U.S. STEEL - Keetac

Annual Dam Status Report

2025

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1.0 Executive Summary

In 2024, Keetac deposited approximately 4.7 million long tons of tailings into Stage 2 Interior and 8.9 million long tons of tailings in Stage 2 Exterior as part of Phase I. Phase I entails hydraulically placing material against the toe of Stage 2 Interior dam (in Stage 2 Exterior's footprint) to provide adequate stability through the designed and permitted life of the Keetac Tailings Storage Facility. Additionally in 2023, Keetac added direct reduction (DR) grade concentrate and DR grade pellet capabilities. Keetac retains the flexibility to transition between blast furnace (BF) grade and DR grade pellet production however, only one product can be made at a time. Only a few trials of DR pellets were produced in 2023 and 2024.

TSF activities proposed for 2025 have the intent to support and advance Phase I through continued emphasis in buttress construction along the toe of Stage 2 Interior embankments. The Stage 2 Exterior dikes were raised to permitted elevations in 2024.

Currently, Keetac is working towards a complete Environmental Assessment Worksheet Application to continue to Phase II.

1.1 Introduction

United States Steel Corporation (USS) Minnesota Ore Operations owns and operates the Keetac Mine in Keewatin, Minnesota. Approximately 70% of the taconite crude ore is stored as tailings within a basin that utilizes a perimeter dike retention system, The Keetac Tailings Storage Facility (TSF). The TSF was constructed in three stages Stage 1, Stage 2, and Stage 2 Interior. Stage 1 was approximately 1,560 acres and was the sole tailings deposition location until Stage 2 was constructed in the 1980s. Stage 2, referred to as Stage 2 Exterior herein, expanded the tailings facility to the south by construction of clay core perimeter dams and created a new deposition area of approximately 4,300 acres. In 1993 it was

determined to raise a portion of Stage 1 and the interior of Stage 2 vertically, creating an internal basin, herein referred to as Stage 2 Interior shown in Figure 1. Stage 2 Interior has a footprint of 2500 acres and over 40,500 lineal feet of dam crest that rises approximately 2.7ft/year (when full production is stored) to sustain current mine production levels.

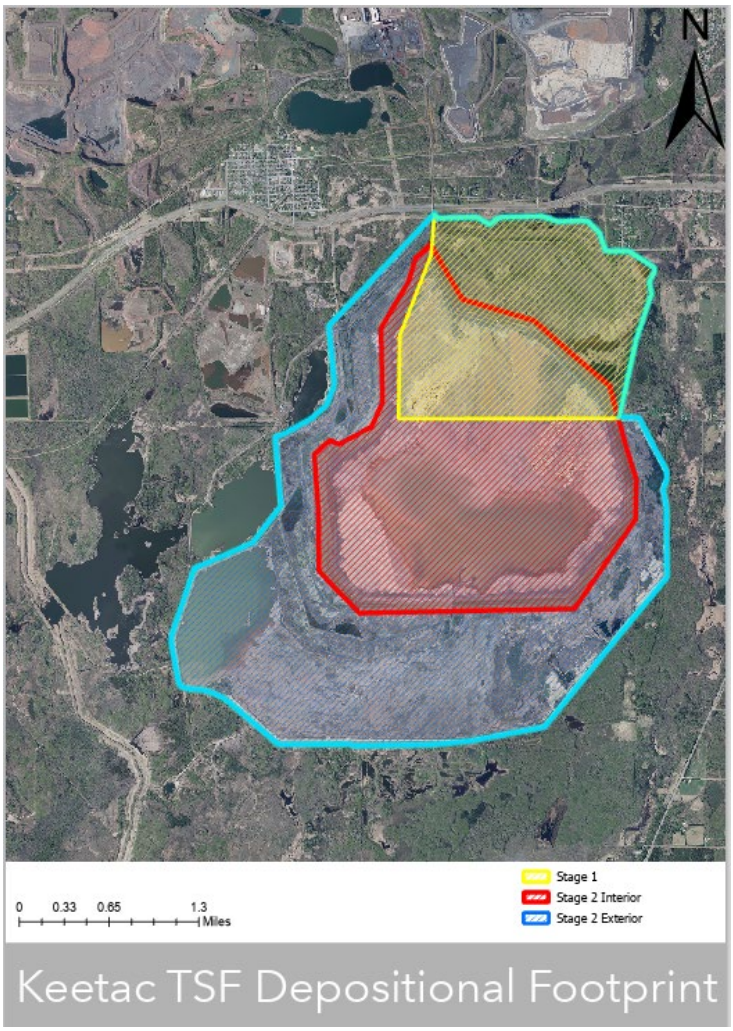

Figure 1: Keetac Tailings Facility Overview and Historical Staged Progression

DR grade pellet production capabilities was added in 2023 and as a result it is anticipated that there will be an increase in solids reporting to the TSF by approximately 10 percent and the flow of water by approximately 5 percent if the DR pellets are produced at maximum capacity. A new 10- inch pipeline was installed within the existing corridor into Stage 2 interior cell to handle the additional

tailings. In 2023, all tailings produced from DR grade trials was added to the existing 22-inch pipeline and was deposited as total tailings. During DR pellet production, two scenarios may take place; 1) total tailings will be pumped to the TSF at ~1,871 NT/hour of solids and 14,450 GPM of water via the same 22-inch line or 2) the fine fraction of tailings generated from the DR pellet process will be deposited separately via the 10-inch line at a solids rate of 171 NT/hour and 700 GPM of water. When DR pellets are not being produced, the tailings will report to the TSF as they historically have.

Excess water is pumped or siphoned down from Stage 2 Interior into Stage 2 Exterior Pond, then decanted into Reservoir No. 6, which is then pumped to the Wolf Hill water tank until it is recirculated back to the concentrator for operational purposes. Operational water bodies and flow are noted in Figure 2.

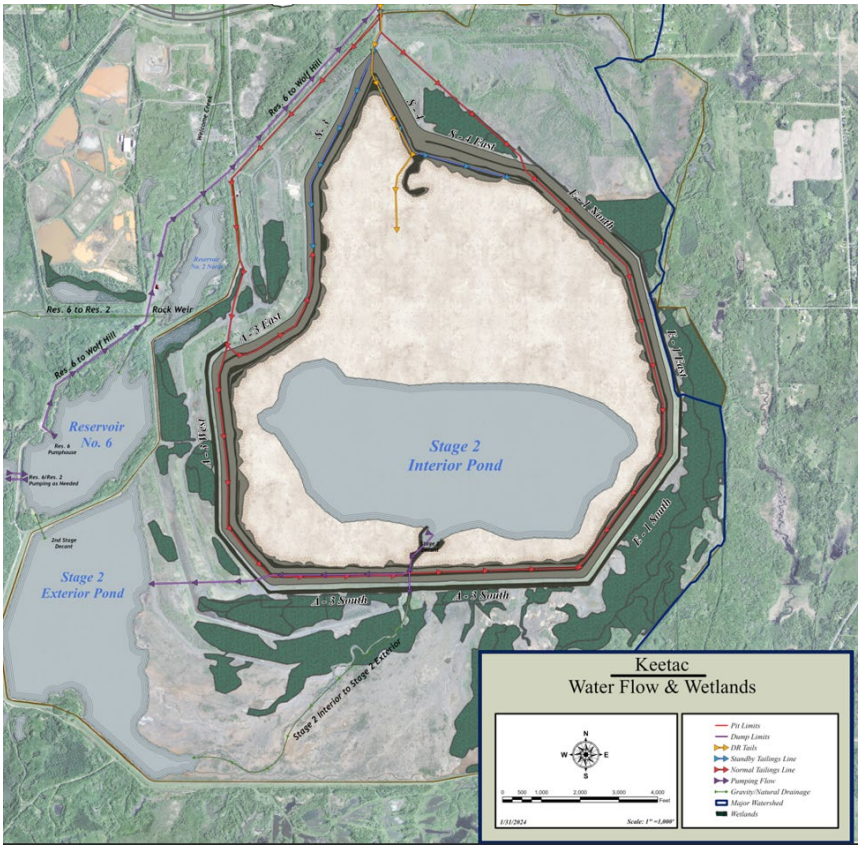

Figure 2: Keetac Water Flow Diagram

2.0 U.S. Steel Keetac Dam Status

Keetac's Tailings Facility (Keetac – NSPC Stage Two Tailings Dam) currently operates under MNDNR Dam Safety Permit No. 2022-0721 which allows the TSF to raise the perimeter dams (Stage 2 Exterior) to a maximum elevation of 1470 in the south, and 1510 elevation in the east, as designed in the "National Tailings Basin Stage 2 Design Report December 1977" (Bechtel Design). The MNDNR Dam Safety Permit and the Bechtel Design can be found in Appendix 4.7 and 4.5, respectively. Stage 2 Exterior Perimeter dam was raised as part of Phase I in 2022 and 2024. The Stage 2 Exterior Perimeter dike was constructed in phases in 2022 and 2024, reaching an elevation of 1470 feet in the west and south, and an elevation of 1500 feet in the east, as depicted in Figure 3. Stage 2 Exterior Water Dam crest is at 1470', where the External East crest is at 1500' as shown by Figure 4. The maximum operating pool elevation in Stage 2 Exterior is currently being evaluated since the 2024 construction raises and Phase I deposition.

Figure 3: Elevation Profile of Stage 2 Exterior Perimeter Dams

Figure 4: Stage 2 Exterior Water Dam Crest Elevations

Stage 2 Interior is planned and permitted to an ultimate perimeter crest elevation of 1585’ (on the southern dikes). The crest elevations currently vary between 1555’ and 1580’ as shown in Figure 5 on the following page. Large elevation variances are due to select coarse tailings stockpile locations e.g., the standby location in the northernmost portion of the TSF and irregularities in unfinished deposition areas. The maximum operating pool elevation in 2024 was 1552’ elevation.

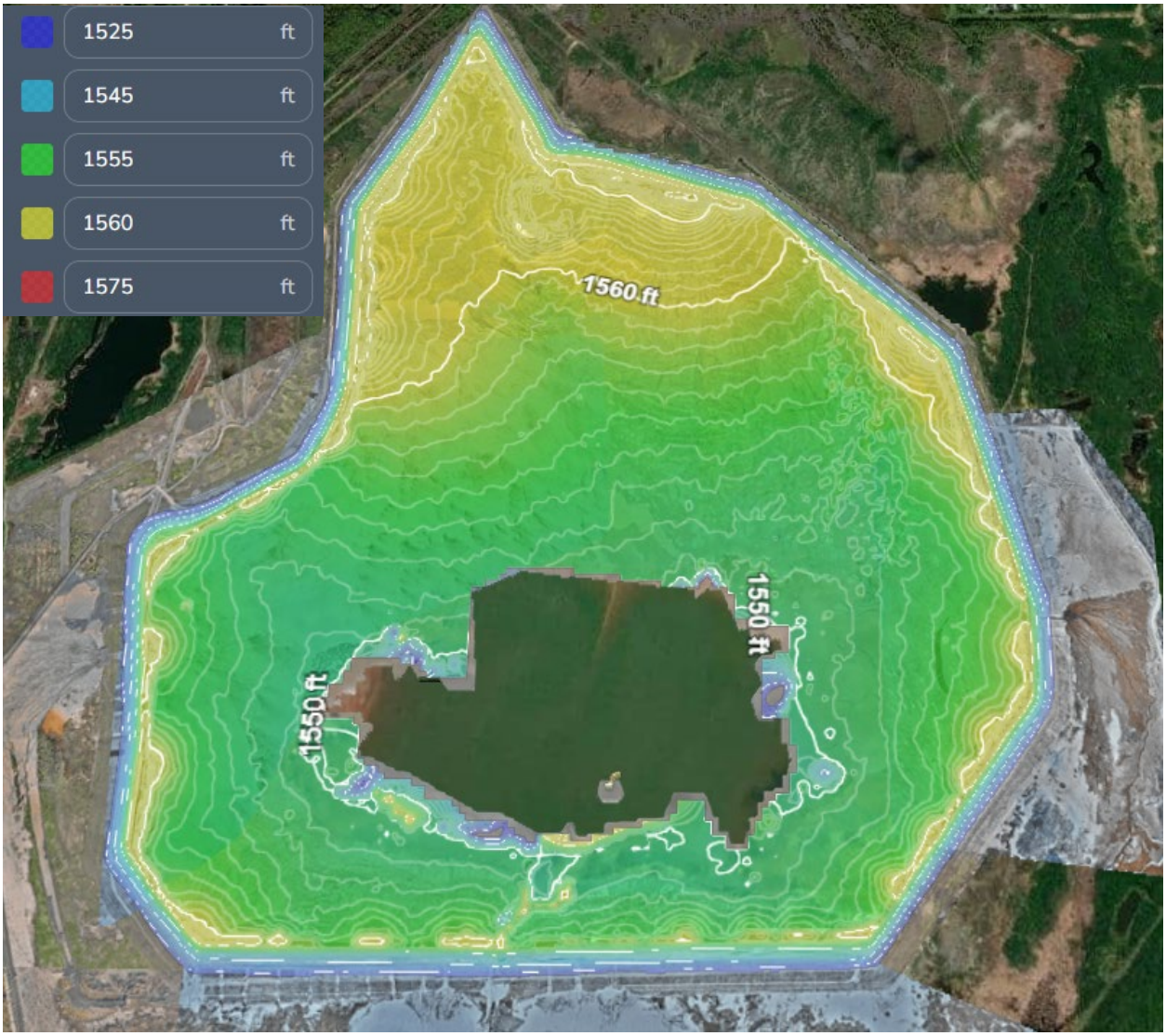

Figure 5: Elevation Heat Map of Keetac Stage 2 Interior

2.1 Stage 2 Exterior

2.1.1 Background

The Stage 2 Exterior Dam is a semi-homogenous clay cored structure which was constructed in stages using the downstream construction method and spans approximately 35,000 linear feet. The starter dike consists of a homogenous clay structure, that in the case where the foundation is below elevation 1460 the dam (Stage 2 Exterior South and Stage 2 Exterior West) was constructed with vertical

chimney drain connecting to near horizontal drains that extend to the downstream toe. The drains were designed to meet a permeability of $1x10^{-3}$ and were constructed to a typical cross-sectional thickness of five feet. The intent of the drain was to control the phreatic surface and to mitigate potential high exit gradients. Portions of the starter dam (Stage 2 Exterior West) where the foundation was above the 1460' elevation there was no drain system, and the downstream side is homogenous. A typical cross-sectional view is provided in Figure 6.

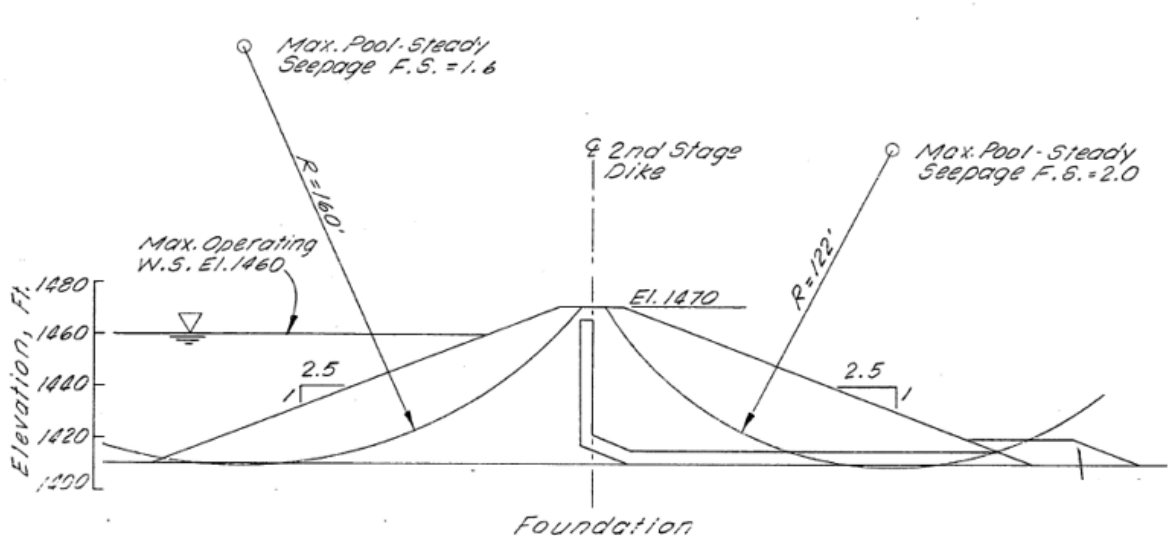

Figure 6: Typical Cross Section of Stage 2 Exterior Perimeter Dam

Stage 2 Exterior starter dike foundation was constructed on stiff glacial till, exposed from excavation of deleterious materials, and consisted of homogenous clay. The dam was then raised using the downstream construction method and incorporated three zones of engineered material:

- Zone 1 consisted of compacted clean impervious clay material which was placed on the upstream portion of the embankment to control seepage forces.
- Zone 2 is compacted semi-impervious fill which consisted of glacial outwash and sand.
- Zone 3, the downstream portion of fill, consisted of compacted random fill.

Stage 2 Exterior consists of a water dam segment to the west and a dike, or tailings dam, to the south and east separated by Baker Hill as indicated in Figure 7.

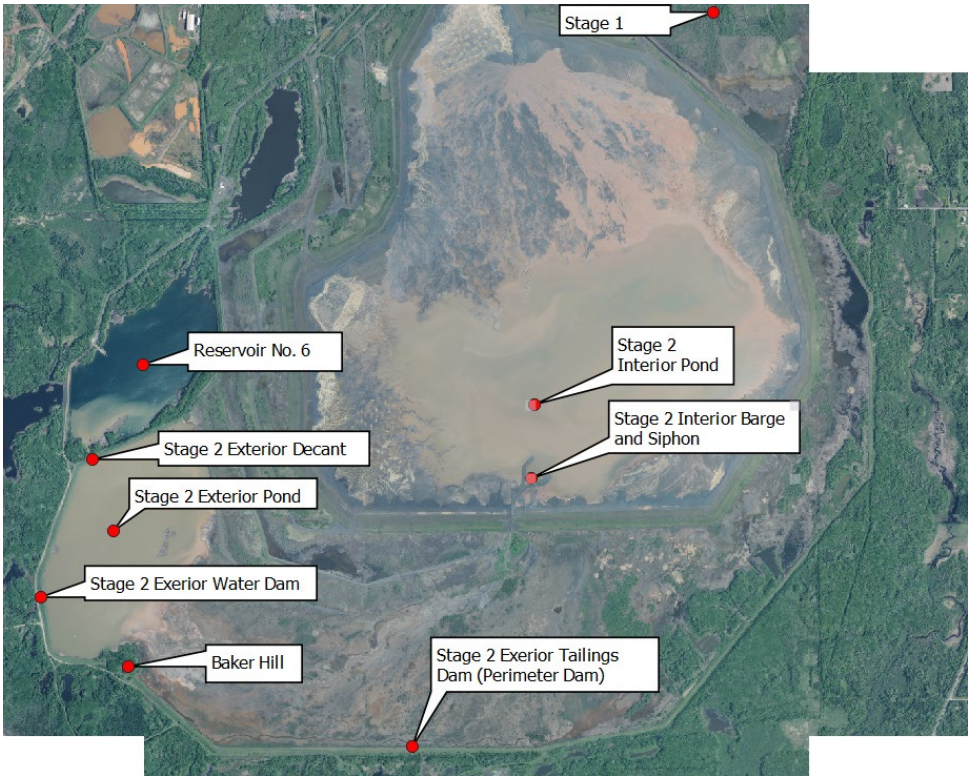

Figure 7: Stage 2 Exterior Dam Configuration

The water dam portion and tailings dam are similar in design except for an addition of riprap which was placed over to the upstream shell of zone 1 and compacted clay bed and filter diaphragm at the decant cross section location shown in Figure 8.

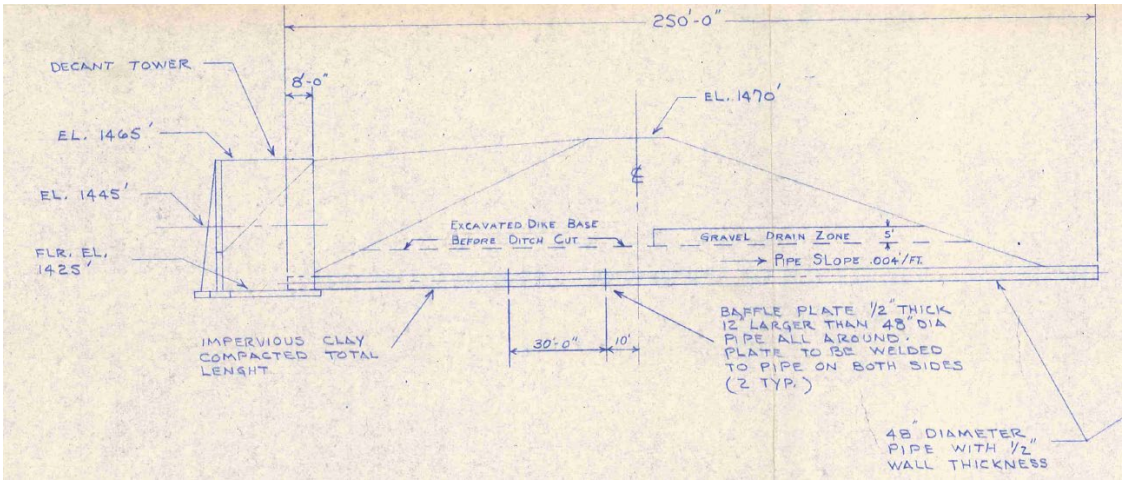

Figure 8: Stage 2 Exterior Decant Cross Section

Stage 2 Exterior was designed with the intent to maintain 8’ of freeboard – an ongoing hydrology assessment will confirm or update the minimum freeboard requirements. Perimeter crests surrounding the Stage 2 pond were built to an approximate elevation of 1462’. Stage 2 Exterior has been designed and permitted following the “1977 National Tailings Basin Stage 2 Design Report” (Bechtel Design).

2.1.2 2024 Construction

Phase 1 of Keetac TSF Construction is a near-term interim solution (Phase 1) to transition to a long-range TSF alternative (Phase 2) that provides tailings storage within the full area of Stage 2 Exterior. Phase 2 is designed to align with the current permitted mine plan capable of 40 years of additional storage capacity and will be completed as a separate project.

The Phase 1 Construction began in 2022 and was completed in 2024 by Ulland Brothers, Inc. of Virginia, MN. Construction was observed by USS and GEI Consultants and field testing was completed by Northeast Technical Services (NTS). Engineering support and review was provided by GEI, which functions as Engineer of Record for Keetac TSF.

Phase 1 included construction of internal diversion dikes to allow for controlled deposition of tailings within Stage 2 Exterior Tailings Facility along the toe of the Stage 2 Internal embankments. The diversion dikes within the basin interior are intended to control excess tailings and water runoff during hydraulic discharge. The diversion dikes were constructed of coarse tailings borrowed from sporadic areas within basin footprint. Phase 1 construction also included mechanically raising the western and eastern portion of the Stage 2 Exterior Dams within the existing toe perimeter to increase freeboard capacity prior to hydraulic deposition within the Stage 2 Exterior cell. The Exterior dams were raised using clay sourced within the facility footprint and remained within the constraints of the Bechtel design. A summary of construction work completed in 2024 is provided in Table 1.

Designation	**Purpose**	**Approximate Height of Phase I Construction**	**Approximate Surface Area of Dike**	**Comment** *Elevations are in NGVD 29
Stage 2 Exterior West Dike	Additional Freeboard	10 feet	16 Acres	Raise to permitted crest elevation of 1470.00 feet
Reservoir 6 Dike	Additional Freeboard	10 feet	10 Acres	Raise to permitted crest elevation of 1470.00 feet
West Interior Diversion Dike	Diversion within Stage 2 Exterior Basin footprint for controlled deposition of tailings	5 to 15 Feet	26 Acres	Internal Dike over previously deposited tailings. Raised to 1495.00 feet.
External East Dike	Additional Freeboard	5 to 10 feet	24 Acres	Raise to permitted crest elevation of 1500.00 feet

Table 1: 2024 Phase 1 Construction Summary

2.1.3 2024 Stage 2 Exterior Hydraulic Deposition (Buttress)

In 2024, the hydraulic deposition along the toe of Stage 2 Interior continued as an effort to mitigate slope stability risk to the upstream constructed embankments. This effort was outlined and permitted in the 2022 Permit to Mine Amendment located in Appendix 4.6 and is part of the Phase 1 work. The specific locations of the depositions are in Appendix 4.1 (2024 Deposition and Reclamation Map) and a summary of the tons of tailings placed hydraulically in Stage 2 Exterior are shown below in Table 2 and also illustrated cross-sectionally in Figure 9.

Deposition Location	**Buttress Tailings Deposition (Dry Long Tons)**
A3 Buttress	5,942,667.00
E1 Buttress	2,971,333.00
Total Stage 2 Exterior Deposition	8,914,000.00

Table 2: Hydraulically Placed Tailings (Buttress) in Stage 2 Exterior

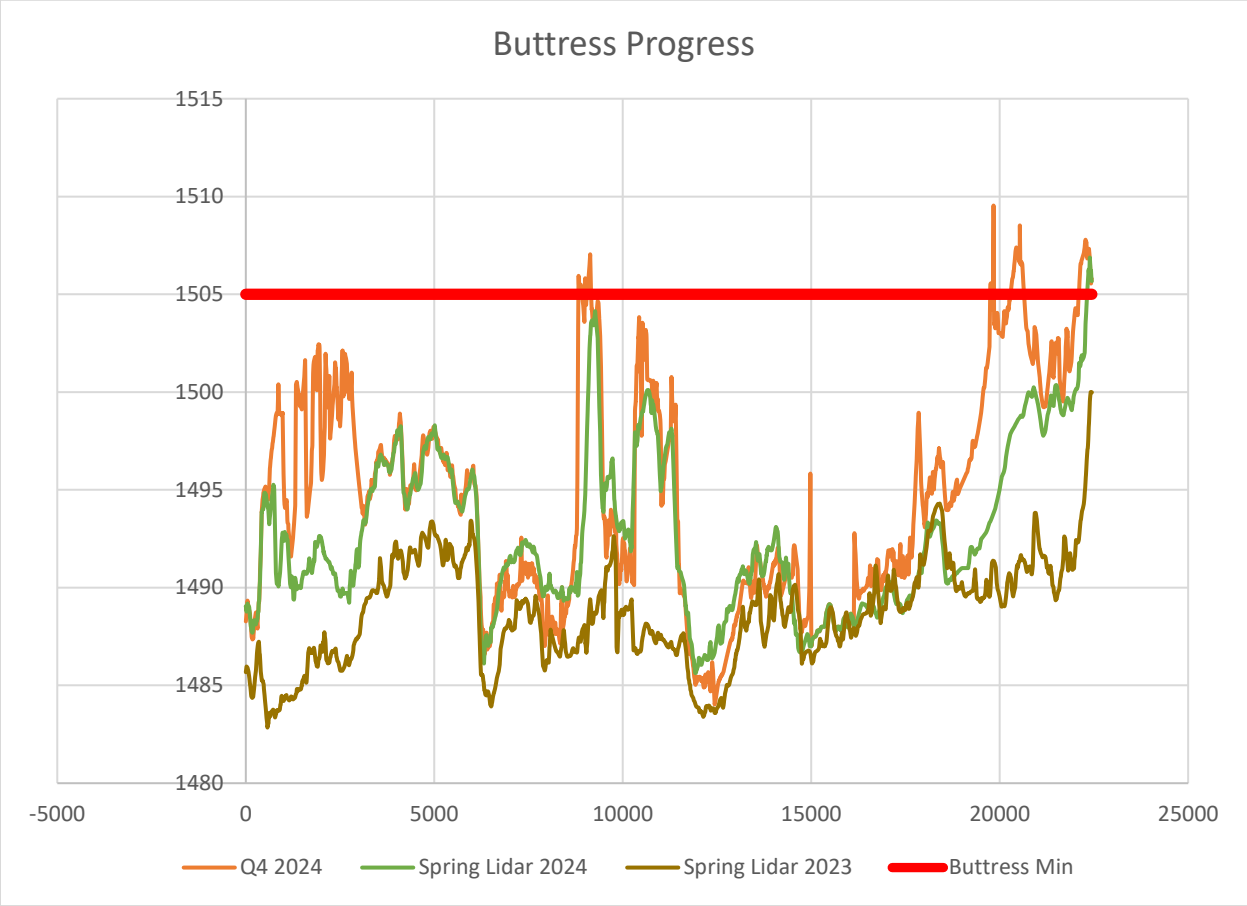

Figure 9: Buttress Progress

2.1.4 2025 Planned Stage 2 Exterior Hydraulic Deposition (Buttress)

As part of Phase I Construction, controlled hydraulic discharge of tailings is planned to continue into 2025 and occur along the toe of Stage 2 Interior, depositing into Stage 2 Exterior. Since the intent is to increase the overall stability of Stage 2 Interior embankments as soon as desired stability is achieved, no more deposition will take place in the Stage 2 Exterior footprint. This may occur in 1 to 3 lifts depending upon monitored porewater pressure responses and the ability to mechanically push the coarse tailings portion against the downstream toe of Stage 2 Interior. The deposition will remain continuous following the 2024 deposition and is prioritized based on a risk profile. Deposition will begin in the most sensitive area first – SW corner and sequence by alternating deposition on the northwest

and northeast corners of Stage 2 Interior and slowly converging in the middle of A3 South as shown in figure 10.

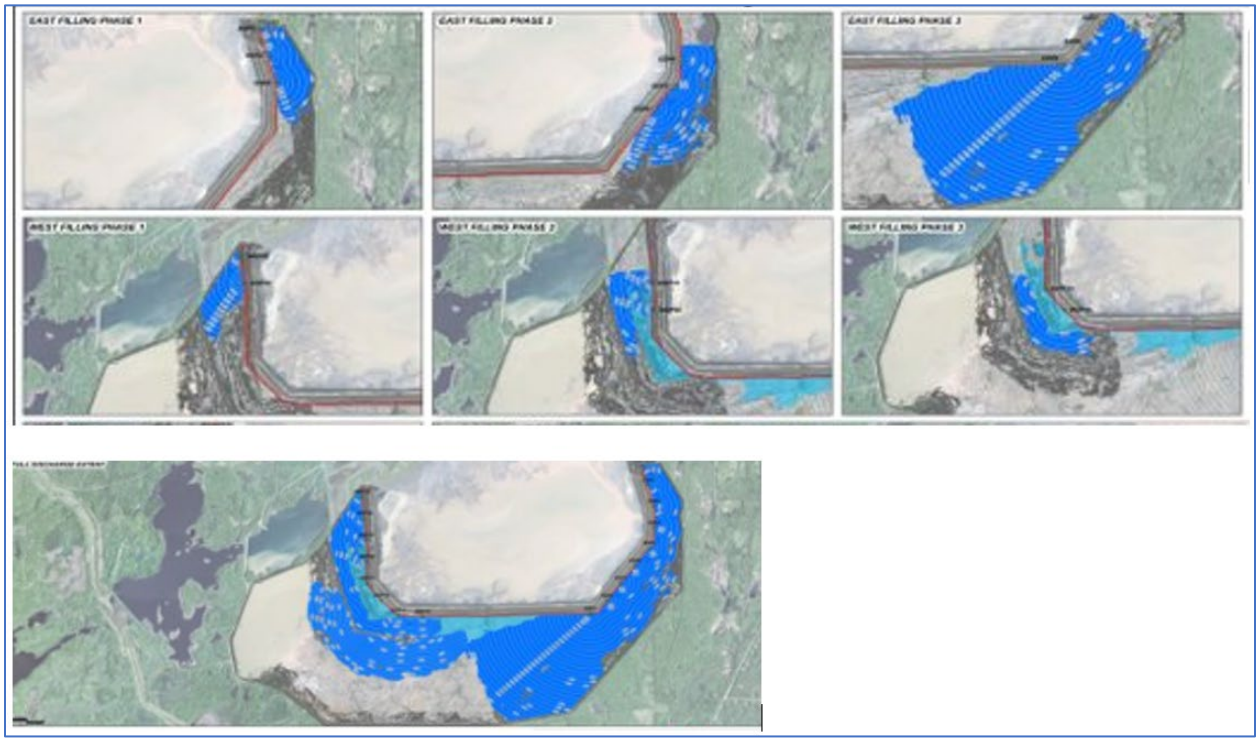

Figure 10: Conceptual Phase I Hydraulic Deposition Sequence.

The final geometry (not likely to be complete in 2025) will include a minimum of 400' downstream deposition of existing Stage 2 Interior toe and a nominal elevation of 1505'. To help control the deposition and mitigate the risk of inundating the Stage 2 Exterior Pond, the Western Diversion Dikes were raised to the elevation of 1495', but there is not additional raise planned.

2.2 Stage 2 Interior

2.2.1 Background

The Stage 2 Interior basin was constructed within the combined footprint of the original Stage 1 and Stage 2 tailings disposal facilities. Construction started in the early 1990's at an approximate

elevation of 1490 and encompassed an area of 2500 acres. Stage 2 Interior was built over varying thicknesses of fine-grained tailings and natural high ground that was previously deposited within either Stage 1 or Stage 2. Stage 2 Interior is a homogenous dam that is just over 8 miles in circumference and constructed from coarse tailings via hydraulic deposition and mechanical placement. Stage 2 Interior utilized staged upstream construction with 35 feet wide benches per 25-foot lift, this brings the overall slope angle to approximately 1V:8.5H. The benches also serve as access roads, pipe foundations, and utility corridors. Stage 2 Interior has an ultimate elevation of 1585 feet. Figure 9 is a typical surface cross section for Stage 2 Interior and Figure 10 represents typical stratigraphy.

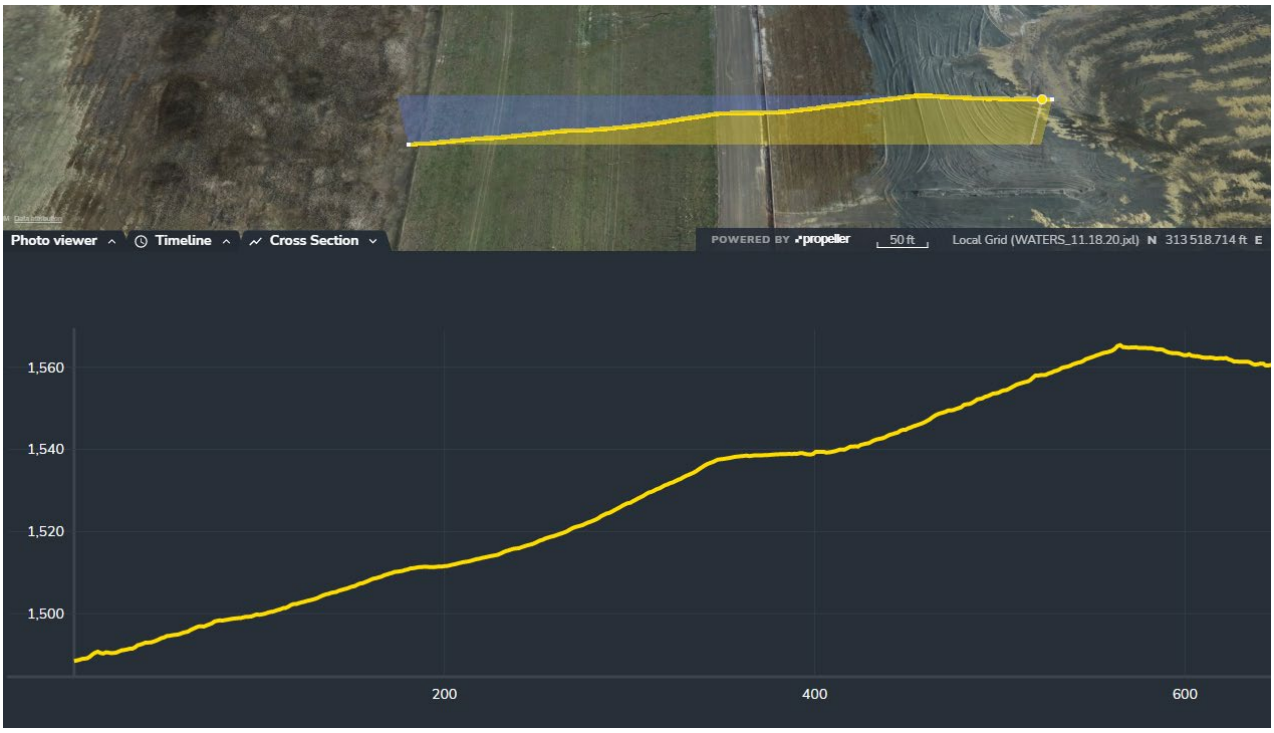

Figure 11: Stage 2 Interior Typical Cross Section

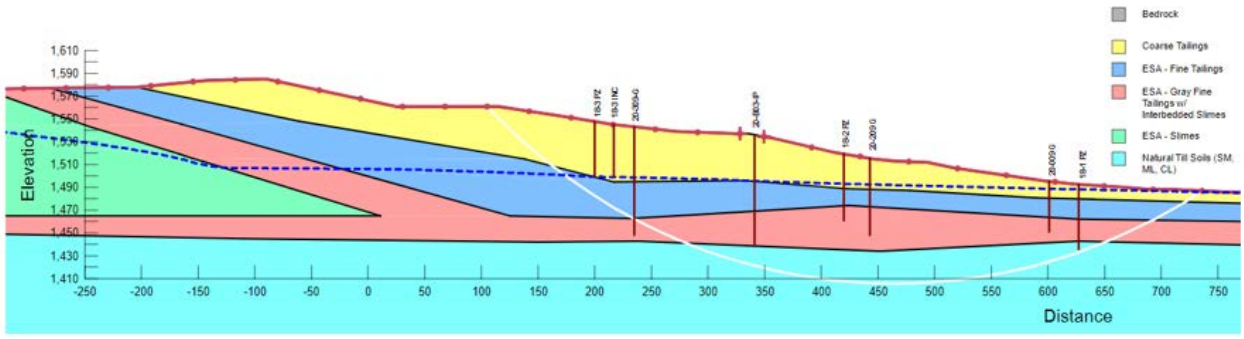

Figure 12: Typical Material Strata of Stage 2 Interior Dam

Stage 2 Interior is designed and constructed to maintain a minimum freeboard of 7 feet. As best practice, the facility also maintains a minimum adequate beach that extends from crest to pool and described in the OMS. Stage 2 Interior historically utilized a ring-drop-down decant structure commonly referred to as the “Morning Glory” decant. In 2021 the Morning Glory decant was idled due to concerns of structural integrity, then decommissioned in 2022. Currently, Stage 2 Interior Pond is managed by a pumping barge system and two passive siphons which is located adjacent to the old Morning Glory as shown in Figure 11. The total pumping capacity now exceeds 23,000 GPM.

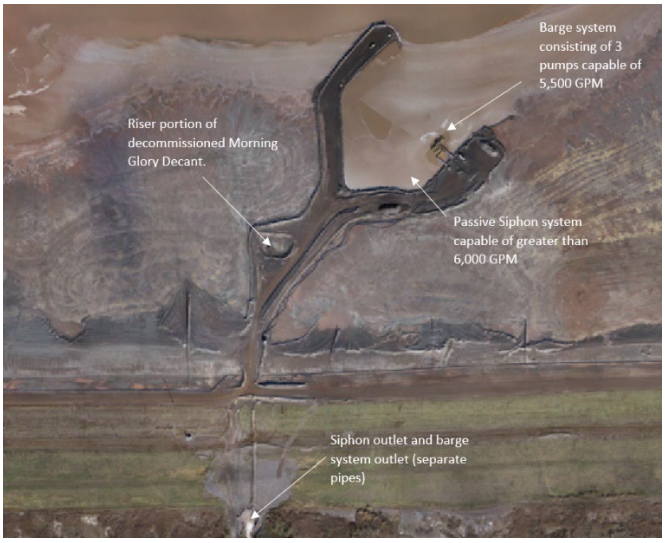

Figure 13: Current Decanting Infrastructure.

2.2.2 2024 Stage 2 Interior Deposition/Construction

In 2024, approximately 4,743,039.0 dry long tons of tailings were deposited in Stage 2 Interior hydraulically to maintain beach lengths and freeboard. The interior deposition occurred sporadically between January and December of 2024 and included areas E1, A3, S3, and S4. Detailed locations of depositions are illustrated in Appendix 4.1 (2024 Deposition and Reclamation Map). An approximate breakdown by area is indicated in Table 4 below.

Deposition Line	Interior Tailings Deposition (Dry Long Tons)
E1	1,050,548.00
A3	525,275.00
S3	2,926,508.00
S4	240,708
Total	4,743,039.00

Table 3: Deposition into Stage 2 Interior Separated by Line and Pump Location

2.2.3 2025 Planned Stage 2 Interior Deposition/Construction

It is anticipated that Keetac will deposit approximately 4 million long tons of tailings between Stage 2 Interior in 2025[1]. The interior deposition is largely planned to occur through the Standby pipe when phase I buttress deposition is not taking place. However, a strategic focus will be placed on raising

[1] Subject to change based on operational need, water balance, and geotechnical monitoring.

the southern portion of E1 East and A-3 South to an elevation of 1560'-1565' to maintain adequate freeboard and beach length designed for extreme storm events. A detailed map of 2024 deposition locations are shown in Appendix 4.2 (2024 Deposition Locations and Activities).

3.0 2022 Instrumentation, Monitoring, and Surveillance

In 2008, Keetac began a large geotechnical investigation and monitoring program and installed additional instrumentation that has contributed to the Observational Method. The Observational Method originally proposed by Peck in 1969, is reliant on continuous monitoring, observations, and performance assessments that provide data feedback into staged design and construction progress. Stage 2 Interior historically has relied heavily on pore-water pressure monitoring and in the past 5 years several additional instruments have been installed.

In 2022, USS began using an ArcGIS Online (AGOL) platform to help continuous feed of data and sharing of instrumentation, surveillance, and monitoring across all necessary parties. An example of the site dashboard is shown in figure 13.

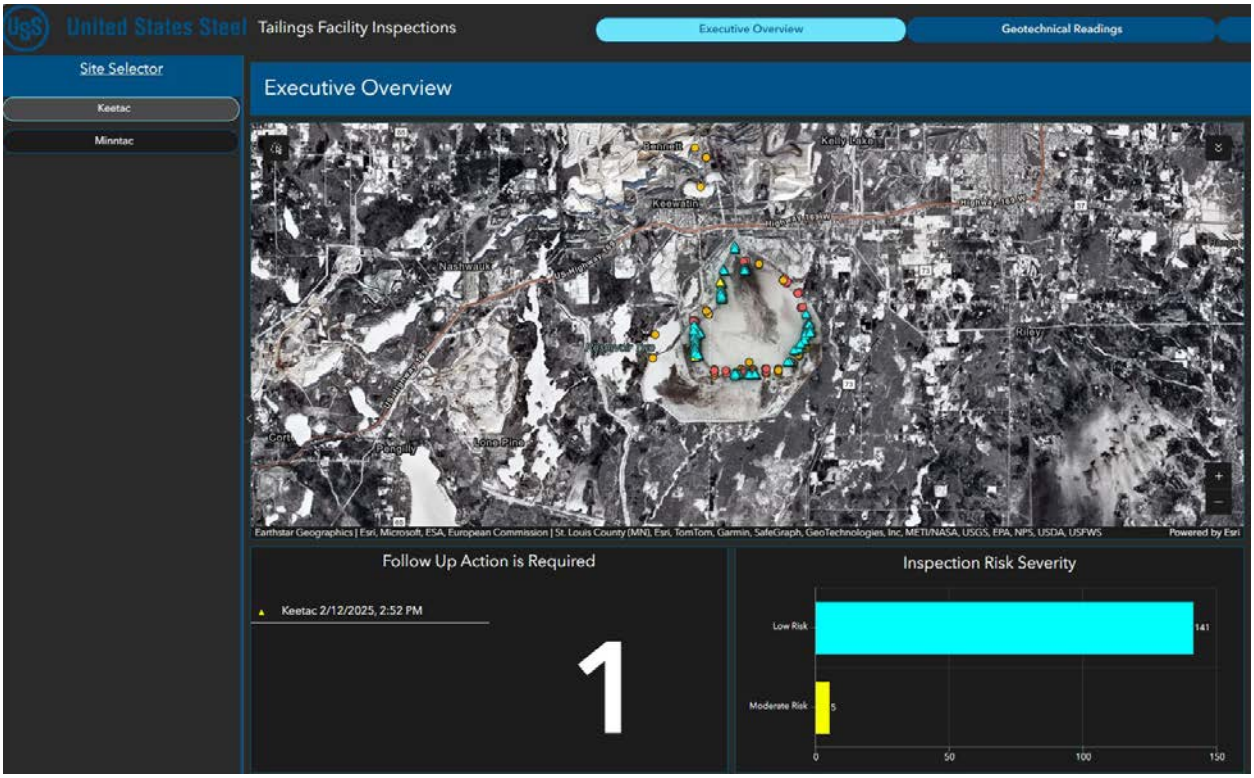

Figure 14: Keetac Instrumentation Dashboard

All instrumentation data is collected no less than quarterly and occasionally at greater frequency depending on site conditions and proximity to construction activities. Instrumentation data is automatically uploaded to be reviewed internally and externally, and a report is produced by Keetac's Engineer of Record (GEI) quarterly. The 2024 Quarterly Instrumentation Reports to date can be found in Appendix 4.4. In general, there has been no visual signs of distress (i.e., cracking, sloughing, or significant seepage). Inclinometer readings showed negligible horizontal movements across the TSF, and no adverse movements or trends were noted. All increased porewater pressures observed were correlated to increased pond elevation and fit with the general understanding of the TSF. Additionally, Stage 2 Exterior and Stage 2 Interior was observed to be in good condition with no visual signs of seepage, cracking, or settlement. Please refer to Appendix 4.3 for additional details regarding observations noted during the 2024 Annual Dam Safety Inspection.

4.0 Appendices

4.1 2024 Deposition and Reclamation Map

4.2 2025 Proposed Deposition Locations and Activities

4.3 2024 Dam Safety Inspection Report

4.4 2024 Quarterly Instrumentation and Monitoring Reports

4.4.1 2024 Quarter 1 Instrumentation and Monitoring Memo

4.4.2 2024 Quarter 2 Instrumentation and Monitoring Memo

4.4.3 2024 Quarter 3 Instrumentation and Monitoring Memo

4.4.4 2024 Quarter 4 Instrumentation and Monitoring Memo

4.5 1977 National Tailings Basin Stage 2 Design Report

4.6 2022 Permit to Mine Amendment Application

4.7 2024 Keetac Construction Plan Set

4.8 2022-0721_97983_Dam Safety permit