FACT SHEET
(Pursuant to Nevada Administrative Code (NAC) 445A.401)

Permittee Name: **Au-Reka Gold Corporation**

Project Name: **Cove Helen Rapid Infiltration Basins**

Permit Number: **NEV2010107**
Review Type/Year/Revision: **Renewal 2016, Fact Sheet Revision 00**

A. Location and General Description

Location: The Cove Helen Rapid Infiltration Basins are located in the Fish Creek Mountains within the historic McCoy Mining District. The Project site is approximately 32 miles southwest of Battle Mountain and 57 miles northwest of Austin, in Lander County, Nevada. The Project is located entirely on public land administered by the U.S. Bureau of Land Management (BLM), Battle Mountain District – Mount Lewis Field Office.

The Rapid Infiltration Basins (RIBs) occupy a portion of the historic McCoy/Cove mine site (now closed), within all or portions of Sections 1, 2, 11, and 12, Township 28 North (T28N), Range 42 East (R42E); Sections 5, 6, 7, and 8, T28N, R43E; Sections 25, 26, 35, and 36, T28N, R42E; and Sections 30 and 31, T29N, R43E, Mount Diablo Baseline and Meridian.. The disturbance for the Cove Helen RIBs is approximately 18 acres. The total disturbance for the Cove Helen Underground Exploration Project and RIBs is approximately 367 acres.

A minerals lease and agreement between the current Permittee (Au-Reka Gold Corporation) and Newmont Mining Corporation (Newmont) allows the Permittee to lease a portion of the McCoy/Cove mine site (e.g. Cove Helen Project site (Water Pollution Control Permit (WPCP) NEV2010102) for mineral exploration and to infiltrate excess mine water.

Site Access: From central Battle Mountain, proceed south approximately 32 miles on State Route (SR)-305 to McCoy Mine Road. Turn west on McCoy Mine Road and proceed to the mine site, a distance of approximately 6 miles. From Austin, proceed north approximately 57 miles SR-305 to McCoy Mine Road. Turn west on McCoy Mine Road and proceed to the mine site, a distance of approximately 6 miles.

General Description: The Cove Helen RIBs are intended to manage and reintroduce excess dewatering water that is not currently consumed by the Cove Helen Underground Exploration Project (WPCP NEV2010102) into the local groundwater basin. The Permittee is authorized to infiltrate up to 3,600,000 gallons of dewatering water daily. However, during the initial decline development phase, the Permittee estimates that between 593,000 and 1,705,000 gallons per day (gpd) of dewatering water will need to be managed. Of this amount, the Permittee anticipates that between 524,000 and 1,619,000 gpd of dewatering water will be disposed of via RIBs. The RIBs are designed to be constructed, operated (except for the discharge authorized by the Permit), and closed without any discharge or release in excess of those standards established in the Permit or in regulation except for meteorological events, which exceed the design storm event.

The Permittee is not authorized to dispose or treat Petroleum-Contaminated Soil (PCS) at the project or RIB site without first obtaining an approved PCS Management Plan.

B. Synopsis

Dewatering History: In 1989, groundwater was first encountered in the Cove Pit at an elevation of 4,660 feet above mean sea level (ft amsl), facilitating the need for removal (dewatering). In an effort to return dewatering water to the aquifer, Echo Bay Mines Limited (Echo Bay) received authorization from the Division in 1989 for the two-phase construction of 23 RIBs at the McCoy/Cove facility (WPCP NEV0088009, now permanently closed and terminated). Phase I included the construction of 14 RIBs, while Phase II included the construction of 9 additional RIBs. With the exception of a small quantity of water used in processing and dust suppression for mining activities, the dewatering water was conveyed to the RIBs, located north and downgradient of the site, and infiltrated into the alluvial aquifer. Over the next several years, a total of 23 dewatering wells and two in-pit pumping stations were also installed in and around the open pit to facilitate dewatering.

In 1994, Echo Bay received authorization from the Division for the construction of 16 additional RIBs. Infiltration rates reached their peak of 27,360,000 gpd in 1995. By 2000, the rate had decreased to approximately 19,300,000 gpd. Underground mining at McCoy/Cove continued until July 2001. By 2002, all dewatering wells had been abandoned per Nevada Division of Water Resources (NDWR) regulations and all RIBs had been closed and reclaimed.

Cove Pit Lake: Dewatering of the Cove Pit ceased in July 2001, and within a short time, a lake formed in the pit. Groundwater inflow into the pit was approximately 335 gallons per minute (gpm) and 540 acre-feet per year (acre-ft/yr). Pursuant to WPCP NEV0088009 (now in permanent closure), the Cove Pit water is analyzed quarterly at three separate locations (North, Middle, and South) with samples collected from three discrete depths. The pit water quality generally meets Profile III reference values with the exception of sulfate, TDS, and antimony, which have on occasion exceeded the Profile III reference values.

Based on the pre-mining groundwater elevation and predicted steady-state conditions, the Cove Pit is expected to form a sink and not discharge to the groundwater system. By 2057, the pit lake will rebound to its final elevation of 4,660 ft amsl (685 ft deep) and will occupy a surface area of approximately 163 acres. Predicted pit water chemistry 100 years after the cessation of dewatering will not have an adverse effect on human, terrestrial, or avian life, nor will it degrade any surrounding ground or surface waters. As of September 2010, the pit lake elevation was 4,564 ft amsl (589 ft deep) and the lake occupied a surface area of approximately 150 acres. There is now evidence drawdown associated with whether the lake has affected any local water resources.

Cove Helen Underground Exploration Project: In 2007, the previous Permittee (Victoria Resources (US), Inc.) discovered a high-grade gold deposit (the Helen Deposit),

approximately 2,000 ft northwest of the Cove Pit. The Helen Deposit is a gold ore deposit with a number of small, high-grade gold-bearing zones that appear to be either flat or steep dipping. In order to further delineate the deposit and verify the deposit's economic viability, the current Permittee has obtained a Permit (WPCP NEV2010102) for the Cove Helen Project.

Portal and Decline Development: Development work will begin with the construction of a13-ft by 13-ft entry portal at the 4,700 ft amsl of the Cove Pit on the northeast side and is projected to continue to the 3,950 ft amsl at a minus 15-percent grade and in a "figure-8" pattern. The Permittee expects to contact ground water at an elevation of 4,600 ft amsl between 800 and 1,000 ft from the portal entrance.

Dewatering Water Management: Based on the known lithology, hydrology, and historical dewatering data for the Cove Pit and adjoining areas, the Permittee estimates that between 593,000 and 1,705,000 gpd of dewatering water will need to be managed during the initial phases of decline development. Based on anticipated consumptive needs, the Permittee will need to infiltrate between 524,000 and 1,619,000 gpd of dewatering water daily. However, as additional dewatering data from the underground development is collected, characterized, and evaluated, the volume and quality of dewatering water requiring management will be further refined and updated.

Dewatering water quality data collected during Echo Bay's 13 years of active dewatering indicated good groundwater quality with no persistent exceedances of the Profile I reference values reported. Elevated concentrations of fluoride, TDS, aluminum, and iron were observed on occasion.

In the event groundwater inflows are too great to be effectively pumped from the decline, the Permittee will implement a program to reduce groundwater flows and/or install dewatering wells outside the underground workings. In the event discharge water quality from the decline exceeds Profile I reference values, a treatment system will be implemented by the Permittee. Until a treatment system is designed, permitted, and constructed, all dewatering operations will cease.

The Permittee anticipates that dewatering water quality will remain good during their active dewatering operations; however, the Permittee anticipates that a minor amount of hydrocarbons and nitrates will be introduced to the mine water inflows from mechanical equipment and blasting activities within the exploration decline and workings and will require removal.

Dewatering water will be collected in sumps and then pumped to the surface for hydrocarbon removal, followed by treatment at an engineered water treatment plant prior to its discharge to the RIBs. Refer to WPCP NEV2010102 Fact Sheet for additional details regarding hydrocarbon removal and the engineered water treatment plant. Clean water exiting the water treatment plant enters a trapezoidal shaped channel lined with 60-mil HDPE and

overlain with a layer of rock in which fifty-percent of the diameters of the rocks are less than 8 inches (d_{50}=8 in). The lined channel conveys dewatering water to the RIBs.

RIB Design: The Permittee intends to construct new RIBs at the former Echo Bay RIB site to take advantage of existing geotechnical data and percolation rates. The alluvium at this location is characterized by a hydraulic conductivity which ranges between 0.003 and 0.010 centimeters per second (cm/sec). Depth to groundwater in this area ranges between 40 and 120 feet below ground surface (ft bgs) and the average alluvium thickness is between 130 and 150 ft.

From 1988 through 2000, a RIB system operated by Echo Bay at the McCoy/Cove site (WPCP NEV0088009) successfully disposed of up to 23,000 gpm (33,120,000 gpd) of dewatering water. To size the Cove Helen RIBs, a maximum design inflow rate of 2,500 gpm (3,600,000 gpd), a pond working depth of 2 ft (with a minimum freeboard of 2 ft), an infiltration rate of 0.003 cm/sec, and a safety factor of 2 were assumed. Based on these assumptions, an infiltration area of approximately 370,000 square feet (sq ft) and an excavation 4 ft deep will be necessary.

To optimize RIB operation, the RIB design features five basins (RIB-1A, -1B, -1C, -1D, and -1E), which will allow for dewatering water inflow to be cycled between each cell, thereby providing a rest period for each cell. The length of the rest period will be determined by the observed infiltration/percolation rate for each cell; however, the Permittee anticipates a wet/dry cycle for the RIBs of at least five days.

RIB-1A will have nominal dimensions of 340 ft by 880 ft. Because of the topography, RIB-1B will be slightly narrower and longer with nominal dimensions of 310 ft by 1,470 ft. Each basin will be excavated to a depth of 4 ft. A soil embankment, ranging from 2 to 6 ft in height, surrounds the RIBs. The embankment will be constructed from on-site materials and have internal and external slopes of 3 horizontal to 1 vertical (3h:1v). RIB-1C, -1D, and -1E have yet to be constructed, but were approved as "contingency RIBs" in the original Permit application.

RIB Modeling: MODFLOW-SURFACT (Version 3.0) was utilized to numerically model the Cove Helen RIB hydrology. Modeling results were used to determine the approximate extent of mounding due to the infiltration of dewatering solution and for the determination of potential upgradient and downgradient groundwater monitoring locations outside the mound area.

MODFLOW SURFACT is a comprehensive three dimensional finite difference flow and contaminant transport model based on the US Geological Survey MODFLOW computer code, a widely-used ground-water flow code. The 3.0 version of the MODFLOW-SURFACT model specifically allows for the simulation of unsaturated flow and transport, including infiltration and recharge to an underlying aquifer, generating a fate and transport model of various solutes contained within the recharge water with respect to the underlying

aquifer. The MODFLOW-SURFACT model assumes a continuous and steadily increasing groundwater recharge rate as a result of the RIB operation to generate conservative predictive modeling results.

C. Receiving Water Characteristics

Surface Water: With the exception of the Cove Pit Lake, there are no surface water bodies, seeps, or springs within 1 mile of the Cove Helen site.

Groundwater: Two groundwater systems, an unconfined shallow alluvial aquifer and a deep, confined bedrock aquifer, have been identified in the vicinity of the Cove Pit. The September 2010 groundwater elevation was estimated at 4,564 ft amsl (589 ft bgs).

The deep aquifer appears to be the most significant contributor to the formation of the Cove Pit Lake and is characterized by relatively low hydraulic conductivity. Intense fracturing within the pit area has also increased the hydraulic conductivity of some hydrogeologic units.

There are five main faults (Light House, Hidden Valley, Cay, Bay, and Dome) within the Cove Helen Project area, each with their own unique hydrogeologic characteristics. In addition, two range-front faults east of the Lighthouse Fault form barriers to flow from the alluvium in the Project area to the alluvium in the Lower Reese River Valley. The faults are approximately ½ mile east of the Cove Pit and are covered by the Tertiary alluvium. The shallow alluvial groundwater gradient at the Cove Helen site is from west to east toward the Reese River Valley. Bedrock groundwater gradient is also toward the Reese River Valley, and generally follows topography in a northeast direction.

In general, the north-south striking, steeply dipping faults and fractures in the vicinity of the Cove Pit area provide a localized decrease in horizontal hydraulic conductivity, but provide a moderate north-south to west-east lateral hydraulic conductivity.

The north-south-trending Lighthouse Fault flanks the east side of the Cove Helen Project, but becomes less of a hydrologic barrier on the northern part of the Project site. The portion of the fault that serves as a barrier is most likely the result of clay gouge along the fault. Rocks along the footwall (west) side of the fault are more fractured and consequently have a greater hydraulic conductivity. The hydraulic conductivity ranges from 2.82×10^{-5} to 1.76×10^{-4} cm/s on the hanging wall side and 1.76×10^{-5} to 8.82×10^{-4} on the footwall side of the fault.

A set of northeast-trending faults occurs in the Project area perpendicular to the proposed decline path that influences groundwater flow. The Hidden Valley Fault forms a significant barrier to flow on the west side of the Cove Pit. Exploration boreholes drilled into the fault indicate that there is a thick gouge zone along the fault. The hydraulic conductivity of the Hidden Valley Fault is estimated to be about 3.53×10^{-5} cm/s.

The Cay, Bay, and Dome faults, which transect the Cove Pit in a northeast-southwest direction, moderately compartmentalize the groundwater flow system. The hydraulic conductivity of these faults is about 1.76×10^{-4} cm/s.

The bedrock units near the Project portal entrance (north highwall of the Cove Pit) are affected by intense faulting and fracturing and by hydrothermal alteration. This area is characterized by argillization of the limestones, by northwest-southeast faulting, and by local karstification. This area has a high hydraulic conductivity of about 3.53×10^{-3} to 7.06×10^{-3} cm/s.

During previous operations at the Cove Mine, groundwater flow direction was primarily from the west to the east, and flow into the mine occurred primarily along faults and fracture systems and to a lesser degree from the hydrogeologic units. As a result of the high dewatering rates required at the Cove Mine, a preliminary groundwater inflow analysis was completed on the proposed Cove Helen Underground Exploration decline and exploration development.

The estimated groundwater inflow to the decline and workings is based on hydrologic testing and groundwater model calibration efforts, hydrogeologic and geologic information compiled by the Permittee, and discussions with Newmont personnel. To analyze the inflow along the known geologic structures and hydrogeologic units, the hydraulic conductivities of the water-bearing zones were calculated based on hydraulic parameters developed from pumping tests and groundwater modeling calibrations, and discussions with the Permittee and Newmont personnel.

A purpose of the Cove Helen Project will be to collect additional hydrogeologic data so that the groundwater inflow calculations can be further refined and the dewatering system optimized. During exploration decline development, long-hole hydrogeologic testing will be completed ahead of decline development to evaluate groundwater conditions including pressure head, flow, and hydraulic conductivity. In the case of potentially high groundwater inflows, a cover grouting program will be applied to control the groundwater flows.

Groundwater Quality and Monitoring: As of 2016, Newmont maintains and monitors seven groundwater monitoring wells (IM-2, IM-3, LP-2D, LP-5B, TM-3, TM-4, and TM-5) at the McCoy/Cove Mine site, pursuant to WPCP NEV0088009.

Groundwater monitoring wells IM-2 and IM-3 are located east of the Cove Pit and monitor the shallow alluvial groundwater. Both wells are currently dry and have had insufficient water to sample for several years. Groundwater monitoring wells LP-2D and LP-5B are also east of the Cove Pit and monitor deep bedrock flow. Groundwater monitoring wells TM-3, TM-4, and TM-5 monitor the shallow alluvial groundwater flow and are located downgradient of the historic McCoy/Cove tailings impoundment.

Data provided by the Permittee (and Newmont) indicate similarities in groundwater quality

of the bedrock and alluvial aquifers. The pH of both sources is distinctly alkaline, with bicarbonate concentrations generally higher in the bedrock groundwater than in the alluvial groundwater.

Water quality in the alluvial and bedrock wells is good and generally meets the Profile I reference values for all constituents. On occasion, groundwater monitoring wells LP-2D and LP-5B have reported fluoride concentrations slightly above the Profile I reference value. Groundwater monitoring well TM-4 also had slight exceedances of the Profile I reference values for aluminum and iron on occasion.

The Division is not aware of any impacts to the alluvial or bedrock groundwater quality from the McCoy/Cove mining and closure activities in the Project Area.

The Permittee will install four dedicated piezometers (PZ-1, PZ-2, PZ-3, and PZ-4) located peripheral to the RIBs to monitor and manage the infiltration mound. PZ-1 through PZ-3 will monitor downgradient infiltration mound elevations and PZ-4 will monitor upgradient infiltration mound elevation.

The Permittee will install four dedicated groundwater monitoring wells for the Cove Helen RIBs. Three monitoring wells (MW-1, MW-2, and MW-3) will be located downgradient of the proposed RIB site. Monitoring well (MW-4) will be located up-gradient of the RIB site to provide data to effectively monitor the potential impacts of the RIB operations on shallow alluvial groundwater elevation and quality.

D. Procedures for Public Comment

The Notice of the Division's intent to issue the new water pollution control Permit, authorizing the facility to construct, operate and close subject to the conditions described therein and according to all information received by the Permittee and approved by the Division, is being sent to the Battle Mountain Bugle for publication.

The Notice is also being mailed to interested persons on our mailing list. Anyone wishing to comment on the proposed Permit renewal can do so in writing within a period of 30 days following the publication date of the public notice. The comment period can be extended at the discretion of the Administrator. All written comments received during the comment period will be retained and considered in the final determination.

A public hearing on the proposed determination can be requested by the applicant, any affected State, any affected intrastate agency, or any interested agency, person or group of persons. The request must be filed within the comment period and must indicate the interest of the person filing the request and the reasons why a hearing is warranted.

Any public hearing determined by the Administrator to be held must be conducted in the geographical area of the proposed facility or any other area the Administrator determines to

be appropriate. All public hearings must be conducted in accordance with NAC 445A.403 through NAC 445A.406.

E. Proposed Determination

The Division has made the tentative determination to issue the renewed Permit.

F. Proposed Effluent Discharge Limitations, Schedule of Compliance, Monitoring, and Special Conditions

Refer to Section I of Permit NEV2010107.

G. Rationale for Permit Requirements

The facility has been designed to remain fully functional and fully contain all process fluids. It is located in an area where annual evaporation is greater than annual precipitation. Therefore, it must operate under a standard of performance which authorizes no discharge(s) except for those accumulations resulting from a storm event beyond that required by design of a 24-hour storm event with a 25-year recurrence interval pursuant to NAC 445A.433 for containment. Groundwater quality beneath the site has been historically monitored and no degradation from prior mining activities is indicated.

The primary method for identification of escaping process solution will be placed on required routine monitoring of leak detection systems as well as routinely sampling downgradient monitoring well(s) and surface water. Specific monitoring requirements can be found in the Water Pollution Control Permit.

H. Federal Migratory Bird Treaty Act

Under the Federal Migratory Bird Treaty Act, 16 U.S. Code 701-718, it is unlawful to kill migratory birds without license or permit, and no permits are issued to take migratory birds using toxic ponds. The Federal list of migratory birds (50 Code of Federal Regulations 10, April 15, 1985) includes nearly every bird species found in the State of Nevada. The U.S. Fish and Wildlife Service is authorized to enforce the prevention of migratory bird mortalities at ponds and tailings impoundments. Compliance with state permits may not be adequate to ensure protection of migratory birds for compliance with provisions of Federal

statutes to protect wildlife.

Open waters attract migratory waterfowl and other avian species. High mortality rates of birds have resulted from contact with toxic ponds at operations utilizing toxic substances. The Service is aware of two approaches that are available to prevent migratory bird mortality: (1) physical isolation of toxic water bodies through barriers (covering with netting), and (2) chemical detoxification. These approaches may be facilitated by minimizing the extent of toxic water. Methods which attempt to make uncovered ponds unattractive to wildlife are not always effective. Contact the U.S. Fish and Wildlife Service at 1340 Financial Boulevard, Suite 234, Reno, Nevada 89502-7147, (775) 861-6300, for additional information.

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