

STATE OF UTAH
DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WATER QUALITY (DWQ)
WATER QUALITY BOARD
P.O. BOX 144870
SALT LAKE CITY, UTAH 84114-4870

**Ground Water Quality Discharge Permit
Permit Number UGW370005**

In compliance with the provisions of the Utah Water Pollution Control Act, Title 19, Chapter 5, Utah Code Annotated 1953, as amended,

**Lisbon Valley Mining Co., LLC - Operator
P.O. Box 400
Moab, Utah 84532**

hereafter referred to as the Permittee, is granted a Ground Water Quality Discharge Permit for the Lisbon Valley Copper Project located from latitude 38° 08' 28" to 38° 08' 56" North, longitude 109° 08' 32" to 109° 09' 47" West in accordance with conditions set forth herein.

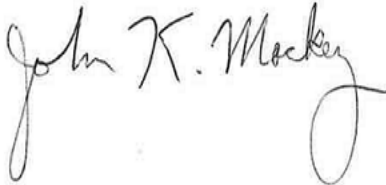
This permit is based on representation made by the Permittee and other information contained in the administrative record. It is the responsibility of the Permittee to read and understand all provisions of this permit.

The facility shall be constructed and operated in accordance with conditions set forth in the permit and the Utah Administrative Rules for Ground Water Quality Protection (Utah Admin. Code R317-6).

This permit renewal shall become effective on May 1, 2023.

This permit and the authorization to operate shall expire at midnight, April 30, 2028.

Signed this First day of May, 2023.



John K. Mackey, P.E.
Director

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Part I. SPECIFIC CONDITIONS

A. Ground Water Classification

In accordance with Utah Administrative Code (UAC) R317-6-3, the ground water is considered Class III based upon the levels of alpha and beta activity above ground water standards, as defined in UAC R317-6-2.

B. Background Ground Water Quality

Background ground water quality for wells SLV-2, MW06-15, PW-3, PW-8, 96MW-7A, PW-12, PW-7, and PW-11 are defined in Table 1. The levels described are based on available data gathered over a five-year period for each well as follows:

1. SLV-2: Monitoring Data taken from date of drilling (1994) – 1999
2. MW06-15: Monitoring Data taken from date of drilling (2006) – 2011
3. PW-3: Monitoring Data taken from date of drilling (2004) – 2009
4. PW-8: Monitoring Data taken from date of drilling (2007) – 2012, 2011-2020 (nitrates)
5. 96MW-7A: Monitoring Data taken from date of drilling (1996) – 2001
6. PW-12: Monitoring Data taken from date of drilling (2012) – 2017
7. PW-7: Monitoring Data taken from date of drilling (2005) – 2010
8. PW-11: Monitoring Data taken from date of drilling (2013) – 2018

C. Ground Water Protection Levels

1. Protection Levels for Compliance Monitoring Wells – Ground water quality shall not exceed the ground water protection levels defined in Table 2 for the following compliance wells:
 - a. SLV-2: In the Alluvial aquifer; located immediately downgradient of process ponds & leach pad.
 - b. PW-3: In the Burro Canyon aquifer; located downgradient of the open pit mining activities.
 - c. PW-12: In the Burro Canyon aquifer; located upgradient of the open pit mining activities.
 - d. PW-8: In the Navajo aquifer; located downgradient of the open pit mining activities.
 - e. PW-7: In the Navajo aquifer; located upgradient of the open pit mining activities.
2. Compliance Determination Method - Compliance with ground water protection levels shall be accomplished with the use of compliance monitoring wells. If future monitoring data indicate an exceedance of protection levels, compliance status will be determined in accordance with Part II.F, below, and if necessary reference to the methods described in the EPA Guidance Document entitled "Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities—Unified Guidance", dated March, 2009. Subsequent updates of this document shall be utilized as available and appropriate.

TABLE 1 -Compliance Monitoring Well Background Statistics

Parameter	method detection limit	ground water quality standard	Monitoring Well SLV-2		Monitoring Well MW06-15		Monitoring Well PW-3	
			Background Level (mg/l)		Background Level (mg/l)		Background Level (mg/l)	
			mean	stddev	mean	stddev	mean	stddev
pH (units)	n/a	6.5-8.5	7.68	3.89	8.83	4.52	7.90	4.02
Antimony	0.002	0.006g	0.005	0.004	0.003	0.003	0.001	0.000
Arsenic	0.005	0.05	0.008	0.007	0.005	0.005	0.002	0.002
Barium	0.01	2	0.05	0.01	0.07	0.02	0.04	0.01
Beryllium	0.001	.004g	0.002	0.002	0.001	0.001	0.000	0.000
Cadmium	0.001	0.005	0.002	0.002	0.001	0.001	0.000	0.000
Chromium	0.005	0.1	0.005	0.003	0.002	0.003	0.000	0.000
Copper	0.01	1.3	0.01	0.01	0.01	0.01	0.01	0.01
Lead	0.005	0.015	0.006	0.004	0.001	0.002	0.000	0.000
Manganese	0.01	.05f	0.05	0.08	0.05	0.03	0.15	0.07
Mercury	0.0002	0.002	0.0002	0.0001	0.0002	0.0001	0.0002	0.0001
Nickel	0.01	0.1g	0.01	0.00	0.01	0.01	0.01	0.01
Selenium	0.002	0.05	0.004	0.003	0.001	0.001	0.001	0.001
Silver	0.002	0.1	0.066	0.119	0.001	0.001	0.000	0.000
Thallium	0.001	0.002g	0.001	0.001	0.001	0.001	0.000	0.000
Vanadium	0.01	n/a	0.01	0.01	0.01	0.00	0.01	0.00
Zinc	0.05	5	0.15	0.17	0.04	0.04	0.08	0.05
Fluoride	0.3	4	0.51	0.23	2.60	0.10	0.43	0.35
Nitrate-N	0.02	10	0.13	0.11	0.04	0.02	0.06	0.06
Nitrite-N	0.01	1	0.01	0.01	0.01	0.01	0.01	0.01
TDS	5	10,000	541	304	748	21	1232	453
Uranium	0.001	.02e	0.01	0.01	0.00	0.00	0.02	0.01
alpha-activity	2 pCi/l	15 pCi/l	51	11.1	7.6	6.1	18.1	9.2
beta-activity	4 pCi/l	8 pCi/l	35	14.3	25.8	14.5	18.3	6.4

- a** Protection Level established based on 1.X times the mean background concentration, where X = 0.50 (X=0.25 for TDS).
- b** Protection Level established based on 0.X times the Ground Water Quality Standard, where X = 0.50.
- c** Protection Level established at mean background concentration, as the mean exceeds the standard.
- d** Compliance Level greater of protection level or background mean plus 2 standard deviations.
- e** Secondary MCL.
- f** Final MCL.
- g** Protection Level established at standard due to lack of background data. May be updated based upon sufficient data.

TABLE 1 (cont.) -Compliance Monitoring Well Background Statistics

Parameter	method detection limit	ground water quality standard	Monitoring Well PW-8		Monitoring Well 96MW-7A		Monitoring Well PW-12	
			Background Level (mg/l)		Background Level (mg/l)		Background Level (mg/l)	
			mean	stddev	mean	stddev	mean	stddev
pH (units)	n/a	6.5-8.5	8.43	4.62	6.91	3.51	8.13	3.95
Antimony	0.002	0.006 ^g	0.007	0.005	0.004	0.003	0.000	0.000
Arsenic	0.005	0.05	0.006	0.004	0.006	0.004	0.005	0.007
Barium	0.01	2	0.04	0.01	0.11	0.19	0.01	0.01
Beryllium	0.001	.004 ^g	0.002	0.002	0.001	0.000	0.000	0.000
Cadmium	0.001	0.005	0.002	0.002	0.001	0.001	0.002	0.001
Chromium	0.005	0.1	0.007	0.005	0.004	0.003	0.001	0.000
Copper	0.01	1.3	0.01	0.01	0.01	0.00	0.01	0.01
Lead	0.005	0.015	0.003	0.002	0.005	0.003	0.000	0.000
Manganese	0.01	.05 ^f	0.01	0.01	0.34	0.15	0.31	0.01
Mercury	0.0002	0.002	0.0002	0.0001	0.0004	0.0005	0.0002	0.0001
Nickel	0.01	0.1 ^g	0.01	0.01	0.01	0.01	0.01	0.00
Selenium	0.002	0.05	0.001	0.001	0.004	0.003	0.001	0.000
Silver	0.002	0.1	0.001	0.001	0.123	0.169	0.000	0.000
Thallium	0.001	0.002 ^g	0.002	0.002	0.001	0.001	0.000	0.000
Vanadium	0.01	n/a	0.01	0.00	0.01	0.00	0.01	0.00
Zinc	0.05	5	0.02	0.02	0.41	0.47	0.07	0.05
Fluoride	0.3	4	1.77	0.65	0.42	0.17	0.51	0.16
Nitrate-N	0.02	10	0.715 ^h	2.74 ^h	0.25	0.21	0.02	0.01
Nitrite-N	0.01	1	0.01 ^h	0.00 ^h	0.01	0.01	0.01	0.00
TDS	5	10,000	563	50	1365	553	1166	366
Uranium	0.001	.02 ^e	0.00	0.00	0.01	0.01	0.02	0.00
alpha-activity	2 pCi/l	15 pCi/l	0.8	1.0	56.9	59.0	24.9	10.1
beta-activity	4 pCi/l	8 pCi/l	7.4	3.1	36.4	27.0	22.9	5.8

- a** Protection Level established based on 1.X times the mean background concentration, where X = 0.50 (X=0.25 for TDS).
- b** Protection Level established based on 0.X times the Ground Water Quality Standard, where X = 0.50.
- c** Protection Level established at mean background concentration, as the mean exceeds the standard.
- d** Compliance Level greater of protection level or background mean plus 2 standard deviations.
- e** Secondary MCL.
- f** Final MCL.
- g** Protection Level established at standard due to lack of background data. May be updated based upon sufficient data.
- h** Nitrate and nitrite data was taken from 2011-2020 due to outliers in the original dataset.

TABLE 1 (cont.) -Compliance Monitoring Well Background Statistics

Parameter	method detection limit	ground water quality standard	Monitoring Well PW-7		Monitoring Well PW-11	
			Background Level (mg/l)		Background Level (mg/l)	
			mean	stddev	mean	stddev
pH (units)	n/a	6.5-8.5	8.22	4.11	8.31	4.14
Antimony	0.002	0.006 ^g	0.001	0.000	0.000	0.000
Arsenic	0.005	0.05	0.020	0.004	0.005	0.001
Barium	0.01	2	0.06	0.06	0.05	0.01
Beryllium	0.001	.004 ^g	0.000	0.000	0.000	0.000
Cadmium	0.001	0.005	0.000	0.000	0.000	0.000
Chromium	0.005	0.1	0.000	0.000	0.001	0.000
Copper	0.01	1.3	0.01	0.01	0.01	0.01
Lead	0.005	0.015	0.000	0.000	0.000	0.000
Manganese	0.01	.05 ^f	0.08	0.09	0.03	0.01
Mercury	0.0002	0.002	0.0002	0.0001	0.0002	0.0001
Nickel	0.01	0.1 ^g	0.01	0.01	0.01	0.00
Selenium	0.002	0.05	0.001	0.001	0.000	0.000
Silver	0.002	0.1	0.000	0.000	0.000	0.000
Thallium	0.001	0.002 ^g	0.000	0.000	0.000	0.000
Vanadium	0.01	n/a	0.01	0.00	0.01	0.00
Zinc	0.05	5	0.01	0.01	0.05	0.07
Fluoride	0.3	4	0.50	0.24	0.55	0.03
Nitrate-N	0.02	10	0.02	0.01	0.02	0.01
Nitrite-N	0.01	1	0.01	0.01	0.01	0.01
TDS	5	10,000	578	259	530	177
Uranium	0.001	.02 ^e	0.03	0.05	0.00	0.00
alpha-activity	2 pCi/l	15 pCi/l	22.7	47.7	1.6	1.5
beta-activity	4 pCi/l	8 pCi/l	12.6	11.4	10.2	4.0

- a** Protection Level established based on 1.X times the mean background concentration, where X = 0.50 (X=0.25 for TDS).
- b** Protection Level established based on 0.X times the Ground Water Quality Standard, where X = 0.50.
- c** Protection Level established at mean background concentration, as the mean exceeds the standard.
- d** Compliance Level greater of protection level or background mean plus 2 standard deviations.
- e** Secondary MCL.
- f** Final MCL.
- g** Protection Level established at standard due to lack of background data. May be updated based upon sufficient data.

Table 2 Protection Limits

	SLV-2	PW-3	PW-8	PW-12	PW-7
	Protection Limit	Protection Limit	Protection Limit	Protection Limit	Protection Limit
Parameter	Level (mg/L)	Level (mg/L)	Level (mg/L)	Level (mg/L)	Level (mg/L)
pH (units)	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5
Antimony	0.013 ^d	0.0015 ^a	0.017 ^a	0.003 ^b	0.0015 ^a
Arsenic	0.015 ^d	0.006 ^d	0.014 ^d	0.019 ^d	0.03 ^a
Barium	0.075 ^a	0.06 ^a	0.06 ^a	0.03 ^d	0.18 ^d
Beryllium	0.006 ^d	0.002 ^b	0.006 ^d	0.002 ^b	0.002 ^b
Cadmium	0.006 ^d	0.0025 ^b	0.006 ^d	0.0025 ^b	0.0025 ^b
Chromium	0.011 ^d	0.050 ^b	0.017 ^d	0.0015 ^a	0.050 ^b
Copper	0.03 ^d	0.03 ^d	0.03 ^d	0.03 ^d	0.03 ^d
Lead	0.014 ^d	0.0075 ^b	0.007 ^d	0.0075 ^b	0.0075 ^b
Mercury	0.0004 ^d	0.0004 ^d	0.0004 ^d	0.0004 ^d	0.0004 ^d
Selenium	0.01 ^d	0.003 ^d	0.003 ^d	0.0015 ^a	0.003 ^d
Silver	0.304 ^d	0.05 ^b	0.003 ^d	0.05 ^b	0.05 ^b
Thallium	0.003 ^d	0.001 ^b	0.006 ^d	0.001 ^b	0.001 ^b
Zinc	0.49 ^d	0.18 ^d	0.06 ^d	0.17 ^d	0.03 ^d
Fluoride	0.97 ^d	0.18 ^d	3.07 ^d	0.83 ^d	0.98 ^d
Nitrate-N	0.35 ^d	0.18 ^d	6.195 ^{d,e}	0.03 ^d	0.03 ^d
Nitrite-N	0.03 ^d	0.03 ^d	0.015 ^{a,e}	0.015 ^a	0.03 ^d
TDS	1,149 ^d	2,138 ^d	844.5 ^a	1,898 ^d	1,096 ^d
Uranium	0.03 ^d	0.04 ^d	0.01 ^b	0.03 ^a	0.13 ^d
Gross Alpha pCi/l	51 ^c	18.1 ^c	2.8 ^d	24.9 ^c	22.7 ^c
Gross Beta pCi/l	35 ^c	18.3 ^c	13.6 ^d	22.9 ^c	12.6 ^d

- a** Protection Level established based on 1.X times the mean background concentration, where X = 0.50 (X=0.25 for TDS).
- b** Protection Level established based on 0.X times the Ground Water Quality Standard, where X = 0.50.
- c** Protection Level established at mean background concentration, as the mean exceeds the standard.
- d** Compliance Level greater of protection level or background mean plus 2 standard deviations.
- e** Nitrate and nitrite data was taken from 2011-2020 due to outliers in the original dataset.

D. Best Available Technology (BAT) Standard

BAT construction and operation standards of this permit apply to the following facilities: 1) Heap Leach Pad; 2) Raffinate, Pre-Raffinate, Pregnant Leach Solution (PLS) and Storm Water Ponds; 3) Emergency Overflow Pond; 4) Heap Leach Solution Ditches; 5) Waste Rock Piles; and 6) Wetlands Treatment Cell. All facilities shall be constructed in accordance with the approved Plans and Specifications and the conditions of the Construction Permit. The following paragraphs list the construction and operating standards for the specifically permitted facilities.

1. BAT Construction Standards

- a. **Heap Leach Pads, Stage 1 and 2:** The liner has been constructed of the following layers in order from bottom to top: a) 12 inches of compacted silt with a maximum permeability of 1×10^{-6} cm/sec; b) Leak detection strips spaced at a 200-foot intervals, consisting of 2-inch diameter perforated Schedule 80, polyvinyl chloride (PVC) pipe laid in the bottom of gravel bed wrapped with 8-ounce non-woven geo-textile; c) The compacted silt and the leakage detection system is covered by a minimum 6 inch layer of compacted clayey soil with a maximum permeability of 1×10^{-7} cm/sec; d) The primary liner is a 80-mil linear low-density polyethylene (LLDPE) liner with a minimum two foot protective cover of minus 3/4 inch sedimentary ore.

Stage 1 and 2 Leak Detection: Underdrains surrounded by geotextile with 2-inch perforated pipe, spaced east-west at 200 feet from the solution ditch to the conveyor corridor. 2-inch drains change to solid PVC at the edge of the pad and terminate at the inspection point. A 3-inch pipe connects the inspection ports and terminates at the PLS pond. Upon leakage, the 3-inch will drain in to the PLS pond.

- b. **Heap Leach Pads, Stage 3 and 4:** Stage 4 has yet to be constructed, but it will be constructed to the exact specifications as Stage 3. The Stage 3 liner is constructed of the following layers in order from bottom to top: a) 12 inches of compacted fine-grained clayey soil with maximum permeability of 1×10^{-7} cm/sec; and b) the primary liner is a 60-mil LLDPE liner with a minimum two-foot protective cover of crushed ore.

Stage 3 and 4 Leak Detection: 10 lysimeters are/will be installed at a depth of 5 feet below final grade of Stage 3 and 4. The lysimeters are constructed with a porous lysimeter probe and internal collection cup. The lysimeters are connected to tubing installed within the Schedule 80 PVC piping that is routed to monitoring locations downhill from the toe of the berm. The lysimeters are spaced 20 feet apart.

- c. **Intermediate Leachate Solution (ILS), Raffinate, Pre-Raffinate, PLS, and Storm Water Ponds:** The liner was constructed to a minimum 2.0 percent slope and be constructed of the following layers in order from bottom to top: a) 12 inches of compacted clayey soil with a maximum permeability of 1×10^{-7} cm/sec; b) a 40 mil high-density polyethylene (HDPE) secondary liner, 60 mil LLDPE secondary liner for the ILS pond; c) a geonet leak detection system, with five leak detection ports along the west edge of the ILS pond and; d) a 80 mil HDPE primary liner.
- d. **Emergency Overflow Pond:** The liner is constructed of the following layers in order from bottom to top: a) 12 inches of compacted clayey soil having a maximum permeability of 1×10^{-7} cm/sec; b) an 8 oz geotextile fabric leakage detection layer and; b) a 60 mil HDPE primary liner.

- e. **Heap Leach Solution Ditches:** The liner was constructed of the following layers in order from top to bottom: a) 12 inches of compacted clayey soil with a maximum permeability of 1×10^{-7} cm/sec; b) a 40 mil HDPE secondary liner; c) a geonet between the secondary and primary liners for leakage detection; d) a primary 80 mil HDPE liner with geonet below all pipes as protection against abrasion. The 40 mil HDPE will extend into the pad for a distance of not less than 10 feet.
 - f. **Waste Rock Piles:** There are three large waste rock repositories at the site. Potentially acid generating materials from coal-stringers within the Burro Canyon and Dakota formations will be encapsulated within acid neutralizing material from other formations within the mine. At closure the waste rock repositories are graded and vegetated in accordance with Division of Oil Gas and Mining rules. Encapsulation is defined as a minimum of 40 feet of neutralizing material below, above and to the sides of all acid generating materials. The maximum lift thickness for acid generating material is 50 feet.
 - g. **Wetlands Treatment Cell:** The liner was constructed of the following layers in order from top to bottom: a) 12 inches of compacted clayey soil with a maximum permeability of 1×10^{-6} cm/sec; b) a primary 80 mil HDPE Liner.
2. BAT Performance Standards
- a. **Heap Leach Pads:** Due to the design of the leakage detection system that allows small leaks in the primary liner to go undetected the allowable leakage rate from any of the leakage detection ports is zero gallons per acre per day.
 - b. **Raffinate, Pre-Raffinate, PLS and Storm Water Ponds:** The allowable leakage rate for these ponds is 200 gallons per acre per day.
 - c. **Emergency Overflow Pond:** Use of this pond constitutes a BAT failure. The Permittee is required to notify the Director within 24 hours of the time heap leach runoff is directed to this pond. Notification shall be in accordance with the conditions of Part II.E.3, below. In addition to meeting the requirements above the following conditions must be met in order for the Permittee to demonstrate affirmative defense under Part IV.F:
 - 1) All solutions entering this pond must be neutralized to a pH of 6.5 to 8.5;
 - 2) Because the geotextile that functions as the leakage detection layer will only conduct water once the clay beneath it is saturated, the allowable detectable leakage rate may not exceed zero gallons per acre per day; and
 - 3) The Permittee must take all appropriate steps to limit use of the emergency pond to the shortest length of time possible.
 - d. **Heap Leach Solution Ditches:** The allowable leakage rate is 200 gallons per acre per day.
 - e. **Waste Rock Piles:** Encapsulation of potentially acid generating material within the waste rock repositories.
3. Leakage Detection Fluids - any fluid collected in any of the leakage detection systems shall be contained and pumped to one of the double lined process or storm water ponds. Any fluid collected shall be monitored in accordance with Part II.E.2, below.
4. Spill Containment - The Permittee shall design, maintain and construct all pipelines, storage tanks, and milling facilities with a spill containment system that shall:

- a. Prevent any spills or leakage from any contact with the ground surface or ground water.
- b. Convey all spills or leakage to the double lined process or storm water ponds.

Any spill that does come into contact with the ground surface or ground water that causes pollution or has the potential to cause pollution to waters of the state shall be reported in accordance with Part II.I.

5. Future Construction - New construction of the heap leach pad shall be according to the design and methods approved in this Permit.
 - a. Authorized Construction - The heap leach pad is authorized to be constructed in 4 phases for a total surface area of 266 acres. Expansion of the pad by more than 10% of the acreage stated above will require ground water permit modification and may be subject additional ground water monitoring requirements.
 - b. Advance Notification of Seasonal Construction - The Permittee shall submit a facility construction plan on an annual basis that outlines the planned construction for the year. This will allow DWQ to appropriately schedule inspections during key activities. The plan shall be submitted in accordance with Part II.G.4. The heap leach pad for stage 4 will require a construction permit for the pad extension. The pad expansion will meet current DWQ BAT requirements.
 - c. Monitoring Well Construction - Monitoring well construction shall conform to A Guide to the Selection of Materials for Monitoring Well Construction (1983) and RCRA Groundwater Monitoring Technical Enforcement Guidance Manual (1986).

Steel casing or other suitable material when approved by the Director shall be required on all new wells constructed for the purposes of this permit.

E. Compliance Monitoring Requirements

1. Ground Water Monitoring Requirements
 - a. Water Quality Monitoring QA/QC Plan - All water quality monitoring to be conducted under this permit shall be conducted in accordance with the general requirements, hereunder, and the other requirements found in the Lisbon Valley Project Mitigation and Monitoring Plan (DWQ-2022-027192).
 - b. Monitoring Wells - For the purposes of this permit the Permittee shall monitor the following wells at the locations described below.
 - 1) Compliance Monitoring Well SLV-2 – Latitude 38.14856 N; Longitude 109.141828 W
 - 2) Compliance Monitoring Well MW06-15 – Latitude 38.157267 N; Longitude 109.140098 W
 - 3) Compliance Monitoring Well PW-8 – Latitude 38.14782 N; Longitude 109.134327 W
 - 4) Compliance Monitoring Well 96MW-7A – Latitude 38.145761 N; Longitude 109.13057 W

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- 5) Compliance Monitoring Well PW-12 – Latitude 38.124897 N; Longitude 109.121207 W
- 6) Compliance Monitoring Well PW-7 – Latitude 38.124927 N; Longitude 109.111428 W
- 7) Informational Monitoring Well PW-11 – Latitude 38.126115 N; Longitude 109.100561 W
- 8) Informational Monitoring Well PW-9 – Latitude 38.121161 N; Longitude 109.090624 W
- 9) Informational Monitoring Well 94MW4* – Latitude 38.149233 N; Longitude 109.169192 W

*Informational Monitoring Well 94MW4 is currently dry. The Operator proposes to either deepen the existing well, or determine a proper method of gathering adequate water from the Honaker aquifer in order to continue monitoring this isolated aquifer.

- c. Protection of Monitoring Well Network - All compliance monitoring wells must be protected from damage due to surface vehicular traffic or contamination due to surface spills. They shall be maintained in full operational condition for the life of this permit. Any well that becomes damaged beyond repair or is rendered unusable for any reason will be replaced by the Permittee within 90 days or as directed by the Director.
- d. Ground Water Sampling/Frequency Requirements
 - (1) Ground Water Level Measurements - Ground water level measurements shall be made in each monitoring well prior to any collection of ground water samples. These measurements will be made from a permanent single reference point clearly demarcated on the top of the well or surface casing. Measurements will be made to the nearest 0.1 foot.
 - (2) Ground Water Quality Sampling - grab samples of ground water from all compliance monitoring wells will be collected for chemical analysis on a quarterly basis, except MW96-7A which shall be monitored on an annual basis, in conformance with the Water Quality Monitoring QA/QC Plan that has been approved by the Director.
- e. Ground Water Analysis Requirements
 - (1) Analysis by Certified Laboratories - analysis of any ground water sample shall be performed by laboratories certified by the State Health Laboratory.
 - (2) Ground Water Analytical Methods - methods used to analyze ground water samples must comply with the following:
 - (a) Are methods cited in UAC R317-6-6.3(L), and
 - (b) Have detection limits which are less than or equal to the method detection limits found in Part I.C, Table 1.
 - (3) Analysis Parameters - the following analyses will be conducted on all ground water samples collected:
 - (a) Field Parameters - pH, temperature, and specific conductance

- (b) Laboratory Parameters - including:
- Major Anions and Cations: including chloride, sulfate, carbonate, bicarbonate, sodium, potassium, magnesium and calcium.
 - Protection Level Parameters - found in Part I.C, Table 1.
2. BAT Monitoring Requirements - The Permittee shall monitor all leakage detection and collection systems and settlement monitoring devices in accordance with the Best Available Technology Monitoring Plan submitted as required in Part II.H.3.
3. Hydrogeologic Monitoring Requirements - The Permittee shall complete an annual update of the Hydrogeologic Summary Report, submitted as part of the ground water permit application. The report will be submitted according to the schedule and reporting requirements of Part II.G.3, below. The purpose of the annual evaluation is to update and refine the original evaluation based on data obtained from the construction, testing and operation of de-watering and water supply wells. The evaluation will address whether or not pit lakes will form following mining in any of the mining pits and whether or not ground water quality in the Navajo/Entrada aquifer will be impacted by mining activities or by post closure conditions. In addition to updating the original evaluation each annual report will include:
- a. The evaluation will contain summarized dewatering data for each point of withdrawal.
 - b. An annual water quality report with at least one (1) complete water quality analysis from each active point of ground water withdrawal. Ground water sampling will meet the requirements outlined in Part I.E.1, above. Accelerated monitoring requirements do not apply to wells not listed as Monitoring Wells in Part I.E.1(b).
 - c. A well construction As-Built report for all wells constructed in the year. The report shall meet the conditions of Part II.H.2, below.
 - d. Potentiometric Map - The potentiometric map shall illustrate the ground water elevation of the uppermost aquifers beneath the mining facilities. The map must be superimposed on a topographic base map of at least 1:2400 (1"=200') or other scale approved by the Director and must be inclusive of the entire mining and processing site. Known contours must be distinguished from suspected or inferred contours. Other pertinent geologic, hydrologic, or manmade features, including wells, must be displayed.

F. Non-Compliance Status

1. Probable Out-of-Compliance Based on Exceedance of Ground Water Protection Limits - the Permittee shall evaluate the results of each round of ground water sampling and analysis to determine any exceedance of the ground water protection levels found in Table 2. Upon determination by the Permittee that the data indicate a ground water protection level may have been exceeded at any downgradient compliance monitoring well, the Permittee shall:
- a. Immediately resample the monitoring well(s) found to be in probable out-of-compliance, for the protection level parameters that have been exceeded. Submit the analytical results thereof, and notify the Director of the probable out-of-compliance status within 30 days of the initial detection.

- b. Immediately implement an accelerated schedule of monthly ground water sampling and analysis, consistent with the requirements of Part I.E.1, above. This monthly sampling will continue for at least two months or until the compliance status can be determined by the Director. Reports of the results of this sampling will be submitted to the Director as soon as they are available, but not later than 30 days from each date of sampling.
2. Out-of-Compliance Status Based on Confirmed Exceedance of Permit Ground Water Protection Limits
- a. Out of Compliance Status shall be defined as follows:
 - (1) For parameters that have been defined as detectable in the background and for which protection levels have been established based on 1.5 times the mean background concentration, out-of-compliance shall be defined as two consecutive samples exceeding the protection level and the mean background concentration by two standard deviations.
 - (2) For parameters that have been defined as detectable in the background and for which protection levels have been established based on 0.5 times the ground water quality standard, out-of-compliance shall be defined as 2 consecutive samples exceeding the protection level and the mean background concentration by two standard deviations.
 - (3) For parameters that have background data sets between 50-85% non-detectable analyses, out-of-compliance shall be defined as 2 consecutive samples from a compliance monitoring point exceeding the established protection level.
 - (4) For parameters that have been defined non-detectable in the background and for which protection limits have been determined based on 0.5 times the ground water quality standard or the limit of detection out-of-compliance shall be defined as 2 consecutive samples from a compliance monitoring point exceeding the established protection limit.
 - b. Notification and Accelerated Monitoring - upon determination by the Permittee or the Director, in accordance with UAC R317-6-6.17, that an out-of-compliance status exists, the Permittee shall:
 - (1) Verbally notify the Director of the out-of-compliance status or acknowledge Director notice that such a status exists within 24 hours of receipt of data in accordance with Part II.I.1, and
 - (2) Provide written notice within 5 days of the determination in accordance with Part II.I.2, and
 - (3) Continue an accelerated schedule of monthly ground water monitoring for at least two months and continue monthly monitoring until the facility is brought into compliance.
 - c. Source and Contamination Assessment Study Plan - within 30 days of the written notice to the Director required in Part I.F.2(b), above, the Permittee shall submit an assessment study plan and compliance schedule for:

- (1) Assessment of the source or cause of the contamination, and determination of steps necessary to correct the source.
 - (2) Assessment of the extent of the ground water contamination and any potential dispersion.
 - (3) Evaluation of potential remedial actions to restore and maintain ground water quality, and ensure that the ground water standards will not be exceeded at the compliance monitoring wells.
3. Out-of-Compliance Status Based Upon Failure to Maintain BAT

In the event that BAT monitoring indicates violation of any of the construction or performance standards outlined in Part I.D, of this permit, the Permittee shall submit to the Director a notification and description of the violation in accordance with Part III.I and Part III.J.

G. Reporting Requirements

1. Ground Water Monitoring
 - a. Schedule - The sampling and analysis required in Part I.E.1, above, shall be reported according to Table 3, below.

Table 3 Compliance Monitoring Reporting Schedule

<u>Annual</u>	<u>While Under Non-Operational Status</u>	<u>Report Due On</u>
October 31		December 31
	<u>Operational Status</u>	<u>Report Due On</u>
<u>Quarterly</u>		
1st (Jan., Feb., March)		April 30
2nd (April, May, June)		July 31
3 rd (July, Aug. Sept.)		October 31
4 th (Oct., Nov., Dec.)		January 31

- b. Sampling and Analysis Report - will include:
 - (1) Field Data Sheets - or copies thereof, including the field measurements, required in Part I.E.1.e.3.A, above, and other pertinent field data, such as: well name/number, date and time, names of sampling crew, type of sampling pump or bail, measured casing volume, volume of water purged before sampling.
 - (2) Results of Ground Water Analysis - including date sampled, date received, ion balance; and the results of analysis for each parameter, including: value or concentration, units of measurement, reporting limit (minimum detection limit for the examination), analytical method, and the date of the analysis.
 - (3) Quarterly Ground Water Level Measurements - water level measurements from ground water monitoring wells will be reported in both measured depth to ground water and ground water elevation above mean sea level.

- (4) Electronic Filing Requirements - In addition to submittal of the hard copy data, above, the Permittee will electronically submit the required ground water monitoring data in the electronic format specified by the Director. Submit electronically using the electronic method defined in Part II.D.
2. Best Available Technology Report:
 - a. Routine Schedule - BAT monitoring, sampling and analysis required under Part I.E.2 shall be summarized on a monthly basis and reported to the Director in accordance with the Compliance Monitoring Schedule of Table 3.
 - b. In the event that any of the performance standards of Part I.D.2 are exceeded, the Permittee shall notify the Director in accordance with Part I.F.3.
 - c. Electronic Filing Requirements - In addition to submittal of the hard copy data, the Permittee shall electronically submit the required water quality monitoring data in the electronic format specified by the Director. Submit electronically using the electronic method defined in Part II.D.
3. Annual Monitoring Report:
 - a. Schedule - The monitoring report required in Part I.E.3, above, shall be submitted to the Director by January 30 of each year. The Permittee shall resubmit the report within 60 days of receipt of written notice, from the Director, detailing any deficiencies or omissions.
 - b. Electronic Filing Requirements - In addition to submittal of the hard copy data, the Permittee shall electronically submit the required water quality monitoring data in the electronic format specified by the Director.
4. Seasonal Construction Notification Report
 - a. Schedule - The advance notification of the seasonal construction activities required in Part II.E.3., above, shall be submitted to the Director by January 30 of each year. The Permittee shall resubmit the report within 60 days of receipt of written notice, from the Director, detailing any deficiencies or omissions.

H. Compliance Schedule

1. Water Quality Monitoring QA/QC Plan - The water quality sampling, handling and analysis plan, Appendix A of the permit, shall be updated and/or modified as required by the Director. The revised plan will be submitted for Director approval, within 60 days following receipt of notice from the Director, that updates or revisions to the plan are required.
2. Compliance Monitoring Well Requirements
 - a. Heap Leach Facility Monitoring Wells - Because the two monitoring wells (MW97-8 and MW05-14) installed near the southeast corner of Stage 1 and Stage 2 Heap Leach Pad have been dry, no additional monitoring wells are required for Stage 3 and Stage 4 Heap Leach Pad.

- b. Monitoring Well As-Built Report - For each well constructed, the Permittee shall submit diagrams and descriptions of the final completion of the monitoring wells. The report is due within 60 days of the date of well completion. The report shall include:
- (1) Casing: depth, diameter, and type of material;
 - (2) Screen: length, depth interval, diameter, material type, slot size;
 - (3) Sand Pack: depth interval, material type and grain size;
 - (4) Annular Seals: depth interval, material type;
 - (5) Surface Casing and Cap: depth, diameter, material type, protection measures constructed;
 - (6) Elevation and Location: ground surface elevation, elevation of water level measuring point, latitude and longitude in hours, minutes and seconds; and
 - (7) Well construction description, well completion description, results of pumping or aquifer tests.
3. BAT Monitoring Plan - The Permittee shall submit a BAT Monitoring Plan to the Director and secure approval of the plan prior to construction of any facilities described in this permit. The plan will include all procedures and methods sufficient to ensure compliance with the BAT performance standards of Part I.D.2, including the criteria for encapsulation of potentially acid generating waste rock. The approved document will become an enforceable Appendix B to this permit and is hereby incorporated by reference.
4. Interim Conceptual Closure Plan - The Permittee shall submit a conceptual closure plan and secure approval of the plan prior to construction of any facilities described in this permit. The interim conceptual closure plan must specifically address neutralization, cover design, fluid disposal and long-term fluid management. The Permittee will modify the plan in accordance with agency review comments and the results of any ongoing studies to form the basis for the Final Conceptual Closure Plan required in Part I.H.5.
5. Final Closure Plan - In the event that the Permittee decides to discontinue its operations at the facility the Permittee shall notify the Director of such a decision and submit a Final Closure Plan within 180 days. The Final Closure Plan shall be submitted no later than 180 days prior to the closure of the facility. The Permittee shall resubmit Final Closure Plans within 60 days of receipt of written notice of deficiencies therein. Any material changes made to this plan, after it receives Director approval, shall also require approval of the Director. Said closure plans will require a construction permit in addition to approval under this permit.

II. MONITORING, RECORDING AND REPORTING REQUIREMENTS

A. Representative Sampling

Samples taken in compliance with the monitoring requirements established under Part I shall be representative of the monitored activity.

B. Analytical Procedures

Water sample analysis must be conducted according to test procedures specified under UAC R317-6-6.3(L), unless other test procedures have been specified in this permit.

C. Penalties for Tampering

The Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate, any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than six months per violation, or by both.

D. Reporting of Monitoring Results

Monitoring results obtained during each reporting period specified in the permit, shall be submitted to the Director, Utah Division of Water Quality at the following address or using the electronic portal no later than the 30th day of the month following the completed reporting period:

State of Utah
Division of Water Quality
Department of Environmental Quality
P.O. Box 144870
Salt Lake City, Utah 84114-4870

Electronic Document Submission:

<https://deq.utah.gov/water-quality/water-quality-electronic-submissions>

E. Compliance Schedules

Reports of compliance or noncompliance with, or any progress reports on interim and final requirements contained in any Compliance Schedule of this permit shall be submitted no later than 14 days following each schedule date.

F. Additional Monitoring by the Permittee

If the Permittee monitors any pollutant more frequently than required by this permit, using approved test procedures as specified in this permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted. Such increased frequency shall also be indicated.

G. Records Contents

Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements;
2. The individual(s) who performed the sampling or measurements;
3. The date(s) and time(s) analyses were performed;
4. The individual(s) who performed the analyses;
5. The analytical techniques or methods used; and
6. The results of such analyses.

H. Retention of Records

The Permittee shall retain records of all monitoring information, including all calibration and maintenance records and copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three years from the date of the sample, measurement, report or application. This period may be extended by request of the Director at any time.

I. Twenty-four Hour Notice of Noncompliance Reporting

1. The Permittee shall verbally report any noncompliance with permit conditions or limits as soon as possible, but no later than twenty-four (24) hours from the time the Permittee first became aware of the circumstances. The report shall be made to the Utah Department of Environmental Quality 24 hour number, (801) 536-4123, or to the Division of Water Quality, Ground Water Protection Section at (801) 536-4300, during normal business hours (8:00 am - 5:00 pm Mountain Time).
2. A written submission of any noncompliance with permit conditions or limits shall be provided to the Director within five days of the time that the Permittee becomes aware of the circumstances. The written submission shall contain:
 - a. A description of the noncompliance and its cause;
 - b. The period of noncompliance, including exact dates and times;
 - c. The estimated time noncompliance is expected to continue if it has not been corrected;
 - d. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance; and
 - e. When applicable, either an estimation of the quantity of material discharged or an estimation of the quantity of material released outside containment structures.
3. Written reports shall be submitted to the addresses in Part II.D, Reporting of Monitoring Results.

J. Other Noncompliance Reporting

Instances of noncompliance not required to be reported within 24 hours, shall be reported at the time that monitoring reports for Part II.D are submitted.

K. Inspection and Entry

The Permittee shall allow the Director, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:

1. Enter upon the Permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of the permit;
2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
4. Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the Act, any substances or parameters at any location.

III. COMPLIANCE RESPONSIBILITIES

A. Duty to Comply.

The Permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Utah Water Quality Act (the Act) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application. The Permittee shall give advance notice to the Director of the Utah Water Quality Board of any planned changes in the permitted facility or activity, which may result in noncompliance with permit requirements.

B. Penalties for Violations of Permit Conditions.

The Act provides that any person who violates a permit condition implementing provisions of the Act is subject to a civil penalty not to exceed \$10,000 per day of such violation. Any person who willfully or negligently violates permit conditions is subject to a fine not exceeding \$25,000 per day of violation. Any person convicted under Section 19-5-115(2) of the Act a second time shall be punished by a fine not exceeding \$50,000 per day. Nothing in this permit shall be construed to relieve the Permittee of the civil or criminal penalties for noncompliance.

C. Need to Halt or Reduce Activity not a Defense.

It shall not be a defense for a Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

D. Duty to Mitigate.

The Permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit, which has a reasonable likelihood of adversely affecting human health or the environment.

E. Proper Operation and Maintenance.

The Permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems, which are installed by a Permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

F. Affirmative Defense

In the event that a compliance action is initiated against the Permittee for violation of permit conditions relating to discharge minimization technology, the Permittee may affirmatively defend against that action by demonstrating the following:

1. The Permittee submitted notification according to Part I.F.3 and Part II.I and J;
2. The failure was not intentional or caused by the Permittee's negligence, either in action or in failure to act;
3. The Permittee has taken adequate measures to meet permit conditions in a timely manner or

has submitted to the Director, for the Director's approval, an adequate plan and schedule for meeting permit conditions; and

4. The provisions of Utah Code § 19-5-107 have not been violated.

IV. GENERAL REQUIREMENTS

A. Planned Changes.

The Permittee shall give notice to the Director as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required when the alteration or addition could significantly change the nature of the facility or increase the quantity of pollutants discharged.

B. Anticipated Noncompliance.

The Permittee shall give advance notice of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

C. Spill Reporting

The Permittee shall immediately report as per Section 19-5-114 of the Act any spill or leakage which is not totally contained by a collection system. This report shall be made to the phone numbers given in Part II.I. A written report will be required within 5 days of the occurrence and should address the requirements of Utah Code § 19-5-114 and Parts II.I. and J. of this permit.

D. Permit Actions.

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

E. Duty to Reapply.

If the Permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Permittee must apply for and obtain a permit renewal or extension. The application should be submitted at least 180 days before the expiration date of this permit.

F. Duty to Provide Information.

The Permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The Permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.

G. Other Information.

When the Permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or any report to the Director, it shall promptly submit such facts or information.

H. Signatory Requirements.

All applications, reports or information submitted to the Director shall be signed and certified.

1. All permit applications shall be signed as follows:
 - a. For a corporation: by a responsible corporate officer;
 - b. For a partnership or sole proprietorship: by a general partner or the proprietor, respectively.
 - c. For a municipality, State, Federal, or other public agency: by either a principal executive officer or ranking elected official.
2. All reports required by the permit and other information requested by the Director shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:
 - a. The authorization is made in writing by a person described above and submitted to the Director, and,
 - b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.)
3. Changes to Authorization. If authorization under Part IV.H.2. is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Part IV.H.2. must be submitted to the Director prior to or together with any reports, information, or applications to be signed by an authorized representative.
4. Certification. Any person signing a document under this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

I. Penalties for Falsification of Reports.

The Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than six months per violation, or by both.

J. Availability of Reports.

Except for data determined to be confidential by the Permittee, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Director. As required by the Act, permit applications, permits, effluent data, and ground water quality data shall not be considered confidential.

K. Property Rights.

The issuance of this permit does not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.

L. Severability.

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

M. Transfers.

This permit may be automatically transferred to a new Permittee if:

1. The current Permittee notifies the Director at least 30 days in advance of the proposed transfer date;
2. The notice includes a written agreement between the existing and new Permittee containing a specific date for transfer of permit responsibility, coverage, and liability between them; and,
3. The Director does not notify the existing Permittee and the proposed new Permittee of his or her intent to modify, or revoke and reissue the permit. If this notice is not received, the transfer is effective on the date specified in the agreement as described in Part IV.M.2.

N. State Laws.

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the Permittee from any responsibilities, liabilities, penalties established pursuant to any applicable state law or regulation under authority preserved by Utah Code § 19-5-117.

O. Reopener Provisions.

This permit may be reopened and modified pursuant to UAC R317-6-6.6.B. to include the appropriate limitations and compliance schedule, if necessary, if one or more of the following events occurs:

1. If new ground water standards are adopted by the Board, the permit may be reopened and modified to extend the terms of the permit or to include pollutants covered by new standards. The Permittee may apply for a variance under the conditions outlined in UAC R317-6-6.4.D.
2. Changes have been determined in background ground water quality.

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3. When at the end of the accelerated monitoring period, protection levels for the new wells are established.
4. When approval of any Compliance Schedule Item, under Part II.E, is considered, by the Director, to be a major modification to the permit.

STATEMENT OF BASIS

GROUND WATER QUALITY DISCHARGE PERMIT RENEWAL UGW370005

**Lisbon Valley Mining Company, LLC
Lisbon Valley Copper Mine
920 South County Road 313
La Sal, UT 84530**

February 2023

Introduction

The Division of Water Quality (DWQ) under the authority of the Utah Ground Water Quality Protection Rules¹ (Ground Water Rules) issues ground water discharge permits to facilities which have a potential to discharge contaminants to ground water.² As defined by the Ground Water Rules, such facilities include mining operations.³ The Ground Water Rules are based on an anti-degradation strategy for ground water protection as opposed to non-degradation; therefore, discharge of contaminants to ground water may be allowed provided that current and future beneficial uses of the ground water are not impaired and the other requirements of Rule 317-6-6.4.A are met.⁴ Following this strategy, ground water is divided into classes based on its quality⁵; and higher-quality ground water is given greater protection⁶ due to the greater potential for beneficial uses.

DWQ has developed permit conditions consistent with R317-6 and appropriate to the nature of the stored material, facility operations, maintenance, best available technology⁷ (BAT) and the hydrogeologic and climatic conditions of the site, to ensure that the operation would not contaminate ground water.

Basis for Permit Renewal

This Permit is being renewed in accordance with R317-6-6.8 which states that a permit may be terminated or a renewal denied if any one of the four items below applies:

- A. Noncompliance by the permittee with any condition of the Permit where the permittee has failed to take appropriate action in a timely manner to remedy the Permit violation;
- B. The Permittee's failure in the application or during the Permit approval process to disclose fully all significant relevant facts at any time;
- C. A determination that the permitted facility endangers human health or the environment and can only be regulated to acceptable levels by plan modification or termination; or
- D. The Permittee requests termination of the Permit.

1 Utah Admin. Code Rule 317-6

2 https://deq.utah.gov/ProgramsServices/programs/water/groundwater/docs/2008/08Aug/GWQP_PermitInfo.pdf

3 Utah Admin Code Rule 317-6-6.1A

4 Preamble to the Ground Water Quality Protection Regulations of the State of Utah, sec. 2.1, August, 1989

5 Utah Admin. Code Rule 317-6-3

6 Utah Admin. Code Rule 317-6-4

7 Utah Admin. Code Rule 317-6-1(1.3)

Basis for Modification and Permit Issuance

Under Rule 317-6-6.4A, DWQ may issue a ground water discharge permit if:

- 1) The applicant demonstrates that the applicable class TDS limits, ground water quality standards protection levels and permit limits established under R317-6-6.4E will be met;
- 2) The monitoring plan, sampling and reporting requirements are adequate to determine compliance with applicable requirements;
- 3) The applicant is using BAT to minimize the discharge of any pollutant; and
- 4) There is no impairment of present and future beneficial uses of ground water.

Site Location/Background and Description

Lisbon Valley Mining Company (LVMC) is a copper mining facility located southwest of La Sal Junction, Utah. The primary extraction of copper is via heap leaching.

Changes from Last Permit

In the previous permit, protection limits were established for the following wells; 94MW4, MW97-7A, MW96-7B, and MW06-15. Due to factors explained in the 2018 Hydrogeologic Summary Report (DWQ-2022-027212), protection limits have been established for the following wells, replacing the wells from the previous permit:

1. SLV-2: located immediately downgradient of process ponds & leach pad.
2. PW-3: located downgradient of the open pit mining activities.
3. PW-12: located upgradient of the open pit mining activities.
4. PW-8: located downgradient of the open pit mining activities.
5. PW-7: located upgradient of the open pit mining activities.

The 2018 Hydrogeologic Summary Report is on file with DWQ. Due to the size of the 2018 Hydrogeologic Summary Report, it is incorporated in this permit only by reference.

Site Hydrogeology

Lisbon Valley - The hydrogeology of the local flow system within Lisbon Valley is dominated by vertical heads between the shallow (Burro Canyon) aquifer and the deeper (Navajo/Entrada) aquifer. Geologic structure prevents the horizontal flow of ground water over significant distances within the Burro Canyon aquifer which consists of largely unconnected zones of water ponded on top of the Morrison Formation. These pockets of water are generally 100 to 300 feet below ground surface with average saturated thicknesses of around 40 feet. Although supported by the 2018 Hydrogeologic Report and subsequent studies, there does not appear to be known connectivity between the Burro Canyon and Navajo aquifers within the Lisbon Valley. However, the Navajo aquifer has regional significance, and water quality should be monitored. The Navajo aquifer is considered the regional aquifer and transmits water to the southeast, with the Dolores River being the distant point of regional discharge. Within Lisbon Valley, ground water quality concerns will be focused on the Navajo aquifer because of its regional significance. The processing facilities, water supply wells, mine pits and waste rock dumps will all be located within Lisbon Valley, with the mine pits extending out from the actual fault to the east. The Cretaceous Burro Canyon Formation consists of upper beds of shale, sandstone, mudstone, limestone and chert and a lower bed of clean sandstone and conglomerate. The lower bed is the primary host for ore. The Jurassic-aged Navajo/Entrada Formation consists of various sandstones and is disconnected from the larger Navajo aquifer outside of Lisbon Valley due to the collapsed structure of Lisbon Valley. The quality of water in the Burro Canyon aquifer and the Navajo\Entrada aquifer will be monitored to study potential water quality impacts related to development of the mine pits.

Little Valley - Little Valley is a small valley to the west of the main Lisbon Valley. It is an eroded up thrown block that lies to the west of the Lisbon Valley Fault. The heap leach pad and process water ponds are located within Little Valley. The geology within Little Valley is totally distinct from that of Lisbon Valley in that all of the water bearing formations (Dakota, Burro Canyon, Morrison and Navajo) within Little Valley have been eroded away. The stratigraphy in Little Valley consists of 10-35 feet of Quaternary eolian sands and silts, underlain by the Permian Cutler Formation, a shallow water deposition of arkose, conglomerate and silty mudstone, which outcrops to north of the valley and is generally around 500 feet in depth. Underlying the Cutler formation is the Pennsylvanian Honaker Trail Formation, an interbedded limestone/siltstone/shale. Borehole 94MW4 was initially dry for about 1 year. Thereafter water appeared in the well and is now present at an elevation of 410 feet below ground surface. Although water is present, as stated in the 2018 Hydrogeologic Report, the well contains insufficient water to collect a sample. It is this potential Honaker Formation aquifer on the south side of the heap leach that would be impacted if there was significant discharge from the Heap Leach or Ponds.

Ground Water Quality

Background - Background has been determined for all monitoring wells. The data collected prior to startup (1994-2004) indicates elevated alpha and beta particle levels are present in wells completed in the Burro Canyon aquifer and Navajo aquifer.

Class - In accordance with Utah Admin. Code R317-6-3 and R317-6-5(5.2)(H) ground water at the existing monitoring wells in the Burro Canyon and Navajo aquifer are classified as Class III, based upon levels of alpha and beta activity above the ground water standards as defined in Utah Admin. Code R317-6-2.

Protection Limits - Protection limits have been established for wells: SLV-2, PW-3, PW-12, PW-8, and PW-7.

Facility Description (Best Available Technology Standards)

Little Valley Heap Leach - The pad liner shall be a composite clay/linear low-density polyethylene (LLDPE) with a leakage detection system. The standard design for a heap leach pad consists of a composite clay/high-density polyethylene (HDPE) liner below a leakage detection system (geonet or gravel) and another HDPE liner. The alternative design was approved for this facility since a combination of site factors and design allow for a less conservative approach to still be protective of ground water. These factors include:

1. a pad design that will not allow a hydraulic head in excess of 24 inches on the pad surface;
2. depth to ground water at the site is estimated to be at least 500 feet;
3. intervening stratigraphy between the pad bottom and ground water has a strong buffering capacity which would neutralize any acidic leakage;
4. the quality of the ground water beneath the site limits its beneficial use due to the natural radioactivity present in the area, and;
5. the quantity of ground water (if any) is believed to be very limited. The liner shall be constructed of the following layers in order from bottom to top:
 - a. Heap Leach Pads, Stage 1 and 2: The liner has been constructed of the following layers in order from bottom to top: a) 12 inches of compacted silt with a maximum permeability of 1×10^{-6} cm/sec; b) Leak detection strips spaced at a 200-foot intervals, consisting of 2-inch diameter perforated Schedule 80, polyvinyl chloride (PVC) pipe laid in the bottom of gravel bed wrapped with 8-ounce non-woven geo-textile; c) The compacted silt and the leakage detection system is covered by a minimum 6 inch layer of compacted clayey soil with a maximum permeability of 1×10^{-7} cm/sec; d) The primary liner is a 80-mil LLDPE liner with a minimum two foot protective cover of minus 3/4 inch sedimentary ore.

Stage 1 and 2 Leak Detection: Underdrains surrounded by geotextile with 2-inch perforated pipe, spaced east-west at 200 feet from the solution ditch to the conveyor corridor. 2-inch drains change to solid PVC at the edge of the pad and terminate at the inspection point. A 3-inch pipe connects the inspection ports and terminates at the Pregnant Leachate Solution (PLS) pond. Upon leakage, the 3-inch will drain in to the PLS pond.

- b. Heap Leach Pads, Stage 3 and 4: Stage 4 has yet to be constructed, but it will be constructed to the exact specifications as Stage 3. The Stage 3 liner is constructed of the following layers in order from bottom to top: a) 12 inches of compacted fine-grained clayey soil with maximum permeability of 1×10^{-7} cm/sec; and b) The primary liner is a 60-mil LLDPE liner with a minimum two-foot protective cover of crushed ore.

Stage 3 and 4 Leak Detection: 10 lysimeters are/will be installed at a depth of 5 feet below final grade of Stage 3 and 4. The lysimeters are constructed with a porous lysimeter probe and internal collection cup. The lysimeters are connected to tubing installed within the Schedule 80 PVC piping that is routed to monitoring locations downhill from the toe of the berm. The lysimeters are spaced 20 feet apart.

The leakage detection system for the heap leach pad is designed such that only significant failure of the composite liner will be detected. Small leaks may go undetected. This is justified by local hydrogeologic considerations as described above. The allowable leakage rate due to the leakage detection system design is thus zero gallons per acre per day.

Process and Storm Water Ponds - The standard design was applied to the Raffinate, Pre-Raffinate, PLS, Intermediate Leachate Solution (ILS) and Storm Water Ponds. This consists of a double HDPE liner with leakage collection systems. The allowable leakage rate for this pond is 200 gallons per acre per day. An alternative design was approved for the Emergency Overflow Pond that has a single composite clay/HDPE liner. The Emergency Overflow Pond is designed for use only under the most extreme combination of meteorological events and any solutions entering this pond will be neutralized to a pH of between 6.5 and 8.5. In addition to neutralizing to the ground water quality standard for pH, the use of this pond will be limited to relatively short periods of time. There is no allowable detectable leakage from this pond.

Waste Rock Piles – LVMC operates under requirements set forth in the 1997 Record of Decision for the Final Environmental Impact Statement (FEIS). The FEIS states that only about 10% of the waste rock generated could be potentially acid producing. The other 90% of the waste rock is predicted to be acid neutralizing. The potentially acid producing rock will come from the Burro Canyon and Dakota formations and can be identified by color. Potentially acid generating waste rock from beds 6 through 10 of these formations will be encapsulated in acid neutralizing material within the waste dumps.

Wetlands Treatment Cell – The standard design was applied to the Wetlands Treatment Cell. This design consists of a single HDPE liner above 12 inches of clay. The allowable leakage rate for this facility is 200 gallons per acre per day.

Solvent Extraction/Electrowinning Plant - All processing tanks and chemical storage tanks are designed with secondary containment. Any spills within the process areas will be cleaned up and/or conveyed to a lined (Concrete, PVC or HDPE) sump which is then pumped to the Raffinate or Pre-Raffinate pond.

Mine Pits - The Permittee is committed through its mine plan to backfill the pit(s) to a minimum of 20 feet above the post-mining potentiometric surface with neutralizing waste rock -- this commitment can be found in the 2018 Centennial Backfill Environmental Assessment (EA), and re-iterated in the most recent EA modification. This is considered best practice as it best eliminates the risk of post-closure pit pooling – monitoring through the life of the mine is required by permit to ensure water is not pooling.

Activities Since the Last Modification/Renewal -- Due to factors explained in the 2018 Hydrogeologic Summary Report, including dry wells and well abandonment, wells being monitored consistently have changed. The following wells will be monitored quarterly: SLV-2, MW06-15, PW-8, 96MW-7A, PW-12, PW-7, PW-11, PW-9, and 94MW4.

Potential Impacts to Ground Water Quality

Potential impacts to ground water have been minimized by the design of process facilities that under normal operating conditions will not discharge. There is also an economic incentive to prevent ground water discharge since it is the process fluids that provide revenue for the permittee. Poor construction practices and/or inadequate operation and inspection procedures would result not only in potential discharge to ground water but would also reduce the return on the Permittee's investment. DWQ will conduct periodic onsite inspections during operation of the above facilities. Permittee's compliance with its BAT monitoring plan ensures that the facility is operated in accordance with design specifications and also ensures that any early indications of facility problems will be addressed.

Basis for other Specific Permit Conditions

Best Available Technology Monitoring Plan - The permittee submitted a BAT monitoring plan, under the name Process Fluid Management Plan (DWQ-2022-027192), to the Director for approval prior to the start of construction of the facilities described in the permit. The plan includes procedures and methods sufficient to ensure compliance with the BAT performance standards as well as an appropriate mechanism for demonstrating compliance with the waste rock standard for encapsulation of potentially acid generating waste rock. The approved document is an enforceable part of this Permit. The BAT Monitoring Plan was updated in 2020 is on file with DWQ. Due to the size of the BAT monitoring plan, it is incorporated in this permit only by reference.

Closure Plan - DWQ has determined through this permit renewal that the Permittee's Interim Conceptual Closure Plan is protective of ground water. The Closure Plan, updated in July 2020, is on file with DWQ (DWQ-2022-027192). Due to the size of the Closure Plan, it is incorporated in this permit only by reference. In the event that the Permittee decides to discontinue its operations at the facility, the Permittee shall notify the Director of such a decision and submit a Final Closure Plan within 180 days. The Final Closure Plan shall be submitted no later than 180 days prior to the closure of the facility.

Document List

1. 2018 Update of the Lisbon Valley Hydrogeologic System Evaluation (DWQ-2022-027212)
2. Process Fluid Management Plan & Closure Plan (DWQ-2022-027192)
3. Lisbon Valley Mining Co. Well Map 2022 (DWQ-2022-027193)
4. Lisbon Valley Mining Co. Record of Decision (DWQ- 2022-032005)
5. 2018 Centennial Backfill Environmental Assessment and 2021 Modification (DWQ-2022-032031)

Available upon request.

Public Notice

Began: March 14, 2023

Ended: April 14, 2023

The Public Notice of the draft permit was published on the Division of Water Quality webpage. No comments were received during the Public Notice period.