Exhibit T

JD-8 Environmental Protection Plan

Updated 2025 by BRS

From

M-1984-014 Whetstone EPP dated 2011

JD-8 MINE

ENVIRONMENTAL PROTECTION PLAN

Work performed under contract to

Cotter Corporation (N.S.L.)

West Slope Operations

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1. INTRODUCTION

The JD-8 Mine is an underground uranium and vanadium mine located in western Montrose County, Colorado. The JD-8 mine is owned/leased by Highbury Resources Inc. (Highbury) and was permitted for mining in 1984 under Colorado mining permit number M-1984-014. The permit was issued to allow for the extraction of 70,000 tons of mineral and waste rock or more annually over a total surface acreage of 20.9 acres. The JD-8 mine has not operated since 2005.

The Colorado Division of Reclamation, Mining and Safety (DRMS) determined that the JD-8 Mine is an 112d-l Designated Mining Operation (DMO) based on the passage of House Bill 1161 which changed the statutory definition of DMO to include all uranium mines. As a DMO, the JD-8 Mine is required to submit an Environmental Protection Plan (EPP or Plan) in accordance with the Colorado Mined Land Reclamation Act (C.R.S. 34-32, the Act) and the Hard Rock/Metal Mining Rules and Regulations (the Rules).

This EPP describes how the Operator will assure compliance with the provisions of the Act and Rules to protect all areas that have the potential to be affected by designated chemicals or toxic materials or acid mine drainage. The mine is expected to be operational at some future date, and this EPP is intended to address both the current (intermittent) and future (active) mining status. The specific facilities required for consideration under the Rules include the following:

- leach facilities, or heap leach pad (Not Applicable);
- tailings storage or disposal areas (Not Applicable);
- impoundments;
- waste rock piles;
- stock piles, temporary, or permanent; and
- land application sites (Not Applicable).

The facilities of interest for the EPP at the JD-8 Mine include the waste rock pile, ore storage area, and underground workings. The purpose of this EPP is to provide for protection of human health, property and the environment related to these features. Stormwater management and the prevention of water-rock interaction are the particular focus of environmental protection measures for the JD-8 mine.

1.1 Site Location and Ownership

The JD-8 Mine is located approximately eleven miles west of Naturita, Colorado, and seven miles east of Bedrock, Colorado, off Montrose County Road DD19, 2.5 miles from State Highway 90 (Figure 1). The street address is 31423 DD19 Road.

The site is located at the northern end of Monogram Mesa in the southwest portion of the Paradox Valley. The lower mine permit boundary lies within the following sections:

- NW ¼ of the NE ¼ of Section 20, T46N R17W, NMPM
- NE ¼ of the NW ¼ of Section 20, T46N R17W, NMPM
- SE ¼ of the SW ¼ of Section 17, T46N R17W, NMPM

The JD-8 mine consists of the C-JD-8 Department of Energy (DOE) lease tract, the patented Doagy No. 2 claim, and the patented Opera Box claim (see Map l in Attachment 1). The lower affected area (addressed in this EPP) occurs on the Doagy No. 2 and Opera Box claims. Although the permit includes a proposed upper affected area on the DOE JD-8 lease tract, the permitted surface area in the upper lease tract has not been affected at this time.

Cotter re-designed the lower mine waste pile and Highbury anticipates that the proposed upper affected area on top of Monogram Mesa for the mine waste pile and ore storage pad will not be required at this time. However, future exploration drilling may locate sufficient resources to require the use of the upper mine waste area and ore storage pad. If the upper mine waste area and ore storage pad are required in the future, the EPP will be updated to address this area prior to any new disturbance on the lease tract.

1.2 Site History

Highbury reported the acquisition of JD-8 in March 2019. Cotter acquired the JD-8 lease tract from the DOE following a successful bid in 1974. The Doagy No. 2 patented claim was acquired from Union Carbide Corporation in 1983. An easement to cross the Opera Box patented claim was acquired from Union Carbide Corporation in 1983. The Opera Box claim was later purchased from Union Carbide Corporation. Cotter applied for a mine permit in 1984. Following acquisition of the mine permit, Cotter began rehabilitation work on the Opera Box portal and adit. Since then, the Opera Box portal has been referred to as the JD-8 portal. Historical workings existed from the Opera Box and JD-8 portals prior to Cotter's acquisition of the mine permit. In addition, historical workings existed in the abandoned Black Diamond Mine, located approximately 200 feet below the JD-8 Mine.

Access to the underground workings of JD-8 is provided through a 600-ft long tunnel located inside the pre-permit Opera Box Mine portal, for which Cotter secured an easement agreement with Union Carbide in 1983. Cotter began mine development at the site in April 1986 and suspended mining shortly thereafter due to a decline in the uranium market. Cotter enlarged the original 6-ft by 7-ft adit to 10-ft by 11-ft. During active mining operations, ore and waste material were brought to the surface through the JD-8 adit, then the ore-grade material was trucked to Cotter's Mill in Canon City. Ore was stockpiled on a waste rock constructed pad just east of the portal. Waste materials were brought out and placed to the north of existing waste piles.

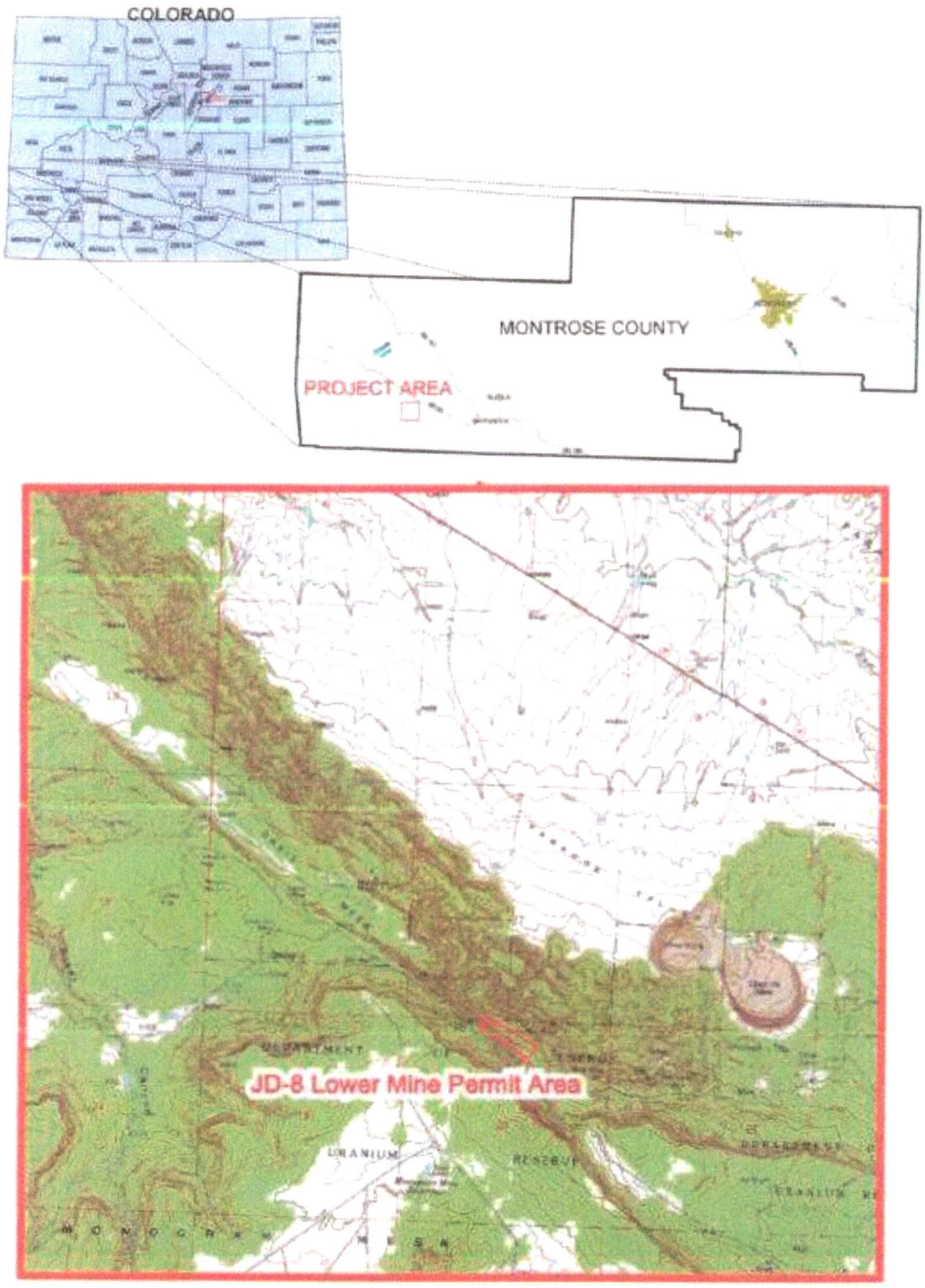

Figure 1: General Location of the JD-8 Mine

1.3 EPP Organization

The EPP requirements are specified in Section 6.4.21 Exhibit U of the Hard Rock/Metal Mining Rules. The specific Rules are addressed in this EPP as follows:

- Rule 6.4.21(1) describes the overall applicability and goals of an EPP.
- Rule 6.4.21(2) requires that the EPP include maps identifying the locations where designated chemicals or toxic or acid-forming materials will exist within the permit area. These maps are provided in Attachment I and described in Section 2.
- Rule 6.4.21(3) requires that the EPP identify other agencies' environmental protection measures and monitoring requirements. These requirements are described in Section 3.
- Rule 6.4.21(4) requires that the EPP list any air quality, water quality, solid and hazardous waste, and other federal, state permits or local licenses. These licenses are listed in Section 3.
- Rule 6.4.21(5) requires a Designated Chemicals Evaluation. The evaluation of designated chemicals is described in Section 5. Applicable Material Safety Data Sheets (MSDSs) are provided in Attachment 2.
- Rule 6.4.21(6) lists the requirements for a Designated Chemicals and Materials Handling Plan. This plan is described in Section 6.
- Rule 6.4.21(7) lists the requirements for a Facilities Evaluation. The Facilities Evaluation is provided in Section 4 of this EPP.
- Rule 6.4.21(8) describes the required groundwater information. Groundwater occurrence, availability, recharge, and flow information is provided in Section 9.
- Rule 6.4.21(9) describes the required groundwater quality information. Information on groundwater quality is provided in 9.5.4.
- Rule 6.4.21(10) addresses surface water control and containment facilities information. Surface water control and containment facilities are addressed in the Stormwater Management Plan in Attachment 4.
- Rule 6.4.21(11) describes the required surface water information. No perennial streams, ephemeral streams, ponds, lakes, or reservoirs occur on the property. Therefore, no specific surface water data are available for the JD-8 Mine. Regional and local surface water hydrology are discussed in Section 8. As mentioned previously, surface water control and containment facilities are addressed in the Stormwater Management Plan in Attachment 4.
- Rule 6.4.21(12) requires a Water Quality Monitoring Plan "where necessary to demonstrate that the Environmental Protection Plan requirements are being met". Because the JD-8 is a dry mine, and because lysimeter monitoring is conducted as described in Section 9.4, no separate water quality monitoring plan is required.
- Rule 6.4.21(13) specifies the climate data necessary to perform an acceptable water balance. Climate data are provided in Section 7. Statistical climate summaries and design storms are provided in the Stormwater Management Plan in Attachment 4.
- Rule 6.4.21(14) identifies the geochemical data and analysis necessary for evaluation of any potentially toxic materials that may be exposed during mining, stockpiling, or disposing on the affected land. Geochemical testing results and analysis are provided in the Designated Chemicals Evaluation in Section 5.2.3.

- Rule 6.4.21(15) addresses construction schedule information for all Environmental Protection Facilities designed to contain or transport toxic or acid-forming materials or designated chemicals used in the extractive metallurgical process and all facilities proposed to contain, hold, or dispose of material that has the potential to cause acid mine drainage. A construction schedule is provided in Section 10.
- Rule 6.4.21(16) asks for a description of the Quality Assurance and Quality Control program and measures to be employed during construction of the Environmental Protection Facilities discussed in Rule 6.4.21(15).
- Rule 6.4.21(17) addresses plant growth media (soils). The soil stockpile and revegetation are discussed in Section 11.
- Rule 6.4.21(18) addresses wildlife protection. Wildlife protection is discussed in Section 12.
- Rule 6.4.21(19) requires that the disposal of tailings and sludges in mine workings shall comply with the provisions of Subsection 3.1.7. Because no disposal of tailings and sludges is planned at the JD-8 Mine, this section is not applicable.

2. MAPS

Rule 6.4.21(2) requires the Operator to identify in the EPP on maps, sketches, and plans, the locations where designated chemicals and toxic or acid-forming materials may be used, stored, handled, exposed, disturbed or disposed of within the permit area, and existing or potential sources of acid mine drainage.

A map showing lease boundaries and the Lower Mine Permit Area (addressed in this EPP) is provided as Map 1 in Attachment l. Maps showing Mine Facilities (Map 2), Environmental Protection Facilities (Map 3), and Soil Types (Map 4) are provided in Attachment l. In addition, geologic maps are provided in Section 9.

The coordinate system for digital base maps of the site is State Plane Colorado South (COS) NAD27 feet. In the EPP, coordinates for site facilities may be reported in State Plane or Latitude/Longitude.

3. OTHER PERMITS AND LICENSES, INCLUDING ENVIRONMENTAL PROTECTION AND MONITORING REQUIREMENTS

Rule 6.4.21(3) requires a listing of other agencies' environmental protection measures and monitoring, and identification of which environmental protection measures and monitoring are required by statute, regulation, or permit by other agencies or jurisdictions. A list of environmental monitoring requirements is provided in Table l.

Rule 6.4.21(4) requires a listing of any air quality, water quality, solid and hazardous waste, and other federal, state permits or local licenses, or other formal authorizations which the Operator/Applicant holds or will be seeking applicable to the use, handling, storage, or disposal of designated chemicals and acid mine drainage-forming materials within the permit area. A list of all permits for the JD-8 Mine is provided in Table 1. Copies of these permits are on file at Anfield's Western Slope office at 28151 DD Road in Nucla, Colorado.

Table 1: Permits and Environmental Monitoring Requirements

Permit	Construction Requirements	Monitoring Requirements	Issuing/Reporting Agency	Rule
Mine Permit number M1984-014	Per Mine Plan and Reclamation Plan	Lysimeter Monitoring	DRMS	Colorado Hard Rock Mining Rules
NESHAPS (National Emissions Standards for Hazardous Air Pollutants)	N/A	Air monitoring for radon emissions from underground mines	EPA	Clean Air Act (CAA) Section 112
Colorado State Air Pollution Emission	N/A	To be determined	CDPHE	C.R.S. §25-7-101 et seq.
Sanitary Permit	Per County Building Code	N/A	Montrose County Land Use Dept	County Land Use Code
Explosives Permit	N/A	N/A	Dept of Treasury-Bureau of Alcohol, Tobacco and Firearms	ATF Federal Explosives Law and Regulations
Industrial Stormwater Discharge Permit (Permit Type: Metal Mining) COR040027	BMPs	Routine inspection, BMP maintenance	CDPHE	40 CFR 122.26 = Industrial Stormwater; 40 CFR subchapter N Subpart 440 – Metal Mining ELGs

Notes: C.R.S. = Colorado Revised Statues
BMP = Best Management Practices
CFR = Code of Federal Regulations
CDPHE = Colorado Department of Public Health and Environment
ELG = Effluent Limitation Guidelines

4. FACILITIES EVALUATION

Rule 6.4.21(7) lists the requirements for a Facilities Evaluation. "Environmental Protection Plan Facilities" are those facilities that will retain, either temporarily or permanently, designated chemicals, acid mine drainage locations, toxic or acid-forming materials, and associated by-products or sludges. As discussed in the Designated Chemicals Evaluation and Materials Handling Plan, the mine facilities that would be considered Environmental Protection Plan Facilities are:

1. Waste rock piles;
2. Temporary ore storage pile;
3. Planned stormwater impoundment;
4. Diesel fuel storage area.

The locations of these Environmental Protection Plan Facilities are shown in Map 3. The naturally occurring geological and geochemical conditions related to these facilities are described in the Designated Chemicals Evaluation (Section 5 of this EPP) and Materials Handling Plan (Section 6 of this EPP). No metallurgical processing will occur on site that would alter the natural character of these materials. Weathering processes that might alter the natural character of these materials are evaluated in Section 5.2.3.

Monitoring of these Environmental Protection Facilities includes lysimeter monitoring of the waste rock pile as described in Section 9.4. The above ground storage tanks for diesel fuel will be routinely inspected, and the berms will be maintained as described in the Materials Handling Plan. In addition, stormwater Best Management Practices (BMPs) will be routinely monitored and maintained as described in Attachment 4.

5. DESIGNATED CHEMICALS EVALUATION

5.1 Rationale

Section 6.4.20(5) of the Hard Rock/Metal Mining Rules and Regulations (Rules) requires that an EPP shall contain a presentation and discussion of the types, quantities, and concentrations of "designated chemicals" within the permit area, and to the degree such chemicals are present or used within the permit area, shall characterize the designated chemicals as to:

a) Their known potential to affect human health, property, or the environment;
b) Based on the best information available at the time of submittal of the EPP, specify the expected concentrations, process solution volumes and fate of designated chemicals to be used in existing and proposed extractive metallurgical processes at the mine, and/or mill site, if applicable; and
c) Provide, to the extent reasonably available, material safety data sheets for designated chemicals.

Additionally, Section 6.4.20(6) of the Rules requires that an EPP provide a materials handling plan containing the following information:

a) Fully describe the procedures for the disposal, decommissioning, detoxification or stabilization for all designated chemicals and toxic or acid-forming materials. Specifically describe measures to be taken to prevent any unauthorized release of pollutants to the environment. Include adequate reclamation and closure practices for such designated chemicals, toxic or acid-forming materials and how unauthorized discharge of acid mine drainage will be prevented.

b) Submit a narrative description or plan that:
   i. Describes how all designated chemicals used in the extractive metallurgical process will be handled during active mining operations and during periods of Temporary Cessation and disposed or detoxified at the conclusion of operations so as to comply with all applicable environmental protection and reclamation standards and regulations;
   ii. Describes how materials that have the potential to produce acid mine drainage or are toxic or acid-forming will be handled to ensure that the affected lands will be reclaimed and returned to the approved post-mining land use; and
   iii. Describes how the Operator/Applicant will prevent adverse off-site impacts during periods of active mine site operations and periods of Temporary Cessation.

c) Based upon acceptable site-specific analyses of site construction materials, waste rock, ore, product stockpiles, and mill tailings, if applicable, provide an assessment of the nature, concentrations and expected fate of potential acid mine drainage-forming materials.

5.2 Types, Quantities, and Concentrations of Designated Chemicals

For the purpose of the EPP, designated chemicals have been grouped into two general categories: chemicals that are derived offsite and used onsite for mining operations (such as diesel fuel and lubricants) and native rock materials derived onsite that are mined as waste rock or ore. Native rocks that are not mined are not considered designated chemicals for the purpose of this EPP.

5.2.1 Designated Chemicals Originating Offsite

The designated chemicals that are derived offsite and used on site for mining operations include diesel fuel and lubricants. During the operation of the mine, less than 1,320 gallons of fuel and oils will be stored on the property in an existing above-ground fuel tank. The fuel tank will be located within a bermed and lined catchment. The oils stored on the surface will be located within a bermed and lined catchment. Because the volume of fuel and oils stored onsite will be less than the regulatory threshold of 1,320 gallons, a spill containment plan is not required (40 CFR 112, U.S. EPA Spill Prevention, Control, and Countermeasure Regulation).

Materials Safety Data Sheets (MSDSs) for diesel fuel, rock drill oil, motor oil, and hydraulic oil are provided in Attachment 2.

5.2.2 Designated Chemicals Originating Onsite

Uranium and vanadium ore and the accompanying waste rock will be mined from the underground workings. The ore is derived primarily from the Salt Wash Member of the Morrison Formation, which consists of interbedded fine-grained sandstone and mudstone. The uranium and vanadium mineralization occurs in bands that range in thickness from a few inches to more than six feet, with an average ore thickness of 2.5 to 3.5 feet. The mining plan is provided in Exhibit D of the JD-8 Mine Permit.

The mineralization at JD-8 is similar to the rest of the Uravan Mineral District. Uranium occurs primarily in the form of uraninite (pitchblende variety UO_2) with traces of coffinite ($USiO_4OH$) filling in the pore space between individual sand grains (Peters, 2011). The uraninite (pitchblende) occurs as a more massive, darker colored mineral (Nininger, 1954). When oxidized, these minerals may become much brighter in color and reveal secondary minerals such as corvusite, ravite, and pascoite (Peters, 2011). These oxidation minerals are often seen in conjunction with uraninite within the Uravan Mineral District.

The primary vanadium mineral is montroseite (VOOH) in conjunction with vanadium clays and hydromica. Carnotite and tyuyamunite are also commonly seen vanadium minerals after oxidation of the ore occurs. It is possible that other oxidized vanadium minerals occur on the JD-8 mine site. The presence of other cations, increased moisture levels, and differing pH levels may enable other vanadium oxides to form over time (Peters, 2011).

Ore will be temporarily stored onsite for no longer than 180 days for offsite transport to a processing facility. The ore storage pad is located on the waste rock pile (Figure 2) and occupies less than 0.25 acres. The amount of ore stored on the ore storage pad at any given time will not exceed 4,000 tons. Currently, because the mine is on intermittent status, all stockpiled ore is stored inside the mine and will be moved to the external ore storage area after the mine resumes active status. In the event of a mine shut down the ore will not be left on the surface for more than 30 days.

Waste rock is placed on the waste rock piles as described in the mine plan. Waste rock is also gobbed underground into mined out stopes, to reduce the volume of the external waste rock pile. The current waste rock pile contains approximately 36,000 tons of material. According to the expected mine plan, approximately 184,000 tons will be added to the waste rock pile for a total of approximately 220,000 tons. These estimates may change if future exploration drilling locates additional resources. At the end of mining, the waste rock piles will be reclaimed as described in the Reclamation Plan included as Exhibit E of the JD-8 Mine Permit.

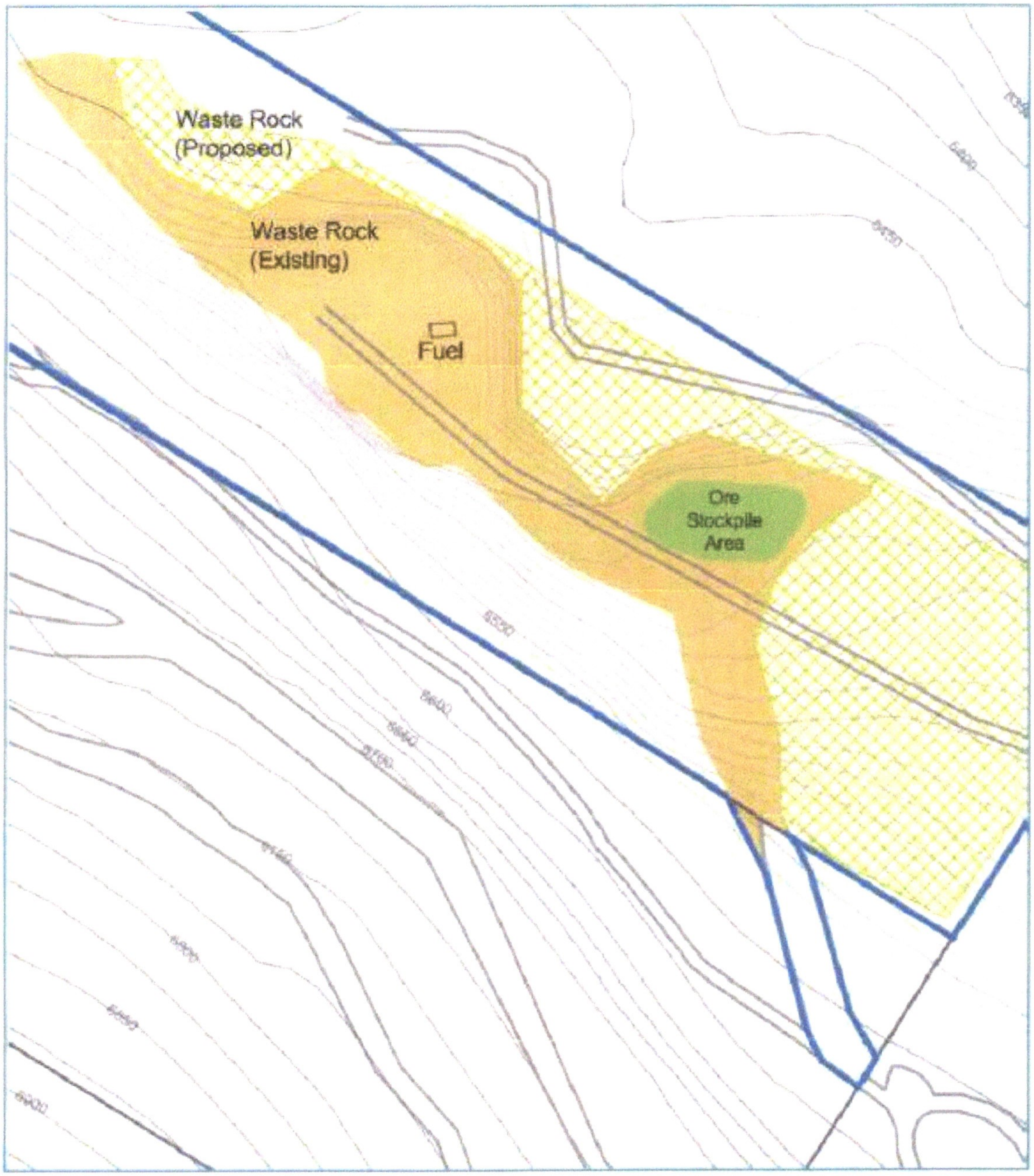

Figure 2: EPP Facilities Location Map

5.2.3 Geochemical Characterization of Waste Rock and Ore

5.2.3.1 Sample Collection and Handling

Samples of waste rock and ore were collected from the JD-8 Mine for geochemical testing in December 2010. The locations of eight samples collected from the working face of the existing ore pile (since removed) and three samples from the waste rock pile are shown in Figure 3 and Figure 4, respectively. The sampled locations were spatially distributed throughout the length of the exposed piles and were collected from areas that appeared to be representative of the ore stockpile and waste rock pile.

The samples were collected from small pits using a shovel and placed into individual one-gallon Zip-loc® bags for transport prior to logging and compositing.

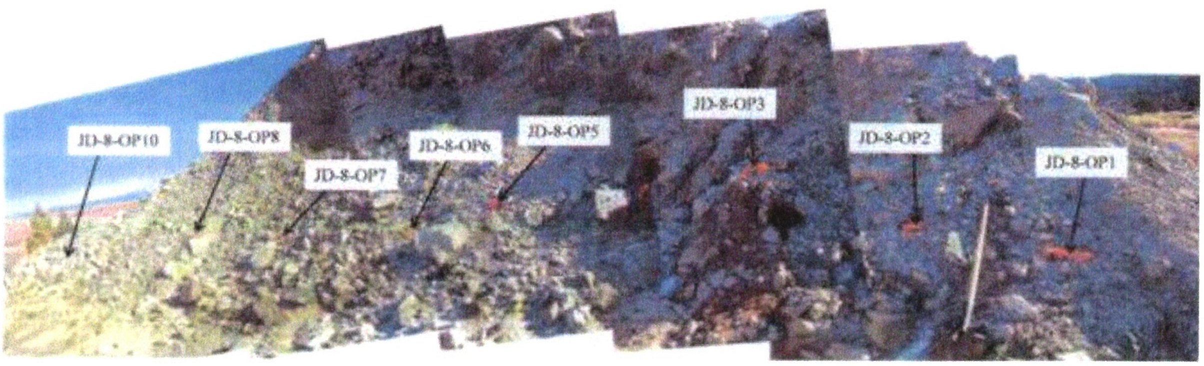

Figure 3: Ore Pile Sample Locations

Figure 4: Waste Rock Pile Sample Locations

The individual samples were crushed and composited in Whetstone's geochemistry facilities in Gunnison, Colorado. A 30 cubic centimeter (cc) split was collected from each sample and placed in chip trays for archive and visual logging. The remainder of each sample was crushed in its entirety to -3/4 inch using a jaw crusher. The samples were composited as shown in Table 2 to develop representative composite samples for the ore pile (JD-8-ROPC1, JD-8-ROPC2) and waste rock (JD-8-WRCl).

Cone-and-quarter compositing and splitting were performed by gathering the sample into a pile (cone), digging out the center of the cone and distributing the material around the edges of the pile in a ring, and gathering the ring back into a center cone. The procedure homogenizes the sample and was repeated three times. The cone was then split into equal quarters, and opposite quarters were combined to produce a representative split. Sequential generations of splits were combined until the sample for the composite was within the target weight. The final splits were sent to Energy Laboratories for the analyses shown in Table 3, with a request to process and analyze them in their entirety. These procedures were implemented to avoid potential sample bias related to shipping, settlement, and unrepresentative splitting at the analytical lab. The resulting composited samples are believed to be representative of the materials of interest.

Table 2: Composited Samples for Geochemical Testing

Composite ID	Samples	Northing y	Easting x
JD-8-ROPC1	JD-8-OP1	586,263	1,061,601
	JD-8-OP3	586,273	1,061,604
	JD-8-OP6	586,286	1,061,607
	JD-8-OP8	586,294	1,061,609
JD-8-ROPC2	JD-8-OP2	586,267	1,061,602
	JD-8-OP5	586,282	1,061,606
	JD-8-OP7	586,290	1,061,608
	JD-8-OP10	586,302	1,061,611
JD-8-WRC1	JD-8-WR1	586,372	1,061,272
	JD-8-WR2	586,430	1,061,274
	JD-8-WR3	586,463	1,061,274

Notes: ROPC = representative ore pile composite
WRC = representative waste rock composite
Sample coordinates given in State Plane Colorado South NAD 27 ft

Table 3: Mass of Composited Samples Submitted for SPLP, Whole Rock, and ABA Analysis

Composite ID	Sample ID	Weight (g)
JD-8-ROPC1	JD-8-ROPC1 (SPLP)	176.2
	JD-8-ROPC1 (WR)	54.7
	JD-8-ROPC1 (ABA)	59.9
JD-8-ROPC2	JD-8-ROPC2 (SPLP)	161.1
	JD-8-ROPC2 (WR)	59.6
	JD-8-ROPC2 (ABA)	66.8
JD-8-WRC1	JD-8-WRC1 (SPLP)	133.4
	JD-8-WRC1 (WR)	51.2
	JD-8-WRC1 (ABA)	69.7

Notes: ROPC = representative ore pile composite
WRC = representative waste rock composite
SPLP = sample designated for synthetic precipitation leaching procedure
WR = sample designated for whole rock analysis
ABA = sample designated for acid base accounting analysis

5.2.3.2 <u>Acid Base Accounting Results</u>

Acid-base accounting (ABA) tests were used to evaluate the potential for ore and waste rock material to generate acid rock drainage. Acid-base accounting provides a theoretical estimate of the net acid-producing potential of rock materials by comparing the total acid generating potential (AGP) to total acid neutralizing potential (ANP). Test results are generally evaluated by calculating the net neutralizing potential (NNP = ANP-AGP) or by the ratio of ANP to AGP (ANP/AGP). Samples with NNPs greater than 20 and ANP/AGP ratios greater than 3 are considered to have low potential to produce acid. Samples with NNP values between 0 and 20 and ANP/AGP ratios between 3 and 1 are indeterminate. Samples with negative NNP values and ANP/AGP ratios below 1 are potentially acid generating (EPA, 1994).

The results of the ABA tests indicate that waste rock from the JD-8 Mine has a net neutralizing (NNP) capacity of 54 t $CaCO_3$/kt and an ANP/AGP ratio of 5.4 (Table 4). Based on these results, the potential for material in the waste rock pile to generate acidic drainage is low.

The results of the ABA tests indicate that ore from the JD-8 Mine has an average net neutralizing (NNP) capacity of 60 t $CaCO_3$/kt and an average ANP/AGP ratio of 12.7 (Table 4). The NNP of the tested samples ranged from 56 to 64 t $CaCO_3$/kt while the ANP/AGP ratios ranged from 10.1 to 15.3. Based on these results, the potential for material in the ore storage pile to generate acidic drainage is low.

The results of the December 2010 geochemical sampling and previous geochemical sampling (Section 5.2.3.4) indicate that no materials classified as acid-forming exist on site.

Table 4: ABA Results for Representative Composite Samples from the JD-8 Waste Rock Pile and Ore Pile

Acid-Base Accounting Results	JD-8-ROPC1	JD-8-ROPC2	AVERAGE ORE	JD-8-WRC1
Acid Potential (AGP) (t/kt)	4	7	5.5	10
Neutralization Potential (ANP) (t/kt)	61	71	66	54
Net Neutralizing Potential (NNP) (t/kt)	56	64	60	43
ANP/AGP ratio	15.3	10.1	12.7	5.4
Sulfur, HCl Extractable (%)	0.04	0.08	0.06	0.24
Sulfur, HNO_3 Extractable (%)	0.10	0.13	0.115	0.08
Sulfur, Hot Water Extractable (%)	0.68	0.64	0.66	1
Sulfur, Residual (%)	<0.01	<0.01	0.01	<0.01
Sulfur, Total (%)	0.82	0.86	0.84	1.4

5.2.3.3 *Whole Rock Elemental Analysis and SPLP Testing Results*

Geochemical testing performed on the composited samples also included whole rock elemental analysis and synthetic precipitation leaching procedure (SPLP) testing.

Samples for whole rock elemental analysis were prepared using the cone-and-quarter method to generate 51 to 60 gram splits (Table 3). The split samples were crushed in their entirety by Energy Laboratories and grab sample was taken from the pulverized blended sample for the analytical split.

The samples were analyzed for 23 elements by inductively coupled plasma atomic emission spectrometry (ICP-AES) and mass spectrometry (ICP-MS). An initial nitric acid (HNO_3) and hydrogen peroxide (H_2O_2) digestion (EPA method 3050B) was used to prepare samples for ICP-MS (EPA method 6020). ICP-AES analysis (EPA method 6010B) required the addition of hydrochloric acid (HCl) to the initial digestate (EPA method 3050B-M). EPA method 7471A, an aqua regia digestion with cold vapor atomic absorption spectrometry was used for mercury. Sulfur species were determined using the Sobek Modified method. Analytical results and laboratory reports for whole rock elemental analyses are presented in Table 5.

Elemental data indicate that the ore and waste rock are enriched in arsenic, cadmium, lead, molybdenum, selenium, uranium, and vanadium compared to world shale averages and world sandstone averages (Rose et al., 1979). The ore and waste rock are deficient in aluminum, barium, boron, chromium, copper, and iron compared to world shale averages and world sandstone averages (Table 5). For most metals, an abundance in the whole rock sample did not necessarily correlate with high leachate concentrations in the SPLP testing.

The SPLP tests were performed by Energy Laboratories in accordance with EPA method 1312 (EPA, 1994) and consisted of leaching the samples in a solution of weakly acidified deionized water for 18 hours. The extraction fluid was prepared by titrating a 60/40 weight percent mixture of sulfuric and nitric acids to deionized water until the pH was 5.00 (± 0.05). The solution and samples were then added to a sealed container in 20: l ratios (solution:sample)[1] and tumbled for 18 hours at 30 rotations per minute (rpm) (± 2 rpm). The resulting solution was decanted, filtered (0.45 μm), and analyzed.

SPLP results indicated that metal concentrations were below the detection limit in 81% (57 of 69) of the metals results for representative samples of ore and waste rock (Table 5).

[1] Samples for the core comparison were leached using a 2:1 ratio (solution:sample) to generate leachates with higher concentrations that could be more easily compared.

The waste rock SPLP leachates met the Federal drinking water standards (Maximum Contaminant Levels [MCLs], Secondary Maximum Contaminant Levels [SMCLs]), and Colorado domestic water supply standards[2] for all metals. Gross alpha activity in the SPLP leachate from the waste rock composite sample exceeded MCLs by a factor of 7. Sulfate and TDS exceeded secondary SMCLs by a factor of 6 and 4, respectively. Vanadium concentrations in the SPLP leachate exceeded the Colorado agricultural standard of 0. l mg/L by a factor of 6.

The representative ore pile SPLP leachates exceeded MCLs for arsenic, selenium, gross alpha, and fluoride, SMCLs for sulfate and TDS, Colorado drinking water standards for molybdenum, and the Colorado agricultural standard for vanadium (Table 5).

Based on these results, the constituents of potential concern for the waste rock pile are gross alpha, sulfate, TDS, and vanadium. The constituents of potential concern in the ore pile are arsenic, molybdenum, selenium, gross alpha, sulfate, TDS, and vanadium. Further analysis was performed to determine whether or not these constituents would be mobile in the environment, based on site-specific precipitation rates, infiltration rates, and groundwater and surface conditions (Section 5.3).

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[2] Federal drinking water standards, maximum contaminant levels, Colorado domestic water supply standards discussed in Section 5.2.3 and 5.3.1 are used as screening levels to identify COPCs. These standards apply to groundwater in the environment and are not directly applicable to laboratory leachates.

Table 5: SPLP and Whole Rock Results for Representative Composite Samples from the JD-8 Waste Rock Pile and Ore Pile

	JD-8-ROPC1		JD-8-ROPC2		JD-8-WRC1		Whole Rock		FEDERAL DW STANDARDS		COLORADO GROUND WATER QUALITY STANDARDS[2]		
	SPLP	WHOLE ROCK	SPLP	WHOLE ROCK	SPLP	WHOLE ROCK	World Shale Averages[1]	World Sandstone Averages[2]	MCL	SMCL	Domestic Water Supply - Human Health Standards	Domestic Water Supply - Table 2 Stds	Groundwater Agricultural Standards
Metals[3]:													
Aluminum	<0.1	5,730	<0.1	6,860	<0.1	3,820	82,000	82,000		0.2			5.0
Antimony	<0.006	1.2 D	<0.006	2.7 D	<0.006	<0.842 D	1.2	1.0	0.006		0.006		
Arsenic	**0.028**	25.8	**0.028**	20.4	0.008 B	5.1	12	1.2	0.01		0.01		0.1
Barium	<0.1	130	<0.1	170	<0.1	107	550	170	2		2		
Beryllium	<0.004	<0.5	<0.004	<0.5	<0.004	<0.5	3	0	0.004		0.004		0.1
Boron	<0.11	<5.	<0.11	<5.	<0.11	<5.	100	35					0.75
Cadmium	<0.005	11.2	<0.005	6.3	<0.005	3.6	0.3	0	0.005		0.005		0.01
Chromium	<0.05	3	<0.05	3.9	<0.05	2.3	90	35	0.1		0.1		0.1
Cobalt	<0.01	8	<0.01	5.3	<0.01	3	19	0.33					0.05
Copper	<0.01	9.3 D	<0.01	13.3 D	<0.01	9.4 D	42	10	1.3	1	1.3	1	0.2
Iron	<0.03	3,840 D	<0.03	4,910 D	<0.03	3,400 D	47,000	9,800		0.3		0.3	5.0
Lead	<0.015	38.3	<0.015	90.9	<0.015	19.6	25	10	0.015[4]		0.05		0.1
Lithium	<0.1	10.9	<0.1	13.1	<0.1	8.3	66	15					2.5
Manganese	<0.01	171 D	<0.01	285 D	<0.01	107	850	0		0.05		0.05	0.2
Mercury	<0.001	<0.05	<0.001	<0.05	<0.001	<0.05	0.4	0.03	0.002		0.002		0.01
Molybdenum	**0.6**	149	**0.5**	57.6	<0.1	24.8	2.6	0.2			0.035		
Nickel	<0.05	4.4	<0.05	4.9	<0.05	2.9	68	2			0.1		0.2
Selenium	**0.14**	108	**0.12**	81.1	0.021	25	0.6	0.05	0.05		0.05		0.02
Silver	<0.01	<0.5	<0.01	<0.5	<0.01	<0.5	0.19	0.25		0.1	0.05	0.1	
Thallium	<0.002	0.9	<0.002	0.6	<0.002	<0.5	0.85	0.85	0.002		0.002		
Uranium	<0.0003	912	0.0006	5,860	0.0032	212	3.7	1.7	0.03		0.03		
Vanadium	14	4,530	19	9,710 D	0.6	698	130	20					0.1
Zinc	<0.01	135 D	<0.01	200 D	<0.01	48.6 D	100	40		5		5	2.0
Radionuclides:													
Gross alpha (pCi/L)	**88**		**81.4**		**109**				15		15		
Gross beta (pCi/L)	12.6		11.8		21.3				4 mrem/y		4 mrem/yr		
Major ions & indicator parameters[3]:													
pH (s.u.)	9.72		8.44		8.72					6.5-8.5			6.5 - 8.5
Elec. Conductivity (umhos/cm)	1,610		1,620		2,130								
Dissolved oxygen	7.25		7.16		6.91								
ORP	368		332		361								
Chloride	<1.		<1.		<1.					250			
Fluoride	0.2		**6.9**		2.8				4	2	4		2.0
Sulfate	992 D		1,010 D		1,460 D					250			
Nitrate+Nitrite (as N)	0.2		0.2		0.2				10		10		100
TDS	1,540		1,570		2,180					500			
Alkalinity	38		33		9								

Notes:
- 0.22 — Shaded values exceed Federal secondary MCLs (SMCLs) or Colorado Table 2 groundwater standards
- **0.12** — Bolded and shaded values exceed Federal MCLs or Colorado Domestic Water Supply Human Health Standards
- (1) World shale average values from Rose et. al,. (1979). Aluminum and thallium values are average crustal abundance
- (2) CDHPE, 2009. Colorado Department of Public Health And Environment, Water Quality Control Commission, Regulation No. 41, The Basic Standards For Ground Water (5CCR1002-41)
- (3) All results reported in mg/L unless otherwise noted
- (4) Lead MCL/MCLG is 0; action level is 0.015
- (5) EPA Action Level for gross beta particle activity in drinking water is 50 pCi/L
- D – Laboratory-assigned flag indicating the reporting limit (RL) was increased due to sample matrix interference.

5.2.3.4 *Results of Previous Geochemical Sampling*

In 2005, SPLP tests were conducted on waste rock representing the JD-8 mine. The results indicated that aluminum, arsenic, lead, selenium SPLP results exceeded chronic aquatic standards or drinking water standards (Table 6). Compared to the current SPLP testing results, the 2005 leachates contained higher concentrations of aluminum, arsenic, and lead, and lower concentrations of selenium. However, the 2005 SPLP analysis was performed on an uncomposited grab sample (Williams, 2010, verbal communication), and the overall level of agreement between the samples was reasonable, given the inherent variability of earth materials.

Table 6: 2005 SPLP Test Results for Waste Rock and Ore for the JD-8 Mine

Parameters	Units	JD-8 Ore Results	JD-8 Waste Results
Metals - SPLP Extractable			
Aluminum	ug/L	250.0	<1.
Antimony	ug/L	<1.	<1.
Arsenic	ug/L	20.0	<1.
Barium	ug/L	40.0	98
Beryllium	ug/L	<1.	<1.
Boron	ug/L	<100.	<100.
Cadmium	ug/L	1.7	<1.
Chromium	ug/L	<1.	<1.
Chromium, Hexavalent	ug/L	<10. H	<10.
Copper	ug/L	4.2	<1.
Iron	ug/L	160	<50.
Lead	ug/L	3.0	<1.
Manganese	ug/L	62	23
Mercury	ug/L	<1.	<1.
Nickel	ug/L	4.8	<1.
Selenium	ug/L	34	4.4
Silver	ug/L	<1.	<1.
Thallium	ug/L	<1.	<1.
Uranium	ug/L	<130.	<1.
Zinc	ug/L	49	3.1
Major Ions - SPLP Extractable			
Chloride	mg/L	<1.	<1.
Fluoride	mg/L	<0.1	<0.1
Nitrogen, Nitrate+Nitrite as N	mg/L	1.4	0.3
Nitrogen, Nitrite as N	mg/L	<0.1 H	<0.1
Sulfate	mg/L	606 D	1430 D
Metals - Total			
Uranium	mg/kg-dry	5570	
Vanadium	mg/kg-dry	80,000 D	

Additional geochemical testing was performed on waste rock and ore from the JD-8 mine in 2007. The results of whole rock and ABA testing were reported by GeoScience Services (2008) and are summarized in Table 7.

Table 7: 2007 ABA and Whole Rock Testing for the JD-8 Mine Waste Rock and Ore Pile

Sample / Analyses	Ore Pile Sample 8O1		Waste Rock Sample 8W1	
Acid-Base Potential	**Result**	**RL**	**Result**	**RL**
Neutralization Potential (t/kt)	57	1.0	45	1.0
Acid Potential (t/kt)	6.8	1.0	4.7	1.0
Acid/Base Potential (t/kt)	50		41	
Metals, Total-EPA SW846	**Result**	**RL**	**Result**	**RL**
Uranium (mg/kg)	1,460	5	91	5
Vanadium (mg/kg)	4,610	1	376	1

RL = reporting limit

5.3 Environmental Protection Evaluation

The SPLP testing (Section 5.2.3.3) identified four constituents in waste rock and eight constituents in the representative ore pile composites as constituents of potential concern (COPCs) based on SPLP leachate concentrations exceeding groundwater standards. These constituents are listed in Table 8 and are described individually in Section 5.3.1, below. The potential for transport to groundwater is discussed in Section 5.3.2.

Table 8: Constituents of Potential Concern in JD-8 Waste Rock Pile and Ore Pile

Parameter	Waste Rock	Ore		Water Quality Standards		
	SPLP JD-8-WRC1	SPLP JD-8-ROPC1	SPLP JD-8-ROPC2	Federal MCL (Colorado HHS)	Federal SMCL (Colorado DW Table 2)	Groundwater Agricultural Standards
Arsenic (mg/L)	---	0.028	0.028	0.01		0.1
Molybdenum (mg/L)	---	0.6	0.5	CO 0.035		
Selenium (mg/L)	---	0.14	0.12	0.05		0.02
Gross alpha (pCi/L)	109	88	81.4	15		
Fluoride (mg/L)	---	---	6.9	4	2	2.0
Sulfate (mg/L)	1,460 D	992 D	1,010 D		250	
TDS (mg/L)	2,180	1,540	1,570		500	
Vanadium (mg/L)	0.6	14	19			0.1

Notes: HHS - Human health standard
DW - Drinking water standard
--- - Constituent did not exceed standards shown
CO - Colorado standard; no federal drinking water standard exists for molybdenum

5.3.1 *COPC Chemistry and Occurrence in the Environment*

5.3.1.1 *Arsenic*

Waste rock SPLP results met the drinking water standard for arsenic. However, SPLP results for the two representative ore pile composites exceeded the drinking water standard by a factor of 2.8.

Arsenic occurs naturally in groundwater wells in the Paradox Basin above the drinking water standard of 0.01 mg/L. Golder (2009) reported that, in background monitoring wells at the Piñon Ridge site, arsenic concentrations were above the domestic supply standard in samples from six pumping wells, exploratory holes, and a domestic well. The highest background arsenic concentration reported in the Piñon Ridge wells (0.0177 mg/L) was measured in the sample from PW-1.

Welch, et al., (1988) reported that natural occurrences of groundwater with moderate to high arsenic occur throughout the western United States, and that high concentrations of arsenic are associated with basin-fill deposits of alluvial-lacustrine origin, particularly in semiarid areas. Based on over 7,000 groundwater samples for arsenic in the western US, the research also found that, in addition to basin-fill deposits, arsenic is associated with volcanic deposits, uranium and gold mining areas, and geothermal systems.

While the source of arsenic in the Paradox Valley has not been definitively identified, in Lisbon Valley (located on the Colorado Plateau 22 miles west of the JD-8 site), the alteration of the mineral jarosite in the Navajo and Entrada Sandstone is associated with anomalous amounts of copper, lead. zinc, and arsenic.

5.3.1.2 *Selenium*

Waste rock SPLP results met the drinking water standard for selenium. However, SPLP results for the two representative ore pile composites exceeded the drinking water standard for selenium by a factor of 2.8.

Selenium occurs naturally in wells in the Paradox Basin at concentrations above the agricultural standard of 0.02 mg/L, based on several samples from exploration holes, off-site wells, monitoring wells, and production well PW-3 at the nearby Piñon Ridge site (Golder, 2009). Background selenium concentrations from five wells at the Piñon Ridge site (EX-15, EX-23, MW-6, MW-8B, and the BLM well) exceeded the domestic water supply standard of 0.05 mg/L (Golder, 2009). Selenium is common in shale in sedimentary rocks of the western U.S. and the Colorado Plateau area (e.g., Coleman and Delevaux, 1957). Golder (2009) reported that the highest selenium concentration from a monitoring or production well was 0.24 mg/L from a sample collected at MW-6 in November 2008. This value is nearly twice the concentration of selenium in SPLP leachates from the JD-8 Mine temporary ore stockpile.

5.3.1.3 *Fluoride*

Waste rock SPLP results met the drinking water standard for fluoride, as did half of the representative ore pile composite sample SPLP results. However, SPLP results for one of the representative ore pile composites exceeded the drinking water standard for fluoride by a factor of 1.7.

5.3.1.4 *Molybdenum*

No federal drinking water standard exists for molybdenum. However, Colorado has established a groundwater standard of 0.035 mg/L. Waste rock SPLP results were below detection (<0.1 mg/L) while SPLP leachates from representative composite samples of the temporary ore pile (0.5-0.6 mg/L) exceeded the Colorado standard.

Golder (2009) reported that background molybdenum concentrations in some background or baseline wells at the Piñon Ridge site exceeded the CDPHE standards. The report on 2010 monitoring of production wells at Piñon Ridge site did not show any exceedances of Colorado molybdenum samples in the limited number of production wells (PWs) sampled (Energy Fuels, 2011).

5.3.1.5 *Sulfate*

Sulfate concentrations exceeded secondary standards in SPLP leachates from representative composite samples of waste rock and ore from the JD-8 Mine by a factor of 4 to 6. Sulfate is ubiquitous in groundwater in the Paradox Valley. Golder (2009) found that groundwater at the Hermosa/Chinle contact in the Paradox. Valley had sulfate concentrations ranging from 1,070 to 1,810 mg/L. These values for naturally occurring sulfate in groundwater are higher than the SPLP leachate concentrations in waste rock and ore from the JD-8 Mine.

SMCLs are non-mandatory, non-enforceable water quality standards that are established only as guidelines to assist public water systems in managing their drinking water for aesthetic considerations, such as taste, color and odor. These contaminants are not considered to present a risk to human health at the SMCL (EPA, 2011b).

5.3.1.6 *Total Dissolved Solids*

Total dissolved solids (TDS) exceeded secondary standards in SPLP leachates from representative composite samples of waste rock and ore from the JD-8 Mine by a factor of 4 to 6. The federal standard of 500 mg/L is a secondary water quality standard based on a palatability (taste) of drinking water. SMCLs are non-mandatory, non-enforceable water quality standards that are established only as guidelines to assist public water systems in managing their drinking water for aesthetic considerations, such as taste, color and odor. These contaminants are not considered to present a risk to human health at the SMCL (EPA, 2011b).

TDS is naturally high in groundwater throughout the Paradox Basin and elsewhere in the arid west. Golder (2009) found that total dissolved solids (TDS) in groundwater at the contact of the Moenkopi/Chinle had TDS concentrations between 590 and 1,030 mg/L, while groundwater near the Hermosa/Chinle contact had higher IDS concentrations (1,140 to 3,040 mg/L). No other groundwater was encountered at the Piñon Ridge site in the Paradox Valley, as the alluvium was dry. Similarly, Weir, et al., (1983) reported that total dissolved solids in the alluvium of the Paradox Basin ranged from 302 to l,560 mg/L, with an average of 770 mg/L. These concentrations naturally exceed SMCLs established for drinking water.

5.3.1.7 *Vanadium*

No MCL currently exists for vanadium; however, the Superfund Removal Action Level for vanadium is 0.25 mg/L and the Colorado agricultural standard is 0.1 mg/L. SPLP leachates of waste rock (0.6 mg/L) and ore (14 to 19 mg/L) exceeded the agricultural groundwater quality standard.

Vanadium concentrations in groundwater collected from monitoring wells and pumping wells in 2010 from the Piñon Ridge site ranged up to 0.035 mg/L (Energy Fuels, 2011). Elsewhere in Colorado, at the New Rifle Processing Site, the Ground Water Compliance Action Plan set an alternate concentration limit (ACL) of 50 mg/L for vanadium which was determined to be protective at the Colorado River point of compliance (DOE, 2010).

5.3.1.8 *Uranium*

Notably, uranium did not exceed drinking water standards in the SPLP leachates from the ore or waste rock. However, uranium is discussed here because uranium has been identified as the potentially toxic material necessitating the EPP.

Soils at the JD-8 site and surrounding area have a high potential for sequestration of radioactive materials according to information developed by the NRCS (2011). Table 9 shows that the Ustic torriothents, Monogram Loam, and other soils on and near the site have very low bioavailability of radioactive constituents and a very high potential for sequestration of radioactive materials. The bioavailability of all soils is rated as 0 due to cation exchange capacity (CEC), pH, or organic sorption (Table 9) while the sequestration potential of all soils is rated as 1.0 due to adsorption by clay. Sequestration potential based on adsorptive capacity due to $CaCO_3$ is rated at 0.82 to 1.0 for all soils except the Monogram Loam, which is rated at 0.50. Sequestration immobilizes or impedes the transport of constituents into the environment.

Table 9: Potential for Radioactive Bioaccumulation and Sequestration of Site Soils

Selected Soil Interpretations - San Miguel Area, Colorado, Parts of Dolores, Montrose, and San Miguel Counties

Map symbol and soil name	Pct. of map unit	Dhs - potential for radioactive bioaccumulation		Dhs - potential for radioactive sequestration	
		Rating class and limiting features	Value	Rating class and limiting features	Value
23-Bodot, dry-Ustic Torriothents complex, 5 to 50 percent slopes					
Bodot, dry	45	Low bioaccumulation potential		High sequestration potential	
		Bioavailability low due to CEC, pH, or organic sorption	0.00	Adsorption by clay	1.00
		Gains bioavailable material	0.02	Sequestration due to fertility effects	0.97
		Bioavailability due to attenuation by carbonates or gypsum	0.18	Adsorptive capacity due to CaCO3	0.82
				Loses material	0.02
Ustic torriothents	40	Low bioaccumulation potential		High sequestration potential	
		Bioavailability low due to CEC, pH, or organic sorption	0.00	Adsorption by clay	1.00
		Gains bioavailable material	0.02	Adsorptive capacity due to $CaCO_3$	0.92
		Bioavailability due to attenuation by carbonates or gypsum	0.08	Sequestration due to fertility effects	0.72
				Loses material	0.02
60-Monogram loam, 1 to 8 percent slopes					
Monogram	85	Low bioaccumulation potential		High sequestration potential	
		Bioavailability low due to CEC, pH, or organic sorption	0	Adsorption by clay	1.00
		Gains bioavailable material	0.01	Sequestration due to fertility effects	0.85
		Bioavailability low due to CEC, pH, or organic sorption	0.5	Adsorptive capacity due to CaCO3	0.50
				Loses material	0.01
75-Piñon-Bowdish-Progresso loams, cool, 1 to 12 percent slopes					
Piñon, cool	35	Low bioaccumulation potential		High sequestration potential	
		Bioavailability due to attenuation by carbonates or gypsum	0.00	Adsorptive capacity due to CaCO3	1.00
		Bioavailability low due to CEC, pH, or organic sorption	0.00	Adsorption by clay	1.00
		Gains bioavailable material	0.01	Sequestration due to fertility effects	0.66

(continued on next page)

Selected Soil Interpretations - San Miguel Area, Colorado, Parts of Dolores, Montrose, and San Miguel Counties

Table 9: Potential for Radioactive Bioaccumulation and Sequestration of Site Soils (Part 2)

Selected Soil Interpretations - San Miguel Area, Colorado, Parts of Dolores, Montrose, and San Miguel Counties					
		Dhs - potential for radioactive bioaccumulation		Dhs - potential for radioactive sequestration	
Map symbol and soil name	Pct. of map unit	Rating class and limiting features	Value	Rating class and limiting features	Value
Bowdish, cool	30	Low bioaccumulation potential		High sequestration potential	
		Bioavailability due to attenuation by carbonates or gypsum	0.00	Adsorptive capacity due to $CaCO_3$	1.00
		Bioavailability low due to CEC, pH, or organic sorption	0.00	Adsorption by clay	1.00
		Gains bioavailable material	0.01	Sequestration due to fertility effects	0.62
				Loses material	0.01
Progresso, cool	20	Low bioaccumulation potential		High sequestration potential	
		Bioavailability low due to CEC, pH, or organic sorption	0.00	Adsorption by clay	1.00
		Gains bioavailable material	0.01	Sequestration due to fertility effects	0.86
				Loses material	0.01
87-Rock outcrop					
Rock outcrop	90	Not rated		Not rated	
88-Rock outcrop-Orthents complex, 40 to 90 percent slopes					
Rock outcrop	50	Not rated		Not rated	
Orthents	45	Low bioaccumulation potential		Moderately high sequestrationpotential	
		Bioavailability due to attenuation by carbonates or gypsum	0.00	Adsorptive capacity due to CaCO3	1.00
		Bioavailability low due to CEC, pH, or organic sorption	0.00	Adsorption by clay	1.00
		Gains bioavailable material	0.12	Sequestration due to fertility effects	0.61
				Loses material	0.12

5.3.2 Fate and Transport

The occurrence of COPCs in SPLP leachates does not necessarily indicate that these constituents will be mobilized from the waste rock or temporary ore stockpile and migrate to groundwater or report to a point of compliance or environmental receptor within a reasonable time frame. The fate and transport of constituents in groundwater is generally controlled by three mechanisms or pathways: release, transport, and uptake.

5.3.2.1 Release

The SPLP test is intended to investigate which constituents could be released from rock by meteoric water that infiltrates through waste rock or ore stockpiles. However, SPLP results may overestimate the release of constituents from waste rock and ore at the JD-8 site due to (1) the aggressive nature of the accelerated weathering test, (2) the lack of significant precipitation infiltration, and therefore little moisture available as a leachant under real world conditions, and (3) the relatively short term exposure of the ore stockpile to weathering processes.

The SPLP is a relatively aggressive test that may conservatively overestimate environmental releases. As reported by DRMS (2006):

> "The SPLP test is a rigorous physically aggressive test that combines "synthetic" rainwater with the solids, which are finely crushed, then tumbled together for a number of hours... The Division considers this test to be "conservative" for several reasons: (a) the rock samples present an extraordinarily high surface area to the leachant, relative to what would be presented in the field;

(b) the tumbling process provides the maximum exposure of all potentially reactive sites to the leachant; and (c) the tumbling process exposes even more surface area through semi-autogenous grinding."

DRMS (2006)

The SPLP test uses a water:rock ratio of 20:1. If the results are applied to the site, the analysis inherently assumes that water is available in the environment to leach constituents from the rock. As discussed in the site hydrologic summary, potential evaporation (PE) exceeds precipitation (P) in the region. Although PE>P does not ensure that no water would ever migrate through the waste rock or temporary ore stockpile, the amount of water available to leach and transport elements is limited.

In the case of the temporary ore stockpile, the SPLP test results may overestimate the weathering and release that could occur in the limited time that any given ore is on the stockpile. The external ore stockpile is a temporary feature. Currently, no external ore stockpile exists. (All stockpiled ore [approximately 1,600 tons] in the external ore stockpiles was removed from the surface in January 2011 and placed inside the mine where the rock will not be subject to environmental effects.) During future operations, material on the stockpile will be transitory as stockpiled ore is shipped offsite and fresh ore is added. A maximum of 4,000 tons of ore will be contained on the ore stockpile at any given time, and material will be handled on a "first in, first out" basis. As such, material on the pile will be exposed to weathering processes for a limited time. Material on the ore stockpile is not expected to experience significant weathering processes during the relatively short exposure (months to years) and Limited precipitation infiltration (see EPP Sections 7 and 9).

5.3.2.2 *Transport*

Hydrologic modeling performed by GeoScience Services (2005) suggested that any downward vertical migration of fluid or constituents from the JD-8 Mine waste rock pile could take up to 1,000 years, for a transport pathway of 400 feet from the waste rock to a saturated aquifer in the Entrada sandstone. If flow and constituents from the JD-8 mine were to reach the Entrada sandstone aquifer, transport in the saturated zone would be controlled by the regional dip of the units in the Mesozoic aquifer and the regional hydrologic controls. Flow in these Mesozoic units, which comprise the stratigraphy of Monogram Mesa and the adjacent Davis Mesa, is generally toward the south (downdip) and west. The Entrada sandstone outcrops in Bull Canyon, approximately 5.1 miles downdip (southwest) of the JD-8 Mine. No seeps or springs have been mapped in this area. The Bull Canyon drainage is mapped by the USGS as intermittent along its entire length. The stream path length is approximately 4.8 miles for the intermittent stream, from the outcrop 5.1 miles downdip from the JD-8 Mine to where it contacts the Dolores River. Therefore, the sandstone aquifer that underlies the JD-8 mine does not appear to directly discharge to the Dolores River downdip of the mine.

5.3.2.3 *Uptake*

The third component of an environmental exposure pathway is uptake by human or biological receptors. The Hydrologic Site Summary (Attachment 3 of the EPP) indicates that no intermittent or perennial streams have been mapped in the JD-8 Mine Lower Permit Area. The surface water exposure pathway is limited to ephemeral drainages that could contain water for very short time periods immediately after major storm events. Any potential chemical loading to surface water will be controlled and minimized by the implementation of best management practices (BMPs) described in the Stormwater Management Plan (Attachment 4 of the EPP).

Potential receptors for the groundwater pathway are similarly limited. The inventory of wells and springs provided in the Hydrologic Site Summary indicates that most of the nearby wells are deep monitoring wells (200 to 600 feet deep) located greater than one half mile from the JD-8 site and associated with the Piñon Ridge Mill site project. These nearest wells are located in the Paradox Valley, northwest of the JD-8 site, where the Mesozoic sandstone aquifers are absent. In contrast, the flow of groundwater below the JD-8 Mine is expected to be south and west, in response to the dip of units in the Mesozoic aquifer and the hydrologic control of the Dolores River as the regional discharge. No groundwater wells have been identified in the Mesozoic aquifers on Monogram Mesa, downdip of the JD-8 Mine Lower Permit Area. Based on the hydrologic flow regimes described in Section 9, no potential groundwater receptors are anticipated.

6. MATERIALS HANDLING

6.1 Materials Handling for Designated Chemicals Originating Offsite

As described previously, the designated chemicals that are derived offsite and used on site for mining operations include less than 1,320 total gallons of diesel fuel and lubricants. The fuel will be stored in an above-ground fuel tank within a bermed and lined catchment during mine operations. The oils will be stored on the surface within a bermed and lined catchment. Routine inspections of the berm and lining will be conducted. Materials Safety Data Sheets (MSDSs) for diesel fuel, rock drill oil, motor oil, and hydraulic oil are provided in Attachment 2.

6.2 Materials Handling for Designated Chemicals Originating Onsite

The ore and waste rock will be handled in accordance with the Mine Plan. Mining of the ore is generally accomplished by "split-shooting" the ore and the associated waste material. During the "split-shooting" effort the drill round is completely drilled, the drillholes are probed to determine where the break between ore and waste material is, and then the waste material is blasted and removed. Once the waste material is removed, the ore material is blasted and removed to the ore stockpile area. The quantity of ore in the ore stockpile area at any given time will not exceed 4,000 tons, which limits the length of time that ore will be exposed to atmospheric weathering processes.

The waste rock pile will be capped with previously stockpiled growth media and reseeded after mining is complete, in accordance with the Mine Reclamation Plan. Lysimeter monitoring data (described in Section 9.4) has not detected any seepage from the existing waste rock pile. Evaporation from the surface and shallow subsurface limits infiltration through the existing waste rock pile. After revegetation is complete, evaporation coupled with plant growth will limit infiltration and fugitive dust.

7. CLIMATE

7.1 Meteorological Stations

Climatological records are available from nine stations located 2 to 33 miles from the JD-8 mine site (Table 10). The Uravan station was selected as most representative of long-term climate conditions at the JD-8 site due to its proximity to the site (10 miles), somewhat comparable elevation (5,021 ft in Uravan vs. 6,550 ft at JD-8), and the long-term period of record (50 years). The closest meteorological station to the JD-8 mine is the private meteorological monitoring network located at the proposed Piñon Ridge Mill. The station is of interest due to its proximity, although the publicly available data span only a 12-month period (Table 10).

Table 10: Meteorological Stations, Type, Period of Record, and Distance from the JD-8 Site

Station Type	Site Location	Elevation [1] (ft)	Period of Record	Distance from the JD-8 Site (miles)	Easting[2]	Northing[2]	Available Parameters for Climate Analysis
Private	Piñon Ridge Mill Site	5,460	May 2008 - April 2009	2.2	1061858.418	598119.093	Precipitation
COOP [3]	BEDROCK	4,980	1997 - 2005	8.9	1027491.795	619258.684	Precipitation Temperature
	URAVAN	5,021	1960 - 2010	10	1070679.976	638575.692	
	PARADOX 1 E	5,282	1948 - 1977	13.5	1011017.062	637273.832	
	PARADOX 2N	5,447	2005 - 2008	14.6	1011498.887	645655.954	
	PARADOX 1 W	5,530	1977 - 1995	15.6	1001701.823	643691.002	
	LA SAL 1SW	6,864	1978 - 2010	25.7	928807.428	616544.017	
	GATEWAY	4,595	1947 - 2010	33	1008930.693	752453.279	
RAWS[4]	NUCLA	5,860	1999 - 2010	11.3	1120693.771	584851.472	Precipitation Temperature Relative Humidity Wind Speed Wind Direction Solar Radiation Barometric Pressure

NOTES:
1. The elevation at the JD-8 site is approximately 6,550 feet.
2. Coordinates shown in State Plane Colorado South (COS), NAD27 (ft).
3. COOP stations refer to the National Weather Service (NWS) Cooperative Observer Network.
4. RAWS stations refer to the Bureau of Land Management (BLM) Remote Automatic Weather Station.

7.2 Precipitation

The JD-8 Mine area has a semiarid climate characteristic of much of the central Rocky Mountain region. Precipitation records from 1960 to 2010 at Uravan, Colorado (located about 10 miles from the site and 1,529 feet lower in elevation) show a mean annual precipitation of 12.61 inches (Table 11). Historical data from Uravan indicates that winter and spring are the drier seasons, each accounting for approximately 20% of the annual precipitation. Summer and fall each account for approximately 30% of the annual precipitation. Snowfall averages 11.1 inches per year, falling from October through April.

More recent precipitation records are available from a private meteorological monitoring network[3] located approximately 2.2 miles from the JD-8 Mine on the proposed Piñon Ridge Mill site (Kleinfelder, 2009). One complete year of precipitation data was evaluated from this source, starting in May 2008 and ending April 2009. The trend of precipitation data from the Piñon Ridge Mill site is similar to the precipitation data from Uravan. Colorado during this timeframe with the exception of the period from July 2008 to October 2008 (Figure 5). The differences during this time period can possibly be explained by isolated thunderstorm events, but the general trend indicates that the Piñon n Ridge Mill site is wetter during the late summer and fall than Uravan, Colorado. The Piñon Ridge Mill site precipitation annual

[3] The Piñon Ridge Mill site precipitation data set is a compilation of automated precipitation measurements supplemented with manually-recorded precipitation gauge measurements (Kleinfelder, 2009). The automated precipitation gauge was out of calibration during the period of May 1, 2008 through October 19, 2008. Manually-recorded precipitation measurements were used in place of the automated measurements during this time period (Kleinfelder, 2009).

total (10.01 inches) is approximately 5% greater than the Uravan precipitation annual total (9.52 inches) for the May 2008 to April 2009 time period. Scaling the Uravan, Colorado long-term average annual precipitation total (12.61 inches) upward by 5% gave an expected annual precipitation of 13.22 inches for the Piñon Ridge Mill site (Kleinfelder, 2009).

Precipitation variation from the monthly and annual averages for Uravan, Colorado is shown in Table 13. Based on a standard deviation of 3.03 inches, precipitation ranged from 9.47 to 15.53 inches during 68% of all years. The lowest recorded precipitation was 7.13 inches in 1989 while the highest recorded precipitation was 21.4 inches in 1965.

Table 11: Monthly Climate Summary at Uravan, Colorado
November 17, 1960 – December 31, 2010

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	42.7	49.8	58.7	67.5	78.5	89.4	95.6	92.3	83.8	71.4	55.1	43.3	69.0
Average Min. Temperature (F)	15.5	22.4	29.2	35.6	44.6	52.4	59.5	58.2	48.4	37.0	26.6	17.9	37.3
Average Total Precipitation (in.)	0.88	0.78	1.03	1.00	0.94	0.49	1.16	1.37	1.48	1.47	1.01	0.99	12.61
Average Total SnowFall (in.)	3.8	1.3	0.5	0.2	0	0	0	0	0	0.2	0.8	4.2	11.1
Average Snow Depth (in.)	1	0	0	0	0	0	0	0	0	0	0	0	0

Source: Western Regional Climate Center (WRCC), data download for station 058560 (Uravan, Colorado), May 4, 2011
Percent of possible observations for period of record: Max. Temp.: 97.7% Min. Temp.: 98.2% Precipitation: 99.5% Snowfall: 86.4% Snow Depth: 82.3%

Table 12: Monthly Climate Summary at the Proposed Piñon Ridge Mill Site
May 2008 – April 2009

	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Annual
Average Total Precipitation (in.)	0.61	0.45	0.20	0.84	1.08	1.16	1.19	2.62	0.46	0.32	0.61	0.47	10.01
Average Temperature (F)	57.1	70.1	76.2	74.1	64.0	51.4	40.2	27.7	27.5	35.8	43.5	n/a	51.6

Source: Meteorology, Air Quality and Climatology Report (Kleinfelder, 2009).

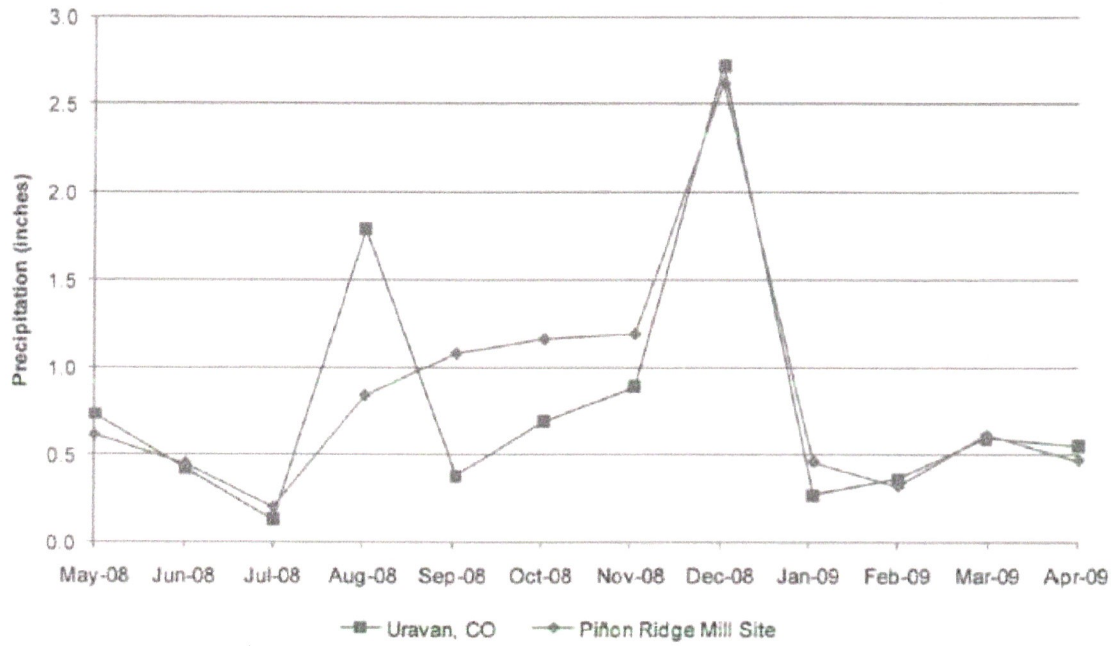

Figure 5: Comparison of Monthly Precipitation Measurements at the Proposed Piñon Ridge Mill Site and Uravan, CO for May 2008 – April 2009

Table 13: Monthly Precipitation at Uravan, Colorado

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1960	0 z	0 z	0 z	0 z	0 z	0 z	0 z	0 z	0 z	0 z	0.07 p	0.76	0.76
1961	0.18	0.26	2.67	1.14	0.99	0	0.51	1.46	2.48	1.42	0.89	0.73	12.7
1962	0.48	1.66	0.59	1.72	0.96	0.44	0.42	0.3	1.48	0.77	1.14	0.7	10.7
1963	1.38	0.46	0.93	0.52	0.19	0.12	0.95	2.25	0.29	1.23	1.44	0.62	10.4
1964	1.4	0	1.03	2.26	0.97	0.21	2.45	1.55	1.06	0.01	1.12	1.01	13.1
1965	1.54	0.8	0.61	2.37	1.34	0.93	2.73	1.59	2.62	2.48	2.28	2.11	21.4
1966	0.37	0.76	0	1.18	1.22	0.25	0.55	1.62	1.43	0.81	0.93	3.55	12.7
1967	0.52	0.25	0.27	0.23	2.41	1.03	0.69	1.35	0.34	0.23	0.81	2.19	10.3
1968	0.26	1.11	0.49	1.02	1.4	0.23	2.51	2.26	0.15	0.77	0.76	0.59	11.6
1969	3.19	0.88	0.26	1	0.87	0.62	0.98	0.43	0.83	3.41	0.88	0.44	13.8
1970	0.52	0.08	3.43	0.96	0.08	0.63	0.74	1.16	2.28	1.15	1.09	0.61	12.7
1971	0.36	0.25	0.15	0.65	0.87	0	0 z	2.65	1.52	2.89	0.79	1.51	11.6
1972	0	0	0.08	0.22	0	0.51	0.28	0.21	1.2	5.89	0.88	0.85	10.1
1973	1.03	0.14	1.33	0.5	1.65	1.65	0.34	1.71	0.7	0.74	1	0.43	11.2
1974	2.45	0.04	0.2	0.74	0.04	0.03	1.26	0.21	0.52	1.28	0.87	0.21	7.85
1975	0.68	0.87	1.93	2.4	0.6	0.4	2.83	0.37	0.41	0.82	0.86	0.44	12.6
1976	0.21	0.43	0.61	0.63	1.19	0.32	0.54	1.05	2.74	0.09	0.1	0.05	7.96
1977	0.86	0.3	0.16	0.51	0.5	0.06	3.54	1.92	0.38	0.65	1.45	0.52	10.9
1978	1.69	1.13	1.88	1.64	1.8	0.35	0.43	0.2	0.15	1.1	2.33	2.25	15
1979	1.82	0.42	1.46	0.18	1.54	0.6	0.5	0.92	0.06	0.52	0.65	0.66	9.33
1980	1.08	1.32	1.34	1.07	1.6	0.01	0.59	0.66	0.79	1.79	0.86	0.5	11.6
1981	0.51	0.55	0.84	0.87	0.91	0.42	2.82	1.91	0.98	3.86	0.61	0.69	15
1982	0.53 b	0.27	1.29	0.23	0.39	0.14	1.58	2.28	4.11	1.65	1.49	1.24	14.7
1983	0.36	1.2	2	1.55	1.48	1.15 a	1.93 b	2	0.72	1.13	2.39	1.61	17.5
1984	0.25	0.17	1.11	0.94	0.18	1.61	1.35	3.32	0.77	2.4	0.43	0 z	12.5
1985	1.22	0.92	1.54	1.77 a	2.07	0.43	1.45	0.2	2.45	1.87 c	1.65	0.49	16.1
1986	0.05	1.62	0.8	0.93	0.68	0.11	1.32	1.84	4.78	2.59	1.09	0.57	16.4
1987	1.6	1.26	1.39	0.41	1.81	0.04	1.56	3.3	0.51	1.48	1.99	1.39	16.7
1988	0.69	0.42	0.31	1.29	1.41	0.42	0.39	1.46	1.55	0.22	1.15	0.89	10.2
1989	0.71	0.67	0.53	0.03	0.04	0	1.95	1.85	0.36	0.96	0	0.03	7.13
1990	0.44	0.37	0.69	1.33	0.68	0.81	1.98	0.54	1.33	1.74	0.69	0.45	11.1
1991	0.92	0.13	0.95	0.24	0.14	0.17	0.88	1.21	1.37	1.39	1.87	1.3	10.6
1992	0.34	0.76	1.1	0.29	2.85	0.04	1.51	0.93	0.37	1.32	0.75	0.87	11.1
1993	2.25	1.98	1.05	1.15	2.21	0.09	0.23	2.17	0.42	2.14	0.63	0.3	14.6
1994	0.72	1.96	0.28	2.3	0.37	1.24	0.09	0.61	0.96	1.04	1.6	0.79	12
1995	1.39	0.5	3.25	1.03	1.7	1.48	1.83	0.7	2.28	0	0.05	0.27	14.5
1996	0.72	1.66	0.42	0.6	0.76	1.55	0.33	0.38	3.15	2.36	2.16	1.8	15.9
1997	1.09	0.48	0.17	2.41	1.78	0.62	1.2	1.1	4.7	1.52	1.83	0.95	17.9
1998	0.27	1.1	2.42	1.17	0.4	0.33	1.96	0.41	0.84	2.22	1.35	0.13 f	12.5
1999	0.4	0.46	0.02	2.68	0.25	0.72	1.27	3.07	1.83	0.04	0.15	0.32	11.2
2000	1.41	0.99	1.47	0.05	0.47	0.44	0.69	1.01	1.01	1.96	0.22	0.56	10.3
2001	1.08	0.84	1.18	0.73	0.63	0.06	0.71	2.91	0.58	0.56	0.86	0.86	11
2002	0.24	0.09	0.66	0.4	0.13	0	0.55	0.65	2.97	1.6	0.56	0.37	8.22
2003	0.27	2.05	1.17	0.1	0.81	0.1	0.74	1.07	0.77	0.72 b	0.73	1.18	9.71
2004	0.85	1.29	0.37	1.97	0.3	0.02	0.64	0.18 a	3.67	1.46	1.82	1.07	13.6
2005	1.83	1.83	1.89	0.72	0.37	1.09	0.37	1.29	1.35	1.61	0.54	0.58	13.5
2006	0.32	0.4	1.52	0.49	0.02	0.31	1.93	2	3.78	3.53	0.58	0.44	15.3
2007	0.35	0.65 a	0.79	0.9	1.02	0.95	0.78	1.83	3.27	1.36	0.24	2.81	15
2008	1.05	1.3	0.36	0.32	0.73	0.42	0.13	1.79	0.38	0.69	0.89	2.72	10.8
2009	0.27	0.36	0.59	0.55	1.52	1.18	0.58	0.24	0.67	0.78	0.47	1.4	8.61
2010	1.43	1.7	2.14	1.48	0.63	0.38	1.38	2.44	0.57	1.38	0.71	1.76	16

Period of Record Statistics

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
MEAN	0.88	0.78	1.03	1.00	0.94	0.49	1.16	1.37	1.48	1.47	1.01	0.99	12.5
S.D.	0.68	0.59	0.81	0.71	0.70	0.47	0.83	0.88	1.25	1.10	0.61	0.76	3.03
SKEW	1.19	0.61	1.06	0.75	0.63	0.99	0.92	0.41	1.10	1.57	0.60	1.44	0.55
MAX	3.19	2.05	3.43	2.68	2.85	1.65	3.54	3.32	4.78	5.89	2.39	3.55	21.4
MIN	0	0	0	0.03	0	0	0.09	0.18	0.06	0	0	0.03	7.13
# YRS	49	50	50	50	50	50	49	50	50	50	50	49	46

SOURCE: Western Regional Climate Center (WRCC), data download for station 058560 (Uravan, Colorado). File last updated on Mar 24, 2011

NOTES: S.D. = Standard deviation

a = 1 day missing, b = 2 days missing, c = 3 days, ..etc, z = 26 or more days missing, A = Accumulations present

Long-term means based on columns; thus, the monthly row may not sum (or average) to the long-term annual value

MAXIMUM ALLOWABLE NUMBER OF MISSING DAYS : 5 (Individual Months not used for annual or monthly statistics if more than 5 days are missing.) Individual Years not used for annual statistics if any month in that year has more than 5 days missing

7.3 Storm Frequency

The rainfall intensity for 24-hour storms with 2-year to 100-year recurrence intervals were interpolated from the NOAA Atlas 2, Vol. III, for the purpose of runoff calculations and engineering design. The magnitude of the design storms is shown in Table 14.

Table 14: Recurrence Interval for Design Storms

Recurrence Interval	Duration (Hours)	Storm Magnitude (inches)
100-year	24	2.6
50-year	24	2.3
25-year	24	2.1
10-year	24	1.8
5-year	24	1.4
2-year	24	1.2

Runoff generated by design storms is discussed in the site drainage plan and Stormwater Management Plan (Attachment 4).

7.4 Temperature

Temperatures at the Uravan NWS meteorological station generally range from 48 to 96 °F in the summer, and from 16 to 59 °F in the winter. The temperature data collected at the private meteorological station at the Piñon Ridge Mill site from May 2008 to March 2009 are consistent with the Uravan temperature ranges. The overall average annual temperature at Uravan is 53.2 °F and the average temperature at the Piñon Ridge Mill site for the period of record (May 2008 to March 2009) is 51.6 °F (Table 12).

7.5 Wind Speed

Wind speed data are not available for most meteorological stations in the area (Table 10). Short-term wind speed records are available from the private meteorological station at the Piñon Ridge site located 2.2 miles from the JD-8 mine. Longer term wind speed records are available from the Bureau of Land Management (BLM) Remote Automatic Weather Station (RAWS) in Nucla, Colorado. Based on the available data for the Nucla station from 1999 through 2010, the average annual wind speed is 5.1 mph.

Wind speed and direction was recorded hourly at the Piñon Ridge Mill site from April 2008 to March 2009 (Kleinfelder, 2009). Generally, daytime westerly winds with higher speeds (approximately 8 mph) were observed in April, May, and June of 2008 and in March of 2009. Calm night-time southeasterly breezes were observed in all months, but the calmest conditions were recorded in the months of November and December 2008 and January and February 2009 (Kleinfelder, 2009).

Table 15: Average Monthly Wind Speed (mph) at Nucla Meteorological Station

Month/ Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Average 1999-2010
Jan	4.5	3.4	3.5	4.1	3.3	2.1	4	4.3	4	3.2	3.1	2.6	3.5
Feb	5.2	4.8	5	4.3	4.4	2.7	3.6	4.7	4.7	2.7	4.2	2.7	4.1
Mar	6.9	4.5	4.7	6.2	5.6	5.1	5.1	5.9	4.7	5.6	6	4.6	5.4
Apr	6.3	6.6	7.1	8.1	7.7	6	6.4	6.7	5.7	6.6	6.2	6.8	6.7
May	7.7	7.5	6.1	7	6.5	7.3	6.1	6.4	5.4	6.1	4.8	7.6	6.5
Jun	7.2	6.5	6.9	7.6	7.2	6.6	6.8	6.4	6.1	5.7	5.7	6.4	6.6
Jul	5.8	5.8	6.1	5.7	6	6	5.4	4.9	5.2	4.6	5	4.7	5.4
Aug	4.6	5.5	5	6	5.5	5.9	4.9	4.8	5.1	4.5	5.3	4.6	5.1
Sep	5	6.2	5.4	5.1	5.4	5.5	5.4	5.2	5.5	4.6	4.9	4.8	5.3
Oct	5.3	5	5.2	4.7	5.7	5.6	4.6	4.2	4.6	4.7	5.1	4.3	4.9
Nov	3.9	4.2	4.3	4	5.1	3.6	4.3	4.3	3.4	3.5	3.6	4.2	4.0
Dec	3.4	3.5	3.7	3.4	4.3	3.5	3.5	3.5	3.4	3.8	3.3	3.5	3.6

Table 16: Average and Maximum Wind Speed (mph) at Nucla Meteorological Station

Month/ Year	Maximum Wind Gust (miles per hour)												Average Gust 1999-2010	Maximum Gust 1999-2010
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010		
Jan	52	30	47	34	19	34	42	44	43	58	31	33	38.9	58
Feb	54	38	41	46	45	41	24	56	48	54	39	24	42.5	56
Mar	52	44	49	52	45	40	37	44	54	46	56	43	46.8	56
Apr	52	56	54	52	52	46	51	55	58	45	45	50	51.3	58
May	51	58	43	53	49	60	44	57	47	40	35	49	48.8	60
Jun	54	48	44	53	52	53	76	54	54	52	43	44	52.3	76
Jul	45	40	58	44	43	43	43	39	41	34	41	40	42.6	58
Aug	34	50	44	55	40	45	40	37	33	59	40	43	43.3	59
Sep	37	48	43	51	48	44	57	43	52	34	51	41	45.8	57
Oct	46	53	45	43	53	45	51	42	43	45	42	41	45.8	53
Nov	54	37	39	39	48	43	43	36	31	36	29	36	39.3	54
Dec	35	41	44	43	51	41	34	41	35	44	39	38	40.5	51

7.6 Evaporation

The local climate is classified as a BSk semi-arid steppe, according to the Köppen-Geiger Climate Classification System[4]. Group B climates include dry (arid and semiarid desert) climates with potential evapotranspiration exceeding precipitation (PE > P)). The third letter in the classification ("k") indicates a middle latitude climate with an average annual temperature below 18 °C (64 °F).

Pan evaporation is measured at the nearest NWS meteorological stations in Montrose and Grand Junction. Pan average for the site was based on the average of these two stations (Table 17) and is estimated at 64.8 inches per year. At the nearby Piñon Ridge site, the pan evaporation measured during a seven month period in 2008 was 55.26 inches (Kleinfelder, 2009).

Using a pan coefficient of 0.70, the annual free water surface (FWS) evaporation rate is 45.36 inches. Evapotranspiration rates will vary based on plant cover and timing of available precipitation.

[4] The Köppen-Geiger climate classification is one of the most widely used climate classification systems. It defines climate zone boundaries based on average annual and monthly temperature and precipitation, and the seasonality of precipitation, which affect vegetation distribution.

Table 17: Monthly Average and Annual Pan Evaporation

Station: Period of Record:	Grand Junction 1962 - 2005	Montrose 1948 - 1982	Average
January	n/a	1.7	1.7
February	n/a	1.5	1.5
March	n/a	3.3	3.3
April	6.6	5.7	6.2
May	9.3	7.5	8.4
June	11.8	9.5	10.7
July	12	9	10.5
August	10.2	7.4	8.8
September	7.5	5.5	6.5
October	4.7	3.5	4.1
November	2.1	1.6	1.9
December	n/a	1.3	1.3
Annual Total	**64.1**	**57.5**	**64.8**

8. SURFACE WATER DATA

The JD-8 site lies within the Dolores River basin, a 4,620 square mile basin in western Colorado and eastern Utah (Figure 6) with hydrologic unit code (HUC) 14030002. The Dolores River flows approximately 200 miles from its headwaters in the San Juan Mountains to its intersection with the Colorado River near Cisco, Utah. In the Paradox Valley, the Dolores River is located approximately eight miles from the JD-8 mine site and flows north across the valley, then receives the San Miguel River, flows northwest, and crosses into Utah.

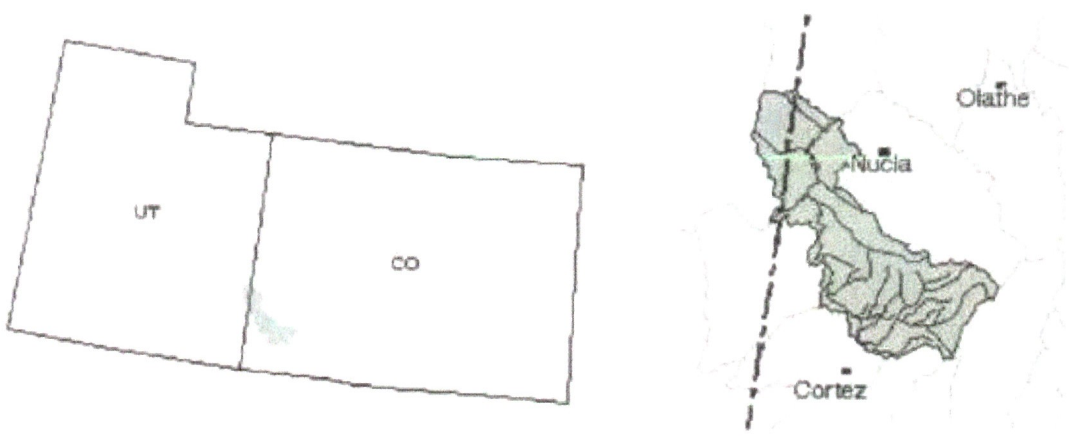

Figure 6: Upper Dolores River Basin (EPA, 2010)

Locally, the crest of Monogram Mesa is a surface water divide, with runoff from the top of the mesa flowing south and west to the Dolores River by way of Bull Canyon Creek and Wild Steer Canyon Creek. North of the divide, runoff from the steep escarpment at the north side of the mesa flows north toward East Paradox Creek, which flows west to the Dolores River.

The JD-8 mine is located 1,270 feet from the nearest perennial stream, an unnamed tributary that flows north from the Monogram Mesa escarpment (Plate 1). No perennial streams or natural, permanent ponds, lakes or water bodies occur within the lower mine permit boundary (the focus of this EPP).

Surface water near the JD-8 mine is sparse. Hydrologic studies conducted for the nearby Piñon Ridge project sampled surface water on a run-off event basis, rather than a fixed calendar schedule, due to the intermittent nature of run-off events in the area and lack of perennial flow.

Natural and engineered surface water runoff at the JD-8 Mine is further addressed in the Stormwater Management Plan, which is provided as Attachment 4 of the EPP.

8.1 Inventory of Water Courses, Springs, Reservoirs, and Ditches

The locations of all tributary water courses, springs, stock water ponds, and reservoirs located within two miles of the JD-8 Mine are shown on Plate 1 and summarized in Table 18. The two-mile distance is measured from the JD-8 mine portal.

Although Table 18 lists all surface water features within two miles of the JD-8 mine portal, none of the surface water features located on Monogram Mesa (south of the drainage divide) are pertinent to runoff at the Lower Mine Permit Area (the subject of this EPP). Surface runoff at the JD-8 Lower Permit Area would flow north from the escarpment toward the Paradox Valley; therefore surface water features located south of the drainage divide at the crest of Monogram Mesa will not be influenced by surface runoff from the JD-8 affected area.

Table 18: Springs, Reservoirs and Ditches Located within Two Miles of the JD-8 Mine Portal

Feature	Description	Location	Distance From Mine Portal (ft)	Distance From Mine Portal (miles)
Surface Water Features in Paradox Creek Basin				
Intermittent Streams in Paradox Valley	Intermittent streams, tributary to the East Paradox Creek (9)	North of drainage divide (i.e., north of crest of mesa)	>4,400 ft	>0.83 mi
Ephemeral Pond in Paradox Valley	Ephemeral pond (1)	NW1/4 Section 17, T46N, R17W	4,425 ft	0.84 mi
Perennial Stream in Paradox Valley	Unnamed perennial stream, tributary to East Paradox Creek (1)	North of drainage divide (i.e., north of crest of mesa)	1,270 ft	0.24 mi
Surface Water Features in Bull Canyon Basin or Wild Steer Canyon Basin (Across Drainage Divide from JD-8)				
Ephemeral or Intermittent Streams south of drainage divide	Intermittent/ephemeral streams, tributary to Bull Canyon Basin (2) or Wild Steer Canyon (6)	South of mesa (across drainage divide from JD-8 mine)	2,700 ft	0.51 mi
Monogram Mesa Reservoir	Minor reservoir mapped by USGS on 7.5' quad	Sec 20, T46N, R17W	3,870	0.73
Minor reservoirs / stock ponds	Various unnamed minor reservoirs/stock ponds mapped by USGS on 7.5' quad	Various locations south of drainage divide	Varies	Varies
USGS Spring	Spring mapped by USGS on 7.5' quad	NE1/4 SW1/4 Sec 18 T46N, R17W	6,580	1.25

9. GROUNDWATER DATA

9.1 Geologic Setting

9.1.1 Regional Geology

The Paradox Basin[5] is located in the Colorado Plateau Physiographic Province. Regional stratigraphy includes marine and terrestrial sedimentary rocks deposited in response to multiple stages of seaway transgression-regression and orogenic uplift during Late Paleozoic to Quaternary time periods (Table 19). Regionally, these sedimentary rocks include shale, salt, gypsum, claystone, siltstone, and thick sequences of sandstone which, for the most part, are flat lying except for areas deformed by local faulting and folding caused by the uplift of the Colorado Plateau.

Many folds and faults occur in the area, with the most prominent being the Uncompahgre Plateau with a fold axis estimated at one hundred miles long in the northeast section of the region (Kleinfelder, 2009). Well-developed anticlines with intrusive gypsum and salt cores underlie Paradox Valley, Sinbad Valley, and Gypsum Valley (Cater, 1954). The present northwest-trending valleys are formed by the collapse of the anticline cores due to rapid dissolution of salt during the Tertiary uplift of the Colorado Plateau (Strauss, 1982).

In Paradox Valley, older Paleozoic age rocks crop out on the valley floor and younger Triassic and Jurassic age rocks are exposed in the valley walls (Figure 7, Figure 8). The order of the geologic units correlates to the order of geologic succession of the Colorado Plateau with the exception of missing members (including the Mesozoic Navajo Sandstone). The unconformable contacts with missing Mesozoic units observed elsewhere in the Colorado Plateau may be evidence for regional uplift. The missing units could result from either lack of deposition or erosion due to uplift.

The uppermost geologic units are Holocene deposits of eolian (wind-blown) material and sheet wash, which are widely distributed on the valley floors, along the benches, and on top of the mesas (Cater, 1954). Although these younger units may be hosts for near-surface hydrologic activity, the alluvium has been shown to be dry at the Piñon Ridge site (Section 9.2) and the JD-8 site (Section 9.5).

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[5] The "Paradox Basin" is defined as that part of the Colorado Plateau physiographic province that is underlain by Pennsylvanian evaporites (i.e., Paradox Member of the Hermosa Formation). The "Paradox Valley" is a local structural/geomorphological feature (i.e., an eroded anticline) within the Paradox Basin.

Table 19: Lithologic Units in Colorado Plateau Physiographic Province and Paradox Basin Sub-Province

Geologic Symbol	Formation	Geologic Age
Qal	Alluvium	Quaternary
Qls	Landslide Deposits	Quaternary
Km	Mancos Shale	Cretaceous
Kd	Dakota Sandstone	Cretaceous
Kbc	Burro Canyon Formation	Cretaceous
Jmb	Brushy Basin Member Morrison Formation	Jurassic
Jms	Salt Wash Member Morrison Formation	Jurassic
Js	Summerville Formation	Jurassic
Jec	Entrada/Carmel Formations	Jurassic
Jn	Navajo	Jurassic
Jk	Kayenta	Jurassic
Jw	Wingate	Jurassic
Td	Dolores Formation	Upper Triassic
Tc	Chinle Formation	Upper Triassic
Tm	Moenkopi Formation	Lower Triassic
Pc	Cutler Formation	Permian
Php	Hermosa Formation	Pennsylvanian
Ml	Leadville Limestone	Mississippian
Dco, De,Ci	Ouray, Elbert, and Ignacio Formations	Devonian and Cambrian

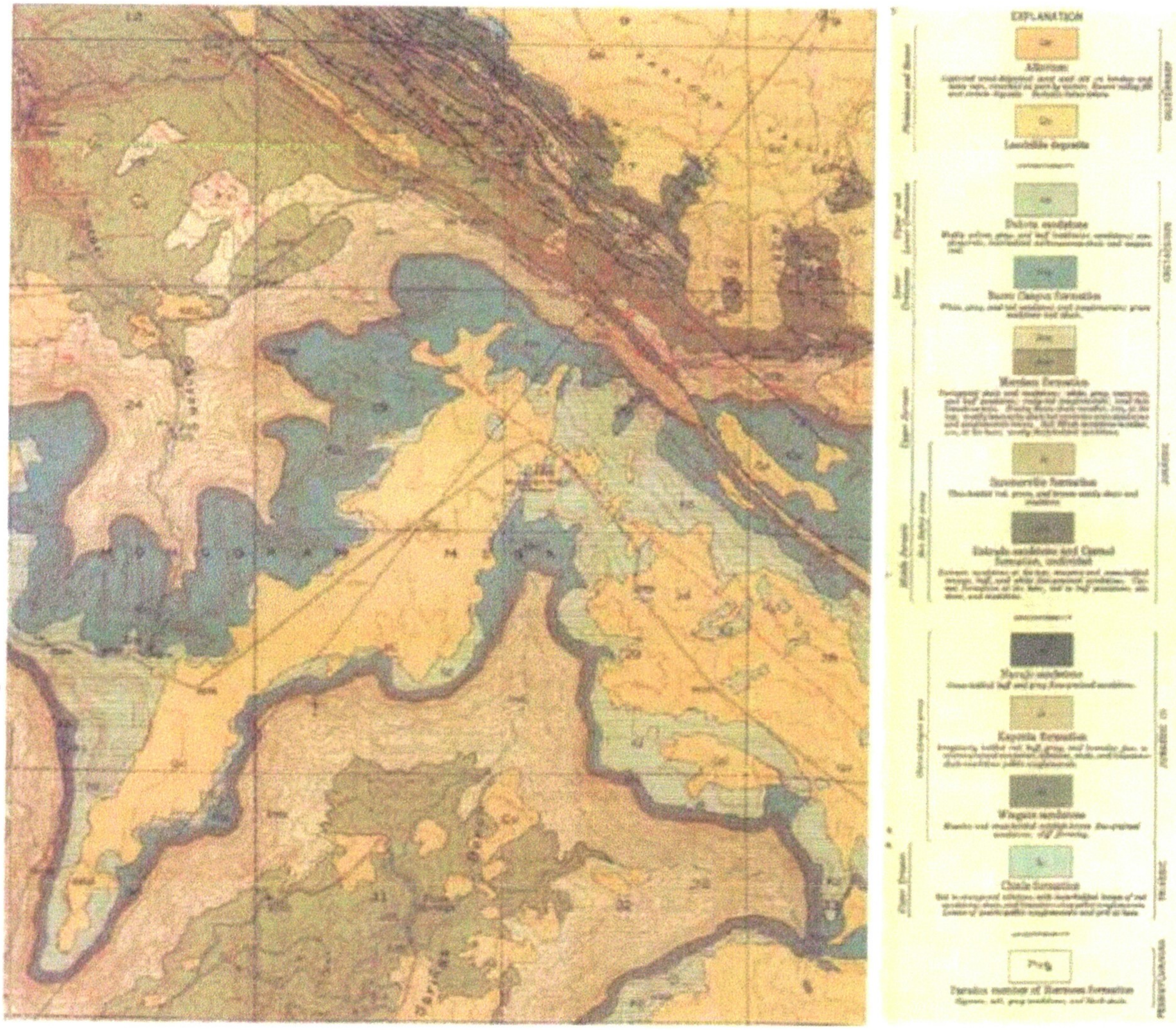

Figure 7: Geologic Map of the Bull Canyon Quad (Cater, 1954)

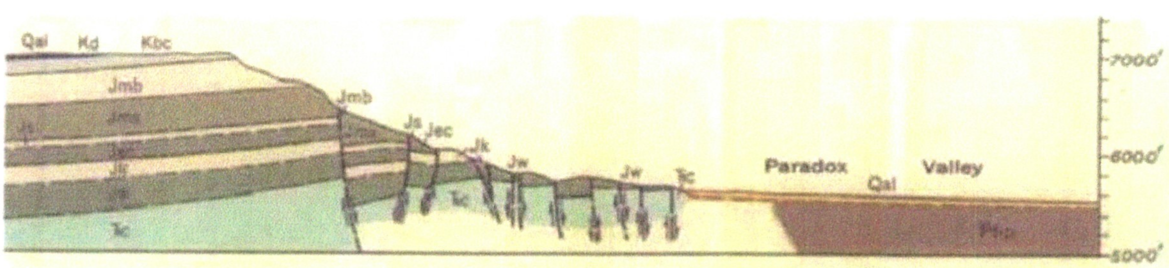

Figure 8: Geologic Cross Section of the Paradox Valley (Cater, 1954)

9.1.2 Site Geology

The JD-8 site is located in the southwest corner of Paradox Valley within the Colorado Plateau Physiographic Province. It lies on a portion of a well-developed, extensively faulted salt anticline underlying the Monogram Mesa. The site is located within a large rotational fault block on the northeast hanging wall of an extensive normal fault. This normal fault trends in extent through Paradox Valley. Many lesser faults further dissect the rotated fault block in the vicinity of the mined area (White, 2006).

Major geologic units within the JD-8 mine site consist of the Morrison (Brushy Basin shale and Salt Wash sandstone members), Summerville sandy shale-mudstone, Entrada sandstone, Kayenta sandstone, siltstone, shale pebble conglomerate, and Wingate sandstone Formations (Table 19). The Salt Wash Member of the Morrison Formation is the target for economic mineralization. The underlying units dip to the southwest which correlates with regional structure (i.e., the dip of Monogram Mesa), indicating cohesive uplift and subsequent tectonic effects on a local as well as regional scale (Geoscience Services, 2005).

The JD-8 waste rock pile is located above underground workings of the abandoned Black Diamond Mine (Figure 9). The Black Diamond Mine workings penetrate the Brushy Basin shale Member of the Morrison Formation to access mineralization hosted in the Salt Wash Member of the Morrison Formation. Most of the waste rock pile is located on the hanging wall side of the normal fault but a small portion of the waste rock pile is located on the foot-wall side of the normal fault. The fault offsets the Brushy Basin Shale Member against the lower boundary of the Salt Wash Sandstone Member to the northeast (White, 2006).

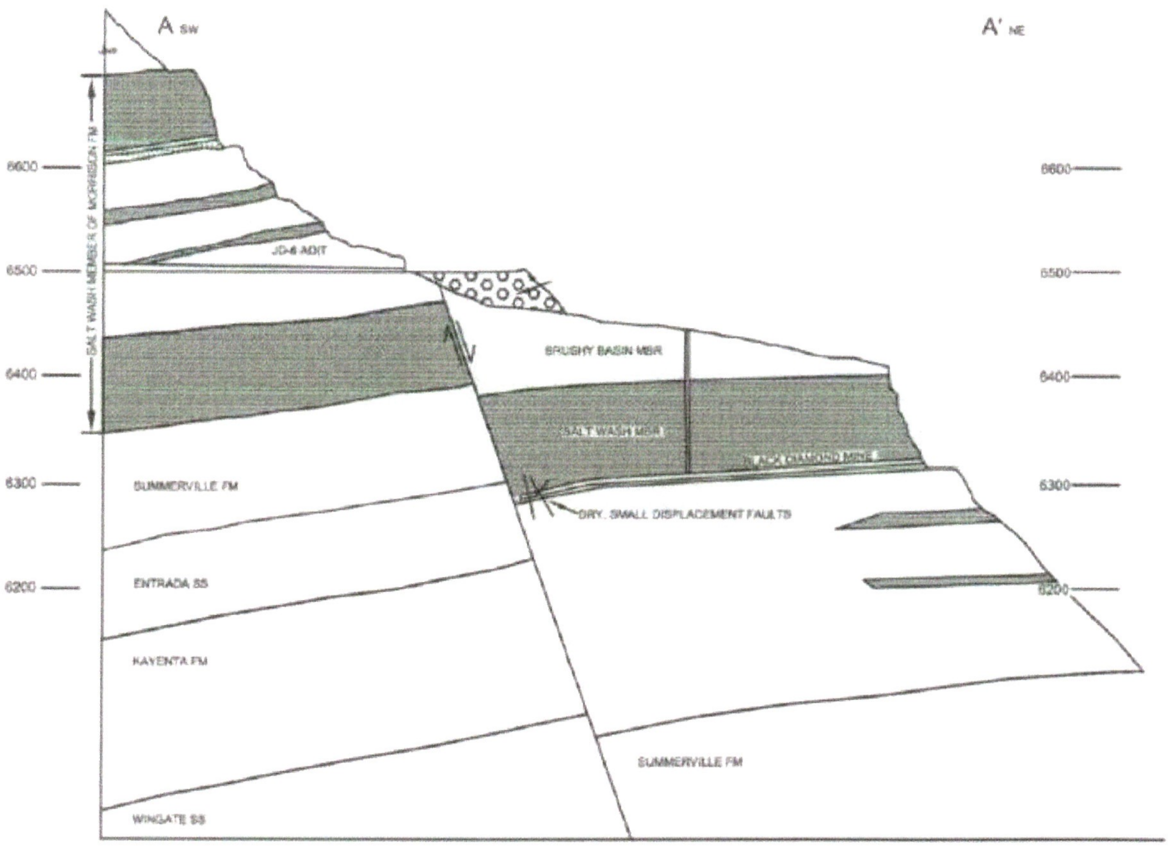

Figure 9: Stratigraphic Cross Section of JD-8 Mine Site (White, 2006)

9.1.3 Economic Geology

The JD-8 Mine is located in the Uravan Mineral District, which is characterized by its uranium-vanadium ore deposits. These ore deposits contain a distinctive suite of elements including vanadium, molybdenum, and selenium. Other base metals including thallium are present within the ore bodies, but are present in low concentrations. The uranium and vanadium at JD-8 typically mineralizes as roll and tabular layers approximately 3.75 feet thick within the Third Rim of the Salt Wash Member of the Morrison Formation. Ore deposits are typically seen in channel sandstone. Within the Third Rim Sandstone, there are two points of interest for ore deposits. The first appears at a depth of six hundred thirty to six hundred fifty feet near the middle of the Third Rim. The other is seen at a depth of seven hundred to seven hundred twenty five feet closer to the bottom of the Third Rim (Cotter, 1984).

The mineralization of JD-8 is much like the rest of the Uravan Mineral District. The uranium occurs in the form of uraninite (pitchblende variety UO_2) with traces of coffinite ($USiO_4OH$) filling in the pore space between individual sand grains (Peters, 2011). The uraninite (pitchblende) occurs as a more massive, darker colored mineral (Nininger, 1954). When oxidized, these minerals may become much brighter in color and reveal secondary minerals such as corvusite, ravite, and pascoite (Peters, 2011). These oxidation minerals are often seen in conjunction with uraninite within the Uravan Mineral District.

The primary vanadium mineral is montroseite (VOOH) in conjunction with vanadium clays and hydromica. Carnotite and tyuyamunite are also commonly seen vanadium minerals after oxidation of the ore occurs. It is possible that other oxidized minerals occur on the JD-8 mine site. The presence of other cations, increased moisture levels, and differing pH levels may enable other vanadium oxides to form over time (Peters, 2011).

9.2 Regional Groundwater System

9.2.1 Hydrostratigraphic Units

The regional groundwater system in the Paradox Basin consists of an upper Mesozoic sandstone aquifer and a lower Paleozoic carbonate aquifer (Topper, et al., 2003), separated by a thick sequence of Mesozoic- Upper Paleozoic confining beds and salt confining beds (including the Paradox Member of the Hermosa Formation). The hydrostratigraphic units of the Paradox Valley are shown in Table 20.

The upper Mesozoic sandstone aquifer has been called the N-aquifer elsewhere on the Colorado Plateau, where the Navajo Sandstone and Wingate Sandstone are the main water bearing units in the N-aquifer over large portions of Utah and Arizona. In the Paradox Basin, the Mesozoic sandstone aquifer includes interbedded sandstones, siltstones, and shales which are bounded at the top by the Mancos Shale and on the bottom by mudstones, siltstones, and salt beds (Table 20), while the Navajo Sandstone and Wingate sandstones may be absent in places. Although the Navajo Sandstone and Wingate Sandstone, where present, are the main water-bearing units in the Mesozoic sandstone aquifer, these units are missing from portions of the Paradox Valley. As reported by Golder (2009a) along the axis of the eastern Paradox Valley:

> "Although numerous reports [have been] published to address the regional hydrogeology, no published research has focused on the hydrogeology of the eastern Paradox Valley. Many of the regional studies name the Navajo Sandstone, Wingate Sandstone, and the Entrada Sandstone as important bedrock aquifers. However, these formations are either absent or not known to be water-bearing within the project study area, resulting in almost no relevant published information on groundwater." (Golder, 2009a)

The confining beds between the upper Mesozoic aquifer and the lower Paleozoic aquifer include the Dolores Formation (mudstone and fine-grained sandstone which are not water-bearing), Chinle Formation (interbedded shales and siltstones with minor fine-grained sandstone, which may be water-bearing in some places), Moenkopi Formation (mudstone interbedded with minor sandstone, which may yield small quantities of water), and Cutler Formation (fine grained sandstone interbedded with minor conglomerate and mudstone which may yield small quantities of water). The most significant confining beds are the Hermosa Formation, which consists of salt beds (including the Paradox Member).

The confining units described in regional studies of the Paradox Basin were defined as aquifers in the hydrogeologic study of the Piñon Ridge site. Golder (2009a) found that groundwater occurs in two units: first at the base of the Chinle Formation at depths of 340 - 400 feet and second at the base of the Moenkopi Formation at depths of approximately 870 feet. For baseline hydrologic characterization in the valley floor, Golder drilled 35 boreholes, of which nine were completed as monitoring wells (MW-series), three were completed as production wells (PW-series), six were completed as observation wells near the production wells, and the remaining holes were groundwater exploratory boreholes (EX-series). The investigation revealed that no groundwater occurred in the alluvium, and "the only known groundwater occurrences within the study area are close to the contact between the Chinle and Moenkopi formations, and close to the contact between the Moenkopi and Hermosa formations" (Golder, 2009a). The Hermosa (salt) formations impeded the downward migration of groundwater flow.

The lower Paleozoic carbonate aquifer includes the Leadville Limestone and other porous and permeable limestones and dolomites, which transmits saltwater through fractures. Groundwater in the lower Paleozoic carbonate aquifer is not suitable for human consumption (Topper, et al., 2003).

9.2.2 Aquifer Recharge

Recharge to the upper Mesozoic aquifer occurs as infiltration of runoff and direct precipitation. Runoff in the Dolores River basin occurs primarily from spring snowmelt at higher elevations. In the summer and fall, additional runoff occurs from rainstorms that are sometimes intense and usually limited in extent (Weir et al., 1983). Little or no recharge to the upper Mesozoic aquifer occurs from direct precipitation or infiltration of snowmelt in the Paradox Valley. As reported by Golder (2009a), studies have shown that diffuse recharge (rain and snowmelt over the valley area) to basin aquifers in arid areas like Paradox Valley is limited or absent due to low precipitation rates, large vadose zones, and the water-scavenging vegetation found in dry areas (Wilson and Guan 2004; Foster and Smith-Carrington 1980).

Recharge to the lower Paleozoic aquifer occurs outside of the Paradox Basin (Weir, et al., 1983). The Leadville Limestone outcrops north of Durango and receives recharge at the outcrop from runoff and snowmelt from the San Juan Mountains.

9.2.3 Flow Direction and Aquifer Discharge

Regionally, groundwater flows to the west-northwest, discharging to the Dolores River (Weir et al., 1983, Topper et al., 2003). Flow direction in the lower Paleozoic carbonate aquifer is shown in Figure 10. The flow regime in the lower aquifer does not appear to be affected by the overlying Mesozoic aquifer, surface topography, or surface water flow, as it is essentially isolated by the confining evaporates (salt layers).

Flow directions in the upper Mesozoic aquifer are variable on a local and regional scale and are affected by geologic structure and areas of recharge and discharge. The overall general flow direction is toward the Dolores River. As reported by Weir, et al., (1983), "where the Dolores River is deeply incised, water from the Mesozoic sandstone aquifers discharges directly to the Dolores River."

Hydrogeologic studies at the Piñon Ridge site surmised that groundwater near the Piñon Ridge site "generally flows away from the mesa in a northeast direction and is intercepted by faults that parallel the valley axis. These faults appear to act as conduits for flow and recharge and direct groundwater flow to the northwest" (Golder, 2009a). Data from the study area supported the conclusion by Weir et al. (1983) that, regionally, groundwater flows to the northwest, discharging to the Dolores River.

Table 20: Hydrostratigraphic Units of the Paradox Basin (Topper, et al., 2003)

Era	System	Stratigraphic Unit	Thickness (feet)	Physical Characteristics	Hydrogeologic Unit	Hydrologic Characteristics
Cenozoic	Quaternary	Alluvium	0 - 100	Alluvial sands and gravels, loess, colluvium, windblown sands	Alluvium	Locally yields large quantities for domestic, stock, and municipal
Mesozoic	Upper Cretaceous	Mancos Shale	1,000 - 5,000	Shales interbedded with minor sandstone	Cretaceous Confining Bed	Confining unit; none
	Lower Cretaceous	Dakota Sandstone	0 - 200	Fine to coarse-grained cross-bedded sandstone	Mesozoic sandstone aquifer	Yields some water, stock and domestic
		Burro Canyon Formation	0-250	Conglomerate, sand-stone and shale		Yields water to springs
	Upper Jurrasic	Morrison Formation: Brushy Basin Member	400 - 500	Shales interbedded with minor sandstone		None
		Morrison Formation: Saltwash Member	300	Medium-grained sandstone interbedded with red shale		Yields small quantities, stock and domestic
	Upper and Middle Jurassic	Summerville Formation	0 - 120	Shales interbedded with minor sandstones		None
		Entrada Sandstone	15 - 170	Buff to grayish-white cross-bedded sandstones		Yields water
		Carmel Formation	0 - 40	Siltstone and mudstone interbedded with fine-grained sandstone		None
		Navajo Sandstone	0 - 125	Fine-grained, cross-bedded quartz sandstone		Small to moderate amount from fractures, stock and domestic
		Kayenta Formation	0 - 200	Sandstone interbedded with siltstone and thin-bedded shale		Yields little to no water
	Upper Triassic	Wingate Sandstone	0-400	Medium grained, poorly cemented, cross-bedded sandstone		Yields water to numerous springs
		Dolores Formation	150 - 230	Pink to red mudstone and fine-grained sandstone. Not present in all areas	Mesozoic-Upper Paleozoic Confining Bed	Not water bearing
		Chinle Formation	0 - 500	Shales, siltstones, interbedded with minor fine-grained sandstone		Yields small quantities where fractured, stock and domestic
	Lower Triassic	Moenkopi Formation	0 - 480	Mudstone interbedded with minor sandstone		Yields small quantities where fractured, stock and domestic
Paleozoic	Permian	Cutler Formation	0 - 3,500	Fine grained sandstone interbedded with minor conglomerate and mudstone		Yields small quantities where fractured, stock and domestic
	Pennsylvanian	Hermosa Formation	0 - 3,900	Shales, limestones, salt, and gypsum; includes the Paradox Member	Confining salt beds	None
	Mississippian	Leadville Limestone	20 - 100	Massive to thinly laminated, gray buff and yellow limestone	Lower Paleozoic carbonate aquifer	Transmits saltwater through fractures
	Devonian and Cambrian	Ouray, Elbert, and Ignacio Formations	0 - 150	Limestone, shale, dolomite; Ignacio is a quartzite		

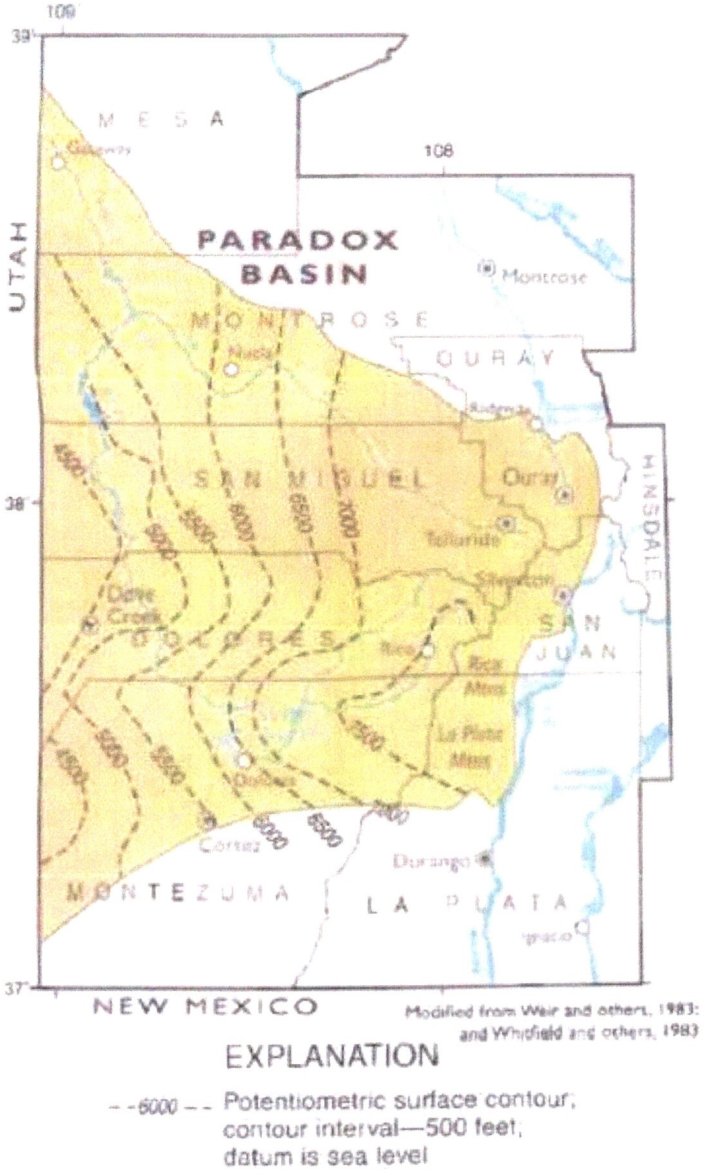

Figure 10: Regional Groundwater Flow System in the Paradox Basin (Topper, et al. 2003)

9.3 Inventory of Wells and Water Use

Wells drilled in Colorado are registered with the Colorado Division of Water Resources (DWR) and are a matter of public record. DWR records list 32 unique wells within a two-mile radius of the mine waste rock pile, most of which are monitoring wells associated with the proposed Piñon Ridge Mill northwest of the JD-8 mine site. Of the 32 wells, 23 are located more than one mile from the mine waste pile. The nearest well is located 0.49 miles (2,590 ft) from the JD-8 Mine waste pile.

Water requirements for the mine are shown in Table 21. The source of water for the mining and development efforts will be the Nucla Municipal System. No adjudicated water rights will be injured by this project.

Table 21: Project Water Requirements

Development	10,000 gal/month	120,000 gal/yr
Mining	10,000 gal/month	120,000 gal/yr
Reclamation	None Anticipated	

Table 22: Inventory of Wells Located within Two Miles of the JD-8 Mine Waste Pile

Permit No.	Distance (Miles)	Owner Name	Address	City	State	Qtr40	Qtr160	Sec.	Tperf	Bperf	Yield	Depth	Level
257495-	0.49	COOPER DAN CLAYTON	PO BOX 65	NUCLA	CO	NW	SE	17					
279307-	1.74	ENERGY FUELS RESOURCES CORPORATION	31161 HWY 90	NUCLA	CO	SW	NW	8				100	
279308-	0.69	ENERGY FUELS RESOURCES CORPORATION	31161 HWY 90	NUCLA	CO	SE	NW	17				470	
279311-	1.09	ENERGY FUELS RESOURCES CORPORATION	31161 HWY 90	NUCLA	CO	NE	NE	17				422	
279312-	1.14	ENERGY FUELS RESOURCES CORPORATION	31161 HWY 90	NUCLA	CO	SE	SW	8				439	
279675-	2.09	ENERGY FUELS RESOURCES CORPORATION	31161 HWY 90	NUCLA	CO	NE	NW	8				598	
279676-	2.08	ENERGY FUELS RESOURCES CORPORATION	31161 HWY 90	NUCLA	CO	NE	NE	8				100	
279677-	1.70	ENERGY FUELS RESOURCES CORPORATION	31161 HWY 90	NUCLA	CO	SE	NE	8				139	
279678-	0.98	ENERGY FUELS RESOURCES CORPORATION	31161 HWY 90	NUCLA	CO	NE	NW	17				600	
279679-	0.95	ENERGY FUELS RESOURCES CORPORATION	31161 HWY 90	NUCLA	CO	NW	NE	17				490	
282307-	0.72	NUVEMCO LLC	10771 3200 RD	HOTCHKISS	CO	NE	SE	18	270	300		340	290
282308-	1.05	NUVEMCO LLC	10771 3200 RD	HOTCHKISS	CO	NW	SE	18	133	153		220	
36544-MH	1.91	HUSTON, EUGENE E	PO BOX 641	NUCLA	CO	SE	NW	9	163	203		213	147
47342-MH	1.76	ENERGY FUELS RESOURCES CORP	C/O KLEINFELDER 8300 JEFFERSON NE STE B	ALBUQUERQUE	NM	SE	NE	8	15	24		598	
47343-MH	2.00	ENERGY FUELS RESOURCES CORP	C/O KLEINFELDER 8300 JEFFERSON NE STE B	ALBUQUERQUE	NM	NE	NW	8	20	25		100	
47344-MH	1.79	ENERGY FUELS RESOURCES CORP	C/O KLEINFELDER 8300 JEFFERSON NE STE B	ALBUQUERQUE	NM	SW	NW	8	75	100		300	95
47345-MH	2.01	ENERGY FUELS RESOURCES CORP	C/O KLEINFELDER 8300 JEFFERSON NE STE B	ALBUQUERQUE	NM	NE	NE	8	50	60		139	
47346-MH	1.04	ENERGY FUELS RESOURCES CORP	C/O KLEINFELDER 8300 JEFFERSON NE STE B	ALBUQUERQUE	NM	NE	NE	17	274	294		600	
47347-MH	1.01	ENERGY FUELS RESOURCES CORP	C/O KLEINFELDER 8300 JEFFERSON NE STE B	ALBUQUERQUE	NM	NE	NW	17	459	479		488	
47832-MH	0.64	ENERGY FUELS RESOURCES CORP	C/O KLEINFELDER 8300 JEFFERSON NE STE B	ALBUQUERQUE	NM	SE	NW	17	365	425		470	343
47943-MH	1.49	ENERGY FUELS RESOURCES CORP	C/O KLEINFELDER 8300 JEFFERSON NE STE B	ALBUQUERQUE	NM	NE	SW	8					
47944-MH	1.24	ENERGY FUELS RESOURCES CORP	C/O KLEINFELDER 8300 JEFFERSON NE STE B	ALBUQUERQUE	NM	SE	SW	8	334	434		439	410
47945-MH	1.04	ENERGY FUELS RESOURCES CORP	C/O KLEINFELDER 8300 JEFFERSON NE STE B	ALBUQUERQUE	NM	NE	NE	17	297	417		422	379
48011-MH	1.49	ENERGY FUELS RESOURCES CORP	C/O GORDON SMITH & CO PO BOX 667	NUCLA	CO	NE	SW	8					
48086-MH	1.18	NUVEMCO LLC C/O LINDA CARTER	C/O O & G ENVIRONMENTAL 11 INVERNESS WAY S	ENGLEWOOD	CO	SW	NE	18					
48088-MH	0.85	NUVEMCO LLC C/O LINDA CARTER	C/O O & G ENVIRONMENTAL 11 INVERNESS WAY S	ENGLEWOOD	CO	NE	SE	18	270	300		340	290
67228-F	1.72	ENERGY FUELS RESOURCES CORP	44 UNION BLD STE 600	DENVER	CO	NW	SE	7	240	370	50	380	286
67229-F	0.64	ENERGY FUELS RESOURCES CORP	44 UNION BLD STE 600	DENVER	CO	SE	NW	17	340	410	11	420	336
67230-F	1.16	ENERGY FUELS RESOURCES CORP	44 UNION BLD STE 600	DENVER	CO	NW	NW	17	320	370	25	380	286
74659-F	0.67	ENERGY FUELS RESOURCES CORP	31161 HWY 90	NUCLA	CO	SE	NW	17			10	420	
74660-F	1.75	ENERGY FUELS RESOURCES CORP	31161 HWY 90	NUCLA	CO	NW	SE	7			68	380	
74661-F	1.20	ENERGY FUELS RESOURCES CORP	31161 HWY 90	NUCLA	CO	NW	NW	17			52	380	

9.4 Lysimeter Monitoring

Lysimeter monitoring has been conducted at the JD-8 project since January 2007. The suction lysimeter is located below the toe of the waste rock pile adjacent to the current runoff collection area (Figure 11) and was installed to a depth of 22 feet below ground surface in December 2006. The suction lysimeter is equipped with a Soilmoisture® pressure-vacuum Soil Water Sampler model 1920F1/K1, which uses a porous water cup to obtain soil water samples from both saturated and unsaturated soils at depth. The sampler is designed to remove any available water from the soil by creating a vacuum inside the sampler that is greater than the soil suction, which creates a gradient which draws water into the ceramic cup.

The purpose of lysimeter monitoring at the JD-8 Mine is to provide data on whether any localized water exists in the subsurface of the waste rock and the underlying soils, and to identify whether any potential flowpaths exist. The secondary use of the lysimeter is as an early detection system for any potential migration of constituents from the waste rock pile in the future.

The lysimeter has been sampled monthly, with few exceptions, since January 2007 until February 2011. The lysimeter was dry during all sampling events, indicating that no seepage from the waste rock pile has been detected (Table 23). The lack of seepage is consistent with the climactic data and hydrogeologic conceptual model of the site (Sections 7.2, 7.6, and 9.5) which indicate that evapotranspiration often exceeds infiltration in the area.

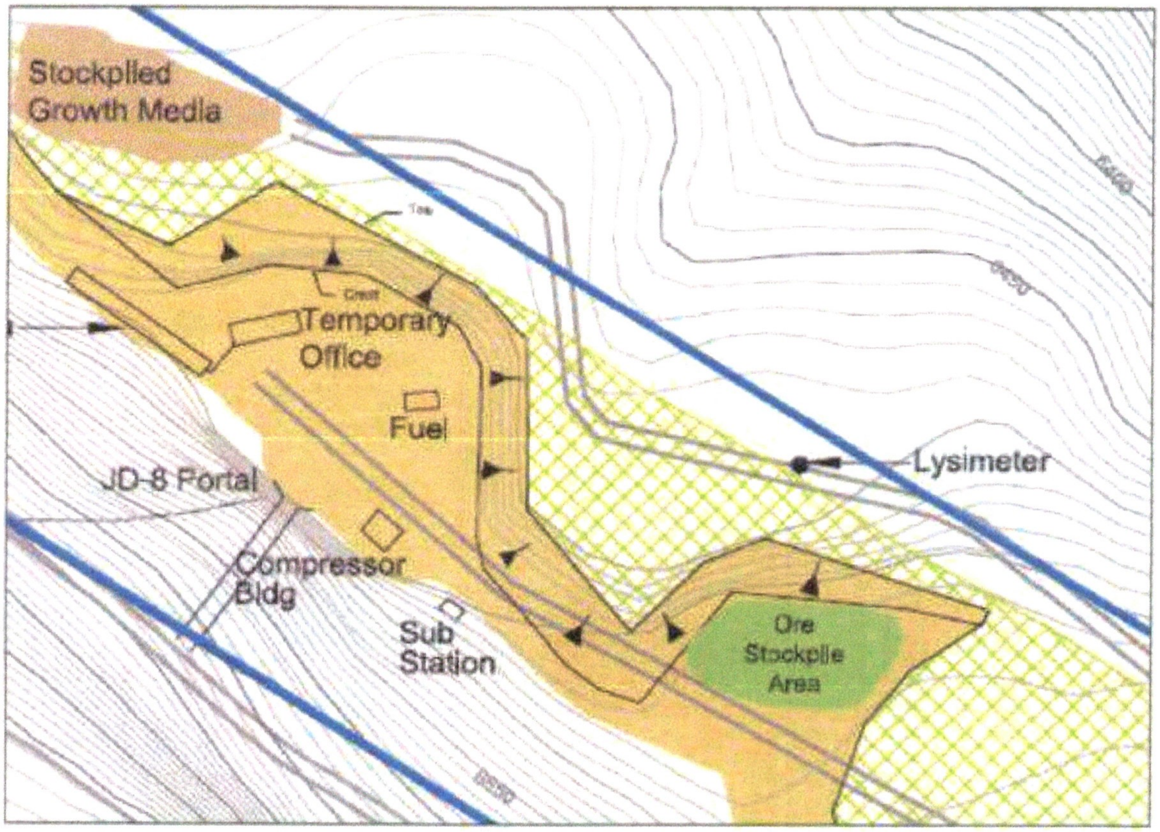

Figure 11: Lysimeter Location

Table 23: Lysimeter Monitoring Results

Date Sampled	Results	Vacuum (mmHg)
1/29/2007	No water collected	50
2/12/2007	No water collected	35
2/20/2007	No water collected	40
3/22/2007	No water collected	50
4/11/2007	No water collected	50
5/10/2007	No water collected	50
6/18/2007	No water collected	50
7/16/2007	No water collected	50
8/15/2007	No water collected	45
9/13/2007	No water collected	50
10/17/2007	No water collected	45
11/5/2007	No water collected	40
12/6/2007	No water collected	40
1/3/2008	No water collected	40
2/5/2008	No water collected	40
3/11/2008	No water collected	40
4/1/2008	No water collected	50
5/6/2008	No water collected	45
6/2/2008	No water collected	40
7/8/2008	No water collected	40
8/4/2008	No water collected	40
9/3/2008	No water collected	50
10/7/2008	No water collected	45
11/3/2008	No water collected	40
12/10/2008	No water collected	45
1/7/2009	Snowed out	
2/3/2009	No water collected	40
4/14/2009	No water collected	40
6/8/2009	No water collected	50
7/13/2009	No water collected	45
8/17/2009	No water collected	45
10/27/2009	No water collected	40
11/23/2009	No water collected	45
1/28/2010	No water collected	45
2/10/2010	No water collected	40
3/23/2010	No water collected	40
5/4/2010	No water collected	40
5/20/2010	No water collected	40
6/16/2010	No water collected	45
8/24/2010	No water collected	40
9/16/2010	No water collected	40
10/14/2010	No water collected	45
11/17/2010	No water collected	45
12/2/2010	No water collected	40
1/13/2011	No water collected	40
2/23/2011	No water collected	40

9.5 Local Hydrogeologic System

The JD-8 Mine is located on the north-facing escarpment of Monogram Mesa, on a rotated fault block of Mesozoic sedimentary rocks. The ore zone occurs in the Saltwash Member of the Morrison Formation. The Saltwash Member is confined between the overlying bentonitic mudstone of the Brushy Basin Member and the underlying mudstone and siltstone of the Summerville Formation (Weir, et al., 1983). The northwest-trending faults that parallel the Paradox Valley also transect the JD-8 Mine Lower Permit Area, parallel to the crest of Monogram Mesa. This structural setting is of particular importance in assessing hydrologic models for water flow through these geologic units.

9.5.1 Stratigraphic Units

The principal stratigraphic units at the JD-8 site include:

- Colluvium and aeolian soil as a thin veneer on the escarpment
- Brushy Basin Member Morrison Formation
- Salt Wash Member Morrison Formation
- Summerville Formation
- Entrada Sandstone

As shown previously in Figure 9, the majority of the waste rock pile overlies mudstone of the Brushy Basin Member of the Morrison Formation. The waste rock pile spans a fault, and the portion south of the fault overlies the lower beds of the Saltwash Member of the Morrison Formation (White, 2006).

9.5.2 Recharge

The facilities at the JD-8 Mine are located on the escarpment between Monogram Mesa and the floor of the Paradox Valley. This escarpment has no upgradient groundwater recharge area. The only potential source of groundwater recharge is direct precipitation onto the escarpment. The rate of recharge from direct precipitation is very low or negligible, based on several lines of evidence:

- Groundwater has not been identified in the JD-8 Mine Lower Permit Area. No seepage has been detected at the toe of the waste rock pile, in the lysimeter below the toe of the waste rock pile, or in any faults or fractures in the Lower Mine Permit Area.
- Studies have shown that diffuse recharge (rain and snowmelt over the area) to aquifers in arid basins like Paradox Valley is limited or absent due to low precipitation rates, large vadose zones, and the water-scavenging vegetation found in dry areas (Wilson and Guan 2004; Foster and Smith- Carrington 1980).
- The abandoned Black Diamond Mine, located two hundred feet below the waste rock pile, is dry. White (2006) reported that a number of small displacement faults have been found in the abandoned Black Diamond mine adit near the large fault on the down dropped block and that "these faults have no history of water flow and it is believed that they are not conduits for groundwater flow". If recharge was occurring on the escarpment, groundwater (or traces of groundwater flow) should be evident in the subsurface extent of the Black Diamond Mine.

9.5.3 Local Groundwater Occurrence and Flow Direction

Groundwater has not been identified in the JD-8 Mine Lower Permit Area. No seepage has been detected at the toe of the waste rock pile, in the lysimeter below the toe of the waste rock pile, or in any faults or fractures in the Lower Mine Permit Area.

Investigations have been performed to identify groundwater flow in the abandoned Black Diamond Mine 200 feet below the JD-8 waste rock pile. The Black Diamond mine is dry, and the small displacement faults (Figure 9) show no evidence of groundwater flow. These direct observations contrast with the assertion by Golder (2009b) that the "northwest-trending faults that parallel Davis Mesa and likely act as conduits to flow". With so little recharge area above the fault, and potential evaporation exceeding precipitation in the area, a source of water into the fault would be limited. Further, the role of fractures in unsaturated flow (on the escarpment) would be different from the role of fractures in a saturated flow regime. As described by Geoscience Services (2005), fractures behave as capillary barriers that restrict the movement of water in the unsaturated zone. This concept was used at the Piñon Ridge site in the design of evapotranspiration (ET) covers, which incorporated a capillary break using coarse-grained material with larger pore spaces.

In summary, there is no observed evidence for downward vertical flow at the JD-8 Lower Mine Permit Area. The recharge zone is limited to the area receiving direct precipitation and snowmelt. Potential evaporation exceeds precipitation, and any excess water that occurs temporarily is likely to run off due to the steep slopes in the area. Surface water runoff is addressed in Attachment 4 of the EPP.

9.5.4 Groundwater Quality

Groundwater has not been encountered at the JD-8 Mine Lower Permit Area. Therefore, site-specific water quality data are not available. However, groundwater investigations at the Piñon Ridge project, located 2.2 miles from the JD-8 site, indicated that two general types of groundwater quality were identified. Groundwater at the contact of the Moenkopi/Chinle is characterized by near neutral pH values (pH approximately 7 to 8), total dissolved solids (TDS) concentrations between 590 and 1,030 mg/L, and alkalinity between 154 and 250 mg/L as $CaCO_3$ (Golder, 2009b). Groundwater near the Hermosa/Chinle contact is characterized by higher TDS concentrations (1,140 to 3,040 mg/L), primarily due to higher concentrations of sulfate (1,070 to 1,810 mg/L) (Golder, 2009b). These results represent the water quality in the "middle confining units" between the upper Mesozoic aquifer (missing in the central portion of Paradox Valley) and the lower Paleozoic carbonate aquifer.

Weir, et al., (1983) reported that total dissolved solids in the alluvium of the Paradox Basin ranged from 302 to 1,560 mg/L, with an average of 770 mg/L. These concentrations exceed Secondary Maximum Contaminant Levels (SMCLs) established for drinking water. Alluvial groundwater, where it occurs, is a calcium sulfate or calcium bicarbonate type water, with sodium concentrations of 130 mg/L or less (Weir, et al., 1983).

Weir, et al., (1983) reported that the upper Mesozoic aquifer is typically a calcium bicarbonate water containing varying concentrations of sulfate and that "water from units containing abundant shale, such as the Mesaverde Group, Mancos Shale, and Brushy Basin Member of the Morrison Formation is typically a sodium bicarbonate water containing sulfate or chloride." The range of dissolved solids reported by Weir, et al. (1983) for the Morrison Formation was 1,260 to 4,040 mg/L with sulfate ranging from 310 to 1,200 mg/L. These TDS and sulfate values naturally exceed SMCLs for drinking water and are comparable to the SPLP results from the JD-8 Mine described in Section 5.2.3.

10. CONSTRUCTION SCHEDULE

Rule 6.4.21(15) requires that the Operator submit construction schedule information for all Environmental Protection Facilities designed to contain or transport toxic or acid-forming materials or designated chemicals used in the extractive metallurgical process and all facilities proposed to contain, hold, or dispose of material that has the potential to cause acid mine drainage. At the JD-8 Mine, the Environmental Protection Facilities requiring construction schedule information include the waste rock piles, temporary ore storage pile, planned stormwater impoundment, and diesel fuel storage area. The construction schedule is provided in Table 24.

Table 24: Construction Schedule

Dates	Activity	Status
2005-present	Maintenance of existing stormwater BMPs	Ongoing
2006	Lysimeter installation	Complete
Jan 2007-2011	Lysimeter monitoring	Complete
Feb 2011	Relocation of temporary ore stockpile into underground storage area	Complete
2027	Retention pond 1 and spillway construction	Pending (contingent of DRMS approval of Drainage Design Plan)
2027	Retention pond 2 and spillway/culvert construction/installation	Pending (contingent of DRMS approval of Drainage Design Plan)
TBD	Implementation of operational stormwater BMP	Pending (contingent on mine buildout)
TBD	Reconstruction of temporary ore storage pile	Pending (contingent of resumption of active mining status)
TBD	Sealing of mine portals	Pending (post mining)
TBD	Decommissioning of fuel storage area	Pending (post mining)
TBD	Implementation of post-mining BMPs	Pending (post mining)
TBD	Waste rock pile final reclamation	Pending (post mining)

TBD - To Be Determined

11. SOILS STOCKPILE AND REVEGETATION

Revegetation is part of the mine Reclamation Plan. As such, Rule 6.4.21(17) requires that the Operator provide the following information to assure that acceptable plant growth medium is preserved and to determine what soil amendments may be necessary to promote reclamation:

a) A soil survey map of the proposed affected area that delineates soil units, soil texture, estimated cubic yards of soil and subsoils available for reclamation and if saved, where such material will be stockpiled for reclamation;
b) Such map shall be based on site-specific soils investigations and shall be on such a scale as to provide a basis for soil management recommendations and be the same scale as the reclamation map; and
c) For each soil map unit, provide in tabular form, all data from analyses of representative samples of surface and subsurface soil units as to
    i. soil pH, texture, electrical conductivity, sodium adsorption ratio and any other parameters that the Operator/Applicant or Office deems necessary for proper soils characterization;
    ii. indicate on a map, or in the soils narrative, the location of each soil unit on the affected area where the above soil characteristics may be problematic as to suitability for a plant growth medium; and
    iii. type, form and amounts of any soil amendments that may be necessary or recommended by the local Soil Conservation Service, Soil Conservation District, or other qualified special district, and standard soil laboratory analyses and fertilizer recommendations (if available) for the types of plant species proposed to be established; or

iv. provide, as an alternative, a plan of experiments to determine the type, form and amount of any soil amendments that may be necessary to fulfill the requirements of the Reclamation Plan.

11.1 Soils

Topsoil and growth media designated for use for revegetation was stockpiled during initial mine development. The location of the soils stockpile is shown in Map 2. Volumetric estimates based on GPS mapping of the toe, crest, and height of the stockpile indicate that 1,680 cyds of topsoil and growth media are currently contained in the topsoil stockpile.

The soil types within the JD-8 Mine lower permit boundary and surrounding area are shown on Map 4. Soil properties, including texture, pH, electrical conductivity and sodium adsorption ratio for soil types in the study area are shown in Table 25. The soil data was derived from the Soil SURvey Geographic (SSURGO) data set for CO641: San Miguel Area, Colorado, Parts of Dolores, Montrose, and San Miguel Counties (NRCS, 2011), which was downloaded from the federal Soil Data Mart online database. The SSURGO data set is a digital soil survey and is the most detailed level of soil geographic data developed by the National Cooperative Soil Survey.

The JD-8 Mine Lower Permit Area is located on the steep north-facing escarpment of Monogram Mesa, with significant rock outcrop and thin soil cover. The dominant soil types within the JD-8 Mine lower permit boundary are the Bodot and Ustic Torriorthents soils, which are shown as Unit 23 on Map 4. These soils are classified as fine, montmorillonitic, calcareous, mesic Ustic Torriorthents. Soil pH ranges from 7.9 to 9.0. Soil salinity ranges from 0 to 8.0 mmhos/cm while sodium adsorption ratios (SAR) for soils in the study area range from 0 to 10. The site is mapped as Hydrologic Soil Group C (NRCS. 2011). Group C soils are defined as:

> ***Group C:*** *Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.*

Table 25: Soil Types in Vicinity of the JD-8 Mine

Map Unit	Soil Name	Taxonomic Classification	Depth (*in*)	pH (*s.u.*)	Salinity (*mmhos/cm*)	Sodium Adsorption Ratio
23	Bodot, dry.	Fine, montmorillonitic (calcareous), mesic Ustic Torriorthents	0-3	7.9 - 8.4	0.0	0
			3-30	8.5 - 9.0	2.0-8.0	0-10
			30-34	---	---	---
	Ustic Torriorthents	Ustic Torriorthents	0-4	7.9 - 8.4	0.0-2.0	0
			4-31	7.9 - 8.4	0.0-2.0	0
			31-35	---	---	---
45	Gladel	Loamy, mixed (calcareous), mesic Lithic Ustic Torriorthents	0-8	7.4 - 8.4	0.0-2.0	0
			8-12	---	---	---
	Bond	Loamy, mixed, mesic Lithic Ustollic Haplargids	0-3	6.6 - 7.8	0.0-2.0	0-5
			3-16	6.6 - 8.4	0.0-2.0	0-5
			16-20	---	---	---
	Rock outcrop	---	0-60	---	---	---
60	Monogram	Fine-silty, mixed, mesic Ustollic Haplargids	0-3	6.6 - 7.8	0.0	0
			3-14	6.6 - 7.8	0.0-2.0	0
			14-28	7.9 - 8.4	0.0-2.0	0-10
			28-60	7.9 - 8.4	0.0-2.0	0-10
75	Piñon, cool	Loamy, mixed, mesic Lithic Ustollic Calciorthids	0-5	7.4 - 8.4	0.0-2.0	0
			5-16	7.9 - 8.4	0.0-2.0	0
			16-20	---	---	---
	Bowdish, cool	Fine-loamy, mixed, mesic Ustollic Calciorthids	0-5	7.4 - 8.4	0.0-2.0	0
			5-12	7.9 - 8.4	0.0-4.0	0
			12-23	7.9 - 9.0	0.0-4.0	0-10
			23-27	---	---	---
	Progresso, cool	Fine-loamy, mixed, mesic Ustollic Haplargids	0-7	7.4 - 7.8	0.0	0
			7-14	7.4 - 7.8	0.0	0
			14-24	7.9 - 8.4	0.0-2.0	0
			24-36	7.9 - 8.4	0.0-2.0	0
			36-40	---	---	---
87	Rock outcrop	---	0-60	---	---	---
88	Rock outcrop	---	0-60	---	---	---
	Orthents	Orthents	0-1	7.9 - 8.4	0.0	0
			1-14	7.9 - 8.4	0.0-2.0	0
			14-24	7.9 - 8.4	0.0-2.0	0
			24-60	7.9 - 8.4	0.0-2.0	0

11.2 Reseeding Specifications

The reclamation seed mix was specified by DOE for DOE uranium leasing sites. The seed mixture was developed in consultation with U.S. Bureau of Land Management and is generally approved for use within the Slick Rock, Naturita, Uravan, and Gateway, Colorado areas. Seed selection criteria were based on climate and elevation ranges within these areas. All seed tags must be submitted to DOE for verification prior to the seed application.

Table 26: Reseeding Mix for DOE Uranium Leasing Sites

Species		Broadcast Application Rate (lb.PLS/acre)
Scientific Name	Common Name	
Pascopyrum smithii	Arriba western wheatgrass	4.0
Elymus trachycaulus ssp. *trachycaulus*	Slender wheatgrass	2.0
Achnatherum hymenoides	Paloma or Rimrock Indian Ricegrass	3.0
Bouteloua gracilis	Hachita blue grama	2.0
Pleuraphis jamesii (florets)	James' galleta	2.0
Hesperostipa comata ssp. *comata*	Needle and thread	1.0
Nassella viridula	Lodorm green needlegrass	2.0
Achillea millefolium var. *occidentalis*	Western yarrow	0.1
Dieteria bigelovii var. *bigelovii*	Bigelow's tansyaster	0.1
Dieteria canescens	Hoary tansyaster	0.1
Heliomeris multiflora	Showy goldeneye	0.1
Helianthus annuus	Common sunflower	1.0
Linum lewisii	Lewis flax	1.0
Penstemon cyanocaulis	Bluestem beardtongue	0.5
Peritoma serrulata	Rocky Mountain beeplant	1.0
Sphaeralcea coccinea or Sphaeralcea parvifolia	Scarlet or small-leaf globemallow	0.3
Atriplex canescens	Fourwing saltbush	2.0
Krascheninnikovia lanata	Winterfat	1.0
	Total pounds per live seed per acre	**23.2**

As specified by the DOE:

a) Seeding immediately following placement of soil before crust formation, preferably in the spring or fall.
b) Seed shall be broadcast at the specified application rate and covered (except pocked surfaces) using a drag bar, chain link, or packer wheels. If seed is drilled, use one-half the broadcast rate.
c) Revegetation efforts on the disturbed areas will be considered satisfactory when:
    i. Soil erosion from the operation has been stabilized; and
    ii. A vegetative cover at least equal to that present prior to the disturbance and a plant species composition at least as desirable as that present prior to the disturbance has been established.

12. WILDLIFE PROTECTIONS

Rule 6.4.21(18) requires the mine operator to describe measures to minimize or prevent harm or damage to wildlife species and habitat, including:

- Mitigation measures to ensure that there is no overall net loss of critical or important wildlife habitat consistent with State of Colorado Division of Wildlife (DOW) and United States Fish and Wildlife Service (USFWS) recommendations, if any; and

- Measures to prevent wildlife from coming into contact with designated chemicals, toxic or acid-forming materials or areas with acid mine drainage.

12.1 Wildlife Species

A wildlife survey was performed in 2024 of several DOE lease sites including JD-8 (Travsky, 2024). The Threatened, endangered, and candidate species that could potentially be affected by the project include: the gray wolf, yellow-billed cuckoo, Gunnison sage-grouse, Mexican spotted owl, Colorado pikeminnow, bonytail, humpback chub, razorback sucker, monarch butterfly and silverspot butterfly (Travsky, 2024). The lease area is currently outside of gray wolf range, and none of the other species are likely to be found in the vicinity of JD-8 due to lack of suitable habitat. Raptors potentially in the area include: the golden eagle, burrowing owl, northern harrier and prairie falcon. The rock outcrop near the JD-8 portal, could potentially be suitable for nesting, but no raptor nests were observed (Travsky, 2024). Burrowing owls nest in extensive prairie dog colonies and none were present. Colorado Division of Wildlife (DOW, 2011) indicated that small numbers of mule deer and elk are in the area throughout the year, and the mine lies within mapped winter range for mule deer and severe winter range for elk. During the Travsky (2024) survey mule deer and elk sign was present but no individuals were observed. Suitable habitat at JD-8 is available for at least 7 bat species of concern from the CODEX database, guano was present in the portal but no bats were seen (Travsky, 2024).

All of Montrose County is located within the Principal Western Route of the Pacific Flyway migratory bird route. The Pacific Flyway is the geographic area extending west of the continental divide to the Pacific Ocean. Most migratory species utilize waterways and water courses as travel corridors. The JD-8 site is primarily located above the valley floor of the Paradox Basin, several miles from the Dolores River and Paradox Creek. Therefore, the isolated occurrences of transitory species (i.e. terrestrial wildlife, eagles, hawks, owls, shorebirds. waterfowl and near-arctic birds) that migrate along the local water courses are not expected to occupy the JD-8 mine site.

12.2 Mitigation Measures for Wildlife Protection

The following measures have been, or will be implemented to minimize or prevent potential harm to wildlife species and habitat:

- Wildlife are prevented from accessing the underground workings at the JD-8 mine by a double-locked steel gate while the mine is in the inactive phase of intermittent status.
- DOE mitigation measures from the Final Uranium Leasing Program Programmatic Environmental Impact Statement (ULP PEIS) will be used to minimize or avoid the impacts to bats during mine renewal or reclamation activities.
- Noxious weeds are controlled during the current intermittent phase of mining and weed control will continue throughout the project. Noxious weed control is recommended by DOW for the preservation of the ecosystem and the survival of native plants and the wildlife that depend on them.
- If water quality in surface runoff impoundments is deemed suitable for wildlife, based on Colorado agricultural water quality standards, surface impoundments constructed for the collection of stormwater runoff may serve as a local water source for wildlife.

13. CONCLUSIONS

The JD-8 Mine is currently in "intermittent status" and is not producing ore. Ore production is expected to resume at a future date (as yet to be determined). This EPP has addressed the facilities in the Lower Mine Permit Area, which includes disturbance on the Doagy No. 2 and Opera Box claims, in both the current (intermittent) and future (active) mining conditions. Although the mine permit includes a proposed upper affected area on the DOE JD-8 lease tract, the permitted surface area in the upper lease tract has not been affected at this time. Cotter re-designed the lower mine waste pile and Highbury anticipates that the proposed upper affected area on top of Monogram Mesa for the mine waste pile and ore storage pad will not be required at this time. However, if the upper mine waste area and ore storage pad are required in the future, the EPP will be updated to address this area prior to any new disturbance on the DOE lease tract.

EPP facilities include the waste rock piles, temporary ore storage pile, and fuel storage area. The Designated Chemicals Evaluation (Section 5) indicated that the waste rock pile has the potential to leach gross alpha in excess of the maximum contaminant level (MCL) for drinking water. SPLP results also indicate that the waste rock pile could leach sulfate and TDS in concentrations exceeding aesthetic drinking water standards (SMCLs) for sulfate and TDS, as well as potentially exceeding Colorado agricultural standards for vanadium. Previous modeling has shown that it could take over 1,000 years for constituents to migrate vertically to the Entrada sandstone aquifer some 400 feet below the JD-8 waste rock pile. Meteorological data indicate that potential evaporation exceeds precipitation in the region; thus infiltration and leaching from the waste rock and ore pile will be limited by the availability of water to migrate through the piles. Capping of the waste rock pile is expected to further reduce infiltration from the existing (uncapped) condition.

Stormwater management has been identified as an important component of the JD-8 Mine EPP. The Stormwater Management Plan and Drainage Plan (provided in Attachment 4) describe the engineering practices and BMPs currently in use and planned for future operations at the mine. Stormwater runoff control structures will be engineered, constructed, and maintained to minimize erosion and sediment transport.

The EPP also describes the site soils and stockpiled growth media, along with a seed mix for revegetation to achieve the post-mining land use of grazing and wildlife habitat. Descriptions of wildlife and mitigation measures for the protection of wildlife are also addressed.

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