

2015 Annual Groundwater Monitoring Report

Federal 23-12
South Canyon Field
Garfield County, Colorado



Submitted to:
Colorado Oil and Gas
Conservation Commission
707 Wapiti Court, Suite 204
Rifle, CO 81650

Prepared for:
Chevron Environmental
Management Company
1400 Smith Street
Houston, TX 77002

Prepared by:
Stantec Consulting Services Inc.
2321 Club Meridian Dr., Suite E
Okemos, MI 48864

June 24, 2016



June 24, 2016

Attention: **Mr. Stan Spencer**
Colorado Oil and Gas Conservation Commission
796 Megan Avenue, Suite 201, Rifle, CO 81650

Reference: **2015 Annual Groundwater Monitoring Report**
Federal 23-12, South Canyon Field, Garfield County, Colorado

Dear Mr. Spencer:

Stantec Consulting Services Inc. (Stantec), on behalf of Chevron Environmental Management Company (Chevron), is pleased to submit the *2015 Annual Groundwater Monitoring Report* for Federal 23-12 at the South Canyon Field located in Garfield County, Colorado (the Site - shown on **Figure 1**). This report is presented in three sections: Site Background, 2015 Groundwater Monitoring and Sampling Program, and Conclusions and Recommendations.

SITE BACKGROUND

The South Canyon Field is a coal bed methane gas field owned by the Bureau of Land Management (BLM). It was formerly leased and operated by Chevron USA, Mid-Continent Business Unit. The field and lease are currently operated by Foundation Energy.

In 2008, prior to the divestiture of the lease for the Site, Chevron initiated pit closure activities. Excavation activities were completed to 18 feet below ground surface (bgs) and a test pit within the larger excavation extended sampling to 46 feet bgs. Excavated soils were amended with fertilizer and bulk gypsum to provide nutrients and an electron acceptor for biological degradation of the hydrocarbons in-situ. The excavation was then backfilled with the amended soils.

Following review of the *2014 Annual Groundwater Monitoring Report*, dated June 12, 2015, the Colorado Oil and Gas Conservation Commission (COGCC) approved Stantec's recommendation to reduce the groundwater monitoring and sampling frequency at the Site from semi-annual to annual during Second Quarters. Subsequently, only a Second Quarter groundwater monitoring and sampling event was conducted during 2015.

2015 GROUNDWATER MONITORING AND SAMPLING PROGRAM

Stantec performed the Second Quarter 2015 groundwater monitoring and sampling event on May 12, 2015. Stantec's field data sheets are included in **Attachment A**. Stantec gauged depth-to-groundwater in five Site wells (111760-MW-1 through 111760-MW-5) prior to collecting groundwater samples for laboratory analysis. All five Site wells were sampled.

Purge water generated from groundwater sampling activities conducted during Second Quarter 2015 was returned to the formation via the same well bore from which it was extracted.

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Groundwater Elevation and Gradient

Current and historical groundwater elevation data for the Site are presented in **Table 1**. During Second Quarter 2015, the groundwater elevation ranged from 5304.36 feet above mean sea level (msl; well 111760-MW-5) to 5313.02 feet above msl (well 111760-MW-4). A groundwater elevation contour map (based on Second Quarter 2015 data) is shown on **Figure 2**, and a groundwater flow direction rose diagram illustrating the direction of groundwater flow is shown on **Figure 3**. A figure showing the predominant groundwater flow direction plotted on a Site Plan is included as **Figure 4**. The direction of groundwater flow beneath the Site at the time of sampling was towards the south-southeast (generally consistent with the predominant flow direction to the south-southwest) at an approximate hydraulic gradient of 0.047 feet per foot (ft/ft).

Schedule of Laboratory Analysis

Groundwater samples were analyzed for total petroleum hydrocarbons (TPH) as gasoline range organics (TPH-GRO), TPH as diesel range organics (TPH-DRO), and TPH as oil range organics (TPH-ORO) using United States Environmental Protection Agency Method (US EPA) 8015B modified (SW-846), and benzene, toluene, ethylbenzene, and total xylenes (BTEX compounds) using US EPA Method 8260C (SW-846). In addition, all groundwater samples were analyzed for total dissolved solids (TDS) by SM 2540C, chloride, sulfate (SO_4^{2-}), and nitrate (NO_3^-) by US EPA Method 300.0, methane (CH_4) by RSK-175, and ferrous iron (Fe^{2+}) by SM 3500 Fe B/HACH Method 8146 to evaluate if conditions are suitable for monitored natural attenuation (MNA). Field measurements of dissolved oxygen (DO) and oxidation-reduction potential (ORP) were collected from all Site wells during groundwater purging.

Groundwater Analytical Results

Stantec collected groundwater samples from all five Site wells (111760-MW-1 through 111760-MW-5) during Second Quarter 2015. Current and historical groundwater analytical results are included in **Table 1**. A figure showing Second Quarter 2015 groundwater analytical data plotted on a Site Plan is included as **Figure 5**.

Certified laboratory analysis reports and chain-of-custody documents are included in **Attachment B**. These documents also include data for nearby Federal 27-11, which will be submitted under separate cover. Quality assurance/quality control (QA/QC) measures were implemented as appropriate. A duplicate sample was collected at well 111760-MW-1, 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 benzene analytical results are included in **Attachment C**.

A summary of Second Quarter 2015 groundwater analytical results follows, with results compared to COGCC Series 900 Allowable Concentrations in Table 910-1 (Allowable Concentrations):

- **Total TPH** is equal to the sum of TPH-GRO, TPH-DRO, and TPH-ORO. For the calculation of total TPH, if a constituent was not detected above the laboratory reporting limit (LRL), it was not included in the total TPH result. Total TPH was detected in two of the five Site wells, at concentrations of 400 micrograms per liter ($\mu\text{g/L}$; well 111760-MW-3) and 3,800 $\mu\text{g/L}$ (well 111760-MW-1). There is no Allowable Concentration set for total TPH in groundwater.

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- **Benzene** was detected in one of the five Site wells, at a concentration of 102 µg/L (well 111760-MW-1), which exceeded the Allowable Concentration of 5 µg/L.
- **Toluene** was not detected in any of the five Site wells.
- **Ethylbenzene** was not detected in any of the five Site wells.
- **Total Xylenes** were not detected in any of the five Site wells.
- **Chloride** was detected in all five Site wells, at concentrations ranging from 166 milligrams per liter (mg/L; well 111760-MW-5) to 176 mg/L (well 111760-MW-1). The Allowable Concentration for chloride in groundwater is 1.25 times the background concentration. Using the concentration in well 111760-MW-4 (171 mg/L) as background, the Allowable Concentration would be 214 mg/L. No chloride concentrations exceeded the Allowable Concentration of 214 mg/L.
- **TDS** were detected in all five Site wells, at concentrations ranging from 10,500 mg/L (well 111760-MW-3) to 10,930 mg/L (well 111760-MW-1). The Allowable Concentration for TDS in groundwater is 1.25 times the background concentration. Using the concentration in well 111760-MW-4 (10,890 mg/L) as background, the Allowable Concentration would be 13,613 mg/L. No TDS concentrations exceeded the Allowable Concentration of 13,613 mg/L.

Monitored Natural Attenuation Evaluation

An evaluation of MNA involves assessing a variety of 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, intrinsic biodegradation is typically the most important natural attenuation mechanism for the reduction of concentrations in groundwater. Intrinsic biodegradation involves the transfer of energy in the form of electrons by microorganisms in the subsurface. Bacteria use petroleum hydrocarbon constituents such as TPH and BTEX compounds as electron donors while DO, NO₃⁻, ferric iron (Fe³⁺), SO₄²⁻, and carbon dioxide (CO₂), in order of preference, act as electron acceptors.

The geochemical parameters measured at the Site include DO; ORP; NO₃⁻; SO₄²⁻; Fe²⁺, a metabolite of Fe³⁺ reduction; and CH₄, a metabolite of CO₂ reduction. These parameters provide lines of evidence for evaluating MNA and determining the most likely biodegradation mechanisms utilized within the plume (e.g., Fe³⁺ reduction, SO₄²⁻ reduction, etc.). MNA parameters are summarized in **Table 1**.

During Second Quarter 2015, DO levels (post-purge) in the sampled wells ranged between 0.68 mg/L (well 111760-MW-1) and 3.79 mg/L (well 111760-MW-4). The depletion of DO concentrations within the plume (well 111760-MW-1; as compared to other Site wells, which are outside the plume) suggests DO has been utilized as an electron acceptor for bioremediation of dissolved-phase petroleum hydrocarbons by indigenous microbes.

ORP levels (post-purge) ranged between -115.3 millivolts (mV; well 111760-MW-1) and 48.7 mV (well 111760-MW-4). The range of ORP values present within the plume (wells 111760-MW-1 and 111760-MW-3) is indicative of reducing conditions.

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Concentrations of NO_3^- were below the LRL of 500 $\mu\text{g/L}$ in all samples collected from the Site, indicating the natural supply of NO_3^- is exhausted.

Concentrations of SO_4^{2-} ranged from 7,090,000 $\mu\text{g/L}$ (well 111760-MW-5) to 7,530,000 $\mu\text{g/L}$ (well 111760-MW-4). Because gypsum was amended to the soil backfill during pit reclamation activities, SO_4^{2-} concentrations may not be a good indicator of the natural attenuation processes at the Site.

Concentrations of Fe^{2+} ranged from 280 $\mu\text{g/L}$ (well 111760-MW-4) to 88,800 $\mu\text{g/L}$ (well 111760-MW-1). Higher concentrations of metabolic by-product Fe^{2+} were generally found in wells with higher petroleum hydrocarbon concentrations such as wells 111760-MW-1 and 111760-MW-3 (and vice versa). This indicates that Fe^{3+} reduction may be occurring within the plume.

Concentrations of CH_4 ranged from below the LRL of 0.50 $\mu\text{g/L}$ (wells 111760-MW-2 and 111760-MW-4) to 51 $\mu\text{g/L}$ (wells 111760-MW-1 and 111760-MW-3). Higher concentrations of metabolic by-product CH_4 were generally found in wells with higher petroleum hydrocarbon concentrations such as wells 111760-MW-1 and 111760-MW-3 (and vice versa). This indicates that CO_2 reduction may be occurring within the plume.

The MNA evaluation suggests that subsurface conditions are generally favorable for intrinsic biodegradation of petroleum hydrocarbons by anaerobic degradation, which is likely contributing to reduction in petroleum hydrocarbon concentrations. It appears that oxygen and NO_3^- have been nearly consumed as electron acceptors; therefore, Fe^{3+} reduction is likely the dominant biodegradation process within the dissolved-phase petroleum hydrocarbon plume.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

- Free product has never been detected at the Site.
- Geochemical data provide evidence for the contribution of biodegradation processes to the natural attenuation of the dissolved-phase benzene plume. Reducing conditions are likely present, as indicated by ORP values within the plume, and geochemical data indicate reduction of Fe^{3+} appears to be the mechanism currently driving bioremediation at the Site.
- Dissolved-phase benzene data provide spatial and temporal evidence of natural attenuation at the Site. Overall, the dissolved-phase benzene plume is isolated to the area directly around well 111760-MW-1; whereas, previously, a benzene concentration equal to the Allowable Concentration was detected at well 111760-MW-3.
- Well 111760-MW-1 is the only well with concentrations above the Allowable Concentrations. Though some variability is observed, an overall decreasing benzene concentration trend is observed in well 111760-MW-1.

Recommendations

Groundwater concentrations for all constituents of concern at MW-2 through MW-5 have been less than method reporting limits and/or Allowable Concentrations for the past five years (8 Sampling Events). In addition, a decreasing concentration trend observed at MW-1 further

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supports that groundwater elevated above Allowable Concentrations is localized to the former pit boundary and the area directly around MW-1.

- Based on the observations above, Stantec would like to request that groundwater monitoring wells MW-2, MW-3, MW-4, and MW-5 be eliminated from the sampling program.

Groundwater monitoring will continue at the Site on an annual basis through 2016. Laboratory analysis will continue to include TPH, BTEX compounds, chloride, TDS, and MNA parameters for the monitor well.

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

Sincerely,

Stantec Consulting Services Inc.



Brent Lucyk

Associate Project Manager

Phone: (231) 384-6357

Brent.Lucyk@stantec.com

Attachments:

Table 1 – Groundwater Monitoring Data and Analytical Results

Figure 1 – Site Location Map

Figure 2 – Site Plan Showing Groundwater Elevation Contours – Second Quarter 2015

Figure 3 – Groundwater Flow Direction Rose Diagram – Second Quarter 2015

Figure 4 – Site Plan Showing Predominant Groundwater Flow Direction

Figure 5 – Site Plan Showing Groundwater Concentrations – Second Quarter 2015

Attachment A – Stantec Field Data Sheets – Second Quarter 2015

Attachment B – Certified Laboratory Analysis Reports and Chain-of-Custody Documents

Attachment C – Hydrographs

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LIMITATIONS

This document entitled 2015 Annual Groundwater Monitoring 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.

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Brent Lucyk
Associate Project Manager

TABLES

Table 1
Groundwater Monitoring Data and Analytical Results
Federal 23-12 (Pit #111760)
South Canyon Field
Garfield County, CO

Well ID	Sample Date	TOC Elevation (feet above msl)	Depth to GW (feet below TOC)	GW Elevation (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)
Table 910-1 Allowable Concentrations					--	--	--	--	5	1,000	700	--	--	10,000	--	--	--	--	--	--	--	--
111760-MW-1	06/01/10	5356.37	43.27	5313.10	5,000	600	<100	5,600	690	1,100	40	390	100	490	--	--	0.69	-83.4	<200	6,270,000	33,700	--
	11/15/10		44.43	5311.94	1,200	400	<100	1,600	40	19	2	18	5	23	161	10,492	6.55	-92.3	<200	6,310,000	34,900	--
	03/23/11		44.20	5312.17	700	200	<100	900	57	19	<1	10	5	15	160	9,696	1.36	-125.7	<200	6,560,000	31,200	--
	09/13/11		44.71	5311.66	500	200	<100	700	42	15	<1	5	3	8	160	9,846	1.67	-103.1	<500	6,410,000	26,300	--
	03/25/13		47.20	5309.17	2,400	100	<100	2,500	33	2	<1	<2	<1	<2	173	2,354	0.53	-129.7	<500	6,780,000	32,000	1.3
	10/22/13		47.30	5309.07	1,600	700	200	2,500	200	<10	<10	<20	<10	<20	174	10,896	--	-128.4	<500	6,670,000	64,100	42
	05/13/14		47.40	5308.97	2,200	300	200	2,700	169	2	<1	<2	1	1	172	10,700	1.11	-153.2	<500	6,600,000	51,800	50
	09/23/14		48.14	5308.23	2,500	1,000	<200	3,500	13	2	<1	<2	2	2	171	11,064	1.46	-130.6	<500	7,880,000	39,300	20
	05/12/15		48.56	5307.81	3,200	600	<100	3,800	102	<3	<3	<5	<3	<5	176	10,930	0.68	-115.3	<500	7,280,000	88,800	51
111760-MW-2	06/02/10	5356.16	42.98	5313.18	<200	<100	<100	<200	<1	<1	<1	<2	<1	<2	--	--	0.81	90.8	<200	6,290,000	2,810	--
	11/15/10		44.14	5312.02	<200	<100	<100	<200	<1	<1	<1	<2	<1	<2	--	--	6.17	11.7	--	--	--	--
	03/23/11		43.92	5312.24	<200	<100	<100	<200	<1	<1	<1	<2	<1	<2	154	8,232	2.77	12.1	<200	6,300,000	5,200	--
	09/13/11		44.43	5311.73	<200	<100	<100	<200	<1	<1	<1	<2	<1	<2	157	9,688	1.08	-13.4	<500	6,210,000	4,100	--
	03/25/13		45.50	5310.66	<200	<100	<100	<200	<1	<1	<1	<2	<1	<2	172	10,484	1.41	-71.3	<500	6,630,000	5,380	1.3
	10/22/13		47.00	5309.16	<200	<100	<100	<200	<1	<1	<1	<2	<1	<2	171	10,756	--	-26.4	<500	6,390,000	8,080	1.3
	05/13/14		47.10	5309.06	<200	200	400	600	<1	<1	<1	<2	<1	<2	165	10,600	2.01	-30.8	<500	6,370,000	5,200	1.2
	09/23/14		47.80	5308.36	<200	<100	<100	<200	<1	<1	<1	<2	<1	<2	164	10,908	2.59	99.0	<500	7,610,000	5,200	1.9
	05/12/15		48.28	5307.88	<200	<100	<100	<200	<1	<1	<1	<2	<1	<2	170	10,830	3.29	42.6	<500	7,330,000	860	<0.50
111760-MW-3	06/02/10	5354.99	42.63	5312.36	500	200	<100	700	5	1	<1	<2	<1	<2	--	--	1.89	-49.1	<200	6,110,000	13,700	--
	11/15/10		43.80	5311.19	400	100	<100	500	3	<1	<1	<2	<1	<2	--	--	5.90	-67.6	--	--	--	--
	03/23/11		43.52	5311.47	300	<100	<100	300	1	<1	<1	<2	<1	<2	162	9,696	3.37	-62.7	<200	6,640,000	26,400	--
	09/13/11		44.06	5310.93	<200	<100	<100	<200	<1	<1	<1	<2	<1	<2	160	9,786	1.75	-66.0	<500	6,440,000	11,400	--
	03/25/13		45.40	5309.59	400	<100	<100	400	<1	<1	<1	<2	<1	<2	172	10,512	0.73	-104.4	<500	6,680,000	16,000	1.8
	10/22/13		46.50	5308.49	700	100	<100	800	<1	<1	<1	<2	<1	<2	172	10,712	--	-97.7	<500	6,520,000	28,600	320
	05/13/14		46.70	5308.29	<200	200	200	400	<1	<1	<1	<2	<1	<2	167	10,400	1.60	-112.5	<500	6,290,000	25,900	90
	09/23/14		47.41	5307.58	400	<100	<100	400	<1	<1	<1	<2	<1	<2	169	10,956	1.58	-93.0	<500	7,900,000	33,400	42
	05/12/15		47.85	5307.14	300	100	<100	400	<1	<1	<1	<2	<1	<2	170	10,500	1.83	-83.6	<500	7,500,000	25,600	51
111760-MW-4	06/02/10	5354.12	41.34	5312.78	<200	<100	<100	<200	<1	<1	<1	<2	<1	<2	--	--	1.23	-20.5	<200	6,420,000	2,300	--
	11/15/10		42.44	5311.68	<200	<100	<100	<200	<1	<1	<1	<2	<1	<2	153	9,067	6.84	-50.1	<200	6,200,000	1,710	--
	03/23/11		42.22	5311.90	<200	<100	<100	<200	<1	<1	<1	<2	<1	<2	158	9,340	3.02	-14.9	<200	6,670,000	3,980	--
	09/13/11		42.71	5311.41	<200	<100	<100	<200	<1	<1	<1	<2	<1	<2	155	10,168	2.01	115.6	<500	6,290,000	4,280	--
	03/25/13	5361.62	44.00	5310.12	<200	<100	<100	<200	<1	<1	<1	<2	<1	<2	170	10,504	0.99	-62.0	<500	6,740,000	560	0.51
	10/22/13		50.77	5310.85	<200	<100	<100	<200	<1	<1	<1	<2	<1	<2	170	10,788	--	76.2	<500	6,650,000	480	0.84
	05/14/14		47.50	5314.12	<200	100	200	300	<1	<1	<1	<2	<1	<2	165	10,700	2.74	65.9	<500	6,430,000	140	<0.50
	09/23/14		48.20	5313.42	<200	<100	<100	<200	<1	<1	<1	<2	<1	<2	168	11,128	3.95	169.0	<500	8,040,000	680	2.4
	05/12/15		48.60	5313.02	<200	<100	<100	<200	<1	<1	<1	<2	<1	<2	171	10,890	3.79	48.7	<500	7,530,000	280	<0.50
111760-MW-5	11/15/10	5352.58	44.32	5308.26	<200	<100	<100	<200	<1	<1	<1	<2	<1	<2	--	--	6.40	18.1	--	--	--	--
	03/23/11		44.05	5308.53	<200	<100	<100	<200	<1	<1	<1	<2	<1	<2	152	10,513	3.44	20.7	<200	6,430,000	2,450	--
	09/13/11		44.57	5308.01	<200	<100	<100	<200	<1	<1	<1	<2	<1	<2	151	9,848	2.23	131.9	<500	6,350,000	890	--
	03/25/13		45.75	5306.83	<200	<100	<100	<200	<1	<1	<1	<2	<1	<2	166	10,596	0.74	-37.1	<500	6,750,000	240	0.66
	10/22/13		46.95	5305.63	<200	<100	<100	<200	<1	<1	<1	<2	<1	<2	166	10,852	--	-26.1	<500	6,430,000	790	3.8
	05/14/14		47.10	5305.48	<200	200	200	400	<1	<1	<1	<2	<1	<2	157	10,500	2.99	21.7	<500	6,300,000	720	43
	09/23/14		47.81	5304.77	<200	<100	<100	<200	<1	<1	<1	<2	<1	<2	166	11,144	1.96	25.7	<500	6,990,000	2,420	41
	05/12/15		48.22	5304.36	<200	<100	<100	<200	<1	<1	<1	<2	<1	<2	166	10,780	3.14	39.3	<500	7,090,000	2,040	22
Average for wells within plume ¹																	1.45	-99.9	<500	6,755,294	34,300	66.9
Average for wells outside plume ¹																	2.31	24.5	<500	6,685,000	2,533	9.99

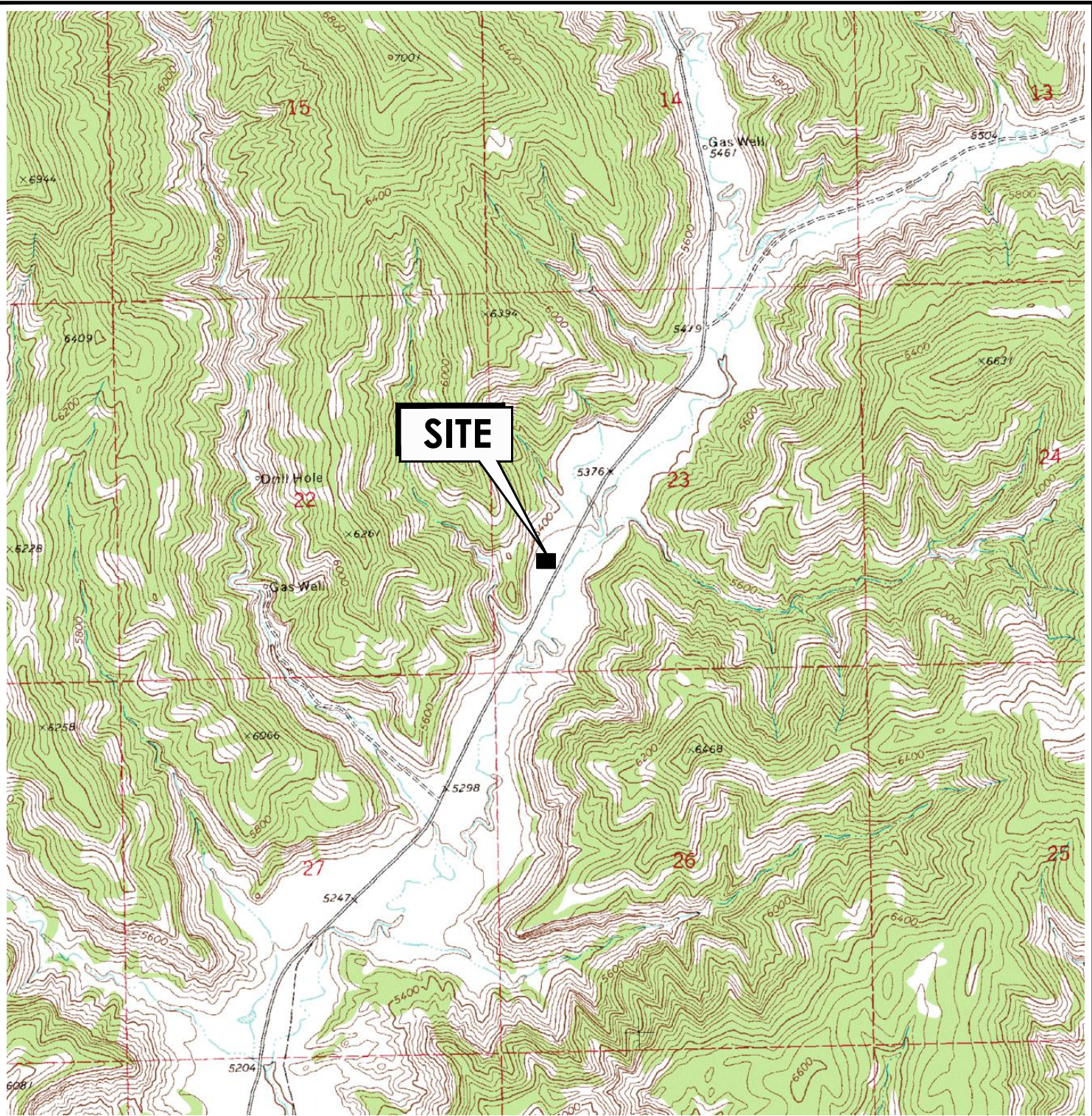
Explanations:

DO = dissolved oxygen
GW = groundwater
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

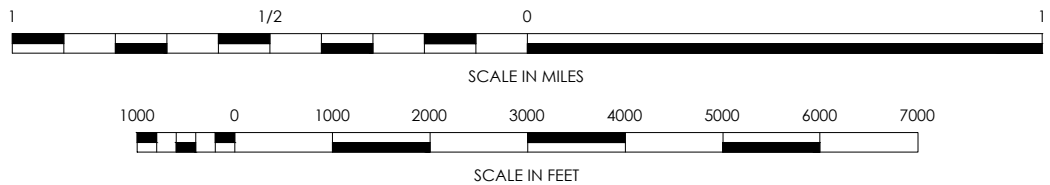
Notes:

Values equal to or exceeding Allowable Concentrations are in **blue bold** text.
¹ Anomalous high DO levels were measured at all wells during November 2010; therefore, these DO levels were excluded from the average.

FIGURES



COLORADO



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

FOR:
CHEVRON
FEDERAL 23-12 (PIT #111760)
SOUTH CANYON FIELD
GARFIELD COUNTY, CO

JOB NUMBER:
213201183

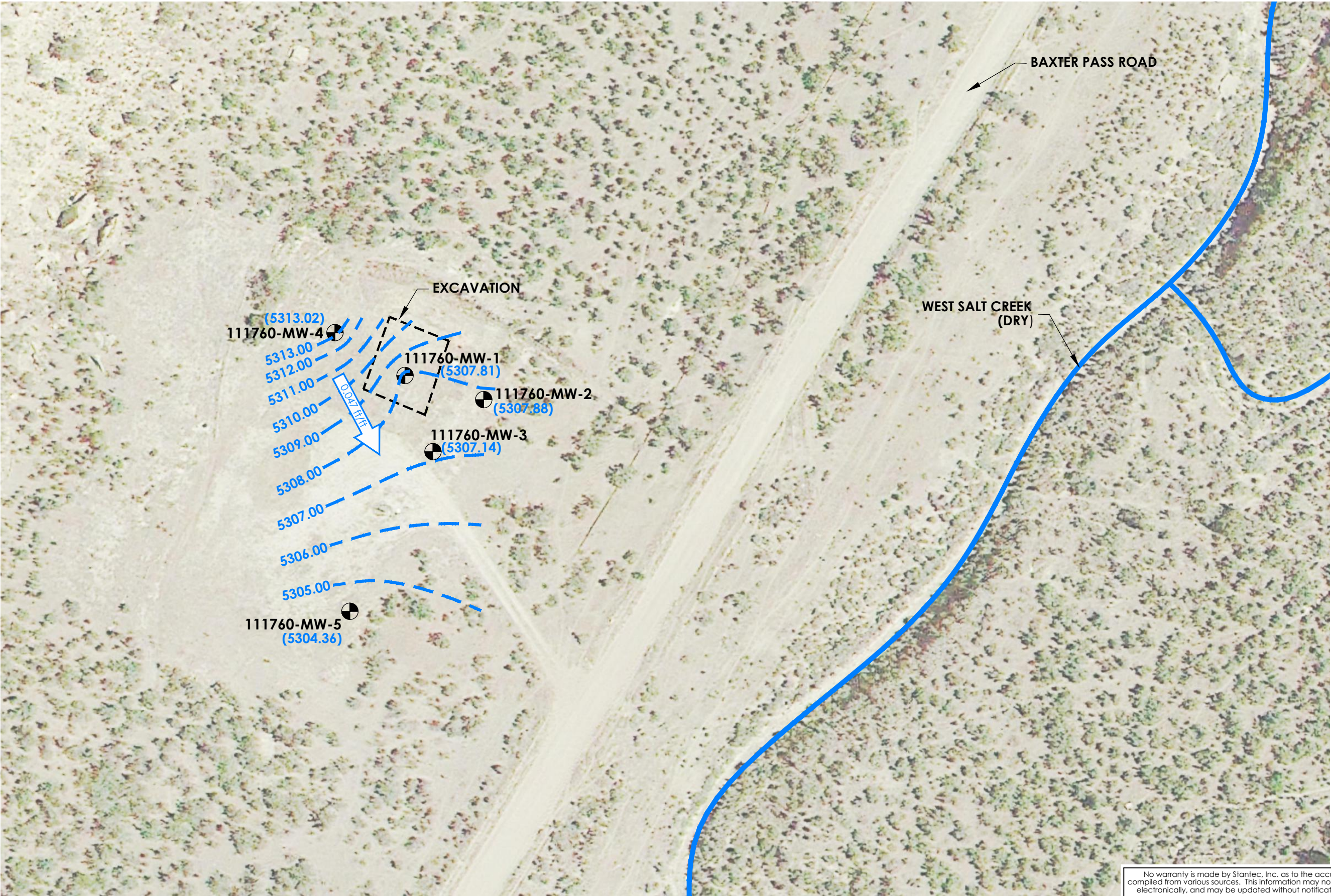
DRAWN BY:
JRO

CHECKED BY:
EEO/MRK

APPROVED BY:
BAL

FIGURE:
1
DATE:
11/03/15

SITE LOCATION MAP



LEGEND

MONITOR WELL LOCATION

(5307.81)

GROUNDWATER ELEVATION
(FEET ABOVE MEAN SEA LEVEL)

GROUNDWATER ELEVATION CONTOUR
(FEET ABOVE MEAN SEA LEVEL)

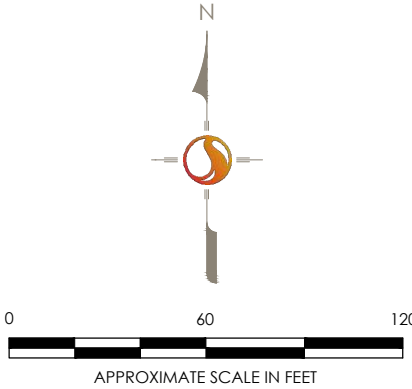
GRADIENT

APPROXIMATE DIRECTION OF
GROUNDWATER FLOW. HYDRAULIC
GRADIENT AVERAGES APPROXIMATELY
0.047 FEET PER FOOT (ft/ft)

NOTES

GROUNDWATER ELEVATION DATA
WERE COLLECTED ON MAY 12, 2015

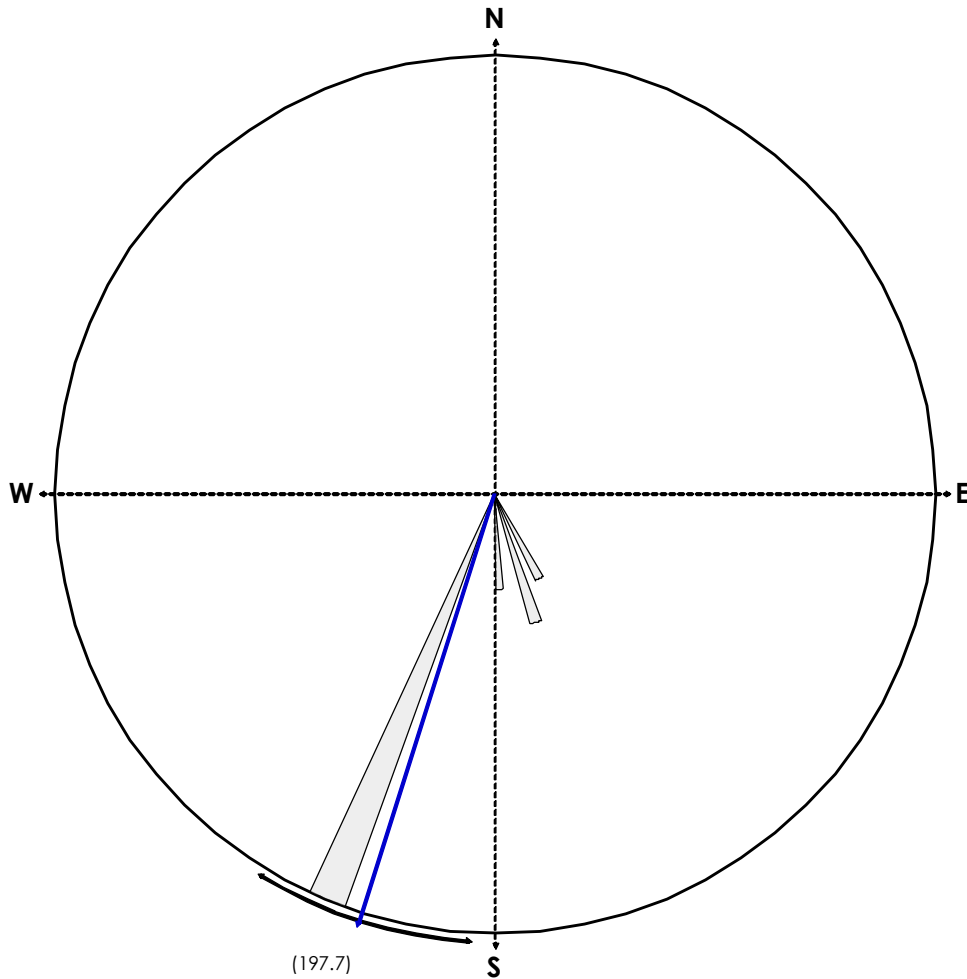
GROUNDWATER CONTOURS WERE
CREATED USING SURFER VERSION 11.6



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REFERENCE: THIS FIGURE WAS CREATED USING GOOGLE EARTH IMAGE 2012.

<div>2321 Club Meridian Drive, Suite E Okemos, MI 48864 PHONE: (517)349-9499 FAX: (517)349-6863</div>	FOR: <div>CHEVRON FEDERAL 23-12 (PIT #111760) SOUTH CANYON FIELD GARFIELD COUNTY, CO</div>		SITE PLAN SHOWING GROUNDWATER ELEVATION CONTOURS - SECOND QUARTER 2015		FIGURE: <div>2</div>
	JOB NUMBER: <div>213201183</div>	DRAWN BY: <div>JRO</div>	CHECKED BY: <div>EEO/MRK</div>	APPROVED BY: <div>BAL</div>	DATE: <div>11/03/15</div>



EQUAL AREA PLOT

Number of Points 26
 Class Size 5
 Vector Mean 197.70
 Vector Magnitude 25.15
 Consistency Ratio 0.97



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

FOR:

CHEVRON
 FEDERAL 23-12 (PIT #111760)
 SOUTH CANYON FIELD
 GARFIELD COUNTY, CO

JOB NUMBER:
 213201183

DRAWN BY:
 JRO

GROUNDWATER FLOW DIRECTION
 ROSE DIAGRAM -
 SECOND QUARTER 2015

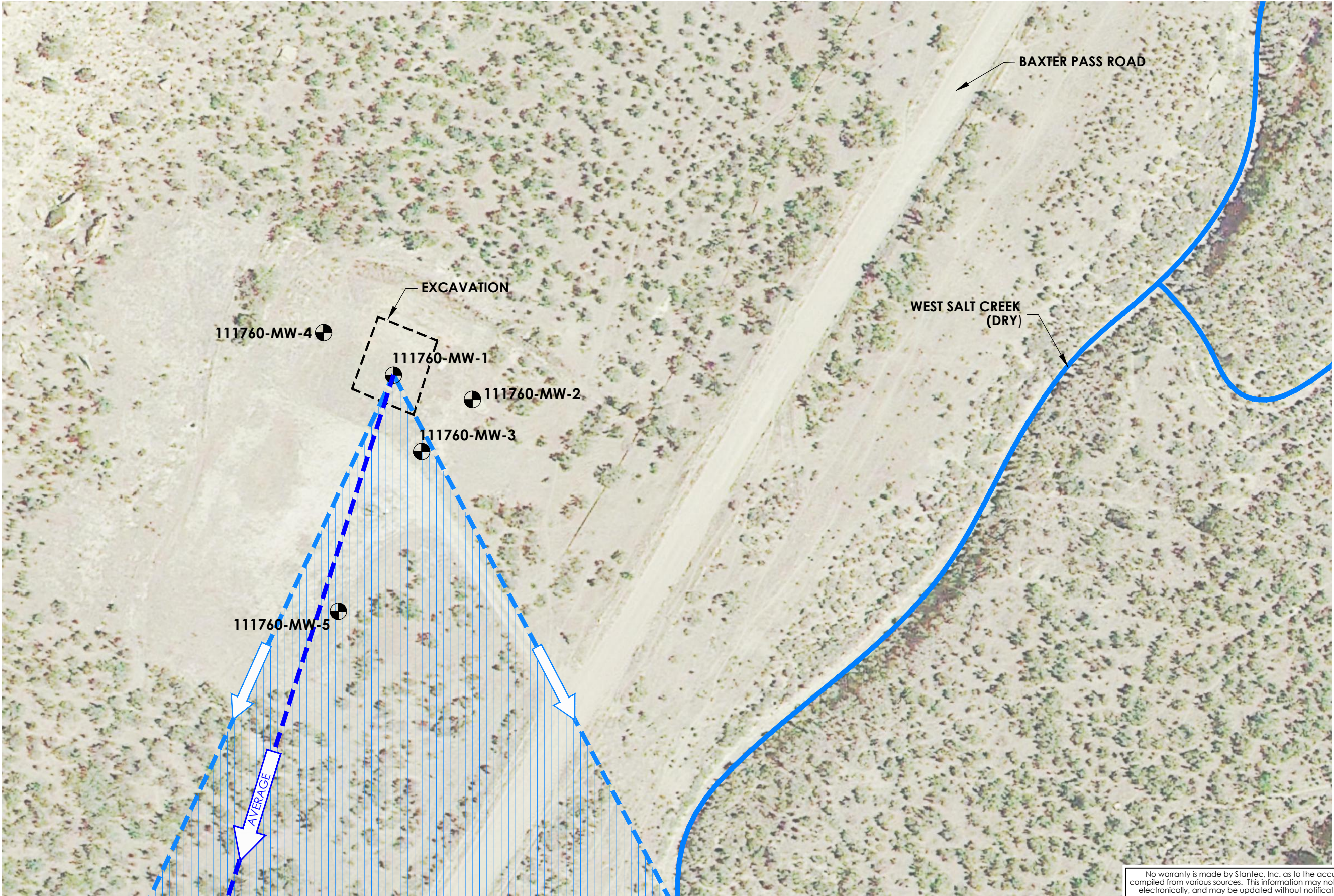
CHECKED BY:
 EEO/MRK

APPROVED BY:
 BAL


FIGURE:


3


DATE:
 11/03/15

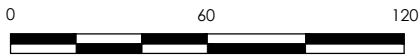


LEGEND

 MONITOR WELL LOCATION

 RANGE OF APPROXIMATE DIRECTION OF GROUNDWATER FLOW (NOVEMBER 2010 THROUGH SEPTEMBER 2011, MARCH & OCTOBER 2013, MAY & SEPTEMBER 2014, AND MAY 2015)




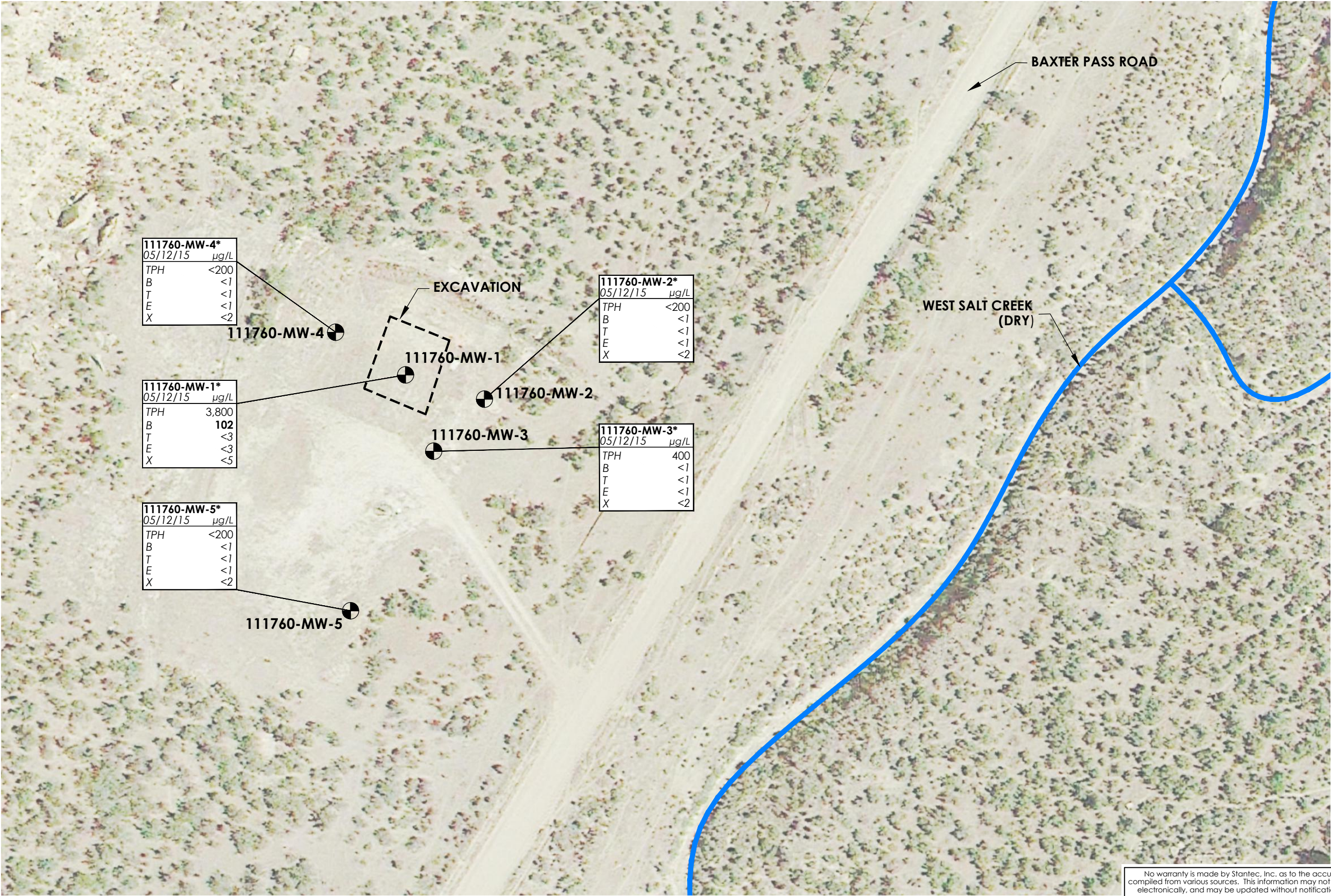


APPROXIMATE SCALE IN FEET

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REFERENCE: THIS FIGURE WAS CREATED USING GOOGLE EARTH IMAGE 2012.

 2321 Club Meridian Drive, Suite E Okemos, MI 48864 PHONE: (517)349-9499 FAX: (517)349-6863	FOR: CHEVRON FEDERAL 23-12 (PIT #111760) SOUTH CANYON FIELD GARFIELD COUNTY, CO		SITE PLAN SHOWING PREDOMINANT GROUNDWATER FLOW DIRECTION		FIGURE: 4
	JOB NUMBER: 213201183	DRAWN BY: JRO	CHECKED BY: EEO/MRK	APPROVED BY: BAL	DATE: 11/03/15



LEGEND

MONITOR WELL LOCATION

ANALYTES

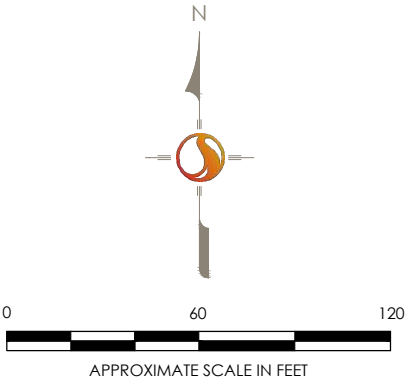
TPH	TOTAL PETROLEUM HYDROCARBONS
B	BENZENE
T	TOLUENE
E	ETHYLBENZENE
X	TOTAL XYLENES

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

µg/L = MICROGRAMS PER LITER


NOTES

BOLD TEXT INDICATES ABOVE ALLOWABLE CONCENTRATIONS



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REFERENCE: THIS FIGURE WAS CREATED USING GOOGLE EARTH IMAGE 2012.

 2321 Club Meridian Drive, Suite E Okemos, MI 48864 PHONE: (517)349-9499 FAX: (517)349-6863	FOR: CHEVRON FEDERAL 23-12 (PIT #111760) SOUTH CANYON FIELD GARFIELD COUNTY, CO		SITE PLAN SHOWING GROUNDWATER CONCENTRATIONS - SECOND QUARTER 2015		FIGURE: 5
	JOB NUMBER: 213201183	DRAWN BY: JRO	CHECKED BY: EEO/MRK	APPROVED BY: BAL	DATE: 11/03/15

ATTACHMENT A

Stantec Field Data Sheets – Second Quarter 2015

STANTEC
GROUNDWATER SAMPLING FIELD DATA SHEET

Stantec PN: 213201183 DATE: 5/12/15 WELL NO. 11760-mw1
FACILITY NAME: Chevron - South Canyon TEMPERATURE: 72 °F or °C
FIELD PERSONNEL: SW/BC WEATHER: clear, sunny

FIELD MEASUREMENTS:

A. Static Water Level (SWL) below top of casing/piezometer: 48.56 FT. or IN.
B. Thickness of Free Product, if present: _____ Inches _____ FT. or IN.
C. Total Depth of well (TD) from top of casing/piezometer: 55.05 FT. or IN.
D. Height of Water Column in casing (h = TD - SWL): 6.49 FT. or IN.
E. Useful approximate Purge Volumes (PV) per foot of water column for common casing sizes:

	3 Well Vols.	5 Well Vols.			
2" Diameter =	0.5 gals/ft	0.82 gals/ft	<u>6.49</u>	x feet of water	<u>3.245</u> = <u>1.08</u> PV (Gal)
4" Diameter =	2.0 gals/ft	3.25 gals/ft		x feet of water	= _____ PV (Gal)
6" Diameter =	4.4 gals/ft	7.35 gals/ft		x feet of water	= _____ PV (Gal)

PURGING METHOD: Disposable bailer

DURATION: _____

OBSERVATIONS:

	Time	Turbidity	Color	Sheen	DO (mg/L)	pH	ORP (mv)	Temp. °C	Conduct. (ms/cm)	SWL
1st Volume:	<u>1230</u>	<u>moderate</u>	<u>brown</u>	<u>no</u>	<u>1.94</u>	<u>7.34</u>	<u>-109.9</u>	<u>15.47</u>	<u>10.64</u>	<u>48-</u>
2nd Volume:	<u>1234</u>	<u>moderate</u>	<u>brown</u>	<u>no</u>	<u>1.51</u>	<u>7.35</u>	<u>-111.6</u>	<u>15.34</u>	<u>10.62</u>	<u>48-</u>
3rd Volume:	<u>1237</u>	<u>moderate</u>	<u>brown</u>	<u>no</u>	<u>0.68</u>	<u>7.35</u>	<u>-115.3</u>	<u>15.28</u>	<u>10.41</u>	<u>48-</u>
4th Volume:	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
Addl. Volumes:	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____

TOTAL VOLUME OF WATER PURGED FROM WELL: _____

PURGE WATER STORED/DISPOSED OF WHERE/HOW: _____

SAMPLES COLLECTED: Depth to Water at time of sample collection: _____

Sample Number(s)	Time	Size/Number of Container(s)	Preservative
<u>11760-MW1</u>	<u>1240</u>	<u>40ml x 3 6</u>	<u>HCL</u> <u>BTEX</u>
<u>DUP-1-051215</u>	_____	<u>40ml x 3 6</u>	<u>HCL</u> <u>TPH (GRO, DRO, ORO)</u>
_____	_____	<u>500ml x 1 2</u>	<u>None</u> <u>Chloride/TDS, nitrate, sulf</u>
_____	_____	<u>1 L x 1 4</u>	<u>None</u> _____
_____	_____	<u>40ml x 3 6</u>	<u>HCL</u> <u>Ferrous Iron</u>

COMMENTS:

No odor.

Casing Capacities:
2-inch hole.....0.16 gal/in ft.
4-inch hole.....0.65 gal/in ft.
6.5-inch hole.....1.70 gal/in ft.
8-inch hole.....2.60 gal/in ft.
10-inch hole.....4.10 gal/in ft.

Recharge Calculation at Time of Sample Collection:

Total Depth of Well: _____ Ft
Original Water Column: _____ x 0.80 = _____ (_____) Ft

Collect sample when Depth to Water measures Less than or equal to: _____ Ft

Signature: Jarred White

STANTEC
GROUNDWATER SAMPLING FIELD DATA SHEET

Stantec PN: 213201183 DATE: 5/12/15 WELL NO. 11760-MW-2
FACILITY NAME: Chevron - South Canyon TEMPERATURE: 60 °F or °C
FIELD PERSONNEL: SW/BC WEATHER: clear sunny

FIELD MEASUREMENTS:

- A. Static Water Level (SWL) below top of casing/piezometer: 48.28 FT. or IN.
B. Thickness of Free Product, if present: _____ Inches _____ FT. or IN.
C. Total Depth of well (TD) from top of casing/piezometer: 54.9 FT. or IN.
D. Height of Water Column in casing (h = TD - SWL): 6.62 FT. or IN.
E. Useful approximate Purge Volumes (PV) per foot of water column for common casing sizes:

	3 Well Vols.	5 Well Vols.				
2" Diameter =	0.5 gals/ft	0.82 gals/ft	6.62	x feet of water	3.31	= 1.10 PV (Gal)
4" Diameter =	2.0 gals/ft	3.25 gals/ft		x feet of water		= _____ PV (Gal)
6" Diameter =	4.4 gals/ft	7.35 gals/ft		x feet of water		= _____ PV (Gal)

PURGING METHOD: Disposable bailer

DURATION: _____

OBSERVATIONS:

	Time	Turbidity	Color	Sheen	DO (mg/L)	pH	ORP (mv)	Temp. °C	Conduct. (ms/cm)	SWL
1st Volume:	<u>1054</u>	<u>moderate</u>	<u>brown</u>	<u>no</u>	<u>3.48</u>	<u>7.17</u>	<u>49.4</u>	<u>14.36</u>	<u>10.36</u>	<u>48</u>
2nd Volume:	<u>1058</u>	<u>moderate</u>	<u>brown</u>	<u>no</u>	<u>3.03</u>	<u>7.16</u>	<u>37.8</u>	<u>14.40</u>	<u>10.35</u>	<u>48</u>
3rd Volume:	<u>1101</u>	<u>moderate</u>	<u>brown</u>	<u>no</u>	<u>3.29</u>	<u>7.16</u>	<u>42.6</u>	<u>14.42</u>	<u>10.36</u>	<u>48</u>
4th Volume:	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
Addl. Volumes:	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____

TOTAL VOLUME OF WATER PURGED FROM WELL: _____

PURGE WATER STORED/DISPOSED OF WHERE/HOW: _____

SAMPLES COLLECTED: Depth to Water at time of sample collection: _____

Sample Number(s)	Time	Size/Number of Container(s)	Preservative
<u>11760-MW-2</u>	<u>1102</u>	<u>40 ml x 3</u>	<u>HCL</u> <u>BTEX</u>
		<u>40 ml x 3</u>	<u>HCL</u> <u>TPH (GRO, DRO, ORO)</u>
		<u>500 ml x 1</u>	<u>None</u> <u>Chloride/TDS, nitrate, sulf</u>
		<u>1 L x 2</u>	<u>None</u>
		<u>40 ml x 3</u>	<u>HCL</u> <u>Ferrous Iron</u>

COMMENTS:

No odor

Casing Capacities:
2-inch hole.....0.16 gal/lin ft.
4-inch hole.....0.65 gal/lin ft.
6.5-inch hole.....1.70 gal/lin ft.
8-inch hole.....2.60 gal/lin ft.
10-inch hole.....4.10 gal/lin ft.

Recharge Calculation at Time of Sample Collection:

Total Depth of Well: _____ Ft
Original Water Column: _____ x 0.80 = _____ () Ft

Collect sample when Depth to Water measures Less than or equal to: _____ Ft

Signature: Jared White

STANTEC
GROUNDWATER SAMPLING FIELD DATA SHEET

Stantec PN: 213201183 DATE: 5/12/15 WELL NO. 111760-MW3
FACILITY NAME: Chevron - South Canyon TEMPERATURE: 68 °F or °C
FIELD PERSONNEL: SW/BC WEATHER: Clear, sunny

FIELD MEASUREMENTS:

A. Static Water Level (SWL) below top of casing/piezometer: 47.85 FT. or IN.
B. Thickness of Free Product, if present: _____ Inches _____ FT. or IN.
C. Total Depth of well (TD) from top of casing/piezometer: 53.4 FT. or IN.
D. Height of Water Column in casing (h = TD - SWL): 5.55 FT. or IN.
E. Useful approximate Purge Volumes (PV) per foot of water column for common casing sizes:

	<u>3 Well Vols.</u>	<u>5 Well Vols.</u>			
2" Diameter =	0.5 gals/ft	0.82 gals/ft	<u>5.55</u>	x feet of water	<u>2.775</u> = <u>0.925</u> PV (Gal)
4" Diameter =	2.0 gals/ft	3.25 gals/ft		x feet of water	= _____ PV (Gal)
6" Diameter =	4.4 gals/ft	7.35 gals/ft		x feet of water	= _____ PV (Gal)

PURGING METHOD: Disposable bailer

DURATION: _____

OBSERVATIONS:

	<u>Time</u>	<u>Turbidity</u>	<u>Color</u>	<u>Sheen</u>	<u>DO (mg/L)</u>	<u>pH</u>	<u>ORP (mv)</u>	<u>Temp. °C</u>	<u>Conduct. (mc/cm)</u>	<u>SWL</u>
1st Volume:	<u>1204</u>	<u>moderate</u>	<u>brown</u>	<u>no</u>	<u>2.53</u>	<u>7.29</u>	<u>-74.4</u>	<u>14.87</u>	<u>10.41</u>	<u>47-</u>
2nd Volume:	<u>1207</u>	<u>moderate</u>	<u>brown</u>	<u>no</u>	<u>2.36</u>	<u>7.25</u>	<u>-80.1</u>	<u>14.61</u>	<u>10.35</u>	<u>47-</u>
3rd Volume:	<u>1210</u>	<u>moderate</u>	<u>brown</u>	<u>no</u>	<u>1.83</u>	<u>7.22</u>	<u>-83.6</u>	<u>14.81</u>	<u>10.35</u>	<u>47-</u>
4th Volume:	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
Addl. Volumes:	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____

TOTAL VOLUME OF WATER PURGED FROM WELL: _____

PURGE WATER STORED/DISPOSED OF WHERE/HOW: _____

SAMPLES COLLECTED: Depth to Water at time of sample collection: _____

Sample Number(s)	Time	Size/Number of Container(s)	Preservative
<u>111760-MW3</u>	<u>1212</u>	<u>40 ml x 3</u>	<u>HCL</u> <u>BTEX</u>
		<u>40 ml x 3</u>	<u>HCL</u> <u>TPH (GRO, DRO, ORO)</u>
		<u>500 ml x 1</u>	<u>None</u> <u>Chloride/TDS, nitrate, sulf</u>
		<u>1 L x 2</u>	<u>None</u>
		<u>40 ml x 3</u>	<u>HCL</u> <u>Ferrous Iron</u>

COMMENTS:

No odor

Casing Capacities:

2-inch hole.....0.16 gal/lin ft.
4-inch hole.....0.65 gal/lin ft.
6.5-inch hole.....1.70 gal/lin ft.
8-inch hole.....2.60 gal/lin ft.
10-inch hole.....4.10 gal/lin ft.

Recharge Calculation at Time of Sample Collection:

Total Depth of Well: _____ Ft
Original Water Column: _____ x 0.80 = _____ Ft

Collect sample when Depth to Water measures Less than or equal to: _____ Ft

Signature: Journal With

STANTEC
GROUNDWATER SAMPLING FIELD DATA SHEET

Stantec PN: 213201183 DATE: 5/12/15 WELL NO. 111760-MW4
FACILITY NAME: Chevron - South Canyon TEMPERATURE: 65 °F or °C
FIELD PERSONNEL: SW/BC WEATHER: clear, sunny

FIELD MEASUREMENTS:

A. Static Water Level (SWL) below top of casing/piezometer: 48.60 FT. or IN.
B. Thickness of Free Product, if present: _____ Inches _____ FT. or IN.
C. Total Depth of well (TD) from top of casing/piezometer: 54.2 FT. or IN.
D. Height of Water Column in casing (h = TD - SWL): 5.6 FT. or IN.
E. Useful approximate Purge Volumes (PV) per foot of water column for common casing sizes:

	<u>3 Well Vols.</u>	<u>5 Well Vols.</u>	
2" Diameter =	0.5 gals/ft	0.82 gals/ft	<u>5.6</u> x feet of water <u>2.8</u> = <u>0.93</u> PV (Gal)
4" Diameter =	2.0 gals/ft	3.25 gals/ft	x feet of water _____ = _____ PV (Gal)
6" Diameter =	4.4 gals/ft	7.35 gals/ft	x feet of water _____ = _____ PV (Gal)

PURGING METHOD: Disposable bailer

DURATION: _____

OBSERVATIONS:

	Time	Turbidity	Color	Sheen	DO (mg/L)	pH	ORP (mv)	Temp. °C	Conduct. (mc/cm)	SWL
1st Volume:	<u>1130</u>	<u>moderate</u>	<u>brown</u>	<u>no</u>	<u>4.41</u>	<u>7.23</u>	<u>45.1</u>	<u>14.80</u>	<u>10.41</u>	<u>48-</u>
2nd Volume:	<u>1133</u>	<u>moderate</u>	<u>brown</u>	<u>no</u>	<u>4.14</u>	<u>7.18</u>	<u>46.4</u>	<u>14.61</u>	<u>10.42</u>	<u>48-</u>
3rd Volume:	<u>1136</u>	<u>moderate</u>	<u>brown</u>	<u>no</u>	<u>3.79</u>	<u>7.17</u>	<u>48.7</u>	<u>14.77</u>	<u>10.42</u>	<u>48-</u>
4th Volume:	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
Addl. Volumes:	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____

TOTAL VOLUME OF WATER PURGED FROM WELL: _____

PURGE WATER STORED/DISPOSED OF WHERE/HOW: _____

SAMPLES COLLECTED: Depth to Water at time of sample collection: _____

Sample Number(s)	Time	Size/Number of Container(s)	Preservative
<u>111760-MW4</u>	<u>1138</u>	<u>40 ml x 3</u>	<u>HCL</u> <u>BTEX</u>
		<u>40 ml x 3</u>	<u>HCL</u> <u>TPH (GRO, DRO, ORO)</u>
		<u>500 ml x 1</u>	<u>None</u> <u>Chloride/TDS, nitrate, sulf</u>
		<u>1 L x 2</u>	<u>None</u>
		<u>40 ml x 3</u>	<u>HCL</u> <u>Ferrous Iron</u>

COMMENTS:

No odor.

Casing Capacities:

2-inch hole.....0.16 gal/lin ft.
4-inch hole.....0.65 gal/lin ft.
6.5-inch hole.....1.70 gal/lin ft.
8-inch hole.....2.60 gal/lin ft.
10-inch hole.....4.10 gal/lin ft.

Recharge Calculation at Time of Sample Collection:

Total Depth of Well: _____ Ft
Original Water Column: _____ x 0.80 = _____ () Ft

Collect sample when Depth to Water measures Less than or equal to: _____ Ft

Signature: James White

STANTEC
GROUNDWATER SAMPLING FIELD DATA SHEET

Stantec PN: 213201183 DATE: 5/12/15 WELL NO. 111760-MW-5
FACILITY NAME: Chevron - South Canyon TEMPERATURE: 50 °F or °C
FIELD PERSONNEL: SW/BC WEATHER: Partly cloudy

FIELD MEASUREMENTS:

A. Static Water Level (SWL) below top of casing/piezometer: 48.22 FT. or IN.
B. Thickness of Free Product, if present: _____ Inches _____ FT. or IN.
C. Total Depth of well (TD) from top of casing/piezometer: 55.00 FT. or IN.
D. Height of Water Column in casing (h = TD - SWL): 6.78 FT. or IN.
E. Useful approximate Purge Volumes (PV) per foot of water column for common casing sizes:

	<u>3 Well Vols.</u>	<u>5 Well Vols.</u>	
2" Diameter =	0.5 gals/ft	0.82 gals/ft	<u>6.78</u> x feet of water <u>3.39</u> = <u>1.8</u> PV (Gal)
4" Diameter =	2.0 gals/ft	3.25 gals/ft	x feet of water _____ = _____ PV (Gal)
6" Diameter =	4.4 gals/ft	7.35 gals/ft	x feet of water _____ = _____ PV (Gal)

PURGING METHOD: Disposable bailer

DURATION: _____

OBSERVATIONS:

	Time	Turbidity	Color	Sheen	DO (mg/L)	pH	ORP (mv)	Temp. °C	Conduct. (mc/cm)	SWL
1st Volume:	<u>1025</u>	<u>moderate</u>	<u>light brown</u>	<u>no</u>	<u>3.03</u>	<u>7.23</u>	<u>152.4</u>	<u>14.22</u>	<u>10.38</u>	<u>48-</u>
2nd Volume:	<u>1028</u>	<u>moderate</u>	<u>light brown</u>	<u>no</u>	<u>3.17</u>	<u>7.19</u>	<u>46.8</u>	<u>14.23</u>	<u>10.38</u>	<u>48-</u>
3rd Volume:	<u>1031</u>	<u>moderate</u>	<u>light brown</u>	<u>no</u>	<u>3.14</u>	<u>7.23</u>	<u>39.3</u>	<u>14.44</u>	<u>10.42</u>	<u>48-</u>
4th Volume:	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
Addl. Volumes:	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____

TOTAL VOLUME OF WATER PURGED FROM WELL: _____

PURGE WATER STORED/DISPOSED OF WHERE/HOW: _____

SAMPLES COLLECTED: Depth to Water at time of sample collection: _____

Sample Number(s)	Time	Size/Number of Container(s)	Preservative
<u>111760-MW5</u>	<u>1032</u>	<u>40 ml x 3</u>	<u>HCL</u> <u>BTEX</u>
		<u>40 ml x 3</u>	<u>HCL</u> <u>TPH (GRO, DRO, ORO)</u>
		<u>500 ml x 1</u>	<u>None</u> <u>Chloride/TDS, nitrate, sulf</u>
		<u>1 L x 2</u>	<u>None</u> <u>-</u>
		<u>40 ml x 3</u>	<u>HCL</u> <u>Ferrous Iron</u>

COMMENTS:

No odor or sheen.
Static water level stayed
the same.

Casing Capacities:
2-inch hole.....0.16 gal/lin ft
4-inch hole.....0.65 gal/lin ft
6.5-inch hole.....1.70 gal/lin ft
8-inch hole.....2.60 gal/lin ft
10-inch hole.....4.10 gal/lin ft

Recharge Calculation at Time of Sample Collection:

Total Depth of Well: _____ Ft
Original Water Column: _____ x 0.80 = - (_____) Ft
Collect sample when Depth to Water measures Less than or equal to: _____ Ft

Signature: Jamal Whitaker

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



Analytical Laboratory Report

Report ID: S65656.01(01)
Generated on 05/29/2015

Report to

Attention: Brent Lucyk
Stantec
2321 Club Meridian Dr. #E
Okemos, MI 48864-4505
MSA# 94023

Phone: 517-349-9499 FAX: 517-349-6863
Email: brent.lucyk@stantec.com

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:

Kevin George (kgeorge@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S65656.01-S65656.11
Project: South Canyon / Chevron
Collected Date: 05/12/2015
Submitted Date/Time: 05/13/2015 09:30
Sampled by: Savanah Whitaker
P.O. #: 213201183

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Maya Murshak
Technical Director



Analytical Laboratory Report

General Report Notes

Results relate only to items tested as received by laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis were applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Report Narrative

There is no additional narrative for this analytical report



Analytical Laboratory Report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods



Analytical Laboratory Report

Method Summary

Method	Version
E300.0	EPA Method 300.0 Revision 2.1
N/A	Not Applicable
RSK-175	RSK-175
SM2540C	Standard Method 2540 C 20th Edition
SM3500FeB/HACH81	Standard Method 3500 Fe B 20th Edition / HACH Method 8146
SW3510C	SW 846 Method 3510C Revision 3 December 1996
SW8015M	SW 846 Method 8015C Revision 3 February 2007 Modified
SW8260C	SW 846 Method 8260C Revision 3 August 2006



Analytical Laboratory Report

Sample Summary (11 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S65656.01	111760-MW5	Groundwater	05/12/2015 10:32
S65656.02	111760-MW2	Groundwater	05/12/2015 11:02
S65656.03	111760-MW4	Groundwater	05/12/2015 11:38
S65656.04	111760-MW3	Groundwater	05/12/2015 12:12
S65656.05	111760-MW1	Groundwater	05/12/2015 12:40
S65656.06	Trip Blank	Liquid	05/12/2015 00:01
S65656.07	111762-MW3	Groundwater	05/12/2015 14:25
S65656.08	111762-MW5	Groundwater	05/12/2015 14:55
S65656.09	DUP-1-051215	Groundwater	05/12/2015 00:01
S65656.10	DUP-2-051215	Groundwater	05/12/2015 00:01
S65656.11	111762-MW7	Groundwater	05/12/2015 15:39



Analytical Laboratory Report

Lab Sample ID: S65656.01
Sample Tag: 111760-MW5
Collected Date/Time: 05/12/2015 10:32
Matrix: Groundwater
COC Reference: 83471

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
9	40ml Glass	HCL	Yes	4.6	IR
2	1L Amber	None	Yes	4.6	IR
1	500ml Plastic	None	Yes	4.6	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
Extraction / Prep.								
DRO Extraction	Completed			SW3510C	05/15/15 09:04	EMR		
pH check for VOCs	<2	STD Units		N/A	05/15/15 14:40	LBR		
Inorganics								
Chloride	166	mg/L	12	E300.0	05/14/15 08:17	JDP	16887-00-6	
Ferrous Iron	2.04	mg/L	0.1	SM3500FeB/HACH	05/18/15 14:20	JKB		
Nitrate-N	Not detected	mg/L	0.5	E300.0	05/14/15 08:17	JDP	14797-55-8	
Sulfate	7,090	mg/L	500	E300.0	05/14/15 10:25	JDP	14808-79-8	
Total Dissolved Solids	10,780	mg/L	1	SM2540C	05/16/15 16:45	ASB		
Organics - Semi-Volatiles								
TPH DRO (C10-C28)	Not detected	ug/L	100	SW8015M	05/18/15 23:11	PL		
TPH ORO (C28-C36)	Not detected	ug/L	100	SW8015M	05/18/15 23:11	PL		
Organics - Volatiles								
TPH GRO (C4-C10)	Not detected	ug/L	200	SW8015M	05/15/15 15:03	WAT		
BTEX, GC/MS								
Benzene	Not detected	ug/L	1	SW8260C	05/19/15 05:50	JGH	71-43-2	
Toluene	Not detected	ug/L	1	SW8260C	05/19/15 05:50	JGH	108-88-3	
Ethylbenzene	Not detected	ug/L	1	SW8260C	05/19/15 05:50	JGH	100-41-4	
p,m-Xylene	Not detected	ug/L	2	SW8260C	05/19/15 05:50	JGH		
o-Xylene	Not detected	ug/L	1	SW8260C	05/19/15 05:50	JGH	95-47-6	
Organics								
Methane in Water	22	ug/L	0.50	RSK-175	05/20/15 13:32	Tri	74-82-8	O

O-Analysis performed by outside laboratory. See attached report.



Analytical Laboratory Report

Lab Sample ID: S65656.02
Sample Tag: 111760-MW2
Collected Date/Time: 05/12/2015 11:02
Matrix: Groundwater
COC Reference: 83471

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
9	40ml Glass	HCL	Yes	4.6	IR
2	1L Amber	None	Yes	4.6	IR
1	500ml Plastic	None	Yes	4.6	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
Extraction / Prep.								
DRO Extraction	Completed			SW3510C	05/15/15 09:04	EMR		
pH check for VOCs	<2	STD Units		N/A	05/15/15 14:40	LBR		
Inorganics								
Chloride	170	mg/L	12	E300.0	05/14/15 08:30	JDP	16887-00-6	
Ferrous Iron	0.86	mg/L	0.1	SM3500FeB/HACH	05/18/15 14:30	JKB		
Nitrate-N	Not detected	mg/L	0.5	E300.0	05/14/15 08:30	JDP	14797-55-8	
Sulfate	7,330	mg/L	500	E300.0	05/14/15 10:38	JDP	14808-79-8	
Total Dissolved Solids	10,830	mg/L	1	SM2540C	05/16/15 16:45	ASB		
Organics - Semi-Volatiles								
TPH DRO (C10-C28)	Not detected	ug/L	100	SW8015M	05/18/15 23:33	PL		
TPH ORO (C28-C36)	Not detected	ug/L	100	SW8015M	05/18/15 23:33	PL		
Organics - Volatiles								
TPH GRO (C4-C10)	Not detected	ug/L	200	SW8015M	05/15/15 15:20	WAT		
BTEX, GC/MS								
Benzene	Not detected	ug/L	1	SW8260C	05/19/15 06:11	JGH	71-43-2	
Toluene	Not detected	ug/L	1	SW8260C	05/19/15 06:11	JGH	108-88-3	
Ethylbenzene	Not detected	ug/L	1	SW8260C	05/19/15 06:11	JGH	100-41-4	
p,m-Xylene	Not detected	ug/L	2	SW8260C	05/19/15 06:11	JGH		
o-Xylene	Not detected	ug/L	1	SW8260C	05/19/15 06:11	JGH	95-47-6	
Organics								
Methane in Water	Not detected	ug/L	0.50	RSK-175	05/20/15 13:36	Tri	74-82-8	O

O-Analysis performed by outside laboratory. See attached report.



Analytical Laboratory Report

Lab Sample ID: S65656.03
Sample Tag: 111760-MW4
Collected Date/Time: 05/12/2015 11:38
Matrix: Groundwater
COC Reference: 83471

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
9	40ml Glass	HCL	Yes	4.6	IR
2	1L Amber	None	Yes	4.6	IR
1	500ml Plastic	None	Yes	4.6	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
Extraction / Prep.								
DRO Extraction	Completed			SW3510C	05/15/15 09:04	EMR		
pH check for VOCs	<2	STD Units		N/A	05/15/15 14:40	LBR		
Inorganics								
Chloride	171	mg/L	12	E300.0	05/14/15 08:43	JDP	16887-00-6	
Ferrous Iron	0.28	mg/L	0.1	SM3500FeB/HACH	05/18/15 14:40	JKB		
Nitrate-N	Not detected	mg/L	0.5	E300.0	05/14/15 08:43	JDP	14797-55-8	
Sulfate	7,530	mg/L	500	E300.0	05/14/15 10:51	JDP	14808-79-8	
Total Dissolved Solids	10,890	mg/L	1	SM2540C	05/16/15 16:45	ASB		
Organics - Semi-Volatiles								
TPH DRO (C10-C28)	Not detected	ug/L	100	SW8015M	05/18/15 23:54	PL		
TPH ORO (C28-C36)	Not detected	ug/L	100	SW8015M	05/18/15 23:54	PL		
Organics - Volatiles								
TPH GRO (C4-C10)	Not detected	ug/L	200	SW8015M	05/15/15 15:38	WAT		
BTEX, GC/MS								
Benzene	Not detected	ug/L	1	SW8260C	05/19/15 06:31	JGH	71-43-2	
Toluene	Not detected	ug/L	1	SW8260C	05/19/15 06:31	JGH	108-88-3	
Ethylbenzene	Not detected	ug/L	1	SW8260C	05/19/15 06:31	JGH	100-41-4	
p,m-Xylene	Not detected	ug/L	2	SW8260C	05/19/15 06:31	JGH		
o-Xylene	Not detected	ug/L	1	SW8260C	05/19/15 06:31	JGH	95-47-6	
Organics								
Methane in Water	Not detected	ug/L	0.50	RSK-175	05/20/15 13:42	Tri	74-82-8	O

O-Analysis performed by outside laboratory. See attached report.



Analytical Laboratory Report

Lab Sample ID: S65656.04
Sample Tag: 111760-MW3
Collected Date/Time: 05/12/2015 12:12
Matrix: Groundwater
COC Reference: 83471

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
9	40ml Glass	HCL	Yes	4.6	IR
2	1L Amber	None	Yes	4.6	IR
1	500ml Plastic	None	Yes	4.6	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
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Extraction / Prep.

DRO Extraction	Completed			SW3510C	05/15/15 09:04	EMR		
pH check for VOCs	<2	STD Units		N/A	05/15/15 14:40	LBR		

Inorganics

Chloride	170	mg/L	12	E300.0	05/14/15 08:56	JDP	16887-00-6	
Ferrous Iron	25.6	mg/L	0.5	SM3500FeB/HACH	05/18/15 14:45	JKB		
Nitrate-N	Not detected	mg/L	0.5	E300.0	05/14/15 08:56	JDP	14797-55-8	
Sulfate	7,500	mg/L	500	E300.0	05/14/15 11:04	JDP	14808-79-8	
Total Dissolved Solids	10,500	mg/L	1	SM2540C	05/16/15 16:45	ASB		

Organics - Semi-Volatiles

TPH DRO (C10-C28)	100	ug/L	100	SW8015M	05/19/15 00:16	PL		
TPH ORO (C28-C36)	Not detected	ug/L	100	SW8015M	05/19/15 00:16	PL		

Organics - Volatiles

TPH GRO (C4-C10)	300	ug/L	200	SW8015M	05/15/15 15:56	WAT		
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BTEX, GC/MS

Benzene	Not detected	ug/L	1	SW8260C	05/19/15 06:51	JGH	71-43-2	
Toluene	Not detected	ug/L	1	SW8260C	05/19/15 06:51	JGH	108-88-3	
Ethylbenzene	Not detected	ug/L	1	SW8260C	05/19/15 06:51	JGH	100-41-4	
p,m-Xylene	Not detected	ug/L	2	SW8260C	05/19/15 06:51	JGH		
o-Xylene	Not detected	ug/L	1	SW8260C	05/19/15 06:51	JGH	95-47-6	

Organics

Methane in Water	51	ug/L	1.0	RSK-175	05/20/15 14:06	Tri	74-82-8	O
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O-Analysis performed by outside laboratory. See attached report.



Analytical Laboratory Report

Lab Sample ID: S65656.05
Sample Tag: 111760-MW1
Collected Date/Time: 05/12/2015 12:40
Matrix: Groundwater
COC Reference: 83471

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
9	40ml Glass	HCL	Yes	4.6	IR
2	1L Amber	None	Yes	4.6	IR
1	500ml Plastic	None	Yes	4.6	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
Extraction / Prep.								
DRO Extraction	Completed			SW3510C	05/15/15 09:04	EMR		
pH check for VOCs	<2	STD Units		N/A	05/15/15 14:40	LBR		
Inorganics								
Chloride	176	mg/L	12	E300.0	05/14/15 09:08	JDP	16887-00-6	
Ferrous Iron	88.8	mg/L	1.0	SM3500FeB/HACH	05/18/15 14:50	JKB		
Nitrate-N	Not detected	mg/L	0.5	E300.0	05/14/15 09:08	JDP	14797-55-8	
Sulfate	7,280	mg/L	500	E300.0	05/14/15 11:16	JDP	14808-79-8	
Total Dissolved Solids	10,930	mg/L	1	SM2540C	05/16/15 16:45	ASB		
Organics - Semi-Volatiles								
TPH DRO (C10-C28)	600	ug/L	100	SW8015M	05/19/15 00:38	PL		
TPH ORO (C28-C36)	Not detected	ug/L	100	SW8015M	05/19/15 00:38	PL		
Organics - Volatiles								
TPH GRO (C4-C10)	3,200	ug/L	200	SW8015M	05/15/15 16:14	WAT		
BTEX, GC/MS								
Benzene	102	ug/L	3	SW8260C	05/19/15 09:31	JGH	71-43-2	Y
Toluene	Not detected	ug/L	3	SW8260C	05/19/15 09:31	JGH	108-88-3	Y
Ethylbenzene	Not detected	ug/L	3	SW8260C	05/19/15 09:31	JGH	100-41-4	Y
p,m-Xylene	Not detected	ug/L	5	SW8260C	05/19/15 09:31	JGH		Y
o-Xylene	Not detected	ug/L	3	SW8260C	05/19/15 09:31	JGH	95-47-6	Y
Organics								
Methane in Water	51	ug/L	1.0	RSK-175	05/20/15 14:31	Tri	74-82-8	O

Y-Elevated reporting limit due to high target concentration

O-Analysis performed by outside laboratory. See attached report.



Analytical Laboratory Report

Lab Sample ID: S65656.06
Sample Tag: Trip Blank
Collected Date/Time: 05/12/2015 00:01
Matrix: Liquid
COC Reference: 83471

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	4.6	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
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Extraction / Prep.

pH check for VOCs	<2	STD Units		N/A	05/15/15 14:40	LBR		
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Organics - Volatiles

BTEX, GC/MS

Benzene	Not detected	ug/L	1	SW8260C	05/19/15 04:31	JGH	71-43-2	
Toluene	Not detected	ug/L	1	SW8260C	05/19/15 04:31	JGH	108-88-3	
Ethylbenzene	Not detected	ug/L	1	SW8260C	05/19/15 04:31	JGH	100-41-4	
p,m-Xylene	Not detected	ug/L	2	SW8260C	05/19/15 04:31	JGH		
o-Xylene	Not detected	ug/L	1	SW8260C	05/19/15 04:31	JGH	95-47-6	



Analytical Laboratory Report

Lab Sample ID: S65656.07
Sample Tag: 111762-MW3
Collected Date/Time: 05/12/2015 14:25
Matrix: Groundwater
COC Reference: 83471

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
9	40ml Glass	None	Yes	4.6	IR
2	1L Amber	None	Yes	4.6	IR
1	500ml Plastic	None	Yes	4.6	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
Extraction / Prep.								
DRO Extraction	Completed			SW3510C	05/15/15 09:04	EMR		
pH check for VOCs	>2	STD Units		N/A	05/15/15 14:40	LBR		
Inorganics								
Chloride	511	mg/L	50	E300.0	05/14/15 12:33	JDP	16887-00-6	
Ferrous Iron	Not detected	mg/L	0.1	SM3500FeB/HACH	05/18/15 14:55	JKB		
Nitrate-N	Not detected	mg/L	0.5	E300.0	05/14/15 11:29	JDP	14797-55-8	
Sulfate	19,500	mg/L	1,000	E300.0	05/14/15 12:46	JDP	14808-79-8	
Total Dissolved Solids	31,900	mg/L	1	SM2540C	05/19/15 21:30	ASB		
Organics - Semi-Volatiles								
TPH DRO (C10-C28)	8,300	ug/L	5,600	SW8015M	05/19/15 03:11	PL		Y
TPH ORO (C28-C36)	Not detected	ug/L	5,600	SW8015M	05/19/15 03:11	PL		Y
Organics - Volatiles								
TPH GRO (C6-C10)	9,000	ug/L	1,000	SW8015M	05/15/15 21:22	WAT		Y
BTEX, GC/MS								
Benzene	28,500	ug/L	200	SW8260C	05/19/15 17:13	WAT	71-43-2	Y
Toluene	200	ug/L	200	SW8260C	05/19/15 17:13	WAT	108-88-3	Y
Ethylbenzene	Not detected	ug/L	200	SW8260C	05/19/15 17:13	WAT	100-41-4	Y
p,m-Xylene	700	ug/L	400	SW8260C	05/19/15 17:13	WAT		Y
o-Xylene	Not detected	ug/L	200	SW8260C	05/19/15 17:13	WAT	95-47-6	Y
Organics								
Methane in Water	360	ug/L	5.0	RSK-175	05/20/15 14:39	Tri	74-82-8	O

Y-Elevated reporting limit due to high target concentration

O-Analysis performed by outside laboratory. See attached report.



Analytical Laboratory Report

Lab Sample ID: S65656.08
Sample Tag: 111762-MW5
Collected Date/Time: 05/12/2015 14:55
Matrix: Groundwater
COC Reference: 83471

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	None	Yes	4.6	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
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Extraction / Prep.

pH check for VOCs	>2	STD Units		N/A	05/15/15 14:40	LBR		
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Organics - Volatiles

BTEX, GC/MS

Benzene	Not detected	ug/L	1	SW8260C	05/19/15 04:51	JGH	71-43-2	
Toluene	Not detected	ug/L	1	SW8260C	05/19/15 04:51	JGH	108-88-3	
Ethylbenzene	Not detected	ug/L	1	SW8260C	05/19/15 04:51	JGH	100-41-4	
p,m-Xylene	Not detected	ug/L	2	SW8260C	05/19/15 04:51	JGH		
o-Xylene	Not detected	ug/L	1	SW8260C	05/19/15 04:51	JGH	95-47-6	



Analytical Laboratory Report

Lab Sample ID: S65656.09
Sample Tag: DUP-1-051215
Collected Date/Time: 05/12/2015 00:01
Matrix: Groundwater
COC Reference: 83471

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
9	40ml Glass	HCL	Yes	4.6	IR
2	1L Amber	None	Yes	4.6	IR
1	500ml Plastic	None	Yes	4.6	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
Extraction / Prep.								
DRO Extraction	Completed			SW3510C	05/15/15 09:04	EMR		
pH check for VOCs	>2	STD Units		N/A	05/15/15 14:40	LBR		
Inorganics								
Chloride	179	mg/L	12	E300.0	05/14/15 11:42	JDP	16887-00-6	
Ferrous Iron	102	mg/L	1.0	SM3500FeB/HACH	05/18/15 15:00	JKB		
Nitrate-N	Not detected	mg/L	0.5	E300.0	05/14/15 11:42	JDP	14797-55-8	
Sulfate	7,170	mg/L	500	E300.0	05/14/15 12:59	JDP	14808-79-8	
Total Dissolved Solids	10,700	mg/L	1	SM2540C	05/19/15 21:30	ASB		
Organics - Semi-Volatiles								
TPH DRO (C10-C28)	700	ug/L	100	SW8015M	05/19/15 01:00	PL		
TPH ORO (C28-C36)	200	ug/L	100	SW8015M	05/19/15 01:00	PL		
Organics - Volatiles								
TPH GRO (C4-C10)	3,000	ug/L	200	SW8015M	05/15/15 17:08	WAT		
BTEX, GC/MS								
Benzene	86	ug/L	3	SW8260C	05/19/15 09:51	JGH	71-43-2	Y
Toluene	Not detected	ug/L	3	SW8260C	05/19/15 09:51	JGH	108-88-3	Y
Ethylbenzene	Not detected	ug/L	3	SW8260C	05/19/15 09:51	JGH	100-41-4	Y
p,m-Xylene	Not detected	ug/L	5	SW8260C	05/19/15 09:51	JGH		Y
o-Xylene	Not detected	ug/L	3	SW8260C	05/19/15 09:51	JGH	95-47-6	Y
Organics								
Methane in Water	45	ug/L	0.50	RSK-175	05/20/15 14:44	Tri	74-82-8	O

Y-Elevated reporting limit due to high target concentration

O-Analysis performed by outside laboratory. See attached report.



Analytical Laboratory Report

Lab Sample ID: S65656.10
Sample Tag: DUP-2-051215
Collected Date/Time: 05/12/2015 00:01
Matrix: Groundwater
COC Reference: 83471

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
9	40ml Glass	None	Yes	4.6	IR
2	1L Amber	None	Yes	4.6	IR
1	500ml Plastic	None	Yes	4.6	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
Extraction / Prep.								
DRO Extraction	Completed			SW3510C	05/15/15 09:04	EMR		
pH check for VOCs	>2	STD Units		N/A	05/15/15 14:40	LBR		
Inorganics								
Chloride	394	mg/L	50	E300.0	05/14/15 13:12	JDP	16887-00-6	
Ferrous Iron	Not detected	mg/L	0.1	SM3500FeB/HACH	05/18/15 15:05	JKB		
Nitrate-N	7.1	mg/L	0.5	E300.0	05/14/15 13:12	JDP	14797-55-8	
Sulfate	38,500	mg/L	5,000	E300.0	05/14/15 13:25	JDP	14808-79-8	
Total Dissolved Solids	63,300	mg/L	1	SM2540C	05/19/15 21:30	ASB		
Organics - Semi-Volatiles								
TPH DRO (C10-C28)	500	ug/L	100	SW8015M	05/19/15 01:22	PL		
TPH ORO (C28-C36)	Not detected	ug/L	100	SW8015M	05/19/15 01:22	PL		
Organics - Volatiles								
TPH GRO (C6-C10)	Not detected	ug/L	200	SW8015M	05/15/15 17:26	WAT		
BTEX, GC/MS								
Benzene	Not detected	ug/L	1	SW8260C	05/19/15 05:10	JGH	71-43-2	
Toluene	Not detected	ug/L	1	SW8260C	05/19/15 05:10	JGH	108-88-3	
Ethylbenzene	Not detected	ug/L	1	SW8260C	05/19/15 05:10	JGH	100-41-4	
p,m-Xylene	Not detected	ug/L	2	SW8260C	05/19/15 05:10	JGH		
o-Xylene	Not detected	ug/L	1	SW8260C	05/19/15 05:10	JGH	95-47-6	
Organics								
Methane in Water	3.1	ug/L	0.50	RSK-175	05/20/15 14:53	Tri	74-82-8	O

O-Analysis performed by outside laboratory. See attached report.



Analytical Laboratory Report

Lab Sample ID: S65656.11
Sample Tag: 111762-MW7
Collected Date/Time: 05/12/2015 15:39
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
9	40ml Glass	None	Yes	4.6	IR
2	1L Amber	None	Yes	4.6	IR
1	500ml Plastic	None	Yes	4.6	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
Extraction / Prep.								
DRO Extraction	Completed			SW3510C	05/15/15 09:04	EMR		
pH check for VOCs	>2	STD Units		N/A	05/15/15 14:50	LBR		
Inorganics								
Chloride	397	mg/L	50	E300.0	05/14/15 12:08	JDP	16887-00-6	
Ferrous Iron	Not detected	mg/L	0.1	SM3500FeB/HACH	05/18/15 15:10	JKB		
Nitrate-N	6.9	mg/L	0.5	E300.0	05/14/15 12:08	JDP	14797-55-8	
Sulfate	39,000	mg/L	5,000	E300.0	05/14/15 13:37	JDP	14808-79-8	
Total Dissolved Solids	62,200	mg/L	1	SM2540C	05/19/15 21:30	ASB		
Organics - Semi-Volatiles								
TPH DRO (C10-C28)	500	ug/L	100	SW8015M	05/19/15 01:44	PL		
TPH ORO (C28-C36)	Not detected	ug/L	100	SW8015M	05/19/15 01:44	PL		
Organics - Volatiles								
TPH GRO (C6-C10)	Not detected	ug/L	200	SW8015M	05/15/15 17:44	WAT		
BTEX, GC/MS								
Benzene	Not detected	ug/L	1	SW8260C	05/19/15 05:30	JGH	71-43-2	
Toluene	Not detected	ug/L	1	SW8260C	05/19/15 05:30	JGH	108-88-3	
Ethylbenzene	Not detected	ug/L	1	SW8260C	05/19/15 05:30	JGH	100-41-4	
p,m-Xylene	Not detected	ug/L	2	SW8260C	05/19/15 05:30	JGH		
o-Xylene	Not detected	ug/L	1	SW8260C	05/19/15 05:30	JGH	95-47-6	
Organics								
Methane in Water	3.1	ug/L	0.50	RSK-175	05/20/15 14:57	Tri	74-82-8	O

O-Analysis performed by outside laboratory. See attached report.



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C.O.C. PAGE # 1 OF 1

83471

REPORT TO

CHAIN OF CUSTODY RECORD

INVOICE TO

CONTACT NAME Brent Lucyk			
COMPANY Stantec Consulting			
ADDRESS 2321 Club Meridian Dr Ste E			
CITY Okemos	STATE MI	ZIP CODE 48864	
PHONE NO. 517 749-9405	FAX NO.	P.O. NO. 21320U83	QUOTE NO.
E-MAIL ADDRESS brent.Lucyk@stantec.com			

CONTACT NAME X SAME	
COMPANY	
ADDRESS	
CITY	STATE ZIP CODE
PHONE NO.	E-MAIL ADDRESS

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

PROJECT NO./NAME South Canyon/Chevron	SAMPLER(S) - PLEASE PRINT/SIGN NAME Savannah Whitaker
TURNAROUND TIME REQUIRED <input type="checkbox"/> 1 DAY <input type="checkbox"/> 2 DAYS <input type="checkbox"/> 3 DAYS <input checked="" type="checkbox"/> STANDARD <input type="checkbox"/> OTHER	
DELIVERABLES REQUIRED <input type="checkbox"/> STD <input type="checkbox"/> LEVEL II <input type="checkbox"/> LEVEL III <input type="checkbox"/> LEVEL IV <input type="checkbox"/> EDD <input type="checkbox"/> OTHER	

MATRIX CODE:	GW=GROUNDWATER	WW=WASTEWATER	S=SOIL	L=LIQUID	SD=SOLID	
	SL=SLUDGE	DW=DRINKING WATER	O=OIL	WP=WPIE	A=AIR	W=WASTE

Containers & Preservatives

MERIT LAB NO. FOR LAB USE ONLY	YEAR		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	NONE	HCl	HNO ₃	H ₂ SO ₄	NaOH	MeOH	OTHER	PbEX (8200)	TbHGO (8015M)	TbHDO (8015M)	Chloride (E300)	TDS *** (25400)	Nitrate ** (E300)	Sulfate (E300)	Perovous Iron (3500 Fe) (HACH)	Methane (P84-17)	Certifications <input type="checkbox"/> OHIO VAP <input type="checkbox"/> Drinking Water <input type="checkbox"/> DoD <input type="checkbox"/> NPDES Project Locations <input type="checkbox"/> Detroit <input type="checkbox"/> New York <input type="checkbox"/> Other Special Instructions
	DATE	TIME																				
05056.01	5/12/15	1032	111760-MW5	GW	12	X	X						X	X	X	X	X	X	X	X	X	* All times EST
02	5/12/15	1102	111760-MW2		12	X	X						X	X	X	X	X	X	X	X	X	
03	5/12/15	1138	111760-MW4		12	X	X						X	X	X	X	X	X	X	X	X	** Nitrates =
04	5/12/15	1212	111760-MW3		12	X	X						X	X	X	X	X	X	X	X	X	Short Hold Time
05	5/12/15	1240	111760-MW1		12	X	X						X	X	X	X	X	X	X	X	X	
06	5/12/15	—	Trip Blank		1		X						X									*** TDS have
07	5/12/15	1425	111762-MW3 *****	GW	12	X							X	X	X	X	X	X	X	X	X	not been field
08	5/12/15	1455	111762-MW5 *****	GW	3	X							X									filtered
09	5/12/15	—	DUP - 1 - 051215		12	X	X						X	X	X	X	X	X	X	X	X	
10	5/12/15	—	DUP - 2 - 051215 *****		12	X							X	X	X	X	X	X	X	X	X	***** Report Spec.
																						carbon chains
																						***** - HCl was removed from NDAs due to reaction. Separately

RELINQUISHED BY: SIGNATURE/ORGANIZATION Savannah Whitaker	DATE 5/12/15	TIME 1600
RECEIVED BY: SIGNATURE/ORGANIZATION	DATE	TIME
RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION	DATE	TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION FedEx	DATE 5/13/15	TIME 930
RECEIVED BY: SIGNATURE/ORGANIZATION Martin	DATE 5/13/15	TIME 930
SEAL NO.	SEAL INTACT YES <input type="checkbox"/> NO <input type="checkbox"/>	INITIALS
SEAL NO.	SEAL INTACT YES <input type="checkbox"/> NO <input type="checkbox"/>	INITIALS
NOTES:		TEMP. ON ARRIVAL 46

May 27, 2015

Merit Laboratories, Inc.
Attn: Kevin George
2680 East Lansing Road
East Lansing, MI 48823

Project: Subcontract Lab Services

Dear Kevin George,

Enclosed is a copy of the laboratory report for the following work order(s) received by TriMatrix Laboratories:

Work Order	Received	Description
1505280	05/14/2015	S65656

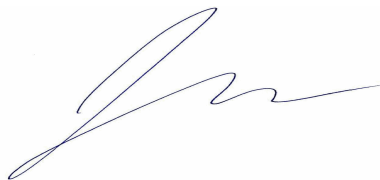
This report relates only to the sample(s) as received. Test results are in compliance with the requirements of the National Environmental Laboratory Accreditation Program (NELAP) and/or one of the following certification programs:

ACCLASS DoD-ELAP/ISO17025 (#ADE-1542); Arkansas DEP (#88-0730/13-049-0); Florida DEP (#E87622-24); Georgia EPD (#E87622-24); Illinois DEP (#200026/003329); Kansas DPH (#E-10302); Kentucky DEP (#0021); Louisiana DEP (#103068); Michigan DPH (#0034); Minnesota DPH (#491715); New York ELAP (#11776/48855); North Carolina DNRE (#659); Virginia DCLS (#460153/2592); Wisconsin DNR (#999472650); USDA Soil Import Permit (#P330-12-00236).

Any qualification or narration of results, including sample acceptance requirements and test exceptions to the above referenced programs, is presented in the Statement of Data Qualifications and Project Technical Narrative sections of this report. Estimates of analytical uncertainties and certification documents for the test results contained within this report are available upon request.

If you have any questions or require further information, please do not hesitate to contact me.

Sincerely,



James D. McFadden
Project Chemist

PROJECT TECHNICAL NARRATIVE(s)

No Project Narrative is associated with this report.

STATEMENT OF DATA QUALIFICATIONS

All analyses have been validated and comply with our Quality Control Program.
No Qualification is required.

ANALYTICAL REPORT

Client: **Merit Laboratories, Inc.**
Project: Subcontract Lab Services
Client Sample ID: **65656.01**
Lab Sample ID: **1505280-01**
Matrix: Water

Work Order: **1505280**
Description: S65656
Sampled: 05/12/15 10:32
Sampled By: Client
Received: 05/14/15 09:45

Dissolved Gases in Water by RSK-175 Headspace Analysis

Analyte	Analytical Result	RL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Methane	22	0.50	ug/L	1	RSK-175	05/20/15 13:32	JMF	1505063

ANALYTICAL REPORT

Client: **Merit Laboratories, Inc.**
Project: Subcontract Lab Services
Client Sample ID: **65656.02**
Lab Sample ID: **1505280-02**
Matrix: Water

Work Order: **1505280**
Description: S65656
Sampled: 05/12/15 11:02
Sampled By: Client
Received: 05/14/15 09:45

Dissolved Gases in Water by RSK-175 Headspace Analysis

Analyte	Analytical Result	RL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Methane	<0.50	0.50	ug/L	1	RSK-175	05/20/15 13:36	JMF	1505063

ANALYTICAL REPORT

Client: **Merit Laboratories, Inc.**
Project: Subcontract Lab Services
Client Sample ID: **65656.03**
Lab Sample ID: **1505280-03**
Matrix: Water

Work Order: **1505280**
Description: S65656
Sampled: 05/12/15 11:38
Sampled By: Client
Received: 05/14/15 09:45

Dissolved Gases in Water by RSK-175 Headspace Analysis

Analyte	Analytical Result	RL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Methane	<0.50	0.50	ug/L	1	RSK-175	05/20/15 13:42	JMF	1505063

ANALYTICAL REPORT

Client: **Merit Laboratories, Inc.**
Project: Subcontract Lab Services
Client Sample ID: **65656.04**
Lab Sample ID: **1505280-04**
Matrix: Water

Work Order: **1505280**
Description: S65656
Sampled: 05/12/15 12:12
Sampled By: Client
Received: 05/14/15 09:45

Dissolved Gases in Water by RSK-175 Headspace Analysis

Analyte	Analytical Result	RL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Methane	51	1.0	ug/L	2	RSK-175	05/20/15 14:06	JMF	1505063

ANALYTICAL REPORT

Client: **Merit Laboratories, Inc.**
Project: Subcontract Lab Services
Client Sample ID: **65656.05**
Lab Sample ID: **1505280-05**
Matrix: Water

Work Order: **1505280**
Description: S65656
Sampled: 05/12/15 12:40
Sampled By: Client
Received: 05/14/15 09:45

Dissolved Gases in Water by RSK-175 Headspace Analysis

Analyte	Analytical Result	RL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Methane	51	1.0	ug/L	2	RSK-175	05/20/15 14:31	JMF	1505063

ANALYTICAL REPORT

Client: **Merit Laboratories, Inc.**
 Project: Subcontract Lab Services
 Client Sample ID: **65656.07**
 Lab Sample ID: **1505280-06**
 Matrix: Water

Work Order: **1505280**
 Description: S65656
 Sampled: 05/12/15 14:25
 Sampled By: Client
 Received: 05/14/15 09:45

Dissolved Gases in Water by RSK-175 Headspace Analysis

Analyte	Analytical Result	RL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Methane	360	5.0	ug/L	10	RSK-175	05/20/15 14:39	JMF	1505063

ANALYTICAL REPORT

Client: **Merit Laboratories, Inc.**
Project: Subcontract Lab Services
Client Sample ID: **65656.09**
Lab Sample ID: **1505280-07**
Matrix: Water

Work Order: **1505280**
Description: S65656
Sampled: 05/12/15 00:00
Sampled By: Client
Received: 05/14/15 09:45

Dissolved Gases in Water by RSK-175 Headspace Analysis

Analyte	Analytical Result	RL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Methane	45	0.50	ug/L	1	RSK-175	05/20/15 14:44	JMF	1505063

ANALYTICAL REPORT

Client: **Merit Laboratories, Inc.**
Project: Subcontract Lab Services
Client Sample ID: **65656.10**
Lab Sample ID: **1505280-08**
Matrix: Water

Work Order: **1505280**
Description: S65656
Sampled: 05/12/15 00:00
Sampled By: Client
Received: 05/14/15 09:45

Dissolved Gases in Water by RSK-175 Headspace Analysis

Analyte	Analytical Result	RL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Methane	3.1	0.50	ug/L	1	RSK-175	05/20/15 14:53	JMF	1505063

ANALYTICAL REPORT

Client: **Merit Laboratories, Inc.**
Project: Subcontract Lab Services
Client Sample ID: **65656.11**
Lab Sample ID: **1505280-09**
Matrix: Water

Work Order: **1505280**
Description: S65656
Sampled: 05/12/15 15:39
Sampled By: Client
Received: 05/14/15 09:45

Dissolved Gases in Water by RSK-175 Headspace Analysis

Analyte	Analytical Result	RL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Methane	3.1	0.50	ug/L	1	RSK-175	05/20/15 14:57	JMF	1505063

QUALITY CONTROL REPORT

Dissolved Gases in Water by RSK-175 Headspace Analysis

Analyte	Sample Conc.	Spike Qty.	Result	Spike % Rec.	Control Limits	RPD	RPD Limits	RL
---------	--------------	------------	--------	--------------	----------------	-----	------------	----

QC Batch: 1505063 Method-Specific Extraction/RSK-175

Method Blank					Analyzed:		05/20/2015	By: JMF
Unit: ug/L					Analytical Batch:		5E21043	
Methane			<0.50				0.50	
Laboratory Control Sample					Analyzed:		05/20/2015	By: JMF
Unit: ug/L					Analytical Batch:		5E21043	
Methane		34.1	24.8	73	70-116	--	0.50	
Matrix Spike 1505280-03 65656.03					Analyzed:		05/20/2015	By: JMF
Unit: ug/L					Analytical Batch:		5E21043	
Methane	<0.50	34.1	23.1	68	42-112	--	0.50	
Matrix Spike Duplicate 1505280-03 65656.03					Analyzed:		05/20/2015	By: JMF
Unit: ug/L					Analytical Batch:		5E21043	
Methane	<0.50	34.1	21.9	64	42-112	5	20	0.50

34.26
420W 3 718W



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C.O.C. PAGE # 1 OF 1

83413

REPORT TO

CONTACT NAME: Kevin George
COMPANY: Merit Labs
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: FAX NO.: P.O. NO.:
E-MAIL ADDRESS: kgeorge@meritlabs.com
QUOTE NO.:

CHAIN OF CUSTODY RECORD

CONTACT NAME: Julie Teague
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

#1505280

INVOICE TO

PROJECT NO./NAME: S65656
SAMPLER(S) - PLEASE PRINT/SIGN NAME:
TURNAROUND TIME REQUIRED: ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER
DELIVERABLES REQUIRED: ☒ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID
SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIFE A=AIR W=WASTE

Containers & Preservatives

MERIT LAB NO.	20 YEAR 15	DATE	TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	NONE	HCl	HNO ₃	H ₂ SO ₄	NaOH	MeOH	OTHER
01	5/12	1032		65656.01	GW	3	3						
02		1102		65656.02									
03		1138		65656.03									
04		1212		65656.04									
05		1240		65656.05									
06		1425		65656.07			3						
07				65656.09			3						
08				65656.10			3						
09		1539		65656.11			3						

Methane (8K-175)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES
Project Locations
☐ Detroit ☐ New York
☐ Other
Special Instructions

RELINQUISHED BY: [Signature] DATE: 5/13/15 TIME: 1000
RECEIVED BY: UPS #124664770359575677 DATE: 5/14/15 TIME: 0945
RELINQUISHED BY: DATE: TIME:
RECEIVED BY: DATE: TIME:

RELINQUISHED BY: [Signature] DATE: 5/14/15 TIME: 0945
RECEIVED BY: [Signature] DATE: 5/14/15 TIME: 0945
SEAL NO. SEAL INTACT INITIALS
YES ☐ NO ☐
SEAL NO. SEAL INTACT INITIALS
YES ☐ NO ☐

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

SAMPLE RECEIVING / LOG-IN CHECKLIST



Client: <u>Merit</u>	Work Order #: <u>1505280</u>
Receipt Record Page/Line #: <u>34.26</u>	Project Chemist: _____ Sample #: _____

Recorded by (initials/date): <u>WC 5.14.15</u>	<input checked="" type="checkbox"/> Cooler <input type="checkbox"/> Box <input type="checkbox"/> Other _____	Qty Received: <u>1</u>	<input checked="" type="checkbox"/> IR Gun (#202) <input type="checkbox"/> Digital Thermometer (#54) <input type="checkbox"/> Other (# _____)	Thermometer Used: _____ See Additional Cooler Information Form: <input type="checkbox"/>
--	--	------------------------	---	---

Cooler #	Time	Cooler #	Time	Cooler #	Time	Cooler #	Time	
<u>1530</u>								
Custody Seals: <input checked="" type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		Custody Seals: <input type="checkbox"/> None <input type="checkbox"/> Present / Intact <input type="checkbox"/> Present / Not Intact		
Coolant Type: <input checked="" type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		Coolant Type: <input type="checkbox"/> Loose Ice <input type="checkbox"/> Bagged Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> None		
Coolant Location: <input checked="" type="checkbox"/> Dispersed / <input type="checkbox"/> Top / <input type="checkbox"/> Middle / <input type="checkbox"/> Bottom		Coolant Location: <input type="checkbox"/> Dispersed / <input type="checkbox"/> Top / <input type="checkbox"/> Middle / <input type="checkbox"/> Bottom		Coolant Location: <input type="checkbox"/> Dispersed / <input type="checkbox"/> Top / <input type="checkbox"/> Middle / <input type="checkbox"/> Bottom		Coolant Location: <input type="checkbox"/> Dispersed / <input type="checkbox"/> Top / <input type="checkbox"/> Middle / <input type="checkbox"/> Bottom		
Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		Temp Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No If Present, Temperature Blank Location is: <input type="checkbox"/> Representative <input type="checkbox"/> Not Representative		
Observed °C	Correction Factor °C	Actual °C	Observed °C	Correction Factor °C	Actual °C	Observed °C	Correction Factor °C	
Temp Blank:			Temp Blank:			Temp Blank:		
Sample 1: <u>4.0</u>	<u>-</u>	<u>4.0</u>	Sample 1:			Sample 1:		
Sample 2: <u>4.0</u>	<u>-</u>	<u>4.0</u>	Sample 2:			Sample 2:		
Sample 3: <u>3.2</u>	<u>-</u>	<u>3.2</u>	Sample 3:			Sample 3:		
3 Sample Average °C: <u>3.7</u>			3 Sample Average °C:			3 Sample Average °C:		
<input type="checkbox"/> Cooler ID on COC? <input type="checkbox"/> VOC Trip Blank received?			<input type="checkbox"/> Cooler ID on COC? <input type="checkbox"/> VOC Trip Blank received?			<input type="checkbox"/> Cooler ID on COC? <input type="checkbox"/> VOC Trip Blank received?		

If any shaded areas checked, complete Sample Receiving Non-Conformance and/or Inventory Form

Paperwork Received

Yes ☒ No ☐ Chain of Custody record(s)? If No, Initiated By _____

Received for Lab Signed/Date/Time? _____

☐ Shipping document?

☐ Other _____

COC Information

☐ TriMatrix COC ☒ Other: Merit

COC ID Numbers: _____

Check COC for Accuracy

Yes ☒ No ☐ Analysis Requested?

☒ Sample ID matches COC?

☒ Sample Date and Time matches COC?

☒ Container type completed on COC?

☒ All container types indicated are received?

Sample Condition Summary

N/A	Yes	No
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/> Broken containers/lids?
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/> Missing or incomplete labels?
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/> Illegible information on labels?
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/> Low volume received?
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/> Inappropriate or non-TriMatrix containers received?
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/> VOC vials / TOX containers have headspace?
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/> Extra sample locations / containers not listed on COC?

Check Sample Preservation

N/A ☐ Yes ☒ No ☐ Temperature Blank OR average sample temperature, ≥6° C?

☐ If either is ≥6° C, was thermal preservation required?

If "Yes", Project Chemist Approval Initials: _____

If "Yes" Completed Non Con Cooler - Cont Inventory Form?

Completed Sample Preservation Verification Form?

☒ Samples chemically preserved correctly?

If "No", added orange tag?

☐ Received pre-preserved VOC soils?

☐ MeOH ☐ Na₂SO₄

Check for Short Hold-Time Prep/Analyses

☐ Bacteriological

☐ Air Bags

☐ EnCores / Methanol Pre-Preserved

☐ Formaldehyde/Aldehyde

☐ Green-tagged containers

☐ Yellow/White-tagged 1 L ambers (SV Prep-Lab)

AFTER HOURS ONLY:

COPIES OF COC TO LAB AREA(S)

☒ NONE RECEIVED

☐ RECEIVED, COCs TO LAB(S)

Notes

☐ Trip Blank received ☐ Trip Blank not listed on COC

Cooler Received (Date/Time): <u>5.14.15 0945</u>	Paperwork Delivered (Date/Time): <u>5.14.15 1535</u>	≤1 Hour Goal Met? <u>Yes</u> / <u>No</u>
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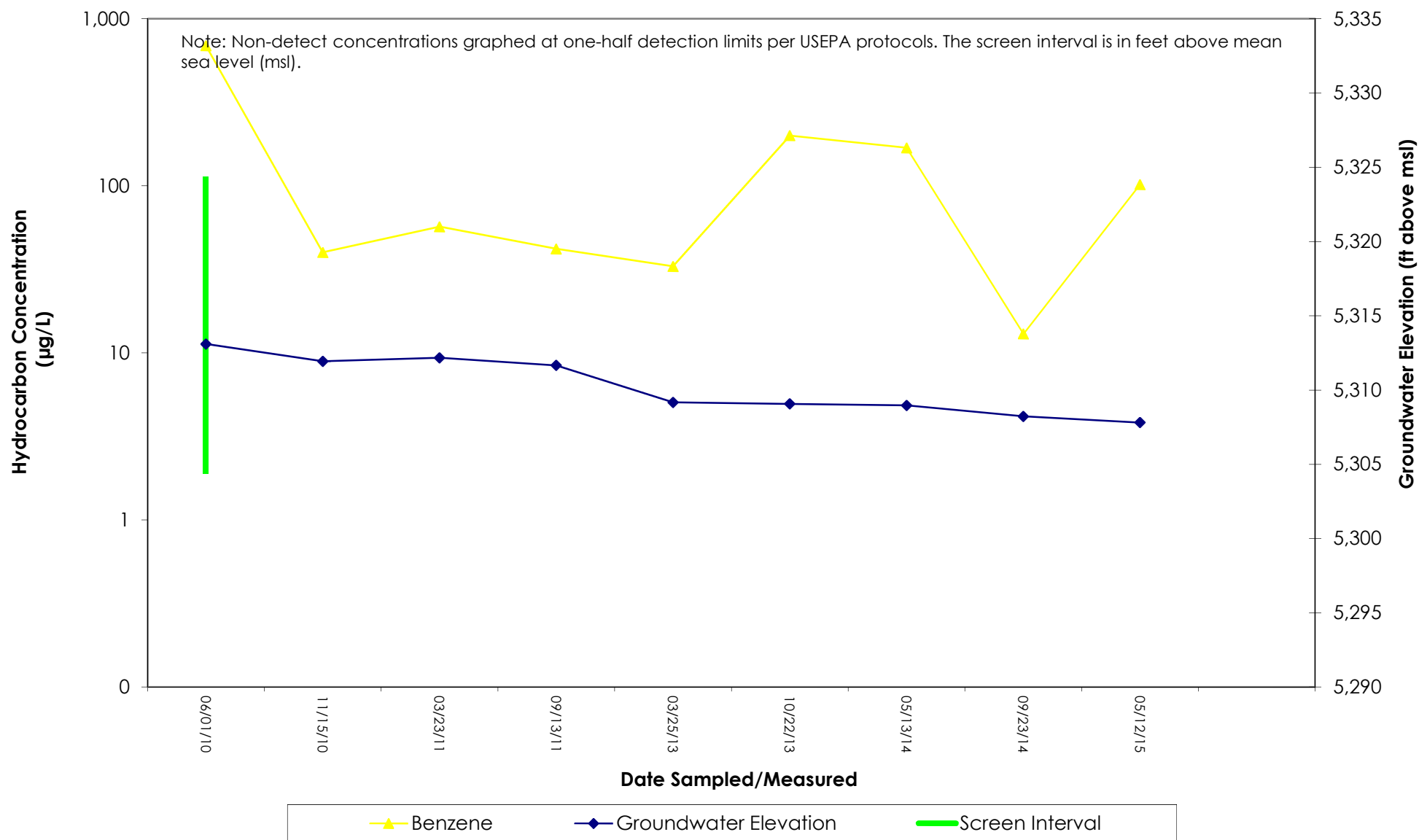
ATTACHMENT C
Hydrographs

111760-MW-1 Benzene Concentrations and Groundwater Elevations vs. Time

Federal 23-12 (Pit #111760)

South Canyon Field

Garfield County, CO

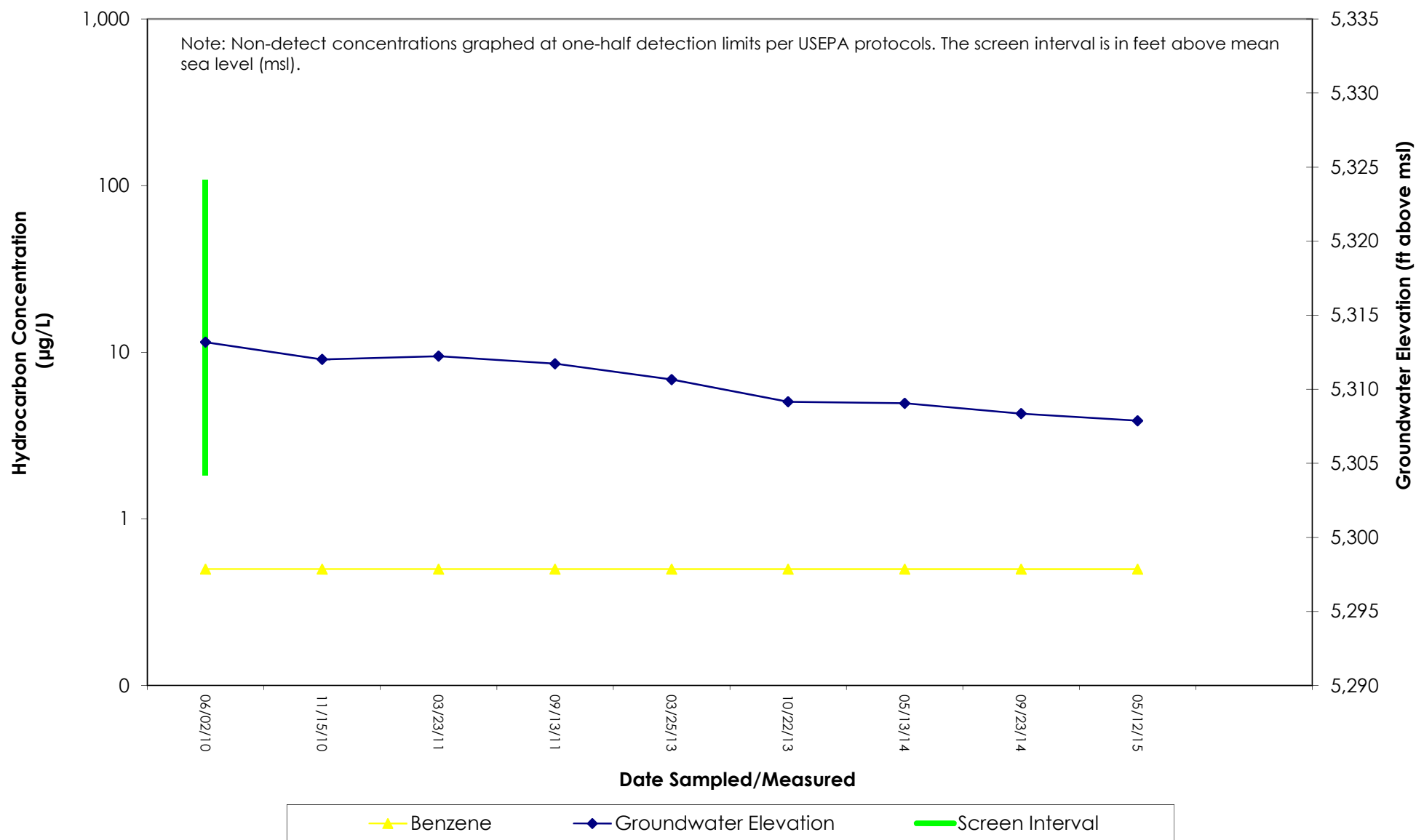


111760-MW-2 Benzene Concentrations and Groundwater Elevations vs. Time

Federal 23-12 (Pit #111760)

South Canyon Field

Garfield County, CO

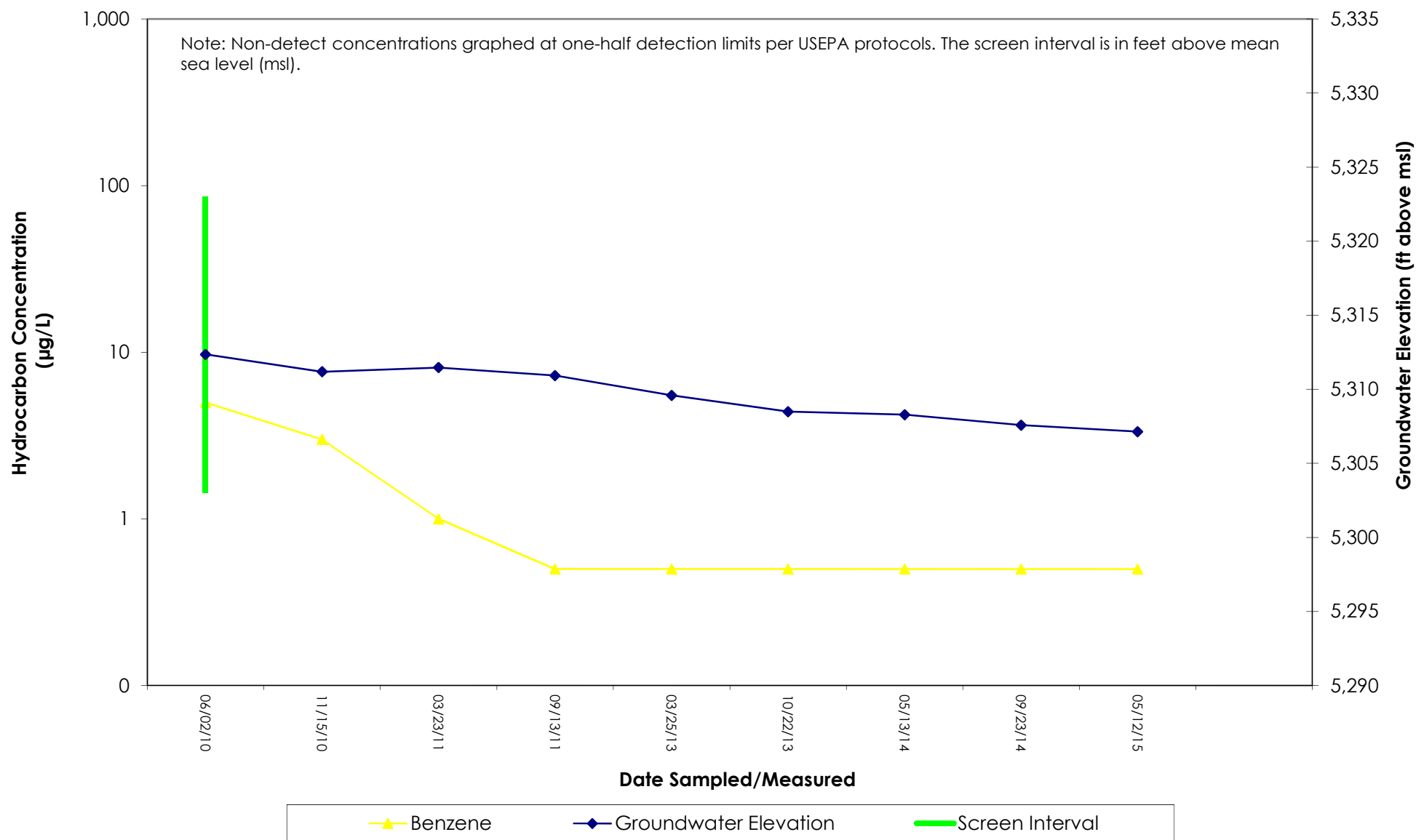


111760-MW-3 Benzene Concentrations and Groundwater Elevations vs. Time

Federal 23-12 (Pit #111760)

South Canyon Field

Garfield County, CO

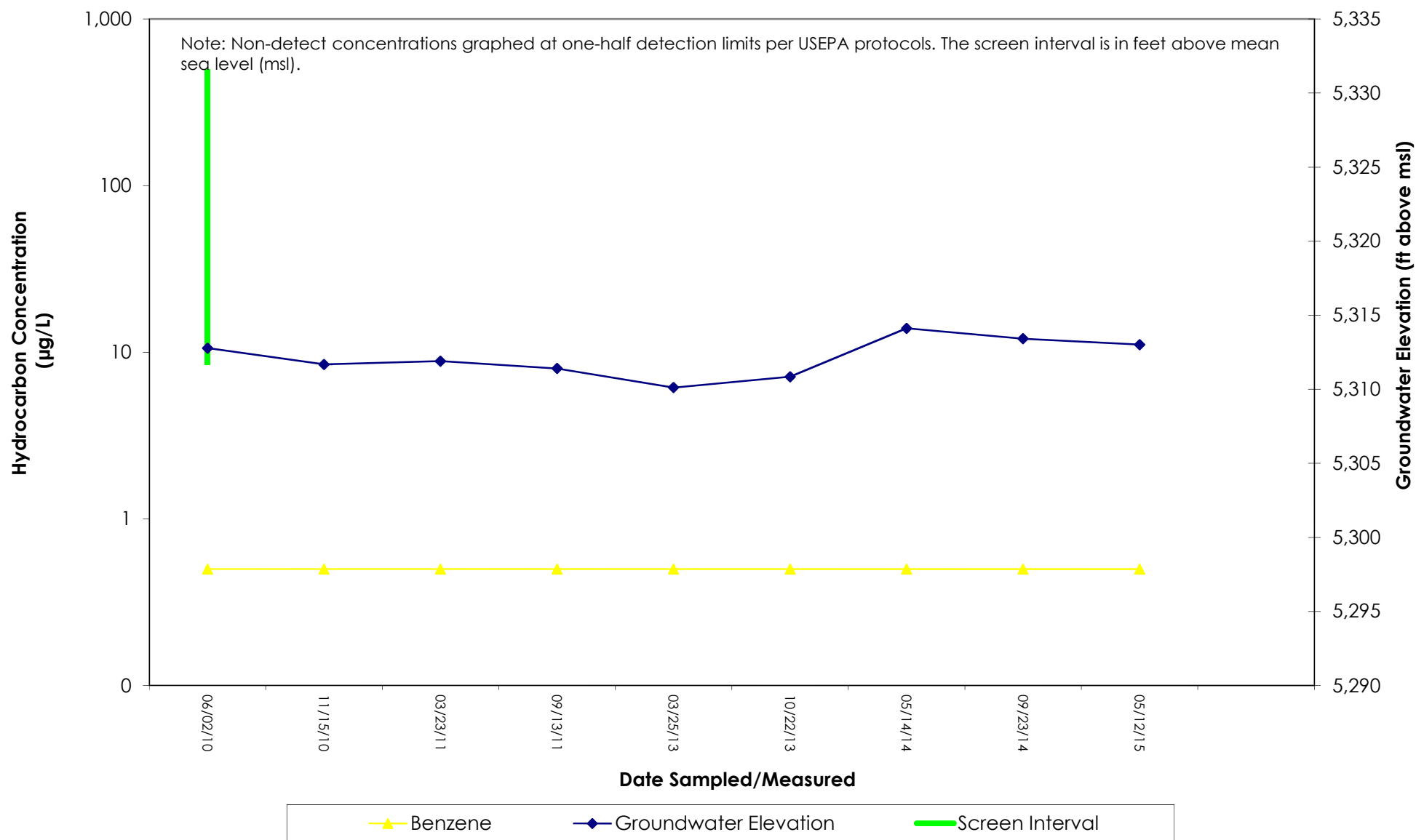


111760-MW-4 Benzene Concentrations and Groundwater Elevations vs. Time

Federal 23-12 (Pit #111760)

South Canyon Field

Garfield County, CO



111760-MW-5 Benzene Concentrations and Groundwater Elevations vs. Time

Federal 23-12 (Pit #111760)

South Canyon Field

Garfield County, CO

