Government of Western Australia
Department of Water and Environmental Regulation

Decision Report

Application for Works Approval

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

Works Approval Number	W2948/2025/1
Applicant	Cygnet Gold Pty Ltd
ACN	660 841 252
File number	APP-0027829
Premises	Copperhead Underground Mining Project Legal description Within mining tenements M77/1026, M77/480, M77/46, M77/572, M77/299 and G77/36 Shire of Yilgarn 6426
Date of report	18 December 2025
Decision	Works approval granted

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1. Decision summary

This decision report documents the assessment of potential risks to the environment and public health from emissions and discharges during the construction and time limited operation of the premises. As a result of this assessment, works approval W2948/2025/1 has been granted.

2. Scope of assessment

2.1 Regulatory framework

In completing the assessment documented in this decision report, the Department of Water and Environmental Regulation (the department; DWER) 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 and overview of premises

On 5 March 2025, the applicant applied for a works approval to the department under section 54 of the *Environmental Protection Act 1986* (EP Act).

The Copperhead Project is a gold mining project originally operational between 1952 and 1964. It consisted of open cut and underground mining onsite processing (amalgam). A second cycle of mining and processing of ore ran between 1988 and 2001. The processing plant was decommissioned after 2001 and subsequently placed into care and maintenance. Following this decommissioning, the underground dewatering pump systems and underground mining areas became submerged by natural groundwater ingress and was consequently inoperable.

The application is for the construction and time-limited operations of an evaporation pond (EVP) and associate dewatering pipeline infrastructure at the Copperhead Project (Figure 1) which is located approximately 2 km southwest of Bullfinch. The applicant is planning to recommence mining operations at the Copperhead Project and needs to establish the necessary dewatering infrastructure to support the recommencement of underground mining operations.

Construction activities will consist of the establishment of an EVP which will be situated on top of an existing, decommissioned Tailings Storage Facility (TSF), and associated dewater pipeline infrastructure which will extend from the Copperhead Project into the newly constructed EVP.

Water will be initially pumped from the open pit lake, followed by underground stored water It will be transferred via a pipeline into the EVP to avoid discharge to a natural creek or salt lake. Following the completion of initial dewatering activities, continued pumping at a lower volume will be required to enable underground entry for drive rehabilitation and preparations for recommencement of underground mining activities.

The premises relates to the category and assessed design capacity under Schedule 1 of the *Environmental Protection Regulations 1987* (EP Regulations) which are defined in works approval W2948/2025/1. The infrastructure and equipment relating to the premises category and any associated activities which the department has considered in line with *Guideline: Risk Assessments* (DWER 2020) are outlined in works approval W2948/2025/1.

2.2.1 Historic tailings impacts

The site is suspected to contain buried heap leach areas and potentially buried oil and grease drums. Mining, mineral processing and TSFs are land uses that have the potential to cause contamination (DWER 2021). The department holds no records of site investigations of soil and groundwater on the site and therefore, the nature and extent of contamination of the site has not been confirmed.

Environmental reporting for the site notes that contamination of cyanide, metals, low pH and salinity has been identified in soil and groundwater. Likely sources of contamination include the TSF, waste rock dumps (including underlying heap leach areas and suspected buried oil and

grease drums) and decommissioned processing areas (including fuel storage and workshop areas).

Figure 1: Proposed EVP and premises boundary

2.2.2 Construction of EVP and pipeline

The engineered EVP is to be located on top of the decommissioned TSF (Figure 1) which commenced operation in 1998 and was decommissioned and partly rehabilitated after 2001. Construction of the EVP will utilise in situ tailings materials

Approximately 295,000 tonnes[1] per annual period of mine dewater will be delivered to the EVP from the Copperhead Project via a 700 m long pipeline which will follow the existing pit ramp (Figure 1).

The total footprint of the EVP, TSF and related drainage infrastructure is approximately 17.3 ha. The total internal storage area of the EVP is 12 ha, with a final build crest height of RL 373.0 m AHD. The estimated holding capacity is 358,422 kL with an evaporation rate of 2.4 m per annum over 1.3 years of evaporation (estimated 528,274 kL of ground water requires removal from underground work areas). The EVP will be constructed by excavating tailings to a depth of 1m and using it to construct the embankments of the EVP. Tailings in the EVP have been laboratory tested and found to have a permeability $1.16x10^{-7}$ to $1x10^{-8}$.

Design elements of the EVP include the following and detailed diagrams are in Appendix 2: Design drawings:

- Construction of the embankment with suitable tailings materials borrowed from within the TSF basin area. The applicant confirms that the tailings samples tested to date are representative of what will be used in the construction of the EVP. Refer section 2.2.4 below.
- The perimeter embankments of the EVP will have a design crest width of 10 m and design slopes of 1:10 (V:H) for downstream and 1:2 (V:H) for upstream. The embankment crest will have a 2% crossfall towards the downstream side. The embankment crest and downstream faces will be capped with nominal 0.5 m thick mine waste material.
- The in-situ tailings material within the basin area of the EVP will be reworked (i.e. comprising ripping, moisture condition and compaction to a nominal depth of 0.3 m) to mitigate vertical seepage from the EVP.
- A riprap rock layer (0.5 m thick; utilising 100 - 250 mm rock) overlying a separate geotextile layer on the entire upstream embankment and spillway (Figure 7 in Appendix 2).
- An emergency spillway (50 m wide x 0.5 m deep) on the eastern side of the EVP (to minimise potential impacts to mining operations. Spillway design to a 1:100-year (1%) AEP event for Probable Maximum Precipitation (PMP) as per Figure 4 and Figure 5).
- A cut-off trench with a 3 m wide base. A toe drain and sump, with maintenance and upgrade to nominal depth of 1.0 m, a minimum base width of 1.5 m and side cut batters of 1:1 (V:H).
- The pipeline will be constructed of 160 PN10 Coex Pipeline, will be polywelded and designed to take the head pressure of the water leaving the pit.

The foundation of the TSF comprises a clay layer of approximately 30 m thickness overlying saprolite. The current TSF was constructed in 1998, however, it is understood to contain a thin layer (nominally 5 m) of historical tailings which was likely deposited sometime between 1952 and 1964 as part of a previous operation. Since being decommissioned, the TSF has been used as a waste rock dump which has effectively stabilised the historical tailings surface (CDM Smith 2025). The original 1998 TSF expansion design concluded that the TSF was going to be a leaky

[1] Tonnes is the unit of measurement associated with category 6 as identified in Schedule 1 of the EP Regulations. 1 tonne of water is equivalent to the volumetric measure of 1,000 litres of water (kL). The volumetric measure will be used in this report from this point in place of tonnes.

dam and a system of drains and collector sumps were included in the design.

Geotechnical investigations of the TSF have been used for development of the engineered design in accordance with the Australian National Committee on Large Dams Incorporated (ANCOLD) guidelines. The EVP has been designed in line with ANCOLD (2012), 'Guidelines on Consequence Category Assessment' and a dam break analysis with a medium level of damage or loss, with a Potential Loss of Life (PLL) downstream as a result (unlikely event) of a dam break rating of < 0.1 (CDM Smith 2025). The Dam Failure Consequence Category (DFCC) for the proposed EVP design with a nominal 4.0 m crest height (RL 373.0 m AHD) is deemed 'low' and allowance for the temporary storage of a 1:100-year Annual Exceedance Probability (AEP), 72-hour storm event (ANCOLD, 2000, 'Guidelines on Selection of Acceptable Flood Capacity') has been incorporated.

The construction of the EVP will also consist of a turkey's nest, which will be located within the EVP footprint and separated by a dividing bund (Figure 4 and Figure 6 in Appendix 2). The general construction of the turkey's consists of the following:

- A geotextile layer (Bidim A44 or equivalent) to cover the internal turkeys nest area with a minimum overlap of 0.3 m.
- A HDPE liner (2mm thick) to cover the internal turkeys nest area with a minimum overlap of 0.3 m.
- The crest of the completed embankments of the proposed EVP will be graded to the downstream (external) side of the storage at a 2% crossfall.
- A nominal 0.5 m thick layer of mine waste material will be placed over the final embankment crest and downstream surfaces.

Figure 2: EVP and discharge pipeline with monitoring bore locations

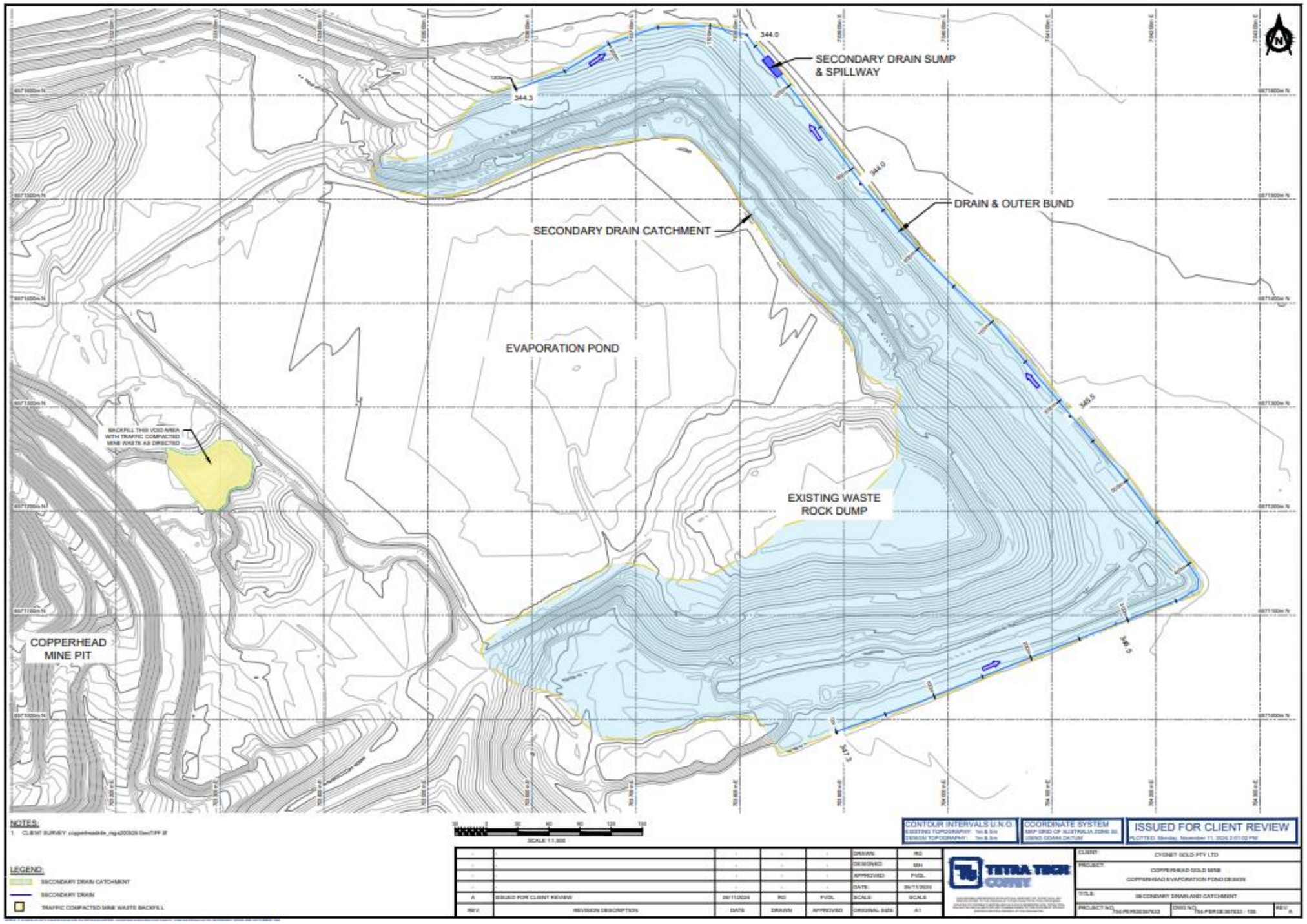


Figure 3: Secondary drains and catchment locations

2.2.3 Operation of the EVP

The EVP has been designed with a 1.0 m freeboard (the distance between the maximal operating level (MOL) of the pond surface and the embankment crest) to accommodate the stormwater volume from a 1:100-year AEP, 72-hour storm event plus the wave run-up due to a 1:10-year AEP wind event, with the provision for an additional freeboard of 0.5 m (between the wave run-up and embankment crest level and to be incorporated into spillway design). This is deemed to be sufficient under normal operations (Tetra Tech Coffey 2025).

A water balance analysis was undertaken by the applicant using a GoldSim model which was developed using daily time steps and climate data from the past 50 years (post-1975). Although earlier records exist, the model uses more recent data to reflect more current climatic trends.

The model uses the following data from the Coffey Evaporation Pond Design Report (Tetra Tech Coffey 2025):

- A total evaporation pond design capacity of 466,100 kL, including 1 m freeboard. (Coffey Design Report); and
- A total approximate volume of 530,000 kL of water currently stored in the Copperhead pit and underground voids which is required to be pumped into the evaporation pond.

Using the above model data, the water balance analysis provides the following inputs and outputs:

Inputs to the evaporation pond:

- Maximum dewatering rate of 40 L/s (equivalent to 3,456 kL/day) from the underground and open pit.
- Direct rainfall has been calculated using measurements from the nearest weather station and applied to the pond's 12 ha surface area. Perennial surface water bodies in the area are uncommon, as the annual rainfall only accounts for 10% of the annual potential evaporation. After large rainfall events, intermittent surface runoff flows can be expected within the area which are generally of a short duration; and
- There are no additional inputs expected from surface runoff or drainage, as the location and design height of the EVP above the surrounding landscape negates these inputs.

System Outputs:

- Annual pan evaporation in Southern Cross according to the BoM is 2400 mm which means that evaporation exceeds monthly rainfall for all months and by order of magnitude over the summer months; and
- Infiltration at a constant rate of 46 kL/day, with no limitation applied to aquifer capacity. Seepage will be captured in recovery trenches and water will be returned to the evaporation pond (Tetra Tech Coffey 2025).

Table 1 provides a breakdown of the water balance for the EVP.

	Year 1	Year 2	Subsequent years
Input			
Dewatering including recharge	295,673 kL	295,673 kL	To be determined
Recharge	N/A	N/A	30,000 kL
Output			
Evaporation	288,000 kL	288,000 kL	288,000 kL
Difference			
	7,673 kL	7,673 kL	Evaporation greater than recharge
EVP capacity			
Capacity incl. 1:100 flood	466,100 kL	466,100 kL	466,100 kL
Capacity excl 1:100 flood	358,422 kL	358,422 kL	358,422 kL

Table 1: Water balance for the evaporation pond

Considering the high evaporation rates recorded at the nearest weather station, the results of the modelling suggest that the evaporation pond can facilitate the entire dewatering volume effectively. Further to this, the probability plot for pond storage indicates that even under the wettest conditions (1st percentile), the volume of water within the evaporation pond only slightly exceeds 400,000 kL, below the pond's design capacity.

Regular inspections of the EVP and the freeboard, and the operation of an emergency spillway will minimise overtopping. Seepage modelling also indicates that seepage will be high enough to avoid overtopping of the EVP in higher-than-average rainfall events (Tetra Tech Coffey 2025a). Bunding, drains and surrounding catchment areas are also in place to manage higher than average rainfall events (Figure 3).

2.2.4 Tailings characterisation

The deposited tailings within the TSF5 basin area comprised of three to four major layers: a thicker silty SAND & sandy SILT (or SAND) zone at the top and bottom with a zone of CLAY & silty CLAY (or CLAY) in between. At lower depth the profiles transitions to sand and sandy SILT.

Given the site geology includes sulphides, the tailings could be potentially acid forming, and the risk of acidic, metalliferous and/or neutral drainage needed to be assessed as the pond will be partially constructed using tailings from the TSF.

In consideration of this, tailings characterisation and the elemental leachability of the tailings to determine contaminants of potential concern was carried out. This assists in the formulation of a site-specific seepage and groundwater monitoring program.

Summary of results

Following analysis of the results for the Acid Base Accounting (ABA), the following observations can be made:

- Negative Net Acid Producing Potential values (ranging from -2.1 to -35.9).
- Some Acid Neutralising Capacity kg H_2SO_4 per tonne of sample (ranging from 28.0 to 60.4 kg H_2SO_4/tonne); and
- Net Acid Generating (NAG) pH values of >4.5 (ranging from 7.6 to 8.5).

All samples analysed as part of the ABA for the Copperhead TSF fall into the Non-Acid Forming category.

Further to the above analysis, a full suite of metals was analysed for each tailings sample, reporting metal concentrations above the laboratory detection limit for the following metals: Al, As, Cr, Co, Cu, Pb, Mn, Ni, V and Zn.

When considering the potential leaching of these metals from the TSF to groundwater, evaluation of leaching risk to groundwater needs to be made in the context of the pH recorded from the NAG testing. Given that all samples presented ranges in pH from 7.6 to 8.5, the applicant has confirmed that most of the metals reported are not considered to be leachable at these pH ranges.

However, Arsenic (As) and Chromium (Cr) are considered to be leachable at pH > 6, and as such these metals (As and Cr) are currently included in the analytical suit for monitoring of the Copperhead TSF monitoring bores, as outlined in the Groundwater Operating Strategy (CDM Smith 2025a). It is anticipated that the inclusion of these analytes in the groundwater analytical suite for groundwater monitoring of bores directly adjacent to the TSF will provide the best indication in the event that leaching of metals such as As and Cr occurs.

The Delegated officer considers the construction of an EVP on top of a TSF to be generally suitable, however, given the nature of potential contaminants in the TSF, a well-defined and adequate groundwater and seepage monitoring program is required. This monitoring is outlined in further detail in section 3.1.1.

Arsenic mobilisation potential

The department has assessed the potential for leaching of arsenic from tailings due to the saturation of the material with dewatering seeping from the EVP.

The chemical data indicates that the tailings materials contain very high concentrations of arsenic (varying between about 490 and 1960 mg/kg). Although no mineralogical data were provided with the chemical analyses, it is likely that much of the arsenic in the tailings is adsorbed to iron oxyhydroxide minerals that would have formed from the oxidation of sulphide minerals. Under the aerobic conditions that would be present in aged tailings, this adsorbed arsenic would be strongly bound to these iron minerals and would not be leached at significant concentrations by infiltrating water from infrequent heavy rainfall events.

However, this situation could change if there were to be significant leaks from a poorly lined EVP. Under constantly saturated conditions, the surfaces of iron oxyhydroxide minerals can undergo partial reduction, which could lead to some arsenic being released from these minerals into leachate. The extent to which this would take place would depend on the chemical composition of the water in the EVP, and the availability of organic carbon to support microbes that often help drive iron reduction reactions.

To mitigate the risk of arsenic mobilisation, the department considered the necessity of lining the EVP with a geosynthetic liner in accordance with industry best practices, with the findings presented as follows:

- The lining of the EVP with a full geosynthetic liner is a significant additional regulatory burden and the delegated officer has considered that the potential for mobilisation of the arsenic is low considering the high absorption rates into surrounding iron minerals (as outlined above).
- Geological information for the area (Keats, 1991) indicates that host rocks at this mine

site are likely to have a high acid neutralisation capacity (ANC), so it is unlikely that the tailings would produce sufficient acidity to mobilise metals if the evaporation dam were to experience a large leak.

- The background depth to groundwater at the TSF is approximately between 2.5 mbgl and 8.5 mbgl and vertical seepage is expected to migrate toward the open pit as it is a groundwater sink whilst lateral seepage is reduced by construction of walls by compacting tailings to be low permeability (Refer 3.1.1).
- The substantial area (over 17ha) of the EVP with construction of the walls and base of the EVP with compacted tailings to reduce permeability (Refer 3.1.1),
- The monitoring of groundwater for seepage and upgrading of the drainage systems in place for the TSF (Refer 3.1.1).

Considering the above, the delegated officer considers the in-situ tailings material within the basin area of the EVP to provide sufficient lining and management practices of monitoring and seepage recovery sufficient to mitigate vertical and horizontal seepage from the EVP.

2.2.5 Seepage management

The estimated seepage from the facility is 46 kL/day based on modelling using highest estimated permeability value for the deposited tailings (Tetra Tech Coffey 2025).

The site conditions at the TSF of a very deep permanent water table, low permeabilities in the deep bedrock and a flow direction in the deep-water table towards the Copperhead pit, are expected to result in negligible observable vertical seepage, (Tetra Tech Coffey 2025). To further mitigate vertical seepage, in-situ, low permeability compacted tailings material will be used in the construction of the EVP (Tetra Tech Coffey 2025). Even so, it is expected that vertical seepage from the EVP will saturate underlying tailings, forming a perched water body above the clay ground surface. Minor lateral seepage from the TSF is expected to occur from perched water on the historical tailings and on the clay foundation flowing into the waste rock embankments mostly in the southern and eastern walls. This flow will be collected by the toe drains (Tetra Tech Coffey 2025a). The lateral seepage flow path is expected to mostly be in a north-easterly direction (Tetra Tech Coffey 2025a). To mitigate lateral seepage, the proposed EVP perimeter walls will be constructed using low permeable compacted tailings recovered from within the TSF, and adequate compaction of the floor to break up desiccation cracks will also be undertaken (Tetra Tech Coffey 2025a). The primary and secondary drainage systems, which were used during the TSF operations as a tailings dam, will be upgraded to capture any seepage of hypersaline water (Figure 3).

The primary and secondary drains will have sufficient capacity to capture rainfall runoff and seepage from the EVP and TSF (Tetra Tech Coffey 2025a), and water will exit the drains via a dedicated spillway (Figure 4 and Figure 5 in Appendix 2). Drains and pumps have been sized for flow rates of 1,000 kL/day to 2,000 kL/day which is greater than the estimated seepage flow rates. It is therefore expected that the relatively low estimated seepage rates from the operation of the EVP will have minimal impact on the capacity of the designated primary and secondary drainage and pumping systems (Tetra Tech Coffey 2025a).

3. Monitoring

3.1.1 Seepage and groundwater monitoring

Groundwater and seepage will be monitored using existing, functioning bores, with new monitoring bores to be installed between the pit and the EVP (Figure 2). Any seepage will be detected by a raise in standing water level (SWL). Bores were installed in 2001 during the previous closure of the TSF, and SWL was measured up to 1.6 mbg at this time. Proposed trigger levels for the EVP operations are 5 mbgl and below the level of most tree species in the area (CDM Smith 2025).

Groundwater quality from within previously mined underground areas is hypersaline.

Monitoring of the bores will consist of the analytical suit as per the Groundwater Operating Strategy (CDM Smith 2025a):

- Metals (Al, As, Cd, Co, Cr, Cu, F, Fe, Hg, Mn, Ni, Pb, Se, Zn)
- Major ions and cations (Ca, Cl, K, Mg, Na, CaCO3 (bicarbonate alkalinity, carbonate, hydroxide alkalinity), SO4, SiO2)
- Silica
- Cyanide
- pH, EC, TDS, TSS; and
- Nutrients (Nitrate and Nitrite)

3.1.2 Dewater discharge monitoring

Monitoring and annual reporting of groundwater quality for the proposed dewatering activities is to remain consistent with current monitoring and laboratory analysis conducted under the Groundwater Operating Strategy (CDM Smith 2025a), which outlines the groundwater monitoring requirements for a number of premises in the region. Samples will be collected from the Copperhead Portal which will provide an indication of the water quality of mine dewater to be discharged into the EVP via the authorised discharge point located at the junction between the pond and the pipeline (Figure 2). The following parameters are to be monitored:

- Metals (Al, As, Cd, Co, Cr, Cu, F, Fe, Hg, Mn, Ni, Pb, Se, Zn)
- Major ions and cations (Ca, Cl, K, Mg, Na, CaCO3 (bicarbonate alkalinity, carbonate, hydroxide alkalinity), SO4, SiO2).
- Silica.
- pH, Electrical Conductivity, Total Dissolved Solids, Total Suspended Solids; and
- Nutrients (Nitrate and Nitrite).

Mine dewater is primarily comprised of groundwater that has infiltrated the walls of the Copperhead underground mine. Monitoring the dewater discharge and analysis of samples collected from Copperhead Portal will ensure the collection of baseline data for the overall quality of this groundwater.

4. 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.

4.1 Source-pathways and receptors

4.1.1 Emissions and controls

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

Table 2: Proposed applicant controls

Emission	Sources	Potential pathways	Proposed controls
Construction			
Dust	Construction of EVP and dewater pipeline	Air/windborne pathway	Dust suppression activities including water carts.
Sediment laden stormwater		Overland runoff	Bunding Emergency spillway conservatively designed for a Probable Maximum Precipitation (PMP) storm event.
Operation			
Hypersaline water	EVP overtopping	Discharge to land	The EVP has been assessed to accommodate stormwater volume from a 1:100-year Annual Exceedance Probability (AEP), 72-hour storm event above the MOL plus the wave run-up due to a 1:10-year AEP wind event above the Design Water Storage Allowance (DSA) water level, with the provision for an additional freeboard of 0.5 m (between the wave run-up and embankment crest level and to be incorporated into spillway design). Emergency spillway conservatively designed for a Probable Maximum Precipitation (PMP) storm event. Regular monitoring of the MOL and freeboard will be carried out during operations. Maintenance of total freeboard level of 1.0 metres.
Leachate	Seepage from EVP	Vertical seepage from EVP through	HDPE liner is not proposed due to the presence of in-situ low permeability tailings materials, based on geotechnical investigation results

Emission	Sources	Potential pathways	Proposed controls
		TSF	(Tetra Tech Coffey, 2025). Existing TSF5 downstream embankment with toe drains and collector sump system. Controlled construction for both perimeter embankment and in-situ basin layer, including adequate compaction and moisture control and Quality Assurance /Quality Control (QA/QC) testing to reduce seepage rate.
Leaks from pipeline, leaks from lining	Operation of saline dewater pipeline	Dewatering pipeline leak or rupture	Adequate secondary containment and leak detection will be installed on all pipelines and pumping infrastructure. Telemetry and automatic cutoffs will be installed to monitor the pipeline.

4.1.2 Receptors

In accordance with the *Guideline: Risk Assessment* (DWER 2020), the Delegated officer has excluded the applicant's employees, visitors, and contractors 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

Town of Bullfinch	Approximately 1.5 km southwest of the proposed EVP. The townsite has been screened out of this proposal due to distance and lack of interaction with groundwater sources.
Environmental receptors	**Distance from prescribed activity**
Adjacent native vegetation ▪ *Dodonaea* Shrubland ▪ Mixed Shrubland ▪ Two *Eucalypt* Woodlands.	Within 200 metres from proposed activity None of the vegetation communities represent a Threatened or Priority Ecological Community (TEC or PEC). The vegetation condition within the Copperhead Project varied from Completely Degraded to Very Good. (AECOM, 2024).
Fauna Carnaby' s Cockatoo (*Zanda latirostris*) listed under EPBC Act and BC Act (Endangered) ▪ Common Greenshank (*Tringia nebularia*) listed under EPBC Act and BC Act (Endangered) ▪ Western Quoll, Chuditch (*Dasyurus geoffroii*) listed under EPBC and BC Act (Vulnerable) ▪ Malleefowl (*Leipoa ocellata*) listed under EPBC and BC Act (Vulnerable).	Conservation significant fauna species have not been observed within the Proposed Copperhead work areas or nearby but are considered to occur within the habitat's greater region. There is low potential for localised fauna species to enter a work area during construction of the evaporation pond or other site preparation activities.
Groundwater	It is noted that current pit water level is 226 m AHD which is over 120 m below TSF5 ground level, and the pit is a groundwater "sink". 2001 groundwater level data collected from monitoring bores within proximity to TSF 5 show groundwater levels between approximately 2.5 mbgl and 8.5 mbgl.

4.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020) for each identified emission source and takes into account potential source-pathway and receptor linkages as identified in Section 4.1. Where linkages are in-complete they have not been considered further in the risk assessment.

Where the applicant has proposed mitigation measures/controls (as detailed in Section 4.1), these have been considered when determining the final risk rating. Where the delegated officer considers the applicant's proposed controls to be critical to maintaining an acceptable level of risk, these will be incorporated into the works approval as regulatory controls.

Additional regulatory controls may be imposed where the applicant's controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in Table 4.

Works approval W2948/2025/1 that accompanies this decision report authorises construction and time-limited operations. The conditions in the issued works approval, as outlined in Table 4 have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

A licence is required following the time-limited operational phase authorised under the works approval to authorise emissions associated with the ongoing operation of the premises i.e. Category 6 activities. A risk assessment for the operational phase has been included in this decision report, however licence conditions will not be finalised until the department assesses the licence application.

Table 4: 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 works approval**	**Justification for regulatory controls**
Source/Activities	**Potential emissions**	**Potential pathways and impact**	**Receptors**	**Applicant controls**				
Construction								
Construction of EVP and dewater pipeline	Dust	**Pathway:** Air/windborne pathway **Impact:** Health of vegetation through coating of leaves	Native Vegetation	Section 3.1.1	C = Slight L = Unlikely **Low Risk**	Y	Condition 1, Table 1	N/A
	Sediment laden stormwater	**Pathway** Overland runoff **Impact** Health of vegetation through potential covering of plants in	Native vegetation	Section 3.1.1	C = Slight L = Possible **Low Risk**	Y	Condition 1, Table 1	N/A

Risk Event					Risk rating C = consequence L = likelihood	Applicant controls sufficient?	Conditions of works approval	Justification for regulatory controls
Source/Activities	**Potential emissions**	**Potential pathways and impact**	**Receptors**	**Applicant controls**				
		sediment.						
Time Limited Operation								
Operation of EVP on top of TSF5.	Overtopping of evaporation pond - Hypersaline water	**Pathway:** Discharge to land **Impact:** Ecological health	Native Vegetation Groundwater	Section 3.1.1	C = Moderate L = Rare **Medium Risk**	Y	Condition 6, Table 2	N/A
	Seepage	**Pathway:** Seepage from EVP TSF into aquifers causing mounding around the facility. Contamination of surface soils contaminating stormwater runoff with elevated salt and potentially arsenic **Impact:** Death of vegetation through salinity damaging roots of vegetation and salinisation of soil preventing regrowth. Potential health impact to fauna from heightened arsenic in the environment.	Native Vegetation Fauna Groundwater	Section 3.1.1	C = Moderate L = Possible **Medium Risk**	Y	**Condition 1, Table 1** Condition 6, Table 2	The delegated officer considers the in-situ tailings material within the basin area of the EVP to provide sufficient lining, and management practices of monitoring and seepage recovery sufficient to mitigate vertical and horizontal seepage from the EVP. **To ensure the lining is maintained Table 1 includes item 1 c) requiring the discharge point to be constructed with sufficient energy dissipation structures and/or positioned such that the discharge of dewater will not erode the lining of the EVP.**

Risk Event					Risk rating C = consequence L = likelihood	Applicant controls sufficient?	Conditions of works approval	Justification for regulatory controls
Source/Activities	**Potential emissions**	**Potential pathways and impact**	**Receptors**	**Applicant controls**				
Operation of saline dewater pipeline	Hypersaline water leaking from pipeline,	**Pathway:** Direct discharge to land **Impact** Death of vegetation through salinity damaging roots of vegetation and salinisation of soil preventing regrowth.	Native Vegetation	Section 3.1.1	C = Moderate L = Rare **Medium Risk**	Y	Condition 6, Table 2	N/A

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

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

5. Consultation

Table 5 provides a summary of the consultation undertaken by the department.

Table 5: Consultation

Consultation method	Comments received	Department response
Application advertised on the department's website on 23 May 2025	N/A	N/A
Shire of Yilgarn advised of proposal on 23 May 2025	N/A	N/A
Department of Mines, Petroleum and Exploration (DMPE) advised of proposal on 23 May 2025	DMPE confirms that the proponent submitted a Mining Proposal (MP) under Registration (Reg) ID 500215, Copperhead received 24 January 2025 for the Golden Pig underground operations, which is currently under assessment with DMPE.	Noted.
	MP Reg ID 500215 describes an HDPE pipeline to an EVP proposed at a decommissioned tailings storage facility (mine reference TSF5) for disposal of dewater.	Noted.
Applicant was provided with draft documents on 7 November 2025.	N/A	N/A

6. Conclusion

Based on the assessment in this decision report, the delegated officer has determined that a works approval will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

References

1. CDM Smith 2025, *Works Approval Application Supporting Document*, Perth, Western Australia.
2. CDM Smith 2025a, *Groundwater Operating Strategy Cygnet Gold Pty Ltd*, Perth, Western Australia.
3. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
4. DWER 2020, *Guideline: Environmental Siting*, Perth, Western Australia.
5. DWER 2020, *Guideline: Risk Assessments*, Perth, Western Australia.
6. DWER 2021, *Guideline: Assessment and management of contaminated sites*, Perth, Western Australia.
7. Keats, W., 1991. *Geology and Gold Mines of the Bullfinch-Parker Range Region, Southern*

Cross Province, Western Australia. Geological Survey of WA, Report 28.

8. Tetra Tech Coffey 2025, *Copperhead Gold Mine, Bullfinch EVP Design Report*, Perth, Western Australia.
9. Tetra Tech Coffey 2025a, *Copperhead Gold Mine, Bullfinch EVP Hydrogeological Study Report*, Perth, Western Australia

Appendix 2: Design drawings

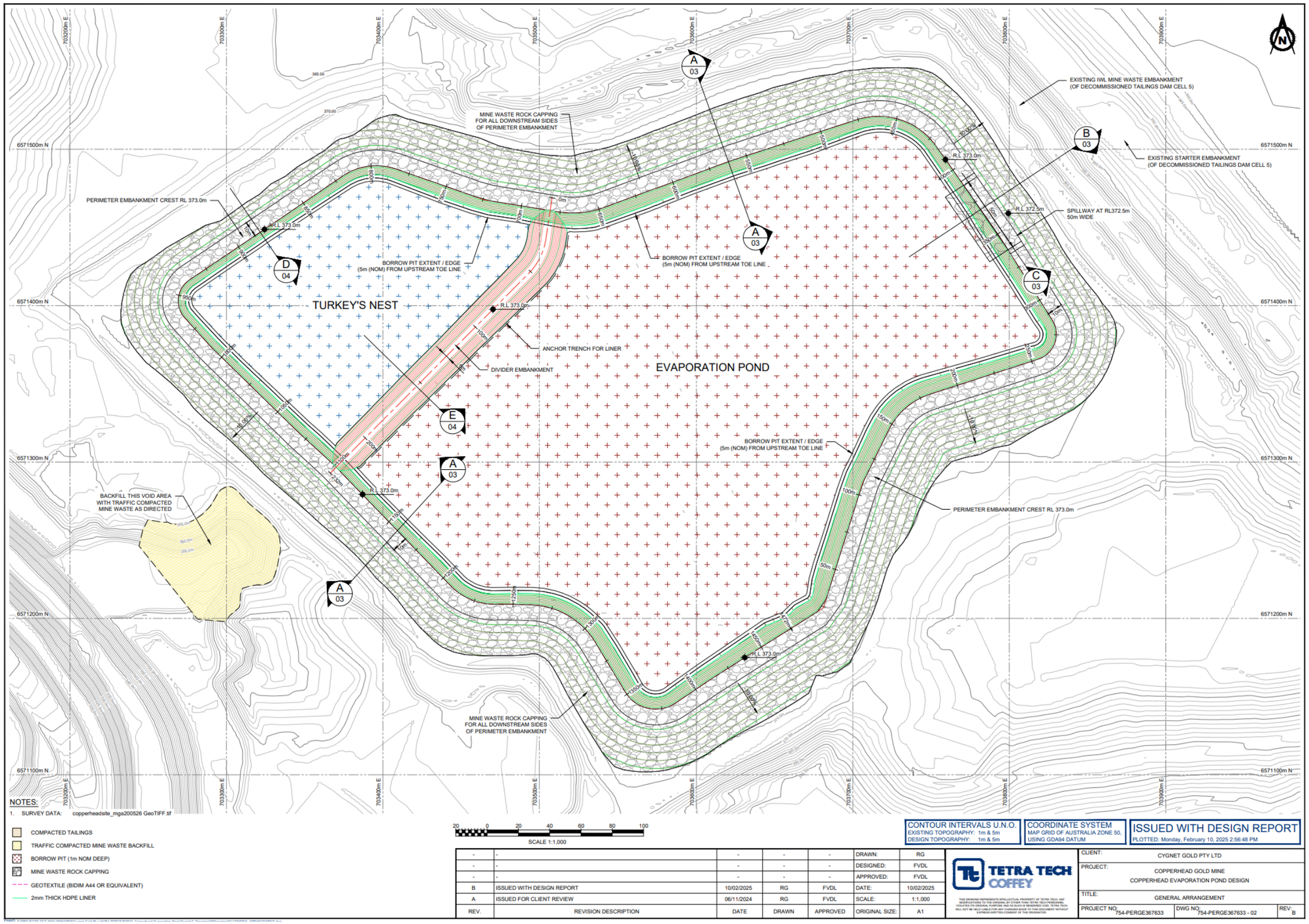


Figure 4: General arrangement

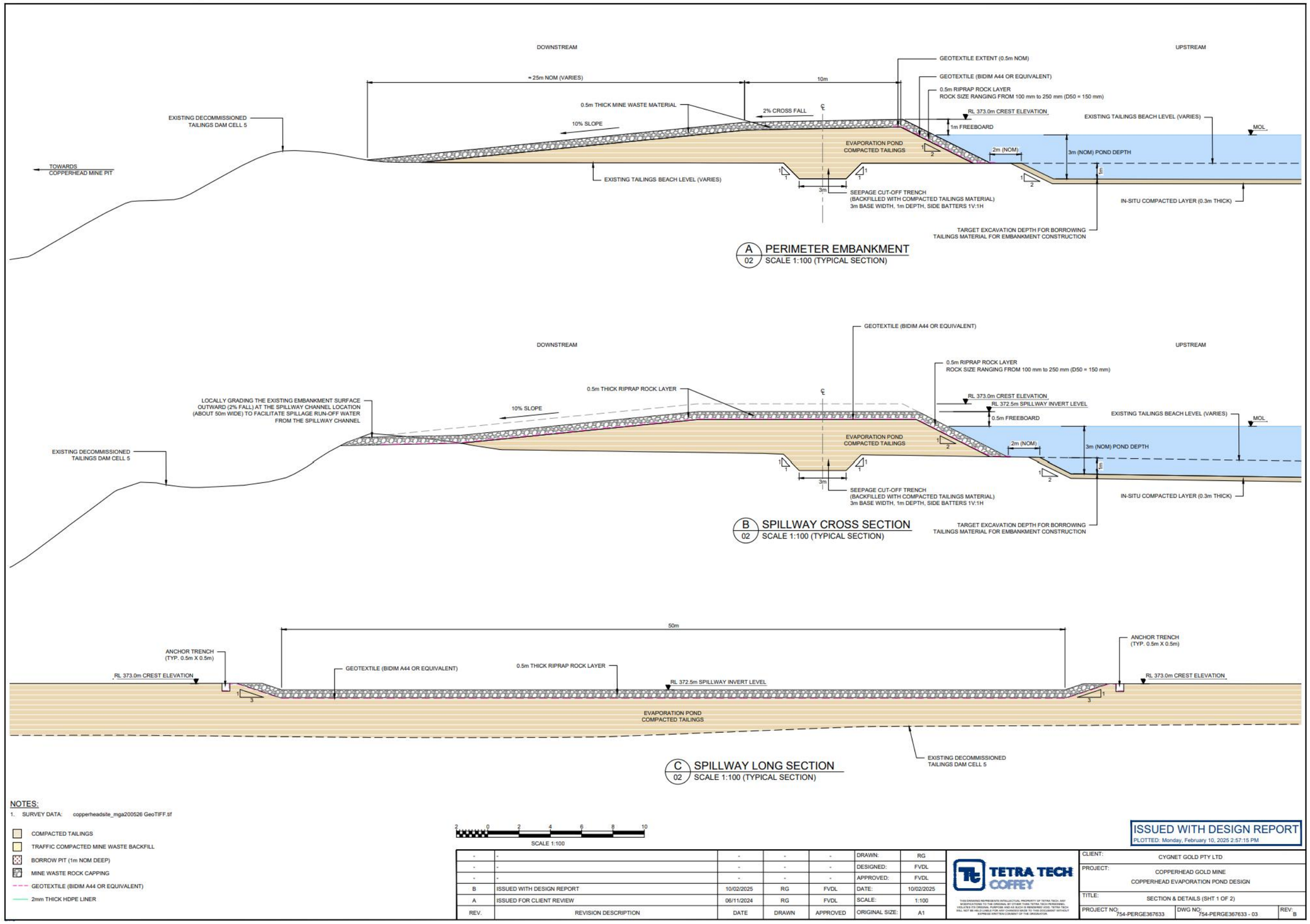
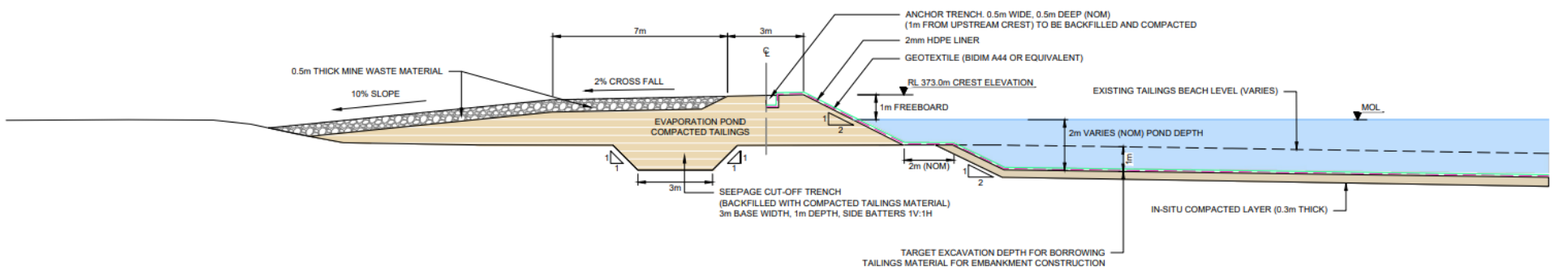
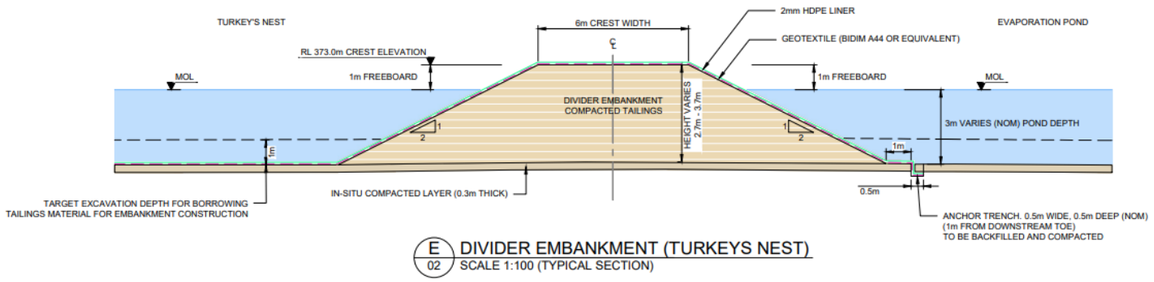


Figure 5: EVP cross section sheet 1



D 02 PERIMETER EMBANKMENT (TURKEYS NEST ONLY)
SCALE 1:100 (TYPICAL SECTION)



E 02 DIVIDER EMBANKMENT (TURKEYS NEST)
SCALE 1:100 (TYPICAL SECTION)

NOTES:
1. SURVEY DATA: copperheadsite_mga200526 GeoTIFF.tif

- COMPACTED TAILINGS
- TRAFFIC COMPACTED MINE WASTE BACKFILL
- BORROW PIT (1m NOM DEEP)
- MINE WASTE ROCK CAPPING
- GEOTEXTILE (BIDIM A44 OR EQUIVALENT)
- 2mm THICK HDPE LINER

2 0 2 4 6 8 10
SCALE 1:100

ISSUED WITH DESIGN REPORT
PLOTTED: Monday, February 10, 2025 3:00:33 PM

REV.	REVISION DESCRIPTION	DATE	DRAWN	APPROVED	ORIGINAL SIZE:	A1
B	ISSUED WITH DESIGN REPORT	10/02/2025	RG	FVDL	SCALE:	1:100
-	-	-	-	-	DATE:	10/02/2025
-	-	-	-	-	APPROVED:	FVDL
-	-	-	-	-	DESIGNED:	FVDL
-	-	-	-	-	DRAWN:	RG

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CLIENT: CYGNET GOLD PTY LTD
PROJECT: COPPERHEAD GOLD MINE
COPPERHEAD EVAPORATION POND DESIGN
TITLE: SECTION & DETAILS (SHT 2 OF 2)
PROJECT NO: 754-PERGE367633
DWG NO: 754-PERGE367633 - 04
REV: B

Figure 6: EVP cross section sheet 2

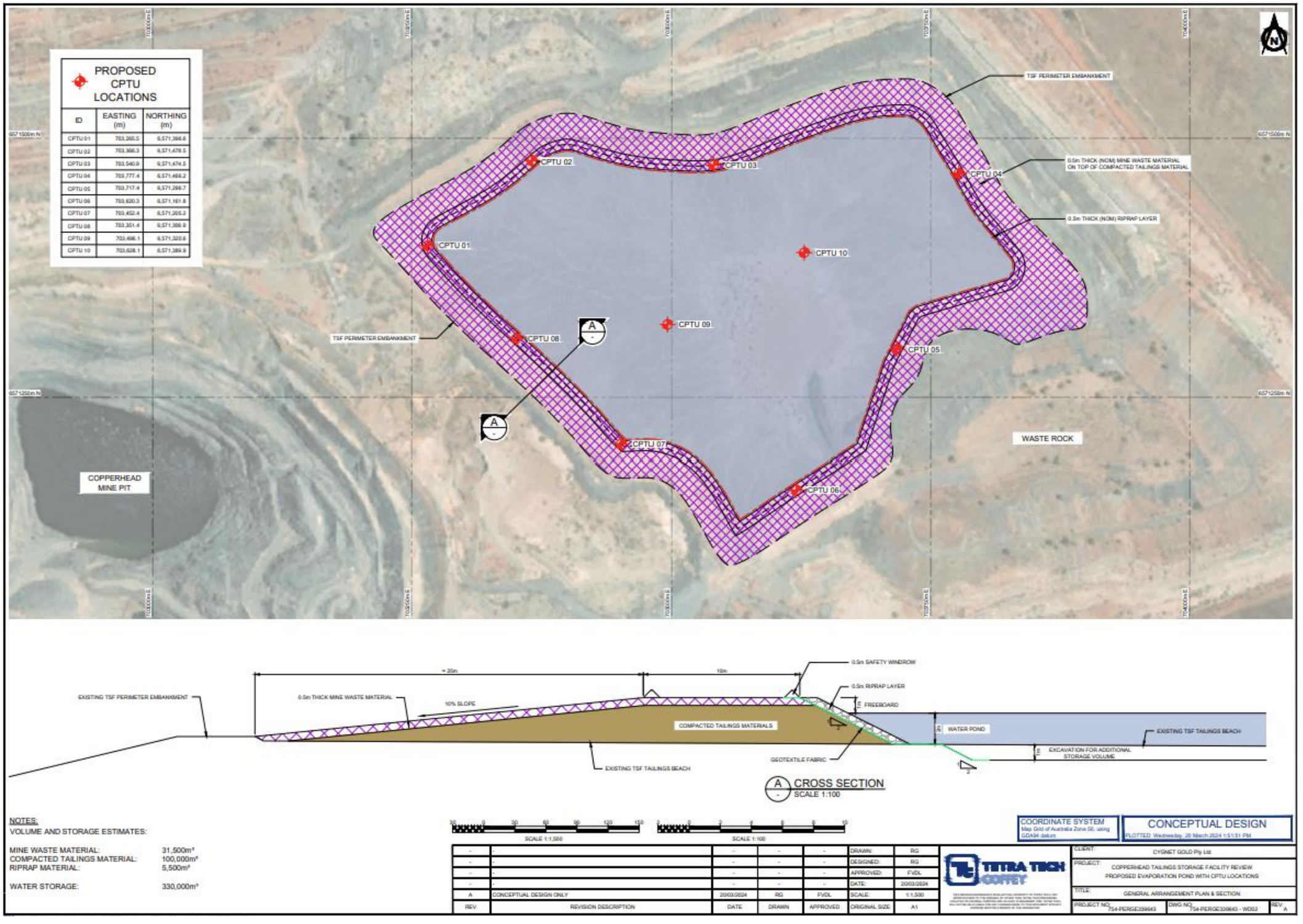

Figure 7: EVP showing Cone Penetration Test locations and extent of riprap layer