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

Permittee Name: **Geo-Nevada, Inc.**
230 E. Liberty St.
Reno, NV 89501

Project Name: **Spring Valley Project**

Permit Number: **NEV2003112**
Review Type/Year/Revision: Renewal 2015, Revision 00

A. Location and General Description

Location: The Spring Valley Project is a physical separation facility located approximately eight (8) miles northeast of Carson City and three (3) miles west of Dayton, in Lyon County, within portions of Sections 20, 21, and 28, Township 16 North, Range 21 East, Mount Diablo Baseline and Meridian.

Site Access: From Carson City, proceed east on US-50, to the junction of SR-341. Continue north on SR-341 approximately 1.5 miles to the entrance of the mine site, located on the east side of the road.

General Description: The Spring Valley Project uses physical separation methods to extract gold from hard rock ore mined at the project site at a permitted rate of 36,500 tons per year. The facility is required to be designed, constructed, operated, and closed without any discharge or release in excess of those standards established in regulation except for meteorological events which exceed the 24-hour, 25-year design storm event.

Permitting History: In 1993, Geo-Nevada (Permittee) submitted application materials for a physical separation facility, located in Spring Valley. The mine and mill facility were assigned the Water Pollution Control Permit (WPCP) number NEV0093108; however, the permit was not issued.

The Permittee updated their application materials and reapplied for a physical separation facility Permit in November 2003. To avoid confusion, the Division assigned the Spring Valley Project a new WPCP number NEV2003112, which became effective in March 2004. Since March 2004, Geo-Nevada has submitted and the Division has approved five (5) Minor Modifications and two (2) Engineering Design Changes (EDCs):

Minor Modifications:

1. Tailings Pond Reconfiguration, Lined Tailings Weir Construction and Phased Mining of Lund Pit, effective 22 June 2006.

2. Mill Gravity Circuit Redesign and Upgrades, effective 05 October 2007.

3. Tailings Water Recycle System, effective 22 April 2008.

4. Process Upgrade – Addition of Magnetic Separator and Cyclone Clarifier, effective 25 September 2008.

5. Tailings Solids Co-Disposal – Deposition of dried tailings solids in cells within Waste Rock Dump 2 with engineered setbacks and cover, effective 12 March 2010.

EDCs:

1. Redesign and Reconfigure Ore Stockpile Pad, effective 24 August 2006.

2. Mill Containment Area Upgrades and Expansion, effective 01 June 2007.

B. Synopsis

Mining: Conventional open pit mining methods are used to remove gold-bearing ore from two (2) existing pits, the Lund Pit and the West Pit. Mining of the Lund Pit (Minor Modification effective 22 June 2007) began with the west rim of the pit. The small lake that has formed within the Lund Pit is the result of meteoric accumulation combined with groundwater seepage. The Permittee performs confirmatory analyses for pit lake water quality and elevation quarterly.

Although the Permit allows for use of Lund Pit water in the mill process, since the installation of the well and, more recently, the water recycling system (see below), no pumping of pit water has been necessary. Dewatering of the pit by land application was carried out from August 2006 to December 2006. The Permit for this method of discharge expired on 30 January 2007.

Ore and Waste Rock Characterization: Initial acid neutralization potential/acid generating potential (ANP/AGP) testing of stockpiled ore material and waste rock indicates a very low acid generating potential and excess acid neutralization potential. ANP/AGP ratios range from a low of 8.83 to a high of 19.6. Samples of pit run material were analyzed for ANP:AGP in 2013 with results consistent with previous years of very low acid generating potential and excess acid neutralization potential ranging from 26.6 to 46.6.

Meteoric water mobility procedure (MWMP) analyses performed have shown slight exceedances of the Profile I reference values for mercury and arsenic. Geo-Nevada performs waste rock characterization (Profile I, MWMP and ANP/AGP) for ore, waste rock, and tailings quarterly.

In March 2010, a minor modification was approved allowing the co-disposal of dried tailings solids in cells within Waste Rock Dump 2. The dump is engineered to provide minimum of 12 feet of setback from the tailings material to any side of the dump, with a minimum of three (3) feet of cover on top. Tailings solids must be completely dried prior to disposal and only Dump 2 has been approved as a tailings repository. Analysis of leachate extracted during the MWMP run on tailings solids samples shows that disposal of the tailings within Waste Rock Dump 2 will not degrade waters of the State.

Crusher Feed Stockpile Pad: An engineered ore stockpile pad with containment has been constructed to ensure that contaminants mobilized by meteoric water do not create a potential to degrade waters of the State. This stockpile pad consists of an 80-mil high density polyethylene (HDPE) single liner over a layer of geo-net material, installed over a prepared subbase. The subbase is comprised of two 6-inch layers of compacted subgrade material (95 percent Standard Proctor Density and within plus or minus three (3) percent of the optimum moisture content) applied over the prepared subgrade. A minimum two (2) foot layer of minus ¾-inch gravel covers the HDPE liner. The pad is graded to drain to an HDPE lined collection sump in the southeast corner of the pad. Solution collected in the sump is conveyed to the lined tailings pond for storage and recycling into process.

Mineral Processing and Beneficiation: Gold-bearing ore is excavated and transported to the crusher feed stockpile. The material is transferred from the stockpile and fed into a hopper/grizzly and then conveyed to a jaw crusher. Crushed material is screened with oversize reporting to a waste rock pile and undersize material reporting to a surge bin. The undersize material is discharged onto a belt conveyor and conveyed to a wet ball mill. The wet ground pulp is conveyed to a series of gravity separation devices (vibrating screen deck, magnetic separator, Knelson concentrator, cyclone classifier, and a vibrating table concentrator) for further concentration. The final concentrate is shipped off-site for refining and the tailings are conveyed via a launder to the lined tailings facility.

Gravity Circuit Modifications: On 28 September 2007, the Permittee submitted a Minor Modification to reconfigure the gravity circuit, followed by another Minor Modification on 22 September 2008. In the present circuit configuration, the ball mill product is discharged to the ball mill sump where it is wetted and fed to the vibrating screen deck. Low grade output from the screen deck is returned to the ball mill via the ball mill recirculation pump, while concentrates are passed to the magnetic separator.

Iron is extracted by the magnetic separator and saved for resale. The iron-free concentrates are conveyed to the Knelson concentrator for additional refining of the high grade material stream. This material continues to the concentrate holding tank, from

which it is dispensed to the vibrating table concentrator. The gold concentrates are recovered for off-site refining.

Low grade discharge from the Knelson concentrator is fed to the cyclone feed sump where it is divided into two streams – one directed to the ball mill via the recirculation sump, and the other sent to the cyclone classifier. From the cyclone classifier it is divided once more, one stream sent to the recirculation sump, the other joining the low grade discharge from the vibrating table concentrator going to the tailings weir and conveyed to the double-lined tailings facility for disposal.

Fluids Management and Containment: NAC 445A.433 to 445A.438, inclusive, define the minimum design criteria required of each process component and the site and operating conditions which are considered to exist when these criteria are applied. These provisions establish minimum contaminant control technologies and define the site and operating conditions that must be evaluated.

Pursuant to NAC 445A.428, physical separation facilities such as the Spring Valley Project are allowed to maintain a lower level of containment, depending on ore and process water characterization results. However, with the possibility of chemical processing occurring at the Spring Valley Project site in the future, the Permittee upgraded the original gravel and concrete floor in the mill building with new, reinforced concrete pad, surrounded by a 12-inch stem wall. The concrete is coated with a chemically resistant epoxy material with waterstops installed to preclude any solution from seeping off containment. The floor is also graded to drain to a concrete-lined sump for collection and recovery. The new containment has a volumetric capacity in excess of the required 110-percent. The mill containment area upgrades and expansion EDC became effective on 01 June 2007.

Diversion Channels: Three (3) engineered V-shaped diversion channels two (2) feet deep by six (6) feet wide are constructed around the perimeter of the process area and tie in to the existing artificial or natural drainage channels. The diversion channel on the west side of the process area is V-shaped, 2.6 feet deep by eight (8) feet wide. Because of the steep gradient, the southernmost portion of the diversion channel is lined with a minimum of 12 inches of riprap, consisting of native boulders greater than six (6) inches diameter and free of organic material as specified in the design drawings.

Two V-shaped diversion channels, two (2) feet deep by six (6) feet wide, are constructed around the perimeter of the sedimentation pond and the Lund Pit and drain into the sedimentation pond (refer to *Sedimentation Pond* subsection for additional details). A third V-shaped diversion channel is constructed near the west and north faces of the West Pit and drains into the non-rip-rapped portion of the diversion channel that will run on the west side of the process area. The channels are constructed from native soils or structural fill, compacted to a minimum 92 percent of maximum dry density. The artificial channels tie into existing natural or artificial drainage channels or the sedimentation pond (refer to *Sedimentation Pond* subsection for additional design details).

Tailings Launder: The tailings launder rests on wood beam supports and is surrounded by a berm comprised of compacted native soils and/or structural fill, 1.5 feet in height and lined with 60-mil HDPE. A 60-mil HDPE wear sheet is placed on top of the liner with the tailings launder and support structure installed on top of the wear sheet.

Lined Tailings Weir: A lined tailings weir (Minor Modification effective 22 June 2006), is located on the east side of the mill building. The lined weir conveys tailings into a free-draining area and directs any fluids into the tailings pond. The tailings weir is comprised of a layer of 60-mil HDPE, overlying a layer of geonet, anchored to a 3-foot high berm surrounding the weir. The geonet overlies a layer of 12 inches of compacted soil, overlying compacted structural fill. A 2.5-foot layer of drain gravel is placed over the HDPE liner prior to the placement of the gravity tailings. Operating plans indicate that gravity circuit tailings are to be placed in a series of four (4) lifts, approximately ten (10) feet in height with a 3Horiznotal:1Vertical gradient. A 6-inch diameter Acrylonitrile butadiene styrene (ABS) drain pipe is spaced at regular intervals on each lift to facilitate drainage.

Tailings Pond: The tailings pond design has been revised since it was first proposed in the November 2003 New Permit Application. The pond was reconfigured and rotated to avoid a mineralized zone discovered during condemnation drilling. The pond structure occupies a footprint of 300 feet by 178 feet and the pond floor is graded to drain to a leak detection collection sump located in the east corner of the pond. The pond lining system consists of (from bottom to top) two (2) 6-inch layers of compacted subgrade material (95 percent Standard Proctor Density and within plus or minus three (3) percent of the optimum moisture content) applied over the prepared subgrade, a 60-mil HDPE secondary liner, a layer of HDPE geonet, and a 60-mil HDPE primary liner, with all synthetic liners secured in an anchor trench. The sump is 6-foot by 6-foot by 4-foot deep and is filled with ¾-inch cobbles as fill material (net capacity approximately 700 gallons). A 6-inch diameter Polyvinyl chloride **(**PVC) pipe serves as a leak detection port. The revised tailings impoundment Minor Modification became effective 22 June 2006.

A Minor Modification to add a water recycle capability to the tailings pond became effective on 22 April 2008. This system consists of a pontoon mounted pump, conveyance piping to the water tank, 60-mil HDPE lined ditch, in which the piping is routed, and the required electrical service for the pump. Water is delivered from the tailings pond to the holding tank at the mill site, reducing the amount of make-up water needed from the well. The water discharges above the maximum level of the tank, preventing backflow through the delivery pipe.

Sedimentation Pond: A sedimentation pond 95 feet by 95 feet by 12 feet deep was originally constructed to collect water from two (2) diversion channels. The pond was constructed from native soil or structural fill as specified in the design drawings, compacted to a minimum 92 percent of maximum dry density. Three 15-inch diameter

Corrugated Polyethylene (CPE) discharge pipes exit the south wall of the pond. The need for this pond has now been negated by the construction of the tailings weir and tailings pond; it is now considered to be in temporary closure.

C. Receiving Water Characteristics

The closest surface water source within one-half mile of the Spring Valley Project is the Lund Pit Lake, located at the southeast corner of the property. The pit is approximately 45 feet deep and water depth in the pit fluctuates between 18 and 20 feet. The persistence of the pit lake throughout the summer months and the ability of the lake to recover from dewatering without meteoric input indicate that there is a strong groundwater contribution to the lake.

In 1999, the Lund Pit water was analyzed throughout the entire depth profile at depths of 0, 10, 15 and 18 feet. All water samples met the Division Profile I reference values for all constituents, with the exception of the sample collected at the 15-foot interval. A slight exceedence of the lead reference value was observed at this interval; however lead concentrations were below detection limit for the remaining samples, indicating a possible analytical error. Analytical results to date show the water accumulating in the Lund Pit Lake does not pose a threat to groundwater quality or any plant and animal life in the vicinity.

Geo-Nevada is required to submit to the Division an updated pit lake water quality study that will address the requirements of NAC 445A.429 for the existing Lund Pit Lake at each subsequent application for renewal. Any modification of this Permit or change in operation that could affect the Lund Pit Lake Study must be accompanied by an updated version of, or modification to, the study and its conclusions. Any update or modification shall include, but not be limited to, 1) all new data developed during the period elapsed since the date of the previous submittal; 2) an updated study of the most likely scenario or alternative; and 3) as applicable, revised conclusions and recommendations based on current regulations and best engineering and scientific principles and practices. As a part of the 2014 renewal this SOC requirement was moved to the new WPCP section N (Continuing Investigations). Also the new profile III requirements for pit lake monitoring were incorporated into the WPCP.

The Pit Lake Study submitted as part of the renewal application in 2009 showed that acid neutralization potential in the pit exceeds acid generating potential by 27.4:1 or more, and that the water continues to meet the Profile I reference values with the exception of slight exceedances of arsenic (0.063 mg/L). The Pit Lake Study submitted as part of the renewal application in 2014 shows that the water continues to meet the Profile I reference values with the exception of slight exceedances of arsenic (0.030 mg/L), aluminum (0.27 mg/L), and manganese (0.11 mg/L).

One permitted well (NDWR #22237) is located on the Project site, approximately 150 feet west of the mill and provides make-up water. The well driller's report indicates that

this well has a depth of 200 feet and a static water level 100 feet below ground surface. A sample of the well water was collected for Profile I analysis in March 1999 and was shown to meet the Division Profile I reference values for all constituents, with the exception of iron. The iron concentration exceeded the 0.6 mg/l reference value with a concentration of 0.703 mg/l. Subsequent water quality analyses submitted with the quarterly reports have shown that the well water meets Profile I reference values. The monitoring frequency was therefore changed to annual for 2009 Permit renewal. In the 2014 renewal application, the water well had a minor exceedance for arsenic of 0.012 mg/L.

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 **Nevada Appeal** 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: Joe Sawyer, P.E.
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