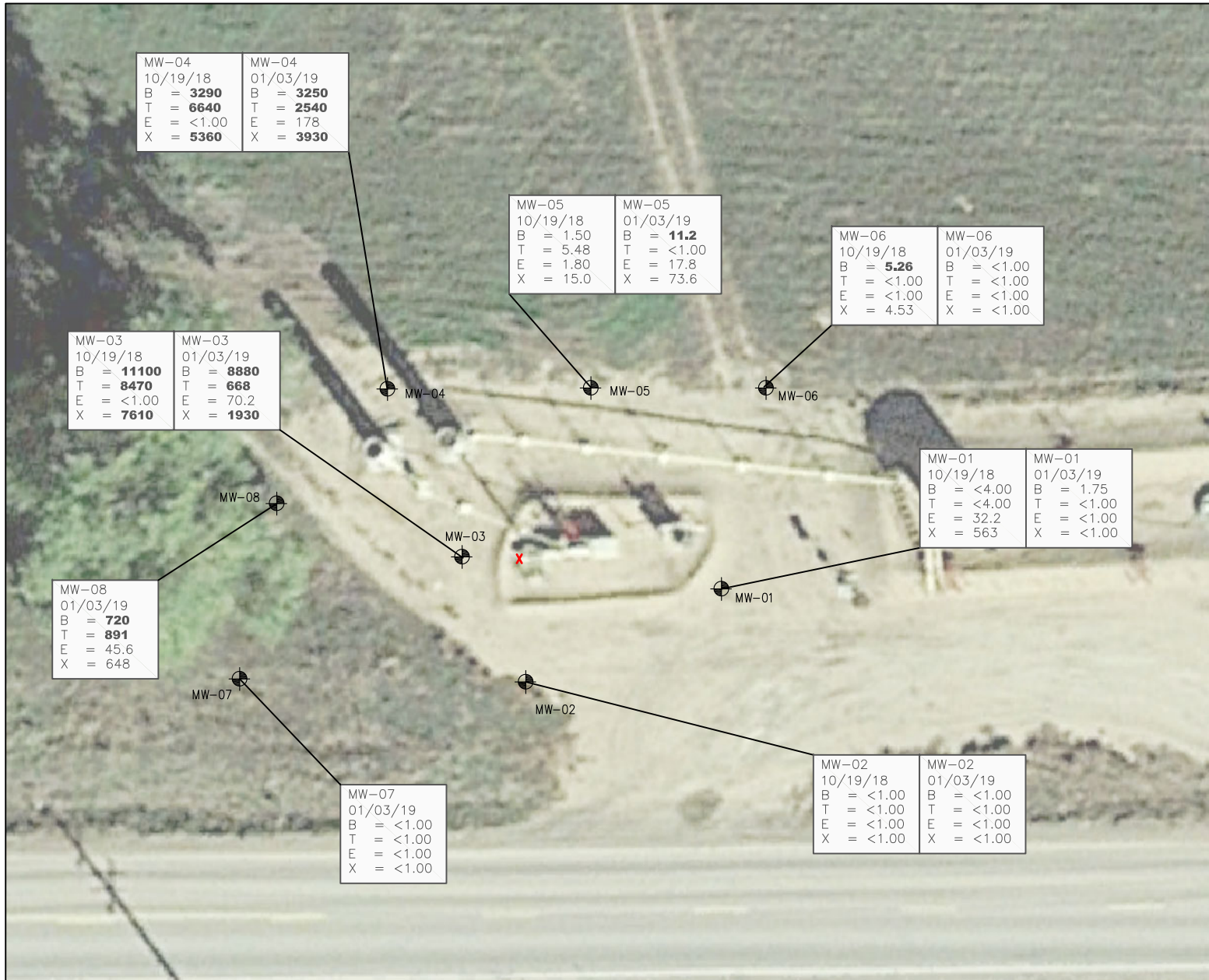
GROUNDWATER ELEVATION DATA WAS COLLECTED FROM MONITORING WELLS MW-01 THROUGH MW-08 ON JANUARY 3, 2019.



GROUNDWATER ELEVATION MAP  
 GEMINI B #31-11, 12, 13, 14, 25  
 FLOW LINE RELEASE  
 40.348614 / -104.597099  
 SE1/4 SW1/4 SEC.31 T5N R64W 6PM  
 WELD COUNTY, COLORADO  
 SPILL ID 458290

DATE:	01/09/19
DRAWN BY:	AMN
FIG. NO.	5

**EAGLE**  
 ENVIRONMENTAL  
 CONSULTING, INC.  
 4101 INCA STREET, DENVER, CO 80211  
 Ph: 303-433-0479 • F: 303-325-5449



**LEGEND**

- X APPROXIMATE RELEASE LOCATION
- APPROXIMATE MONITORING WELL LOCATIONS

PARAMETERS

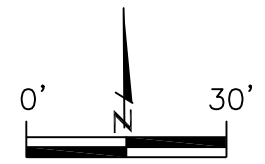
SAMPLE LOCATION	
DATE	
B	= BENZENE (µg/L)
T	= TOLUENE (µg/L)
E	= ETHYLBENZENE (µg/L)
X	= TOTAL XYLENES (µg/L)

µg/L = MICROGRAMS PER LITER

VALUES PRESENTED WITH A LESS THAN SYMBOL (<) DID NOT CONTAIN CONCENTRATIONS AT OR ABOVE LABORATORY DETECTION LIMITS.

VALUES PRESENTED IN **BOLD** TYPEFACE EXCEED COGCC TABLE 910-1 REGULATORY LIMITS.

COGCC – COLORADO OIL AND GAS CONSERVATION COMMISSION



APPROXIMATE SCALE IN FEET

GROUNDWATER ANALYTICAL MAP  
 (10/19/18 & 01/03/19)  
 GEMINI B #31-11, 12, 13, 14, 25  
 FLOW LINE RELEASE  
 40.348614 / -104.597099  
 SE1/4 SW1/4 SEC.31 T5N R64W 6PM  
 WELD COUNTY, COLORADO  
 SPILL ID 458290

DATE:  
01/09/19

DRAWN BY:  
AMN

FIG. NO. 6



**EAGLE**  
 ENVIRONMENTAL  
 CONSULTING, INC.  
 4101 INCA STREET, DENVER, CO 80211  
 Ph: 303-433-0479 • F: 303-325-5449

## **TABLES**

**Table 1: Soil Analytical Results Summary**

**Table 2: Groundwater Elevation Summary**

**Table 3: Groundwater Analytical Results Summary**

**TABLE 1**  
**SOIL ANALYTICAL RESULTS SUMMARY**  
**GEMINI B #31-11, 12, 13, 14, 25**  
**FLOW LINE RELEASE**  
**40.348614 / -104.597099**  
**SE¼ SW¼ SEC.31 T5N R64W 6PM**  
**WELD COUNTY, COLORADO**  
**SPILL ID 458290**

Sample Location (Latitude/Longitude)	Date	Approximate Depth (feet)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	Naphthalene (mg/kg)	TPH-GRO (mg/kg)	TPH-DRO (mg/kg)
<b>COGCC Table 910-1 Regulatory Limits (mg/kg)</b>			<b>0.17</b>	<b>85</b>	<b>100</b>	<b>175</b>	<b>23</b>	<b>500</b>	
MW-01 @ 7.5-10' (40.348598/-104.596953)	10/17/18	7.5-10	<0.050	<0.050	0.116	1.64	<0.200	165	<50.0
MW-01 @ 12.5-15' (40.348598/-104.596953)	10/17/18	12.5-15	0.012	0.011	<0.002	<0.002	<0.008	<0.200	<50.0
MW-02 @ 7.5-10' (40.348562/-104.597124)	10/17/18	7.5-10	0.008	0.008	0.002	<0.002	<0.008	<0.200	<50.0
MW-02 @ 17.5-20' (40.348562/-104.597124)	10/17/18	17.5-20	0.025	0.023	<0.002	0.007	<0.008	<0.200	<50.0
MW-03 @ 7.5-10' (40.348624/-104.597153)	10/17/18	7.5-20	<b>87.2</b>	<b>533</b>	48.6	<b>749</b>	<0.200	<b>13500</b>	<b>1390</b>
MW-03 @ 15-17.5' (40.348624/-104.597153)	10/17/18	15-17.5	<0.002	<0.002	<0.002	<0.002	<0.008	<0.200	<50.0
MW-04 @ 5-7.5' (40.348710/-104.597192)	10/17/18	5-7.5	0.114	0.377	0.356	5.82	<0.200	186	<50.0
MW-04 @ 10-12.5' (40.348710/-104.597192)	10/17/18	10-12.5	<0.002	<0.002	<0.002	<0.002	<0.008	<0.200	<50.0
MW-05 @ 10-12.5' (40.348709/-104.597051)	10/17/18	10-12.5	<0.002	<0.002	0.008	0.041	<0.008	14.4	<50.0
MW-05 @ 12.5-15' (40.348709/-104.597051)	10/17/18	12.5-15	<0.002	<0.002	<0.002	<0.002	<0.008	<0.200	<50.0
MW-06 @ 10-12.5' (40.348710/-104.596927)	10/17/18	10-12.5	<0.050	<0.050	<0.050	0.272	<0.200	<b>839</b>	151
MW-06 @ 12.5-15' (40.348710/-104.596927)	10/17/18	12.5-15	<0.002	<0.002	<0.002	<0.002	<0.008	0.588	<50.0
SS-01 @ 4-5' (40.348617/-104.597021)	10/17/18	4-5	<0.002	<0.002	<0.002	<0.002	<0.008	<0.200	<50.0
SB-01 @ 7.5-10' (40.348624/-104.597237)	10/25/18	7.5-10	<b>39.6</b>	<b>244</b>	21.8	<b>342</b>	<2.00	<b>8110</b>	<b>1590</b>
MW-07 @ 10-12' (40.348557/-104.597285)	12/17/18	10-12	0.014	0.004	<0.002	<0.002	<0.008	<0.200	<50.0
MW-08 @ 5-7.5' (40.348649/-104.597266)	12/17/18	5-7.5	<b>1.92</b>	7.35	3.84	57.0	0.398	<b>1220</b>	420

**TABLE 1**  
**SOIL ANALYTICAL RESULTS SUMMARY**  
**GEMINI B #31-11, 12, 13, 14, 25**  
**FLOW LINE RELEASE**  
**40.348614 / -104.597099**  
**SE¼ SW¼ SEC.31 T5N R64W 6PM**  
**WELD COUNTY, COLORADO**  
**SPILL ID 458290**

Sample Location (Latitude/Longitude)	Date	Approximate Depth (feet)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	Naphthalene (mg/kg)	TPH-GRO (mg/kg)	TPH-DRO (mg/kg)
<b>COGCC Table 910-1 Regulatory Limits (mg/kg)</b>			<b>0.17</b>	<b>85</b>	<b>100</b>	<b>175</b>	<b>23</b>	<b>500</b>	
AS-01 @ 10-12.5' (40.348589/-104.597179)	12/17/18	10-12.5	<0.050	0.075	0.134	0.920	<0.200	79.7	<50.0
SVE-01 @ 5-7.5' (40.348607/-104.597219)	12/17/18	5-7.5	<b>0.264</b>	1.18	1.04	12.7	<0.200	<b>269</b>	<b>236</b>
SB-02 @ 7.5-10' (40.348643/-104.597406)	12/17/18	7.5-10	0.002	0.002	<0.002	0.005	<0.008	0.480	<50.0
COGCC = Colorado Oil and Gas Conservation Commission mg/kg = milligrams per kilogram TPH-GRO = Total Petroleum Hydrocarbons - Gasoline Range Organics TPH-DRO = Total Petroleum Hydrocarbons - Diesel Range Organics Note: Values presented with a less than symbol (<) did not contain concentrations at or above the laboratory reporting limit. Note: Values presented in <b>BOLD</b> contained concentrations exceeding COGCC Table 910-1 Regulatory Limits									

**TABLE 2  
GROUNDWATER ELEVATION SUMMARY  
GEMINI B #31-11, 12, 13, 14, 25  
FLOW LINE RELEASE  
40.348614 / -104.597099  
SE¼ SW¼ SEC.31 T5N R64W 6PM  
WELD COUNTY, COLORADO  
SPILL ID 458290**

Sample Location (Latitude/Longitude)	Date	Top of Casing Elevation (feet)	Depth to Groundwater from TOC (feet)	Relative Groundwater Elevation (feet) (TOC)	Stickup Height (feet)	Depth to Groundwater (feet) (BGS)
MW-01 (40.348598/-104.596953)	10/19/18	99.54	14.35	85.19	2.87	11.48
	01/03/19		15.56	83.98		12.69
MW-02 (40.348562/-104.597124)	10/19/18	100.00	13.55	86.45	3.23	10.32
	01/03/19		14.97	85.03		11.74
MW-03 (40.348624/-104.597153)	10/19/18	99.67	13.65	86.02	3.01	10.64
	01/03/19		14.59	85.08		11.58
MW-04 (40.348710/-104.597192)	10/19/18	97.86	12.75	85.11	3.07	9.68
	01/03/19		13.60	84.26		10.53
MW-05 (40.348709/-104.597051)	10/19/18	98.53	16.00	82.53	2.66	13.34
	01/03/19		15.61	82.92		12.95
MW-06 (40.348710/-104.596927)	10/19/18	98.89	15.15	83.74	2.53	12.62
	01/03/19		15.72	83.17		13.19
MW-07 (40.348557/-104.597285)	01/03/19	100.92	14.28	86.64	2.68	11.60
MW-08 (40.348649/-104.597266)	01/03/19	97.46	11.86	85.60	2.55	9.31
NOTES: TOC - top of casing BGS - below ground surface						

**TABLE 3**  
**GROUNDWATER ANALYTICAL RESULTS SUMMARY**  
**GEMINI B #31-11, 12, 13, 14, 25**  
**FLOW LINE RELEASE**  
**40.348614 / -104.597099**  
**SE¼ SW¼ SEC.31 T5N R64W 6PM**  
**WELD COUNTY, COLORADO**  
**SPILL ID 458290**

Sample Location (Latitude/Longitude)	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
<b>COGCC Table 910-1 Regulatory Limits (µg/L)</b>		<b>5</b>	<b>560</b>	<b>700</b>	<b>1400</b>
MW-01 (40.348598/-104.596953)	10/19/18	<4.00	<4.00	32.2	563
	01/03/19	1.75	<1.00	<1.00	<1.00
MW-02 (40.348562/-104.597124)	10/19/18	<1.00	<1.00	<1.00	<1.00
	01/03/19	<1.00	<1.00	<1.00	<1.00
MW-03 (40.348624/-104.597153)	10/19/18	<b>11100</b>	<b>8470</b>	<1.00	<b>7610</b>
	01/03/19	<b>8880</b>	<b>668</b>	70.2	<b>1930</b>
MW-04 (40.348710/-104.597192)	10/19/18	<b>3290</b>	<b>6640</b>	<1.00	<b>5360</b>
	01/03/19	<b>3250</b>	<b>2540</b>	178	<b>3930</b>
MW-05 (40.348709/-104.597051)	10/19/18	1.50	5.48	1.80	15.0
	01/03/19	<b>11.2</b>	<1.00	17.8	73.6
MW-06 (40.348710/-104.596927)	10/19/18	<b>5.26</b>	<1.00	<1.00	4.53
	01/03/19	<1.00	<1.00	<1.00	<1.00
MW-07 (40.348557/-104.597285)	01/03/19	<1.00	<1.00	<1.00	<1.00
MW-08 (40.348649/-104.597266)	01/03/19	<b>720</b>	<b>891</b>	45.6	648

COGCC = Colorado Oil and Gas Conservation Commission

µg/L - micrograms per liter

Note: Values presented with a less than symbol (<) indicate concentrations were not observed at or above the laboratory reporting limit.

Values presented in **bold** typeface exceed their respective COGCC - Regulatory Limits (Table 910-1).

**ATTACHMENT A**

**Soil Boring Logs/Well Completion Diagrams**

# Boring Log/Well Completion Diagram: MW-01

DEPTH (FT)	LITHOLOGY	SAMPLE				OVM/OVA (PPM)	BLOW COUNT (per 0.5 FT)	DEPTH (FT)	WELL CONSTRUCTION DETAIL	COMMENTS
	DESCRIPTION	GRAPHIC LOG	TYPE	NUMBER	RECOVERY %					
0	(0-1') Road base	ML	DP	1	85	0.6	N/A			
5	(1-5') sandy SILT - brown, moderately moist, medium stiff, low plasticity, moderately graded w/ 15-20% fine sand, N/O, N/S					0.6				
5	(5-15') CLAY - brown, moderately moist to moist, stiff to very stiff, low plasticity, poorly graded w/ trace silt @7.5-15' - HC odor, black staining	CL	DP	2	100	1.7	N/A			
10	@12-15' - ~20% silt					1256				
15	@15-19' - trace silt @18-18.5' - decompression fractures	CL	DP	4	100	338.3	N/A			
20	(19-25') silty CLAY - brown, moderately moist, stiff, low plasticity, poorly graded w/ 20% silt, decompression fractures, N/O, N/S					4.8				
25						4.6				
25	BoB @ 25'									
30										

DP - Direct push  
 HC - Hydrocarbon  
 BoB - Bottom of Boring  
 N/O - no odor  
 N/S - no staining  
 TOC - top of casing  
 bgs - below ground surface

START/COMPLETION DATE: 10/17/2018	SAND PACK INTERVAL (FEET): 4-25
PROJECT: GEMINI B #31-11,12,13,14,25	BENTONITE/GROUT INTERVAL (FEET): 0-4
LOGGED BY: K. Peterson	WELL SCREEN INTERVAL (FEET): 5-25
DRILLING COMPANY/EQUIPMENT: EAGLE/GEOPROBE	WELL DIAMETER (INCHES): 1
BORING DEPTH (FEET): 25	WELL DEPTH (FEET): 25
PID INSTRUMENT: MiniRAE 3000 - PID #10	
TIME STARTED/COMPLETED: 0900/1000	
SAMPLE COLLECTION DEPTH (FEET)/TIME: 7.5-10/0930;12.5-15/0945	



**EAGLE**  
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# Boring Log/Well Completion Diagram: MW-02

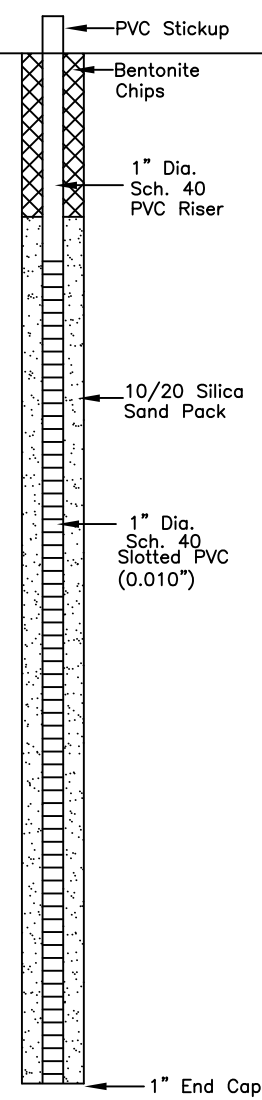
DEPTH (FT)	LITHOLOGY	SAMPLE				OVM/OVA (PPM)	BLOW COUNT (per 0.5 FT)	DEPTH (FT)	WELL CONSTRUCTION DETAIL	COMMENTS
	DESCRIPTION	GRAPHIC LOG	TYPE	NUMBER	RECOVERY %					
0	(0-1') Road base	ML	DP	1	100	4.6	N/A			
1-5	(1-5') sandy SILT - brown, dry, medium stiff, low plasticity, moderately graded w/ 25% fine sand, N/O, N/S					3.4				
5	(5-12') CLAY - brown, moderately moist, very stiff, lows plasticity, poorly graded with trace silt, N/O, N/S	CL	DP	2	100	4.3	N/A			
5-10						13.7				
10	(12-20') silty CLAY - brown, moderately moist, stiff, low plasticity, poorly graded w/ 20% silt, N/O, N/S	CL	DP	3	100	2.2	N/A			
10-15						1.2				
15-20						2.5				
20						4.2				
20	BoB @ 20'									

DP - Direct push  
 HC - Hydrocarbon  
 BoB - Bottom of Boring  
 N/O - no odor  
 N/S - no staining  
 TOC - top of casing  
 bgs - below ground surface


START/COMPLETION DATE: 10/17/2018		SAND PACK INTERVAL (FEET): 4-20	
PROJECT: GEMINI B #31-11,12,13,14,25		BENTONITE/GROUT INTERVAL (FEET): 0-4	
LOGGED BY: K. Peterson		WELL SCREEN INTERVAL (FEET): 5-20	
DRILLING COMPANY/EQUIPMENT: EAGLE/GEOPROBE		WELL DIAMETER (INCHES): 1	
BORING DEPTH (FEET): 20	WELL DEPTH (FEET): 20	<p><b>EAGLE</b>                  ENVIRONMENTAL                  CONSULTING, INC.                  4101 INCA STREET, DENVER, CO 80211                  Ph: 303-433-0479 • F: 303-325-5449</p>	
PID INSTRUMENT: MiniRAE 3000 - PID #10			
TIME STARTED/COMPLETED: 1145/1245			
SAMPLE COLLECTION DEPTH (FEET)/TIME: 7.5-10/1212;12.5-15/1225			

# Boring Log/Well Completion Diagram: MW-03

DEPTH (FT)	LITHOLOGY	SAMPLE				OVN/OVA (PPM)	BLOW COUNT (per 0.5 FT)	DEPTH (FT)	WELL CONSTRUCTION DETAIL	COMMENTS
	DESCRIPTION	GRAPHIC LOG	TYPE	NUMBER	RECOVERY %					
0	(0-1') Road base					3.3	N/A			
1-5	(1-5') sandy SILT - brown, moderately moist, medium stiff, low plasticity, moderately graded w/ 20% fine sand, N/O, N/S	ML	DP	1	90	2.9	N/A			
5	(5-12') CLAY - brown, moderately moist, very dense, lows plasticity, poorly graded w/ trace silt @7.5-12.5' - HC odor, black to gray staining					7.1	N/A			
7.5-12.5			DP	2	100	1464	N/A			
12-17	(12-17') silty CLAY - brown, moderately moist, stiff, low plasticity, poorly graded w/ 20% silt, decompression fractures, N/O, N/S	CL				829.5	N/A			
12-17			DP	3	100	691.2	N/A			
17-20	(17-20') CLAY - brown, moderately moist, stiff, lows plasticity, poorly graded w/ trace silt, N/O, N/S					212.1	N/A			
17-20			DP	4	100		N/A			
20-25	(20-25') silty CLAY - brown, moderately moist, stiff, low plasticity, poorly graded w/ 20% silt, decompression fractures, N/O, N/S					26.3	N/A			
20-25			DP	5	100		N/A			
20-25			DP	6	100		N/A			
20-25			DP	7	100		N/A			
25	BoB @ 25'									




DP - Direct push  
 HC - Hydrocarbon  
 BoB - Bottom of Boring  
 N/O - no odor  
 N/S - no staining  
 TOC - top of casing  
 bgs - below ground surface

START/COMPLETION DATE: 10/17/2018		SAND PACK INTERVAL (FEET): 4-25	
PROJECT: GEMINI B #31-11,12,13,14,25		BENTONITE/GROUT INTERVAL (FEET): 0-4	
LOGGED BY: K. Peterson		WELL SCREEN INTERVAL (FEET): 5-25	
DRILLING COMPANY/EQUIPMENT: EAGLE/GEOPROBE		WELL DIAMETER (INCHES): 1	
BORING DEPTH (FEET): 25	WELL DEPTH (FEET): 25	 <p><b>EAGLE</b>                  ENVIRONMENTAL                  CONSULTING, INC.                  4101 INCA STREET, DENVER, CO 80211                  Ph: 303-433-0479 • F: 303-325-5449</p>	
PID INSTRUMENT: MiniRAE 3000 - PID #10			
TIME STARTED/COMPLETED: 1005/1115			
SAMPLE COLLECTION DEPTH (FEET)/TIME: 7.5-10/1023;15-17.5/1048			

# Boring Log/Well Completion Diagram: MW-04

DEPTH (FT)	LITHOLOGY	SAMPLE				OVM/OVA (PPM)	BLOW COUNT (per 0.5 FT)	DEPTH (FT)	WELL CONSTRUCTION DETAIL	COMMENTS		
	DESCRIPTION	GRAPHIC LOG	TYPE	NUMBER	RECOVERY %							
0	(0-5') sandy SILT - brown, dry, medium stiff, low plasticity, moderately graded w/ 25% fine sand	ML	DP	1	100	2.4	N/A	PVC Stickup Bentonite Chips 1" Dia. Sch. 40 PVC Riser				
					3.1							
5	(5-10') CLAY - brown, moderately moist, very stiff, lows plasticity, poorly graded with trace silt @6-14' - HC odor, black staining	CL	DP	2	100	1550	N/A	10/20 Silica Sand Pack  1" Dia. Sch. 40 Slotted PVC (0.010")				
						1130						
10	(10-20') silty CLAY - brown, moderately moist, stiff, low plasticity, poorly graded w/ 20% silt @10-14' - HC odor/black staining @16-16.5' - decompression fractures @15-20' - N/O, N/S					3				100	342.4	N/A
15						4				90	249.7	N/A
						5				100	10.6	N/A
20	BoB @ 20'					6.1	N/A	1" End Cap				

DP - Direct push  
 HC - Hydrocarbon  
 BoB - Bottom of Boring  
 N/O - no odor  
 N/S - no staining  
 TOC - top of casing  
 bgs - below ground surface

START/COMPLETION DATE: 10/17/2018		SAND PACK INTERVAL (FEET): 4-20	
PROJECT: GEMINI B #31-11,12,13,14,25		BENTONITE/GROUT INTERVAL (FEET): 0-4	
LOGGED BY: K. Peterson		WELL SCREEN INTERVAL (FEET): 5-20	
DRILLING COMPANY/EQUIPMENT: EAGLE/GEOPROBE		WELL DIAMETER (INCHES): 1	
BORING DEPTH (FEET): 20	WELL DEPTH (FEET): 20	 <p><b>EAGLE</b> ENVIRONMENTAL CONSULTING, INC.</p> <p>4101 INCA STREET, DENVER, CO 80211 Ph: 303-433-0479 • F: 303-325-5449</p>	
PID INSTRUMENT: MiniRAE 3000 - PID #10			
TIME STARTED/COMPLETED: 1310/1345			
SAMPLE COLLECTION DEPTH (FEET)/TIME: 5-7.5/1315;10-12.5/1327			

# Boring Log/Well Completion Diagram: MW-05

DEPTH (FT)	LITHOLOGY	SAMPLE			OVM/OVA (PPM)	BLOW COUNT (per 0.5 FT)	DEPTH (FT)	WELL CONSTRUCTION DETAIL	COMMENTS
	DESCRIPTION	GRAPHIC LOG	TYPE	NUMBER					
0	(0-7') sandy SILT - brown, moderately moist, medium stiff, low plasticity, moderately graded w/ 15-20% fine sand, N/O, N/S	ML	DP	1	85	10.1	N/A		
						6.2			
5	(7-15.5') silty CLAY - brown, moderately moist, stiff, low plasticity, poorly graded w/ 20% silt, @9-13' - HC odor, black staining	CL	DP	2	100	4.5	N/A		
						42.4			
						504.3			
10	(15.5-17') CLAY - brown, moderately moist, stiff to very stiff, low plasticity, poorly graded with trace silt, N/O, N/S @16-16.5' - decompression fractures	CL	DP	4	90	3.6	N/A		
						122.6			
15	(17-25') silty CLAY - brown, moderately moist, stiff, low plasticity, poorly graded w/ 20% silt, N/O, N/S	CL	DP	5	100	1.7	N/A		
						0.6			
						0.8			
20		CL	DP	6	85	0.6	N/A		
						0.8			
25	BoB @ 25'								

DP - Direct push  
 HC - Hydrocarbon  
 BoB - Bottom of Boring  
 N/O - no odor  
 N/S - no staining  
 TOC - top of casing  
 bgs - below ground surface

START/COMPLETION DATE: 10/17/2018		SAND PACK INTERVAL (FEET): 4-25	
PROJECT: GEMINI B #31-11,12,13,14,25		BENTONITE/GROUT INTERVAL (FEET): 0-4	
LOGGED BY: K. Peterson		WELL SCREEN INTERVAL (FEET): 5-25	
DRILLING COMPANY/EQUIPMENT: EAGLE/GEOPROBE		WELL DIAMETER (INCHES): 1	
BORING DEPTH (FEET): 25	WELL DEPTH (FEET): 25		
PID INSTRUMENT: MiniRAE 3000 - PID #10			
TIME STARTED/COMPLETED: 1350/1430			
SAMPLE COLLECTION DEPTH (FEET)/TIME: 10-12.5/1405; 15-17.5/1410			

# Boring Log/Well Completion Diagram: MW-06

DEPTH (FT)	LITHOLOGY	SAMPLE			OVM/OVA (PPM)	BLOW COUNT (per 0.5 FT)	DEPTH (FT)	WELL CONSTRUCTION DETAIL	COMMENTS
	DESCRIPTION	GRAPHIC LOG	TYPE	NUMBER					
0	(0-9') sandy SILT - brown, moderately moist, medium stiff, low plasticity, moderately graded w/ 25% fine sand, N/O, N/S	ML	DP	1	90	3.8	N/A		
5						5.9			
10	(9-13') CLAY - brown to gray, moderately moist, very stiff, low plasticity, poorly graded with trace silt  @9.5-15' - HC odor, black staining	CL	DP	2	100	5.6	N/A		
10						51.9			
15	(13-16.5') silty CLAY - brown to black, moderately moist, medium stiff to stiff, low plasticity, poorly graded w/ 20% silt @15' - N/O, N/S	CL	DP	3	100	783.4	N/A		
15						410.8			
20	(16.5-18') CLAY - brown, moderately moist, very stiff, low plasticity, poorly graded trace silt and decompression fractures  (18-25') silty CLAY - brown, moderately moist, medium stiff to stiff, low plasticity, poorly graded w/ 25% silt, decompression fractures	CL	DP	4	100	5.2	N/A		
20						3.3			
20						2.5			
25	BoB @ 25'		DP	5	100	1.2	N/A		
25						2.5			
30									

DP - Direct push  
 HC - Hydrocarbon  
 BoB - Bottom of Boring  
 N/O - no odor  
 N/S - no staining  
 TOC - top of casing  
 bgs - below ground surface

START/COMPLETION DATE: 10/17/2018		SAND PACK INTERVAL (FEET): 4-25	
PROJECT: GEMINI B #31-11,12,13,14,25		BENTONITE/GROUT INTERVAL (FEET): 0-4	
LOGGED BY: K. Peterson		WELL SCREEN INTERVAL (FEET): 5-25	
DRILLING COMPANY/EQUIPMENT: EAGLE/GEOPROBE		WELL DIAMETER (INCHES): 1	
BORING DEPTH (FEET): 25	WELL DEPTH (FEET): 25	<p><b>EAGLE</b>                  ENVIRONMENTAL                  CONSULTING, INC.                  4101 INCA STREET, DENVER, CO 80211                  Ph: 303-433-0479 • F: 303-325-5449</p>	
PID INSTRUMENT: MiniRAE 3000 - PID #10			
TIME STARTED/COMPLETED: 1445/1530			
SAMPLE COLLECTION DEPTH (FEET)/TIME: 10-12.5/1453; 15-17.5/1500			

# Boring Log/Well Completion Diagram: MW-07

DEPTH (FT)	LITHOLOGY	SAMPLE				OVM/OVA (PPM)	BLOW COUNT (per 0.5 FT)	DEPTH (FT)	WELL CONSTRUCTION DETAIL	COMMENTS
	DESCRIPTION	GRAPHIC LOG	TYPE	NUMBER	RECOVERY %					
0	(0-20') silty CLAY - brown, dry to wet, medium stiff, low plasticity, moderately graded w/ 25% silt N/O N/S  wet @ 13.5'	CL	DP	1	100	0.5	N/A			
0.6										
5						N/A				
1.1										
1.1										
10	N/A									
1.2										
0.9										
15	N/A									
0.8										
20	N/A									
0.4										
20	BoB @ 20'									

DP - Direct push  
 HC - Hydrocarbon  
 BoB - Bottom of Boring  
 N/O - no odor  
 N/S - no staining  
 TOC - top of casing  
 bgs - below ground surface

START/COMPLETION DATE: 12/17/2018		SAND PACK INTERVAL (FEET): 5-20	
PROJECT: GEMINI B #31-11,12,13,14,25		BENTONITE/GROUT INTERVAL (FEET): 0-5	
LOGGED BY: K. Peterson		WELL SCREEN INTERVAL (FEET): 7.5-20	
DRILLING COMPANY/EQUIPMENT: EAGLE/GEOPROBE		WELL DIAMETER (INCHES): 1	
BORING DEPTH (FEET): 20	WELL DEPTH (FEET): 20	<p><b>EAGLE</b>                  ENVIRONMENTAL                  CONSULTING, INC.                  4101 INCA STREET, DENVER, CO 80211                  Ph: 303-433-0479 • F: 303-325-5449</p>	
PID INSTRUMENT: MiniRAE 3000 - PID #10			
TIME STARTED/COMPLETED: 1030/1130			
SAMPLE COLLECTION DEPTH (FEET)/TIME: 10-12'/1115			

# Boring Log/Well Completion Diagram: MW-08

DEPTH (FT)	LITHOLOGY	SAMPLE				OVM/OVA (PPM)	BLOW COUNT (per 0.5 FT)	DEPTH (FT)	WELL CONSTRUCTION DETAIL	COMMENTS
	DESCRIPTION	GRAPHIC LOG	TYPE	NUMBER	RECOVERY %					
0	(0-12') silty CLAY - brown, dry-moist, medium stiff, low plasticity, moderately graded w/ 25% silt	CL	DP	1	100	1.4	N/A			
5	@ 5.5-6' - black HC staining + strong odor					1.1				
10	@-9' - wet		DP	2	100	906.3	N/A			
15	(12-15') CLAY - brown and gray, wet, stiff, moderate plasticity, poorly graded w/ 10% silt N/O N/S					702.4				
20	(15-18') silty CLAY - brown, wet, medium stiff, low plasticity, moderately graded w/ 25% silt N/O N/S		DP	3	100	133.9	N/A			
25	(18-20') CLAY - brown, wet, stiff, moderate plasticity, poorly graded w/ 10% silt N/O N/S		DP	4	100	23.7	N/A			
30	(18-20') CLAY - brown, wet, stiff, moderate plasticity, poorly graded w/ 10% silt N/O N/S	DP	5	100	2.9	N/A				
	BoB @ 20'	DP	6	100	1.7	N/A				

DP - Direct push  
 HC - Hydrocarbon  
 BoB - Bottom of Boring  
 N/O - no odor  
 N/S - no staining  
 TOC - top of casing  
 bgs - below ground surface

START/COMPLETION DATE: 12/17/2018	SAND PACK INTERVAL (FEET): 5-20
PROJECT: GEMINI B #31-11,12,13,14,25	BENTONITE/GROUT INTERVAL (FEET): 0-5
LOGGED BY: K. Peterson	WELL SCREEN INTERVAL (FEET): 7.5-20
DRILLING COMPANY/EQUIPMENT: EAGLE/GEOPROBE	WELL DIAMETER (INCHES): 1
BORING DEPTH (FEET): 20	WELL DEPTH (FEET): 20
PID INSTRUMENT: MiniRAE 3000 - PID #10	
TIME STARTED/COMPLETED: 1030/1130	
SAMPLE COLLECTION DEPTH (FEET)/TIME: 10-12'/1115	




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# Boring Log/Well Completion Diagram: SB-01

DEPTH (FT)	LITHOLOGY	SAMPLE				OVM/OVA (PPM)	BLOW COUNT (per 0.5 FT)	DEPTH (FT)	WELL CONSTRUCTION DETAIL	COMMENTS
	DESCRIPTION	GRAPHIC LOG	TYPE	NUMBER	RECOVERY %					
0	(0-6') sandy SILT - brown, moderately moist, medium stiff, low plasticity, moderately graded w/ 20% fine sand N/O N/S	ML	HA	1	100	1.6	N/A			
5			HA	2		3.4				
6		CL	HA	3	100	11.9	N/A			
10			HA	4		1750				
10	BoB @ 10'									


HA - Hand Auger  
 HC - Hydrocarbon  
 BoB - Bottom of Boring  
 N/O - no odor  
 N/S - no staining  
 TOC - top of casing  
 bgs - below ground surface

START/COMPLETION DATE: 10/25/2018		SAND PACK INTERVAL (FEET): N/A	
PROJECT: GEMINI B #31-11,12,13,14,25		BENTONITE/GROUT INTERVAL (FEET): N/A	
LOGGED BY: K. Peterson		WELL SCREEN INTERVAL (FEET): N/A	
DRILLING COMPANY/EQUIPMENT: EAGLE/GEOPROBE		WELL DIAMETER (INCHES): N/A	
BORING DEPTH (FEET): 10	WELL DEPTH (FEET): N/A	 <p><b>EAGLE</b>                  ENVIRONMENTAL                  CONSULTING, INC.                  4101 INCA STREET, DENVER, CO 80211                  Ph: 303-433-0479 • F: 303-325-5449</p>	
PID INSTRUMENT: MiniRAE 3000 - PID #10			
TIME STARTED/COMPLETED: 1000/1015			
SAMPLE COLLECTION DEPTH (FEET)/TIME: 7.5-10'/1015			

# Boring Log/Well Completion Diagram: SB-02

DEPTH (FT)	LITHOLOGY	SAMPLE				OVM/OVA (PPM)	BLOW COUNT (per 0.5 FT)	DEPTH (FT)	WELL CONSTRUCTION DETAIL	COMMENTS
	DESCRIPTION	GRAPHIC LOG	TYPE	NUMBER	RECOVERY %					
0	(0-9') silty CLAY - brown, dry-moist, medium stiff, low plasticity, moderately graded w/ 25% silt	CL	DP	1	100	2.1	N/A			
	2.2									
5	@7-10' - gray HC staining + slight odor		DP	2	100	3.5	N/A			
	251.7									
10	(9-12') CLAY - brown and gray, wet, stiff, moderate plasticity, poorly graded with trace clay @~10' - wet, N/O, N/S	DP	3	100	1.2	N/A				
15	(12-15') silty CLAY - brown, wet, medium stiff, low plasticity, moderately graded w/ 25% silt N/O N/S	DP	4	100	0.4	N/A				
15	BoB @ 15'									

DP - Direct push  
 HC - Hydrocarbon  
 BoB - Bottom of Boring  
 N/O - no odor  
 N/S - no staining  
 TOC - top of casing  
 bgs - below ground surface

START/COMPLETION DATE: 12/17/2018		SAND PACK INTERVAL (FEET): N/A	
PROJECT: GEMINI B #31-11,12,13,14,25		BENTONITE/GROUT INTERVAL (FEET): N/A	
LOGGED BY: K. Peterson		WELL SCREEN INTERVAL (FEET): N/A	
DRILLING COMPANY/EQUIPMENT: EAGLE/GEOPROBE		WELL DIAMETER (INCHES): N/A	
BORING DEPTH (FEET): 15	WELL DEPTH (FEET): N/A	 <p><b>EAGLE</b>                  ENVIRONMENTAL                  CONSULTING, INC.                  4101 INCA STREET, DENVER, CO 80211                  Ph: 303-433-0479 • F: 303-325-5449</p>	
PID INSTRUMENT: MiniRAE 3000 - PID #10			
TIME STARTED/COMPLETED: 1230/1307			
SAMPLE COLLECTION DEPTH (FEET)/TIME: 7.5-10'/1250			

# Boring Log/Well Completion Diagram: AS-01

DEPTH (FT)	LITHOLOGY	SAMPLE				OVM/OVA (PPM)	BLOW COUNT (per 0.5 FT)	DEPTH (FT)	WELL CONSTRUCTION DETAIL	COMMENTS
	DESCRIPTION	GRAPHIC LOG	TYPE	NUMBER	RECOVERY %					
0	(0-9.5') silty CLAY - brown, dry-moist, medium stiff, low plasticity, moderately graded w/ 25% silt	CL	DP	1	100	0.6	N/A			
5	@7.5-11' - gray HC staining and strong odor					0.9				
10	(9.5-14') CLAY - brown-gray, moist to wet, stiff, moderate plasticity, poorly graded trace silt		DP	2	100	6.9	N/A			
15	@13' - wet, N/O, N/S					765.4				
20	(14-18.5') silty CLAY - brown, wet, medium stiff, low plasticity, moderately graded w/ 25% silt N/O N/S		DP	3	100	1124	N/A			
25	(18.5-20') CLAY - brown, wet, stiff, moderate plasticity, poorly graded with trace silt, N/O N/S					8.7				
30	BoB @ 20'	DP	4	100	3.4	N/A				
		DP	5	100	1.3	N/A				

DP - Direct push  
 HC - Hydrocarbon  
 BoB - Bottom of Boring  
 N/O - no odor  
 N/S - no staining  
 TOC - top of casing  
 bgs - below ground surface

START/COMPLETION DATE: 12/17/2018	SAND PACK INTERVAL (FEET): 16.5-20
PROJECT: GEMINI B #31-11,12,13,14,25	BENTONITE/GROUT INTERVAL (FEET): 0-16.5
LOGGED BY: K. Peterson	WELL SCREEN INTERVAL (FEET): 17.5-20
DRILLING COMPANY/EQUIPMENT: EAGLE/GEOPROBE	WELL DIAMETER (INCHES): 1
BORING DEPTH (FEET): 20	WELL DEPTH (FEET): 20
PID INSTRUMENT: MiniRAE 3000 - PID #10	
TIME STARTED/COMPLETED: 1320/1355	
SAMPLE COLLECTION DEPTH (FEET)/TIME: 10-12.5'/1322	



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# Boring Log/Well Completion Diagram: SVE-01

DEPTH (FT)	LITHOLOGY	SAMPLE				OVM/OVA (PPM)	BLOW COUNT (per 0.5 FT)	DEPTH (FT)	WELL CONSTRUCTION DETAIL	COMMENTS
	DESCRIPTION	GRAPHIC LOG	TYPE	NUMBER	RECOVERY %					
0	(0-10') silty CLAY - brown, dry to moist, medium stiff, low plasticity, moderately graded w/ 25% silt  @5-11' - black/gray HC staining + odor	CL	DP	1	100	1.6	N/A			
5						1.0				
10						960.4				
10	(10-11') CLAY - brown and gray, moist to wet, stiff, moderate plasticity, poorly graded with trace silt	CL	DP	2	100	526.1	N/A			
10	334.2					N/A				
11	BoB @ 11'									

DP - Direct push  
 HC - Hydrocarbon  
 BoB - Bottom of Boring  
 N/O - no odor  
 N/S - no staining  
 TOC - top of casing  
 bgs - below ground surface

START/COMPLETION DATE: 12/17/2018		SAND PACK INTERVAL (FEET): 6-11	
PROJECT: GEMINI B #31-11,12,13,14,25		BENTONITE/GROUT INTERVAL (FEET): 0-6	
LOGGED BY: K. Peterson		WELL SCREEN INTERVAL (FEET): 6-11	
DRILLING COMPANY/EQUIPMENT: EAGLE/GEOPROBE		WELL DIAMETER (INCHES): 2	
BORING DEPTH (FEET): 11	WELL DEPTH (FEET): 11	<p><b>EAGLE</b>                  ENVIRONMENTAL                  CONSULTING, INC.                  4101 INCA STREET, DENVER, CO 80211                  Ph: 303-433-0479 • F: 303-325-5449</p>	
PID INSTRUMENT: MiniRAE 3000 - PID #10			
TIME STARTED/COMPLETED: 1405/1426			
SAMPLE COLLECTION DEPTH (FEET)/TIME: 5-7.5'/1415			

## **ATTACHMENT B**

### **Laboratory Analytical Reports**



October 22, 2018

Eagle Environmental Consulting, Inc.

Martin C Eckert III

4101 Inca Street

Denver

CO 80211

**Project Name - Noble - Gemini B  
#31-11,12,13,14,25**

**Project Number - [none]**

Attached are your analytical results for Noble - Gemini B #31-11,12,13,14,25 received by Origins Laboratory, Inc. October 17, 2018. This project is associated with Origins project number Y810273-01.

The analytical results in the following report were analyzed under the guidelines of EPA Methods. These methods are identified as follows; "SW" are defined in SW-846, "EPA" are defined in 40CFR part 136 and "SM" are defined in the most current revision of Standard Methods For the Examination of Water and Wastewater.

The analytical results apply specifically to the samples and analyses specified per the attached Chain of Custody. As such, this report shall not be reproduced except in full, without the written approval of Origin's laboratory.

Unless otherwise noted, the analytical results for all soil samples are reported on a wet weight basis. All analytical analyses were performed under NELAP guidelines unless noted by a data qualifier.

Any holding time exceedances, deviations from the method specifications or deviations from Origins Laboratory's Standard Operating Procedures are outlined in the case narrative.

Thank you for selecting Origins for your analytical needs. Please contact us with any questions concerning this report, or if we can help with anything at all.

Origins Laboratory, Inc.  
303.433.1322  
o-squad@oelabinc.com



1725 Elk Place, Denver, CO 80211 | Phone: 303.433.1322 | Fax: 303.265.9645

Eagle Environmental Consulting, Inc.  
4101 Inca Street  
Denver CO 80211

Martin C Eckert III  
Project Number: [none]  
Project: Noble - Gemini B #31-11,12,13,14,25

**CROSS REFERENCE REPORT**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-01@7.5-10'	Y810273-01	Soil	October 17, 2018 9:30	10/17/2018 17:11
MW-01@12.5-15'	Y810273-02	Soil	October 17, 2018 9:45	10/17/2018 17:11
MW-02@7.5-10'	Y810273-03	Soil	October 17, 2018 12:12	10/17/2018 17:11
MW-02@17.5-20'	Y810273-04	Soil	October 17, 2018 12:25	10/17/2018 17:11
MW-03@7.5-10'	Y810273-05	Soil	October 17, 2018 10:23	10/17/2018 17:11
MW-03@15-17.5'	Y810273-06	Soil	October 17, 2018 10:48	10/17/2018 17:11
MW-04@5-7.5'	Y810273-07	Soil	October 17, 2018 13:15	10/17/2018 17:11
MW-04@10-12.5'	Y810273-08	Soil	October 17, 2018 13:27	10/17/2018 17:11
MW-05@10-12.5'	Y810273-09	Soil	October 17, 2018 14:05	10/17/2018 17:11
MW-05@12.5-15'	Y810273-10	Soil	October 17, 2018 14:10	10/17/2018 17:11
MW-06@10-12.5'	Y810273-11	Soil	October 17, 2018 14:53	10/17/2018 17:11
MW-06@12.5-15'	Y810273-12	Soil	October 17, 2018 15:00	10/17/2018 17:11
SS-01@4-5'	Y810273-13	Soil	October 17, 2018 16:18	10/17/2018 17:11

Origins Laboratory, Inc.



*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*





Eagle Environmental Consulting, Inc.  
 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

Origins Laboratory

F-012207-01-R1  
 Effective Date: 01/09/12

**Sample Receipt Checklist**

Origins Work Order: Y810273

Client: Eagle

Client Project ID: Doble-Gemini B 31-11,12,13,14

Checklist Completed by: JG

Shipped Via: HD  
(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Date/time completed: 10/18 / 2018

Airbill #: N/A

Matrix(s) Received: (Check all that apply):  Soil/Solid  Water  Other: \_\_\_\_\_

Cooler Number/Temperature: 1 / 3.1 °C \_\_\_\_\_ / \_\_\_\_\_ °C \_\_\_\_\_ / \_\_\_\_\_ °C \_\_\_\_\_ / \_\_\_\_\_ °C  
(Describe)

Thermometer ID: T003

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Is there ice present (document if blue ice is used)	<input checked="" type="checkbox"/>			
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)		<input checked="" type="checkbox"/>		
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)		<input checked="" type="checkbox"/>		
Were all samples received intact <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Was adequate sample volume provided <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Are short holding time analytes or samples with HTs due within 48 hours present <sup>(1)</sup> ?		<input checked="" type="checkbox"/>		
Is a chain-of-custody (COC) present and filled out completely <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client with date and time recorded <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
For volatiles in water – is there headspace (> ¼ inch bubble) present? <b>If yes, contact client and note in narrative.</b>			<input checked="" type="checkbox"/>	
Are samples preserved that require preservation and was it checked <sup>(1)</sup> ? (note ID of confirmation instrument used in comments) / (preservation is not confirmed for subcontracted analyses in order to insure sample integrity)/(pH <2 for samples preserved with HNO3, HCL, H2SO4) / (pH >10 for samples preserved with NaAsO2+NaOH, ZnAc+NaOH)		<input checked="" type="checkbox"/>		
Additional Comments (if any):				

<sup>(1)</sup>If NO, then contact the client before proceeding with analysis and note date/time and person contacted as well as the corrective action to in the additional comments (above) and the case narrative.

JG  
 Reviewed by (Project Manager)

10/18/18  
 Date/Time Reviewed

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Eagle Environmental Consulting, Inc.  
 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

MW-01@7.5-10'  
 10/17/2018 9:30:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
 Y810273-01 (Soil)

**Diesel Range Organics (DRO/TEPH) by EPA 8015C**

Diesel (C10-C28)	ND	50.0	mg/kg	1	B8J1802	KDK	10/18/2018	10/18/2018	U
Surrogate: o-Terphenyl	63.8 %	59-131			"	"	"	"	

**GBTEX + Napthalene by 8260C**

Gasoline Range Hydrocarbons	165	5.00	mg/kg	25	B8J1801	JTD	10/18/2018	10/18/2018	
Benzene	ND	0.050	"	"	"	JTD	"	"	U
Toluene	ND	0.050	"	"	"	JTD	"	"	U
Ethylbenzene	0.116	0.050	"	"	"	JTD	"	"	
Xylenes, total	1.64	0.050	"	"	"	JTD	"	"	
Napthalene	ND	0.200	"	"	"	JTD	"	"	U
Surrogate: 1,2-Dichloroethane-d4	96.6 %	70-130			"	"	"	"	
Surrogate: Toluene-d8	96.4 %	70-130			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	111 %	70-130			"	"	"	"	

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Eagle Environmental Consulting, Inc.  
 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**MW-01@12.5-15'**  
**10/17/2018 9:45:00AM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y810273-02 (Soil)**

**Diesel Range Organics (DRO/TEPH) by EPA 8015C**

Diesel (C10-C28)	ND	50.0	mg/kg	1	B8J1802	KDK	10/18/2018	10/22/2018	U
Surrogate: <i>o</i> -Terphenyl	88.6 %	59-131			"	"	"	"	

**GBTEX + Napthalene by 8260C**

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	B8J1801	JTD	10/18/2018	10/18/2018	U
Benzene	0.012	0.002	"	"	"	JTD	"	"	
Toluene	0.011	0.002	"	"	"	JTD	"	"	
Ethylbenzene	ND	0.002	"	"	"	JTD	"	"	U
Xylenes, total	ND	0.002	"	"	"	JTD	"	"	U
Napthalene	ND	0.008	"	"	"	JTD	"	"	U

Surrogate: 1,2-Dichloroethane-d4	98.3 %	70-130			"	"	"	"	
Surrogate: Toluene-d8	101 %	70-130			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	102 %	70-130			"	"	"	"	

Origins Laboratory, Inc.



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Eagle Environmental Consulting, Inc.  
 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**MW-02@7.5-10'**  
**10/17/2018 12:12:00PM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y810273-03 (Soil)**

**Diesel Range Organics (DRO/TEPH) by EPA 8015C**

Diesel (C10-C28)	ND	50.0	mg/kg	1	B8J1802	KDK	10/18/2018	10/18/2018	U
Surrogate: o-Terphenyl	66.3 %	59-131			"	"	"	"	

**GBTEX + Napthalene by 8260C**

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	B8J1801	JTD	10/18/2018	10/18/2018	U
Benzene	0.008	0.002	"	"	"	JTD	"	"	
Toluene	0.008	0.002	"	"	"	JTD	"	"	
Ethylbenzene	0.002	0.002	"	"	"	JTD	"	"	
Xylenes, total	ND	0.002	"	"	"	JTD	"	"	U
Napthalene	ND	0.008	"	"	"	JTD	"	"	U
Surrogate: 1,2-Dichloroethane-d4	101 %	70-130			"	"	"	"	
Surrogate: Toluene-d8	99.0 %	70-130			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	101 %	70-130			"	"	"	"	

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Eagle Environmental Consulting, Inc.  
 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**MW-02@17.5-20'**  
**10/17/2018 12:25:00PM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y810273-04 (Soil)**

**Diesel Range Organics (DRO/TEPH) by EPA 8015C**

Diesel (C10-C28)	ND	50.0	mg/kg	1	B8J1802	KDK	10/18/2018	10/22/2018	U
Surrogate: o-Terphenyl	81.8 %	59-131			"	"	"	"	

**GBTEX + Napthalene by 8260C**

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	B8J1801	JTD	10/18/2018	10/18/2018	U
Benzene	0.025	0.002	"	"	"	JTD	"	"	
Toluene	0.023	0.002	"	"	"	JTD	"	"	
Ethylbenzene	ND	0.002	"	"	"	JTD	"	"	U
Xylenes, total	0.007	0.002	"	"	"	JTD	"	"	
Napthalene	ND	0.008	"	"	"	JTD	"	"	U
Surrogate: 1,2-Dichloroethane-d4	102 %	70-130			"	"	"	"	
Surrogate: Toluene-d8	98.6 %	70-130			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	101 %	70-130			"	"	"	"	

Origins Laboratory, Inc.



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Eagle Environmental Consulting, Inc.  
 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**MW-03@7.5-10'**  
**10/17/2018 10:23:00AM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y810273-05 (Soil)**

**Diesel Range Organics (DRO/TEPH) by EPA 8015C**

Diesel (C10-C28)	1390	50.0	mg/kg	1	B8J1802	KDK	10/18/2018	10/19/2018	
Surrogate: <i>o</i> -Terphenyl	77.7 %	59-131			"	"		"	

**GBTEX + Napthalene by 8260C**

Gasoline Range Hydrocarbons	13500	500	mg/kg	2500	B8J1801	KDK	10/18/2018	10/19/2018	
Benzene	87.2	4.98	"	"	"	KDK	"	"	
Toluene	533	4.98	"	"	"	KDK	"	"	
Ethylbenzene	48.6	4.98	"	"	"	KDK	"	"	
Xylenes, total	749	4.98	"	"	"	KDK	"	"	
Napthalene	ND	0.200	"	25	"	JTD	"	10/18/2018	U
Surrogate: 1,2-Dichloroethane-d4	101 %	70-130			"	"		10/19/2018	
Surrogate: Toluene-d8	96.9 %	70-130			"	"		"	
Surrogate: 4-Bromofluorobenzene	101 %	70-130			"	"		"	

Origins Laboratory, Inc.



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Eagle Environmental Consulting, Inc.  
 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**MW-03@15-17.5'**  
**10/17/2018 10:48:00AM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y810273-06 (Soil)**

**Diesel Range Organics (DRO/TEPH) by EPA 8015C**

Diesel (C10-C28)	ND	50.0	mg/kg	1	B8J1802	KDK	10/18/2018	10/22/2018	U
Surrogate: <i>o</i> -Terphenyl	84.6 %	59-131			"	"	"	"	

**GBTEX + Napthalene by 8260C**

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	B8J1801	KDK	10/18/2018	10/19/2018	U
Benzene	ND	0.002	"	"	"	KDK	"	"	U
Toluene	ND	0.002	"	"	"	KDK	"	"	U
Ethylbenzene	ND	0.002	"	"	"	KDK	"	"	U
Xylenes, total	ND	0.002	"	"	"	KDK	"	"	U
Napthalene	ND	0.008	"	"	"	KDK	"	"	U
Surrogate: 1,2-Dichloroethane-d4	96.4 %	70-130			"	"		10/18/2018	
Surrogate: Toluene-d8	101 %	70-130			"	"		"	
Surrogate: 4-Bromofluorobenzene	98.9 %	70-130			"	"		"	

Origins Laboratory, Inc.



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Eagle Environmental Consulting, Inc.  
 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**MW-04@5-7.5'**  
**10/17/2018 1:15:00PM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y810273-07 (Soil)**

**Diesel Range Organics (DRO/TEPH) by EPA 8015C**

Diesel (C10-C28)	ND	50.0	mg/kg	1	B8J1802	KDK	10/18/2018	10/19/2018	U
Surrogate: o-Terphenyl	64.2 %	59-131			"	"	"	"	

**GBTEX + Napthalene by 8260C**

Gasoline Range Hydrocarbons	186	5.00	mg/kg	25	B8J1801	JTD	10/18/2018	10/19/2018	
Benzene	0.114	0.050	"	"	"	JTD	"	"	
Toluene	0.377	0.050	"	"	"	JTD	"	"	
Ethylbenzene	0.356	0.050	"	"	"	JTD	"	"	
Xylenes, total	5.82	0.050	"	"	"	JTD	"	"	
Napthalene	ND	0.200	"	"	"	JTD	"	"	U

Surrogate: 1,2-Dichloroethane-d4	93.7 %	70-130			"	"	"	"	
Surrogate: Toluene-d8	98.4 %	70-130			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	104 %	70-130			"	"	"	"	

Origins Laboratory, Inc.



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Eagle Environmental Consulting, Inc.  
 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**MW-04@10-12.5'**  
**10/17/2018 1:27:00PM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y810273-08 (Soil)**

**Diesel Range Organics (DRO/TEPH) by EPA 8015C**

Diesel (C10-C28)	ND	50.0	mg/kg	1	B8J1802	KDK	10/18/2018	10/19/2018	U
Surrogate: o-Terphenyl	61.6 %	59-131			"	"	"	"	

**GBTEX + Napthalene by 8260C**

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	B8J1801	KDK	10/18/2018	10/19/2018	U
Benzene	ND	0.002	"	"	"	KDK	"	"	U
Toluene	ND	0.002	"	"	"	KDK	"	"	U
Ethylbenzene	ND	0.002	"	"	"	KDK	"	"	U
Xylenes, total	ND	0.002	"	"	"	KDK	"	"	U
Napthalene	ND	0.008	"	"	"	KDK	"	"	U

Surrogate: 1,2-Dichloroethane-d4	97.6 %	70-130			"	"		10/19/2018	
Surrogate: Toluene-d8	102 %	70-130			"	"		"	
Surrogate: 4-Bromofluorobenzene	98.2 %	70-130			"	"		"	

Origins Laboratory, Inc.



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Eagle Environmental Consulting, Inc.  
 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**MW-05@10-12.5'**  
**10/17/2018 2:05:00PM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y810273-09 (Soil)**

**Diesel Range Organics (DRO/TEPH) by EPA 8015C**

Diesel (C10-C28)	ND	50.0	mg/kg	1	B8J1802	KDK	10/18/2018	10/19/2018	U
Surrogate: o-Terphenyl	60.1 %	59-131			"	"	"	"	

**GBTEX + Napthalene by 8260C**

Gasoline Range Hydrocarbons	14.4	0.200	mg/kg	1	B8J1801	JTD	10/18/2018	10/19/2018	
Benzene	ND	0.002	"	"	"	JTD	"	"	U
Toluene	ND	0.002	"	"	"	JTD	"	"	U
Ethylbenzene	0.008	0.002	"	"	"	JTD	"	"	
Xylenes, total	0.041	0.002	"	"	"	JTD	"	"	
Napthalene	ND	0.008	"	"	"	JTD	"	"	U
Surrogate: 1,2-Dichloroethane-d4	98.4 %	70-130			"	"	"	"	
Surrogate: Toluene-d8	91.2 %	70-130			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	105 %	70-130			"	"	"	"	

Origins Laboratory, Inc.



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Eagle Environmental Consulting, Inc.  
 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**MW-05@12.5-15'**  
**10/17/2018 2:10:00PM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y810273-10 (Soil)**

**Diesel Range Organics (DRO/TEPH) by EPA 8015C**

Diesel (C10-C28)	ND	50.0	mg/kg	1	B8J1802	KDK	10/18/2018	10/19/2018	U
Surrogate: <i>o</i> -Terphenyl	64.4 %	59-131			"	"	"	"	

**GBTEX + Napthalene by 8260C**

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	B8J1801	JTD	10/18/2018	10/19/2018	U
Benzene	ND	0.002	"	"	"	JTD	"	"	U
Toluene	ND	0.002	"	"	"	JTD	"	"	U
Ethylbenzene	ND	0.002	"	"	"	JTD	"	"	U
Xylenes, total	ND	0.002	"	"	"	JTD	"	"	U
Napthalene	ND	0.008	"	"	"	JTD	"	"	U
Surrogate: 1,2-Dichloroethane-d4	99.0 %	70-130			"	"	"	"	
Surrogate: Toluene-d8	100 %	70-130			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	100 %	70-130			"	"	"	"	

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Eagle Environmental Consulting, Inc.  
 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**MW-06@10-12.5'**  
**10/17/2018 2:53:00PM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y810273-11 (Soil)**

**Diesel Range Organics (DRO/TEPH) by EPA 8015C**

Diesel (C10-C28)	151	50.0	mg/kg	1	B8J1802	KDK	10/18/2018	10/19/2018	
Surrogate: o-Terphenyl	59.6 %	59-131			"	"	"	"	

**GBTEX + Napthalene by 8260C**

Gasoline Range Hydrocarbons	839	50.0	mg/kg	250	B8J1801	KDK	10/18/2018	10/19/2018	
Benzene	ND	0.050	"	25	"	JTD	"	10/19/2018	U
Toluene	ND	0.050	"	"	"	JTD	"	"	U
Ethylbenzene	ND	0.050	"	"	"	JTD	"	"	U
Xylenes, total	0.272	0.050	"	"	"	JTD	"	"	
Napthalene	ND	0.200	"	"	"	JTD	"	"	U
Surrogate: 1,2-Dichloroethane-d4	94.8 %	70-130			"	"	"	"	
Surrogate: Toluene-d8	73.5 %	70-130			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	103 %	70-130			"	"	"	10/19/2018	

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Eagle Environmental Consulting, Inc.  
 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**MW-06@12.5-15'**  
**10/17/2018 3:00:00PM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y810273-12 (Soil)**

**Diesel Range Organics (DRO/TEPH) by EPA 8015C**

Diesel (C10-C28)	ND	50.0	mg/kg	1	B8J1802	KDK	10/18/2018	10/22/2018	U
Surrogate: o-Terphenyl	90.6 %	59-131			"	"	"	"	

**GBTEX + Napthalene by 8260C**

Gasoline Range Hydrocarbons	<b>0.588</b>	0.200	mg/kg	1	B8J1801	JTD	10/18/2018	10/19/2018	
Benzene	ND	0.002	"	"	"	JTD	"	"	U
Toluene	ND	0.002	"	"	"	JTD	"	"	U
Ethylbenzene	ND	0.002	"	"	"	JTD	"	"	U
Xylenes, total	ND	0.002	"	"	"	JTD	"	"	U
Napthalene	ND	0.008	"	"	"	JTD	"	"	U

Surrogate: 1,2-Dichloroethane-d4	96.9 %	70-130			"	"	"	"	
Surrogate: Toluene-d8	101 %	70-130			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	101 %	70-130			"	"	"	"	

Origins Laboratory, Inc.



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Eagle Environmental Consulting, Inc.  
 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

SS-01@4-5'

10/17/2018 4:18:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
 Y810273-13 (Soil)

**Diesel Range Organics (DRO/TEPH) by EPA 8015C**

Diesel (C10-C28)	ND	50.0	mg/kg	1	B8J1802	KDK	10/18/2018	10/19/2018	U
Surrogate: <i>o</i> -Terphenyl	62.0 %	59-131			"	"	"	"	

**GBTEX + Napthalene by 8260C**

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	B8J1801	JTD	10/18/2018	10/19/2018	U
Benzene	ND	0.002	"	"	"	JTD	"	"	U
Toluene	ND	0.002	"	"	"	JTD	"	"	U
Ethylbenzene	ND	0.002	"	"	"	JTD	"	"	U
Xylenes, total	ND	0.002	"	"	"	JTD	"	"	U
Napthalene	ND	0.008	"	"	"	JTD	"	"	U
Surrogate: 1,2-Dichloroethane-d4	98.2 %	70-130			"	"	"	"	
Surrogate: Toluene-d8	100 %	70-130			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	98.5 %	70-130			"	"	"	"	

Origins Laboratory, Inc.



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Eagle Environmental Consulting, Inc.  
 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B8J1801 - EPA 5030 (soil)**

**Blank (B8J1801-BLK1)**

Prepared: 10/18/2018 Analyzed: 10/18/2018

Gasoline Range Hydrocarbons	ND	0.200	mg/kg							U
Benzene	ND	0.002	"							U
Toluene	ND	0.002	"							U
Ethylbenzene	ND	0.002	"							U
Xylenes, total	ND	0.002	"							U
Naphthalene	ND	0.008	"							U
Surrogate: 1,2-Dichloroethane-d4	60		ug/kg	62.5		96.3	70-130			
Surrogate: Toluene-d8	62		"	62.5		99.5	70-130			
Surrogate: 4-Bromofluorobenzene	64		"	62.5		103	70-130			

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Eagle Environmental Consulting, Inc.  
 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B8J1801 - EPA 5030 (soil)**

**Blank (B8J1801-BLK2)**

Prepared: 10/18/2018 Analyzed: 10/18/2018

Gasoline Range Hydrocarbons	ND	0.200	mg/kg							U
Benzene	ND	0.002	"							U
Toluene	ND	0.002	"							U
Ethylbenzene	ND	0.002	"							U
Xylenes, total	ND	0.002	"							U
Naphthalene	ND	0.008	"							U
Surrogate: 1,2-Dichloroethane-d4	61		ug/kg	62.5		97.6	70-130			
Surrogate: Toluene-d8	62		"	62.5		99.7	70-130			
Surrogate: 4-Bromofluorobenzene	65		"	62.5		104	70-130			

Origins Laboratory, Inc.



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Eagle Environmental Consulting, Inc.  
 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B8J1801 - EPA 5030 (soil)**

**LCS (B8J1801-BS1)**

Prepared: 10/18/2018 Analyzed: 10/18/2018

Benzene	0.103	0.002	mg/kg	0.100		103	70-130			
Toluene	0.103	0.002	"	0.100		103	70-130			
Ethylbenzene	0.103	0.002	"	0.100		103	70-130			
m,p-Xylene	0.208	0.004	"	0.200		104	70-130			
o-Xylene	0.099	0.002	"	0.100		99.3	70-130			
Naphthalene	0.097	0.008	"	0.100		97.4	70-130			
Surrogate: 1,2-Dichloroethane-d4	60		ug/kg	62.5		95.8	70-130			
Surrogate: Toluene-d8	62		"	62.5		98.7	70-130			
Surrogate: 4-Bromofluorobenzene	61		"	62.5		97.7	70-130			

Origins Laboratory, Inc.



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Eagle Environmental Consulting, Inc.  
 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B8J1801 - EPA 5030 (soil)**

**LCS (B8J1801-BS2)**

Prepared: 10/18/2018 Analyzed: 10/18/2018

Benzene	0.093	0.002	mg/kg	0.100		92.8	70-130			
Toluene	0.094	0.002	"	0.100		93.5	70-130			
Ethylbenzene	0.092	0.002	"	0.100		91.6	70-130			
m,p-Xylene	0.185	0.004	"	0.200		92.5	70-130			
o-Xylene	0.090	0.002	"	0.100		90.2	70-130			
Naphthalene	0.095	0.008	"	0.100		95.3	70-130			
Surrogate: 1,2-Dichloroethane-d4	60		ug/kg	62.5		96.3	70-130			
Surrogate: Toluene-d8	62		"	62.5		99.9	70-130			
Surrogate: 4-Bromofluorobenzene	61		"	62.5		97.3	70-130			

Origins Laboratory, Inc.



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Eagle Environmental Consulting, Inc.  
 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B8J1801 - EPA 5030 (soil)

Matrix Spike (B8J1801-MS1)	Source: Y810273-03			Prepared: 10/18/2018 Analyzed: 10/18/2018						
Benzene	0.109	0.002	mg/kg	0.100	0.008	100	70-130			
Toluene	0.111	0.002	"	0.100	0.008	103	70-130			
Ethylbenzene	0.106	0.002	"	0.100	0.002	105	70-130			
m,p-Xylene	0.215	0.004	"	0.200	0.004	106	70-130			
o-Xylene	0.103	0.002	"	0.100	0.0009	102	70-130			
Naphthalene	0.102	0.008	"	0.100	ND	102	70-130			
Surrogate: 1,2-Dichloroethane-d4	61		ug/kg	62.5		97.5	70-130			
Surrogate: Toluene-d8	63		"	62.5		100	70-130			
Surrogate: 4-Bromofluorobenzene	61		"	62.5		97.2	70-130			

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 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B8J1801 - EPA 5030 (soil)

Matrix Spike (B8J1801-MS2)	Source: Y810282-01			Prepared: 10/18/2018 Analyzed: 10/18/2018						
Benzene	0.103	0.002	mg/kg	0.100	ND	103	70-130			
Toluene	0.102	0.002	"	0.100	ND	102	70-130			
Ethylbenzene	0.100	0.002	"	0.100	ND	99.8	70-130			
m,p-Xylene	0.203	0.004	"	0.200	0.001	101	70-130			
o-Xylene	0.099	0.002	"	0.100	0.0006	98.1	70-130			
Naphthalene	0.117	0.008	"	0.100	0.007	109	70-130			
Surrogate: 1,2-Dichloroethane-d4	65		ug/kg	62.5		104	70-130			
Surrogate: Toluene-d8	61		"	62.5		98.2	70-130			
Surrogate: 4-Bromofluorobenzene	61		"	62.5		96.9	70-130			

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 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B8J1801 - EPA 5030 (soil)

Matrix Spike Dup (B8J1801-MSD1)	Source: Y810273-03			Prepared: 10/18/2018 Analyzed: 10/18/2018						
Benzene	0.106	0.002	mg/kg	0.100	0.008	97.0	70-130	3.10	20	
Toluene	0.108	0.002	"	0.100	0.008	100	70-130	2.52	20	
Ethylbenzene	0.104	0.002	"	0.100	0.002	103	70-130	1.96	20	
m,p-Xylene	0.213	0.004	"	0.200	0.004	105	70-130	1.24	20	
o-Xylene	0.102	0.002	"	0.100	0.0009	101	70-130	1.17	20	
Naphthalene	0.104	0.008	"	0.100	ND	104	70-130	1.34	20	
Surrogate: 1,2-Dichloroethane-d4	60		ug/kg	62.5		96.7	70-130			
Surrogate: Toluene-d8	63		"	62.5		101	70-130			
Surrogate: 4-Bromofluorobenzene	61		"	62.5		97.9	70-130			

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 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B8J1801 - EPA 5030 (soil)

Matrix Spike Dup (B8J1801-MSD2)	Source: Y810282-01			Prepared: 10/18/2018 Analyzed: 10/18/2018						
Benzene	0.085	0.002	mg/kg	0.100	ND	85.3	70-130	19.0	20	
Toluene	0.085	0.002	"	0.100	ND	84.6	70-130	19.2	20	
Ethylbenzene	0.082	0.002	"	0.100	ND	82.3	70-130	19.2	20	
m,p-Xylene	0.166	0.004	"	0.200	0.001	82.7	70-130	19.7	20	
o-Xylene	0.083	0.002	"	0.100	0.0006	82.3	70-130	17.4	20	
Naphthalene	0.108	0.008	"	0.100	0.007	101	70-130	7.62	20	
Surrogate: 1,2-Dichloroethane-d4	64		ug/kg	62.5		103	70-130			
Surrogate: Toluene-d8	61		"	62.5		97.3	70-130			
Surrogate: 4-Bromofluorobenzene	61		"	62.5		97.2	70-130			

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Eagle Environmental Consulting, Inc.  
 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Extractable Petroleum Hydrocarbons by 8015C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B8J1802 - EPA 3580**

**Blank (B8J1802-BLK1)**

Prepared: 10/18/2018 Analyzed: 10/18/2018

Diesel (C10-C28) ND 50.0 mg/kg U

Surrogate: o-Terphenyl 60 " 50.0 120 59-131

**Blank (B8J1802-BLK2)**

Prepared: 10/18/2018 Analyzed: 10/18/2018

Diesel (C10-C28) ND 50.0 mg/kg U

Surrogate: o-Terphenyl 56 " 50.0 112 59-131

**LCS (B8J1802-BS1)**

Prepared: 10/18/2018 Analyzed: 10/18/2018

Diesel (C10-C28) 991 50.0 mg/kg 1000 99.1 64-121

Surrogate: o-Terphenyl 47 " 50.0 93.1 59-131

**LCS (B8J1802-BS2)**

Prepared: 10/18/2018 Analyzed: 10/18/2018

Diesel (C10-C28) 1060 50.0 mg/kg 1000 106 64-121

Surrogate: o-Terphenyl 64 " 50.0 128 59-131

**Matrix Spike (B8J1802-MS1)**

Source: Y810273-03

Prepared: 10/18/2018 Analyzed: 10/18/2018

Diesel (C10-C28) 913 50.0 mg/kg 1000 ND 91.3 53-125

Surrogate: o-Terphenyl 40 " 50.0 80.4 59-131

**Matrix Spike (B8J1802-MS2)**

Source: Y810282-01

Prepared: 10/18/2018 Analyzed: 10/18/2018

Diesel (C10-C28) 1010 50.0 mg/kg 1000 ND 101 53-125

Surrogate: o-Terphenyl 59 " 50.0 119 59-131

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 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**Extractable Petroleum Hydrocarbons by 8015C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B8J1802 - EPA 3580**

<b>Matrix Spike Dup (B8J1802-MSD1)</b>		<b>Source: Y810273-03</b>			Prepared: 10/18/2018 Analyzed: 10/18/2018					
Diesel (C10-C28)	928	50.0	mg/kg	1000	ND	92.8	53-125	1.61	20	
Surrogate: o-Terphenyl	41		"	50.0		81.0	59-131			
<b>Matrix Spike Dup (B8J1802-MSD2)</b>		<b>Source: Y810282-01</b>			Prepared: 10/18/2018 Analyzed: 10/18/2018					
Diesel (C10-C28)	909	50.0	mg/kg	1000	ND	90.9	53-125	10.8	20	
Surrogate: o-Terphenyl	54		"	50.0		108	59-131			

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Eagle Environmental Consulting, Inc.  
4101 Inca Street  
Denver CO 80211

Martin C Eckert III  
Project Number: [none]  
Project: Noble - Gemini B #31-11,12,13,14,25

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**Notes and Definitions**

U Sample is Non-Detect.

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

All soil results are reported at a wet weight basis.

Origins Laboratory, Inc.



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---

Jen Pellegrini For Noelle Doyle Mathis, President



October 24, 2018

Eagle Environmental Consulting, Inc.

Martin C Eckert III

4101 Inca Street

Denver

CO 80211

**Project Name - Noble - Gemini B  
#31-11,12,13,14,25**

**Project Number - [none]**

Attached are your analytical results for Noble - Gemini B #31-11,12,13,14,25 received by Origins Laboratory, Inc. October 19, 2018. This project is associated with Origins project number Y810312-01.

The analytical results in the following report were analyzed under the guidelines of EPA Methods. These methods are identified as follows; "SW" are defined in SW-846, "EPA" are defined in 40CFR part 136 and "SM" are defined in the most current revision of Standard Methods For the Examination of Water and Wastewater.

The analytical results apply specifically to the samples and analyses specified per the attached Chain of Custody. As such, this report shall not be reproduced except in full, without the written approval of Origin's laboratory.

Unless otherwise noted, the analytical results for all soil samples are reported on a wet weight basis. All analytical analyses were performed under NELAP guidelines unless noted by a data qualifier.

Any holding time exceedances, deviations from the method specifications or deviations from Origins Laboratory's Standard Operating Procedures are outlined in the case narrative.

Thank you for selecting Origins for your analytical needs. Please contact us with any questions concerning this report, or if we can help with anything at all.

Origins Laboratory, Inc.  
303.433.1322  
o-squad@oelabinc.com



1725 Elk Place, Denver, CO 80211 | Phone: 303.433.1322 | Fax: 303.265.9645

Eagle Environmental Consulting, Inc.  
4101 Inca Street  
Denver CO 80211

Martin C Eckert III  
Project Number: [none]  
Project: Noble - Gemini B #31-11,12,13,14,25

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-01	Y810312-01	Water	October 19, 2018 11:00	10/19/2018 13:11
MW-02	Y810312-02	Water	October 19, 2018 11:05	10/19/2018 13:11
MW-03	Y810312-03	Water	October 19, 2018 11:15	10/19/2018 13:11
MW-04	Y810312-04	Water	October 19, 2018 11:25	10/19/2018 13:11
MW-05	Y810312-05	Water	October 19, 2018 11:40	10/19/2018 13:11
MW-06	Y810312-06	Water	October 19, 2018 11:55	10/19/2018 13:11

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President

Eagle Environmental Consulting, Inc.  
 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

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7910312

page 1 of 1

## ORIGINS

LABORATORY, INC

Client: Eagle Env. Consulting  
 Project Manager: Martin Eckert III  
 Address: 4101 Inca St.  
 Project Name: Gemini B  
Denver, CO 80211  
 Project Number: ---  
 Telephone Number: (303) 433-0479  
 Samples Collected By: SA  
 Email Address: mce3@eagle-enviro.com

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative				Matrix				Analysis	Sample Instructions	
				Unpreserved	HCl	HNO <sub>3</sub>	Other	Groundwater	Soil	Air Sample #	Other			
MW-01	10/19/18	1100	3	X				X						
MW-02		1105												
MW-03		1115												
MW-04		1125												
MW-05		1140												
MW-06		1155												
Relinquished By: <i>S. Quattrone</i>	Date: 10/19/18	Time: 1311	Received By: <i>[Signature]</i>	Date: 10-19-18	Time: 1311	Turnaround Time: Same Day <input type="checkbox"/> 24 Hr <input type="checkbox"/> 48 Hr <input type="checkbox"/> 72 Hr <input type="checkbox"/> Standard <input type="checkbox"/>								
Relinquished By:	Date:	Time:	Received By:	Date:	Time:									

\* Noble, Bill to Howard  
 Temp Received: 5.1  
 Date Results Needed

1725 Elk Place | Denver, CO 80211 | Phone: 303.433.1322 | Fax: 303.265.9645

Origins Laboratory, Inc.

*Jefe Pellegrini*

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Jen Pellegrini For Noelle Doyle Mathis, President

Eagle Environmental Consulting, Inc.  
 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

Origins Laboratory

F-012207-01-R1  
 Effective Date: 01/09/12

**Sample Receipt Checklist**

Origins Work Order: 1810312 Client: Eagle  
 Client Project ID: Noble - Gemini B  
 Checklist Completed by: JG Shipped Via: HD  
 (UPS, FedEx, Hand Delivered, Pick-up, etc.)  
 Date/time completed: 10/19/2018 Airbill #: N/A  
 Matrix(s) Received: (Check all that apply): Soil/Solid  Water  Other:   
 Cooler Number/Temperature: 1 / 5.1 °C          /          °C          /          °C (Describe)  
 Thermometer ID: T003

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C <sup>(1)?</sup>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is there ice present (document if blue ice is used)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were all samples received intact <sup>(1)?</sup>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was adequate sample volume provided <sup>(1)?</sup>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Are short holding time analytes or samples with HTs due within 48 hours present <sup>(1)?</sup>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Is a chain-of-custody (COC) present and filled out completely <sup>(1)?</sup>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Does the COC agree with the number and type of sample bottles received <sup>(1)?</sup>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Do the sample IDs on the bottle labels match the COC <sup>(1)?</sup>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is the COC properly relinquished by the client with date and time recorded <sup>(1)?</sup>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
For volatiles in water – is there headspace (> ¼ inch bubble) present? <b>If yes, contact client and note in narrative.</b>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Are samples preserved that require preservation and was it checked <sup>(1)?</sup> (note ID of confirmation instrument used in comments) / (preservation is not confirmed for subcontracted analyses in order to insure sample integrity)/(pH <2 for samples preserved with HNO <sub>3</sub> , HCL, H <sub>2</sub> SO <sub>4</sub> ) / (pH >10 for samples preserved with NaAsO <sub>2</sub> +NaOH, ZnAc+NaOH)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Additional Comments (if any):				

<sup>(1)</sup>If NO, then contact the client before proceeding with analysis and note date/time and person contacted as well as the corrective action to in the additional comments (above) and the case narrative.

Reviewed by (Project Manager) JG Date/Time Reviewed 10/22/18

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Eagle Environmental Consulting, Inc.  
 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**MW-01**

**10/19/2018 11:00:00AM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y810312-01 (Water)**

**BTEX by EPA 8260C**

Benzene	ND	4.00	ug/L	4	B8J2203	KDK	10/22/2018	10/22/2018	U
Toluene	ND	4.00	"	"	"	KDK	"	"	U
Ethylbenzene	<b>32.2</b>	4.00	"	"	"	KDK	"	"	
Xylenes, total	<b>563</b>	4.00	"	"	"	KDK	"	"	

Surrogate: 1,2-Dichloroethane-d4	106 %	84-121			"	"	"	"	
Surrogate: Toluene-d8	99.4 %	85-115			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	96.8 %	84-114			"	"	"	"	

Origins Laboratory, Inc.



*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

Eagle Environmental Consulting, Inc.  
 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**MW-02**

**10/19/2018 11:05:00AM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y810312-02 (Water)**

**BTEX by EPA 8260C**

Benzene	ND	1.00	ug/L	1	B8J2203	KDK	10/22/2018	10/22/2018	U
Toluene	ND	1.00	"	"	"	KDK	"	"	U
Ethylbenzene	ND	1.00	"	"	"	KDK	"	"	U
Xylenes, total	ND	1.00	"	"	"	KDK	"	"	U

Surrogate: 1,2-Dichloroethane-d4	106 %	84-121			"	"	"	"	
Surrogate: Toluene-d8	100 %	85-115			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	97.3 %	84-114			"	"	"	"	

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 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**MW-03**

**10/19/2018 11:15:00AM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y810312-03 (Water)**

**BTEX by EPA 8260C**

Benzene	<b>11100</b>	100	ug/L	100	B8J2203	KDK	10/22/2018	10/23/2018	
Toluene	<b>8470</b>	100	"	"	"	KDK	"	"	
Ethylbenzene	ND	1.00	"	1	"	KDK	"	10/22/2018	U
Xylenes, total	<b>7610</b>	50.0	"	50	"	KDK	"	10/22/2018	

Surrogate: 1,2-Dichloroethane-d4	98.6 %	84-121			"	"		10/23/2018	
Surrogate: Toluene-d8	98.3 %	85-115			"	"		10/22/2018	
Surrogate: 4-Bromofluorobenzene	107 %	84-114			"	"		"	

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 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**MW-04**

**10/19/2018 11:25:00AM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y810312-04 (Water)**

**BTEX by EPA 8260C**

Benzene	<b>3290</b>	50.0	ug/L	50	B8J2203	KDK	10/22/2018	10/22/2018	
Toluene	<b>6640</b>	100	"	100	"	KDK	"	10/23/2018	
Ethylbenzene	ND	1.00	"	1	"	KDK	"	10/22/2018	U
Xylenes, total	<b>5360</b>	50.0	"	50	"	KDK	"	10/22/2018	

Surrogate: 1,2-Dichloroethane-d4	102 %	84-121			"	"		10/23/2018	
Surrogate: Toluene-d8	96.5 %	85-115			"	"		10/22/2018	
Surrogate: 4-Bromofluorobenzene	107 %	84-114			"	"		"	

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 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**MW-05**

**10/19/2018 11:40:00AM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y810312-05 (Water)**

**BTEX by EPA 8260C**

Benzene	1.50	1.00	ug/L	1	B8J2203	KDK	10/22/2018	10/22/2018	
Toluene	5.48	1.00	"	"	"	KDK	"	"	
Ethylbenzene	1.80	1.00	"	"	"	KDK	"	"	
Xylenes, total	15.0	1.00	"	"	"	KDK	"	"	
Surrogate: 1,2-Dichloroethane-d4	106 %	84-121			"	"		10/22/2018	
Surrogate: Toluene-d8	99.0 %	85-115			"	"		"	
Surrogate: 4-Bromofluorobenzene	96.4 %	84-114			"	"		"	

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 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**MW-06**

**10/19/2018 11:55:00AM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y810312-06 (Water)**

**BTEX by EPA 8260C**

Benzene	5.26	1.00	ug/L	1	B8J2203	KDK	10/22/2018	10/22/2018	
Toluene	ND	1.00	"	"	"	KDK	"	"	U
Ethylbenzene	ND	1.00	"	"	"	KDK	"	"	U
Xylenes, total	4.53	1.00	"	"	"	KDK	"	"	

Surrogate: 1,2-Dichloroethane-d4	107 %	84-121			"	"	"	"	
Surrogate: Toluene-d8	99.1 %	85-115			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	99.0 %	84-114			"	"	"	"	

Origins Laboratory, Inc.



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Eagle Environmental Consulting, Inc.  
 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B8J2203 - EPA 5030B (Water)**

**Blank (B8J2203-BLK1)**

Prepared: 10/22/2018 Analyzed: 10/22/2018

Benzene	ND	1.00	ug/L							U
Toluene	ND	1.00	"							U
Ethylbenzene	ND	1.00	"							U
Xylenes, total	ND	1.00	"							U
Surrogate: 1,2-Dichloroethane-d4	65		"	62.5	104		84-121			
Surrogate: Toluene-d8	63		"	62.5	101		85-115			
Surrogate: 4-Bromofluorobenzene	60		"	62.5	96.4		84-114			

Origins Laboratory, Inc.



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 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B8J2203 - EPA 5030B (Water)**

**LCS (B8J2203-BS1)**

Prepared: 10/22/2018 Analyzed: 10/22/2018

Benzene	49.8	1.00	ug/L	50.0		99.6	73.3-129			
Toluene	51.8	1.00	"	50.0		104	76.2-123			
Ethylbenzene	53.1	1.00	"	50.0		106	73.6-130			
m,p-Xylene	104	2.00	"	100		104	76.1-126			
o-Xylene	49.8	1.00	"	50.0		99.6	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	62		"	62.5		99.9	84-121			
Surrogate: Toluene-d8	62		"	62.5		99.3	85-115			
Surrogate: 4-Bromofluorobenzene	64		"	62.5		103	84-114			

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 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B8J2203 - EPA 5030B (Water)

Matrix Spike (B8J2203-MS1)	Source: Y810312-02			Prepared: 10/22/2018 Analyzed: 10/22/2018						
Benzene	44.9	1.00	ug/L	50.0	0.140	89.5	74-130			
Toluene	47.3	1.00	"	50.0	0.460	93.6	73-131			
Ethylbenzene	47.4	1.00	"	50.0	ND	94.8	76-132			
m,p-Xylene	96.9	2.00	"	100	ND	96.9	69-139			
o-Xylene	46.9	1.00	"	50.0	0.090	93.7	74-131			
Surrogate: 1,2-Dichloroethane-d4	63		"	62.5		101	84-121			
Surrogate: Toluene-d8	63		"	62.5		100	85-115			
Surrogate: 4-Bromofluorobenzene	64		"	62.5		102	84-114			

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 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B8J2203 - EPA 5030B (Water)**

Matrix Spike Dup (B8J2203-MSD1)	Source: Y810312-02			Prepared: 10/22/2018 Analyzed: 10/22/2018						
Benzene	43.9	1.00	ug/L	50.0	0.140	87.5	74-130	2.25	20	
Toluene	45.4	1.00	"	50.0	0.460	89.8	73-131	4.06	20	
Ethylbenzene	45.0	1.00	"	50.0	ND	90.0	76-132	5.26	20	
m,p-Xylene	91.8	2.00	"	100	ND	91.8	69-139	5.42	20	
o-Xylene	44.9	1.00	"	50.0	0.090	89.6	74-131	4.49	20	
Surrogate: 1,2-Dichloroethane-d4	63		"	62.5		101	84-121			
Surrogate: Toluene-d8	62		"	62.5		98.8	85-115			
Surrogate: 4-Bromofluorobenzene	63		"	62.5		101	84-114			

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4101 Inca Street  
Denver CO 80211

Martin C Eckert III  
Project Number: [none]  
Project: Noble - Gemini B #31-11,12,13,14,25

---

**Notes and Definitions**

U Sample is Non-Detect.

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

All soil results are reported at a wet weight basis.

Origins Laboratory, Inc.



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---

Jen Pellegrini For Noelle Doyle Mathis, President



October 26, 2018

Eagle Environmental Consulting, Inc.

Martin C Eckert III

4101 Inca Street

Denver

CO 80211

**Project Name - Noble - Gemini B  
#31-11,12,13,14,25**

**Project Number - [none]**

Attached are your analytical results for Noble - Gemini B #31-11,12,13,14,25 received by Origins Laboratory, Inc. October 25, 2018. This project is associated with Origins project number Y810388-01.

The analytical results in the following report were analyzed under the guidelines of EPA Methods. These methods are identified as follows; "SW" are defined in SW-846, "EPA" are defined in 40CFR part 136 and "SM" are defined in the most current revision of Standard Methods For the Examination of Water and Wastewater.

The analytical results apply specifically to the samples and analyses specified per the attached Chain of Custody. As such, this report shall not be reproduced except in full, without the written approval of Origin's laboratory.

Unless otherwise noted, the analytical results for all soil samples are reported on a wet weight basis. All analytical analyses were performed under NELAP guidelines unless noted by a data qualifier.

Any holding time exceedances, deviations from the method specifications or deviations from Origins Laboratory's Standard Operating Procedures are outlined in the case narrative.

Thank you for selecting Origins for your analytical needs. Please contact us with any questions concerning this report, or if we can help with anything at all.

Origins Laboratory, Inc.  
303.433.1322  
o-squad@oelabinc.com



1725 Elk Place, Denver, CO 80211 | Phone: 303.433.1322 | Fax: 303.265.9645

Eagle Environmental Consulting, Inc.  
4101 Inca Street  
Denver CO 80211

Martin C Eckert III  
Project Number: [none]  
Project: Noble - Gemini B #31-11,12,13,14,25

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SB-01@7.5-10'	Y810388-01	Soil	October 25, 2018 10:15	10/25/2018 16:09

Origins Laboratory, Inc.



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Eagle Environmental Consulting, Inc.  
 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

Origins Laboratory

F-012207-01-R1  
 Effective Date: 01/09/12

**Sample Receipt Checklist**

Origins Work Order: Y410388

Client: Eagle

Client Project ID: Noble - Gemini B 31-11, 12, 13, 14

Checklist Completed by: JG

Shipped Via: HD  
(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Date/time completed: 10/25/2018

Airbill #: N/A

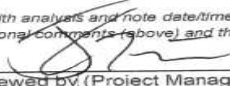
Matrix(s) Received: (Check all that apply):  Soil/Solid  Water  Other: \_\_\_\_\_  
(Describe)

Cooler Number/Temperature: 1 / 4.1 °C      /      °C      /      °C      /      °C

Thermometer ID: T003

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Is there ice present (document if blue ice is used)	<input checked="" type="checkbox"/>			
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)		<input checked="" type="checkbox"/>		
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)		<input checked="" type="checkbox"/>		
Were all samples received intact <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Was adequate sample volume provided <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Are short holding time analytes or samples with HTs due within 48 hours present <sup>(1)</sup> ?		<input checked="" type="checkbox"/>		
Is a chain-of-custody (COC) present and filled out completely <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client with date and time recorded <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.			<input checked="" type="checkbox"/>	
Are samples preserved that require preservation and was it checked <sup>(1)</sup> ? (note ID of confirmation instrument used in comments) / (preservation is not confirmed for subcontracted analyses in order to insure sample integrity)/(pH <2 for samples preserved with HNO <sub>3</sub> , HCL, H <sub>2</sub> SO <sub>4</sub> ) / (pH >10 for samples preserved with NaAsO <sub>2</sub> +NaOH, ZnAc+NaOH)		<input checked="" type="checkbox"/>		
Additional Comments (if any):				

<sup>(1)</sup>If NO, then contact the client before proceeding with analysis and note date/time and person contacted as well as the corrective action to in the additional comments (above) and the case narrative.

  
 Reviewed by (Project Manager)

10/25/18  
 Date/Time Reviewed

Origins Laboratory, Inc.



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 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**SB-01@7.5-10'**  
**10/25/2018 10:15:00AM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y810388-01 (Soil)**

**Diesel Range Organics (DRO/TEPH) by EPA 8015C**

Diesel (C10-C28)	1590	50.0	mg/kg	1	B8J2503	JTD	10/25/2018	10/25/2018	
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Surrogate: <i>o</i> -Terphenyl	81.8 %	59-131			"	"	"	"	
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**GBTEX + Napthalene by 8260C**

Gasoline Range Hydrocarbons	8110	500	mg/kg	2500	B8J2502	JTD	"	10/25/2018	
Benzene	39.6	4.98	"	"	"	JTD	"	"	
Toluene	244	4.98	"	"	"	JTD	"	"	
Ethylbenzene	21.8	4.98	"	"	"	JTD	"	"	
Xylenes, total	342	4.98	"	"	"	JTD	"	"	
Napthalene	ND	2.00	"	250	"	JTD	"	10/25/2018	R-01, U

Surrogate: 1,2-Dichloroethane-d4	97.1 %	70-130			"	"	"	10/25/2018	
Surrogate: Toluene-d8	94.5 %	70-130			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	101 %	70-130			"	"	"	"	

Origins Laboratory, Inc.



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 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B8J2502 - EPA 5030 (soil)**

**Blank (B8J2502-BLK1)**

Prepared: 10/25/2018 Analyzed: 10/25/2018

Gasoline Range Hydrocarbons	ND	0.200	mg/kg							U
Benzene	ND	0.002	"							U
Toluene	ND	0.002	"							U
Ethylbenzene	ND	0.002	"							U
Xylenes, total	ND	0.002	"							U
Naphthalene	ND	0.008	"							U
Surrogate: 1,2-Dichloroethane-d4	58		ug/kg	62.5		92.9	70-130			
Surrogate: Toluene-d8	62		"	62.5		99.2	70-130			
Surrogate: 4-Bromofluorobenzene	60		"	62.5		96.4	70-130			

Origins Laboratory, Inc.



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 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B8J2502 - EPA 5030 (soil)**

**Blank (B8J2502-BLK2)**

Prepared: 10/25/2018 Analyzed: 10/25/2018

Gasoline Range Hydrocarbons	ND	0.200	mg/kg							U
Benzene	ND	0.002	"							U
Toluene	ND	0.002	"							U
Ethylbenzene	ND	0.002	"							U
Xylenes, total	ND	0.002	"							U
Naphthalene	ND	0.008	"							U
Surrogate: 1,2-Dichloroethane-d4	61		ug/kg	62.5		98.4	70-130			
Surrogate: Toluene-d8	60		"	62.5		96.5	70-130			
Surrogate: 4-Bromofluorobenzene	64		"	62.5		102	70-130			

Origins Laboratory, Inc.



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 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B8J2502 - EPA 5030 (soil)

**LCS (B8J2502-BS1)**

Prepared: 10/25/2018 Analyzed: 10/25/2018

Benzene	0.103	0.002	mg/kg	0.100		103	70-130			
Toluene	0.105	0.002	"	0.100		105	70-130			
Ethylbenzene	0.098	0.002	"	0.100		97.7	70-130			
m,p-Xylene	0.199	0.004	"	0.200		99.6	70-130			
o-Xylene	0.099	0.002	"	0.100		98.7	70-130			
Naphthalene	0.092	0.008	"	0.100		91.9	70-130			
Surrogate: 1,2-Dichloroethane-d4	58		ug/kg	62.5		93.6	70-130			
Surrogate: Toluene-d8	62		"	62.5		99.9	70-130			
Surrogate: 4-Bromofluorobenzene	60		"	62.5		96.2	70-130			

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Eagle Environmental Consulting, Inc.  
 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B8J2502 - EPA 5030 (soil)

**LCS (B8J2502-BS2)**

Prepared: 10/25/2018 Analyzed: 10/25/2018

Benzene	0.119	0.002	mg/kg	0.100		119	70-130			
Toluene	0.115	0.002	"	0.100		115	70-130			
Ethylbenzene	0.104	0.002	"	0.100		104	70-130			
m,p-Xylene	0.214	0.004	"	0.200		107	70-130			
o-Xylene	0.104	0.002	"	0.100		104	70-130			
Naphthalene	0.096	0.008	"	0.100		95.9	70-130			
Surrogate: 1,2-Dichloroethane-d4	61		ug/kg	62.5		97.5	70-130			
Surrogate: Toluene-d8	60		"	62.5		95.3	70-130			
Surrogate: 4-Bromofluorobenzene	56		"	62.5		89.9	70-130			

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 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B8J2502 - EPA 5030 (soil)

Matrix Spike (B8J2502-MS1)	Source: Y810374-01			Prepared: 10/25/2018 Analyzed: 10/25/2018						
Benzene	0.101	0.002	mg/kg	0.100	ND	101	70-130			
Toluene	0.096	0.002	"	0.100	ND	96.4	70-130			
Ethylbenzene	0.087	0.002	"	0.100	ND	87.3	70-130			
m,p-Xylene	0.180	0.004	"	0.200	ND	90.2	70-130			
o-Xylene	0.091	0.002	"	0.100	ND	90.7	70-130			
Naphthalene	0.095	0.008	"	0.100	ND	95.2	70-130			
Surrogate: 1,2-Dichloroethane-d4	61		ug/kg	62.5		97.3	70-130			
Surrogate: Toluene-d8	60		"	62.5		95.4	70-130			
Surrogate: 4-Bromofluorobenzene	59		"	62.5		94.0	70-130			

Origins Laboratory, Inc.



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 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B8J2502 - EPA 5030 (soil)

Matrix Spike (B8J2502-MS2)	Source: Y810374-02			Prepared: 10/25/2018 Analyzed: 10/25/2018						
Benzene	0.087	0.002	mg/kg	0.100	ND	87.0	70-130			
Toluene	0.083	0.002	"	0.100	ND	83.3	70-130			
Ethylbenzene	0.078	0.002	"	0.100	ND	78.0	70-130			
m,p-Xylene	0.163	0.004	"	0.200	ND	81.4	70-130			
o-Xylene	0.077	0.002	"	0.100	ND	77.0	70-130			
Naphthalene	0.059	0.008	"	0.100	ND	59.3	70-130			QM-07
Surrogate: 1,2-Dichloroethane-d4	64		ug/kg	62.5		102	70-130			
Surrogate: Toluene-d8	59		"	62.5		94.5	70-130			
Surrogate: 4-Bromofluorobenzene	60		"	62.5		96.2	70-130			

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 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B8J2502 - EPA 5030 (soil)

Matrix Spike Dup (B8J2502-MSD1)	Source: Y810374-01			Prepared: 10/25/2018 Analyzed: 10/25/2018						
Benzene	0.109	0.002	mg/kg	0.100	ND	109	70-130	7.40	20	
Toluene	0.105	0.002	"	0.100	ND	105	70-130	8.16	20	
Ethylbenzene	0.098	0.002	"	0.100	ND	98.3	70-130	11.9	20	
m,p-Xylene	0.202	0.004	"	0.200	ND	101	70-130	11.5	20	
o-Xylene	0.101	0.002	"	0.100	ND	101	70-130	10.8	20	
Naphthalene	0.098	0.008	"	0.100	ND	98.5	70-130	3.32	20	
Surrogate: 1,2-Dichloroethane-d4	59		ug/kg	62.5		94.9	70-130			
Surrogate: Toluene-d8	61		"	62.5		97.1	70-130			
Surrogate: 4-Bromofluorobenzene	61		"	62.5		97.0	70-130			

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 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B8J2502 - EPA 5030 (soil)

Matrix Spike Dup (B8J2502-MSD2)	Source: Y810374-02			Prepared: 10/25/2018 Analyzed: 10/25/2018						
Benzene	0.103	0.002	mg/kg	0.100	ND	103	70-130	16.9	20	
Toluene	0.095	0.002	"	0.100	ND	95.4	70-130	13.6	20	
Ethylbenzene	0.082	0.002	"	0.100	ND	82.4	70-130	5.49	20	
m,p-Xylene	0.169	0.004	"	0.200	ND	84.6	70-130	3.94	20	
o-Xylene	0.082	0.002	"	0.100	ND	82.0	70-130	6.26	20	
Naphthalene	0.070	0.008	"	0.100	ND	70.2	70-130	16.8	20	
Surrogate: 1,2-Dichloroethane-d4	68		ug/kg	62.5		109	70-130			
Surrogate: Toluene-d8	60		"	62.5		95.5	70-130			
Surrogate: 4-Bromofluorobenzene	58		"	62.5		92.5	70-130			

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 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Extractable Petroleum Hydrocarbons by 8015C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B8J2503 - EPA 3550B**

**Blank (B8J2503-BLK1)**

Prepared: 10/25/2018 Analyzed: 10/25/2018

Diesel (C10-C28)	ND	50.0	mg/kg							U
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Surrogate: o-Terphenyl

34			"	50.0		68.4	59-131			
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**LCS (B8J2503-BS1)**

Prepared: 10/25/2018 Analyzed: 10/25/2018

Diesel (C10-C28)	972	50.0	mg/kg	1000		97.2	64-121			
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Surrogate: o-Terphenyl

41			"	50.0		82.7	59-131			
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**Matrix Spike (B8J2503-MS1)**

**Source: Y810374-01**

Prepared: 10/25/2018 Analyzed: 10/25/2018

Diesel (C10-C28)	952	50.0	mg/kg	1000	37.1	91.5	53-125			
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Surrogate: o-Terphenyl

39			"	50.0		79.0	59-131			
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**Matrix Spike Dup (B8J2503-MSD1)**

**Source: Y810374-01**

Prepared: 10/25/2018 Analyzed: 10/25/2018

Diesel (C10-C28)	959	50.0	mg/kg	1000	37.1	92.2	53-125	0.733	20	
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Surrogate: o-Terphenyl

41			"	50.0		82.2	59-131			
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4101 Inca Street  
Denver CO 80211

Martin C Eckert III  
Project Number: [none]  
Project: Noble - Gemini B #31-11,12,13,14,25

---

### Notes and Definitions

U Sample is Non-Detect.

R-01 The Reporting Limit for this analyte has been raised to account for matrix interference.

QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

All soil results are reported at a wet weight basis.

Origins Laboratory, Inc.



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---

Jen Pellegrini For Noelle Doyle Mathis, President



December 26, 2018

Eagle Environmental Consulting, Inc.

Martin C Eckert III

4101 Inca Street

Denver

CO 80211

**Project Name - Noble - Gemini B  
#31-11,12,13,14,25**

**Project Number - [none]**

Attached are your analytical results for Noble - Gemini B #31-11,12,13,14,25 received by Origins Laboratory, Inc. December 18, 2018. This project is associated with Origins project number Y812302-01.

The analytical results in the following report were analyzed under the guidelines of EPA Methods. These methods are identified as follows; "SW" are defined in SW-846, "EPA" are defined in 40CFR part 136 and "SM" are defined in the most current revision of Standard Methods For the Examination of Water and Wastewater.

The analytical results apply specifically to the samples and analyses specified per the attached Chain of Custody. As such, this report shall not be reproduced except in full, without the written approval of Origin's laboratory.

Unless otherwise noted, the analytical results for all soil samples are reported on a wet weight basis. All analytical analyses were performed under NELAP guidelines unless noted by a data qualifier.

Any holding time exceedances, deviations from the method specifications or deviations from Origins Laboratory's Standard Operating Procedures are outlined in the case narrative.

Thank you for selecting Origins for your analytical needs. Please contact us with any questions concerning this report, or if we can help with anything at all.

Origins Laboratory, Inc.  
303.433.1322  
o-squad@oelabinc.com



1725 Elk Place, Denver, CO 80211 | Phone: 303.433.1322 | Fax: 303.265.9645

Eagle Environmental Consulting, Inc.  
4101 Inca Street  
Denver CO 80211

Martin C Eckert III  
Project Number: [none]  
Project: Noble - Gemini B #31-11,12,13,14,25

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-07@10-12	Y812302-01	Soil	December 17, 2018 11:15	12/18/2018 15:58
MW-08@5-7.5	Y812302-02	Soil	December 17, 2018 11:48	12/18/2018 15:58
AS-01@10-12.5	Y812302-03	Soil	December 17, 2018 13:22	12/18/2018 15:58
SVE-01@5-7.5	Y812302-04	Soil	December 17, 2018 14:15	12/18/2018 15:58
SB-01@7.5-10	Y812302-05	Soil	December 17, 2018 12:50	12/18/2018 15:58

Origins Laboratory, Inc.



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Eagle Environmental Consulting, Inc.  
 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

Origins Laboratory

F-012207-01-R1  
 Effective Date: 01/09/12

**Sample Receipt Checklist**

Origins Work Order: 4812302

Client: Eagle Env

Client Project ID: Gemini B # 31-11, 12, 13, 14, 25

Checklist Completed by: JP

Shipped Via: HD  
 (UPS, FedEx, Hand Delivered, Pick-up, etc.)

Date/time completed: 12/19/12

Airbill #: NA

Matrix(s) Received: (Check all that apply):  Soil/Solid  Water  Other: \_\_\_\_\_

Cooler Number/Temperature: 1 / 1.8 °C \_\_\_\_\_ / \_\_\_\_\_ °C \_\_\_\_\_ / \_\_\_\_\_ °C (Describe)

Thermometer ID: TCB

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C <sup>(1)</sup> ?	X			
Is there ice present (document if blue ice is used)	X			
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)		X		
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)		X		
Were all samples received intact <sup>(1)</sup> ?	X			
Was adequate sample volume provided <sup>(1)</sup> ?	X			
Are short holding time analytes or samples with HTs due within 48 hours present <sup>(1)</sup> ?		X		
Is a chain-of-custody (COC) present and filled out completely <sup>(1)</sup> ?	X			
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	X			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	X			
Is the COC properly relinquished by the client with date and time recorded <sup>(1)</sup> ?	X			
For volatiles in water – is there headspace (> ¼ inch bubble) present? <b>If yes, contact client and note in narrative.</b>			X	
Are samples preserved that require preservation and was it checked <sup>(1)</sup> ? (note ID of confirmation instrument used in comments) / (preservation is not confirmed for subcontracted analyses in order to insure sample integrity)/pH <2 for samples preserved with HNO3, HCL, H2SO4) / ( pH >10 for samples preserved with NaAsO2+NaOH, ZnAc+NaOH)			X	
Additional Comments (if any):				

<sup>(1)</sup>If NO, then contact the client before proceeding with analysis and note date/time and person contacted as well as the corrective action to in the additional comments (above) and the case narrative.

Reviewed by (Project Manager) \_\_\_\_\_

Date/Time Reviewed 12-19-12

Origins Laboratory, Inc.



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Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

MW-07@10-12  
 12/17/2018 11:15:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
 Y812302-01 (Soil)

**Diesel Range Organics (DRO/TEPH) by EPA 8015C**

Diesel (C10-C28)	ND	50.0	mg/kg	1	B8L2102	JTD	12/21/2018	12/21/2018	U
Surrogate: o-Terphenyl	80.0 %	59-131			"	"	"	"	

**GBTEX + Napthalene by 8260C**

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	B8L2105	JTD	12/21/2018	12/22/2018	U
Benzene	0.014	0.002	"	"	"	JTD	"	"	
Toluene	0.004	0.002	"	"	"	JTD	"	"	
Ethylbenzene	ND	0.002	"	"	"	JTD	"	"	U
Xylenes, total	ND	0.002	"	"	"	JTD	"	"	U
Napthalene	ND	0.008	"	"	"	JTD	"	"	U

Surrogate: 1,2-Dichloroethane-d4	117 %	70-130			"	"	"	"	
Surrogate: Toluene-d8	96.3 %	70-130			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	96.8 %	70-130			"	"	"	"	

Origins Laboratory, Inc.



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 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**MW-08@5-7.5**  
**12/17/2018 11:48:00AM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y812302-02 (Soil)**

**Diesel Range Organics (DRO/TEPH) by EPA 8015C**

Diesel (C10-C28)	<b>420</b>	50.0	mg/kg	1	B8L2102	JTD	12/21/2018	12/21/2018	
Surrogate: <i>o</i> -Terphenyl	79.7 %	59-131			"	"	"	"	

**GBTEX + Napthalene by 8260C**

Gasoline Range Hydrocarbons	<b>1220</b>	50.0	mg/kg	250	B8L2105	JTD	12/21/2018	12/24/2018	
Benzene	<b>1.92</b>	0.050	"	25	"	JTD	"	12/22/2018	
Toluene	<b>7.35</b>	0.050	"	"	"	JTD	"	"	
Ethylbenzene	<b>3.84</b>	0.050	"	"	"	JTD	"	"	
Xylenes, total	<b>57.0</b>	0.498	"	250	"	JTD	"	12/24/2018	
Naphthalene	<b>0.398</b>	0.200	"	25	"	JTD	"	12/22/2018	

Surrogate: 1,2-Dichloroethane-d4	101 %	70-130			"	"		12/24/2018	
Surrogate: Toluene-d8	97.9 %	70-130			"	"		12/22/2018	
Surrogate: 4-Bromofluorobenzene	111 %	70-130			"	"		12/24/2018	

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 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**AS-01@10-12.5**

**12/17/2018 1:22:00PM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y812302-03 (Soil)**

**Diesel Range Organics (DRO/TEPH) by EPA 8015C**

Diesel (C10-C28)	ND	50.0	mg/kg	1	B8L2102	JTD	12/21/2018	12/21/2018	U
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Surrogate: <i>o</i> -Terphenyl	74.4 %	59-131			"	"	"	"	
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**GBTEX + Napthalene by 8260C**

Gasoline Range Hydrocarbons	79.7	5.00	mg/kg	25	B8L2105	JTD	12/21/2018	12/22/2018	
Benzene	ND	0.050	"	"	"	JTD	"	"	U
Toluene	0.075	0.050	"	"	"	JTD	"	"	
Ethylbenzene	0.134	0.050	"	"	"	JTD	"	"	
Xylenes, total	0.920	0.050	"	"	"	JTD	"	"	
Naphthalene	ND	0.200	"	"	"	JTD	"	"	U

Surrogate: 1,2-Dichloroethane-d4	98.8 %	70-130			"	"	"	"	
Surrogate: Toluene-d8	91.5 %	70-130			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	108 %	70-130			"	"	"	"	

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 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**SVE-01@5-7.5**  
**12/17/2018 2:15:00PM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y812302-04 (Soil)**

**Diesel Range Organics (DRO/TEPH) by EPA 8015C**

Diesel (C10-C28)	236	50.0	mg/kg	1	B8L2102	JTD	12/21/2018	12/21/2018	
Surrogate: <i>o</i> -Terphenyl	81.7 %	59-131			"	"	"	"	

**GBTEX + Napthalene by 8260C**

Gasoline Range Hydrocarbons	269	5.00	mg/kg	25	B8L2105	JTD	12/21/2018	12/22/2018	
Benzene	0.264	0.050	"	"	"	JTD	"	"	
Toluene	1.18	0.050	"	"	"	JTD	"	"	
Ethylbenzene	1.04	0.050	"	"	"	JTD	"	"	
Xylenes, total	12.7	0.050	"	"	"	JTD	"	"	
Napthalene	ND	0.200	"	"	"	JTD	"	"	U
Surrogate: 1,2-Dichloroethane-d4	109 %	70-130			"	"	"	"	
Surrogate: Toluene-d8	95.7 %	70-130			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	97.1 %	70-130			"	"	"	"	

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Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**SB-01@7.5-10**  
**12/17/2018 12:50:00PM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y812302-05 (Soil)**

**Diesel Range Organics (DRO/TEPH) by EPA 8015C**

Diesel (C10-C28)	ND	50.0	mg/kg	1	B8L2102	JTD	12/21/2018	12/21/2018	U
Surrogate: <i>o</i> -Terphenyl	71.7 %	59-131			"	"	"	"	

**GBTEX + Napthalene by 8260C**

Gasoline Range Hydrocarbons	<b>0.480</b>	0.200	mg/kg	1	B8L2105	JTD	12/21/2018	12/24/2018	
Benzene	<b>0.002</b>	0.002	"	"	"	JTD	"	"	
Toluene	<b>0.002</b>	0.002	"	"	"	JTD	"	"	
Ethylbenzene	ND	0.002	"	"	"	JTD	"	"	U
Xylenes, total	<b>0.005</b>	0.002	"	"	"	JTD	"	"	
Naphthalene	ND	0.008	"	"	"	JTD	"	"	U

Surrogate: 1,2-Dichloroethane-d4	101 %	70-130			"	"	"	"	
Surrogate: Toluene-d8	105 %	70-130			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	98.9 %	70-130			"	"	"	"	

Origins Laboratory, Inc.



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Eagle Environmental Consulting, Inc.  
 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B8L2105 - EPA 5030 (soil)**

**Blank (B8L2105-BLK1)**

Prepared: 12/21/2018 Analyzed: 12/22/2018

Gasoline Range Hydrocarbons	ND	0.200	mg/kg							U
Benzene	ND	0.002	"							U
Toluene	ND	0.002	"							U
Ethylbenzene	ND	0.002	"							U
Xylenes, total	ND	0.002	"							U
Naphthalene	ND	0.008	"							U
Surrogate: 1,2-Dichloroethane-d4	0.13		"	0.125		101	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		98.7	70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125		101	70-130			

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Eagle Environmental Consulting, Inc.  
 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B8L2105 - EPA 5030 (soil)

Blank (B8L2105-BLK2)

Prepared: 12/21/2018 Analyzed: 12/22/2018

Gasoline Range Hydrocarbons	ND	0.200	mg/kg							U
Benzene	ND	0.002	"							U
Toluene	ND	0.002	"							U
Ethylbenzene	ND	0.002	"							U
Xylenes, total	ND	0.002	"							U
Naphthalene	ND	0.008	"							U
Surrogate: 1,2-Dichloroethane-d4	0.13		"	0.125		102	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		97.9	70-130			
Surrogate: 4-Bromofluorobenzene	0.12		"	0.125		96.5	70-130			

Origins Laboratory, Inc.



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 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B8L2105 - EPA 5030 (soil)**

**LCS (B8L2105-BS1)**

Prepared: 12/21/2018 Analyzed: 12/21/2018

Benzene	0.100	0.002	mg/kg	0.100		100	70-130			
Toluene	0.105	0.002	"	0.100		105	70-130			
Ethylbenzene	0.108	0.002	"	0.100		108	70-130			
m,p-Xylene	0.207	0.004	"	0.200		103	70-130			
o-Xylene	0.115	0.002	"	0.100		115	70-130			
Naphthalene	0.110	0.008	"	0.100		110	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.12		"	0.125		98.2	70-130			
Surrogate: Toluene-d8	0.13		"	0.125		102	70-130			
Surrogate: 4-Bromofluorobenzene	0.12		"	0.125		99.4	70-130			

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 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B8L2105 - EPA 5030 (soil)

**LCS (B8L2105-BS2)**

Prepared: 12/21/2018 Analyzed: 12/22/2018

Benzene	0.111	0.002	mg/kg	0.100		111	70-130			
Toluene	0.107	0.002	"	0.100		107	70-130			
Ethylbenzene	0.114	0.002	"	0.100		114	70-130			
m,p-Xylene	0.214	0.004	"	0.200		107	70-130			
o-Xylene	0.117	0.002	"	0.100		117	70-130			
Naphthalene	0.111	0.008	"	0.100		111	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.12		"	0.125		96.8	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		97.7	70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125		102	70-130			

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 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B8L2105 - EPA 5030 (soil)

Matrix Spike (B8L2105-MS1)	Source: Y812287-01			Prepared: 12/21/2018 Analyzed: 12/22/2018						
Benzene	0.094	0.002	mg/kg	0.100	ND	94.0	70-130			
Toluene	0.094	0.002	"	0.100	ND	94.1	70-130			
Ethylbenzene	0.100	0.002	"	0.100	ND	100	70-130			
m,p-Xylene	0.189	0.004	"	0.200	ND	94.4	70-130			
o-Xylene	0.101	0.002	"	0.100	ND	101	70-130			
Naphthalene	0.087	0.008	"	0.100	ND	87.3	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.13		"	0.125		105	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		96.0	70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125		103	70-130			

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Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B8L2105 - EPA 5030 (soil)

Matrix Spike (B8L2105-MS2)	Source: Y812287-02			Prepared: 12/21/2018 Analyzed: 12/22/2018						
Benzene	0.079	0.002	mg/kg	0.100	ND	78.5	70-130			
Toluene	0.075	0.002	"	0.100	ND	75.3	70-130			
Ethylbenzene	0.064	0.002	"	0.100	ND	63.9	70-130			QM-07
m,p-Xylene	0.119	0.004	"	0.200	ND	59.4	70-130			QM-07
o-Xylene	0.065	0.002	"	0.100	ND	65.1	70-130			QM-07
Naphthalene	0.068	0.008	"	0.100	ND	67.9	70-130			QM-07
Surrogate: 1,2-Dichloroethane-d4	0.15		"	0.125		123	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		94.4	70-130			
Surrogate: 4-Bromofluorobenzene	0.12		"	0.125		93.4	70-130			

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Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B8L2105 - EPA 5030 (soil)

Matrix Spike Dup (B8L2105-MSD1)	Source: Y812287-01			Prepared: 12/21/2018 Analyzed: 12/22/2018						
Benzene	0.079	0.002	mg/kg	0.100	ND	78.8	70-130	17.6	20	
Toluene	0.078	0.002	"	0.100	ND	78.1	70-130	18.6	20	
Ethylbenzene	0.082	0.002	"	0.100	ND	81.8	70-130	20.3	20	QR-02
m,p-Xylene	0.152	0.004	"	0.200	ND	76.1	70-130	21.4	20	QR-02
o-Xylene	0.084	0.002	"	0.100	ND	84.3	70-130	17.6	20	
Naphthalene	0.070	0.008	"	0.100	ND	69.9	70-130	22.2	20	QM-07, QR-01
Surrogate: 1,2-Dichloroethane-d4	0.13		"	0.125		102	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		98.7	70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125		106	70-130			

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 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B8L2105 - EPA 5030 (soil)

Matrix Spike Dup (B8L2105-MSD2)	Source: Y812287-02			Prepared: 12/21/2018 Analyzed: 12/22/2018						
Benzene	0.092	0.002	mg/kg	0.100	ND	92.5	70-130	16.3	20	
Toluene	0.090	0.002	"	0.100	ND	90.0	70-130	17.8	20	
Ethylbenzene	0.090	0.002	"	0.100	ND	89.8	70-130	33.7	20	QR-02
m,p-Xylene	0.167	0.004	"	0.200	ND	83.5	70-130	33.8	20	QR-02
o-Xylene	0.093	0.002	"	0.100	ND	93.0	70-130	35.3	20	QR-02
Naphthalene	0.079	0.008	"	0.100	ND	78.6	70-130	14.6	20	
Surrogate: 1,2-Dichloroethane-d4	0.13		"	0.125		102	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		98.9	70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125		103	70-130			

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Eagle Environmental Consulting, Inc.  
 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Extractable Petroleum Hydrocarbons by 8015C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B8L2102 - EPA 3550B**

**Blank (B8L2102-BLK1)**

Prepared: 12/21/2018 Analyzed: 12/21/2018

Diesel (C10-C28)	ND	50.0	mg/kg							U
Surrogate: o-Terphenyl	41		"	50.0		81.2	59-131			

**LCS (B8L2102-BS1)**

Prepared: 12/21/2018 Analyzed: 12/21/2018

Diesel (C10-C28)	959	50.0	mg/kg	1000		95.9	64-121			
Surrogate: o-Terphenyl	47		"	50.0		93.4	59-131			

**Matrix Spike (B8L2102-MS1)**

**Source: Y812281-01**

Prepared: 12/21/2018 Analyzed: 12/21/2018

Diesel (C10-C28)	1200	50.0	mg/kg	1000	ND	120	53-125			
Surrogate: o-Terphenyl	58		"	50.0		115	59-131			

**Matrix Spike Dup (B8L2102-MSD1)**

**Source: Y812281-01**

Prepared: 12/21/2018 Analyzed: 12/21/2018

Diesel (C10-C28)	1090	50.0	mg/kg	1000	ND	109	53-125	9.67	20	
Surrogate: o-Terphenyl	51		"	50.0		103	59-131			

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4101 Inca Street  
Denver CO 80211

Martin C Eckert III  
Project Number: [none]  
Project: Noble - Gemini B #31-11,12,13,14,25

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### Notes and Definitions

U Sample is Non-Detect.

QR-02 The RPD result exceeded the QC control limits; however, both percent recoveries were acceptable. Sample results for the QC batch were accepted based on percent recoveries and completeness of QC data.

QR-01 Analyses are not controlled on RPD values from sample concentrations less than 10 times the reporting limit. QC batch accepted based on LCS and/or LCSD QC results.

QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

All soil results are reported at a wet weight basis.

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January 07, 2019

Eagle Environmental Consulting, Inc.

Martin C Eckert III

4101 Inca Street

Denver

CO 80211

**Project Name - Noble - Gemini B  
#31-11,12,13,14,25**

**Project Number - [none]**

Attached are your analytical results for Noble - Gemini B #31-11,12,13,14,25 received by Origins Laboratory, Inc. January 03, 2019. This project is associated with Origins project number Y901017-01.

The analytical results in the following report were analyzed under the guidelines of EPA Methods. These methods are identified as follows; "SW" are defined in SW-846, "EPA" are defined in 40CFR part 136 and "SM" are defined in the most current revision of Standard Methods For the Examination of Water and Wastewater.

The analytical results apply specifically to the samples and analyses specified per the attached Chain of Custody. As such, this report shall not be reproduced except in full, without the written approval of Origin's laboratory.

Unless otherwise noted, the analytical results for all soil samples are reported on a wet weight basis. All analytical analyses were performed under NELAP guidelines unless noted by a data qualifier.

Any holding time exceedances, deviations from the method specifications or deviations from Origins Laboratory's Standard Operating Procedures are outlined in the case narrative.

Thank you for selecting Origins for your analytical needs. Please contact us with any questions concerning this report, or if we can help with anything at all.

Origins Laboratory, Inc.  
303.433.1322  
o-squad@oelabinc.com



1725 Elk Place, Denver, CO 80211 | Phone: 303.433.1322 | Fax: 303.265.9645

Eagle Environmental Consulting, Inc.  
4101 Inca Street  
Denver CO 80211

Martin C Eckert III  
Project Number: [none]  
Project: Noble - Gemini B #31-11,12,13,14,25

## CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-01	Y901017-01	Water	January 3, 2019 7:55	01/03/2019 11:40
MW-02	Y901017-02	Water	January 3, 2019 7:23	01/03/2019 11:40
MW-03	Y901017-03	Water	January 3, 2019 7:30	01/03/2019 11:40
MW-04	Y901017-04	Water	January 3, 2019 7:35	01/03/2019 11:40
MW-05	Y901017-05	Water	January 3, 2019 7:25	01/03/2019 11:40
MW-06	Y901017-06	Water	January 3, 2019 7:20	01/03/2019 11:40
MW-07	Y901017-07	Water	January 3, 2019 7:36	01/03/2019 11:40
MW-08	Y901017-08	Water	January 3, 2019 7:38	01/03/2019 11:40

Origins Laboratory, Inc.



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 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

www.originslaboratory.com

9901017

page 1 of 1

Client: Eagle Env. Consulting, Inc.  
 Address: 4101 Inca Street  
Denver, CO, 80211  
 Telephone Number: 303-433-0779  
 Email Address: MCC.S@eagleenv.com

Project Manager: Martin Eckert III  
 Project Name: Gemini B #31-11,12,13,14,25  
 Project Number: -  
 Samples Collected By: AN/SQ/RP

Fax: 303.265.9645 | Phone: 303.433.1322 | Denver, CO 80211 | 1725 Elk Place

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative			Matrix			Analysis		Sample Instructions
				Unpreserved	HCl	HNO <sub>3</sub>	Groundwater	Soil	Air Summa #	Other	Date	
MW-01	01/03/19	0722	3	X			X					1
MW-02		0723										2
MW-03		0730										3
MW-04		0735										4
MW-05		0725										5
MW-06		0720										6
MW-07		0736										7
MW-08		0738										8
												9
												10
Relinquished By: <u>And Mjz</u>	Date: <u>01/03/19</u>	Time: <u>140</u>	Received By: <u>[Signature]</u>	Date: <u>1-3-19</u>	Time: <u>140</u>	Turnaround Time: Same Day <input type="checkbox"/> 24 Hr <input type="checkbox"/> 48 Hr <input checked="" type="checkbox"/> 72 Hr <input type="checkbox"/> Standard <input type="checkbox"/>						
Relinquished By:	Date:	Time:	Received By:	Date:	Time:							

Temp Received: 5.2  
 Date Results Needed: Noble

Origins Laboratory, Inc.

*Jefe Pellegrini*

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Eagle Environmental Consulting, Inc.  
 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

Origins Laboratory

F-012207-01-R1  
 Effective Date: 01/09/12

**Sample Receipt Checklist**

Origins Work Order: 7901017

Client: Eagle Env.

Client Project ID: Noble - Gemini B #31-11, 12, 13, 14

Checklist Completed by: D. Lee

Shipped Via: HD

(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Date/time completed: 1-3-19

Airbill #: PA

Matrix(s) Received: (Check all that apply):  Soil/Solid  Water  Other: \_\_\_\_\_

Cooler Number/Temperature:  / 5.2 °C  / \_\_\_\_\_ °C  / \_\_\_\_\_ °C  / \_\_\_\_\_ °C (Describe)

Thermometer ID: 1003

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Is there ice present (document if blue ice is used)	<input checked="" type="checkbox"/>			
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)		<input checked="" type="checkbox"/>		
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)		<input checked="" type="checkbox"/>		
Were all samples received intact <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Was adequate sample volume provided <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Are short holding time analytes or samples with HTs due within 48 hours present <sup>(1)</sup> ?		<input checked="" type="checkbox"/>		
Is a chain-of-custody (COC) present and filled out completely <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client with date and time recorded <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
For volatiles in water – is there headspace (> ¼ inch bubble) present? <b>If yes, contact client and note in narrative.</b>		<input checked="" type="checkbox"/>		
Are samples preserved that require preservation and was it checked <sup>(1)</sup> ? (note ID of confirmation instrument used in comments) / (preservation is not confirmed for subcontracted analyses in order to insure sample integrity)/(pH <2 for samples preserved with HNO3, HCL, H2SO4) / (pH >10 for samples preserved with NaAsO2+NaOH, ZnAc+NaOH)			<input checked="" type="checkbox"/>	
Additional Comments (if any):				

<sup>(1)</sup>If NO, then contact the client before proceeding with analysis and note date/time and person contacted as well as the corrective action to in the additional comments (above) and the case narrative.

Reviewed by (Project Manager) [Signature]

Date/Time Reviewed 1/7/19

Origins Laboratory, Inc.

[Signature: Jen Pellegrini]

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

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 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**MW-01**

**1/3/2019 7:55:00AM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y901017-01 (Water)**

**BTEX by EPA 8260C**

Benzene	1.75	1.00	ug/L	1	B9A0302	KDK	01/03/2019	01/04/2019	
Toluene	ND	1.00	"	"	"	KDK	"	"	U
Ethylbenzene	ND	1.00	"	"	"	KDK	"	"	U
Xylenes, total	ND	1.00	"	"	"	KDK	"	"	U

Surrogate: 1,2-Dichloroethane-d4	91.6 %	84-121			"	"	"	"	
Surrogate: Toluene-d8	89.8 %	85-115			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	97.5 %	84-114			"	"	"	"	

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Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**MW-02**

**1/3/2019 7:23:00AM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y901017-02 (Water)**

**BTEX by EPA 8260C**

Benzene	ND	1.00	ug/L	1	B9A0302	KDK	01/03/2019	01/04/2019	U
Toluene	ND	1.00	"	"	"	KDK	"	"	U
Ethylbenzene	ND	1.00	"	"	"	KDK	"	"	U
Xylenes, total	ND	1.00	"	"	"	KDK	"	"	U

Surrogate: 1,2-Dichloroethane-d4	94.0 %	84-121			"	"	"		
Surrogate: Toluene-d8	90.1 %	85-115			"	"	"		
Surrogate: 4-Bromofluorobenzene	93.7 %	84-114			"	"	"		

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Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**MW-03**

**1/3/2019 7:30:00AM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y901017-03 (Water)**

**BTEX by EPA 8260C**

Benzene	<b>8880</b>	200	ug/L	200	B9A0302	KDK	01/03/2019	01/04/2019	
Toluene	<b>668</b>	200	"	"	"	KDK	"	"	
Ethylbenzene	<b>70.2</b>	4.00	"	4	"	KDK	"	01/04/2019	
Xylenes, total	<b>1930</b>	200	"	200	"	KDK	"	01/04/2019	
Surrogate: 1,2-Dichloroethane-d4	90.4 %			84-121		"	"	"	
Surrogate: Toluene-d8	90.8 %			85-115		"	"	01/04/2019	
Surrogate: 4-Bromofluorobenzene	97.3 %			84-114		"	"	"	

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 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**MW-04**

**1/3/2019 7:35:00AM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y901017-04 (Water)**

**BTEX by EPA 8260C**

Benzene	<b>3250</b>	100	ug/L	100	B9A0302	KDK	01/03/2019	01/04/2019	
Toluene	<b>2540</b>	100	"	"	"	KDK	"	"	
Ethylbenzene	<b>178</b>	100	"	"	"	KDK	"	"	
Xylenes, total	<b>3930</b>	100	"	"	"	KDK	"	"	
Surrogate: 1,2-Dichloroethane-d4	88.5 %	84-121			"	"		"	
Surrogate: Toluene-d8	92.3 %	85-115			"	"		"	
Surrogate: 4-Bromofluorobenzene	95.9 %	84-114			"	"		"	

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Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**MW-05**

**1/3/2019 7:25:00AM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y901017-05 (Water)**

**BTEX by EPA 8260C**

Benzene	11.2	1.00	ug/L	1	B9A0302	KDK	01/03/2019	01/04/2019	
Toluene	ND	1.00	"	"	"	KDK	"	"	U
Ethylbenzene	17.8	1.00	"	"	"	KDK	"	"	
Xylenes, total	73.6	1.00	"	"	"	KDK	"	"	

Surrogate: 1,2-Dichloroethane-d4	104 %	84-121			"	"	"	"	
Surrogate: Toluene-d8	86.5 %	85-115			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	99.0 %	84-114			"	"	"	"	

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 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**MW-06**

**1/3/2019 7:20:00AM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y901017-06 (Water)**

**BTEX by EPA 8260C**

Benzene	ND	1.00	ug/L	1	B9A0302	KDK	01/03/2019	01/04/2019	U
Toluene	ND	1.00	"	"	"	KDK	"	"	U
Ethylbenzene	ND	1.00	"	"	"	KDK	"	"	U
Xylenes, total	ND	1.00	"	"	"	KDK	"	"	U

Surrogate: 1,2-Dichloroethane-d4	93.8 %	84-121			"	"		"	
Surrogate: Toluene-d8	88.0 %	85-115			"	"		"	
Surrogate: 4-Bromofluorobenzene	103 %	84-114			"	"		"	

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Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**MW-07**

**1/3/2019 7:36:00AM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y901017-07 (Water)**

**BTEX by EPA 8260C**

Benzene	ND	1.00	ug/L	1	B9A0302	KDK	01/03/2019	01/04/2019	U
Toluene	ND	1.00	"	"	"	KDK	"	"	U
Ethylbenzene	ND	1.00	"	"	"	KDK	"	"	U
Xylenes, total	ND	1.00	"	"	"	KDK	"	"	U

Surrogate: 1,2-Dichloroethane-d4	93.8 %	84-121			"	"	"	"	
Surrogate: Toluene-d8	90.2 %	85-115			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	95.3 %	84-114			"	"	"	"	

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Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**MW-08**

**1/3/2019 7:38:00AM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**Y901017-08 (Water)**

**BTEX by EPA 8260C**

Benzene	<b>720</b>	10.0	ug/L	10	B9A0302	KDK	01/03/2019	01/04/2019	
Toluene	<b>891</b>	10.0	"	"	"	KDK	"	"	
Ethylbenzene	<b>45.6</b>	10.0	"	"	"	KDK	"	"	
Xylenes, total	<b>648</b>	10.0	"	"	"	KDK	"	"	
Surrogate: 1,2-Dichloroethane-d4	85.7 %			84-121		"	"	"	
Surrogate: Toluene-d8	93.2 %			85-115		"	"	"	
Surrogate: 4-Bromofluorobenzene	97.9 %			84-114		"	"	"	

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 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B9A0302 - EPA 5030B (Water)**

**Blank (B9A0302-BLK1)**

Prepared: 01/03/2019 Analyzed: 01/04/2019

Benzene	ND	1.00	ug/L							U
Toluene	ND	1.00	"							U
Ethylbenzene	ND	1.00	"							U
Xylenes, total	ND	1.00	"							U
Surrogate: 1,2-Dichloroethane-d4	61		"	62.5	98.2		84-121			
Surrogate: Toluene-d8	65		"	62.5	104		85-115			
Surrogate: 4-Bromofluorobenzene	63		"	62.5	101		84-114			

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 4101 Inca Street  
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Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B9A0302 - EPA 5030B (Water)**

**Blank (B9A0302-BLK2)**

Prepared: 01/03/2019 Analyzed: 01/04/2019

Benzene	ND	1.00	ug/L							U
Toluene	ND	1.00	"							U
Ethylbenzene	ND	1.00	"							U
Xylenes, total	ND	1.00	"							U
Surrogate: 1,2-Dichloroethane-d4	63		"	62.5		101	84-121			
Surrogate: Toluene-d8	62		"	62.5		99.3	85-115			
Surrogate: 4-Bromofluorobenzene	62		"	62.5		99.2	84-114			

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 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B9A0302 - EPA 5030B (Water)**

**LCS (B9A0302-BS1)**

Prepared: 01/03/2019 Analyzed: 01/04/2019

Benzene	41.4	1.00	ug/L	50.0		82.9	73.3-129			
Toluene	42.2	1.00	"	50.0		84.5	76.2-123			
Ethylbenzene	41.8	1.00	"	50.0		83.7	73.6-130			
m,p-Xylene	82.3	2.00	"	100		82.3	76.1-126			
o-Xylene	41.4	1.00	"	50.0		82.9	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	61		"	62.5		97.0	84-121			
Surrogate: Toluene-d8	64		"	62.5		102	85-115			
Surrogate: 4-Bromofluorobenzene	64		"	62.5		102	84-114			

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 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B9A0302 - EPA 5030B (Water)**

**LCS (B9A0302-BS2)**

Prepared: 01/03/2019 Analyzed: 01/04/2019

Benzene	46.0	1.00	ug/L	50.0		92.0	73.3-129			
Toluene	45.0	1.00	"	50.0		90.0	76.2-123			
Ethylbenzene	44.7	1.00	"	50.0		89.5	73.6-130			
m,p-Xylene	88.2	2.00	"	100		88.2	76.1-126			
o-Xylene	43.9	1.00	"	50.0		87.8	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	61		"	62.5		98.0	84-121			
Surrogate: Toluene-d8	62		"	62.5		99.8	85-115			
Surrogate: 4-Bromofluorobenzene	63		"	62.5		100	84-114			

Origins Laboratory, Inc.



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Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B9A0302 - EPA 5030B (Water)

Matrix Spike (B9A0302-MS1)	Source: Y812442-01			Prepared: 01/03/2019 Analyzed: 01/04/2019						
Benzene	44.1	1.00	ug/L	50.0	ND	88.3	74-130			
Toluene	44.1	1.00	"	50.0	ND	88.2	73-131			
Ethylbenzene	43.6	1.00	"	50.0	ND	87.2	76-132			
m,p-Xylene	86.0	2.00	"	100	ND	86.0	69-139			
o-Xylene	43.0	1.00	"	50.0	ND	85.9	74-131			
Surrogate: 1,2-Dichloroethane-d4	61		"	62.5		98.2	84-121			
Surrogate: Toluene-d8	63		"	62.5		102	85-115			
Surrogate: 4-Bromofluorobenzene	62		"	62.5		99.1	84-114			

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Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B9A0302 - EPA 5030B (Water)

Matrix Spike (B9A0302-MS2)	Source: Y901008-01			Prepared: 01/03/2019 Analyzed: 01/04/2019						
Benzene	42.6	1.00	ug/L	50.0	0.880	83.4	74-130			
Toluene	41.3	1.00	"	50.0	ND	82.6	73-131			
Ethylbenzene	40.9	1.00	"	50.0	ND	81.8	76-132			
m,p-Xylene	80.6	2.00	"	100	ND	80.6	69-139			
o-Xylene	40.8	1.00	"	50.0	ND	81.5	74-131			
Surrogate: 1,2-Dichloroethane-d4	62		"	62.5		99.5	84-121			
Surrogate: Toluene-d8	62		"	62.5		99.7	85-115			
Surrogate: 4-Bromofluorobenzene	62		"	62.5		100	84-114			

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Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B9A0302 - EPA 5030B (Water)**

Matrix Spike Dup (B9A0302-MSD1)	Source: Y812442-01			Prepared: 01/03/2019 Analyzed: 01/04/2019						
Benzene	43.1	1.00	ug/L	50.0	ND	86.2	74-130	2.36	20	
Toluene	42.6	1.00	"	50.0	ND	85.3	73-131	3.41	20	
Ethylbenzene	42.8	1.00	"	50.0	ND	85.7	76-132	1.74	20	
m,p-Xylene	84.7	2.00	"	100	ND	84.7	69-139	1.56	20	
o-Xylene	42.0	1.00	"	50.0	ND	84.0	74-131	2.31	20	
Surrogate: 1,2-Dichloroethane-d4	62		"	62.5		98.8	84-121			
Surrogate: Toluene-d8	63		"	62.5		101	85-115			
Surrogate: 4-Bromofluorobenzene	63		"	62.5		101	84-114			

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 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B9A0302 - EPA 5030B (Water)**

Matrix Spike Dup (B9A0302-MSD2)	Source: Y901008-01			Prepared: 01/03/2019 Analyzed: 01/04/2019						
Benzene	41.7	1.00	ug/L	50.0	0.880	81.7	74-130	2.06	20	
Toluene	40.4	1.00	"	50.0	ND	80.8	73-131	2.15	20	
Ethylbenzene	40.5	1.00	"	50.0	ND	81.1	76-132	0.835	20	
m,p-Xylene	79.2	2.00	"	100	ND	79.2	69-139	1.88	20	
o-Xylene	40.2	1.00	"	50.0	ND	80.5	74-131	1.33	20	
Surrogate: 1,2-Dichloroethane-d4	62		"	62.5		98.5	84-121			
Surrogate: Toluene-d8	62		"	62.5		99.2	85-115			
Surrogate: 4-Bromofluorobenzene	62		"	62.5		98.5	84-114			

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4101 Inca Street  
Denver CO 80211

Martin C Eckert III  
Project Number: [none]  
Project: Noble - Gemini B #31-11,12,13,14,25

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**Notes and Definitions**

U Sample is Non-Detect.

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

All soil results are reported at a wet weight basis.

Origins Laboratory, Inc.



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---

Jen Pellegrini For Noelle Doyle Mathis, President



January 07, 2019

Eagle Environmental Consulting, Inc.

Martin C Eckert III

4101 Inca Street

Denver

CO 80211

**Project Name - Noble - Gemini B  
#31-11,12,13,14,25**

**Project Number - [none]**

Attached are your analytical results for Noble - Gemini B #31-11,12,13,14,25 received by Origins Laboratory, Inc. January 03, 2019. This project is associated with Origins project number Y901027-01.

The analytical results in the following report were analyzed under the guidelines of EPA Methods. These methods are identified as follows; "SW" are defined in SW-846, "EPA" are defined in 40CFR part 136 and "SM" are defined in the most current revision of Standard Methods For the Examination of Water and Wastewater.

The analytical results apply specifically to the samples and analyses specified per the attached Chain of Custody. As such, this report shall not be reproduced except in full, without the written approval of Origin's laboratory.

Unless otherwise noted, the analytical results for all soil samples are reported on a wet weight basis. All analytical analyses were performed under NELAP guidelines unless noted by a data qualifier.

Any holding time exceedances, deviations from the method specifications or deviations from Origins Laboratory's Standard Operating Procedures are outlined in the case narrative.

Thank you for selecting Origins for your analytical needs. Please contact us with any questions concerning this report, or if we can help with anything at all.

Origins Laboratory, Inc.  
303.433.1322  
o-squad@oelabinc.com



1725 Elk Place, Denver, CO 80211 | Phone: 303.433.1322 | Fax: 303.265.9645

Eagle Environmental Consulting, Inc.  
4101 Inca Street  
Denver CO 80211

Martin C Eckert III  
Project Number: [none]  
Project: Noble - Gemini B #31-11,12,13,14,25

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Effluent Stack	Y901027-01	Air	January 3, 2019 14:50	01/03/2019 16:45

Origins Laboratory, Inc.



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Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

Origins Laboratory

F-012207-01-R1  
 Effective Date: 01/09/12

**Sample Receipt Checklist**

Origins Work Order: 1901027

Client: Eagle Env

Client Project ID: Noble - Gemini

Checklist Completed by: JP

Shipped Via: HD  
 (UPS, FedEx, Hand Delivered, Pick-up, etc.)

Date/time completed: 1/3/19

Airbill #: NA

Matrix(s) Received: (Check all that apply): Soil/Solid Water  Other: air (Describe)

Cooler Number/Temperature: 1 / - °C 1 °C 1 °C 1 °C

Thermometer ID: TC02

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C <sup>(1)?</sup>			X	
Is there ice present (document if blue ice is used)			X	
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)		X		
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)		X		
Were all samples received intact <sup>(1)?</sup>	Y			
Was adequate sample volume provided <sup>(1)?</sup>	X			
Are short holding time analytes or samples with HTs due within 48 hours present <sup>(1)?</sup>		X		
Is a chain-of-custody (COC) present and filled out completely <sup>(1)?</sup>	X			
Does the COC agree with the number and type of sample bottles received <sup>(1)?</sup>	Y			
Do the sample IDs on the bottle labels match the COC <sup>(1)?</sup>	X			
Is the COC properly relinquished by the client with date and time recorded <sup>(1)?</sup>	X			
For volatiles in water – is there headspace (> ¼ inch bubble) present? <b>If yes, contact client and note in narrative.</b>			X	
Are samples preserved that require preservation and was it checked <sup>(1)?</sup> (note ID of confirmation instrument used in comments) / (preservation is not confirmed for subcontracted analyses in order to insure sample integrity)/(pH <2 for samples preserved with HNO3, HCL, H2SO4) / (pH >10 for samples preserved with NaAsO2+NaOH, ZnAc+NaOH)			X	
Additional Comments (if any):				

<sup>(1)</sup>If NO, then contact the client before proceeding with analysis and note date/time and person contacted as well as the corrective action to in the additional comments (above) and the case narrative.

Reviewed by (Project Manager) [Signature] Date/Time Reviewed 1-4-19

Origins Laboratory, Inc.

*Jefe Pellegrini*

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Eagle Environmental Consulting, Inc.  
 4101 Inca Street  
 Denver CO 80211

Martin C Eckert III  
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**Effluent Stack**

**1/3/2019 2:50:00PM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
 Y901027-01 (Air)

**GBTEX by TO-15M GC/MS**

	Result	Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
Gasoline Range Hydrocarbons	ND	1900	ug/m <sup>3</sup> Air	4.24	B9A0402	DPM	01/04/2019	01/04/2019	U
Benzene	ND	11.9	"	"	"	DPM	"	"	U
Toluene	ND	21.2	"	"	"	DPM	"	"	U
Ethylbenzene	ND	21.2	"	"	"	DPM	"	"	U
m,p-Xylene	ND	80.6	"	"	"	DPM	"	"	U
o-Xylene	ND	19.9	"	"	"	DPM	"	"	U
Surrogate: 1,2-Dichloroethane-d4	90.1 %	70-130			"	"	"	"	
Surrogate: Toluene-d8	100 %	70-130			"	"	"	"	
Surrogate: 4-Bromofluorobenzene	93.9 %	70-130			"	"	"	"	

Origins Laboratory, Inc.



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**Volatile Organic Compounds by TO-15 in Air - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch B9A0402 - Default Prep - Air</b>										
<b>Blank (B9A0402-BLK1)</b>										
					Prepared: 01/04/2019 Analyzed: 01/04/2019					T
Gasoline Range Hydrocarbons	ND	448	ug/m <sup>3</sup> Air							U
Benzene	ND	2.80	"							U
Toluene	ND	5.00	"							U
Ethylbenzene	ND	5.00	"							U
m,p-Xylene	ND	19.0	"							U
o-Xylene	ND	4.70	"							U
Surrogate: 1,2-Dichloroethane-d4	19.3		ppbv	20.0		96.6	70-130			
Surrogate: Toluene-d8	20.0		"	20.0		100	70-130			
Surrogate: 4-Bromofluorobenzene	19.1		"	20.0		95.6	70-130			
<b>LCS (B9A0402-BS1)</b>										
					Prepared: 01/04/2019 Analyzed: 01/04/2019					T
Benzene	32.6	2.80	ug/m <sup>3</sup> Air	32.6		100	70-130			
Toluene	40.1	5.00	"	39.6		101	70-130			
Ethylbenzene	45.3	5.00	"	45.6		99.3	70-130			
m,p-Xylene	212	19.0	"	179		118	70-130			
o-Xylene	45.9	4.70	"	46.5		98.7	70-130			
Surrogate: 1,2-Dichloroethane-d4	18.6		ppbv	20.0		93.2	70-130			
Surrogate: Toluene-d8	19.6		"	20.0		98.2	70-130			
Surrogate: 4-Bromofluorobenzene	19.1		"	20.0		95.4	70-130			
<b>LCS Dup (B9A0402-BSD1)</b>										
					Prepared: 01/04/2019 Analyzed: 01/04/2019					T
Benzene	34.1	2.80	ug/m <sup>3</sup> Air	32.6		105	70-130	4.21	20	
Toluene	41.3	5.00	"	39.6		104	70-130	3.15	20	
Ethylbenzene	47.1	5.00	"	45.6		103	70-130	3.86	20	
m,p-Xylene	188	19.0	"	179		105	70-130	12.1	20	
o-Xylene	47.7	4.70	"	46.5		103	70-130	3.90	20	
Surrogate: 1,2-Dichloroethane-d4	18.8		ppbv	20.0		94.1	70-130			

Origins Laboratory, Inc.



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 Denver CO 80211

Martin C Eckert III  
 Project Number: [none]  
 Project: Noble - Gemini B #31-11,12,13,14,25

**Volatile Organic Compounds by TO-15 in Air - Quality Control**  
**Origins Laboratory, Inc.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B9A0402 - Default Prep - Air

LCS Dup (B9A0402-BSD1)

Prepared: 01/04/2019 Analyzed: 01/04/2019

T

Surrogate: Toluene-d8	19.7		ppbv	20.0		98.4	70-130			
Surrogate: 4-Bromofluorobenzene	19.2		"	20.0		95.8	70-130			

Origins Laboratory, Inc.



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Eagle Environmental Consulting, Inc.  
4101 Inca Street  
Denver CO 80211

Martin C Eckert III  
Project Number: [none]  
Project: Noble - Gemini B #31-11,12,13,14,25

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### Notes and Definitions

U Sample is Non-Detect.

T The TO-15 analysis is not part of the NELAC accreditation

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

All soil results are reported at a wet weight basis.

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President

## **ATTACHMENT C**

### **AS/SVE Pilot Test Data Summary**

**AIR SPARGE AND SOIL VAPOR EXTRACTION PILOT TEST DATA**  
**GEMINI B #31-11, 12, 13, 14, 25**  
**FLOW LINE RELEASE**  
**40.348614 / -104.597099**  
**SPILL ID 458290**

DATE PILOT TEST PERFORMED: 1/3/2019

TEST WELL: AS-01 & SVE-01

Time	MW-02		MW-03		MW-04		MW-05		MW-07		MW-08		
	DTW/DTP (feet)	VOC (ppm-v)	DTW/DTP (feet)	VOC (ppm-v)	DTW/DTP (feet)	VOC (ppm-v)	DTW/DTP (feet)	VOC (ppm-v)	DTW/DTP (feet)	VOC (ppm-v)	DTW/DTP (feet)	VOC (ppm-v)	
Initial	715	14.97	0.0	14.59	14.3	13.60	32.8	15.61	0.0	14.28	2.7	11.86	174.4
Final	1530	13.13	1.0	14.01	11.6	13.42	16.4	15.85	0.4	14.20	0.1	11.12	32.7

**SVE ONLY**

Initial PID at stack: 0.0

Initial PID at manifold: 0.0

Started: 800

Time	Test Well Vacuum Applied ("H <sub>2</sub> O)	Well Head Temp (°F)	Effluent Stack Velocity (ft/min)	Effluent Stack Flow (scfm)	Effluent Stack Temp (°F)	Effluent 4" VOC (ppm-v)
830	30	30.1	4612	417.88	51.5	0.0
900	40	45.3	4855	425.11	54.6	0.1
930	60	52.3	5506	455.23	63.7	0.3
1000	60	49.8	5582	486.37	62.5	0.1
1015	80	50.2	4806	421.59	60.1	0.1
1030	100	55.3	4386	382.71	58.3	0.2

Distance from SVE to MW (feet)	MW-02 (50')		MW-03 (15')		MW-04 (50')		MW-05 (70')		MW-07 (25')		MW-08 (20')	
	Time	Vacuum ("H <sub>2</sub> O)	VOC (ppm-v)	Vacuum ("H <sub>2</sub> O)	VOC (ppm-v)	Vacuum ("H <sub>2</sub> O)	VOC (ppm-v)	Vacuum ("H <sub>2</sub> O)	VOC (ppm-v)	Vacuum ("H <sub>2</sub> O)	VOC (ppm-v)	Vacuum ("H <sub>2</sub> O)
830	0	0.1	0	24.0	0	32.9	0	1.7	0	0.2	0	121.9
900	0	0.1	0	27.0	0	79.6	0	1.9	0	0.4	0	345.2
930	0	0.2	0	30.5	0	39.6	0	1.4	0	0.5	0	311.8
1000	0	0.6	0	44.7	0	33.6	0	1.4	0	0.5	0	334.5
1015	0	0.0	0	44.7	0	60.4	0	0.8	0	0.4	0	406.8
1030	0	0.0	0	51.6	0	58.4	0	1.1	0	0.5	0	438.3

**AS ONLY**

Started: 1030

Breakthrough: 12 PSI

Time	Air Compressor (psi)	Pressure Applied at Test well (psi)	Flow Rate (scfm)
1045	20	19.5	0.0
1115	20	19.5	0.2
1145	20	20	0.5
1215	20	20	1.0
1230	20	20	1.0

**WELL DATA**

MW-02 (38')		MW-03 (16')		MW-04 (56')		MW-05 (68')		MW-07 (28')		MW-08 (35')	
"H <sub>2</sub> O	VOC (ppm-v)	"H <sub>2</sub> O	VOC (ppm-v)	"H <sub>2</sub> O	VOC (ppm-v)	"H <sub>2</sub> O	VOC (ppm-v)	"H <sub>2</sub> O	VOC (ppm-v)	"H <sub>2</sub> O	VOC (ppm-v)
0	0.4	0	124.4	0	107.4	0	1.3	0	0.3	0	513.6
0	0.4	0	116.3	0	115.3	0	0.9	0	0.3	+0.005	573.1
+0.5	0.3	+0.018	135.4	0	79.1	0	1.6	+0.005	0.4	+0.08	538.1
+0.6	0.3	+0.016	112.5	0	87.1	0	1.6	+0.004	0.4	+0.082	524.4
+0.5	0.4	+0.018	117.7	0	71.8	0	1.6	+0.005	0.4	+0.082	535.7

**AS AND SVE**

Started: 1245

Time	Vacuum Applied at Test Well ("H <sub>2</sub> O)	Effluent Stack Flow (scfm)	Effluent VOC (ppm-v)	Pressure Applied at Test Well (psi)	Flow Rate AS (scfm)	MW-02		MW-03		MW-04		MW-05		MW-07		MW-08	
						Pressure ("H <sub>2</sub> O)	VOC (ppm-v)	Pressure ("H <sub>2</sub> O)	VOC (ppm-v)	Pressure ("H <sub>2</sub> O)	VOC (ppm-v)	Pressure ("H <sub>2</sub> O)	VOC (ppm-v)	Pressure ("H <sub>2</sub> O)	VOC (ppm-v)	Pressure ("H <sub>2</sub> O)	VOC (ppm-v)
1300	80	391.02	0.4	20	1	0	0	+0.01	1183	0	39.1	0	3.1	0	2.1	+0.015	151.3
1330	80	374.66	0.2	20	3.5	+0.01	0.2	+0.01	500.8	0	39.0	0	1.0	0	0.8	+0.015	79.1
1400	100	338.52	0.2	20	3.5	+0.01	0.2	+0.01	320.7	0	68.3	0	1.6	0	1.6	+0.015	76.9
1430	100	390.84	0.2	20	3.5	0	0.4	+0.01	204.8	0	37.1	0	1.1	0	1.1	+0.015	55.8
1500**	100	387.22	0.3	20	3.5	0	0.4	+0.01	204.8	0	37.1	0	1.1	0	1.1	+0.015	65.3

PID = Photoionization detector  
DTP = depth to product  
DTW = depth to water  
VOC = Volatile Organic Compound  
DO = Dissolved Oxygen  
SVE = soil vapor extraction  
> = greater than  
°F = degrees fahrenheit  
NA = Not available

" H<sub>2</sub>O = inches of water  
ft/min = feet per minute  
scfm = standard cubic feet per minute  
ppm-v = parts per million by volume  
AS = air sparge  
' = feet  
" = inches  
psi = pounds per square inch  
\* = Unable to obtain PID reading due to increased flow rate at the well-head manifold

\*\* : Generator shut down due to high-engine temperatures after 2-hours of combined AS/SVE test. Re-start attempts failed.  
AS/SVE technology deemed unsuccessful due to lack of influence during AS and SVE only portions of pilot test.

Pilot Test Equipment:  
SVE Blower: Tuthill 15 HP Positive Displacement Blower  
AS Compressor : DTR-140 7.5hp