

# **Harsch 42-27**

NWNE Sec. 27-T2N-R69W

Remediation Project #: 21354

First Quarter 2023 Quarterly Report

February 2023

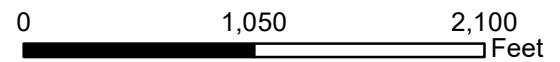
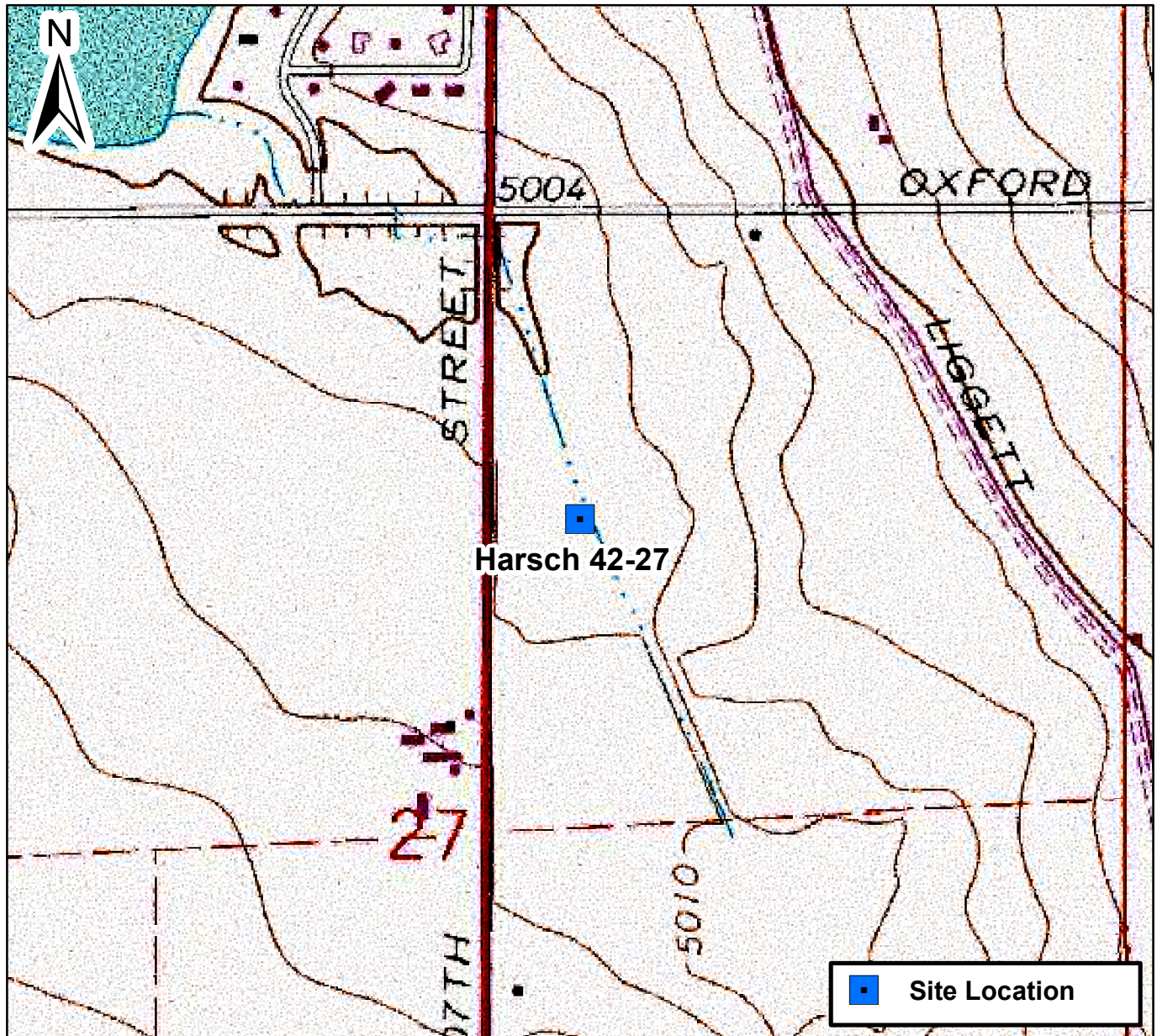
Prepared by Tasman, Inc.



On behalf of Crestone Peak Resources Operating, LLC



## FIGURES




## Figure 1

Site Location Map  
 Harsch 42-27  
 NWNE Sec. 27-T2N-R69W  
 Boulder, Colorado

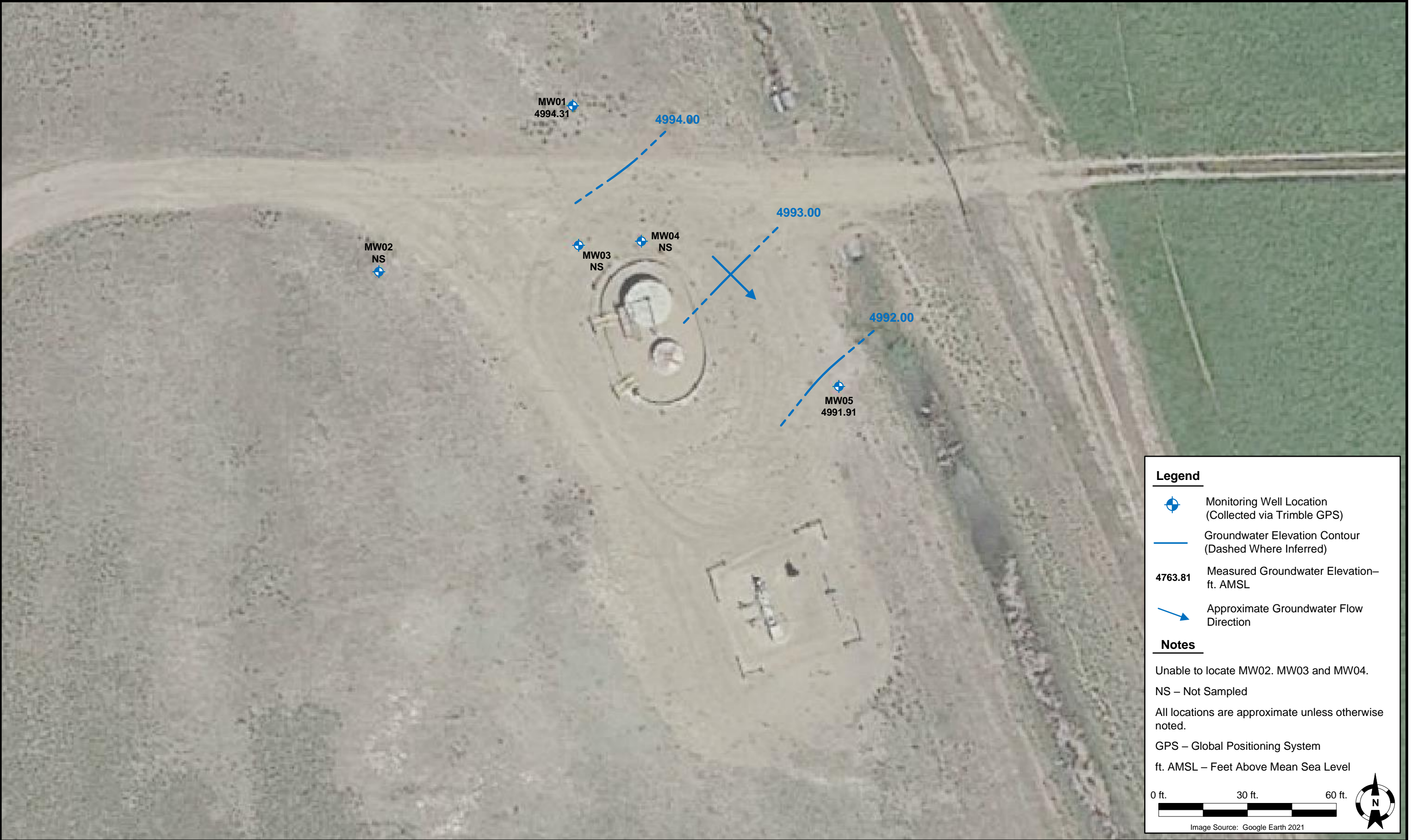







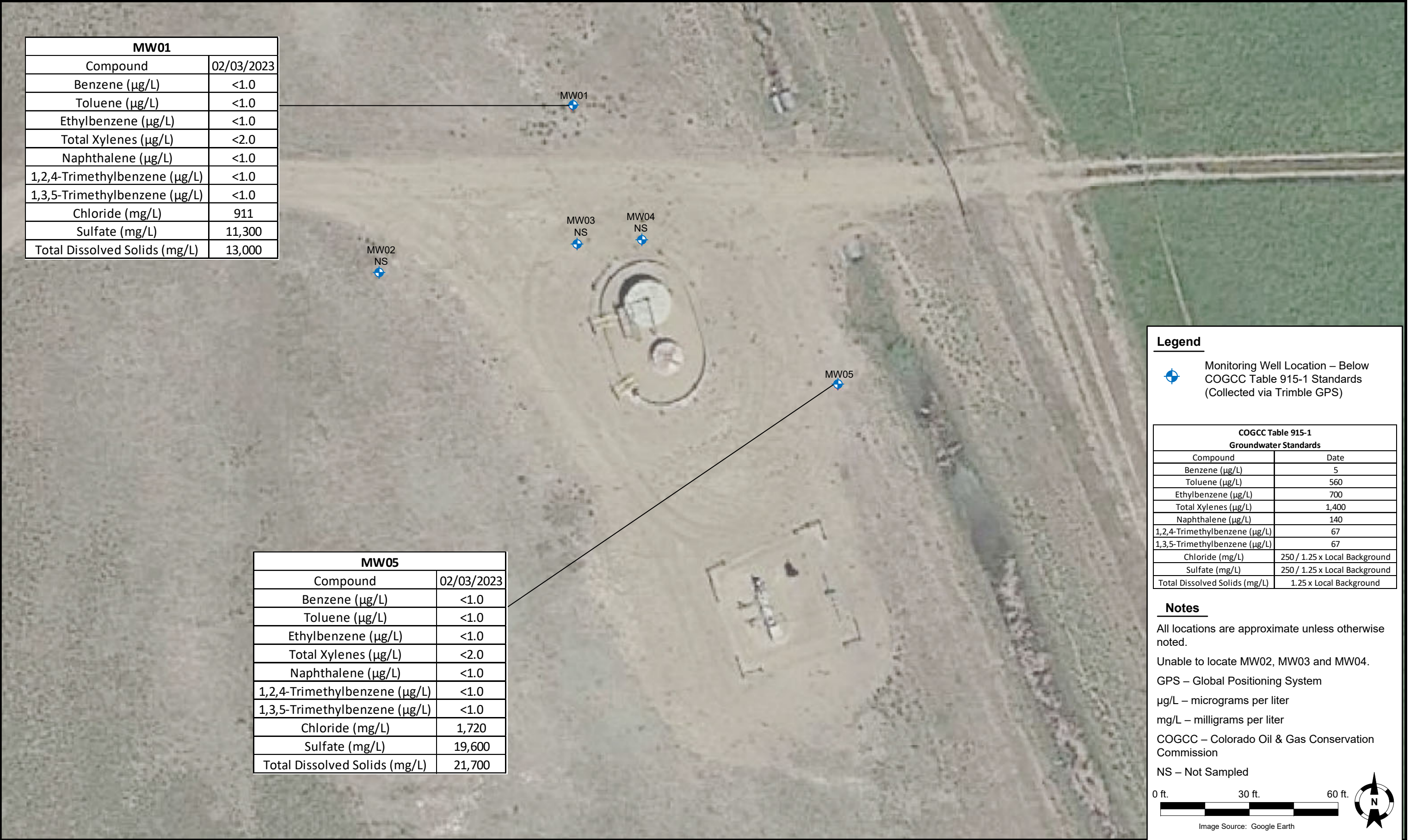
DATE: January 30, 2023	 <b>Tasman, Inc.</b> 6855 W. 119th Avenue Broomfield, Colorado 80020	<b>Crestone Peak Resources Operating, LLC</b> <b>Harsch 42-27</b> NWNE Sec. 27-T2N-R69W Boulder County, Colorado	Site Overview Map	FIGURE 2
DESIGNED BY: S. Vogt				
DRAWN BY: S. Kirylo				





DATE: April 18, 2023	 <b>TASMAN</b> Tasman, Inc. 6855 W. 119th Avenue Broomfield, Colorado 80020	<b>Crestone Peak Resources Operating, LLC</b> <b>Harsch 42-27</b> NWNE Sec. 27-T2N-R6W Boulder County, Colorado	Groundwater Potentiometric Surface Contour Map (02/03/2023)	<b>FIGURE</b> 3
DESIGNED BY: S. Vogt				
DRAWN BY: L. Reed				





# TABLES

**TABLE 1**  
**HARSCH 42-27**  
**SOIL SAMPLE LOCATIONS**  
**CRESTONE PEAK RESOURCES OPERATING, LLC**



Soil Sample Location	Date	PID Reading (ppm)	Latitude	Longitude	GPS PDOP Value	Lab (Y/N)
SB01@5-6	10/08/2021	7.4	40.112769	-105.101412	-	Y
SB02@4-5	10/08/2021	3.2	40.112755	-105.101507	-	Y
SB03@3-4	10/08/2021	2.6	40.112654	-105.101487	-	Y
SB03@4-5	10/08/2021	2.7	40.112654	-105.101487	-	Y
SB04@4-5	10/08/2021	1.6	40.112556	-105.101382	-	Y
BKG01@4-5	10/08/2021	-	40.112693	-105.101568	-	Y
SB01_GW	10/08/2021	-	40.112789	-105.101409	-	Y
BKG01_GW	10/08/2021	-	40.112693	-105.101568	-	Y
MW01@12'	10/27/2022	0.0	40.112893	-105.101424	-	Y
MW02@12'	10/27/2022	0.0	40.112739	-105.101657	-	Y
MW03@2'	10/27/2022	2.5	40.112764	-105.101417	-	Y
MW03@12'	10/27/2022	0.0	40.112764	-105.101417	-	Y
MW04@2'	10/27/2022	3.5	40.112768	-105.101340	-	Y
MW04@10'-11'	10/27/2022	0.0	40.112768	-105.101340	-	Y
MW05@12'	10/27/2022	0.0	40.112634	-105.101102	-	Y

**Notes:**

PID = Photoionization Detector

ppm = parts per million

HC = Hydrocarbon

GPS = Global Positioning System

PDOP = Position Dilution of Precision

- = Not Applicable

10/29/20 [date] = Data collected by 3rd-party consultant(s)



**TABLE 2**  
**HARSCH 42-27**  
**SOIL ANALYTICAL DATA - VOCs**  
**CRESTONE PEAK RESOURCES OPERATING, LLC**

Soil Sample Location	Date	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	Naphthalene (mg/kg)	TVPH-GRO (mg/kg)	TEPH-DRO (mg/kg)	TEPH-ORO (mg/kg)	1,2,4-TMB (mg/kg)	1,3,5-TMB (mg/kg)
<b>COGCC Organic Compounds in Soils <sup>(1)</sup></b>		<b>0.0026</b>	<b>0.69</b>	<b>0.78</b>	<b>9.9</b>	<b>0.0038</b>	<b>500</b>			<b>0.0081</b>	<b>0.0087</b>
<b>COGCC Organic Compounds in Soils <sup>(2)</sup></b>		<b>1.2</b>	<b>490</b>	<b>5.8</b>	<b>58</b>	<b>2</b>	<b>500</b>			<b>30</b>	<b>27</b>
SB01@5-6	10/08/2021	<0.0020	<0.0050	<0.0050	<0.010	<0.0038	<0.50			<0.0050	<0.0050
SB02@4-5	10/08/2021	<0.0020	<0.0050	<0.0050	<0.010	<0.0038	<0.50			<0.0050	<0.0050
SB03@3-4	10/08/2021	<0.0020	<0.0050	<0.0050	<0.010	<0.0038	<0.50			<0.0050	<0.0050
SB03@4-5	10/08/2021	<0.0020	<0.0050	<0.0050	<0.010	<0.0038	<0.50			<0.0050	<0.0050
SB04@4-5	10/08/2021	<0.0020	<0.0050	<0.0050	<0.010	<0.0038	<0.50			<0.0050	<0.0050
MW01@12'	10/27/2022	<0.0020	<0.0050	<0.0050	<0.010	<0.0038	<0.50	<50	<50	<0.0050	<0.0050
MW02@12'	10/27/2022	<0.0020	<0.0050	<0.0050	<0.010	<0.0038	<0.50	<50	<50	<0.0050	<0.0050
MW03@12'	10/27/2022	<0.0020	<0.0050	<0.0050	<0.010	<0.0038	<0.50	<50	<50	<0.0050	<0.0050
MW03@2'	10/27/2022	<0.0020	<0.0050	<0.0050	<0.010	<0.0038	<0.50	<50	<50	<0.0050	<0.0050
MW04@10-11'	10/27/2022	<0.0020	<0.0050	<0.0050	<0.010	<0.0038	<0.50	<50	<50	<0.0050	<0.0050
MW04@2'	10/27/2022	<0.0020	<0.0050	<0.0050	<0.010	<0.0038	<0.50	<50	<50	<0.0050	<0.0050
MW05@12'	10/27/2022	<0.0020	<0.0050	<0.0050	<0.010	<0.0038	<0.50	<50	<50	<0.0050	<0.0050

**Notes:**

VOCs = Volatile Organic Compounds

(1) Standards for soil are taken from COGCC Table 915-1: Organic Compounds in Soils - Protection of Groundwater Soil Screening Level Concentrations (Effective January 15, 2021)

(2) Standards for soil are taken from COGCC Table 915-1: Organic Compounds in Soils - Residential Soil Screening Level Concentrations (Effective January 15, 2021)

COGCC = Colorado Oil and Gas Conservation Commission

(<) = Analytical result is less than the indicated laboratory reporting limit

mg/kg = milligrams per kilogram

TVPH - GRO = Total Volatile Petroleum Hydrocarbons - Gasoline Range Organics

TEPH - DRO = Total Extractable Petroleum Hydrocarbons - Diesel Range Organics

TEPH - ORO = Total Extractable Petroleum Hydrocarbons - Oil Range Organics

1,2,4 - TMB = 1,2,4 - Trimethylbenzene

1,3,5 - TMB = 1,3,5 - Trimethylbenzene

**BOLD** = Analytical result is in exceedance of COGCC Table 915-1: Organic Compounds in Soils - Protection of Groundwater Soil Screening Level Concentrations

**BOLD** = Analytical result is in exceedance of COGCC Table 915-1: Organic Compounds in Soils - Residential Soil Screening Level Concentrations

- = Constituent not analyzed

10/29/20 [date] = Data collected by 3rd-party consultant(s)

**TABLE 3**  
**HARSCH 42-27**  
**SOIL ANALYTICAL DATA - PAHs**  
**CRESTONE PEAK RESOURCES OPERATING, LLC**

Soil Sample Location	Date	Acenaphthene (mg/kg)	Anthracene (mg/kg)	Benzo(a)A (mg/kg)	Benzo(b)F (mg/kg)	Benzo(k)F (mg/kg)	Benzo(a)P (mg/kg)	Chrysene (mg/kg)	D (a,h) A (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	1,2,3-CD (mg/kg)	1-M (mg/kg)	2-M (mg/kg)	Pyrene (mg/kg)
COGCC Organic Compounds in Soils <sup>(1)</sup>		0.55	5.8	0.011	0.3	2.9	0.24	9	0.96	8.9	0.54	0.98	0.006	0.019	1.3
COGCC Organic Compounds in Soils <sup>(2)</sup>		360	1,800	1.1	1.1	11	0.11	110	0.11	240	240	1.1	18	24	180
SB01@5-6	10/08/2021	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
SB02@4-5	10/08/2021	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
SB03@3-4	10/08/2021	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
SB03@4-5	10/08/2021	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
SB04@4-5	10/08/2021	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
MW01@12'	10/27/2022	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
MW02@12'	10/27/2022	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
MW03@12'	10/27/2022	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
MW03@2'	10/27/2022	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
MW04@10-11'	10/27/2022	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
MW04@2'	10/27/2022	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
MW05@12'	10/27/2022	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500

**Notes:**

PAHs = Polycyclic Aromatic Hydrocarbons

(1) Standards for soil are taken from COGCC Table 915-1: Organic Compounds in Soils - Protection of Groundwater Soil Screening Level Concentrations (Effective January 15, 2021)

(2) Standards for soil are taken from COGCC Table 915-1: Organic Compounds in Soils - Residential Soil Screening Level Concentrations (Effective January 15, 2021)

COGCC = Colorado Oil and Gas Conservation Commission

(<) = Analytical result is less than the indicated laboratory reporting limit

mg/kg = milligrams per kilogram

Benzo(a)A = Benzo(a)Anthracene

Benzo(b)F = Benzo(b)Fluoranthene

Benzo(k)F = Benzo(k)Fluoranthene

Benzo(a)P = Benzo(a)Pyrene

D (a,h) A = Dibenzo(a,h)Anthracene

1,2,3-CD = Indeno(1,2,3-cd)Pyrene

1-M = 1-Methylnaphthalene

2-M = 2-Methylnaphthalene

**BOLD** = Analytical result is in exceedance of COGCC Table 915-1: Organic Compounds in Soils - Protection of Groundwater Soil Screening Level Concentrations

**BOLD** = Analytical result is in exceedance of COGCC Table 915-1: Organic Compounds in Soils - Residential Soil Screening Level Concentrations

- = Constituent not analyzed



**TABLE 3**  
**HARSCH 42-27**  
**SOIL ANALYTICAL DATA - PAHs**  
**CRESTONE PEAK RESOURCES OPERATING, LLC**

Soil Sample Location	Date	Acenaphthene (mg/kg)	Anthracene (mg/kg)	Benzo(a)A (mg/kg)	Benzo(b)F (mg/kg)	Benzo(k)F (mg/kg)	Benzo(a)P (mg/kg)	Chrysene (mg/kg)	D (a,h) A (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	1,2,3-CD (mg/kg)	1-M (mg/kg)	2-M (mg/kg)	Pyrene (mg/kg)
COGCC Organic Compounds in Soils <sup>(1)</sup>		0.55	5.8	0.011	0.3	2.9	0.24	9	0.96	8.9	0.54	0.98	0.006	0.019	1.3
COGCC Organic Compounds in Soils <sup>(2)</sup>		360	1,800	1.1	1.1	11	0.11	110	0.11	240	240	1.1	18	24	180

10/29/20 [date] = Data collected by 3rd-party consultant(s)

**TABLE 4**  
**HARSCH 42-27**  
**SOIL ANALYTICAL DATA - METALS**  
**CRESTONE PEAK RESOURCES OPERATING, LLC**

Soil Sample Location	Date	Arsenic (mg/kg)	Barium (mg/kg)	Cadmium (mg/kg)	Chromium (VI) (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Zinc (mg/kg)
COGCC Metals in Soils <sup>(1)</sup>		0.29	82	0.38	0.00067	46	14	26	0.26	0.8	370
COGCC Metals in Soils <sup>(2)</sup>		0.68	15,000	71	0.3	3,100	400	1,500	390	390	23,000
SB01@5-6	10/08/2021	3.53*	117*	0.299	<0.30	18.8	14.5*	18.8	1.32	0.109	78.6
SB02@4-5	10/08/2021	5.07*	116*	0.254	<0.30	18.3	16.7*	16.1	1.40	0.101	74.6
SB03@3-4	10/08/2021	5.73*	65.7	0.284	<0.30	16.7	15.8*	18.0	0.988*	0.106	74.6
SB03@4-5	10/08/2021	6.81*	75.6	0.280	<0.30	17.9	14.6*	18.5	1.05*	0.0986	83.0
SB04@4-5	10/08/2021	6.41*	101*	0.288	<0.30	18.9	15.2*	18.9	1.37	0.102	90.6
MW01@12'	10/27/2022	2.06	112	0.309	<0.30	10.6	12.4	10.7	<0.213	0.0677	40.8
MW02@12'	10/27/2022	1.77	63.3	0.282	<0.30	9.90	11.5	10.7	<0.213	0.0708	38.1
MW03@12'	10/27/2022	1.84	77.0	0.307	<0.30	10.5	11.7	10.3	0.274	0.0668	42.6
MW03@2'	10/27/2022	2.04	92.7	0.333	<0.30	9.35	10.4	8.86	0.272	0.0718	32.9
MW04@10-11'	10/27/2022	2.11	112	0.330	<0.30	11.3	12.3	11.3	0.363	0.0686	43.4
MW04@2'	10/27/2022	2.82	80.9	0.262	<0.30	9.87	10.8	8.79	0.336	0.0692	32.2
MW05@12'	10/27/2022	1.95	70.0	0.334	<0.30	11.0	12.2	10.8	0.510	0.0932	42.8
BACKGROUND											
BKG01@4-5	10/08/2021	5.61	94.9	<0.251	<0.30	16.3	13.4	16.9	1.04	0.0725	71.2

**Notes:**

(1) Standards for soil are taken from COGCC Table 915-1: Metals in Soils - Protection of Groundwater Soil Screening Level Concentrations (Effective January 15, 2021)

(2) Standards for soil are taken from COGCC Table 915-1: Metals in Soils - Residential Soil Screening Level Concentrations (Effective January 15, 2021)

COGCC = Colorado Oil and Gas Conservation Commission

(<) = Analytical result is less than the indicated laboratory minimum detection limit

mg/kg = milligrams per kilogram

**BOLD** = Analytical result is in exceedance of COGCC Table 915-1: Metals in Soils - Protection of Groundwater Soil Screening Level Concentrations

**BOLD** = Analytical result is in exceedance of COGCC Table 915-1: Metals in Soils - Residential Soil Screening Level Concentrations

*Italics* = Laboratory minimum detection limit exceeds the COGCC Table 915-1 Standard

\* Result exceeded the COGCC Table 915-1 standard, but was within site-specific 1.25x background multiplier levels

- = Constituent not analyzed

10/29/20 [date] = Data collected by 3rd-party consultant(s)



TABLE 5  
HARSCH 42-27



SOIL ANALYTICAL DATA - SOIL RECLAMATION  
CRESTONE PEAK RESOURCES OPERATING, LLC

Soil Sample Location	Date	pH	SAR	EC (mmhos/cm)	Boron (mg/L)
COGCC Soil Suitability for Reclamation <sup>(1)</sup>		6 - 8.3	< 6	< 4	2
SB01@5-6	10/08/2021	8.34	12.1*	4.21*	0.499
SB02@4-5	10/08/2021	8.16	11.9*	7.96*	0.209
SB03@3-4	10/08/2021	8.27	13.8*	11.5	0.357
SB03@4-5	10/08/2021	8.25	13.8*	10.8	0.335
SB04@4-5	10/08/2021	8.25	13.3*	10.3	0.284
MW01@12'	10/27/2022	8.21	14.8	5.24	0.817
MW02@12'	10/27/2022	8.50	13.8	3.40	1.47
MW03@12'	10/27/2022	8.07	15.7	9.94	1.37
MW03@2'	10/27/2022	7.71	16.4	11.6	0.567
MW04@10-11'	10/27/2022	8.31	19.5	9.11	1.29
MW04@2'	10/27/2022	8.21	16.2	8.89	0.493
MW05@12'	10/27/2022	8.15	18.0	9.43	1.33
BACKGROUND					
BKG01@4-5	10/08/2021	8.29	15.5	8.58	0.325

**Notes:**

(1) Standards for soil are taken from COGCC Table 915-1: Soil Suitability for Reclamation (Effective January 15, 2021)

COGCC = Colorado Oil and Gas Conservation Commission

(<) = Analytical result is less than the indicated laboratory reporting limit

mmhos/cm = millimhos per centimeter

mg/L = milligrams per liter

pH = Potential of Hydrogen

SAR = Sodium Adsorption Ratio

EC = Electrical Conductivity

**BOLD** = Analytical result is in exceedance of COGCC Table 915-1: Soil Suitability for Reclamation Concentrations

\* Result exceeded the COGCC Table 915-1 standard, but was within site-specific background concentrations

- = Constituent not analyzed

10/29/20 [date] = Data collected by 3rd-party consultant(s)

**TABLE 6**  
**HARSCH 42-27**  
**GROUNDWATER ANALYTICAL DATA**  
**CRESTONE PEAK RESOURCES OPERATING, LLC**

Groundwater Sample ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ehtylbenzene (µg/L)	Total Xylenes (µg/L)	Naphthalene (µg/L)	1,2,4-TMB (µg/L)	1,3,5-TMB (µg/L)	Chloride (mg/L)	Sulfate (mg/L)	TDS (mg/L)
<b>COGCC Organic Compounds in Groundwater and Groundwater Inorganic Parameters<sup>(1)</sup></b>		<b>5</b>	<b>560</b>	<b>700</b>	<b>1,400</b>	<b>140</b>	<b>67</b>	<b>67</b>	<b>250 or &lt;1.25 x Background</b>	<b>250 or &lt;1.25 x Background</b>	<b>&lt;1.25 x Background</b>
SB01_GW	10/08/2021	88	27	2.1	42	<1.0	5.3	4	14,800	1,180	10,400
BKG01_GW	10/08/2021	-	-	-	-	-	-	-	27,900	1,760	17,800
MW01	11/23/2022	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	1,350	11,700	13,100
	02/03/2023	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	911	11,300	13,000
MW02	11/23/2022	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	-	-	-
	02/03/2023	NS - Unable to locate									
MW03	11/23/2022	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	2,580	13,500	16,300
	02/03/2023	Destroyed									
MW04	11/23/2022	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	1,740	16,600	18,700
	02/03/2023	Destroyed									
MW05	11/23/2022	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	-	-	-
	02/03/2023	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	1,720	19,600	21,700

**Notes:**

(1) Standards for groundwater are taken from COGCC Table 915-1: Organic Compounds in Groundwater and Groundwater Inorganic Parameters (Effective January 15, 2021)

COGCC = Colorado Oil and Gas Conservation Commission

(<) = Analytical result is less than the indicated laboratory reporting limit

µg/L = micrograms per liter

1,2,4-TMB = 1,2,4-Trimethylbenzene

1,3,5-TMB = 1,3,5-Trimethylbenzene

TDS = Total Dissolved Solids

**BOLD** = Analytical result is in exceedance of COGCC Table 915-1: Organic Compounds in Groundwater and Groundwater Inorganic Parameters

\* Result exceeded the COGCC Table 915-1 standard, but was within site-specific background concentrations

- = Constituent not analyzed

10/29/20 [date] = Data collected by 3rd-party consultant(s)



**TABLE 7  
HARSCH 42-27**



**GROUNDWATER ELEVATION DATA  
CRESTONE PEAK RESOURCES OPERATING, LLC**

Groundwater Sample ID	Date	Top of Casing Elevation (ft. AMSL)	Total Depth (ft.)	Depth to Water (ft.)	Depth to LNAPL (ft.)	LNAPL Thickness (ft.)	Groundwater Elevation* (ft. AMSL)
MW01	11/23/2022	4,998.50	10.45	7.89	ND		4,990.61
	02/03/2023		10.48	4.19	ND		4,994.31
MW02	11/23/2022	4,998.65	11.10	7.57	ND		4,991.08
	02/03/2023		Unable to locate				
MW03	11/23/2022	4,999.83	10.15	5.73	ND		4,994.10
	02/03/2023		Destroyed				
MW04	11/23/2022	4,999.70	11.34	9.25	ND		4,990.45
	02/03/2023		Destroyed				
MW05	11/23/2022	5,000.69	11.14	10.62	ND		4,990.07
	02/03/2023		11.34	8.78	ND		4,991.91

**Notes:**

\* Groundwater elevation was corrected for product thickness (when present) using the following calculation:  
Groundwater elevation = (TOC Elevation - Measured Depth to Water)+(LNAPL Thickness in Well x LNAPL Relative Density)  
LNAPL relative density was estimated to be approximately 0.75

**Definitions:**

ft. = feet

AMSL = Above Mean Sea Level

LNAPL = Light Non-Aqueous Phase Liquid

10/29/20 [date] = Data collected by 3rd-party consultant(s)

ND = Not detected

## **LABORATORY ANALYTICAL DATA**

# Summit Scientific

---

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

February 13, 2023

Sam Vogt

Civitas Resources

650 Southgate Drive

Windsor, CO 80550

RE: Harsch 42-27

Work Order #2302065

Enclosed are the results of analyses for samples received by Summit Scientific on 02/03/23 17:52. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "Scott Sheely".

Scott Sheely For Paul Shrewsbury  
President





Civitas Resources  
650 Southgate Drive  
Windsor CO, 80550

Project: Harsch 42-27

Project Number: 21354  
Project Manager: Sam Vogt

**Reported:**  
02/13/23 12:33

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW01	2302065-01	Water	02/03/23 13:57	02/03/23 17:52
MW05	2302065-02	Water	02/03/23 13:58	02/03/23 17:52

Summit Scientific

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

		<b>Send Data To:</b>	<b>Send Invoice To:</b>
Client: Civitas/Tasman	Project Manager: Sam Vogt, Jacod Evans		Company:
Address: 6855 W. 119th Ave	E-Mail: svogt@tasman-geo.com		Project Name/Location:
City/State/Zip: Broomfield, CO 80020	jevans@civiresources.com		AFE#: 21354
Phone: PM 610-405-9078	Project Name: Horsch 42-27		PO/Billing Codes:
Sampler Name: Sierra Kingly + Chris Girardi	Project Number: 21354 - CG		Contact:

					Preservative				Matrix				Analysis Requested							Special Instructions	
ID	Sample Description	Date Sampled	Time Sampled	# of containers	HCl	HNO3	None	Other _____	Water	Soil	Air-Canister #	Other _____	BTEX N	TMBS	TDS	Cl	Sol				
1	MW#1	2/3/23	1357	4			X		X				X	X	X	X	X				
2	MW#5	2/3/23	1358	4			X		X				X	X	X	X	X				
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					
13																					
14																					
15																					

Relinquished by: <i>Chris Girardi</i>	Date/Time: 2/3/23 1530	Received by: Tasman Lockbox	Date/Time: 2/3/23 1530	TAT Business Days	Field DO	Notes: <u>Methods:</u> *Sat. paste      **Hot water
Relinquished by: Tasman Lockbox	Date/Time: 2323 1752	Received by: <i>[Signature]</i>	Date/Time: 2323 1752	Same Day	Field EC	
Relinquished by:	Date/Time:	Received by:	Date/Time:	1 Day	Field ORP	
				2 Days	Field pH	
				3 Days	Field Temp.	
Temperature Upon Receipt: 53	Corrected Temperature: <i>6</i>	IR gun #: 1	HNO3 lot #:	Standard	X Field Turb.	

S<sub>2</sub>

## Sample Receipt Checklist

S2 Work Order# 230285Client: Cintas/Trasman Client Project ID: Harsch 42-27Shipped Via: H.D./P.U./FedEx/UPS/USPS/Other ☐ Airbill #: ☐
☐ ☐ ☐ ☐ ☐
Matrix (Check all that apply) Air ☐ Soil/Solid ☐ Water ☐ Other ☐Temp (°C) 6.3Thermometer # 1

	Yes	No	N/A	Comments (if any)
If samples require cooling, is the temperature < 6°C? <sup>(1)</sup> <b>NOTE:</b> If samples are delivered the same day of sampling, this requirement is met if there is evidence that cooling has begun.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	on ice
If custody seals are present, are they intact? <sup>(1)</sup>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Are samples due within 48 hours present?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Are water samples with short hold times present? Note the short hold analysis in the comments column - pH, Nitrate/Nitrite, Ferrous Iron (Fe <sup>2+</sup> ), Hexavalent Chromium (Cr <sup>6+</sup> , Cr VI), COD/BOD, Total Coliform, E. Coli, Total Residual Chlorine (TRC), Dissolved Oxygen	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Is a chain-of-custody (COC) form present and filled out Completely? <sup>(1)</sup>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is the COC properly relinquished by the client w/ date and time recorded? <sup>(1)</sup>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all samples received intact? <sup>(1)</sup>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was adequate sample volume provided? <sup>(1)</sup>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Does the COC agree with the number and type of sample bottles received? <sup>(1)</sup>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Do the sample IDs on the bottle labels match the COC? <sup>(1)</sup>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Are samples preserved that require preservation (excluding cooling)? <sup>(1)</sup> Note the type of preservative in the comments column – HCl, H <sub>2</sub> SO <sub>4</sub> , NaOH, HNO <sub>3</sub> , etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
If samples are acid preserved for metals, is the pH ≤ 2? <sup>(1)</sup> Record the pH in Comments.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
If dissolved metals are requested, were samples field filtered?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Additional Comments (if any):				
<sup>(1)</sup> If NO, then contact the client before proceeding with analysis and note in case narrative.				

AS  
Custodian Printed Name

2/3/23  
Date/Time





Civitas Resources  
650 Southgate Drive  
Windsor CO, 80550

Project: Harsch 42-27

Project Number: 21354  
Project Manager: Sam Vogt

**Reported:**  
02/13/23 12:33

**MW01**  
**2302065-01 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **02/03/23 13:57**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Benzene	ND	1.0	ug/l	1	BGB0138	02/06/23	02/08/23	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	
Naphthalene	ND	1.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	

Date Sampled: **02/03/23 13:57**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: 1,2-Dichloroethane-d4	14.9	112 %	23-173		"	"	"	"	
Surrogate: Toluene-d8	13.6	102 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene	13.4	100 %	21-167		"	"	"	"	

**Anions by EPA Method 300.0**

Date Sampled: **02/03/23 13:57**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Chloride	<b>911</b>	12.0	mg/L	200	BGB0208	02/08/23	02/08/23	EPA 300.0	
Sulfate	<b>11300</b>	60.0	"	"	"	"	"	"	

**Total Dissolved Solids by SM2540C**

Date Sampled: **02/03/23 13:57**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Total Dissolved Solids	<b>13000</b>	10.0	mg/L	1	BGB0128	02/06/23	02/06/23	SM2540C	

Summit Scientific

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Civitas Resources  
650 Southgate Drive  
Windsor CO, 80550

Project: Harsch 42-27  
Project Number: 21354  
Project Manager: Sam Vogt

**Reported:**  
02/13/23 12:33

**MW05**  
**2302065-02 (Water)**

**Summit Scientific**

**Volatile Organic Compounds by EPA Method 8260B**

Date Sampled: **02/03/23 13:58**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Benzene	ND	1.0	ug/l	1	BGB0138	02/06/23	02/08/23	EPA 8260B	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes (total)	ND	2.0	"	"	"	"	"	"	
Naphthalene	ND	1.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	

Date Sampled: **02/03/23 13:58**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Surrogate: 1,2-Dichloroethane-d4	15.3	115 %	23-173		"	"	"	"	
Surrogate: Toluene-d8	13.6	102 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene	13.5	102 %	21-167		"	"	"	"	

**Anions by EPA Method 300.0**

Date Sampled: **02/03/23 13:58**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Chloride	1720	12.0	mg/L	200	BGB0208	02/08/23	02/08/23	EPA 300.0	
Sulfate	19600	120	"	400	"	"	"	"	

**Total Dissolved Solids by SM2540C**

Date Sampled: **02/03/23 13:58**

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							
Total Dissolved Solids	21700	10.0	mg/L	1	BGB0128	02/06/23	02/06/23	SM2540C	

Summit Scientific

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Civitas Resources  
650 Southgate Drive  
Windsor CO, 80550

Project: Harsch 42-27

Project Number: 21354  
Project Manager: Sam Vogt

**Reported:**  
02/13/23 12:33

## Volatile Organic Compounds by EPA Method 8260B - Quality Control

### Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

#### Batch BGB0138 - EPA 5030 Water MS

##### Blank (BGB0138-BLK1)

Prepared: 02/06/23 Analyzed: 02/07/23

Benzene	ND	1.0	ug/l							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes (total)	ND	2.0	"							
Naphthalene	ND	1.0	"							
1,2,4-Trimethylbenzene	ND	1.0	"							
1,3,5-Trimethylbenzene	ND	1.0	"							
Surrogate: 1,2-Dichloroethane-d4	13.4		"	13.3		100	23-173			
Surrogate: Toluene-d8	13.2		"	13.3		98.7	20-170			
Surrogate: 4-Bromofluorobenzene	13.0		"	13.3		97.9	21-167			

##### LCS (BGB0138-BS1)

Prepared: 02/06/23 Analyzed: 02/07/23

Benzene	38.8	1.0	ug/l	33.3		116	51-132			
Toluene	37.5	1.0	"	33.3		112	51-138			
Ethylbenzene	38.5	1.0	"	33.3		116	58-146			
m,p-Xylene	74.9	2.0	"	66.7		112	57-144			
o-Xylene	35.2	1.0	"	33.3		106	53-146			
Naphthalene	25.2	1.0	"	33.3		75.8	70-130			
1,2,4-Trimethylbenzene	37.2	1.0	"	33.3		112	70-130			
1,3,5-Trimethylbenzene	38.6	1.0	"	33.3		116	70-130			
Surrogate: 1,2-Dichloroethane-d4	13.0		"	13.3		97.9	23-173			
Surrogate: Toluene-d8	13.3		"	13.3		100	20-170			
Surrogate: 4-Bromofluorobenzene	12.8		"	13.3		96.2	21-167			

##### Matrix Spike (BGB0138-MS1)

Source: 2302046-01

Prepared: 02/06/23 Analyzed: 02/07/23

Benzene	39.3	1.0	ug/l	33.3	ND	118	34-141			
Toluene	37.8	1.0	"	33.3	ND	114	27-151			
Ethylbenzene	39.1	1.0	"	33.3	ND	117	29-160			
m,p-Xylene	77.0	2.0	"	66.7	ND	115	20-166			
o-Xylene	36.6	1.0	"	33.3	ND	110	33-159			
Naphthalene	28.6	1.0	"	33.3	ND	85.7	70-130			
1,2,4-Trimethylbenzene	37.5	1.0	"	33.3	ND	113	70-130			
1,3,5-Trimethylbenzene	39.4	1.0	"	33.3	ND	118	70-130			
Surrogate: 1,2-Dichloroethane-d4	13.9		"	13.3		104	23-173			
Surrogate: Toluene-d8	13.3		"	13.3		99.6	20-170			
Surrogate: 4-Bromofluorobenzene	13.0		"	13.3		97.9	21-167			

Summit Scientific

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Civitas Resources  
650 Southgate Drive  
Windsor CO, 80550

Project: Harsch 42-27

Project Number: 21354  
Project Manager: Sam Vogt

**Reported:**  
02/13/23 12:33

**Volatile Organic Compounds by EPA Method 8260B - Quality Control**  
**Summit Scientific**

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

**Batch BGB0138 - EPA 5030 Water MS**

Matrix Spike Dup (BGB0138-MSD1)	Source: 2302046-01			Prepared: 02/06/23 Analyzed: 02/07/23						
Benzene	38.8	1.0	ug/l	33.3	ND	116	34-141	1.43	30	
Toluene	37.1	1.0	"	33.3	ND	111	27-151	1.97	30	
Ethylbenzene	38.7	1.0	"	33.3	ND	116	29-160	1.16	30	
m,p-Xylene	75.2	2.0	"	66.7	ND	113	20-166	2.27	30	
o-Xylene	35.8	1.0	"	33.3	ND	107	33-159	2.27	30	
Naphthalene	30.9	1.0	"	33.3	ND	92.7	70-130	7.87	30	
1,2,4-Trimethylbenzene	37.1	1.0	"	33.3	ND	111	70-130	1.07	30	
1,3,5-Trimethylbenzene	38.8	1.0	"	33.3	ND	117	70-130	1.51	30	
Surrogate: 1,2-Dichloroethane-d4	14.6		"	13.3		109	23-173			
Surrogate: Toluene-d8	13.2		"	13.3		98.9	20-170			
Surrogate: 4-Bromofluorobenzene	12.9		"	13.3		96.6	21-167			

Summit Scientific

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Civitas Resources  
650 Southgate Drive  
Windsor CO, 80550

Project: Harsch 42-27

Project Number: 21354  
Project Manager: Sam Vogt

**Reported:**  
02/13/23 12:33

### Anions by EPA Method 300.0 - Quality Control

#### Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

#### Batch BGB0208 - General Preparation

##### Blank (BGB0208-BLK1)

Prepared & Analyzed: 02/08/23

Chloride	ND	0.0600	mg/L
Sulfate	ND	0.300	"

##### LCS (BGB0208-BS1)

Prepared & Analyzed: 02/08/23

Chloride	2.85	0.0600	mg/L	3.00	95.0	90-110
Sulfate	14.4	0.300	"	15.0	95.9	90-110

##### Duplicate (BGB0208-DUP1)

Source: 2302064-01

Prepared & Analyzed: 02/08/23

Chloride	44.4	12.0	mg/L	48.8	9.44	20
Sulfate	191	60.0	"	200	4.71	20

##### Matrix Spike (BGB0208-MS1)

Source: 2302064-01

Prepared & Analyzed: 02/08/23

Chloride	478	12.0	mg/L	600	48.8	71.5	80-120	QM-03
Sulfate	2380	60.0	"	3000	200	72.8	80-120	QM-03

Summit Scientific

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Civitas Resources  
650 Southgate Drive  
Windsor CO, 80550

Project: Harsch 42-27

Project Number: 21354  
Project Manager: Sam Vogt

**Reported:**  
02/13/23 12:33

**Total Dissolved Solids by SM2540C - Quality Control**  
**Summit Scientific**

Analyte	Result	Reporting		Spike Level	Source Result	%REC		RPD		Notes
		Limit	Units			%REC	Limits	RPD	Limit	

**Batch BGB0128 - General Preparation**

**Blank (BGB0128-BLK1)**

Prepared & Analyzed: 02/06/23

Total Dissolved Solids ND 10.0 mg/L

**Duplicate (BGB0128-DUP1)**

Source: 2302046-01

Prepared & Analyzed: 02/06/23

Total Dissolved Solids 1490 10.0 mg/L 1490 0.403 20

Summit Scientific

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





Civitas Resources  
650 Southgate Drive  
Windsor CO, 80550

Project: Harsch 42-27

Project Number: 21354  
Project Manager: Sam Vogt

**Reported:**  
02/13/23 12:33

### Notes and Definitions

QM-03 Multiple analyses indicate the percent recovery exceeds the Quality Control acceptance criteria due to a matrix effect.

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit

NR Not Reported

dry Sample results reported on a dry weight basis

RPD Relative Percent Difference