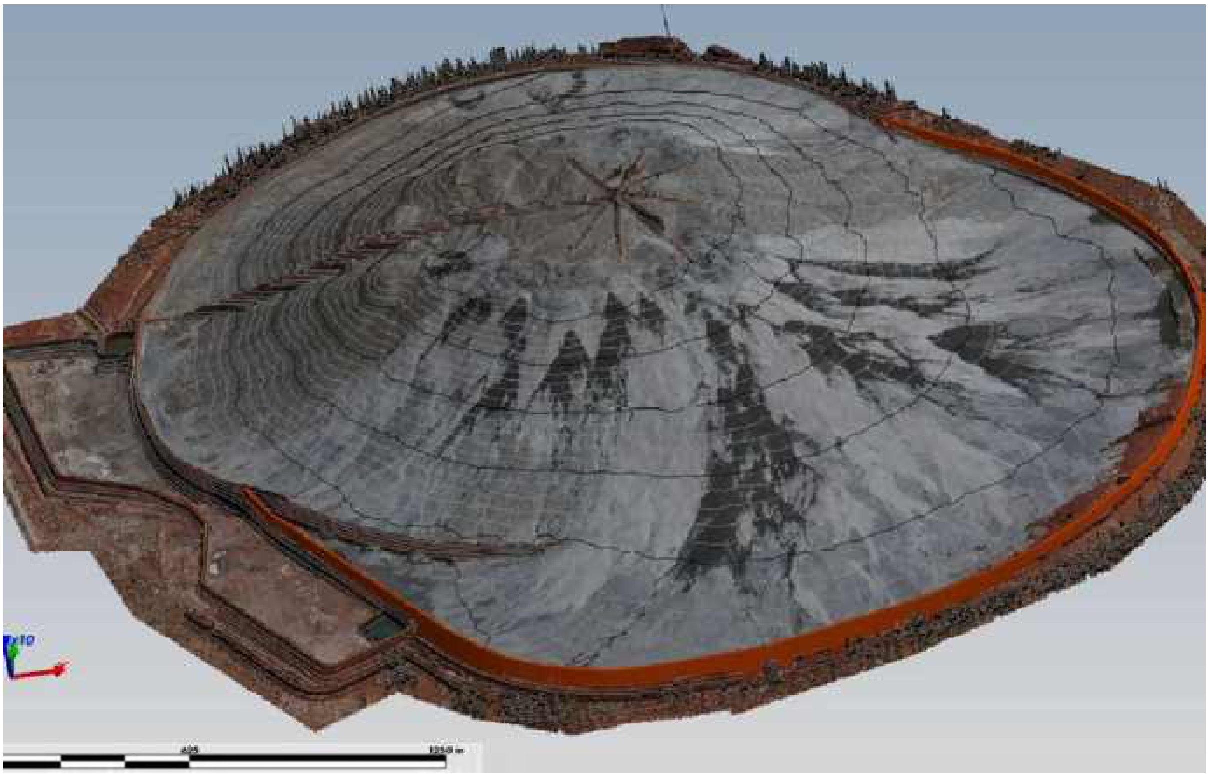
AngloGold Ashanti Australia

Sunrise Dam Gold Mine – Central Thickened Deposition Tailings Storage Facility

Stage 12 Raise Design Report

April 2025



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Sunrise Dam Gold Mine – Central Thickened Deposition Tailings Storage Facility Stage 12 Raise Design Report

AngloGold Ashanti Australia

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WSP acknowledges that every project we work on takes place on First Peoples lands.
We recognise Aboriginal and Torres Strait Islander Peoples as the first scientists and engineers and pay our respects to Elders past and present.

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April 2025

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Abbreviations

AEP	Annual Exceedance Probability
AGAA	AngloGold Ashanti Australia
ANCOLD	Australian National Committee on Large Dams
ARI	Average Recurrence Interval
ARR	Australian Rainfall & Runoff
BGL	Below Ground Level
BOM	Bureau of Meteorology
CDA	Canadian Dam Association
CL	Continuing Loss
CQA	Construction Quality Assurance
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CTD TSF	Central Thickened Discharge Tailings Storage Facility
DEM	Digital Elevation Model
DEMIRS	Department of Energy, Mines, Industry Regulation and Safety (WA) [formerly Department of Mines and Petroleum (DMP)]
DWER	Department of Water and Environmental Regulation
EGM	Engineering Geological Model
EoC	End of Construction
EoR	Engineer of Record
EPA	Environmental Protection Authority (WA)
FoS	Factor of Safety
GISTM	Global Industry Standard on Tailings Management
IFD	Intensity-Duration-Frequency
IL	Initial Loss
ITRB	Independent Technical Review Board
LiDAR	Light Detection and Ranging
LOD	Life of Design
MB	Monitoring Bore
MCE	Maximum Credible Earthquake
NAF	Non-Acid Forming

NATA	National Association of Testing Authorities
PAR	Population at Risk
PGA	Peak Ground Acceleration
PLL	Potential Loss of Life
RCP	Representative Concentration Pathway
RL	Reduced Level
RTFE	Responsible Tailings Facility Engineer
SDGM	Sunrise Dam Gold Mine
SSP	Stormwater Storage Pond
Su	Undrained Shear Strength
SWMP	Surface Water Management Plan
TSF	Tailings Storage Facility

1 Introduction

1.1 Scope

AngloGold Ashanti Australia (AGAA) has engaged WSP Ltd (WSP) as Engineer of Record (EoR) for the tailings storage facilities (TSF) at its Sunrise Dam Gold Mine (SDGM) operations, under the contract reference: SD-P-21-044 (executed: 10 April 2024).

As part of the Life of Mine development of the CTD TSF, Stage 12 construction, involving a downstream raise of the south eastern half of the perimeter embankment is proposed to commence in Q4 2025. Stage 12 represents the LoM construction outlined in the Stage 10 CTD TSF Expansion Design Update completed by ATC Williams (2018a). AGAA has engaged WSP to develop a detailed design and tender package for the Stage 12 works.

1.2 Project background

SDGM is located 50 km south of Laverton, adjacent to Lake Carey as shown in Figure 1.1.

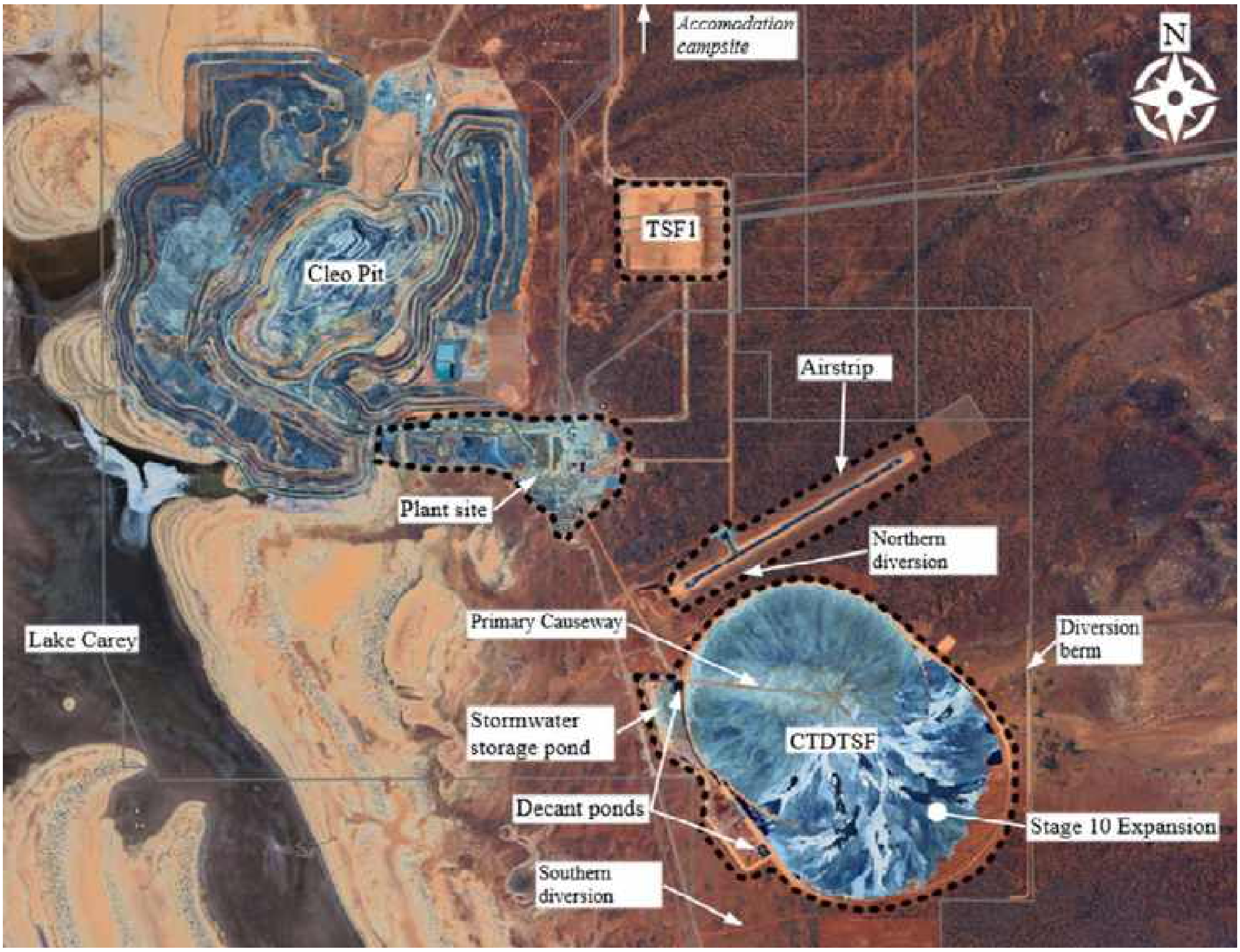


Figure 1.1 SDGM site layout

The CTD TSF is the primary location for tailings storage at SDGM and was commissioned in December 1999. Since the original construction in 1999 (Stage 1), the CTD TSF capacity has been increased and the geometry and deposition methodology modified in stages.

A summary of the CTD TSF construction history is as follows:

- 1999 – Stage 1 initial CTD embankment constructed.
- 2001 – Stage 2 included extension of the crescent shaped perimeter starter embankment to form a circular perimeter embankment.
- 2003 – Stage 3 comprised a 1.3 m downstream raise of the western perimeter embankment to 403.7 m RL, an extension of the deposition causeway by 240 m and an increase in height of 3.2 m (to a maximum crest elevation of 418.4 m RL).
- 2005 – Stage 4 comprised a lateral expansion of the facility by up to 160 m on its eastern flank and a combined upstream and downstream raise of the remainder of the perimeter embankment by approximately 4.7 m (to a maximum crest elevation of 408.4 m RL) to provide additional capacity and raising of the causeway by 2.2 m to 420.6 m RL. The stormwater storage pond capacity was also increase by raising the stormwater storage pond (SSP) embankments by 0.2 m.to RL 403.9 m.
- 2008 – Stage 5 comprised a combination of downstream and centreline raising of part of the perimeter embankment by up to 3.0 m (to a maximum crest elevation of 410.9 m RL) and raising of the discharge causeway by approximately 3.0 m to 423.45 m RL
- 2009 – Stage 6 comprised a centreline raise of the discharge causeway by approximately 3.0 m to 426.6 m RL.
- 2010 – Stage 7 comprised a centreline raise of the discharge causeway by approximately 4.0 m to 430.5 m RL (completed in November 2010).
- 2012 – Stage 8 comprised a 5.0 m raise of the causeway up to 435 m RL, including a 20 m extension and 20 m offset off the upper half of the causeway to the south-east (completed in December 2012).
- 2013–2015 – Stage 9, comprised a partial hybrid raise (downstream raise south of the causeway and upstream raise north of the causeway) of the perimeter embankment by an average of 1.6 m. The original lined decant pond within the SSP area was replaced with a larger pond. Approximately 100,000 m^3 of material was excavated from the base of the SSP to provide additional water storage capacity and waste rock erosion protection was placed against the upstream face of the SSP embankment.
- 2016 – Based on survey comparisons, there was a survey datum correction between January and November 2016, resulting in an apparent increase in surveyed ground surface elevation of approximately 1.2 m.
- 2017–2018 – Stage 10, comprised the perimeter expansion of the CTD TSF to the south-east which included an extension of the SSP.
- 2017–2018 – Stage 11 was an upstream raise of the existing perimeter embankment (pre-stage 10 expansion) up to 414.7 m RL.
- 2023 – Stage 10A, comprised a 2.0 m high downstream raise of an approximately 400 m stretch of the external perimeter embankment aimed at maintaining adequate freeboard along the northern sector of the expansion perimeter embankment.

1.3 Facility layout

The CTD TSF has a perimeter embankment with a maximum height of approximately 8.5 m and length of approximately 9.0 km. The maximum height of the tailings beach is approximately 30 m above original ground level at the centre of the facility, from where deposition takes place, forming a concave conical tailings beach sloping to the facility perimeter.

The tailings storage area is approximately 480 ha, and the SSP water storage area is approximately 35 ha.

The facility catchment area (within and including the perimeter embankment crests) is approximately 530 ha. The facility footprint extends approximately 2 km in the southwest to northeast direction and 3 km in the northwest to southeast direction.

The SSP is located downstream of the western perimeter of the TSF and has a water storage footprint area of approximately 35 ha. Two internal spillways are located on the embankment between the tailings storage area and the SSP and an emergency overflow spillway is located on the north western section of the SSP embankment.

The current tailings storage area and SSP layout is shown on Figure 1.2, including designated tailings deposition sectors (1–9) and causeway fingers (F1–F8).

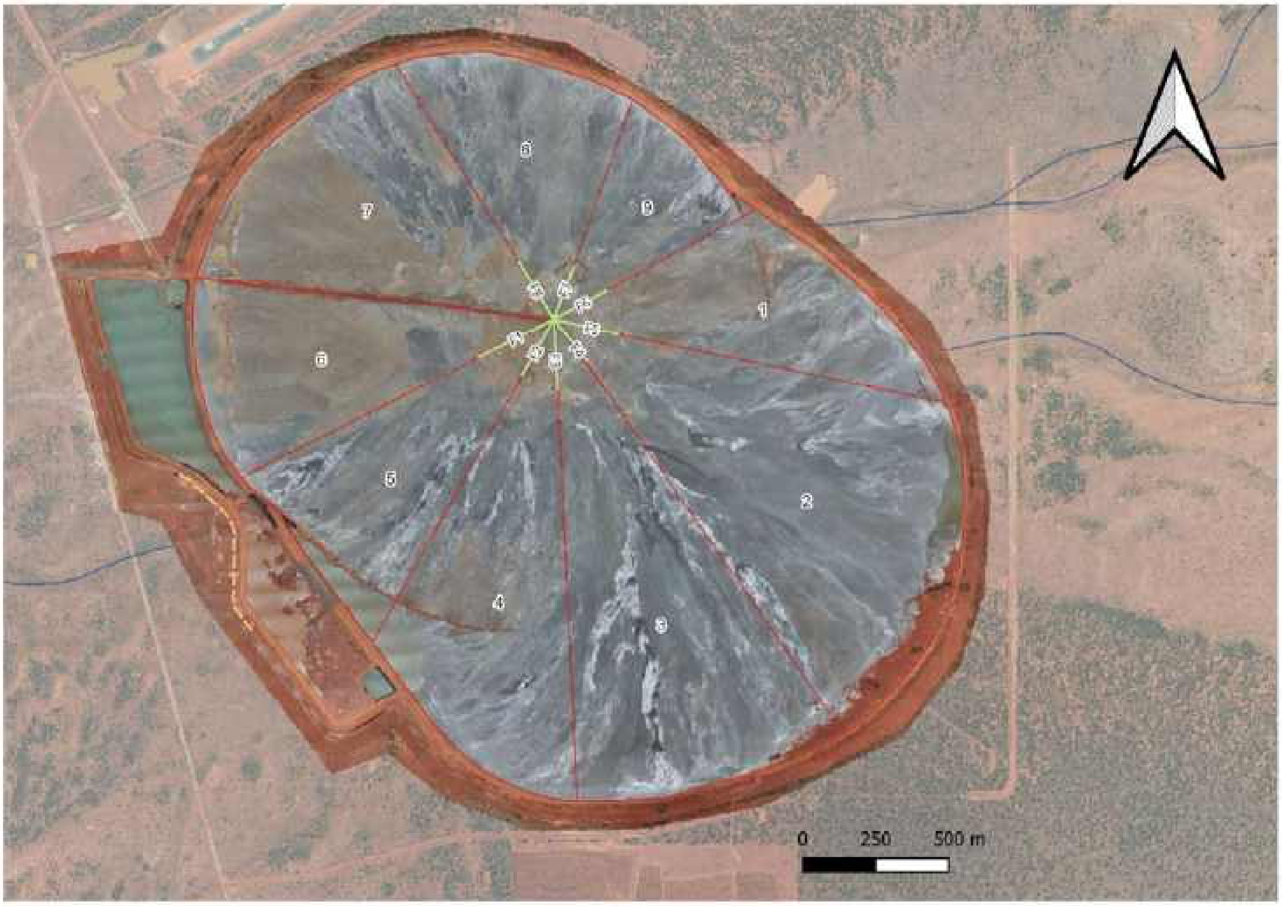


Figure 1.2 CTD TSF tailings deposition system (January 2025)

2 Facility classification

2.1 General

The Stage 12 embankment raise has been designed in alignment with the requirements of the Western Australian Department of Energy, Mines, Industry Regulation and Safety (DEMIRS), the Western Australian Department of Water and Environmental Regulation (DWER), the Australian National Committee on Large Dams (ANCOLD), and the Global Industry Standard on Tailings Management (GISTM).

A risk-based facility classification is used to define design criteria such as seismic loading for embankment stability and design rainfall events for evaluation of required stormwater storage capacity, freeboard, and spillway design. The classification is determined by factors including the population at risk (PAR) and the severity level of the potential consequences associated with a catastrophic dam failure (irrespective of the likelihood of such a failure occurring).

Assessment of severity level accounts for potential damages and losses to the community, environment, and operations in the event of an uncontrolled release of tailings or water. These criteria ensure a robust design to mitigate risks effectively.

2.2 DEMIRS TSF category

A hazard rating is assigned to a TSF, taking into account the size of a facility (height) to determine the facility classification, as outlined in the DEMIRS Code of Practice (DMP, 2013). The classification serves as a framework for establishing the required level of technical input and assessments for the design, operation and closure of a TSF.

The hazard rating is determined by assessing the potential impacts of an uncontrolled release of tailings or water, including:

- Personal injury, loss of life or adverse human health due to direct physical impact and/or contamination (i.e., chemical or radiation denigration of water, soil, air, etc.).
- Safety risks to nearby community infrastructure and/or mining developments.
- Environmental impacts.
- Economic impacts, including the operational consequences of temporarily losing the TSF.

The hazard rating for the CTD TSF has been established based on the criteria listed in Table 2.1 and

- Table 2.2.

Table 2.1 DEMIRS hazard rating for the Stage 12 embankment raise of the CTD TSF

Type of impact or damage	Hazard rating		
	High	**Medium**	**Low**
	Extent or severity of impact or damage		
Loss of human life or personal injury	Loss of life or injury is possible	Loss of life or injury is possible although not expected	No potential for loss of life or injury
Adverse human health due to direct physical impact or contamination of the environment (e.g., chemical or radiation denigration of water, soil, air)	Long-term human exposure is possible, and permanent or prolonged adverse health effects are expected	The potential for human exposure is limited, and temporary adverse health effects are possible	No potential for human exposure
Loss of assets due to direct physical impact or contamination of the environment (e.g., chemical or radioactive pollution of water, soil or air)	Loss of numerous livestock is possible	Loss of some livestock is possible	Limited or no potential for loss of livestock
	Permanent loss of assets (e.g., commercial, industrial, agricultural and pastoral assets, public utilities and infrastructure, mine infrastructure) is possible and no economic repairs can be made	Temporary loss of assets is possible, and economic repairs can be made	Limited or no potential for destruction or loss of assets
	Loss of TSF storage capacity is possible and repair is not practicable	Loss of TSF storage capacity is possible and repair is practicable	Insignificant loss of TSF storage capacity is possible
Damage to items of environmental, heritage or historical value due to direct physical impact or contamination of the environment (e.g., chemical or radioactive pollution of water, soil or air)	Permanent or prolonged damage to the natural environment (including soil, and surface and ground water resources) is possible	Temporary damage to the natural environment is possible	Limited or no potential for damage to the natural environment
	Permanent or prolonged adverse effects on flora and fauna are possible	Temporary adverse effects on flora and fauna are possible	Limited or no potential for adverse effects on flora and fauna
	Permanent damage or loss of items of heritage or historical value is possible	Temporary damage of items of heritage or historical value is possible	Limited or no potential for damage of items of heritage or historical value

Table 2.2 DEMIRS TSF consequence category for the Stage 12 embankment raise of the CTD TSF

Type of impact or damage	Hazard rating		
	High	**Medium**	**Low**
> 15 m	Category 1	Category 1	Category 1
5–15 m	Category 1	Category 2	Category 2
< 5 m	Category 1	Category 2	Category 3

The SDGM CTD TSF complex has been assigned a hazard rating of ''**Medium**' and is classified as a Category 1 facility given the maximum height of the CTD TSF is above 15 m. This classification remains unchanged from that assigned to the Stage 10 facility and described in the facility Design Basis report (WSP, 2023a).

2.3 ANCOLD Consequence categories

The potential damages and losses from dam failure are evaluated based on the anticipated severity level of impact and the predicted population at risk (PAR), which together determine the dam failure consequence category (ANCOLD, 2019). This methodology is also applied to derive an environmental spill consequence category for the scenario where only water is released to the environment.

The severity level impact assessment considers total infrastructure costs, impacts on the dam owner's business, health and social impacts, and environmental effects. Based on this assessment, a "Medium" severity level was assigned to the CTD TSF, as detailed in Table 2.3.

Table 2.3 Severity level impact assessment (ANCOLD)

Damage type	Minor	Medium	Major	Catastrophic
Infrastructure (dam, houses, commerce, farms, community)	<$10M	$10M – $100M	$100M – $1B	>$1B
Business importance	Some restrictions	Significant impacts	Severe to crippling	Business dissolution, bankruptcy
Public health	<100 people affected	100–1000 people affected	<1 000 people are affected for more than 1 month	>10 000 people affected for over 1 year
Social dislocation	<100 person or <20 business months	100–1000 person months or 20–2000 business months	>1 000 person months or >200 business months	
Impact area	<1 km^2	<5 km^2	<20 km^2	>20 km^2
Impact duration	<1 (wet) year	<5 years	<20 years	>20 years

Damage type	Minor	Medium	Major	Catastrophic
Impact on natural environment	Damage limited to items of low conservation value. (e.g., degraded or cleared land, ephemeral streams, non-endangered flora and fauna). Remediation possible.	Significant effects on rural land and local flora and fauna. Limited effects on: a Item(s) of local and state natural heritage b Native flora and fauna within forestry, aquatic and conservation reserves or recognised habitat corridors, wetlands or fish breeding areas.	Extensive rural effects. Significant effects on river system and areas (a) and (b) Limited effects on: a Item(s) of National or World natural heritage. b Native flora and fauna within national parks, recognised wilderness areas, Ramsar wetlands and nationally protected aquatic reserves. Remediation difficult.	Extensive effects on areas (a) and (b). Significant effects on areas (c) and (d) Remediation involves significantly altered ecosystems.

The ANCOLD Guidelines define PAR as "all those who would be directly exposed to tailings or water release, assuming they took no action to evacuate". This includes individuals in dwellings and workplaces, as well as itinerants traveling through the dam breach-affected zone. The PAR may vary depending on temporal-spatial probability, which reflects the likelihood of buildings being occupied or itinerant travellers being in the hazard zone at the time of failure.

A dam break assessment was undertaken for the CTD TSF in 2018 (ATC Williams, 2018) which considered the Stage 10 and Stage 11 CTD TSF geometry to assess PAR and severity level impacts associated with uncontrolled tailings and water release. For the CTD TSF, a PAR in the range of 1–10 was adopted due to its proximity to the administration buildings, the plant site, and active personnel conducting daily inspections of the facility. The Stage 12 embankment raise does not significantly alter the facility geometry or PAR estimate.

As shown in Table 2.4, adoption of a PAR of 1-10 results in a **"Significant"** dam failure consequence category. This classification remains unchanged from that assigned to the Stage 10/11 facility and described in the Design Basis Report (WSP, 2023a).

Table 2.4 Dam failure consequence category (PAR based)

Population at Risk (PAR)	Severity of damages and losses			
	Minor	Medium	Major	Catastrophic
<1	Very low	Low	Significant	High C
≥1 to <10	Significant (Note 2)	Significant (Note 2)	High C	High B
≥10 to <100	High C	High C	High B	High A
≥100 to <1 000	(Note 1)	High B	High A	Extreme
≥1 000		(Note 1)	Extreme	Extreme

Notes:

(1) With a PAR in excess of 100, it is unlikely Damage will be minor. Similarly with a PAR in excess of 1000 it is unlikely Damage will be classified as Medium.

(2) Change to 'High C' where there is potential of one or more lives being lost. The potential for loss of life is determined by the characteristics of the flood area, particularly the depth and velocity of flow.

This classification is also consistent with that derived on the basis of potential loss of life (PLL) assessment in accordance with (ANCOLD, 2012), as illustrated in Table 2.5. A PLL of 0.3 was estimated for the CTD TSF (ATC Williams, 2018).

Table 2.5 Dam failure consequence category (PLL based)

Incremental Potential Loss of Life (PLL)	**Severity of Damages and Losses**			
	Minor	**Medium**	**Major**	**Catastrophic**
<0.1	Very Low	Low	Significant	High C
≥0.1 to <1	Significant	Significant	High C	High B
≥1 to <5	Note 1	High C	High B	High A
≥5 to <50		High A	High A	Extreme
≥50		Note 1	Extreme	Extreme

Notes:

(1) With an incremental PLL equal to or greater than one, it is unlikely damage will be minor. Similarly with an incremental PLL in excess of 50 it is unlikely damage will be classified as medium.

An environmental spill would involve release of accumulated run-off stormwater from the SSP. A lesser spill event could involve localised overtopping of the CTD perimeter embankment by decant water (which has low toxicity potential but is saline). As such events could potentially impact vegetation at the edge of Lake Carey, an environmental spill consequence category of "**Significant**" is considered appropriate. The SSP embankments have been designed on this basis, to store stormwater arising from a 1:100-year, 72-hour storm.

2.4 GISTM Consequence classification

The Global Industry Standard on Tailings Management (GISTM) defines a single consequence classification based on the estimated Population at Risk (PAR) or Potential Loss of Life (PLL) and the severity of incremental loss and damage (Global Tailings Review, 2020). Given the likely incremental economic loss is estimated between $10 million and $100 million (excluding operating losses and dam repair costs as considered under ANCOLD), the consequence classification for the CTD TSF is assessed as **"High"**, as summarised in Table 2.6.

Table 2.6 GISTM Consequence classification matrix

Dam Failure Consequence Classification	Incremental Losses				
	Potential Population at Risk	Potential Loss of Life	Environmental	Health, Social, and Cultural	Infrastructure and Economics
Low	None	None Expected	Minimal short-term loss or deterioration of habitat or rare and endangered species	Minimal effects and disruption of business and livelihoods. No measurable effect on human health. No disruption of heritage, recreation, community, or cultural assets.	Low economic losses: area contains limited infrastructure or services. <US$1M
Significant	1–10	Unspecified	No significant loss or deterioration of habitat. Potential contamination of livestock/fauna water supply with no health effects. Process water low potential toxicity. Tailings not potentially acid generating and have low neutral leaching potential. Restoration possible within1 to 5 years.	Significant disruption of business, service, or social dislocation. Low likelihood of loss of regional heritage, recreation, community, or cultural assets. Low likelihood of health effects.	Losses to recreational facilities, seasonal workplaces, and infrequently used transportation routes. <$US10M.
High	10–100	Possible (1-10)	Significant loss or deterioration of critical habitat or rare and endangered species. Potential contamination of livestock/fauna water supply with no health effects. Process water moderately toxic. Low potential tor acid rock drainage or metal leaching effects of released tailings. Potential area of impact 10–20 km^2. Restoration possible but difficult and could take > 5 years.	500–1,000 people affected by disruption of business, services, or social dislocation. Disruption of regional heritage, recreation, community, or cultural assets. Potential for short term human health effects.	High economic losses affecting infrastructure, public transportation and commercial facilities, or employment. Moderate relocation/compensation to communities <US$100M.

Dam Failure Consequence Classification	Incremental Losses				
	Potential Population at Risk	Potential Loss of Life	Environmental	Health, Social, and Cultural	Infrastructure and Economics
Very High	100–1000	Likely (10—100)	Major loss or deterioration of critical habitat or rare and endangered species. Process water highly toxic. High potential for acid rock drainage or metal leaching effects from released tailings. Potential area of impact > 20 km^2. Restoration or compensation possible but very difficult and requires a long time (5 years to 20 years)	1,000 people affected by disruption of business, services or social dislocation tor more than one year. Significant loss of national heritage, community, or cultural assets. Potential for significant long-term human health effects.	Very high economic losses affecting important infrastructure or services (e.g., highway, industrial facility, storage facilities, for dangerous substances), or employment. High relocation / compensation to communities <US$1B.
Extreme	>1000	Many (>100)	Catastrophic loss of critical habitat or rare and endangered species. Process water highly toxic. Very high potential for acid rock drainage or metal leaching effects from released tailings. Potential area of impact > 20 km^2. Restoration or compensation impossible or requires a very long time (>20 years).	5,000 people affected by disruption of business, services, or social dislocation for years. Significant National heritage or community facilities or cultural assets destroyed. Potential to severe and/or long-term human health effects.	Extreme economic losses affecting critical infrastructure or services (e.g., hospital, major industrial complex, major storage facilities for dangerous substances) or employment. Very high relocation/compensation to communities and very high social readjustment costs >US$1B

3 Site characteristics

The SDGM site characteristics as described in the TSF Design Basis Report (WSP, 2023a) are summarised in this section of the report.

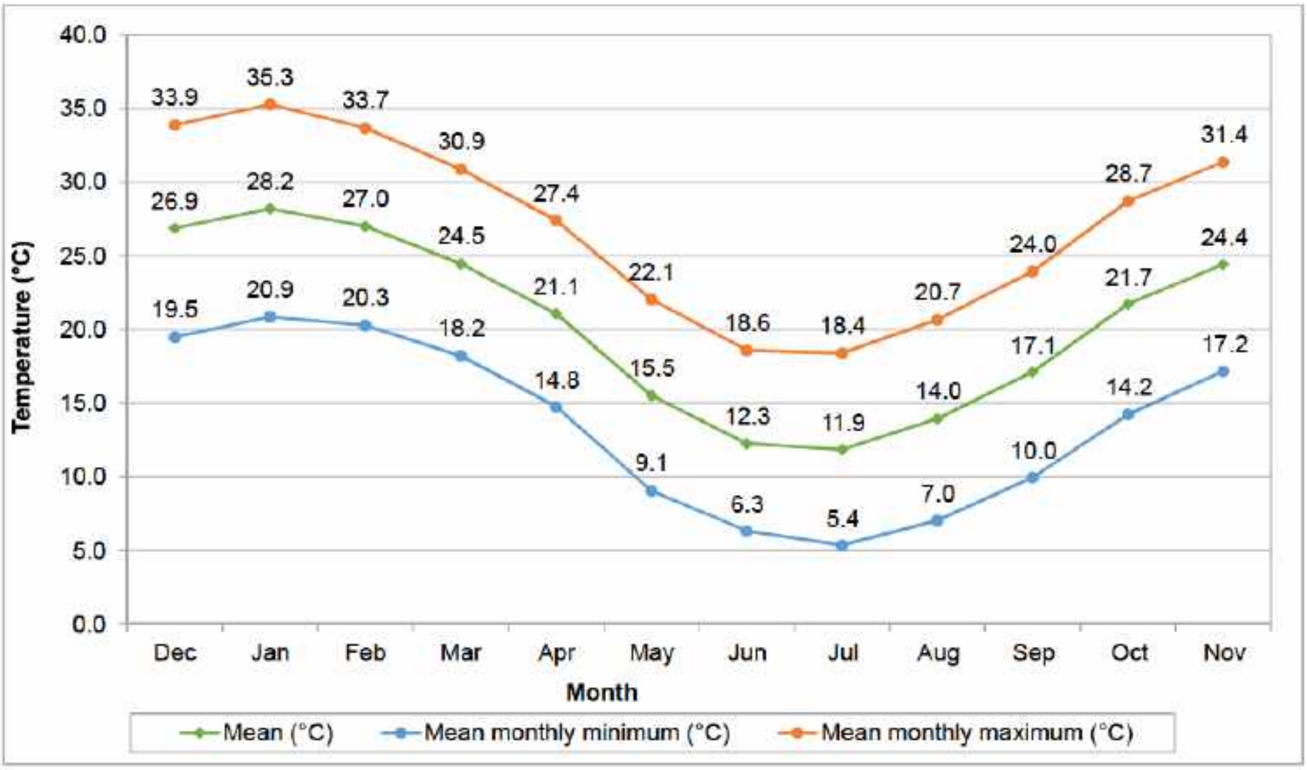
3.1 Climate

Detailed evaluation of the climate parameters is outlined in the Sunrise Dam Gold Mine Climatic Conditions and Design Parameters report (WSP, 2023c).

The site is located in the Rangelands cluster of Australia's natural resource management regions defined by Commonwealth Scientific and Industrial Research Organisation (CSIRO) and Bureau of Meteorology (BoM) (2015) and experiences very hot summers and mild winters, with generally low but highly variable rainfall. A summary is provided in the following sub-sections.

3.1.1 Temperature

Based on SDGM site climate station data, which is available from 2005 to 2022, the mean temperature ranges from 28.2°C in January to 11.9°C in July. The range of monthly temperatures is provided in Figure 3.1.



(blue: minimum; orange: mean; and green: maximum)

Figure 3.1 SDGM climate station monthly mean temperatures

3.1.2 Rainfall

Rainfall is seasonal and overall highest depths occur between December and April, while September and October are the driest months. Analysis of daily rainfall data from the SDGM weather stations between May 2005 and October 2022 and surrounding meteorological stations (Laverton, Minara, and Yundamindra) indicates that rain events are infrequent and typically have low rainfall totals. Average annual accumulated rainfall ranges from 215 mm/year to 240 mm/year for all climate data sources assessed.

Minimum annual rainfall recorded at the SDGM site between 2005 and 2023 was 89 mm (Dec 2022 to Nov 2023). Maximum rainfall recorded at the SDGM site between 2005 and 2023 was 443 mm (Dec 2016 to Nov 2017). Rainfall between December 2023 and November 2024 was 553 mm.

The largest recorded daily rainfall events (111 mm – 129 mm) occurred on 21 February 2011, 25 January 2024, and 9 March 2024 (Figure 3.2).

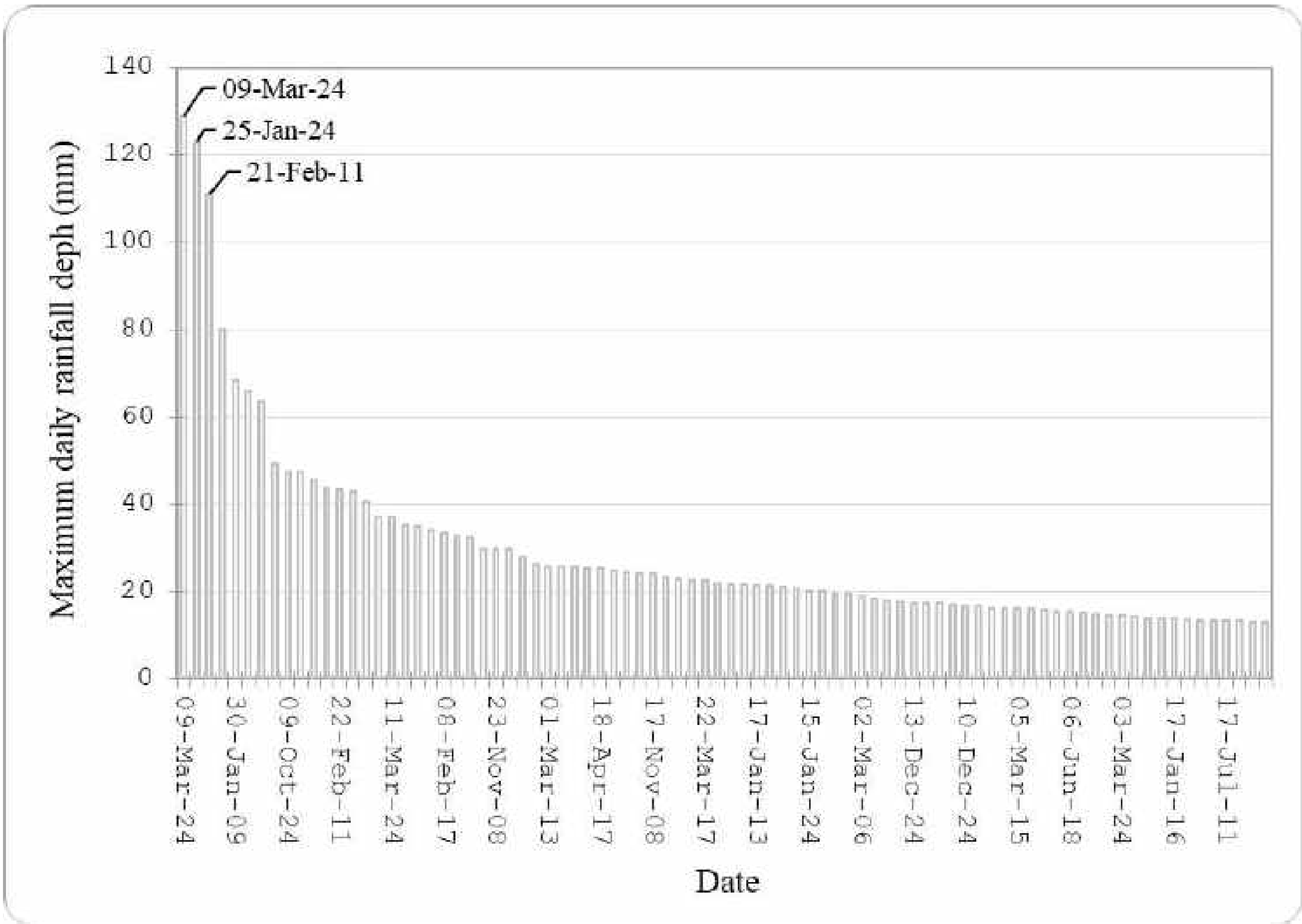


Figure 3.2 SDGM maximum daily rainfall depths

The baseline Intensity Frequency Duration (IFD) curves for the site are illustrated on Figure 3.3. IFD curves for projected climate change to period 2030 are illustrated on Figure 3.4 (WSP, 2023c).

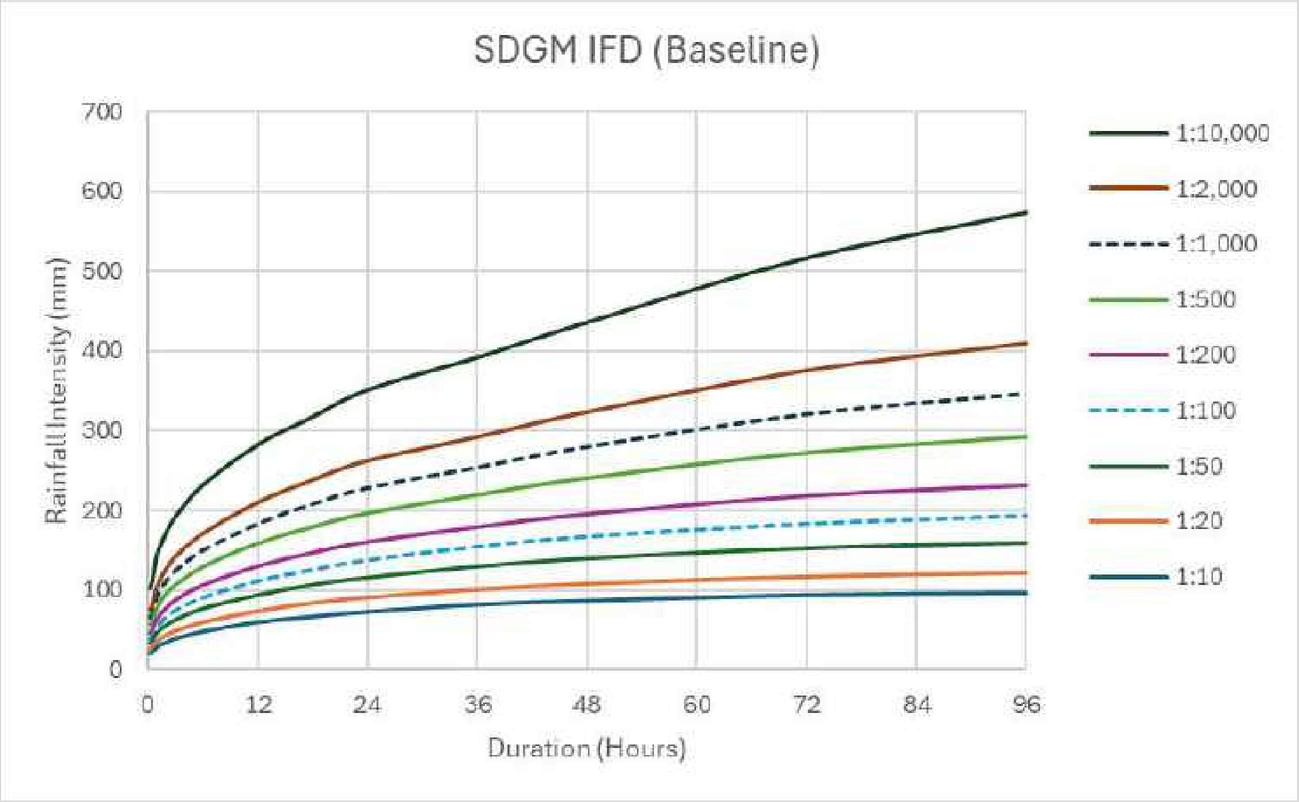


Figure 3.3 IFD curves for SDGM project area (baseline)

Figure 3.4 IFD curves for SDGM project area (period 2030 projection)

3.1.3 Evaporation

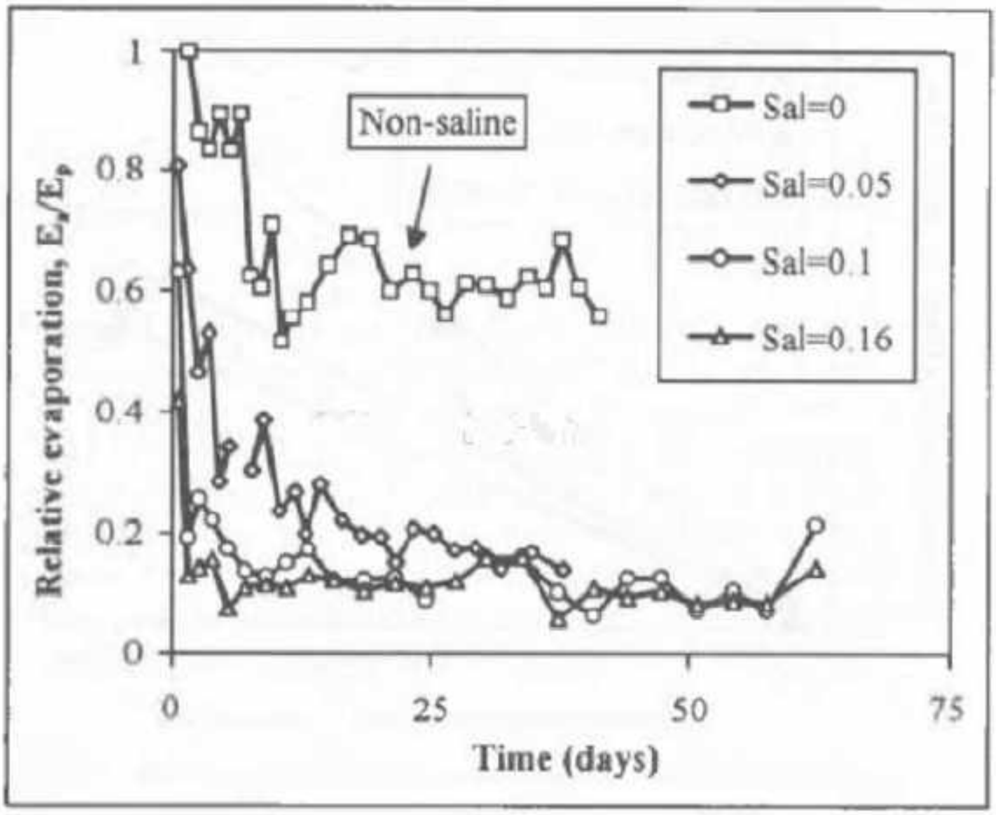
Table 3.1 displays the monthly Class A[1] pan evaporation in the site vicinity, sourced from SILO (QLD Govt, 2024) for the period between 1970 and 2022. Pan evaporation is seasonal, and highest evaporation occurs between October to March. The median pan evaporation fluctuates between 110 mm/month during winter and 360 mm/month during summer. Annual accumulated pan evaporation is approximately 2,780 mm, which exceeds the annual median rainfall keeping the landscape typically arid.

Table 3.1 Monthly mean pan evaporation depths

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Monthly mean (mm)	388.1	307.3	276.0	188.0	126.3	90.9	98.9	135.0	196.3	276.3	321.2	377.4	2,728

Adjustment to pan evaporation values is required when considering evaporation from open saline water bodies or wet surfaces with high salinity (such as Lake Carey or the CTD TSF).

Newson et al (1997) conducted field studies on several tailings facilities in the Goldfields region in 1996, highlighting the effects of salinity on evaporation rates from decant ponds and wet tailings beaches. Actual evaporation was observed to be significantly less than inferred potential evaporation (taken as pan evaporation) for highly saline tailings deposits and furthermore, reduced rapidly as water was removed from the beach surface and salt crusting commenced (Figure 3.5).



(Newson, Fujiyasu, & Fahey, 1997)

Figure 3.5 Evaporation from tailings surfaces with different initial salinities

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[1] Class A pan is defined as a cylindrical container fabricated of galvanised iron or other rust-resistant metal with a depth of 25.4 cm and a diameter of 121.9 cm (in accordance with the requirements of the U.S. Weather Bureau).

A significant portion of the process water at SDGM is saline (average salinity of decant water in 2024 was 0.06 and maximum was 0.11); consequently, initial relative evaporation of the order of 0.8 to 0.4 reducing rapidly over time on the TSF beach may be inferred.

3.1.4 Wind

Figure 3.6 presents the annual vector average wind speed and direction sourced from the SDGM climate station from 2005 to 2022. The overall vector average wind speed is generally less than 5 m/s (18 km/hour). Monthly vector average speed has a lowest average value of 2.4 m/s from April to September and a higher average value of 3.2 m/s from September to March.

Wind direction is predominantly from east to west (approximately 26% of the time). At least 50% of the time from November to April, the wind direction is from east or southeast. From May to October, the wind direction is more evenly distributed, and wind direction has been registered mainly from west and northwest from July to September.

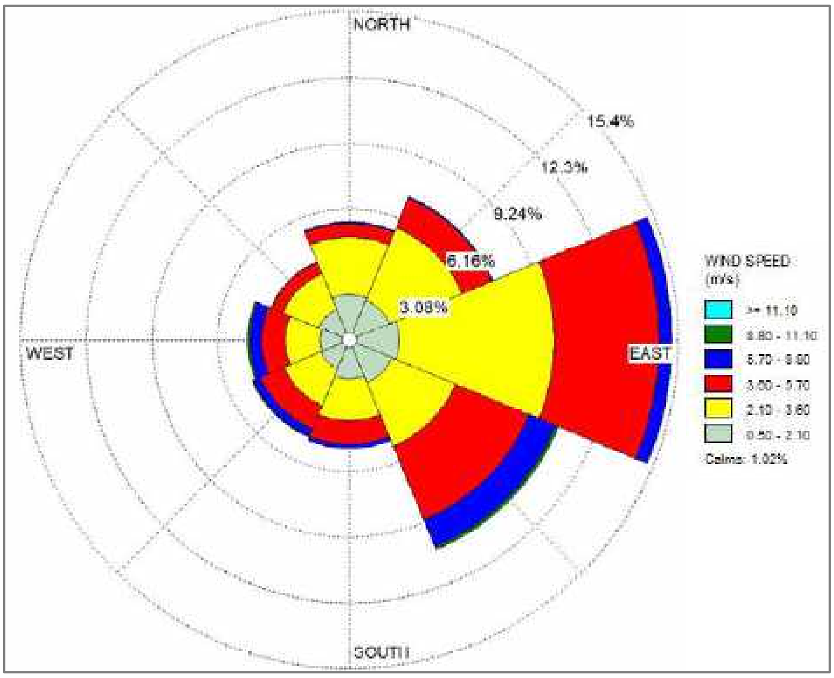


Figure 3.6 Annual vector average wind speed and direction

3.2 Hydrology

3.2.1 Regional hydrology

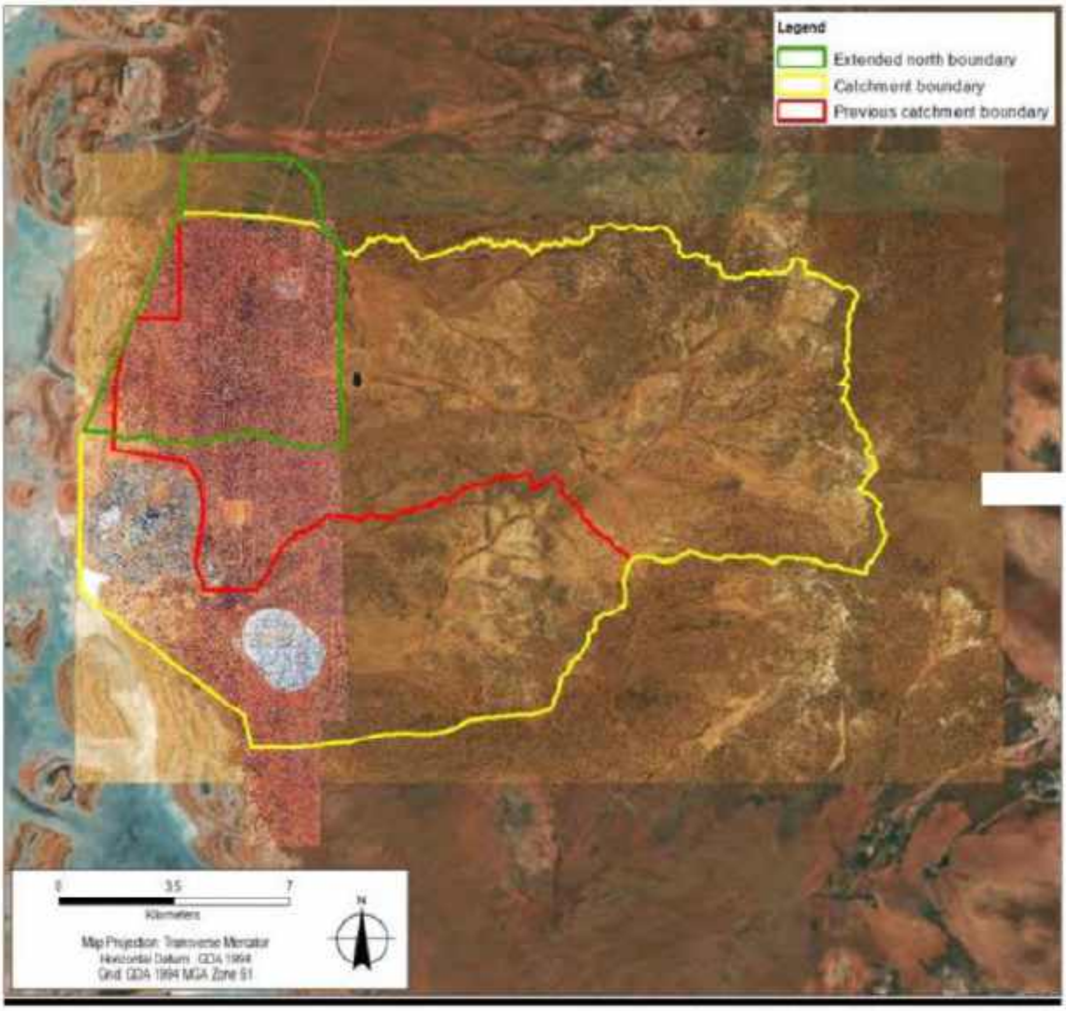
SDGM is located within the Lake Carey catchment which has an area of approximately 113,900 km^2. This catchment forms part of the broader Salt Lake Basin (total catchment area 441,000 km^2), which in turn forms the western part of the Southwestern Plateau basin (1.44 Mm^2). The drainage system of the Salt Lake basin comprises three large and broad, sub-parallel, southeast trending drainage systems referred to as salt-lake drainage systems, palaeoriver or palaeodrainages. These palaeodrainage systems have very low gradients and, at intervals, contain small to very large playa lakes, such as Lake Carey (with an area of approximately 1,000 km^2). During occasional intense rainfall events the lakes may fill, and in very rare events some may overflow, link-up, and discharge on to the Nullarbor Plain through Ponton Creek (Carrick Consulting, 2012).

No streamflow data is available for the Lake Carey catchment. Peak flow estimates for on-site catchments have therefore, not been scaled or benchmarked with those from similar off-site catchments.

Any creeks and drainages located within the SDGM operational area are ephemeral in nature. However, flows will occur episodically during the summer months, when the potential exposure to high intensity cyclonic or tropical depression related rainfall, and potential localised flooding, is greatest.

3.2.2 *Local hydrology*

The SDGM catchment area comprises several sub-catchments to the east of the mining lease, based on a combination of natural topography, engineered drainage measures and identified outlets to Lake Carey (AngloGold Ashanti Australia, 2022). The overall SDGM upstream catchment extends approximately 24 km to the east of Lake Carey and is illustrated on Figure 3.7. The CTD TSF is within a sub-catchment area of 43.5 km² (Carrick Consulting, 2013).



(GHD, 2024a)

Figure 3.7 SDGM catchments

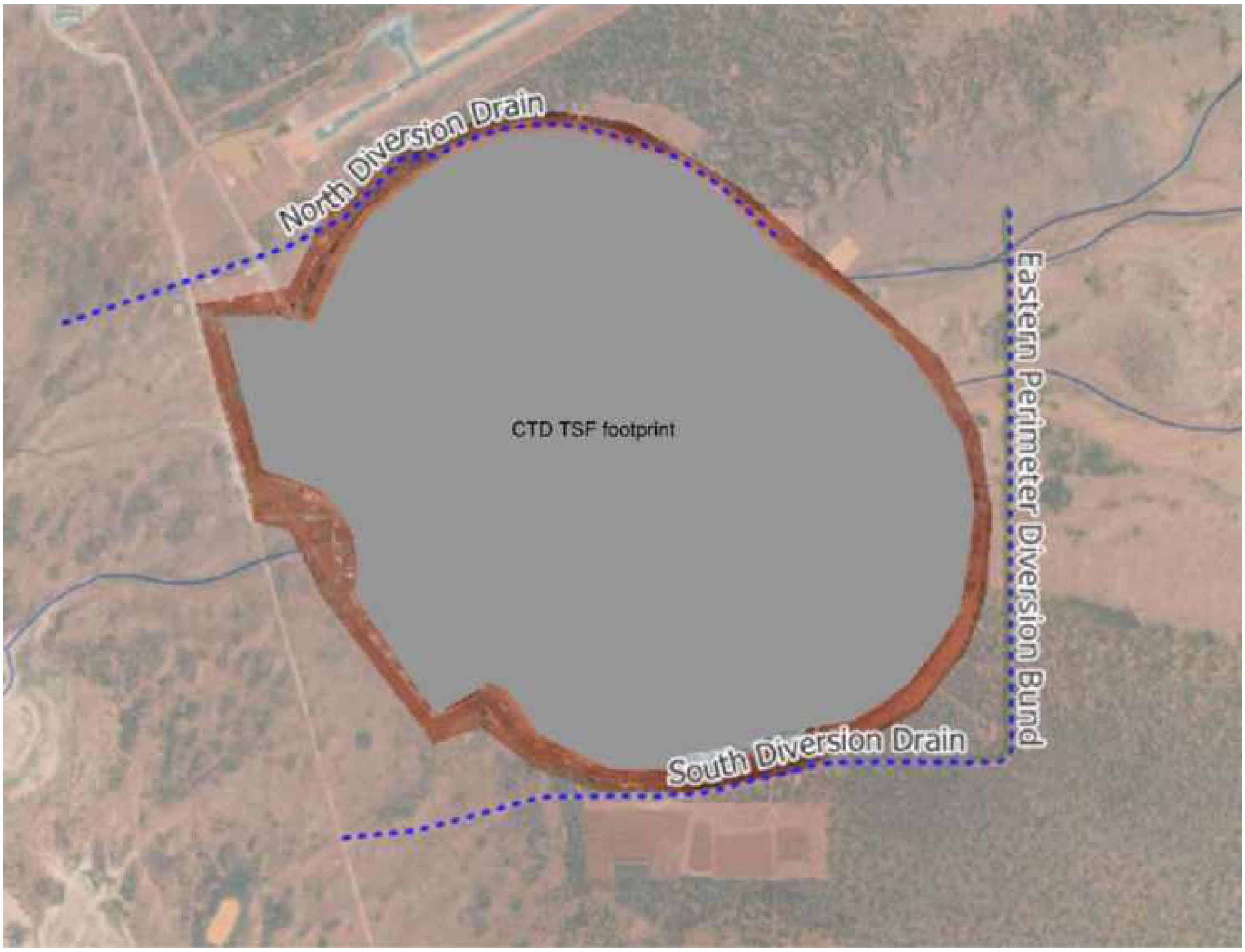
Diversion channels have been constructed around the CTD TSF and designed for a 1% annual exceedance probability (AEP) event with a peak flow estimate of 55.0 m^3/s (Carrick Consulting, 2018).

Run off from the northeastern side of the CTD TSF is collected by the northern perimeter diversion drain, reports to culverts located at the CTD facility gate and flows via a shallow drain extended westwards to discharge overland into Lake Carey.

Run off from the southeastern side of the CTD TSF intercepted by perimeter diversion bund, diverted westwards via a shallow drainage channel to a floodway across the Bindah road and onward, overland towards Lake Carey.

The flood diversion bund is approximately 1,650 m long and was constructed to a height of 2.0 m with a minimum base width of 10.0 m.

The external drainage arrangement is illustrated on Figure 3.8.

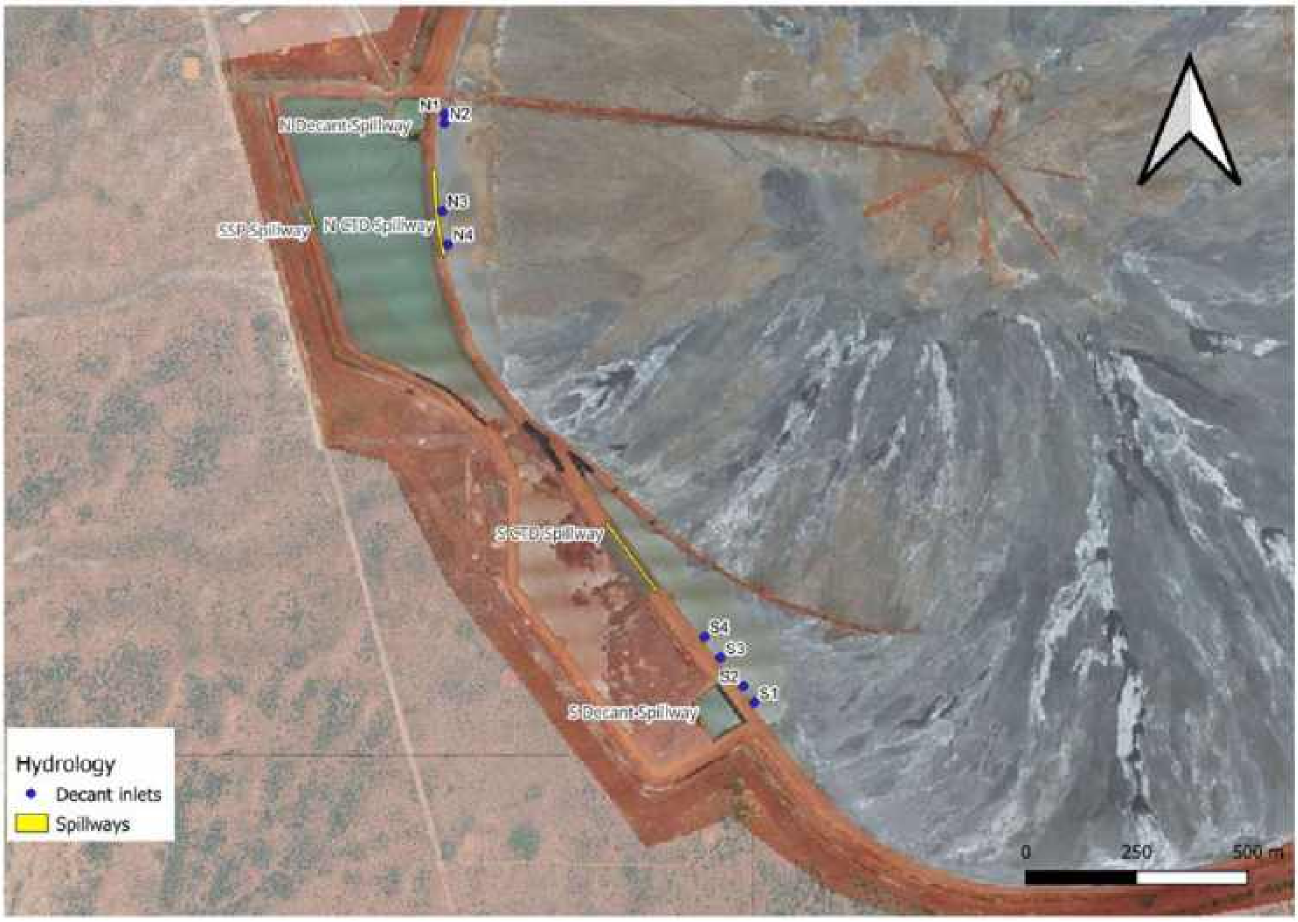


(Jan 2025 Beach)

Figure 3.8 CTD TSF external surface water management features

Flood studies completed in 2023 to update the SDGM surface water management plan (GHD, 2024a) indicate existing flood mitigation measures at the CTD TSF are generally able to protect the facility against flooding from the eastern catchment area. However, it was noted that the bund could be extended further to the north (by approximately 150 m) to mitigate against bypass flow modelled during 1:100 AEP flood events (GHD, 2024b).

The CTD TSF internal surface water management system comprises a series of gravity decant inlet sumps which drain water into the lined decant ponds and SSP via HDPE pipelines beneath the tailings area perimeter embankment, two spillways into the SSP and an emergency discharge spillway on the perimeter embankment of the SSP. The system components are shown on Figure 3.9.



(Jan 2025 Beach)

Figure 3.9 CTD TSF internal surface water management features

The decant inlet sumps are arranged with varying inlet elevations to accommodate transfer of peak flows resulting from runoff from specific storm events; specifically, 1:5 year, 1:10 year and 1:20 year average recurrence interval (ARI).

The spillways between the CTD TSF and the SSP were designed to cater for rare and extreme storm events up to 1:1,000 (ARI), to manage situations where the flow capacity of the gravity system was exceeded. The 1:1,000-year peak flood flow for Stage 11 was calculated to be 88.0 m^3/s. The 1:1,000-year peak flood flow for the Stage 10 expansion was calculated to be 114.0 m^3/s (WSP, 2023c).

Design peak flow depth for the SSP spillway (assuming the pond had already reached spillway level) was 0.4 m for a 1:1,000, 30-minute critical duration storm.

Discharge from the SSP emergency spillway under extreme flood conditions would flow into the southern seepage trench, which would overflow at its northern end and discharge westwards to Lake Carey.

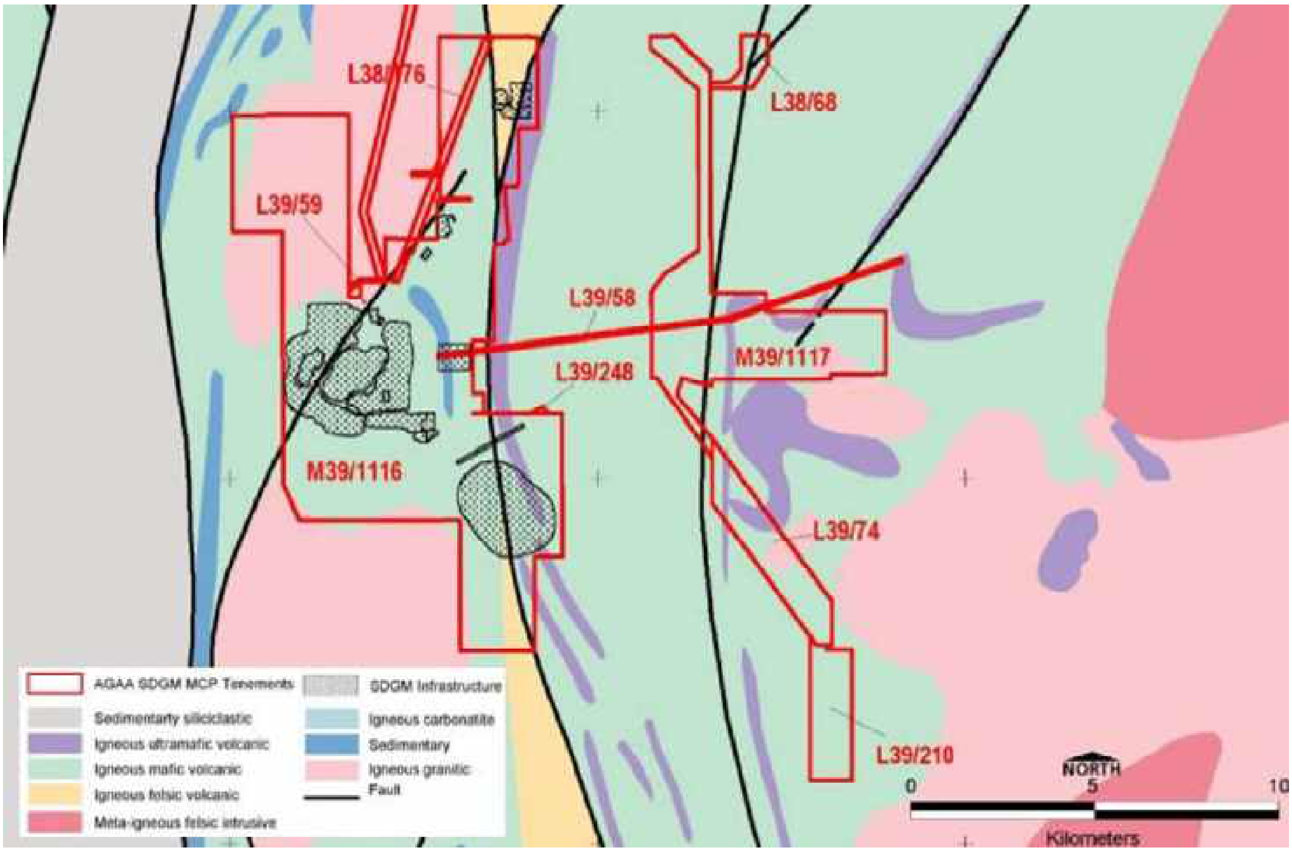
3.3 Site geology

3.3.1 Regional geology

The site is located on the Yilgarn Craton basement of the Eastern Goldfields Superterrane of MesoArchaean and NeoArchaean age (approx. 3200–2500 Ma). The basement rocks are directly overlain by unconsolidated sediments from the Cenozoic era (< 65 Ma). The regional geology is defined by weathered and fractured Achaean bedrock, overlain by palaeochannel deposits and by aeolian, alluvium, colluvium, and lake deposits.

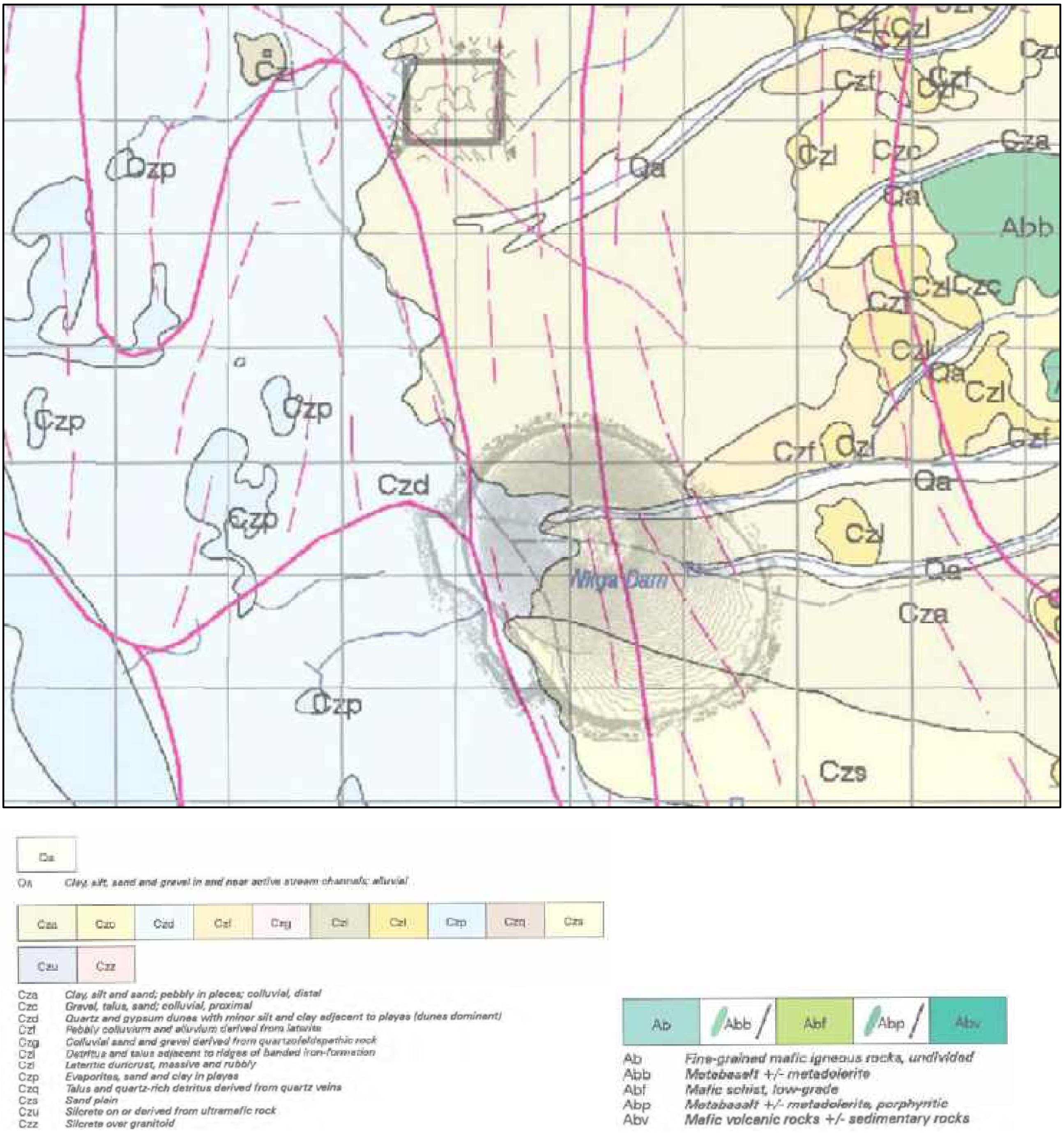
Several faults and shear zones pass through the SDGM tenements, predominantly striking north-south. The major structural feature in the vicinity of the mining area and TSFs is the Hootanui fault which splits into two sub-parallel fault lines both located to the east of the pit.

The solid geology is presented in Figure 3.10 and surface geology in Figure 3.11.



(Geoscience Australia, 2018)

Figure 3.10 SDGM solid geology



(GSWA, 1997)

Figure 3.11 SDGM surface geology

3.3.2 *Local geology*

The bedrock geology of the western third of the CTD TSF is characterised by north – south striking metamorphosed basalts and mixed ultramafic volcanics / iron formations. Localised, contemporaneous mafic intrusions within the basalt are mapped along the western margin of the CTD TSF, extending into the north-western quadrant of the facility.

Bedrock in the eastern two thirds of the CTD TSF is characterised by metamorphosed felsic volcanics and mixed ultramafic volcanics / iron formations together with localised undivided sedimentary rocks (sandstone, siltstone, shale, and chert) in the southern central area.

Cenozoic superficial deposits comprise quartz and gypsum dunes along the western margin of the CTD TSF, sand plain deposits in the southern quadrant and distal colluvium over the remainder of the TSF footprint, with localised Quaternary alluvium in two drainage lines entering from the east. The eastern margin of a north-westerly trending, early Cenozoic palaeovalley (Carey palaeoriver) with infill deposits of alluvial and lacustrine sand, silt, mud, and calcrete is inferred to pass through the south-western part of the CTD TSF. The origins of the various Cenozoic deposits are discussed in Section 3.5.

The eastern expression of the Hootanui fault passes from north to south through the centre of the CTD TSF. An intersecting minor fault or shear zone, splayed to the north-east crosses the south-eastern margin of the facility.

A preliminary engineering geological model (EGM) has been developed for the facility based on published geological information, sterilisation drilling database records, geotechnical and hydrogeological drilling and test pit excavation data. The EGM and further details on the TSF sites are provided in a separate report (WSP, 2024a).

Engineering geological model units have been modelled within Leapfrog Works. An image of the Leapfrog Works model showing the modelled units is presented on Figure 3.12. The diagram is intended to provide an indicative visualisation of units, only.

The results of geotechnical and hydrogeological investigations completed in 2024 (WSP, 2024b) will be used to update the EGM.

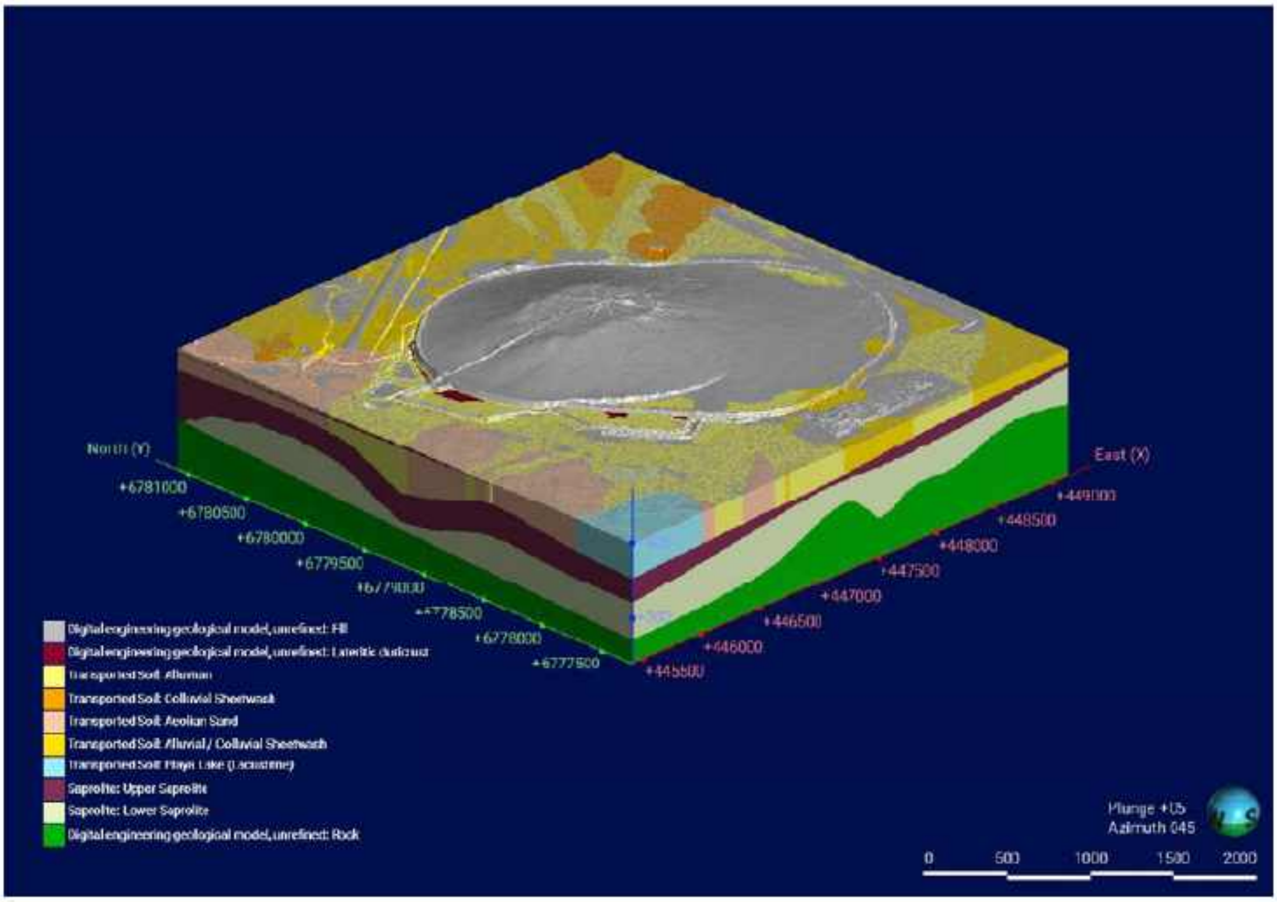


Figure 3.12 Leapfrog engineering geological model (EGM)

The information presented in this image may differ from future deliverables, as the EGM is continuously updated with new data.

3.4 Hydrogeology

SDGM lies within the proclaimed Goldfields Groundwater Area. The regional stratigraphy consists of at least four distinct lithological groups, namely:

- Quaternary aeolian, alluvial and lake deposits.
- Cenozoic alluvial/colluvial deposits.
- Cenozoic laterite weathering profile; and,
- Archaean basement.

The superficial, transported soils in the vicinity of the CTD TSF comprise:

- Alluvium: poorly graded sandy silt with trace gravel, weakly consolidated, and typically unsaturated (though sections near the western perimeter may be saturated due to shallow groundwater).
- Colluvium: gravelly sandy clays, weakly consolidated with limited post-deposition alteration, typically in the upper ~ 2.0 m.
- Aeolian Zones: clayey or silty sands in the western and southwestern regions, with coarser particles and higher permeability compared to other units.
- Highly plastic clays formed in low-energy lacustrine environments are found in the western and southern areas. These have low permeability and higher horizontal permeability relative to vertical (anisotropic).

The transported soils and upper rock mass have undergone significant weathering and diagenetic alteration throughout the Cenozoic Era, developing a deep lateritic profile with an iron rich hardcap duricrust overlying residual clays (saprolite) derived from the predominantly gneissic Archaean basement. The duricrust layer comprises ferricrete, calcrete, and silcrete. Thickness and distribution vary, with ferricrete zones in the northern sector showing permeability up to four times higher than in southern zones. Secondary porosity and preferred groundwater flow paths are present due to variable cementation.

The underlying saprolite comprises clayey, residual soil with intermediate to high plasticity and low permeability. Thickness varies, extending in places to up to 40 m below ground.

The pre-Cenozoic weathered surface of the basement rocks was incised by palaeotributary drainage channels feeding into a north, northeast aligned river system (Carey Palaeoriver). Subsequent palaeochannel infill comprised basal coarse gravelly materials overlain by finer grained sediments as depositional energy decreased. Eventually the river alignments became partially blocked by colluvial soils or sediment transported overland during flood events and a chain of shallow lakes formed.

SDGM is located at the eastern edge of the Lake Carey paleochannel, where its width is approximately 20 km (Figure 3.13).

(Bell, et al., 2012)

Figure 3.13 Carey Palaeochannel extent at SDGM

Regionally identified aquifers include:

- superficial formations of variably cemented ferruginous pisolitic gravel and coarse sand beds to hardcap
- transported palaeochannel sands and gravels; and,
- fractured zones in highly and moderately weathered Archean bedrock, which underlies all areas.

Saprolite and massive, fresh rock are aquitards in the profile, with infrequent fracture zones providing limited linkage between the superficial and fractured rock aquifers. The largest and most productive aquifers are the transitional, fractured rock zones and deeper paleochannel deposits.

Overprinting this hydrogeological setting are the following events at SDGM (Carrick Consulting, 2013):

- Dewatering for open pit mining from the Cleo (1996) and Sunrise (1994) pits (cone of depression)
- Dewatering for the SDGM underground workings (cone of depression)
- Tailings deposition into TSF1 between 1998 and 2000 (groundwater mounding – 0.24 m to + 1.3 m). Transitory mounding has now dissipated under TSF1; and,
- Tailings deposition into the CTD TSF since 2000 (groundwater mounding).

Prior to mining, groundwater was encountered in the superficial aquifer around 5.0 m below ground level at the CTD TSF.

Hydrogeological investigations completed at the CTD TSF in 2003 (URS, 2003) and 2005, (URS, 2005), characterised the hydrogeological units as:

- Tailings: layered with buried layers of salt crust which impede vertical permeability
- Transported deposits (alluvium, colluvium and aeolian deposits) which are typically layered with anisotropic permeability (higher lateral permeability)
- Duricrust: predominantly Ferricrete with localised near surface calcrete and silcrete closer to the base of the unit, particularly in the northwestern quadrant
- Pisolitic palaeochannel in the northeastern quadrant, characterised by 2.0 to 10.0 m thick gravel bands

- Lacustrine clays: locally overlain by dune sands in the western and southern parts of the CTD TSF (associated with Lake Carey)
- Saprolite: low permeability, clayey residual material up to 40 m thick; and,
- Bedrock: moderately to slightly weathered and assumed to be of low permeability (not measured).

A hydrogeological model for the CTD TSF was developed and calibrated by URS in 2005 (URS, 2005) and updated in 2011 (URS, 2011).

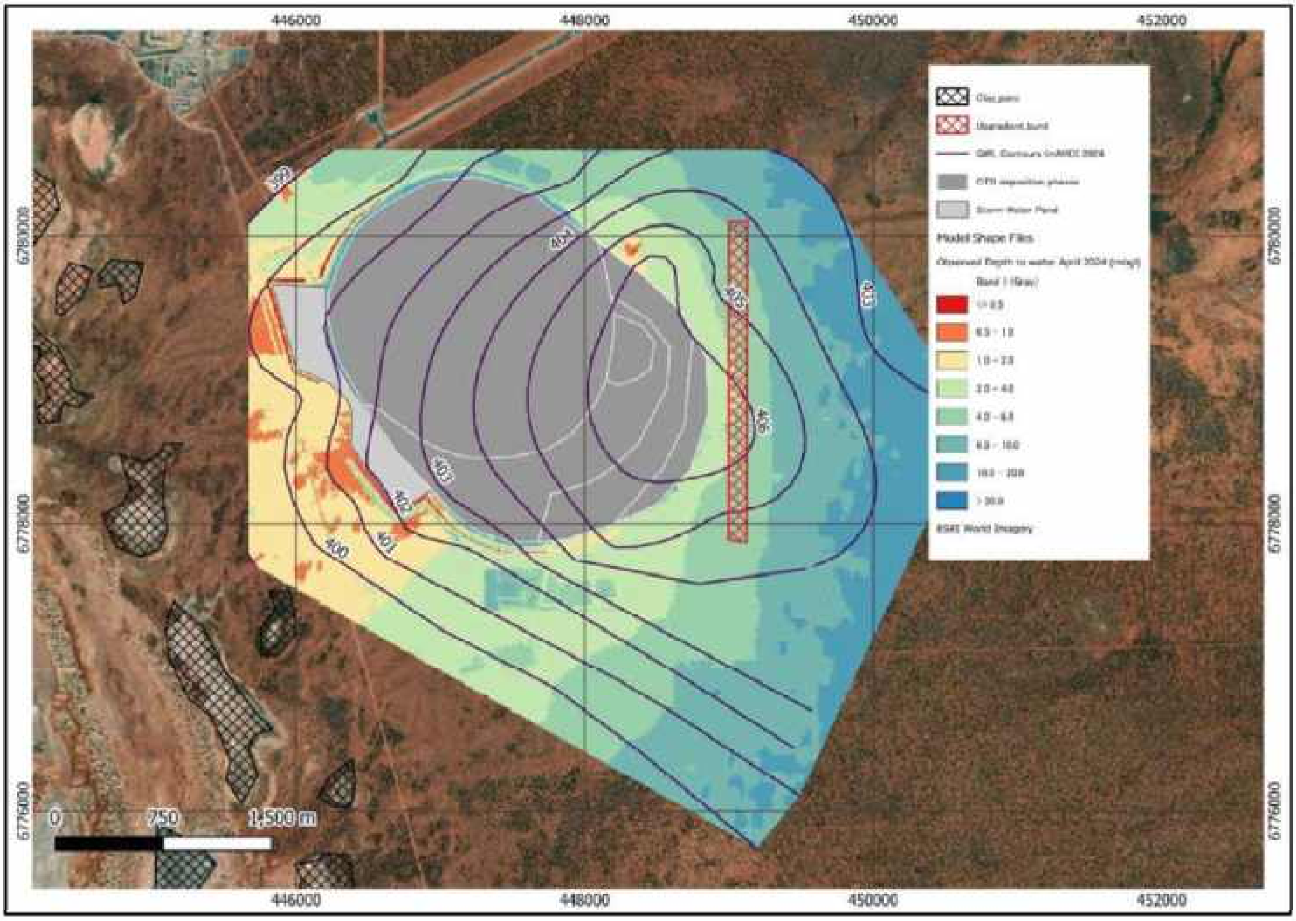
Site-wide hydrogeological modelling focussing on the open pit and underground dewatering impacts from the proposed satellite pits towards the northeast of the existing pit was completed in 2022 (Groundwater Consulting Pty Ltd, 2022), but also including the CTD TSF within the model domain.

Following geotechnical and hydrogeological investigation works in 2024, the hydrostratigraphy at the CTD TSF was refined and an updated, and a calibrated hydrogeological model specifically related to ongoing construction of the CTD TSF was developed (SRK, 2025).

The 2025 numerical groundwater model simulated future groundwater level variations during ongoing operation and subsequent closure of the CTD TSF under a range of climatic scenarios (baseline, RCP 8.5 wet case and RCP 8.5 dry case).

All predictive scenarios simulated a continuation of the decline in water levels following the peak in early 2024 caused by large rainfall events in January and March 2024. A reduction in seepage infiltration is predicted once the Stage 10 expansion area becomes fully covered in tailings (2026) and it was concluded that continuing CTD TSF operation and implementation of existing seepage mitigation measures should result in little impact on existing groundwater levels which are most sensitive to large rainfall and flooding events.

Ground water levels in April 2024 are illustrated on Figure 3.14. Groundwater levels around and within the CTD TSF measured in September 2024 ranged between 3.0 m to 3.9 m below ground level (mBGL) based on recordings taken on completion of geotechnical investigation.

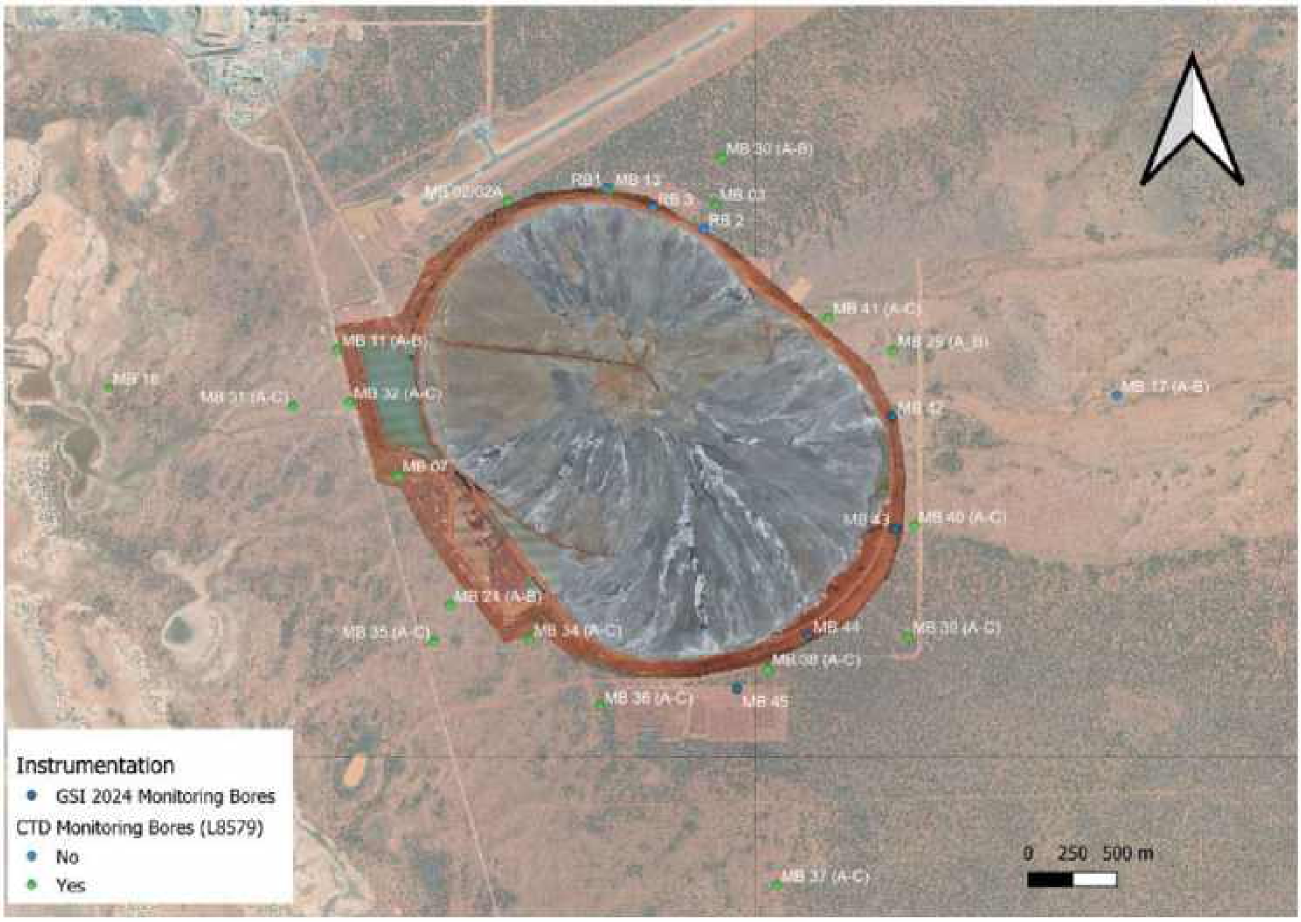


(SRK, 2025)

Figure 3.14 Groundwater contours April 2024

Within the monitoring bore network (shown on Figure 3.15), a maximum groundwater TDS value of 172,000 mg/L was recorded during Q3 2023 at CTDMB31C (located west of the CTD). The lowest TDS value of 34,700 mg/L was measured at CTDMB38A (located south of the CTD). Salinity measurements and contours in April 2024 are illustrated on Figure 3.16 (Anglogold Ashanti Australia, 2024a).

Salinity within the seepage recovery trenches typically ranges between 35,500 and 181,000 mg/L (AngloGold Ashanti Australia, 2023). In 2023, an average recorded total dissolved solids (TDS) concentration of 95,500 mg/L was reported (SRK, 2024).



(Jan 2025 Beach)

Figure 3.15 CTD TSF monitoring bore network

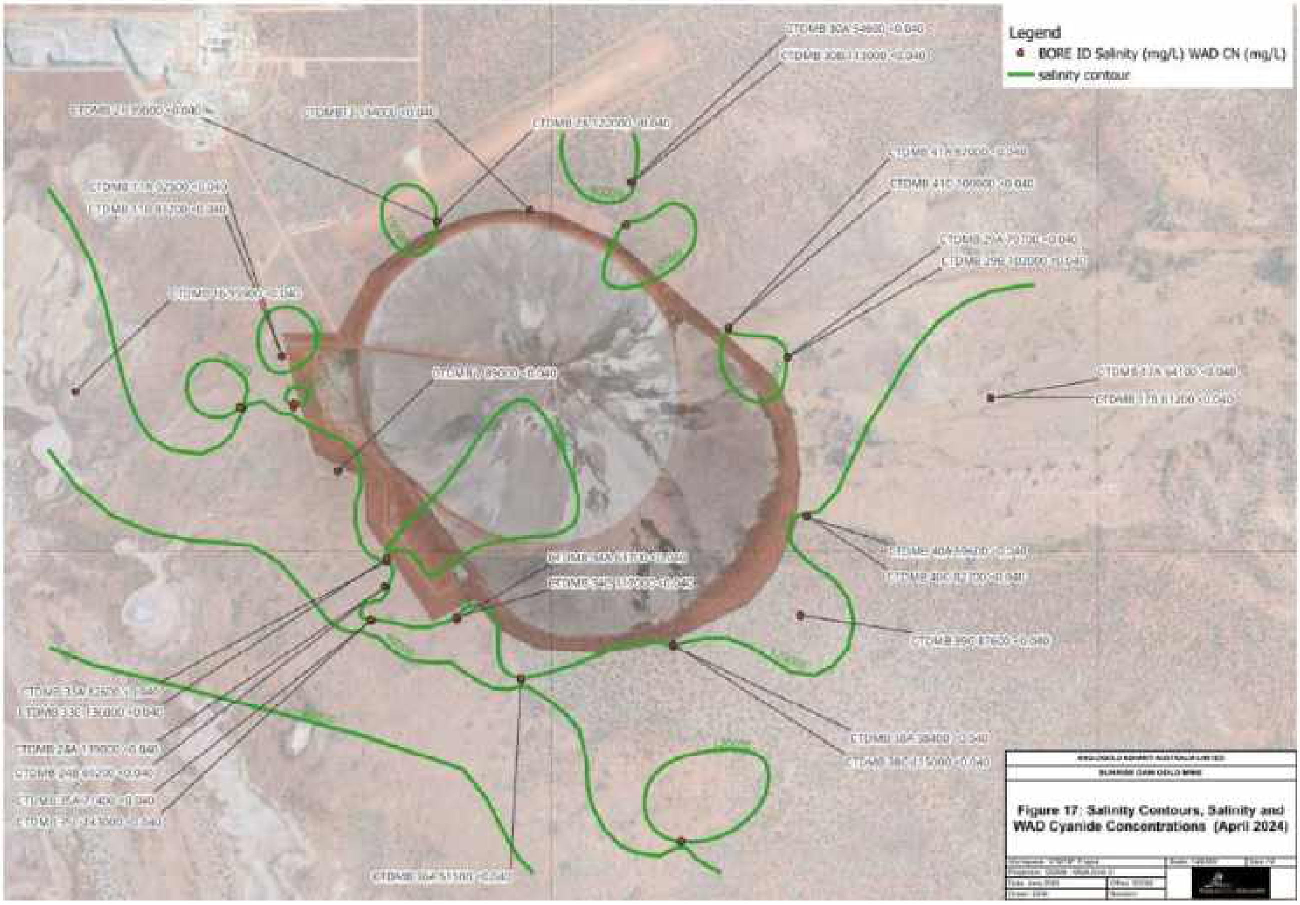


Figure 3.16 CTD TSF salinity contours April 2024

3.5 Topography and geomorphology

The CTD TSF site slopes gently to the southwest towards Lake Carey at approximately 0.25% (a fall of approximately 5.0 m).

The morphotectonic and geological subdivision within which SDGM is located is the Eastern Goldfields province of the Yilgarn block. The corresponding geomorphological division is the Yilgarn Plateau, described as:

> *Sandplains and laterite breakaways; granitic and alluvial plains; ridges of metamorphic rocks and granitic hills and rises; calcretes, large salt lakes and dunes along valleys (Wyrwoll & Glover, 1989).*

Erosion and subaerial weathering of the tectonically stable Yilgarn Craton basement rocks took place over an extended period of geological time throughout the Proterozoic eon and the Palaeozoic era, with increased erosion occurring at the end of the Palaeozoic due to widespread glaciation in the Permian period. Erosion and weathering continued throughout the Mesozoic era, creating a low relief surface upon which sediment transport was dominated by incised drainage lines and flood sheetwash.

Deep weathering during the wet tropical climate of the early Cenozoic (Eocene and Oligocene epochs) resulted in a weathered regolith and extensive laterite formation. Colluvial soil transport from the slopes of low hills and ridges became an important contributor to local geomorphology.

Distal colluvial deposits on the eastern side of the CTD TSF are derived from Wilga Hill, approximately 7.0 km to the east. The top of Wilga Hill is represented by an erosion resistant ridge of ultramafic volcanic rock (Peridotite) at a maximum elevation of 487 m AHD, some 75 m above the eastern perimeter of the CTD TSF. Dissected laterite and proximal colluvial deposits of gravel and sand are present on the hill slopes closer to the ridge.

Under subsequent arid climatic conditions, which have been dominant since global and regional climatic changes in the mid-Cenozoic (Miocene epoch), rainfall became infrequent but when it occurred, poorly vegetated and sun-baked surfaces generated high run-off and localised flooding. As a result of such events, flood waters and sediment debris derived from the regolith accumulated in poorly drained, fault-controlled depressions in the desert landscape or in former river courses blocked by sheetwash or wind-blown debris (such as the sand plain deposits to the south of the CTD TSF).

High evaporation resulted in the rapid drying of surface waters and dissolved salts in the sediment laden floodwaters were concentrated on the dry lakebed forming a dry, playa (Salt Lake) environment. Lake Carey is the largest of a chain of playa lakes formed on the alignment of the Carey Palaeoriver, which extends some 50 km to the southeast (Coleman, 2003), (Anglogold Ashanti Australia, 2012).

The large exposure of dry, fine grained, saline sediment on the lakebed provided source material for localised Cenozoic dune formation within the lake itself and on its margins (as mapped to the west of the CTD TSF). Development of the dunes most likely continued during cyclic periods of increased aridity in the Quaternary, generally thought to be coincident with global glacial maxima. The last massive extension of the arid zone is inferred to have taken place about 18,000-years ago.

Increased rainfall during Quaternary interglacial periods established present day creeks and drainage lines with channel fill deposits varying from clay to gravel (depending on flow activity).

As a result of local geomorphological processes, the topography of the SDGM site is dominated by the gentle (typically 0.4%) western slope of the distal colluvial fan below Wilga Hill (which has an elevation of approximately 414 m AHD at the eastern margin of both TSFs) and the flat expanse of Lake Carey (400 m AHD). The geomorphology of the eastern margin of the CTD TSF is also influenced by two alluvial drainage lines which have cut through the distal colluvium and their associated over wash deposits.

3.6 Seismicity

Estimates of the peak ground accelerations (PGA) for a range of earthquake AEPs at SDGM have been developed from the Australian National Seismic Hazard Assessment of 2023 (NSHA23) (Allen, Griffin, Clark, & King, 2024) . The peak ground accelerations for the site, determined at the cone of the CTD TSF (29.11S (latitude), 122.46E (longitude)) are summarised in Table 3.2.

Table 3.2 NSHA23 ground model accelerations

AEP	1 in 475	1 in 1,490*	1 in 2,475
PGA	0.0186	0.0415	0.0585

* – ANCOLD & GISTM Safety evaluation earthquake requirement for "Significant" dam failure consequence category/classification is 1:1,000 AEP

In the absence of a site-specific seismic hazard assessment, the maximum credible earthquake is inferred to be represented by 85th fractile PGA for a 1:10,000 AEP earthquake event.

4 Basis of design

4.1 Design codes and guidelines

The engineering design of all TSF(s) at SDGM must be consistent with AGAA requirements, industry guidelines and other regulatory requirements. Relevant requirements, codes, and guidelines are summarised in Sections 4.1.1 to 4.1.3.

4.1.1 Industry guidelines and standards

- The Code of Practice for Tailings Storage Facilities administered by DEMIRS (DMP, 2013).
- The Australian National Commission on Large Dams (ANCOLD) Guidelines on Tailings Dams; Planning Design, Construction, Operation and Closure (ANCOLD, 2019).
- The Guide to the Preparation of a Design Report for Tailings Storage Facilities (DMP, 2015a)
- Mine Closure Plan Guidance (DMIRS, 2020).
- The Global Industry Standard on Tailings Management (Global Tailings Review, 2020)
- The Canadian Dam Association Dam Safety Guidelines 2007 (2013 Edition) (CDA, 2013).
- Guidelines for Tailings Management (AngloGold Ashanti Australia, 2001)
- Group Standard – Tailings Management (Anglogold Ashanti, 2024); and,
- International Cyanide Management Institute – The Cyanide Code (International Cyanide Management Institute, 2021).

4.1.2 Environmental legislation

- Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)
- Environmental Protection Act 1986
  - Clearing of Native Vegetation (Part V, Division 2); and,
  - Prescribed premises, works approvals and licences (Part V, Division 3).
- Mining Act 1978
- Biodiversity Conservation Act 2016
- Contaminated Sites Act 2003; and,
- Rights in Water and Irrigation Act 1914 (RIWI Act).

4.1.3 Safety legislation

- Work Health and Safety Act 2020; and,
- Mines Safety and Inspection Regulations, 1995.

4.2 Regulatory conditions

The CTD TSF is operated under the Department of Water and Environmental Regulation (DWER) License Number: L8579/2011/2 (last amended 12/05/2023). The license is valid from 21 July 2014 to 20 July 2029.

License conditions relevant to the CTD TSF are summarised in Table 4.1.

Table 4.1 DWER licence conditions – TSF operation

Condition	Description
2	Disposal of waste shall only take place within the TSF labelled CTD as shown on the Premises map in Schedule 1.
5	The Licence Holder shall ensure that all pipelines containing environmentally hazardous substances are either: — equipped with telemetry systems and pressure sensors along pipelines to allow the detection of leaks and failures. — equipped with automatic cut-outs in the event of pipe failure; or — provided with secondary containment sufficient to contain any spill for a period equal to the time between inspections.
7	The Licence Holder shall ensure that tailings, decant water and effluent are only discharged into containment cells or ponds, lined with clay to achieve a permeability of at least $<10^{-7}$ m/s or equivalent.
8	The Licence Holder shall manage the CTD TSF containment infrastructure such that a minimum top of embankment freeboard of 300 mm or a 1 in 100 year/72-hour storm event (whichever is greater) is maintained.
9	The Licence Holder shall manage TSFs such that — A seepage collection and recovery system is provided and used to capture seepage from the TSF — Seepage is returned to the TSF or re-used in the process — The stormwater storage pond on the TSF is managed so as to provide capacity for a 1 in 100-year, 72-hour rainfall event
10 (Table 4)	TSF Inspection and record requirements: — Twice daily inspections of tailings pipelines and return water lines. — Daily inspection of embankment freeboard to confirm required freeboard capacity is available and visual assessment of tailings beaching. — Daily assessment of the decant pond and stormwater storage pond size and position.
14	The Licence Holder shall ensure that: a all water samples are collected and preserved in accordance with AS/NZS 5667.1. b all surface water sampling is conducted in accordance with AS/NZS 5667.4, AS/NZS 5667.6 or AS/NZS 5667.9 as relevant. c all groundwater sampling is conducted in accordance with AS/NZS 5667.11; and d all laboratory samples are submitted to and tested by a laboratory with current NATA accreditation for the parameters being measured
15	The Licence Holder shall ensure that: a monthly monitoring is undertaken at least 15 days apart. b quarterly monitoring is undertaken at least 45 days apart; and c annual monitoring is undertaken at least 9 months apart.

Condition	Description
19 (Table 9)	The Licence Holder shall undertake monthly monitoring of: — Volume of tailings deposited into the TSF — Volumes of water recovered from the TSF — Volumes of seepage recovered
20 (Table 10)	Table 10 details a requirement for annual monitoring of ambient groundwater environmental quality by sampling from specific groundwater monitoring bores (this monitoring is carried out quarterly). CTD MB's 2/2A, 3, 7, 11A/B, 13, 16, 24A/B, 29A/B, 30A/B, 31 – 41 A/B/C Test parameters are: pH, SWL, TDS, WAD-CN, Na, K, Ca, Mg, (As, B, Cr, Cu, Pb, Mn, Ni, Se)
22	The Licence Holder shall undertake an annual assessment of vegetation within the zone of influence of the CTD TSF.
24	The Licence Holder must submit to the CEO an Annual Audit Compliance Report indicating the extent to which the Licence Holder has complied with the conditions in this Licence for the annual period.
25	The Licence Holder shall implement a complaints management system that as a minimum records the number and details of complaints received concerning the environmental impact of the activities undertaken at the Premises and any action taken in response to the complaint.
26	The Licence Holder shall submit to the CEO an Annual Environmental Report within 60 calendar days after the end of the annual period.

The CTD TSF must also be operated in compliance with the DEMIRS tenement conditions for mining tenement M39/1116.

Figure 4.1 TSF locations within tenement M39/1116

Design of the Stage 12 raise of the CTD TSF perimeter embankment has been undertaken in accordance with existing licence and tenement conditions. A completed DEMIRS Tailings Storage Data Sheet (TSDS) and Design Compliance Certificate are provided in Appendix A.

4.3 Design criteria

The risk-based design criteria for the CTD TSF are summarized in Table 4.2. Mining and process design criteria are summarised in Table 4.3.

Table 4.2 Risk based design criteria

Criteria Application	**Design input**	**Reference**
Tailings and Water Freeboard (CTD TSF)		
Beach freeboard (m)[1] *(Crest to tailings beach head)*	> 0.5 (Stage 11 perimeter – Sectors 6, 7, 8, 9). > 0.8 (Stage 12 perimeter – Sectors 1, 2, 3, 4, 5)	(DMP, 2013), (ANCOLD, 2019) and recent surface water studies conducted on the CTD TSF
Flood Capacity *(Applicable to SSP)*	Store 1:100 AEP, 72-hour rainfall superimposed on normal operating pond + 0.5 m	(DMP, 2013)
	Store 1:100 AEP 72-hour rainfall superimposed on maximum operating pond level + 1:10 AEP wave run up + 0.3 m	(ANCOLD, 2019)
	Manage 1:2,475 AEP flood conditions (Active) Manage 1:10,000 AEP flood conditions (Passive)	(Global Tailings Review, 2020)
Spillway design storm for both the SSP and CTD TSF	1:1,000 AEP and wave run up (0.2 m) or 1:10 AEP wind	(ANCOLD, 2019)
Geotechnical Stability (CTD TSF)		
Minimum Factor of Safety (FoS): — Peak (static) — Post peak (post seismic)	 >1.5 >1.1	 (ANCOLD, 2019)
Earthquake loading and PGAs: — Operating Basis Earthquake (OBE) — Safety Evaluation Earthquake (SEE) — Operations and Closure (Active care)	 1: 475 AEP 1:1,000 AEP 1: 2,475 AEP	 (ANCOLD, 2019) (ANCOLD, 2019) (Global Tailings Review, 2020)
Closure considerations		
Post closure earthquake: — ANCOLD: MCE — GISTM	 1:10,000 AEP[2] 1:10,000 AEP	 (ANCOLD, 2019) (Global Tailings Review, 2020)
Flood design criteria for closure and passive-closure	1:10,000 AEP or PMF	(Global Tailings Review, 2020)

(1) Minimum beach freeboard determined by assessment of channel section area required to pass floodwater around beach toe perimeter to decant inlet sumps without overtopping. DEMIRS and ANCOLD minimum of 0.3 m for deposition from an embankment is not applicable.

(2) Earthquake events for 1:10,000 AEP generally approach the MCE event and can be adopted for post-closure design where MCE cannot be calculated reliably (applies to most of Australia).

Table 4.3 Mining and process design criteria

Design Criteria Description	Design Criteria Value	Derivation
Life of Mine	At least 2032	AGAA H3 Mine Plan
Tailings production (Mtpa)	4.1	AGAA Performance target
Thickener underflow density (% w/w)	55 – 65	AGAA Performance target
Average in situ stored dry density (t/m^3)	1.65	Historical reconciliation for recently deposited tailings

4.4 Design parameters

Design parameters selected to satisfy the design criteria described in Section 4.3 are provided in Table 4.4 to Table 4.8 and are generally consistent with the parameters described in the SDGM climatic conditions report issued in June 2023 (WSP, 2023c) and the TSF design parameter summary report issued in November 2023 (WSP, 2023d).

Material hydraulic conductivity parameters have been updated based on the outcomes of geotechnical and hydrogeological site investigation undertaken in August and September 2024 (WSP, 2024b) and subsequent development and calibration of an updated hydrogeological model for the CTD TSF (SRK, 2025).

Tailings and foundation soil strength parameters are adopted from the design parameter summary report (WSP, 2023d). Additional laboratory testing is currently in progress on samples recovered during the 2024 investigation, which will be used to validate the previously determined parameters. Similar (or less conservative) strength parameters are anticipated based on the material characteristics determined in the field.

Table 4.4 Geometric design parameters

<table>
<tr><th>Parameter</th><th colspan="2">Design Input</th></tr>
<tr><td>Current Crest Level – CTD TSF Stage 10</td><td colspan="2">R.L 406.0 – 410.0 m (from west to east)</td></tr>
<tr><td>Design Crest Level – Stage 12</td><td colspan="2">R.L 410.0 – 415.0 m (from west to east)</td></tr>
<tr><td>Embankment design</td><td colspan="2">Downstream raise and top hat raise near SSP area
Crest width = 8.0 m
Crest slope = 2% towards upstream crest margin
Upstream batter = 1V:2H
Downstream batter = 1V:3H</td></tr>
<tr><td rowspan="6">Target beach slope</td><td>Incremental Distance from Beach Head (m)</td><td>Slope (%)</td></tr>
<tr><td>150</td><td>3.8</td></tr>
<tr><td>350</td><td>2.5</td></tr>
<tr><td>200</td><td>2</td></tr>
<tr><td>150</td><td>1.6</td></tr>
<tr><td>Runout</td><td>0.5</td></tr>
<tr><td>Windrow geometry</td><td colspan="2">0.5 m high minimum, 1V:1.3H side slopes</td></tr>
</table>

Table 4.5 Freeboard assessment parameters

Parameter	Design Input		Source/Derivation
	Baseline	RCP 4.5/8.5 2030 projection	
1 in 100-year, 72-hour Rainfall depth	183 mm	192 mm	(WSP, 2023c)
1 in 1,000-year, 72-hour Rainfall depth	321 mm	337 mm	(WSP, 2023c)
1 in 2,745-year, 72-hour Rainfall depth	383 mm	403 mm	Interpolation (WSP, 2023c)
1 in 10,000-year, 72-hour Rainfall depth	517 mm	543 mm	(WSP, 2023c)
SSP wave run-up	0.2 m	0.2 m	WSP Calculation

Table 4.6 Seepage assessment parameters

Hydrogeological Unit	Hydraulic Conductivity, kx (m/s)
Surficial Soils	$1.2 \times 10^{-5} - 5.8 \times 10^{-5}$
Ferricrete	$5.8 \times 10^{-5} - 1.4 \times 10^{-4}$
Lake Clays	$1.2 \times 10^{-7} - 1.7 \times 10^{-6}$
Saprolite	5.8×10^{-8}
Tailings	1.2×10^{-6}
Embankment Material	4.0×10^{-7}

Table 4.7 Seismic design parameters

Parameter	Design Input	Source
Seismicity		
Operating Basis Earthquake (OBE)	0.0186 g	(ANCOLD, 2019) (Allen, Griffin, Clark, & King, 2024)
Safety Evaluation Earthquake (SEE)	0.0415 g	(ANCOLD, 2019) (Allen, Griffin, Clark, & King, 2024)
Operations and Closure (Active care)	0.0415 g	(Global Tailings Review, 2020) (Allen, Griffin, Clark, & King, 2024)
Passive Closure	MCE (1:10,000 AEP)	(ANCOLD, 2019)
Earthquake magnitude	M = 5.5	Inferred from NSHA 2023 data

Table 4.8 Soil strength parameters

Material (Mohr-Coulomb)	**Unit Weight (kN/m^3)**	**Undrained (Total stress)**			**Drained (Effective stress)**		**Post seismic***		
		c' (kPa)	**Φ' (°)**	**Su/σ'v**	**c' (kPa)**	**Φ' (°)**	**Su/σ'v**	**c' (kPa)**	**Φ' (°)**
Tailings	18	20	0	0.11	0	19	0.06		
Superficial soil	19	0	34	-	0	34	-	0	30
Ferricrete	22	0	46	-	0	46	-	0	41
Lake Clays	19	0	32	-	0	32	-	28	0
Residual Sandy Clay (Upper Saprolite)	19	80	0	-	0	34	-	68	0
Embankment Fill	20	40	0	-	0	30	-	34	0

* – 15% reduction to shear strength applied to foundation materials

4.5 Material characterisation

4.5.1 *Physical characterisation*

Table 4.9 presents a summary of the tailings and construction material physical characteristics at the CTD TSF.

Table 4.9 Summary of material characterisation

Test Item		**Unit**	**Result**	**Reference**
Tailings Geotechnical Characterisation				
Particle Size Distribution (PSD)	Sand (≤ 2.36 mm)	% (average passing)	100	(WSP, 2023d)
	Fines (≤ 0.075 mm)		68.90	
	Clay (≤ 0.002 mm)		12.19	
Atterberg Limits (average)	Liquid Limit	%	28	(WSP, 2023d)
	Plastic Limit		18	
	Plasticity Index		3	
Particle Density[2]		(t/m^3)	2.78–2.80	(WSP, 2024c)
Settled Density[2]		(t/m^3)	1.3	(WSP, 2024c)
In-situ Dry Density[3]	Min.	(t/m^3)	1.62	(WSP, 2024c)
	Max.		1.84	
In-situ Moisture Content (beach)[4]	Min.	%	8	(WSP, 2024c)
	Max.		37	
In-situ Moisture Content (slurry)[5]		%	47	(WSP, 2024c)

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[2] Representative of a tailings sample (collected from the tailings beach) in 2022.

[3] Representative of tailings beach samples collected in 2009, 2013, and 2016.

[4] Representative of tailings beach samples collected in 2009, 2013, 2016, and 2022.

[5] Representative of tailings slurry sample collected in 2022.

Test Item		Unit	Result	Reference
Saturated horizontal permeability (K_X)		m/s	1.0 x 10^{-6}	(WSP, 2023d)
Saturated vertical permeability (K_Y)		m/s	1.2 x 10^{-7}	(WSP, 2023d)
Anisotropy Ratio		(K_X / K_Y)	10	(WSP, 2023d)
Unit Weight		kN/m^3	18	(WSP, 2023d)
Undrained (total stress)	c'	kPa	20	(WSP, 2023d)
	ø'	°	0	(WSP, 2023d)
	Su/σ'v		0.11	(WSP, 2023d)
Drained (effective stress)	c'	kPa	0	(WSP, 2023d)
	ø'	°	19	(WSP, 2023d)
Residual Strength	Su/σ'v	Min.	0.04	(WSP, 2023d)
		Max.	0.06	(WSP, 2023d)
Embankment Material Characterisation (CTD TSF)				
Particle Size Distribution		-	Clayey sands and clays (>30% fines)	(WSP, 2023d)
Plasticity Index		(%)	>15	(WSP, 2023d)
Saturated (K_X)		m/s	4.0 x 10^{-7}	(WSP, 2023d)
Saturated (K_Y)		m/s	4.0 x 10^{-7}	(WSP, 2023d)
Anisotropy Ratio		(K_X / K_Y)	1	(WSP, 2023d)
Unit Weight		kN/m^3	20	(WSP, 2023d)
Undrained (total stress)	c'	kPa	40–50	(WSP, 2023d)
	ø'	°	0	(WSP, 2023d)
	Su/σ'v		0.3	(WSP, 2023d)
Drained (effective stress)	c'	kPa	0–5	(WSP, 2023d)
	ø'	°	26–30	-

4.5.2 Geochemical characterisation

Geochemical analysis of SDGM tailings material has been completed at various stages through the mine's operation.

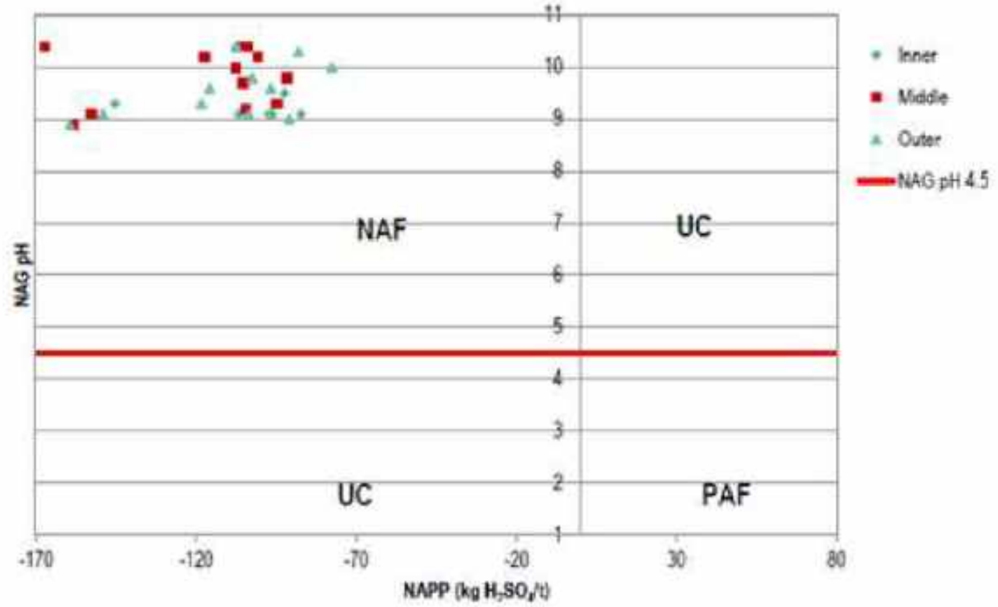
1995, 2002

Graeme Campbell and Associates [(1995) and (2002)] found tailings produced at SDGM were non-acid forming (NAF) and moderately enriched in arsenic and antimony but not to a marked extent. Total and weak acid dissociable (CN_{WAD}) Cyanide concentrations in the slurry water were 77 mg/L and 50 mg/L respectively (2002 samples).

2014

A geochemical characterisation study conducted in 2014 (MBS Environmental, 2014) on 78 tailings samples from varying positions within the CTD TSF indicated that all the samples were NAF (Figure 4.2). Assessed properties of the tailings samples included:

- Very uniform pH and EC in all samples (average pH of 8 and hypersaline EC of 1,196 mS/m).
- Average oxidisable S was 0.95%; however, high ANC values (112 to 192 kg H_2SO_4/t), made all tailings NAF, of which two thirds were classified as acid consuming.
- The key element of environmental significance present was arsenic with lesser amounts of molybdenum, selenium and antimony. Total arsenic concentrations ranged from 191 to 890 mg/kg compared to a nominal earth average soil concentration of 25 mg/kg and a maximum of 16 mg/kg observed in soils sampled for cover material studies.
- The elements with the greatest Global Abundance Index (GAI) in the tailings were: arsenic, molybdenum, antimony and to a much lesser extent selenium. Arsenic was the primary leachable element found, other than major salts, with 1:5 soil:water extracts containing between 0.025 and 0.129 mg/L arsenic (mean 0.054 mg/L compared to the ANZECC livestock drinking water guideline of 0.5 mg/L). Given the low concentrations, arsenic was seen as being immobile and not impacting groundwater. Traces of molybdenum and antimony were also detected in the water extract.
- Tailings were saturated in gypsum. When coupled with high salinity, this indicated the tailings would be non-dispersive and trafficable when dry.



(MBS Environmental, 2014)

Figure 4.2 Geochemical classification of tailings samples

2022

Geochemical screening tests were conducted on samples of slurry and surficial beach tailings recovered in 2022 (WSP Golder, 2023). pH and EC tests are summarised in Table 4.10.

Table 4.10 Geochemical screen pH, EC (WSP Golder)

Test	Thickener Underflow	CTD Apex	CTD perimeter	Expansion Area
pH	8.2 (8.8)	8.13	7.96	8.13
EC (ms/cm)	18.38 (10.9)	16.5	17.98	19.49

Figures in parentheses () – ALS Laboratory result

Static acid base accounting analysis of the thickener underflow slurry solids and bleed water by ALS indicated the tailings to be NAF (NAPP -71.5 kg H_2SO_4/t at NAG pH7 and pH 4.5). Oxidisable Sulfur was 0.89% and acid neutralizing capacity was 107 kg H_2SO_4/t (10.9% $CaCO_3$).

Using an Acid Sulfate Soil (ASS) test suite approach, the material may also be classed as non-acid forming, having net acidity of <0.02 %S (<10 mole H+/t) because of its excess acid neutralising capacity.

Total metal concentrations generally had a GAI of 0 or 1 with the exception of Arsenic (GAI = 6, concentration = 430 mg/kg) and Sulphur (GAI = 3, concentration = 1.18 mg/kg). GAI of 3 or above is considered as significant enrichment (INAP, 2014). These concentrations are consistent with the MBS results of 2014 and possibly reflect the presence of Arsenopyrite (FeAsS) in the ore mineral assemblage.

Semi quantitative XRD analysis indicated the predominant minerals to be Clinochlore (20%), Quartz (19%), and Albite (19%) with lesser representation of Dolomite (15%), Muscovite (10%) and Halite, Thermonatrite, Microcline, Gypsum, and Pyrite (<5%).

Analysis of the slurry supernatant water indicated concentrations in excess of livestock water guideline values (ANZECC, 2000) for TDS, Calcium, Sulphate, Arsenic, Cadmium, Cobalt, Copper, Molybdenum, Nickel, and Selenium. WAD Cyanide concentration was 39.4 mg/L.

2024

Geochemical testing was conducted on a slurry tailings sample and 15 samples of tailings recovered from various locations and depths on the CTD tailings deposit during the 2024 geotechnical investigation. The testing parameters included:

- Acid Base Accounting (ABA)
- Net Acid Generation (NAG)
- Multi-Element Analysis
- Mineralogy Analysis via Quantitative X-Ray Diffraction (XRD)
- Deionised (DI) water leach testing
- NAG Liquor Analysis.

The tailings samples consisted of 80–85% silicate minerals, with neutralizing carbonate minerals (dolomite-Fe and calcite-Mg) comprising ~11–12%. Iron sulfide minerals, primarily pyrite (dominant) and arsenopyrite (minor), were present at ~2.5% abundance. Minor and trace amounts of sulfate minerals (gypsum), non-neutralising carbonate minerals (siderite), halite, and magnetite were also identified.

Paste pH measurements indicated alkaline conditions (pH 8.3–8.7), while paste electrical conductivity (EC) indicated saline conditions (16,000–25,800 µS/cm).

As for previous analyses, geochemical enrichment (GAI ≥3) in arsenic, molybdenum, sulfur, antimony, and to a lesser degree selenium was indicated. Tellurium, and tungsten were also enriched. Most other screened metal(loid) concentrations were near background levels, with the exceptions of silver (GAI=1-3), bismuth (GAI=1-3), chromium (GAI=1), lead (GAI=1), and rhenium (GAI=1-2).

Although total sulfur content was high (~1%), with sulfide sulfur (~0.8%) predominantly present as pyrite, as confirmed by mineralogical analysis, acid neutralization capacity (ANC) was also high (114 kg H_2SO_4/t), likely attributed to the presence of carbonate minerals (calcite and dolomite). Given the negative net acid production potential (NAPP) and alkaline NAG pH (pH 9–11), the tailings samples were classified as non-acid forming (NAF) as illustrated on Figure 4.3.

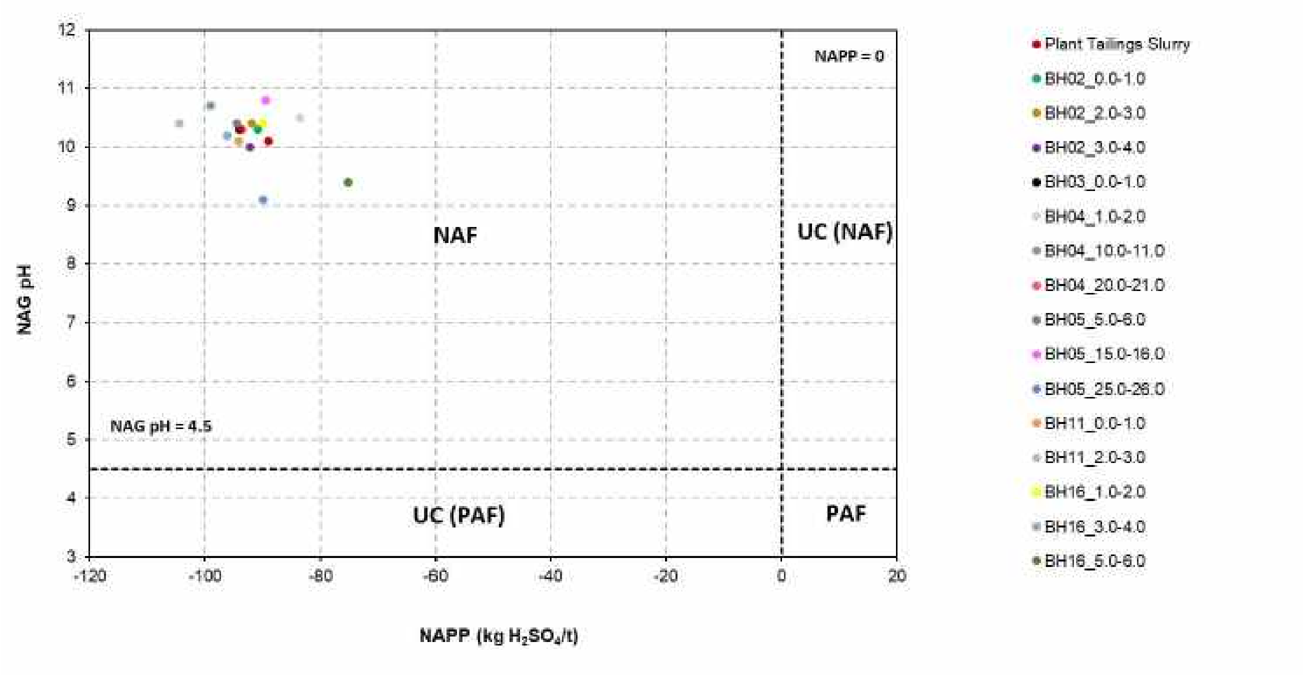


Figure 4.3 Acid base accounting – 2024 tailings samples

5 Design overview

5.1 Storage capacity

The Stage 12 embankment raise will require approximately 380,000 m^3 of fill material and will provide additional tailings storage capacity of approximately 15 Mm^3, equivalent to 24 Mt of tailings (assuming an achieved density of 1.65 t/m^3).

The Stage 12 storage capacity summary is provided in Table 5.1.

Table 5.1 Storage capacity summary

Item	**Stage 12A**	**Stage 12B**[1]	**Total Stage 12**
Expected Crest Elevation (m RL)	409 to 414	410 to 415	409 to 415 maximum
Total Tailings Storage Area (m^2)	2,555,914	3,029,819	3,029,819 maximum
Tailings Storage Volume (m^3)	12,056,111	2,870,840	14,926,951
Storage/Earthworks ratio	49.85	20.56	39.1
Earthworks Volume of Embankment Raise (m^3)	241,870	139,622	381,492
Expected Tailings Density (t/m^3)	1.65	1.65	1.65
Expected Life of Design (assuming 4.1 Mtpa)	4.9 years (approximately 1750 days)	1.1 years (approximately 420 days)	6.0 years (approximately 2180 days)

(1) Values from Stage 12A to Stage 12B

The overall facility storage capacity is summarised in Table 5.2.

Table 5.2 Stage 12A/12B summaries

Design	**Storage Capacity**		
	Volume (Mm^3)	**Tonnage (Mt)**[1]	**Years**[2]
Existing (from date Dec 1999 to Mar 2026[3])	52.99	94.74	26.3
Stage 12A	12.06	19.89	4.9
Stage 12B	2.87	4.74	1.1
Stage 12 Total	14.93	24.63	6.0
LOM Total (from date Dec 1999 to End of Stage 12)	67.92	119.37	32.3

(1) Stage 12A and Stage 12B capacity calculated using a design density of 1.65 t/m^3

(2) Calculated using a deposition rate of 4.1 Mtpa

(3) Expected full capacity of Stage 10/11

5.2 Stage 12 embankment raise

The Stage 12 embankment raise will be completed in two stages (12A and 12B) which are designed to connect directly with the existing north and south abutments of the original CTD TSF. The raise section embankment crest slopes at approximately 0.1 % from the north to the south abutment. This design aims to provide sufficient tailings storage capacity until the current LoM outlined in Table 4.3.

The raise alignment is illustrated on Figure 5.1 and Figure 5.2. Design drawings are provided in Appendix B.

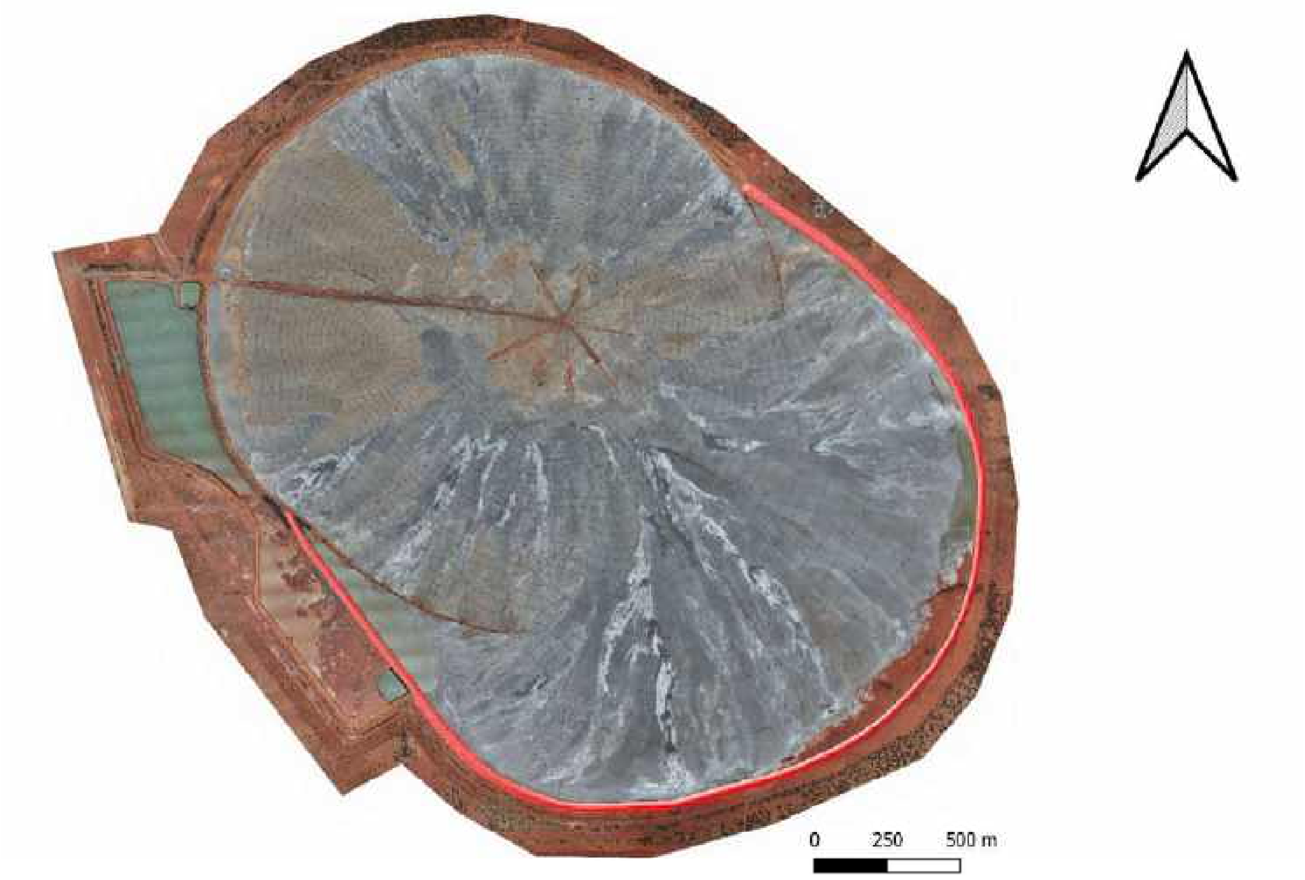


Figure 5.1 Location of Stage 12 embankment raise (red)

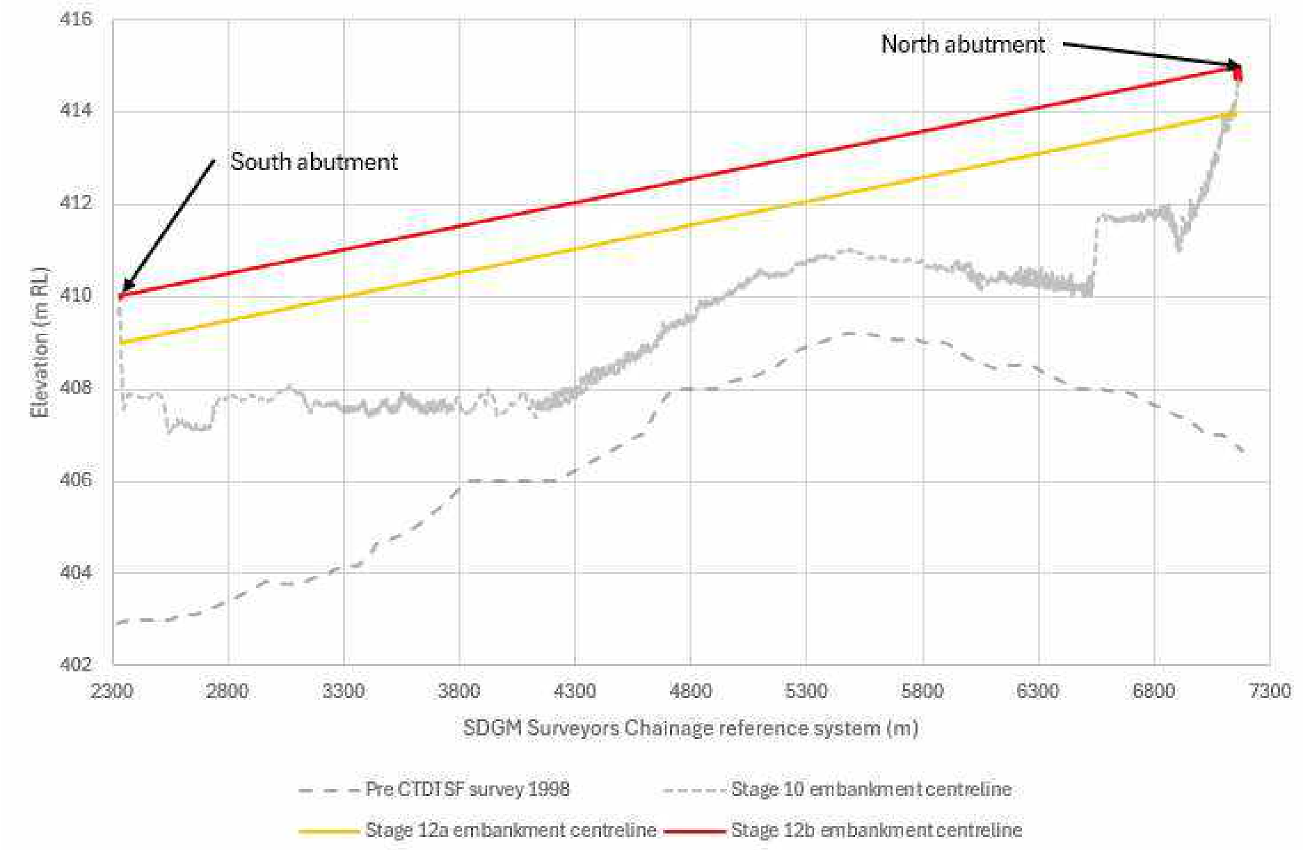


Figure 5.2 Long section of the Stage 12 embankment raise

The existing embankment wall crest is variable due to the natural ground topography, as shown in Figure 5.2. Stage 12A is a downstream raise designed to achieve a uniform slope of 0.1% from the north to south abutments, resulting in a variable raise height ranging from 1 m to 5 m, with a maximum embankment height of 6.2 m. Stage 12B, also a downstream raise, will provide a consistent 1.0 m elevation increase above Stage 12A, bringing the maximum embankment height to 7.2 m in the expansion area.

The existing facility footprint remains largely unchanged, and the embankment design adheres to standard downstream construction practices. The Stage 10 basin was lined by compacting the low permeability near surface clayey sand deposits.

The design and facility management measures remain consistent with the existing as-built design, with no significant deviations or alterations introduced.

The raises will be constructed on the existing Stage 10 embankment with the downstream shoulder constructed on medium-dense clayey sand/gravel of transported soil origin, as well as ferricrete or lateritic duricrust, as indicated by geotechnical borehole logs within the raise footprint vicinity (see Appendix C).

A clearing area for sourcing of fill material has been nominated as shown in Figure 5.3. Borrow pit excavation is expected to provide sufficient material to construct the Stage 12 raises assuming an average borrow depth of 1.5 m. The borrow area extends to the northwest of an existing square borrow pit which was used to provide suitable material (clayey sand/sandy clay) for Stage 10 construction.

Test pits undertaken in 2018 (shown in Figure), immediately south of the proposed borrow area identified medium to high plasticity, sandy clay and clayey sand deposits to depths between 1 m and 3 m.

Figure 5.3 Nominated borrow area clearing extents for stage 12 raise construction

Based on the current engineering geological model, Figure 5.4 shows a cross section through the borrow area indicating the surficial material (alluvial and colluvial sheetwash) is likely to thicken to the north.

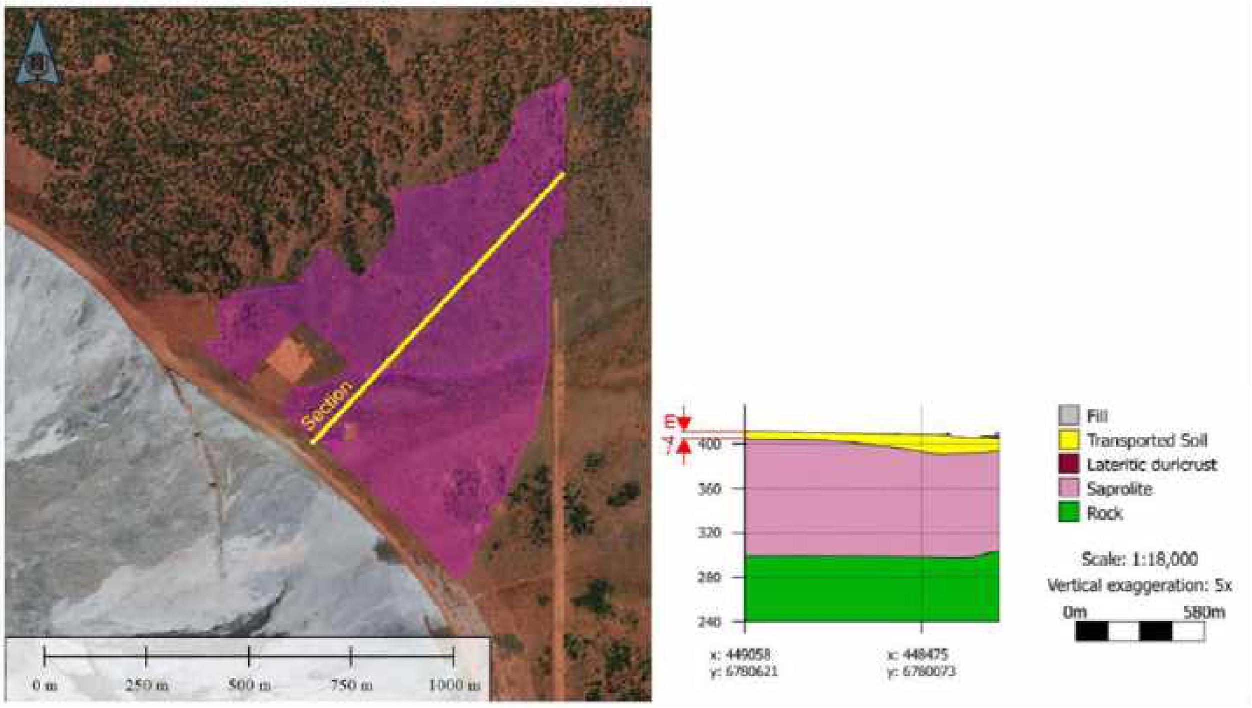


Figure 5.4 Section through stage 12 borrow area with indicative geology

Whilst clearing may extend up to the toe of the proposed raise, development of borrow excavations will be restricted to distances further than 50 m from the design toe set-out line.

As outlined in Section 5.1, completion of the Stage 12 embankment raise will require approximately 380,000 m^3 of embankment fill. This represents approximately 15 Mm^3 of tailings storage capacity and 6.0 years of deposition.

It is proposed to execute the construction works in two stages:

- Stage 12A: construction of the northern and southern CTD TSF perimeter embankment to a *working* crest elevation representative of 250,000 m^3 embankment fill; and,
- Stage 12B: construction of the remaining embankment profile to the maximum crest elevation of the northern and southern perimeter embankments (representing the remaining 130,000 m^3 of embankment fill).
- Figure 5.5 presents a typical embankment profile with the indicative Stage 12A/12B interface profile shown as a dashed line. The Stage 12B works comprise the final 1 m high raise of the Stage 12 embankment. Table 5.2 summarises the earthworks and design capacity of the Stage 12A and 12B raises.

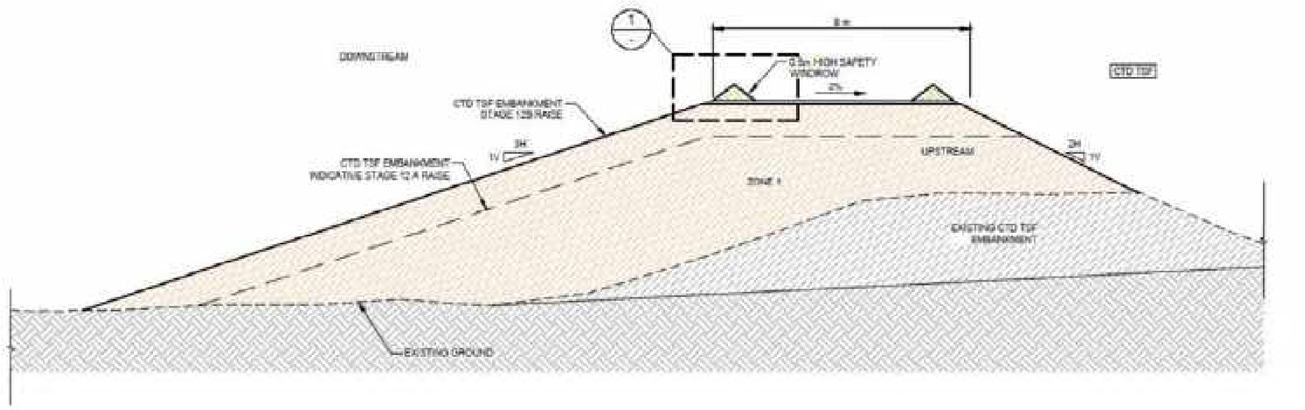


Figure 5.5 Stage 12 typical cross section with indicative Stage 12A and 12B raise profile

5.3 SSP Embankment modifications

Hydrological modelling (WSP, 2025) (Section 6.1.3) has indicated that the SSP spillway requires widening (by extending its length along the embankment crest) to permit passage of 1:1,000 AEP flood events, conservatively assuming a pre-flood pond elevation at spillway invert level. Extension of the spillway by 150 m along the crest of the SSP embankment has been determined appropriate, resulting in a spillway width of 200 m as shown in Figure 5.6. Placement of erosion protection waste rock across the invert (crest) and outflow (downstream embankment slope) is also proposed as part of the Stage 12 works.

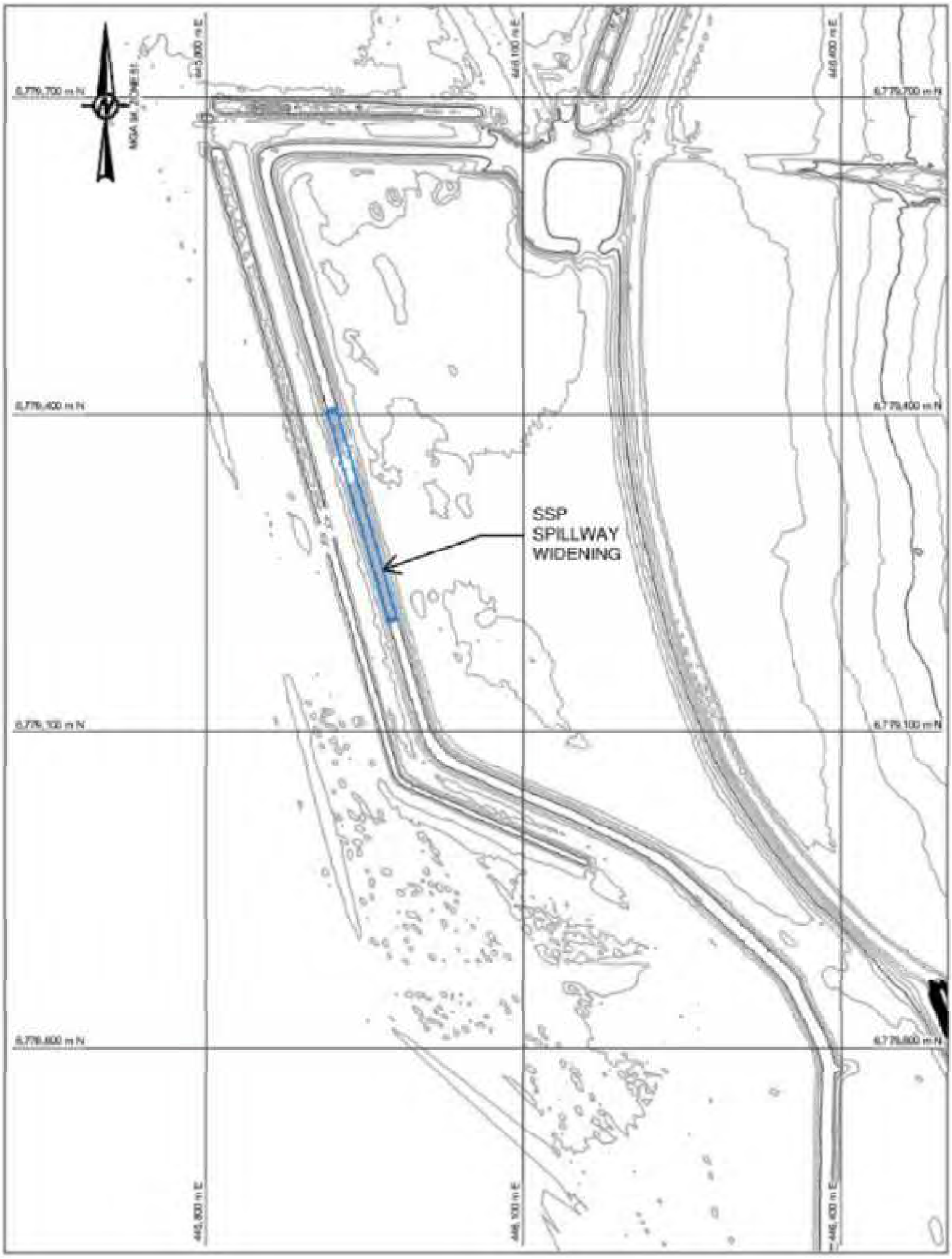


Figure 5.6 Plan view of SSP spillway widening

The SSP embankment crest will be regraded to a uniform crest elevation and a gravel wearing course layer of 100 mm nominal thickness will also be placed on the embankment crest to provide all weather access, resulting in a design crest elevation of RL 405.7 m. The spillway elevation will be increased by 100 mm to RL 405.2 m.

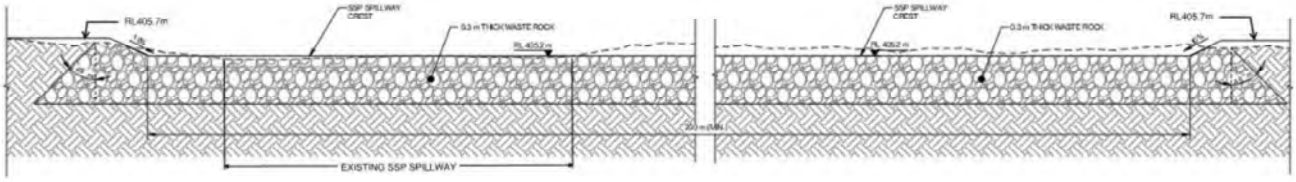


Figure 5.7 Section view looking towards the SSP spillway

5.4 Eastern diversion levee modifications

Flood modelling undertaken by GHD (GHD, 2024a) has indicated that 1:100 (1 %) AEP floodwater is likely to extend beyond the northern end of the existing levee bund on the eastern side of the CTD TSF (Figure 5.8). Consequently, it is proposed to extend the existing levee bund by 160 m. The extension location is illustrated on Figure 5.8.

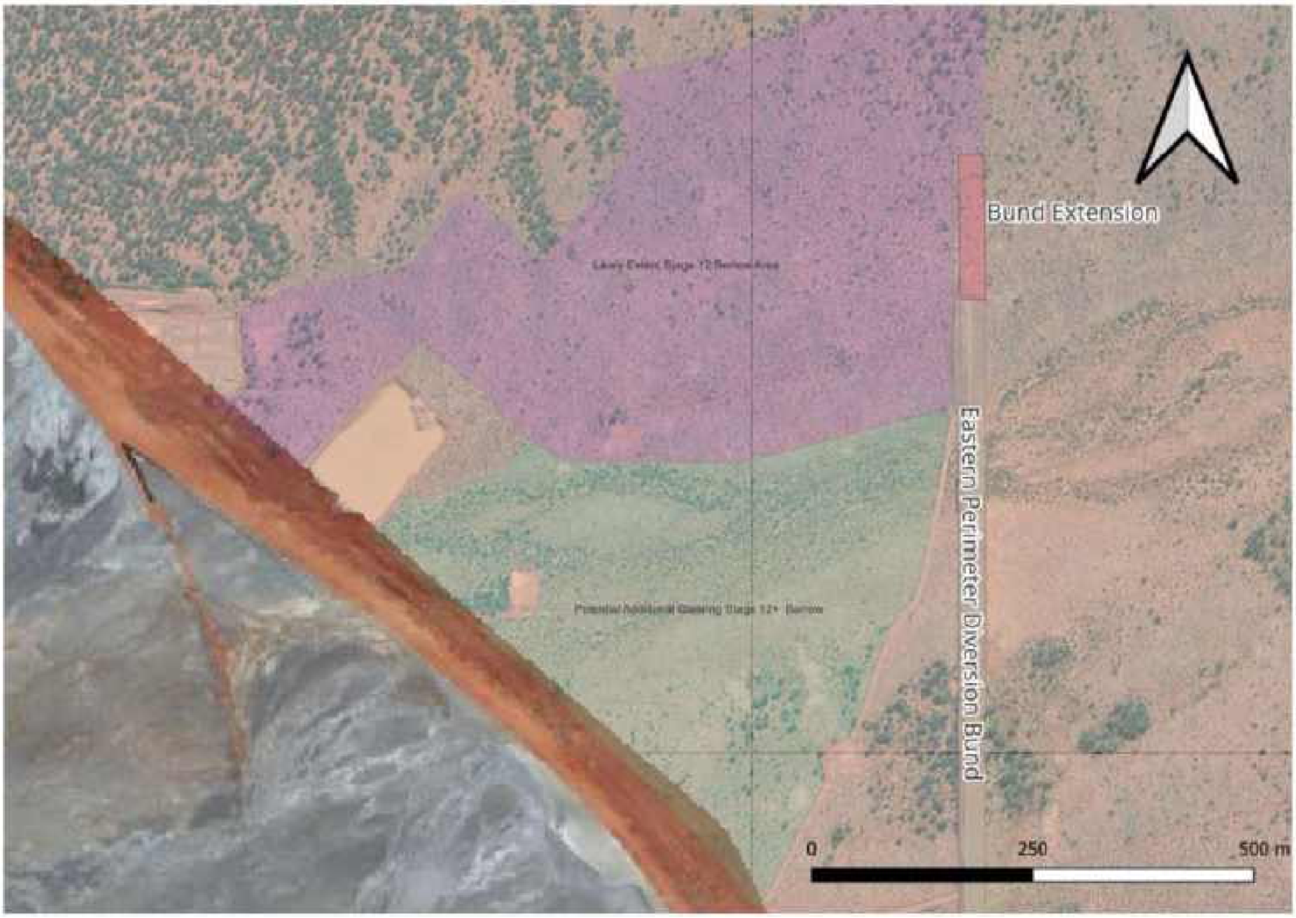


Figure 5.8 Eastern bund extension

5.5 Seepage interception trench modifications

As part of the Stage 12 design works, extension of the Stage 10 seepage interception trench to connect with the southern trench has been proposed.

Connection of the two trenches will provide improved capacity to control groundwater levels in the area between the current trench extents. Pumping capacity at the existing South trench sump will be reviewed and optimised and contingency pumping capacity provided (when required).

The connection alignment is illustrated on Figure 5.9.

Figure 5.9 Proposed seepage trench connection

6 Design analyses

6.1 Freeboard

6.1.1 CTD Beach Area

The SDGM operating license no. L8579/2011/2 (DWER, 2023) specifies that a minimum top of embankment freeboard of 0.3 m is required or a 1:100 AEP, 72-hour storm event (whichever is greater) must be contained within the CTD perimeter.

Since ANCOLD (2019) requires the CTD and SSP spillways to be able to pass 1:1000 AEP storm events, it is considered appropriate that the CTD perimeter should be capable of transferring such events to the spillway locations without overtopping; consequently, for Stage 12 design, based on hydrological modelling (WSP, 2025) the design freeboard for the CTD TSF perimeter for the expansion area has been increased to 0.8 m from the previously adopted 0.7 m in the stage 10 design. The required freeboard for the northern part of the CTD TSF (Sectors 7 to 9) will remain at 0.5 m.

6.1.2 SSP

For the SDGM CTD TSF, decant water is not stored on the tailings surface but is decanted by gravity flow to lined decant ponds. The lined decant ponds are within the footprint of the SSP and have dedicated spillways, thus have a mechanism for overflow to be contained in the SSP during storm events. In this instance, the water storage freeboard requirement for the system is applied to the SSP perimeter embankment. It is implicit that overflow does not occur at the CTD perimeter embankments.

For both the DEMIRS (Category 1) and ANCOLD (Significant) facility classifications, a minimum contingency water storage depth of 0.5 m is required between the SSP spillway and the pond level following a 1:100 AEP, 72-hour storm event.

Water balance calibration following the Q1 2024 rainfall and flood modelling (WSP, 2025) indicates that a minimum height of 3.2 m is required between the SSP spillway invert and the pre-storm SSP pond level to provide sufficient capacity to contain the design flood and maintain 0.5 m contingency storage.

As part of the Stage 12 works, it is proposed to regrade the SSP embankment crest and increase the spillway invert elevation by 100 mm to RL 405.2 m (Section 6.1.3); consequently, the resulting pond elevation (equivalent to DEMIRS *normal operating pond* and ANCOLD *maximum operating pond*) is RL 402 m which equates to an approximate pond depth of 1.8 m and approximate pond volume of 158,500 m^3.

6.1.3 Spillways

A review of the existing CTD and SSP spillway capacities has been completed (WSP, 2025) to determine if any modifications are required, which can be completed as part of the Stage 12 works.

Flood routing modelling indicates that the two CTD spillways can safely pass 1:1,000 storm events to the SSP, even if initial ponding on the tailings beach is at spillway level; consequently, no modifications to these spillways are required.

Flood routing across the existing SSP spillway with an initial pond elevation of RL 402.7 m (2.5 m depth as surveyed in February 2024) indicated attenuation would occur for short duration events, and controlled flow would occur for events longer than 18 hours with peak discharge less than 5 m^3/s (Figure 6.1).

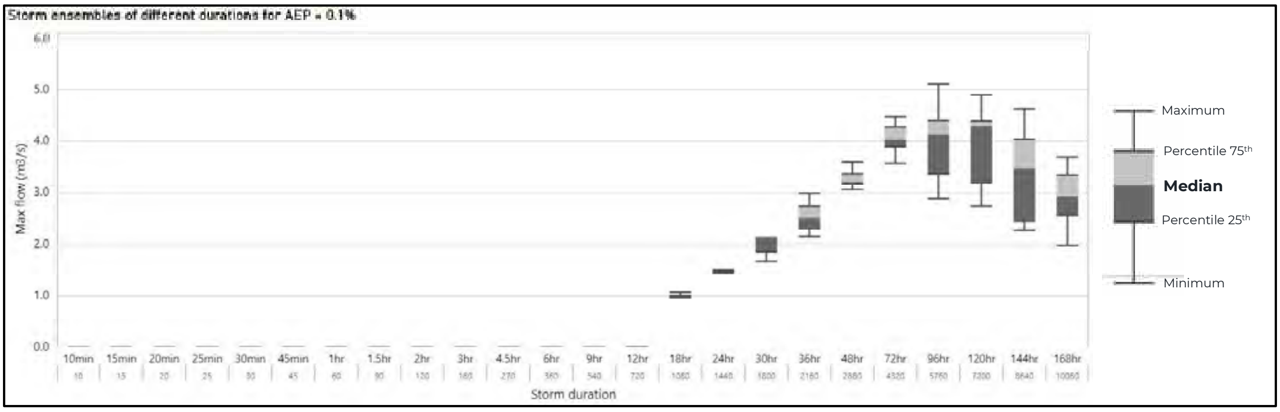


Figure 6.1 SSP Spillway peak outflow discharges for 1:1,000 AEP and initial SSP pond RL 402.7 m.

For the conservative scenario where the SSP pond was assumed to be at spillway level prior to a 1:1,000 AEP storm, the model predicted that there was insufficient spillway freeboard available, and overflow would also occur across the embankment. To safely pass floodwaters under this scenario, lengthening of the existing spillway from 50 m to 200 m would be required. Peak flow conditions for the modified spillway are 45.4 m^3/s, and 0.2 m depth for a critical storm duration of 3 hours.

Although it is not necessary to assume this latter scenario where extreme storm storage and contingency freeboard is provided (ANCOLD, 2019), it is considered that widening of the spillway by 150 m presents an opportunity to mitigate the risk of SSP overtopping to as low as reasonably practical and this modification is included in the Stage 12 work package.

6.2 External flood management

AGAA engaged GHD to evaluate and update the surface water management plan (SWMP) for the SDGM site (AngloGold Ashanti Australia, 2022), including the external diversion infrastructure of the CTD TSF. Internal surface water management of the CTD TSF was evaluated by WSP.

As part of the SWMP evaluation, a surface water flood model was developed to simulate hydrology and drainage under various storm events, identify surface water risk areas, and evaluate proposed management measures. The model was based on a LiDAR Digital Elevation Model (DEM) captured in March 2023, aerial imagery, site culvert data, and design rainfall data from the Bureau of Meteorology (BOM). Surface roughness and soil loss estimates were derived from published references and aerial imagery.

The design event used to assess key risks under existing conditions was a 1:100 (1 %) AEP, 72-hour storm, representative of cyclonic events common in the Goldfields and Pilbara regions.

Modelling for the 1% AEP event showed that floodwaters bypass the northern edge of the levee bund to the east of the CTD TSF, contributing to flooding on the eastern side of the CTD TSF (GHD, 2024a), (GHD, 2024b).

To mitigate this potential issue, it is proposed to extend the bund's northern end further by 160 m as part of the Stage 12 works, thereby reducing the risk of flood impact on the northeastern perimeter of the CTD during operations.

6.3 Seepage analysis

Completion of Stage 10/11 (and continuation of Stage 12) tailings deposition will cover the remaining exposed natural subgrade at the eastern side of the CTD TSF (approximately 10 ha at beginning of January 2025), where localised ponding, transient seepage and groundwater level increase occurred following significant rainfall in Q1 2024. Hydrogeological modelling (SRK, 2025) indicates that once the eastern area is covered in tailings, potential seepage in the eastern side of the CTD TSF decreases significantly and groundwater levels are simulated to decrease throughout Stage 12 operation and following closure of the facility. The model predicts that operation of the CTD TSF will have little impact on maximum groundwater levels, which are most sensitive to large rainfall and flooding events.

Two-dimensional seepage analyses were conducted using the SEEP/W finite element program by GEO-SLOPE International to assess phreatic surfaces, pore pressures, and seepage flux beneath the CTD TSF under a given set of applied boundary conditions. The model geometry was based on the proposed embankment raise and existing subsurface stratigraphy, with foundation units assigned representative hydraulic conductivities, thicknesses, and elevations.

Transient seepage analyses were performed to evaluate the wetting front progression beneath the CTD TSF and SSP following a 1:100 72-hour storm event and to assess the time for subsequent dissipation of groundwater mounding beneath the tailings deposit. Two cross sections were analysed, as shown on Figure 6.2.

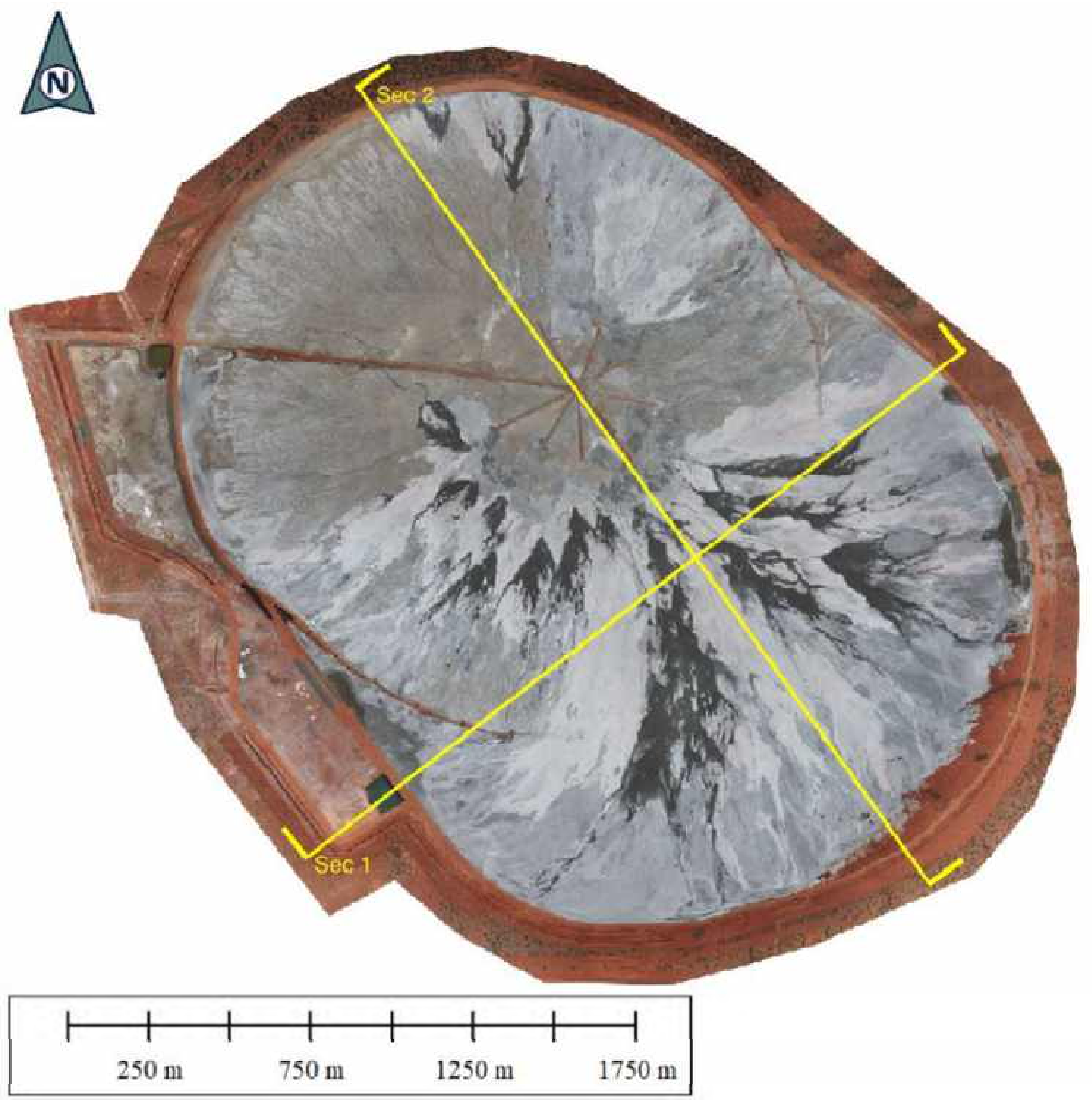


Figure 6.2 Location of seepage analysis section lines

The inferred pre-storm phreatic surface is approximately 2 to 3 m below ground level (m BGL) and a tailings piezometric water level of 3 m above the natural ground surface (maximum observed in 2012) was set as the initial head condition within the CTD area. It is noted that data from the 2024 site investigation and groundwater model calibration (SRK, 2025) that recent piezometric head in the tailings deposit was 1–2 m above the natural ground surface.

A perimeter pond elevation up to the minimum freeboard (0.3 m below the crest) along the perimeter embankment was conservatively adopted as a constant head boundary condition for the storm duration, with saturated/unsaturated material properties applied to simulate variations in saturation levels. These material functions were derived from laboratory test results and tailored within SEEP/W to represent site-specific conditions. Hydraulic parameters for the stratigraphic units were derived from geotechnical investigation data and on-site observations as detailed in

Table 4.6.

The seepage modelling aims to determine whether a storm event induces a piezometric water rise (additional mounding) within the tailings deposit and, if so, to assess the time required for dissipation. The time for overall dissipation of the inferred piezometric head beneath the CTD area was also modelled. The results are presented in Table 6.1. Graphical representations of the results are given in Appendix D.

Table 6.1 Seepage modelling results summary

Section	Storm event induced more mounding?	Time for initial mounding to dissipate
1	No	Approximately 1,490 days (4.08 years)
2	No	Approximately 2,555 days (7.00 years)

The results indicate that temporary accumulation of stormwater at the toe of the tailings beach has little to no direct impact on the piezometric mounding within and directly below the tailings deposit. This is consistent with the outcomes of groundwater modelling (SRK, 2025).

Where the phreatic surface is up to 3 m above the natural ground surface, maximum seepage rates from the tailings deposit into the natural ground (downward seepage) are estimated to be approximately 3.4×10^{-4} $m^3/day/m^2$.

Site investigations in 2012 and 2024 indicate that the lower 1 – 3 m of the tailings deposit is only saturated in areas of active deposition. The largest deposition sector area is approximately 100 ha, consequently the maximum estimated daily seepage is approximately 340 m^3/day which equates to less than 10% of the total water volume regularly deposited in the impoundment. This low seepage rate is achieved through key operational strategies, including:

- The absence of a decant pond on the tailings surface.
- Development of unsaturated conditions within the tailings deposit.
- Thickened tailings deposition, with a target solids content between 55% and 65%.
- Layered tailings settling and consolidation, which forms a low-permeability barrier above the natural ground and previously deposited tailings, minimising seepage and ensuring that water loss primarily occurs through evaporation rather than infiltration.

Temporary infiltration (and evaporation) of accumulated stormwater occurs within the SSP following significant rainfall events (which result in groundwater level increase to the west of the CTD TSF). Infiltration and evaporation decrease significantly as drawdown of the temporary stormwater reservoir by pumping to the process plant occurs.

6.4 2D Stability analysis

Geotechnical stability analyses were conducted for the embankment raise, utilizing the same long-section profiles as those used in the seepage modelling. The limit equilibrium analysis was performed using Rocscience SLIDE software, applying the Morgenstern-Price method, which ensures force and moment equilibrium. The iterative search routines in SLOPE/W were used to determine the lowest factors of safety (FoS) for each specified loading condition. The analysis methodology followed the ANCOLD-recommended stability assessment flowchart (ANCOLD, 2019).

The stability analysis considered three primary loading conditions:

- Short-term (End of Construction – EoC): evaluates embankment stability immediately after construction, before excess pore pressures dissipate. Undrained stress parameters were applied.
- Long-term (normal operating conditions): represents the steady-state condition during and after stage filling when no excess pore pressures remain. Effective stress parameters were applied to embankments and foundation materials.

- Post-Seismic Conditions: assesses stability immediately after an earthquake, assuming that the tailings has liquefied. Reduced post-seismic shear strengths were assigned to the tailings and also to the embankment and foundation materials, assuming they could be affected by cyclic strain softening or pore pressure increase during an earthquake.

Strength parameters for both short-term (undrained) and long-term (drained) stability were derived from geotechnical investigations and on-site observations, as detailed in Table 4.8. The phreatic surface was adopted from the transient seepage analysis, taking the highest pore water pressure observed within the embankment as a conservative assumption.

The stability analysis sections are located along Section 1 and Section 2 and utilised in the seepage analyses undertaken in Section 6.3. Section 1 focuses on the southwestern embankment, representing the highest embankment elevation relative to natural ground. Section 2 examines the southern embankment, providing a typical cross-section of the embankment raise.

The stability analysis results are summarised on Table 6.2 and represented graphically in Appendix D.

Table 6.2 Stability analysis results summary

Loading conditions	Section 1 FoS	Section 2 FoS	Minimum required FoS (Table 4.2)
End of construction	1.69	3.01	1.3
End of design life	1.95	1.76	1.5
End of design – post seismic	1.43	2.58	1.1

7 Construction overview

The following sub-sections of this report present a summary of the primary components comprising the Stage 12 construction works at SDGM, including construction activities associated with the CTD embankment, SSP embankment and spillway, diversion levee and seepage collection trenches.

A full construction package, including technical specifications, construction, quality and assurance (CQA) plans, bill of quantities (BoQ) and issued for construction (IFC) drawings will be prepared and issued prior to construction commencement.

7.1 Preliminary and temporary works

It is anticipated that various temporary works will be utilised to safely manage and facilitate the various construction activities associated with the SDGM Stage 12 embankment raise works. All temporary works are defined as components of the works that do not constitute permanent features critical to achieve the design intent of the CTD (and pertinent infrastructure, including the SSP and diversion levee). Such temporary works activities include:

- Establishment of laydown areas to facilitate the temporary storage of plant, construction materials and welfare facilities during the SDGM Stage 12 embankment raise construction works.
- Establishment of temporary access roads and ramps to facilitate safe access of hauling, construction, and inspection (i.e., light vehicle access) plant. This also includes provisions to support construction activities, such as crane loading platforms.
- Establishment of temporary drainage infrastructure required to facilitate safe construction of the SDGM Stage 12 embankment raise to satisfy construction compliance and overall design intent of the embankment raise works.
- Establishment of temporary safety berms/windrows to satisfy minimum safety requirements for the specific plant onsite during the SDGM Stage 12 embankment raise construction works.
- Establishment of all temporary structures necessary to protect key infrastructure during embankment construction works (i.e., monitoring instrumentation, drainage systems, earthfill structures),

It is expected that all temporary works associated with the SDGM Stage 12 embankment raise will be maintained and/or rehabilitated at the expense of the contractor responsible.

7.2 Site preparation

Prior to commencing with the SDGM Stage 12 embankment raise construction activities, site preparation works will include:

- Clearing/grubbing of all localised vegetation where required (i.e., removal of all stumps and roots that may otherwise impact the integrity of the Stage 12 construction activities).
- Temporary/permanent stockpiling of cleared/stripped material.
- Typically, grubbing involves the stripping of organic material (greater than 100 mm in diameter) and all other vegetation and/or loose detrital material (greater than 200 mm in diameter) to a predefined maximum depth below the natural or finished surface.
- With all clearing/grubbing works, every effort will be made as to minimise unnecessary disturbance and/or generation of waste that can otherwise be stockpiled and/or rehabilitated.
- Where temporary/permanent storage of vegetation is required, stockpiles shall be managed in accordance with the requirements of the supporting technical specification documents.

7.3 Construction works

7.3.1 Materials

As with previous construction works at SDGM, it is anticipated that the Stage 12 raise construction will utilise the following materials:

- Zone 1: Embankment fill material – low-permeability fill used as the primary construction material for the embankment construction works.
- Zone 3 – Safety windrow material – fill material used to construct the safety windrows (windrow construction material can comprise Zone 1 recovered as part of the embankment trimming works).
- Zone 4 – Wearing Course Material – gravel sheeting used to provide road base to support all weather vehicular access.
- Zone 5 – Erosion Protection – coarse, durable waste rock for SSP spillway modification.

Construction materials are to be excavated from nominated borrow fill areas and appropriately stockpiled (where required) prior to placement. Excavation works are to be undertaken in accordance with the lines and grades, as specified in the supporting technical specifications. Zone 4 and 5 materials will be sourced from suitable mine waste stockpiles/borrow areas.

7.3.2 CTD Perimeter embankment raise construction

Construction of the Stage 12A and Stage 12B embankment raises will comprise the downstream raising of the southern perimeter embankment of the CTD TSF (Stage 10 expansion area), in accordance with the lines, levels and geometry of the supporting technical specifications.

Prior to the commencement of the Stage 12A and Stage 12B embankment raises, the necessary foundation preparation works (required to support construction activities on the existing embankment crest and slopes of the previous raise, as well as where the Stage 12 embankment footprint extends onto natural ground) are to be completed. These foundation preparation works include proof compacting the natural ground on which the embankment footprint envelops. Following this, the embankment fill material is to be moisture conditions and placed on the embankments in layers not exceeding 300 mm thickness and compacted to a density of 95% SMDD using a pad food or grid roller.

Conformance testing will be undertaken periodically at predetermined intervals to confirm compliance of the placed, conditioned and compacted embankment fill. This conformance tests will be undertaken using a nuclear density meter, at a minimum frequency of 1 test per 1,000 m^3 and will be arranged by SDGM as part of the contract administration. Standard compaction tests will be carried out on Zone 1 materials sampled from the nominated borrow areas to indicate SDMM and OMC values. Natural moisture content tests will determine whether the material requires moisture conditioning or drying out prior to use as embankment fill. The new embankments will tie into the existing embankments by removing approximately 0.5 m of the outer material from the existing structure to relatively moist, original embankment. This area would then be built in horizontal layers to marry the material.

7.3.3 Stormwater storage pond modifications

Partial infilling of the existing SSP spillway invert is required to form an invert at RL 405.2 m (Figure 7.1). The spillway length will also be increased from 50 m to 200 m and erosion protection materials placed across the invert and on the downstream slope of the spillway extension. The embankment crest will be regraded and a wearing coarse layer placed to provide all weather access as part of the Stage 12A raise works.

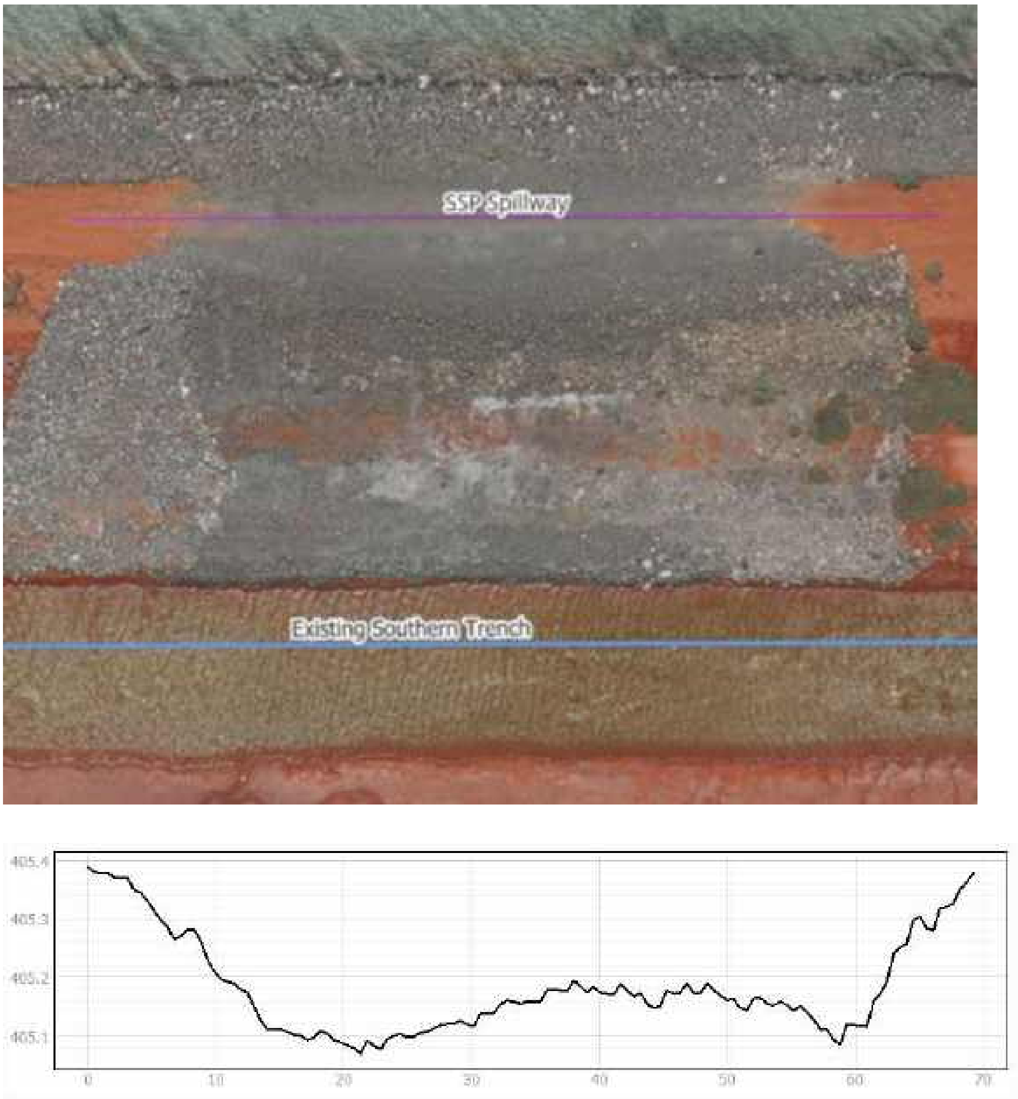


Figure 7.1 Existing SSP spillway geometry

7.3.4 *Seepage interception trench modifications*

The Stage 12A embankment raise works have allowed for connection of the Stage 10 and southern seepage interception trenches, joining both trenches downstream of the SSP (as shown on Figure 5.9) to create a continuous, return water collection system around the south and western perimeter of the CTD.

Construction works will involve excavation of the seepage collection trench extension along the lines, grades and levels, in accordance with the supporting technical specifications (and as per the requirements of all excavation activities as part of the Stage 12 construction works).

Material arising from excavation works (that are not deemed suitable for re-use) will be appropriately disposed of (or stockpiled), as directed by the relevant AGAA personnel.

7.3.5 Eastern diversion levee modifications

Extension of the existing diversion levee bund north of the existing alignment has been incorporated into the Stage 12A construction works. The intent of the extension works is to reduce the potential for stormwater bypassing the northern end of the levee.

As with the Stage 12A embankment raise works at the CTD, it is anticipated that all the necessary foundation preparation works will be completed by the contractor. The diversion levee bund extension works will utilise Zone 1 material which will be placed, conditioned, compacted and tested in accordance with the minimum requirements of the supporting technical specifications. Zone 5 erosion protection will be placed against the upstream side of the levee bund to a distance of 150 m either side of the northernmost drainage line intercepted by the bund.

7.4 Construction schedule

Based on AGAA’s schedule and budget allocations, Stage 12A construction works are anticipated to commence in Q4 2025 (pending the necessary regulatory approvals and contractor availability). It is estimated that construction of the Stage 12A design components will take approximately 6 months. Stage B works are expected to commence in Q2 2029 ready for deposition by Q1 2030.

7.5 Construction management controls

The following sub-sections present a summary of the construction management control measures to mitigate the potential impacts of the Stage 12 construction works on sensitive environmental receptors.

7.5.1 Noise

During the Stage 12 construction works, every effort shall be made to limit excessive disturbances as a result of construction activities (i.e., noise and/or vibrations). The relevant sub-contractor should endeavour the manage plant traffic in a way that mitigates noise and ground disturbances, particularly in areas close to welfare and office spaces. In addition, the construction plant should only be in services during select operating hours (at the discretion of the relevant AGAA personnel).

7.5.2 Dust

During the Stage 12 construction works, land disturbances and the general transportation and placement of dry borrow fill material may result in increased risk of airborne dust (particularly during periods of hot, dry and windy weather). Whilst moisture conditioning efforts may mitigate the risk of dust as part of the embankment raise construction works, areas such as material stockpiles and/or borrow fill excavation zones may be susceptible to dust generation.

It is the responsibility of the relevant sub-contractors to develop appropriate dust mitigation measures during the Stage 12 construction works to mitigate the disturbance (and/or compromise) of the placed, conditioned, compacted and tested embankment fill.

7.5.3 Stormwater/Surface water

During the Stage 12 construction works, temporary stormwater/surface water control measures may be required to safely facilitate site access, as well as maintain the integrity of placed, conditioned, compacted and tested embankment fill.

It is the responsibility of the relevant sub-contractor to manage stormwater/surface water control measures, as and when required. Where such measures are required, construction works should be managed in a way that limits disturbance of the surrounding environment.

All stormwater/surface water controls are considered as *temporary* works. Therefore, all disturbances associated with such measures are to be restored, as per the requirements of the supporting construction specification.

7.5.4 Erosion and sediment control

As with the stormwater/surface water control measures, temporary erosion and sediment controls measures may also be required to safety facility construction works, as well as maintain the integrity of placed, condition, compacted and tested embankment fill material (either generally throughout construction works, or during periods of inclement weather).

It is the responsibility of the relevant contractor or sub-contractor to manage such erosion and sediment control measures, as and when required. Where such measures are required, construction works should be managed in a way that limits disturbance of the surrounding environment.

All erosion and sediment control measures are considered as *temporary* works. Therefore, all disturbances associated with such measures are to be restored, as per the requirements of the supporting construction specification.

7.5.5 Hydrocarbon management

It is the responsibility of the relevant contractor or sub-contractor that all plant onsite are equipped with fully functional spill response kits capable of containing and isolating spilled fluids (i.e., hydraulic oils, fuel, etc.). In the event such incidents occur, the relevant AGAA environmental officers are to be contacted (immediately after the spillage has been contained) to confirm the necessary response and disposal procedure.

8 Operating procedures

8.1 General

Operating procedures for the SDGM CTD TSF are described in the facility operating manual (WSP, 2023b) and in general accordance with DEMIRS requirements (DMP, 2015b).

A summary of the procedures for tailings deposition, water management, and dust management is provided in this section.

8.2 Tailings deposition

Tailings are pumped through the tailings delivery line to the top of the tailings beach, where manifolds have been installed to direct flow to spigot discharge points along multiple deposition fingers or causeways at the top surface of the beach. These deposition fingers generally define nine deposition sectors, as illustrated in Figure 8.1.

Spigot extension pipes of various sizes (typically between 63 to 90 mm) have been installed to direct tailings flow onto the upper tailings beaches, with extensions typically reaching 100 m to 200 m from the end of the deposition fingers. During active deposition, extension pipes may be incrementally repositioned within the deposition sector to optimise beach development. Additional spigots are available along the access causeway, and alternative deposition techniques, such as strategic slot cutting along extension lines, may be used to create localised “geyser” deposition points if needed.

The primary objective of deposition is to reduce erosion on the upper beach, promote low-energy discharge, and control tailings distribution to prevent the formation of erosive channels further down the beach. While Sectors 1 to 5 are the primary deposition areas for expanding the tailings footprint southeast, periodic deposition into the northern sectors (Sectors 7 to 9) may be necessary to manage overall deposition velocity, particularly during low-solids concentration periods. In such cases, additional spigots and more frequent discharge point adjustments may need to be required to limit deep erosion gullies, which can then be naturally infilled once target solids concentrations are restored.

Deposition into the expansion area has resulted in a flatter beach profile in the middle section of the beach at Sectors 1 to 4, as observed in Figure 8.2. This is primarily due to the efforts to cover the exposed natural ground basin with tailings.

Targeted deposition towards the CTD TSF perimeter in sectors 1 and 2 has been undertaken to displace ponded water against the eastern perimeter embankment and develop a uniform perimeter profile for released bleed water and incidental stormwater to flow towards the western decant inlet sumps.

(Jan 2025 Beach)

Figure 8.1 CTD TSF deposition sectors

Figure 8.2 Tailings beach development in the expansion area

8.3 Water management

8.3.1 Operational water management

Surface runoff from the tailings beach, from both excess supernatant liquor and rainfall, flows to the beach toe along the CTD TSF perimeter and flows around to the western quadrant of the facility where it gravity-drains to the decant ponds / stormwater storage pond (SSP).

In the Stage 10 expansion area, where deposition has been occurring over natural topography, localised ponds have occasionally formed at the TSF perimeter until sufficient tailings have been deposited to re-instate perimeter flow. Notably, ponding has occurred in the north-eastern perimeter area (Sectors 1 and 2) due to the presence of an elevated ridge at the eastern edge of the Stage 10 deposition area. This has been managed by use of a mobile pump set-up as required.

Completion of the Stage 12 raise will enable the full expansion area footprint to be filled with tailings and the generation of a consistent tailings beach slope along the perimeter embankment, as per the original CTD Northern area. This will direct all surface water to the western quadrant and decant pond / stormwater storage pond (SSP).

Two concrete decant inlet sumps are installed on the upstream side of the CTD embankment opposite each of two lined decant ponds located in the northern and southern corners of the SSP, to allow gravity drainage of surface water through the western embankment into the lined ponds. As the tailings level rises, the sumps are raised periodically using 300 mm high segmental concrete rings. The two lined decant ponds can each hold approximately 28,000 m^3 of water.

Two additional decant inlet sumps are located at higher elevation close to the primary inlet sumps (approximately 200 m south of the primary inlet sumps to the North decant pond and 80 m north of the primary inlet sumps to the South decant pond). These accommodate drainage of ponded water directly into the unlined SSP area under 1:10 and 1:20 AEP events, when the lined decant ponds are full and discharging via spillways into the SSP. For less frequent storm events, where a larger pond develops at the western perimeter of the tailings deposition area, excess water is transferred to the SSP via the internal spillways.

In the event that the SSP pond depth approaches (or exceeds) the nominated maximum operating pond depth of 1.8 m (Section 6.1) due to successive, significant storm events such as those experienced in Q1 2024, additional pumping effort will be required to draw down water levels to below the maximum operating pond level.

The SSP pond water depth was drawn down from a maximum of 3.65 m in March 2024 to 1.8 m over approximately 14 weeks. The average pond volume reduction was approximately 4,270 m^3/day during this period. It is estimated that approximately 47% of this was due to evaporation and seepage, since the average pumping rate from the CTD to the process plant was 2,275 m^3/day.

8.3.2 Emergency water management

The SSP has an emergency external spillway to protect the integrity of the embankment in an extreme flooding event. Since commencement of operations in 1999, the SSP external spillway has not flowed, although significant rainfall events in Q1 2024 resulted in the SSP water level rising to within 1.2 m of the spillway invert level.

The design intent is for any emergency flow from the SSP emergency external spillway to flow into the southern seepage trench, which under extreme flooding conditions would overflow at its northern end and transfer floodwaters westwards to Lake Carey.

Increasing the length of the spillway is proposed as part of the Stage 12A embankment raise works to further reduce the likelihood of SSP embankment overtopping.

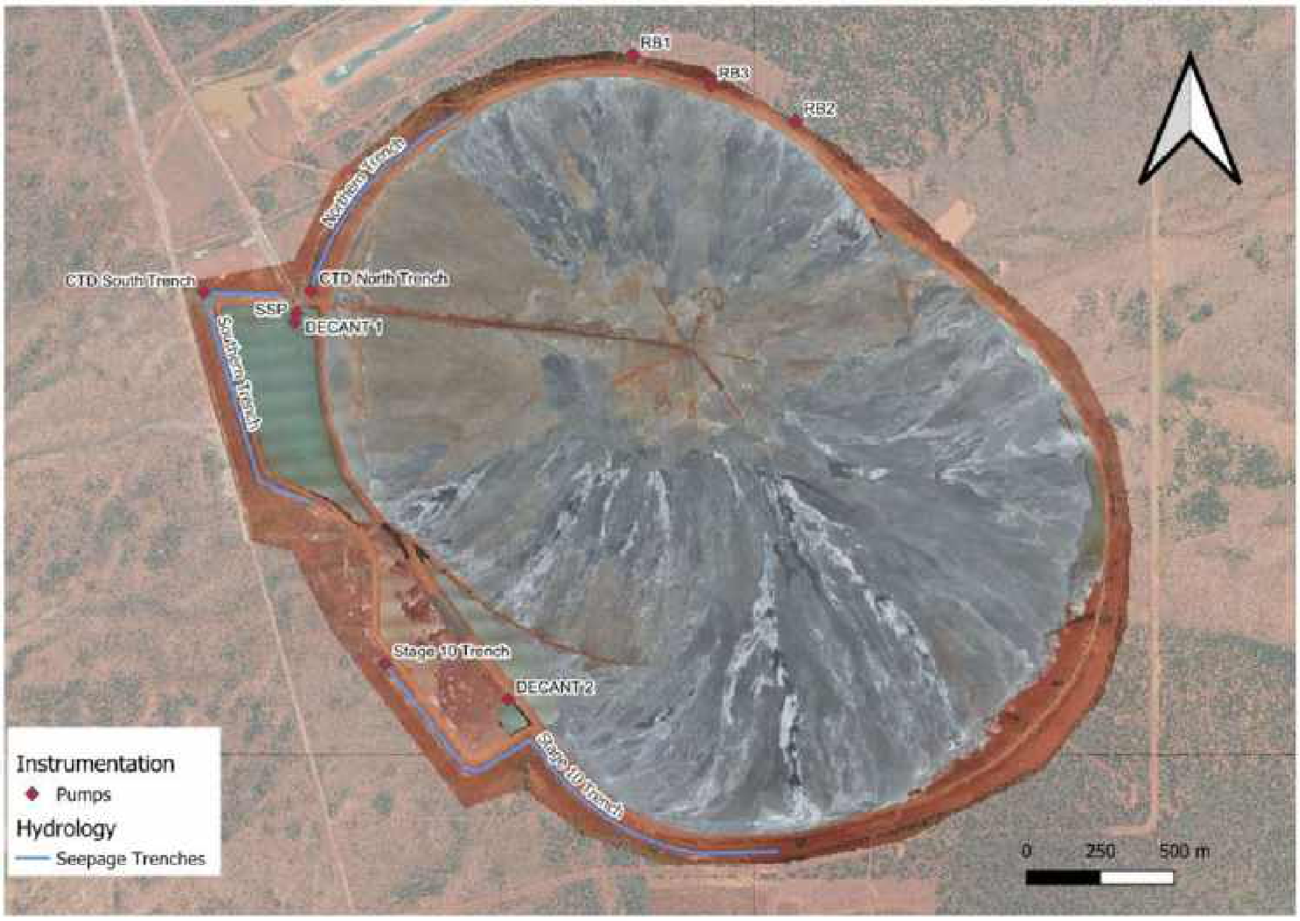
8.3.3 Seepage and groundwater management

A significant portion of the process water at SDGM is recovered from seepage/groundwater collection trenches at the CTD TSF.

The trenches are designated:

- Northern Trench: Water extracted from three seepage recovery bores near the northern topsoil stockpile (RB1–RB3) is also discharged to this trench via HDPE pipelines.
- Southern Trench: Truncated and backfilled during Stage 10 construction, but previously extended (as the "east trench") around the Stage 11 southern perimeter.
- Stage 10 Trench: Water level in this trench generally reflects the upgradient groundwater elevation.

The layout of the CTD TSF water recovery and pumping infrastructure is shown in Figure 8.3.



(Jan 2025 Beach)

Figure 8.3 Seepage recovery infrastructure

Each trench is equipped with dewatering pumps (electric pumps in the Northern and Southern trench and a trailer-mounted diesel pump in the Stage 10 trench) that transfer water to the lined northern decant pond for recovery to the process plant via the DECANT 1 pump station. Stormwater accumulation in the SSP is also pumped via a sump pump into the northern decant pond.

Groundwater modelling (SRK, 2025) predicts a continuation of the decline in water levels at the CTD TSF following the peak in early 2024 caused by large rainfall events in January and March 2024. It was concluded that continuing CTD TSF operation and implementation of existing seepage mitigation measures should result in little impact on existing groundwater levels which are most sensitive to large rainfall and flooding events.

Connection of the Stage 10 trench and Southern trench, proposed as part of the Stage 12 works will enable improved control of groundwater levels in the central area downstream of the SSP following groundwater recharge by large rainfall events.

8.3.4 External surface water management

External surface runoff from the area upstream of CTD TSF is diverted around the facility via a bunded drainage channel at the northern perimeter and a diversion berm / drain on the east side of the facility. The locations of diversion drains are illustrated on Figure 3.8.

8.4 Dust management

The saline nature of the SDGM process and decant water results in a salt crust developing on the tailings surface which mitigates against excessive dust generation. When the salt crust is locally eroded by channelling below deposition points, or dissolution occurs after rainfall, dust can be generated under windy conditions until the salt crust is regenerated as the wetted beach dries out. In these circumstances, dust management is implemented by adjusting the tailings deposition sequence such that fresh, wet tailings is deposited over the affected areas and during pipe flushing, when water is discharged from the tailings lines.

Dust generation has not been a significant issue at the CTD for its 25 years of operation.

9 Monitoring and inspections

9.1 Groundwater, surface water and seepage monitoring

Conditions 9, 14, 19, and 20 of Licence L8579/2011/2 specify the following requirements for groundwater, surface water, and seepage water monitoring:

- A seepage collection and recovery system must be provided and utilised to capture seepage from the TSF, with the captured seepage returned to the TSF or reused in the process plant.
- The Stormwater Storage Pond (SSP) on the TSF must be managed to maintain capacity for a 1:100 year, 72-hour rainfall event.
- All water samples, including surface water and groundwater, must be collected in accordance with AS/NZS 5667.11 and analysed by a laboratory with current NATA accreditation for the relevant parameters.
- Monthly monitoring of recovered seepage volumes is required.
- Annual ambient groundwater quality monitoring is mandated through sampling from specific groundwater monitoring bores (currently conducted quarterly):
- CTD MB's 2/2A, 3, 7, 11A/B, 13, 16, 24A/B, 29A/B, 30A/B, 31–41 A/B/C.
  - The test parameters include:
  - pH, SWL, TDS, WAD-CN, Na, K, Ca, Mg, As, B, Cr, Cu, Pb, Mn, Ni, and Se.

9.2 TSF Inspections

Condition 10 of Licence L8579/2011/2 outlines the inspection and record-keeping requirements for the TSF as follows:

- Twice daily inspections of the tailings pipelines and return water lines.
- Daily inspection of TSF and SSP embankment freeboard to confirm compliance with the required freeboard capacity, along with a visual assessment of tailings beaching.
- Daily assessment of the decant pond and stormwater storage pond, including their size and position.
- Additional observations made during routine daily inspections include:
- Tailings deposition – including location of open spigots, flow rate at spigots, beach formation, beach erosion, low points.
- Integrity of embankment – including any evidence of seepage, cracking, instability, depressions, erosion
- Integrity of geomembrane liners – including visually inspecting the exposed liner for tears, wrinkles, uplift and sagging of liner
- Condition of windrows along embankment crest and ramps
- Dust generation on the TSF
- Any fauna observed on or around the TSF or fauna deaths on or around the TSF
- Changes to previously identified items of concern (e.g., cracking, seepage).

Monthly inspections are completed by the processing manager and/or their delegate to assess all aspects of the TSF covered in the daily inspections, with additional attention to the following:

- any issues or anomalies identified in the daily inspections during the previous month
- condition of embankment – as per daily inspections but shall also include inspection of the downstream toe of the embankment and other areas that would not be readily observed during the daily inspection
- any observable changes to the characteristics of the tailings
- decant system operation and TSF water balance
- any trends or trigger level exceedances in the monitoring data
- the recordkeeping of the daily inspection sheets and monitoring data.

Quarterly inspections are completed by the RTFE, six monthly inspections by the EoR and annual inspections by the ITRB.

An annual operational review (audit) of the TSF is carried out by a suitably qualified third-party engineer (SRK) which includes a site visit, review of the accumulated data and an assessment of the TSF performance.

10 Closure considerations

10.1 CTD TSF rehabilitation strategy

The high strength consolidated tailings surface with a gently sloping self-shedding stable surface will permit early accessibility and trafficability of equipment for rehabilitation and closure works. Completion of rehabilitation will be undertaken according to the approved Mine Closure Plan (Anglogold Ashanti Australia, 2024b). Conceptual details of the facility rehabilitation and closure are provided in (MBS Environmental, 2014) and the SDGM Mine Closure Plan (Anglogold Ashanti Australia, 2024b).

The access road and service corridor will be rehabilitated by deep ripping and seeding when they are no longer required. The seepage collection trenches will be dewatered and filled in.

The surface of the tailings will be capped with a cover layer to break the capillary rise of salts from the tailings surface. The conceptual detail of the cover (MBS Environmental, 2014) is:

- A 300 mm (Upper and Middle zones) and 500 mm (Outer zone) layer of competent waste rock over entire tailings surface.
- A 200 mm layer of low to moderate salinity, gravelly subsoil over the waste rock (Upper and Middle zones).
- A 50 mm layer of topsoil over the subsoil (Upper and Middle zones).
- Access tracks, constructed of competent waste rock, located at 50 m intervals on the contour.
- Scarifying and mixing topsoil and gravelly subsoil layers into the upper surface of the waste rock layer.
- Establishing a vegetated cover of salt-tolerant species on the upper and middle slopes of the CTD-TSF.

The stockpiled topsoil located to the north and south of the CTD TSF is expected to be non-saline to moderately saline (Stantec, 2024) and support good growth of plant species on the basis that the cover layer will break the capillary rise of salts. In the absence of sufficient and readily accessible sources of low to moderate salinity subsoils and due to the limited availability of stockpiled and fresh topsoil, a subsoil/topsoil cover may be excluded from the low-lying outer zone areas of the CTD TSF.

10.2 Rehabilitation trials

The rehabilitation process will require an understanding of the factors influencing rehabilitation and regrowth of vegetation. Research into the rehabilitation of tailings storage facilities in arid environments is limited but is increasing with the current emphasis on the rehabilitation of mining operations.

Rehabilitation trials on selected portions of the surface of the CTD beach will provide the opportunity to develop a rehabilitation prescription for the final closure of the CTD system. Field trials on the CTD TSF will be required prior to proposing a full-scale rehabilitation program.

11 Limitations

This Report is provided by WSP Australia Pty Limited (*WSP*) for AngloGold Ashanti Australia (*Client*) in response to specific instructions from the Client and in accordance with WSP's proposal dated 30 August 2021 and agreement with the Client SD-P-21-044 dated 16 June 2022 (*Agreement*).

Permitted purpose

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Appendix A

Design certificate and TSDS

CERTIFICATION OF COMPLIANCE

Tailings storage facility design report

For and on behalf of ......WSP...

I, ...[redacted]..

being a duly authorised officer of the above company and a qualified geotechnical engineer holding professional registration by a professional body, do hereby certify and confirm that the Stage 12A and 12B raise of the CTD tailings storage facility at the Sunrise Dam mine site has been designed in accordance with the current edition of the *Tailings storage facilities in Western Australia* - code *of practice* issued by the Department of Mines and Petroleum, Western Australia and the design is referenced as

Sunrise Dam Gold Mine - Central Thickened Deposition Tailings Storage Facility, Stage 12 Raise Design Report (PS202899-WSP-PER-REP-003 Rev0) ....

[redacted]

Date: ....8/04/2025...

TAILINGS STORAGE DATA SHEET

Project operator *AngloGold Ashanti Australia Ltd*			
Project name SDGM CTD TSF Stage 12 Detailed Design			Date: ***February 2025***
TSF Name: ***CTD TSF***		Commodity: ***Gold***	
Name of data provider: ***AngloGold Ashanti***			Phone: ***(08) 9080 3612***
TSF centre co-ordinates (GDA 94)	**6,779,540**	m North ***447,450***	m East
Mining Tenement and Holder(s) details: ***M39/1116 - Anglogold Ashanti Australia Limited***			
TSF data			
TSF Status: Proposed ☐ Active ☑ Non Active ☐ Decommissioned ☐ Rehabilitated ☐ Closed ☐			
Type of TSF: [1] ***Central Thickened Discharge***		Number of cells: [2] ***1***	
Hazard rating: [3] ***Significant***		TSF category: [4] ***Category 1***	
Catchment area: [5] **~ 530 *ha***		Nearest watercourse: **Lake Carey**	
Date deposition started (mm/yy): ***Dec 1999***		Date deposition completed (mm/yy): ***N/A***	
Tailings discharge method: [6] ***Multiple central spigot discharge (via central access causeway)***		Water recovery method: [7] ***External decant pond system***	
Bottom of facility sealed or lined? ***No***		Type of seal or liner: [8] ***Clayey gravel***	
Depth to original groundwater level	***5.5 m BGL***	Original groundwater TDS/pH: **70,000 mg/L / 7.3**	
Ore process: [9] ***CIL***		Material storage rate: [10] **4.1 Mtpa**	
Impoundment volume (present)	***49.82 Mm^3(Jan 2025)***	Expected maximum	***67.92 Mm^3***
Mass of solids stored (present)	***89.76 Mt (Jan 2025)***	Expected maximum	***119.37 Mt***
Above Ground Facilities			
Foundation soils ***Clayey gravel***		Foundation rocks ***Ferricrete***	
Starter bund construction materials: [11] ***Gravelly clay and waste rock***		Wall lifting by: Upstream ☑ Downstream ☑ Centre Line ☑	
Wall construction by: ***Various contractors***		Wall lifting material: [12] Mechanically ☑ Hydraulically ☐	
Present maximum wall height (above ground level): [13]	***8.5 m***	Expected maximum	***8.5 m***
Crest length (present)	***9,000 m***	Expected maximum	***9,500 m***
Impoundment area (present)	***514.4 ha***	Expected maximum	***514.4 ha***
Below ground (in pit) facilities			
Initial pit depth (maximum)	-	Area of pit base	-
Thickness of tailings (present)	-	Expected maximum	-
Current surface area of tailings	-	Final surface area of tailings	-
Properties of tailings and return water			
TDS ***120,000 mg/L (average)***	pH ***8.5 (tailings)*** ***8.1 (decant)***	Solids content: ***63 %***	Deposited density estimated: ***1.8 t/m^3 (overall deposit)***
Potentially hazardous substances: [14] ***CN, Caustic***		WAD CN: ***60 mg/L (average)***	Total CN: ***85 mg/L (average)***
		Any other NPI listed substances in the TSF? [15]	Yes

Explanatory notes for completing tailings storage data sheet

The following notes are provided to assist the proponent to complete the tailings storage data sheet.

1 Paddock (ring-dyke), cross-valley, side-hill, in-pit, depression, waste fill, central thickened discharge, stacked tailings

2 Number of cells operated using the same decant arrangement

3 See Table 1 – Hazard rating system in the Code of practice

4 See Table 2 – Matrix of hazard ratings in the Code of practice

5 Internal for paddock (ring-dyke) type, internal plus external catchment for other facilities

6 End of pipe, (fixed), end of pipe (movable) single spigot, multi-spigots, cyclone, central thickened discharge (CTD)

7 Gravity feed decant, pumped central decant, floating pump, wall/side mounted pump

8 Clay, synthetic

9 See list below for ore process method

10 Tonnes of solids per year

11 Record only the main material(s) used for construction, e.g. clay, sand, silt, gravel, laterite, fresh rock, weathered rock, tailings, clayey sand, clayey gravel, sandy clay, silty clay, gravelly clay or any combination of these materials

12 Any one or combination of the materials listed under item 11 above

13 Maximum wall height above the ground level (not AHD or RL)

14 Arsenic, Asbestos, Caustic soda, Copper sulphide, Cyanide, Iron sulphide, Lead, Mercury, Nickel sulphide, Sulphuric acid, Xanthates, radioactive elements

15 NPI - National pollution inventory
(contact Department of Environmental Protection for information on NPI listed substances)

Ore process methods

The ore process methods may be recorded as follows:

Acid leaching (Atmospheric)

Acid leaching (Pressure)

Alkali leaching (Atmospheric)

Alkali leaching (Pressure)

Bayer process

Becher process

BIOX

Crushing and screening

CIUCIP

Flotation

Gravity separation

Heap leaching

Magnetic separation

Ore sorters

Pyromet

SX/EW (Solvent extraction/Electrowinning)

Vat leaching

Washing and screening

Appendix B

Figures

SUNRISE DAM GOLD MINE - CTD TSF STAGE 12 RAISE

FOR

ANGLOGOLD ASHANTI

DRAWING LIST

DRAWING No.	DRAWING TITLE	REVISION
D001	LOCALITY PLAN AND DRAWINGS LIST	0
D002	EXISTING SITE CONDITIONS	0
D003	GENERAL ARRANGEMENT	0
D004	FOUNDATION PREPARATION PLAN	0
D005	CTD TSF EMBANKMENT RAISE PLAN	0
D006	CTD TSF EMBANKMENT RAISE LONG SECTION	0
D007	CTD TSF EMBANKMENT RAISE CROSS SECTION AND DETAIL	0
D008	SSP SPILLWAY PLAN	0
D009	SSP SPILLWAY SECTIONS AND DETAIL	0
D010	CRANE PADS PLAN AND SECTION	0
D011	SSP SEEPAGE COLLECTION TRENCH EXTENSION PLAN	0
D012	SSP SEEPAGE COLLECTION TRENCH EXTENSION SECTIONS	0
D013	DIVERSION LEVEE EXTENSION PLAN AND SECTION	0

GENERAL NOTES

1. ALL LEVELS ARE IN METRES TO AUSTRALIAN HEIGHT DATUM (AHD).
2. ALL CO-ORDINATES ARE IN METRES TO MAP GRID OF AUSTRALIA DATUM 94 (MGA94), ZONE 51.
3. BACKGROUND AERIAL IMAGE REPRODUCED WITH PERMISSION FROM www.bing.com/map (MICROSOFT CORPORATION) IN ACCORDANCE WITH THE SPECIAL SERVICES TERMS FOR AUTODESK LIVE MAP DATA.
4. CTD TSF SURVEY DATA AND AERIAL IMAGE SUPPLIED BY ROCKETMINE, DATED 05/10/2024.
5. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
6. DIMENSIONS SHALL NOT BE SCALED OFF DRAWINGS.
7. DRAWINGS SHALL BE PRINTED OUT IN COLOUR TO ENABLE DETAILS TO BE IDENTIFIED.

ISSUED FOR
APPROVAL

0 1,000 2,000
1:50,000 METRES

REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
0	2025-04-08	ISSUED FOR APPROVAL	P. CONOCONO	V. MATTAR	XXX	XXX

CLIENT
ANGLOGOLD ASHANTI

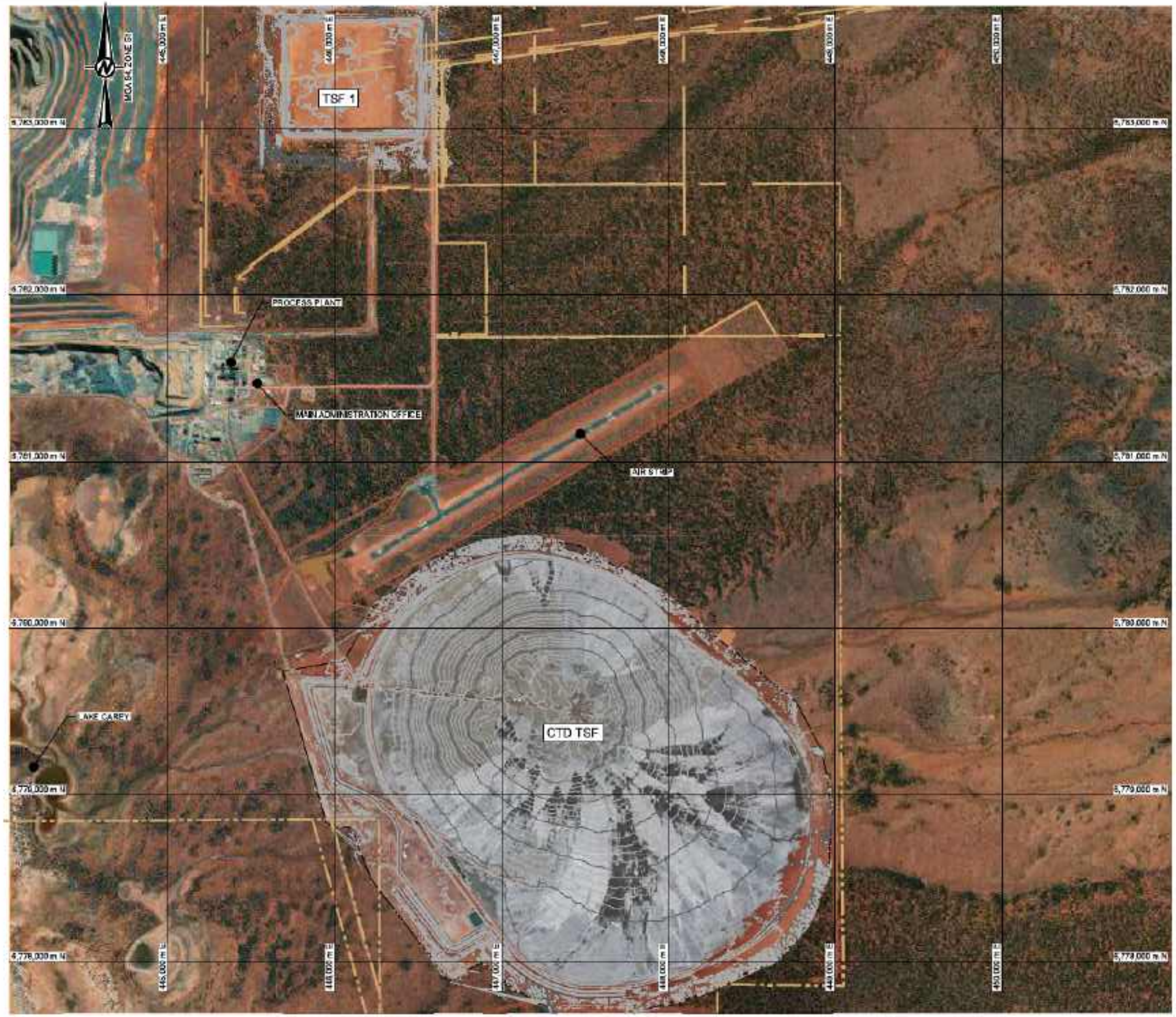
CONSULTANT

MIA YELLAGONGA LEVEL 3 TOWER 2
5 SPRING STREET
PERTH, WA 6000
AUSTRALIA
(+61) (8) 9489 9700

PROJECT
SUNRISE DAM CTD TSF STAGE 12 RAISE

TITLE
LOCALITY PLAN AND DRAWINGS LIST

PROJECT No.	DOCUMENT No.	REV. D001 of D013	FIGURE
PS202899	003-R	0	D001



LEGEND

—— 500 ——	EXISTING TOPOGRAPHICAL CONTOUR AND ELEVATION (mAHD)
— · · —	TENEMENT BOUNDARIES

REFERENCE(S)

1. CTD TSF SURVEY DATA SUPPLIED BY ROCKETMINE, DATED 05/10/2024.
2. TSF1 SURVEY DATA PROVIDED BY ROCKETMINE, DATED 08/05/2023.
3. CTD TSF AERIAL IMAGE DATED 05/10/2024.
4. BACKGROUND AERIAL IMAGE REPRODUCED WITH PERMISSION FROM www.bing.com/maps (© 2020 MICROSOFT CORPORATION) IN ACCORDANCE WITH THE SPECIAL SERVICES TERMS FOR AUTODESK® LIVE MAP DATA.

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0 500 1,000
1:25,000 METRES

REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
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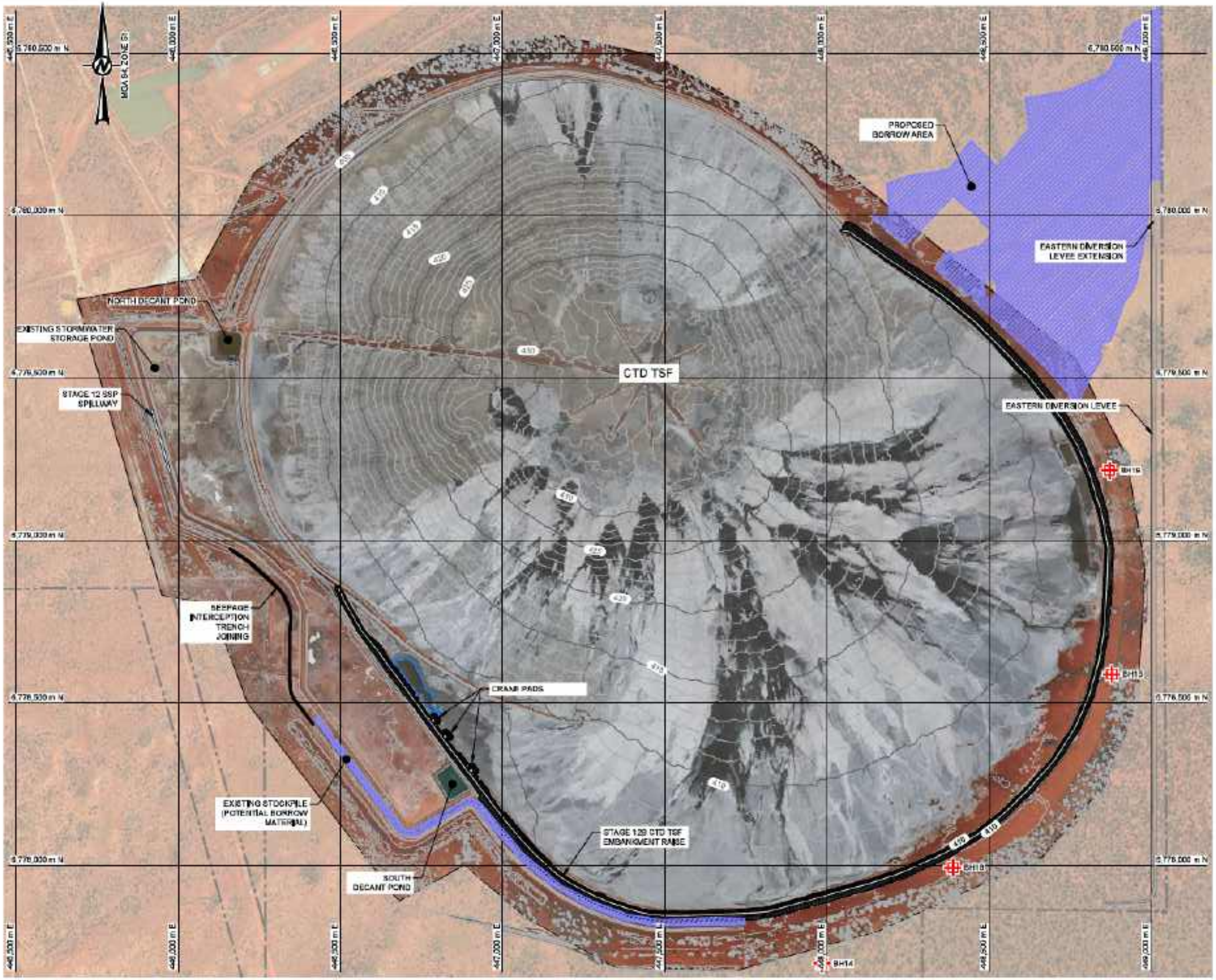
PROJECT
SUNRISE DAM CTD TSF STAGE 12 RAISE

TITLE
SUNRISE DAM EXISTING SITE CONDITIONS

PROJECT NO.	DOCUMENT No.	REV. D002 of D013	FIGURE
PS202899	003-R	0	D002



LEGEND

—— 500 ——	EXISTING TOPOGRAPHICAL CONTOUR AND ELEVATION (mAHD)
—— 500 ——	PROPOSED TOPOGRAPHICAL CONTOUR AND ELEVATION (mAHD)
▨	BORROW ZONES FOOTPRINT
— - - —	TENEMENT BOUNDARIES
⌖ (BH02)	BOREHOLE LOCATION (2024 GEOTECH INVESTIGATION)

REFERENCE(S)

1. SURVEY DATA SUPPLIED BY ROCKETMINE, DATED 05/10/2024.
2. TSF AERIAL IMAGE DATED 05/10/2024.
3. BACKGROUND AERIAL IMAGE REPRODUCED WITH PERMISSION FROM www.bing.com/maps (© 2020 MICROSOFT CORPORATION) IN ACCORDANCE WITH THE SPECIAL SERVICES TERMS FOR AUTODESK® LIVE MAP DATA.

2024 BOREHOLES SETOUT TABLE

POINT No.	EASTING (m)	NORTHING (m)
BH14	447,965.4	6,777,695.3
BH15	448,878.4	6,778,568.1
BH18	448,388.6	6,777,992.6
BH19	448,871.0	6,779,216.6

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APPROVAL

0 250 500
1:12,500 METRES

REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
0	2025-04-08	ISSUED FOR APPROVAL	P. CONOCONO	V. MATTAR	XXX	XXX

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PROJECT
SUNRISE DAM CTD TSF STAGE 12 RAISE

TITLE
SUNRISE DAM CTD TSF STAGE 12 RAISE
GENERAL ARRANGEMENT

PROJECT NO.	DOCUMENT No.	REV. D003 of D013	FIGURE
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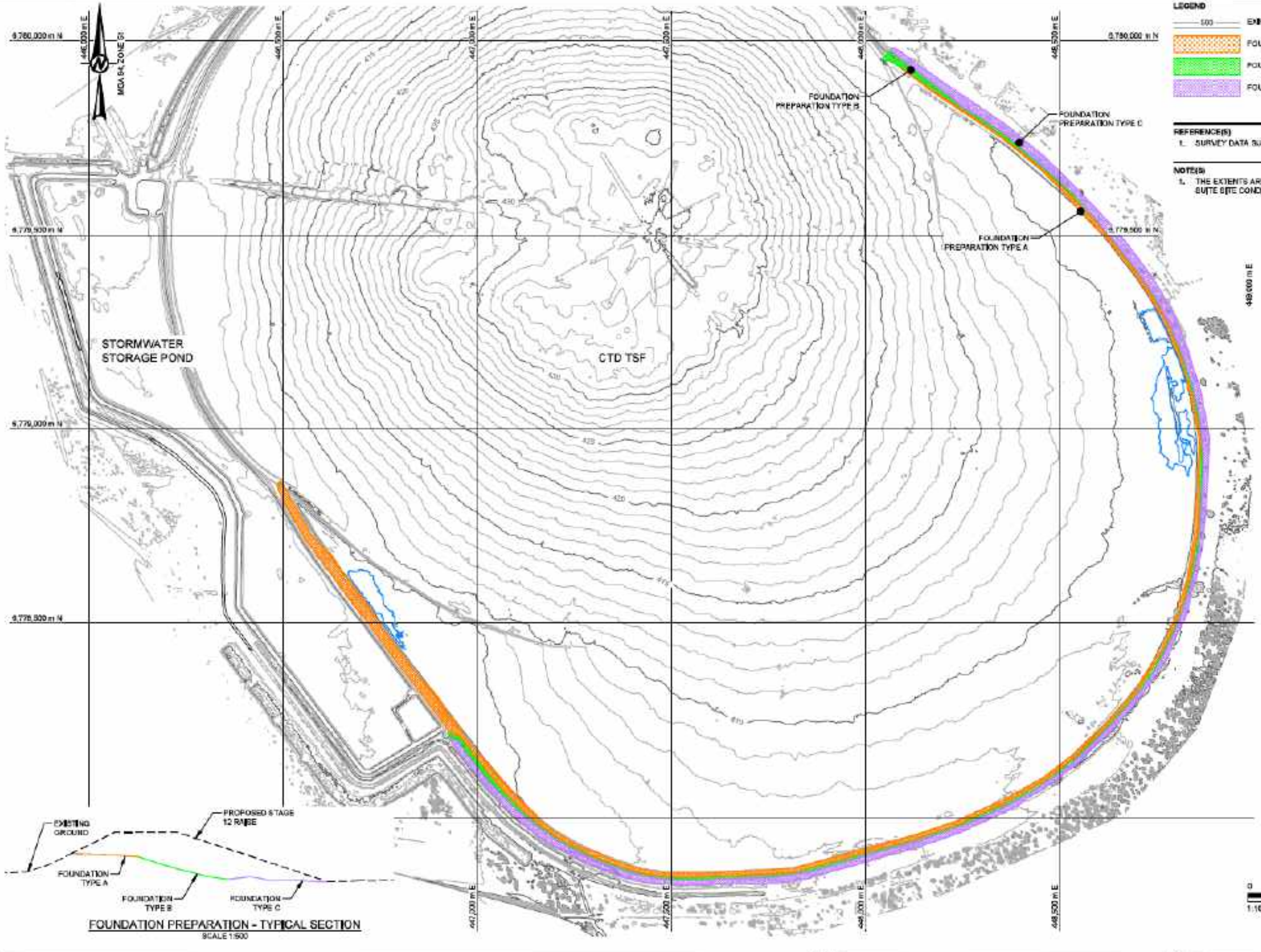

FOUNDATION PREPARATION - TYPICAL SECTION
SCALE 1:500

LEGEND

—— 500 ——	EXISTING TOPOGRAPHICAL CONTOUR AND ELEVATION (mAHD)
▨	FOUNDATION PREPARATION TYPE A (SEE NOTE 1 AND 2)
🟩	FOUNDATION PREPARATION TYPE B (SEE NOTE 1 AND 2)
▨	FOUNDATION PREPARATION TYPE C (SEE NOTE 1 AND 2)

REFERENCE(S)

1. SURVEY DATA SUPPLIED BY ROCKETMINE. DATED 05/10/2024.

NOTE(S)

1. THE EXTENTS ARE INDICATIVE ONLY AND GROUND PREPARATIONS MAY VARY TO SUITE SITE CONDITIONS.

ISSUED FOR
APPROVAL

0 10 20
1:500 METRES

0 250 500
1:10,000 METRES

0	2025-04-08	ISSUED FOR APPROVAL	P. CONOCONO	V. MATTAR	XXX	XXX
REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED

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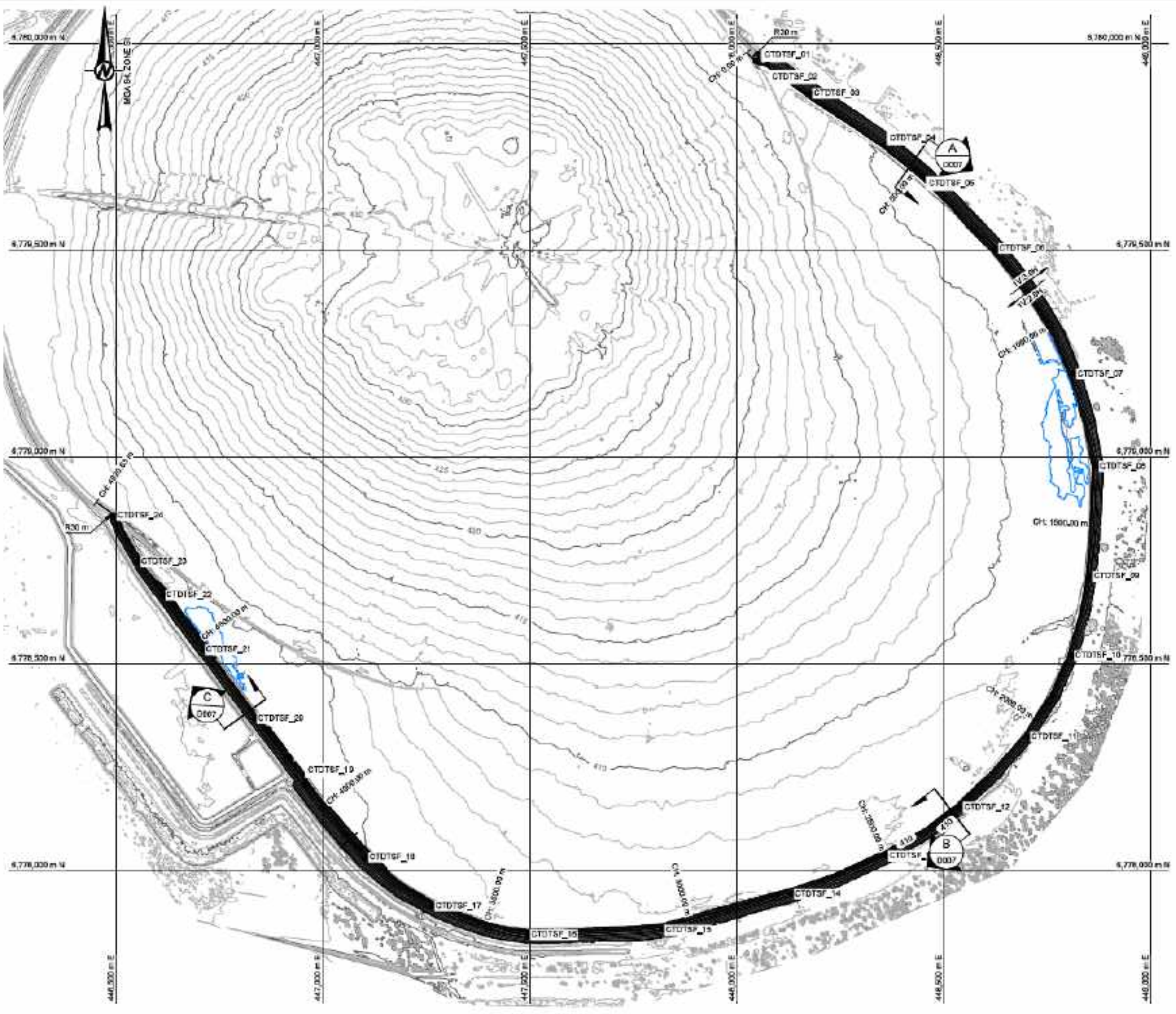
PROJECT
SUNRISE DAM CTD TSF STAGE 12 RAISE

TITLE
FOUNDATION PREPARATION PLAN

PROJECT No.	DOCUMENT No.	REV. D004 of D012	FIGURE
PS202899	003-R	0	D004



LEGEND

500 EXISTING TOPOGRAPHICAL CONTOUR AND ELEVATION (mAHD)

500 PROPOSED TOPOGRAPHICAL CONTOUR AND ELEVATION (mAHD)

● CTDTSF-01 CTD TSF EMBANKMENT STAGE 12 RAISE SETOUT POINTS

REFERENCE(S)

1. SURVEY DATA SUPPLIED BY ROCKETMINE. DATED 05/10/2024.

CTD TSF EMBANKMENT STAGE 12
RAISE SETOUT TABLE

POINT No.	EASTING (m)	NORTHING (m)	ELEVATION RL (m)
CTDTSF_01	448,045.2	6,779,956.8	414.7
CTDTSF_02	448,073.9	6,779,940.3	415.0
CTDTSF_03	448,176.3	6,779,878.3	414.9
CTDTSF_04	448,356.8	6,779,756.5	414.6
CTDTSF_05	448,449.0	6,779,681.0	414.5
CTDTSF_06	448,624.2	6,779,504.1	414.2
CTDTSF_07	448,813.0	6,779,200.0	413.9
CTDTSF_08	448,867.6	6,778,976.7	413.6
CTDTSF_09	448,852.7	6,778,711.3	413.4
CTDTSF_10	448,807.9	6,778,519.4	413.2
CTDTSF_11	448,701.4	6,778,320.0	412.9
CTDTSF_12	448,539.3	6,778,152.5	412.7
CTDTSF_13	448,358.9	6,778,034.9	412.5
CTDTSF_14	448,130.3	6,777,942.8	412.2
CTDTSF_15	447,818.0	6,777,855.9	411.9
CTDTSF_16	447,463.4	6,777,844.9	411.5
CTDTSF_17	447,262.4	6,777,913.9	411.3
CTDTSF_18	447,102.3	6,778,031.3	411.1
CTDTSF_19	446,955.0	6,778,207.2	410.9
CTDTSF_20	446,832.9	6,778,367.2	410.6
CTDTSF_21	446,707.8	6,778,530.7	410.4
CTDTSF_22	446,611.7	6,778,686.6	410.3
CTDTSF_23	446,551.1	6,778,746.4	410.2
CTDTSF_24	446,493.6	6,778,858.0	410.0

0 250 500
1:10,000 METRES

REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
0	2025-04-08	ISSUED FOR APPROVAL	P. CONOCONO	V. MATTAR	XXX	XXX

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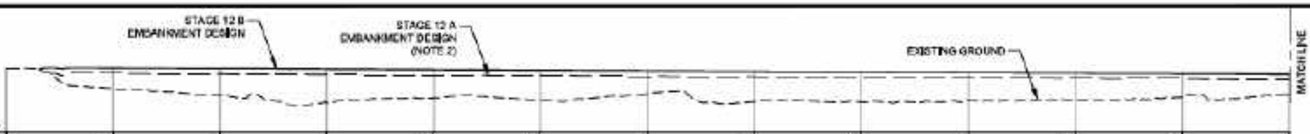
PROJECT
SUNRISE DAM CTD TSF STAGE 12 RAISE

TITLE
CTD TSF EMBANKMENT RAISE PLAN

PROJECT NO.	DOCUMENT No.	REV.	FIGURE
PS202899	003-R	0	D005

D005 of D013



STAGE 12 EMBANKMENT DESIGN		414.9	414.8	414.7	414.6	414.5	414.4	414.3	414.2	414.1	414.0	413.9	413.8
EXISTING GROUND	414.6	411.1	409.8	408.5	409.2	408.9	410.2	408.7	408.6	408.9	409.0	409.5	409.9
CUT AND FILL DEPTH (m)		3.8	5.0	6.2	5.3	5.6	4.2	5.6	5.6	5.2	5.0	4.4	3.9
CHAINAGE	0.0	100.0	200.0	300.0	400.0	500.0	600.0	700.0	800.0	900.0	1,000.0	1,100.0	1,200.0

CTD TSF EMBANKMENT STAGE 12 RAISE LONGITUDINAL SECTION (CHAINAGE 0 - 1,200 m)
HORI. SCALE 1:5,000
VERT. SCALE 1:1,000

STAGE 12 EMBANKMENT DESIGN	413.8	413.7	413.6	413.5	413.4	413.3	413.2	413.1	413.0	412.9	412.8	412.7	412.6	412.5	412.4	412.3	412.2	412.1
EXISTING GROUND	409.9	409.4	409.6	410.3	410.5	410.6	410.7	410.5	410.6	410.2	410.1	410.0	409.0	409.4	408.7	408.4	407.9	408.0
CUT AND FILL DEPTH (m)	3.9	4.3	4.0	3.2	2.9	2.7	2.5	2.6	2.4	2.6	2.6	2.7	3.6	3.1	3.6	3.9	4.2	4.0
CHAINAGE	1,200.0	1,300.0	1,400.0	1,500.0	1,600.0	1,700.0	1,800.0	1,900.0	2,000.0	2,100.0	2,200.0	2,300.0	2,400.0	2,500.0	2,600.0	2,700.0	2,800.0	2,900.0

CTD TSF EMBANKMENT STAGE 12 RAISE LONGITUDINAL SECTION (CHAINAGE 1,200 - 2,900 m)
HORI. SCALE 1:5,000
VERT. SCALE 1:1,000

STAGE 12 EMBANKMENT DESIGN	411.0	410.9	410.8	410.7	410.6	410.5	410.4	410.3	410.2	410.1		
EXISTING GROUND	407.8	407.7	407.9	407.8	407.9	407.8	407.2	407.3	407.9	407.9	405.7	405.8
CUT AND FILL DEPTH (m)	3.2	3.2	2.9	2.9	2.7	2.7	3.2	3.0	2.3	2.2		
CHAINAGE	3,900.0	4,000.0	4,100.0	4,200.0	4,300.0	4,400.0	4,500.0	4,600.0	4,700.0	4,800.0	4,900.0	4,920.0

CTD TSF EMBANKMENT STAGE 12 RAISE LONGITUDINAL SECTION (CHAINAGE 2,900 - 4,920 m)
HORI. SCALE 1:5,000
VERT. SCALE 1:1,000

LEGEND

500 EXISTING TOPOGRAPHICAL CONTOUR AND ELEVATION (mAHD)

500 PROPOSED TOPOGRAPHICAL CONTOUR AND ELEVATION (mAHD)

REFERENCE(S)

1. SURVEY DATA SUPPLIED BY ROCKETMINE, DATED 05/10/2024.
2. STAGE 12 A IS DESIGNED TO BE 1.0 m BELOW STAGE 12B

ISSUED FOR
APPROVAL

0 25 50
1:1,000 METRES

0 100 200
1:5,000 METRES

0	2025-04-08	ISSUED FOR APPROVAL	P. CONOCONO	V. MATTAR	XXX	XXX
REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED

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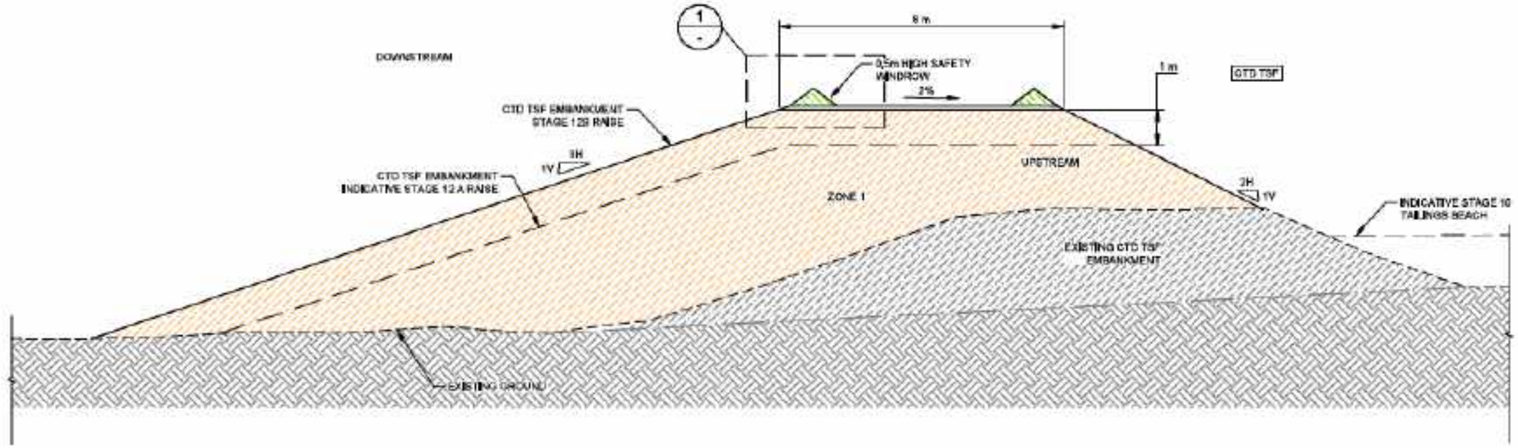
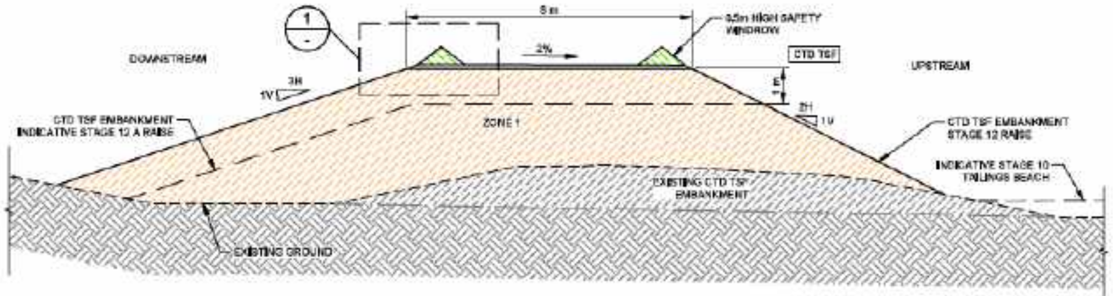
PROJECT
SUNRISE DAM CTD TSF STAGE 12 RAISE

TITLE
CTD TSF EMBANKMENT RAISE
LONGITUDINAL SECTION

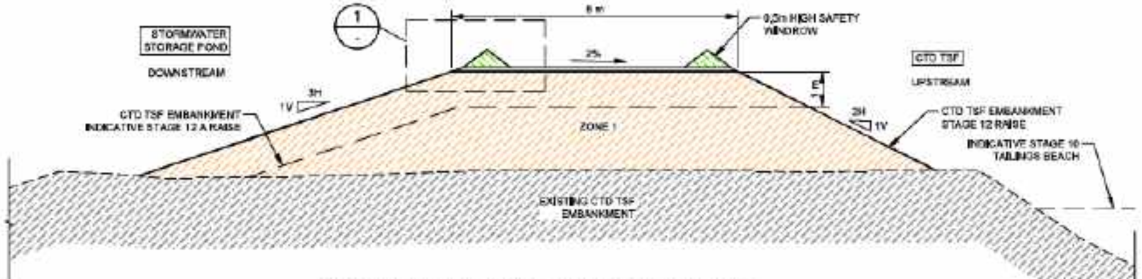
PROJECT NO.	DOCUMENT No.	REV. D006 of D013	FIGURE
PS202899	003-R	0	D006



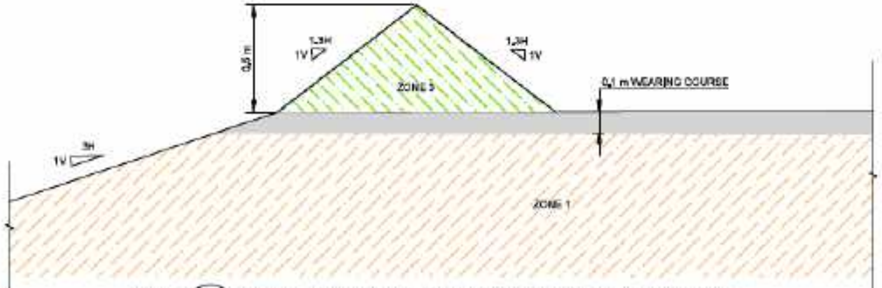
SCALE 1:150 (A / D005) CTD TSF EMBANKMENT STAGE 12 RAISE SECTION



SCALE 1:150 (B / D005) CTD TSF EMBANKMENT STAGE 12 RAISE SECTION



SCALE 1:150 (C / D005) CTD TSF EMBANKMENT STAGE 12 RAISE SECTION



SCALE 1:25 (1) CTD TSF EMBANKMENT STAGE 12 RAISE CREST TYPICAL DETAIL

LEGEND

▨	EXISTING GROUND
▨	EXISTING CTD TSF EMBANKMENT
▨	ZONE 1 - LOW PERMEABILITY MATERIAL
▨	ZONE 3 - SAFETY WINDROW MATERIAL
■	WEARING COURSE

REFERENCE(S)

1. SURVEY DATA SUPPLIED BY ROCKETMINE. DATED 05/10/2024.

ISSUED FOR
APPROVAL

0 0,5 1
1:25 METRES

0 2,5 5
1:150 METRES

REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
0	2025-04-08	ISSUED FOR APPROVAL	P. CONOCONO	V. MATTAR	XXX	XXX

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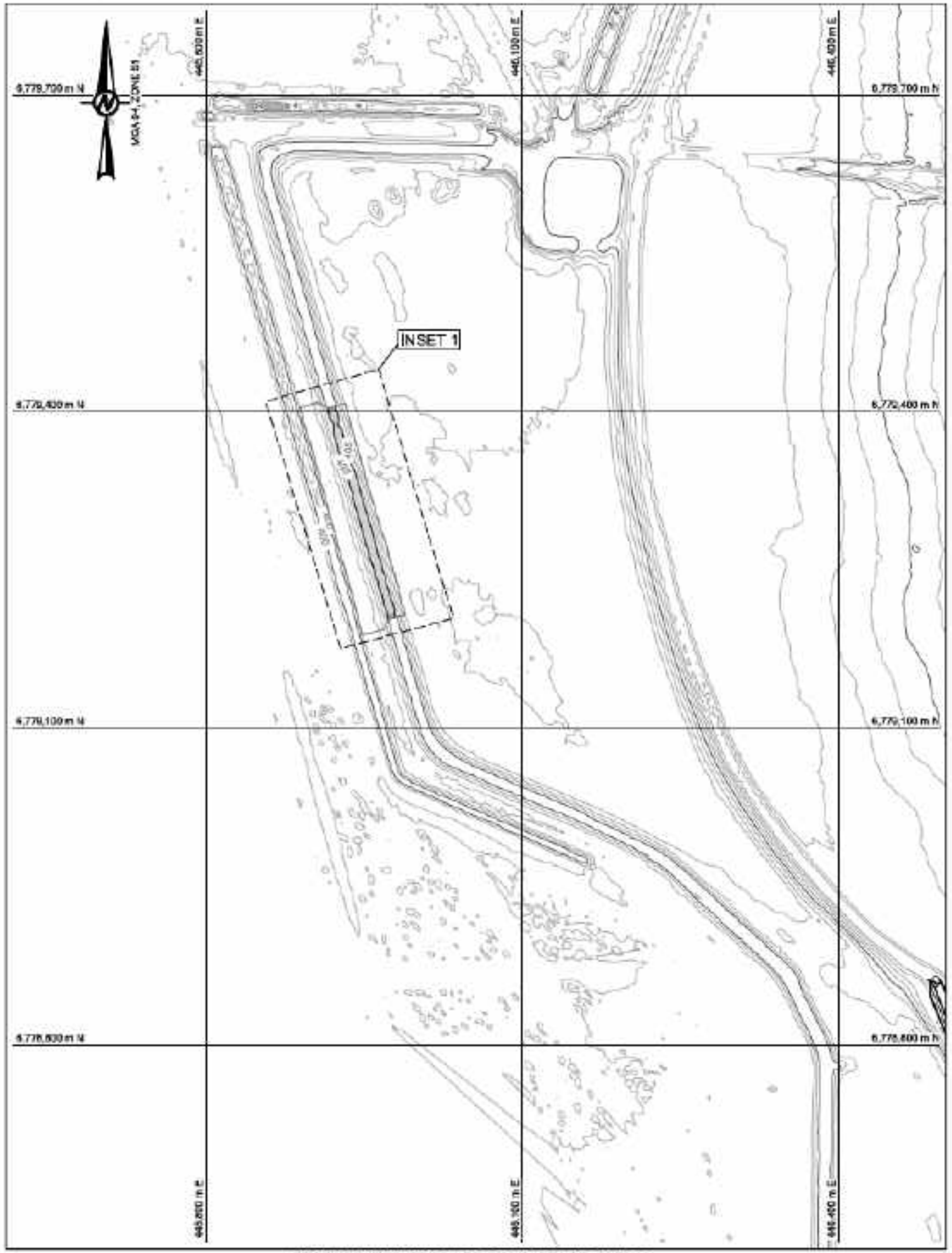
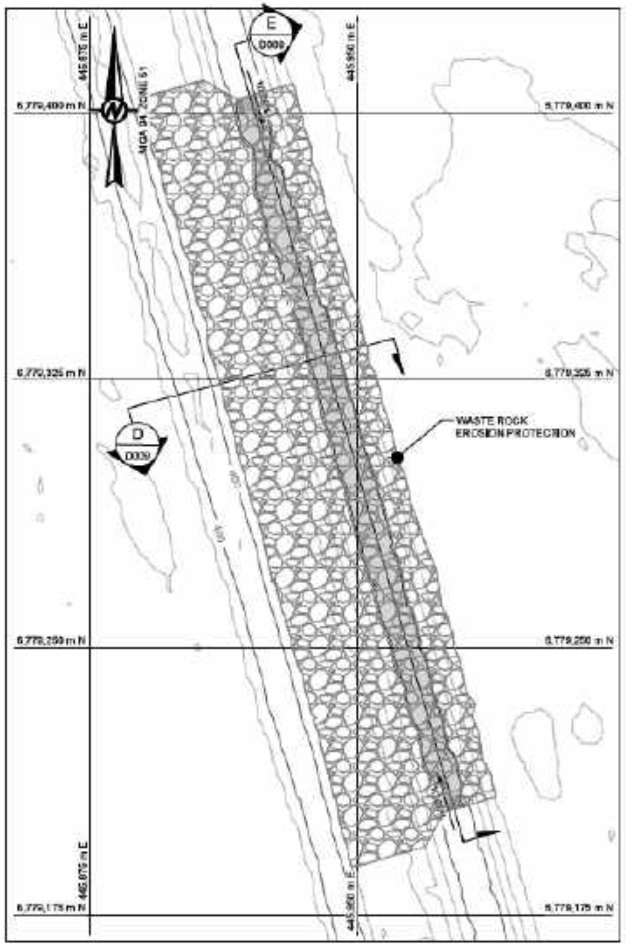
PROJECT
SUNRISE DAM CTD TSF STAGE 12 RAISE

TITLE
CTD TSF EMBANKMENT RAISE CROSS SECTION AND DETAIL

PROJECT NO.	DOCUMENT No.	REV. D007 of D013	FIGURE
PS202899	003-R	0	D007



STORMWATER STORAGE POND STAGE 12 PLAN
SCALE 1:5,000



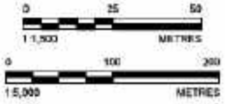
INSET 1 - SSP SPILLWAY STAGE 12
SCALE 1:1,500

LEGEND

500	EXISTING TOPOGRAPHICAL CONTOUR AND ELEVATION (mAHD)
500	PROPOSED TOPOGRAPHICAL CONTOUR AND ELEVATION (mAHD)

REFERENCE(S)

1. SURVEY DATA SUPPLIED BY ROCKETMINE. DATED 05/10/2024.



0	2025-04-08	ISSUED FOR APPROVAL	P. CONGCONO	V. MATTAR	XXX	XXX
REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED

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PROJECT
SUNRISE DAM CTD TSF STAGE 12 RAISE

TITLE
STORMWATER STORAGE POND EMBANKMENT RAISE AND SPILLWAY PLAN

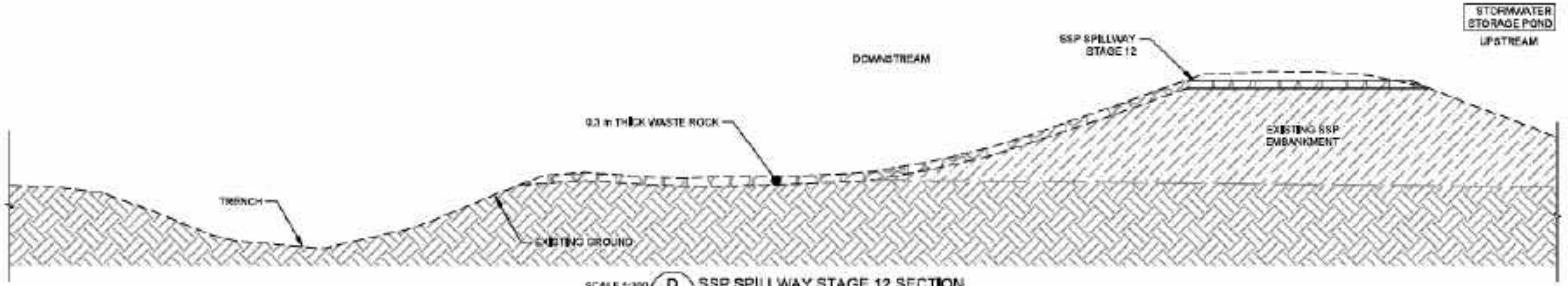
PROJECT NO.	DOCUMENT No.	REV. D008 of D013	FIGURE
PS202899	003-R	0	D008

LEGEND

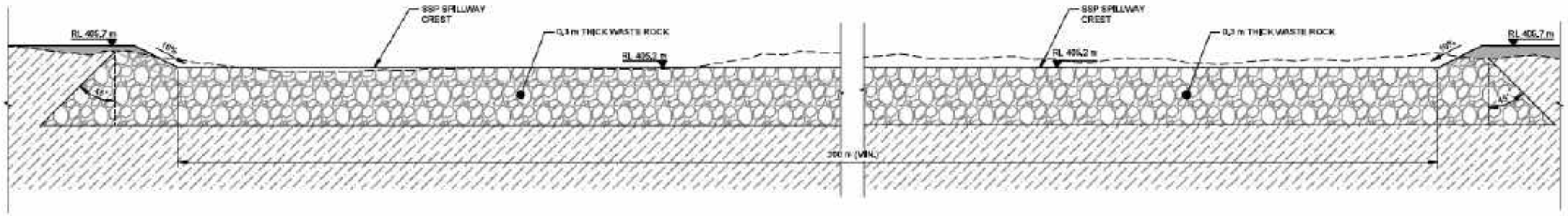
- ▨ EXISTING GROUND
- ▨ WASTE ROCK
- ▩ WEARING COURSE

REFERENCE(S)

1. SURVEY DATA SUPPLIED BY ROCKETMINE, DATED 08/10/2024.

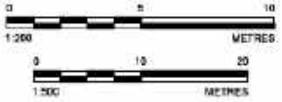


SCALE 1:200 D D008 SSP SPILLWAY STAGE 12 SECTION



SCALE 1:500 E D008 SSP SPILLWAY STAGE 12 SECTION

ISSUED FOR
APPROVAL



0	2025-04-08	ISSUED FOR APPROVAL	P. CONOCONO	V. MATTAR	XXX	XXX
REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED

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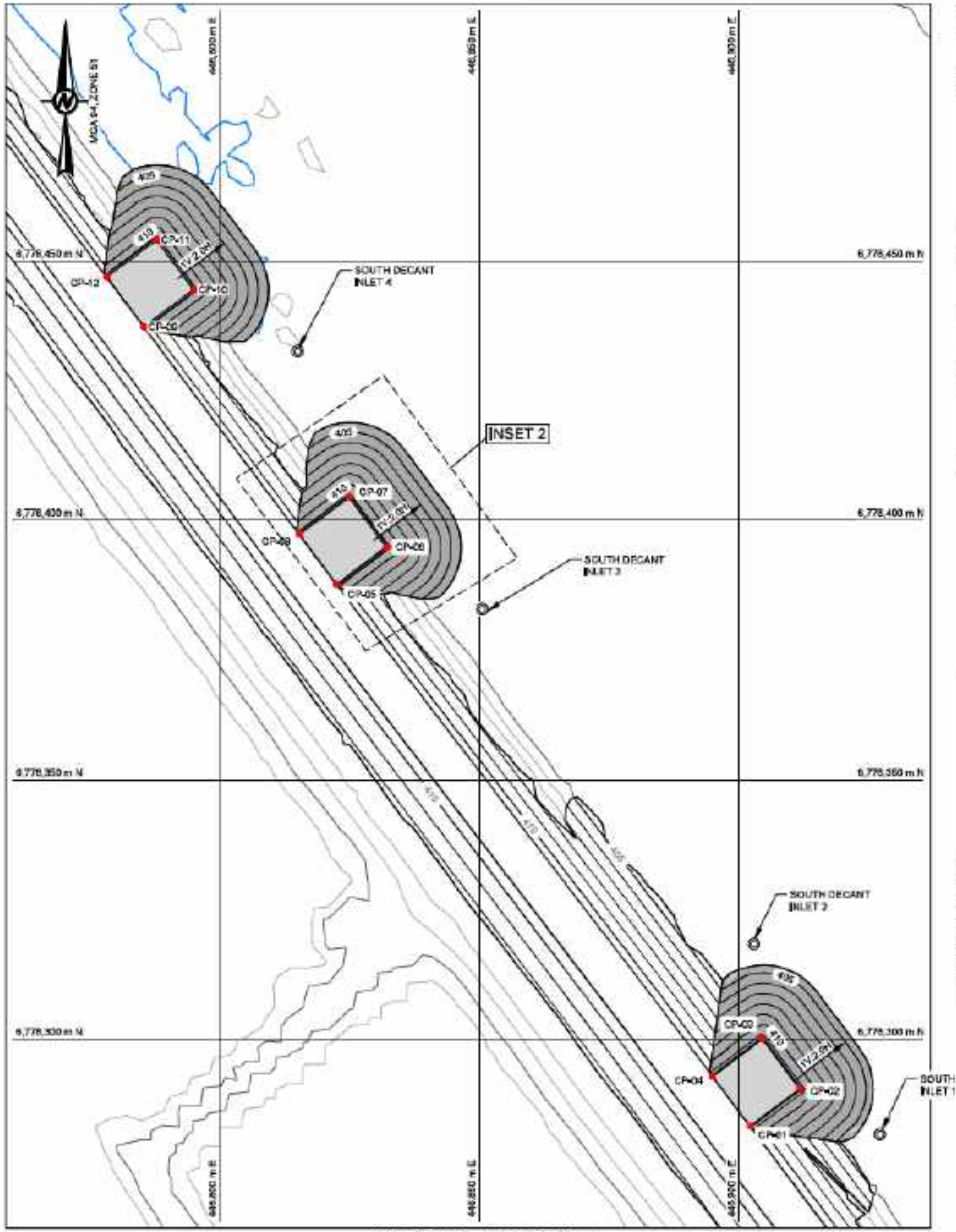
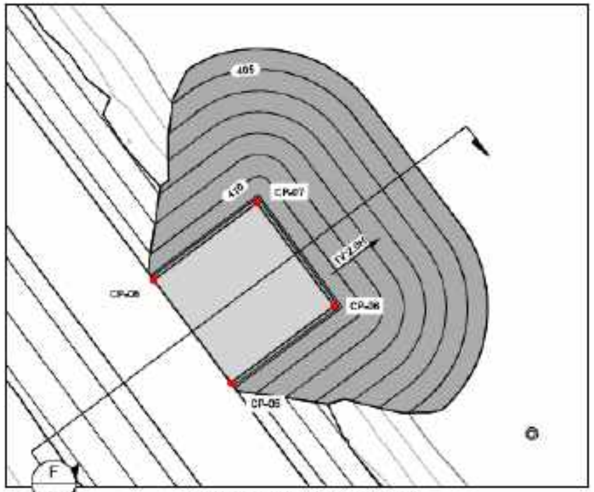
PROJECT
SUNRISE DAM CTD TSF STAGE 12 RAISE

TITLE
STORMWATER STORAGE POND EMBANKMENT RAISE AND SPILLWAY SECTIONS AND DETAIL

PROJECT NO.	DOCUMENT No.	REV. D009 of D013	FIGURE
PS202899	003-R	0	D009



CRANE PADS STAGE 12 PLAN
SCALE 1:1,000



INSET 2 - TYPICAL CRANE PAD
SCALE 1:500

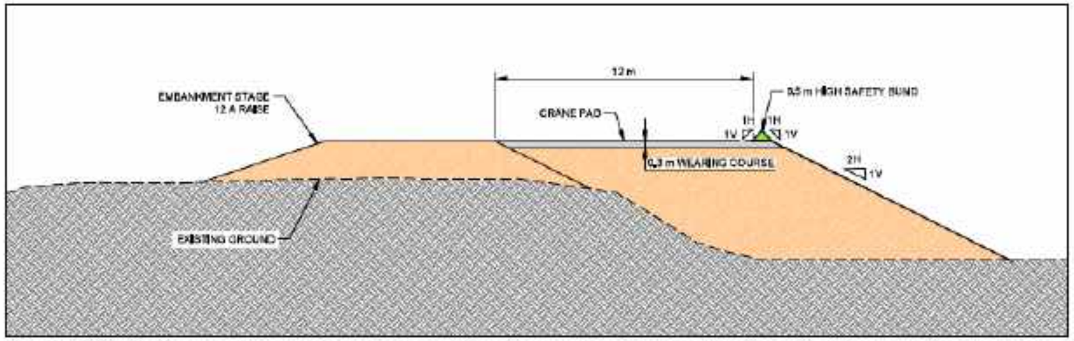
LEGEND

— 500 —	EXISTING TOPOGRAPHICAL CONTOUR AND ELEVATION (mAHD)
━ 500 ━	PROPOSED TOPOGRAPHICAL CONTOUR AND ELEVATION (mAHD)
● CP-01	CRANE PADS STAGE 12 SETOUT POINTS
▨	EXISTING GROUND
🟧	ZONE 1 - LOW PERMEABILITY MATERIAL
🟩	ZONE 3 - SAFETY WINDROW MATERIAL
▩	WEARING COURSE

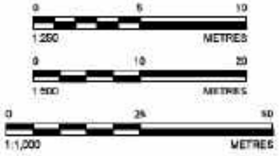
REFERENCE(S)
1. SURVEY DATA SUPPLIED BY ROCKETMINE, DATED 06/10/2024.

CRANE PADS STAGE 12
SETOUT TABLE

POINT No.	EASTING (m)	NORTHING (m)	ELEVATION RL (m)
CP-01	446,902,2	6,778,293,2	410,6
CP-02	446,911,6	6,778,293,4	410,7
CP-03	446,904,6	6,778,300,9	410,7
CP-04	446,895,0	6,778,292,8	410,7
CP-05	446,822,6	6,778,387,7	410,6
CP-06	446,832,1	6,778,394,9	410,6
CP-07	446,824,9	6,778,404,5	410,6
CP-08	446,815,3	6,778,397,3	410,6
CP-09	446,786,4	6,778,437,3	410,6
CP-10	446,795,0	6,778,444,5	410,6
CP-11	446,787,6	6,778,454,1	410,5
CP-12	446,778,2	6,778,446,9	410,5



SCALE 1:250 (F) STAGE 12 CRANE PAD TYPICAL SECTION



ISSUED FOR
APPROVAL

REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
0	2025-04-08	ISSUED FOR APPROVAL	P. CONOCONO	V. MATTAR	XXX	XXX

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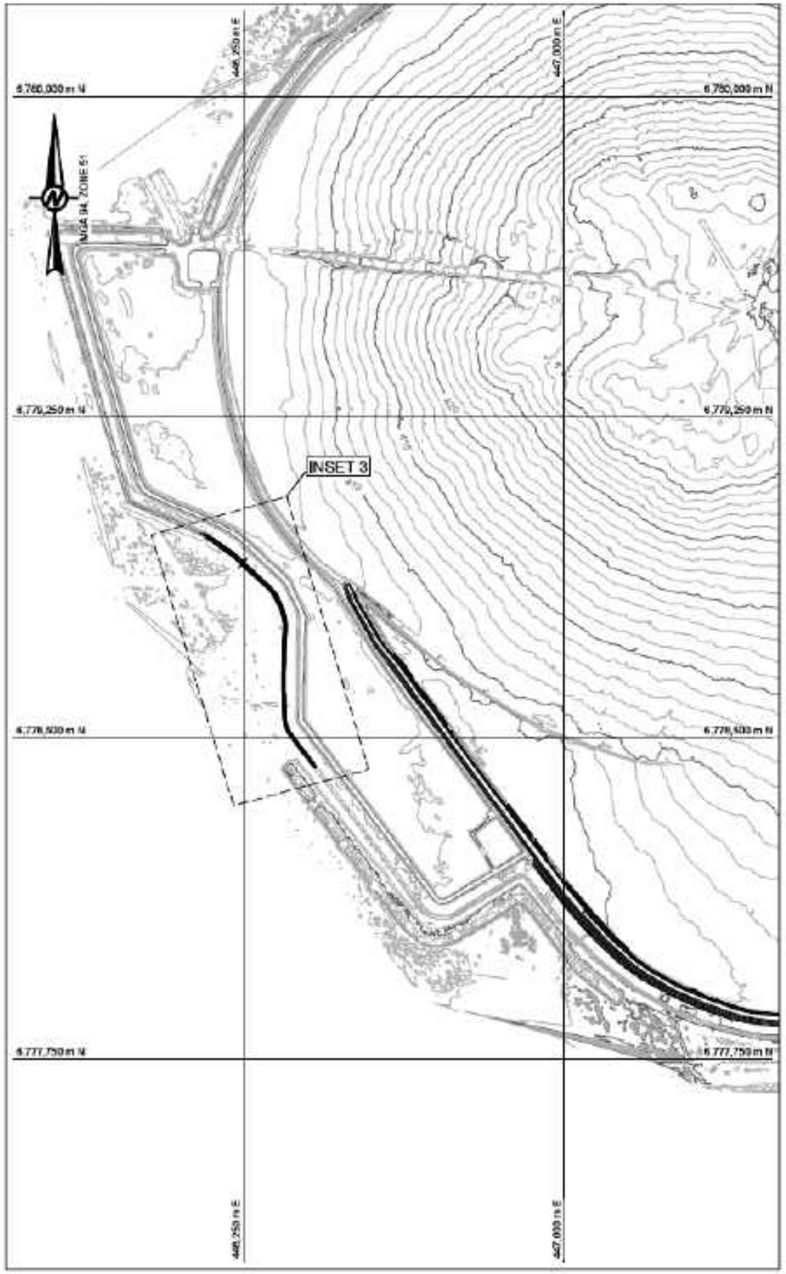
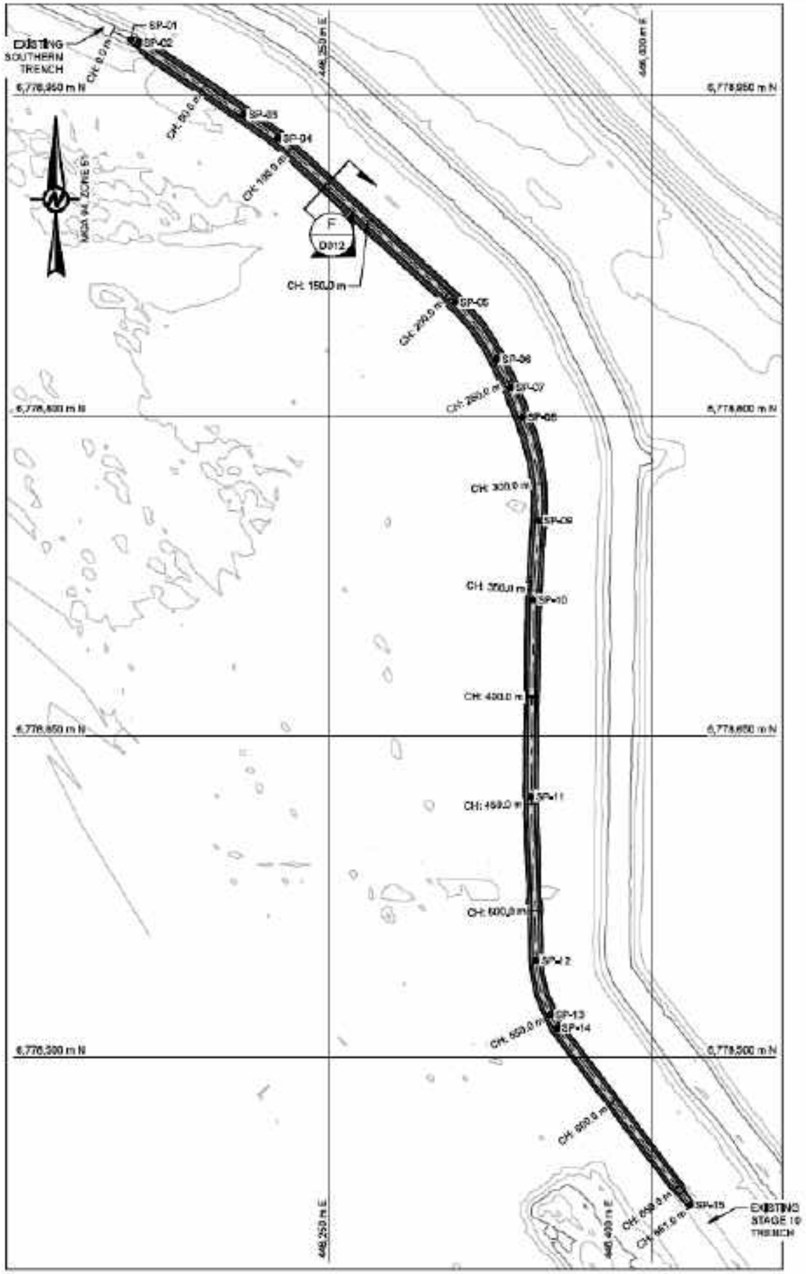
PROJECT
SUNRISE DAM CTD TSF STAGE 12 RAISE

TITLE
CRANE PADS PLAN AND SECTION

PROJECT NO.	DOCUMENT No.	REV.	D010 of D013	FIGURE
PS202899	003-R	0		D010



SEEPAGE COLLECTION TRENCH CONNECTION
SCALE 1:2,500



INSET 3 - SEEPAGE COLLECTION TRENCH CONNECTION EXTENSION PLAN
SCALE 1:2,500

LEGEND

500	EXISTING TOPOGRAPHICAL CONTOUR AND ELEVATION (mAHD)
500	PROPOSED TOPOGRAPHICAL CONTOUR AND ELEVATION (mAHD)
● SP-01	SEEPAGE COLLECTION TRENCH CONNECTION

REFERENCE(S)

1. SURVEY DATA SUPPLIED BY ROCKETMINE, DATED 05/10/2024.

SEEPAGE COLLECTION TRENCH CONNECTION SETOUT TABLE

POINT No.	EASTING (m)	NORTHING (m)	ELEVATION RL (m)
SP-01	446,133.8	6,778,975.9	399.6
SP-02	446,150.4	6,778,974.2	399.6
SP-03	446,200.5	6,778,940.8	399.7
SP-04	446,225.5	6,778,920.6	399.8
SP-05	446,300.4	6,778,853.0	400.0
SP-06	446,328.2	6,778,826.4	400.1
SP-07	446,334.5	6,778,813.3	400.1
SP-08	446,340.1	6,778,789.4	400.1
SP-09	446,347.7	6,778,751.0	400.3
SP-10	446,345.1	6,778,714.1	400.3
SP-11	446,344.0	6,778,622.0	400.5
SP-12	446,346.6	6,778,546.3	400.7
SP-13	446,353.1	6,778,520.0	400.8
SP-14	446,358.2	6,778,513.8	400.8
SP-15	446,418.7	6,778,431.0	401.0

ISSUED FOR
APPROVAL

0 50 100
1:2,500 METRES

0 250 500
1:12,500 METRES

REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
0	2025-04-08	ISSUED FOR APPROVAL	P. CONOCONO	V. MATTAR	XXX	XXX

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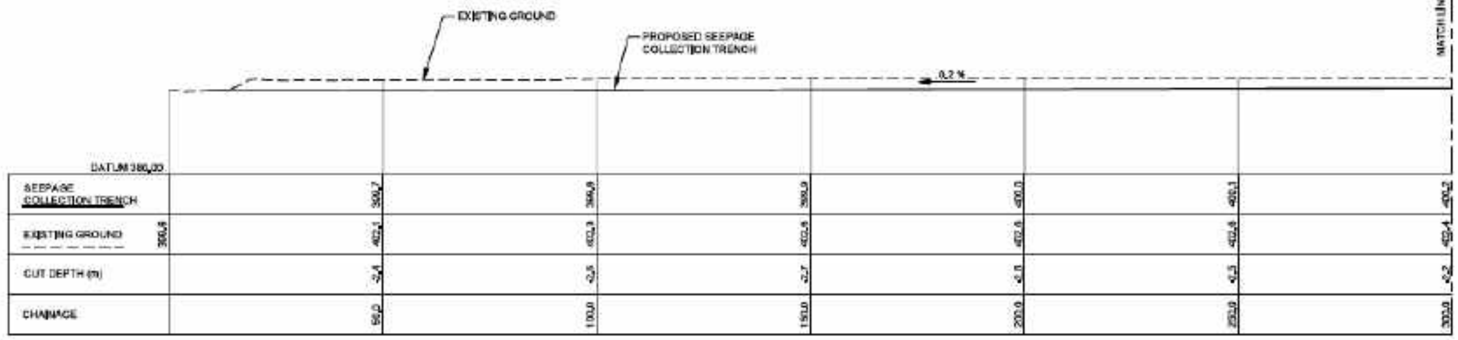
PROJECT
SUNRISE DAM CTD TSF STAGE 12 RAISE

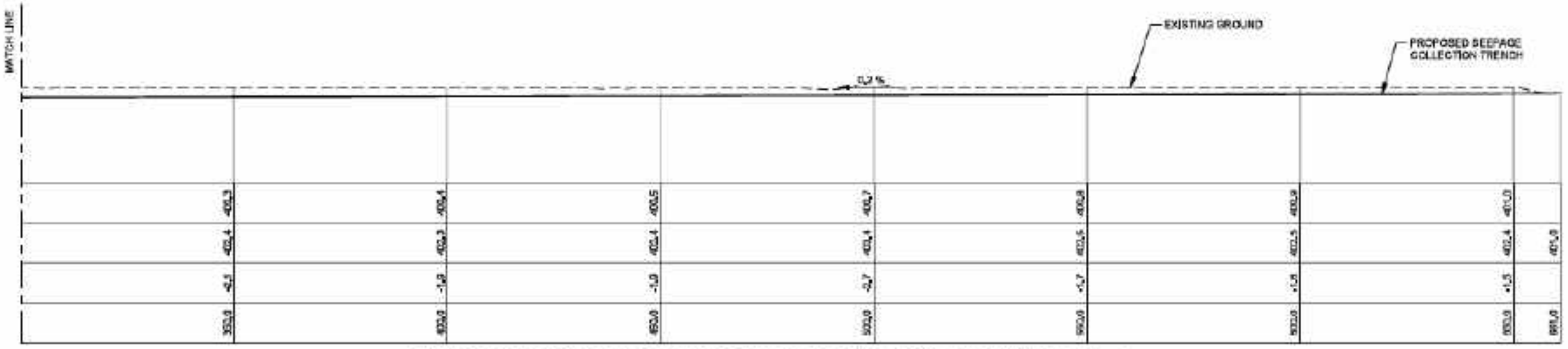
TITLE
SEEPAGE COLLECTION TRENCH CONNECTION
EXTENSION PLAN

PROJECT NO.	DOCUMENT No.	REV.	D011 of D012	FIGURE
PS202899	003-R	0		D011



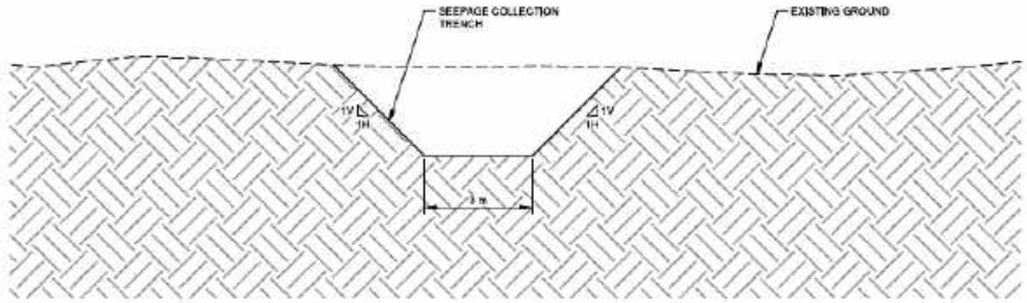
SEEPAGE COLLECTION TRENCH		399,7	399,8	399,9	400,0	400,1	400,2
EXISTING GROUND	399,8	402,1	402,3	402,6	402,6	402,4	402,4
CUT DEPTH (m)		-2,4	-2,5	-2,7	-2,6	-2,3	-2,2
CHAINAGE		50,0	100,0	150,0	200,0	250,0	300,0

SEEPAGE COLLECTION TRENCH CONNECTION LONGITUDINAL SECTION (CHAINAGE 0 - 300 m)
SCALE 1:1,250



400,3	400,4	400,5	400,7	400,8	400,9	401,0	
402,4	402,3	402,4	403,4	402,5	402,5	402,4	401,8
-2,1	-1,9	-1,9	-2,7	-1,7	-1,6	-1,5	
350,0	400,0	450,0	500,0	550,0	600,0	650,0	661,0

SEEPAGE COLLECTION TRENCH CONNECTION LONGITUDINAL SECTION (CHAINAGE 0 - 661 m)
SCALE 1:1,250



SCALE 1:200 (F / D000) SSP SEEPAGE COLLECTION TRENCH CONNECTION SECTION

LEGEND

500 EXISTING TOPOGRAPHICAL CONTOUR AND ELEVATION (mAHD)

500 PROPOSED TOPOGRAPHICAL CONTOUR AND ELEVATION (mAHD)

REFERENCE(S)

1. SURVEY DATA SUPPLIED BY ROCKETMINE DATED 05/10/2024.

ISSUED FOR

APPROVAL

0 2,5 5
1:150 METRES

0 25 50
1:1,250 METRES

REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
0	2025-04-08	ISSUED FOR APPROVAL	P. CONOCONO	V. MATTAR	XXX	XXX

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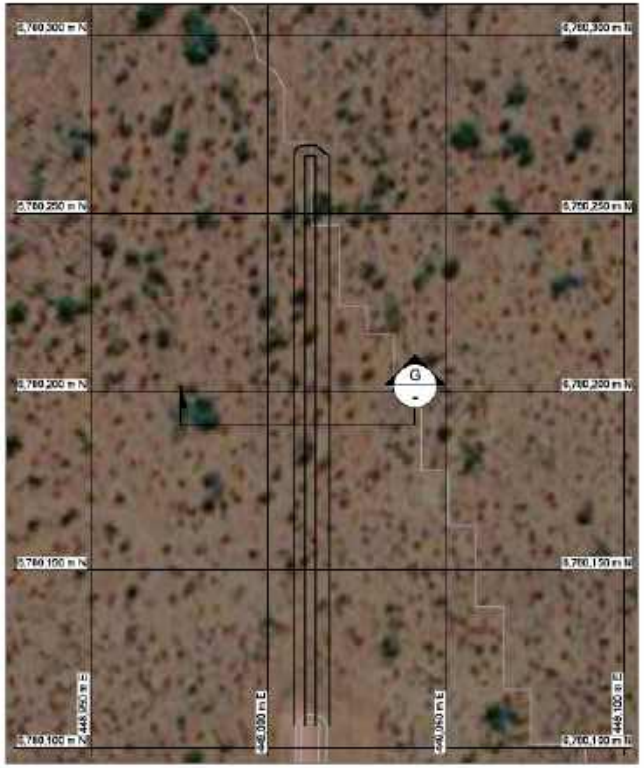
PROJECT
SUNRISE DAM CTD TSF STAGE 12 RAISE

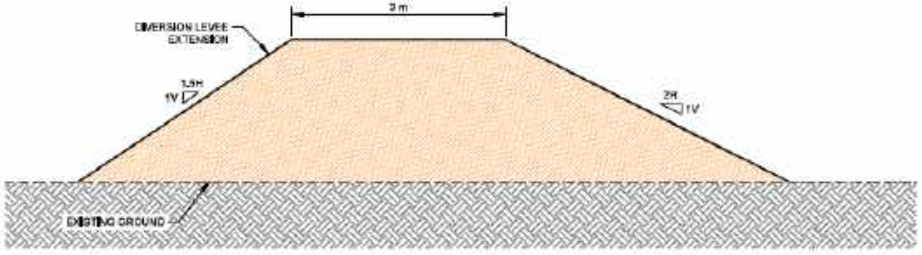
TITLE
SEEPAGE COLLECTION TRENCH CONNECTION SECTIONS

PROJECT NO.	DOCUMENT No.	REV. D012 of D013	FIGURE
PS202899	003-R	0	D012

DIVERSION LEVEE PLAN
SCALE 1:12,500

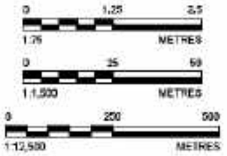


INSET 3 - DIVERSION LEVEE EXTENSION PLAN
SCALE 1:1,500



SCALE 1:75 G - DIVERSION LEVEE EXTENSION TYPICAL SECTION

ISSUED FOR
APPROVAL



LEGEND

500	EXISTING TOPOGRAPHICAL CONTOUR AND ELEVATION (mAHD)
500	PROPOSED TOPOGRAPHICAL CONTOUR AND ELEVATION (mAHD)
● DL-01	DIVERSION LEVEE EXTENSION SETOUT POINTS

REFERENCE(S)

1. SURVEY DATA SUPPLIED BY ROCKETMINE, DATED 06/10/2024.
2. BACKGROUND AERIAL IMAGE REPRODUCED WITH PERMISSION FROM www.bing.com/maps (© 2020 MICROSOFT CORPORATION) IN ACCORDANCE WITH THE SPECIAL SERVICES TERMS FOR AUTODESK® LIVE MAP DATA.

REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
0	2025-04-08	ISSUED FOR APPROVAL	P. CONOCONO	V. MATTAR	XXX	XXX

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PROJECT
SUNRISE DAM CTD TSF STAGE 12 RAISE

TITLE
DIVERSION LEVEE EXTENSION PLAN AND SECTION

PROJECT No.	DOCUMENT No.	REV. D013 of D013	FIGURE
PS202899	003-R	0	D013

Appendix C

Borehole logs

BOREHOLE: BH14

Sheet 1 of 3

Project:	Stage 12 Drilling Investigation	Coords:	447985.354 m E 6777696.268 m N MGA2020-51		
Location:	Sunrise Dam	Surface RL:	407.064 m AHD	Date Started:	4/9/2024
Client:	AngloGold Ashanti Australia	Contractor:	Edge Drilling Drill Rig: Drill Rig	Date Completed:	6/9/2024
Job No.:	PS212928	Inclination:	-90° Direction: 000°	Logged:	CS

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	*DEPTH* RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
S			0	407.06					FERRICRETE: dark brown becoming pale brown-red, amorphous, massive. medium strength; extremely weathered.	M		0.00: LATERITE
				1.50 405.56								
				2.10 404.96					FERRICRETE: pale brown becoming dark brown becoming pale red-brown, amorphous, massive. medium strength; extremely weathered.	W		
				5.20								
				401.76					FERRICRETE: pale brown with pale red-brown, amorphous, massive. medium strength; extremely weathered.	W		
				5.50 401.56				CL-CI	Gravelly CLAY: low to medium plasticity, pale grey mottled with pale brown-yellow and pale brown, gravel is fine and medium.	W	F	5.50: SAPROLITE
					SPT 7.50 m 3, 4, 5; N=9 SPTLS 7.50-7.95 m	■						
				9.00 398.06								
				9.70 397.36				CL	Sandy CLAY: low plasticity, pale brown mottled with pale brown-yellow, sand is fine.	W	S	
			10									

Comments

Checked PLC
Date 4/11/2024

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BOREHOLE: BH14

Sheet 2 of 3

Project:	Stage 12 Drilling Investigation	Coords:	447985.354 m E 6777696.268 m N MGA2020-51		
Location:	Sunrise Dam	Surface RL:	407.064 m AHD	Date Started:	4/9/2024
Client:	AngloGold Ashanti Australia	Contractor:	Edge Drilling Drill Rig: Drill Rig	Date Completed:	6/9/2024
Job No.:	PS212928	Inclination:	-90° Direction: 000°	Logged:	CS

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	*DEPTH* RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
S			10					CL	Sandy CLAY: low plasticity, pale brown mottled with pale brown-yellow, sand is fine.	W	S	
				10.50 396.46				GM	Silty GRAVEL: fine to coarse, white, red and brown, with fine to coarse sand.	W	St	
			11									
			12		SPT 11.90 m 6, 10, 27; N=38 SPTLS 11.90-12.35 m	■						
				12.35 394.71								
			13	*13.00* 394.06					SCHIST SAPROLITE: pale brown mottled with pale grey and pale yellow-brown, amorphous, distinct bedding. very high strength; residual soil to highly weathered.	W		
			14									
			15									
			16									
			17									
			18									
			19	*19.00* 388.06				ML	Sandy SILT: pale grey mottled with pale brown, sand is fine to coarse; with fine to medium gravel.	W		
					SPT 19.60 m 10,15,37; N=52 SPTLS 19.60-20.05 m	■						
			20									

Comments

Checked PLC

Date 4/11/2024

BOREHOLE: BH14

Sheet 3 of 3

Project: Stage 12 Drilling Investigation
Location: Sunrise Dam
Client: AngloGold Ashanti Australia
Job No.: PS212928

Coords: 447985.354 m E 6777696.268 m N MGA2020-51
Surface RL: 407.064 m AHD
Contractor: Edge Drilling Drill Rig: Drill Rig
Inclination: -90° Direction: 000°

Date Started: 4/9/2024
Date Completed: 6/9/2024
Logged: CS

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			20			■			Hole Terminated at 20.05 m Target depth Groundwater monitoring well installed			
			21									
			22									
			23									
			24									
			25									
			26									
			27									
			28									
			29									
			30									

Comments

Checked PLC
Date 4/11/2024

BOREHOLE: BH15

Sheet 1 of 3

Project:	Stage 12 Drilling Investigation	Coords:	448878.353 m E 6778588.138 m N MGA2020-51		
Location:	Sunrise Dam	Surface RL:	410.398 m AHD	Date Started:	29/8/2024
Client:	AngloGold Ashanti Australia	Contractor:	Edge Drilling Drill Rig: Drill Rig	Date Completed:	2/9/2024
Job No.:	PS212928	Inclination:	-90° Direction: 000°	Logged:	MS

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
S			0	410.40				SC	Clayey SAND: fine and coarse grained, red-brown with brown, clay is low plasticity; trace fine gravel.	M	MD	0.00: TRANSPORTED SOIL
				1.30 409.10	SPT 3.00-3.45 m 28,0,0 HB N=0 SPTLS 3.00-3.08 m			GP-GM	GRAVEL: fine to coarse, white pink, with fine sand; with silt.	W	F	
				5.00 405.40	SPT 6.00 m 19, 24, 14 N=38 SPTLS 6.00-6.45 m			CH	CLAY: high plasticity, pale brown, with fine to coarse sand; trace fine to medium gravel.			
				7.10 403.30					With fine to coarse sand; with silt.			
				7.50 402.90	SPT 9.00-9.45 m 29,21,0 HB N=21 SPTLS 9.00-9.45 m			CL-CI	Sandy CLAY: low to medium plasticity, pale grey and pale brown mottled with pale yellow, sand is fine and medium; trace fine and medium gravel.	W	F	
			10									

Comments

Checked PLC

Date 4/11/2024

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BOREHOLE: BH15

Sheet 2 of 3

Project:	Stage 12 Drilling Investigation	Coords:	448878.353 m E 6778588.138 m N MGA2020-51		
Location:	Sunrise Dam	Surface RL:	410.398 m AHD	Date Started:	29/8/2024
Client:	AngloGold Ashanti Australia	Contractor:	Edge Drilling Drill Rig: Drill Rig	Date Completed:	2/9/2024
Job No.:	PS212928	Inclination:	-90° Direction: 000°	Logged:	MS

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	*DEPTH* RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
S			10	400.40								
				10.50 399.90					SCHIST SAPROLITE: pale grey mottled with red-brown. residual soil.	W		10.50: SAPROLITE
			11	*11.10* 399.30					SCHIST SAPROLITE: pale grey mottled with brown and red-brown, amorphous, distinct bedding. low strength; extremely weathered to highly weathered.	W		
			12									
			13									
			14									
			15									
			16		SPT 15.60-16.05 m 34,15,0 HB N=15 SPTLS 15.60-15.78 m							
			17									
			18									
			19		SPT 18.60-19.05 m 32,19,0 HB N=19 SPTLS 18.60-18.81 m							
			20									

Comments

Checked PLC
Date 4/11/2024

BOREHOLE: BH15

Sheet 3 of 3

Project:	Stage 12 Drilling Investigation	Coords:	448878.353 m E 6778588.138 m N MGA2020-51		
Location:	Sunrise Dam	Surface RL:	410.398 m AHD	Date Started:	29/8/2024
Client:	AngloGold Ashanti Australia	Contractor:	Edge Drilling Drill Rig: Drill Rig	Date Completed:	2/9/2024
Job No.:	PS212928	Inclination:	-90° Direction: 000°	Logged:	MS

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
S			20	20.10								
				20.30 390.10					SCHIST SAPROLITE: pale grey mottled with brown and red-brown, amorphous, distinct bedding. low strength; extremely weathered to highly weathered.	W		
			21	21.60 388.80	SPT 21.60-22.05 m 12,40,0 HB N=40 SPTLS 21.60-21.88 m							
			22	22.10 388.30					SCHIST SAPROLITE: pale grey mottled with brown and red-brown, amorphous, distinct bedding. low strength; extremely weathered to highly weathered.	W		
			23									
			24		SPT 24.60-25.05 m 50,0,0 HB N=0 SPTLS 24.60-24.75 m							
			25	25.10 385.30					Hole Terminated at 25.10 m Target depth Groundwater monitoring well installed			
			26									
			27									
			28									
			29									
			30									

Comments

Checked PLC
Date 4/11/2024

BOREHOLE: BH18

Sheet 1 of 2

Project:	Stage 12 Drilling Investigation	Coords:	448388.842 m E 6777992.458 m N MGA2020-51		
Location:	Sunrise Dam	Surface RL:	408.222 m AHD	Date Started:	2/9/2024
Client:	AngloGold Ashanti Australia	Contractor:	Edge Drilling Drill Rig: Drill Rig	Date Completed:	4/9/2024
Job No.:	PS212928	Inclination:	-90° Direction: 000°	Logged:	MS

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
S			0	408.22					FERRICRETE: pale brown-red mottled with pale grey, amorphous, massive. very high strength; highly weathered.	M		0.00: LATERITIC DURICRUST
			5.40	402.82				CL-CI	CLAY: medium plasticity, pale brown mottled with pale yellow, with fine sand; with fine gravel.	W	F	5.40: SAPROLITE
			7.20	401.02						W		
			8.10	400.12	SPT 8.10 m 2, 9, 24 N=33 SPTLS 8.10-8.55 m			CL-CI	CLAY: medium plasticity, Pale grey with yellow brown, mottled with red brown, with fine and medium gravel; trace sand.	W	F	
			9.60	398.62						W		

Comments

Checked PLC
Date 4/11/2024

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BOREHOLE: BH18

				Sheet	2 of 2
Project:	Stage 12 Drilling Investigation	Coords:	448388.842 m E 6777992.458 m N MGA2020-51		
Location:	Sunrise Dam	Surface RL:	408.222 m AHD	Date Started:	2/9/2024
Client:	AngloGold Ashanti Australia	Contractor:	Edge Drilling Drill Rig: Drill Rig	Date Completed:	4/9/2024
Job No.:	PS212928	Inclination:	-90° Direction: 000°	Logged:	MS

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	*DEPTH* RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
S			10	398.22				CH	CLAY: low to medium plasticity, Pale grey mottled with yellow brown and dark purple, trace medium and coarse sand.	W		
			11		SPT 11.10 m 5, 6, 5 N=11 SPTLS 11.10-11.55 m	■						
			12									
				12.60 395.62				CH-MH	Gravelly Sandy CLAY: high plasticity, pale purple and white, sand is fine to coarse; gravel is fine to medium.	W	St	
			13									
			14									
			15	*15.00* 393.22					Hole Terminated at 15.00 m Target depth Groundwater monitoring well installed			
			16									
			17									
			18									
			19									
			20									

Comments

Checked PLC
Date 4/11/2024

BOREHOLE: BH19

Sheet 1 of 4

Project:	Stage 12 Drilling Investigation	Coords:	448871 m E 6779216 m N MGA2020-51		
Location:	Sunrise Dam	Surface RL:	409 m AHD	Date Started:	24/8/2024
Client:	AngloGold Ashanti Australia	Contractor:	Edge Drilling Drill Rig: Drill Rig	Date Completed:	29/8/2024
Job No.:	PS212928	Inclination:	-90° Direction: 000°	Logged:	MS

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
S			0	409.30						M		0.00: TRANSPORTED SOIL
			0.50	408.80				CL	CLAY: low plasticity, brown mottled with pale yellow, with fine and medium gravel; with organic material (tree bark particles).	M	S	
			1.40							M		
			1.50	407.80	SPT 2.60 m 9, 14, 19 N=33 SPTLS 2.60-3.05 m			MH	SILT: pale brown mottled with pale yellow, with fine to coarse sand; trace fine to medium gravel.	M	F	
			3.60	405.70						W		
			4.90	404.40	SPT 5.10 m 10, 11, 18 N=29 SPTLS 5.10-5.55 m			CL-CI	CLAY: low to medium plasticity, pale brown mottled with pale yellow, with fine to coarse gravel; with quartz gravel.	W	F	
			5.90	403.40					FERRICRETE: red-brown mottled with pale yellow, amorphous, massive. very low strength; extremely weathered.	W		
			6.70	402.60	SPT 8.10 m 9, 14, 13 N=27 SPTLS 8.10-8.55 m			CI	Sandy CLAY: medium plasticity, pale grey mottled with yellow-brown, sand is fine to coarse; trace fine to medium gravel.	W	F	6.70: SAPROLITE
			9.50	399.80						W		
			10									

Comments

Checked PLC
Date 4/11/2024

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BOREHOLE: BH19

Sheet 2 of 4

Project:	Stage 12 Drilling Investigation	Coords:	448871 m E 6779216 m N MGA2020-51		
Location:	Sunrise Dam	Surface RL:	409 m AHD	Date Started:	24/8/2024
Client:	AngloGold Ashanti Australia	Contractor:	Edge Drilling Drill Rig: Drill Rig	Date Completed:	29/8/2024
Job No.:	PS212928	Inclination:	-90° Direction: 000°	Logged:	MS

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	*DEPTH* RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
S			10	*10.20* 399.10				CL-CI	CLAY: low to medium plasticity, pale grey mottled with yellow-brown, trace fine to coarse sand.	W		
				10.40 398.90					SILTSTONE SAPROLITE: pale brown and pale grey, amorphous, distinct bedding. low strength; highly weathered.	W		
								CI	CLAY: medium plasticity, pale grey with pale yellow mottled with pale brown, with fine to medium gravel; with fine to coarse sand.			
			11		SPT 11.10 m 10, 14, 21 N=35 SPTLS 11.10-11.55 m	■						
			14		SPT 14.10 m 11, 18, 22 N=40 SPTLS 14.10-14.55 m	■						
			15	*15.00* 394.30				ML	Sandy SILT: brown, sand is fine to coarse; trace fine to medium gravel.	W	VSt	
			17		SPT 17.10 m 13, 17, 14 N=31 SPTLS 17.10-17.55 m	■						
			20									

Comments

Checked	PLC
Date	4/11/2024

BOREHOLE: BH19

Sheet 3 of 4

Project:	Stage 12 Drilling Investigation	Coords:	448871 m E 6779216 m N MGA2020-51		
Location:	Sunrise Dam	Surface RL:	409 m AHD	Date Started:	24/8/2024
Client:	AngloGold Ashanti Australia	Contractor:	Edge Drilling Drill Rig: Drill Rig	Date Completed:	29/8/2024
Job No.:	PS212928	Inclination:	-90° Direction: 000°	Logged:	MS

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	*DEPTH* RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
S			20	389.30	SPT 20.30 m 13, 21, 29 N=50 SPTLS 20.30-20.75 m SPT 23.10-23.55 m 17,31,0 HB N=31 SPTLS 23.10-23.55 m			CH	CLAY: high plasticity, purple brown, trace fine to coarse sand; trace fine to medium gravel.	W	VSt	
				24.55 384.75					SCHIST SAPROLITE: pale grey with pale yellow, purple and red-brown, amorphous, distinct bedding. extremely weathered.	W		

Depth scale: 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30

Comments

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Date 4/11/2024

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BOREHOLE: BH19

Sheet 4 of 4

Project:	Stage 12 Drilling Investigation	Coords:	448871 m E 6779216 m N MGA2020-51		
Location:	Sunrise Dam	Surface RL:	409 m AHD	Date Started:	24/8/2024
Client:	AngloGold Ashanti Australia	Contractor:	Edge Drilling Drill Rig: Drill Rig	Date Completed:	29/8/2024
Job No.:	PS212928	Inclination:	-90° Direction: 000°	Logged:	MS

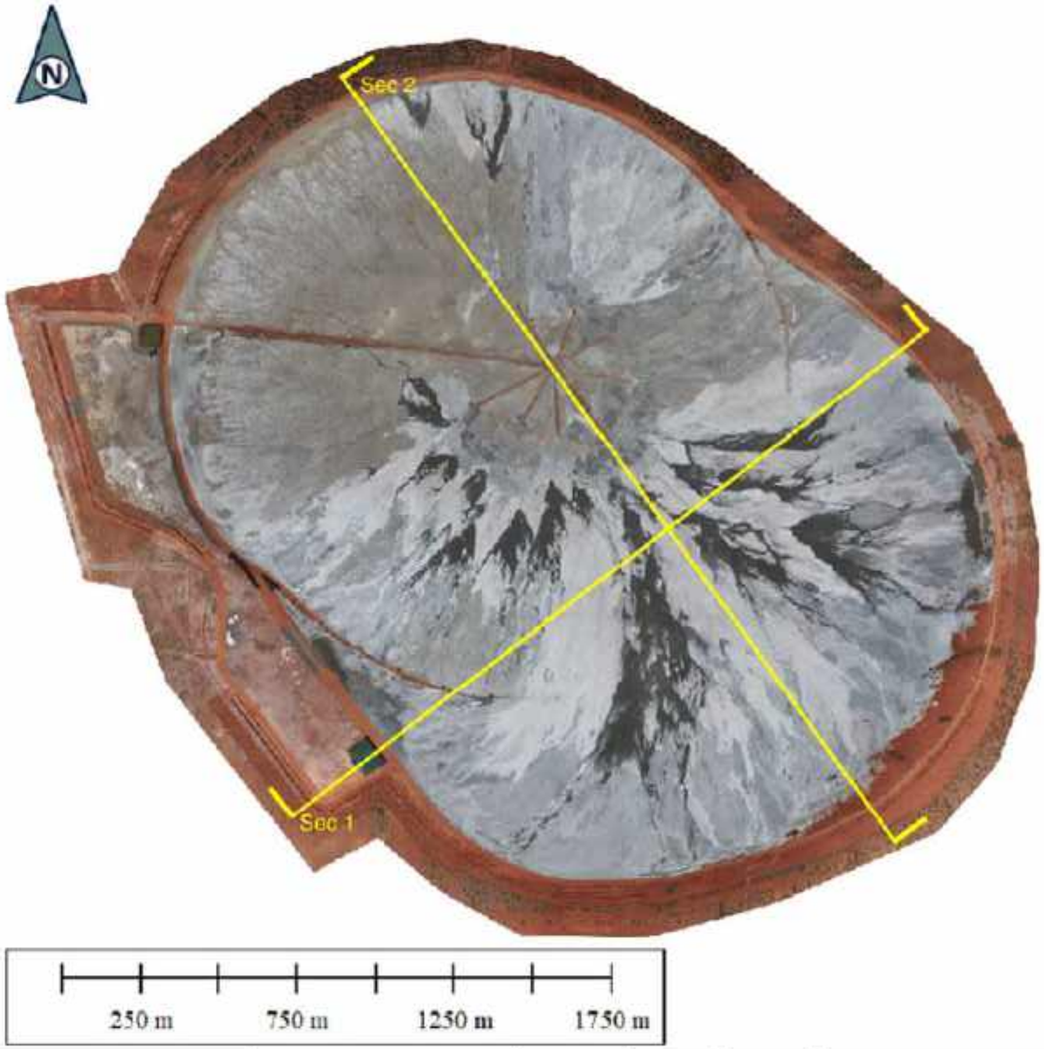
Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	*DEPTH* RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
S			30	*30.20*						W		
									Hole Terminated at 30.20 m Target depth Groundwater monitoring well installed			
			31									
			32									
			33									
			34									
			35									
			36									
			37									
			38									
			39									
			40									

Comments

Checked PLC
Date 4/11/2024

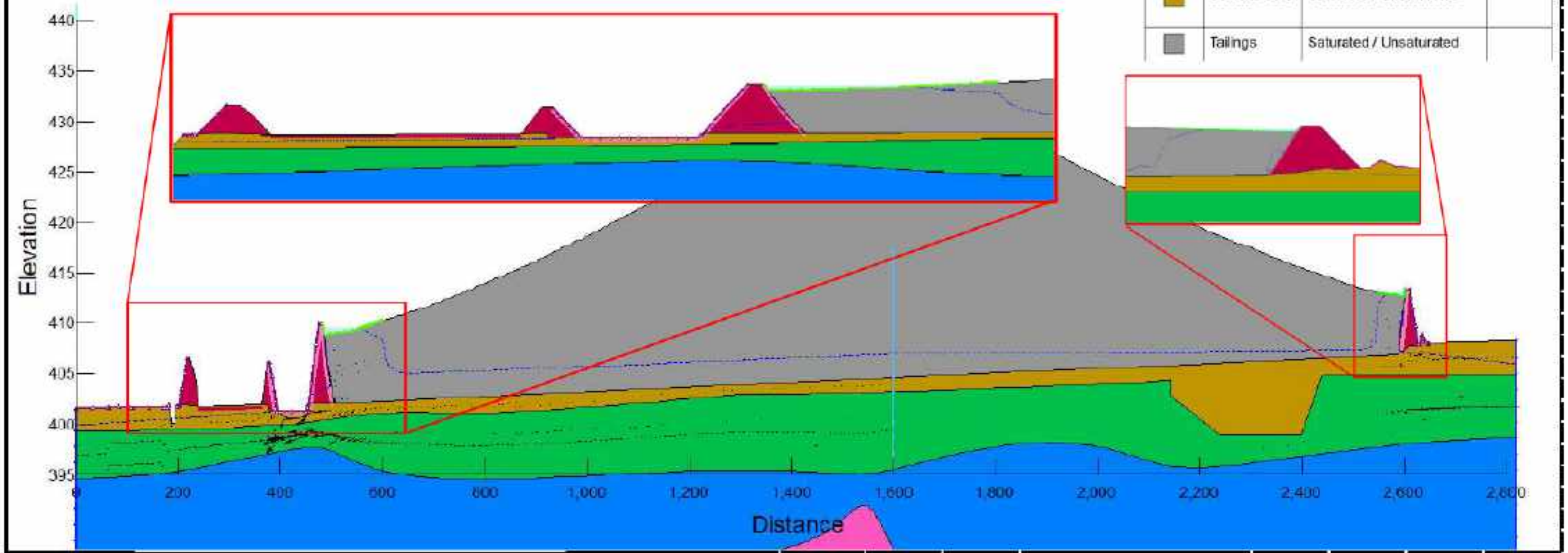
Appendix D

Seepage and stability results



CLIENT	ANGLOGOLD ASHANTI			PROJECT	AGAA CTD TSF Stage 12 Wall Raise
DRAWN	MS	DATE	04-Apr-25	Section 1 and Section 2 Plan View	
CHECK	PC	DATE	06-Apr-25		
SCALE	NTS		A4	PROJECT No. 202899	Figure D0

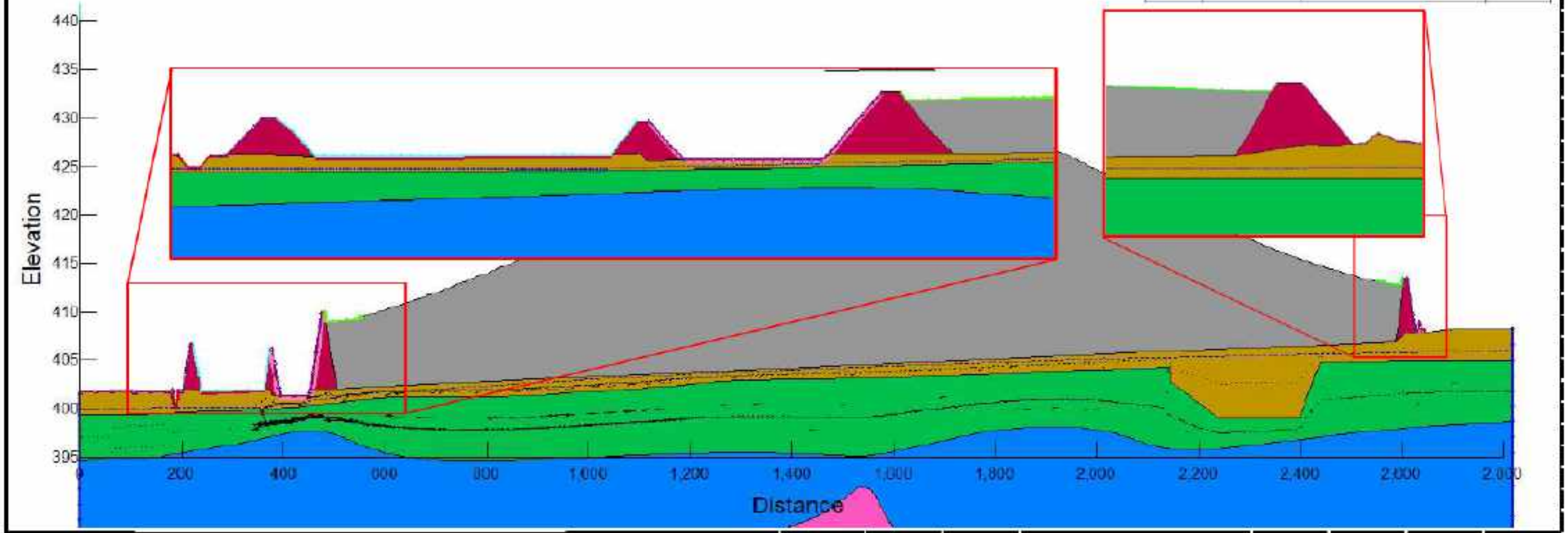
Color	Name	Hydraulic Material Model	Sat Kx (m/sec)
🟨	Bedrock	Saturated Only	5e-07
🟥	Embankment Material	Saturated / Unsaturated	
🟩	Ferricrete	Saturated Only	0.00014
🟪	HDPE Liner	Saturated Only	1e-20
🟦	Lake Clays	Saturated Only	1.7e-08
🟪	Saprolite	Saturated Only	6.8e-08
🟫	Surficial Soils	Saturated / Unsaturated	
⬜	Tailings	Saturated / Unsaturated	



CLIENT	ANGLOGOLD ASHANTI			PROJECT	AGAA CTD TSF Stage 12 Wall Raise
DRAWN	MS	DATE	04-Apr-25	Seepage Section 1 Transient Seepage 0 Days	
CHECK	PC	DATE	06-Apr-25		
SCALE	NTS		A4	PROJECT No.	202899

Figure D1

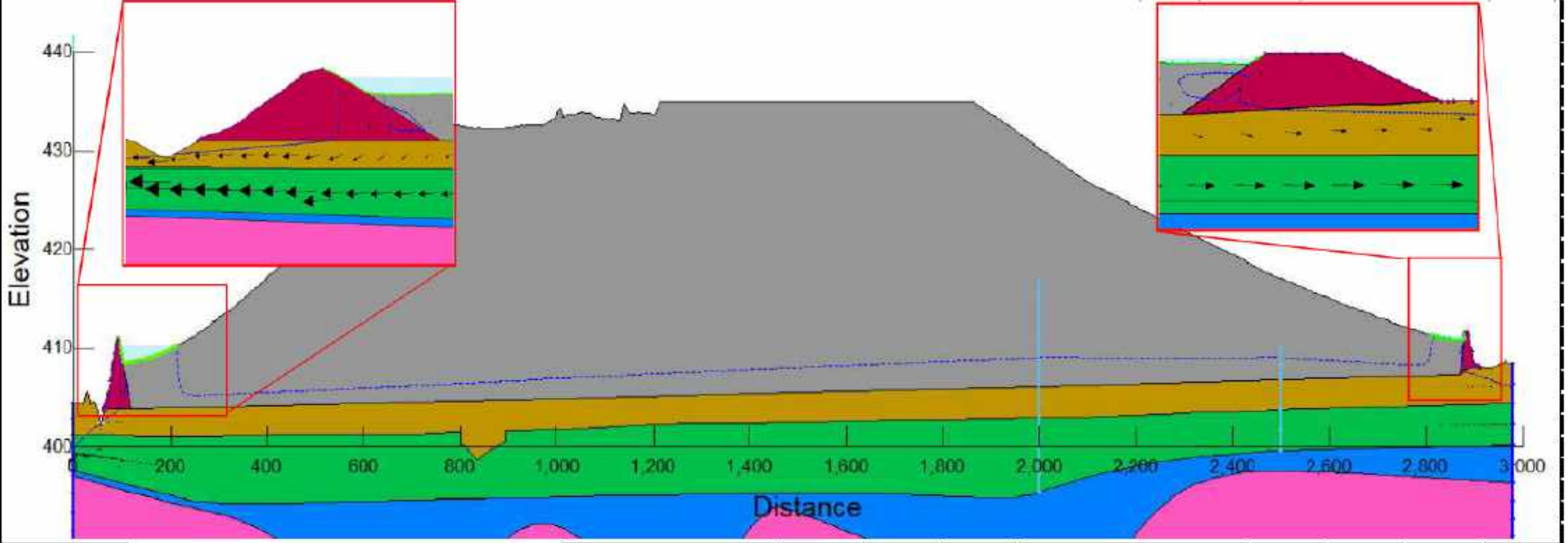
Color	Name	Hydraulic Material Model	Sat Kx (m/sec)
🟨	Bedrock	Saturated Only	5e-07
🟥	Embankment Material	Saturated / Unsaturated	
🟩	Ferricrete	Saturated Only	0.00014
🟪	HDPE Liner	Saturated Only	1e-20
🟦	Lake Clays	Saturated Only	1.7e-06
🟪	Saprolite	Saturated Only	5.8e-08
🟫	Surficial Soils	Saturated / Unsaturated	



CLIENT	ANGLOGOLD ASHANTI			PROJECT	AGAA CTD TSF Stage 12 Wall Raise
DRAWN	MS	DATE	04-Apr-25	Seepage Section 1 Transient Seepage 1825 Days (5 Years)	
CHECK	PC	DATE	06-Apr-25		
SCALE	NTS		A4	PROJECT No.	202899

Figure D2

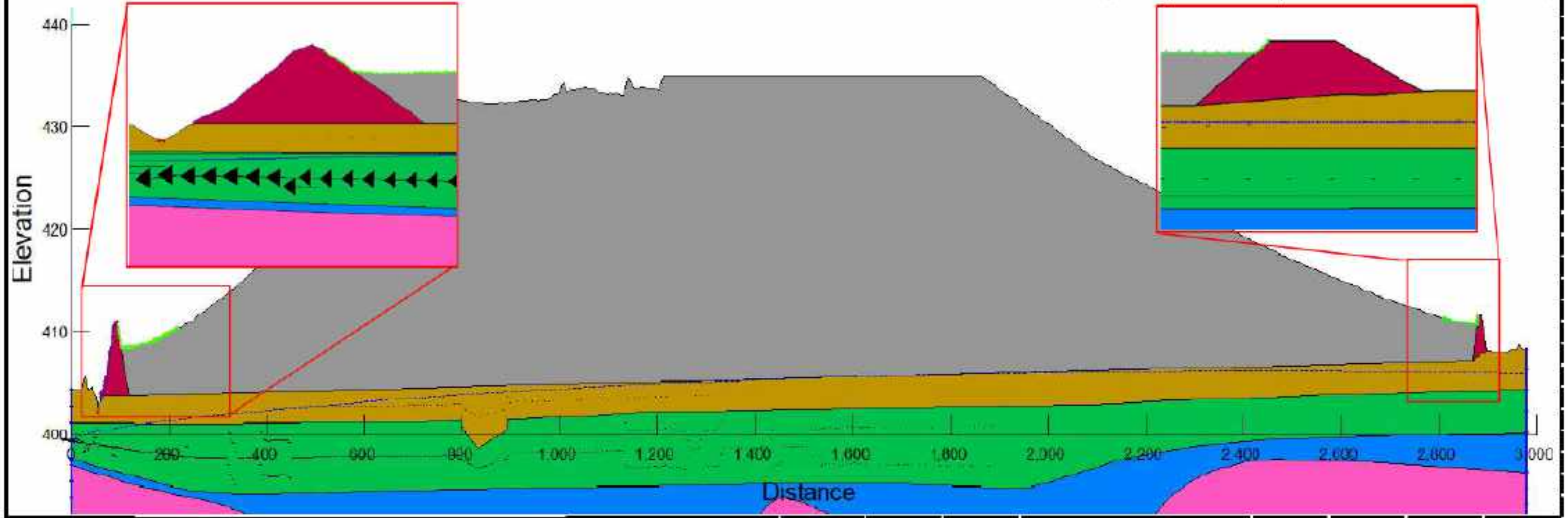
Color	Name	Hydraulic Material Model	Sat Kx (m/sec)
🟨	Bedrock	Saturated Only	5e-07
🟥	Embankment Material	Saturated / Unsaturated	
🟩	Ferricrete	Saturated / Unsaturated	
🟦	Lake Clays	Saturated / Unsaturated	
🟪	Saprolite	Saturated Only	5.8e-08
🟫	Surficial Soils	Saturated / Unsaturated	
⬜	Tailings	Saturated / Unsaturated	



CLIENT	ANGLOGOLD ASHANTI	PROJECT	AGAA CTD TSF Stage 12 Wall Raise
DRAWN	MS	DATE	04-Apr-25
CHECK	PC	DATE	06-Apr-25
SCALE	NTS		A4
PROJECT No.	202899		Figure D3

Seepage Section 2
Transient Seepage 0 Days

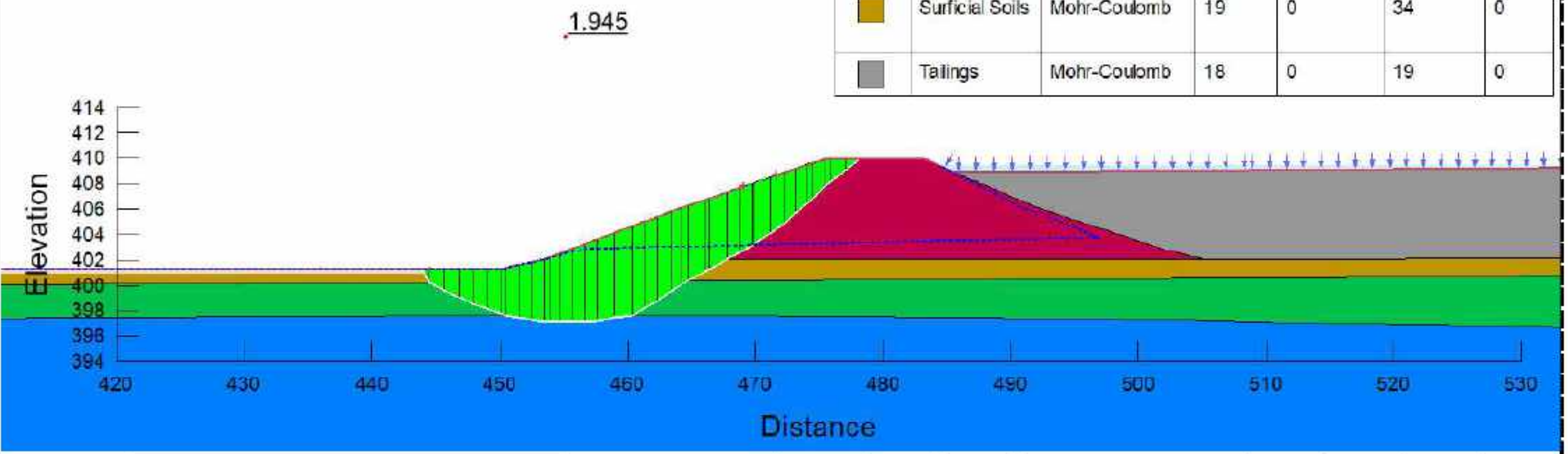
Color	Name	Hydraulic Material Model	Sat Kx (m/sec)
🟨	Bedrock	Saturated Only	5e-07
🟥	Embankment Material	Saturated / Unsaturated	
🟩	Ferricrete	Saturated / Unsaturated	
🟦	Lake Clays	Saturated / Unsaturated	
🟪	Saprolite	Saturated Only	5.6e-08
🟫	Surficial Soils	Saturated / Unsaturated	
⬜	Tailings	Saturated / Unsaturated	



CLIENT	ANGLOGOLD ASHANTI			PROJECT	AGAA CTD TSF Stage 12 Wall Raise
DRAWN	MS	DATE	04-Apr-25	Seepage Section 2 Transient Seepage 2555 Days (7 Years)	
CHECK	PC	DATE	06-Apr-25		
SCALE	NTS		A4	PROJECT No.	202899

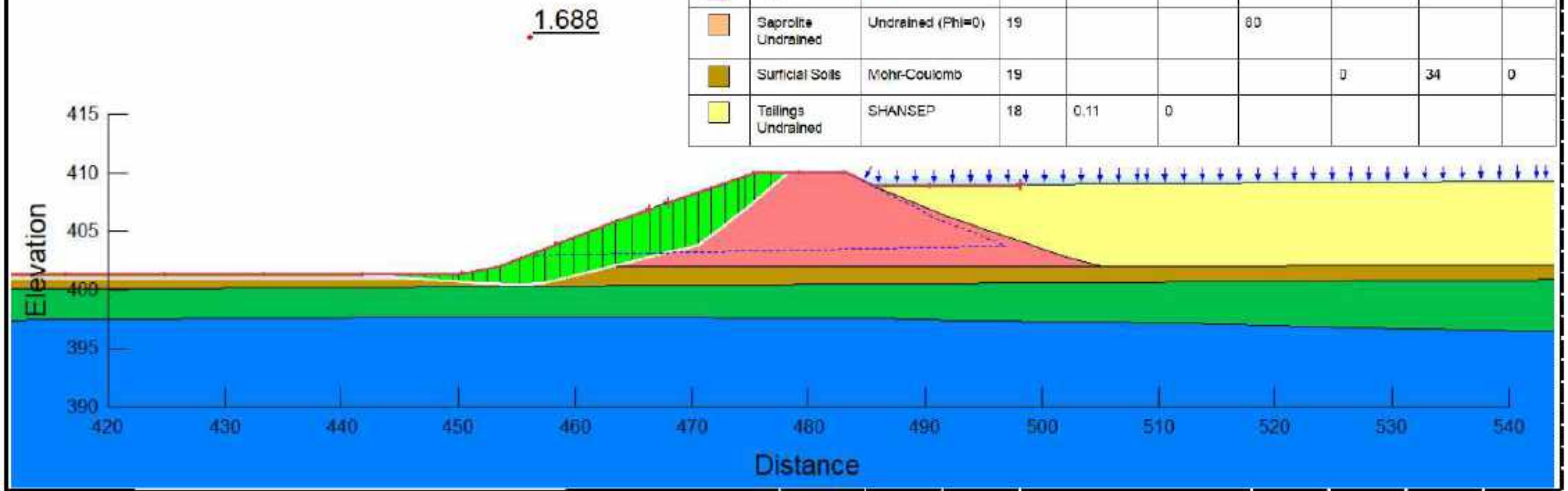
Figure D4

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Phi-B (°)
🟨	Bedrock	Mohr-Coulomb	19	0	34	0
🟥	Embankment Material	Mohr-Coulomb	20	0	30	0
🟩	Ferricrete	Mohr-Coulomb	22	0	46	0
🟪	HDPE Liner	(None)				
🟦	Lake Clays	Mohr-Coulomb	19	0	32	0
🟪	Saprolite	Mohr-Coulomb	19	0	34	0
🟫	Surficial Soils	Mohr-Coulomb	19	0	34	0
⬜	Tailings	Mohr-Coulomb	18	0	19	0



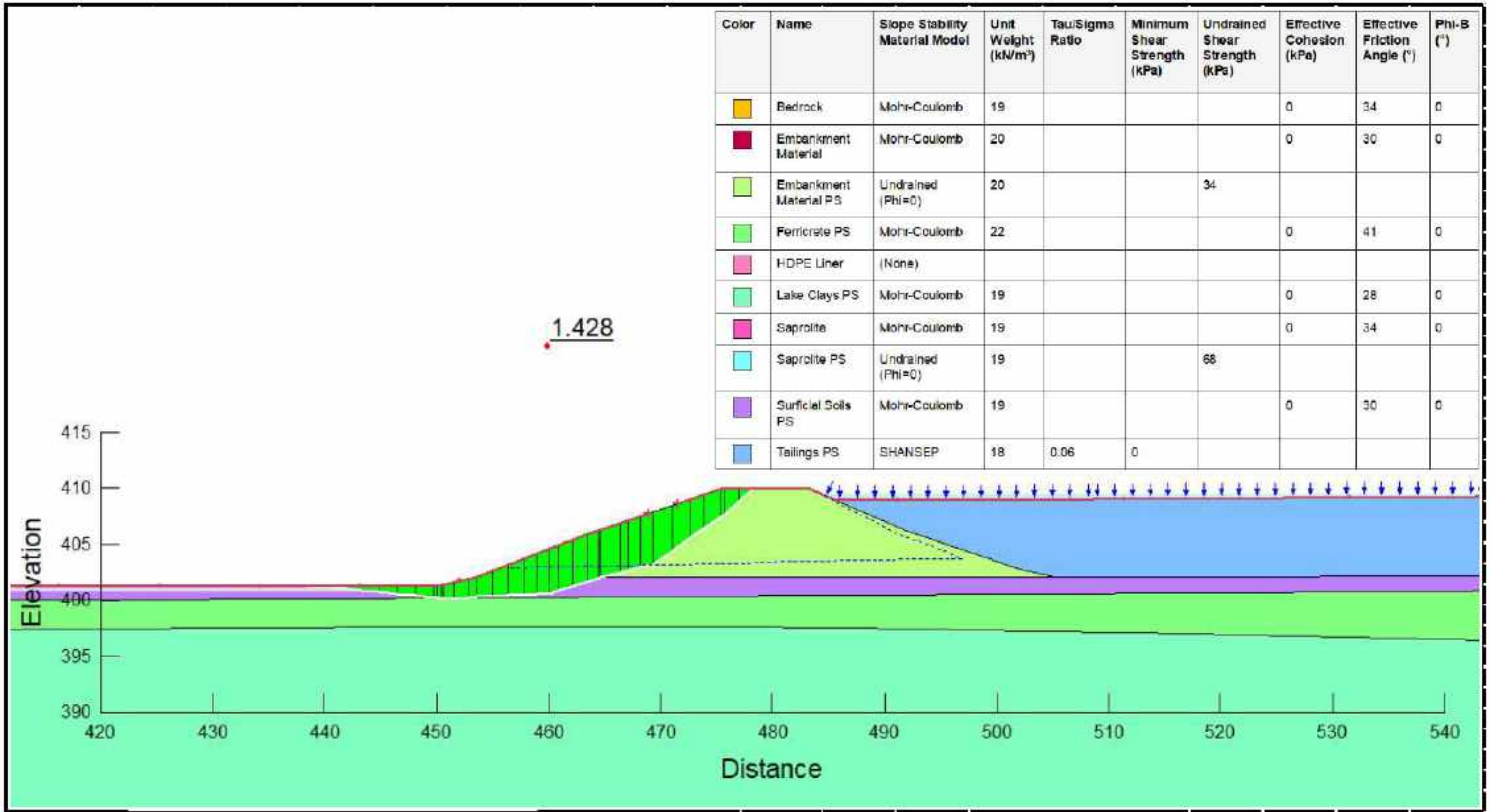
CLIENT	ANGLOGOLD ASHANTI			PROJECT	AGAA CTD TSF Stage 12 Wall Raise
DRAWN	MS	DATE	04-Apr-25	Stability Section 1 Drained Strength Parameters	
CHECK	PC	DATE	06-Apr-25		
SCALE	NTS		A4	PROJECT No. 202899	Figure D5

Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Tau/Sigma Ratio	Minimum Shear Strength (kPa)	Undrained Shear Strength (kPa)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Phi-B (°)
🟥	Embankment Material	Mohr-Coulomb	20				0	30	0
🟥	Embankment Material Undrained	Undrained (Phi=0)	20			40			
🟩	Ferricrete	Mohr-Coulomb	22				0	46	0
🟪	HDPE Liner	(None)							
🟦	Lake Clays	Mohr-Coulomb	19				0	32	0
🟪	Saprolite	Mohr-Coulomb	19				0	34	0
🟧	Saprolite Undrained	Undrained (Phi=0)	19			80			
🟫	Surficial Soils	Mohr-Coulomb	19				0	34	0
🟨	Tailings Undrained	SHANSEP	18	0.11	0				



wsp

CLIENT	ANGLOGOLD ASHANTI			PROJECT	AGAA CTD TSF Stage 12 Wall Raise
DRAWN	MS	DATE	04-Apr-25	Stability Section 1 Undrained Strength Parameters	
CHECK	PC	DATE	06-Apr-25		
SCALE	NTS		A4	PROJECT No. 202899	Figure D6



Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Tau/Sigma Ratio	Minimum Shear Strength (kPa)	Undrained Shear Strength (kPa)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Phi-B (°)
🟧	Bedrock	Mohr-Coulomb	19				0	34	0
🟥	Embankment Material	Mohr-Coulomb	20				0	30	0
🟩	Embankment Material PS	Undrained (Phi=0)	20			34			
🟩	Ferricrete PS	Mohr-Coulomb	22				0	41	0
🟪	HDPE Liner	(None)							
🟩	Lake Clays PS	Mohr-Coulomb	19				0	28	0
🟪	Saprolite	Mohr-Coulomb	19				0	34	0
🟦	Saprolite PS	Undrained (Phi=0)	19			68			
🟪	Surficial Soils PS	Mohr-Coulomb	19				0	30	0
🟦	Tailings PS	SHANSEP	18	0.06	0				

CLIENT	ANGLOGOLD ASHANTI	PROJECT	AGAA CTD TSF Stage 12 Wall Raise
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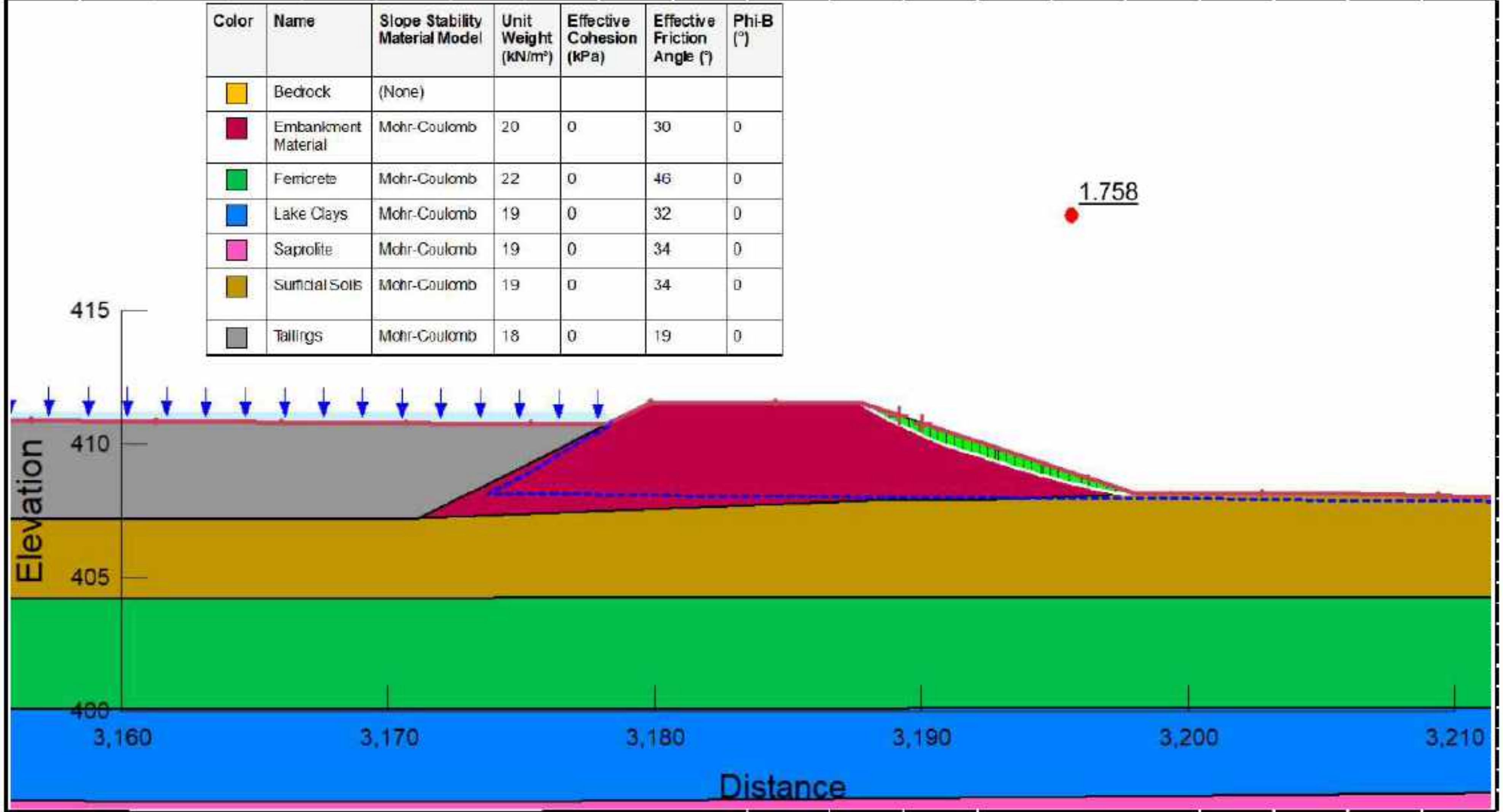
SCALE	NTS		A4
PROJECT No.	202899		Figure D7

Stability Section 1
Post Seismic Strength Parameters



Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Phi-B (°)
🟨	Bedrock	(None)				
🟥	Embankment Material	Mohr-Coulomb	20	0	30	0
🟩	Ferricrete	Mohr-Coulomb	22	0	46	0
🟦	Lake Clays	Mohr-Coulomb	19	0	32	0
🟪	Saprolite	Mohr-Coulomb	19	0	34	0
🟫	Surficial Soils	Mohr-Coulomb	19	0	34	0
⬜	Tailings	Mohr-Coulomb	18	0	19	0

CLIENT	ANGLOGOLD ASHANTI			PROJECT	AGAA CTD TSF Stage 12 Wall Raise
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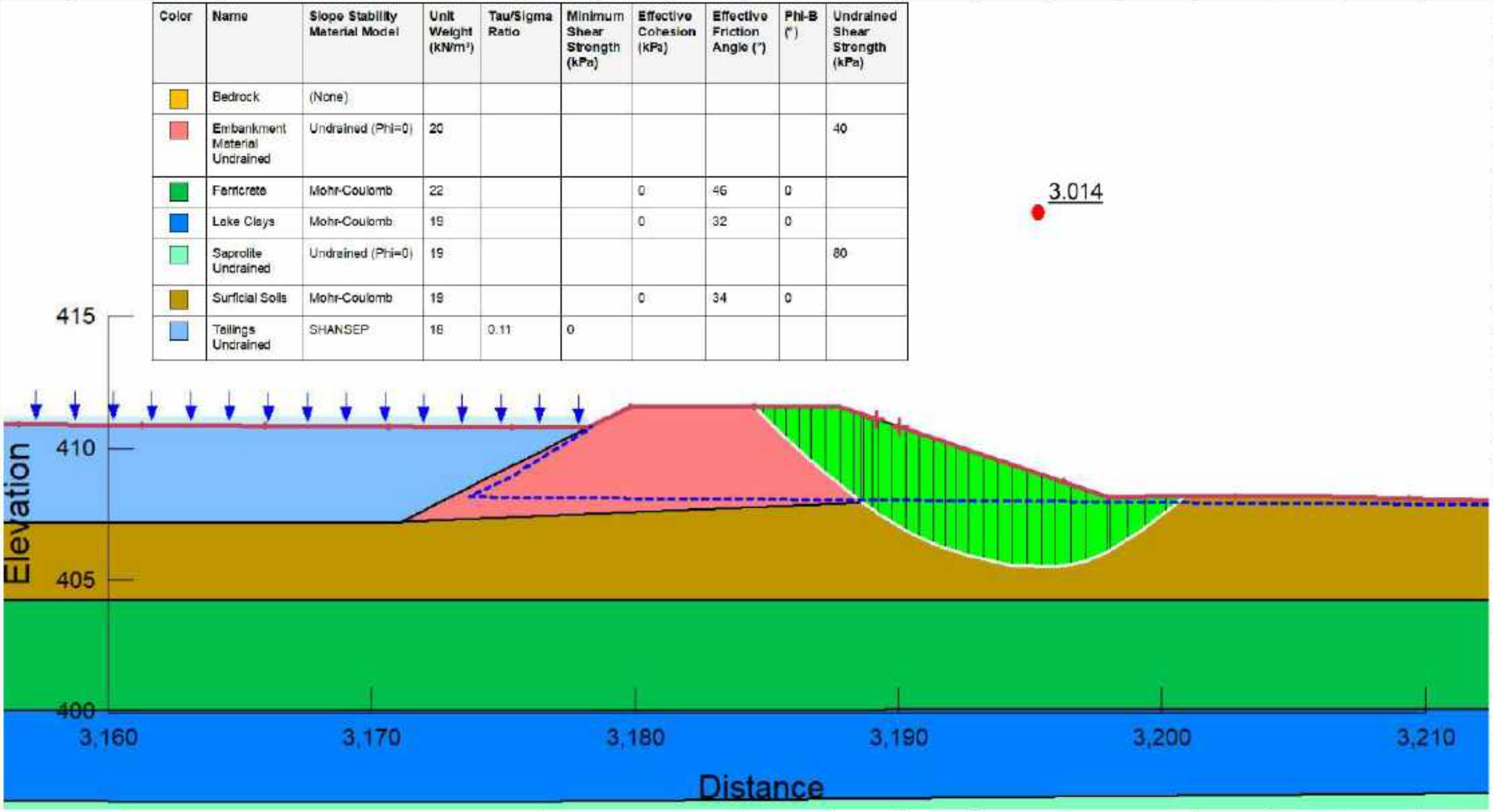
CHECK	PC	DATE	06-Apr-25		
SCALE	NTS		A4	PROJECT No.	202899

Figure D8



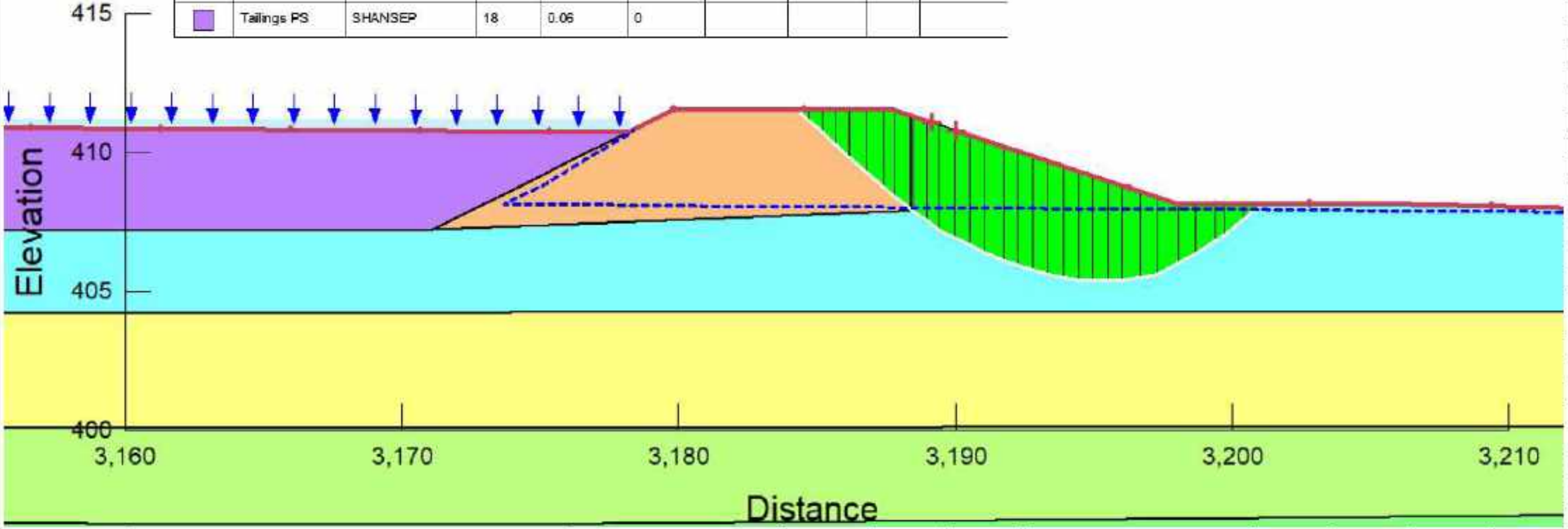
Color	Name	Slope Stability Material Model	Unit Weight (kN/m³)	Tau/Sigma Ratio	Minimum Shear Strength (kPa)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Phi-B (°)	Undrained Shear Strength (kPa)
🟨	Bedrock	(None)							
🟥	Embankment Material Undrained	Undrained (Phi=0)	20						40
🟩	Ferricrete	Mohr-Coulomb	22			0	46	0	
🟦	Lake Clays	Mohr-Coulomb	19			0	32	0	
🟩	Saprolite Undrained	Undrained (Phi=0)	19						80
🟫	Surficial Soils	Mohr-Coulomb	19			0	34	0	
🟦	Tailings Undrained	SHANSEP	18	0.11	0				

wsp

CLIENT	ANGLOGOLD ASHANTI			PROJECT	AGAA CTD TSF Stage 12 Wall Raise
DRAWN	MS	DATE	04-Apr-25	Stability Section 2 Undrained Strength Parameters	
CHECK	PC	DATE	06-Apr-25		
SCALE	NTS		A4	PROJECT No.	202899

Figure D9

Color	Name	Slope Stability Material Model	Unit Weight (kN/m^3)	Tau/Sigma Ratio	Minimum Shear Strength (kPa)	Effective Cohesion (kPa)	Effective Friction Angle (°)	Phi-B (°)	Undrained Shear Strength (kPa)
🟧	Bedrock	(None)							
🟫	Embankment Material PS	Undrained (Phi=0)	20						34
🟨	Ferricrete PS	Mohr-Coulomb	22			0	41	0	
🟩	Lake Clays PS	Mohr-Coulomb	19			0	28	0	
🟩	Saprolite PS	Undrained (Phi=0)	19						68
🟦	Surficial Soils PS	Mohr-Coulomb	19			0	30	0	
🟪	Tailings PS	SHANSEP	18	0.06	0				



CLIENT	ANGLOGOLD ASHANTI			PROJECT	AGAA CTD TSF Stage 12 Wall Raise
DRAWN	MS	DATE	04-Apr-25	Stability Section 2 Post Seismic Strength Parameters	
CHECK	PC	DATE	06-Apr-25		
SCALE	NTS		A4	PROJECT No. 202899	Figure D10

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