

DEPARTMENT OF ENVIRONMENTAL QUALITY
Environmental Assessment

Permitting and Compliance Division
Water Protection Bureau

Name of Project: Madison Mine

Type of Project: Underground Gold
and Copper Mine

Location of Project: 1/4 NW, Section 2, Township 2 S, Range 6 W

City/Town: Silver Star

County: Madison County

Description of Project: (Summary of Proposed Action):

Coronado Resources USA, LLC proposes to lower the ground water in a mineralized zone to facilitate underground mining. The extracted ground water would be discharged to the shallow unconfined aquifer. The project, the Madison Mine, is located on private land, near Silver Star.

The extracted ground water will be discharged to Class I ground water through two percolation ponds (Outfall 001). The percolation ponds are constructed in Tom Benton Gulch, an ephemeral drainage to Cherry Creek (a perennial stream that discharges to the Jefferson River). Primary settling will occur in the percolation ponds; the applicant does not propose any further treatment. The proposal is to pump water from a dewatering well, developed above the portal, convey this water in a 6" polyethylene pipe laid on the surface of the ground, approximately 1 mile downgradient, across 4,440 feet of federal land managed by the Bureau of Land Management (BLM), to land owned by Coronado, and to discharge this water into percolation ponds, excavated to a depth of approximately 15' into alluvial gravels (EA for Exploration license # 00660). Dewatering needs are expected to range from 30-225 gallons per minute (gpm), based on pond storage and seasonal effects. The average flow reported on the application as 75 gpm.

The proposed MGWPCS permit does not allow wastewater produced during mining (e.g. from drilling and blasting activities) to be discharged through Outfall 001. The submitted application materials did not request a discharge location for mine wastewater. Ground water extracted ahead of the mining may contain blasting agent residuals.

Agency Action and Applicable Regulations: The proposed action is to issue an individual MGWPCS permit that has effluent limits and effluent monitoring requirements. The permit is issued under the authority of the Montana Water Quality Act 75-5-101 *et seq.* Montana Ground Water Pollution Control System Administrative Rules of Montana (ARM) 17.30.1001-1070, and Montana Numeric Water Quality Standards in the Department Circular DEQ-7 (February 2008).

The project has approval under the Montana Metal Mine Reclamation Act. For exploration, the project license is #0066. The Small Miner Exclusion Statement is #25-167.

Summary of Issues: The purpose of this action is to regulate the discharges of pollutants to state waters from the regulated facility. Issuance of an individual permit will require the applicant to implement monitor and management practices to prevent pollution and degradation of groundwater.

Affected Environment & Impacts of the Proposed Project:

Y = Impacts may occur (explain under Potential Impacts).

N = Not present or No Impact will likely occur.

IMPACTS ON THE PHYSICAL ENVIRONMENT

RESOURCE	[Y/N] POTENTIAL IMPACTS AND MITIGATION MEASURES
<p>1. GEOLOGY AND SOIL QUALITY, STABILITY AND MOISTURE: Are soils present which are fragile, erosive, susceptible to compaction, or unstable? Are there unusual or unstable geologic features? Are there special reclamation considerations?</p>	<p>[N] The applicant provided basic soil information specific to the location of the percolation ponds; the ponds are located in a well graded alluvium consisting of fine sand to rounded boulders. Well logs show that alluvium in the area is about 30 feet thick and is underlain by silty sand with occasional gravel. A percolation test indicated infiltration is about 12.5 gpm in the alluvium. The ponds were sized to infiltrate 100 gpm.</p> <p>The USDA NRCS soils map shows that the Yetull loamy sand underlies the area of the percolation ponds. The Yetull is described as being a sandy and gravelly alluvium derived from schist and/or gneiss and granite. It is somewhat excessively drained and has a high to very high capacity to transit water. For rapid infiltration, it is rated as “somewhat limited”, which the NRCS has broadly defined as indicating that the soil has features that are “moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected”.</p>
<p>2. WATER QUALITY, QUANTITY AND DISTRIBUTION: Are important surface or groundwater resources present? Is there potential for violation of ambient water quality standards, drinking water maximum contaminant levels, or degradation of water quality?</p>	<p>[Y] The shallow unconfined aquifer is used for drinking water wells installed downgradient of the disposal location. The applicant supplied site specific hydrogeological data. The applicant included a ground water contour map that was produced in August 2007 based on water levels measured in the monitoring wells and near-by private wells. In reviewing the contour map and the topography, ground water flow is due east under the path of Tom Benton Gulch. Approximately 1,000 feet downgradient of the ponds (near the monitoring wells), the gulch widens as it meets Cherry Creek and its flood plane. In this area, the ground water contours indicate that ground water is moving southeast with bearing of S 45°E. Near the town of Silver Star, the contours show the shallow ground water flowing due south to the Jefferson River. The applicant reported that Cherry Creek is located 3,140 feet east of and the Jefferson River is 3,950 feet east-south east of the infiltration ponds.</p> <p>The applicant completed slug test on its two monitoring wells. The calculated hydraulic conductivity (K) is 0.03 to 0.05 feet/day (Water and Environmental Technologies, 2007). Based on the average K (0.04 feet/day), the applicant estimated that discharged water from the infiltration ponds would reach the nearest downgradient private well in 640 years.</p> <p>Ground water quality samples have been collected monthly from the two monitoring wells located downgradient of the infiltration ponds. These water quality data were summarized in the statement of basis for the MGWPCS permit. Specific conductivity (SC) values from the wells ranged from 736 to 974 µS/cm with a reported average of 811 µS/cm. Ground water that is less than 1,000 µS/cm at 25°C is classified as Class I ground water, which must be maintained suitable for public and private water supplies, culinary and food processing, irrigation, commercial and industrial purposes, drinking water for livestock and wildlife, with little or no treatment. Human health</p>

IMPACTS ON THE PHYSICAL ENVIRONMENT

	standards listed in DEQ Circular 7 (February 2008) apply to concentrations of dissolved substances in Class I ground water. In addition, the discharge is considered a new source under the Montana Nondegradation Policy. Effluent limits in the permit were calculated based on nonsignificance criteria and the values used are provided in the statement of basis for the permit.
3. AIR QUALITY: Will pollutants or particulate be produced? Is the project influenced by air quality regulations or zones (Class I airshed)?	[N] Ore hauling could generate road dust and diesel particulate increases around the mine site. There are no residences along the roads around the mine site or percolation ponds. See the 2006 Department EA for the exploration license 00660 for further information.
4. VEGETATION COVER, QUANTITY AND QUALITY: Will vegetative communities be significantly impacted? Are any rare plants or cover types present?	[N] The area of the percolation ponds was historically used for grazing. A search of the Natural Heritage Program database indicated one plant species, Parry's Fleabane, classified by the BLM as "sensitive", was documented in the near vicinity of the percolation ponds. See the 2006 Department EA for the exploration license 00660 for further information.
5. TERRESTRIAL, AVIAN AND AQUATIC LIFE AND HABITATS: Is there substantial use of the area by important wildlife, birds or fish?	[N] See the 2006 Department EA for the exploration license 00660 for further information.
6. UNIQUE, ENDANGERED, FRAGILE OR LIMITED ENVIRONMENTAL RESOURCES: Are any federally listed threatened or endangered species or identified habitat present? Any wetlands? Species of special concern?	[N] A search of the Natural Heritage Program database indicates two species of vertebrate animals are present in the area of the percolation ponds – the Canada Lynx, listed as "threatened" with the FS and "special status" with the BLM; and the Wolverine, listed as "sensitive" by both FS and BLM. Both species have a state ranking as "S3" which means "Potentially at risk because of limited and/or declining numbers, range, and/or habitat, even though it may be abundant in some areas" (NRIS, 2009). The percolation ponds are not located in an area that has been designated as "critical habitat" for the lynx. Lynx prefer areas that include boreal forest landscapes that provide snowshoe hares for prey, abundant large, woody debris piles that are used as dens, and winter snow conditions that are generally deep and fluffy for extended periods of time (US FWS, 2008). The area of the percolation ponds are dominated by prairie species (sage brush, grasses, and perennials). Critical wolverine habitat differs based on season (US FWS, 2007). During the summer months, wolverines move to high-elevation habitats looking for cooler temperatures. During winter months, they move to lower elevations, perhaps following the supply of carrion. Recreation, timber harvest, or livestock grazing could alter the use by wolverines of certain areas.
7. HISTORICAL AND ARCHAEOLOGICAL SITES: Are any historical, archaeological or paleontological resources present?	[N] The area where the mine site sits has buildings listed with the State Historic Preservation Office (SHPO). However, all of the old buildings are on land that does not belong to the applicant. The 2006 Department EA stated that "a BLM archeologist inspected the proposed pipeline right-of-way, and no historical, archaeological, or paleontological resources were observed". Please refer to the 2006 EA for further information.
8. AESTHETICS: Is the project on a prominent topographic feature? Will it be visible from populated or scenic areas? Will there be excessive noise or light?	[N] The percolation ponds are located in a drainage and are not readily visible except from above as viewed from short stretches of the adjacent BLM road. See the Department 2006 EA for more information.
9. DEMANDS ON ENVIRONMENTAL	[N] As the dewatering well is operated, it will create a drawdown

IMPACTS ON THE PHYSICAL ENVIRONMENT

RESOURCES OF LAND, WATER, AIR OR ENERGY: Will the project use resources that are limited in the area? Are there other activities nearby that will affect the project? Will new or upgraded powerline or other energy source be needed)	cone around the mine. The pumping has likely stabilized the cone and no change from the existing drawdown effects are expected. The infiltration ponds could change (steepen) the local ground water gradient; the monitoring wells located 1,000' downgradient have shown very little change in water levels. As the distance from the ponds increases, the impacts will diminish.
10. IMPACTS ON OTHER ENVIRONMENTAL RESOURCES: Are there other activities nearby that will affect the project?	[N] No significant impacts have been identified during EA preparation.

IMPACTS ON THE HUMAN ENVIRONMENT

RESOURCE	[Y/N] POTENTIAL IMPACTS AND MITIGATION MEASURES
11. HUMAN HEALTH AND SAFETY: Will this project add to health and safety risks in the area?	[N] No significant impacts have been identified during EA preparation. The permit contains effluent limits that protect water quality and the receiving water beneficial uses, including human health.
12. INDUSTRIAL, COMMERCIAL AND AGRICULTURAL ACTIVITIES AND PRODUCTION: Will the project add to or alter these activities?	[N] No significant impacts have been identified during EA preparation. Refer to the Department's 2006 EA for further details.
13. QUANTITY AND DISTRIBUTION OF EMPLOYMENT: Will the project create, move or eliminate jobs? If so, estimated number.	[N] No significant impacts have been identified during EA preparation. Refer to the Department's 2006 EA for further details.
14. LOCAL AND STATE TAX BASE AND TAX REVENUES: Will the project create or eliminate tax revenue?	[N] No significant impacts have been identified during EA preparation. Refer to the Department's 2006 EA for further details.
15. DEMAND FOR GOVERNMENT SERVICES: Will substantial traffic be added to existing roads? Will other services (fire protection, police, schools, etc.) be needed?	[N] No significant impacts have been identified during EA preparation. Refer to the Department's 2006 EA for further details.
16. LOCALLY ADOPTED ENVIRONMENTAL PLANS AND GOALS: Are there State, County, City, USFS, BLM, Tribal, etc. zoning or management plans in effect?	[N] No significant impacts have been identified during EA preparation. Refer to the Department's 2006 EA for further details.
17. ACCESS TO AND QUALITY OF RECREATIONAL AND WILDERNESS ACTIVITIES: Are wilderness or recreational areas nearby or accessed through this tract? Is there recreational potential within the tract?	[N] No significant impacts have been identified during EA preparation. Refer to the Department's 2006 EA for further details.
18. DENSITY AND DISTRIBUTION OF POPULATION AND HOUSING: Will the project add to the population and require additional housing?	[N] No significant impacts have been identified during EA preparation. Refer to the Department's 2006 EA for further details.
19. SOCIAL STRUCTURES AND MORES: Is some disruption of native or traditional lifestyles or communities possible?	[N] No significant impacts have been identified during EA preparation. Refer to the Department's 2006 EA for further details.
20. CULTURAL UNIQUENESS AND DIVERSITY: Will the action cause a shift in some unique quality of the area?	[N] No significant impacts have been identified during EA preparation. Refer to the Department's 2006 EA for further details.

IMPACTS ON THE HUMAN ENVIRONMENT	
RESOURCE	[Y/N] POTENTIAL IMPACTS AND MITIGATION MEASURES
21. OTHER APPROPRIATE SOCIAL AND ECONOMIC CIRCUMSTANCES:	[N] No significant impacts have been identified during EA preparation. Refer to the Department's 2006 EA for further details.
22(a). PRIVATE PROPERTY IMPACTS: Are we regulating the use of private property under a regulatory statute adopted pursuant to the police power of the state? (Property management, grants of financial assistance, and the exercise of the power of eminent domain are not within this category.) If not, no further analysis is required.	[N] No significant impacts have been identified during EA preparation. Refer to the Department's 2006 EA for further details.
22(b). PRIVATE PROPERTY IMPACTS: Is the agency proposing to deny the application or condition the approval in a way that restricts the use of the regulated person's private property? If not, no further analysis is required.	[N/A] see 22 a.
22(c). PRIVATE PROPERTY IMPACTS: If the answer to 21(b) is affirmative, does the agency have legal discretion to impose or not impose the proposed restriction or discretion as to how the restriction will be imposed? If not, no further analysis is required. If so, the agency must determine if there are alternatives that would reduce, minimize or eliminate the restriction on the use of private property, and analyze such alternatives. The agency must disclose the potential costs of identified restrictions.	[N/A] see 22 a.

23. Description of and Impacts of other Alternatives Considered:

A. No Action: Under the 'No Action' alternative the Department would not issue an individual ground water discharge permit under the Montana Ground Water Pollution Control System administrative rules.

B. Approval with modification: The Department has not identified any necessary modifications to grant approval.

24. Summary of Magnitude and Significance of Potential Impacts: Impacts were assessed with the assumption that the permittee will comply with the terms and conditions of the permit. Violations of the permit could lead to significant adverse impacts to state waters. In preparing permit effluent limits, the Department has taken steps to ensure that beneficial uses of the receiving water are preserved and exceedance of water quality standards will not occur, which includes that the discharge will remain "nonsignificant", as required by ARM 17.30.subchapter 7 "Nondegradation of Water Quality". The Department provides assistance to applicants in understanding and implementing the requirements of the permit and conducts periodic inspections of permitted facilities, where potential problems with design or management practices might be identified. If violations of the permit do occur, the Department will take appropriate action under the

water quality act (Section 75-5-617, MCA). Enforcement sanctions for violations of the permit include injunctions, civil and administrative penalties, and cleanup orders.

- 25. Cumulative Effects: The issuance of this individual MGWPCS discharge permit would not have cumulative effects because the permit prohibits pollution and degradation of state waters.
- 26. Preferred Action Alternative and Rationale: The preferred action is to issue the individual MGWPCS discharge permit. This action is preferred because the permit provides a regulatory mechanism for protecting ground water quality by applying effluent limits and monitoring requirements to the discharged wastewater.

Recommendation for Further Environmental Analysis:

EIS More Detailed EA No Further Analysis

Rationale for Recommendation:

- 27. Public Involvement: A 30-day public comment period will be from February 9 through March 11, 2009. A public hearing is not scheduled.
- 28. Persons and agencies consulted in the preparation of this analysis:
Damon Murdo, Cultural Records Manager, State Historic Preservation Office
Montana Natural Heritage Program

EA Checklist Prepared By:

Rebecca Ridenour

January 29, 2009

Approved By:

Jenny Chambers, Chief
Water Protection Bureau

Date