2021 Annual Report

Federal 27-11
South Canyon Field
Garfield County, Colorado

Submitted to:
Colorado Oil and Gas Conservation Commission
818 Taughenbaugh Blvd., Suite 103
Rifle, CO 81650

Prepared for:
Shelby Lathrop
Chevron Environmental Management Company
6001 Bollinger Canyon Road, C2092,
San Ramon, CA 94583

Prepared by:
Stantec Consulting Services Inc.
2000 South Colorado Blvd.
Suite 2-300
Denver, CO 80222

May 3, 2022

May 3, 2022

Attention: **Mr. John Heil**
Colorado Oil and Gas Conservation Commission
818 Taughenbaugh Blvd., Suite 103, Rifle, CO 81650

Reference: **2021 Annual Report**
Federal 27-11, South Canyon Field, Garfield County, Colorado

Dear Mr. Heil:

Stantec Consulting Services Inc. (Stantec), on behalf of Chevron Environmental Management Company (CEMC), is pleased to submit the *2021 Annual Report* for Federal 27-11 at the South Canyon Field located in Garfield County, Colorado (the Site - shown on **Figure 1**). This report is presented in three sections: 2021 Groundwater Monitoring and Sampling Program, 2021 Mobile Multi-Phase Extraction Events, and Conclusions and Recommendations.

The Colorado Oil and Gas Conservation Commission (COGCC) responded to the 2020 Annual Report (Stantec, 2021) for the Site with a Form 27 approval letter dated October 18, 2021 (COGCC, 2021b). The Form 27 approval included multiple Conditions of Approval (COAs) including the requirement to perform additional soil and groundwater assessment. A separate work plan will be submitted which addresses the COAs as detailed in the COGCC Form 27 approval.

2021 GROUNDWATER MONITORING AND SAMPLING PROGRAM

Stantec performed Second and Third Quarter 2021 groundwater monitoring and sampling events on May 22 and August 27, 2021, respectively. During Second and Third Quarter 2021 groundwater monitoring and sampling events, Stantec gauged depth-to-groundwater in seven Site wells (111762-MW-1 through 111762-MW-7) prior to collecting groundwater samples for laboratory analysis. Insufficient water was present to collect groundwater samples from wells 111762-MW-1, 111762-MW-4, and 111762-MW-5 during Second and Third Quarter 2021 events. In addition, during Second Quarter 2021, liquid-phase hydrocarbons (LPH) were observed in well 111762-MW-2 at a thickness of 0.02 feet and the well was not sampled.

Purge water generated from groundwater sampling activities conducted during Second and Third Quarter 2021 was returned to the formation via the same Site well from which it was extracted.

Prior to 2021 the Site groundwater was compared to the COGCC 900 Series Rules including the Table 910-1 Concentration Levels (COGCC, 2020). As of 2021, the Site groundwater is compared to the new COGCC Series 900 Rules including the COGCC Table 915-1 Cleanup Concentrations (COGCC, 2021a).

Groundwater Elevation and Gradient

Current and historical groundwater elevation data are presented in **Table 1**. Since the installation of wells in 2010 and 2011, and with the exception of well 111762-MW-7, groundwater elevations have decreased by as much as 11 feet (111762-MW-2). In 2021, wells 111762-MW-1, 111762-MW-4, and 111762-MW-5 were gauged for depth-to-groundwater but were observed with insufficient water for groundwater sample collection. During future monitoring and sampling events, wells with a limited water column of 0.5 foot or less will considered dry. This will help to ensure groundwater is being measured and not residual water in the well sump or borehole.

During 2021, the groundwater elevation ranged from 5196.64 feet above mean sea level (msl; well 111762-MW-7 in Third Quarter 2021) to 5204.21 feet above msl (well 111762-MW-5 in Second and Third Quarters 2021).

Groundwater elevation contour maps for Second and Third Quarter 2021 data are shown on **Figure 2** and **Figure 3**, respectively. A groundwater flow direction rose diagram illustrating historical directions of groundwater flow for the Site is shown on **Figure 4**. The Second and Third Quarter 2021 direction of groundwater flow beneath the Site at the time of sampling were towards the south-southeast. The approximate average hydraulic gradients measured between 111762-MW-5 and 111762-MW-6 during the Second and Third Quarter 2021 were 0.037 feet per foot (ft/ft) and 0.040 ft/ft, respectively.

Schedule of Laboratory Analysis

The following schedule of laboratory analysis was performed during Second and Third Quarter 2021:

- When sufficient groundwater was present without LPH, samples were analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX compounds) using United States Environmental Protection Agency (US EPA) Method 8260B (SW-846); chloride and sulfate (SO_4^{2-}) using US EPA Method 300.0; and total dissolved solids (TDS) using SM20 2540C.

- During Third Quarter 2021 only, when sufficient groundwater was present without LPH, samples were analyzed for nitrate (NO_3^-) using US EPA Method 300.0; ferrous iron (Fe^{2+}) using Method SM 3500 Fe B; and methane (CH_4) using Method RSK-175.

- During the Second and Third Quarter 2021, when sufficient water without LPH was present for purging, field measurements of dissolved oxygen (DO) and oxidation-reduction potential (ORP) were recorded.

Groundwater Analytical Results

Stantec collected groundwater samples from three Site wells (111762-MW-3, 111762-MW-6, and 111762-MW-7) during Second Quarter and from four Site wells (111762-MW-2, 111762-MW-3, 111762-MW-6, and 111762-MW-7) during Third Quarter 2021. Current and historical groundwater analytical results are included in **Table 1**. A figure showing Second and Third Quarter 2021 groundwater analytical data plotted on a Site Plan is included as **Figure 6**.

Certified laboratory analysis reports and chain-of-custody documents are included in **Attachment A**. Quality assurance/quality control (QA/QC) measures were implemented as appropriate. Trip blanks were submitted and laboratory blanks (e.g., method blank, instrument blank) were prepared and analyzed as appropriate by the laboratory. The results of the QA/QC measures showed that data quality was acceptable.

Hydrographs based on current and historical groundwater elevations and dissolved benzene analytical results for the Site wells that were sampled during 2021 (111762-MW-2, 111762-MW-3, 111762-MW-6, and 111762-MW-7) are included in **Attachment B**. Site well 111762-MW-2 was sampled in Third Quarter but had LPH present in the Second Quarter 2021, therefore only Third Quarter data were included in the hydrograph. A summary of 2021 groundwater analytical results follow, with results compared to COGCC Table 915-1 Cleanup Concentrations (Cleanup Concentrations).

- **Benzene** was detected in all four Site wells sampled during 2021. Benzene concentrations exceeded the Cleanup Concentration of 5 micrograms per liter (µg/L) during Second Quarter 2021 in samples collected from wells 111762-MW-3, and 111762-MW-6 and in Third Quarter 2021 in samples collected from wells 111762-MW-2, 111762-MW-3 and 111762-MW-6.

- **Toluene** was detected in two of four Site wells sampled during 2021. Toluene concentrations exceeded the Cleanup Concentration of 1,000 µg/L during the Second Quarter 2021 in the sample collected from well 111762-MW-3.

- **Ethylbenzene** was detected in all four Site wells sampled during 2021. Ethylbenzene concentrations exceeded the Cleanup Concentration of 700 µg/L during Second Quarter 2021 in samples collected from wells 111762-MW-3 and 111762-MW-6, and during Third Quarter 2021 in the sample collected from well 111762-MW-6.

- **Total Xylenes** were detected in all four Site wells sampled during 2021. No total xylenes concentrations exceeded the Cleanup Concentration of 10,000 µg/L.

- **Chloride** was detected in both Site wells (111762-MW-6 and 111762-MW-7) sampled for chloride during 2021. Using the Fourth Quarter 2011 concentration in well 111762-MW-7 (531 milligrams per liter [mg/L]) as background, the Cleanup Concentration of 664 mg/L has been calculated for the Site (1.25 times background). Chloride concentrations did not exceed the Cleanup Concentration in samples collected during Second or Third Quarter 2021.

- **TDS** was detected in both Site wells (111762-MW-6 and 111762-MW-7) sampled for TDS during 2021. Using the Third Quarter 2019 concentration in samples collected from well 111762-MW-7 (86,000 mg/L) as background, the Cleanup Concentration of 107,500 mg/L has been calculated for the Site (1.25 times background). TDS concentrations did not exceed the Cleanup Concentration in samples collected during the Second or Third Quarter 2021.

- **Sulfate** was detected in both Site wells (111762-MW-6 and 111762-MW-7) sampled for sulfate during 2021. Using the Second Quarter 2019 concentration in samples collected from well 111762-MW-7 (60,000,000 µg/L) as background, the Cleanup Concentration of 75,000,000 µg/L has been calculated for the Site (1.25 times background). Sulfate concentrations did not exceed the Cleanup Concentration in samples collected during Second or Third Quarter 2021.

Monitored Natural Attenuation Evaluation

An evaluation of monitored natural attenuation (MNA) involves assessing physical, chemical, and biological processes that, under favorable conditions, may effectively reduce the mass, toxicity, mobility, volume, or concentration of constituents in soil or groundwater. For petroleum hydrocarbons, biodegradation is an important natural attenuation mechanism for the reduction of concentrations in groundwater.

When sufficient groundwater was present, groundwater samples were measured in the field or submitted to the laboratory for analysis of geochemical parameters including DO; ORP; NO_3^-; SO_4^{2-}; Fe^{2+}, a metabolite of Fe^{3+} reduction; and CH_4, a metabolite of CO_2 reduction. These parameters provide lines of evidence for evaluating MNA and determining the most likely biodegradation mechanisms utilized within the plume (e.g., Fe^{3+} reduction, SO_4^{2-} reduction, etc.). MNA parameters are summarized in **Table 1**.

During Second Quarter 2021, DO levels (post-purge) ranged between 1.50 mg/L (well 111762-MW-6) and 3.40 mg/L (well 111762-MW-7). During Third Quarter 2021, DO levels (post-purge) ranged between 1.52 mg/L (well 111762-MW-6) and 1.80 mg/L (well 111762-MW-7). The current and historical depletion of DO concentrations within the plume (wells 111762-MW-1 through 111762-MW-4 and 111762-MW-6; as compared to other Site wells, which are outside the plume) generally suggests DO has been utilized as an electron acceptor during biodegradation of petroleum hydrocarbons by indigenous microbes. During Second Quarter 2021, ORP levels (post-purge) ranged between -46.7 millivolts (mV; well 111762-MW-6) and 103.8 mV (well 111762-MW-7). During Third Quarter 2021, ORP levels (post-purge) ranged between -52.1 mV (well 111762-MW-6) and 32.1 mV (well 111762-MW-7). The range of negative ORP values present within the plume is indicative of slightly reducing conditions.

In Third Quarter 2021, concentrations of NO_3^- were below the Laboratory Reporting Limits (LRL) of 500 µg/L and 2,500 µg/L in samples collected from wells111762-MW-6 and 111762-MW-7, respectively. The number of downgradient wells with NO_3^- concentrations below LRLs indicates that NO_3^- is depleted at the Site.

Concentrations of Fe^{2+} in Third Quarter 2021 ranged from 0.44 µg/L (well 111762-MW-6) to 110 µg/L (well 111762-MW-7). The presence of Fe^{2+} concentrations in wells 111762-MW-6 and 111762-MW-7 indicates that the groundwater conditions are slightly reducing in those wells.

Concentrations of SO_4^{2-} ranged from 18,000,000 µg/L (well 111762-MW-6 in Second and Third Quarter 2021) to 57,000,000 µg/L (well 111762-MW-7 in Third Quarter 2021). As indicated by these data, sulfate concentrations are not depleted in groundwater but seem to be slightly lower at the site than the background concentration (60,000,000 µg/L). During the pit reclamation activities, gypsum was also amended to the soil backfill.

Concentrations of CH_4 in Third Quarter 2021 ranged from 4.0 µg/L (well 111762-MW-7) to 33 µg/L (well 111762-MW-6). Currently and historically, higher concentrations of metabolic by-product CH_4 were generally found in wells with higher petroleum hydrocarbon concentrations such as wells 111762-MW-1, 111762-MW-3, and 111762-MW-6 (and vice versa). These concentrations of CH_4 indicate that methanogenesis may be occurring.

The MNA evaluation suggests that subsurface conditions are generally favorable for anaerobic biodegradation of petroleum hydrocarbons, which is likely contributing to a decrease in petroleum hydrocarbon concentrations. It appears that NO_3^- has been consumed as an electron acceptor. Based on this preliminary assessment, Fe^{3+} reducing, sulfate reducing or methanogenesis may be the primary biodegradation processes within the dissolved-phase petroleum hydrocarbon plume.

2021 MOBILE MULTI-PHASE EXTRACTION EVENTS

MMPE events were conducted during Second and Third Quarter 2021 by Stantec and subcontractor Seneca Companies (Seneca), in accordance with the *Work Plan for Mobile Multi-Phase Extraction Pilot Event*, dated May 1, 2017 (Stantec, 2017). Second and Third Quarter 2021 MMPE events were conducted on June 15 through 16 and September 21 through 22, 2021, respectively, at wells 111762-MW-2, 111762-MW-3, and 111762-MW-6 (extraction wells).

In 2021, MMPE was performed using a vacuum truck-mounted liquid ring pump to extract VOC vapors and impacted groundwater from the extraction wells. During the MMPE events, a stinger hose was lowered to a depth near the bottom of each extraction well casing to maximize the amount of soil vapor and impacted groundwater that could be recovered. The flow rate and VOC concentrations were monitored and recorded to estimate the mass of vapor-phase volatile organic compounds (VOCs) removed during each MMPE event.

The MMPE flow rate was measured at the vacuum truck discharge stack using a VelociCalc® flow meter. VOC concentrations were measured at a polyvinyl chloride (PVC) manifold installed in-line with the vacuum hose influent to the vacuum truck. VOCs were measured by filling a Tedlar® bag from a fitting on the manifold using a vacuum chamber and vacuum pump and then screening the Tedlar® bag with a photoionization detector (PID). Vacuum measurements were collected from a vacuum gauge installed on the PVC manifold.

Extracted fluids generated during MMPE events were contained in a 1,350-gallon truck-mounted storage tank. The quantity of impacted groundwater removed from each individual well could not be measured due to the MMPE system configuration and lack of access to the vacuum truck tank. Field data collected during the MMPE events are summarized in **Table 2**.

Because MMPE from extraction wells 111762-MW-2 and 111762-MW-3 was conducted simultaneously, effluent flow measurements included contributions from both wells. Each extraction well was assumed to have contributed equally to the total flow; therefore, the estimated flow rate at each well is assumed to be one-half of the system effluent flow rate.

Groundwater elevation and LPH thickness from the extraction wells were measured before and after each MMPE event. Prior to Second Quarter 2021 MMPE event, LPH were measured at a thickness of 0.03 feet in extraction well 11762-MW-2 and 0.02 feet in extraction well 11762-MW-3. Prior to Third Quarter 2021 MMPE event, LPH were measured at a thickness of 0.01 feet in extraction wells 11762-MW-2 and 11762-MW-3. The thickness of LPH was reduced in extraction wells immediately following the MMPE events. Gauging data are summarized in **Table 3**.

During Second and Third Quarter 2021 MMPE events, vacuum measurements were collected from monitor well 111762-MW-1 (observation well), located approximately 22 feet from the nearest extraction well (111762-MW-3) and monitor well 111762-MW-3 (observation well), located approximately 72 feet from the nearest extraction well (111762-MW-6). During Second and Third Quarter 2021, vacuum was present in both 111762-MW-1 and 111762-MW-3 (observation wells) throughout the duration of the events. Observation well vacuum data are summarized in **Table 4**.

Second Quarter 2021 MMPE Event

MMPE was conducted on extraction wells 111762-MW-2 and 111762-MW-3 simultaneously, and then on extraction well 111762-MW-6 individually during Second Quarter 2021 MMPE event. MMPE was conducted at wells 111762-MW-2 and 111762-MW-3 over a period of 10 hours and at an average flow rate of 16.9 standard cubic feet per minute (scfm) and 18.7 scfm, respectively. Extraction vacuums ranged from 7.5 to 10 inches of mercury (in Hg) at 111762-MW-2 and 4.5 to 9.5 in Hg at 111762-MW-3. MMPE was conducted at well 111762-MW-6 over a period of 5 hours (shortened due to equipment malfunction) at an average flow rate of 44.4 scfm and extraction vacuum ranging from 4.5 to 5 in Hg.

During Second Quarter 2021 MMPE event, 3.45 pounds (the equivalent of 0.55 gallons) of VOCs in vapor were removed from well 111762-MW-2, 3.72 pounds (the equivalent of 0.59 gallons) of VOCs in vapor were removed from well 111762-MW-3, and 2.89 pounds (the equivalent of 0.46 gallons) of VOCs in vapor were removed from well 111762-MW-6. Vapor mass removal calculation sheets for the MMPE event are provided in **Attachment C**.

Third Quarter 2021 MMPE Event

MMPE was conducted on extraction wells 111762-MW-2 and 111762-MW-3 simultaneously, and then on extraction well 111762-MW-6 individually during Third Quarter 2021 MMPE event. MMPE was conducted at wells 111762-MW-2 and 111762-MW-3 over a period of 10 hours and at an average flow rate of 45.9 scfm and 28.2 scfm, respectively. Extraction vacuums ranged from 4.0 to 5.0 in Hg at 111762-MW-2 and from 9.5 to 15.0 in Hg at 111762-MW-3. MMPE was conducted at well 111762-MW-6 over a period of 10 hours at an average flow rate of 70.7 scfm and extraction vacuum of 10.5 to 11.5 in Hg.

During Third Quarter 2021 MMPE event, 10.24 pounds (the equivalent of 1.64 gallons) of VOCs in vapor were removed from well 111762-MW-2, 7.07 pounds (the equivalent of 1.13 gallons) of VOCs in vapor were removed from well 111762-MW-3, and 13.25 pounds (the equivalent of 2.12 gallons) of VOCs in vapor were removed from well 111762-MW-6. Vapor mass removal calculation sheets for the MMPE event are provided in **Attachment C**.

Waste Management

During Second and Third Quarter 2021 MMPE events, approximately 5 and 12 gallons of fluid, respectively, were generated. Following each MMPE event, waste was transported by Seneca to the RNI Dalbo, Inc. (RNI) ACE facility, located in Vernal, Uinta County, Utah.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

- MMPE events have been successful at reducing the amounts of LPH in the subsurface. LPH has been historically detected in well 111762-MW-2, at thicknesses ranging from 0.01 feet (Third Quarter 2011) to 1.04 feet (Second Quarter 2017). During 2021, LPH were observed during semi-annual monitoring and sampling at a thickness of 0.02 feet in 111762-MW-2 (Second Quarter) and during the MMPE events in 111762-MW-2 at a thickness of 0.03 feet (Second Quarter) and 0.01 feet (Third Quarter) and in 111762-MW-3 at a thickness of 0.02 feet (Second Quarter) and 0.01 feet (Third Quarter).

- With the exception of well 111762-MW-7, groundwater evaluations have decreased by as much as 11 feet since the installation of wells in 2010 and 2011.

- Dissolved-phase benzene data provide spatial and temporal evidence of natural attenuation at the Site. Wells in 2021 with benzene exceeding the COGCC Table 910-1 Cleanup Concentrations Level (111762-MW-2, 111762-MW-3, 111762-MW-6, and 111762-MW-7) have overall decreasing or stable benzene concentration trends.

- Dissolved-phase benzene was observed in Second and Third Quarter 2021 in well 111762-MW-7; ethylbenzene and total xylene detections were observed in the Second Quarter. These detections were below the COGCC Table 915-1 Cleanup Concentrations. BTEX detections in well 111762-MW-7 will continue to be monitored during the next monitoring and sampling event planned for Second Quarter 2022.

- TDS observed in Fourth Quarter 2020 in well 111762-MW-6 was an order of magnitude greater than any historical TDS concentration found at the Site. TDS concentrations observed in the Second and Third Quarter 2021 returned to levels within the historically observed range.

- During Second Quarter 2021 MMPE event, a combined total of 10.06 pounds (the equivalent of 1.6 gallons) of vapor-phase petroleum hydrocarbons were removed. During Third Quarter 2021 MMPE event, a combined total of 30.56 pounds (the equivalent of 4.89 gallons) of vapor-phase petroleum hydrocarbons were removed. The MMPE events successfully removed hydrocarbons in the vapor-phase in the extraction wells and were shown to reduce the presence of LPH in well 111762-MW-2 and 111762-MW-3.

- Geochemical data provide evidence for the contribution of biodegradation processes to the natural attenuation of the dissolved-phase benzene plume at the Site. Reducing conditions are likely present, as indicated by ORP values within the plume, and geochemical data indicate that It appears that NO_3^- has been consumed as an electron acceptor. Based on this preliminary assessment, Fe^{3+} reducing, sulfate reducing or methanogenesis may be the primary biodegradation processes within the dissolved-phase petroleum hydrocarbon plume.

Recommendations

The following recommendations for 2022 are based on data gathered during the 2021 semi-annual groundwater monitoring and sampling events, MMPE events, as well as historical Site data:

- Conduct the 2022 semi-annual groundwater monitoring and sampling events in Second and Third Quarter 2022 with laboratory analysis to include the COGCC Table 915-1 Groundwater Contaminates of Concern (COCs) BTEX, naphthalene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene, TDS, chloride, and sulfate.
    - During one of the semi-annual groundwater monitoring and sampling events, additional laboratory analysis to include the MNA parameters NO_3^-, Fe^{2+}, and CH_4.

- Conduct two MMPE events at MW-2, MW-3, and MW-6 in Second and Third Quarter 2022.

- Submit a work plan to address the COAs as detailed in COGCC Form 27 approval dated October 18, 2021.

- Complete annual reporting for the Site.
  - Report to be submitted in the first quarter of the year following completed work.
  - Report to include activities completed and recommendations for the following year.

Additionally, recommendations that address the COGCC Conditions of Approval (COAs; COGCC, 2021b) to the 2020 Annual Report (Stantec, 2021) will be submitted in a work plan under a separate cover.

Please feel free to contact me if you have any questions regarding the contents of this report.

Sincerely,
Stantec Consulting Services Inc.

Brent Lucyk
Senior Project Manager
Phone: (231) 384-6357
Brent.Lucyk@stantec.com

Attachments:

Table 1 – Groundwater Monitoring Data and Analytical Results
Table 2 – 2021 Mobile Multi-Phase Extraction Event Field Data
Table 3 – 2021 Mobile Multi-Phase Extraction Groundwater Gauging Data
Table 4 – 2021 Mobile Multi-Phase Extraction Well Vacuum Data

Figure 1 – Site Location Map
Figure 2 – Site Plan Showing Groundwater Elevation Contours – Second Quarter 2021
Figure 3 – Site Plan Showing Groundwater Elevation Contours – Third Quarter 2021
Figure 4 – Groundwater Flow Direction – Rose Diagram – Third Quarter 2021
Figure 5 – Site Plan Showing Groundwater Concentrations – Second and Third Quarter 2021

Attachment A – Certified Laboratory Analysis Reports and Chain-of-Custody Documents
Attachment B – Hydrographs
Attachment C – 2021 Mobile Multi-Phase Extraction Vapor Mass Removal Worksheets

References:

COGCC, 2020. *900 Series Rules, E&P Waste Management.* January 14.

COGCC, 2021a. *900 Series Rules, Environmental Impact Prevention.* January 15.

COGCC, 2021b. *Approved COGCC Site Investigation and Remediation Workplan (Supplemental Form) eForm 27 Document Number 402635767.* October 18.

Stantec, 2017. *Work Plan for Mobile Multi-Phase Extraction Pilot Event, Chevron North America Exploration and Production Company, Federal 27-11, Pit #111762, South Canyon Field, Garfield County, Colorado.* May 1.

Stantec, 2021. 2020 Annual Report, Federal 27-11, South Canyon Field Garfield County, Colorado. April 7.

LIMITATIONS

This document entitled 2021 Annual Report was prepared by Stantec Consulting Services Inc. ("Stantec") for the account of Chevron Environmental Management Company (the "Client"). Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec's professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

Prepared by ______________________
(signature)

Byron Collins, MS
Project Scientist

Reviewed by ______________________
(signature)

Tom Fendler, PG
Senior Geologist

Reviewed by ______________________
(signature)

Brent Lucyk
Senior Project Manager

TABLES

Table 1
Groundwater Monitoring Data and Analytical Results
Federal 27-11 (Pit #111762)
South Canyon Field
Garfield County, CO

Well ID	Sample Date	Depth to GW (feet below TOC)	LPH Thickness (feet)	GW Elevation[1] (feet above msl)	TPH GRO (µg/L)	TPH DRO (µg/L)	TPH ORO (µg/L)	Total TPH (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	p,m-Xylene (µg/L)	o-Xylene (µg/L)	Total Xylenes (µg/L)	Chloride (mg/L)	TDS (mg/L)	DO (mg/L)	ORP (mV)	Nitrate (µg/L)	Sulfate (µg/L)	Ferrous Iron (µg/L)	Methane (µg/L)
COGCC Table 915-1 Cleanup Concentration					--	--	--	--	**5**	**1,000**	**700**	--	--	**10,000**	664[2]	107,500[3]	--	--	--	75,000,000[4]	--	--
111762-MW-1	06/01/10	54.79	0.00	5211.11	30,000	3,300	<300	33,300	**11,900**	**11,800**	500	4,600	1,300	5,900	--	--	0.76	-18.2	<200	24,700,000	10,200	--
	11/15/10	55.59	0.00	5210.31	30,000	3,000	300	33,300	**19,800**	200	**800**	6,400	<200	6,400	--	--	6.59	-76.1	--	--	--	--
	03/24/11	56.08	0.00	5209.82	17,000	2,700	<100	19,700	**19,600**	<200	**800**	5,900	<200	5,900	453	42,140	1.91	-121.8	<200	28,200,000	19,700	--
	09/13/11	56.65	0.00	5209.25	16,000	1,800	<100	17,800	**20,000**	<200	400	900	<200	900	446	39,602	1.18	-178.3	<500	24,600,000	4,160	--
	10/24/11	56.80	0.00	5209.10	NOT SAMPLED; ONLY DEPTH-TO-GROUNDWATER DATA REQUIRED							--	--	--	--	--	--	--	--	--	--	--
	03/26/13	58.50	0.00	5207.40	12,000	300	<100	12,300	**9,700**	<200	**1,100**	<400	<200	<400	441	38,356	0.35	-161.6	<500	23,600,000	2,800	74
	10/23/13	59.45	0.00	5206.45	11,000	1,000	200	12,200	**14,700**	<100	**1,600**	<200	<100	<200	419	40,302	--	-366.1	<500	25,300,000	9,650	82
	05/12/14	60.00	0.00	5205.90	9,000	900	300	10,200	**13,900**	<100	**1,800**	<200	<100	<200	383	35,200	1.39	-269.1	<500	21,700,000	2,520	81
	09/24/14	60.43	0.00	5205.47	9,000	1,400	<1,000	10,400	**9,800**	<200	**1,900**	<400	<200	<400	372	32,890	2.22	-300.7	<500	22,000,000	4,720	88
	05/13/15	60.95	0.00	5204.95	2,000	1,500	400	3,900	**2,520**	30	**1,670**	<40	<20	<40	343	29,300	0.42	-273.6	<500	18,000,000	430	130
	09/22/15	61.38	0.00	5204.52	4,000	700	100	4,800	**3,470**	30	**2,780**	40	<20	40	404	28,200	0.55	-264.9	<500	17,300,000	370	140
	06/18/16	62.19	0.00	5203.71	--	--	--	--	**8,070**	<50	**2,890**	<100	<50	<100	419	25,900	0.62	-190.5	--	15,400,000	--	--
	09/12/16	62.22	0.00	5203.68	8,000	1,800	<600	9,800	**8,010**	<50	**2,220**	<100	<50	<100	325	25,800	0.76	-226.1	<500	16,500,000	360	290
	06/05/17	62.95	0.00	5202.95	--	--	--	--	**620**	<50	**3,110**	<100	<50	<100	340	27,000	1.01	-90.9	--	16,500,000	--	--
	09/11/17	63.48	0.00	5202.42	5,000	1,100	100	6,200	**2,340**	<20	**2,690**	<40	<20	<40	367	--	--	--	<500	15,500,000	<100	203
	06/17/18	64.01	0.00	5201.89	7,300	4,900	--	12,200	**770**	<10	**1,500**	--	--	13	317	22,900	1.15	-120.0	--	13,000,000	--	--
	09/17/18	64.53	0.00	5201.37	8,900	--	--	8,900	**1400**	<10	**1,600**	--	--	<50	392	--	--	--	<5,000	30,200,000	15,900	170
	06/15/19	64.85	0.00	5201.05	NOT SAMPLED; INSUFFICIENT WATER FOR SAMPLING					--	--	--	--	--	--	--	--	--	--	--	--	--
	09/05/19	65.22	0.00	5200.68	NOT SAMPLED; INSUFFICIENT WATER FOR SAMPLING					--	--	--	--	--	--	--	--	--	--	--	--	--
	06/19/20	65.58	0.00	5200.32	NOT SAMPLED; INSUFFICIENT WATER FOR SAMPLING					--	--	--	--	--	--	--	--	--	--	--	--	--
	10/09/20	65.74	0.00	5200.16	NOT SAMPLED; INSUFFICIENT WATER FOR SAMPLING					--	--	--	--	--	--	--	--	--	--	--	--	--
	05/22/21	65.75	0.00	5200.15	NOT SAMPLED; INSUFFICIENT WATER FOR SAMPLING					--	--	--	--	--	--	--	--	--	--	--	--	--
	08/27/21	66.14	0.00	5199.76	NOT SAMPLED; INSUFFICIENT WATER FOR SAMPLING					--	--	--	--	--	--	--	--	--	--	--	--	--
111762-MW-2	06/01/10	53.21	0.00	5211.00	20,000	10,800	<500	30,800	**16,200**	**2,400**	600	6,000	1,200	7,200	--	--	0.68	62.5	<200	15,300,000	790	--
	11/15/10	53.64	0.00	5210.57	NOT SAMPLED DUE TO FREE PRODUCT				--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/23/11	54.15	0.03	5210.08	NOT SAMPLED DUE TO FREE PRODUCT				--	--	--	--	--	--	--	--	--	--	--	--	--	--
	09/13/11	54.73	0.01	5209.49	NOT SAMPLED DUE TO FREE PRODUCT				--	--	--	--	--	--	--	--	--	--	--	--	--	--
	10/24/11	54.88	0.00	5209.33	NOT SAMPLED; ONLY DEPTH-TO-GROUNDWATER DATA REQUIRED						--	--	--	--	--	--	--	--	--	--	--	--
	03/26/13	58.10	0.04	5206.14	NOT SAMPLED DUE TO FREE PRODUCT				--	--	--	--	--	--	--	--	--	--	--	--	--	--
	10/24/13	57.48	0.00	5206.73	24,000	29,700	700	54,400	**28,500**	<200	400	3,400	<200	3,400	294	21,932	--	-279.1	<500	12,760,000	1,950	200
	05/12/14	58.15	0.05	5206.10	20,000	4,200	<1,000	24,200	**15,400**	<100	400	3,800	100	3,900	290	21,000	1.87	-311.9	<500	12,100,000	1,560	160
	09/24/14	59.33	0.57	5205.34	NOT SAMPLED DUE TO FREE PRODUCT				--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/12/15	59.92	0.66	5204.82	NOT SAMPLED DUE TO FREE PRODUCT				--	--	--	--	--	--	--	--	--	--	--	--	--	--
	09/22/15	60.34	0.70	5204.43	NOT SAMPLED DUE TO FREE PRODUCT				--	--	--	--	--	--	--	--	--	--	--	--	--	--
	06/18/16	61.19	0.84	5203.69	NOT SAMPLED DUE TO FREE PRODUCT				--	--	--	--	--	--	--	--	--	--	--	--	--	--
	09/12/16	61.59	0.93	5203.36	NOT SAMPLED DUE TO FREE PRODUCT				--	--	--	--	--	--	--	--	--	--	--	--	--	--
	06/05/17	62.37	1.04	5202.67	NOT SAMPLED DUE TO FREE PRODUCT				--	--	--	--	--	--	--	--	--	--	--	--	--	--
	09/11/17	62.49	0.34	5201.99	NOT SAMPLED DUE TO FREE PRODUCT				--	--	--	--	--	--	--	--	--	--	--	--	--	--
	06/17/18	62.75	0.04	5201.49	NOT SAMPLED DUE TO FREE PRODUCT				--	--	--	--	--	--	--	--	--	--	--	--	--	--
	09/17/18	62.30	0.02	5201.93	NOT SAMPLED DUE TO FREE PRODUCT				--	--	--	--	--	--	--	--	--	--	--	--	--	--
	06/15/19	63.60	0.00	5200.61	--	--	--	--	**13,000**	**5,900**	<500	3,200	1,300	4,500	300	25,000	--	--	--	17,000,000	--	--
	09/05/19	63.95	0.00	5200.26	--	--	--	--	**16,000**	43	**2,000**	1,300	53	1,400	310	--	--	--	<2,500	14,000,000	650	180
	06/19/20	64.47	0.00	5199.74	--	--	--	--	**12,000**	<100	**1,700**	730	<100	730	--	--	--	--	--	--	--	--
	10/09/20	64.65	0.07	5199.62	NOT SAMPLED DUE TO FREE PRODUCT				--	--	--	--	--	--	--	--	--	--	--	--	--	--
	05/22/21	64.83	0.02	5199.40	NOT SAMPLED DUE TO FREE PRODUCT				--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/27/21	64.88	0.00	5199.33	--	--	--	--	**7,900**	<100	330	340	<100	340	--	--	--	--	--	--	--	--

Table 1
Groundwater Monitoring Data and Analytical Results
Federal 27-11 (Pit #111762)
South Canyon Field
Garfield County, CO

Well ID	Sample Date	Depth to GW (feet below TOC)	LPH Thickness (feet)	GW Elevation[1] (feet above msl)	TPH GRO (µg/L)	TPH DRO (µg/L)	TPH ORO (µg/L)	Total TPH (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	p,m-Xylene (µg/L)	o-Xylene (µg/L)	Total Xylenes (µg/L)	Chloride (mg/L)	TDS (mg/L)	DO (mg/L)	ORP (mV)	Nitrate (µg/L)	Sulfate (µg/L)	Ferrous Iron (µg/L)	Methane (µg/L)
COGCC Table 915-1 Cleanup Concentration					--	--	--	--	**5**	**1,000**	**700**	--	--	**10,000**	664[2]	107,500[3]	--	--	--	75,000,000[4]	--	--
111762-MW-3	06/01/10	53.76	0.00	5210.86	60,000	5,100	<300	65,100	**22,200**	**19,600**	**700**	6,000	1,600	7,600	--	--	0.78	36.7	<200	18,400,000	4,040	--
	11/16/10	54.39	0.00	5210.23	44,000	4,300	<200	48,300	**20,400**	**8,500**	**800**	6,800	800	7,600	449	30,810	4.59	-115.9	<200	19,500,000	37,900	--
	03/24/11	54.93	0.00	5209.69	14,000	7,200	<400	21,200	**22,900**	300	**800**	7,000	<200	7,000	509	35,927	1.37	-109.4	<200	22,300,000	19,200	--
	09/13/11	55.51	0.00	5209.11	27,000	19,900	<800	46,900	**22,700**	500	**900**	5,700	<200	5,700	491	33,812	0.69	-198.4	<500	21,200,000	9,850	--
	10/24/11	55.65	0.00	5208.97	NOT SAMPLED; ONLY DEPTH-TO-GROUNDWATER DATA REQUIRED							--	--	--	--	--	--	--	--	--	--	--
	03/26/13	58.50	0.00	5206.12	16,000	700	<100	16,700	**15,700**	<200	<200	400	<200	400	517	32,520	0.17	-236.7	<500	19,500,000	520	200
	10/23/13	58.20	0.00	5206.42	17,000	3,000	800	20,800	**16,700**	200	100	500	<100	500	498	32,698	--	-269.3	<500	19,500,000	3,380	190
	05/13/14	58.20	0.00	5206.42	10,000	2,300	1,100	13,400	**15,900**	<200	<200	800	<200	800	531	32,000	1.77	-268.2	<500	21,300,000	2,800	78
	09/24/14	59.20	0.00	5205.42	16,000	8,700	<5,100	24,700	**19,200**	<200	<200	<400	<200	<400	519	32,530	1.11	-325.1	<500	21,600,000	2,460	140
	05/12/15	59.84	0.00	5204.78	9,000	8,300	<5,600	17,300	**28,500**	200	<200	700	<200	700	511	31,900	0.66	-249.7	<500	19,500,000	<100	360
	09/22/15	60.17	0.00	5204.45	16,000	1,500	200	17,700	**26,200**	<200	**2,600**	<400	<200	<400	579	31,300	0.84	-270.4	<500	19,800,000	<100	340
	06/18/16	60.86	0.00	5203.76	--	--	--	--	**29,600**	<200	**3,800**	<400	<200	<400	508	31,600	0.59	-250.5	--	19,000,000	--	--
	09/12/16	61.03	0.00	5203.59	24,000	6,400	<3,400	30,400	**21,800**	<200	**2,100**	<400	<200	<400	493	31,100	0.03	-245.9	<500	19,500,000	60	450
	06/05/17	61.70	0.00	5202.92	--	--	--	--	**23,700**	<200	**2,300**	<400	<200	<400	520	31,800	0.49	-135.2	--	20,100,000	--	--
	09/11/17	62.12	0.00	5202.50	20,000	3,100	100	23,200	**28,400**	<200	**2,200**	<400	<200	<400	513	32,100	--	--	<500	18,800,000	420	215
	06/17/18	62.68	0.00	5201.94	63,000	40,000	--	103,000	**27,000**	<200	**1,800**	--	--	290	517	29,300	0.05	-228.4	--	10,900,000	--	--
	09/17/18	63.10	0.00	5201.52	65,000	48,000	--	113,000	**19,000**	740	**930**	--	--	2,500	565	29,100	--	--	<5,000	19,100,000	328	160
	06/15/19	63.54	0.00	5201.08	--	--	--	--	**14,000**	89	190	810	<500	810	610	32,000	--	--	--	34,000,000	--	--
	09/05/19	63.81	0.00	5200.81	--	--	--	--	**27,000**	**7,600**	**2,000**	6,300	3,200	9,500	500	29,000	--	--	<2,500	19,000,000	1,800	120
	06/19/20	64.16	0.00	5200.46	--	--	--	--	**21,000**	**1,400**	**1,000**	2,800	1,800	4,600	460	--	--	--	--	16,000,000	--	--
	10/09/20	64.41	0.00	5200.21	--	--	--	--	**12,000**	170	500	1,700	1,400	3,100	--	--	--	--	--	--	--	--
	05/22/21	64.65	0.00	5199.97	--	--	--	--	**13,000**	**2,200**	**900**	6,000	1,500	7,500	--	--	--	--	--	--	--	--
	08/27/21	64.65	0.00	5199.97	--	--	--	--	**10,000**	160	430	1,200	760	2,000	--	--	--	--	--	--	--	--
111762-MW-4	06/01/10	57.23	0.00	5211.71	5,000	300	<100	5,300	**1,040**	**2,380**	80	530	230	760	--	--	1.43	112.4	<200	19,400,000	740	--
	11/16/10	57.97	0.00	5210.97	3,900	400	<100	4,300	**3,360**	290	350	730	40	770	273	23,660	6.06	-128.0	<200	20,600,000	11,400	--
	03/24/11	58.59	0.00	5210.35	2,300	300	<100	2,600	**2,910**	90	350	<100	<50	<100	284	31,073	1.40	-150.1	<200	21,900,000	16,100	--
	09/13/11	59.11	0.00	5209.83	3,200	400	<100	3,600	**2,040**	40	390	<40	<20	<40	274	31,580	0.96	-241.1	<500	20,400,000	12,000	--
	10/24/11	59.20	0.00	5209.74	NOT SAMPLED; ONLY DEPTH-TO-GROUNDWATER DATA REQUIRED							--	--	--	--	--	--	--	--	--	--	--
	03/26/13	61.00	0.00	5207.94	1,300	200	<100	1,500	**250**	109	381	50	17	67	310	30,368	1.53	95.7	<500	18,500,000	8,240	5.0
	10/23/13	62.10	0.00	5206.84	2,200	700	100	3,000	**270**	50	**950**	<20	<10	<20	296	30,920	--	-112.1	<500	19,300,000	9,200	5.2
	05/13/14	62.70	0.00	5206.24	2,000	600	200	2,800	**390**	20	**1,550**	<20	<10	<20	294	28,900	2.08	-106.7	<500	18,800,000	9,280	17
	09/24/14	63.06	0.00	5205.88	2,000	1,300	<500	3,300	**400**	50	**1,320**	30	<10	30	288	27,180	2.61	-104.5	<500	17,900,000	12,900	34
	05/13/15	63.58	0.00	5205.36	1,600	700	300	2,600	**300**	<20	**1,420**	<40	<20	<40	290	25,600	1.10	-133.0	<500	16,000,000	100	45
	09/22/15	64.10	0.00	5204.84	3,400	500	100	4,000	**840**	120	**2,620**	<100	<50	<100	322	26,100	1.95	-95.3	<500	16,400,000	480	43
	06/18/16	64.93	0.00	5204.01	--	--	--	--	**280**	10	**910**	<20	<10	<20	271	25,600	2.02	-28.5	--	16,600,000	--	--
	09/12/16	64.98	0.00	5203.96	820	--	--	820	**590**	100	360	40	20	60	--	--	1.80	-99.3	--	--	33,000	76
	06/05/17	65.75	0.00	5203.19	--	--	--	--	**430**	50	20	20	10	30	--	--	--	--	--	--	--	--
	09/11/17	66.24	0.00	5202.70	NOT SAMPLED; INSUFFICIENT WATER FOR SAMPLING							--	--	--	--	--	--	--	--	--	--	--
	06/17/18	66.47	0.00	5202.47	NOT SAMPLED; INSUFFICIENT WATER FOR SAMPLING							--	--	--	--	--	--	--	--	--	--	--
	09/17/18	66.38	0.00	5202.56	NOT SAMPLED; INSUFFICIENT WATER FOR SAMPLING							--	--	--	--	--	--	--	--	--	--	--
	06/15/19	66.40	0.00	5202.54	NOT SAMPLED; INSUFFICIENT WATER FOR SAMPLING							--	--	--	--	--	--	--	--	--	--	--
	09/05/19	66.35	0.00	5202.59	NOT SAMPLED; INSUFFICIENT WATER FOR SAMPLING							--	--	--	--	--	--	--	--	--	--	--
	06/19/20	66.38	0.00	5202.56	NOT SAMPLED; INSUFFICIENT WATER FOR SAMPLING							--	--	--	--	--	--	--	--	--	--	--
	10/09/20	66.38	0.00	5202.56	NOT SAMPLED; INSUFFICIENT WATER FOR SAMPLING							--	--	--	--	--	--	--	--	--	--	--
	05/22/21	66.38	0.00	5202.56	NOT SAMPLED; INSUFFICIENT WATER FOR SAMPLING							--	--	--	--	--	--	--	--	--	--	--
	08/27/21	66.38	0.00	5202.56	NOT SAMPLED; INSUFFICIENT WATER FOR SAMPLING							--	--	--	--	--	--	--	--	--	--	--

Table 1
Groundwater Monitoring Data and Analytical Results
Federal 27-11 (Pit #111762)
South Canyon Field
Garfield County, CO

Well ID	Sample Date	Depth to GW (feet below TOC)	LPH Thickness (feet)	GW Elevation[1] (feet above msl)	TPH GRO (µg/L)	TPH DRO (µg/L)	TPH ORO (µg/L)	Total TPH (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	p,m-Xylene (µg/L)	o-Xylene (µg/L)	Total Xylenes (µg/L)	Chloride (mg/L)	TDS (mg/L)	DO (mg/L)	ORP (mV)	Nitrate (µg/L)	Sulfate (µg/L)	Ferrous Iron (µg/L)	Methane (µg/L)
COGCC Table 915-1 Cleanup Concentration					--	--	--	--	**5**	**1,000**	**700**	--	--	**10,000**	664[2]	107,500[3]	--	--	--	75,000,000[4]	--	--
111762-MW-5	10/24/11	63.50	0.00	5208.89	<200	300	<100	300	<1	<1	<1	<2	1	1	298	28,120	2.56	257.1	7,900	19,700,000	540	--
	03/26/13	64.10	0.00	5208.29	<200	200	<100	200	<1	<1	<1	<2	<1	<2	320	29,056	3.35	232.0	6,600	17,900,000	8,180	19
	10/24/13	65.15	0.00	5207.24	<200	100	200	300	<1	<1	<1	<2	<1	<2	--	--	--	122.0	--	--	--	--
	05/12/14	65.65	0.00	5206.74	NOT SAMPLED; INSUFFICIENT WATER FOR SAMPLING							--	--	--	--	--	--	--	--	--	--	--
	09/24/14	66.16	0.00	5206.23	NOT SAMPLED; INSUFFICIENT WATER FOR SAMPLING							--	--	--	--	--	--	--	--	--	--	--
	05/12/15	66.82	0.00	5205.57	--	--	--	--	<1	<1	<1	<2	<1	<2	--	--	1.27	-112.3	--	--	--	--
	09/22/15	67.31	0.00	5205.08	--	--	--	--	<1	<1	3	<2	<1	<2	--	--	1.42	-88.9	--	--	--	--
	06/18/16	67.99	0.00	5204.40	NOT SAMPLED; INSUFFICIENT WATER FOR SAMPLING							--	--	--	--	--	--	--	--	--	--	--
	09/12/16	68.15	0.00	5204.24	NOT SAMPLED; INSUFFICIENT WATER FOR SAMPLING							--	--	--	--	--	--	--	--	--	--	--
	06/05/17	68.13	0.00	5204.26	NOT SAMPLED; INSUFFICIENT WATER FOR SAMPLING							--	--	--	--	--	--	--	--	--	--	--
	09/11/17	68.12	0.00	5204.27	NOT SAMPLED; INSUFFICIENT WATER FOR SAMPLING							--	--	--	--	--	--	--	--	--	--	--
	06/17/18	68.21	0.00	5204.18	NOT SAMPLED; INSUFFICIENT WATER FOR SAMPLING							--	--	--	--	--	--	--	--	--	--	--
	09/17/18	68.18	0.00	5204.21	NOT SAMPLED; INSUFFICIENT WATER FOR SAMPLING							--	--	--	--	--	--	--	--	--	--	--
	06/15/19	68.21	0.00	5204.18	NOT SAMPLED; INSUFFICIENT WATER FOR SAMPLING							--	--	--	--	--	--	--	--	--	--	--
	09/05/19	68.16	0.00	5204.23	NOT SAMPLED; INSUFFICIENT WATER FOR SAMPLING							--	--	--	--	--	--	--	--	--	--	--
	06/19/20	68.18	0.00	5204.21	NOT SAMPLED; INSUFFICIENT WATER FOR SAMPLING							--	--	--	--	--	--	--	--	--	--	--
	10/09/20	68.18	0.00	5204.21	NOT SAMPLED; INSUFFICIENT WATER FOR SAMPLING							--	--	--	--	--	--	--	--	--	--	--
	05/22/21	68.18	0.00	5204.21	NOT SAMPLED; INSUFFICIENT WATER FOR SAMPLING							--	--	--	--	--	--	--	--	--	--	--
	08/27/21	68.18	0.00	5204.21	NOT SAMPLED; INSUFFICIENT WATER FOR SAMPLING							--	--	--	--	--	--	--	--	--	--	--
111762-MW-6	10/24/11	54.90	0.00	5206.56	31,000	8,300	<800	39,300	**22,100**	**15,400**	600	4,200	1,200	5,400	288	24,128	1.22	251.3	<500	14,900,000	235	--
	03/26/13	56.35	0.00	5205.11	20,000	1,300	<100	21,300	**12,400**	<200	400	3,700	<200	3,700	331	22,668	1.13	-149.9	<500	12,900,000	11,800	190
	10/23/13	57.20	0.00	5204.26	26,000	10,800	900	37,700	**19,700**	<100	500	5,300	<100	5,300	321	23,486	--	-147.3	<500	13,400,000	5,320	230
	05/12/14	57.35	0.00	5204.11	20,000	3,100	1,200	24,300	**30,200**	<200	**2,600**	5,300	<200	5,300	298	22,400	2.86	-228.7	<500	13,100,000	3,120	230
	09/24/14	57.80	0.00	5203.66	22,000	2,700	<1,000	24,700	**18,500**	<200	**2,500**	700	<200	700	314	22,500	1.94	-307.7	<500	14,100,000	1,950	230
	05/13/15	58.35	0.00	5203.11	16,000	5,900	<4,400	21,900	**24,400**	<200	**5,700**	<400	<200	<400	315	22,100	2.36	-268.4	<500	12,900,000	180	380
	09/22/15	58.76	0.00	5202.70	21,000	2,500	400	23,900	**28,200**	<200	**3,600**	400	<200	400	333	21,900	1.20	-167.0	<500	12,700,000	<100	290
	06/18/16	59.55	0.00	5201.91	--	--	--	--	**31,600**	<200	**7,100**	<400	<200	<400	306	21,700	0.33	-285.6	--	12,200,000	--	--
	09/12/16	59.88	0.00	5201.58	40,000	9,200	<3,200	49,200	**24,700**	<200	**3,000**	<400	<200	<400	298	21,300	1.25	-106.2	<500	12,900,000	290	210
	06/05/17	60.48	0.00	5200.98	--	--	--	--	**16,200**	<100	**7,700**	6,100	<100	6,100	290	22,600	0.13	-150.1	--	13,600,000	--	--
	09/11/17	60.93	0.00	5200.53	40,000	5,700	100	45,800	**27,100**	<200	**12,600**	<400	<200	<400	308	22,600	0.14	-255.0	<500	13,200,000	<100	134
	06/17/18	61.26	0.00	5200.20	83,000	70,000	--	153,000	**23,000**	<50	**12,000**	--	--	66	301	17,500	0.06	-163.8	--	10,800,000	--	--
	09/17/18	61.74	0.00	5199.72	99,000	45,000	--	144,000	**26,000**	<50	**9,400**	--	--	<250	367	20,800	1.20	-234.1	<5,000	14,400,000	299	330
	06/15/19	62.87	0.00	5198.59	--	--	--	--	**8,000**	500	320	190	<500	190	320	25,000	1.87	-73.2	--	22,000,000	--	--
	09/05/19	62.75	0.00	5198.71	--	--	--	--	**11,000**	41	**2,000**	37	<100	37	330	25,000	--	--	<2,500	15,000,000	470	59
	06/19/20	63.06	0.00	5198.40	--	--	--	--	**3,900**	6.3	**2,400**	24	<20	24	300	19,000	2.80	-66.6	--	17,000,000	--	--
	10/09/20	63.63	0.00	5197.83	--	--	--	--	**7,800**	<50	**1,700**	72	<50	72	290	**350,000**[6]	0.27	-46.1	<500	16,000,000	300	53
	05/22/21	63.57	0.00	5197.89	--	--	--	--	**5,800**	17	**1,200**	77	23	100	290	27,000	1.50	-46.7	--	18,000,000	--	--
	08/27/21	64.18	0.00	5197.28	--	--	--	--	**5,600**	<100	**1,100**	63	<100	63	300	27,000	1.52	-52.1	<500	18,000,000	0.44	33

Table 1
Groundwater Monitoring Data and Analytical Results
Federal 27-11 (Pit #111762)
South Canyon Field
Garfield County, CO

Well ID	Sample Date	Depth to GW (feet below TOC)	LPH Thickness (feet)	GW Elevation[1] (feet above msl)	TPH GRO (µg/L)	TPH DRO (µg/L)	TPH ORO (µg/L)	Total TPH (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	p,m-Xylene (µg/L)	o-Xylene (µg/L)	Total Xylenes (µg/L)	Chloride (mg/L)	TDS (mg/L)	DO (mg/L)	ORP (mV)	Nitrate (µg/L)	Sulfate (µg/L)	Ferrous Iron (µg/L)	Methane (µg/L)
COGCC Table 915-1 Cleanup Concentration					--	--	--	--	**5**	**1,000**	**700**	--	--	**10,000**	664[2]	107,500[3]	--	--	--	75,000,000[4]	--	--
111762-MW-7	10/24/11	51.90	0.00	5191.18	200	<100	<100	200	<1	<1	<1	<2	<1	<2	531	37,482	1.37	225.9	800	23,900,000	520	--
	03/26/13	47.50	0.00	5195.58	<200	<100	<100	<200	2	<1	<1	<2	<1	<2	438	55,644	2.06	41.1	<500	35,400,000	6,580	2.7
	10/23/13	41.65	0.00	5201.43	<200	200	<100	200	<1	<1	<1	<2	<1	<2	432	58,713	--	148.2	13,400	39,500,000	36,300	16
	05/12/14	44.81	0.00	5198.27	<200	1,100	200	1,300	<1	<1	<1	<2	<1	<2	375	62,100	3.79	165.2	40,800	40,000,000	31,800	4.0
	09/24/14	44.92	0.00	5198.16	<200	1,100	400	1,500	<1	<1	<1	<2	<1	<2	387	61,000	1.72	-158.8	23,300	48,200,000	1,460	6.2
	05/12/15	45.45	0.00	5197.63	<200	500	<100	500	<1	<1	<1	<2	<1	<2	397	62,200	2.66	-45.2	6,900	39,000,000	<100	3.1
	09/22/15	44.24	0.00	5198.84	<200	400	<100	400	<1	<1	<1	<2	<1	<2	414	59,000	2.19	41.9	24,200	41,000,000	<100	2.0
	06/18/16	45.18	0.00	5197.90	--	--	--	--	<1	<1	<1	<2	<1	<2	364	60,200	2.28	23.4	--	39,900,000	--	--
	09/12/16	45.34	0.00	5197.74	<100	300	100	400	<1	<1	<1	<2	<1	<2	371	64,300	1.30	238.6	17,800	44,500,000	2,130	3.1
	06/05/17	45.15	0.00	5197.93	--	--	--	--	<1	<1	<1	<2	<1	<2	368	67,600	3.11	99.1	--	46,100,000	--	--
	09/11/17	45.75	0.00	5197.33	<200	300	300	600	<1	<1	<1	<2	<1	<2	389	69,300	1.89	246.0	11,800	41,500,000	1,330	3.0
	06/17/18	46.18	0.00	5196.90	<50	270	--	270	<1	<1	<1	--	--	<1	381	69,600	4.35	-19.3	--	36,000,000	--	--
	09/17/18	44.79	0.00	5198.29	<50	410	--	410	<1	<1	<1	--	--	<5	449	72,000	1.49	-73.8	9,100	52,200,000	10,900	<5.0
	06/15/19	43.83	0.00	5199.25	--	--	--	--	<1	<1	<1	<2	<1	<2	410	78,000	2.44	181.0	--	60,000,000	--	--
	09/05/19	44.94	0.00	5198.14	--	--	--	--	2.2	0.28	0.39	0.27	<1	0.27	420	79,000	--	--	<500,000	<25,000	290	5.2
	06/19/20	45.04	0.00	5198.04	--	--	--	--	0.47	<1.0	0.39	<2.0	<1.0	<2.0	380	32,000	1.17	68.3	--	49,000,000	--	--
	10/09/20	45.70	0.00	5197.38	--	--	--	--	0.45	<1.0	0.17	<2.0	<1.0	<2.0	410	33,000	0.79	57.5	<500	55,000,000	250	1.4
	05/22/21	46.22	0.00	5196.86	--	--	--	--	1.6	<1.0	0.45	0.56	<1.0	0.56	330	74,000	3.40	103.8	--	52,000,000	--	--
	08/27/21	46.44	0.00	5196.64	--	--	--	--	0.30	<1.0	<1.0	<2.0	<1.0	<2.0	430	86,000	1.80	32.1	<2,500	57,000,000	110	4.0
Average detections for wells within plume[5]																	1.17	-156.4	--	18,051,594	6,039	162.1
Average detections for wells outside plume[5]																	2.21	77.6	14,782	41,890,000	7,722	5.8

Explanations:
DO = dissolved oxygen
GW = groundwater
LPH = liquid-phase hydrocarbons
µg/L = micrograms per liter
mg/L = milligrams per liter
msl = mean sea level
mV = millivolts
ORP = oxidation-reduction potential
TDS = total dissolved solids
TOC = top of casing
TPH DRO = total petroleum hydrocarbons as diesel range organics
TPH GRO = total petroleum hydrocarbons as gasoline range organics
TPH ORO = total petroleum hydrocarbons as oil range organics
-- = not analyzed/not measured/not applicable

Notes:
Values equal to or exceeding the Colorado Oil and Gas Conservation Commission (COGCC) Series 900 Cleanup Concentrations are in **blue bold** text.
[1] When LPH is present, groundwater elevations are adjusted for LPH thickness using a density factor of 0.8.
[2] COGCC Concentration Level = 1.25 x background. 111762-MW-7 sample collected on October 24, 2011 used as background.
[3] COGCC Concentration Level = 1.25 x background. 111762-MW-7 sample collected on August 27, 2021 used as background.
[4] COGCC Concentration Level = 1.25 x background. 111762-MW-7 sample collected on June 15, 2019 used as background.
[5] Anomalous high DO concentrations were measured at all wells during November 2010; therefore, these DO levels were excluded from the average.
[6] Anomalous high TDS concentration. Laboratory note stated that the result exceeded the calibration range.

Table 2
2021 Mobile Multi-Phase Extraction Event Field Data
Federal 27-11 (Pit #111762)
South Canyon Field
Garfield County, CO

Extraction Well	Date	Time	Stinger Depth (ft BTOC)	Vacuum Truck Vacuum (in Hg)	Extraction Well Vacuum (in Hg)	Cumulative Fluid Removal (gallons)	Influent Temperature (°F)	Influent PID (ppmv)	Process Discharge Flow (ft/min)	Process Discharge Flow (acfm)	Influent O_2 (%)	Influent CO (ppmv)	Influent CO_2 (ppmv)	Influent LEL (ppmv)
MW-2	06/15/21	7:30	--	--	--	--	--	27	--	--	--	--	--	--
MW-2	06/15/21	7:45	65.00	12.5	10.0	--	80.3	1,589	569	29.64	3.3	12.0	> 10,000	>20,000
MW-2	06/15/21	8:00	65.00	12.5	10.0	--	105.8	1,554	561	27.54	7.6	15.0	> 10,000	>20,000
MW-2	06/15/21	8:15	65.00	12.5	10.0	--	105.7	1,490	564	28.04	5.4	5.0	> 10,000	>20,000
MW-2	06/15/21	8:30	65.00	12.0	9.0	--	107.7	1,461	477	23.40	5.7	8.0	> 10,000	>20,000
MW-2	06/15/21	9:00	65.00	12.0	8.5	--	112.3	1,397	479	23.52	7.3	8.0	> 10,000	>20,000
MW-2	06/15/21	9:30	65.00	12.0	8.0	--	112.1	1,434	416	20.43	9.3	6.0	> 10,000	>20,000
MW-2	06/15/21	10:00	65.00	12.0	8.0	--	127.5	1,389	466	22.86	9.1	5.0	> 10,000	>20,000
MW-2	06/15/21	10:30	65.00	12.0	8.0	--	124.5	1,558	478	23.43	7.3	2.0	> 10,000	>20,000
MW-2	06/15/21	11:00	65.00	12.0	8.0	--	112.0	1,396	501	24.59	6.3	1.0	> 10,000	>20,000
MW-2	06/15/21	11:30	65.00	12.0	8.0	--	124.3	657	504	24.71	19.7	1.0	> 10,000	>20,000
MW-2	06/15/21	12:00	65.00	12.0	7.5	--	126.3	1,389	512	25.12	6.3	0.0	> 10,000	>20,000
MW-2	06/15/21	12:30	65.00	12.0	7.5	--	127.5	1,343	526	25.81	6.7	1.0	> 10,000	>20,000
MW-2	06/15/21	13:00	65.00	12.0	7.5	--	128.2	1,291	520	25.53	6.9	0.0	> 10,000	>20,000
MW-2	06/15/21	13:30	65.00	12.0	7.5	--	121.6	1,297	535	26.23	6.8	0.0	> 10,000	>20,000
MW-2	06/15/21	14:00	65.00	12.0	8.0	--	132.5	1,320	527	25.87	6.8	0.0	> 10,000	>20,000
MW-2	06/15/21	14:30	65.00	12.0	8.0	--	132.7	1,324	525	25.75	6.2	2.0	> 10,000	>20,000
MW-2	06/15/21	15:00	65.00	12.0	8.0	--	129.2	1,398	532	26.11	8.4	1.0	> 10,000	>20,000
MW-2	06/15/21	15:30	65.00	12.0	8.0	--	137.1	1,315	519	25.46	7.1	2.0	> 10,000	>20,000
MW-2	06/15/21	16:00	65.00	12.0	8.0	--	129.1	1,306	534	26.19	6.6	0.0	> 10,000	>20,000
MW-2	06/15/21	16:30	65.00	12.0	8.0	--	121.1	1,316	552	27.08	8.0	0.0	> 10,000	>20,000
MW-2	06/15/21	17:00	65.00	12.0	8.0	--	138.3	1,247	550	26.95	8.1	0.0	> 10,000	>20,000
MW-2	06/15/21	17:30	65.00	12.0	8.0	--	129.7	1,298	539	27.10	7.8	0.0	> 10,000	>20,000
MW-2	06/15/21	18:00	65.00	12.0	8.0	--	135.8	1,345	565	26.35	7.3	0.0	> 10,000	>20,000
MW-2	09/21/21	7:15	--	--	--	--	--	27	--	--	--	--	--	--
MW-2	09/21/21	7:30	66.00	16.0	0.0	--	52.5	1,280	522	45.52	7.2	0.0	> 10,000	>20,000
MW-2	09/21/21	7:45	66.00	19.0	4.0	--	53.4	1,309	533	46.46	4.9	0.0	> 10,000	>20,000
MW-2	09/21/21	8:00	66.00	19.0	4.0	--	59.4	1,375	573	49.96	7.5	0.0	> 10,000	>20,000
MW-2	09/21/21	8:15	66.00	19.0	4.0	--	66.8	1,469	586	51.09	5.5	0.0	> 10,000	>20,000
MW-2	09/21/21	8:30	66.00	19.0	4.5	--	63.6	1,450	578	50.44	5.1	1.0	> 10,000	>20,000
MW-2	09/21/21	9:00	66.00	19.0	4.5	--	97.1	1,472	635	55.36	5.9	2.0	> 10,000	>20,000
MW-2	09/21/21	9:30	66.00	19.0	5.0	--	110.7	1,405	615	53.62	8.1	2.0	> 10,000	>20,000
MW-2	09/21/21	10:00	66.00	19.0	5.0	--	77.5	1,399	581	50.65	8.5	6.0	> 10,000	>20,000
MW-2	09/21/21	10:30	66.00	19.0	4.5	--	103.6	1,477	668	58.28	7.7	4.0	> 10,000	>20,000
MW-2	09/21/21	11:00	66.00	19.0	4.5	--	78.8	1,440	611	53.30	10.6	4.0	> 10,000	>20,000
MW-2	09/21/21	11:30	66.00	19.0	4.0	--	104.8	1,675	638	55.63	7.9	2.0	> 10,000	>20,000
MW-2	09/21/21	12:00	66.00	19.0	4.0	--	86.6	1,684	655	57.11	9.0	3.0	> 10,000	>20,000
MW-2	09/21/21	12:30	66.00	19.0	4.0	--	104.9	1,607	693	60.46	7.8	3.0	> 10,000	>20,000
MW-2	09/21/21	13:00	66.00	19.0	4.0	--	120.0	1,704	769	67.07	7.9	4.0	> 10,000	>20,000
MW-2	09/21/21	13:30	66.00	19.0	4.0	--	136.6	1,444	680	59.32	7.5	2.0	> 10,000	>20,000
MW-2	09/21/21	14:00	66.00	19.0	4.0	--	145.9	1,570	682	59.53	11.0	1.0	> 10,000	>20,000
MW-2	09/21/21	14:30	66.00	19.0	4.0	--	125.7	1,359	696	60.69	10.2	1.0	> 10,000	>20,000
MW-2	09/21/21	15:00	66.00	19.0	4.0	--	144.2	1,395	681	59.39	8.7	2.0	> 10,000	>20,000
MW-2	09/21/21	15:30	66.00	19.0	4.0	--	156.4	1,367	684	59.66	9.3	3.0	> 10,000	>20,000
MW-2	09/21/21	16:00	66.00	19.0	4.0	--	105.1	1,444	678	59.12	8.6	1.0	> 10,000	>20,000
MW-2	09/21/21	16:30	66.00	19.0	5.0	--	116.5	1,361	702	61.2	9.1	3.0	> 10,000	>20,000
MW-2	09/21/21	17:00	66.00	19.0	5.0	--	126.0	1,309	706	61.6	8.2	2.0	> 10,000	>20,000
MW-2	09/21/21	17:30	66.00	19.0	5.0	--	125.4	1,307	789	68.9	11.2	2.0	> 10,000	>20,000

Table 2
2021 Mobile Multi-Phase Extraction Event Field Data
Federal 27-11 (Pit #111762)
South Canyon Field
Garfield County, CO

Extraction Well	Date	Time	Stinger Depth (ft BTOC)	Vacuum Truck Vacuum (in Hg)	Extraction Well Vacuum (in Hg)	Cumulative Fluid Removal (gallons)	Influent Temperature (°F)	Influent PID (ppmv)	Process Discharge Flow (ft/min)	Process Discharge Flow (acfm)	Influent O_2 (%)	Influent CO (ppmv)	Influent CO_2 (ppmv)	Influent LEL (ppmv)
MW-3	06/15/21	7:30	--	--	--	--	--	102	--	--	--	--	--	--
MW-3	06/15/21	7:45	65.00	12.5	9.5	--	80.3	1,605	569	29.64	8.2	0.0	> 10,000	>20,000
MW-3	06/15/21	8:00	65.00	12.5	9.0	--	105.8	1,317	561	27.54	7.7	8.0	> 10,000	>20,000
MW-3	06/15/21	8:15	65.00	12.5	9.0	--	105.7	1,556	564	28.04	9.4	10.0	> 10,000	>20,000
MW-3	06/15/21	8:30	65.00	12.0	8.5	--	107.7	1,500	477	23.40	8.9	12.0	> 10,000	>20,000
MW-3	06/15/21	9:00	65.00	12.0	8.5	--	112.3	1,344	479	23.52	9.6	22.0	> 10,000	>20,000
MW-3	06/15/21	9:30	65.00	12.0	6.5	--	112.1	1,420	416	20.43	9.9	9.0	> 10,000	>20,000
MW-3	06/15/21	10:00	65.00	12.0	6.0	--	127.5	1,414	466	22.86	13.0	9.5	> 10,000	>20,000
MW-3	06/15/21	10:30	65.00	12.0	6.0	--	124.5	1,380	478	23.43	9.7	2.0	> 10,000	>20,000
MW-3	06/15/21	11:00	65.00	12.0	6.0	--	112.0	1,407	501	24.59	10.3	3.0	> 10,000	>20,000
MW-3	06/15/21	11:30	65.00	12.0	6.0	--	124.3	1,296	504	24.71	11.1	0.0	> 10,000	>20,000
MW-3	06/15/21	12:00	65.00	12.0	5.0	--	126.3	1,284	512	25.12	10.3	0.0	> 10,000	>20,000
MW-3	06/15/21	12:30	65.00	12.0	5.0	--	127.5	1,293	526	25.81	10.0	0.0	> 10,000	>20,000
MW-3	06/15/21	13:00	65.00	12.0	5.0	--	128.2	1,233	520	25.53	10.3	0.0	> 10,000	>20,000
MW-3	06/15/21	13:30	65.00	12.0	5.0	--	121.6	1,226	535	26.23	9.8	1.0	> 10,000	>20,000
MW-3	06/15/21	14:00	65.00	12.0	4.5	--	132.5	1,260	527	25.87	11.3	2.0	> 10,000	>20,000
MW-3	06/15/21	14:30	65.00	12.0	4.5	--	132.7	1,261	525	25.75	10.8	1.0	> 10,000	>20,000
MW-3	06/15/21	15:00	65.00	12.0	4.5	--	129.2	1,180	532	26.11	10.9	1.0	> 10,000	>20,000
MW-3	06/15/21	15:30	65.00	12.0	4.5	--	137.1	1,185	519	25.46	11.1	1.0	> 10,000	>20,000
MW-3	06/15/21	16:00	65.00	12.0	4.5	--	129.1	1,184	534	26.19	10.6	0.0	> 10,000	>20,000
MW-3	06/15/21	16:30	65.00	12.0	4.5	--	121.1	1,182	552	27.08	11.3	0.0	> 10,000	>20,000
MW-3	06/15/21	17:00	65.00	12.0	4.5	--	138.3	1,197	550	26.95	12.7	0.0	> 10,000	>20,000
MW-3	06/15/21	17:30	65.00	12.0	4.5	--	129.7	1,183	539	27.10	12.4	0.0	> 10,000	>20,000
MW-3	06/15/21	18:00	65.00	12.0	4.5	--	135.8	1,194	565	26.35	12.2	0.0	> 10,000	>20,000
MW-3	09/22/21	7:15	66.00	--	--	--	--	102	--	--	--	--	--	--
MW-3	09/22/21	7:30	66.00	16.0	9.5	--	52.5	1,132	522	45.52	17.1	0.0	> 10,000	> 20,000
MW-3	09/22/21	7:45	66.00	19.0	10.0	--	53.4	1,446	533	46.46	13.1	0.0	> 10,000	> 20,000
MW-3	09/22/21	8:00	66.00	19.0	13.0	--	105.8	1,474	573	49.96	12.2	0.0	> 10,000	> 20,000
MW-3	09/22/21	8:15	66.00	19.0	13.0	--	66.8	1,571	586	51.09	12.0	3.0	> 10,000	> 20,000
MW-3	09/22/21	8:30	66.00	19.0	14.5	--	63.6	1,516	578	50.44	12.4	5.0	> 10,000	> 20,000
MW-3	09/22/21	9:00	66.00	19.0	14.0	--	97.1	1,535	635	55.36	12.1	12.0	> 10,000	> 20,000
MW-3	09/22/21	9:30	66.00	19.0	14.0	--	110.7	1,455	615	53.62	12.3	7.0	> 10,000	> 20,000
MW-3	09/22/21	10:00	66.00	19.0	14.0	--	77.5	1,453	581	50.65	13.6	10.0	> 10,000	> 20,000
MW-3	09/22/21	10:30	66.00	19.0	14.0	--	103.6	1,533	668	58.28	13.1	11.0	> 10,000	> 20,000
MW-3	09/22/21	11:00	66.00	19.0	14.0	--	78.8	1,958	611	53.30	15.6	7.0	> 10,000	> 20,000
MW-3	09/22/21	11:30	66.00	19.0	15.0	--	104.8	1,950	638	55.63	12.5	4.0	> 10,000	> 20,000
MW-3	09/22/21	12:00	66.00	19.0	15.0	--	86.6	2,545	655	57.11	11.9	3.0	> 10,000	> 20,000
MW-3	09/22/21	12:30	66.00	19.0	15.0	--	104.9	2,973	693	60.46	12.6	4.0	> 10,000	> 20,000
MW-3	09/22/21	13:00	66.00	19.0	15.0	--	120.0	1,971	769	67.07	11.9	6.0	> 10,000	> 20,000
MW-3	09/22/21	13:30	66.00	19.0	15.0	--	136.6	1,485	680	59.32	12.2	4.0	> 10,000	> 20,000
MW-3	09/22/21	14:00	66.00	19.0	15.0	--	145.9	1,503	682	59.53	11.6	6.0	> 10,000	> 20,000
MW-3	09/22/21	14:30	66.00	19.0	15.0	--	125.7	1,357	696	60.69	10.2	3.0	> 10,000	> 20,000
MW-3	09/22/21	15:00	66.00	19.0	15.0	--	144.2	1,334	681	59.39	11.7	2.0	> 10,000	> 20,000
MW-3	09/22/21	15:30	66.00	19.0	15.0	--	156.4	1,536	684	59.66	12.0	3.0	> 10,000	> 20,000
MW-3	09/22/21	16:00	66.00	19.0	15.0	--	105.1	1,441	678	59.12	13.3	2.0	> 10,000	> 20,000
MW-3	09/22/21	16:30	66.00	19.0	14.0	--	116.5	1,469	702	61.2	13.3	3.0	> 10,000	> 20,000
MW-3	09/22/21	17:00	66.00	19.0	14.0	--	126.0	1,403	706	61.6	8.2	2.0	> 10,000	> 20,000
MW-3	09/22/21	17:30	66.00	19.0	14.0	--	125.4	1,472	789	68.9	13.7	2.0	> 10,000	> 20,000

Table 2
2021 Mobile Multi-Phase Extraction Event Field Data
Federal 27-11 (Pit #111762)
South Canyon Field
Garfield County, CO

Extraction Well	Date	Time	Stinger Depth (ft BTOC)	Vacuum Truck Vacuum (in Hg)	Extraction Well Vacuum (in Hg)	Cumulative Fluid Removal (gallons)	Influent Temperature (°F)	Influent PID (ppmv)	Process Discharge Flow (ft/min)	Process Discharge Flow (acfm)	Influent O_2 (%)	Influent CO (ppmv)	Influent CO_2 (ppmv)	Influent LEL (ppmv)
MW-6	06/16/21	7:00	--	--	--	--	--	48	--	--	--	--	--	--
MW-6	06/16/21	7:30	68.00	15.0	5.0	--	80.4	203	1,407	69.05	20.9	0.0	> 10,000	> 20,000
MW-6	06/16/21	7:45	68.00	16.0	5.0	--	80.1	830	1,399	68.16	18.6	0.0	> 10,000	> 20,000
MW-6	06/16/21	8:00	68.00	16.5	5.0	--	82.6	1,094	1,081	53.04	17.9	0.0	> 10,000	> 20,000
MW-6	06/16/21	8:15	68.00	16.5	5.0	--	85.0	1,170	1,094	53.72	17.7	0.0	> 10,000	> 20,000
MW-6	06/16/21	8:30	68.00	16.5	5.0	--	92.3	1,506	1,004	49.29	17.3	0.0	> 10,000	> 20,000
MW-6	06/16/21	9:00	68.00	16.5	5.0	--	94.6	1,124	1,035	50.83	17.5	0.0	> 10,000	> 20,000
MW-6	06/16/21	9:30	68.00	16.5	5.0	--	101.5	1,037	1,139	55.89	17.4	0.0	> 10,000	> 20,000
MW-6	06/16/21	10:00	68.00	16.5	5.0	--	104.8	981	1,069	52.50	17.5	0.0	> 10,000	> 20,000
MW-6	06/16/21	10:30	68.00	16.5	5.0	--	97.4	910	1,150	56.45	17.4	0.0	> 10,000	> 20,000
MW-6	06/16/21	11:00	68.00	16.5	5.0	--	87.6	939	1,024	50.24	17.5	0.0	> 10,000	> 20,000
MW-6	06/16/21	11:30	68.00	16.5	5.0	--	92.6	856	1,054	51.75	17.5	0.0	> 10,000	> 20,000
MW-6	06/16/21	12:00	68.00	16.5	4.5	--	90.1	798	1,057	51.89	18.0	0.0	> 10,000	> 20,000
MW-6	09/22/21	7:00	68.00	--	--	--	--	47	--	--	--	--	--	--
MW-6	09/22/21	7:30	68.00	19.0	11.0	--	60.1	972	1,430	124.80	17.5	0.0	> 10,000	> 20,000
MW-6	09/22/21	7:45	68.00	19.0	11.0	--	71.3	1,335	1,476	128.76	16.5	0.0	> 10,000	> 20,000
MW-6	09/22/21	8:00	68.00	19.0	11.0	--	91.7	1,403	1,431	124.91	16.5	0.0	> 10,000	> 20,000
MW-6	09/22/21	8:15	68.00	19.0	11.0	--	94.5	1,238	1,397	121.87	16.0	0.0	> 10,000	> 20,000
MW-6	09/22/21	8:30	68.00	19.0	11.5	--	110.3	1,229	1,483	129.39	16.0	0.0	> 10,000	> 20,000
MW-6	09/22/21	9:00	68.00	19.0	11.5	--	119.5	1,240	1,431	124.84	16.3	0.0	> 10,000	> 20,000
MW-6	09/22/21	9:30	68.00	19.0	11.5	--	152.8	1,248	1,450	126.55	16.5	0.0	> 10,000	> 20,000
MW-6	09/22/21	10:00	68.00	19.0	11.5	--	124.2	1,294	1,503	131.15	16.1	0.0	> 10,000	> 20,000
MW-6	09/22/21	10:30	68.00	19.0	11.0	--	125.5	1,274	1,481	129.24	16.0	0.0	> 10,000	> 20,000
MW-6	09/22/21	11:00	68.00	19.0	10.5	--	128.8	1,262	1,445	126.07	16.1	0.0	> 10,000	> 20,000
MW-6	09/22/21	11:30	68.00	19.0	11.0	--	135.6	1,292	1,469	128.16	16.1	0.0	> 10,000	> 20,000
MW-6	09/22/21	12:00	68.00	19.0	11.5	--	158.0	1,259	1,425	124.37	16.1	0.0	> 10,000	> 20,000
MW-6	09/22/21	12:30	68.00	19.0	11.0	--	170.7	1,244	1,553	135.55	16.2	0.0	> 10,000	> 20,000
MW-6	09/22/21	13:00	68.00	19.0	10.5	--	159.9	1,213	1,443	125.95	16.7	0.0	> 10,000	> 20,000
MW-6	09/22/21	13:30	68.00	19.0	11.0	--	176.9	1,223	1,340	116.95	16.3	0.0	> 10,000	> 20,000
MW-6	09/22/21	14:00	68.00	19.0	10.5	--	134.3	1,247	1,412	123.25	16.2	0.0	> 10,000	> 20,000
MW-6	09/22/21	14:30	68.00	19.0	11.0	--	136.6	1,274	1,466	127.91	16.5	0.0	> 10,000	> 20,000
MW-6	09/22/21	15:00	68.00	19.0	11.5	--	148.6	1,239	1,417	123.65	16.4	0.0	> 10,000	> 20,000
MW-6	09/22/21	15:30	68.00	19.0	11.5	--	160.1	1,249	1,476	128.81	16.6	0.0	> 10,000	> 20,000
MW-6	09/22/21	16:00	68.00	19.0	11.5	--	163.5	1,271	1418	123.77	16.6	0.0	> 10,000	> 20,000
MW-6	09/22/21	16:30	68.00	19.0	11.5	--	162.8	1,252	1417	124.55	16.4	0.0	> 10,000	> 20,000
MW-6	09/22/21	17:00	68.00	19.0	11.5	--	160.7	1,263	1455	128.31	16.2	0.0	> 10,000	> 20,000
MW-6	09/22/21	17:30	68.00	19.0	11.5	--	161.9	1,246	1428	126.89	16.5	0.0	> 10,000	> 20,000

Notes:
1. For process discharge flow of MW-2 and MW-3, a combined flow rate in the field was measured at the system effluent. Each well is assumed to have contributed equally to the total flow; therefore, the estimated flow rate at each well is assumed to be one-half of the system effluent flow rate and is accounted for here.
ft BTOC - Feet below top of casing
in Hg - Inches of mercury
°F - Degrees Fahrenheit
PID - Photoionization detector
LEL - Lower explosive limit
ppmv - Parts per million by volume
acfm - Actual cubic feet per minute
ft/min - Feet per minute
O_2 - Oxygen
CO - Carbon monoxide
CO_2 - Carbon dioxide
-- - Not measured

Table 3
2021 Mobile Multi-Phase Extraction
Groundwater Gauging Data
Federal 27-11 (Pit #111762)
South Canyon Field
Garfield County, CO

Extraction Well	Date	Time	DTW Ext Well (ft BTOC)	DTLPH Ext Well (ft BTOC)	LPH Thickness (ft)	LPH Type[1]	TD Ext Well (ft BTOC)
MW-2	06/15/21	7:30	64.85	64.82	0.03	Condensate	65.40
	06/15/21	18:30	64.40	ND	0.00	NA	65.40
	09/21/21	7:15	65.25	65.24	0.01	Condensate	65.40
	09/21/21	18:00	64.79	ND	0.00	NA	65.40
MW-3	06/15/21	7:30	64.82	64.80	0.02	Condensate	65.15
	06/15/21	18:30	64.52	ND	0.00	NA	65.15
	09/22/21	7:15	65.07	65.06	0.01	Condensate	65.15
	09/22/21	18:00	64.83	ND	0.00	NA	65.15
MW-6	06/16/21	7:00	64.06	ND	0.00	NA	68.51
	06/16/21	12:30	66.92	ND	0.00	NA	68.51
	09/22/21	7:00	64.46	ND	0.00	NA	68.51
	09/22/21	18:00	65.04	ND	0.00	NA	68.51

Notes:
[1] Based on historical observations.
DTW - Depth to groundwater
DTLPH - Depth to liquid phase hydrocarbons
LPH - Liquid phase hydrocarbons
TD - Total depth
ft BTOC - Feet below top of casing
Ext - Extraction
-- - Not measured
ND - Not detected
NA - Not applicable

Table 4
Mobile Multi-Phase Extraction
2021 Well Vacuum Data
Federal 27-11 (Pit #111762)
South Canyon Field
Garfield County, CO

Extraction Well(s)	Observation Well	Approximate Distance from Extraction Well (ft)	Date	Time	DTW (ft BTOC)	In-Well Vacuum (in H_2O)
MW-2/MW-3	MW-1	22	06/15/21	7:45	66.20	0.4
MW-2/MW-3	MW-1	22	06/15/21	8:00	66.20	0.5
MW-2/MW-3	MW-1	22	06/15/21	8:15	66.20	0.7
MW-2/MW-3	MW-1	22	06/15/21	8:30	66.20	0.8
MW-2/MW-3	MW-1	22	06/15/21	9:00	66.20	0.8
MW-2/MW-3	MW-1	22	06/15/21	9:30	66.20	1.2
MW-2/MW-3	MW-1	22	06/15/21	10:00	66.20	1.3
MW-2/MW-3	MW-1	22	06/15/21	10:30	66.20	1.5
MW-2/MW-3	MW-1	22	06/15/21	11:00	66.20	1.7
MW-2/MW-3	MW-1	22	06/15/21	11:30	66.20	1.7
MW-2/MW-3	MW-1	22	06/15/21	12:00	66.20	1.7
MW-2/MW-3	MW-1	22	06/15/21	12:30	66.20	1.7
MW-2/MW-3	MW-1	22	06/15/21	13:00	66.20	1.7
MW-2/MW-3	MW-1	22	06/15/21	13:30	66.20	1.5
MW-2/MW-3	MW-1	22	06/15/21	14:00	66.20	1.5
MW-2/MW-3	MW-1	22	06/15/21	14:30	66.20	1.5
MW-2/MW-3	MW-1	22	06/15/21	15:00	66.20	1.5
MW-2/MW-3	MW-1	22	06/15/21	15:30	66.20	1.5
MW-2/MW-3	MW-1	22	06/15/21	16:00	66.20	1.5
MW-2/MW-3	MW-1	22	06/15/21	16:30	66.20	1.5
MW-2/MW-3	MW-1	22	06/15/21	17:00	66.20	1.5
MW-2/MW-3	MW-1	22	06/15/21	17:30	66.20	1.5
MW-2/MW-3	MW-1	22	06/15/21	18:00	66.15	1.5
MW-2/MW-3	MW-1	22	09/21/21	7:30	66.14	0.4
MW-2/MW-3	MW-1	22	09/21/21	7:45	66.14	0.5
MW-2/MW-3	MW-1	22	09/21/21	8:00	66.14	0.7
MW-2/MW-3	MW-1	22	09/21/21	8:15	66.14	0.8
MW-2/MW-3	MW-1	22	09/21/21	9:30	66.14	1.2
MW-2/MW-3	MW-1	22	09/21/21	10:00	66.14	2.0

Table 4
Mobile Multi-Phase Extraction
2021 Well Vacuum Data
Federal 27-11 (Pit #111762)
South Canyon Field
Garfield County, CO

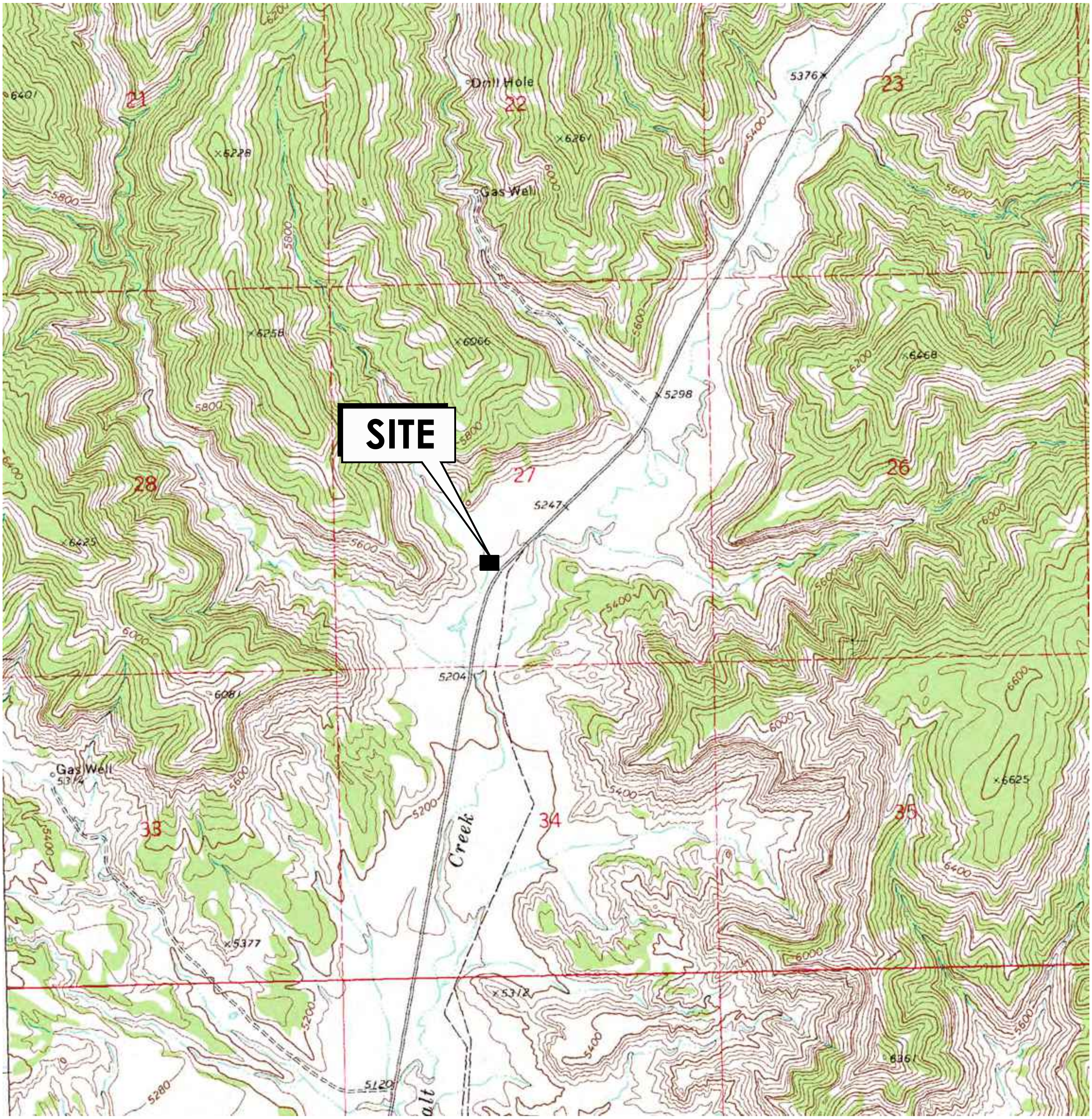
Extraction Well(s)	Observation Well	Approximate Distance from Extraction Well (ft)	Date	Time	DTW (ft BTOC)	In-Well Vacuum (in H_2O)
MW-2/MW-3	MW-1	22	09/21/21	10:30	66.14	2.1
MW-2/MW-3	MW-1	22	09/21/21	11:00	66.14	2.1
MW-2/MW-3	MW-1	22	09/21/21	11:30	66.14	2.6
MW-2/MW-3	MW-1	22	09/21/21	12:00	66.14	2.6
MW-2/MW-3	MW-1	22	09/21/21	12:30	66.14	2.6
MW-2/MW-3	MW-1	22	09/21/21	13:00	66.14	2.6
MW-2/MW-3	MW-1	22	09/21/21	13:30	66.14	2.6
MW-2/MW-3	MW-1	22	09/21/21	14:00	66.14	2.6
MW-2/MW-3	MW-1	22	09/21/21	14:30	66.14	2.4
MW-2/MW-3	MW-1	22	09/21/21	15:00	66.14	2.6
MW-2/MW-3	MW-1	22	09/21/21	15:30	66.14	2.6
MW-2/MW-3	MW-1	22	09/21/21	16:00	66.14	2.6
MW-2/MW-3	MW-1	22	09/21/21	16:30	66.14	2.6
MW-2/MW-3	MW-1	22	09/21/21	17:00	66.14	2.7
MW-2/MW-3	MW-1	22	09/21/21	17:30	66.12	2.8
MW-6	MW-3	72	06/16/21	7:00	64.80	0.0
MW-6	MW-3	72	06/16/21	7:30	64.80	0.0
MW-6	MW-3	72	06/16/21	7:45	64.80	0.0
MW-6	MW-3	72	06/16/21	8:00	64.80	0.0
MW-6	MW-3	72	06/16/21	8:15	64.80	0.1
MW-6	MW-3	72	06/16/21	8:30	64.80	0.1
MW-6	MW-3	72	06/16/21	9:00	64.80	0.1
MW-6	MW-3	72	06/16/21	9:30	64.80	0.1
MW-6	MW-3	72	06/16/21	10:00	64.80	0.1
MW-6	MW-3	72	06/16/21	10:30	64.80	0.1
MW-6	MW-3	72	06/16/21	11:00	64.80	0.1
MW-6	MW-3	72	06/16/21	11:30	64.80	0.1
MW-6	MW-3	72	06/16/21	12:00	64.80	0.1
MW-6	MW-3	72	09/22/21	7:00	64.85	0.0

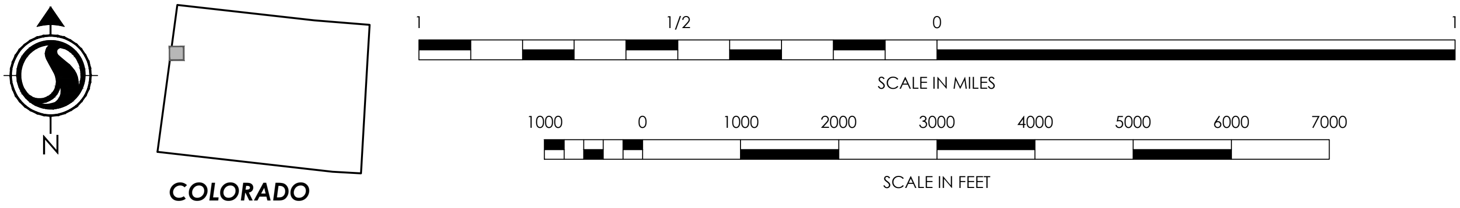
Table 4
Mobile Multi-Phase Extraction
2021 Well Vacuum Data
Federal 27-11 (Pit #111762)
South Canyon Field
Garfield County, CO

Extraction Well(s)	Observation Well	Approximate Distance from Extraction Well (ft)	Date	Time	DTW (ft BTOC)	In-Well Vacuum (in H_2O)
MW-6	MW-3	72	09/22/21	7:30	64.85	0.0
MW-6	MW-3	72	09/22/21	7:45	64.85	0.0
MW-6	MW-3	72	09/22/21	8:00	64.85	0.0
MW-6	MW-3	72	09/22/21	8:15	64.85	0.1
MW-6	MW-3	72	09/22/21	8:30	64.85	0.1
MW-6	MW-3	72	09/22/21	9:00	64.85	0.1
MW-6	MW-3	72	09/22/21	9:30	64.85	0.1
MW-6	MW-3	72	09/22/21	10:00	64.85	0.1
MW-6	MW-3	72	09/22/21	10:30	64.85	0.1
MW-6	MW-3	72	09/22/21	11:00	64.85	0.1
MW-6	MW-3	72	09/22/21	11:30	64.85	0.1
MW-6	MW-3	72	09/22/21	12:00	64.85	0.1
MW-6	MW-3	72	09/22/21	12:30	64.85	0.2
MW-6	MW-3	72	09/22/21	13:00	64.85	0.2
MW-6	MW-3	72	09/22/21	13:30	64.85	0.2
MW-6	MW-3	72	09/22/21	14:00	64.85	0.1
MW-6	MW-3	72	09/22/21	14:30	64.85	0.1
MW-6	MW-3	72	09/22/21	15:00	64.85	0.1
MW-6	MW-3	72	09/22/21	15:30	64.85	0.1
MW-6	MW-3	72	09/22/21	16:00	64.85	0.1
MW-6	MW-3	72	09/22/21	16:30	64.85	0.1
MW-6	MW-3	72	09/22/21	17:00	64.85	0.1
MW-6	MW-3	72	09/22/21	17:30	64.89	0.1

Notes:
DTW - Depth to groundwater
ft BTOC - Feet below top of casing
in H_2O - Inches of water

FIGURES



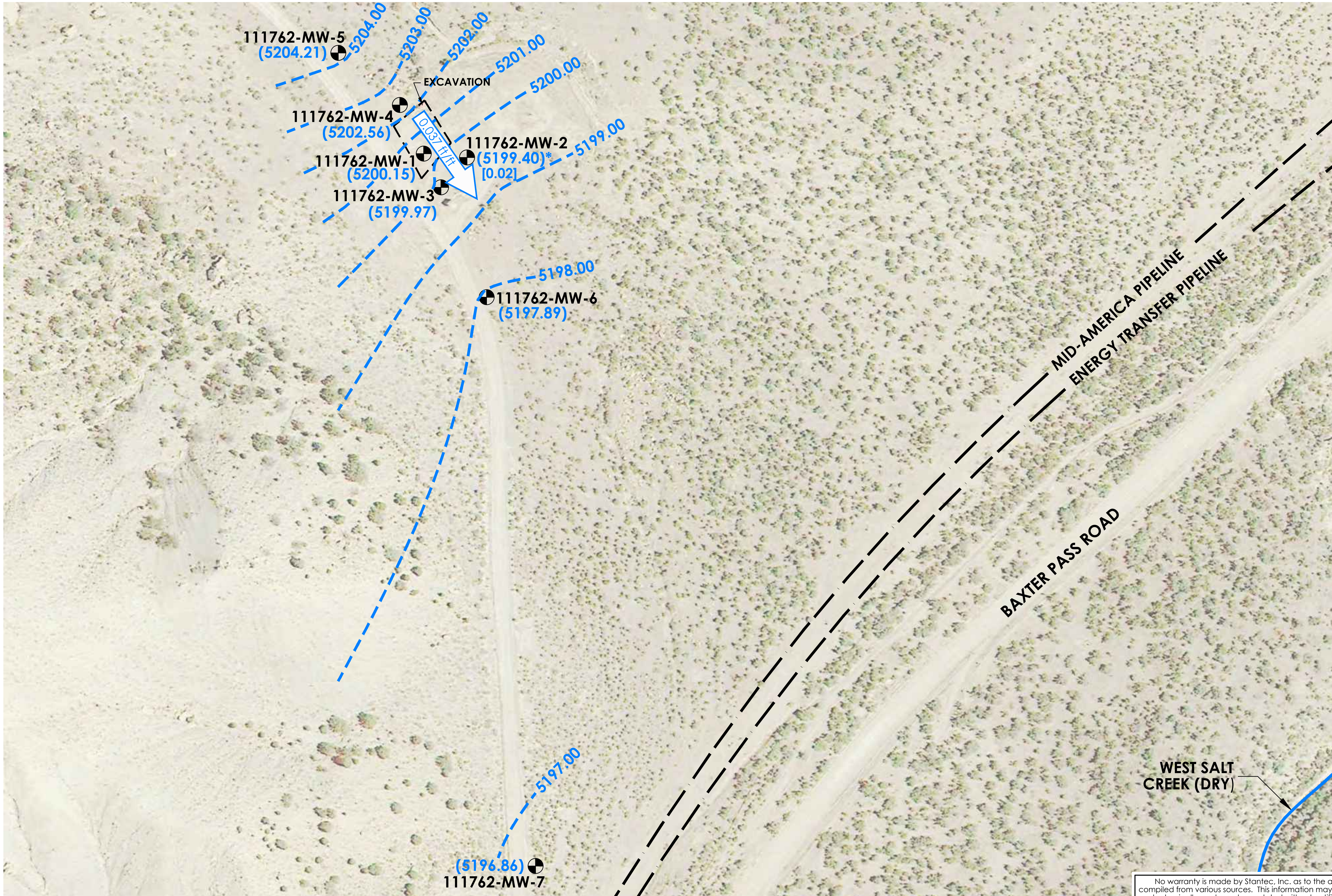


Stantec

2321 Club Meridian Drive, Suite E
Okemos, MI 48864
Phone: (517) 349-9499 Fax: (517) 349-6863

FOR:		SITE LOCATION MAP		FIGURE:
CHEVRON FEDERAL 27-11 (PIT #111762) SOUTH CANYON FIELD GARFIELD COUNTY, CO				1
JOB NUMBER: 203721943	DRAWN BY: JO	CHECKED BY: CB	APPROVED BY: BL	DATE: 12/08/21

FILEPATH:\\us0257-ppfss01\shared_projects\203721943\05_report_deliv\dwgs_design\cad_figures\dwg_203721943_slm_2021.dwg | JOpalekOpsahl | Dec 08, 2021 at 12:53 | Layout: slm_111762



REFERENCE: THIS FIGURE WAS CREATED USING 2012 IMAGE.

LEGEND

(symbol)	MONITOR WELL LOCATION
(symbol)	PIPELINE LOCATION
(5200.15)	GROUNDWATER ELEVATION (FEET ABOVE MEAN SEA LEVEL)
[0.02]	LIQUID PHASE HYDROCARBONS (LPH) THICKNESS (FEET)
(symbol)	GROUNDWATER ELEVATION CONTOUR (FEET ABOVE MEAN SEA LEVEL)
GRADIENT	APPROXIMATE DIRECTION OF GROUNDWATER FLOW. HYDRAULIC GRADIENT AVERAGES APPROXIMATELY 0.037 FEET PER FOOT (FT/FT)
*	GROUNDWATER ELEVATION HAS BEEN CORRECTED DUE TO THE PRESENCE OF LPH

NOTES

GROUNDWATER ELEVATION DATA WERE COLLECTED ON MAY 22, 2021

GROUNDWATER CONTOURS WERE CREATED USING SURFER VERSION 16.0

N

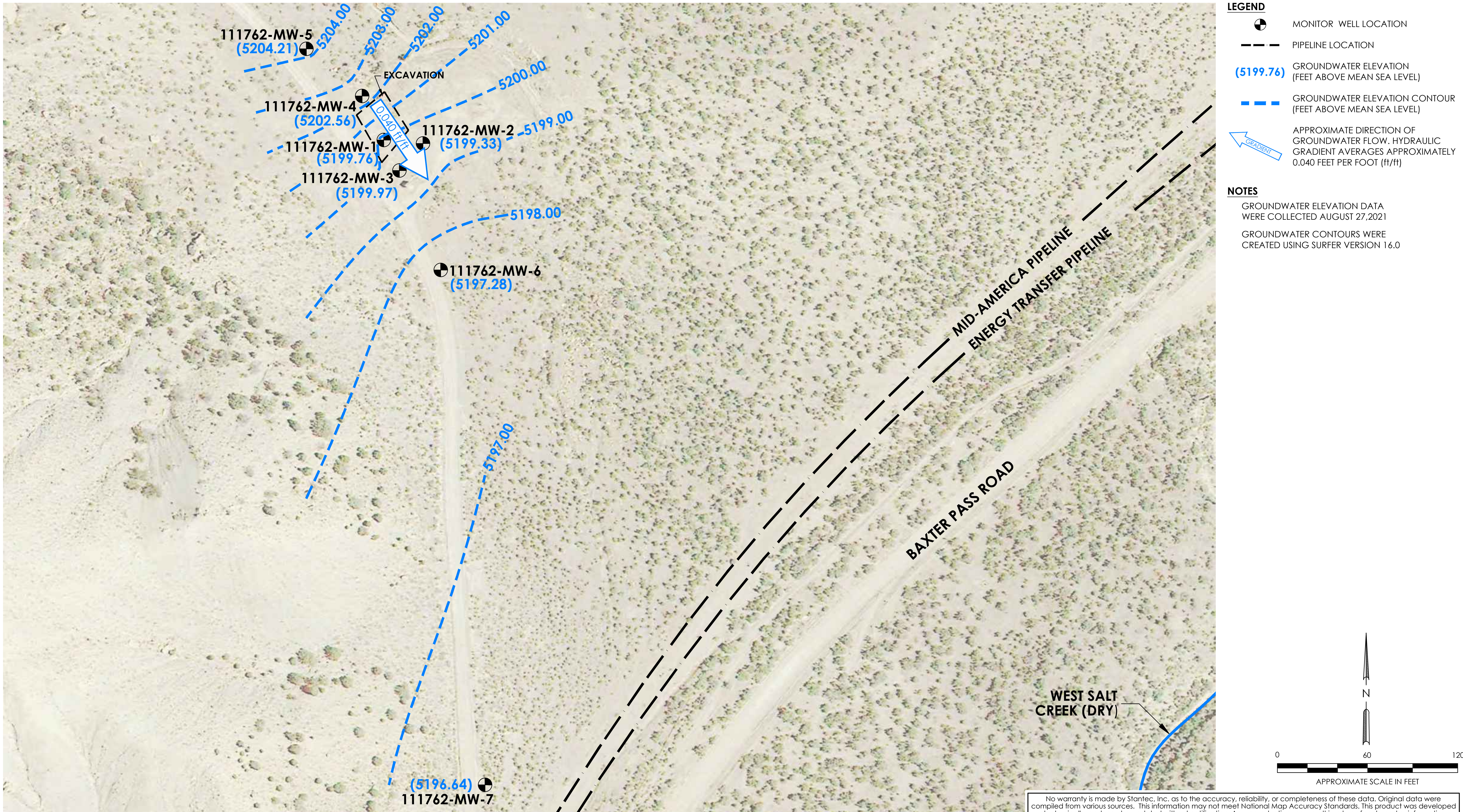
0 60 120

APPROXIMATE SCALE IN FEET

Stantec
2321 Club Meridian Drive, Suite E
Okemos, MI 48864
PHONE: (517)349-9499 FAX: (517)349-6863

FOR:		SITE PLAN SHOWING		FIGURE:
CHEVRON FEDERAL 27-11 (PIT #111762) SOUTH CANYON FIELD GARFIELD COUNTY, CO		SITE PLAN SHOWING GROUNDWATER ELEVATION CONTOURS - SECOND QUARTER 2021		2
JOB NUMBER: 203721943	DRAWN BY: JO	CHECKED BY: CB	APPROVED BY: BL	DATE: 12/08/21

FILEPATH:\\us0257-ppfss01\shared_projects\203721943\05_report_deliv\dwgs_design\cad_figures\dwg_203721943_allfigs_2021.dwg | JOpalekOpsahl | Feb 03, 2022 at 7:25 | Layout: 111762_gwe_2q21



REFERENCE: THIS FIGURE WAS CREATED USING 2012 IMAGE.

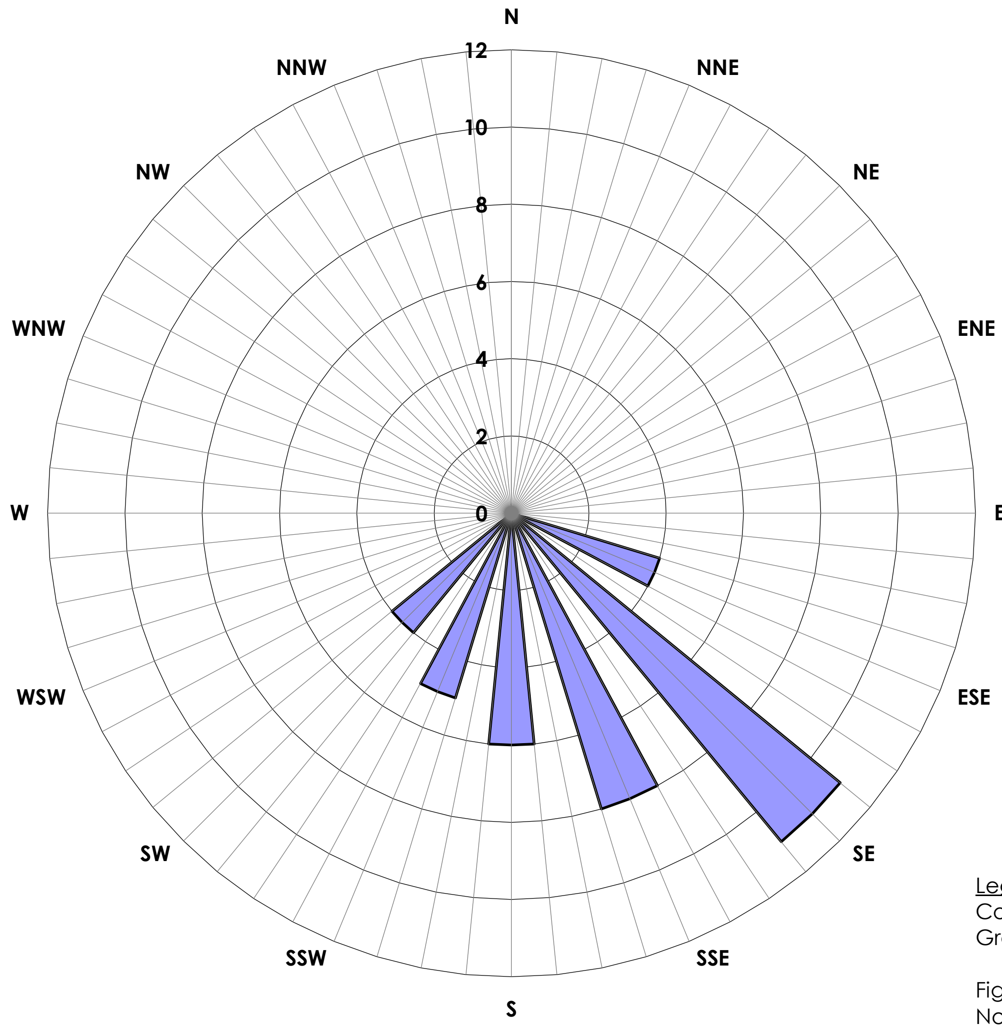
Stantec
2321 Club Meridian Drive, Suite E
Okemos, MI 48864
PHONE: (517)349-9499 FAX: (517)349-6863

FOR:	SITE PLAN	FIGURE:
CHEVRON FEDERAL 27-11 (PIT #111762) SOUTH CANYON FIELD GARFIELD COUNTY, CO	SITE PLAN SHOWING GROUNDWATER ELEVATION CONTOURS - THIRD QUARTER 2021	3

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
203721943	JO	CB	BL	12/08/21

FILEPATH:\\us0257-ppfss01\shared_projects\203721943\05_report_deliv\dwgs_design\cad_figures\dwg_203721943_allfigs_2021.dwg | JOpalekOpsahl | Feb 03, 2022 at 7:26 | Layout: 111762_gwe_3q21

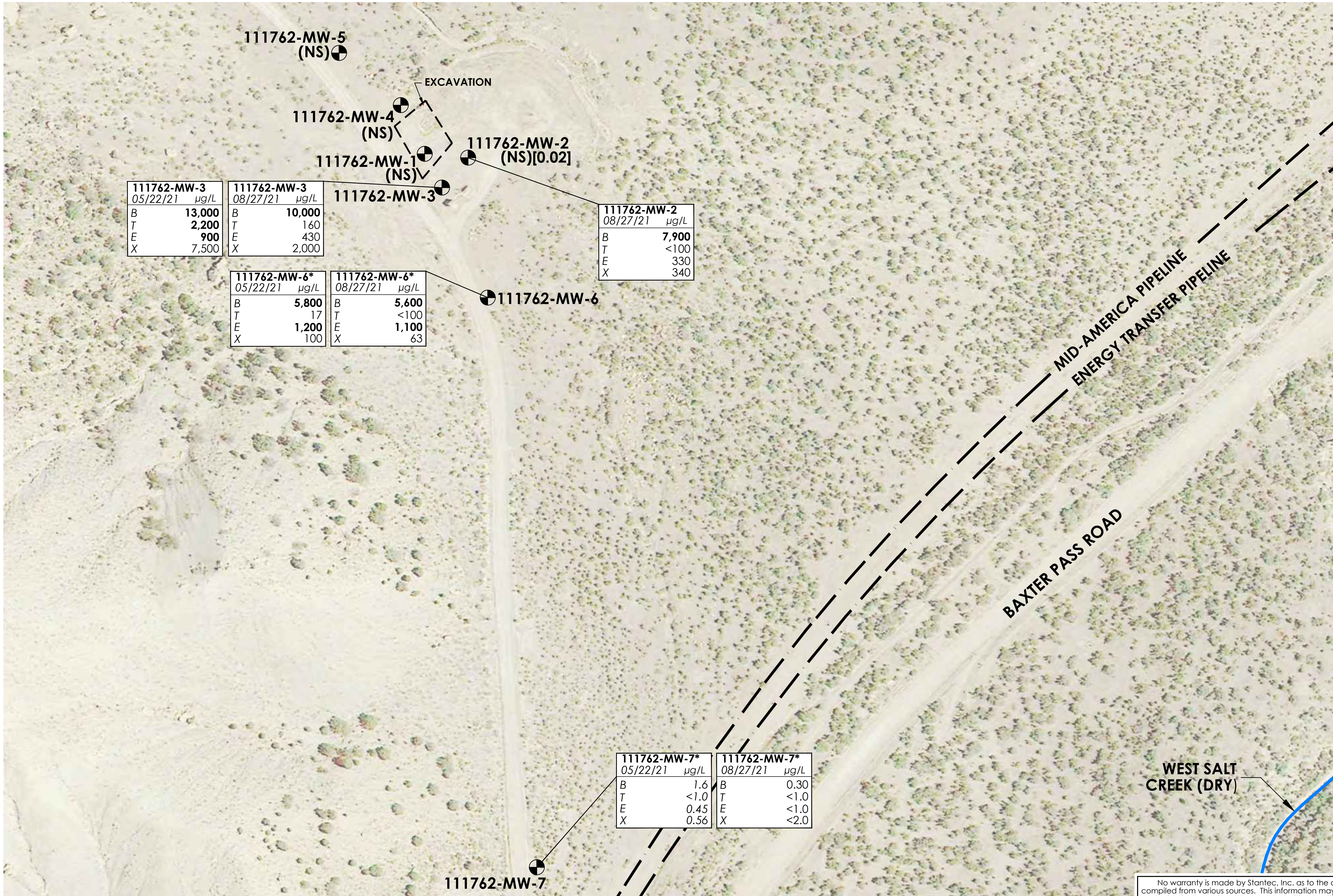
FIGURE 4
GROUNDWATER FLOW DIRECTION ROSE DIAGRAM
CHEVRON
FEDERAL 27-11 (PIT #111762)
SOUTH CANYON FIELD
GARFIELD COUNTY, CO



Legend
Concentric Circles represent Every Other Groundwater Monitoring Event

Figure represents data collected between November 2010 and August 2021

39 Events Shown; Mean Vector DIrection is 170 degrees East of North



111762-MW-3 05/22/21	µg/L
B	**13,000**
T	**2,200**
E	**900**
X	7,500

111762-MW-3 08/27/21	µg/L
B	**10,000**
T	160
E	430
X	2,000

111762-MW-2 08/27/21	µg/L
B	**7,900**
T	<100
E	330
X	340

111762-MW-6* 05/22/21	µg/L
B	**5,800**
T	17
E	**1,200**
X	100

111762-MW-6* 08/27/21	µg/L
B	**5,600**
T	<100
E	**1,100**
X	63

111762-MW-7* 05/22/21	µg/L
B	1.6
T	<1.0
E	0.45
X	0.56

111762-MW-7* 08/27/21	µg/L
B	0.30
T	<1.0
E	<1.0
X	<2.0

REFERENCE: THIS FIGURE WAS CREATED USING 2012 IMAGE.

LEGEND

MONITOR WELL LOCATION

PIPELINE LOCATION

(NS) NOT SAMPLED

[0.02] LIQUID-PHASE HYDROCARBONS (LPH) THICKNESS (FEET) SECOND QUARTER 2021

ANALYTES

B —— BENZENE
T —— TOLUENE
E —— ETHYLBENZENE
X —— TOTAL XYLENES

* = ADDITIONAL ANALYSES WERE RUN AND COMPLETE RESULTS ARE PRESENTED IN TABLE 1 AND ATTACHMENT A

µg/L = MICROGRAMS PER LITER

NOTES

BOLD TEXT INDICATES ABOVE ALLOWABLE CONCENTRATIONS

N

0 60 120

APPROXIMATE SCALE IN FEET

Stantec
2321 Club Meridian Drive, Suite E
Okemos, MI 48864
PHONE: (517)349-9499 FAX: (517)349-6863

FOR: CHEVRON
FEDERAL 27-11 (PIT #111762)
SOUTH CANYON FIELD
GARFIELD COUNTY, CO

SITE PLAN SHOWING GROUNDWATER CONCENTRATIONS - SECOND AND THIRD QUARTER 2021

FIGURE: 5

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
20721943	JO	CB	BL	12/08/21

FILEPATH:\\us0257-ppfss01\shared_projects\203721943\05_report_deliv\dwgs_design\cad_figures\dwg_203721943_allfigs_2021.dwg | JOpalekOpsahl | Feb 03, 2022 at 15:01 | Layout: 111762_gwc

ATTACHMENT A
Certified Laboratory Analysis Reports and Chain-of-Custody Documents

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins TestAmerica, Denver
4955 Yarrow Street
Arvada, CO 80002
Tel: (303)736-0100

Laboratory Job ID: 280-148977-1
Client Project/Site: Chevron - South Canyon 2Q21

For:
Stantec Consulting Corp.
2000 South Colorado Blvd
Suite 2-300
Denver, Colorado 80222

Attn: Christopher Beall

Authorized for release by:
6/9/2021 5:15:18 AM

Patrick McEntee, Client Service Manager
(303)736-0107
Patrick.McEntee@Eurofinset.com

The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Client: Stantec Consulting Corp.
Project/Site: Chevron - South Canyon 2Q21

Job ID: 280-148977-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 280-148977-1

Laboratory: Eurofins TestAmerica, Denver

Narrative

CASE NARRATIVE

Client: Stantec Consulting Corp.

Project: Chevron - South Canyon 2Q21

Report Number: 280-148977-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT
The samples were received on 5/24/2021 11:02 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 3.7° C.

VOLATILE ORGANIC COMPOUNDS (GC-MS)
Samples 111762-MW-3-052221 (280-148977-1), 111762-MW-6-052221 (280-148977-2), 111762-MW-7-052221 (280-148977-3) and Trip Blank-W-051821 (280-148977-4) were analyzed for volatile organic compounds (GC-MS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 05/26/2021.

Samples 111762-MW-3-052221 (280-148977-1)[100X] and 111762-MW-6-052221 (280-148977-2)[50X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL DISSOLVED SOLIDS
Samples 111762-MW-6-052221 (280-148977-2) and 111762-MW-7-052221 (280-148977-3) were analyzed for total dissolved solids in accordance with SM20 2540C. The samples were analyzed on 05/25/2021.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ANIONS (28 DAYS)
Samples 111762-MW-6-052221 (280-148977-2) and 111762-MW-7-052221 (280-148977-3) were analyzed for anions (28 days) in accordance with EPA Method 300.0 (28 Days). The samples were analyzed on 06/05/2021 and 06/07/2021.

Samples 111762-MW-6-052221 (280-148977-2)[100X], 111762-MW-6-052221 (280-148977-2)[2X], 111762-MW-7-052221 (280-148977-3) [2X] and 111762-MW-7-052221 (280-148977-3)[500X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Stantec Consulting Corp.
Project/Site: Chevron - South Canyon 2Q21

Job ID: 280-148977-1

Client Sample ID: 111762-MW-3-052221 — Lab Sample ID: 280-148977-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	13000		100	16	ug/L	100		8260B	Total/NA
Ethylbenzene	900		100	16	ug/L	100		8260B	Total/NA
Toluene	2200		100	17	ug/L	100		8260B	Total/NA
m-Xylene & p-Xylene	6000		200	15	ug/L	100		8260B	Total/NA
o-Xylene	1500		100	19	ug/L	100		8260B	Total/NA
Xylenes, Total	7500		200	19	ug/L	100		8260B	Total/NA

Client Sample ID: 111762-MW-6-052221 — Lab Sample ID: 280-148977-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	5800		50	8.0	ug/L	50		8260B	Total/NA
Ethylbenzene	1200		50	8.0	ug/L	50		8260B	Total/NA
Toluene	17	J	50	8.5	ug/L	50		8260B	Total/NA
m-Xylene & p-Xylene	77	J	100	7.7	ug/L	50		8260B	Total/NA
o-Xylene	23	J	50	9.5	ug/L	50		8260B	Total/NA
Xylenes, Total	100		100	9.5	ug/L	50		8260B	Total/NA
Chloride	290		6.0	2.0	mg/L	2		300.0	Total/NA
Sulfate	18000		500	100	mg/L	100		300.0	Total/NA
Total Dissolved Solids (TDS)	27000		1000	470	mg/L	1		SM 2540C	Total/NA

Client Sample ID: 111762-MW-7-052221 — Lab Sample ID: 280-148977-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	1.6		1.0	0.16	ug/L	1		8260B	Total/NA
Ethylbenzene	0.45	J	1.0	0.16	ug/L	1		8260B	Total/NA
m-Xylene & p-Xylene	0.56	J	2.0	0.15	ug/L	1		8260B	Total/NA
Xylenes, Total	0.56	J	2.0	0.19	ug/L	1		8260B	Total/NA
Chloride	330		6.0	2.0	mg/L	2		300.0	Total/NA
Sulfate	52000		2500	520	mg/L	500		300.0	Total/NA
Total Dissolved Solids (TDS)	74000		1000	470	mg/L	1		SM 2540C	Total/NA

Client Sample ID: Trip Blank-W-052221 — Lab Sample ID: 280-148977-4

No Detections.

This Detection Summary does not include radiochemical test results.

Method Summary

Client: Stantec Consulting Corp.
Project/Site: Chevron - South Canyon 2Q21

Job ID: 280-148977-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL DEN
300.0	Anions, Ion Chromatography	MCAWW	TAL DEN
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL DEN
5030B	Purge and Trap	SW846	TAL DEN

Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

Sample Summary

Client: Stantec Consulting Corp.
Job ID: 280-148977-1
Project/Site: Chevron - South Canyon 2Q21

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
280-148977-1	111762-MW-3-052221	Water	05/22/21 10:00	05/24/21 11:02	
280-148977-2	111762-MW-6-052221	Water	05/22/21 08:10	05/24/21 11:02	
280-148977-3	111762-MW-7-052221	Water	05/22/21 09:05	05/24/21 11:02	
280-148977-4	Trip Blank-W-052221	Water	05/22/21 08:10	05/24/21 11:02	

Method: 8260B - Volatile Organic Compounds (GC/MS)

Client Sample ID: 111762-MW-3-052221 **Lab Sample ID: 280-148977-1**
Date Collected: 05/22/21 10:00 **Matrix: Water**
Date Received: 05/24/21 11:02

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	**13000**		100	16	ug/L			05/26/21 12:29	100
Ethylbenzene	**900**		100	16	ug/L			05/26/21 12:29	100
Toluene	**2200**		100	17	ug/L			05/26/21 12:29	100
m-Xylene & p-Xylene	**6000**		200	15	ug/L			05/26/21 12:29	100
o-Xylene	**1500**		100	19	ug/L			05/26/21 12:29	100
Xylenes, Total	**7500**		200	19	ug/L			05/26/21 12:29	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*70 - 127*		*05/26/21 12:29*	*100*
Toluene-d8 (Surr)	*94*		*80 - 125*		*05/26/21 12:29*	*100*
4-Bromofluorobenzene (Surr)	*93*		*78 - 120*		*05/26/21 12:29*	*100*
Dibromofluoromethane (Surr)	*105*		*77 - 120*		*05/26/21 12:29*	*100*

Client Sample ID: 111762-MW-6-052221 **Lab Sample ID: 280-148977-2**
Date Collected: 05/22/21 08:10 **Matrix: Water**
Date Received: 05/24/21 11:02

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	**5800**		50	8.0	ug/L			05/26/21 12:52	50
Ethylbenzene	**1200**		50	8.0	ug/L			05/26/21 12:52	50
Toluene	**17**	**J**	50	8.5	ug/L			05/26/21 12:52	50
m-Xylene & p-Xylene	**77**	**J**	100	7.7	ug/L			05/26/21 12:52	50
o-Xylene	**23**	**J**	50	9.5	ug/L			05/26/21 12:52	50
Xylenes, Total	**100**		100	9.5	ug/L			05/26/21 12:52	50

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*70 - 127*		*05/26/21 12:52*	*50*
Toluene-d8 (Surr)	*96*		*80 - 125*		*05/26/21 12:52*	*50*
4-Bromofluorobenzene (Surr)	*92*		*78 - 120*		*05/26/21 12:52*	*50*
Dibromofluoromethane (Surr)	*104*		*77 - 120*		*05/26/21 12:52*	*50*

Client Sample ID: 111762-MW-7-052221 **Lab Sample ID: 280-148977-3**
Date Collected: 05/22/21 09:05 **Matrix: Water**
Date Received: 05/24/21 11:02

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	**1.6**		1.0	0.16	ug/L			05/26/21 13:15	1
Ethylbenzene	**0.45**	**J**	1.0	0.16	ug/L			05/26/21 13:15	1
Toluene	ND		1.0	0.17	ug/L			05/26/21 13:15	1
m-Xylene & p-Xylene	**0.56**	**J**	2.0	0.15	ug/L			05/26/21 13:15	1
o-Xylene	ND		1.0	0.19	ug/L			05/26/21 13:15	1
Xylenes, Total	**0.56**	**J**	2.0	0.19	ug/L			05/26/21 13:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*70 - 127*		*05/26/21 13:15*	*1*
Toluene-d8 (Surr)	*93*		*80 - 125*		*05/26/21 13:15*	*1*
4-Bromofluorobenzene (Surr)	*92*		*78 - 120*		*05/26/21 13:15*	*1*
Dibromofluoromethane (Surr)	*106*		*77 - 120*		*05/26/21 13:15*	*1*

Client Sample Results

Client: Stantec Consulting Corp.
Project/Site: Chevron - South Canyon 2Q21

Job ID: 280-148977-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Client Sample ID: Trip Blank-W-052221
Date Collected: 05/22/21 08:10
Date Received: 05/24/21 11:02

Lab Sample ID: 280-148977-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	0.16	ug/L			05/26/21 12:06	1
Ethylbenzene	ND		1.0	0.16	ug/L			05/26/21 12:06	1
Toluene	ND		1.0	0.17	ug/L			05/26/21 12:06	1
m-Xylene & p-Xylene	ND		2.0	0.15	ug/L			05/26/21 12:06	1
o-Xylene	ND		1.0	0.19	ug/L			05/26/21 12:06	1
Xylenes, Total	ND		2.0	0.19	ug/L			05/26/21 12:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*70 - 127*		*05/26/21 12:06*	*1*
Toluene-d8 (Surr)	*98*		*80 - 125*		*05/26/21 12:06*	*1*
4-Bromofluorobenzene (Surr)	*91*		*78 - 120*		*05/26/21 12:06*	*1*
Dibromofluoromethane (Surr)	*106*		*77 - 120*		*05/26/21 12:06*	*1*

General Chemistry

Client Sample ID: 111762-MW-6-052221
Date Collected: 05/22/21 08:10
Date Received: 05/24/21 11:02

Lab Sample ID: 280-148977-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**290**		6.0	2.0	mg/L			06/05/21 08:23	2
Sulfate	**18000**		500	100	mg/L			06/07/21 14:51	100
Total Dissolved Solids (TDS)	**27000**		1000	470	mg/L			05/25/21 08:14	1

Client Sample ID: 111762-MW-7-052221
Date Collected: 05/22/21 09:05
Date Received: 05/24/21 11:02

Lab Sample ID: 280-148977-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**330**		6.0	2.0	mg/L			06/05/21 08:51	2
Sulfate	**52000**		2500	520	mg/L			06/07/21 17:24	500
Total Dissolved Solids (TDS)	**74000**		1000	470	mg/L			05/25/21 08:14	1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	TOL	BFB	DBFM
Lab Sample ID	Client Sample ID	(70-127)	(80-125)	(78-120)	(77-120)
280-148977-1	111762-MW-3-052221	102	94	93	105
280-148977-2	111762-MW-6-052221	103	96	92	104
280-148977-3	111762-MW-7-052221	103	93	92	106
280-148977-4	Trip Blank-W-052221	101	98	91	106
LCS 280-537462/4	Lab Control Sample	102	95	92	109
LCSD 280-537462/5	Lab Control Sample Dup	100	96	93	107
MB 280-537462/9	Method Blank	103	96	91	106

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
TOL = Toluene-d8 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)

Client: Stantec Consulting Corp.
Project/Site: Chevron - South Canyon 2Q21

Job ID: 280-148977-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 280-537462/9
Matrix: Water
Analysis Batch: 537462

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	0.16	ug/L			05/26/21 11:34	1
Ethylbenzene	ND		1.0	0.16	ug/L			05/26/21 11:34	1
Toluene	ND		1.0	0.17	ug/L			05/26/21 11:34	1
m-Xylene & p-Xylene	ND		2.0	0.15	ug/L			05/26/21 11:34	1
o-Xylene	ND		1.0	0.19	ug/L			05/26/21 11:34	1
Xylenes, Total	ND		2.0	0.19	ug/L			05/26/21 11:34	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*70 - 127*		*05/26/21 11:34*	*1*
Toluene-d8 (Surr)	*96*		*80 - 125*		*05/26/21 11:34*	*1*
4-Bromofluorobenzene (Surr)	*91*		*78 - 120*		*05/26/21 11:34*	*1*
Dibromofluoromethane (Surr)	*106*		*77 - 120*		*05/26/21 11:34*	*1*

Lab Sample ID: LCS 280-537462/4
Matrix: Water
Analysis Batch: 537462

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	25.0	26.1		ug/L		104	65 - 135
Ethylbenzene	25.0	24.9		ug/L		99	65 - 135
Toluene	25.0	25.5		ug/L		102	65 - 135
m-Xylene & p-Xylene	25.0	26.5		ug/L		106	65 - 135
o-Xylene	25.0	26.3		ug/L		105	65 - 135
Xylenes, Total	50.0	52.8		ug/L		106	65 - 135

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*102*		*70 - 127*
Toluene-d8 (Surr)	*95*		*80 - 125*
4-Bromofluorobenzene (Surr)	*92*		*78 - 120*
Dibromofluoromethane (Surr)	*109*		*77 - 120*

Lab Sample ID: LCSD 280-537462/5
Matrix: Water
Analysis Batch: 537462

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	25.0	26.3		ug/L		105	65 - 135	1	20
Ethylbenzene	25.0	25.6		ug/L		103	65 - 135	3	20
Toluene	25.0	25.5		ug/L		102	65 - 135	0	20
m-Xylene & p-Xylene	25.0	26.4		ug/L		106	65 - 135	0	20
o-Xylene	25.0	26.3		ug/L		105	65 - 135	0	20
Xylenes, Total	50.0	52.7		ug/L		105	65 - 135	0	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*70 - 127*
Toluene-d8 (Surr)	*96*		*80 - 125*
4-Bromofluorobenzene (Surr)	*93*		*78 - 120*

Client: Stantec Consulting Corp.
Project/Site: Chevron - South Canyon 2Q21

Job ID: 280-148977-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 280-537462/5
Matrix: Water
Analysis Batch: 537462

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*107*		*77 - 120*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 280-538609/6
Matrix: Water
Analysis Batch: 538609

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.0	1.0	mg/L			06/04/21 18:03	1
Sulfate	ND		5.0	1.0	mg/L			06/04/21 18:03	1

Lab Sample ID: LCS 280-538609/4
Matrix: Water
Analysis Batch: 538609

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	100	98.3		mg/L		98	90 - 110
Sulfate	100	98.5		mg/L		99	90 - 110

Lab Sample ID: LCSD 280-538609/5
Matrix: Water
Analysis Batch: 538609

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	100	98.6		mg/L		99	90 - 110	0	10
Sulfate	100	98.7		mg/L		99	90 - 110	0	10

Lab Sample ID: MRL 280-538609/3
Matrix: Water
Analysis Batch: 538609

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	5.00	4.61		mg/L		92	50 - 150
Sulfate	5.00	4.39	J	mg/L		88	50 - 150

Lab Sample ID: MB 280-538878/6
Matrix: Water
Analysis Batch: 538878

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		5.0	1.0	mg/L			06/07/21 13:59	1

Lab Sample ID: LCS 280-538878/4
Matrix: Water
Analysis Batch: 538878

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	100	98.4		mg/L		98	90 - 110

Client: Stantec Consulting Corp.
Project/Site: Chevron - South Canyon 2Q21

Job ID: 280-148977-1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCSD 280-538878/5
Matrix: Water
Analysis Batch: 538878

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate	100	98.4		mg/L		98	90 - 110	0	10

Lab Sample ID: MRL 280-538878/3
Matrix: Water
Analysis Batch: 538878

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	5.00	3.97	J	mg/L		79	50 - 150

Lab Sample ID: MB 280-538883/6
Matrix: Water
Analysis Batch: 538883

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.0	1.0	mg/L			06/07/21 14:17	1
Sulfate	ND		5.0	1.0	mg/L			06/07/21 14:17	1

Lab Sample ID: LCS 280-538883/4
Matrix: Water
Analysis Batch: 538883

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	100	100		mg/L		100	90 - 110
Sulfate	100	99.4		mg/L		99	90 - 110

Lab Sample ID: LCSD 280-538883/5
Matrix: Water
Analysis Batch: 538883

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	100	100		mg/L		100	90 - 110	0	10
Sulfate	100	99.4		mg/L		99	90 - 110	0	10

Lab Sample ID: MRL 280-538883/3
Matrix: Water
Analysis Batch: 538883

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	5.00	4.64		mg/L		93	50 - 150
Sulfate	5.00	4.54	J	mg/L		91	50 - 150

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 280-537323/1
Matrix: Water
Analysis Batch: 537323

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (TDS)	ND		10	4.7	mg/L			05/25/21 08:14	1

QC Sample Results

Client: Stantec Consulting Corp.
Project/Site: Chevron - South Canyon 2Q21

Job ID: 280-148977-1

Method: SM 2540C - Solids, Total Dissolved (TDS) (Continued)

Lab Sample ID: LCS 280-537323/2
Matrix: Water
Analysis Batch: 537323

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids (TDS)	501	489		mg/L		98	88 - 114

GC/MS VOA

Analysis Batch: 537462

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-148977-1	111762-MW-3-052221	Total/NA	Water	8260B	
280-148977-2	111762-MW-6-052221	Total/NA	Water	8260B	
280-148977-3	111762-MW-7-052221	Total/NA	Water	8260B	
280-148977-4	Trip Blank-W-052221	Total/NA	Water	8260B	
MB 280-537462/9	Method Blank	Total/NA	Water	8260B	
LCS 280-537462/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 280-537462/5	Lab Control Sample Dup	Total/NA	Water	8260B	

General Chemistry

Analysis Batch: 537323

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-148977-2	111762-MW-6-052221	Total/NA	Water	SM 2540C	
280-148977-3	111762-MW-7-052221	Total/NA	Water	SM 2540C	
MB 280-537323/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-537323/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Analysis Batch: 538609

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-148977-2	111762-MW-6-052221	Total/NA	Water	300.0	
280-148977-3	111762-MW-7-052221	Total/NA	Water	300.0	
MB 280-538609/6	Method Blank	Total/NA	Water	300.0	
LCS 280-538609/4	Lab Control Sample	Total/NA	Water	300.0	
LCSD 280-538609/5	Lab Control Sample Dup	Total/NA	Water	300.0	
MRL 280-538609/3	Lab Control Sample	Total/NA	Water	300.0	

Analysis Batch: 538878

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-148977-2	111762-MW-6-052221	Total/NA	Water	300.0	
MB 280-538878/6	Method Blank	Total/NA	Water	300.0	
LCS 280-538878/4	Lab Control Sample	Total/NA	Water	300.0	
LCSD 280-538878/5	Lab Control Sample Dup	Total/NA	Water	300.0	
MRL 280-538878/3	Lab Control Sample	Total/NA	Water	300.0	

Analysis Batch: 538883

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-148977-3	111762-MW-7-052221	Total/NA	Water	300.0	
MB 280-538883/6	Method Blank	Total/NA	Water	300.0	
LCS 280-538883/4	Lab Control Sample	Total/NA	Water	300.0	
LCSD 280-538883/5	Lab Control Sample Dup	Total/NA	Water	300.0	
MRL 280-538883/3	Lab Control Sample	Total/NA	Water	300.0	

Client Sample ID: 111762-MW-3-052221 — Lab Sample ID: 280-148977-1

Date Collected: 05/22/21 10:00 — **Matrix: Water**

Date Received: 05/24/21 11:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		100	5 mL	5 mL	537462	05/26/21 12:29	JLS	TAL DEN

Client Sample ID: 111762-MW-6-052221 — Lab Sample ID: 280-148977-2

Date Collected: 05/22/21 08:10 — **Matrix: Water**

Date Received: 05/24/21 11:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		50	5 mL	5 mL	537462	05/26/21 12:52	JLS	TAL DEN
Total/NA	Analysis	300.0		100	5 mL	5 mL	538878	06/07/21 14:51	CJ	TAL DEN
Total/NA	Analysis	300.0		2	10 mL	10 mL	538609	06/05/21 08:23	CJ	TAL DEN
Total/NA	Analysis	SM 2540C		1	1 mL	100 mL	537323	05/25/21 08:14	LRB	TAL DEN

Client Sample ID: 111762-MW-7-052221 — Lab Sample ID: 280-148977-3

Date Collected: 05/22/21 09:05 — **Matrix: Water**

Date Received: 05/24/21 11:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	537462	05/26/21 13:15	JLS	TAL DEN
Total/NA	Analysis	300.0		2	10 mL	10 mL	538609	06/05/21 08:51	CJ	TAL DEN
Total/NA	Analysis	300.0		500	10 mL	10 mL	538883	06/07/21 17:24	CJ	TAL DEN
Total/NA	Analysis	SM 2540C		1	1 mL	100 mL	537323	05/25/21 08:14	LRB	TAL DEN

Client Sample ID: Trip Blank-W-052221 — Lab Sample ID: 280-148977-4

Date Collected: 05/22/21 08:10 — **Matrix: Water**

Date Received: 05/24/21 11:02

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	537462	05/26/21 12:06	JLS	TAL DEN

Laboratory References:

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

Accreditation/Certification Summary

Client: Stantec Consulting Corp. Job ID: 280-148977-1
Project/Site: Chevron - South Canyon 2Q21

Laboratory: Eurofins TestAmerica, Denver

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
A2LA	Dept. of Defense ELAP	2907.01	10-31-21
A2LA	ISO/IEC 17025	2907.01	10-31-21
Alabama	State Program	40730	09-30-12 *
Alaska (UST)	State	18-001	02-28-22
Arizona	State	AZ0713	12-21-21
Arkansas DEQ	State	19-047-0	06-01-21 *
California	State	2513	01-08-22
Connecticut	State	PH-0686	11-30-22
Florida	NELAP	E87667-57	07-01-21
Georgia	State	4025-011	01-08-22
Illinois	NELAP	2000172019-1	04-30-21 *
Iowa	State	IA#370	12-02-21
Kansas	NELAP	E-10166	04-30-22
Kentucky (WW)	State	KY98047	12-31-21
Louisiana	NELAP	30785	06-30-14 *
Louisiana	NELAP	30785	06-30-21
Minnesota	NELAP	1788752	12-31-21
Nevada	State	CO000262020-1	07-31-21
New Hampshire	NELAP	205319	04-29-22
New Jersey	NELAP	190002	06-30-21
New York	NELAP	59923	04-01-22
North Carolina (WW/SW)	State	358	12-31-21
North Dakota	State	R-034	01-08-22
Oklahoma	State	2018-006	09-01-21
Oregon	NELAP	4025-011	01-08-22
Pennsylvania	NELAP	013	07-31-21
South Carolina	State	72002001	01-08-22
Texas	NELAP	TX104704183-08-TX	09-30-09 *
Texas	NELAP	T104704183-20-18	09-30-21
US Fish & Wildlife	US Federal Programs	058448	08-01-21
USDA	US Federal Programs	P330-20-00065	03-06-23
Utah	NELAP	QUAN5	06-30-13 *
Utah	NELAP	CO000262019-11	07-31-21
Virginia	NELAP	10490	06-14-21
Washington	State	C583-19	08-03-21
West Virginia DEP	State	354	11-30-21
Wisconsin	State	999615430	08-31-21
Wyoming (UST)	A2LA	2907.01	10-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Eurofins TestAmerica, Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Phone (303) 431-7171

Chain of Custody Record

Denver #280

eurofins Environment Testing America

Client Information			
Sampler: B. Collins	Lab PM: McEntee, Patrick J	Carrier Tracking No(s):	COC No: 280-108694-29938.1
Client Contact: Christopher Beall	Phone: 720 233-1409	E-Mail: Patrick.McEntee@Eurofinset.com	State of Origin: CO	Page: 1 of 1
Company: Stantec Consulting Corp.	PWSID:		Job #:
Address: 2000 South Colorado Blvd Suite 2-300	Due Date Requested:		
City: Denver	TAT Requested (days): Standard		
State, Zip: CO, 80222	Compliance Project: Δ Yes Δ No		
Phone: (303) 285-4541	PO #: Project:203721946		
Email: Christopher.Beall@stantec.com	WO #: Project: 212201118		
Project Name: Chevron - South Canyon 2Q21	Project #: 28017354		
Site:	SSOW#:		

Analysis Requested

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8260B - BTEX	2540C_Calcd - TDS	300.0_28D - Chlorides/Sulfates	Total Number of containers	Special Instructions/Note:
				Preservation Code:			N	N	N		
111762-MW-3-052221	5/22/21	1000	G	Water	N	N	X			3	
111762-MW-6-052221		810		Water			X	X	X	5	
111762-MW-7-052221		905		Water			X	X	X	5	
Tripblank		810		Water			X			2	
				Water							
				Water							
				Water							
				Water							
				Water							
				Water							
				Water							
				Water							

280-148977 Chain of Custody

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA

M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Deliverable Requested: I, II, III, IV, Other (specify)

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For ______ Months

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:		
Relinquished by: [signature]	Date/Time: 5/22/21 1107	Company: Stantec	Received by: [signature]	Date/Time: 5/24/21 1102	Company: ETA Denver
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 3.3 ICN CF+0.4

Ver: 01/16/2019

Login Sample Receipt Checklist

Client: Stantec Consulting Corp. | Job Number: 280-148977-1

Login Number: 148977 | **List Source: Eurofins TestAmerica, Denver**
List Number: 1
Creator: Rystrom, Joshua R

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

eurofins

Environment Testing America

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

ANALYTICAL REPORT

Eurofins TestAmerica, Denver
4955 Yarrow Street
Arvada, CO 80002
Tel: (303)736-0100

Laboratory Job ID: 280-152338-1
Client Project/Site: Chevron - Wilson/South Canyon

For:
Stantec Consulting Corp.
2000 South Colorado Blvd
Suite 2-300
Denver, Colorado 80222

Attn: Christopher Beall

Authorized for release by:
9/9/2021 10:23:16 PM

Patrick McEntee, Client Service Manager
(303)736-0107
Patrick.McEntee@Eurofinset.com

LINKS

Table of Contents

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

GC VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.
H	Sample was prepped or analyzed beyond the specified holding time
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 280-152338-1

Laboratory: Eurofins TestAmerica, Denver

Narrative

CASE NARRATIVE

Client: Stantec Consulting Corp.

Project: Chevron - South Canyon 3Q21

Report Number: 280-152338-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The samples were received on 8/27/2021 1:15 PM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 3.4º C.

Receipt Exceptions

The Chain-of-Custody (COC) was incomplete as received and/or improperly completed. Analysis not selected on the COC for TB-1-082721 (280-152338-5)

Only 1 vial received for sample 111762-MW-3-082721 (280-152338-2).

The container label for the following sample did not match the information listed on the Chain-of-Custody (COC): 111762-MW-7-082721 (280-152338-4). All containers have collection time as 0800. Logged per COC.

VOLATILE ORGANIC COMPOUNDS (GC-MS)

Samples 111762-MW-2-082721 (280-152338-1), 111762-MW-3-082721 (280-152338-2), 111762-MW-6-082721 (280-152338-3), 111762-MW-7-082721 (280-152338-4) and TB-1-082721 (280-152338-5) were analyzed for volatile organic compounds (GC-MS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 08/30/2021.

Samples 111762-MW-2-082721 (280-152338-1)[100X], 111762-MW-3-082721 (280-152338-2)[100X] and 111762-MW-6-082721 (280-152338-3)[100X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

RSK-175

Samples 111762-MW-6-082721 (280-152338-3) and 111762-MW-7-082721 (280-152338-4) were analyzed for RSK-175 in accordance with RSK-175. The samples were prepared and analyzed on 09/03/2021.

The following sample(s) were collected in properly preserved vials for analysis of volatile organic compounds (VOCs). However, the pH at the time of analysis was 3: 111762-MW-6-082721 (280-152338-3).

The following sample(s) were collected in properly preserved vials for analysis of volatile organic compounds (VOCs). However, the pH at

Job ID: 280-152338-1 (Continued)

Laboratory: Eurofins TestAmerica, Denver (Continued)

the time of analysis was 2: 111762-MW-7-082721 (280-152338-4).

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL DISSOLVED SOLIDS

Samples 111762-MW-6-082721 (280-152338-3) and 111762-MW-7-082721 (280-152338-4) were analyzed for total dissolved solids in accordance with SM20 2540C. The samples were analyzed on 09/01/2021.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ANIONS (28 DAYS)

Samples 111762-MW-6-082721 (280-152338-3) and 111762-MW-7-082721 (280-152338-4) were analyzed for anions (28 days) in accordance with EPA Method 300.0 (28 Days). The samples were analyzed on 08/27/2021, 08/28/2021, 09/03/2021 and 09/04/2021.

Samples 111762-MW-6-082721 (280-152338-3)[100X], 111762-MW-6-082721 (280-152338-3)[5X], 111762-MW-7-082721 (280-152338-4)[5X] and 111762-MW-7-082721 (280-152338-4)[500X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ANIONS (48 HOURS)

Samples 111762-MW-6-082721 (280-152338-3) and 111762-MW-7-082721 (280-152338-4) were analyzed for anions (48 hours) in accordance with EPA Method 300.0 (48 Hours). The samples were analyzed on 08/28/2021 and 09/03/2021.

Sample 111762-MW-7-082721 (280-152338-4)[5X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

The following sample has chromatographic interferences that could adversely impact the identification and quantitation of nitrate: 111762-MW-7-082721 (280-152338-4) These interferences could cause false positive and/or false negative results.

Reanalysis of the following sample was performed outside of the analytical holding time due to chromatographic interferences in the initial analysis of nitrate: 111762-MW-7-082721 (280-152338-4).

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

FERROUS IRON

Samples 111762-MW-6-082721 (280-152338-3) and 111762-MW-7-082721 (280-152338-4) were analyzed for ferrous iron in accordance with SM 3500 FE B. The samples were analyzed on 09/08/2021.

Ferrous Iron failed the recovery criteria low for the MS of sample 111762-MW-6-082721MS (280-152338-3) in batch 280-549186. Ferrous Iron failed the recovery criteria low for the MSD of sample 111762-MW-6-082721MSD (280-152338-3) in batch 280-549186.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Stantec Consulting Corp. Job ID: 280-152338-1
Project/Site: Chevron - Wilson/South Canyon

Client Sample ID: 111762-MW-2-082721 Lab Sample ID: 280-152338-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	7900		100	16	ug/L	100		8260B	Total/NA
Ethylbenzene	330		100	16	ug/L	100		8260B	Total/NA
m-Xylene & p-Xylene	340		200	15	ug/L	100		8260B	Total/NA
Xylenes, Total	340		200	19	ug/L	100		8260B	Total/NA

Client Sample ID: 111762-MW-3-082721 Lab Sample ID: 280-152338-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	10000		100	16	ug/L	100		8260B	Total/NA
Ethylbenzene	430		100	16	ug/L	100		8260B	Total/NA
Toluene	160		100	17	ug/L	100		8260B	Total/NA
m-Xylene & p-Xylene	1200		200	15	ug/L	100		8260B	Total/NA
o-Xylene	760		100	19	ug/L	100		8260B	Total/NA
Xylenes, Total	2000		200	19	ug/L	100		8260B	Total/NA

Client Sample ID: 111762-MW-6-082721 Lab Sample ID: 280-152338-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	5600		100	16	ug/L	100		8260B	Total/NA
Ethylbenzene	1100		100	16	ug/L	100		8260B	Total/NA
m-Xylene & p-Xylene	63	J	200	15	ug/L	100		8260B	Total/NA
Xylenes, Total	63	J	200	19	ug/L	100		8260B	Total/NA
Methane	33		5.0	3.0	ug/L	1		RSK-175	Total/NA
Chloride	300		15	5.1	mg/L	5		300.0	Total/NA
Sulfate	18000		500	100	mg/L	100		300.0	Total/NA
Total Dissolved Solids (TDS)	27000		1000	470	mg/L	1		SM 2540C	Total/NA
Ferrous Iron	0.44	HF F1	0.20	0.021	mg/L	1		SM 3500 FE B	Total/NA

Client Sample ID: 111762-MW-7-082721 Lab Sample ID: 280-152338-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	0.30	J	1.0	0.16	ug/L	1		8260B	Total/NA
Methane	4.0	J	5.0	3.0	ug/L	1		RSK-175	Total/NA
Chloride	430		15	5.1	mg/L	5		300.0	Total/NA
Sulfate	57000		2500	520	mg/L	500		300.0	Total/NA
Total Dissolved Solids (TDS)	86000		1000	470	mg/L	1		SM 2540C	Total/NA
Ferrous Iron	0.11	J HF	0.20	0.021	mg/L	1		SM 3500 FE B	Total/NA

Client Sample ID: TB-1-082721 Lab Sample ID: 280-152338-5

No Detections.

This Detection Summary does not include radiochemical test results.

Method Summary

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL DEN
RSK-175	Dissolved Gases (GC)	RSK	ELLE
300.0	Anions, Ion Chromatography	MCAWW	TAL DEN
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL DEN
SM 3500 FE B	Iron, Ferrous and Ferric	SM	TAL DEN
5030B	Purge and Trap	SW846	TAL DEN
RSK-175	Dissolved Gases Prep	RSK	ELLE

Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

RSK = Sample Prep And Calculations For Dissolved Gas Analysis In Water Samples Using A GC Headspace Equilibration Technique, RSKSOP-175, Rev. 0, 8/11/94, USEPA Research Lab

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

Sample Summary

Client: Stantec Consulting Corp.
Job ID: 280-152338-1
Project/Site: Chevron - Wilson/South Canyon

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-152338-1	111762-MW-2-082721	Water	08/27/21 10:10	08/27/21 13:15
280-152338-2	111762-MW-3-082721	Water	08/27/21 09:40	08/27/21 13:15
280-152338-3	111762-MW-6-082721	Water	08/27/21 08:50	08/27/21 13:15
280-152338-4	111762-MW-7-082721	Water	08/27/21 07:00	08/27/21 13:15
280-152338-5	TB-1-082721	Water	08/27/21 08:00	08/27/21 13:15

Client: Stantec Consulting Corp. Job ID: 280-152338-1
Project/Site: Chevron - Wilson/South Canyon

Method: 8260B - Volatile Organic Compounds (GC/MS)

Client Sample ID: 111762-MW-2-082721 **Lab Sample ID: 280-152338-1**
Date Collected: 08/27/21 10:10 **Matrix: Water**
Date Received: 08/27/21 13:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	**7900**		100	16	ug/L			08/30/21 13:57	100
Ethylbenzene	**330**		100	16	ug/L			08/30/21 13:57	100
Toluene	ND		100	17	ug/L			08/30/21 13:57	100
m-Xylene & p-Xylene	**340**		200	15	ug/L			08/30/21 13:57	100
o-Xylene	ND		100	19	ug/L			08/30/21 13:57	100
Xylenes, Total	**340**		200	19	ug/L			08/30/21 13:57	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*70 - 127*		*08/30/21 13:57*	*100*
Toluene-d8 (Surr)	*103*		*80 - 125*		*08/30/21 13:57*	*100*
4-Bromofluorobenzene (Surr)	*101*		*78 - 120*		*08/30/21 13:57*	*100*
Dibromofluoromethane (Surr)	*96*		*77 - 120*		*08/30/21 13:57*	*100*

Client Sample ID: 111762-MW-3-082721 **Lab Sample ID: 280-152338-2**
Date Collected: 08/27/21 09:40 **Matrix: Water**
Date Received: 08/27/21 13:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	**10000**		100	16	ug/L			08/30/21 14:18	100
Ethylbenzene	**430**		100	16	ug/L			08/30/21 14:18	100
Toluene	**160**		100	17	ug/L			08/30/21 14:18	100
m-Xylene & p-Xylene	**1200**		200	15	ug/L			08/30/21 14:18	100
o-Xylene	**760**		100	19	ug/L			08/30/21 14:18	100
Xylenes, Total	**2000**		200	19	ug/L			08/30/21 14:18	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*70 - 127*		*08/30/21 14:18*	*100*
Toluene-d8 (Surr)	*104*		*80 - 125*		*08/30/21 14:18*	*100*
4-Bromofluorobenzene (Surr)	*101*		*78 - 120*		*08/30/21 14:18*	*100*
Dibromofluoromethane (Surr)	*96*		*77 - 120*		*08/30/21 14:18*	*100*

Client Sample ID: 111762-MW-6-082721 **Lab Sample ID: 280-152338-3**
Date Collected: 08/27/21 08:50 **Matrix: Water**
Date Received: 08/27/21 13:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	**5600**		100	16	ug/L			08/30/21 14:39	100
Ethylbenzene	**1100**		100	16	ug/L			08/30/21 14:39	100
Toluene	ND		100	17	ug/L			08/30/21 14:39	100
m-Xylene & p-Xylene	**63**	**J**	200	15	ug/L			08/30/21 14:39	100
o-Xylene	ND		100	19	ug/L			08/30/21 14:39	100
Xylenes, Total	**63**	**J**	200	19	ug/L			08/30/21 14:39	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*70 - 127*		*08/30/21 14:39*	*100*
Toluene-d8 (Surr)	*104*		*80 - 125*		*08/30/21 14:39*	*100*
4-Bromofluorobenzene (Surr)	*100*		*78 - 120*		*08/30/21 14:39*	*100*
Dibromofluoromethane (Surr)	*96*		*77 - 120*		*08/30/21 14:39*	*100*

Client: Stantec Consulting Corp. Job ID: 280-152338-1
Project/Site: Chevron - Wilson/South Canyon

Method: 8260B - Volatile Organic Compounds (GC/MS)

Client Sample ID: 111762-MW-7-082721 **Lab Sample ID: 280-152338-4**
Date Collected: 08/27/21 07:00 **Matrix: Water**
Date Received: 08/27/21 13:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	**0.30**	**J**	1.0	0.16	ug/L			08/30/21 15:00	1
Ethylbenzene	ND		1.0	0.16	ug/L			08/30/21 15:00	1
Toluene	ND		1.0	0.17	ug/L			08/30/21 15:00	1
m-Xylene & p-Xylene	ND		2.0	0.15	ug/L			08/30/21 15:00	1
o-Xylene	ND		1.0	0.19	ug/L			08/30/21 15:00	1
Xylenes, Total	ND		2.0	0.19	ug/L			08/30/21 15:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*70 - 127*		*08/30/21 15:00*	*1*
Toluene-d8 (Surr)	*103*		*80 - 125*		*08/30/21 15:00*	*1*
4-Bromofluorobenzene (Surr)	*100*		*78 - 120*		*08/30/21 15:00*	*1*
Dibromofluoromethane (Surr)	*97*		*77 - 120*		*08/30/21 15:00*	*1*

Client Sample ID: TB-1-082721 **Lab Sample ID: 280-152338-5**
Date Collected: 08/27/21 08:00 **Matrix: Water**
Date Received: 08/27/21 13:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	0.16	ug/L			08/30/21 10:46	1
Ethylbenzene	ND		1.0	0.16	ug/L			08/30/21 10:46	1
Toluene	ND		1.0	0.17	ug/L			08/30/21 10:46	1
m-Xylene & p-Xylene	ND		2.0	0.15	ug/L			08/30/21 10:46	1
o-Xylene	ND		1.0	0.19	ug/L			08/30/21 10:46	1
Xylenes, Total	ND		2.0	0.19	ug/L			08/30/21 10:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*70 - 127*		*08/30/21 10:46*	*1*
Toluene-d8 (Surr)	*105*		*80 - 125*		*08/30/21 10:46*	*1*
4-Bromofluorobenzene (Surr)	*101*		*78 - 120*		*08/30/21 10:46*	*1*
Dibromofluoromethane (Surr)	*97*		*77 - 120*		*08/30/21 10:46*	*1*

Method: RSK-175 - Dissolved Gases (GC)

Client Sample ID: 111762-MW-6-082721 **Lab Sample ID: 280-152338-3**
Date Collected: 08/27/21 08:50 **Matrix: Water**
Date Received: 08/27/21 13:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane	**33**		5.0	3.0	ug/L		09/03/21 12:53	09/03/21 22:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Propene	*69*		*28 - 130*	*09/03/21 12:53*	*09/03/21 22:43*	*1*

Client Sample ID: 111762-MW-7-082721 **Lab Sample ID: 280-152338-4**
Date Collected: 08/27/21 07:00 **Matrix: Water**
Date Received: 08/27/21 13:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane	**4.0**	**J**	5.0	3.0	ug/L		09/03/21 12:53	09/03/21 22:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Propene	*76*		*28 - 130*	*09/03/21 12:53*	*09/03/21 22:59*	*1*

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

General Chemistry

Client Sample ID: 111762-MW-6-082721 **Lab Sample ID: 280-152338-3**
Date Collected: 08/27/21 08:50 **Matrix: Water**
Date Received: 08/27/21 13:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**300**		15	5.1	mg/L			08/28/21 00:41	5
Nitrate as N	ND		0.50	0.090	mg/L			08/28/21 00:27	1
Sulfate	**18000**		500	100	mg/L			09/03/21 01:38	100
Total Dissolved Solids (TDS)	**27000**		1000	470	mg/L			09/01/21 11:39	1
Ferrous Iron	**0.44**	**HF F1**	0.20	0.021	mg/L			09/08/21 13:17	1

Client Sample ID: 111762-MW-7-082721 **Lab Sample ID: 280-152338-4**
Date Collected: 08/27/21 07:00 **Matrix: Water**
Date Received: 08/27/21 13:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**430**		15	5.1	mg/L			08/27/21 23:31	5
Nitrate as N	ND	H	2.5	0.45	mg/L			09/03/21 02:20	5
Sulfate	**57000**		2500	520	mg/L			09/04/21 23:41	500
Total Dissolved Solids (TDS)	**86000**		1000	470	mg/L			09/01/21 11:39	1
Ferrous Iron	**0.11**	**J HF**	0.20	0.021	mg/L			09/08/21 13:01	1

Surrogate Summary

Client: Stantec Consulting Corp. Job ID: 280-152338-1
Project/Site: Chevron - Wilson/South Canyon

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	TOL	BFB	DBFM
Lab Sample ID	Client Sample ID	(70-127)	(80-125)	(78-120)	(77-120)
280-152338-1	111762-MW-2-082721	98	103	101	96
280-152338-2	111762-MW-3-082721	98	104	101	96
280-152338-3	111762-MW-6-082721	96	104	100	96
280-152338-4	111762-MW-7-082721	102	103	100	97
280-152338-5	TB-1-082721	101	105	101	97
LCS 280-548196/4	Lab Control Sample	97	105	101	100
LCSD 280-548196/5	Lab Control Sample Dup	98	104	101	100
MB 280-548196/9	Method Blank	101	106	100	96

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
TOL = Toluene-d8 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: RSK-175 - Dissolved Gases (GC)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		Propene1
Lab Sample ID	Client Sample ID	(28-130)
280-152338-3	111762-MW-6-082721	69
280-152338-4	111762-MW-7-082721	76
LCS 410-167753/2-A	Lab Control Sample	101
LCSD 410-167753/3-A	Lab Control Sample Dup	96
MB 410-167753/1-A	Method Blank	99

Surrogate Legend

Propene = Propene

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 280-548196/9
Matrix: Water
Analysis Batch: 548196

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0	0.16	ug/L			08/30/21 10:25	1
Ethylbenzene	ND		1.0	0.16	ug/L			08/30/21 10:25	1
Toluene	ND		1.0	0.17	ug/L			08/30/21 10:25	1
m-Xylene & p-Xylene	ND		2.0	0.15	ug/L			08/30/21 10:25	1
o-Xylene	ND		1.0	0.19	ug/L			08/30/21 10:25	1
Xylenes, Total	ND		2.0	0.19	ug/L			08/30/21 10:25	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*70 - 127*		*08/30/21 10:25*	*1*
Toluene-d8 (Surr)	*106*		*80 - 125*		*08/30/21 10:25*	*1*
4-Bromofluorobenzene (Surr)	*100*		*78 - 120*		*08/30/21 10:25*	*1*
Dibromofluoromethane (Surr)	*96*		*77 - 120*		*08/30/21 10:25*	*1*

Lab Sample ID: LCS 280-548196/4
Matrix: Water
Analysis Batch: 548196

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	25.0	23.5		ug/L		94	65 - 135
Ethylbenzene	25.0	24.8		ug/L		99	65 - 135
Toluene	25.0	23.6		ug/L		94	65 - 135
m-Xylene & p-Xylene	25.0	25.0		ug/L		100	65 - 135
o-Xylene	25.0	25.0		ug/L		100	65 - 135
Xylenes, Total	50.0	50.0		ug/L		100	65 - 135

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*97*		*70 - 127*
Toluene-d8 (Surr)	*105*		*80 - 125*
4-Bromofluorobenzene (Surr)	*101*		*78 - 120*
Dibromofluoromethane (Surr)	*100*		*77 - 120*

Lab Sample ID: LCSD 280-548196/5
Matrix: Water
Analysis Batch: 548196

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	25.0	24.0		ug/L		96	65 - 135	2	20
Ethylbenzene	25.0	24.8		ug/L		99	65 - 135	0	20
Toluene	25.0	24.0		ug/L		96	65 - 135	1	20
m-Xylene & p-Xylene	25.0	24.9		ug/L		100	65 - 135	0	20
o-Xylene	25.0	24.9		ug/L		99	65 - 135	1	20
Xylenes, Total	50.0	49.8		ug/L		100	65 - 135	0	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*98*		*70 - 127*
Toluene-d8 (Surr)	*104*		*80 - 125*
4-Bromofluorobenzene (Surr)	*101*		*78 - 120*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 280-548196/5
Matrix: Water
Analysis Batch: 548196

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*100*		*77 - 120*

Method: RSK-175 - Dissolved Gases (GC)

Lab Sample ID: MB 410-167753/1-A
Matrix: Water
Analysis Batch: 167750

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 167753

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane	ND		5.0	3.0	ug/L		09/03/21 12:53	09/03/21 19:17	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Propene	*99*		*28 - 130*	*09/03/21 12:53*	*09/03/21 19:17*	*1*

Lab Sample ID: LCS 410-167753/2-A
Matrix: Water
Analysis Batch: 167750

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 167753

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Methane	59.4	57.7		ug/L		97	85 - 115

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Propene	*101*		*28 - 130*

Lab Sample ID: LCSD 410-167753/3-A
Matrix: Water
Analysis Batch: 167750

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 167753

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Methane	59.4	55.5		ug/L		93	85 - 115	4	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Propene	*96*		*28 - 130*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 280-547958/6
Matrix: Water
Analysis Batch: 547958

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	ND		0.50	0.090	mg/L			08/27/21 14:53	1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 280-547958/4
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 547958

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	5.00	4.80		mg/L		96	90 - 110

Lab Sample ID: LCSD 280-547958/5
Client Sample ID: Lab Control Sample Dup
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 547958

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrate as N	5.00	4.80		mg/L		96	90 - 110	0	10

Lab Sample ID: MRL 280-547958/3
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 547958

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	0.500	0.418	J	mg/L		84	50 - 150

Lab Sample ID: MB 280-547959/6
Client Sample ID: Method Blank
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 547959

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.0	1.0	mg/L			08/27/21 14:53	1
Sulfate	ND		5.0	1.0	mg/L			08/27/21 14:53	1

Lab Sample ID: LCS 280-547959/4
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 547959

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	100	100		mg/L		100	90 - 110
Sulfate	100	98.2		mg/L		98	90 - 110

Lab Sample ID: LCSD 280-547959/5
Client Sample ID: Lab Control Sample Dup
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 547959

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	100	100		mg/L		100	90 - 110	0	10
Sulfate	100	98.3		mg/L		98	90 - 110	0	10

Lab Sample ID: MRL 280-547959/3
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 547959

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	5.00	4.39		mg/L		88	50 - 150
Sulfate	5.00	4.11	J	mg/L		82	50 - 150

Client: Stantec Consulting Corp.
Project/Site: Chevron - Wilson/South Canyon

Job ID: 280-152338-1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: MB 280-548603/6
Matrix: Water
Analysis Batch: 548603

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	ND		0.50	0.090	mg/L			09/02/21 11:42	1

Lab Sample ID: LCS 280-548603/4
Matrix: Water
Analysis Batch: 548603

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	5.00	4.84		mg/L		97	90 - 110

Lab Sample ID: LCSD 280-548603/5
Matrix: Water
Analysis Batch: 548603

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrate as N	5.00	4.83		mg/L		97	90 - 110	0	10

Lab Sample ID: MRL 280-548603/3
Matrix: Water
Analysis Batch: 548603

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	0.500	0.499	J	mg/L		100	50 - 150

Lab Sample ID: MB 280-548604/6
Matrix: Water
Analysis Batch: 548604

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.0	1.0	mg/L			09/02/21 11:42	1
Sulfate	ND		5.0	1.0	mg/L			09/02/21 11:42	1

Lab Sample ID: LCS 280-548604/4
Matrix: Water
Analysis Batch: 548604

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	100	98.6		mg/L		99	90 - 110
Sulfate	100	100		mg/L		100	90 - 110

Lab Sample ID: LCSD 280-548604/5
Matrix: Water
Analysis Batch: 548604

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	100	98.5		mg/L		98	90 - 110	0	10
Sulfate	100	100		mg/L		100	90 - 110	0	10

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: MRL 280-548604/3 **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 548604

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	5.00	5.12		mg/L		102	50 - 150
Sulfate	5.00	5.06		mg/L		101	50 - 150

Lab Sample ID: MB 280-548871/6 **Client Sample ID: Method Blank**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 548871

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		5.0	1.0	mg/L			09/04/21 12:20	1

Lab Sample ID: LCS 280-548871/4 **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 548871

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	100	99.4		mg/L		99	90 - 110

Lab Sample ID: LCSD 280-548871/5 **Client Sample ID: Lab Control Sample Dup**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 548871

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate	100	99.3		mg/L		99	90 - 110	0	10

Lab Sample ID: MRL 280-548871/3 **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 548871

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	5.00	4.79	J	mg/L		96	50 - 150

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 280-548514/1 **Client Sample ID: Method Blank**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 548514

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (TDS)	ND		10	4.7	mg/L			09/01/21 11:39	1

Lab Sample ID: LCS 280-548514/2 **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 548514

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids (TDS)	500	491		mg/L		98	88 - 114

Method: SM 3500 FE B - Iron, Ferrous and Ferric

Lab Sample ID: MB 280-549186/15
Client Sample ID: Method Blank
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 549186

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ferrous Iron	ND		0.20	0.021	mg/L			09/08/21 13:00	1

Lab Sample ID: LCS 280-549186/13
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 549186

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ferrous Iron	2.00	1.93		mg/L		97	85 - 121

Lab Sample ID: LCSD 280-549186/14
Client Sample ID: Lab Control Sample Dup
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 549186

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ferrous Iron	2.00	1.91		mg/L		96	85 - 121	1	10

Lab Sample ID: 280-152338-3 MS
Client Sample ID: 111762-MW-6-082721
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 549186

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Ferrous Iron	0.44	HF F1	2.00	ND	F1	mg/L		0	85 - 121

Lab Sample ID: 280-152338-3 MSD
Client Sample ID: 111762-MW-6-082721
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 549186

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ferrous Iron	0.44	HF F1	2.00	1.20	F1	mg/L		38	85 - 121	NC	10

QC Association Summary

Client: Stantec Consulting Corp. Job ID: 280-152338-1
Project/Site: Chevron - Wilson/South Canyon

GC/MS VOA

Analysis Batch: 548196

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-152338-1	111762-MW-2-082721	Total/NA	Water	8260B	
280-152338-2	111762-MW-3-082721	Total/NA	Water	8260B	
280-152338-3	111762-MW-6-082721	Total/NA	Water	8260B	
280-152338-4	111762-MW-7-082721	Total/NA	Water	8260B	
280-152338-5	TB-1-082721	Total/NA	Water	8260B	
MB 280-548196/9	Method Blank	Total/NA	Water	8260B	
LCS 280-548196/4	Lab Control Sample	Total/NA	Water	8260B	
LCSD 280-548196/5	Lab Control Sample Dup	Total/NA	Water	8260B	

GC VOA

Analysis Batch: 167750

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-152338-3	111762-MW-6-082721	Total/NA	Water	RSK-175	167753
280-152338-4	111762-MW-7-082721	Total/NA	Water	RSK-175	167753
MB 410-167753/1-A	Method Blank	Total/NA	Water	RSK-175	167753
LCS 410-167753/2-A	Lab Control Sample	Total/NA	Water	RSK-175	167753
LCSD 410-167753/3-A	Lab Control Sample Dup	Total/NA	Water	RSK-175	167753

Prep Batch: 167753

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-152338-3	111762-MW-6-082721	Total/NA	Water	RSK-175	
280-152338-4	111762-MW-7-082721	Total/NA	Water	RSK-175	
MB 410-167753/1-A	Method Blank	Total/NA	Water	RSK-175	
LCS 410-167753/2-A	Lab Control Sample	Total/NA	Water	RSK-175	
LCSD 410-167753/3-A	Lab Control Sample Dup	Total/NA	Water	RSK-175	

General Chemistry

Analysis Batch: 547958

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-152338-3	111762-MW-6-082721	Total/NA	Water	300.0	
MB 280-547958/6	Method Blank	Total/NA	Water	300.0	
LCS 280-547958/4	Lab Control Sample	Total/NA	Water	300.0	
LCSD 280-547958/5	Lab Control Sample Dup	Total/NA	Water	300.0	
MRL 280-547958/3	Lab Control Sample	Total/NA	Water	300.0	

Analysis Batch: 547959

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-152338-3	111762-MW-6-082721	Total/NA	Water	300.0	
280-152338-4	111762-MW-7-082721	Total/NA	Water	300.0	
MB 280-547959/6	Method Blank	Total/NA	Water	300.0	
LCS 280-547959/4	Lab Control Sample	Total/NA	Water	300.0	
LCSD 280-547959/5	Lab Control Sample Dup	Total/NA	Water	300.0	
MRL 280-547959/3	Lab Control Sample	Total/NA	Water	300.0	

Analysis Batch: 548514

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-152338-3	111762-MW-6-082721	Total/NA	Water	SM 2540C	
280-152338-4	111762-MW-7-082721	Total/NA	Water	SM 2540C	
MB 280-548514/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-548514/2	Lab Control Sample	Total/NA	Water	SM 2540C	

General Chemistry

Analysis Batch: 548603

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-152338-4	111762-MW-7-082721	Total/NA	Water	300.0	
MB 280-548603/6	Method Blank	Total/NA	Water	300.0	
LCS 280-548603/4	Lab Control Sample	Total/NA	Water	300.0	
LCSD 280-548603/5	Lab Control Sample Dup	Total/NA	Water	300.0	
MRL 280-548603/3	Lab Control Sample	Total/NA	Water	300.0	

Analysis Batch: 548604

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-152338-3	111762-MW-6-082721	Total/NA	Water	300.0	
MB 280-548604/6	Method Blank	Total/NA	Water	300.0	
LCS 280-548604/4	Lab Control Sample	Total/NA	Water	300.0	
LCSD 280-548604/5	Lab Control Sample Dup	Total/NA	Water	300.0	
MRL 280-548604/3	Lab Control Sample	Total/NA	Water	300.0	

Analysis Batch: 548871

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-152338-4	111762-MW-7-082721	Total/NA	Water	300.0	
MB 280-548871/6	Method Blank	Total/NA	Water	300.0	
LCS 280-548871/4	Lab Control Sample	Total/NA	Water	300.0	
LCSD 280-548871/5	Lab Control Sample Dup	Total/NA	Water	300.0	
MRL 280-548871/3	Lab Control Sample	Total/NA	Water	300.0	

Analysis Batch: 549186

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-152338-3	111762-MW-6-082721	Total/NA	Water	SM 3500 FE B	
280-152338-4	111762-MW-7-082721	Total/NA	Water	SM 3500 FE B	
MB 280-549186/15	Method Blank	Total/NA	Water	SM 3500 FE B	
LCS 280-549186/13	Lab Control Sample	Total/NA	Water	SM 3500 FE B	
LCSD 280-549186/14	Lab Control Sample Dup	Total/NA	Water	SM 3500 FE B	
280-152338-3 MS	111762-MW-6-082721	Total/NA	Water	SM 3500 FE B	
280-152338-3 MSD	111762-MW-6-082721	Total/NA	Water	SM 3500 FE B	

Lab Chronicle

Client: Stantec Consulting Corp. | Job ID: 280-152338-1
Project/Site: Chevron - Wilson/South Canyon

Client Sample ID: 111762-MW-2-082721 | Lab Sample ID: 280-152338-1
Date Collected: 08/27/21 10:10 | **Matrix: Water**
Date Received: 08/27/21 13:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		100	5 mL	5 mL	548196	08/30/21 13:57	TAW	TAL DEN

Client Sample ID: 111762-MW-3-082721 | Lab Sample ID: 280-152338-2
Date Collected: 08/27/21 09:40 | **Matrix: Water**
Date Received: 08/27/21 13:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		100	5 mL	5 mL	548196	08/30/21 14:18	TAW	TAL DEN

Client Sample ID: 111762-MW-6-082721 | Lab Sample ID: 280-152338-3
Date Collected: 08/27/21 08:50 | **Matrix: Water**
Date Received: 08/27/21 13:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		100	5 mL	5 mL	548196	08/30/21 14:39	TAW	TAL DEN
Total/NA	Prep	RSK-175			5 mL	5 mL	167753	09/03/21 12:53	LXF2	ELLE
Total/NA	Analysis	RSK-175		1	5 mL	5 mL	167750	09/03/21 22:43	LXF2	ELLE
Total/NA	Analysis	300.0		100	10 mL	10 mL	548604	09/03/21 01:38	SPG	TAL DEN
Total/NA	Analysis	300.0		1	10 mL	10 mL	547958	08/28/21 00:27	SPG	TAL DEN
Total/NA	Analysis	300.0		5	10 mL	10 mL	547959	08/28/21 00:41	SPG	TAL DEN
Total/NA	Analysis	SM 2540C		1	1 mL	100 mL	548514	09/01/21 11:39	LRB	TAL DEN
Total/NA	Analysis	SM 3500 FE B		1	2 mL	2 mL	549186	09/08/21 13:17	SPG	TAL DEN

Client Sample ID: 111762-MW-7-082721 | Lab Sample ID: 280-152338-4
Date Collected: 08/27/21 07:00 | **Matrix: Water**
Date Received: 08/27/21 13:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	548196	08/30/21 15:00	TAW	TAL DEN
Total/NA	Prep	RSK-175			5 mL	5 mL	167753	09/03/21 12:53	LXF2	ELLE
Total/NA	Analysis	RSK-175		1	5 mL	5 mL	167750	09/03/21 22:59	LXF2	ELLE
Total/NA	Analysis	300.0		5	10 mL	10 mL	548603	09/03/21 02:20	SPG	TAL DEN
Total/NA	Analysis	300.0		500	10 mL	10 mL	548871	09/04/21 23:41	CJ	TAL DEN
Total/NA	Analysis	300.0		5	10 mL	10 mL	547959	08/27/21 23:31	SPG	TAL DEN
Total/NA	Analysis	SM 2540C		1	1 mL	100 mL	548514	09/01/21 11:39	LRB	TAL DEN
Total/NA	Analysis	SM 3500 FE B		1	2 mL	2 mL	549186	09/08/21 13:01	SPG	TAL DEN

Client Sample ID: TB-1-082721 | Lab Sample ID: 280-152338-5
Date Collected: 08/27/21 08:00 | **Matrix: Water**
Date Received: 08/27/21 13:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 mL	5 mL	548196	08/30/21 10:46	TAW	TAL DEN

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Env, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

Accreditation/Certification Summary

Client: Stantec Consulting Corp. Job ID: 280-152338-1
Project/Site: Chevron - Wilson/South Canyon

Laboratory: Eurofins TestAmerica, Denver

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
A2LA	Dept. of Defense ELAP	2907.01	11-02-21
A2LA	ISO/IEC 17025	2907.01	11-02-21
Alabama	State Program	40730	09-30-12 *
Alaska (UST)	State	18-001	02-28-22
Arizona	State	AZ0713	12-21-21
Arkansas DEQ	State	19-047-0	06-01-21 *
California	State	2513	01-08-22
Connecticut	State	PH-0686	09-30-22
Florida	NELAP	E87667-57	06-30-22
Georgia	State	4025-011	01-08-22
Illinois	NELAP	2000172019-1	04-30-22
Iowa	State	IA#370	12-02-22
Kansas	NELAP	E-10166	04-30-22
Kentucky (WW)	State	KY98047	12-31-21
Louisiana	NELAP	30785	06-30-14 *
Louisiana	NELAP	30785	06-30-22
Minnesota	NELAP	1788752	12-31-21
Nevada	State	CO000262020-1	08-01-22
New Hampshire	NELAP	205319	04-29-22
New Jersey	NELAP	190002	07-01-22
New York	NELAP	59923	04-01-22
North Carolina (WW/SW)	State	358	12-31-21
North Dakota	State	R-034	01-08-22
Oklahoma	State	2018-006	09-01-21 *
Oregon	NELAP	4025-011	01-08-22
Pennsylvania	NELAP	013	07-31-22
South Carolina	State	72002001	01-08-22
Texas	NELAP	TX104704183-08-TX	09-30-09 *
Texas	NELAP	T104704183-20-18	09-30-21
US Fish & Wildlife	US Federal Programs	058448	07-31-22
USDA	US Federal Programs	P330-20-00065	03-06-23
Utah	NELAP	QUAN5	06-30-13 *
Utah	NELAP	CO000262019-11	07-31-21 *
Virginia	NELAP	10490	06-14-22
Washington	State	C583-19	08-03-22
West Virginia DEP	State	354	11-30-21
Wisconsin	State	999615430	08-31-22
Wyoming (UST)	A2LA	2907.01	10-31-21

Laboratory: Eurofins Lancaster Laboratories Env, LLC

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
A2LA	Dept. of Defense ELAP	1.01	11-30-22
Alaska	State	PA00009	06-30-22
Alaska (UST)	State	17-027	02-28-22
Arizona	State	AZ0780	03-12-22
California	State	2792	02-02-22
Connecticut	State	PH-0746	07-30-21 *
DE Haz. Subst. Cleanup Act (HSCA)	State	019-006 (PA cert)	01-31-22

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Laboratory: Eurofins Lancaster Laboratories Env, LLC (Continued)

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Delaware (DW)	State	N/A	02-01-22
Florida	NELAP	E87997	06-30-22
Hawaii	State	N/A	01-31-22
Illinois	NELAP	004559	01-31-22
Iowa	State	361	03-02-22
Kansas	NELAP	E-10151	10-31-21
Kentucky (DW)	State	KY90088	01-01-22
Kentucky (UST)	State	1.01	11-30-22
Kentucky (WW)	State	KY90088	12-31-21
Louisiana	NELAP	02055	06-30-22
Maine	State	2019012	03-12-22
Maryland	State	100	06-30-22
Massachusetts	State	M-PA009	06-30-22
Michigan	State	9930	01-31-22
Minnesota	NELAP	042-999-487	12-31-21
Missouri	State	450	01-31-22
Montana (DW)	State	0098	01-01-22
Montana (UST)	State	0098	01-01-22
Nebraska	State	NE-OS-32-17	01-31-22
New Hampshire	NELAP	273019	01-10-22
New Jersey	NELAP	PA011	06-30-22
New York	NELAP	10670	04-01-22
North Carolina (DW)	State	42705	07-31-22
North Carolina (WW/SW)	State	521	12-31-21
North Dakota	State	R-205	01-31-22
Oregon	NELAP	PA200001-018	09-11-21
PALA	Canada	1978	09-16-24
Pennsylvania	NELAP	36-00037	01-31-22
Rhode Island	State	LAO00338	01-31-22
South Carolina	State	89002002	01-31-22
Tennessee	State	02838	01-31-22
Texas	NELAP	T104704194-20-38	08-31-22
Utah	NELAP	PA000092019-16	03-01-22
Vermont	State	VT - 36037	10-29-21
Virginia	NELAP	10561	06-14-22
Washington	State	C457	04-12-22
West Virginia (DW)	State	9906 C	12-31-21
West Virginia DEP	State	055	09-30-21
Wyoming	State	8TMS-L	01-31-22
Wyoming (UST)	A2LA	1.01	11-30-22

Eurofins TestAmerica, Denver
4955 Yarrow Street
Arvada, CO 80002
Phone: 303-736-0100 Fax: 303-431-7171

Chain of Custody Record

eurofins | Environment Testing America

Client Information

Client Contact: Mr. Byron Collins
Company: Stantec Consulting Corp.
Address: 2000 South Colorado Blvd Suite 2-300
City: Denver
State, Zip: CO, 80222
Phone: 970-214-1126(Tel)
Email: BJ.Collins@stantec.com
Project Name: Chevron - South Canyon 3Q21
Site:

Sampler: B Collins
Phone: 720 233-1409
PWSID:
Due Date Requested:
TAT Requested (days): Standard
Compliance Project: Δ Yes Δ No
PO #: Project:203721946
WO #: Project: 212201118
Project #: 28017354
SSOW#:

Lab PM: McEntee, Patrick J
E-Mail: Patrick.McEntee@Eurofinset.com
Carrier Tracking No(s):
State of Origin:
COC No: 280-111382-30345.1
Page: Page 1 of 1
Job #:

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

Analysis Requested

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD	8260B - BTEX	2540C_Calcd - TDS	300.0_28D, 300_48HR, SM3500_FE_B	RSK_175 - (MOD) Local Method	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	A		
111762-MW-2-082721	8/27/21	1010	G	Water	N	N	X				3	
111762-MW-3-082721	↓	940	↓	Water	↓	↓	X				1	Only 1 Voa, low water!
111762-MW-6-082721	↓	850	↓	Water	↓	↓	X	X	X	X		
111762-MW-7-082721	↓	700	↓	Water	↓	↓	X	X	X	X		
TB-1-082721	↓	800		Water	↓	↓						
				Water								
				Water								
				Water								
				Water								
				Water								
				Water								

280-152338 Chain of Custody

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For ______ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by: Date: Time: Method of Shipment:

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
[signature]	8/27/21		[signature]	08/27/2021 1315	ETA Den

Custody Seals Intact: Δ Yes Δ No
Custody Seal No.:
Cooler Temperature(s) °C and Other Remarks: 2.4 IR11 +1.0

Ver: 06/08/2021

Eurofins TestAmerica, Denver
4955 Yarrow Street
Arvada, CO 80002
Phone: 303-736-0100 Fax: 303-431-7171

Chain of Custody Record

eurofins | Environment Testing America

Client Information (Sub Contract Lab)	Sampler:	Lab PM: McEntee, Patrick J	Carrier Tracking No(s):	COC No: 280-583121.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Patrick.McEntee@Eurofinset.com	State of Origin: Colorado	Page: Page 1 of 1
Company: Eurofins Lancaster Laboratories Environm		Accreditations Required (See note):		Job #: 280-152338-1
Address: 2425 New Holland Pike, ,	Due Date Requested: 9/12/2021			
City: Lancaster	TAT Requested (days):			
State, Zip: PA, 17601				
Phone: 717-656-2300(Tel)	PO #:			
Email:	WO #:			
Project Name: Chevron - Wilson/South Canyon	Project #: 28017354			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	RSK_175/RSK_HS_Prep (MOD) Methane Ethane Ethene	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
111762-MW-6-082721 (280-152338-3)	8/27/21	08:50 Mountain		Water			X	3	
111762-MW-7-082721 (280-152338-4)	8/27/21	07:00 Mountain		Water			X	3	

Note: Since laboratory accreditations are subject to change, Eurofins TestAmerica places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins TestAmerica attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins TestAmerica.

Possible Hazard Identification
Unconfirmed

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* ______ *Months*

Deliverable Requested: I, II, III, IV, Other (specify) | Primary Deliverable Rank: 2
Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time: 9/3/21 1300	Company: ETA Denver	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 9/9/21 1050	Company: ELLE

Custody Seals Intact: X Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: 1.7

Ver: 06/08/2021

Login Sample Receipt Checklist

Client: Stantec Consulting Corp. Job Number: 280-152338-1

Login Number: 152338 **List Source: Eurofins TestAmerica, Denver**
List Number: 1
Creator: O'Hara, Jake F

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.		
The cooler's custody seal, if present, is intact.		
Sample custody seals, if present, are intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the containers received and the COC.		
Samples are received within Holding Time (excluding tests with immediate HTs)		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified.		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Residual Chlorine Checked.		

Login Sample Receipt Checklist

Client: Stantec Consulting Corp.

Job Number: 280-152338-1

Login Number: 152338
List Number: 2
Creator: Lugardo, Tamara

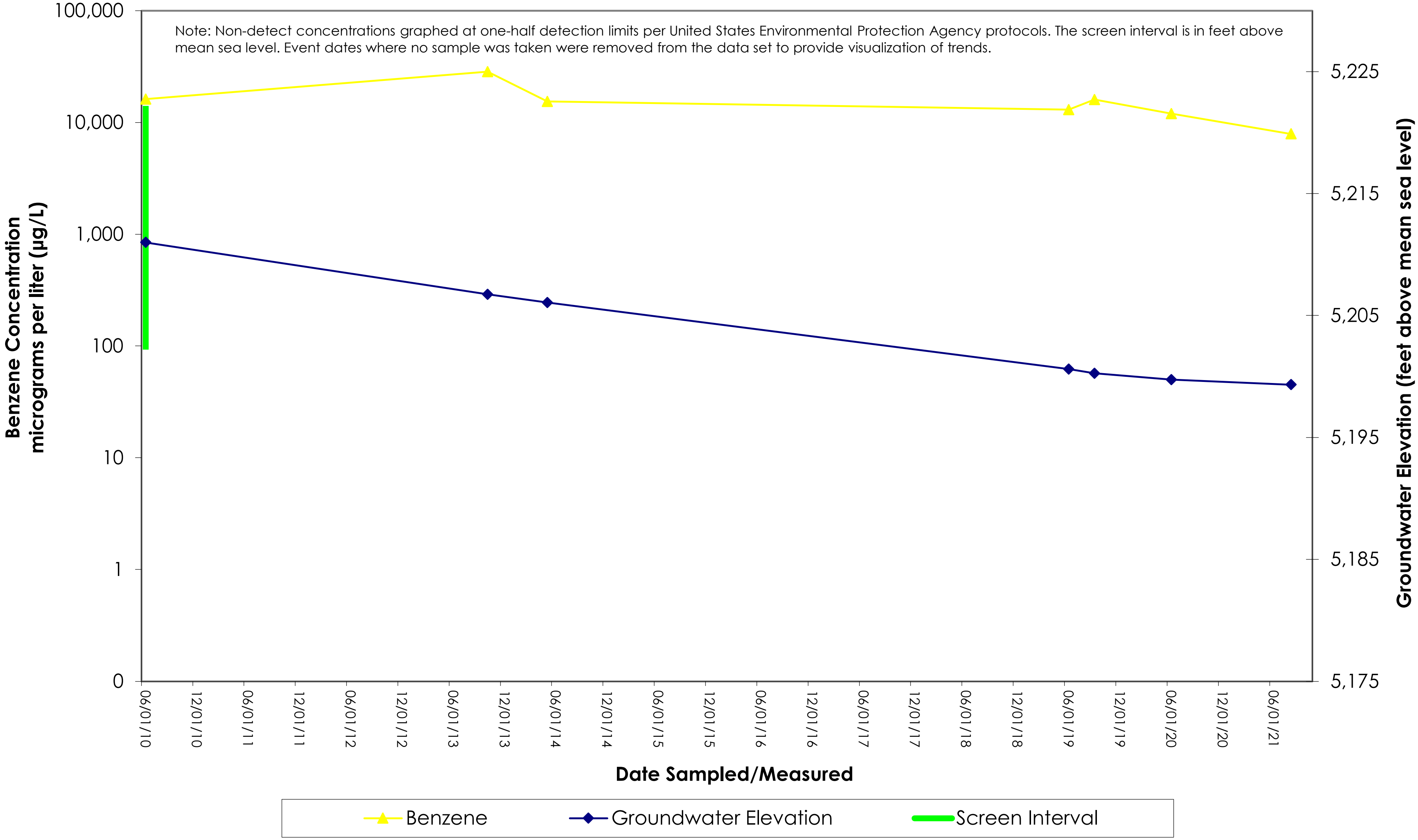
List Source: Eurofins Lancaster Laboratories Env, LLC
List Creation: 09/02/21 12:40 PM

Question	Answer	Comment
The cooler's custody seal is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable (</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
Sample custody seals are intact.	N/A	

ATTACHMENT B
Hydrographs

111762-MW-2 Benzene Concentrations and Groundwater Elevations vs. Time

Federal 27-11 (Pit #111762)
South Canyon Field
Garfield County, CO

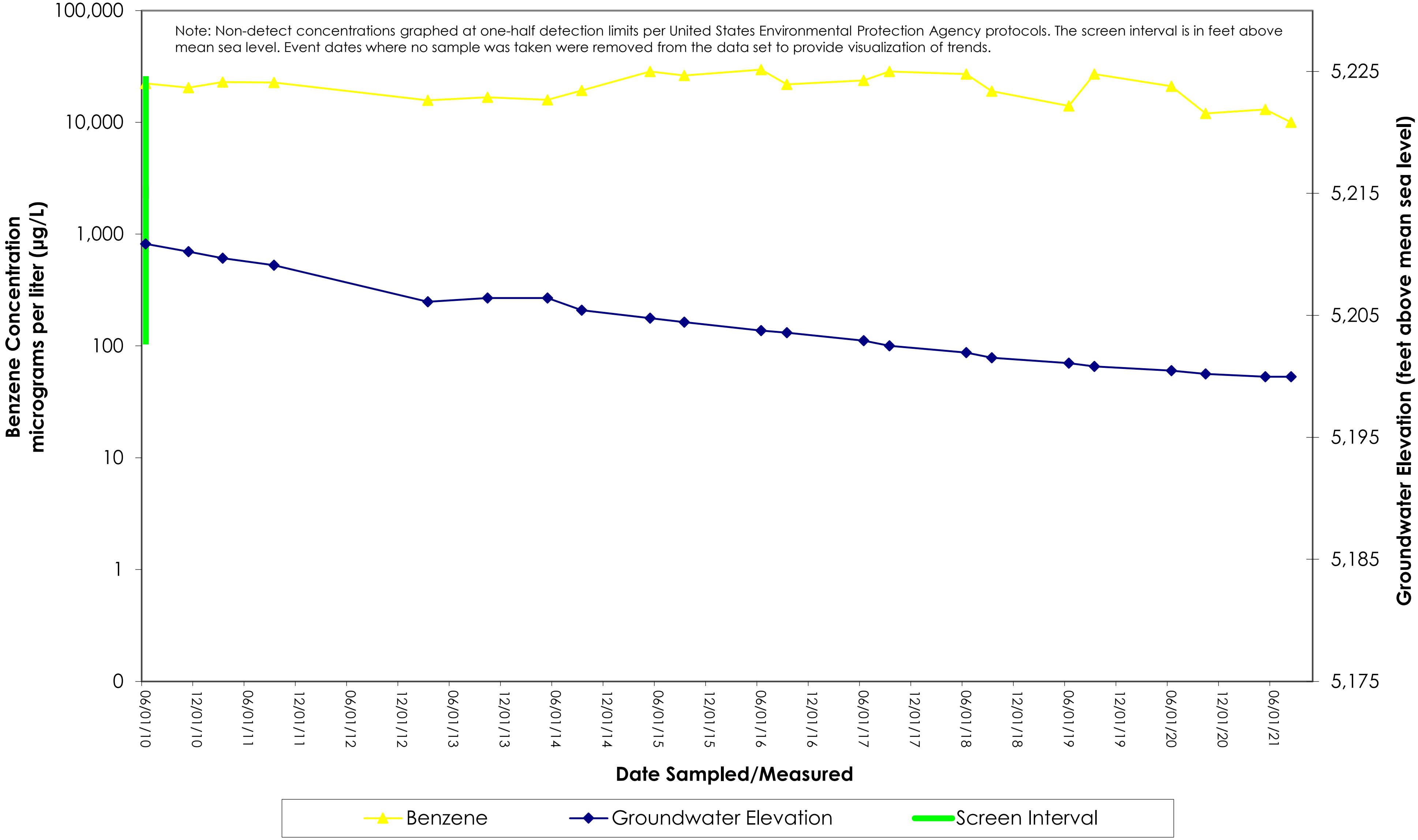


cht_27_11_4q2021_hydros_20220203.xlsx

Stantec Consulting Services Inc.

111762-MW-3 Benzene Concentrations and Groundwater Elevations vs. Time

Federal 27-11 (Pit #111762)
South Canyon Field
Garfield County, CO

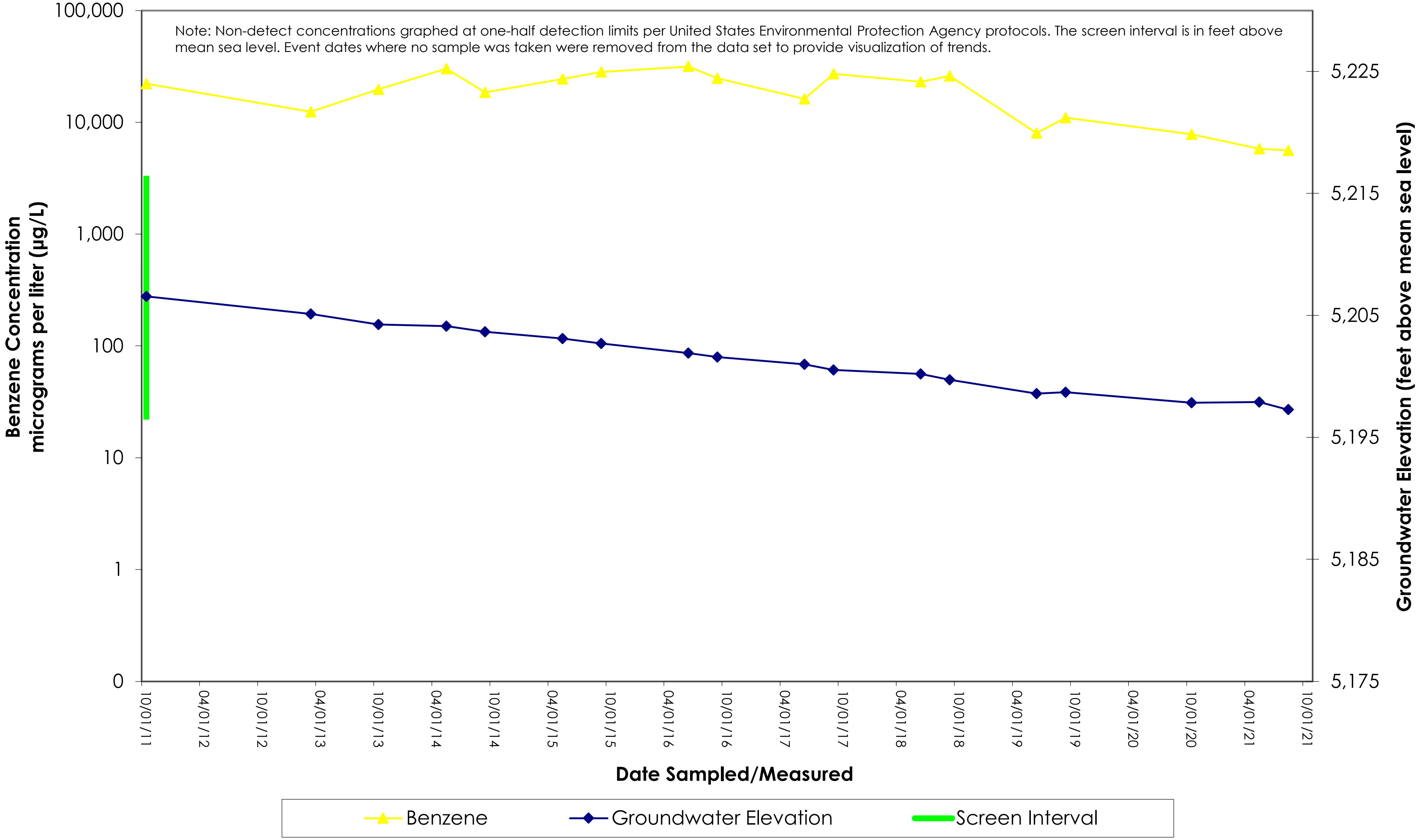


111762-MW-6 Benzene Concentrations and Groundwater Elevations vs. Time

Federal 27-11 (Pit #111762)

South Canyon Field

Garfield County, CO

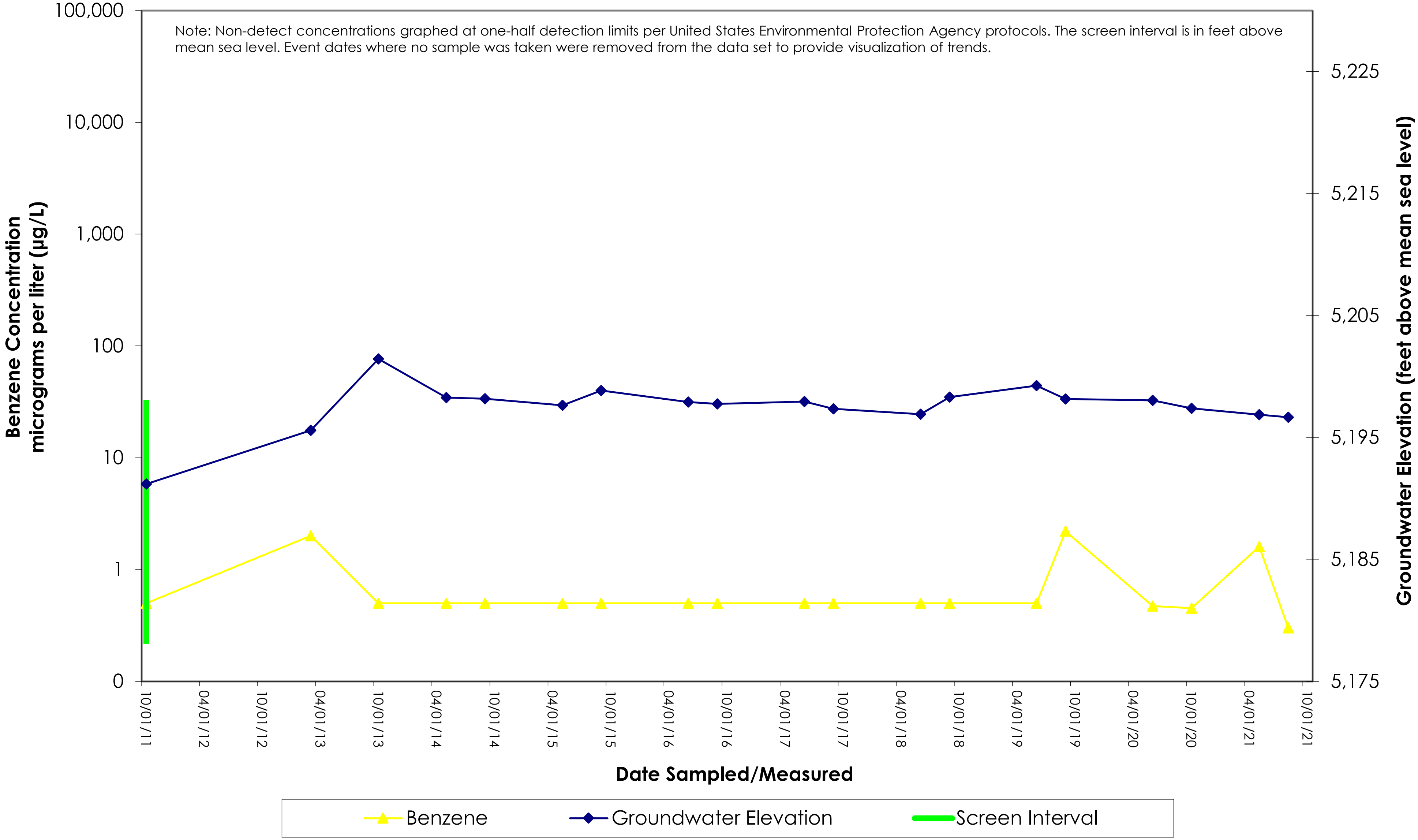


cht_27_11_4q2021_hydros_20220203.xlsx

Stantec Consulting Services Inc.

111762-MW-7 Benzene Concentrations and Groundwater Elevations vs. Time

Federal 27-11 (Pit #111762)
South Canyon Field
Garfield County, CO



cht_27_11_4q2021_hydros_20220203.xlsx

Stantec Consulting Services Inc.

ATTACHMENT C
2021 Mobile Multi-Phase Extraction Vapor Mass Removal Worksheets

Attachment C
Mobile Multi-Phase Extraction
2021 MW-2 Vapor Mass Removal Worksheet
Federal 27-11 (Pit #111762)
South Canyon Field
Garfield County, CO

Site:	South Canyon				
Date:	06/15/21	**Extraction Well:**	MW-2	**Gallons Extracted:**	--
Pre-Event Hose Discharge VOCs (ppmv):			27.31		

VAPOR DATA

Extraction Well	Stinger Depth (ft BTOC)	Time	Minutes in Interval	Influent VOC Concentration from PID (ppmv)	Calculated VOC Concentration[1,2,3] (µg/m³)	Influent Wellhead Vacuum (in Hg)	Influent Temperature (°F)	Flow Velocity (ft/min)	Estimated Process Discharge Flow Rate (acfm)[4]	Estimated Process Discharge Flow Rate at Standard Condition (scfm)[5]	Calculated Pounds of VOCs per Interval	Calculated Gallons of VOCs Extracted per Interval[6]
MW-2	65.00	7:45	0	1,589	0	10.0	80.3	569	29.64	19.4	0.00	0.00
MW-2	65.00	8:00	15	1,554	6,355,828	10.0	105.8	561	27.54	17.2	0.05	0.01
MW-2	65.00	8:15	15	1,490	6,094,070	10.0	105.7	564	28.04	17.5	0.10	0.02
MW-2	65.00	8:30	15	1,461	5,975,460	9.0	107.7	477	23.40	15.3	0.09	0.01
MW-2	65.00	9:00	30	1,397	5,713,701	8.5	112.3	479	23.52	15.6	0.17	0.03
MW-2	65.00	9:30	30	1,434	5,865,031	8.0	112.1	416	20.43	13.9	0.15	0.02
MW-2	65.00	10:00	30	1,389	5,680,982	8.0	127.5	466	22.86	15.1	0.16	0.03
MW-2	65.00	10:30	30	1,558	6,372,188	8.0	124.5	478	23.43	15.6	0.18	0.03
MW-2	65.00	11:00	30	1,396	5,709,611	8.0	112	501	24.59	16.7	0.19	0.03
MW-2	65.00	11:30	30	657	2,687,117	8.0	124.3	504	24.71	16.4	0.13	0.02
MW-2	65.00	12:00	30	1,389	5,680,982	7.5	126.3	512	25.12	17.0	0.13	0.02
MW-2	65.00	12:30	30	1,343	5,492,843	7.5	127.5	526	25.81	17.4	0.18	0.03
MW-2	65.00	13:00	30	1,291	5,280,164	7.5	128.2	520	25.53	17.2	0.17	0.03
MW-2	65.00	13:30	30	1,297	5,304,703	7.5	121.6	535	26.23	17.9	0.18	0.03
MW-2	65.00	14:00	30	1,320	5,398,773	8.0	132.5	527	25.87	17.0	0.17	0.03
MW-2	65.00	14:30	30	1,324	5,415,133	8.0	132.7	525	25.75	16.9	0.17	0.03
MW-2	65.00	15:00	30	1,398	5,717,791	8.0	129.2	532	26.11	17.2	0.18	0.03
MW-2	65.00	15:30	30	1,315	5,378,323	8.0	137.1	519	25.46	16.6	0.17	0.03
MW-2	65.00	16:00	30	1,306	5,341,513	8.0	129.1	534	26.19	17.3	0.17	0.03
MW-2	65.00	16:30	30	1,316	5,382,413	8.0	121.1	552	27.08	18.1	0.18	0.03
MW-2	65.00	17:00	30	1,247	5,100,204	8.0	138.3	550	26.95	17.5	0.17	0.03
MW-2	65.00	17:30	30	1,298	5,308,793	8.0	129.7	539	27.10	17.8	0.17	0.03
MW-2	65.00	18:00	30	1,345	5,501,022	8.0	135.8	565	26.35	17.2	0.17	0.03
										Total	**3.45**	**0.55**

Vapor-Phase VOCs Extracted (pounds)	**3.45**
Calculated VOCs extracted via vapor recovery (gallons)	**0.55**

Notes:

[1] Photoionization detector (PID) measurements used to calculate volatile organic compound (VOC) concentration.

[2] Molecular weight of 100 grams per mole (g/mol) used for VOC value in calculation.

[3] Value of 24.45 liters per mole used in calculation.

[4] Combined flow rate in the field was measured at the system effluent and was comprised of flow from both MW-2 and MW-3. Each well is assumed to have contributed equally to the total flow; therefore, the estimated flow rate at each well is assumed to be one-half of the system effluent flow rate.

[5] Flow rate at standard condition (SCFM) is calculated from the measured flow rate (ACFM) using the following equation: SCFM = ACFM x [530/(460+F)] x [(14.7-V)/14.7], where °F = temperature in degree Fahrenheit, and V = influent vacuum in psig.

[6] A density of 6.25 pounds per liquid gallon used in calculation. Based on density of gasoline at 15 °C.

ft BTOC - Feet below top of casing
ppmv - Parts per million by volume
µg/m³ - Micrograms per cubic meter
in Hg - Inches of mercury
acfm - Actual cubic feet per minute
scfm - Standard cubic feet per minute
-- - Data not collected

Attachment C
Mobile Multi-Phase Extraction
2021 MW-2 Vapor Mass Removal Worksheet
Federal 27-11 (Pit #111762)
South Canyon Field
Garfield County, CO

Site:	South Canyon					
Date:	09/21/21	**Extraction Well:**	MW-2	**Gallons Extracted:**		--
Pre-Event Hose Discharge VOCs (ppmv):			27.31			

VAPOR DATA

Extraction Well	Stinger Depth (ft BTOC)	Time	Minutes in Interval	Influent VOC Concentration from PID (ppmv)	Calculated VOC Concentration[1,2,3] ($\mu g/m^3$)	Influent Wellhead Vacuum (in Hg)	Influent Temperature (°F)	Flow Velocity (ft/min)	Estimated Process Discharge Flow Rate (acfm)[4]	Estimated Process Discharge Flow Rate at Standard Condition (scfm)[5]	Calculated Pounds of VOCs per Interval	Calculated Gallons of VOCs Extracted per Interval[6]
MW-2	66.00	7:30	0	1,280	0	0.0	52.5	522	45.50	47.1	0.00	0.00
MW-2	66.00	7:45	15	1,309	5,353,783	4.0	53.4	533	46.46	41.6	0.10	0.02
MW-2	66.00	8:00	15	1,375	5,623,722	4.0	59.4	573	49.96	44.2	0.23	0.04
MW-2	66.00	8:15	15	1,469	6,008,180	4.0	66.8	586	51.09	44.5	0.24	0.04
MW-2	66.00	8:30	15	1,450	5,930,470	4.5	63.6	578	50.44	43.4	0.24	0.04
MW-2	66.00	9:00	30	1,472	6,020,450	4.5	97.1	635	55.36	44.7	0.50	0.08
MW-2	66.00	9:30	30	1,405	5,746,421	5.0	110.7	615	53.62	41.5	0.46	0.07
MW-2	66.00	10:00	30	1,399	5,721,881	5.0	77.5	581	50.65	41.6	0.45	0.07
MW-2	66.00	10:30	30	1,477	6,040,900	4.5	103.6	668	58.28	46.6	0.51	0.08
MW-2	66.00	11:00	30	1,440	5,889,571	4.5	78.8	611	53.30	44.5	0.50	0.08
MW-2	66.00	11:30	30	1,675	6,850,716	4.0	104.8	638	55.63	45.2	0.54	0.09
MW-2	66.00	12:00	30	1,684	6,887,526	4.0	86.6	655	57.11	48.0	0.62	0.10
MW-2	66.00	12:30	30	1,607	6,572,597	4.0	104.9	693	60.46	49.1	0.62	0.10
MW-2	66.00	13:00	30	1,704	6,969,325	4.0	120	769	67.07	53.1	0.67	0.11
MW-2	66.00	13:30	30	1,444	5,905,930	4.0	136.6	680	59.32	45.7	0.55	0.09
MW-2	66.00	14:00	30	1,570	6,421,268	4.0	145.9	682	59.53	45.1	0.52	0.08
MW-2	66.00	14:30	30	1,359	5,558,282	4.0	125.7	696	60.69	47.6	0.53	0.09
MW-2	66.00	15:00	30	1,395	5,705,521	4.0	144.2	681	59.39	45.1	0.48	0.08
MW-2	66.00	15:30	30	1,367	5,591,002	4.0	156.4	684	59.66	44.4	0.47	0.08
MW-2	66.00	16:00	30	1,444	5,905,930	4.0	105.1	678	59.12	48.0	0.52	0.08
MW-2	66.00	16:30	30	1,361	5,566,462	5.0	116.5	702	61.2	46.9	0.50	0.08
MW-2	66.00	17:00	30	1,309	5,353,783	5.0	126	706	61.6	46.4	0.47	0.08
MW-2	66.00	17:30	30	1,307	5,345,603	5.0	125.4	789	68.9	51.9	0.52	0.08
										Total	**10.24**	**1.64**

Vapor-Phase VOCs Extracted (pounds)	**10.24**
Calculated VOCs extracted via vapor recovery (gallons)	**1.64**

Notes:
[1] Photoionization detector (PID) measurements used to calculate volatile organic compound (VOC) concentration.
[2] Molecular weight of 100 grams per mole (g/mol) used for VOC value in calculation.
[3] Value of 24.45 liters per mole used in calculation.
[4] Combined flow rate in the field was measured at the system effluent and was comprised of flow from both MW-2 and MW-3. Each well is assumed to have contributed equally to the total flow; therefore, the estimated flow rate at each well is assumed to be one-half of the system effluent flow rate.
[5] Flow rate at standard condition (SCFM) is calculated from the measured flow rate (ACFM) using the following equation: SCFM = ACFM x [530/(460+F)] x [(14.7-V)/14.7], where °F = temperature in degree Fahrenheit, and V = influent vacuum in psig.
[6] A density of 6.25 pounds per liquid gallon used in calculation. Based on density of gasoline at 15 °C.
ft BTOC - Feet below top of casing
ppmv - Parts per million by volume
$\mu g/m^3$ - Micrograms per cubic meter
in Hg - Inches of mercury
acfm - Actual cubic feet per minute
scfm - Standard cubic feet per minute
-- - Data not collected

Attachment C
Mobile Multi-Phase Extraction
2021 MW-3 Vapor Mass Removal Worksheet
Federal 27-11 (Pit #111762)
South Canyon Field
Garfield County, CO

Site:	South Canyon				
Date:	06/15/21	**Extraction Well:**	MW-3	**Gallons Extracted:**	--
Pre-Event Hose Discharge VOCs (ppmv):			102.3		

VAPOR DATA

Extraction Well	Stinger Depth (ft BTOC)	Time	Minutes in Interval	Influent VOC Concentration from PID (ppmv)	Calculated VOC Concentration[1,2,3] (µg/m^3)	Influent Wellhead Vacuum (in Hg)	Influent Temperature (°F)	Flow Velocity (ft/min)	Estimated Process Discharge Flow Rate (acfm)[4]	Estimated Process Discharge Flow Rate at Standard Condition (scfm)[5]	Calculated Pounds of VOCs per Interval	Calculated Gallons of VOCs Extracted per Interval[6]
MW-3	65.0	7:45	0	1,605	0	9.5	80.3	569	29.64	19.8	0.00	0.00
MW-3	65.0	8:00	15	1,317	5,386,503	9.0	105.8	561	27.54	18.0	0.05	0.01
MW-3	65.0	8:15	15	1,556	6,364,008	9.0	105.7	564	28.04	18.4	0.10	0.02
MW-3	65.0	8:30	15	1,500	6,134,969	8.5	107.7	477	23.40	15.6	0.09	0.01
MW-3	65.0	9:00	30	1,344	5,496,933	8.5	112.3	479	23.52	15.6	0.17	0.03
MW-3	65.0	9:30	30	1,420	5,807,771	6.5	112.1	416	20.43	14.8	0.16	0.03
MW-3	65.0	10:00	30	1,414	5,783,231	6.0	127.5	466	22.86	16.5	0.18	0.03
MW-3	65.0	10:30	30	1,380	5,644,172	6.0	124.5	478	23.43	17.0	0.18	0.03
MW-3	65.0	11:00	30	1,407	5,754,601	6.0	112	501	24.59	18.2	0.19	0.03
MW-3	65.0	11:30	30	1,296	5,300,613	6.0	124.3	504	24.71	17.9	0.19	0.03
MW-3	65.0	12:00	30	1,284	5,251,534	5.0	126.3	512	25.12	18.9	0.19	0.03
MW-3	65.0	12:30	30	1,293	5,288,344	5.0	127.5	526	25.81	19.4	0.19	0.03
MW-3	65.0	13:00	30	1,233	5,042,945	5.0	128.2	520	25.53	19.2	0.19	0.03
MW-3	65.0	13:30	30	1,226	5,014,315	5.0	121.6	535	26.23	19.9	0.19	0.03
MW-3	65.0	14:00	30	1,260	5,153,374	4.5	132.5	527	25.87	19.7	0.19	0.03
MW-3	65.0	14:30	30	1,261	5,157,464	4.5	132.7	525	25.75	19.6	0.19	0.03
MW-3	65.0	15:00	30	1,180	4,826,176	4.5	129.2	532	26.11	20.0	0.19	0.03
MW-3	65.0	15:30	30	1,185	4,846,626	4.5	137.1	519	25.46	19.2	0.17	0.03
MW-3	65.0	16:00	30	1,184	4,842,536	4.5	129.1	534	26.19	20.0	0.18	0.03
MW-3	65.0	16:30	30	1,182	4,834,356	4.5	121.1	552	27.08	21.0	0.19	0.03
MW-3	65.0	17:00	30	1,197	4,895,706	4.5	138.3	550	26.95	20.3	0.18	0.03
MW-3	65.0	17:30	30	1,183	4,838,446	4.5	129.7	539	27.10	20.7	0.19	0.03
MW-3	65.0	18:00	30	1,194	4,883,436	4.5	135.8	565	26.35	19.9	0.18	0.03
										Total	**3.72**	**0.59**

Vapor-Phase VOCs Extracted (pounds)	**3.72**
Calculated VOCs extracted via vapor recovery (gallons)	**0.59**

Notes:
[1] Photoionization detector (PID) measurements used to calculate volatile organic compound (VOC) concentration.
[2] Molecular weight of 100 grams per mole (g/mol) used for VOC value in calculation.
[3] Value of 24.45 liters per mole used in calculation.
[4] Combined flow rate in the field was measured at the system effluent and was comprised of flow from both MW-2 and MW-3. Each well is assumed to have contributed equally to the total flow; therefore, the estimated flow rate at each well is assumed to be one-half of the system effluent flow rate.
[5] Flow rate at standard condition (SCFM) is calculated from the measured flow rate (ACFM) using the following equation: SCFM = ACFM x [530/(460+F)] x [(14.7-V)/14.7], where °F = temperature in degree Fahrenheit, and V = influent vacuum in psig.
[6] A density of 6.25 pounds per liquid gallon used in calculation. Based on density of gasoline at 15 °C.
ft BTOC - Feet below top of casing
ppmv - Parts per million by volume
µg/m^3 - Micrograms per cubic meter
in Hg - Inches of mercury
acfm - Actual cubic feet per minute
scfm - Standard cubic feet per minute
-- - Data not collected

Attachment C
Mobile Multi-Phase Extraction
2021 MW-3 Vapor Mass Removal Worksheet
Federal 27-11 (Pit #111762)
South Canyon Field
Garfield County, CO

Site:	South Canyon				
Date:	09/22/21	**Extraction Well:**	MW-3	**Gallons Extracted:**	--
Pre-Event Hose Discharge VOCs (ppmv):			102.3		

VAPOR DATA

Extraction Well	Stinger Depth (ft BTOC)	Time	Minutes in Interval	Influent VOC Concentration from PID (ppmv)	Calculated VOC Concentration[1,2,3] (µg/m^3)	Influent Wellhead Vacuum (in Hg)	Influent Temperature (°F)	Flow Velocity (ft/min)	Estimated Process Discharge Flow Rate (acfm)[4]	Estimated Process Discharge Flow Rate at Standard Condition (scfm)[5]	Calculated Pounds of VOCs per Interval	Calculated Gallons of VOCs Extracted per Interval[6]
MW-3	66.00	7:30	0	1,132	0	9.5	52.5	522	45.50	32.1	0.00	0.00
MW-3	66.00	7:45	15	1,446	5,914,110	10.0	53.4	533	46.46	31.9	0.09	0.01
MW-3	66.00	8:00	15	1,474	6,028,630	13.0	105.8	573	49.96	26.5	0.15	0.02
MW-3	66.00	8:15	15	1,571	6,425,358	13.0	66.8	586	51.09	29.1	0.17	0.03
MW-3	66.00	8:30	15	1,516	6,200,409	14.5	63.6	578	50.44	26.3	0.16	0.02
MW-3	66.00	9:00	30	1,535	6,278,119	14.0	97.1	635	55.36	28.0	0.33	0.05
MW-3	66.00	9:30	30	1,455	5,950,920	14.0	110.7	615	53.62	26.5	0.30	0.05
MW-3	66.00	10:00	30	1,453	5,942,740	14.0	77.5	581	50.65	26.6	0.30	0.05
MW-3	66.00	10:30	30	1,533	6,269,939	14.0	103.6	668	58.28	29.2	0.33	0.05
MW-3	66.00	11:00	30	1,958	8,008,180	14.0	78.8	611	53.30	27.9	0.37	0.06
MW-3	66.00	11:30	30	1,950	7,975,460	15.0	104.8	638	55.63	26.0	0.39	0.06
MW-3	66.00	12:00	30	2,545	10,408,998	15.0	86.6	655	57.11	27.6	0.48	0.08
MW-3	66.00	12:30	30	2,973	12,159,509	15.0	104.9	693	60.46	28.3	0.60	0.10
MW-3	66.00	13:00	30	1,971	8,061,350	15.0	120	769	67.07	30.6	0.58	0.09
MW-3	66.00	13:30	30	1,485	6,073,620	15.0	136.6	680	59.32	26.3	0.35	0.06
MW-3	66.00	14:00	30	1,503	6,147,239	15.0	145.9	682	59.53	26.0	0.30	0.05
MW-3	66.00	14:30	30	1,357	5,550,102	15.0	125.7	696	60.69	27.4	0.30	0.05
MW-3	66.00	15:00	30	1,334	5,456,033	15.0	144.2	681	59.39	26.0	0.27	0.04
MW-3	66.00	15:30	30	1,536	6,282,209	15.0	156.4	684	59.66	25.6	0.28	0.04
MW-3	66.00	16:00	30	1,441	5,893,661	15.0	105.1	678	59.12	27.7	0.32	0.05
MW-3	66.00	16:30	30	1,469	6,008,180	14.0	116.5	702	61.2	29.9	0.33	0.05
MW-3	66.00	17:00	30	1,403	5,738,241	14.0	126	706	61.6	29.7	0.33	0.05
MW-3	66.00	17:30	30	1,472	6,020,450	14.0	125.4	789	68.9	33.2	0.37	0.06
										Total	**7.07**	**1.13**

Vapor-Phase VOCs Extracted (pounds)	**7.07**
Calculated VOCs extracted via vapor recovery (gallons)	**1.13**

Notes:
[1] Photoionization detector (PID) measurements used to calculate volatile organic compound (VOC) concentration.
[2] Molecular weight of 100 grams per mole (g/mol) used for VOC value in calculation.
[3] Value of 24.45 liters per mole used in calculation.
[4] Combined flow rate in the field was measured at the system effluent and was comprised of flow from both MW-2 and MW-3. Each well is assumed to have contributed equally to the total flow; therefore, the estimated flow rate at each well is assumed to be one-half of the system effluent flow rate.
[5] Flow rate at standard condition (SCFM) is calculated from the measured flow rate (ACFM) using the following equation: SCFM = ACFM x [530/(460+F)] x [(14.7-V)/14.7], where °F = temperature in degree Fahrenheit, and V = influent vacuum in psig.
[6] A density of 6.25 pounds per liquid gallon used in calculation. Based on density of gasoline at 15 °C.
ft BTOC - Feet below top of casing
ppmv - Parts per million by volume
µg/m^3 - Micrograms per cubic meter
in Hg - Inches of mercury
acfm - Actual cubic feet per minute
scfm - Standard cubic feet per minute
-- - Data not collected

Attachment C
Mobile Multi-Phase Extraction
2021 MW-6 Vapor Mass Removal Worksheet
Federal 27-11 (Pit #111762)
South Canyon Field
Garfield County, CO

Site:	South Canyon					
Date:	06/16/21	**Extraction Well:**	MW-6	**Gallons Extracted:**		--
Pre-Event Hose Discharge VOCs (ppmv):			64.1			

VAPOR DATA

Extraction Well	Stinger Depth (ft BTOC)	Time	Minutes in Interval	Influent VOC Concentration from PID (ppmv)	Calculated VOC Concentration[1,2,3] (μg/m³)	Influent Wellhead Vacuum (in Hg)	Influent Temperature (°F)	Flow Velocity (ft/min)	Process Discharge Flow Rate (acfm)	Process Discharge Flow Rate at Standard Condition (scfm)[4]	Calculated Pounds of VOCs per Interval	Calculated Gallons of VOCs Extracted per Interval[5]
MW-6	68.00	7:30	0	203	0	5.0	80.4	1,407	69.05	56.4	0.00	0.00
MW-6	68.00	7:45	15	830	3,394,683	5.0	80.1	1,399	68.16	55.7	0.09	0.01
MW-6	68.00	8:00	15	1,094	4,474,438	5.0	82.6	1,081	53.04	43.2	0.16	0.03
MW-6	68.00	8:15	15	1,170	4,785,276	5.0	85.0	1,094	53.72	43.5	0.19	0.03
MW-6	68.00	8:30	15	1,506	6,159,509	5.0	92.3	1,004	49.29	39.4	0.20	0.03
MW-6	68.00	9:00	30	1,124	4,597,137	5.0	94.6	1,035	50.83	40.5	0.41	0.07
MW-6	68.00	9:30	30	1,037	4,241,309	5.0	101.5	1,139	55.89	43.9	0.36	0.06
MW-6	68.00	10:00	30	981	4,012,270	5.0	104.8	1,069	52.50	41.0	0.32	0.05
MW-6	68.00	10:30	30	910	3,721,881	5.0	97.4	1,150	56.45	44.7	0.32	0.05
MW-6	68.00	11:00	30	939	3,840,491	5.0	87.6	1,024	50.24	40.5	0.29	0.05
MW-6	68.00	11:30	30	856	3,501,022	5.0	92.6	1,054	51.75	41.3	0.28	0.05
MW-6	68.00	12:00	30	798	3,263,804	4.5	90.1	1,057	51.89	42.5	0.27	0.04
										Total	**2.89**	**0.46**

Vapor-Phase VOCs Extracted (pounds)	**2.89**
Calculated VOCs extracted via vapor recovery (gallons)	**0.46**

Notes:
[1] Photoionization detector (PID) measurements used to calculate volatile organic compound (VOC) concentration.
[2] Molecular weight of 100 grams per mole (g/mol) used for VOC value in calculation.
[3] Value of 24.45 liters per mole used in calculation.
[4] Flow rate at standard condition (SCFM) is calculated from the measured flow rate (ACFM) using the following equation: SCFM = ACFM x [530/(460+F)] x [(14.7-V)/14.7], where °F = temperature in degree Fahrenheit, and V = influent vacuum in psig.
[5] A density of 6.25 pounds per liquid gallon used in calculation. Based on density of gasoline at 15 °C.
ft BTOC - Feet below top of casing
ppmv - Parts per million by volume
μg/m³ - Micrograms per cubic meter
in Hg - Inches of mercury
acfm - Actual cubic feet per minute
scfm - Standard cubic feet per minute
-- - Data not collected

Attachment C
Mobile Multi-Phase Extraction
2021 MW-6 Vapor Mass Removal Worksheet
Federal 27-11 (Pit #111762)
South Canyon Field
Garfield County, CO

Site:	South Canyon				
Date:	09/22/21	**Extraction Well:**	MW-6	**Gallons Extracted:**	--
Pre-Event Hose Discharge VOCs (ppmv):			46.5		

VAPOR DATA

Extraction Well	Stinger Depth (ft BTOC)	Time	Minutes in Interval	Influent VOC Concentration from PID (ppmv)	Calculated VOC Concentration[1,2,3] (μg/m^3)	Influent Wellhead Vacuum (in Hg)	Influent Temperature (°F)	Flow Velocity (ft/min)	Process Discharge Flow Rate (acfm)	Process Discharge Flow Rate at Standard Condition (scfm)[4]	Calculated Pounds of VOCs per Interval	Calculated Gallons of VOCs Extracted per Interval[5]
MW-6	68.00	7:30	0	972	0	11.0	60.1	1430	124.80	80.4	0.00	0.00
MW-6	68.00	7:45	15	1,335	5,460,123	11.0	71.3	1476	128.76	81.2	0.21	0.03
MW-6	68.00	8:00	15	1,403	5,738,241	11.0	91.7	1431	124.91	75.9	0.40	0.06
MW-6	68.00	8:15	15	1,238	5,063,395	11.0	94.5	1397	121.87	73.7	0.37	0.06
MW-6	68.00	8:30	15	1,229	5,026,585	11.5	110.3	1483	129.39	74.0	0.35	0.06
MW-6	68.00	9:00	30	1,240	5,071,575	11.5	119.5	1431	124.84	70.3	0.66	0.11
MW-6	68.00	9:30	30	1,248	5,104,294	11.5	152.8	1450	126.55	67.4	0.64	0.10
MW-6	68.00	10:00	30	1,294	5,292,434	11.5	124.2	1503	131.15	73.3	0.71	0.11
MW-6	68.00	10:30	30	1,274	5,210,634	11.0	125.5	1481	129.24	74.0	0.73	0.12
MW-6	68.00	11:00	30	1,262	5,161,554	10.5	128.8	1445	126.07	73.7	0.72	0.11
MW-6	68.00	11:30	30	1,292	5,284,254	11.0	135.6	1469	128.16	72.1	0.71	0.11
MW-6	68.00	12:00	30	1,259	5,149,284	11.5	158	1425	124.37	65.7	0.64	0.10
MW-6	68.00	12:30	30	1,244	5,087,935	11.0	170.7	1553	135.55	72.0	0.69	0.11
MW-6	68.00	13:00	30	1,213	4,961,145	10.5	159.9	1443	125.95	69.9	0.66	0.11
MW-6	68.00	13:30	30	1,223	5,002,045	11.0	176.9	1340	116.95	61.6	0.57	0.09
MW-6	68.00	14:00	30	1,247	5,100,204	10.5	134.3	1412	123.25	71.4	0.67	0.11
MW-6	68.00	14:30	30	1,274	5,210,634	11.0	136.6	1466	127.91	71.9	0.69	0.11
MW-6	68.00	15:00	30	1,239	5,067,485	11.5	148.6	1417	123.65	66.3	0.64	0.10
MW-6	68.00	15:30	30	1,249	5,108,384	11.5	160.1	1476	128.81	67.8	0.65	0.10
MW-6	68.00	16:00	30	1,271	5,198,364	11.5	163.5	1418	123.77	64.8	0.62	0.10
MW-6	68.00	16:30	30	1,252	5,120,654	11.5	162.8	1417	124.55	65.3	0.63	0.10
MW-6	68.00	17:00	30	1,263	5,165,644	11.5	160.7	1455	128.31	67.5	0.65	0.10
MW-6	68.00	17:30	30	1,246	5,096,115	11.5	161.9	1428	126.89	66.6	0.64	0.10
										Total	**13.25**	**2.12**

Vapor-Phase VOCs Extracted (pounds)	**13.25**
Calculated VOCs extracted via vapor recovery (gallons)	**2.12**

Notes:

[1] Photoionization detector (PID) measurements used to calculate volatile organic compound (VOC) concentration.

[2] Molecular weight of 100 grams per mole (g/mol) used for VOC value in calculation.

[3] Value of 24.45 liters per mole used in calculation.

[4] Flow rate at standard condition (SCFM) is calculated from the measured flow rate (ACFM) using the following equation: SCFM = ACFM x [530/(460+F)] x [(14.7-V)/14.7], where °F = temperature in degree Fahrenheit, and V = influent vacuum in psig.

[5] A density of 6.25 pounds per liquid gallon used in calculation. Based on density of gasoline at 15 °C.

ft BTOC - Feet below top of casing
ppmv - Parts per million by volume
μg/m^3 - Micrograms per cubic meter
in Hg - Inches of mercury
acfm - Actual cubic feet per minute
scfm - Standard cubic feet per minute
-- - Data not collected