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

Permittee: **Newmont USA Limited dba Newmont Mining Corporation**

Project Name: **Rain Project**

Permit Number: **NEV0087011**
Review Type/Year/Revision: **Renewal 2016, Fact Sheet Revision 00**

A. Location and General Description

Location: The Rain Project is located in Elko, County Nevada, within Sections 3, 4, and 9 of Township 31 North (T31N), Range 53 East (R53E); and Sections 33 and 34 of T32N, R53E, Mount Diablo Baseline and Meridian, approximately 9 miles southeast of Carlin.

General Description: Existing facilities include: One Rain Tailings Storage Facility (RTSF) with an associated seepage collection system, one gold heap leach pad (HLP), two waste rock dumps, each with a seepage collection system, underground mine workings, and mill components. Ore was mined from two open pits. Active mining operations have been completed and selective closure activities have been ongoing since 1998.

The project is located on both private and public lands. The project encompasses approximately 866 acres, of which 697 acres are on private land and the remaining 169 acres are on unpatented mining claims administered by the Bureau of Land Management, Elko District, Tuscarora Field Office. The project is in closure.

B. Synopsis

Water Pollution Control Permit (Permit) NEV0087011 was first issued to Newmont Mining Corporation (Newmont) in April 1988 and previously renewed in 2011. This 2016 Permit renewal continues with site closure and does not allow any further mining or processing and shall remain in effect until 15 November 2020.

Ore and waste rock were mined from two separate pits – the Rain and the SMZ Pits. The Rain Pit was mined from 1987 to 1991. The SMZ Pit was mined from June 1993 to April 1994. Underground mining, accessed from the Rain Pit, began in October 1993 and ceased in 2002.

Lower grade ore was placed on the heap leach pad. The heap leach pad was constructed in 1987, and active leaching continued until October 2004. High grade ore was processed in the mill by the carbon-in-pulp (CIP) method. Loaded

carbon from both types of processing was transported offsite to the Gold Quarry Mill 5/6 (WPCP NEV0090056) for stripping and refining. The mill tailings were conveyed by pipeline to the TSF. The first phase of the tailings impoundment was completed in October 1987.

Figure 1, page 3 provides a site map of the Rain Project.

Site Closure Plan: The Final Plan for Permanent Closure (FPPC) was submitted in February 2012 and approved as a conceptual Tentative Plan for Permanent Closure (TPPC). This plan was changed to a TPPC due to the proposed long-term closure approaches, some of which have been determined by the Bureau of Land Management (BLM) to require analysis through the National Environmental Policy Act (NEPA) process. Typically, the Division does not rely on a NEPA analysis to determine closure direction; however, since there are many complex issues relating to this site, NEPA approval or disapproval of all/some of the proposed activities may impact the final closure direction significantly. The Permittee has proposed the following closure strategy: construction of an approximately 4 mile long pipeline to connect the North Waste Rock Dump Facility (NWRDF) seepage to a water treatment plant located at the Emigrant Mine (WPCP NEV2005107), located approximately 3 air miles southeast of the Rain Mine; placement of a geomembrane cover overlain by soil on the heap leach pad; and regrading and covering the TSF surface with a soil cover and treatment of residual fluids through a series of evaporation/evapotranspiration (E/ET) cells.

Geology: The Rain Project is located at the eastern limit of the Upper Plate Western Assemblage, toward the northern end of the Basin and Range Province. Major faulting near the Project site is comprised of west- and northwest-trending high-angle normal and reverse faults, and the northeast-trending, low-angle, Roberts Mountain Thrust Fault.

The majority of the site is underlain by rocks of the Lower Mississippian Chainman Shale, and, to a lesser degree, the Mississippian Webb Formation and the Upper Devonian Devils Gate Limestone. The Chainman Shale consists of gray to black shale, quartz- and chert-rich sandstone, conglomerate lenses, thin-bedded limestone, calcareous sandstone beds, and pebbly limestone. This material contains carbon and sulfide-rich siltstones which are considered acid generating. The Webb Formation consists of gray argillized siltstones and shales with tan interbedded, fine- to medium-grained sandstone. The Devils Gate Limestone is characterized by medium-to thick-bedded, light to dark gray limestone.

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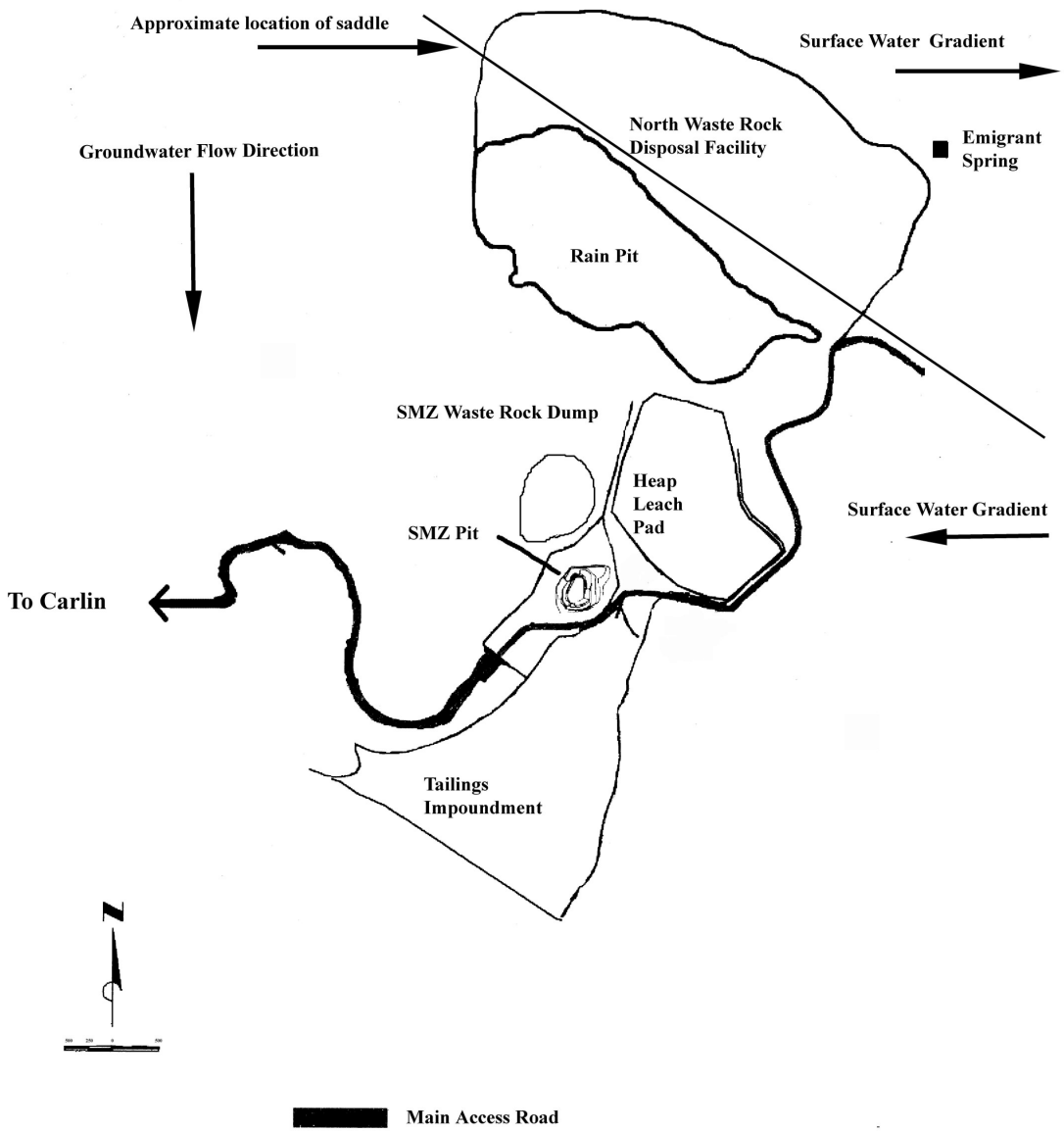
Figure 1. Site Map (not to scale for relative component locations only)



Open Pits: The Rain Pit was mined from 1987 to 1991. This pit is oriented northwest to southeast in alignment with the Rain Fault. Gold orebodies in the area of the Rain Pit are found consistently in a zone along the Rain Fault at the contact between the Devils Gate Limestone and the Webb Formation. Gold occurs as elemental gold encapsulated in quartz as well as in submicron substitutions in arsenian rims over pyrite. The hydrothermal breccia that contains the gold orebody is silicified and also contains sulfides, principally pyrite. Underground mining began in October 1993 and ceased in 2002.

The eastern extension of the Rain Pit, named the East Pit Extension, is essentially a lower bench of the Rain Pit. This extension occasionally impounds meteoric water and has been sampled once since mining ceased. The water quality, with the exception of arsenic at 0.07 milligrams per Liter (mg/L), meets the Nevada Division of Environmental Protection (the Division) Profile I reference values for all parameters.

The SMZ Pit, located approximately 2,000 feet south-southwest of the Rain Pit, was mined from June 1993 to April 1994. The SMZ deposit was characterized as completely oxidized, with no carbonaceous or sulfidic material, and no potentially acid generating (PAG) material was moved during mining. The mineralization is hosted in silicified siltstone of the basal Webb Formation immediately above the contact with the underlying Devils Gate Limestone. Mineralization has a blanket-like geometry and is elongated in a north-south direction.

Neither pit intercepted the groundwater and no active dewatering was required. Additionally, no dewatering was required for the underground operations.

Table 1. Approximate Rain Project Open Pit Dimensions

Pit	Length, feet	Width, feet	Depth, feet	Area, acres
SMZ	520	560	140	5.25
Rain (incl. East Pit Extension)	3,400	1,300	600	100

Within the SMZ Pit area, both surface and groundwater gradients are generally in a northerly direction. A persistent SMZ pit lake has not been present since December 2011, only occasional seasonal impoundment of water that typically dries up during the summer months. An SMZ pit lake sample was collected in May 2013 for a Profile I analysis with total metals. Although not specifically applicable at the time of sampling, comparison of those results to current Division Profile III reference values indicated no reference value exceedances. Since that time, the pit has either been dry or access to the pit has been determined as unsafe, therefore no additional samples have been collected.

By 1995, the natural upgradient topography directed shallow spring (seasonal/ephemeral) alluvial groundwater flow into the SMZ Pit, thereby establishing a small but persistent pit lake. An ephemeral 'spring,' located in the northwest highwall, was identified as one source of the upgradient seasonal inflow to the SMZ pit. It was estimated that this 'spring' contributed up to 20 gallons per minute (gpm) from late winter to early summer. With the intent to reduce or even eliminate this 'spring', in 2005, the Permittee constructed a cut-off trench upgradient of this 'spring'. The SMZ trench is designed to intercept and

redirect this 'spring' flow at the contact between shallow alluvium and underlying indurated soils, via an unlined existing stormwater diversion ditch, around the pit. This stormwater diversion ditch discharges downgradient of the tailings impoundment into the Ferdelford Creek drainage. This activity appears to be successful as the seasonal 'spring' input, has been visibly greatly reduced since construction. A 'spring' sample (Division Profile I with total recoverable metals and flowrate) will be collected at the outfall of the trench cut-off pipe. This WPCP monitoring location, designated as SMZ Cutoff Trench (SMZ-CT), will continue to be monitored on a quarterly basis and after storm events. Average water quality data (10 samples to date) values for the following constituents of interest records a neutral pH, alkalinity averaging 133 mg/l, sulfate averaging 33 mg/l, nitrate averaging 0.8 mg/l, and elevated iron and aluminum at 0.86 mg/l and 1.3 mg/l, respectively.

In order to confirm the lack of groundwater input into the SMZ Pit, in 2005 two adjacent monitoring wells were constructed. SMZ-MW1 was constructed approximately 300 feet north (upgradient) of the SMZ Pit while SMZ-MW2 is located approximately 300 feet south (downgradient) of the pit. The following table presents the pertinent well characteristics.

Table 2. SMZ Pit Monitoring Wells

Well ID	Collar Elevation (feet, AMSL)	Total Depth (feet)	Well Bottom (feet, AMSL)	Depth to water (feet below collar)
SMZ-MW1	6,524	220	6,304	Always Dry
SMZ-MW2	6,483	174	6,309	Varies from 166 to Dry

*The SMZ pit bottom elevation is approximately 6345 ft AMSL

Well SMZ-MW1 has been essentially dry since installation; Well SMZ-MW2 was sampled from late 2005 through early 2007 (eight samples). The well has remained dry since the middle of 2007. SMZ-MW2 groundwater quality trends are of concern as alkalinity values showed a consistent decline, from a high of approximately 80 mg/l to the last 2007 sample value of 8 mg/l. pH also showed a steady decline with the lowest value (5.3 standard units (SU)) recorded in early 2007. Sulfate concentrations averaged 200 mg/l and manganese concentrations averaged 0.20 mg/l, both were steady. Nitrate values showed a slightly increasing trend over time recording a high of 10 mg/l in 2007.

The Permit requires monitoring of wells SMZ-MW1 and SMZ-MW2 shall be performed quarterly. Groundwater elevation (feet amsl) and a groundwater sample (if available) will be collected and analyzed for Division Profile I.

Routine pit lake quality monitoring of SMZ Pit Lake was initiated in 1997. In general, pit lake water quality is very good (40 samples as of 2016). Although there may be some seasonal variation in constituent values, alkalinity values average approximately 40 mg/l, and pH has always been circum-neutral, while sulfate averages 500 mg/l. Both aluminum and manganese are elevated at times. Of interest is nitrate+nitrite, which although variable, has seen an increasing trend since 2006 and recorded a value of 21 mg/l in 2010. It should be noted that depth to groundwater in SMZ-MW2 has always been lower than the elevation of the SMZ pit bottom – hence it would appear that groundwater is not a source of SMZ Pit Lake water. However, the presence of water in SMZ-MW2 suggests an outflow from the SMZ pit and as such, when sufficient water is present in SMZ-MW2, i.e. minimum 5 ft. of static water, the Permittee shall sample the pit lake for both a Profile I and Profile III analytical suite. Otherwise, only Profile III analyses are required for the SMZ pit lake.

The Permit requires monitoring of the Rain Main (RMPIT), Rain East Pit Extension (REPIT), and SMZ Pits (SMZPIT) and shall consist of designating pit surface as dry, damp, or wet (visible flow or ponding). If any ponded water is present, the Permittee must collect a representative sample and analyze for Division Profile III constituents. A field pH and field specific conductance (SC), reported as total dissolved solids (TDS), together with photos and dimension of the ponded areas(s) shall also be taken. The operator will investigate the source(s) of ponded water. The pits will also be inspected for stability, safety, and access restrictions.

Additionally, should pit lake access, due to unstable surrounding materials, become unattainable, the Permittee will be required to provide an alternative empirical method, e.g. improvement and/or construction of existing/new access road, as applicable, remote unmanned aerial system sampling, etc., to demonstrate that the health of human, terrestrial, or avian life will not be adversely affected nor would pit lake water degrade waters of the State.

Heap Leach Pad (HLP):

The HLP was constructed in 1987. The 2.7 million square foot heap leach pad (HLP) encompasses approximately 63 acres. Pad construction consists of 80-mil high density polyethylene (HDPE) primary liner placed over a 12-inch layer of scarified and compacted native soils with a maximum design hydraulic conductivity of 1 x 10^{-6} centimeters per second (cm/sec). An 18- to 24-inch thick drainage layer of unagglomerated ore and a system of 4-inch diameter corrugated polyethylene (CPE) collection pipes spaced 50 feet apart were placed on the surface of the synthetic liner to minimize hydraulic head on the liner system. The 4-inch diameter pipes drain to 8-inch diameter non-perforated CPE main collection pipes located along the main drainage channels on the base of the pad.

Leached ore included both crushed/agglomerated and run-of-mine material. Leachate was collected in a single pregnant pond (permanently closed and removed in 2010) below the heap, and then pumped to carbon columns in the mill. Leaching of ore continued until October 2004.

During the subgrade preparation, springs and/or wet areas were encountered within the subgrade. In order to mitigate potential subsurface instability and groundwater infiltration into the liner system, a French Drain (FD) system was constructed beneath the composite liner.

This leach pad FD system consists of three drains - Main, East, and West FDs. These FD are approximately 2 feet wide by 6 feet deep (or to bedrock) with a minimum gravel depth of 4 feet. The gravel fill is surrounded by 4 ounce needle punched geotextile. The Main FD is located within the primary subsurface drainage path which also corresponds to the center of the HLP. The Main FD is plumbed into the East FD. The East and West FD exist on either side of the Main FD.

A portion of the HLP/FD draindown solution was recycled to the HLP for evaporation until mid-2006. Since that time, the heap has been in passive draindown mode with draindown solution reporting to the RTSF. Heap leach draindown solution flows from the leach pad to the flume drop structure (via the conveyance channel) into double-wall pipe which bypasses the Underdrain Collection Structure (UCS). The flow from the UCS and the leach pad tie together downstream of the UCS.

With the completion of the HLP/FD conveyance system retrofit in November 2010, future monitoring and sampling of the EFD and WFD, SMZ Waste Rock Dump Seepage UCS (SMZ-WRDS-UCS) and Heap Leach Solution Channel Leak Detection (HLCLD) will all be conducted at the UCS. A combined flow measurement, representative of the above-listed flows and the Heap Leach Pad Draindown Flume (HLPDD-F), will be taken weekly at the Tailings Impoundment Outflow Structure (TIOS) prior to discharge into the tailings impoundment. All UCS locations, with the exception of HLCLD, will be sampled quarterly on the same day of the week for Profile II constituents and flows; HLCLD will be monitored for flow only. The water quality and flow measurements for these three sources will be collected within the UCS. Heap leach draindown solution will be sampled quarterly for Profile II analyses and flows will be recorded weekly at HLPDD-F.

Closure of the HLP as of 2016 has included regrading the entire heap to a slope of approximately 2.5H:1V (horizontal to vertical) and direct seeding of the regraded surface. The current long-term HLP/FD solution management plan utilizes the 189-acre RTSF as a passive long-term storage/evaporation basin providing for a zero discharge of solution. Without a final cover, modeled long-term HLP annual

average draindown flow is anticipated to be 7 - 10 gallons per minute (gpm). The FD system long-term flows are expected to continue varying due to seasonal meteoric input. A conservative estimate of combined HLP/FD annual average flow is 20 gpm.

Currently, HLP draindown flowrates and chemistry are measured and collected in the HLPDD-F. Heap draindown flowrates and chemistry vary seasonally, with flows ranging from throughout the year from 7 to 27 gpm.

HLPDD solution samples collected prior to January 2008 represent a mixture of heap draindown and East/West FD Port solutions. After January 2008, discrete heap draindown samples have been collected and data presented in Table 3 (below) represent samples collected since that time. This table provides solution concentrations only for constituents considered of interest or currently elevated. HLPDD average concentration range, is based on a simple average of all available analyses (maximum of 40 sampling events - 2008 through 2015). The range reflects the lowest and highest values from all sampling events.

Table 3. Heap Leach Pad draindown chemistry for selected constituents

Chemical Constituent	Units	NDEP Profile I and II Reference Value	HLPDD Average Concentration (Range)	Current Concentration (Fourth Quarter 2015)
Alkalinity	mg/L	N/A	21 (<1.0 – 69)	2
Aluminum	mg/L	0.2	11.1 (1.04 – 28.3)	12
Arsenic	mg/L	0.01	0.214 (0.136 -0.425)	0.136
Cadmium	mg/L	0.002	0.011 (<0.002 – 0.024)	0.009
Manganese	mg/L	0.10	0.474 (0.140 – 1.12)	0.338
Mercury	mg/L	0.002	0.0239 (0.0158 – 0.0344)	0.0180
Nitrate + nitrite as N	mg/L	10	167 (94 – 249)	171
pH	SU	6.5 – 8.5	6.02 (4.67 – 7.50)	5.31
Selenium	mg/L	0.05	0.074 (0.036 – 0.585)	0.047

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Sulfate	mg/L	500	1,193 (822 – 1,560)	1,030
Thallium	mg/L	0.002	0.003 (0.003 – 0.004)	0.004
TDS	mg/L	1,000	2,812 (1,900 – 3,640)	2,390
WAD Cyanide	mg/L	0.2	0.065 (0.015 – 0.201)	<0.010

Pregnant Pond Removal and Reclamation:

The Pregnant Pond Removal and Reclamation Project involved the removal of all HLP draindown components including the pregnant pond, the Mushroom Port, the East and West drain system south of the riser and the lined channel south of the pond. The East and West drain system along and beneath the pond were removed with their respective risers (ports). The existing subdrain at both drain locations below the HLP were modified to non-perforated dual-wall HDPE pipe. The transition from the existing perforated underdrain pipe to a solid (non-perforated) HDPE pipe incorporated the use of bentonite fill around the pipe to force flow into the pipe. A permanent dual-wall pipe-in-pipe system was installed downstream of the existing monitoring flume and upstream of the HLP solution channel outlet to convey draindown solution from the HLP to the tailings impoundment.

During excavation, seepage was observed along the southwestern toe of the heap and along the western edge of the pregnant pond. A cut-off drain was installed to collect this solution. This cut-off drain system ties into the new WFD dual containment pipe prior to the UCS. A cut-off drain was also installed along the toe of the north pond slope. This cut-off drain system ties into the new East Drain dual containment pipe flowing to the southwest and follows along the trace of the old EFD Trench. The cut-off drains consist of lined trenches filled with drain fill and perforated CPE pipe.

Due to these seepages and the resulting modifications, the location of the UCS was moved further downstream to allow capture of all solutions via gravity flow to the UCS.

The flows from the UCS and the existing HLP Solution Channel will combine downstream of the UCS and are carried through the buried dual-containment pipe to the tailings impoundment. Prior to discharge into the impoundment, flows will be passed through a drop structure (TIOS) that will act as a final flow monitoring point.

The EFD and WFDs are currently monitored weekly for flow and quarterly for solution quality prior to discharge to the tailings impoundment. (The FDs not

only collect water from beneath the leach pad but also collect solution from the newly installed East and West Cut-off Drains.)

As a result of the retrofit, the pond and five monitoring points, EFD Port (EFDP), WFD Port (WFDP), Mushroom Port (MP), Pregnant Pond Sump (PPS) and Pregnant Pond (PP) were eliminated and have been removed from the Permit.

Waste Rock Disposal Facilities (WRDF):

SMZ Waste Rock Dump (SMZWRDF)

Approximately 200,000 tons of oxide waste rock from the SMZ Pit were placed in the SMZ Waste Rock Dump Facility (SMZWRDF), located to the northwest of the SMZ Pit. This facility was regraded and covered in 2002-2003 with a nominal 12-inch soil cover. The SMZWRDF was constructed without an engineered base or liner.

Seasonal (spring) seepage has occurred along the toe of the WRDF. As such, in 1999 – 2000, a seepage collection system was constructed along the toe of the WRDF. This system collects and directs seepage to the stormwater diversion channel (SMZ-WRDS-DC) or the SMZ-WRDS-UCS, where sampling can be conducted.

Weekly field analyses, when seepage is present, consists of pH, SC (as TDS) and flowrate, of which there are 84 data points beginning 1 October 2009 through 30 December 2015, and indicate an average pH of 6.9 SU, TDS of 1,815 mg/L, and an average flow of approximately 8 gpm. The Profile I water quality data (eight samples collected as of 2016) indicates a neutral pH (7.1 SU), alkalinity of 79 mg/L, sulfate of 176 mg/L, nitrate+nitrite as N of 4 mg/L, and TDS of 374 mg/l.

Based on the numerous weekly monitoring results, the Division has determined that the SMZ-WRDF seepage (SMZ-WRDS) solution does not require engineered containment and can be discharged into the stormwater diversion channel. In the event that weekly and/or quarterly monitoring indicates degrading/worsening chemistry, the Permittee may be required to immediately re-route solution to the UCS.

SMZ-WRDS solution flowing into the diversion channel will be sampled at the pipe outfall to the diversion channel (SMZ-WRDS-DC). Monitoring will also be performed at the UCS prior to flowing to the tailings impoundment (SMZ-WRDS-UCS). The Permittee will continue to monitor SMZ-WRDS seepage weekly, when flowing, for pH, SC (as TDS), and flowrate, and quarterly for seepage quality (NDEP Profile I - Total Recoverable Metals) and flowrate. Profile I samples shall be collected the same day as the corresponding weekly field measurements are taken.

North Waste Rock Disposal Facility (NWRDF)

Approximately 70 million tons of waste rock, much of it sulfidic, was deposited into the North Waste Rock Disposal Facility (NWRDF) located on the north side of the saddle bisecting the Rain Project. The NWRDF encompasses an area of approximately 193 acres and was constructed without an engineered base or liner. Beginning in 1990, acid rock drainage (ARD) was identified seeping from the base of portions of the NWRDF and flowing into the ephemeral drainage located adjacent to the toe of the NWRDF. The NWRDF discharge solution has elevated levels of metals and TDS. The pH is low - averaging approximately 2.5 SU.

The volume of discharge is seasonally controlled. Peak flows coincide with spring snowmelt and significant precipitation events. NWRDF average daily flows, since 1990, have ranged from 3 gpm to greater than 400 gpm.

Chemistry of the NWRDF ARD discharge solution (TRTIN) (Profile II) is presented in Table 4 below. This table provides solution concentrations only for constituents considered of interest or currently elevated. The TRTIN average concentrations are simple averages of all available analyses (maximum of 78 sampling events - 1997 through 2015). The range reflects the lowest and highest values from all sampling events. No definitive trends are evident

Table 4. – NWRDF Seepage Solution Quality (TRTIN)

Chemical Constituent	Units	NDEP Profile I and II Reference Value	TRTIN Average Concentration (Range)	Current Concentration (Fourth Quarter 2015)
Acidity (Total as $CaCO_3$)	mg/L	-	13,200 (4,760 – 16,200)	4,760
Alkalinity (Total as $CaCO_3$)	mg/L	-	<1	<1
Aluminum	mg/L	0.2	1,550 (296 – 2,860)	760
Arsenic	mg/L	0.05	10.4 (0.484 – 32.6)	1.66
Cadmium	mg/L	0.002	0.350 (0.058 – 0.599)	0.224
Chromium	mg/L	0.1	1.30 (0.238- 2.46)	0.382
Copper	mg/L	1.3	18.9 (3.23 – 38.3)	8.12

Fluoride	mg/L	4	25.9 (0.1 – 107)	28.7
Iron	mg/L	0.6	726 (76.3 – 1,670)	142
Manganese	mg/L	0.10	52.2 (14.3 – 85.7)	38.3
Mercury	mg/L	0.002	0.0111 (0.0029 - 0.0470)	0.0302
Nickel	mg/L	0.1	16.7 (3.02 – 75.8)	8.65
Nitrate + Nitrite as N	mg/L	10	43.9 (23.1 -78)	23.1
pH	SU	6.5 - 8.5	2.53 (1.58 – 2.98)	2.88
Sulfate	mg/L	500	12,560 (2,790 – 22,500)	6,430
TDS	mg/L	1,000	19,430 (2,000 – 29,900)	9,090
Zinc	mg/L	5	29.9 (2.93 – 77.0)	19.1

The Permittee is required to inspect all WRDFs (quarterly) for physical stability and designate surfaces as dry, damp, or wet (visible flow or ponding). Should a discharge be present from any portion of any WRDF, the Permittee shall measure field pH and field specific conductance (reported as TDS), collect and submit a water quality sample for a Division Profile II analysis (as total recoverable metals), take photos, and document the event in the quarterly monitoring report.

NWRDF Seepage Remediation Actions

Remediation actions as of 2016 consist of:

1. construction and operation of an ARD seepage collection system;
2. seepage treatment;
3. treated seepage disposal into the RTSF;
4. placement of an engineered evapotranspiration (ET) cover over the entire surface of NWRDF; and
5. continued investigation into source(s) of water contributing to the toe seepage.

Two ARD collection systems are comprised of five drain pipes, an ARD solution cut-off trench, an ARD Collection Pond, and an emergency stormwater pond. The cut-off trench bottom follows the bedrock contact across the drainage and both the downstream wall and trench bottom are lined with 80-mil HDPE liner.

The two collection systems consist of:

1. A system of collection pipes installed in areas of initial ARD seepage. In addition, perforated CPE collection pipes were also placed in areas prepared to receive additional potentially acid generating waste; and
2. In 1996, additional ARD seepage locations became evident and a network of collection trenches was constructed on the north side of the NDWRF in 1997. This network also drains to the ARD solution collection pond.

The two collection systems, containing the five drain pipes, drain to the double-lined ARD Collection Pond. The sump collection pond must be pumped to the double-lined ARD Collection Pond.

The 180,000-gallon capacity ARD Collection Pond, installed in the drainage downgradient of the NWRDF, is double-lined with 80-mil HDPE and includes a geonet leak detection layer and solution sump (ARDLD). This pond is designed to overflow, if additional capacity is needed, into the 582,000-gallon Emergency Stormwater Pond.

The ARD solution is pumped from the ARD Collection Pond to the RTSF via a pipe-in-pipe HDPE pipeline. The ARD solution is neutralized via lime addition prior to discharge into the RTSF. In November 2014, the Permittee submitted an engineering design change (EDC) to upgrade the containment for the ARD lime mixing tank treatment system. The Division approved the EDC in October 2015.

The Emergency Stormwater Pond is constructed with a single 80-mil HDPE liner overlying a layer of geotextile fabric that covers a sub-base of compacted native soils. As of 2016, no ARD solution has reported to the stormwater pond. The confined nature of the ephemeral drainage in the area of the seepage precludes the construction of larger ponds.

In the late 1980's, the Desilting Pond (DSP) was constructed to capture surface water and/or groundwater collecting near the eastern toe of the dump south of the ARD Collection Pond. The pond was constructed in native alluvial material, is not lined. No water quality or flow data is available prior to 2010. Water collected in this pond is automatically pumped from a standpipe to the acid pond, and then pumped to the RTSF for treatment. DSP is monitored quarterly for a Division Profile II analysis and weekly for flow, field pH, and SC.

In January 2002, the Division determined that a monitor well was required downgradient of the DSP to monitor the shallow groundwater water quality. In June 2002, the Permittee installed monitor well RWD-14 approximately 100 feet downgradient of DSP. The well is drilled to a total depth of 20 feet, is screened

between 18 and 20 feet, and was dry when drilled. The well has been monitored since installation, and there has only been sufficient volume to collect and analyze groundwater a total of four times. Water quality data indicates neutral pH, alkalinity of approximately 307 mg/L, and slightly elevated selenium.

In 2002, the Permittee regraded and placed an engineered evapotranspiration (ET) cover over the entire surface of the NWRDF in an attempt to reduce the amount of meteoric water infiltrating into the dump and contributing to the seepage. The ET cover system was designed as a minimum of 12 inches of topsoil overlying a minimum of 36-inches of cover material. Since construction of this ET cover, seepage has continued.

Investigations into the source(s) of solution discharging from the NWRDF support infiltration of meteoric water through the cover. With the submittal of the February 2012 Final Plan for Permanent Closure (FPPC), the Permittee proposed further investigations consisting of a phased approach, including short-term efforts to fill critical data gaps, followed by an alternatives analysis to evaluate effects of re-grading, installation of additional surface water controls and different cover design alternatives with the goal of minimizing/reducing ARD solution emanating from the toe of the NWRDF and reducing solution volumes reporting to the RTSF. The FPPC was approved conceptually in February 2015.

In December 2014, the Permittee submitted a report entitled "Update to 2012 FPPC - ARD Due Diligence Study Seepage Pipeline & Infiltration Gallery." The report presented various options for long-term management of the NWRDF ARD solution, which included construction of a pipeline to the Emigrant Mine (WPCP NEV2005107) for use of the ARD solution as make-up water during active mine operations and treatment and disposal of the solution following closure of the Emigrant Mine. Although not proposed in that report, the Division subsequently requested that the Permittee investigate water treatment facilities located at the Rain Mine instead. In January 2015, the Division provided comments stating that the proposed actions may be a viable alternative but would require additional data and engineering designs to prior to consideration.

Data collected from the additional investigations will be used to update the site-wide FPPC. Submittal of this updated FPPC is included as a Schedule of Compliance item in the Permit.

The Permittee will continue to monitor NWRDF seepage solution water quality and flows into the ARD solution collection pond (TRTIN) and ARDLD on a weekly basis.

NWRDF Seepage Remediation Results

There are several surface water and groundwater monitoring locations downgradient of the NWRDF. Surface water monitoring location Rain Ephemeral Drainage (RN-CC) is located within the drainage approximately 200 feet downgradient of the ARD Collection Pond. This location has been monitored since 2000 (as surface grab samples for total metals). The flows in this drainage are seasonal (spring) and/or event driven. Water quality results from RN-CC exhibit a high degree of variation. RN-CC reflects elevated aluminum, iron, and manganese concentrations. Average water pH and alkalinity values are 7.9 SU and 49 mg/L, respectively.

A release of 1,000 gallons of ARD solution to the ephemeral drainage above RN-CC occurred in April 2006. Samples from RN-CC shortly after the release detected only a minor decrease in pH (from approximately 8 SU above the release to 7 SU below the release). No residual chemical impacts to the drainage have been detected from the release.

Emigrant Spring (ESPR-1) is located approximately 650 feet downgradient from the NWRDF adjacent to the ephemeral drainage. The spring has been monitored since October 1994 for a total of 78 sampling events.

With the 2009 WPCP renewal, an additional downgradient surface monitoring location, EMI-D1-A, was established downstream of Emigrant Spring. This monitoring location represents an intermittent stream and is located near the Rain property boundary to monitor the quality of surface water leaving the site. As of December 2015, twelve water quality samples have been collected and data indicates a neutral pH (average 7.61 SU) and average alkalinity of approximately 164 mg/L. Additionally, this also serves as an upgradient monitoring location for the Emigrant Project (WPCP NEV2005107).

Groundwater monitoring well REP-1 is located approximately 100 feet southeast of the ARD Collection Pond. This well, constructed in October of 1990, has a total depth of 25 feet and is screened from 20 to 25 feet below collar. Depth to water is shallow, averaging 5.45 feet below ground surface (bgs). The well has been sampled and analyzed quarterly a total of 97 times as of 2016, beginning in November 1990, and consistently reports circumneutral water with high alkalinity that meets all reference values except iron and manganese.

Long term monitoring of Emigrant Spring (ESPR-1), stream location EMI-D1-A, and well REP-1 suggests:

a) The NWRDF ARD collection system has been successful capturing the majority of seepage;

b) Alkalinity and pH of the spring, stream, and well appear to be stable; and,
c) REP-1 indicates slight but continuous sulfate and TDS increases over time.

Future plans consist of continued active management of the existing ARD Seepage Collection System. In addition, actions designed to locate and isolate the source(s) to minimize and/or eliminate meteoric, groundwater, and/or surface water contact with the NWRDF are ongoing. Monthly monitoring of RN-CC and quarterly monitoring of Emigrant Spring, EMI-D1-A, and monitor well REP-1 will continue for water quality, and where appropriate, flowrate, and depth to groundwater.

Rain Tailings Storage Facility (RTSF):

The RTSF encompasses an area of 189 acres. This storage facility is located downgradient of the mill, heap leach pad, both open pits and the SMZ waste rock dump. This facility was originally designed as a zero discharge facility.

The RTSF embankment was constructed to an elevation of 6,409 feet AMSL in the fall and winter of 1987, and was lined with 12 inches of native soil having a design permeability of less than 1×10^{-7} cm/sec.

In April 1988, prior to deposition of tails, stormwater collected in the RTSF and seepage was observed in the natural channel approximately 800 feet downgradient of the RTSF (300 feet now due to phased dam expansions). The initial remedial actions were started in June 1988, as described in a separate section below.

The Phase I embankment raise to elevation 6,424 feet AMSL was completed in October 1989, and was designed to provide approximately one year of tailings storage. In addition to the downstream raise, this expansion included the installation of a basin seal/underdrain system within the basin and the construction of the outlet pipeworks and underdrain collection pond.

The RTSF basin seal and underdrainage system were designed to provide a hydraulic barrier and break beneath areas of the basin that would be affected as the supernatant pond solution migrated to higher basin elevations during filling. The basin seal consists of a 1 foot thick layer of compacted, low permeability, 1×10^{-6} cm/sec, clayey soil, borrowed and placed or scarified and compacted in-place. A 1 foot thick layer of pit-run gravel overlies the basin seal and serves as a drainage blanket. An internal system of perforated CPT located within the drainage blanket collects underdrain flows and conveys it to the main HDPE conveyance pipe located around the basin. Collected solution is conveyed through a concrete encasement in the embankment to the Underdrain Collection Pond (UCP) and sampled (Profile II/Flow) at the pipe outfall – monitoring

location Underdrain Water (UW). Solution contained in the UCP is then pumped into the RTSF (UW return), which is monitored weekly for pumpback flowrate. The basin seal and underdrainage system was extended where the required minimum freeboard ties into the existing system. To prevent direct inflow of pond waters to the underdrain system, a 30-mil polyvinyl chloride (PVC) retarding layer was placed over the underdrain areas within the basin to an elevation 2 feet above the maximum expected supernatant pond level. The retarding layer was anchored into the natural soil at the basin extension.

Construction of the UCP began with placing, moisture conditioning, and compacting random fill material. The random fill material was primarily mine waste. The liner system consists of a secondary 80-mil HDPE overlain with geonet, which is overlain by a primary liner of 80-mil HDPE. The primary liner extended up the pipe trench under the flume and was fastened to the concrete sediment tank and the downstream end of the concrete that encases the 6-inch and 8-inch diameter HDPE pipes.

The Underdrain Collection Pond Leak Collection and Recovery System (UCP LCRS) is installed between the primary and secondary liners. The LCRS is composed of geonet, a short piece of 4-inch CPT pipe, and sand backfill around the CPT pipe, is working as designed and has not indicated leakage.

The 1990 raise, Phase II, provided a two-year expansion in capacity at a crest elevation that varied between 6,432 feet and 6,440 feet AMSL. The 1993 raise, Phase III, resulted in new crest elevations of between 6,451 feet and 6,458 feet AMSL, and provided additional storage capacity on the order of 2,250,000 tons. The 1996 raise, Phase IV, increased the embankment elevation by 3.5 feet and provided an additional 390,000 tons of tailings capacity. The 1996 expansion extended the existing soil seal and underdrain system within the basin to an elevation of 6,450.5 feet AMSL.

The RTSF was designed to accommodate overflow from the other process components and runoff from the 100-year, 72-hour storm event. Deposition of tails ceased in 1998. Since that time, the RTSF has been acting in a solution storage capacity for various upgradient sources.

Monitoring of the RTSF will continue to consist of:

1. sampling of the underdrain solution at UW (Profile II/Flow);
2. the volume of solution contained in the RTSF;
3. inflows (daily average in gpd) into the RTSF from the following sources: the NWRDF ARD treatment system; the HLP; the HLP FD system; UW return, and direct meteoric precipitation;
4. sampling of the treated ARD solution and tails water (TW); and
5. the UCP LCRS for average daily accumulation.

Tailings Impoundment Plume Remediation Actions

A groundwater contaminant plume was first detected downgradient of the impoundment in 1988. A remedial action program was immediately initiated.

The initial geotechnical investigation utilized a tracer study, exploratory borings, test pits and groundwater monitoring wells. This investigation concluded that the source of the contamination was derived from two points:

1. A fractured area located within the bedrock in the immediate area of the seepage collection pond; and
2. Along the western flank of the RTSF HDPE barrier wall.

The seepage then appeared to migrate downgradient through the shallow alluvium of the natural channel. This observation was confirmed by the lack of contamination to wells located outside the natural channel. In addition, only wells in the natural channel with shallow screened intervals recorded contamination. This suggested that the major seepage pathway is via the highly fractured material in the natural channel bottom rather than through relatively competent bedrock below the natural channel alluvium.

This 1988 program also recommended upgradient and downgradient remedial actions to contain and recover the seepage. The upgradient controls consisted of removing saturated soils within the impoundment, installing a clay cut-off trench and clay liner, and repairing the abutment liner along the south side of the RTSF. The downgradient controls consisted of construction of a Seepage Collection Pond (SCP), installation of an HDPE-lined barrier trench just downgradient of the seepage collection pond, installation of a trench drain to run parallel to the toe of the dam and drain to the SCP, and installation of a series of monitoring wells.

The earthen, soil-lined SCP is located downstream of the RTSF. The SCP was designed to intercept and collect seepage originating from the RTSF as it drains along the alluvium/siltstone interface. The pond has a volume of approximately 240,000 gallons with a depth of 10 feet. The upper 5 feet are constructed in alluvium and the lower 5 feet are in siltstone (bedrock). The pond is equipped with a pump which automatically evacuates the collected solution (from Parallel Trench Drain (PTD), Upper Trench Drain (UTD), and Downstream Trench Drain (DTD)) to the UCP located north of the SCP. The SCP is monitored quarterly for water quality and weekly for pumpback flow.

A vertical barrier trench (embankment trench), lined with 60-mil HDPE, was constructed immediately downgradient of the SCP. This cut-off wall, 120 feet long by 15 to 20 feet deep, is keyed into the bedrock along its entire length and serves the dual purpose of forming a barrier to the near surface flows while enhancing groundwater recovery from the SCP. Soils with high clay content were

backfilled on the upstream side of the liner. Solutions captured by this trench are pumped to the UCP.

The PTD approximately 400 feet long, 3 feet wide, and 15 to 18 feet deep, was dug from the northeast corner of the SCP westward almost parallel with the toe of the RSTF embankment. A 60-mil HDPE liner was placed in the bottom of the trench. Geotextile fabric was placed along the bottom and sides of the trench directly above the liner. A 6-inch diameter perforated, corrugated ADS pipe was placed on top of the liner and the trench was backfilled with 6-inch minus drain rock. The remaining fabric was draped over the backfill and a 2-foot clay cap was placed over the trench to prevent surface water infiltration. Solution flows directly from this trench drain to the SCP.

The construction of these upgradient and downgradient controls was completed by September 1988. In 1989, a follow-up report was completed. Based on the results of the 1988 investigation and, with additional data, two additional remediation trench drains were constructed.

The UTD is located approximately 100 feet south (downgradient) of the SCP and embankment trench, and approximately 30 feet north of the paired monitor wells MW-2B and MW-3. The total trench length is approximately 215 feet and maximum depth is about 26 feet below existing site grades. This trench drain serves as a redundant seepage collection facility, primarily during the spring runoff high-flow periods. Any seepage bypassing the SCP or the HDPE-lined embankment trench will be intercepted by this trench drain.

The DTD is located about 50 feet north (upgradient) of the paired monitor wells MW-16 and MW- 23, and about 800 feet south of UTD. The total trench length is approximately 130 feet and maximum depth is approximately 20 feet below existing site grades.

The UTD and DTD fully intercept the limited thickness of relatively permeable younger channel alluvium and colluvium that has a maximum thickness of 10 feet and 15 feet respectively. A 60-mil HDPE liner seals the bottom 3 feet of each trench and contains a 6-inch diameter perforated HDPE pipe embedded in a 3/8-inch minus backfill material to convey intercepted solution to the pumpback sump. The sump consists of a vertical 12-inch diameter slotted PVC well casing equipped with an automatic 30 gpm downhole pump and flow totalizer to return solution to the SCP. A backup pumpback sump was installed in the UTD as a contingency measure for peak flows. Table 5 provides details of the monitoring wells.

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Table 5 – Monitor well construction and depth to water details

Well ID	Collar Elevation (feet AMSL)	Total Depth (feet)	Well Bottom (feet AMSL)	Depth to water (feet below collar)	Groundwater Elevation (feet AMSL)	Screen Interval (feet below collar)
MW-2B	6,307.4	80	6,227	63.2	6,244	45 - 80
MW-3	6,307.9	21	6,287	12.9	6,295	5 - 21
MW-16	6,274.8	59.5	6,215	Dry	N/A	19 - 59
MW-23	6,274.6	24	6,251	19.2	6,255	4 – 23.5

In addition to groundwater monitoring, several springs downgradient of the RTSF are also monitored for water quality. In late 2010, a new spring was observed on the western side of the access road, approximately midway between the UTD and DTD. The spring is identified as Trench Drain Spring (TDSP) and appears to be ephemeral. TDSP, Ferdelford Spring 2 (FSPR-2), and Ferdelford Spring 3 (FSPR-3) are sampled on a quarterly basis for Profile II, total metals. FSPR-2 and FSPR-3 are located approximately 2.1 miles and 2.3 miles, respectively, downgradient of the RTSF.

RTSF Plume Remediation Results

Chemistry of the underdrain water – as sampled at UW – is presumed to represent the plume chemistry. The UTD, DTD, and several wells have been monitored for water quality and flow/depth to water since construction. Monitoring of the PTD began in December 2009. Table 6 below provides a comparison of UW (plume) solution quality to the downgradient capture trench drains PTD/UTD/DTD. Table 7 provides the Fourth Quarter 2015 water quality data.

This table provides solution concentrations only for constituents considered of interest or currently elevated. Average UW, UTD and DTD solution concentrations are based on a simple average of all available analyses (approximately 109 sampling events – September 1988 through November 2015); PTD solution concentrations are based on a simple average of all available analyses (approximately 25 sampling events – December 2009 through November 2015). The range reflects the lowest and highest values from all sampling events.

Table 6 – Comparison of average UTD and DTD, January 1997 to November 2015, and PTD, December 2009 to November 2015, Constituents of Concern (COC) to UW

COC (in mg/L unless noted)	**Average UW (Range)**	**Average PTD (Range)**	**Average UTD (Range)**	**Average DTD (Range)**
Alkalinity	36 (<1.0 – 85)	56 (38.5 – 86.5)	48 (31.8 – 84.7)	64 (34.7 – 101)
Aluminum	2.1 (ND – 19.6)	0.100 (ND – 1.55)	0.080 (ND) (ND – 0.971)	0.168 (ND – 3.81)
Arsenic	0.080 (0.020 – 0.683)	0.003 (ND) (ND – 0.004)	0.009 (ND – 0.074)	0.007 (ND - 0.118)
Manganese	4.2 (1.61 – 9.4)	0.004 (ND) (ND – 0.014)	0.297 (ND – 2.48)	0.043 (ND – 0.534)
Nitrate + Nitrite as N	40 (7.1 – 111)	9.8 (1.33 – 20)	11.8 (2.76 – 24.8)	5.6 (ND – 20.5)
pH, SU	6.28 (4.83 – 7.94)	6.94 (5.69 – 8.52)	6.62 (4.93 – 8.05)	6.93 (5.36 – 8.07)
Sulfate	1,960 (24 – 3,240)	1,315 (108 – 1,940)	1,020 (110 – 2,650)	728 (39 – 1,620)
TDS	3,210 (1,700 – 4,740)	2,140 (266 – 2,850)	1,675 (269 – 3,160)	1,260 (200 – 2,680)
WAD Cyanide	0.035 (0.010 – 0.190)	0.014 (ND – 0.063	0.013 (ND – 0.070)	0.010 (ND – 0.239)
Flow, gpm	56.9 (327 data points)	4.12 (327 data points)	1.35 (330 data points)	3.32 (330 data points)

Table 7 – Fourth Quarter 2015 Constituents of Concern Concentrations: UW, PTD, UTD, and DTD

COC (in mg/L unless noted)	**UW**	**PTD**	**UTD**	**DTD**
Alkalinity	84.7	68.8	50.5	66.7
Aluminum	<0.08	<0.08	<0.08	<0.08
Arsenic	0.074	<0.003	0.00353	<0.003
Manganese	2.48	<0.004	0.0042	<0.004
Nitrate + Nitrite as N	7.13	6.38	6.8	3.33
pH, SU	6.71	7.28	6.54	6.72

Sulfate	2,100	1,760	1,310	1,610
TDS	3,160	2,780	2,080	2,680
WAD Cyanide	0.012	0.012	0.011	0.011
Flow, gpm	26	1.17	0.96	16.4

All flows appear to be seasonally controlled. Trend analysis of the PTD, UTD, DTD and UW for alkalinity, nitrate, sulfate and flowrate suggests an inverse relationship, i.e. – the higher the flow, the lower the concentration.

In general, downgradient monitoring of the plume, as provided by the PTD, UTD, and DTD, indicate that:

1. Aluminum, arsenic, and manganese concentrations are reduced significantly immediately downgradient of the RTSF;
2. Alkalinity and pH values increase as one moves downgradient of the RTSF; and
3. Nitrate, sulfate, and TDS concentrations also indicate reductions downgradient of the RTSF.

Water quality for well MW-2B is excellent, meeting all Division Profile I reference values. Water quality data since 1993 does not indicate the presence of process solution.

Well MW-3 is screened in the contaminated shallow aquifer and past data indicate trace levels of WAD cyanide. However, the sulfate and TDS concentrations are not significantly elevated. In recent years water quality has improved with only occasional elevated concentrations of iron and manganese.

Monitoring well MW-16 has been essentially dry since construction.

MW-23 water chemistry has pH in the range of 3.5 SU to 6.5 SU. Historic 1997 values for magnesium (54.6 mg/L), sulfate (937 mg/L), and TDS (1,340 mg/L) are elevated compared to that of monitor well MW-3, i.e. – magnesium 6.8 mg/L, sulfate 39 mg/L, and TDS 150 mg/L, for the same timeframe. During construction of the road in the immediate area of MW-23, the area was backfilled with PAG waste rock. In 2002, the area immediately surrounding well MW-23 was excavated and backfilled with clean waste rock.

MW-23 trend analysis of magnesium, sulfate, and TDS concentrations indicates that these three constituents have been on a steep downward trend, having recent concentrations of 5.5 mg/L, 93.7 mg/L, and 285 mg/L, respectively. Additionally, the pH indicates an increasing trend, beginning with 3.6 SU in 1997, and as of May 2011 (the last sample collected), having a pH of 6.8 SU, also suggesting that the sulfides have been and continue to be oxidized. With the exception of the May

2011 sampling event, this well has either been dry or has had insufficient water available for sampling since September 2006.

In conclusion, under existing conditions:

1. The PTD, UTD, and DTD appear to be capturing and removing tailings seepage as designed;
2. Trench Drain Spring (TDSP), Ferdelford Spring 2 (FSPR-2), and Ferdelford Spring 3 (FSPR-3) water quality data do not indicate contamination from process solution; and,
3. Additional downgradient monitoring/locations are not necessary at this time.

The 2016 Permit renewal requires the operator to continue to monitor quarterly:

1. UTD, DTD, and PTD solution quality quarterly (Profile II/dissolved) and pumpback volumes (daily average in gpd);
2. all four existing downgradient monitoring wells – quarterly Profile I/dissolved and depth to groundwater;
3. Trench Drain Spring (TDSP) will be sampled on a quarterly basis for an Profile II analysis (total metals);
4. Ferdelford Spring 2 (FSPR-2) and Ferdelford Spring 3 (FSPR-3) will both continue to be sampled on a quarterly basis for Profile II, total metals; and.
5. To confirm that downgradient surface is not being impacted, three new monitoring points, FF-HW1-A and FF-D1-A, located upgradient and downgradient, respectively, of the confluence of the unnamed drainage and Ferdelford Creek above FSPR-2, and PC-D1-A, located downgradient of the confluence of Ferdelford Creek and Pine Creek, were added with the 2016 Permit renewal.

Based on the chemistry observed at PTD and UTD, the SCP, a single-layer (clay) pond, appears to be the source of groundwater contamination to the UTD, the Division will require the Permittee to upgrade the existing SCP to a synthetically-lined leak-detected process solution pond, or, if the Permittee may, eliminate the SCP and manage solutions reporting from the PTD and related tailings discharge appropriately. This is included in the Permit as a Schedule of Compliance Item.

Rain Tailings Storage Facility Source Reduction Program (RTSF-SRP)

The current RTSF permanent closure strategy utilizes the RTSF as a passive long-term storage/evaporation basin providing for a zero discharge of solution derived from upgradient components.

The RTSF, although conceived as a tailings impoundment, has and will continue to be utilized, at least into the short term, in a solution storage capacity servicing upgradient mine components.

Beginning with its construction in 1988, the RTSF has received in the past, or is currently receiving, solution from seven separate sources: the Mill; the NWRDF ARD treatment system; the HLP; the HLP FD system; the SMZ-WRDS, tails recycle solution; and direct meteoric precipitation.

The site-wide water balance indicates that stormwater run-on has been precluded from reporting to the RTSF.

Excessive solution inventory requires active solution management (currently via evaporators/snow makers), precludes the establishment of physical conditions suitable for the construction of passive long-term storage/evaporation basins, and may contribute to the continued existence of the RTSF plume - which in itself requires active remediation activities. As such, the RTSF water balance must be reduced. The RTSF SRP will focus on actions that will reduce solution from all sources. Each of the six current RTSF sources, and reduction actions, are presented below.

1. NWRDF ARD treatment system: This system currently provides a significant source of both solution and constituents to the RTSF (the NWRDF ARD solution, although neutralized, contains elevated levels of metals). The NWRDF flows are seasonal/event controlled. Average daily flow since the 2011 renewal, beginning with the third quarter of 2011, was 12.8 gpm. See the NWRDF Seepage Remediation Results section above for details on future solution reduction activities.
2. HLP: With the completion of the pond retrofit project, both the HLP and HLP FD systems have been upgraded to allow for more discrete water quality and flow sampling. These actions are a component of the RTSF SRP. Average daily flow since the 2011 renewal, beginning with the third quarter of 2011 was 12.9 gpm. A conceptual HLP with simple 2 foot thick soil cover was modeled and predicted a long-term annual average draindown of 2 to 7 gpm, depending on the soil type utilized.
3. HLP FD System: The combined FD long-term flows will continue to vary due to seasonal impacts. The average annual flows from EFD and WFD, for the same time period, were 0.72 and 0.60 gpm, respectively. A conservative annual average flow, based on the average flows for EFD and WFD is estimated at 5 gpm. An improvement to FD water quality may allow for a future discharge into the environment, thereby reducing one more source to the RTSF. Since the retrofit of the French drain was only completed in 2010, an insufficient amount of water quality data is

available as of 2016 to determine trends in chemistry or flows reporting to the drain system.

4. SMZ-WRDS: Overall flows are expected to remain minimal. Based on weekly and quarterly monitoring performed to date, the Division continues to allow water to be discharged to the storm diversion channel. This should result in approximately 9 gpm annual average (approx. 4.7 million gallons annually) less inflow to the RTSF.
5. UW Return: Based on the site-wide water accounting balance, an approximate additional 25 gpm is pumped back to the RTSF. This amount represents the difference between the tails underdrain water (UW) and solutions pumped from the SCP and direct precipitation over the area downgradient of the RTSF encompassing the PTD, DTD, and UTD.
6. Direct Meteoric Precipitation: The direct average annual precipitation is approximately 14 inches per year, which corresponds to approximately 140 gpm (73,584,000 gallons annually).

Rain Tailings Storage Facility – Solution Balance Reduction (RTSF-SBR)

The 2012 FPPC RTSF permanent closure strategy utilizes the RTSF as a passive long-term storage/evaporation basin providing for a zero discharge of solution derived from upgradient components/direct precipitation as discussed above. In order to obtain this configuration, RTSF solution inventory must be reduced. The advantages of solution reduction include:

1. Freeing-up storage capacity for potential heavy spring inflows from all sources;
2. Reducing head on remaining RTSF basin solution potentially leading to a reduced or eliminated downgradient plume signature;
3. Reduced solution inventory may be conducive to tails solids consolidation, and hence reducing hydraulic conductivity - both saturated and unsaturated - again potentially leading to a reduced or eliminated downgradient plume signature; and
4. Allow for RTSF surface construction activities to proceed.

Evaporation of solution in the RTSF is an on-going process. Utilizing snowmakers and evaporation trees, the active evaporation of RTSF solution has been a successful seasonal solution reduction on-going activity since 2006.

Reporting requirements for the active solution reduction activities will consist of:

1. Number/hours individual evaporators active;
2. Estimated volume of solution reporting to evaporators;
3. Estimated volume of solution evaporated; and

4. Lime usage - (see Permit).

Active seasonal evaporation activities are anticipated until such time that upgradient source inputs are reduced. As of 2016, the constructions of open ponds and/or evaporation cells (E-cells) on the surface of the RTSF are anticipated as a preliminary closure action. It may also be anticipated that an additional gravity-fed, E-cell will be required downgradient of the RTSF to collect and contain pumpback solution from the process plume.

In December 2014, the Permittee submitted a report entitled "Update to 2012 FPCP - Tailings Storage Facility-Seepage Pipeline and Infiltration Gallery Due Diligence Study." The report presented various options for long-term management of the RTSF seepage solution, which included the proposed construction of a seepage solution gravity pipeline and infiltration gallery to provide ultimate disposal of the solution from a physical perspective. The report did not consider solution chemistry or potential attenuation capacity of the subsurface soils. In January 2015, the Division provided comments stating that the proposed actions may be a feasible alternative but would require additional data and engineering designs to allow for consideration.

Data collected from the additional investigations will be used to update the site-wide FPPC. Submittal of this updated FPPC is included in the Permit as a Schedule of Compliance item.

Aerobic Cyanide Destruction Facility:

The aerobic cyanide destruction facility was constructed in the early 1990's for cyanide detoxification of the RTSF solution. The facility has not been operated for over 15 years. The Permittee submitted an FPPC which was approved on 12 October 2010. Original plans included a closure completion date of 31 December 2010, but due to the coming winter, the date was extened to July 2011.

The approved FPPC included removal of any accumulated solution, the majority of which was meteoric, either by evaporation or pumping to the RTSF. All gravel fill material, HDPE liner and related piping was buried in the southwest corner of the RTSF. Soil beneath the facility was sampled and no contamination was discovered.

All closure activities for the aerobic cyanide destruction facility were completed in late August 2011. The Final Closure Report (FCR) was received and approved by the Division in September 2011.

Bioremediation Facility:

A bioremediation pad was constructed north of the mill area to treat the petroleum-contaminated soil (PCS) generated from Rain mine operations. The pad was not used for storage of hazardous waste. An Individual Hydrocarbon Permit (IHP-02) was issued in June 1996.

In December 2011, the Permittee submitted an FPPC for closure of the bioremediation cell. The FPPC provided for the relocation and encapsulation of the PCS material from the original location to private land owned by the Permittee.

Based on topography, the Permittee chose a location near the southwest corner of the RTSF. The location is in an area with a greater depth to water, is removed from natural drainages and has existing access from the bioremediation pad with little chance of future disturbance due to ongoing reclamation activities.

The FPPC was approved by the Division in December 2011 and implemented in May 2012. The Permittee submitted the FCR, which was subsequently approved by the Division in February 2013. IHP-02 was terminated in January 2014.

Aerobic Cell ARD Passive Treatment System:

The aerobic cell was constructed in 1993 to evaluate the applicability of passive treatment technology to the remediation of low pH and metal-laden waters seeping from the NWRDF. The aerobic cell was constructed on the flat bench west of the ARD Seepage Collection Pond, having a bottom area of 1,600 square feet. The aerobic cell was used to polish water treated in the anaerobic cell using surface reactions involving algae. The facility was not operated since 1995.

The Permittee submitted an FPPC in June 2011 for the aerobic cell system, which was approved by the Division in July 2011. Closure consisted of cutting the liner to allow removal in sections, excavating the liner material, gravel bars, and any sediment in the cell, and transporting to the southwest corner of the RTSF. A trench was excavated within the RTSF and the excavated material was buried. The 2-inch diameter pipeline draining the cell to the ARD Seepage Collection Pond was removed and also buried within the RTSF. Soil sampling was conducted once the liner was removed to verify that process solution remained within containment during its operation, which was confirmed by the analytical results. Closure activities, including soil sampling, were completed at the end of August 2011. An FCR was submitted in October 2011 and approved by the Division in December 2011.

Mill and Associated Structures:

Demolition of the mill began in 1998 and was completed in 2004. The grinding circuit was demolished and removed in 2005. The surge tank, which has not operated since 1998, was relocated to the Leeville water treatment plant (NEV2002105), located adjacent to the Leeville Mine, in December 2004.

The crushing circuit, truck shop fuel dock and Truck Shop 3 wash bay have been closed. The mill building and associated structures, truck shop, water supply well and power substation will remain in place as administration and maintenance facilities for the Emigrant Project. Tanks, sumps, and other process related components remaining from the Rain operation shall be closed out as required by a Schedule of Compliance (SOC) item.

C. Receiving Water Characteristics

The Project is situated at the northern end of the Pinón Mountain Range at an elevation of approximately 6,600 feet AMSL. The site is bounded to the west by Rain Peak and to the south by Snow Peak, with the mine located on the east flank of Rain Peak and the processing facilities located in the valley 3,000 feet to the east.

The average annual precipitation, based on data collected from the Rain Project meteorological station since 1989, is approximately 14 inches per year. Estimated pan evaporation is 40 inches per year. The majority of the precipitation occurs as snow, generally falling during the months of November through February.

The Rain Project is located on the saddle separating two basins. Seasonal surface water on the south side of the saddle, where the two open pits, HLP, mill/associated structures, and RTSF are located, drains to the west into the ephemeral headwater drainage of Ferdelford Creek. Ferdelford Creek becomes a perennial stream 4 miles below the facility, and drains southwest for 10 miles before entering Pine Creek, a direct tributary to the Humboldt River. From this point, Pine Creek flows northwest and joins the Humboldt River, 6 miles further downstream. Because of the tributary rule (NAC 445A.1239), surface water in the Ferdelford Creek drainage is subject to the surface water quality standards for the Humboldt River at NAC 445A.1442 (the reach from Palisade Gage to the Battle Mountain Gage), and to the water quality standards at NAC 445A.1236 that apply to the beneficial uses designated for that reach of the Humboldt River. The designated beneficial uses for the Humboldt River from Palisade to Battle Mountain are watering of livestock, irrigation, aquatic life, recreation involving contact, recreation not involving contact, municipal or domestic supply, industrial supply, and wildlife.

In order to confirm that downgradient surface waters are not being impacted, and with the implementation of the tributary rule, the Division added two new monitoring locations for Ferdelford Creek in the 2016 Permit renewal. To establish upgradient background conditions, the Division has determined that a monitoring location, representative of the Ferdelford Creek headwaters, identified as FF-HW1-A, shall be sampled as far upstream as possible. A second location was added upstream of Ferdelford Spring 2 and downstream of the confluence of the unnamed ephemeral drainage and Ferdelford Creek, identified as FF-D1-A. And a third location, located downgradient of the confluence of Ferdelford Creek and Pine Creek, identified as PC-D1-A, will be sampled only if water quality results of FF-D1-A exceed the Surface Water Profile and associated Most Restrictive Beneficial Uses Standards for Ferdelford Creek.

In general, background groundwater in the area of the RTSF meets Division Profile I reference values. Water quality of downgradient springs Ferdelford Spring 2 (FSPR-2) and Ferdelford Spring 3 (FSPR-3) indicate occasional natural elevated concentrations, as compared to Division Profile I reference values for aluminum, iron, and manganese.

Seasonal surface water on the north side of the saddle, where the NWRDF is located, drains predominantly eastward in an un-named ephemeral drainage. Emigrant Spring (ESPR-1) feeds the headwaters of this un-named ephemeral drainage which then joins Dixie Creek. Dixie Creek flows into the South Fork Humboldt River approximately 8 miles northeast of the Project. The South Fork Humboldt River flows into the Humboldt River approximately 12 miles north-northeast of the Project. Because of the tributary rule (NAC 445A.1239), surface water in the Emigrant Spring Drainage is subject to the surface water quality standards for the South Fork Humboldt River at NAC 445A.1466 (the reach from Lee to the confluence with the Humboldt River), and to the water quality standards at NAC 445A.1236 that apply to the beneficial uses designated for that reach of the South Fork Humboldt River. The designated beneficial uses for the South Fork Humboldt River from Lee to the Humboldt River are watering of livestock, irrigation, aquatic life, recreation involving contact, recreation not involving contact, municipal or domestic supply, industrial supply, and wildlife.

Background ground and surface water quality in the area of the NWRDF is of good quality. This is demonstrated by surface water monitoring station Emigrant Spring (ESPR-1) and groundwater monitoring well REP-1. Water quality data collection for both locations began in the 1990. Emigrant Spring (ESPR-1) has an elevation of roughly 6,550 feet AMSL.

Groundwater resources at and near the site are limited. Shallow, perched groundwater exists and discharges as perennial or ephemeral springs, such as Emigrant Spring. These discharges occur where alluvial material overlies low permeability clays or silts. Prior exploration drilling near the current Rain Pit

indicated a regional groundwater elevation at approximately 6,100 to 6,160 feet AMSL, which is approximately 500 feet or more below ground surface in the area of the pits/HLP. The shallow groundwater system is recharged by local precipitation and snow melt and is not considered to be connected to this regional aquifer.

During active mining, two production wells located approximately 6 miles to the east of the Project in central Dixie Creek Valley were utilized. The wells were completed in 700 to 860 feet of unconsolidated valley-fill deposits of clay, sand, and gravel. The wells have been plumbed together and groundwater is monitored annually as RN-WS; the water quality meets all Division Profile I reference standards.

D. Procedures for Public Comment

The Notice of the Division's intent to issue a Permit authorizing the facility to close and monitor this mine subject to the conditions contained within the Permit, is being sent to **Elko Daily Free Press** for publication. The notice is being mailed to interested persons on the Bureau of Mining Regulation and Reclamation mailing list. Anyone wishing to comment on the proposed Permit can do so in writing within a period of 30 days following the 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 discharge 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 renew the Permit.

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

Except as detailed in the Permit, no proposed limitations or special conditions are stipulated.

G. Rationale for Permit Requirements

This site is in closure. The Rain Project permanent closure activities began with the partial demolition of the mill in 1998. The closure of select components is continuing. Ongoing closure-related investigations and remediation activities continue and the results of these investigations/remediation activities may induce changes to existing and proposed component FPPC and Permit rationale/requirements.

As of 2016, the Permittee's long-term plan is to reduce and/or eliminate solution emanating from the toe of the NWRDF to de-minimus levels, thereby allowing closure activities to begin at the RTSF. Additional work is on-going. These required actions are a WPCP SOC item.

Permanent closure activities are either complete or near completion for the following components:

1. the Rain and SMZ open pits;
2. the SMZ Waste Rock Dump;
3. the aerobic cyanide treatment cell;
4. the aerobic ARD treatment cell; and
5. the bioremediation cell;

Closure activities continue for the following components:

1. NWRDF;
2. Heap Leach Pad ;
3. RTSF; and
4. Mill and associated structures, tanks, sumps, etc.

NWRDF:

The Permittee has begun additional investigations to review various options to improve the NWRDF cover performance, water treatment options, and the economics of each, with the goal being to reduce, eliminate, or treat the effluent in the long-term. The results of these investigations will be provided in the updated FPPC per the WPCP SOC item.

As of 2016, no other additional NWRDF monitoring locations are proposed. However, future NRWDF actions and/or changes to water quality may require changes to the existing monitoring regime.

HLP/FD:

The current long-term HLP/FD solution management plan utilizes the 189-acre RTSF as a passive long-term storage/evaporation basin providing for a zero discharge of solution. Currently the HLP is without a final cover. A conceptual

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HLP simple 2-two foot thick final soil cover was modeled, and resulted in a predicted long-term annual average draindown of approximately 7 gpm. Since this is a conceptual TPPC, the final design and timeframe for installation has not been determined.

Rain Tailings Storage Facility (RTSF):

The RTSF, although originally conceived as a tailings impoundment, has and will continue to be utilized, at least into the short term, in a solution storage capacity servicing upgradient mine components.

A process solution leak and groundwater plume was discovered in 1988. Remediation actions to date appear to be successful. At this time no other additional RTSF monitoring locations are proposed. However, the Permittee is required to either upgrade or eliminate the SCP as it appears this pond, in its current configuration, is a source of degradation as indicated by UTD water quality data.

Future RTSF/NWRDF actions and/or changes to water quality in existing monitored locations may require changes to the existing monitoring regime.

Rain Tailings Storage Facility – Solution Balance Reduction (RTSF-SBR)

The current RTSF permanent closure strategy utilizes the RTSF as a passive long-term storage/evaporation basin providing for a zero discharge of solution derived from upgradient components/direct precipitation as discussed above. In order to obtain this configuration, RTSF solution inventory must be reduced. The advantages of inventory reduction include:

1. free up storage capacity for potential heavy spring inflows from all sources;
2. reducing head on remaining RTSF basin solution potentially leading to a reduced or eliminated downgradient plume signature;
3. reduced solution inventory may be conducive to tails solids consolidation, and hence reducing hydraulic conductivity - both saturated and unsaturated - again potentially leading to a reduced or eliminated downgradient plume signature; and
4. allow for the RTSF surface construction activities to proceed.

H. <u>Federal Migratory Bird Treaty Act</u>

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, 15 April 1985) includes nearly every bird species found in the State of Nevada. The U.S. Fish and Wildlife Service (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 (e.g., by covering with netting), and 2) chemical detoxification. These approaches may be facilitated by minimizing the extent of the 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.

Written by: Karl W. McCrea
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Revision 00: Renewal

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