EXHIBIT 1

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FACT SHEET

(Pursuant to Nevada Administrative Code [NAC] 445A.401)

Permittee Name:	**Lithium Nevada Corp.**
Project Name:	**Thacker Pass Project**
Permit Number:	**NEV2020104**
Review Type/Year/Revision:	**New Permit 2022, Fact Sheet Revision 00**

A. Location and General Description

Location: The Thacker Pass Project (the Project) is a lithium mining and chemical processing facility located in Humboldt County, within Sections 1 and 12, Township 44 North (T44N), Range 34 East (R34E); Sections 2-17, T44N, R35E; and sections 7, 8, 14-23, and 29, T44N, R36E, Mount Diablo Baseline and Meridian, approximately 20 miles northwest of the town of Orovada, Nevada; north of Nevada State Route 293. The facility is located exclusively on public land administered by the U.S. Bureau of Land Management (BLM), Humboldt River Field Office in Winnemucca, Nevada.

Site Access: To access the site, drive north from Winnemucca on U.S. Highway 95 approximately 44 miles to Orovada. Proceed west on the Kings River Road (Nevada State Route 293) for 19.7 miles. Turn north off the paved road and proceed 0.9 miles on a dirt road, then turn west on another dirt road and proceed 0.4 miles to the Project site.

General Description: Lithium Nevada Corp. (LNC) is the Permittee for the Thacker Pass Project which consists of an open pit lithium mine, two waste rock storage facilities (WRSFs) and associated stormwater sediment and runoff ponds (EWRSF and WWRSF Ponds), coarse gangue stockpile (CGS) and stormwater sediment and runoff pond (CGS Pond), sulfuric acid plant (SAP), processing plant, and clay tailings filter stack (CTFS).

The Thacker Pass Project is required to be designed, constructed, operated, and closed without any release or discharge from the fluid management system except for meteorological events which exceed the design storm event.

B. Synopsis

Geology: The Thacker Pass Project is located in north-central Nevada at the northern end of the Basin and Range tectonic province. Regional geology stretches from southern Oregon to Mexico and is characterized by a series of extension-related normal faults trending roughly north-south resulting in a repetitive series of mountain ranges separated by valleys. The project site is bounded to the north by the Montana Mountains; to the south by the Double H Mountains; to the west by the Kings River Valley; and to the east by the Quinn River Valley.

Local geology of the Thacker Pass Project is controlled by the McDermitt Volcanic Field, a volcanic complex containing four large calderas (or “super volcanoes”) that formed in the middle Miocene. The McDermitt Volcanic Field is located within the southeastern-propagating swarm of volcanism from the Steens Mountain into north-central Nevada. The largest and southeasternmost caldera of the McDermitt Volcanic Field, the McDermitt Caldera, hosts the ore body of the Thacker Pass Project. Prior to collapse of the McDermitt Caldera at 16.33 Ma (million years ago), volcanism in the northern portion of the McDermitt Volcanic Field and locally small volumes of lavas erupted near the present-day Oregon-Nevada border. These lavas and the flood basalts are exposed along walls of the McDermitt Caldera and are approximately 16.5 to 16.3 million years old.

A large lake formed in the caldera basin following the eruptions in the McDermitt Volcanic Field. Associated caldera lake sediments that host the Thacker Pass deposit were deposited on top of the horsts and grabens formed during the faulting associated with the Tuff of Thacker Creek. The lake captured sediments that were eroded from the surrounding drainages.

Lacustrine claystone sediments which host lithium ore are found intimately interbedded with thin, repetitive water-lain ash sequences. Ash layers are well-sorted, medium to coarse sized lapilli grains deposited across wide extents, particularly in the Southwest Basin where thick sequences of basal ash beds were encountered across multiple exploration boreholes. Diagenesis at depth has silicified claystone beds in finely laminated, mudstone sequences. The ratio of ash to claystone in these lacustrine units is a continuum, with thick sequences of ash beds found more abundantly in basal lacustrine deposits in the Southwest Basin Area, and greater components of claystone found in the open pit footprint. The rhyolitic Tuff of Long Ridge is found underlying lacustrine sediments and is present in latite textures of felsic phenocrysts to a fine-grained groundmass. In some instances, the Tuff of Long Ridge was deposited as viscous lava, forming flows and pseudo bedding planes. These deposits are referred to as Rheomorphic Tuffs.

Hydrology: The Thacker Pass Project resides along a hydrographic basin divide between two designated hydrographic basins; the Kings River Valley to the west and the Quinn River Valley to the east.

Recharge in Quinn River and Kings River valleys begins in mountain blocks with elevations above 5,000 feet amsl (above mean sea level) and is distributed to the alluvial basin via two processes: (1) deep bedrock recharge representing precipitation and snowmelt percolation in bedrock mountain blocks; and (2) runoff recharge derived from infiltration of surface water runoff as it flows across alluvium material along basin margins.

Groundwater discharge from Quinn River and Kings River valleys occurs primarily through four processes: (1) evapotranspiration through phreatophytes; (2) irrigation pumping; (3) seeps and springs; and (4) groundwater outflow to adjacent basins. Prior to the 1950s, discharge occurred primarily through evapotranspiration of phreatophytes. However, with the increase in agricultural production during the 1950-60s, irrigation pumping is the largest component of groundwater discharge.

Lands within the Project area primarily drain eastward in the direction of the Quinn River Valley. A small portion of the proposed mine pit area and West WRSF resides in the Kings Valley hydrographic basin and thus drains west in the direction of Thacker Creek. Groundwater levels tend to reside between 4,625 ft amsl to 5,034 ft amsl.

Rock Characterization: Geochemical characterization of ore and waste rock has been on-going since 2011, which involved the collection and analysis of a combined total of 246 samples for static geochemical testing representative of waste rock, ore, gangue, and tailings. In addition, 14 representative waste rock and ore samples, 4 gangue samples, and 2 tailings samples were submitted for humidity cell testing (HCT).

The results of the static testing demonstrate that the Thacker Pass waste rock and ore will be net neutralizing with an average neutralization potential ratio (NPR) greater than 3 for all material types. This low potential for acid generation was confirmed by the kinetic testing program. Based on the static testing, a minor component of the ash, claystone, and claystone/ash material types (i.e., 2% of the total samples) exhibit a higher potential for acid generation and is predicted to be potentially acid generating (PAG).

Kinetic testing was completed for a sample of unoxidized ash material (HC-15) that was predicted to be acid generating based on the acid base accounting (ABA) results; however, after 62 weeks, the sample remained neutral with a pH of 7.81.

Due to the acid neutralization potential of the waste rock and ore and the limited quantity of estimated PAG, segregated waste rock management is not necessary for the Thacker Pass project. Although the excess of neutralizing capacity means that net acid conditions are unlikely to develop, there is still a potential for the Project's material types to leach some constituents of concern under neutral to alkaline conditions. Based on kinetic testing of waste rock, antimony and arsenic are consistently released at concentrations above Profile I Reference Values (RVs) through the test duration. Other constituents were initially flushed from the HCTs from weeks 0 to 4 at concentrations above the RVs including fluoride, iron, magnesium, manganese, and sulfate. However, these constituents equilibrate to lower concentrations after the initial flush. Low levels of uranium are also initially flushed from the HCTs at concentrations above Profile I-R (i.e., 0.03 mg/L); however, concentrations rapidly decrease to levels below Profile I-R within the first few weeks of testing.

Mining: Mining is proposed to be conducted by open pit method throughout the 41-year mine life. Mining operations will be conducted in an open pit potentially using a modified panel mining method. A section along the length of the pit will be mined to the entire width and depth before proceeding to the next section of the pit. Mining will begin in the southwestern side of the proposed pit (West Pit). After the pit is fully developed, mining can proceed easterly by concurrently mining the North Pit and the South Pit.

The groundwater and geochemical fate and transport modeling for the initial proposal to mine and concurrently backfill the west, north, and south pits demonstrated that groundwater would be degraded due to outflow from the backfilled pit which exceeds Profile I reference values for several Profile I constituents. Therefore, the Permit does not authorize mining below the regional water table and restricts mining to 15 feet above the regional water table (4,840 feet amsl) under Part I.G of the Permit. While the first phase of the Project is approximately 10 years, the first 20 years of mining may occur above this elevation. A major modification to the Permit with a public comment period is required prior to mining below the water table.

This elevation has been demonstrated to be at least 15 feet above the regional water table with water level measurements from piezometers and wells at the site. Water levels at the deepest portion of the initial West Pit (WSH-11) have been recorded since 2011 when groundwater was measured at 4,825 feet amsl and has since decreased to 4,817 feet amsl in 2020. Water levels measured at MW 18-01 and piezometers in the west pit vicinity, where mining will begin, range between 4,820 feet amsl and 4,822 feet amsl.

In order to verify the water levels and ensure that mining will comply with the 15-foot buffer above the regional water table during operations, a series of at least two 300-foot deep standpipe piezometers will be drilled 2 years in advance of the current mining panel. The piezometers are required for installation through a schedule of compliance item under Part I.B of the Permit and required for monthly monitoring and quarterly reporting under Part I.D and II.B of the Permit, respectively.

Ore will be mined using either truck loaders, a surface miner, or excavators, then hauled to the ROM stockpile located south of the open pit, while waste rock generated during mining activities will be placed either in the WRSFs (initial years of operation) or within the pit limits as backfill (later years of operation). The ROM stockpile, the Coarse Gangue Stockpile (CGS), and both WRSFs will be constructed with a low hydraulic conductivity soil layer (LHCSL) with a hydraulic conductivity of less than 10^{-6} centimeters per second.

The ROM ore stockpile will be designed to store approximately 494,000 cubic yards (approximately 543,000 tons) of ore. Ore will be end-dumped by haul trucks while dozers and motor graders will be used to move the ore around the stockpile area. The ore may be segregated within the pile based on lithium grade to allow the ore to be blended prior to feeding the mineral classification facility. Two dozer traptype feeders with lump breakers will be located on the south side of the ROM ore stockpile which feed ore onto a belt conveyor that will deliver the ore to the attrition scrubbers. While being conveyed to the attrition scrubbers, ore may pass through a mineral sizer to ensure that there are no clumps of ore larger than 4 inches in diameter. Once the ore passes through the mineral sizer, it will be conveyed to a surge bin that feeds attrition scrubbers via belt feeders located at the bottom of the surge bin.

Waste Rock/Gangue Management and Pit Backfill: Waste rock material that will be generated from open pit operations during the first 10 years of operation will be placed in two proposed WRSFs located west and east of the pit (the East WRSF and West WRSF). The waste rock material will be placed in the WRSFs in approximately 50-foot lifts to form overall slopes of 3.5H:1V. Waste rock will be hauled to either WRSF depending on operational requirements, such as capacity and haul cycle efficiency.

The base of the WRSFs will be constructed with a one foot low-hydraulic conductivity soil layer (LHCSL) overlain with a minimum of 2 feet of cover material to prevent the LHCSL from drying out or freezing and cracking. Berms will be constructed around the perimeters of the WRSFs to fully contain any stormwater within the containment. Stormwater falling directly on the WRSFs will be directed to their respective 80-mil HDPE-lined stormwater sediment pond (the EWRSF or WWRSF Ponds).

Four-inch diameter perforated corrugated polyethylene (CPe) pipes with 2 feet of overliner material covering the pipes will be placed in the natural drainages of each facility to improve lateral flow to the single 80-mil HDPE geomembrane-lined ponds sized for the 100-year, 24-hour storm event, plus 2 feet of sediment and 3 feet of freeboard. The stormwater sediment ponds will also have emergency spillways designed to discharge runoff from the 500-year, 24-hour storm event with 1 foot of freeboard. Each pond will be constructed with a 3-foot deep sump with a volume of approximately 16,000 gallons and a sloping pumpback system that will allow water to be pumped out of the pond and back into the process circuit.

After approximately 4 years of operation, pit development will have advanced enough to accommodate a portion of the waste rock material being placed in the pit as backfill. During the initial phase of the operation (i.e., during the 10-year period of the initial WPCP), mining will only occur above the groundwater table and only waste rock material will be placed in the dry pit as backfill. Because mining is initially not planned below the water table, there will not be the potential to form a pit lake and pit backfill will be unsaturated.

A pit backfill design was completed using a one-foot thick LHCSL overlain by a 2-foot thick cover which will be graded near the base of the pit to allow positive drainage of runoff and infiltration through the backfill to drain to the sump at the low point of the pit. During operations, water collected in the sump will be pumped into water trucks and hauled out for use as dust suppression on other contained facilities such as the CTFS, CGS, or WRSFs.

Coarse Gangue Stockpile: Coarse gangue is produced in the classification stage of the mineral processing and is conveyed into the CGS after going through a dewatering process. Coarse gangue material will be conveyed to the CGS located east of the open pit. The CGS will be contained in a similar manner to the WRSFs, with one foot thick of LHCSL and a minimum of 2 feet of cover material placed to prevent the LHCSL from drying out or freezing and cracking. Four-inch perforated CPe pipes will be placed in the natural drainages of the facility with 2 feet of overliner material above the pipes to convey stormwater to an 80-mil HDPE-lined CGS pond.

The CGS pond is sized for the 100-year, 24-hour storm event with 3 feet of freeboard. The spillway outlet channel is sized to convey runoff from the 500-year, 24-hour storm event with one foot of freeboard. Water from the stormwater sediment pond will be pumped back into the process circuit. The stockpile is expected to accommodate approximately 26M CY (million cubic yards) of material during the first 10 years of operation and with the ability to expand.

The CGS will be stacked in 50-foot lift heights and 75.5-foot benches graded between each lift to provide an overall stacking slope of 5.5H:1V and intermediate lift slopes of 4H:1V.

Sulfuric Acid Plant: Sulfuric acid will be manufactured on site for use in the lithium extraction process. The Sulfuric Acid Plant (SAP) will be purchased from EXP/DuPont MECS or a comparable industry leader which will be placed in concrete containment sufficient to contain 110% of the volume of the largest containment vessel and the 100-year, 24-hour storm event, if open to the environment. The concrete containment is also lined with an acid-resistant brick or epoxy coating depending on whether the containment is for a strong acid. The gas side of the SAP will be constructed on a concrete pad.

Molten, elemental sulfur will be stored in the molten sulfur storage tank and heated to an elevated temperature to make it exist in the liquid form. Upon cooling to approximately 250 degrees Fahrenheit, it rapidly solidifies preventing it from spreading any appreciable distance from the source tank. In the event of a spill, molten sulfur would solidify prior to escaping the curbed concrete containment.

Air is required to provide oxygen for the combustion and conversion reactions and will travel through a blower and ducting to the sulfur burners where it meets molten sulfur and is combusted to generate gaseous sulfur dioxide.

Gas will flow through a spray of sodium sulfate solution containing sodium hydroxide, which will remove SO_2 from the gas and then through mist eliminators to remove submicron acid mist and reducing emissions before exiting through the plant stack.

The strong acid system will circulate acid through three towers; drying, interpass, and final. This is the final step in producing sulfuric acid from molten sulfur and air. The strong acid storage area contains two carbon steel Product Acid Storage Tanks. From these storage tanks, sulfuric acid is transferred to the leaching process via horizontal centrifugal pumps.

Heat generated from the combustion and conversion reactions is recovered as steam that will be used for the process and create electricity. Steam exported from the SAP will be used to generate power in the steam driven Turbo Generator.

As previously mentioned, each area has concrete secondary containment sufficient to contain 110% of the largest vessel. The gas side will be constructed on a concrete pad to facilitate maintenance.

Processing: Lithium will be recovered from the claystone ore at a processing plant which will be constructed on site. The process facility will be capable of producing lithium carbonate, lithium sulfide, lithium hydroxide monohydrate, and lithium metal. Sodium hypochlorite solution (chlorine bleach) will be produced as a co-product with lithium metal. Lithium carbonate and lithium hydroxide monohydrate are the products that are expected to be produced in the initial phase of operations.

Ore will be reclaimed from the ROM stockpile to the attrition scrubbers using dozers, material sizers, a crusher for size reduction, belt conveyors, a storage bin, and belt feeders. Recycle water, raw water make-up, and ore will be combined in the attrition scrubbers where the fine clay particles are “scrubbed” from coarse gangue particles. Slurry from each train of attrition scrubbers will gravity discharge onto vibrating screens to remove oversize material prior to pumping the undersize slurry to the classification circuit. The screen oversize will discharge onto a belt conveyor which will report to a stockpile for periodic haulage to one of the WRSFs.

Classification Process: Attrition scrubbing and classification areas will be used to separate the lithium-rich, fine clay material from the low-grade, coarse material referred to as coarse gangue. The attrition scrubbers will use high speed agitators to cause slurry particles to impact one another, thereby creating a scrubbing effect between particles. By exploiting differences in breakage characteristics between lithium-rich and low-grade lithium bearing particles, the attrition scrubbers reduce lithium bearing particles to a size fraction less than approximately 100 microns (μm), while harder, low-grade lithium bearing particles remain in a size fraction larger than approximately 100 μm. Up to 40% of the ROM material delivered to the attrition scrubbers may be discarded and conveyed to the CGS once entrained lithium fines have been removed. The lithium-bearing ore will be pumped as a slurry to the downstream processing plant to be processed into various lithium products.

The classification circuit will separate the coarse gangue from the fine clay ore via a series of hydrocyclones. Coarse gangue will be pumped to a dewatering screen prior to conveying the oversize gangue to the CGS. The fine, lithium-bearing clay in the hydrocyclone overflows report to a thickener from which the underflow reports to the acid leaching circuit and the overflow is recycled to the attrition scrubbing circuit.

Leaching: The fine, lithium-bearing clay ore slurry from the classification process will be combined with concentrated sulfuric acid in a series of agitated tanks designed to optimally control the amount of lithium leached. The sulfuric acid will be supplied from the on-site SAP described previously. Refer to the section titled "*Sulfuric Acid Plant*" for additional details. The undissolved solids and the solids generated during acid leaching, primarily gypsum, will be removed by pressure filtration and blended with filter cake generated from the neutralization process. The combined filter cake product will be dried to optimal moisture content for structural stability in the CTFS before being conveyed to the CTFS for disposal. Refer to the section titled "*Clay Tailings Filter Stack (CTFS)*" for additional details.

The acidic, lithium-bearing solution from acid leaching will be neutralized in agitation tanks by mixing with recycled alkaline solids from the downstream magnesium precipitation and causticizing process areas. Solids generated during the neutralization process will be thickened and filtered by pressure filtration prior to being combined with the clay solids from the leaching process and conveyed to the CTFS for disposal.

Magnesium Sulfate Crystallization: Magnesium is removed from the neutralized lithium-bearing filtrate in two steps. The first step removes magnesium as a hydrated, magnesium sulfate salt in a "triple-effect" evaporation system, essentially a counter-current evapo-concentration circuit The magnesium sulfate salt is separated from the lithium-bearing mother liquor using a centrifuge. Prior to being conveyed to the CTFS for disposal, the magnesium sulfate salt is combined with other sulfate salts produced in downstream chemical processes.

Magnesium Precipitation: In the second magnesium removal step, residual magnesium, calcium, and other divalent cations in the lithium-bearing solution that remain after crystallization will be removed by chemical precipitation at an alkaline pH. Chemical precipitation takes place by adding quicklime in a conventional vertical mill lime slaker followed by agitated precipitation tanks, thickening, and pressure filtration. Soda ash solution is also added in this step to precipitate calcium carbonate. The filter cake will be recycled to the neutralization process as previously described. Further refinement of the filtered lithium-bearing solution will be done by an ion exchange process prior to being sent to the lithium carbonate and/or lithium hydroxide processes.

Lithium Sulfate Brine Purification by Ion Exchange: The filtrate produced from the magnesium precipitation process still contains trace quantities of divalent cationic species. The final step of purification, prior to production of lithium hydroxide and lithium carbonate, uses ion exchange to exchange divalent cations with sodium cations. Hydrochloric acid is used to strip the divalent species from the resin while caustic solution is used to regenerate the resin. The stripped solution is sent to the zero liquid discharge sulfate crystallizer for disposal in the CTFS as sulfate salts.

Lithium Hydroxide Monohydrate Production: Purified lithium-bearing solution from the ion exchange process will be transferred to lithium hydroxide monohydrate production. In the first step of lithium hydroxide production, all cations except for sodium, potassium, and lithium will be precipitated from solution using caustic soda. Precipitated solids will be removed in a pressure filter and recycled into the neutralization process as described previously.

In the second step, the brine resulting from this causticizing process will be flash cooled and chilled to precipitate sodium sulfate (Glauber's Salt) and potassium sulfate. The sodium and potassium sulfate are removed by filtration prior to being conveyed to the CTFS for disposal.

In the third and final step of lithium hydroxide production, the lithium-bearing solution is evaporated and crystallized in standard industrial equipment. This equipment will continuously produce crystals of lithium hydroxide monohydrate product as a wet cake from a centrifuge. These crystals will be centrifuged, washed, and potentially dissolved and re-crystalized in the process to meet the product purity and consistency requirements. As the concentration of impurities build up in the mother liquor of the lithium hydroxide crystallization circuit, mother liquor will be purged to the lithium carbonate production circuit to be converted to lithium carbonate. Following the final crystallization step, lithium hydroxide monohydrate will be dried in nitrogen and packaged in a variety of bulk bags ranging from 50 lbs to 2,000 lbs in weight.

Lithium Carbonate Production: Mother liquor purged from the lithium hydroxide production process will constitute the feed to the lithium carbonate circuit. Lithium carbonate will be precipitated out of solution using delivered and recycled carbon dioxide, filtered, and then dried. The filtrate will be sent to the zero liquid discharge crystallizer for water recovery. The precipitation and filtration system will be engineered to produce consistent, high-quality product that will meet or exceed a variety of industry standards, namely specifications corresponding to lithium ion batteries.

In all process areas, tanks are equipped with high-high alarms warning before any overflow events. Operating levels for tanks are specified on drawings and in operating philosophy and equipment design documentation to contain surge volumes of pipelines and upstream equipment. Concrete containment is designed at 110% of tank volumes to passively contain catastrophic tank failure, and segregated such that incompatible overflows will not mix. Standard level detection is provided at the sumps in the form of a high and low limit switch.

Clay Tailings Filter Stack (CTFS): Lithium processing will produce tailings comprised of acid leach filter cake (clay material), neutralization filter cake, magnesium sulfate salt, and sodium/potassium sulfate salts, which are collectively referred to as clay tailings. Tailings material will be conveyed from the tailings filter press located in the filtration and neutralization building at the process plant to the CTFS. Clay tailings and the collective salt wastes will be transported via two separate conveyors over 80-mil HDPE liner and will form two distinct stockpiles within cell 0 of the CTFS footprint. The blends are (1) undissolved solids and neutralization solids, and (2) sulfate salts. Material from these temporary stockpiles will be placed on the CTFS in conformance with the stacking plan.

Undissolved solids from the leaching process, gypsum produced during the leaching process, and precipitated solids produced during the neutralization process will be combined and dried to optimal moisture content for structural stability in the CTFS before being conveyed to a temporary stockpile within the geomembrane lined area of the CTFS.

Approximately 67 million cubic yards of clay tailings will be placed on the Phase 1 facility over the first 10 years of operation. There is an expansion area that would require a minor modification for Division review and approval which would accommodate approximately 353.6 million cubic yards of clay tailings over the 41-year mine life (ultimate facility buildout).

MWMP analyses indicate the expected blend of tailings material exceeds Profile I reference values for several constituents including aluminum (1,230 mg/L), antimony (0.14 mg/L), arsenic (3.39 mg/L), beryllium (0.947 mg/L), cadmium (0.208 mg/L), chromium (1 mg/L), iron (1510 mg/L), lead (0.07 mg/L), magnesium (15,800 mg/L), manganese (130 mg/L), mercury (0.0024 mg/L), pH (2.8 SU), sulfate (71,400 mg/L), thallium (0.26 mg/L), TDS (134,000 mg/L), uranium (1.08 mg/L), and zinc (16 mg/L). The Permittee is evaluating the potential to neutralize the tailings material prior to filtration and being stacked on the CTFS.

Although the material exceeds drinking water reference values for radiological constituents, the State of Nevada Department of Health Radiation Control Program (NDOH RCP) regulates radioactive material. Data collected to date indicate that the material is exempt from regulation by the NDOH RCP because uranium is less than 500 mg/kg (ranging from 0.1 to 7.9 mg/kg) and radium-226 is less than 5 pCi/g (ranging from non-detect to 1.1 pCi/g). The CTFS will be constructed as a lined, zero discharge facility and covered with waste rock/growth media at closure; therefore, no degradation to groundwater is anticipated.

As previously mentioned, the CTFS will be fully lined with an 80-mil HDPE geomembrane and underlain with a 6-inch liner bedding material. The facility will include an underdrain seepage collection system within a 2-foot overliner placed between the geomembrane and the clay tailings, which will allow seepage water and stormwater to drain to the Reclaim Pond. The overliner layer consists of a 24-inch thick drainage medium consisting of minus 1.5-inch sand and gravel mixture that covers the surface of the CTFS. This single layer will provide protection to the geomembrane during tailings placement and will have a high transmissivity to promote lateral drainage of seepage and stormwater runoff from the CTFS. Overliner will initially be processed from native soils on site, and later the coarse gangue stockpile can be used as an overliner source as the material will consist of washed sands. Precipitation that falls upon the CTFS will runoff or infiltrate through the tailings and will be collected by the underdrain system to flow to the Reclaim Pond. A conservative seepage calculation was completed in order to size the Reclaim Pond which showed a maximum seepage rate of up to 74 gpm as a result of tailings consolidation. However, a more refined seepage analysis was later completed using Hydrus 1D which indicated seepage from the tailings material is not anticipated and infiltration would travel approximately 20 meters in 1,000 years. The Reclaim Pond will still be constructed with an operating capacity of 74 gpm for 7 days plus storage for the 100-year, 24-hour event with 3 feet of freeboard allowing for adequate operational flexibility. Seepage flow from the CTFS will be measured and reported in accordance with the Permit. If greater flow than anticipated is observed during operations, the Permittee will be required to increase the storage capacity and update the draindown model and associated closure plan, if necessary. Under covered closure conditions, the resulting seepage is 0.01 percent of the Mean Annual Precipitation which translates to a total 0.02 gpm over the facility.

The solution collection piping system will consist of 4-inch diameter dual wall smooth interior perforated CPe (ADS N-12 equivalent) secondary collection pipes located on the geomembrane and spaced 200 feet apart in a herringbone pattern. The secondary collection pipes drain to a 12-inch diameter dual wall smooth interior perforated CPe (ADS N-12 equivalent) collection header pipe situated in the topographic low points of each cell in the CTFS. The collection header pipes connect into a 12-inch diameter dual wall smooth interior perforated CPe pipe that runs along the channel on the south side of the CTFS. At the CTFS solution outlet channel the 12-inch dual walled perforated CPe pipe connects to a solid, 12-inch diameter HDPE DR 17, underdrain outlet pipe which will convey flow into a Parshall Flume for measuring the seepage flow rate and then into the CTFS Reclaim Pond.

The facility will be constructed in horizontal lifts which will be sloped toward the exterior edges of the stack to shed precipitation runoff to the perimeter of the facility. No solution will be applied to the CTFS other than for periodic surface dust suppression and meteoric water; therefore, the only fluid collected by the underdrain system will be precipitation or pore water squeezed out of tailings due to long-term consolidation of the tailings material. Additionally, the Permit has a limitation which prohibits ponding on the surface of the facility. The facility is divided into six cells of similar size for permanent placement of tailings plus one cell in the southwest corner used for temporary clay tailings and salt stockpiles, but the underdrain systems for all the cells are connected.

Seven 36-inch diameter HDPE DR 17, stormwater overflow pipes are located at the CTFS Solution Outlet Channel approximately 24 inches above the invert of the 12-inch diameter underdrain outlet pipe. These pipes are designed to convey the CTFS stormwater runoff during a 100-year, 24-hour storm event under the haul road and into the CTFS Solution Outlet Channel, which then drains into the Reclaim Pond.

The tailings will be dewatered to approximately 61 percent dry basis (geotechnical) moisture content prior to being conveyed to the temporary tailings stockpile located in Cell 0 of the facility. From the stockpile, the material is hauled and placed in either the structural or nonstructural zone in a 12-inch thick lift and scarified to dry to the allowable moisture content. The material placed in the structural zone must have the moisture content required to achieve structural stability (46 ± 6 percent) and must be compacted at 95% of Modified Maximum Dry Density (MMDD) as determined by ASTM D1557 resulting in a permeability of approximately 10^{-7} cm/sec. If placed in the nonstructural zone, the material must have a moisture content of 46 ± 12 percent and compacted at 85 percent of MMDD as determined by ASTM D1557 resulting in a permeability of approximately 10^{-6} cm/sec. Centrifuged mineral salts will be approximately 10% water by weight before being conveyed to the CTFS.

Because compaction and moisture content are critical components to ensure the CTFS functions as designed, moisture content and percent compaction is included as a monitoring requirement under Part I.D of the Permit.

As mentioned previously, the CTFS will be constructed with a structural zone in the exterior of the facility and a non-structural zone in the interior. An interior non-structural zone will be constructed with layers of tailings and salts compacted at 85% of MMDD as determined by ASTM D1557. Surrounding this core, a structural zone will be constructed at 95% compaction of MMDD and with 4H:1V side slopes. The structural zone will be stacked against the nonstructural zone at a slope of 1H:1V with a 3-foot thick chimney drain between which extends from the overliner layer to the surface. The chimney drain will consist primarily of sands and gravels to provide a hydraulic break between the two zones to dissipate potential pore pressure.

Correct construction and placement of the chimney drain is also a critical component to ensure that the facility functions as designed; therefore, the Permit requires annual interim as-built reports to verify the proper placement of the chimney drain.

Vibrating wire piezometers will be installed on both sides of the chimney drain, one foot above the overliner to monitor pore pressures in each zone.

CTFS Stability Analysis: Stability analyses were performed using the computer program SLIDE v8 by RocScience. SLIDE is a two-dimensional slope stability program for evaluating circular or noncircular failure surfaces in soil or rock slopes using limit equilibrium methods. The Spencer's method, which is appropriate for all slope geometries and soil profiles, was utilized within the stability model and assumes all interslice forces are parallel and have the same inclination. The factor of safety can be defined generally as the resisting forces along a potential failure plane divided by the gravitational and dynamic driving forces. Both static and seismic conditions were analyzed.

The corresponding peak ground acceleration (PGA) for the 475-year Operational Based Earthquake (OBE) and 2,475-year Maximum Design Earthquake (MDE) events are 0.09g and 0.26g, respectively. Based on these seismic hazard parameters, and the Hynes-Griffin and Franklin analytical method, a reduced pseudostatic seismic coefficient of 0.13g (one-half of the PGA) is valid and was used to evaluate for post-closure pseudostatic conditions.

To assess the stability of slopes during seismic loadings, a pseudostatic approach was used where the potential slide mass is subjected to an additional, destabilizing horizontal force which represents the effect of earthquake motions and is directly related to the PGA. Very simply, the seismic force is the weight of the slide mass multiplied by a horizontal pseudostatic earthquake coefficient (k_H). Since the earthquake motion is not a constant, horizontal destabilizing force, using the full PGA for k_H has been shown to be overly conservative. Hynes-Griffin and Franklin (1984) discussed the concept that using one-half of the PGA for the horizontal pseudostatic earthquake coefficient more closely simulates actual earthquake loading, and with the resulting minimum factor of safety being equal to at least 1.0, slope deformations will be within tolerable limits. Thus, a seismic coefficient equal to one-half the PGA, or 0.13g, was adopted for the pseudostatic stability analyses. Minimum acceptable factors of safety for static and pseudostatic conditions were established as 1.3 and 1.05, respectively.

Design parameters utilized in the stability evaluations for the CTFS were conservatively selected based upon laboratory index and strength test data in conjunction with observations from the field investigation and historical experience with similar materials.

Material properties used in the stability analysis were based on available laboratory test data and experience with similar materials. Based upon triaxial laboratory testing results, the cohesion within the tailings materials is very sensitive to relatively small changes in moisture contents. For this reason, any effects that cohesion may have on strength have been assumed to be negligible for this stability analysis. It is recommended that long term monitoring and testing be performed to ensure that these assumptions are correct; therefore, a revised stability analysis will be submitted annually for Division review.

Both static and pseudostatic loadings were evaluated for a critical cross section through the ultimate CTFS configurations. This critical location was selected based upon existing topography, proposed grading of the facility foundations (if required), and proposed grading of the facility slopes. Based on this evaluation, the CTFS will remain stable for static loading conditions with a FOS of 1.3.

Pseudostatic loading conditions indicated that the factor of safety could be less than 1.05 for the CTFS under both the Operational Based Earthquake (OBE) and Maximum Design Earthquake (MDE) events, and thus a deformation analysis was completed to estimate potential slope movements. Since the pseudostatic stability evaluation for the CTFS resulted in calculated minimum factors of safety less than 1.05 for the OBE and MDE event, potential seismic deformations of the facility slopes were evaluated using a simplified method. Bray and Travasarou developed a semi-empirical relationship for estimating the magnitude and probability of permanent slope displacements that utilizes a non-linear, fully coupled stick-slip sliding block model to estimate dynamic performance of soil slopes.

Results of the CTFS deformation analysis indicate that for the MDE event, potential slope displacements between 17 to 32 inches could be expected. This estimate is for movement along the entire slope length for the maximum height of 400 feet of the ultimate CTFS buildout. The slope movements and any potential slope deformation from the MDE seismic event would not result in an excursion of the tailings outside containment.

CTFS Leak Detection: The leak detection system for the CTFS consists of a layer of studded 60-mil HDPE geomembrane underneath the CTFS 80-mil primary HDPE liner along the southern channel, which runs along the downstream side of each cell. At the outlet of each cell, a 6-inch, PVC Schedule 80 leak detection pipe extends from the base of the channel to the crest of the haul road between CTFS 80-mil HDPE geomembrane liner and studded drainliner geomembrane. The leak detection pipes will be checked for seepage if water is observed draining out of the 2-inch, HDPE DR17 leak detection pipe emptying into the reclaim pond. If constant flows are observed, a routine inspection plan will be put in place to determine where the leakage is occurring and the quantity and quality of leakage to determine if it is from a penetration through the geomembrane liner or if it is from a natural spring or condensation formed from moist soil beneath the liner. Additionally, vadose zone piezometers will be installed at the perimeter of the facility.

Reclaim Pond: The Reclaim Pond is a double-lined and leak-detected pond with an operating capacity of 9.2 million gallons, can store a 100-year, 24-hour storm event runoff volume of 17.8 million gallons and has 3.6 million gallons of storage available in the top 3 feet of freeboard. The total pond volume to the crest is 30.6 million gallons.

The Reclaim Pond will be double-lined with a 60-mil HDPE, double-sided textured geomembrane liner on bottom overlain by a 200-mil thick layer of geonet, and an 80-mil HDPE double-sided textured geomembrane liner above the geonet. The solution collected in the pond will be pumped to the processing plant to be used as make-up water for processing operations or will evaporate.

The Reclaim Pond has a sump located in the southeast corner. The sump is a total of five feet deep with the lower 2 feet of the sump being the leak collection and recovery sump (LCRS), and the upper 3 feet serving as the pond surface water sump. The LCRS is between the primary and secondary geomembranes and the pond surface water sump is located above the primary geomembrane. The LCRS has bottom dimensions of 10 feet by 10 feet with 2.5H:1V slopes and has select gravel wrapped in geotextile on top of the secondary geomembrane. A 12-inch diameter HDPE DR 21 pipe with slots cut into the lower 10 feet is positioned into the LCRS, which serves as a pump sleeve. A submersible pump will be positioned inside of the pump sleeve and connected to a discharge pipe that will pump leakage from between the layers to the crest of the pond and back onto the primary geomembrane.

The upper 3 feet of the 5-foot-deep CTFS Reclaim Pond sump is a recessed sump above the primary geomembrane that allows the sloping pumpback system to evacuate water out of the pond. The sloping pumpback system is a submersible pump attached to an 8-inch diameter HDPE pipe that is sleeved inside of an 18-inch diameter HDPE pipe, which serves as a pump sleeve. The pump will pump water out of the pond through the 8-inch pipe back to the Leaching Tanks in the Process Plant. The 18-inch diameter HDPE pipe sleeve will be held down by sheet of 80-mil HDPE liner ballasted with two concrete filled, six-inch diameter HDPE pipes. At the crest of the pond, the 18-inch diameter HDPE pipe transitions to a flanged stainless-steel pipe that is braced and welded to a steel plate embedded into a 6 feet wide by 6 feet long by 3 feet deep reinforced concrete anchor block.

CTFS Diversion Channels: Two diversion channels were designed to the north and west of the CTFS to divert stormwater runoff of undisturbed areas around the facility. The stormwater diversions are designed with a maximum 2.5H:1V cut and fill slopes and can convey stormwater runoff from a 500-year/24-hour storm event. The diversion channel varies from 30 feet to 60 feet in width and 2.5H:1V slopes. There are three culvert crossings designed for the CTFS West Diversion Channel. One is for haul truck traffic entering into the CTFS and the other two are for conveyor crossings from the Process Plant for the clay tailings stockpile and the salt stockpile.

The CTFS North Diversion Channel is approximately 80 feet wide with 2.5H:1V slopes and diverts water around to the east side of the CTFS.

Emergency Response Plan: The Permittee shall do every practical thing to prevent spills and unauthorized releases. This includes, but is not limited to, regular inspections of control devices, engines, and storage facilities. If coolants or petroleum products are released, they shall be excavated, characterized, and properly disposed of at a facility that is authorized to receive such material. In the event of release of sulfuric acid, personnel will be evacuated, and all ignition sources will be eliminated, and the spill neutralized with crushed limestone or soda ash. Spill material will be placed in sealed containers for disposal.

C. Receiving Water Characteristics

The Thacker Pass Project resides along a hydrographic basin divide between two designated hydrographic basins; the Kings River Valley to the west and the Quinn River Valley to the east. Lands within the Project area primarily drain eastward in the direction of the Quinn River Valley. A small portion of the proposed mine pit area and West WRSF resides in the Kings Valley hydrographic basin and thus drains west in the direction of Thacker Creek. Groundwater levels tend to reside between 4,625 ft amsl to 5,034 ft amsl.

Groundwater in the Project area was measured to have elevated background concentrations of arsenic, fluoride, and aluminum. Baseline data collected from monitoring wells found that arsenic exceeded Profile I reference value (RV) of 0.01 mg/L in 67% of samples. Averaged arsenic concentrations vary throughout the project site in each well, ranging from non-detect (0.001 mg/L) in WSH-03 (downgradient of the proposed CGS) to 0.042 mg/L in MW 18-03 at the West WRSF. In the pit area, arsenic concentrations are approximately 0.03 mg/L; downgradient of the proposed CTFS, arsenic concentrations averaged approximately 0.024 mg/L at MW 18-02.

Fluoride has been consistently analyzed above the Profile I RV of 4 mg/l at monitoring wells WSH-11, WSH-13, and WSH-17 with the averages ranging from 4 mg/L to 5.31 mg/L.

Aluminum has been observed to be locally elevated at WSH-03 with an average concentration 0.26 mg/l.

This described water quality data represents background pre-mining conditions. In accordance with NAC445A.424.1(b)(1)(ii), a facility may not degrade the waters of the State to the extent that the quality is lowered below the natural background concentration of the regulated drinking water constituent; therefore, degradation will be evaluated by analyzing trends of these constituents at each well and comparing to pre-mining concentrations over the course of the mine life and into closure.

Profile I-R Analysis: As stated previously, MWMP analysis of ore, waste rock, and tailings material present exceedances of drinking water standards for radiological constituents including gross alpha, uranium, radium226 + radium228, and gross beta; therefore, the Permit requires Profile I-R monitoring at all sampling locations in accordance with the Division Guidance document "2021 MODIFICATION TO PROFILE 1-R PARAMETER LIST."

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 published on the Division website: https://ndep.nv.gov/posts/category/land. 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 the public notice is posted to the Division website. 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.

Pursuant to NAC 445A.404, a public hearing on the proposed determination is being held on 1 December 2021 in Winnemucca, NV at 6:00 p.m. at the following location:

Boys and Girls Club of Winnemucca
1973 Whitworth Way
Winnemucca, NV 89445

E. Proposed Determination

The Division has made the tentative determination to issue the new 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 (the 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: Michelle Griffin
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Revision 00: New Permit.