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

Permittee Name: **Anova Metals USA LLC**

Project Name: **Big Springs Project-2**

Permit Number: **NEV2015103**
Review Type/Year/Revision: **New Permit 2016, Fact Sheet Revision 00**

A. Location and General Description

Location: The Big Springs Project-2 (BSP-2) is the second project of the same name to be operated at the Big Springs site. The original BSP was a mine, mill, and heap leach facility that operated from 1987 until 1993 under Water Pollution Control Permit (WPCP) NEV0087001. The original BSP is now in post-closure monitoring. Refer to ***Background/History*** for additional details.

BSP-2 is located in north central Elko County, approximately 54 miles north of Elko, in the historic Independence Mining District (also referred to as the Jerritt Canyon Mining District). Anova Metals USA LLC (Anova) is the Permittee for the BSP-2 and is authorized to mine up to 230,000 tons of ore per year. Projected mine life is less than five years.

The mine and support facilities are located in the Independence Mountain Range on public land administered by the U.S. Forest Service-Humboldt-Toiyabe National Forest (USFS-HTNF) within portions of Sections 1, 2, and 11, Township 42 North, Range 53 East, Mount Diablo Baseline and Meridian.

Site Access: The BSP-2 can be accessed from Elko by proceeding north on State Route (SR)-225 approximately 54 miles to the intersection of County Road (CR)-732/Jack Creek Summit Road (also referred to as Forest Service Road [FR]-473) and then proceeding west 4.5 miles past the Doheny Ranch and then west an additional 4.5 miles to the entrance gate located at the Ore Stockpile Pad and Pit.

General Description: The BSP-2 area includes previously mined areas, including open pits and reclaimed overburden storage areas, access roads, and the reclaimed crusher and maintenance site. The new proposed operations include reopening reclaimed surface disturbance, and utilizing areas of existing surface disturbance associated with the former BSP. The Permittee proposes to conduct open pit mining in the existing partially disturbed 601 Pit and underground mining of ore below both the 601 Pit (once open pit mining has been completed) and the existing 701 Pit, over a period of two years. The proposed mining activities are located within areas of previous and partially reclaimed surface disturbance associated with the original Big Springs Mine. Existing disturbed acreages will be redisturbed as part of the proposed disturbance and minimal new disturbance

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will be created. The proposed surface disturbance will include disturbance associated with water/sediment control structures.

Mining and waste rock disposal will occur on both public and private land, while maintenance and administrative activities occur on private land. The stockpiled gold-bearing ore will be transported to an off-site permitted facility for processing and gold recovery. No on-site processing will occur.

The BSP-2 facilities are designed and constructed to operate and close without any release or discharge from the fluid management systems. Discharges may occur as a result of meteorological events, which exceed the design storm event and exceed the standards established in regulation.

B. Synopsis

Background/History: Historical documentation obtained from the Nevada Bureau of Mines and Geology indicate that prior to World War I and up until the end of World War II; minor amounts of stibnite (antimony sulfide [Sb_2S_3]) were mined and shipped from the Independence Range for use in the manufacture of munitions. In 1972, stimulated in part by resurgence in the demand for antimony use in lead-acid battery manufacturing, the present day BSP site was explored jointly by Superior Oil Company (now a part of ExxonMobil) and Falconbridge Ltd (formerly Falconbridge Nickel) and in 1976, gold mineralization was discovered in an area referred to as Mac Ridge.

Bull Run Gold Mines Ltd. acquired the claims in 1980 and later initiated a joint venture agreement with Freeport Minerals Co. (predecessor to Freeport-McMoRan Gold Incorporated [FMGI]), then operator of the Jerritt Canyon Mine, located nine miles south of the BSP site. Freeport undertook a comprehensive exploration drilling program in 1982, and identified additional mineralization, most notably the North Sammy Creek and South Sammy Creek areas.

The Nevada Division of Environmental Protection-Bureau of Mining Regulation and Reclamation (the Division) issued Water Pollution Control Permit (WPCP) NEV0087001 to FMGI in early 1987. In 1990, Independence Mining Company Inc. (IMCI) acquired both the FMGI and Bull Run interest in the Project and the Permit was transferred to IMCI. AngloGold Corporation assumed all operating and ownership interest in IMCI (including the Jerritt Canyon Mine) in November 1999 and the company was renamed AngloGold (Nevada) Corporation in August of 2003. In December of 2004, AngloGold (Nevada) Corporation was renamed AngloGold Ashanti (Nevada) Corporation.

AngloGold Ashanti allowed the Big Springs claims to lapse, and the claims were subsequently re-staked by GSI Exploration in November 2001. Gateway Gold Corporation (Gateway) acquired a 100 percent interest in the BSP in 2002 and conducted an extensive exploration program beginning in 2003 until they were

taken over by Victoria Gold Corporation (VGC) in December 2008. Exploration at the BSP ceased due to VGC's preoccupation with a major discovery in the Yukon.

In February 2013, VGC sold the entire BSP to MRG Copper LLC (renamed as Anova Metals USA LLC), the U.S. subsidiary of Big Springs Project Pty Ltd, which was in the process of being acquired by Anova Metals Limited.

The original BSP operation was a conventional open pit gold mine with ore processing by milling and heap leach cyanidation with precious metal recovery by carbon adsorption. The Project included 12 open pit mines, six waste rock dumps, ore beneficiation facilities, high-density polyethylene (HDPE)-lined heap leach pads, process water ponds, and tailings impoundment. The open pits were designated 131, 219, 303, 401, 601, 701, SWX, North, Lower Sammy Creek, Middle Sammy Creek, Upper Sammy Creek, and Mac Ridge. The waste rock dumps were designated Lower Sammy Creek, Upper Sammy Creek, Mac Ridge, Lower Water Canyon, Upper Water Canyon, and Dry Canyon.

Open pit mining was conducted on a seasonal basis until mining operations ceased in August 1993. The haulage of ore from stockpiles in the mined areas to the BSP mill site continued until August of 1994.

Processing of carbonaceous and sulfide-bearing ore at the Doheny Ranch Roaster and Mill began in 1989 and ceased in October 1994. Gold recovery from the spent heap and tails materials at the BSP was concluded in June 2000 and total gold production was estimated at 386,000 ounces. Final reclamation and closure of the mine areas began in 1995 and completed in early 2005. The BSP facility is currently in post-closure monitoring.

Physiography and Topography: Big Springs is located on the eastern flank of the Independence Mountains range, north of McAfee Peak in the valley of the North Fork Humboldt River (NFHR). The NFHR runs through the northern boundary of the Big Springs area. The range runs for approximately 70 miles from a point near the town of Carlin to the banks of the Owyhee River. To the west of the range is the Owyhee River and to the east is the NF Humboldt River. The main branch of the Humboldt River passes to the south. North of Big Springs is the Wild Horse State Recreation Area. Elevations within the Big Springs area range between 7,000 and 8,200 feet above mean sea level (amsl).

Geology: The Big Springs mineral deposits are hosted in sediments, intrusive rocks, and marine volcanic rocks. Deformation related to the Antler Orogeny is the earliest major tectonic event recorded in the Big Springs rocks. This event placed siliceous western assemblage rocks over eastern assemblage carbonates and siltstones along the Roberts Mountain thrust fault. Following the Antler Orogeny, siliciclastic rocks accumulated in the Antler foreland basin to form the Schoonover Sequence. This accumulation continued from Mississippian to

Permian time when compressional deformation of the Sonoma Orogeny occurred during the Late Permian to Early Triassic. During the Sonoma Orogeny the Schoonover Sequence was placed over allochthonous western and autochthonous eastern assemblage rocks. Sonoma thrusting in the Big Springs area was southeastern in direction evidenced by southeast-verging overturned folds and overlapping layered thrust faults that have been cut by later normal faults. Jurassic plutons are exposed north of Big Springs and are composed of granite and diorite.

At Big Springs, intrusive rocks occur as dikes along high-angle structures, small intrusive bodies, and as dikes and sills intersected in drilling and exposed in pit walls. Compositions range from quartz monzonite to diorite and are probably related to the Jurassic intrusions, though none have been successfully dated. Many of the dikes occur along east-west and northeast-striking fault intersections.

Ash-flow tuffs and flow rocks overlie the Schoonover Sequence along a Cretaceous erosional surface. Numerous Tertiary dikes, andesite to rhyolite in composition, cut the Schoonover Sequence. Vent breccias with numerous Schoonover clasts are found in the southwest portion of the area near Jacks Creek. Andesite dikes occur along northeast and east-west structures. A quartz latite dike crops out with the same structural orientation near the headwaters of Jacks Creek and in Cole Canyon.

Stratigraphy: Rocks exposed in the Big Springs area include Silurian-Ordovician rocks of the Hanson Creek Formation and Valmy (McAfee Quartzite) Group, Devonian-to-Silurian Roberts Mountain Formation, Devonian-to-Permian Schoonover Formation, Jurassic dikes and sills and Tertiary volcanic rocks.

Mineralization: Mineralization is concentrated between Sammy Creek and the east side of Mac Ridge Summit. Ore zones are cut off to the north by the east-west shear zone that begins near the mouth of NFHR drainage and extends west through Cole Canyon. Ten miles north of this major shear zone two ore deposits occur in Schoonover Sequence rocks; Doby George and Wood Gulch. Seven distinct deposits were mined previously at Big Springs: Mac Ridge, North Sammy, South Sammy, the 401, 219, 131, and 701 deposits. The 601 deposit was stripped but not mined.

Ore mineralogy at Big Springs is characterized by pyrite (isometric iron sulfide [FeS_2]), marcasite (orthorhombic iron sulfide [FeS_2]), arsenopyrite (iron arsenic sulfide [FeAsS]), sphalerite (zinc sulfide [ZnS]), chalcopyrite (copper iron sulfide [$CuFeS_2$]), stibnite, and gold. The gold can be encapsulated in silica or as native gold.

The Big Springs ore bodies formed in a complex structural environment with mineralization concentrated along northeast and east-west structural intersections. Host lithologies played a subordinate role. All of the rock types discussed may

contain anomalous to ore-grade gold if in the correct structural settings. Major northeast-striking faults cross cut the various lithologic units and intersect east-west structures. This intersection hosted the ore-bodies that were mined previously at Big Springs.

Waste Rock and Ore Characterization: Beginning in 2013, the Permittee undertook a comprehensive geochemical characterization program for the BSP-2 waste rock and ore to expand the database first started during the mid-1980s. The program included Meteoric Water Mobility Procedure (MWMP) testing; Acid-Base Accounting (also referred to as ABA, acid neutralization potential/acid generation potential [ANP/AGP], or "static" testing); Net Acid Generating (NAG) Potential; and Humidity Cell Testing (also referred to as HCT or "kinetic" testing) of diamond drill core samples acquired by Gateway in 2005 and recently collected grab samples. The Gateway core had been stored in covered core racks at Doheny Ranch since the completion of drilling in 2008.

Ore and waste rock from the 601 Pit area is comprised of four main rock types plus the overlying moraine cover sequence. Each rock type is described below with approximate percentages within the 601 pit area:

- Pillow Basalt (7.5 percent)--A massive, blue-green, fine-grained mafic volcanic unit with distinctive pillow structures indicating submarine extrusion. Mostly undeformed and unfoliated, this unit often forms marker horizons within the Schoonover Sequence.
- Mafic Volcanic and Mafic Sills (29 percent)--Massive, dark green. fine-grained, relatively undeformed mafic rock either of volcanic origin or forming sills and crossing cutting dikes. Compositionally, this unit is similar to the pillowed basalts.
- Allochthonous Schoonover Sequence (15 percent)--This sequence consists of quartz arenite, conglomerate, siliceous argillaceous lutite with minor intercalated chert and carbonaceous siltstone. These rocks are generally tan to grey in color with varying grain size ranging between fine and very course. Compositionally, all of these sedimentary units are very similar being dominated by silica.
- Dolomitic Siltstone (7.5 percent)--A fine-grained tan to orange, bioturbated, blocky sediment often displaying well-defined bedding. This unit is often calcareous to dolomitic in composition becoming dark and carbonaceous in proximity to localized structures.
- Glacial Moraine Cover Sequence (41 percent)--A veneer of unconsolidated glacial moraine overlying the Schoonover Sequence. The moraine is very poorly sorted and comprised predominantly of detrital matter derived from the McAfee Quartzite unit located further south. Fine-grained clay or rock flour is generally lacking and the unit is fairly inert

being comprised of predominantly grey, hard quartzite cobbles and boulders within a fine- to medium-grained matrix.

A total of 36 representative waste rock samples were selected for MWMP, ABA, NAG, and HCT characterization. Thirty-three of the waste rock samples and all of the ore samples were obtained from spatially- and vertically- distributed drill core samples primarily from within the current proposed 601 Pit and three surficial grab samples adjacent to the proposed pit.

The static testing component of the study was completed in November 2013. Of the 36 samples submitted, only one sample was classified as potentially acid generating based on the Division neutralization potential ratio threshold of 1.2. The test work also identified that a significant proportion of the material to be mined had strong acid neutralization potential (ANP) that will counteract any acid that may be generated. The static test results indicated that acid generation was unlikely to occur due to the overall neutralizing nature of all rock types.

Results from ABA testing of waste rock indicated the following:

- Thirty-one of the 35 waste rock samples and all of the ore samples characterized have measurable pyrite based on mineralogical quantification ranging from 0.3 percent to 18.2 percent. Acid neutralization minerals are present predominantly as dolomite ($CaMg(CO_3)_2$), observed in 28 of 35 samples with concentrations ranging from 2.6 percent to 24.4 percent.
- Total elemental arsenic in excess of 1,000 milligram/kilogram (mg/kg) was reported in seven waste rock samples, six of which were from the mafic volcanic rock type.
- The pH of leachate generated by the MWMP remained predominantly circum neutral. Six samples reported values below the Division Profile I reference value of 6.5 standard units (SU). A total of 13 samples reported arsenic concentrations above the Division Profile I reference value of 0.01 milligram/liter (mg/L), but no correlation was observed with total elemental arsenic. Isolated exceedances of iron, manganese, and antimony were also reported.
- Sufficient acid neutralization capacity exists to counteract all acid that may theoretically be generated as a result of weathering processes. Thirty-six of the 37 samples are considered non-potentially acid generating suggesting that acid generation is highly unlikely at the site. Statistical evaluation suggests that all rock types are overall neutralizing and will likely produce circum neutral pH leachate. Four samples reported NAG pH testing values below 7 SU. The range for all samples was 2.1 to 11.3 SU, while the average was 8.6 SU. All individual rock types returned overall slightly alkaline NAG pH values.

The HCT testing component of the study commenced in December 2013 and consisted of four blended cell composites that underwent HCT. The make-up of the blends was carefully designed in order to test specific waste rock placement scenarios. The testing program was run for 20 weeks.

Leachate generated by all four humidity cells remained circum-neutral after 20 weeks of testing and it was concluded that net acid generation is unlikely. Arsenic and antimony released in humidity cell testing suggests that some management of the waste rock disposal area (WRDA) to minimize potential for leaching may be required.

The Permittee intends to place waste rock from open pit mining in a waste dump within the confines of the previously mined North and Thumb pits. A sufficient volume of moraine will be retained at the temporary moraine stockpile to allow for placement of a 5 foot evapotranspiration cover on top of the WRDA. The optimal thickness and effectiveness of glacial moraine for use as an evapotranspiration cover will be determined once mining at the 601 Pit commences and representative samples for test work can be collected.

HCT testing of the waste rock was conducted on four composite samples which were evaluated for a total of 20 weeks. Results from 20 weeks of HCT testing indicated the following:

- All humidity cells produced circum-neutral pH values;
- Concentrations of arsenic and antimony show a continual steady release, predominantly above their respective Division Profile I reference values of 0.01 mg/L and 0.006 mg/L;
- Concentrations of manganese were above the Division Profile I reference value (0.10 mg/L) during the initial flushes in two humidity cells; and
- No other metals exceeded their respective Division Profile I reference values in the four Humidity Cells.

Specific handling of individual rock types to manage acid generation is not required. However, arsenic and antimony release in humidity cell testing suggests that management of leachate emanating from the waste rock pile will have to be conducted during operations. ABA and HCT results indicate that mafic volcanics have the greatest contribution of leachable arsenic.

Scheduling the waste rock such that this material is placed within the core of the waste rock pile (e.g., encapsulation) will reduce the potential for metal leaching generation at closure. This is discussed further in ***Waste Rock Management***.

In the event that waste rock placement scheduling does not allow for encapsulation of the mafic volcanics as described above, design of the waste rock dump will be required to minimize infiltration at closure. This can include a

suitable cover design to enhance runoff or a suitable vegetative cover to reduce infiltration, or both.
Results of ABA, NAG and MWMP testing of three representative ore samples confirm the potential for acid generation and metal/metalloid leaching if water is in contact with ore for a sufficient period of time.

The Permittee will construct a lined run-of-mine (ROM) Ore Stockpile Pad and associated drainage ditch and catchment basin with a 60-mil HDPE geomembrane. The drainage ditch and catchment basin is designed to contain a 100-year, 24-hour storm event and will capture all leachate emanating from the ROM Stockpile Pad and the rest of the infrastructure pad area. Water collected in the water collection basin will be 1) evaporated; 2) sampled and released to Water Canyon Creek if uncontaminated; or 3) trucked off-site for disposal if contaminated.

Waste Rock Management: The current operating plan states that waste rock and overburden from the operation will be stored in three locations:

1. Shallow glacial moraine surficial overburden stripped from 601 Pit will be temporarily stored close to the 601 Pit for later use in reclamation of the pit and waste rock disposal area (WRDA) at closure. Previous operators used the unscreened moraine for reclamation; Anova will screen and remove the oversize fraction, for placement/disposal within the 601 pit at closure. The USFS has requested the Permittee conduct a study, concurrent with mining, to determine the optimum screen oversize, if any, for the a WRDA evapotranspiration cover.
2. Deeper open-pit Paleozoic waste rock will be trucked to the WRDA for placement/disposal.
3. Decline development waste rock from the underground mine will be temporarily stored in the new 601 Pit and/or existing 701 Pit, to be used for backfill and ground support in the underground mine.

The Permittee plans to establish a WRDA within the existing partially backfilled North and Thumb pits, which were first developed during the 1980s. Pursuant to the current mine plan, the Permittee projects that development at BSP-2 site is expected to generate 1.7 million tons of waste rock and moraine material requiring management.

A haul road will be established as a spur from the main 601 Pit haul road. Waste will be dumped on the floor of the existing North and Thumb pits, buttressed against the pit walls. The WRDA is located and designed to minimize infiltration of precipitation into the structure. The WRDA will be located high in the local catchment, minimizing potential run-on, and upon completion of mining, the crest of the waste rock dump will be contoured to encourage runoff of precipitation. A sufficient volume of moraine will be retained at the temporary moraine stockpile

to allow for placement of a 5-foot evapotranspiration cover on top of the WRDA in order to further reduce infiltration. Topsoil stripped from the 601 Pit will be placed on top of the evapotranspiration cover at the WRDA and seeded.

Best management practices (BMPs) such as stormwater sediment basins and other sediment control devices will be used to contain runoff from precipitation and snow melt from the waste rock slope if required. It is expected, however, that during WRDA construction all stormwater will penetrate into the waste material.

Groundwater Hydrology and Quality: The pathway for groundwater starts as recharge from the infiltration of precipitation, including snowmelt, through the ground surface. This infiltration flows through the unsaturated zone to reach the underlying aquifers, then flows down gradient to ultimately discharge as surface water in some of the lower drainages.

At the BSP-2 site, infiltrating water from precipitation is believed to migrate through a system of perched local aquifers, eventually discharging as seeps and springs that eventually contribute to the base flow of watercourses like the NFHR. Water (primarily from snowmelt) enters the extensive bedrock fracture system and moves under local topographical control and hill slope morphology from higher elevations to lower elevations. Fracture systems within tens of feet of the surface generally conduct more water than deeper fractures where fractures are generally more tightly closed due to lithostatic pressures.

A conceptual groundwater model developed in 2008 incorporated groundwater-bearing strata as unconsolidated and bedrock units and later revised to incorporate the glacial moraine aquifer not previously recognized. Separate bedrock hydro-stratigraphic units were conceptualized based on available groundwater and surface water elevation data. The groundwater elevation and surface water elevation data suggest there is hydrogeological compartmentalization caused by local faulting and low-permeability strata. The compartmentalization of the bedrock aquifers appears to create near-isolated groundwater-bearing zones that have different flow paths and hydraulic heads and recharge/discharge characteristics.

The monitoring of groundwater began in 1987 as part of pit-dewatering studies at North Sammy and used sporadic water level data from MW-1 (abandoned), MW-2, and MW-3 (abandoned). MW-2 was originally used as a water-supply well during mining operations until the early 1990's. Between 2000 and 2006 MW-2 was used as a passive artesian depressurization well to control the pit lake peak water-levels in the SWX and 303 Pits. BSMW-1s and BSMW-1d were installed in 1997 in the NFHR downstream of the confluence with Sammy Creek and down gradient of the 303 and SWX pit areas. BSMW-2s and BSMW-2d were installed in 1997 in the NFHR downstream of the confluence with Dry Canyon.

Background groundwater quality generally exceeds the Division Profile I reference values for arsenic, and antimony. Isolated exceedences of the Division Profile I reference values for iron, magnesium, and manganese are also observed. Sulfate and TDS are below their corresponding Division Profile I reference values, but isolated wells appear to be on an upward trend.

Surface Water Hydrology and Quality: The BSP-2 area intersects the catchments of three tributaries to the NFHR. From east to west they are Beadles Creek, Water Canyon Creek and Sammy Creek. In addition the boundary also intersects a small part of the NFHR "origin" basin, although no mining activities will occur within the aforementioned and Beadles Creek basins.

Proposed mining activities will be entirely contained within the Sammy Creek and Water Canyon Creek basins. The 601 and 701 deposits are located within the Water Canyon watershed immediately below the previously mined South Sammy and 701 areas. The proposed open pit and underground workings are all located within the Water Canyon catchment, while the proposed Waste Rock Disposal Area (WRDA) is located on the eastern flank of the Sammy Creek catchment where waste will be placed in the partially backfilled North and Thumb pits.

Water Canyon Catchment--The Water Canyon catchment or basin is a relatively small (297 acres), north-south elongated basin. At its highest point the basin is approximately 9,340 feet above mean sea level (amsl) and approximately 7,100 feet amsl at its lowest point. The pre-mining valley has been interrupted by numerous pits and historic waste dumps located in Water Canyon. Waste from previous operations was placed as valley fill in two locations, the Lower Water Canyon and Upper Water Canyon WRDAs. Presently, water that accumulates in the basin drains northward and flows into the NFHR primarily via the subsurface moraine aquifer.

Bedrock is exposed in the western portion of the Water Canyon basin. The central and eastern portions of the basin are covered by unconsolidated Quaternary glacial moraine material or "till". The moraine was deposited on top of bedrock and created a topographical valley that is perched on top of a subsurface bedrock paleo valley.

The paleo valley within the Beadles Ridge moraine is host to seasonal subsurface flows. Snowmelt infiltrates the more permeable moraine and accumulates immediately above the less permeable bedrock. Water migrates northwards within the moraine paleo valley under hydrostatic pressure and discharges into the NFHR shallow colluvial aquifer. When the water level in the paleo valley is of sufficient elevation, water will "daylight" in Water Canyon Creek.

Two "springs" have been identified in Water Canyon: the 601 Pit Spring and the 219 Highwall Spring. The 601 Spring is located in the backfilled 601 mine and is believed to be a surface outflow of the moraine deposit, During snowmelt, water

accumulates at the bedrock moraine contact and flows north through the 601 Pit towards Water Canyon Creek. In years where precipitation is moderate to high and when the aquifer contains sufficient volumes of water, the paleo valley fills and water flows out at the 601 Pit Spring site.

The 219 Highwall Spring is located higher up in the Water Canyon catchment towards its western margin. The spring has been observed to periodically flow from the high wall that separates the backfilled 219 Pit from the South Sammy Pit, usually drying up during summer. The 219 Highwall Spring is likely the result of water accumulating in the backfilled pit during snowmelt and overtopping. The spring stops flowing once the water-level in the pit has sufficiently receded.

Sammy Creek Catchment--The Sammy Creek catchment is a north-south elongated basin that totals approximately 538 acres. Water that accumulates in the Sammy Creek basin drains northward and flows into the NFHR via Sammy Creek. At its highest elevation, the basin is approximately 9,340 feet amsl and approximately 7,145 ft amsl at its lowest elevation.

Mining in the Sammy Creek area was undertaken at the SWX, 303, Thumb and North pits collectively referred to as the North Sammy Pit. Waste from previous operations was placed as cross-valley fill in the upper portion of the Sammy Creek Catchment. Water that accumulates upgradient or on top of the WRDA infiltrates into the waste rock and is the likely source for elevated sulfate observed in the lower reach of Sammy Creek.

A thin cover of moraine has been observed in the upper portions of the Sammy Creek catchment, but does not control water flow in the same manner as the moraine in Water Canyon Creek does. Surface water is believed to primarily accumulate in the Sammy Creek Catchment and is thought to provide a portion of the base flow to the upper NFHR and recharge to the upper portion of the aquifer that hosts the pit lakes along geologic structures.

In 1996, a potential spring field was identified within the drainage near the Sammy Creek WRDA. It is believed that under normal circumstances, the main source of surface flow to Sammy Creek is from this spring field, but this has not been verified as the spring field was covered by the WRDA during operation of the mine. The spring is not flowing due to a decline in water level associated with the Aquifer Dewatering Event (ADE).

The surface water monitoring program for the original BSP began in April 1986, approximately one year prior to mining. Monitoring has been continuous with a few periodic revisions over time with stations located near the mouth of each major tributary to the NFHR containing mine-related facilities. Over time, several stream monitoring stations were discontinued, while intermediate surface water monitoring stations were monitored at various times.

Water quality in the streams has degraded, and in some instances continues to degrade when compared to pre-mining quality, primarily as a result of oxidation of waste rock that was placed as cross-valley fill in Dry Canyon, Water Canyon and Sammy Creek Canyon.

The Permittee does not anticipate surface water quality to further degrade as a result of the proposed mining activities. Waste rock will be permanently stored above the water table in the previously mined and partially backfilled North and Thumb pits. As the pits are internally draining, no surface water outflows from the dump will occur.

Background surface water quality from all sources show isolated exceedences of the Division Profile I Reference Values for iron, magnesium, manganese, arsenic, antimony, sulfate, and total dissolved solids (TDS).

Aquifer Dewatering Event (ADE) and Administrative Order on Consent (AOC): Faulty abandonment procedures for two deep exploration holes completed by a previous operator at the site in 2005/2006 inadvertently led to the draining of a localized aquifer that supported the 303 and SWX pit lakes in addition to affecting other localized aquifers and surface waters. This subsequent lowering of groundwater elevations and surface water flows in the Project area is commonly referred to as the ADE. The ADE impacted the local groundwater system and resulted in reduced stream flows in some headwater reaches of the NFHR. The drill holes responsible for the ADE were subsequently reclaimed and groundwater-levels have recovered substantially since remediation was completed.

Gateway installed five new monitoring wells (MW-6, BSMW- 7s & 7d, BSMW-8b and BSMW-9) following the ADE in order to track the recovery of ground water. These wells have been monitored since January 2008. In 2013, the Permittee installed four wells, AWVDD-0001 to -0003 and AWVRC-0004, in the vicinity of the proposed 601 Pit area (Water Canyon) in order to assess hydrological parameters of the bedrock and the subsurface moraine aquifer. In addition, the Permittee completed four new wells, BSPW-10, BSMW-11, BSPW-12 and BSMW-13, in the vicinity of the 303 and Thumb Pits in late 2014.

Under the AOC, surface water flow and quality is currently monitored by the Permittee on a quarterly basis at surface monitoring sites S-110, S-112, S-120 (or S-118 if S-120 is dry), S-130, and S-150. In addition, the Permittee also collects water samples from the 303 and SWX pit lakes and the 601 Pit Spring when possible. The Permittee will increase the frequency of water quality sampling at S-110, S-120, and S-130 from quarterly to monthly in the BSP-2 Permit. Furthermore, the Permittee is proposing the addition of station S-100 as a surface water monitoring site upstream of disturbance related to historical and new mining activities, as well as historical monitoring station S-125 located

immediately downstream of the proposed Infrastructure Pad. Once mining commences, the 601 Pit Spring site will no longer be available for sampling.

Mining Operations: The Permittee intends to mine material from the existing 601 Pit and from new underground operations to be developed beneath the 601 Pit and the existing 701 Pit, to truck ore to a stockpile facility and haul waste rock to the WRDA for storage.

Road Construction--The Project is located in steep terrain accessed by the existing access road that was constructed for the BSP. This road is in serviceable condition and will require minimal restoration to its original condition in areas that were previously partially reclaimed or have degraded with time. Rehabilitation of the haul road and access roads will mainly include regrading to a smooth crowned surface, reshaping of berms, and installation of drainage ditches on the cut side of the roadbed.

At Water Canyon Creek a haul road stream crossing will be established using a culvert at least the same size and type as that which is currently in use downstream where the County Road crosses Water Canyon Creek. The Permittee may be required to obtain a "Working in Waterways" Permit from the Division's Bureau of Water Pollution Control and other associated permits for this activity.

Upon completion of mining, the road fill and culvert will be removed and Water Canyon Creek will be restored to the pre-existing profile. Ditches along the access road within the Project Area and haul roads will be built with sediment traps constructed with weed-free straw bales to reduce flow velocity and catch sediment during storm events prior to diversion to sediment basins. Periodic cleaning of the ditches and sediment basins will be required during operation. The mine facility will be zero discharge and no runoff will enter the surrounding environment.

A mine haul road will be constructed from the northern edge of the 601 Pit to provide access to the Ore Stockpile Area. Temporary haul roads will be constructed internally to the ultimate pit limits as necessary to provide access within the developing pit. The new mine haul roads will be constructed using excavated waste rock generated during the initial strip of the 601 Pit, typically unconsolidated glacial moraine. Road surface material may be screened if necessary.

Former mine haul roads and stormwater diversions will be reestablished and constructed using existing available materials, generally waste rock. Pit haul roads will generally be 80 feet wide with the safety berms and ditches immediately adjacent to the travel width, and will support the traffic of off-highway mine haulage trucks. The gradient for the mine haul roads will be a maximum of 10 percent. Roads will be sloped to promote drainage of surface runoff to side ditches or berms. Safety berms will be constructed to a minimum

height of 3.6 feet, the height at the center of the largest truck wheel and haul truck speeds will be limited to 25 miles per hour (mph). Dust will be suppressed by wetting road surfaces using a water truck.

Open Pit Mining--The 601 Pit was previously stripped by IMCI in 1992, however ore mining did not proceed and the overburden was returned to the excavated area. The Permittee intends to redevelop the 601 Pit using conventional surface mining methods such as trucks and excavators to extract ore and waste rock. Drilling and blasting will be used as required to fracture rock prior to excavation. Waste from the open pit will consist of two material types: overburden comprised principally of glacial moraine material and in-pit hard rock waste. The glacial moraine material will be hauled from the pit and temporarily stockpiled on the surface adjacent to the pit. All hard rock waste will be hauled to the proposed WRDA site for permanent storage.

Once mining is completed, the Permittee will place approximately 9.2 million cubic feet of moraine material (approximately 85 percent of total mined moraine material) back in the pit. Smaller volumes of moraine material may be screened and used around the site as fill, such as base for the ore stockpile area.

Ore will be loaded into haul trucks and transported to the ROM ore stockpile located in an area that was historically utilized for ore crushing operations. The ore will subsequently be trucked off site using highway-rated covered trucks, for processing at an off-site facility, either a Nevada-permitted in-state facility or an out-of-state facility.

The Permittee predicts the 601 Pit to be fully mined within the first year of operation. The peak mining rate for ore and waste will be approximately 25,000 tons per day. A total of approximately 1.8 million tons of material (ore and waste) will be mined from the 601 Pit per year).

Slope angles within an open pit mine are influenced by rock strength, geologic structure, hydrology, pit wall orientation, and operational considerations. Geotechnical mapping will be ongoing and may influence pit slope engineering and design during the mining operations. Additional evaluations are ongoing for the 601 Pit based on recent 2013 geotechnical drilling results, historical geotechnical drilling results and the existing pit slopes from previous mining.

Based on these analyses, the Permittee is planning on pit slopes for the 601 Pit of approximately 50 degrees using 20-foot high benches with 60 degree bench face angles. Catch benches will typically be 15 to 23 (with an average of 20) feet in width. Composite bench heights may reach 60 feet. Historical pit slopes at the partially mined and partially refilled 601 Pit exceeded these slope angles and generally display a high degree of stability.

A geotechnical pit slope evaluation of the 601 Pit was completed and included with the new Permit application materials. The evaluation recommended optimal pit slope angles and pit configuration for mine design purposes. If pre-production or operational geotechnical studies show that steeper or flatter pit slopes are warranted or required then the configuration of pushbacks and ultimate highwall footprint may vary from those initially planned. The overall surface disturbance footprint will not change.

Underground Mining--Since the orebody is a combination of ore shoots with differing orientations, the underground mine will be developed using a combination of room-and-pillar, and cut-and-fill extraction methods to follow the irregular ore bodies. The Permittee projects that approximately 105,000 tons of ore will be mined from underground operations.

Access to the 601 and 701 underground orebodies will be from two decline portals to be developed within the 601 and 701 Pits. The declines will serve as access and haul routes, established to intersect the base of the 601 and 701 orebodies, and will measure 15 feet wide, 17 feet high, and 600 feet long at a 15 percent decline.

Waste rock generated from underground development of the 601 and 701 orebodies will total approximately 30,000 tons. Waste rock generated from underground development may be temporarily stockpiled in the new 601 Pit and/or the historical 701 Pit and used as backfill or ground support during the latter stages of mining. No waste from underground workings will be placed on the WRDA.

All mine portals, when not in use, will be secured with locked gates or grates to ensure public safety. All underground ore will be transported to the surface through the main access and haulage declines and placed on the ore stockpile. After mine development is completed and all sections of the underground mine are at full production, the mine will achieve monthly ore production of approximately 17,500 tons. Total underground mine production will be 105,000 tons of ore. Ore production is expected to average less than 12,000 tons per month over the 12-month life of the underground mine operation, including the development and reclamation phases of the operation.

Moraine Water Management System: The Moraine Water Management System (MWMS) is designed to intercept and re-direct seasonal snowpack melt that saturates the glacial till above the bedrock contact and flows northward along the bedrock paleo valley under hydrostatic pressure. The eastern and southern walls of the South Sammy 601 Pit intersect the base of the paleo valley and will interrupt the seasonal flow originating from catchments upgradient of the pit.

The MWMS will be located inside the 601 Pit in bedrock (e.g., the Bedrock Channel) within the south and eastern portions of the 601 Pit and in glacial

moraine material (e.g. the Moraine Channel) within the northern portion of the 601 Pit. The Bedrock Channel will have a triangular cross-section and have a nominal length of 900 feet from the western extent of the moraine/bedrock contact exposure along the east and south pit walls and terminate at the farthest west exposure of moraine material near the southwest corner of the 601 Pit. The Bedrock Channel will be constructed in the dolomitic siltstone and mafic intrusive bedrock that lie immediately below the moraine/bedrock contact.

The Moraine Channel will have a trapezoidal cross-section (nominal floor width 3 feet and 1.0 horizontal (h):1.5 vertical (v) side slopes) with a nominal length of 700 feet, extending from the moraine/bedrock contact exposure to the Moraine Water Collection Basin (MWCB), where the collected water is redirected to the BSP-2 drainage system. Both channels are designed to transport the maximum combined flow of 2,600 gpm from the seasonal snowpack melt as well as run-off from the 100-year, 24-hour storm event while maintaining a 1-foot freeboard below the channel crest.

The MWCB will be located approximately 300 feet north of the 601 Pit on the west flank of Beadles Ridge just above the eastern margin of the historic Lower Water Canyon WRDA. The basin will be excavated in native Moraine material with cut material to be placed on the western and northern margins of the basin as embankments. Nominal dimensions for the MWCB will be 40 feet by 200 feet by 6 feet deep with 2 feet of freeboard and 2h:1v embankment side slopes. A small overflow ditch at the north end of the basin will protect the embankment from erosion in the unlikely event that the basin's capacity is exceeded. Water from the overflow will be diverted to the site drainage system downgradient from the MWCB.

Infrastructure Pad: The 9.2 acre Infrastructure Pad will be constructed at the site of the former crusher pad used by the previous operator to stockpile and crush ore prior to processing. Reclamation fill that was placed on the pad by previous operators will be reshaped to form a surface that slopes gently towards the northeast. Approximately 6 acres of the infrastructure pad will be lined with 60-mil HDPE underlain by a 24-inch layer of minus 1-inch material and overlain with a 24-inch layer of plus 1/2-inch to minus 2-inch layer of screened material. The Infrastructure Pad subgrade will consist of sub-base material compacted to 95 percent maximum dry density (American Society for Testing and Materials [ASTM] Method D 1557) placed in two, six-inch thick lifts.

The lined area will include the Ore Stockpile Pad and Loading Area, the Sedimentation Basin, an ore loading and truck turnaround area, a self-contained petroleum-oil-lubricant (POL) delivery, storage, and dispensing area, the Wash Bay, and the Infrastructure Pad Storm Water Ditch.

The 60-mil HDPE-lined ditch located down-gradient from disturbed areas will collect and divert run-off to the 60-mil, HDPE-lined Sedimentation Basin

(approximate capacity 13,500 gallons at 2 feet of freeboard) constructed within Infrastructure Pad, which overflows via an HDPE-lined ditch to the 60-mil, HDPE-lined Water Collection (or Pad) Basin (approximate capacity 940,000 gallons at 2 feet of freeboard). The Infrastructure Pad water management system is designed to manage run-off associated with a 100-year, 24-hour storm event. Water collected in the Water Collection Basin will be 1) evaporated; 2) sampled and released to Water Canyon Creek if un-impacted; or 3) trucked off-site for disposal if impacted. Water is considered "impacted" when Division Profile I reference values and established background concentrations are exceeded.

Facilities to be located on the unlined portion of the infrastructure pad include a 13,400 cubic yard topsoil stockpile, a parking/laydown area and mobile office and workshop structures.

Ore Stockpile Pad and Loading Area--The HDPE-lined Ore Stockpile Pad will measure 400 feet by 250 feet by 20 feet in height and will be capable of storing up to 125,000 tons of ore. Ore transported from the mining areas will be temporarily stored at the Ore Stockpile Pad prior to being loaded on to highway trucks and transported off-site for processing.

Ore will be hauled from the 601 Pit by 50-ton capacity haul trucks and from underground by 33-ton capacity haul trucks. The stockpile will be loaded by end dumping the ore onto the footprint of the ore stockpile. The dumped ore will then be smoothed with a dozer to form a flat platform. Stockpiled ore will be loaded by a front-end loader onto covered highway ore haulage trucks and transported to an off-site process facility.

Ancillary Facilities--All mine operations facilities will be temporary mobile structures and will include one 10-foot by 24-foot office trailer, two 8-foot by 40-foot sea containers, portable generators and portable toilets.

Self-Contained POL Delivery, Storage, and Dispensing Facility--A contractor-supplied self-contained POL facility will be located over a lined area within the Infrastructure Pad and comprised of five main components:

- 8.5-foot by 53-foot van with internal storage and distribution manifolds containing eight, 1500-gallon tanks for miscellaneous fluids and fitted with a fire protection system;
- 4-foot by 8-foot by 20-foot skid-mounted dumpster-type containment for used fluids, barrels, and totes fitted with hand pumps;
- 4-foot by 8-foot by 20-foot skid-mounted dumpster-type containment for used oil, 5000-gallon capacity fitted with an electric pump;
- Double-walled diesel fuel tank, 10,000-gallon capacity fitted with electric pump; and
- Portable Generator (trailer mounted), 480 volt/70 kilowatt.

Portable spill protection measures will be maintained at the fuel area and will consist of 76-gallon multi-purpose polyethylene Universal Drum Spill Kits. A minimum of 800 pounds of diatomaceous absorbent will be maintained on site. Petroleum contaminated soil (PCS), used oil, and used containers will be collected and transported off-site to an authorized facility for proper disposal.

Wash Bay--The Wash Bay will be located on top of the lined area west of the ore stockpile and contained within precast concrete blocks and will measure approximately 80 feet by 60 feet. The Wash Bay will be lined with 60-mil HDPE placed over the primary Infrastructure Pad liner. The Wash Bay liner will be sloped to drain to a concrete vault where a submersible pump will direct water to an 18-foot by 10-foot by 2-foot deep sump equipped with gravity-driven oil-water separator. Clear water may be pumped to the water tank adjacent to the Wash Bay and recycled for use if appropriate. Alternatively, water may be discharged via a 4-inch diameter pipeline to a 16,000-gallon standpipe sump where water can be returned to the Wash Bay area following solids sedimentation and removal.

The Wash Bay area will also be used by contractors to perform minor vehicle maintenance. It is anticipated that equipment will be transported to the contractor's facilities in Elko to complete major maintenance or repairs if required.

Water Collection Basins: Two unlined water collection basins, referred to as the Lower Cumulative and Truck Access water basins, will be constructed to contain run-off from the 24-hour, 100-year storm event. The Lower Cumulative Water Basin (approximate capacity 1,600,000 gallons at 2 feet of freeboard) is located on the lower west end of the BSP-2 site and the 78,000 gallon Truck Access Water Basin (approximate capacity 78,000 gallons at 2 feet of freeboard) is located on the lower east end of the BSP-2 site. Both ponds will be constructed using cut-and-fill methods.

C. Receiving Water Characteristics

Since no processing occurs at the BSP-2 site, water utilized during active mining operations will be for the purpose of dust suppression. Estimated peak water requirement is 8.1 million gallons per month during the summer months.

The source of water will be a combination of the Big Springs Well #2 (Nevada Division of Water Resources [NDWR] Permit #82956), BSPW-12 (NDWR Permit #84999 - pending) and the 601 Pit Sump (NDWR Permit #84747 pending) and will all be derived from separate underground aquifers. Water may also be extracted from MW-2 (aka Dust Well #2, NDWR Permit #53003), but will only be used in lieu of BSPW-12. Water during the initial stages of development will be sourced from Big Springs Well #2 and BSPW-12, while water extracted from the 601 Pit Sump (subject to availability) will replace the contribution of water

from BSPW-12 once mining has sufficiently advanced subject to availability. Background water quality from all sources show isolated exceedences of the Division Profile I Reference Values for iron, magnesium, manganese, arsenic, and antimony. Sulfate and total dissolved solids (TDS) are below their corresponding Division Profile I reference values, but appear to be on upward trend.

Water for the office complex and initially for dust suppression will be piped from a 10,000-gallon holding tank to be installed at the 303 Pit, near well BSPW-12. A 4-inch diameter polyethylene water pipe will deliver water from the 303 Pit holding tank to the Infrastructure Pad to provide water for site facilities, and to a stand pipe adjacent to the haul road to provide water for dust suppression during the initial phases of mining. Holding tanks and a stand pipe will also be established adjacent to the 601 Pit where water collected from the 601 Pit Sump water trucks will be filled. The pipeline alignment will follow existing roads. All water pipelines will be buried at least 18 inches deep to prevent freezing and damage. Potable water will be transported to the site by a local contractor from Elko for use as drinking water on the property.

D. Procedures for Public Comment

The Notice of the Division's intent to issue a Permit authorizing the facility to construct, operate, and close, subject to the conditions within the Permit, is being sent to the **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 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 issue the Permit.

F. Proposed Limitations, Schedule of Compliance, Monitoring, Special Conditions

See Section I of the Permit.

G. Rationale for Permit Requirements

The facility 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 for containment.

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, 15 April 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 (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.

Prepared By:	*Rob Kuczynski, P.E.*
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