

Trench Camp Property - Tailings Storage Facility (TSF)
Aquifer Protection Permit No. P-512235
Place ID 18640, LTF No. 101257
SIGNIFICANT AMENDMENT

I. Introduction:

The Arizona Department of Environmental Quality (ADEQ) proposes to issue an Aquifer Protection Permit (APP) for the subject facility that covers the life of the facility, including operational, closure, and post-closure periods unless suspended or revoked pursuant to Arizona Administrative Code (A.A.C.) R18-9-A213. The requirements contained in this permit will allow the permittee to comply with the two key requirements of the Aquifer Protection Program: 1) meet Aquifer Water Quality Standards (AWQS) at the Point of Compliance (POC); and 2) demonstrate Best Available Demonstrated Control Technology (BADCT). BADCT's purpose is to employ engineering controls, processes, operating methods or other alternatives, including site-specific characteristics (i.e., the local subsurface geology), to reduce discharge of pollutants to the greatest degree achievable before they reach the aquifer or to prevent pollutants from reaching the aquifer.

II. Permittee:

South32 Hermosa Inc. 1860 E River Road, Suite 200
Tucson, Arizona 85718

III. Facility Name & Location:

Hermosa Project
749 Harshaw Road
Patagonia, Arizona 85624

IV. Facility Description:

The Hermosa Project Property is located approximately 5 miles south of the Town of Patagonia, Arizona. Arizona Minerals Inc. (AMI) purchased the historic, January and Norton Mine Claims and the Trench Camp Mine claims and associated Tailings Pile/waste rock from the ASARCO Trust in early 2016. The historic Mine Claims are closed and not considered APP regulated facilities and thus exempt according to the Arizona Revised Statute (A.R.S.) § 49-201.7 and A.R.S. § 49-250.B.11. The original APP application has been submitted for APP-regulated discharges associated with ADEQ's Voluntary Remediation Program (VRP) project related to eliminating discharges of mine impacted water from January Adit mine workings and tailing piles (which includes potentially acid generating (PAG) waste rock) seepage to Alum Gulch. The permit is being amended for purposes described further below.

The historic tailings piles (1 through 4) were located within an unlined natural basin in a three-pile configuration. Tailings Pile #1 contained tailings and potentially acid generating (PAG) waste rock. Stockpiles #2 and #4 contained only tailings and were combined into one pile. In addition, Tailings Pile #3 contained only tailings. These tailings piles were moved onto the Trench Camp TSF under the terms of the APP and VRP.

The TSF was originally designed as a lined, dry-stack permanent storage area for the remediation of the historic tailings piles, described above. Placement of the historic tailings piles on the lined permanent containment is part of the VRP program in Arizona under the site code 505143-2. Tailings, PAG waste rock and impacted soils beneath the existing tailings piles are to be excavated and placed in the lined TSF as an earthen material. PAG development rock from site surface construction and from a planned exploration decline or shaft, solids from the water treatment plants (WTP1 and WTP2), core cuttings, drill cuttings, and stormwater best management practices (BMPs) solids are also be stored in the lined TSF as a co-mingled material with the historic tailings and PAG waste rock. Additionally, construction or development rock may be placed on the exterior face of the TSF, thereby acting as armoring, to prevent water and wind erosion prior to closure.

The TSF construction began in 2018. The TSF consists of a lined tailings storage facility, two stormwater detention ponds and an underdrain collection pond. The tailings seepage water is collected through an underground collection system and gravity fed to the double lined underdrain collection pond (UDCP). The UDCP was constructed downgradient of the Trench Camp TSF. The captured tailings seepage water, precipitation that falls within the UDCP and water from the January Adit (the January and Norton Mine Claims) are piped to WTP1 and/or WTP2 for treatment and discharge to Alum Gulch and/or Harshaw Creek under AZPDES permit No AZ0026387. The TSF was constructed in stages as follows:

Interim Stage

The materials from historic Tailings Pile #1, which included 225,000 cubic yards of tailings, waste rock, and native material were excavated, hauled and temporarily placed on Tailings Piles #2 and #4 in order to provide space for the construction of the Stage 1 TSF. The temporary placement of Tailings Pile #1 on Tailings Piles #2 and #4 consisted of approximately 5H:1V (horizontal:vertical) slopes, a 50 foot setback from the brow of the existing slope on Tailings Pile #2, and an approximate maximum height of 30 ft.

Stage 1

Stage 1 of the Trench Camp TSF was constructed and utilizes approximately 650,000 square feet (ft²) of lined containment. Approximately 950,000 cubic yards of tailings, waste rock and native material were excavated, hauled, placed and compacted within the lined Stage 1 TSF from temporary Tailings Pile #1 and Tailings Piles #2 and #4. This volume includes the 225,000 cubic yards of Interim Stage material discussed above.

Stage 2

Stage 2 of the TSF was constructed after Stage 1 and utilizes approximately 596,000 ft² of additional lined containment. Approximately 280,500 cubic yards of additional tailings, waste rock and native material were excavated, hauled, placed and compacted within the lined Stage 2 TSF from Tailings Piles #2 and #4, and Tailings Pile #3. All historic tailings, waste rock and native materials from Tailings Piles #1, #2, #3 and #4 have been relocated within the constructed Stage 1 and 2 TSF lined containment as a compacted earthen fill totaling approximately 1,230,500 cubic yards.

To complete the design stacking geometry, approximately 1,400,000 cubic yards of additional material including exploration decline or shaft development rock, solids associated with water treatment (e.g. filter cake) from WTP1 and WTP2, core cutting solids, drill cuttings, construction PAG rock, and sediments from stormwater control features, will be placed on the TSF using the placement requirements for each material type (see Section 2.2.1.1 of the APP). The Stage 2 TSF has not exceeded the permitted elevation of 5,175 feet. All materials were authorized for placement within the existing lined Stage 1 and Stage 2 TSF footprint.

Stage 3:

The TSF expansion, referred to as “TSF1”, will increase the geomembrane lined footprint laterally from the current footprint of approximately 28 acres to approximately 55 acres. TSF1 will have a maximum stacking height of 243 feet reaching a maximum elevation of 5,275 feet. TSF1 will employ a composite lining system consisting of 60 mil double-sided textured HDPE geomembrane overlying either 12 inches of compacted LPSL (Low Permeability Soil Layer) or GCL (Geosynthetic Clay Liner) in designated areas. With the permitting of TSF1 (Stage 3), the following materials will be permitted for placement in TSF1:

- Historic tailings (during Stages 1 and 2)
- Production tailings (dry stack) (Stage 3)
- Development rock from exploration and future mine development
- Soil and rock from construction cuts, including PAG
- Solids associated with water treatment including filter cake
- Core-cutting solids
- Drill cuttings
- Assay rejects
- Sediments from vehicle and equipment wash sumps
- Sediments from stormwater BMPs

Dry stack historic and production tailings are the primary material placed in TSF1. Filter cake from WTP1 and WTP2, core cutting solids, drill cuttings, assay rejects, sediments from vehicle and equipment wash sumps, and sediments from stormwater BMPs constitute a small amount (<2%) of the total TSF1 volume.

V. Amendment Description:

The purpose of this significant amendment is for the following:

- Expand the existing lined tailing storage facility (TSF). With the expansion, this facility will be referred to as Tailings Storage Facility 1 (TSF1).
- Permit production tailings and other materials to be placed in TSF1.
- Revise the Pollutant Management Area (PMA) to reflect the TSF1 footprint.
- Revised the frequency of routine discharge monitoring at AZPDES Outfall 1 and Outfall 2, from quarterly to monthly.
- Update the Discharge Impact Area (DIA) to reflect the above revisions.
- Update the Contingency Plan.
- Update closure costs and financial assurance mechanism.

VI. Regulatory Status:

The facility is in compliance with the permit.

VII. Best Available Demonstrated Control Technology (BADCT):

The TSF and the UDCP will employ prescriptive BADCT components (in accordance with the Arizona Mining BADCT Guidance Manual (AMBGM)). BADCT has been determined in accordance with the AMBGM. The design of the UDCP incorporates enhanced discharge control measures (such as double liner and leak collection and recovery systems) that go beyond the prescriptive components identified in the AMBGM for non-stormwater impoundments.

Tailings Storage Facility 1 (TSF1) (Stages 1, 2, and 3)

The lined, dry stack TSF was constructed in two Stages. BADCT for Stage3 is provided below:

Stage 3

Stage 3 (TSF1) shall be constructed in a manner similar to that of Stages 1 and 2. As per design, the permittee will use GCL or LPSL, and it is approved by the design engineer. The maximum elevation of the Stage 3 TSF shall not exceed 5,275 feet. The footprint will expand from approximately 28 acres to 55 acres. In addition to filtered production tailings and materials allowed in previous stages of the TSF development, the permittee is allowed to place additional materials including solid from water treatment, core cutting solids, drill cuttings, sediments generated from site stormwater best management practices (BMPs), waste/development rock from decline and shaft excavation, PAG material generated during construction, assay rejects, and sediments from vehicle and equipment wash as described under Section 2.2.1.1.4.

No changes were made to other permitted facilities.

VIII. Compliance with Aquifer Water Quality Standards (AWQS):

The permittee shall conduct Compliance Groundwater monitoring at MW3, located approximately 300 feet downgradient of the AZPDES Outfall-001 as per Section 4.2, Table 4.2.3.

Discharge Monitoring:

Compliance discharge monitoring shall be conducted for quality and daily flow from the WTPs at AZPDES Outfall 001 and AZPDES Outfall 002 per Section 4.2, Table 4.2.2 of the permit.

Other Monitoring:

Table 4.2.1 – Facility Inspections includes seepage monitoring of the piezometer wells at the Tailings Storage Facility (TSF) and shall be monitored for water levels and presence/absence of fluids.

Facility Inspections also include:

TSF: Tailings height, and structural integrity.

UDCP: Freeboard, anchor trench integrity, embankment integrity, liner integrity, pumping system integrity, sediment control.