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OURAY SILVER MINES

To: Colorado Division of Reclamation, Mining & Safety
1313 Sherman Street, Rm 215
Denver, CO 80203
From: Todd Jesse, Environmental Specialist
Date: June 8, 2021
Subject: Technical Revision No. 15 to DRMS 112(d) Mining Permit # M2012-032 Request for Urgent

Dear Mr. West,

Ouray Silver Mines Inc. (OSMI) is submitting Technical Revision 15 (TR-15) to DRMS 112(d) Mining Permit # M2012-032 through the ePermitting Portal. TR-15 is intended to recertify the Revenue Mill. Given the current construction schedules, OSMI would greatly appreciate an expedited review to avoid delays in achieving production.

Please do not hesitate to call me with concerns or questions at 970-325-9830.

Sincerely,

Todd Jesse
Environmental Specialist
Ouray Silver Mines Inc.

OURAY SILVER MINES

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Revenue Virginius Mine
Mill Recertification

Technical Revision No. 15
CDRMS Permit No. M-2012032
June 4, 2021

Contents

1 Introduction....3
2 Background Information....4
3 Mill Design Discussion....4
3.1 Crushing 5
3.2 Lead Concentrate 6
3.3 Zinc Concentrate 6
3.4 Tailings 7
4 Mill Construction, Modifications, and Test Operation....8
5 Water/Slurry Handling Systems and Environmental Protection 9
5.1 Coarse Ore Tunnel, Crusher Gallery, Decline and Mill Tunnel....9
5.2 Filter Building 9
5.3 Thickener....10
5.3 Reagent Room....10
6 Chemical Handling Systems and Containment 10
7 Tailing Chemistry and Water Quality at the Tailings Storage Facilities....11

Figures

Figure 1 – Mill Process Flow Diagram

Tables

Table 1 - List of major tanks in mill.
Table 2 - Volume of reagent tanks compared to the volume of secondary containment.
Table 3 - Reagent dosing rates in the flotation circuit.
Table 4 - Sizes of day tanks and mixing/storage tanks in gallons.
Table 5 - 2017 Multi-element analyses of concentrate and tailings.
Table 6 - 2017 ABA of tailings.

Appendices

Appendix 1 – For Construction Drawings
Appendix 2 – Reagent SDS
Appendix 3 – 2015 Tailing Geotechnical Testing
Appendix 4 – Groundwater Quality Data

1 Introduction

This Technical Revision 15 (TR) requests the following revisions to the Revenue-Virginius Mine (Mine) Division of Reclamation, Mining, and Safety (DRMS) Permit No. M-2012-032 (Permit).

1) Recertification of the mill at the Revenue Mine site.

This TR request describes the reasoning, characteristics, construction, and operation measures associated with the mill recertification at the Mine. Supporting information is presented under the following sections, background information (Section 2), mill design discussion (Section 3), mill construction, modifications, and test operations (Section 4), water and slurry handling systems and environmental protections (Section 5), chemical handling system and containment (Section 6), and tailing chemistry and water quality at the tailings embankment (Section 7).

As of the date of this TR, the mill is not in operation. The certification approval for the mill was originally granted by the DRMS on January 11, 2016. In February 2017, the Mine submitted TR-09 to DRMS, which allowed for changes in the mill process for improved recovery and bringing the mine back into full production. Within the crushing circuit, TR-09 allows for jaw crushers and a rod mill to replace the pre-existing cone crusher that would clog with fines. TR-09 also permitted two Derrick screens to replace a poorly sized cyclone circuit, addition of another conditioning tank to the zinc flotation circuit, rougher flotation tank cells (with air blowers) to the bulk lead and zinc circuits, and two additional cleaner flotation tank cells for the lead circuit. In addition to the changes in equipment, TR-09 also requested changes in the chemicals used in the milling process. The chemicals that were approved for use in TR-09 are: Xanthate (SIPX, Zn collector), AERO 242 (Pb promoter), AERO 3418A (Au Pb collector), Oreprep F-549 (aka MIBC, used as a frother), Flocculant (Tails Thickener), sodium metabisulphite (Pb depressant), CuSO4 (Zn activator), and ZnSO4 (Zn depressant). The mine received approval for TR-09 from the DRMS on March 16th, 2017.

On April 9th, 2021, the mine received notice of mill de-certification from the DRMS citing mill reconfiguration, equipment modifications, and a change to chemicals used in the metallurgic process as the reasons for decertification. Upon conditional approval of Technical Revision 15, the mill will be allowed to process ore to optimize the milling procedure through adjustments to equipment, chemicals, monitoring procedures, and tailings management so that permanent operations can take place. During mill commissioning, representative tailings samples will be subject to Synthetic Precipitation Leaching Procedure (SPLP) and acid-base accounting with sulfur forms to allow placement in permitted tailings storage facilities (TSF) and/or resale of blended waste rock and tailings (Revenue TSF or Atlas TSF). This Certification applies only to the environmental protection items of the mill; it does not apply to other environmental items of the mine permit. This Certification document is meant to satisfy the requirements of Rule 7.4 of the Hard Rock/Metal Mining Rules.

2 Background Information

The Mine, owned and operated by Ouray Silver Mines Inc. (OSMI), is an active silver mine located approximately 6 miles south west of Ouray Colorado along County Road 26. The Mine is currently permitted to operate under Amendment 1 to DRMS designated mining operations (DMO) permit (Section 112-d) M-2012-032. The current mill at the Revenue-Virginius Mine was commissioned in 2015 and certified by the DRMS on January 11th, 2016 to process 400 tons per day. On April 9th, 2021, the mine received formal notification of mill de-certification from the DRMS due to reconfiguration and modification to the mill equipment permitted in TR-09.

Several Technical Revisions (TRs) to Amendment 1 of M-2012-032 have been filed over the recent years. These revisions, summarized below, have focused on improved mill functioning, waste reduction, and improved environmental protocols. Recent TRs are summarized below.

TR-14 – Ongoing. Certification of the new mill filter building extension which will house reagent chemicals (permitted under TR-09) to be designated as an Environmental Protection Facility (EPF) for control and containment of designated chemicals used as reagents in the milling process.

TR-13 – Officially withdrawn. Building modifications and bond update that were proposed under this TR will be addressed by Amendment 2.

TR-12- Ongoing. Characterization and monitoring of hydrocarbons found in GW-4. Allows for the abandonment of GW-4.

TR-11- Updated the water monitoring program. Allowed placement of Pilot Passive Water Treatment Materials withing permit boundary. Updated reclamation plan to incorporate Waste Storage Pad and address minor modifications to topsoil placement.

TR10- Allowed the construction of the five-stage passive treatment system with discharge to surface water as permitted through CDPHE (CO-0000003 Modification 5)

TR09 – Updated groundwater standards, allowed the sale of mixed tailings and waste rock as road base. Allowed changes to the mill circuit, the relocation of buildings, and construction of two additional storage areas.

TR08 – Allowed for infiltration of mine discharge to groundwater following passive treatment in a sulfate reducing bioreactor.

3 Mill Design Discussion

The Revenue Mill is designed as an underground mill with a 540 ton per day of ore capacity. The Mill area excavations (four tunnels that constitute the mill complex) were performed under previous operators. The areas are a) the mine car unloading tunnel and coarse ore bin with slusher b) the crushing gallery with conveyor leading to the mill tunnel (fine ore bin incline), c) the mill tunnel which contains two flotation circuits (lead and zinc) and leads to the filter building at the outside edge of the mill tunnel and d) the decline tunnel, which provides equipment access to the crushing gallery from the mill tunnel. All these areas are shown on the attached drawing 100-GA which is a general arrangement drawing of the entire mill area. The original mill was designed by CH2MHill in Denver, Colorado based on ore samples and production targets for the mine and mill. Tunnel excavation began in March of 2013. Installation of mill concrete flooring, crushers, screens, ball mill, flotation cells, water handling systems, filter presses, control room, reagent storage, and electrical room equipment occurred in April of 2014.

Barr Engineering of Minneapolis, Minnesota redesigned the mill in 2017 under OSMI direction. Mill upgrades were necessary to improve ore recovery. TR09 permitted replacing the previous single stage jaw followed by a cone crusher with two-stage jaw crushers and a rod mill to prevent clogging with fines. The original cyclone circuit was poorly sized to achieve the correct operating pressure given the expected tonnages; the screens that were approved under TR-09 are not reliant on operating pressure. Changes in the flotation system were also needed based on two years of successive metallurgical testing, which proved that changes in reaction time and reagents will improve metal recovery from the ore.. The changes are discussed in detail in Section 4 below. As permitted in TR-09, the mill filter building is being expanded to house a compressor room and reagent room as well as a small roof structure over the transformers near the mill entrance.

A simplified flow diagram that outlines the milling process and indicates which components are new is found in Figure 1. A detailed flow diagram of the milling process is found in drawings MF and PI in Appendix 1.

3.1 Crushing

Ore is transported by mine cars to the slusher tunnel (Coarse Ore Bin), which has the rail siding above the crushing gallery. The ore cars are side dumped to an approximate 400 ton coarse ore bin which sits directly above a plate feeder which slowly delivers ore to the first conveyor which feeds the 1st stage jaw crusher.

Material leaving the primary jaw crusher is –2 1/2”. Material is conveyed from the primary jaw crusher to a ¾ inch screen. Oversize from the screen is conveyed to a secondary jaw crusher and -3/4-inch fines are conveyed to the rod mill for 1st stage grinding. At both jaw crushers dust is suppressed using water. The -3/4” from the screening and secondary crushing is delivered to the rod mill along with process water where the ore is ground to p80 of approximately 3/8-inch minus.

Slurry discharge from the rod mill will be delivered via slurry pumping to one of two locations. In the initial first months to a year of operation the slurry will report to the ball mill discharge tank which would then report to Derrick screens for sizing. Once final design and construction of two 12,690 gallon slurry retention tanks are finalized, the slurry will be pumped to those tanks which will be located in the previously constructed fine ore bin. The two slurry storage tanks are currently being engineered and will not be in place when the mill is commissioned. The slurry storage tanks are for surge capacity and the mill can be started without them. The slurry tanks will be added to the circuit in 2022. A list of tanks described in this section can be found in Table 1.

All processes from the rod mill downstream are fully wet. From the ball mill discharge tank or slurry storage tanks slurry is pumped to the 2 Derrick stack sizer screens, which size to p80 of -130 micron. These screens replaced the previously used hydro cyclone. Undersized material is sent to the Pb conditioning tank (1064 gallons). Oversize material is circulated to the ball mill where it is ground and returned to the screens for sizing. The ball mill reduction takes place in a wet enclosed ball mill. Sodium metabisulfite (pH control & Zn suppressant), Zinc Sulfate (Zn suppressant), and Lime (pH adjustment) are introduced into the process in the ball mill.

3.2 Lead Concentrate

In the Pb conditioning tank, process water, Aerofloat 242, Aerophine 3418A, and MIBC are added to promote the flotation of Pb and Ag while depressing the Zn to prepare for the concentrate separation in the lead rougher flotation cell (1320 gallons). The rougher flotation cell mixes air into the slurry with a rotor so that Pb can adhere to the bubbles and float to the surface. The rougher flotation cell feeds tailings from the bottom of the cell into Pb rougher scavenger flotation cells which consist of two sets of tanks (1320 gallons each) with three rotors in each tank (these tanks will also have two products - a concentrate and a tails). The concentrate goes to the Pb cleaner flotation cell. The tails from rougher scavenger cells report to the Zn rougher feed. The concentrate comes off the top of the rougher flotation cell and is fed to the Pb cleaner flotation cell or Pb cleaner column determined by recovery/concentrate grade.

The slurry then enters Pb cleaner floatation cells (unless bypassed to the Pb cleaner column) which consist of two banks that both have two tank cells (1st cell 449 gallons, 2nd cell 290 gallons). This step also creates two products – concentrate and tails. The concentrate reports to the Pb cleaner flotation columns. The tails from bank #1 tank #1 report to the bank #2 tank #1. Tails from bank #1 tank #2 goes to bank #2 tank #2. Tails from bank #2 tank #1 goes to bank #1 tank #2. Bank #2 tank #2 tails report to the Zn rougher conditioning tank (which is mislabeled on drawing 300-PI-004). Concentrate from the Pb cleaner flotation cells reports to the Pb cleaner column (214 gallons). Like all other tanks in the circuit, the Pb cleaner column creates both a concentrate and a tail. The tail from the Pb cleaner column are pumped back into the Pb cleaner flotation tank cell #1. The concentrate from the Pb cleaner column reports to the Pb concentrate thickener. Process water and flocculant are added to the slurry at the Pb concentrate thickener.

After the Pb concentrate thickener, material reports to the Pb concentrate filter feed tank (933 gallons). From the Pb concentrate filter feed tank, the concentrate is pumped to the Pb concentrate filter. Water removed from this step is sent to the filtrate water tank. The Pb concentrate is sent to a screw conveyor that feeds the bagging system. Once bagged the Pb concentrate is trucked off site to be sold. An SDS will accompany the bagged product to final delivery. Offtake is sold to a third party FOB mine warehouse and OSMI does not own the product once the bags are loaded for shipment.

3.3 Zinc Concentrate

The tails from the Pb circuit are sent to the Zn conditioning tanks (1064 gallons each) where lime from the recirculation circuit is added for a pH adjustment along with CuSO4, Oreprep, and xanthate are added to promote the flotation of zinc and to prepare for the concentrate separation in the Zn rougher flotation tank cell (1320 gallons). The rougher flotation cell mixes air into the slurry with a blower so that Zn can adhere to the bubbles and float to the surface. A concentrate is collected off the top the Zn rougher flotation tank cell and sent to the Zn cleaner flotation cells. Tailings from the bottom of the Zn rougher flotation tank cell report to the Zn rougher scavenger flotation cells. The Zn rougher flotation cells consist of two banks (1320 gallons each). The concentrate from the Zn rougher scavenger flotation cells reports to the Zn cleaner flotation cells along with the concentrate from the Zn rougher flotation tank cell.

The Zn cleaner flotation cells consist of two banks (1320 gallons each). Tailings from the Zn cleaner flotation cells report back to the Zn conditioning tank and the concentrate that is produced in this step goes to the Zn cleaner flotation column (214 gallon). The concentrate that is removed from the top of the Zn cleaner flotation column reports to the Zn concentrate thickener. The tailings that are produced by the Zn cleaner flotation column is sent back to the Zn cleaner flotation cell or the Zn conditioning tank, determined by recovery/concentrate grade.

Following the Zn concentrate thickener, the concentrate goes to the Zn concentrate filter feed tank (1728 gallons). The concentrate is then pumped into the Zn concentrate filter where water is removed. Water is either sent to the Zn concentrate thickener or the filtrate water tank depending on recovery/concentrate grade. The Zn concentrate cake created by the filter is then sent to a screw conveyor which feeds the Zn concentrate bagging system where the concentrate is placed in a super sack and transported off site for sale. An SDS will accompany the bagged product to final delivery. Offtake is sold to a third party FOB mine warehouse and OSMI does not own the product once the bags are loaded for shipment.

3.4 Tailings

Tailings from the Zn rougher scavenger flotation cells report to the tails filter feed tank or the tails thickener depending on the water content of the slurry. If additional water needs to be removed the tails will go to the tailings thickener. The tailings can be recirculated through the tailings thickener if need be before being sent on to the tailings filter feed tank (18,000 gallons).

The tailings filter feed tank reports to the tailings filter presses. Here the water is squeezed out of the tailings and the cake tailings are allowed to drop down into two concrete floor bays, where a front-end loader will load the filter cake out for permanent placement in the Revenue or Atlas tailings storage facilities (TSFs). The tailings from the filer presses will be approximately 13-20% moisture, which is appropriate for good compaction in either of the two permanent TSFs in the permit area. Tails will be compacted with a percentage of waste rock in accordance with OSMI's tailings management plan.

The water removed from the tailings is recycled back into the process water circuit to be used in the mill process. Drawings 800-PI-003 and 800 -MF-003 show a water treatment plant that discharges to a leach field, which is not going to be installed. The mill will start without a water treatment facility. After the mill process has been refined during commissioning and actual water chemistry is known, then a zero-discharge water treatment facility will be installed in the mill.

4 Mill Construction, Modifications, and Test Operation

In 2017, elements of the mill were redesigned by Barr Engineering. Figure 1 illustrates what components of the mill were modified. Mill upgrades include improvements to the crushing, milling, and flotation circuits as well as the filtration plant, as discussed below. No changes in environmental controls were proposed with the exception of the reagent room addition to the mill filter building which is being designated as an EPF under TR-14.

The crushing circuit improvements approved under TR-09 include removal of the existing secondary crusher and screening equipment; the equipment will be replaced with a small Rod mill and secondary Jaw crusher. The rod mill slurry will flow to two 12,690-gallon storage tank before being transferred by two slurry pumps to the mill circuit. The mill will start without the 12,690 gallon slurry storage tanks All equipment will be in the existing crusher gallery underground. The crushing gallery is the low point in the mill and any spill will be captured by sumps. These sumps will return spilled material back into the mill circuit.

Milling circuit improvements approved in TR-09 also include the removal of the existing cyclone circuit and replacing it with two Derrick screens for increased efficiency. Materials leaving the milling circuit will enter the flotation circuit.

Within the flotation circuit, the following changes were approved under TR-09 to facilitate ore recovery. Addition of another conditioning tank to the Zn flotation circuit, rougher flotation tank cells (with air blowers) to the bulk Pb and Zn circuits, and two additional cleaner flotation tank cells for the lead circuit. Pb and Zn concentrate thickeners will be added along with an overflow tank; the overflow from the thickeners reports back to the process. New reagent tanks, pump boxes and pumps will be added to support the new Pb and Zn flotation circuits. Sizes of the tanks and the volume of their secondary containments are listed in Table 2.

Both the milling circuit and the flotation circuit are located inside of the mill tunnel, which is graded at a 1.0% grade to the south, away from the portal. Since the length of the tunnel is 288 feet to the electrical room, this provides more than sufficient storage of any spillage or pipe rupture, even if the sump pumps failed.

Reagents utilized and the amount used per ton in throughout the flotation circuit are presented in Table 3, with safety data sheets (SDS) in Appendix 2. These reagents were approved in TR-09, with additional information presented in TR-14. Reagents will be stored in the reagent building as proposed in TR-09, with an EPF certification pending in TR-14. The original reagent distribution systems are being replaced with systems utilizing Clarkson feeders and dosing pumps with head tanks. Two new compressors, dryers and receivers will supply fresh air to the plant and mill. The current compressors will be dedicated to underground air supply.

The mill is currently being reconstructed by Western Refractory. Once construction has been completed, as-built drawings and photos of the mill will be sent to the DRMS. Once conditional approval to start the mill has been granted by the DRMS the mine will begin to feed ore into the mill and conduct test operations. The results of sampling will be sent to the DRMS.

5 Water/Slurry Handling Systems and Environmental Protection

5.1 Coarse Ore Tunnel, Crusher Gallery, Decline and Mill Tunnel

The water handling system in the crusher gallery, mill tunnel, filter building, and thickener is complex, but it is illustrated in drawings MF and PI. Water is recycled through the 18,000 gallon process water tank and the 18,000 gallon tailings tank in the mill filter building. Makeup water is provided from the coffer dam located in the coarse ore tunnel. Water from the Revenue Tunnel ditch is mechanically fed to this coffer dam through HDPE pipes using the Revenue Tunnel and Course Ore Tunnel. Water is then gravity fed from this coffer dam into a metal surge tank of dimensions 5’ wide x 5’ high x 10’ long, located immediately near the coffer dam. A portion of the water is then fed to the crusher gallery, where it is used in dust suppression at the jaw crushers, the rod mill and screens. Water is also pumped up the decline into the mill tunnel where it is piped to the 18,000 gallon process water tank in the filter building. From this tank, water is pumped back into the mill tunnel where it is used in the ball mill, the flotation cells and filtrate tanks. The third outlet from the metal surge tank prior to any interaction with the crushing, grinding or processing is simply an emergency overflow pipe to the mine ditch located in the main tunnel.

No water, slurry or other liquids can leave the mill tunnel since it is graded at a 1.0% grade to the south, away from the portal. Since the length of the tunnel is 288 feet to the electrical room, this provides sufficient storage of any spillage or pipe rupture, even if the sump pumps failed. The sumps and Gallagher pumps shown on the Issued for Construction (IFC) drawings are strategically located so that water buildup on the mill floor is pumped back into the system of tanks. The mill (and mine) receives line power, but a 1 Megawatt backup generator may be located on the surface in case line power is disrupted. Also, in the case of a power failure, no water would be delivered from the pumps to the mill, so the only water and/or slurry that could build up would be that which is already in the mill tunnel in the flotation cells and filtrate tanks. The mill tunnel and the crusher gallery have concrete floors with secondary containment sumps.

In the case of a pipe rupture or tank rupture in the mill, power would be shut off to the pumps so that no significant water volume could build up in the mill tunnel. As an even greater protection, if a very large volume of water built up in the mill tunnel, it would spill over into the decline and flow down to the crusher gallery before coming out the mill portal. There is approximately 129,0000 gallons of storage in this tunnel that will prevent water from discharging to the surface through the portal. The sump pumps in the crusher gallery pump water back into the system so that no discharge occurs. The coarse ore tunnel also drains to the crusher gallery which is the low point of the entire mill. All sump pumps are on automatic operation.

5.2 Filter Building

See discussion below on Chemical Handling Systems and Containment.

5.3 Thickener

There have been no changes made to the tailings thickener. The thickener is 26 feet in diameter and 8 feet deep. The total height of the thickener from the ground is 15 feet. The volume of the thickener is a maximum of 4400 cubic feet of slurry. The concrete containment is bigger than the thickener itself and will handle a minimum of 110% of the full volume of the thickener. The thickener has a 6 inch thick reinforced concrete containment.

Based on the footprint area of 1693 sq. ft, as measured from the site inspection and using a minimum wall height of 3.0 feet, this results in a containment volume of 5079 cu. ft. Since there is approximately 200 cu. ft. of structures in the containment, the actual volume of containment is 5079 – 200 = 4879 cu. ft, which is 111% of the tank volume. The plans correspond to the designs presented in TR-05.

In the case of a rupture of the thickener tank or piping, a slurry pump is located at the low point of the thickener containment, which would then pump the slurry back to the 18,000 gallon tailings tank located in the filter building. In this way, no tailings will be allowed to leave the area.

The slurry will be transported from the filter building to the thickener by overhead HDPE process water lines of 8” diameter. A return slurry line for concentrated slurry and a return waterline is installed on the bridge. The bridge consists of a steel truss structure of 6 feet width and 100 feet long. An airline and electric cable are also suspended in the same bridge. The bridge is 18 feet high to allow clearance and there will be two support structures; one at the filter building end of the overhead truss and the other at the thickener end, and the distance between them is 100 feet. The truss supports at both ends are steel supports in a foundation which is separate from both the thickener and the filter building.

5.4 Reagent Room

See discussion below on Chemical Handling Systems and Containment.

6 Chemical Handling Systems and Containment

Chemicals will be mixed in the reagent room - a separate partition of the mill filter building expansion. As stated in TR 14, chemicals arrive in secured sacks, metal drums or plastic totes, which have a protective metal mesh around them. The chemical list was revised in TR 9 and is included below in Table 4 for convenience. The floor of the Reagent Room area is 6” reinforced concrete slab sealed with an epoxy layer to prevent damage to the concrete should a spill occur. There are no under drains or liners. The reagent room will contain, at a maximum, 12,730 gallons of reagents. The secondary containment volume is 28,019 gallons including the sump volume of 268 gallons.

A telehandler or skidsteer is used to transfer new chemicals into the reagent room. Sumps are located throughout the reagent room. If water, slurry or liquid chemical is spilled in the reagent room area, it will flow to a sump, where it will be pumped back to the 18,000 gallon process water tank or reagent mixing tanks depending on the material spilled.

The maximum amount of chemicals to be on site at any one time are listed in Table 2. Reagents are stored in the reagent room located on the east side of the mill filter building except the lime day tank of 9200 gallons. Chemical SDS sheets for the chemicals above have been included in Appendix 2, which was included as part of TR-14.

The mill filter building houses two large 18,000 gallon tanks; one is for tailings slurry and the other is for process water. The area where these tanks are housed was used as a reagent room by previous operators and the environmental controls have remained the same. The 18,000 gallon tanks sit on a 6" concrete slab with a sump and vertical curbs that was coated with an epoxy for secondary containment. There is an additional protection against spills leaving the mill filter building area, which is a concrete apron of 78 feet long and 9-10 feet wide. The thickness of the reinforced concrete is 6 inches. A swale was formed in this concrete which is 6" to 8" deep and leads to a sump on the east side of the building. A level-controlled pump of 300 gpm capacity has been installed in this sump to automatically pump any liquids or slurry back to the thickener or 18,000 gallon slurry tank. The apron captures leakage from the garage door as well as the 2 doors where the fine tailings are dropped from the filter presses into the two filter cake bays. This concrete apron was approved as part of TR-05.

In the mill area, portable spill kits have been placed, which can be used to clean up spills in the area. Employees assigned to the mill are trained in Standard Operating Procedures (SOP's) which address inspection of pumps, piping, chemical containers and the epoxied berm for leaks, cracks or other malfunctions. They area also trained in the use of the spill kit and reporting procedures.

7 Tailing Chemistry and Water Quality at the Tailings Storage Facilities

Tailings from the milling process have a size range from approximately 100 mesh to below 200 mesh. After the metal sulfides are extracted in the flotation cells, the tailings slurry is then pumped to the thickener across the bridge where a large portion of the water is extracted. The remaining slurry is then pumped back to the 18,000 gallon tailings tank in the filter building, where it is then pumped to the filter presses where remaining water is squeezed out, and the tailings drop into either one of two filter cake bays, which are separated by a concrete wall. A backhoe or small loader is used to enter the filter bays and load them into trucks which haul the tailings to either the Revenue Tailing Storage Facility (immediately west of the mine portal) or the Atlas Tailing Storage Facility, which is on the west side of Atlas Creek and is currently being constructed. The trucks must utilize County Road 26 to reach the Atlas Tailing Storage Facility. Prior to removal from the filter bays, tailings will be checked to see if they have the proper moisture content to allow compaction in the piles.

In 2015,, samples of the tailings were sent to CTL Thompson in Denver for gradation, moisture/compaction, as well as triaxial shear and cohesion. The results of the tests are provided in Appendix 3. Using these parameters, slope stability tests were performed which confirm that both piles would be stable and have an adequate safety factor as long as the proper compaction were achieved when the material was placed in the piles. This compaction requirement was 94% of the maximum dry density, as determined using ASTM D-698. The results of the 2015 slope stability analysis are presented in Appendix 3. The geotechnical work on tailings stability will be updated (once conditional approval is granted) with data from the tails generated by the upgraded mill to demonstrate stability of the TSFs.

In 2017, feasibility-level metallurgical studies were conducted by FLSmidth. This program was conducted on variability composites that represented spatial and grade variations within the Virginius Main Vein, the Footwall Vein and the Yellow Rose Vein, as well as a master composite the was formulated to represent the weighted average contribution from these veins during the first five years of mining. Multi-element analyses were conducted on the final lead concentrate, zinc concentrate, and flotation tailings produced from Locked-cycle tests on the master composite and the results are presented in Table 5. A weighted tailings composite sample from the last 3 cycles was submitted for acid-base accounting (ABA) determination by McClelland Labs in Reno, Nevada and the results are summarized in Table 6. It was found that the flotation tailings had an acid generating potential (AGP) of 38.1 and an acid neutralizing potential (ANP) of 89.4, resulting in a net neutralizing potential (NNP) of 51.3 and an ANP/ANP ratio of 2.35. These results indicate that the flotation tailings are not acid generating.

Ouray Silver Mines installed groundwater monitoring wells at the toe of the designated tailings embankments along Sneffels Creek as part of the approved DRMS permit. The groundwater that passes through the Revenue and Atlas waste pile areas is properly intercepted by the wells GW-1, GW-2, and GW- 3. Each well location represents a pair of wells that are used to compare the water that might pass through any tailings with the water that is present in the porous rock below the original topsoil level. The (A) well in each location represents the background water, while the (B) well represents water that may have passed through the tailings. Well GW-3A was replaced by well GW-3R (TR-10) to assist monitoring Pond #2. All wells were initially sampled to establish a baseline. GW-1A and GE-1B were not sampled from August 2015 through August 2019 with DRMS permission because there had development there. Currently, all the wells are purged and sampled at least quarterly, with additional samples being taken as desired. The last 5 years of water quality data can be found in Appendix 4.