



Application for Licence Amendment

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

Licence Number	L7815/2001/12
Licence Holder	Northern Star (Thunderbox) Pty Ltd
ACN	107 154 727
File Number	APP-0030571
Premises	North Eastern Goldfields Operations LEINSTER WA 6437 Legal description - Mining tenements L36/155, L36/157, L36/158, L37/61, L37/73, L37/142, L37/166, L37/199, L37/215, L37/216, M36/35, M36/177, M36/421, M36/462, M36/473, M36/494, M36/503, M36/504, M36/512, M36/516, M36/525, M36/527, M36/541, M36/542, M36/582, M36/584, M36/585, M36/586, M36/587, M36/589, M36/599, M36/600, M36/1148, M37/339, M37/340, M37/356, M37/357, M37/358, M37/359, M37/360, M37/361, M37/367, M37/368, M37/437, M37/465 and M37/1148
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Decision	Revised licence granted

Table of Contents

1. Decision summary	1
2. Scope of assessment	1
2.1 Regulatory framework	1
2.2 Amendment summary	1
2.2.1 Construction of lift stages and associated infrastructure	2
2.2.2 Life of Mine (LOM) assessment	5
2.2.3 Hydrology	6
2.2.4 Seepage	7
2.2.5 Tailings characterisation	8
2.2.6 Tailings rehandle pad	9
3. Risk assessment	12
3.1 Source-pathways and receptors	12
3.1.1 Emissions and controls	12
3.1.2 Receptors	15
3.2 Risk ratings	16
4. Consultation	20
5. Conclusion	20
5.1 Summary of amendments	20
References	21
Appendix 1: Summary of stakeholder comments	22
Appendix 2: Tailings storage facility Cell C and D expansion embankment sections and details	30
Table 1: Proposed design changes	2
Table 2: Construction requirements for lift stages 2 to 5 of TSF cells C and D	3
Table 3: Thunderbox cells C and D lift stages	6
Table 4: Tailings material properties	8
Table 5: Licence holder controls	12
Table 6: Sensitive human and environmental receptors and distance from prescribed activity	15
Table 7. Risk assessment of potential emissions and discharges from the Premises during construction and operation	16
Table 8: Consultation	20
Table 9: Summary of licence amendments	20
Figure 1: Thunderbox TSF cell C and D	4

Figure 2: Tailings rehandle location and sensitive receptors	10
Figure 3: Tailings rehandle schematic.....	11
Figure 4: Tailings rehandle dimensions.....	12
Figure 5: Cell C and D lift sections sheet 1.....	30
Figure 6: Cell C and D lift sections sheet 2.....	31
Figure 7: Decant system location and layout.....	32
Figure 8: Decant sections and details – sheet 1	33
Figure 9: Decant sections and details – sheet 2.....	34

1. Decision summary

Licence L7815/2001/12 is held by Northern Star (Thunderbox) Pty Ltd (Licence Holder) for the North Eastern Goldfields Operations (the Premises), located at Leinster, Western Australia.

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 L7815/2001/12 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 Amendment summary

On 15 August 2025, the Licence Holder submitted an application to the department to amend Licence L7815/2001/12 under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act). The following amendments are being sought:

- The inclusion of infrastructure requirements for the construction and operation of future lift stages (Stage 2 – 5) of Thunderbox TSF Cell C & D; and
- The construction and operation of a tailings rehandle pad.

Works approval W6601/2021/1 was granted on 3 May 2022, which approved the construction of two additional tailings storage facilities (TSF) Cells C and D on the adjacent eastern boundary of the pre-existing TSFs Cells A and B at the premises (Figure 1). The Licence Holder is now seeking approval for embankment lift stages 2 to 5 for TSF Cells C and D to facilitate the deposition of up to the authorised 7 million tonnes per annum (Mtpa) throughput as per licence L7815/2001/12.

Upon consideration of the proposal for the inclusion of stages 2 to 5 of TSF Cells C and D into Licence L7815/2001/12, the Delegated Officer has determined that this assessment will be for stages 2 and 3 only, with stages 4 and 5 to be assessed separately under future licence amendment applications. This determination considers the 10-year lifespan for the proposed works, as well as the yet unknown extent and severity of cumulative seepage impacts as the TSF stages are progressively constructed and operated. Further, Life of Mine assessments to date have indicated a higher recorded density for dry tailings than previously expected, and some assumptions around the initial design of the TSF, such as tailings beach slope and throughputs, have been demonstrated to be inaccurate (Northern Star 2025).

The Licence Holder is also seeking approval for the construction and operation of a tailings rehandle pad which will be used to stockpile tailings harvested from the Thunderbox TSF. The purpose of the rehandle pad is to support a paste fill deposition strategy at Northern Star's nearby Bundarra project.

This amendment is limited only to changes to category 5 activities from the Existing Licence. No changes to the aspects of the existing Licence relating to Category 6, 52, 54, 64 and 73 have been requested by the Licence Holder.

Table 1 below outlines the proposed changes to the design capacity for the existing Licence.

Table 1: Proposed design changes

Category	Current design capacity	Proposed design capacity	Description of proposed amendment
Category 5: Processing or beneficiation of metallic or non-metallic ore	<u>Existing:</u> 7,000,000 tonnes per annual period	No change	Construction and operation of TSF Cell C & D lift stages 2 and 3, including associated infrastructure and monitoring requirements.
Category 5: Processing or beneficiation of metallic or non-metallic ore - Tailings Rehandle Pad	<u>Proposed:</u> 1,512,000 tonnes of tailings per annum (captured within existing Category 5 throughput)	No change	Construction and operation of the tailings rehandle pad.

2.2.1 Construction of lift stages and associated infrastructure

TSF lift stages 2 and 3

The TSF is a paddock style TSF which manages the disposal of all tailings generated from mining and processing across the premises. The TSF is split into cells A and B, which were originally constructed in 2002, and Cells C and D, which were approved under Works Approval W6601/2021/1 and constructed in 2023. Cells A & B are managed independently to C & D, to allow staggered raises whilst maintaining continuous operations (Northern Star 2025).

The general construction requirements for lift stages 2 and 3 of Thunderbox TSF Cell C & D will be undertaken in accordance with the original design drawings as shown in Appendix 2, with the key pieces of infrastructure to be constructed as follows:

- Divider embankment
- Embankment raises
- Toe drain
- Buttress
- Underdrainage tower
- Decant tower
- Piezometer

Construction of the first stage (the starter embankment) of Cells C and D was completed to 498.2 m RL in accordance with conditions specified in Works Approval W6601/2021/1. The construction requirements specific to each lift stage (stages 2 to 5), including the anticipated lift heights, are shown in

Table 2 below.

Table 2: Construction requirements for lift stages 2 to 5 of TSF cells C and D

Lift Stage	Design and Construction requirements
Stage 2	<ul style="list-style-type: none"> • Embankment lift to 498.2 m RL. • Divider embankment lift to 498.2 m RL. • Decant tower raise to 498.2 m RL. • Underdrainage tower raise to 498.2 m RL. • Installation of ten new piezometers to replace decommissioned piezometers from Stage 1. • Installation of new perimeter toe drain and berm to replace decommissioned ones from Stage 1.
Stage 3	<ul style="list-style-type: none"> • Embankment lift to 500.6 m RL. • Divider embankment lift to 500.6 m RL. • Decant tower raise to 500.6 m RL. • Underdrainage tower raise to 500.6 m RL. • Installation of ten new piezometers to replace decommissioned piezometers from Stage 2.
Stage 4	<ul style="list-style-type: none"> • Embankment lift to 503.0 m RL. • Divider embankment lift to 503.0 m RL. • Decant tower raise to 503.0 m RL. • Underdrainage tower raise to 503.0 m RL. • Installation of ten new piezometers to replace decommissioned piezometers at Stage 4. • Installation of new perimeter toe berm to replace decommissioned ones from Stage 3.
Stage 5	<ul style="list-style-type: none"> • Embankment lift to 504.8 m RL. • Divider embankment lift to 504.8 m RL. • Decant tower raise to 504.8 m RL. • Underdrainage tower raise to 504.8 m R.L • Installation of ten new piezometers to replace decommissioned piezometers at Stage 5. • Installation of new perimeter toe berm to replace decommissioned ones.

It should be noted that the construction requirements outlined in

Table 2 above are subject to change, and as such, this assessment considers stages 2 and 3 only. Further, the Licence Holder has advised that the raise heights, particularly at later stages, will vary from the original design as outlined in Works Approval W6601/2021/1 and will follow the revised assessment design provided in Table 3.

The embankment construction for stages 2 and 3 are illustrated in Appendix 2, Figures 5 and 6, with the embankment being constructed with an upstream slope of 1V:2.0H, a downstream slope of 1V:2.75H (interim) and a crest width of 6 m. Stages 2 and 3 will be raised using downstream construction technique with Run of Mine (ROM) waste from the current pit cutback and upstream construction technique using tailings in subsequent stages (Knight Piésold 2021).

The embankments to date have been constructed with ROM waste from the current pit cutback, with future stages proposed to be raised with the compacted dry tailings sourced from the exposed tailings beach and constructed using the downstream construction technique.

Once constructed, the combined TSF consisting of cells A to D will facilitate tailings deposition at a rate of up to a permitted 7 million tonnes per annum (Mtpa) throughput at TBO (estimated to 2034) in accordance with licence L7815/2001/12.

The site layout for TSF cells C and D, along with associated infrastructure is shown in Figure 1.

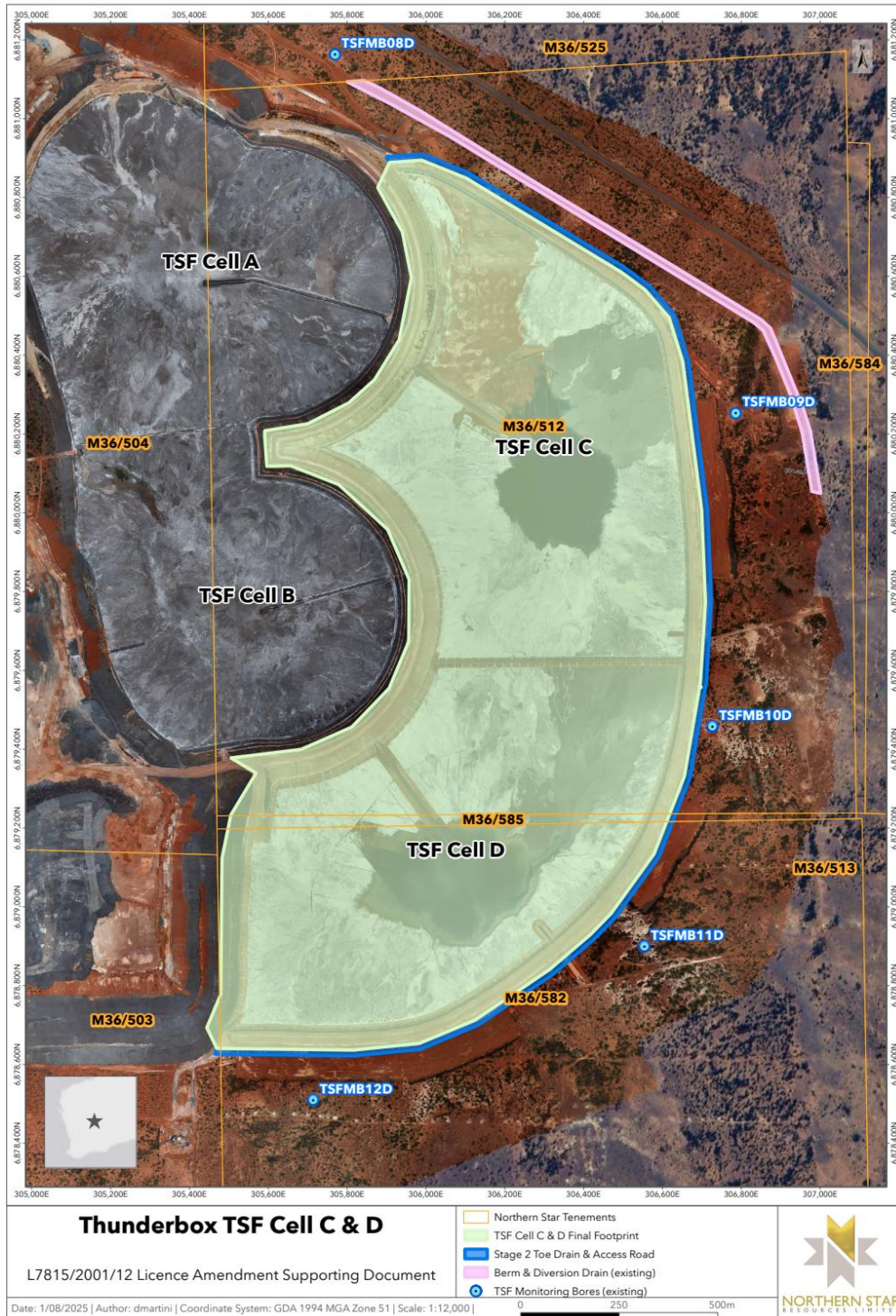


Figure 1: Thunderbox TSF cell C and D

Decant infrastructure

The deposition of tailings into TSF Cells C and D moves the supernatant pond towards the centre of the TSF. The decant pump will be raised on a regular basis in response to embankment lifts to ensure that tailings do not enter the pump intake (Northern Star 2025).

The decant system will comprise of the following components:

- An access causeway.
- A decant tower, consisting of an 1,800 mm diameter slotted concrete pipe surrounded by

clean waste rock.

- A submersible pump and pipework; and
- A hoist and pulley to raise and lower the pump.

The location and layout of the decant system is shown on Figure 7 of Appendix 2, with relevant sections and details on Figure 8 and Figure 9 of Appendix 2.

Freeboard assessment

The TSF has been designed to manage direct rainfall and runoff from a total catchment of approximately 140 ha, which partially consists of direct rainfall on the tailings and supernatant pond surfaces. The TSF has also been designed without the need for a spillway, and the Licence Holder believes that freeboard allowances are set such that a probable maximum precipitation event can be retained on the facility without breach of the perimeter embankments. Following high rainfall events, increased decant returning to the plant will be used to lower the pond level and increase available storm storage capacity (Knight Piésold 2021).

The existing licence L7815/2001/12 prescribes a minimum total freeboard of 500 mm to be maintained at all times, or containment of a 1-in-100 year 72-hour rainfall event, whichever is greater. This rainfall event is approximately 200 mm, so the 500 mm is currently what is complied with on the premises.

The storm capacity freeboard in the facility is therefore maintained significantly greater than the minimum requirement of a 1% AEP 72-hour event (Northern Star 2025).

2.2.2 Life of Mine (LOM) assessment

A Life-of-Mine (LOM) assessment for Cells C and D of the Thunderbox TSF has been undertaken by the Licence Holder, which reviewed the tailings management and disposal requirements for tailings at the premises until 2033. The assessment was based on the following parameters:

- Amendments to tailings throughput.
- Estimated achieved in-situ dry tailings densities.
- Achieved tailings beach slope; and
- As-built records of existing cells.

The updated LOM assessment has determined that in-situ dry tailings densities are higher than estimated in the original design of the TSF, tailings beach slope is flatter than assumed, and throughputs between 2021 to 2024 were lower than assumed (Northern Star 2025).

Considering these updates in tailings conditions, the LOM assessment has revised the lift heights for all future stages as outlined in Table 3 below. No changes have been made to Stage 2 (downstream raise) parameters and consequently the overall footprint of the TSF will not change from the original authorised design.

Table 3: Thunderbox cells C and D lift stages

Stage	Lift Type	Original Permitting Design		Revised LOM Assessment Design		
		Lift Height (m)	Operating Height (m RL)	Lift Height (m)	Operating Height (m RL)	Change (m)
Stage 1 (constructed)	Starter embankment	10.0	494.1			
Stage 2	Downstream raise	4.1	498.2	4.1	498.2	0
Stage 3	Upstream raise*	2.0	500.2	2.4	500.6	+0.4
Stage 4	Upstream raise*	2.4	502.6	2.4	503.0	+0.4
Stage 5	Upstream raise*	2.4	505.0	1.0	504.0	-1.0
Stage 6	Upstream raise*	0.8	505.8	Not required based upon LOM assessment.		

* Upstream raised against external perimeters. Embankments abutting the Eastern Waste Dump and TSF Cell A & B are downstream raised.

It is noted that these levels are best estimates based upon current information available, and that changes to tailings throughput, in-situ dry tailings densities and beach slope will impact future levels (Northern Star 2025), with updated design reports being required prior to construction of each stage based upon updated parameters.

The Licence Holder has acknowledged that subsequent licence amendment applications will need to be sought in response to any material changes to previously approved lift heights (Northern Star 2025).

2.2.3 Hydrology

Hydrogeological assessment

Water levels measured from monitoring bores surrounding the TSF (Figure 1) have been shown to be relatively stable, and range between 21 mbgl and 29 mbgl (Knight Piésold 2021). The geology in the region facilitates a relatively deep water table, with the underlying Archaean Yandal Greenstone Belt rocks exhibiting very little capacity for primary aquifer storage (Pennington Scott 2021).

The hydraulic parameters in the fractured rock aquifer around Thunderbox were derived from several phases of test pumping, which showed a local transmissivity estimate of between 2 and 60 m²/day, with a median of approximately 12 m²/day, and median hydraulic conductivity of 0.6 m/day.

Numerical modelling suggests that the water table beneath the TSF walls may rise by up to 10 m (within 5 m of the ground surface) as a result of the construction of lift stages 2 to 5. While the mounding effects diminish with distance away from the TSF wall, discernible water table mounding of up to 0.5 m may extend up to several kilometres from the TSF (Pennington Scott 2021). Despite this anticipated mounding, modelling shows that groundwater migration from the TSF would be projected to travel less than one kilometre over the projected 10-year life of mine.

Groundwater management

Numerical groundwater modelling of the premises undertaken by Pennington Scott (2021) considered the observed water levels within bores at the vicinity the TSF and the pit and the average flow rates towards the pit sumps over the last five years. With this modelling, analytical surface water analysis was also used to assess and design appropriate surface water management around the TSF in response to the proposed lift stages. As a result of the combined surface and ground water modelling, the following water management design considerations have been considered (Pennington Scott 2021):

- Given the proximity of the Goldfields Highway, a diversion channel has been constructed to minimise the risk of inundating the highway during large storm events, diverting storm water around the northern boundary of the new TSF cell (Figure 1).
- A 0.5 m deep toe drain has been constructed around the perimeter of the TSF to intercept and manage any seepage loss through the toe of the TSF walls (Figure 1).
- An engineered berm has been constructed between the toe drain and the diversion channel on the northern boundary of the TSF to ensure that there is minimal mixing between the different water qualities in the two drains (Figure 1).
- Seven (7) interception wells around the periphery of the TSF are considered, by the Licence Holder, to be an effective solution to mitigate water table mounding and contain leakage at a small distance from the TSF. The Licence Holder has indicated that seepage recovery bores will be installed when standing water levels exceed 6 mbgl (Northern Star 2025).

TSF water balance

Water balance modelling was conducted by the Licence Holder using six different climate scenarios. The TSF water balance modelling resulted in the following conclusions (Northern Star 2025):

- The water balance for the expansion is expected to be negative during the LOM. Additionally, the supernatant pond is anticipated to stay at minimum size for the duration of the operations, while ponding of water against the embankment wall is unlikely to occur under any storm event, provided that the facility ponds are maintained to be as small as practical.
- Plant site make-up water will be required throughout the operation, with the quantity required varying between wet and dry seasons. Due to the low rainfall, the benefit of storing the wet season runoff prior to the commissioning of TSF Cells C and D is not insignificant.
- Under average climatic conditions, available water from the TSF is expected to be less than the required plant make-up. Decant returns range from 13,000 to 83,000 m³/month and the make-up requirement ranges from 30,000 to 131,000 m³/month. Consequently, the minimum operating pond volume is maintained throughout the year.
- Under dry climatic conditions, comparatively less make-up water is available from the TSF. Decant returns range from 14,000 to 79,000 m³/month. This results in an increase in the external water requirement, ranging from 32,000 to 132,000 m³/month.
- Under wet climatic conditions, water available from the TSF increases and results in a temporary increase in TSF recycle to as high as 144,000 m³/month; and
- The TSF expansion footprint is considered to be sufficient for a tailings production rate of 6.0 Mtpa.

Further to the above, investigations into the design of the TSF have determined design storms for the 1% Annual Exceedance Probability (AEP) 72-hour event as 201 mm and the Probable Maximum Precipitation (PMP) 24-hour event as 560 mm. As such, the TSF and supporting drainage and water storage infrastructure have been designed to mitigate the impact of storm events.

2.2.4 Seepage

To reduce seepage losses through the TSF expansion basin and to increase the settled densities of deposited tailings, several seepage control and underdrainage collection features have been integrated into the design. As such, seepage is currently managed under the following existing controls that are included in Licence L7815/2001/12, and outlined in Section 3.1.1 below.

Given the geology of the area and the anticipated volume of tailings to be stored, proposed lifts to TSF Cells C and D are expected to further contribute to vertical seepage of tailings water through the floor of the TSF, facilitating mounding of the water table in the underlying aquifer (Pennington Scott 2021). An analysis of the regional water table concluded that most of the seepage from the existing TSF cells currently flows to the west towards the pits, where it is captured by sumps and recycled in the processing plant and back to the TSF (Pennington Scott 2021).

In anticipation of increased seepage, additional controls are proposed by the Licence Holder which are outlined in Section 3.1.1, Table 5.

Considering the nature of the proposal and relative uncertainty around the impacts of lift stages on seepage, the Delegated Officer has determined that this assessment will consider stages 2 and 3 only, with future lift stages being subject to separate licence amendment applications.

This will allow greater accuracy of TSF lift stage design as design parameters can be based on the latest groundwater and seepage monitoring information.

2.2.5 Tailings characterisation

The Licence Holder carried out tailings geochemistry testing of a representative sample of tailings solids and supernatant water for the Thunderbox Operations in 2017 and 2018.

The TSF expansion deposition design uses expected tailings material types and properties based on this laboratory testing of bench scale samples in 2017. Material properties for Cells C and D tailings are expected to be like those present in Cells A and B, but this may vary daily and over the life of the project (Knight Piésold 2021). Material properties which may affect the deposition methodology include particle size distribution, percent solids of discharge, slurry flow rate and specific gravity of solids and liquids. The design parameters for Cells C and D are based on the tailings material properties shown in Table 4.

Table 4: Tailings material properties

Parameter	Value
Maximum Air-Dried Density	1.62 t/m ³
Solids Particle Density	2.77 t/m ³
P ₈₀	72 µm
Beach Slope	1V: 100H (latest beach survey)
Solids Content	62%
Supernatant Release	28 – 35%
Underdrainage Release	3-8%
Vertical Permeability	4×10 ⁻⁷ m/s
Coeff. of Consolidation (Cv)	73 m ² /yr
Coeff. of Volume Decrease (Mv)	0.014m ² /kN
Compression Index (Cc)	0.226

The tailings geochemistry testing of representative tailings solid samples undertaken in 2017 and 2018 identify the following conclusions and recommendations for the operation of TSF Cells C and D (Knight Piésold 2021):

- The tailings are Non-Acid Forming (NAF).
- The multi-element analyses of the solids indicate several metals to be present at elevated concentrations (namely arsenic, antimony, chromium, lead, sulfur and zinc). Arsenic and Sulfur were found to be highly enriched. As such, a cover system is required on closure to isolate the tailings from the environment.
- The results of the supernatant testing have been compared to reference water quality standards for release of water from mining operations and livestock drinking water. The results indicate that the supernatant exceeds a number of reference guidelines. The laboratory was unable to determine the total cyanide concentration due to suspected interference with thiocyanate in the sample. The concentrations of both free and Weak Acid Dissociable (WAD) cyanide were high. Although the WAD cyanide level does not meet the release criteria, it is lower than the 50 mg/L target required under the International Cyanide Guideline for decant ponds. Measures are incorporated into the design to reduce seepage from the basin and release of supernatant to the environment. Monitoring bore data for the existing Cells A and B show that no significant elevations of cyanide or arsenic have been registered and are well below the DWER licence conditions.
- The supernatant and seepage are saline due to the use of saline groundwater in the processing of ore. The groundwater in the vicinity of the TSF is stock water quality. As such it is not expected that seepage from the facility will result in a significant increase in groundwater salinity. Monitoring data for the existing cells A and B indicate that Total Dissolved Solids are well below the DWER licence limit of 1,500 mg/L, fluctuating within a range of 290 mg/L to 750 mg/L during the most recent monitoring period.
- A cover system will need to be constructed on closure to reduce any dust generation and be resistant to erosion to prevent loss of tailings solids, also water ingress and resulting seepage. A modified store and release cover system is proposed over the tailings beach on closure to isolate the tailings solids from the environment. This cover system would limit infiltration of rainfall via a lower permeability layer and promote revegetation through provision of a water storage zone. A capillary break would also prevent the upward migration of salts; and
- The TSF design should ensure that there is sufficient stormwater capacity.

The results of tailings geochemistry testing to date indicate that the characteristics of the tailings between all Cells should remain consistent, meaning that the TSF Cell C and D design parameters are supported by the tailings characteristics.

2.2.6 Tailings rehandle pad

The Licence Holder is proposing to construct a tailings rehandle pad to the west of TSF Cells C and D (Figure 2). The rehandle pad will stockpile tailings that have been harvested from the Thunderbox TSF, prior to them being transported to Northern Star's Bundarra site as part of the Licence Holder's paste fill deposition strategy. A separate works approval application (W3064/2025/1) has been submitted to facilitate construction of the paste plant, which will be operated under a separate licence to Thunderbox.

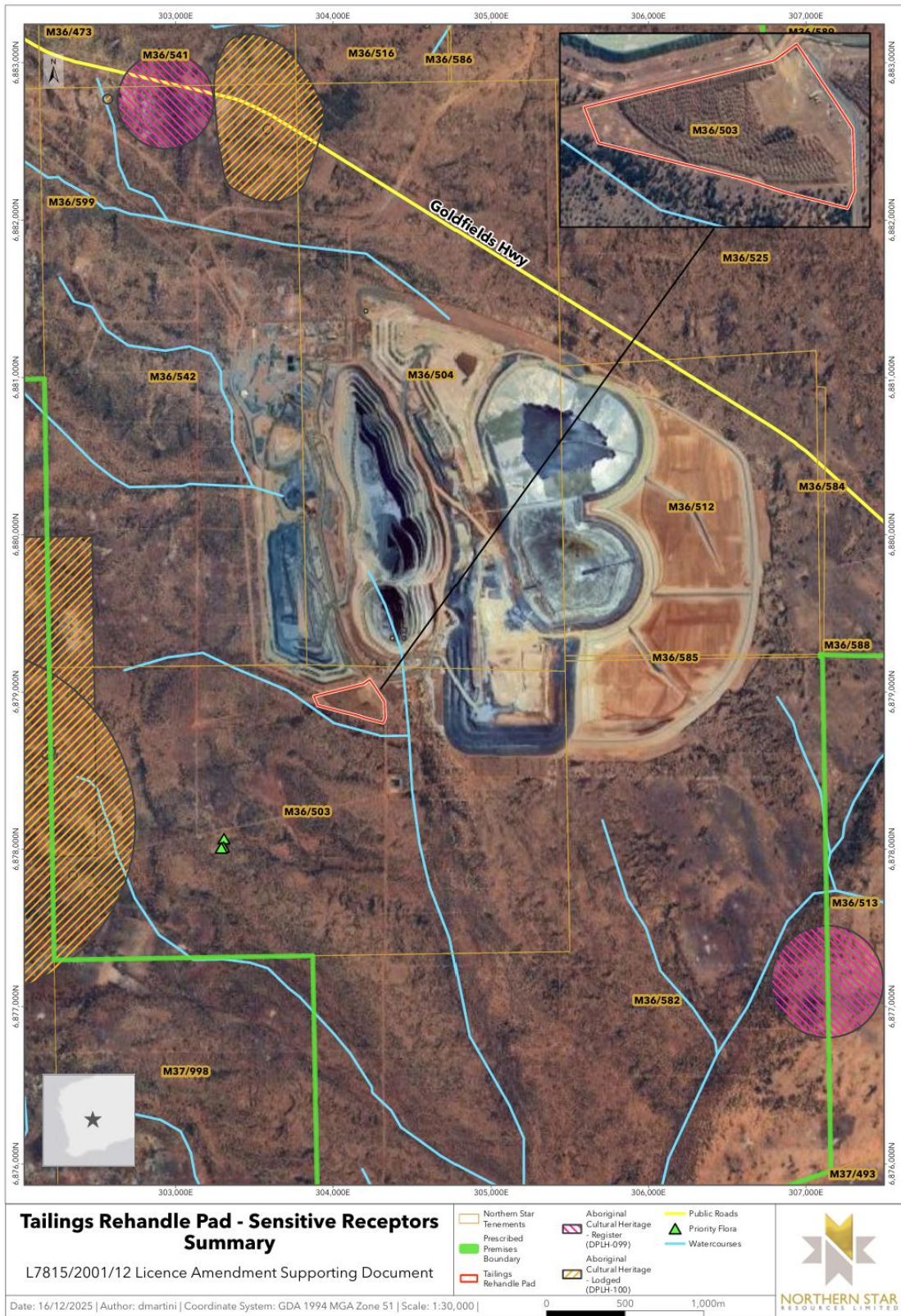


Figure 2: Tailings rehandle location and sensitive receptors

Once constructed, the rehandle pad will enable stockpiling between TSF cell operations and lift stages, as there will likely be times that no tailings excavation can occur due to operational restrictions. Excavated tailings from Thunderbox TSF will be predominantly sourced from the surface of the inactive TSF cell following a period of consolidation and drying.

The tailings rehandle pad will be constructed with a foundation of tailings which will be used to form the base, resulting in an initial height of approximately 0.5 – 1 m above ground level. The total area of the rehandle pad is estimated to be 4.2 ha, while the design capacity has been calculated based on tonnes per annum (tpa) assuming a maximum four full turnovers of the pad per annum. The proposed output has been calculated based upon paste plant utilisation plus storage contingency. Tailings will be stored at a maximum height of 6 m height on the pad, with stockpiles remaining for an estimated 3 to 6 months residence time.

The rehandle pad location has been selected to minimise potential impacts to sensitive receptors, including to provide protection from dust impacts to the Goldfields Highway by surrounding by waste rock landforms and distancing, and protection from ephemeral water courses through the positioning of access to the tailings, grading the pad, and the installation of perimeter bunds and spoon drains (Northern Star 2025a). Further, the area proposed for the tailings rehandle pad is currently used for topsoil stockpiles and as such is highly disturbed, with no new clearing of vegetation being required.

As tailings are deposited on the rehandle pad, it will be graded towards the northeast, which will serve to retain water runoff within the operational footprint. To further mitigate impacts from water runoff, bunds will be constructed on the northeast and southwest perimeter of the pad out of waste rock to a minimum height of 0.5 m will provide protection from stormwater. Spoon drains will be placed at the external side of bunds to divert water around and towards natural drainage lines (Northern Star 2025a).

The Licence Holder does not anticipate dust lift-off will present any issues given the residual moisture in the tailings (approximately 10-15%), will limit dust liftoff during excavation and transport activities (Northern Star 2025a). However, stockpiles will be visually monitored daily, and watercarts will be deployed if required to prevent dusting.

The schematic of the tailings drying pad is shown in Figure 3 with approximate dimensions shown in Figure 4.



Figure 3: Tailings rehandle schematic

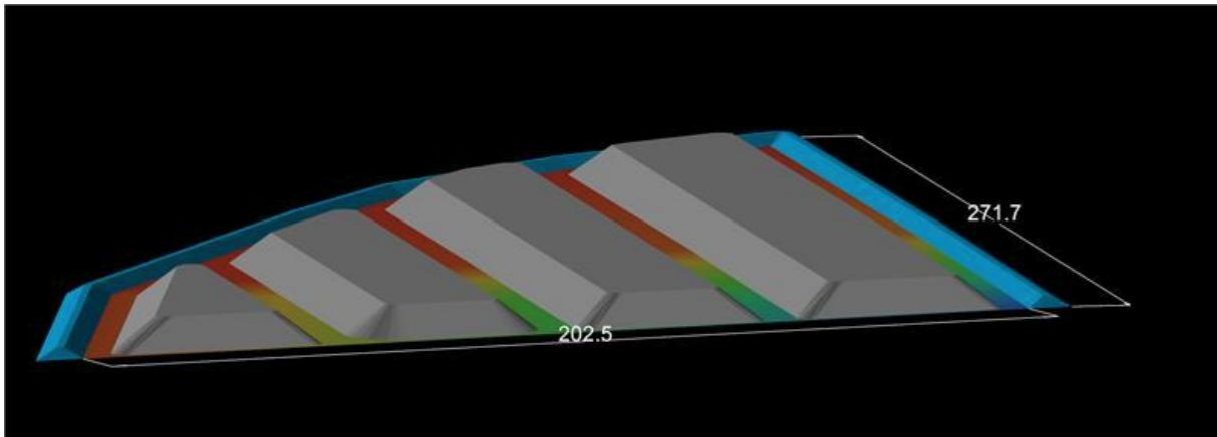


Figure 4: Tailings rehandle dimensions

3. 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.

3.1 Source-pathways and receptors

3.1.1 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 below. Table also details the proposed control measures the Licence Holder has proposed to assist in controlling these emissions, where necessary.

Table 5: Licence holder controls

Emission	Sources	Potential pathways	Proposed controls
Construction			
Dust	Earthworks and mobile plant movements Construction of TSF Cell lifts Stages 2-5 Construction of rehandle pad	Air/windborne pathway	<ul style="list-style-type: none"> Visual dust monitoring during earthworks Provision of watercarts during construction activities with regular spraying as required to prevent dust liftoff. Monitoring of wind conditions and ceasing activities during excessive visual dusting towards Goldfields Highway.
Noise			No controls are proposed.

Emission	Sources	Potential pathways	Proposed controls
Hydrocarbons	Earthworks and mobile plant movements Construction of TSF Cell lifts Stages 2-5 Construction of rehandle pad	Direct contact via overland pathways from leaks and spills	<ul style="list-style-type: none"> Spills kits available onsite Any contaminated soil removed from work area and bioremediated off site
Operation			
Dust	Discharge of tailings to TSF Cells C and D	Dry tailings dusting via air/windborne pathway	Capping of tailings and rehabilitation in accordance with approved Mine Closure Plan.
	Excavation of tailings Transportation of tailings to and from the rehandle pad		<ul style="list-style-type: none"> Visual monitoring and dust suppression as required Haul trucks to not be overfilled Site speed limits in place Transport route through existing operational areas
	Storage of tailings on rehandle pad		<ul style="list-style-type: none"> Siting approximately 2.8 km from Goldfields Highway between waste rock landforms for protection Daily visual dust monitoring during storage Watercarts available and used as required to wet down stockpiles
Leachate	Discharge of tailings to TSF Cells C and D	Direct contact with ground via overland pathway	<u>Existing controls</u> <ul style="list-style-type: none"> Pipelines constructed from HDPE PE100 and installed in accordance with AS4130 and AS413. Tailings stored in V-drains sufficient to contain spillages between routine inspections. Tailings pipelines fitted with telemetry A minimum top of embankment freeboard of 500 mm maintained at all times.
		Seepage through base or walls of TSF into surrounding natural soils / groundwater	<u>Existing Controls</u> <ul style="list-style-type: none"> Low permeability compacted soil liner and underdrainage collection system installed. Diversion drain in place to ensure natural surface water flows are diverted

Emission	Sources	Potential pathways	Proposed controls
		table.	<p>around TSF maintain downstream flows.</p> <ul style="list-style-type: none"> • Berm positioned between toe drain and diversion drain to prevent mixing of clean and potentially contaminated water. • Cut-off trench installed. • Groundwater monitoring in accordance with licence, consisting of 4 monitoring bores as per Figure 1. <p><u>Proposed Controls</u></p> <ul style="list-style-type: none"> • Seepage collection and recovery system implemented (decant and underdrainage tower raises). • Seepage is returned to the TSF, or pumped back into the mine water circuit. • Perimeter toe drain to be installed adjacent to downstream embankment (Stage 2) raise to replace existing toe drain. • Seepage recovery bores installed when trigger levels reached (standing water levels rise higher than 6 mbgl).
	Storage of tailings on rehandle pad	Seepage of fugitive tailings through the base of the rehandle pad	Grading north-east towards operational footprint to divert surface water away from stored tailings.
Stormwater	Storage of tailings on rehandle pad	Direct overland runoff	<ul style="list-style-type: none"> • Building up rehandle pad minimum 500 mm above natural ground surface. • Bunding external perimeters of rehandle pad to 500 mm height above constructed tailings pad with waste rock to prevent interaction with drainage. • Grading towards north-east Thunderbox operational footprint and existing access road drains to manage stormwater runoff. • Spoon drain installed on the external side of perimeter bund to divert stormwater flows away from pad.

3.1.2 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 6 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 6: Sensitive human and environmental receptors and distance from prescribed activity

Human receptors	Distance from prescribed activity
Weebo Pastoral Station Homestead	20 km north west of the TSF Cells C and D. <u>This receptor has been screened out due to distance.</u>
Goldfields Highway	200 m from TSF Cells C and D (L7815 premises intersects Goldfields Highway). The tailings rehandle pad is approximately 2.8 km from the Goldfields Highway.
Environmental receptors	Distance from prescribed activity
Native vegetation	Immediately surrounding the TSF.
Surface Water	Ephemeral watercourses traverse the proposed prescribed premises boundary.
Groundwater	Groundwater within the project area is generally within 29 m of the natural ground level and typically flows southeast across the site. Groundwater within the project area is saline, and is of stock quality, with the closest active pastoral bore is located approximately 7 km to the south of the TSF.

3.2 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 3.1. 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 3.1), 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 7.

The Revised Licence L7815/2001/12 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 7. 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 for additional regulatory controls
Source/Activities	Potential emissions	Potential pathways and impact	Receptors	Applicant controls				
Construction								
Earthworks and mobile plant movements Construction of TSF Cell lifts Construction of rehandle pad	Dust	Pathway: Air/windborne pathway Impact: Adverse impacts to vegetation health, surface water quality, and health and amenity for users of Goldfields Highway	Adjacent Vegetation Surface water Users of Goldfields Highway	Refer to Section 3.1.1	C = Minor L = Possible Medium Risk	Y	Condition 3, Table 3	N/A

Risk Event					Risk rating C = consequence L = likelihood	Applicant controls sufficient?	Conditions of licence	Justification for additional regulatory controls
Source/Activities	Potential emissions	Potential pathways and impact	Receptors	Applicant controls				
Earthworks and mobile plant movements Construction of TSF Cell lifts Construction of rehandle pad	Hydrocarbons	Pathway: Direct contact with ground and vegetation due to leaks and spills from pad; infiltration to groundwater Impact: Adverse impacts to vegetation health and impacts to groundwater and surface water quality	Adjacent Vegetation Surface water Groundwater	Refer to Section 3.1.1	C = Minor L = Possible Medium Risk	Y		N/A
	Noise	Pathway: Air/windborne pathway Impact: Adverse impacts to health and amenity for users of Goldfields Highway	Users of Goldfields Highway	Refer to Section 3.1.1	C = Minor L = Unlikely Low Risk	Y	N/A	N/A
Operation								
Discharge of tailings to TSF Cells C and D	Leachate	Pathway: Direct contact with ground and vegetation due to leaks and spills from pipelines; overtopping of TSF Impact: Adverse impacts to vegetation health and surface water quality	Adjacent Vegetation Surface water	Refer to Section 3.1.1	C = Moderate L = Unlikely Medium Risk	Y	Condition 1, Table 1 Condition 2, Table 2 Condition 3, Table 3	N/A

Risk Event					Risk rating C = consequence L = likelihood	Applicant controls sufficient?	Conditions of licence	Justification for additional regulatory controls
Source/Activities	Potential emissions	Potential pathways and impact	Receptors	Applicant controls				
Discharge of tailings to TSF Cells C and D	Leachate	Pathway: Seepage through base or walls of TSF into surrounding natural soils / groundwater table. Impact: Adverse impacts to vegetation health and groundwater	Adjacent vegetation Groundwater	Refer to Section 3.1.1	C = Moderate L = Possible Medium Risk	Y	Condition 1, Table 1 Condition 2, Table 2 Condition 3, Table 3	The conditions relate to the assessment of stages 2 and 3 only. This decision considers the 10-year lifespan for the proposed works, the LOM assessment, as well as the yet unknown extent and severity of cumulative seepage impacts as the TSF stages are constructed and operated.
Storage of tailings on rehandle pad	Leachate	Pathway: Seepage of fugitive tailings through ground into surrounding natural soils / groundwater table Impact: Adverse impacts to vegetation health and groundwater	Adjacent vegetation Groundwater	Refer to Section 3.1.1	C = Moderate L = Possible Medium Risk	Y	Condition 2, Table 2 Condition 3, Table 3	N/A
Discharge of tailings to TSF Cells C and D Excavation of tailings Transportation of tailings to and from the rehandle pad Storage of tailings on rehandle pad	Dust	Pathway: Air/windborne pathway Impact: Adverse impacts to vegetation health, surface water quality, and health and amenity for users of Goldfields Highway	Adjacent Vegetation Surface water Users of Goldfields Highway	Refer to Section 3.1.1	C = Minor L = Possible Medium Risk	Y	Condition 2, Table 2 Condition 17	N/A

Risk Event					Risk rating C = consequence L = likelihood	Applicant controls sufficient?	Conditions of licence	Justification for additional regulatory controls
Source/Activities	Potential emissions	Potential pathways and impact	Receptors	Applicant controls				
Storage of tailings on rehandle pad	Contaminated stormwater	<p>Pathway: Direct runoff of tailings impacted stormwater into surrounding environment and surface waters; infiltration to groundwater</p> <p>Impact: Adverse impacts to vegetation health and degradation to surface water and groundwater quality</p>	<p>Adjacent vegetation</p> <p>Surface water</p> <p>Groundwater</p>	Refer to Section 3.1.1	<p>C = Minor</p> <p>L = Possible</p> <p>Medium Risk</p>	Y	<p>Condition 2, Table 2</p> <p>Condition 3, Table 3</p>	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.

4. Consultation

Table 8 provides a summary of the consultation undertaken by the department.

Table 8: Consultation

Consultation method	Comments received	Department response
Application advertised on the department's website 11 November 2025.	One submission was received on 24 November 2025.	Refer to Appendix 1.
Shire of Leonora advised of proposal 12 November 2025.	No comments received.	N/A
Watarra Aboriginal Corporation advised of proposal 12 November 2025.	No comments received.	N/A
Licence Holder was provided with draft amendment on 21 January 2026.	Information that was requested during the 21-day consultation period was provided by the Licence Holder.	Licence conditions (Table 3) updated to remove previous infrastructure that has been constructed.

5. 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.

5.1 Summary of amendments

Table 9 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 9: Summary of licence amendments

Condition no.	Proposed amendments
Instrument history	Removal of redundant wording in row for the amendment granted 11/03/2020. Added "Approval for construction and operation of TSF Cell C & D lift stages 2–5, including associated infrastructure and monitoring requirements." Added "Construction and operation of a tailings rehandle pad."
Condition 1, Table 1	Added requirement to maintain sufficient pumping capacity of decant system to limit size of decant pond. Pipelines have been added to Table 1 and consolidates requirements previously included in Condition 2, Table 2, and Condition 8.
Condition 2, Table 2	Addition of operational requirements for excavation of tailings and transport and storage of tailings on the tailings rehandle pad. Removal of requirements for Pipelines and TSF Cells C and D, as these requirements have been merged into the pipelines requirement now in Table 1.

Condition no.	Proposed amendments
Condition 3, Table 3	<p>Addition of construction requirements for the tailings rehandle pad, TSF Cells C and D lift stages 2 and 3 and associated infrastructure.</p> <p>Removal of Banockburn East dam, WWTP, power supply and fuel storage as this infrastructure has been constructed.</p>
Condition 8	<p>This condition has been removed as it duplicated previous requirements for pipelines. This condition is now incorporated into the pipelines requirements in Condition 1, Table 1, which relates to all pipelines.</p> <p>All subsequent conditions have now been renumbered, as well as renumbering any reference to conditions within other conditions and/or tables.</p>
Condition 16 (previously condition 18)	Minor modification to wording for better clarity on what this condition requires
Schedule 1, Figures 24 to 30	Addition of Figures 24 to 30 showing the construction specifications for the tailings rehandle pad, embankment sections, decant raise construction, and associated infrastructure for TSF Cells C and D lift stages 2 and 3.

References

1. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
2. Department of Water and Environmental Regulation (DWER) 2020, *Guideline: Environmental Siting*, Perth, Western Australia.
3. DWER 2020, *Guideline: Risk Assessments*, Perth, Western Australia.
4. Knight Piésold 2021, *Tailings Storage Facility Cell C and D Permitting Design*, East Perth, Western Australia.
5. Northern Star Resources Ltd (Northern Star) 2025, *L7815/2001/12 Licence Amendment supporting Attachments*, Subiaco, Western Australia.
6. Northern Star Resources Ltd (Northern Star) 2025a, *Thunderbox Tailings Rehandle Pad*, Subiaco, Western Australia.
7. Pennington Scott 2021, *Water studies for TSF Cells C and D North Eastern Goldfield Operations - 6 Mtpa Expansion Project*, Perth, Western Australia.

Appendix 1: Summary of stakeholder comments

Summary of stakeholder comments	Department's response
<p><u>Introduction and context</u></p> <p>The submission summarises the amendment application as being for the construction of TSF Cells C and D for the purpose of facilitating increased plant throughput.</p>	<p>The construction of Cells C and D of the Thunderbox TSF has already been completed, with the starter embankment being the subject of Works Approval W6601/2021/1. The Environmental Compliance Report submitted in November 2024 confirms the construction and compliance with Works Approval conditions.</p> <p>Deposition of tailings into TSF Cells C and D was authorised under an amendment to existing Licence L7815/2001/12 in January 2025.</p> <p>However, the scope of this assessment is for lift stages 2 and 3 for TSF Cells C and D only. As such, the subsequent comments raised in the submission are addressed in this context.</p>
<p><u>Geochemical characterisation and environmental risk</u></p> <p>Concerns were raised about elevated metal concentrations in tailings from the 2017/2018 geochemical characterisation, posing a persistent environmental hazard and questioning barrier effectiveness. Supernatant water does not meet release criteria, requiring containment and recycling, with added concern over groundwater salinity from seepage. A critical gap identified is the absence of long-term geochemical stability modelling post-closure.</p> <p>Information requested:</p> <ul style="list-style-type: none"> • Long-term kinetic leaching tests or predictive modelling (≥100 years). • Sensitivity analysis for metal leaching under varying pH/redox conditions. • Assessment of salt accumulation and cover system requirements. <p>Recommendation: Include long-term kinetic testing to predict metal leaching behaviour post-closure.</p>	<p>The 2017/2018 geochemical assessment confirms tailings are non-acid forming. Previous approvals (L7815/2001/1) cover deposition into TSF Cells C and D, with management and monitoring conditions in place.</p> <p>The application notes supernatant water does not meet release criteria; closure planning includes a store-and-release cover with capillary break and low-permeability layer to limit infiltration and salt migration. This assessment is limited to stages 2 and 3 to enable monitoring of seepage and tailings before future lifts. Groundwater monitoring wells (W6601/2021/1) will track seepage and quality, with results reported under Licence L7815/2001/12. Future lifts will incorporate these findings.</p> <p>The Delegated Officer confirmed sufficient information to assess lift stages 2 and 3 for Cells C and D. Starter embankment assessment occurred under prior approvals W6601/2021/1 and L7815/2001/12.</p> <p>Post-closure management falls under the DMPE mine closure plan and is outside Part V scope.</p>
<p><u>Seepage Control and Groundwater Protection</u></p> <p>Concerns have been raised about the effectiveness of proposed seepage control measures (compacted soil liner, cut-off trenches, underdrainage network) and the lack of</p>	<p>Seepage control measures (soil liners, cut-off trenches, and underdrainage network) have been constructed and assessed under Works Approval W6601/2021/1. Figures 2 and 3 of the approval detail the underdrainage network and trench construction, while Figures 21 and 22 of Licence</p>

Summary of stakeholder comments	Department's response
<p>detail on the monitoring network.</p> <p>Information Requests</p> <ul style="list-style-type: none"> • Characterise laterite/ferricrete hardpan continuity, thickness, and permeability across the facility footprint. • Justify limited cut-off trench depths and demonstrate adequacy with hardpan; assess deeper cut-offs or supplementary barriers where hardpan quality is uncertain. • Consider expanding underdrainage coverage beyond 35% of basin area. • Provide detailed groundwater monitoring design: bore locations (coordinates), screen depths, construction specs, baseline program, sampling frequency, and analyte suite. • Commit to at least 12 months of baseline monitoring before operations. • Define groundwater quality trigger levels for corrective action. <p>Recommendations</p> <ul style="list-style-type: none"> • Meet compacted soil liner specs (target permeability, compaction, QA testing) before tailings deposition. • Ensure underdrainage system is fully operational with proven pumping capacity before deposition. • Submit and approve monitoring network design; complete baseline monitoring before operations. • Report groundwater monitoring quarterly with defined trigger levels for investigation. • Submit annual review of seepage volumes and groundwater impacts. 	<p>L7815/2001/12 show toe drains, berm, and diversion channel locations.</p> <p>This application proposes expansions to existing infrastructure, including raises to the underdrainage network, which have been built and will be monitored per Licence L7815/2001/12. Future lift stages will include further integrity assessments.</p> <p>Groundwater monitoring was approved under W6601/2021/1, constructed, and confirmed compliant via the January 2025 Time-Limited Operations report. Monitoring locations and parameters are outlined in Licence L7815/2001/12 (Figure 4). No additions are proposed at this stage, though future lifts may require amendments.</p> <p>Construction specifications were previously assessed under L7815/2001/12 and W6601/2021/1. A Critical Containment Construction Report submitted in April 2024 confirmed compliance with approved requirements.</p> <p>Given this, new seepage management and monitoring infrastructure is outside the scope of this amendment. The Delegated Officer considers the application information sufficient. The staged TSF lift approach ensures confidence in seepage control and groundwater protection.</p>
<p><u>Hazard Classification and Design Standards</u></p> <p>Comment provided on the need for periodic review of Population at Risk (PAR) assessments.</p> <p>Consequence Classification Concerns raised about design standards, their alignment with consequence classification, and current Australian practices. Submission recommends considering lessons from recent international dam failures.</p> <p>Liquefaction Assessment Issues highlighted regarding liquefaction risk management. Key considerations:</p> <ul style="list-style-type: none"> • Strict control of embankment raise rates for tailings consolidation. 	<p>As there is minimal risk to human receptors, a PAR is not considered necessary for this proposal.</p> <p>Works approval W6601/2021/1 approving the TSF was reviewed by DMPE's Geotechnical Inspector, confirming sufficient consideration of geotechnical aspects.</p> <p>Stability and liquefaction considerations are addressed in the recommended amendments to licence L7815/2001/12. Table 2 outlines design requirements for embankment raises, underdrainage, piezometer replacement, and pond size.</p> <p>The staged approach for TSF Cells C and D lifts allows reassessment at each stage, providing greater control over raise rates and associated risks.</p>

Summary of stakeholder comments	Department's response
<ul style="list-style-type: none"> • Continuous underdrainage operation to reduce pore pressure. • Real-time pore pressure monitoring via piezometers at critical points. • Conservative pond management—keep ponds small and away from embankments. <p>Recommendations Enhance liquefaction risk management through binding licence conditions requiring:</p> <ul style="list-style-type: none"> • Conservative pond management. • Rigorous raise rate control. • Ongoing tailings strength verification. 	
<p><u>Water Balance and Stormwater Management</u></p> <p>Water balance modelling approach The submission comments on the reliability of water balance modelling, however concerns are raised as to the effects of climate change and operational uncertainties.</p> <p>Climate change considerations Consideration of climate change is recommended to inform adaptive management strategies in response to changing conditions.</p> <p>Pond management and freeboard maintenance Concerns are raised around the pond management protocols, in particular increased pond levels in response to severe storm events.</p> <p>Stormwater diversion and external catchment management Concerns are raised around the adequacy of external stormwater management infrastructure.</p> <p>Information requests</p> <ul style="list-style-type: none"> • Sensitivity analysis examining how projected climate change scenarios might affect facility water balance, pond levels, and storm storage adequacy. • Definition of adaptive management strategies if climate change impacts materialise. 	<p>The amendment scope is limited to embankment raises for stages 2 and 3, and the risks posed from those. Impacts from additional future raises will be addressed in subsequent TSF lift stages. The staged approach allows for adaptation of design and controls over time if required.</p> <p>Freeboard and pond level controls ensure adequate storm event storage. Licence L7815/2001/12 (Table 4) requires regular freeboard inspections per Table 1. Trigger levels for pond management are unnecessary if inspections comply with licence conditions.</p> <p>Stormwater infrastructure—toe drains, diversion drains, and berms—was assessed and approved under Works Approval W6601/2021/1, with details in Figures 4 and 5. These structures are also listed in Table 1 of licence L7815/2001/12, with locations shown in Figures 21 and 22.</p>

Summary of stakeholder comments	Department's response
<p>Recommendations</p> <ul style="list-style-type: none"> Operational pond must be maintained at maximum practicable distance from embankments at all times. Pond level monitoring and reporting must occur daily with defined trigger levels for increased decant pumping or deposition suspension. Annual verification that available freeboard meets design criteria following seasonal peak rainfall must be documented and reported. 	
<p><u>Embankment Design and Stability</u></p> <p>Construction Methodology</p> <p>Key risks in the proposed design:</p> <ul style="list-style-type: none"> Foundation tailings may weaken due to saturation from impounded water and deposited tailings. Inadequate drainage could lead to pore pressure buildup. Contractive tailings risk flow liquefaction under seismic or rapid embankment loading. Limited access for observation and remediation once tailings cover previous embankment areas. <p>Quality Assurance & Verification</p> <p>Independent construction oversight is recommended to strengthen design and construction assurance. Many jurisdictions mandate this for high-consequence tailings facilities.</p> <p>As-Built Documentation: Submission of stage-specific 'as-built' drawings is required for each TSF lift.</p> <p>Recommendations</p> <ul style="list-style-type: none"> Engage an independent geotechnical engineer (not the contractor) for all embankment construction. Submit construction reports to DWER after each stage, including QA results, design changes, and updated stability analyses. Operations may only proceed after DWER accepts as-built documentation 	<p>Existing construction controls for TSF Cells C and D are outlined in Table 1 of Works Approval W6601/2021/1, with operational controls in Table 1 of Licence L7815/2001/12. Proposed construction controls, including maximum design heights and piezometer replacement, are detailed in Table 2 of the Amendment Report and Table 3 of the amended licence. Operational controls, such as maintaining pond size, remain in Table 1.</p> <p>Document submission between stages will ensure design integrity, stability, and performance. Independent oversight is not required; instead, condition 7(a) of W6601/2021/1 mandates certification by a qualified geotechnical engineer, providing sufficient assurance of design and construction quality. The Delegated Officer does not consider the proposal as a high-consequence TSF.</p> <p>"As-constructed" diagrams are in Schedule 1 of W6601/2021/1 and Licence L7815/2001/12, with detailed design drawings for TSF Cells C and D (Stages 2 and 3 lifts) included in the amended licence and Amendment Report. Construction must comply with Table 3 of Licence L7815/2001/12. Future lifts will require similar design documentation.</p>

Summary of stakeholder comments	Department's response
<p>confirming compliance.</p>	
<p><u>Geotechnical Monitoring and Performance</u></p> <p>Proposed Monitoring Program</p> <p>The submission requests detailed monitoring requirements, including:</p> <ul style="list-style-type: none"> • Daily: Visual inspections of facility integrity, pipelines, tailings, and water levels. • Monthly: Embankment survey pins and water volume estimates. • Quarterly: Bore sampling for water quality. • Annually: Topographic surveys and full facility inspections by qualified engineers. • Continuous/Periodic: Automated monitoring of climate, tailings discharge, and decant flows. <p>Geotechnical Instrument Requirements</p> <ul style="list-style-type: none"> • Provide specifications for monitoring equipment, including: • Instrument types, specs, and installation details (locations, coordinates, elevations). • Installation procedures, QA, and reading frequencies (manual/automated). • Normal operating ranges, alert/action thresholds, and TARPs. • Data management and reporting protocols <p>Monitoring Bore Network Design</p> <p>Recommendations for groundwater monitoring network:</p> <ul style="list-style-type: none"> • Bore placement based on flow directions/velocities. • Screening intervals suited to aquifer and plume geometry. • Construction specs for representative sampling. • Adequate spatial density to detect seepage and delineate plume. • Baseline monitoring before operations to establish pre-impact conditions. <p>Information Requests</p>	<p>Monitoring requirements are outlined in conditions 20–26 of licence L7815/2001/12, covering infrastructure inspections, groundwater, and surface water monitoring. The Delegated Officer confirms that the initial licence amendment for TSF Cells C and D adequately addressed monitoring parameters and frequencies, with no changes proposed in this amendment.</p> <p>Specifications for individual instruments are not provided, but existing licence conditions ensure accurate monitoring and reporting. For example, condition 20 requires sampling in accordance with AS/NZS 5667.1 and AS/NZS 5667.11, and all laboratory analyses must be conducted by NATA-accredited facilities using appropriate reporting limits.</p> <p>Groundwater bores were constructed per Table 2 of Works Approval W6601/2021/1, which details design, location, and maintenance requirements. Baseline monitoring was included in the January 2025 Time-Limited Operations Report. Monitoring parameters are listed in Table 11 of the licence, and no changes to the network or program are proposed. Future TSF lift stages may prompt network expansion if needed.</p> <p>Works Approval W6601/2021/1 was reviewed by DMPE's Geotechnical Inspector, confirming adequate geotechnical consideration. Piezometers will be installed as per Table 2 of the Amendment Report, and tailings stability testing will occur during subsequent lifts. Condition 24 of the licence outlines response requirements for elevated standing water levels.</p>

Summary of stakeholder comments	Department's response
<ul style="list-style-type: none"> • Comprehensive instrumentation and monitoring plan (types, locations, specs, frequencies, ranges, thresholds). • TARP's for threshold exceedance. • Independent construction oversight with defined reporting. • Demonstration of safety margin for post-liquefaction or mitigation measures. <p>Recommendations</p> <ul style="list-style-type: none"> • Submit and approve full monitoring plan before operations. • Report monthly piezometer readings (phreatic surface, pore pressures). • Conduct cone penetration tests before each embankment raise. • Submit updated stability analyses before each raise. • Develop and implement TARP's for adverse trends. 	
<p><u>Closure Planning and Post-Closure Monitoring</u></p> <p>Closure Concept</p> <p>The submission raises several concerns pertaining to mine close which are summarised below.</p> <p>Cover system design performance</p> <p>The submission raises concerns around cover system design, noting that early cover system design development and field trials would be beneficial.</p> <p>Long-term Monitoring and Maintenance Requirements</p> <p>Further concerns are raised regarding long-term monitoring and post-closure maintenance requirements.</p> <p>Consistency with Leading Practice</p> <p>The submission suggested that closure planning reflects a commitment to the Global Industry Standard on Tailings Management (GISTM).</p> <p>Information requests</p> <ul style="list-style-type: none"> • Preliminary cover system design or conceptual approach with performance criteria 	<p>Closure cover design and post-closure maintenance are not assessed under Part V of the EP Act and is therefore out of scope for this assessment. This is addressed by the DMPE mine closure plan for this proposal.</p>

Summary of stakeholder comments	Department's response
<p>specified.</p> <ul style="list-style-type: none"> • Commitment to cover system field trial establishment and monitoring timeline. • Definition of minimum post-closure monitoring period and criteria for monitoring reduction or cessation. • Long-term maintenance requirements and funding mechanisms. <p>Recommendations</p> <ul style="list-style-type: none"> • Detailed closure plan including cover system design, performance criteria, monitoring and maintenance requirements, and financial provisions must be submitted for approval at least five years prior to anticipated closure. • Cover system field trials must be established and monitored for at least three years prior to final cover construction. • Post-closure monitoring must continue for a minimum period specified in the approved closure plan, with criteria for monitoring reduction or cessation subject to DWER approval. • Annual post-closure monitoring reports must be submitted documenting cover performance, groundwater quality trends, and geotechnical stability. 	
<p><u>Alternative Assessment and Justification</u></p> <p>Design Alternative Considerations</p> <p>The submission suggests that alternative designs for TSF Cells C and D should be considered.</p> <p>Upstream versus Downstream Construction</p> <p>Comment is provided on there being a need for a comprehensive alternative design assessment, to consider the pros and cons of upstream vs downstream construction.</p> <p>Information requests</p> <ul style="list-style-type: none"> • Comprehensive alternatives assessment examining other facility designs, locations, and construction methodologies including evaluation of continued downstream construction as an alternative to upstream construction. • Risk-cost trade-off analysis comparing upstream construction risks with alternative approaches. 	<p>The design and construction of TSF Cells C and D have been approved and constructed in accordance with Works Approval W6601/2021/1. Alternative design considerations for infrastructure that has already been constructed are outside of the scope of this assessment.</p>

Summary of stakeholder comments	Department's response
<p><u>Regulatory Framework and Licence Conditions</u></p> <p>Existing Regulatory Context</p> <p>The submission raises concerns that the assessment has not been considered under Part IV of the EP Act.</p> <p>Licence Condition Recommendations</p> <p>The submission sets out a list of recommended conditions to apply to the licence. These have been summarised in each of the points above.</p>	<p>This assessment is carried out under Part V of the EP Act, and the Delegated Officer is satisfied with the decision not to assess under Part IV. Not all matters are considered under Part IV, and this takes into consideration the nature, impact, context and significance of the proposal, which was not considered a significant amendment.</p> <p>The new licence conditions have considered the application and reflect the assessment that has been undertaken. Licence condition amendments are summarised in Table 9 of this report.</p>
<p><u>Public Interest Considerations</u></p> <p>Environmental Justice and Community Impacts</p> <p>The submission notes the location of the premises in relation to Aboriginal heritage sites and suggests that the application does not address stakeholder engagement, including consultation with Traditional Owners.</p> <p>Cumulative Environmental Impacts</p> <p>The application does not address cumulative impact considerations or assess how the proposed expansion might contribute to regional environmental pressures.</p> <p>Climate Change and Resource Stewardship</p> <p>Comment is made on the application within the context of climate change, stating that "In the absence of evidence that the expansion would cause unacceptable environmental harm, approval subject to appropriate conditions appears reasonable from a sustainable development perspective."</p>	<p>The risk assessment has considered the location of heritage sites. In addition, the application states that ongoing communication with Traditional Owners has been undertaken over the life of the operations. Heritage surveys have been undertaken surrounding the footprint of TSF Cells C and D in May 2021. The nearest Aboriginal heritage site is located approximately 1.5 km southwest of the Thunderbox TSF.</p> <p>As part of this assessment, the Department advised the Watarra Aboriginal Corporation of the proposal on 12 November 2025.</p> <p>Assessments under Part V of the EP Act consider current impacts and direct risk to receptors as a result of the proposal that has been received. Cumulative impacts of the assessment in the context of other assessments and approvals is outside of the scope of this assessment.</p>

Appendix 2: Tailings storage facility Cell C and D expansion embankment sections and details.

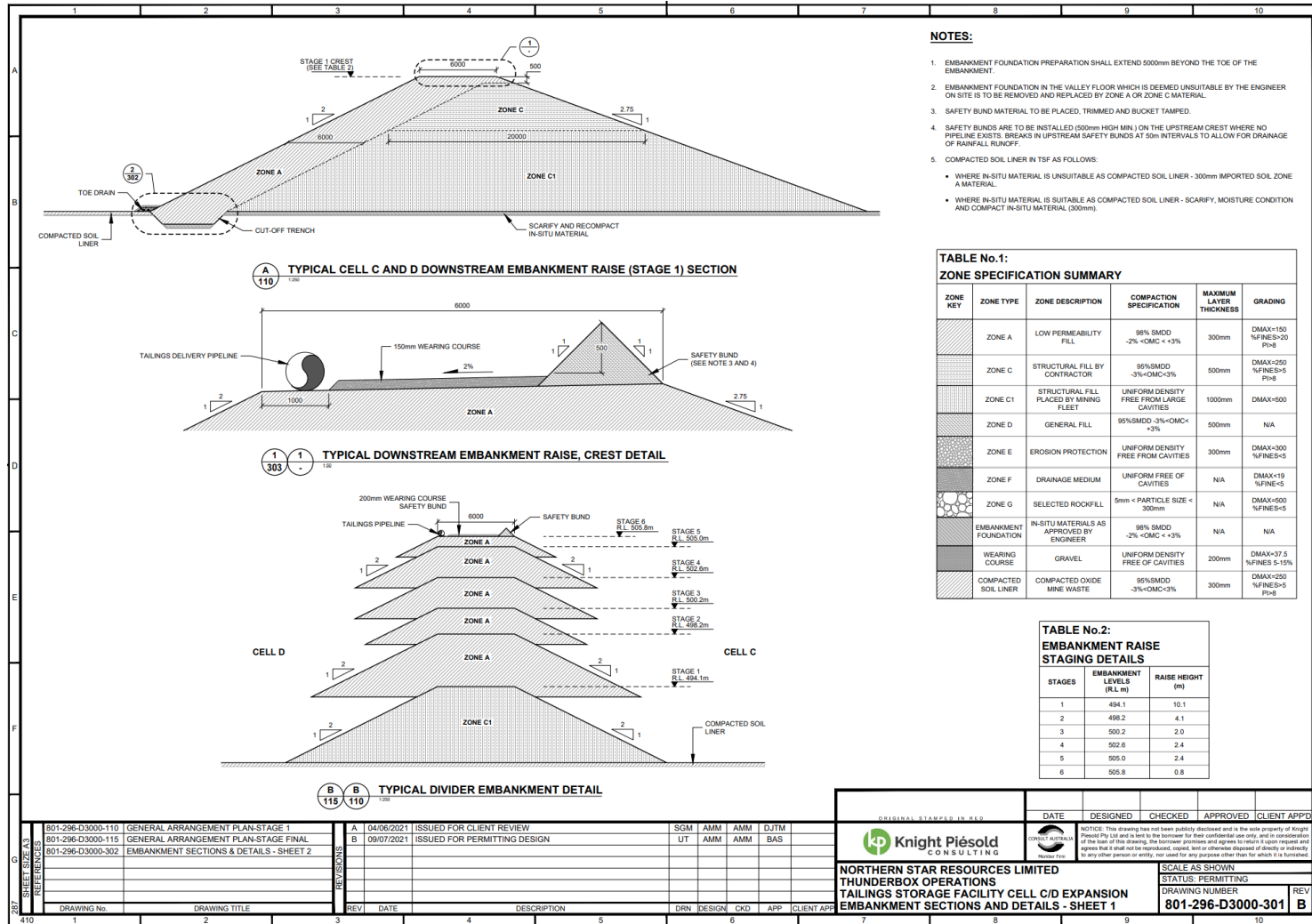


Figure 5: Cell C and D lift sections sheet 1

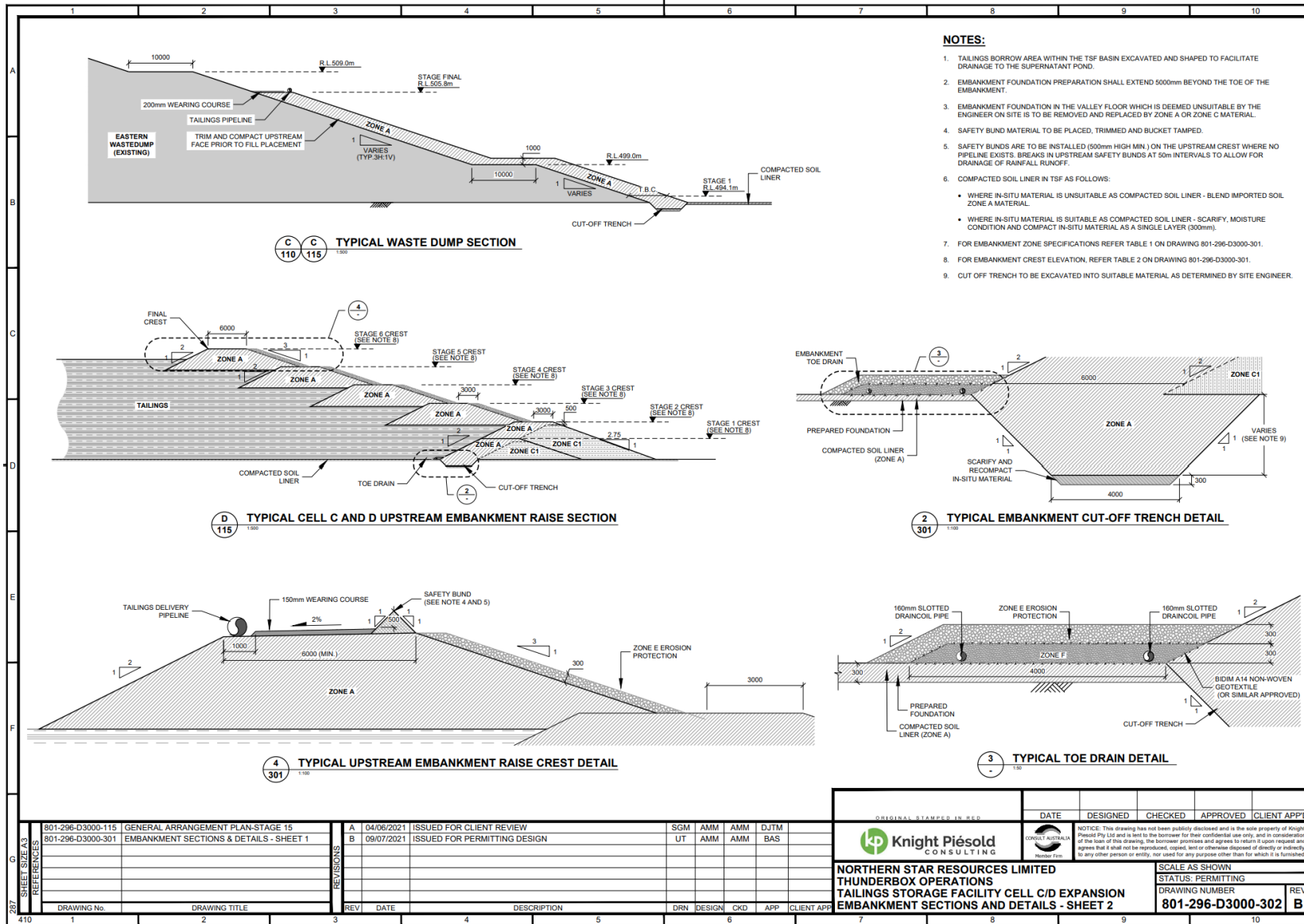


Figure 6: Cell C and D lift sections sheet 2

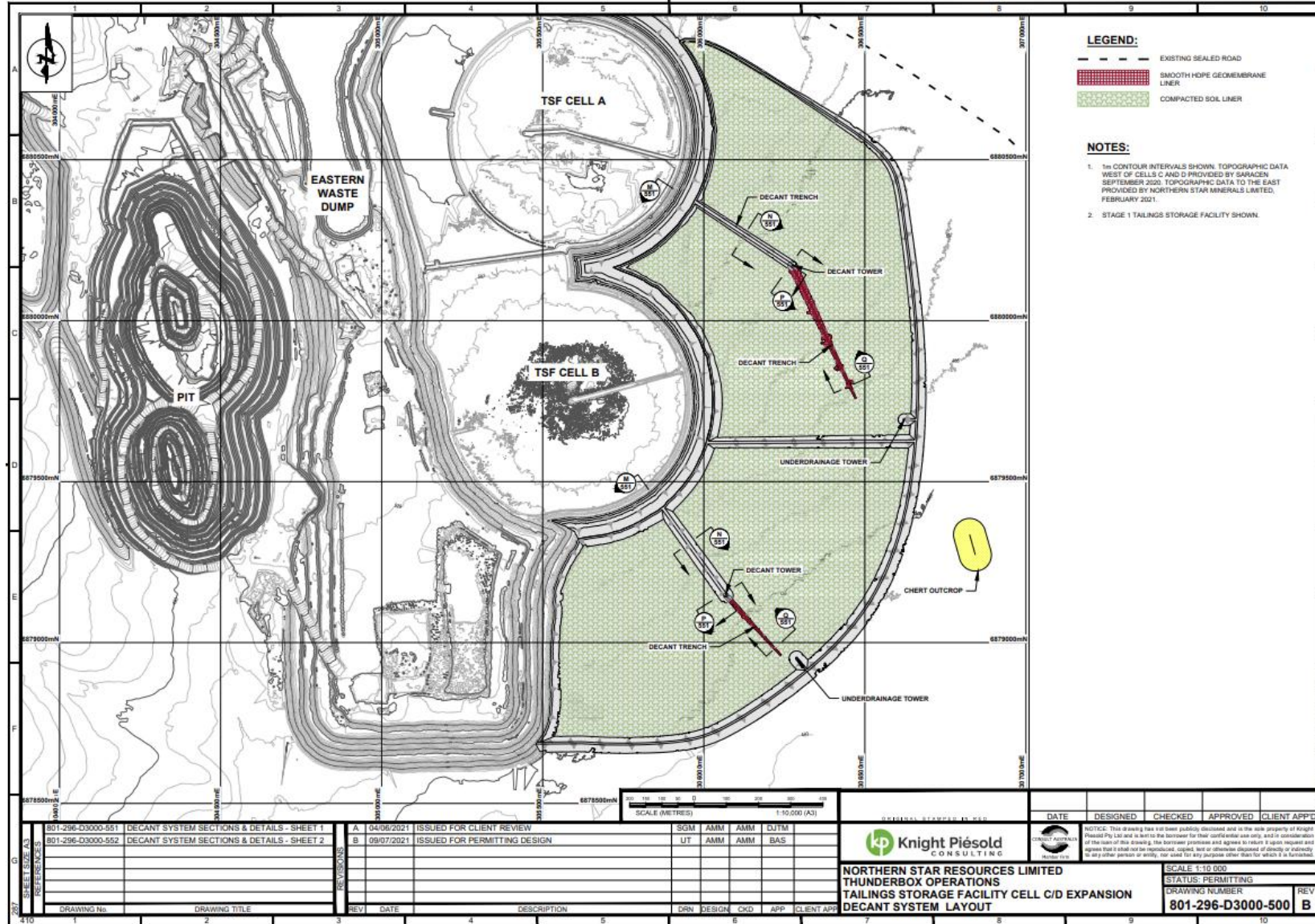


Figure 7: Decant system location and layout

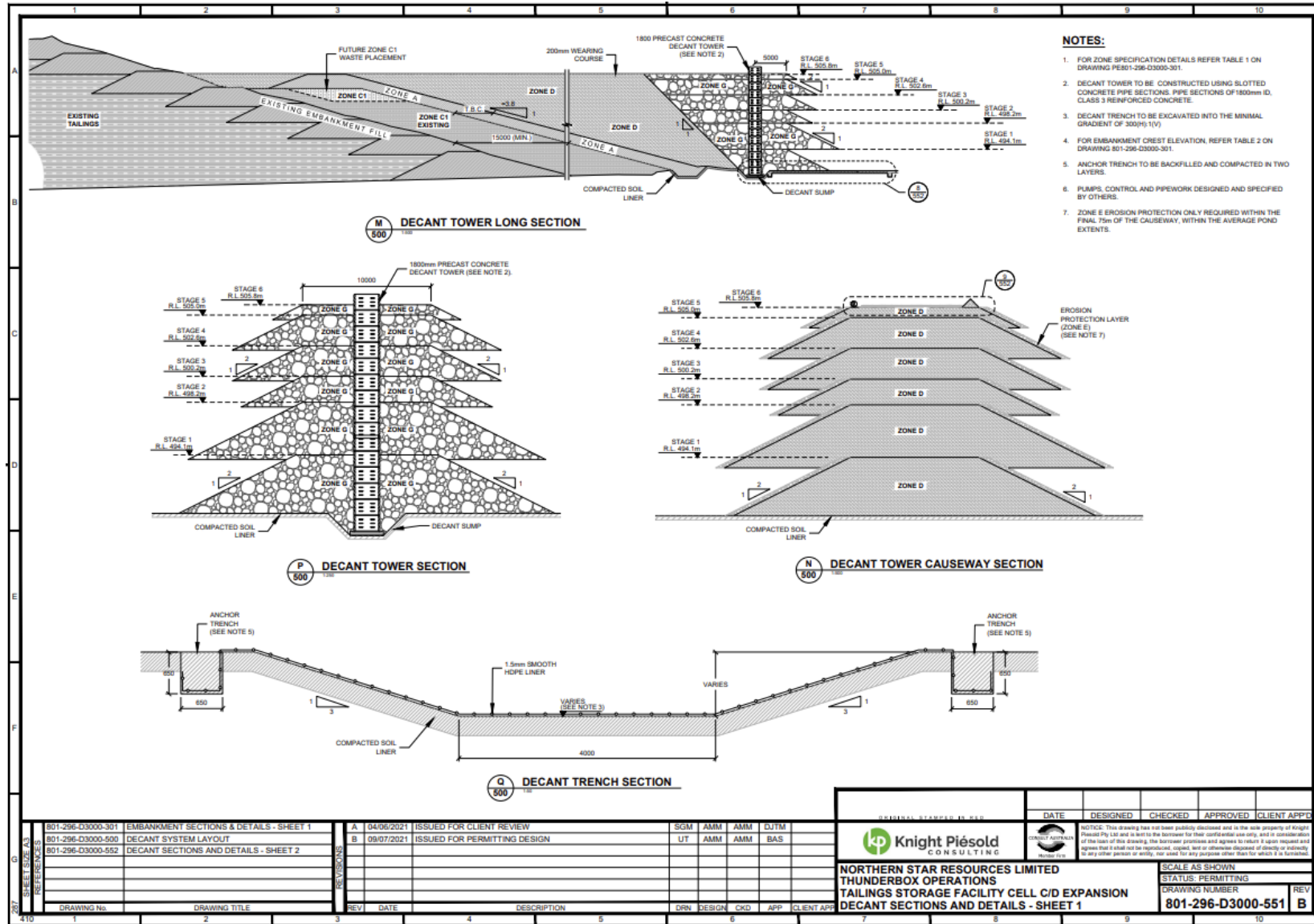


Figure 8: Decant sections and details – sheet 1

