January 26, 2024

Mr. Tim Cazier
Division of Reclamation, Mining and Safety
1313 Sherman Street, Room 215
Denver, CO 80203

RE: Parkdale Quarry, M-1997-054, Technical Revision, Groundwater Monitoring

Dear Mr. Cazier,

Front Range Aggregates LLC, ("Front Range") submits this Technical Revision to Permit M-1997-054 to:

- Provide background results from the groundwater monitoring program
- Request modifications to the groundwater monitoring program

The attached summary report provides the Division with the results of monitoring from monitoring wells MW-1, MW-3 and MW-10 in the expanded permit area approved in AM-02, as well as surface monitoring locations CC-1, TC-1, CC-2, and TC-2. Front Range collected 6 quarters of data from each of these wells to ensure we collected background samples.

Front Range requests the following changes to the ground water monitoring program:

1. Front Range has not commenced mining activities in the expanded permit area as shown in the monitoring and mitigation plan exhibits as Parkdale Quarry BLM Permit Area. Therefore, Front Range requests that monitoring of groundwater wells and surface monitoring locations be suspended until mining begins in the expanded area. Front Range will resume sampling just prior to commencement of mining the expanded permit area. Front Range will notify DRMS when sampling has resumed.

2. Once mining activities begin in the expanded permit area, Front Range requests that compliance monitoring be completed at a frequency of once per year for the downstream compliance monitoring location CC-2. If results of the parameters in CC-2 increase significantly from the 6 quarters of background samples, Front Range will also sample CC-1 or relevant monitoring well(s) on future monitoring, if the Division requests.

3. During the 6 quarters during which background samples were collected, no flow was observed in Tallahassee Creek at monitoring locations TC-1 and TC-2. Therefore, Front Range proposes to eliminate TC-1 and TC-2 as monitoring locations. Front Range has a Colorado Discharge Permit System permit (COG500325) which requires monitoring of five (5) permitted outfalls to Tallahassee Creek. Discharge of water from the mine to Tallahassee Creek is monitored per the requirements of this permit.

4. Based on the results of background sampling showing that most parameters were either not detected or detected below the water quality standards for at least 5 quarters, Front Range requests that once compliance monitoring resumes, analysis will include the following parameters:

West Division
1627 Cole Blvd, Suite 200, Lakewood, CO 80401
t. (720) 245-6400 f. (303) 657-4212
www.martinmarietta.com

- Field parameters (Dissolved Oxygen, pH, specific conductivity, temperature, turbidity)
- Total Dissolved Solids (TDS)
- Fluoride
- Sulfide
- Aluminum
- Iron
- Manganese

There is no activity at the mine that is expected to impact these parameters. Therefore, Front Range proposes to report the results of compliance monitoring for information to the Division of Reclamation, Mining & Safety with the submittal of the annual report due for this permit on January 11 each year.

When mining in the expanded permit area commences, monitoring of groundwater levels will resume for MW-1, MW-3 and MW-10, at a frequency of twice per year with the monitoring events being spaced at least 5 months apart.

Should you have additional questions please contact me at 720-612-6232 or phillip.courtney@martinmarietta.com.

Sincerely,

Phillip J. Courtney
Land Manager

Beth Haake
Senior Environmental Engineer

December 19, 2023

Re: Front Range Aggregates Parkdale Quarry Background Surface and Groundwater Monitoring, Permit M-1997-054

Surface and groundwater sampling was conducted at Parkdale Quarry per Exhibit G, Monitoring and Mitigation Plan for Surface Water and Groundwater, Parkdale Quarry. Five quarters of background data are required before mining in the new leased area. Six quarters were completed to ensure five quarters were analyzed for each required sampling location as some analyses were missed in previous sampling events.
Throughout the sampling events, TC-1 and TC-2 did not have flow. These locations will be monitored going forward and sampled as required.
Surface sampling events for CC-1 and CC-2 occurred on 9/29/22, 12/6/22, 3/6/23, 5/24/23, 8/21/23, and 10/17/23.
Groundwater well sampling occurred on 10/28/22 (MW-3), 10/19/22 (MW-1, MW-10 for 3Q22), 12/6/22, 3/6/23, 5/24/23, 8/22/23, and 10/18/23.

The results of each sampling event were compared to the standards listed in Table 9 of Exhibit G. A summary of exceedances is below.

Please note the exceedances of the applicable water quality standards:

CC-1			
Sampling Quarter	Parameter	Standard (mg/L)	Result (mg/L)
1Q23	Fluoride	2	<2.5
1Q23	Sulfide	0.002	0.8
2Q23	Sulfide	0.002	0.6

CC-2			
Sampling Quarter	Parameter	Standard (mg/L)	Result (mg/L)
1Q23	Sulfide	0.002	1

MW-1			
Sampling Quarter	Parameter	Standard (mg/L)	Result (mg/L)
3Q22	TDS	400	454
3Q23	Iron	0.3	2.18
4Q23	Iron	0.3	0.69

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MW-3			
Sampling Quarter	Parameter	Standard (mg/L)	Result (mg/L)
4Q22	Uranium (Unspeciated)	0.03 (MCL)	0.0498
1Q23	Fluoride	2	2.1
1Q23	Uranium (U)	0.0168 (HHS)	0.0247*
3Q23	Uranium (U)	0.0168-0.03	0.024
4Q23	Fluoride	2	2.1
4Q23	Nitrogen, Nitrate	1	1.9
4Q23	Uranium (U)	0.0168 (HHS)	0.025*

MW-10			
Sampling Quarter	Parameter	Standard (mg/L)	Result (mg/L)
3Q22	TDS	400	458
3Q22	Uranium (U)	0.03	0.0363
4Q22	TDS	400	401
1Q23	TDS	400	439
1Q23	Uranium (U)	0.0168 (HHS)	0.0172*
2Q23	Aluminum (Al)	5	7.12
2Q23	Iron (Fe)	0.3	5.3
2Q23	Manganese (Mn)	0.05	0.106
3Q23	TDS	400	449
4Q23	TDS	400	410

*Please note that the unspeciated (U) uranium results exceed the HHS established by the Colorado Water Quality Control Commission but do not exceed the MCL established by the EPA.

Should you have any questions or need additional information regarding this submittal please do not hesitate to contact me at (720) 249-7447 or beth.haake@martinmarietta.com.

Sincerely,

Beth Haake

Beth Haake
Environmental Engineer

Sampling Results for CC-1

			Q3 2022		Q4 2022		Q1 2023		Q2 2023		Q3 2023		Q4 2023	
Flow during Sampling event?	Yes/No		Yes		Yes		Yes							
Parameter	Units	Standard(1)	Result	Calculated Standard	Result	Calculated Standard	Result	Calculated Standard	Result	Calculated Standard	Result	Calculated Standard	Result	Calculated Standard
Field														
Dissolved Oxygen (DO)	mg/L	>6	8.27		10.61		9.26		219.6		8.12		8.15	
pH	std units	--	8.36		7.96		8.69		8.44		8.64		8.91	
Specific Conductivity (SC)	µS/Cm	--	970		974		NS		369.35		867.94		445.96	
Temperature (T)	Celsius	--	13.7		NS		7.7		20.06		8.39		18.26	
Turbidity	NTU	--	0.26		3.47		19.91		107.85		9.48		0	
Solution Paramters, Nonmetals, Major Ions														
Ammonia (NH3)	mg/L	TVS ch (2)	ND	1.379	ND	2.576	ND	0.791	ND	1.206	ND	0.860	0.062	0.556
Chloride	mg/L	250	69.5		70.2		68.3		7.5		75.6		79	
Fluoride	mg/L	2	0.84		0.79		<2.5		0.42		0.77		1.3	
Sulfate	mg/L	250	96.9		97.2		94.1		25.2		99.2		78	
Sulfide	mg/L	0.002	0.5		ND		0.8		0.6		ND		0.022	
Total Suspended Solids (TSS)	mg/L	--	8.9		ND		31.8		85		6.4		ND	
Nutrients														
Nitrogen, Nitrate	mg/L	10	0.046		0.96		0.54		ND		ND		1.5	
Nitrogen, Nitrite	mg/L	0.05	ND		ND		ND		0.0042		ND		ND	
Dissolved Metals														
Arsenic (As)	mg/L	0.34	ND		0.00099		0.00089		0.0016		0.00094		0.0011	
Cadmium (Cd)	mg/L	0.005	ND		ND		ND		ND		ND		ND	
Calcuim	mg/L	--	78.9		86.7		75.1		42.6		70		70	
Chromium (Cr)					ND		ND		ND		ND		ND	
Chromium III (Cr 3)	mg/L	0.5	ND		ND		ND		ND		NS		ND	
Chromium VI (Cr 6)	mg/L	0.5	ND		ND		ND		ND		NS		ND	
Copper (Cu)	µg/L	ch(3)	ND	25.952	ND	27.815	ND	24.524	0.0084	13.258	0.0024	22.682	ND	24.127
Iron (Fe)	mg/L	1	ND		ND		0.459		ND		ND		0.0088	
Lead (Pb)	mg/L	0.05	ND		ND		ND		0.0012		ND		ND	
Magnesium	mg/L	--	36.5		38.9		33.4		12.6		29.6		35	
Manganese (Mn)	mg/L	--	ND	0.050	ND	0.051	0.0163	0.049	ND	0.038	ND	0.047	ND	0.048
Molybdenum (Mo)	mg/L	150	0.0037		0.0043		0.0037		0.0031		0.0045		0.0042	
Nickel (Ni)	mg/L	0.1	ND		ND		ND		ND		ND		ND	
Selenium (Se)	mg/L	4.6	ND		0.0053		0.005		ND		0.047		0.0043	
Silver (Ag)	mg/L	ch(5)	ND	0.639	ND	0.735	ND	0.570	ND	0.165	ND	0.487	ND	0.552
Zinc (Zn)	mg/L	ch(6)	ND	376.010	ND	404.808	ND	354.035	ND	183.978	ND	325.808	ND	347.943
Oil and Grease (visual)	Yes/No		No		No		No		No		No		No	
Oil and Grease	mg/L		N/A		N/A		N/A		N/A		N/A		N/A	

No exceedances in 5 quarters

ND for 5 quarters

Notes:

ND = Reported value less than Reporting Limit

NS- Not collected/measured

-- = No Applicable Standard

TVS = Table Value Standard.

ac =acute

ch = chronic

(1) Standards from 5 CCR 1002-31 TABLE II and TABLE III: The referenced water quality standard is the lower of the drinking water standard, human health standard, agricultural standard, or TVS.

(2) TVS (chronic elsp) from 5 CCR 1002-31 TABLE II

(3) Cu chronic standard from 5 CCR 1002-31 TABLE III = exp(0.8545*[ln(hardness)]-1.7428)

(4) Mg chronic standard from 5 CCR 1002-31 TABLE III = exp(0.3331*[ln(hardness)]+5.8743)

(5) Ag chronic trout standard from 5 CCR 1002-31 TABLE III = exp(1.72*[ln(hardness)]-10.51)

(6) Zn chronic standard from 5 CCR 1002-31 TABLE III = 0.986*exp((0.9094*[ln(hardness)]+0.6235)

Hardness = (Ca*2.497) + (Mg*4.118)

Sampling Results for CC-2

			Q3 2022		Q4 2022		Q1 2023		Q2 2023		Q3 2023		Q4 2023	
Flow during Sampling event?	Yes/No		Yes		Yes		Yes		Yes		Yes		Yes	
Parameter	Units	Standard(1)	Result	Calculated Standard	Result	Calculated Standard	Result	Calculated Standard	Result	Calculated Standard	Result	Calculated Standard	Result	Calculated Standard
Field														
Dissolved Oxygen (DO)	mg/L	>6	6.39		11		9.53		227.5		8.86		7.87	
pH	std units	--	8.07		7.84		8.25		6.74		8.78		8.78	
Specific Conductivity (SC)	µS/Cm	--	988		981		NS		360.14		911.89		586.46	
Temperature (T)	Celsius	--	15.2		NS		9.45		19.56		9.36		19.27	
Turbidity	NTU	--	1740		10.15		9.22		112.09		0.59		0	
Solution Paramters, Nonmetals, Major Ions														
Ammonia (NH3)	mg/L	TVS ch (2)	ND	2.195	0.05	3.027	ND	1.654	ND	6.387	ND	0.683	ND	0.683
Chloride	mg/L	250	66.3		71		71		7.3		75.8		79	
Fluoride	mg/L	2	0.8		0.73		0.74		0.4		0.77		1.5	
Sulfate	mg/L	250	95.5		97.2		97.7		24.9		99.6		79	
Sulfide	mg/L	0.002	ND		ND		1		ND		ND		ND	
Total Suspended Solids (TSS)	mg/L	--	7.3		13.2		ND		82.5		ND		ND	
Nutrients														
Nitrogen, Nitrate	mg/L	10	0.63		0.25		0.11		ND		0.56		1.6	
Nitrogen, Nitrite	mg/L	0.05	ND		ND		ND		ND		ND		ND	
Dissolved Metals														
Arsenic (As)	mg/L	0.34	ND		0.0009		0.00065		0.0016		0.0009		0.0011	
Cadmium (Cd)	mg/L	0.005	ND		ND		ND		ND		ND		ND	
Calcuim	mg/L	--	82.6		80.5		67.4		42.9		74.1		72	
Chromium (Cr)					ND		ND		ND		ND		ND	
Chromium III (Cr 3)	mg/L	0.5	ND		ND		ND		ND		NS		ND	
Chromium VI (Cr 6)	mg/L	0.5	ND		ND		ND		ND		NS		ND	
Copper (Cu)	µg/L	ch(3)	ND	26.226	ND	27.096	ND	23.065	ND	13.341	<0.002	23.830	ND	24.184
Iron (Fe)	mg/L	1	ND		0.197		ND		ND		ND		0.0088	
Lead (Pb)	mg/L	0.05	ND		ND		ND		ND		ND		ND	
Magnesium	mg/L	--	35.3		39.9		32.6		12.7		31.4		34	
Manganese (Mn)	mg/L	--	ND	0.050	0.0117	0.051	0.0081	0.047	ND	0.038	0.0012	0.048	ND	0.048
Molybdenum (Mo)	mg/L	150	0.0042		0.0039		0.0038		0.003		0.0044		0.0044	
Nickel (Ni)	mg/L	0.1	ND		ND		ND		ND		ND		ND	
Selenium (Se)	mg/L	4.6	ND		0.0037		0.0038		ND		0.0045		0.0045	
Silver (Ag)	mg/L	ch(5)	ND	0.653	ND	0.697	ND	0.504	ND	0.167	ND	0.538	ND	0.555
Zinc (Zn)	mg/L	ch(6)	ND	380.239	ND	393.687	ND	331.657	ND	185.205	ND	343.389	0.002	348.812
Oil and Grease (visual)	Yes/No		No		No		No		No		No		No	
Oil and Grease	mg/L		N/A		N/A		N/A		N/A		N/A		N/A	

No exceedances in 5 quarters

ND for 5 quarters

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(1) Standards from 5 CCR 1002-31 TABLE II and TABLE III: The referenced water quality standard is the lower of the drinking water standard, human health standard, agricultural standard, or TVS.

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(3) Cu chronic standard from 5 CCR 1002-31 TABLE III = exp(0.8545*[ln(hardness)]-1.7428)

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Hardness = (Ca*2.497) + (Mg*4.118)

Sampling Results for TC-1

			Q3 2022		Q4 2022		Q1 2023		Q2 2023		Q3 2023	
Flow during Sampling event?	Yes/No		No		No		No		No		No	
Parameter	Units	Standard(1)	Result	Calculated Standard	Result	Calculated Standard	Result	Calculated Standard	Result	Calculated Standard	Result	Calculated Standard
Field												
Dissolved Oxygen (DO)	mg/L	>6										
pH	std units	--										
Specific Conductivity (SC)	µS/Cm	--										
Temperature (T)	Celsius	--										
Turbidity	NTU	--										
Solution Paramters, Nonmetals, Major Ions												
Ammonia (NH3)	mg/L	TVS ch (2)										
Chloride	mg/L	250										
Fluoride	mg/L	2										
Sulfate	mg/L	250										
Sulfide	mg/L	0.002										
Total Suspended Solids (TSS)	mg/L	--										
Nutrients												
Nitrogen, Nitrate	mg/L	10										
Nitrogen, Nitrite	mg/L	0.05										
Dissolved Metals												
Arsenic (As)	mg/L	0.34										
Cadmium (Cd)	mg/L	0.005										
Calcuim	mg/L	--										
Chromium III (Cr 3)	mg/L	0.5										
Chromium VI (Cr 6)	mg/L	0.5										
Copper (Cu)	µg/L	ch(3)										
Iron (Fe)	mg/L	1										
Lead (Pb)	mg/L	0.05										
Magnesium	mg/L	--										
Manganese (Mn)	mg/L	--										
Molybdenum (Mo)	mg/L	150										
Nickel (Ni)	mg/L	0.1										
Selenium (Se)	mg/L	4.6										
Silver (Ag)	mg/L	ch(5)										
Zinc (Zn)	mg/L	ch(6)										
Oil and Grease (visual)	Yes/No											
Oil and Grease	mg/L											

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Hardness = (Ca*2.497) + (Mg*4.118)

Sampling Results for TC-2

			Q3 2022		Q4 2022		Q1 2023		Q2 2023		Q3 2023	
Flow during Sampling event?	Yes/No		No		No		No		No		No	
Parameter	Units	Standard(1)	Result	Calculated Standard	Result	Calculated Standard	Result	Calculated Standard	Result	Calculated Standard	Result	Calculated Standard
Field												
Dissolved Oxygen (DO)	mg/L	>6										
pH	std units	--										
Specific Conductivity (SC)	µS/Cm	--										
Temperature (T)	Celsius	--										
Turbidity	NTU	--										
Solution Paramters, Nonmetals, Major Ions												
Ammonia (NH3)	mg/L	TVS ch (2)										
Chloride	mg/L	250										
Fluoride	mg/L	2										
Sulfate	mg/L	250										
Sulfide	mg/L	0.002										
Total Suspended Solids (TSS)	mg/L	--										
Nutrients												
Nitrogen, Nitrate	mg/L	10										
Nitrogen, Nitrite	mg/L	0.05										
Dissolved Metals												
Arsenic (As)	mg/L	0.34										
Cadmium (Cd)	mg/L	0.005										
Calcuim	mg/L	--										
Chromium III (Cr 3)	mg/L	0.5										
Chromium VI (Cr 6)	mg/L	0.5										
Copper (Cu)	µg/L	ch(3)										
Iron (Fe)	mg/L	1										
Lead (Pb)	mg/L	0.05										
Magnesium	mg/L	--										
Manganese (Mn)	mg/L	--										
Molybdenum (Mo)	mg/L	150										
Nickel (Ni)	mg/L	0.1										
Selenium (Se)	mg/L	4.6										
Silver (Ag)	mg/L	ch(5)										
Zinc (Zn)	mg/L	ch(6)										
Oil and Grease (visual)	Yes/No											
Oil and Grease	mg/L											

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Hardness = (Ca*2.497) + (Mg*4.118)

Sampling Results for MW-1

				Q3 2022			Q4 2022			Q1 2023			Q2 2023			Q3 2023			Q4 2023		
Parameter	Units	Standard(1)	Note	Result		Calculated Standard	Result		Calculated Standard	Result		Calculated Standard	Result		Calculated Standard	Result		Calculated Standard	Result		Calculated Standard
Field																					
pH	std units	6.5-8.5	DWS	7.7			7.02			7.94			7.34			7.7			7.67		
Corrosivity (as pH)		Noncorrosive	DWS	Noncorrosive			Noncorrosive			Noncorrosive			Noncorrosive			Noncorrosive			Noncorrosive		
Specific Conductivity (SC)	mS/Cm	-	-	575			560.19			569.34			530.37			446.78			426.62		
Temperature (T)	Celsius	-	-	15.8			15.6			15.88			15.2			17.39			16.73		
Turbidity	NTU	-	-	NS			67.21			14.32			42.35			0			5.8		
Solution Paramters, Nonmetals, Major Ions																					
Chloride	mg/L	250	-	6.2			6.4			6.4			6.4			6.4			7.5		
Fluoride	mg/L	2	A	1.8			1.9			2.0			2.0			2.0			2.0		
Sulfate	mg/L	250	DWS	85.4			86.7			84.7			88			84.6			77		
Total Dissolved Solids (TDS)	mg/L	400	Note 2	454			306			365.0			357			376			350		
Total Suspended Solids (TSS)	mg/L	-	-	1080			103			14.8			47.7			82			40		
Nutrients																					
Nitrogen, Nitrate	mg/L	10	HHS	6.6			7.2			6.7			6.5			6.6			6.2		
Nitrogen, Nitrite	mg/L	1	HHS	ND			ND			ND			ND			ND			ND		
Total Nitrate + Nitrite	mg/L	10	HHS	6.6			7.2			6.7			6.5			6.6			6.6		
Dissolved Metals																					
Aluminum (Al)	mg/L	5	A	0.471			ND			ND			ND			4.83			1.2		
Antimony (Sb)	mg/L	0.006	HHS	ND			ND			ND			ND			ND			ND		
Arsenic (As)	mg/L	0.01	HHS	ND			ND			ND			ND			0.00037			ND		
Barium (Ba)	mg/L	2	HHS	0.017			0.0131			0.013			0.0157			0.0377			0.019		
Beryllium (Be)	mg/L	0.004	HHS	ND			ND			ND			ND			0.00023			ND		
Boron (B)	mg/L	0.75	A	ND			ND			ND			ND			0.0401			0.04		
Cadmium (Cd)	mg/L	0.005	HHS	ND			ND			ND			ND			ND			ND		
Chromium (Cr)	mg/L	0.1	HHS	ND			ND			ND			ND			0.0093			0.00071		
Chromium III (Cr 3)	mg/L			NS			ND			ND			ND			ND			ND		
Chromium VI (Cr 6)	mg/L			NS			ND			ND			ND			ND			ND		
Cobalt (Co)	mg/L	0.05	A	ND			ND			ND			ND			0.00066			ND		
Copper (Cu)	mg/L	0.2	A	ND			0.0192			ND			ND			0.0171			0.0035		
Iron (Fe)	mg/L	0.3	DWS	0.229			ND			ND			ND			2.18			0.69		
Lead (Pb)	mg/L	0.05	HHS	ND			ND			ND			ND			0.0019			0.00075		
Lithium (Li)	mg/L	2.5	A	0.0213			0.0201			0.0189			0.0198			0.0191			0.023		
Manganese (Mn)	mg/L	0.05	DWS	0.0037			ND			ND			ND			0.0274			0.011		
Molybdenum (Mo)	mg/L	0.21	HHS	0.018			0.0206			0.0157			0.0189			0.0182			0.017		
Nickel (Ni)	mg/L	0.1	HHS	ND			ND			ND			ND			0.0056			ND		
Selenium (Se)	mg/L	0.02	A	0.0046			0.0044			0.0041			0.0046			0.0046			0.0047		
Silver (Ag)	mg/L	0.05	HHS	ND			ND			ND			ND			0.0016			0.00048		
Thalium (Tl)	mg/L	0.002	HHS	ND			ND			ND			ND			ND			ND		
Uranium (U), unspeciated	mg/L	0.0168 to 0.03	HHS	0.0163			0.0165			0.0156			0.0182			0.0194			0.019		
Vanadium (V)	mg/L	0.1	A	ND			0.002			ND			ND			0.0028			0.0024		
Zinc (Zn)	mg/L	2	A	ND			ND			ND			ND			0.0115			0.015		
Radionuclides																					
				Result	Precision	MDC	Result	Precision	MDC	Result	Precision	MDC	Result	Precision	MDC	Result	Precision	MDC	Result	Precision	MDC
Gross Alpha	pCi/L	-		8.8	3.8	3.9	23.6	5.6	2.8	17.3	4.8	3.9	21.20	5.60	3.60	8.00	3.20	3.20	36.10	8.22	3.00
Adjusted Gross Alpha (calculated)	pCi/L	15	Note 3	-12.5	-	-	2.7	-	-	-6.1	-	-	-1.70	-	-	-15.40	-	-	14.03	-	-
Gross Beta	pCi/L	50	Scrn Levl	4	2	3.9	16.1	2.7	3.5	5.2	1.8	3.6	15.60	2.80	3.70	13.70	2.10	2.30	12.30	2.60	4.00
Radium 226	pCi/L	-	-	2.4	0.5	0.2	0.6	0.2	0.2	0.3	0.2	0.3	0.40	0.20	0.20	0.70	0.20	0.20	0.49	0.17	0.13
Radium 228	pCi/L	-	-	7	1.6	1.1	-0.7	0.6	1.1	0.9	0.6	0.9	1.10	0.70	1.10	1.50	0.70	1.00	1.35	0.73	1.11
Total Radium (Rad 226 + Rad 228)	pCi/L	5	Note 7	9.4	2.1	1.3	1.2	0.6	1.1	1.2	0.6	0.9	1.0	0.7	1.1	2.2	0.8	1	1.838	0.903	1.243
Radon 222	pCi/L	-	-	1740	73.8	91.6	1760	78.8	99.3	2430.0	74.0	81.0	2020.00	62.80	69.00	2180.00	80.30	94.10	319.00	36.40	16.00
Uranium 234	pCi/L	-	-	15.3	3	0.2	14.6	2.8	0.5	18.4	3.6	1.1	17.80	3.50	0.70	17.30	3.40	0.90	15.70	1.82	0.13
Uranium 235	pCi/L	-	-	0.8	0.2	0.1	0.3	0.3	0.5	1.7	0.3	1.0	0.90	0.70	8.00	1.60	0.30	0.60	0.33	0.21	0.18
Uranium 238	pCi/L	-	-	6	1.2	0.2	6.3	1.2	0.6	5.0	1.0	1.0	5.10	1.00	0.70	6.10	1.20	0.50	6.37	0.96	0.13

No exceedances in 5 quarters

ND for 5 quarters

NS- Not collected/measured

ND = Reported value less than Reporting Limit

A - Agricultural Standard

DWS - Drinking Water Standard

HHS - Human Health Standard

MDC - Minimal Detectable Concentration

TVS: Table value standard

WS: Water Supply Standard

(1) Standards from 5 CCR 1002-41: The referenced water quality standard is the lower of the drinking water standard, human health standard, agricultural standard, or TVS.

(2) 5 CCR 1002-41, Table 4

(3) Activity of Adjusted Gross Alpha calculated using: (Gross Alpha pCi- [U 234 pCi + U 238 pCi]). If Uranium is not speciated then activity of Uranium species estimated by: Uranium, Total ug/L * 0.67

(4) Not dectected, value represents method dection limit

(5) Results not received from analytical laboratory as of 1/3/2023

(6) QA/QC sample (Field Blank and Equipment Blank) results will be provided with laboratory reports in final Q3 2022 report

(7) The sum of radium 226 and 228 for the sample exceeds the maximum contaminant level (MCL) per the 2000 EPA radionuclides rule.

Sampling Results for MW-3

Parameter	Units	Standard(1)	Note	Q3 2022 Result	Q3 2022	Q3 2022 Calculated Standard	Q4 2022 Result	Q4 2022	Q4 2022 Calculated Standard	Q1 2023 Result	Q1 2023	Q1 2023 Calculated Standard	Q2 2023 Result	Q2 2023	Q2 2023 Calculated Standard	Q3 2023 Result	Q3 2023	Q3 2023 Calculated Standard	Q4 2023 Result	Q4 2023	Q4 2023 Calculated Standard
Field																					
pH	std units	6.5-8.5	DWS	7.64			7.26			7.54			7.26			7.79			7.85		
Corrosivity (as pH)		Noncorrosive	DWS	Noncorrosive			Noncorrosive			Noncorrosive			Noncorrosive			Noncorrosive			Noncorrosive		
Specific Conductivity (SC)	mS/Cm	-	-	45.3			440.64			436.31			308.82			433.4			426.22		
Temperature (T)	Celsius	-	-	18.7			15.11			15.78			16.96			17.17			16.84		
Turbidity	NTU	-	-	14.85			11.37			6.18			15.86			20.2			7.96		
Solution Paramters, Nonmetals, Major Ions																					
Chloride	mg/L	250	-	5.2			5.5			5.4			1.8			5.3			5.8		
Fluoride	mg/L	2	A	2.0			2.0			2.1			1.0			2.0			2.1		
Sulfate	mg/L	250	DWS	51			52.3			51.2			21.6			53.1			50		
Total Dissolved Solids (TDS)	mg/L	400	Note 2	278			213			266.0			212			318			260		
Total Suspended Solids (TSS)	mg/L	-	-	9.1			25.6			7.7			10.7			7.7			4.4		
Nutrients																					
Nitrogen, Nitrate	mg/L	10	HHS	1.9			2			1.90			3.6			1.9			1.7		
Nitrogen, Nitrite	mg/L	1	HHS	ND			ND			ND			ND			ND			1.9		
Total Nitrate + Nitrite	mg/L	10	HHS	1.9			2			1.9			3.6			1.9			1.9		
Dissolved Metals																					
Aluminum (Al)	mg/L	5	A	ND			ND			ND			ND			ND			0.026		
Antimony (Sb)	mg/L	0.006	HHS	ND			ND			ND			ND			ND			ND		
Arsenic (As)	mg/L	0.01	HHS	ND			0.00071			0.00073			ND			0.00069			0.00085		
Barium (Ba)	mg/L	2	HHS	ND			0.0081			0.0075			0.012			0.0064			0.0067		
Beryllium (Be)	mg/L	0.004	HHS	ND			ND			ND			ND			ND			ND		
Boron (B)	mg/L	0.75	A	0.0518			ND			ND			ND			0.0449			0.045		
Cadmium (Cd)	mg/L	0.005	HHS	ND			ND			ND			ND			ND			ND		
Chromium (Cr)	mg/L	0.1	HHS	ND			ND			ND			ND			ND			ND		
Chromium III (Cr 3)	mg/L			NS			ND			ND			ND			ND			ND		
Chromium VI (Cr 6)	mg/L			NS			ND			ND			ND			ND			ND		
Cobalt (Co)	mg/L	0.05	A	ND			ND			ND			ND			ND			ND		
Copper (Cu)	mg/L	0.2	A	ND			0.0096			ND			ND			0.0022			ND		
Iron (Fe)	mg/L	0.3	DWS	ND			ND			ND			ND			ND			0.02		
Lead (Pb)	mg/L	0.05	HHS	ND			ND			ND			ND			ND			ND		
Lithium (Li)	mg/L	2.5	A	0.0212			0.0195			0.0167			0.0133			0.0195			0.023		
Manganese (Mn)	mg/L	0.05	DWS	ND			ND			ND			0.0022			ND			0.00051		
Molybdenum (Mo)	mg/L	0.21	HHS	0.022			0.0251			0.0209			0.0895			0.0206			0.019		
Nickel (Ni)	mg/L	0.1	HHS	ND			ND			ND			ND			ND			ND		
Selenium (Se)	mg/L	0.02	A	ND			0.0033			0.0034			0.0009			0.0034			0.0031		
Silver (Ag)	mg/L	0.05	HHS	ND			ND			ND			0.00021			ND			ND		
Thalium (Tl)	mg/L	0.002	HHS	ND			ND			ND			ND			ND			ND		
Uranium (U), unspeciated	mg/L	0.0168 to 0.03	HHS	ND			0.0237			0.0247			0.005			0.024			0.025		
Vanadium (V)	mg/L	0.1	A	ND			0.0025			ND			0.0021			0.0017			0.0022		
Zinc (Zn)	mg/L	2	A	ND			ND			ND			0.0293			ND			ND		
Radionuclides																					
				Result	Precision	MDC	Result	Precision	MDC	Result	Precision	MDC	Result	Precision	MDC	Result	Precision	MDC	Result	Precision	MDC
Gross Alpha	pCi/L	-		30.7	6.5	2.3	29.5	6.5	2.2	24.7	6.0	3.6	11.3	3.4	2.3	14.7	3.6	2.1	44.2	7.8	3.8
Adjusted Gross Alpha (calculated)	pCi/L	15	Note 3	2.2	-	-	1	-	-	-5.5	-	-	5.6	-	-	-14.0	-	-	15.8	-	-
Gross Beta	pCi/L	50	Scrn Levl	11.5	1.9	2.8	19.8	3.1	3.8	8.0	1.9	3.6	10.5	2.4	3.6	9.9	1.8	2.4	3.8	1.6	4.0
Radium 226	pCi/L	-	-	0.2	0.1	0.2	0.3	0.2	0.2	0.3	0.2	0.3	0.3	0.2	0.2	0.3	0.1	0.2	0.2	0.1	1.0
Radium 228	pCi/L	-	-	1.6	0.5	0.7	2.6	1.1	1.5	0.4	0.6	0.9	2.0	0.8	1.3	0.9	0.7	1.1	1.3	0.5	58.0
Total Radium (Rad 226 + Rad 228)	pCi/L	5	Note 7	1.8	0.6	0.9	2.9	1.1	1.5	0.8	0.6	0.9	1.0	0.8	1.3	0.9	0.7	1.1	1.438	0.5654	59
Radon 222	pCi/L	-	-	4230	118	123	1930	77.5	94.2	2370.0	71.3	77.8	549.0	47.2	69.1	2290.0	80.9	93.4	474.0	48.9	16.0
Uranium 234	pCi/L	-	-	20.3	3.9	0.2	20.6	4	0.6	21.3	4.2	0.6	3.6	0.7	0.5	20.7	4.0	0.7	20.7	2.2	0.1
Uranium 235	pCi/L	-	-	0.9	0.2	0.1	1.4	0.3	0.6	0.8	0.6	0.6	0.3	0.3	0.5	1.2	0.2	0.6	0.5	0.2	0.1
Uranium 238	pCi/L	-	-	8.2	1.6	0.1	7.9	1.5	0.5	8.9	1.7	0.5	2.1	0.4	0.4	8.0	1.6	0.6	7.7	1.0	0.1

No exceedances in 5 quarters

ND for 5 quarters

NS- Not collected/measured — HHS - Human Health Standard

ND = Reported value less than Reporting Limit — MDC - Minimal Detectable Concentration

A - Agricultural Standard — TVS: Table value standard

DWS - Drinking Water Standard — WS: Water Supply Standard

(1) Standards from 5 CCR 1002-41: The referenced water quality standard is the lower of the drinking water standard, human health standard, agricultural standard, or TVS.

(2) 5 CCR 1002-41, Table 4

(3) Activity of Adjusted Gross Alpha calculated using: (Gross Alpha pCi- [U 234 pCI + U 238 pCi]). If Uranium is not speciated then activity of Uranium species estimated by: Uranium, Total ug/L * 0.67

(4) Not dectected, value represents method dection limit

(5) Results not received from analytical laboratory as of 1/3/2023

(6) QA/QC sample (Field Blank and Equipment Blank) results will be provided with laboratory reports in final Q3 2022 report

(7) The sum of radium 226 and 228 for the sample exceeds the maximum contaminant level (MCL) per the 2000 EPA radionuclides rule.

Sampling Results for MW-10

Parameter	Units	Standard(1)	Note	Q3 2022 Result		Calculated Standard	Q4 2022 Result		Calculated Standard	Q1 2023 Result		Calculated Standard	Q2 2023 Result		Calculated Standard	Q3 2023 Result		Calculated Standard	Q4 2023 Result		Calculated Standard
Field																					
pH	std units	6.5-8.5	DWS	7.09			6.76			6.93			6.81			7.22			6.95		
Corrosivity (as pH)		Noncorrosive	DWS	Noncorrosive			Noncorrosive			Noncorrosive			Noncorrosive			Noncorrosive			Noncorrosive		
Specific Conductivity (SC)	mS/Cm	-	-	684			672.56			663.41			535.35			651.07			589.94		
Temperature (T)	Celsius	-	-	26.5			13.37			14.44			14.36			15.64			17.87		
Turbidity	NTU	-	-	NS			219.05			42.52			143.42			501.96			630.97		
Solution Paramters, Nonmetals, Major Ions																					
Chloride	mg/L	250	-	7.1			7.4			7.0			6.7			7			7.2		
Fluoride	mg/L	2	A	1.5			1.5			1.5			1.5			1.4			1.7		
Sulfate	mg/L	250	DWS	89.7			91.2			99.8			88.7			94.9			71		
Total Dissolved Solids (TDS)	mg/L	400	Note 2	458			401			439			367			449			410		
Total Suspended Solids (TSS)	mg/L	-	-	168			362			71.4			359			178			92		
Nutrients																					
Nitrogen, Nitrate	mg/L	10	HHS	0.51			0.37			0.77			1.1			ND			1.3		
Nitrogen, Nitrite	mg/L	1	HHS	ND			ND			ND			ND			ND			ND		
Total Nitrate + Nitrite	mg/L	10	HHS	0.51			0.37			0.77			1.1			<0.010			1.3		
Dissolved Metals																					
Aluminum (Al)	mg/L	5	A	ND			ND			ND			7.12			ND			0.026		
Antimony (Sb)	mg/L	0.006	HHS	ND			ND			ND			ND			ND			ND		
Arsenic (As)	mg/L	0.01	HHS	0.00041			0.00043			0.00045			0.00078			0.00042			ND		
Barium (Ba)	mg/L	2	HHS	0.0467			0.0405			0.0516			0.0964			0.0507			0.046		
Berylium (Be)	mg/L	0.004	HHS	ND			ND			ND			ND			ND			ND		
Boron (B)	mg/L	0.75	A	ND			ND			ND			ND			ND			0.045		
Cadmium (Cd)	mg/L	0.005	HHS	ND			ND			ND			ND			ND			ND		
Chromium (Cr)	mg/L	0.1	HHS	ND			ND			ND			0.0103			ND			ND		
Chromium III (Cr 3)	mg/L			NS			ND			ND			ND			ND			ND		
Chromium VI (Cr 6)	mg/L			NS			ND			ND			ND			ND			ND		
Cobalt (Co)	mg/L	0.05	A	ND			ND			ND			0.002			ND			ND		
Copper (Cu)	mg/L	0.2	A	ND			ND			ND			0.0192			0.0057			0.0031		
Iron (Fe)	mg/L	0.3	DWS	ND			ND			ND			5.3			ND			0.03		
Lead (Pb)	mg/L	0.05	HHS	ND			ND			ND			0.0035			ND			ND		
Lithium (Li)	mg/L	2.5	A	0.0247			0.0249			0.0188			0.0237			0.0205			0.025		
Manganese (Mn)	mg/L	0.05	DWS	ND			ND			ND			0.106			0.019			0.0033		
Molybdenum (Mo)	mg/L	0.21	HHS	0.0147			0.0161			0.0052			0.006			0.0066			0.0065		
Nickel (Ni)	mg/L	0.1	HHS	ND			ND			ND			0.0057			ND			0.0012		
Selenium (Se)	mg/L	0.02	A	0.0029			0.003			0.0036			0.0038			0.0028			0.0025		
Silver (Ag)	mg/L	0.05	HHS	ND			ND			ND			0.0055			ND			ND		
Thalium (Tl)	mg/L	0.002	HHS	ND			ND			ND			ND			ND			ND		
Uranium (U), unspeciated	mg/L	0.0168 to 0.03	HHS	0.0363			0.0498			0.0172			0.0084			0.0139			0.014		
Vanadium (V)	mg/L	0.1	A	0.0027			0.0029			0.0024			0.0089			0.0026			0.0026		
Zinc (Zn)	mg/L	2	A	ND			ND			0.0215			0.0717			ND			0.0034		
Radionuclides				Result	Precision	MDC	Result	Precision	MDC	Result	Precision	MDC	Result	Precision	MDC	Result	Precision	MDC	Result	Precision	MDC
Gross Alpha	pCi/L	-		34.1	7.8	3.5	55.4	12	3.9	15.2	4.6	3.9	19.9	5.8	4.2	7.6	3.4	3.5	26.4	7.54	7.46
Adjusted Gross Alpha (calculated)	pCi/L	15	Note 3	9.779	-	-	13.3	-	-	-6.4	-	-	11.1	-	-	-7.9	-	-	12.34	-	-
Gross Beta	pCi/L	50	Scrn Levl	3	1.1	3.6	38.9	4.7	3.5	8.8	2.4	4.1	17.1	2.9	3.6	12.4	2.1	2.4	7.6	2.26	2.26
Radium 226	pCi/L	-	-	1.2	0.3	1.1	1.0	0.3	0.3	1.7	0.4	0.3	1	0.3	0.2	0.9	0.2	0.2	0.46	0.15	0.116
Radium 228	pCi/L	-	-	2.1	0.8	1.1	2.2	1.2	1.6	2.9	0.9	1	1	0.8	1.3	2	0.8	1	1.52	0.56	0.658
Total Radium (Rad 226 + Rad 228)	pCi/L	5	Note 7	3.3	1.1	2.2	3.2	1.2	1.6	4.6	1	1	1.7	0.9	1.3	2.9	0.8	1.1	1.98	0.71	0.774
Radon 222	pCi/L	-	-	1310	70.2	93.2	1720	76.9	96.8	1620	65.6	80.1	719	49	68.7	909	65.9	93.4	176	24.6	16
Uranium 234	pCi/L	-	-	LE	-	-	27.3	5.3	0.8	14.7	2.9	1.1	5.5	1.1	0.6	11.4	2.2	0.6	9.36	1.28	0.232
Uranium 235	pCi/L	-	-	LE	-	-	1.7	0.3	0.5	0.8	0.9	1.1	0.3	0.3	0.4	0.4	0.5	0.6	0.21	0.18	0.205
Uranium 238	pCi/L	-	-	LE	-	-	14.8	2.9	0.5	6.9	1.4	0.7	3.3	0.6	0.5	4.1	0.8	0.6	4.7	0.819	0.237

No exceedances in 5 quarters

ND for 5 quarters

NS- Not collected/measured

ND = Reported value less than Reporting Limit

A - Agricultural Standard

DWS - Drinking Water Standard

LE - Lab Error/Lab lost samples

HHS - Human Health Standard

MDC - Minimal Detectable Concentration

TVS: Table value standard

WS: Water Supply Standard

(1) Standards from 5 CCR 1002-41: The referenced water quality standard is the lower of the drinking water standard, human health standard, agricultural standard, or TVS.

(2) 5 CCR 1002-41, Table 4

(3) Activity of Adjusted Gross Alpha calculated using: (Gross Alpha pCi- [U 234 pCI + U 238 pCi]). If Uranium is not speciated then activity of Uranium species estimated by: Uranium, Total ug/L * 0.67

(4) Not dectected, value represents method dection limit

(5) Results not received from analytical laboratory as of 1/3/2023

(6) QA/QC sample (Field Blank and Equipment Blank) results will be provided with laboratory reports in final Q3 2022 report

Groundwater Levels

			Q3 2022 (Sept 23 2022)		Q4 2022 (Dec 6 2022)		Q1 2023 (Mar 6 2023)		Q2 2023 (May 24 2023)		Q3 2023 (Aug 22 2023		Q4 2023 (Oct 18 2023)	
Well	Permit #	Ground Elevation (ASL)	Water Depth	Water Level (ASL)	Water Depth	Water Level (ASL)	Water Depth	Water Level (ASL)	Water Depth	Water Level (ASL)	Water Depth	Water Level (ASL)	Water Depth	Water Level (ASL)
MW-1	58186-MH	6250	141.08	6108.92	141.33	6108.67	142.22	6107.78	143.1	6106.9	144.37	6105.63	144.63	6105.37
MW-3	58187-MH	6073	49.9	6023.1	50.81	6022.19	51.08	6021.92	45.81	6027.19	49.65	6023.35	49.28	6023.72
MW-10	58185-MH	6285	30.27	6254.73	31.28	6253.72	22.92	6262.08	10.72	6274.28	24.87	6260.13	25.91	6259.09

Average Levels

MW-1 6107.212 Feet ASL
MW-3 6023.578
MW-10 6260.672

Notes: All measurements in feet
ASL = Above mean sea level