Government of Western Australia
Department of Water and Environmental Regulation

Amendment Report

Application for Licence Amendment

Part V Division 3 of the *Environmental Protection Act 1986*

Licence Number	L8579/2011/2
Licence Holder	AngloGold Ashanti Australia Limited
ACN	008 737 424
File Number	APP-0028495
Premises	Sunrise Dam Gold Mine Via Bindah Road LAVERTON WA 6440 Mining tenements M39/1116 and L38/176 As defined by the premises maps attached to the revised licence
Date of Report	13 October 2025
Decision	Revised licence granted

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1. Decision summary

L8579/2011/2 is held by AngloGold Ashanti Australia Limited (Licence Holder) for the Sunrise Dam Gold Mine (the Premises), located at mining tenements M39/1116 and L38/176 in the Shire of Laverton.

This Amendment Report documents the assessment of potential risks to the environment and public health from proposed changes to the emissions and discharges during the construction and operation of the Premises. As a result of this assessment, Revised Licence L8579/2011/2 has been granted.

2. Scope of assessment

2.1 Regulatory framework

In completing the assessment documented in this Amendment Report, the department has considered and given due regard to its Regulatory Framework and relevant policy documents which are available at https://dwer.wa.gov.au/regulatory-documents.

2.2 Application summary

On 23 April 2025, the Licence Holder submitted an application to the department to amend Licence L8579/2011/2 under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act). The following amendments are being sought:

- Construction of the Stage 12A and Stage 12B embankment raises at the Centrally Thickened Discharge (CTD) Tailings Storage Facility (TSF).

Stage 12A works include raising the embankment to 409-414 mRL, widening the stormwater storage pond (SSP) spillway by 200 m and connecting the Stage 10 seepage interception trench with the Southern seepage interception trench. Stage 12B comprises raising the CTD TSF embankment to between 410–415 mRL, depending on the section of CTD TSF. There is no change proposed to the existing tailings or decant water return pipelines associated with the CTD TSF.

2.2.1 Proposed TSF construction works

Stage 12 embankment raise

Stage 12 of the CTD TSF involves a downstream raise of the southern (Stage 10) perimeter embankment around the CTD TSF from 406-410 mRL to 409-415 mRL (Figure 1). In effect, the embankment raise will result in an increase by a total height of between 2 m and 6 m depending on location along the embankment. The embankment will be raised via two sub-stages, Stage 12A and Stage 12B (Figure 2). The CTD Stage 12 design (A + B) has been prepared based on an estimated production rate of 4.1 Mtpa, noting the Premises is licensed for a Category 5 throughput of 5.5 million tonnes per annum (Mtpa).

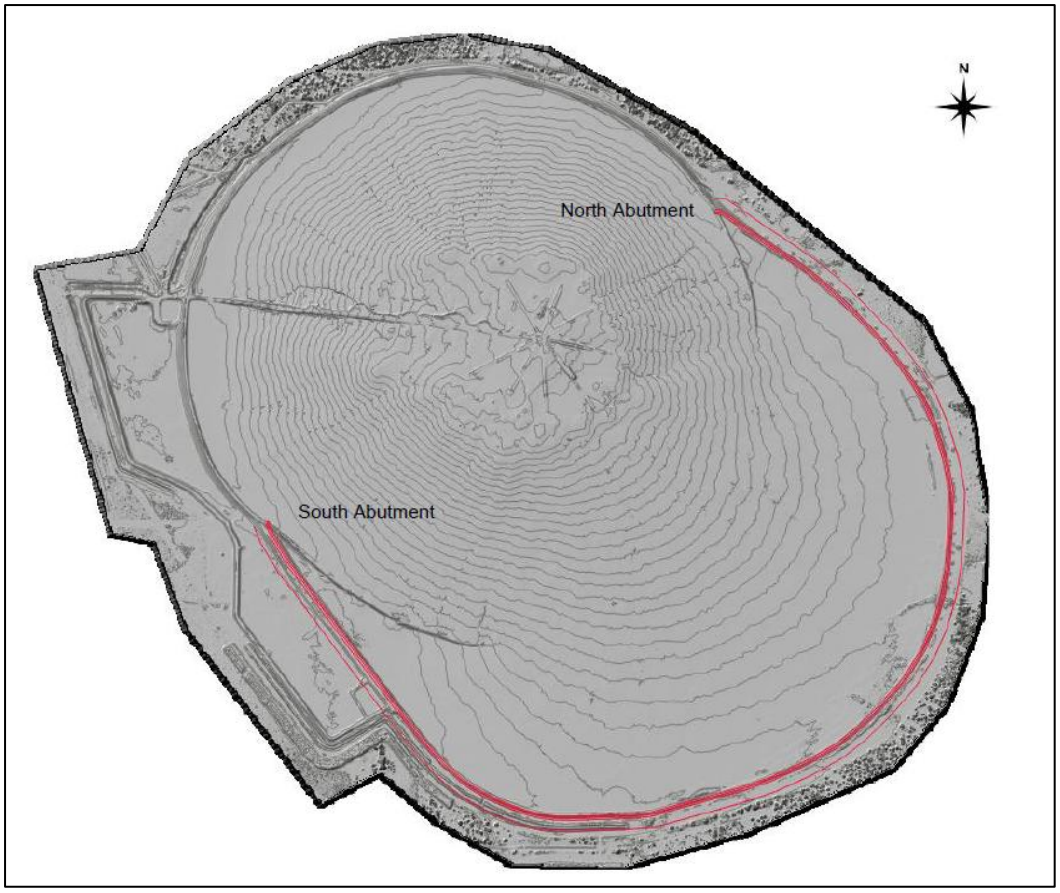

Figure 1: Proposed CTD TSF Stage 12 raise extent as shown in red

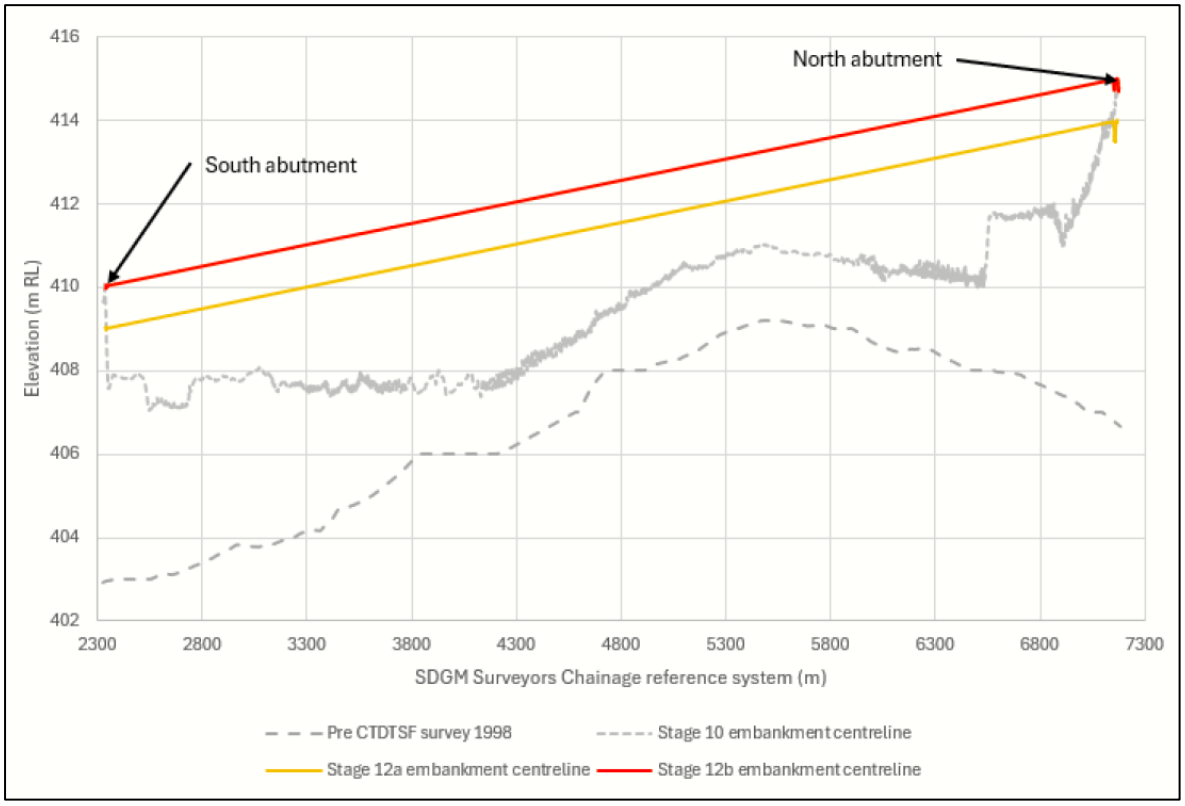

Figure 2 Long section showing milestone heights of the CTD TSF Stage 12A and 12B embankment raises

The CTD embankment wall will be constructed from Zone 1 Embankment fill material (low permeability fill material). The material will be moisture conditioned, placed in horizontal layers not exceeding 300 mm thickness and compacted to a minimum density ratio of 95% Standard Maximum Dry Density.

Stage 12A works are anticipated to take about 6 months, commencing Quarter 4 2025, pending regulatory approvals and contractor availability. Stage 12B works are expected to commence in Quarter 2 2029, ready for deposition by Quarter 1 2030.

No changes to pipelines have been proposed.

Table 1 Summary of CTD TSF Stage 12A and Stage 12B storage capacity

Item	Stage 12A	Stage 12B	Stage 12 Total
Expected Southern Embankment Crest Elevation (mRL)	409 to 414	410 to 415	409 to 415
Tailings Storage Volume (m^3)	12,056,111	2,870,840	14,926,951
Expected Life of Design (assuming 4.1 Mtpa)	4.9 years (approximately 1,750 days)	1.1 years (approximately 420 days)	6.0 years (approximately 2,180 days)

Design Stage	Storage Capacity		
	Volume (Mm^3)	Tonnage (Mt)	Years
Existing (Dec 1999 – Mar 2026)	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
Total End Stage 12	67.92	119.37	32.3

Notes:
Existing denotes existing facility through to the expected full capacity of Stage 10/11
Values calculated using a deposition rate of 4.1 Mtpa and a tailings density of 1.65 t/m^3

Stormwater storage pond spillway upgrades

Unlike a traditional paddock or valley fill TSF, the CTD TSF discharges thickened tailings from a central causeway via a series of spigots, creating a convex, inverted cone. The central tailings cone is higher than the perimeter embankments, which serve as drainage collection berms. As the tailings settle, supernatant runs off the surface where the majority evaporates, and the balance collects around the internal toe of the facility. Supernatant and incidental rainfall that collects at the outer embankments of the CTD TSF then flows clockwise towards the decant ponds located immediately adjacent to the stormwater storage pond (SSP) (Figure 3).

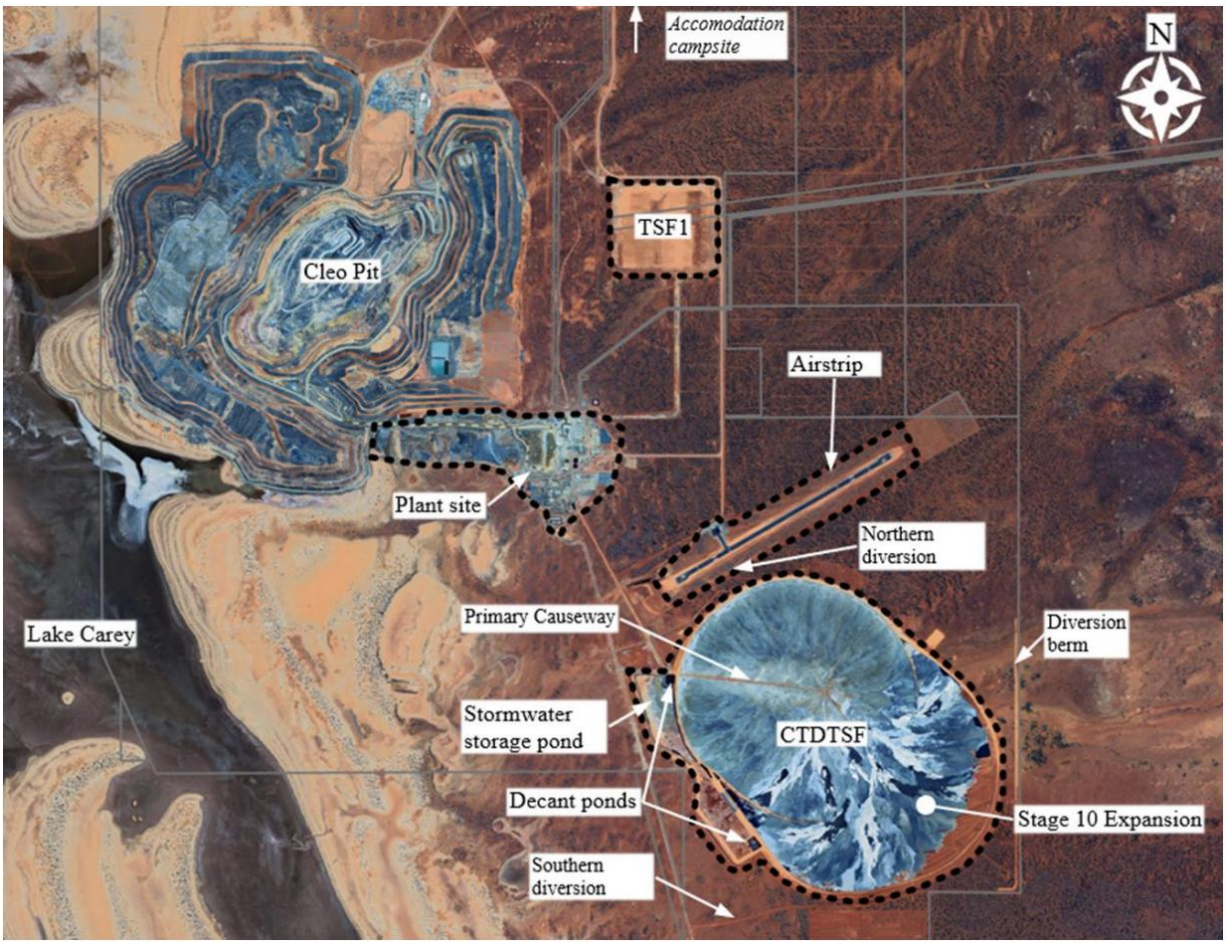

Figure 3: Site layout

Updated hydrological modelling indicates minor modifications are required to ensure the SSP spillway can permit passage of a 0.1% AEP flood event, conservatively assuming pre-flood pond level elevation is at the spillway invert level (AngloGold Ashanti Australia Ltd, 2025). To achieve this, 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 405.7 mRL. The spillway elevation will be increased by 100 mm to 405.2 mRL.

Seepage trench extension

The licence holder is proposing to connect the Stage 10 seepage interception trench with the southern seepage interception trench (Figure 4). Recent numerical groundwater modelling indicates connection of the two trenches provides improved capacity to control groundwater levels by intercepting groundwater over a greater section of the western CTD TSF perimeter. This will require excavation in the area between the two trenches on the western side of the CTD TSF.

Figure 4 Proposed linkage of the Southern Seepage Interception Trench with the Stage 10 Seepage Interception Trench

Extension of the Eastern Diversion Levee

The licence holder is planning to extend the existing Eastern Diversion Levee by 160 m to the north with the objective to control potential stormwater bypassing the existing levee extent (Figure 5). The purpose of the levee is to protect the CTD TSF embankments from erosion that could potentially be caused by floodwaters entering the site via stormwater runoff from surrounding land tenures. The levee maintains embankment stability and keeps clean stormwater from entering the site and potentially becoming contaminated.

The levee will not be included in the risk assessment or the licence as the design and construction of the diversion levee is regulated by the Department of Mines, Petroleum and Energy (DMPE), who has the expertise to ensure the design is appropriate to protect the stability of the TSF facility.

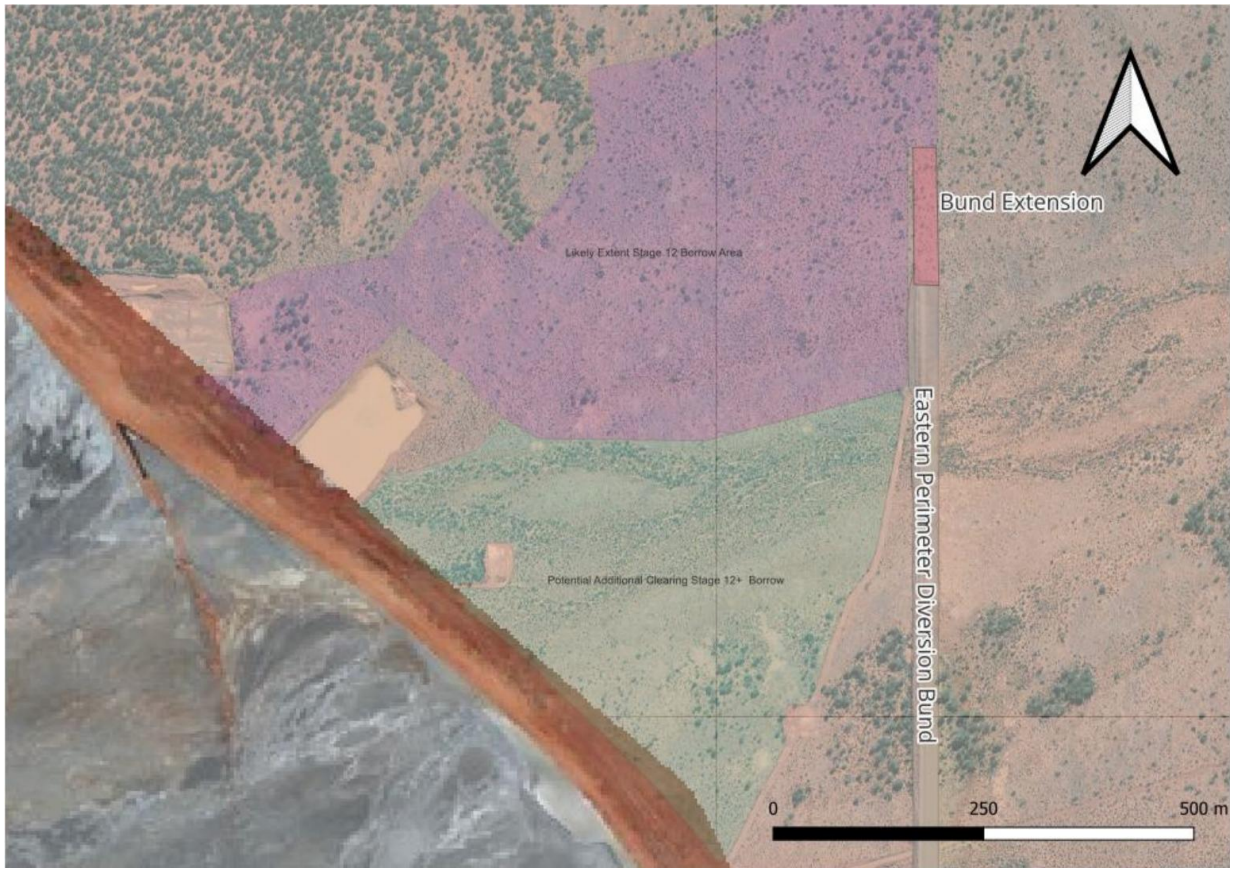

Figure 5: Proposed Extension of the Eastern Diversion Levee

2.2.2 TSF operational aspects

The licence holder commissioned SRK Consulting to develop a numerical groundwater modelling report (SRK Consulting 2025) to assess potential seepage impacts from the Stage 12 embankment raise. All predictive scenarios simulated a decline in groundwater levels in bores surrounding the CTD TSF following a peak in early 2024 caused by flooding at the premises. Post-closure, groundwater levels have been simulated to recover (reduction of the mound under the CTD TSF to background levels) in less than 10 years.

Decant water management

The CTD TSF surface water management system comprises two gravity decant systems draining into the SSP, two spillways into the SSP and an emergency discharge spillway on the perimeter embankment of the SSP (AngloGold Ashanti Australia Ltd, 2025). The decant towers have been arranged with varying inlet elevations to accommodate transfer of peak flows resulting from runoff from specific storm events (i.e. 1:5 year, 1:10 year and 1:20 year average recurrence interval (ARI)).

The CTD TSF is designed to spill into the SSP, which has a design capacity of 1:100-year, 72-hour storm event plus contingency storage allowance of 0.5 metres dry freeboard. Water that is captured in the SSP can be pumped from the SSP to the processing plant for use.

The SSP spillways are designed with a peak flow depth of 0.4 m for a 1:1,000, 30-minute duration storm. This allows the discharge from the SSP emergency spillway to flow into the southern seepage trench, which will typically overflow at its northern end before releasing onto natural land enroute to Lake Carey. The spillways between the CTD TSF and the SSP have been designed to cater for rare and extreme storm events up to 1:1,000 ARI. This allows the infrastructure to adequately manage situations where the flow capacity of the gravity system is exceeded. The 1:1,000-year peak flood flow for the Stage 10 expansion was calculated to be

114.0 m^3/s (AngloGold Ashanti Australia Ltd, 2025).

The licence holder advises that its process water is sourced from primarily hypersaline groundwater, therefore supernatant water within the CTD TSF is unpalatable to birds and bats, eliminating the potential for a source-pathway-receptor link. There is no proposed change to the existing tailings or decant water return pipelines associated with the CTD TSF Stage 12 embankment raise.

Tailings material characterisation

Tailings produced at the site have been confirmed to be non-acid forming (NAF) (Graeme Campbell and Associates 1995 and 2002). A follow-up geochemical characterisation study was conducted in 2014 (MBS Environmental 2014) on 78 tailings samples from varying positions within the CTD TSF. The study identified the following properties for the tailings sampled:

- An average pH of 8 and Electrical Conductivity (EC) of 1,196 mS/m across all samples.
- Although average oxidisable Sulfide was 0.95%, the tailings were found to have a high Acid Neutralization Capacity (ANC), with tailings sampled recording between 112 and 192 kg/t. This means that tailings are predominantly NAF, with two thirds being classified as acid consuming.
- The key element of environmental significance present was found to be arsenic, with lesser amounts of molybdenum, selenium and antimony being recorded. 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, tailings will be nondispersive and trafficable when dry.

As part of preliminary investigations for Stage 12 of the CTD TSF, geochemical testing was conducted on a slurry tailings sample and 15 samples of tailings recovered from various locations and depths on the CTD TSF (AngloGold Ashanti Australia Ltd 2025). The tailings slurry was shown to have the following characteristics:

- Sulfide sulfur present (~0.8%) was predominantly pyrite, with a particularly high acid neutralization capacity (ANC) of 114 kg H_2SO_4/t. The licence holder expects that this is likely attributed to the presence of carbonate minerals (calcite and dolomite).
- With resultant negative Net Acid Production Potential (NAPP) and alkaline Net Acid Generation (NAG), pH was found to be between pH 9 - 11, further confirming that all tailings samples were classified as NAF which is consistent with previous data from the CTD TSF.
- Paste pH measurements indicated alkaline conditions (pH 8.3 – 8.7), while paste EC indicated saline conditions (16,000 - 25,800 µS/cm).
- Geochemical enrichment (GAI ≥3) in arsenic, molybdenum, sulfur, antimony, and to a lesser degree selenium has been 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).

Water entering the SSP from the tailings is characterised as hypersaline, which means it is unpalatable for fauna ingestion, so impact from the tailings on local native fauna is negligible.

The design of the TSF has resulted in a high strength tailings surface with a gently sloping, self-shedding stable surface which provides an accessible and trafficable surface to facilitate rehabilitation and closure works (WSP 2025). Rehabilitation of the site will include revegetation of the access road and service corridor via ripping and seeding, while seepage collection trenches are to be dewatered and filled in. The tailings surface is to be sufficiently covered with waste rock and topsoil (sourced from non-saline and moderately saline topsoil stockpiles located to the north and south of the CTD TSF) prior to being revegetated (WSP 2025).

3. Legislative context

3.1 Approvals under the *Mining Act 1978*

At the time of submission of this Licence Amendment, a mining proposal (Reg ID 500660) was being prepared for submission to the Department of Mines, Petroleum and Exploration (DMPE) to enable parallel processing.

A review of the mining proposal and the Licence Amendment was undertaken by the DMPE and it was confirmed that the mining proposal and the licence amendment application are consistent with each other.

As part of the review, geotechnical assessment was undertaken and no concerns were noted with the Stage 12 embankment raise.

3.2 Part V – Native Vegetation clearing

The proposed TSF raise does not include an expansion of the operational area of the CTD TSF, and the downstream construction footprint for Stage 12 is minimal, with any works predominantly falling within existing perimeter roadways and other existing clearing footprints for which the applicant states that minimal clearing is required (AngloGold Ashanti Australia Ltd 2025). However, some clearing will be required to expand the borrow pit area for construction materials, works around the perimeter of the CTD TSF, and other infrastructure. This clearing is covered by clearing permit CPS 10741 which was granted on 1 May 2025, and expires on 23 May 2030).

4. Groundwater monitoring review

Seepage modelling and management

Numerical groundwater modelling was undertaken to assess the potential seepage impacts resulting from embankment raises of the CTD TSF. Groundwater responses observed over approximately 14 years of deposition of tailings into the CTD TSF are of the same magnitude as expected for future CTD TSF behaviour (SRK Consulting 2025). Additionally, modelling shows that the seepage infiltration rates are anticipated to reduce once the foundation is fully covered by tailings (reliant on Stage 12 embankment raise and anticipated in early 2026), having a lower hydraulic conductivity than the foundation material (SRK Consulting 2025). Further, high rainfall events in early 2024 have led to increased water levels, although these are currently receding following a groundwater level peak.

Observations show that mounding is concentrated to the east of Sunrise dam where depth to groundwater is greater due to a higher topography. Lower depth to groundwater on the western side is likely due to lower topography in this area as well as the closer proximity to Lake Carey. Modelling shows that groundwater levels following Stage 12 of the CTD TSF are expected to recede, which the licence holder claims is due to the reduction in seepage from the CTD TSF that is expected to occur once the foundation is covered by tailings, as well as a combination of

natural recession from evaporation at Lake Carey, some pit dewatering influence, and ongoing abstraction of the seepage interception system.

According to the modelling and recent geotechnical and hydrogeological field investigations, the tailings material is largely unsaturated, and the seepage rate is not expected to increase in response to the raise in embankment height and increased tailings thickness (SRK Consulting 2025). This is due to unique deposition and facility arrangement which avoids the creation of permanent pools of water on top of the tailings, as well as the thickened slurry discharge and thin layer deposition which promotes evaporative drying and desiccation of the tailings mass. Due to the limited seepage that has been observed, and which is to continue to be expected, groundwater levels in early 2024 were simulated to be the highest that the area around the CTD TSF will reach.

The operation of the CTD TSF is anticipated to have little impact on the maximum groundwater levels and the groundwater level peak may even be higher without the operation of the seepage mitigation abstraction in certain scenarios. Groundwater levels are most sensitive to large rainfall and flooding events (SRK Consulting, 2025).

The current licence L8579/2011/2 contains several existing controls that aim to address seepage from the CTD TSF. These include interception measures comprised of trenches and abstraction bores and a spatially extensive groundwater monitoring network with monthly observations. Vegetation monitoring is also undertaken under licence L8579/2011/2, with no changes proposed under this amendment. Monitoring of seepage recovery bores is also proposed to continue as per the current licence. Excavation of seepage interception trenches is proposed under this amendment with the aim of further improving seepage recovery and management.

Groundwater levels

The CTD TSF is located within close proximity to Lake Carey, which has resulted in a naturally shallow groundwater environment, with baseline groundwater levels ranging between 399.5 mRL east of the CTD TSF to 397.5 mRL (approximately 1 to 6 mbgl) west of the CTD TSF. Contours in this area display a north-south orientation, which indicates a westerly groundwater flow towards Lake Carey (AngloGold Ashanti Australia Ltd 2025). Interpreted baseline groundwater level contours for the CTD TSF area are displayed in Figure 6.

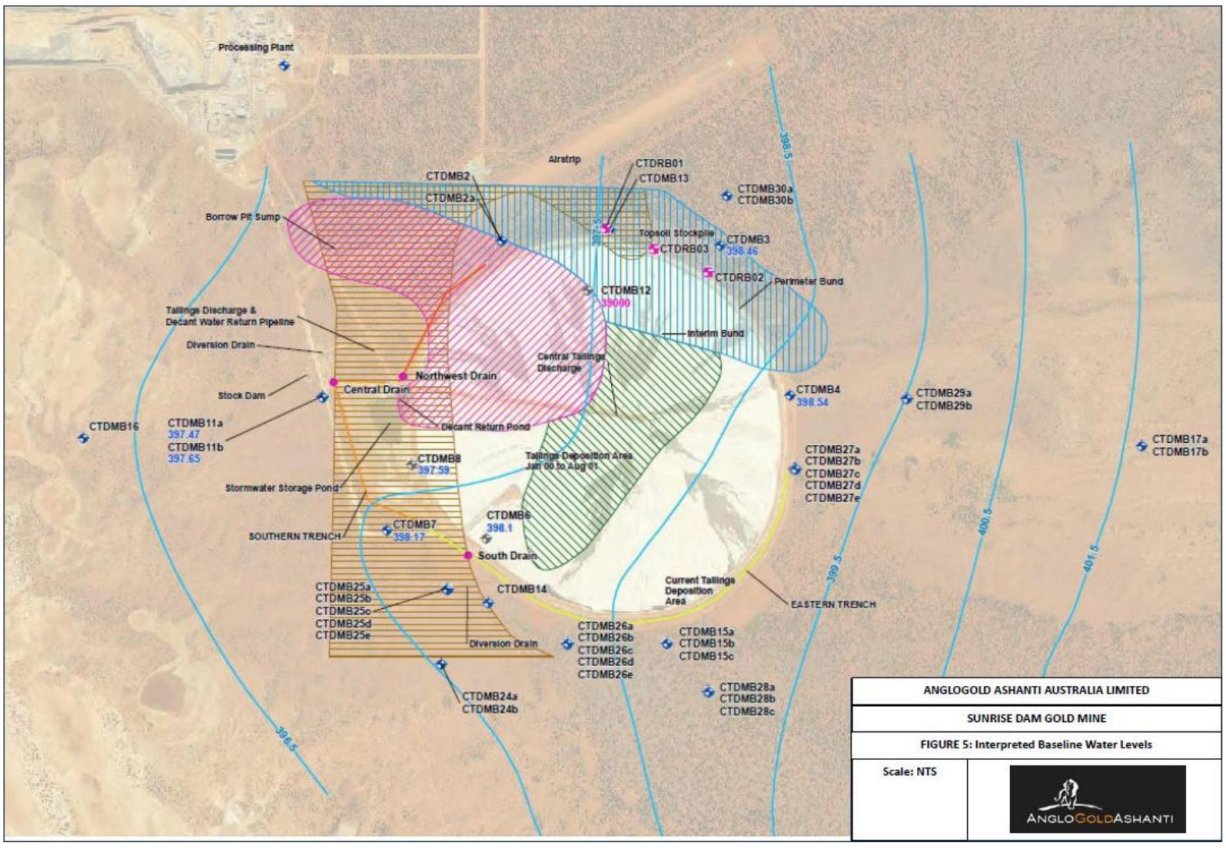

Figure 6: Baseline Groundwater Contours Around the CTD TSF

As of April 2024, groundwater levels have been observed to range between 401 and 406 mRL east of the CTD TSF and approximately 399 mRL west of the CTD TSF (Figure 7). The reason for this change in groundwater from baseline levels is that the contour orientation has been altered due to a combination of nearby bore field drawdown influences around Cleo and Sunrise Pits and significant rainfall events throughout 2024. The groundwater mound is at its highest in the southeastern corner of the CTD TSF and shallowest in the northwestern corner of the CTD TSF.

High rainfall in 2024 resulted in localized ponding, transient seepage and groundwater level increase. Since then, groundwater levels have resumed their downward trend except for the southeastern corner of the CTD TSF where tailings deposition has not fully covered the CTD TSF floor within the expanded footprint of the Stage 10 expansion. In this area, groundwater level trends have ranged between slight downward to slight upward movement.

Hydrogeological modelling indicates that once this area is covered in tailings, potential seepage of the CTD TSF will decrease significantly due to the low hydraulic conductivity of consolidated tailings (SRK, 2025). Groundwater levels are simulated to continue to decrease during the operation of Stage 12 and following closure of the facility. The model predicts that the continued operation of the CTD TSF will have little impact on maximum groundwater levels, which are most sensitive to large rainfall events (WSP 2025).

Over the lifetime of the operation to date (approximately 26 years), the greatest fluctuations in groundwater levels have been driven by large rainfall events such as 2011, 2017 and 2024 (Figure 8), whereby groundwater levels have risen at times to within 1 m of ground level. Despite this, groundwater levels have demonstrated a declining trend since 2010 by between 1 and 2.5 m (Figure 8), punctuated by temporary rises induced by the abovementioned high rainfall events.

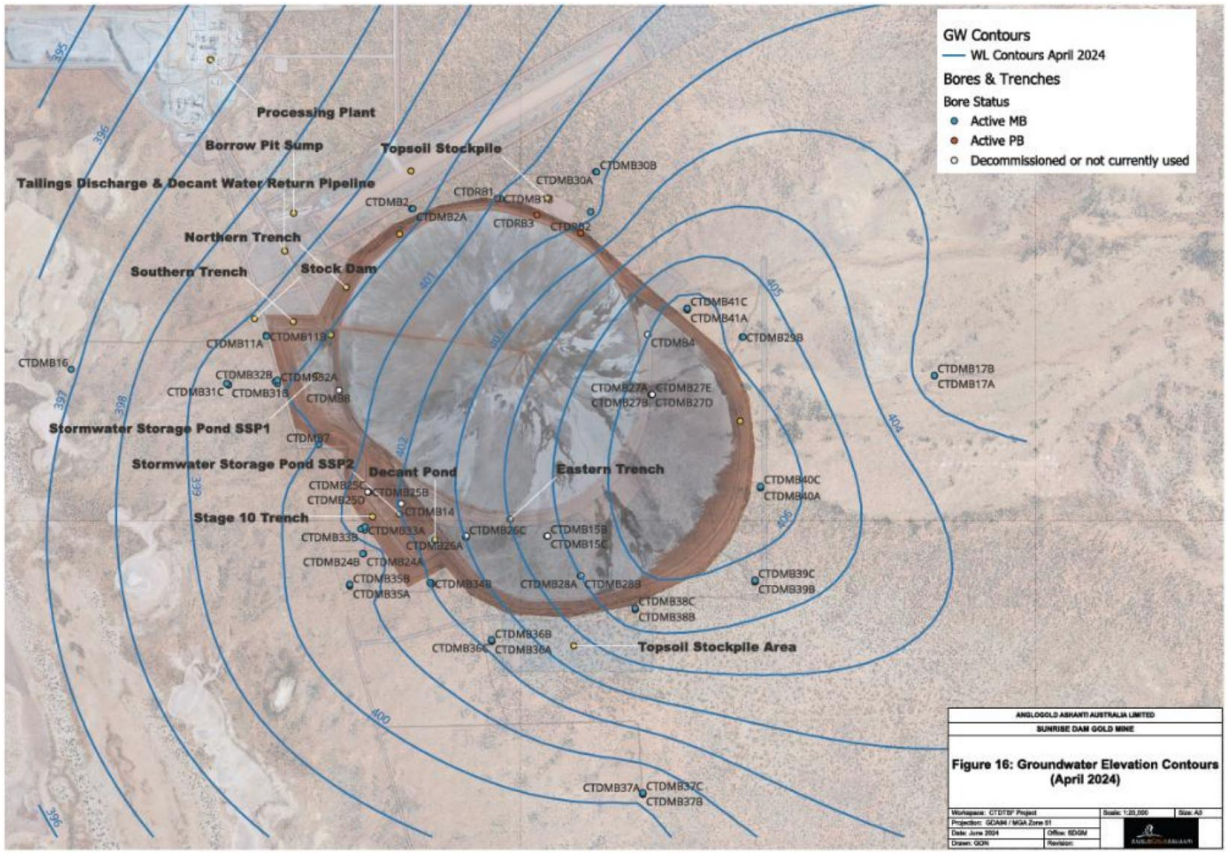

Figure 7: Groundwater Contours and Monitoring Bores Location Around the CTD TSF

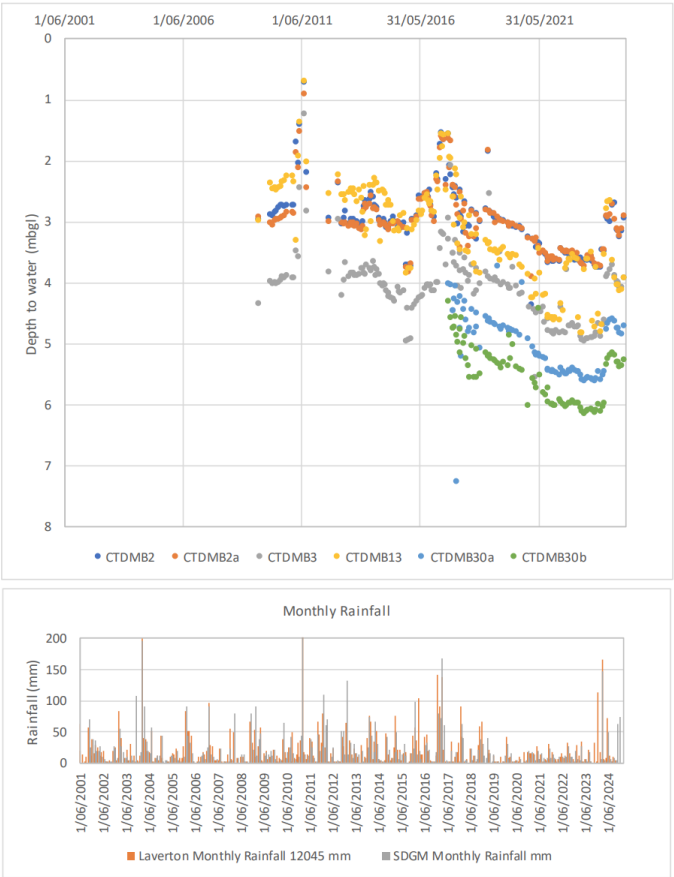

Figure 8: Historic Rainfall Hydrographs and Monitoring Bore Groundwater Levels

Groundwater quality

Baseline groundwater quality around the CTD TSF has been observed to be broadly saline to hypersaline. Groundwater quality trends adjacent to the CTD TSF have experienced a slow increase in salinity over time, punctuated by periods of reduced salinity after high rainfall events in 2011, 2017 and 2024 (AngloGold Ashanti Australia Ltd 2025). Where groundwater salinity has increased, it has been mostly limited to shallow groundwater bores close to the CTD TSF, whereas bores located further away from the CTD TSF or at greater depths have been largely unaffected by the CTD TSF.

Licence L8579/2011/2 requires the preparation of an Annual Audit Compliance Report (AACR) and Annual Environmental Report (AER), respectively, for submission to the Department of Water and Environmental Regulation (DWER) within 60 calendar days after the end of the annual period. The latest report (AngloGold Ashanti Australia Limited 2024) has been developed to meet the licence condition requirements and covers the period 1 January 2024 to 31 December 2024 (the reporting period). The Delegated Officer has undertaken a review of the AER and the following observations are noted:

- pH has raised slightly in primarily northern and eastern bores, with most bores over the site remaining within the circumneutral range.
- Total Dissolved Solids (TDS) decreased in most of the northern and eastern bores, with bores in the south and west showing primarily increases in TDS. All bores remain in the hypersaline range.
- Northern and western bores showed a slight increase (less than 1 mg/L) in boron, with boron generally increasing in the southern and eastern bores.
- Arsenic, copper and lead concentration all remained less than the laboratory Limit of Reporting or showed decreasing concentrations across all bores.

The AACR declared no instances of non-compliance regarding the CTD TSF.

From vegetation monitoring around the CTD TSF, the combination of groundwater levels and hypersaline groundwater quality has not resulted in an impact to vegetation. The 2024 vegetation monitoring around the CTD TSF found that overall condition of vegetation around the CTD had improved from a previous downward trend, which was a result of the regional drought conditions. Understorey vegetation parameters have been observed to have improved beyond values previously recorded, and upper storey parameters have remained stable (AngloGold Ashanti Australia Ltd 2025).

Reporting and modelling to date has revealed that there are no major seepage issues observed, and there is an adequate monitoring network in place. The Delegated Officer suggests that monitoring should continue to monitor as per the current licence conditions.

5. Risk assessment

The department assesses the risks of emissions from prescribed premises and identifies the potential source, pathway and impact to receptors in accordance with the *Guideline: Risk assessments* (DWER 2020).

To establish a Risk Event there must be an emission, a receptor which may be exposed to that emission through an identified actual or likely pathway, and a potential adverse effect to the receptor from exposure to that emission.

5.1 Source-pathways and receptors

5.1.1 Emissions and controls

The key emissions and associated actual or likely pathway during premises construction and operation which have been considered in this Amendment Report are detailed in Table 2 below. Table 2 also details the proposed control measures the Licence Holder has proposed to assist in controlling these emissions, where necessary.

Table 2: Licence Holder controls

Emission	Sources	Potential pathways	Proposed controls
Construction			
Dust	Construction of TSF raise Stages 12A and 12B	Air / windborne pathway	• No specific controls have been proposed by the applicant. • The Delegated Officer notes that due to the separation distance there is no likely pathway for dust emission from the proposed activity to nearest receptor.
Operation			
Tailings leachate with elevated concentrations of cyanide, salinity, metals	Category 5: Deposition of tailings into CTD TSF at Stage 12 height	Seepage through the TSF floor, causing changes to groundwater quality and localised mounding of the groundwater table and root uptake by native flora species.	• Continue decant recovery. • Continued use of groundwater recovery bores. • Extend seepage trenches to intercept seepage. • Continue bore monitoring program as per existing licence L8579/2011/2. • Continuing vegetation monitoring program as per existing licence L8579/2011/2. • Seepage recovery pumps operated to maximise seepage volumes recovered.
Decant water, tailings with elevated concentrations of cyanide, salinity, metals		Overtopping from operational failure and/or heavy rainfall event, causing runoff, infiltration and root uptake by native flora species.	• Existing surface water management structures around the CTD TSF. • Extension of the eastern flood levee during Stage 12 embankment earthworks. • CTD footprint not substantially altered by Stage 12 embankment raise. • At least 0.8 m freeboard around the Stage 12 perimeter embankment. • The Stormwater Storage Pond is designed to contain 1 in 100-year, 72-hour event as per existing licence L8579/2011/2. • Daily inspection of deposition and embankment freeboard as per existing licence L8579/2011/2. • Monthly aerial survey of the CTD TSF.

5.1.2 Human and environmental receptors

In accordance with the *Guideline: Risk assessments* (DWER 2020), the Delegated Officer has excluded employees, visitors and contractors of the Licence Holder's from its assessment. Protection of these parties often involves different exposure risks and prevention strategies and is provided for under other state legislation.

Table 3 below provides a summary of potential human and environmental receptors that may be impacted as a result of activities upon or emission and discharges from the prescribed premises *(Guideline: Environmental siting* (DWER 2020)).

Table 3: Sensitive human and environmental receptors and distance from prescribed activity

Human receptors	**Distance from prescribed activity**
Mt Weld Pastoral Station	Overlapping premises boundary.
Environmental receptors	**Distance from prescribed activity**
Native vegetation Austin Botanical District characterised by Mulga Low Woodlands and numerous salt flats surrounding salt lakes, vegetated by halophytes and samphires (*Tecticornia* sp.).	Native vegetation surrounds the CTD TSF.
Underlying groundwater (non-potable purposes) Broadly saline to hypersaline, between 49,000 to 172,000 mg/L adjacent to the CTD TSF Groundwater salinity in bores surrounding the CTD TSF has slowly increased over time, punctuated by periods of reduced salinity after high rainfall events in 2011, 2017 and 2024. Overall water quality is between 49,000 and 105,000 mg/L. Where groundwater salinity has increased, it has been mostly limited to shallow groundwater bores close to the CTD TSF, whereas bores away from the CTD TSF or at greater depths have been largely unaffected by the CTD TSF (AngloGold Ashanti Australia Ltd, 2025). Groundwater flows west toward Lake Carey. Elevated sodium, manganese, magnesium, potassium, calcium, boron have been reported in groundwater in the vicinity of the CTD TSF (2024 Annual Environmental Report).	Groundwater levels around and within the CTD TSF measured in September 2024 ranged between 3.0 – 3.9 m BGL. The CTD TSF is situated in a naturally shallow groundwater environment, owing to its close proximity to Lake Carey. Depth to water decreases east to west towards Lake Carey.
Lake Carey – Ephemeral, hypersaline salt lake Creeks and drainages located within the premises operational area are ephemeral in nature.	3 km west of CTD TSF. Nearest fringing lakes to Lake Carey are about 1.5 km west of the TSF.

5.1.3 Hydrogeology

This site is situated within the Goldfields Groundwater Area which is a proclaimed groundwater area as defined in section 57 of the *Environmental Protection Act 1986*. Table 4 provides a summary of the proclaimed groundwater area as a receptor and the environmental values associated with it as they may be impacted by the activities proposed in this amendment.

Table 4: Hydrogeological receptors

Groundwater and water sources	Distance from Premises	Environmental value
Proclaimed groundwater area: Goldfields Groundwater Area.	The site is located within the Goldfields Groundwater Area.	Surface formations have undergone significant weathering and diagenetic alteration throughout the Cenozoic Era, developing a deep lateritic profile. The predominantly gneissic Archaean basement was once incised by ancient NNE draining streams, which are now buried beneath at least 30 m of Cenozoic alluvium and clayey colluvium deposits. The basement and Cenozoic deposits have in turn been subjected to millions of years of continuous lateritic weathering, which has created a gently undulating semi-arid terrain with generally low relief. The following activities are expected to impact groundwater levels: • Open pit and underground dewatering and the subsequent cone of depression. • Tailings deposition into TSF1 between 1998 and 2000. • Tailings deposition into CTD TSF since 2000 resulting in groundwater mounding. • The operation of multiple borefields, of most relevance to the CTD TSF is the recently commissioned (2022) Bravo borefield ~ 2.5 km north of the CTD TSF. Prior to construction of the CTD TSF, groundwater recharge was driven by a combination of rainfall from within and up-gradient of the site and throughflow from up-gradient areas to the northeast. The inferred flow direction is generally from east to west. Interpreted baseline groundwater level contours for the CTD TSF area are displayed on Figure 8. Locally, minor influences of permeable paleochannel sediments have been included in the interpretation. Regionally, the depth to groundwater decreases with proximity to Lake Carey. West of the CTD TSF and close to Lake Carey, the shallow depth to groundwater permits the significant discharge of groundwater and accumulation of salt within groundwater via evapotranspiration. Baseline groundwater salinity levels beneath and surrounding the CTD TSF varied from brackish (approximately 1,200 mg/L TDS) at the groundwater table to approximately 126,000 mg/L TDS within the bedrock. These salinities are the result of natural salt accumulation processes linked to recharge, throughflow rates and proximity to regional discharge sites such as Lake Carey (AngloGold Ashanti Australia Ltd, 2025). Groundwater levels in the vicinity of the CTD TSF and Sunrise Dam as a whole are most sensitive to large rainfall and surface flooding events.

5.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020) for those emission sources which are proposed to change and takes into account potential source-pathway and receptor linkages as identified in Section 5.1. Where linkages are incomplete they have not been considered further in the risk assessment.

Where the Licence Holder has proposed mitigation measures/controls (as detailed in Section 5.1), these have been considered when determining the final risk rating. Where the Delegated Officer considers the Licence Holder's proposed controls to be critical to maintaining an acceptable level of risk, these will be incorporated into the licence as regulatory controls.

Additional regulatory controls may be imposed where the Licence Holder's controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in Table 5.

The Revised Licence L8579/2011/2 that accompanies this Amendment Report authorises emissions associated with the operation of the Premises i.e. Category 5 activities.

The conditions in the Revised Licence have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

Table 5. Risk assessment of potential emissions and discharges from the Premises during construction and operation

Risk Event					**Risk rating** C = consequence L = likelihood	**Applicant controls sufficient?**	**Conditions of licence**	**Justification**
Source/Activities	**Potential emissions**	**Potential pathways and impact**	**Receptors**	**Applicant controls**				
Construction								
Construction of TSF raise Stages 12 a and 12 b	Dust	Air / windborne pathway	Native vegetation	Refer to section 5.1.1	C = Moderate L = Possible **Medium Risk**	Y	N/A	Conditions specific to dust during the construction of the TSF are not required as there is no likely pathway for dust emission from the proposed activity to nearest receptor.

Risk Event					Risk rating C = consequence L = likelihood	Applicant controls sufficient?	Conditions of licence	Justification
Source/Activities	**Potential emissions**	**Potential pathways and impact**	**Receptors**	**Applicant controls**				
Operation								
Category 5: Deposition of tailings into CTD TSF at Stage 12 height	Tailings leachate with elevated concentrations of cyanide, salinity, metals	**Pathway**: Seepage through the TSF floor, causing changes to groundwater quality and localised mounding of the groundwater table and root uptake by native flora species **Impact**: Death or decline in health of native vegetation	Native vegetation surrounding CTD TSF Lake Carey and adjacent playa lakes and ephemeral water lines	Refer to section 5.1.1	C = Moderate L = Possible **Medium Risk**	Y	Condition 14, Table 5	N/A
	Decant water, tailings with elevated concentrations of cyanide, salinity, metals	**Pathway**: Overtopping from operational failure and/or heavy rainfall event, causing runoff, infiltration and root uptake by native flora species **Impact**: Death or decline in health of native vegetation	Native vegetation surrounding CTD TSF Lake Carey and adjacent playa lakes and ephemeral water lines	Refer to section 5.1.1	C = Moderate L = Possible **Medium Risk**	Y	Condition 14, Table 5	N/A

Note 1: Consequence ratings, likelihood ratings and risk descriptions are detailed in the *Guideline: Risk assessments* (DWER 2020).

Note 2: Proposed Licence Holder's controls are depicted by standard text. **Bold and underline text** depicts additional regulatory controls imposed by department.

6. Consultation

Table 6 provides a summary of the consultation undertaken by the department.

Table 6: Consultation

Consultation method	Comments received	Department response
Department of Mines, Petroleum and Exploration (DMPE) were advised of the proposal on 18 July 2025.	The DMPE responded on 26 August, confirming that the Licence Holder has recently submitted an amended mining proposal for the CTD TSF Stage 12, received as Reg ID 500660. A review of the mining proposal has been completed and it is confirmed that the mining proposal is consistent with the licence amendment application. A geotechnical review was undertaken and from a geotechnical perspective, no concerns were noted with the Stage 12 embankment raise.	Noted.
Licence Holder was provided with draft amendment on 16 September 2025	Comments were received on 7 October 2025. Refer to Appendix 1	Refer to Appendix 1

7. Conclusion

Based on the assessment in this Amendment Report, the Delegated Officer has determined that a Revised Licence will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

7.1 Summary of amendments

Table 7 provides a summary of the proposed amendments and will act as record of implemented changes. All proposed changes have been incorporated into the Revised Licence as part of the amendment process.

Table 7: Summary of licence amendments

Condition no.	Proposed amendments
Cover page	Update DWER file number Update date of amendment
Licence history	Add licence amendment to add the maximum Stage 12 CTD TSF height to the requirements for containment infrastructure (Condition 14, Table 5) (this assessment).
Condition 1, Table 1	Addition of Stage 12A and Stage 12B to the construction table to allow for the construction as per the design and reporting via conditions 2 and 3.
Condition 2	Increased timeframe for delivery of report to allow for greater complexity of report.

Condition no.	Proposed amendments
Condition 14, Table 5	Construction report as required in condition 2 prior to discharge to new height.
Definitions	Definition added for 'suitably qualified engineer' for both the construction of the WWTP infrastructure and the construction of the CTD TSF stages

References

1. AngloGold Ashanti Australia Limited 2024, *Sunrise Dam Gold Mine Prescribed Premises Licence - L8579/2011/2 Annual Environmental Report*, Perth, Western Australia.
2. AngloGold Ashanti Australia Ltd 2025, *Sunrise Dam Gold Mine Licence L8579/2011/2 Amendment Application Supporting Document - CTD TSF Stage 12*, Perth, Western Australia.
3. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
4. Department of Water and Environmental Regulation (DWER) 2020, *Guideline: Environmental Siting*, Perth, Western Australia.
5. DWER 2020, *Guideline: Risk Assessments*, Perth, Western Australia.
6. Greame Campbell and Associates 1995, *Sunrise Dam Project, geochemical characterization of process tailings produced from saprolite, transitional and fresh ores (Golden delicious project), Implications for tailings management*.
7. Graeme Campbell and Associates Pty Ltd (2002). *Geochemical Characterisation of Process - Tailings Samples.*
8. MBS Environmental 2014, *Geochemical assessment and conceptual cover design for the central thickened discharge tailings storage facility*, Sunrise Dam operations, Laverton, Western Australia.
9. SRK Consulting 2025, *Sunrise Dam Gold Mine – Tailings Dam Stage 12 Embankment Raise Numerical Modelling*, West Perth, Western Australia.
10. WSP 2025, *Sunrise Dam Goldmine – Central Thickened Deposition Tailings Storage Facility Stage 12 Raise Design Report*, Perth, Western Australia.

Appendix 1: Summary of Licence Holder's comments on risk assessment and draft conditions

Condition	Summary of Licence Holder's comment	Department's response
Amendment Report		
Multiple sections	The CTD is incorrectly referred to as the 'CDT' in a number of sections throughout the Amendment Report. AGAA requests that the text is corrected to reflect 'CTD' as the correct term.	Noted. This has been amended throughout the Amendment Report.
Section 2.2	Amend "Stage 12A works include raising the embankment to 409-415 mRL 409-414 mRL" to state correct mRL range for Stage 12A (i.e. 409 – 414 mRL).	Amended to reflect the correct height of the Stage 12A embankment raise.
Section 2.2.1	The Amendment report states that "The embankment will be lined with clay to achieve a permeability of at least <1x10-7…." As per the TSF Design Report, the CTD embankment wall will be constructed from Zone 1 Embankment fill material - low-permeability fill material. The material will be moisture conditioned, placed in horizontal layers not exceeding 300 mm thickness and compacted to a minimum density ratio of 95% Standard Maximum Dry Density. The embankment is not proposed to be clay lined – AGAA requests that this section be amended to reflect the proposed embankment construction as per the TSF Design Report.	Section 2.2.1 has been updated to accurately reflect the correct design and construction of the embankment.
Table 2 – Licence Holder controls (Operation)	Potential pathways for TSF seepage lists "Seepage through pit base and walls". This text appears to be from an in-pit TSF and is not applicable to the CTD Stage 12 Embankment raise. AGAA requests that this section be amended to refer to "Seepage through the TSF floor".	The seepage pathway has been amended as required to reflect the applicable pathway through the TSF floor.
Table 5 – Risk assessment of potential emissions and discharges from the Premises during construction and operation (Operation)	Potential pathways for TSF seepage lists "Seepage through pit base and walls". This text appears to be from an in-pit TSF and is not applicable to the CTD Stage 12 Embankment raise. AGAA requests that this section be amended to refer to "Seepage through the TSF floor".	The risk assessment table has been updated to show the correct pathway for TSF seepage through the floor.
Table 7 – Condition 14, Table 5	Amend 'Proposed Amendments' to align with AGAA feedback on Condition 14, Table 5 within the draft Licence Amendment.	Table 7 has been updated to remove reference to maximum stage heights which are no longer included in Table 5 of the licence.

Condition	Summary of Licence Holder's comment	Department's response
Draft Licence		
Licence History	Amend "Licence amendment to add the construction and operation of Stages 12A and 12B of the CTD TSF."	Noted and updated accordingly.
Condition 1, Table 1 – Design and construction/ infrastructure requirements	Amend Infrastructure description to include reference to 'CTD'. i.e. "CTD Stage 12A embankment…" and "CTD Stage 12B embankment…"	Table 1 has been amended to include 'CTD' in the description of each embankment stage.
	The 'Design and construction \ installation requirements' for both the CTD Stage 12A and Stage 12B include "Fill material is to be used to construct the safety windrows". This proposed safety windrow construction criteria does not have any direct correlation to the containment of tailings. AGAA requests that this construction criteria is removed from Table 1 for both CTD Stage 12A and 12B.	The construction of safety windrows has been removed from Table 1 as they are not considered a control for risks associated with tailings.
	The 'Infrastructure Location' for both CTD Stage 12A and Stage 12B is listed as 'Schedule 2, Figure 1". This Figure does not exist in draft Licence Amendment. AGAA requests that the 'Infrastructure Location' is amended to reflect the correct Figure reference.	Table 1 has been updated to correctly refer to Schedule 1, Figure 1 which shows the location of the CTD TSF within the prescribed premises boundary.
Condition 14, Table 5 – Containment Infrastructure	The 'Requirements' for the CTD TSF only refer to Stage 12A. AGAA requests that the 'Requirements' for the CTD TSF be amended to also include the execution of Stage 12B.	Table 5 has been updated to correctly refer to Stage 12B.
	The 'Requirements' for the CTD TSF state a "maximum wall height of 414 mRL (maximum height of Stage 12A)". This is a duplication of the Construction infrastructure requirements listed in Table 1. AGAA requests that the duplicated compliance requirements for the maximum wall height are removed from Table 5 as it is already listed within Table 1 of the draft Licence Amendment.	Table 5 has been updated to remove duplication of maximum wall height, which is stated in Table 1 for each stage.