Coconut

Greenbushes Lithium Operation

Mining Proposal

Licence Amendment

31

7 January 2026, Revision 1

TSF4 1,270mRL Raise Licence Amendment

Issue No	Issue Date	Document Author	Issue Amendments
0	10/25	Preston Consulting	Initial Issue
1	1/26	Talison Lithium Australia	TSF1 Ore Stockpile added

Reviewed By Toby Semler Date *7/1/2026*

Senior Approvals Specialist

Authorised By Toby Semler Date *30/1/2026*

Senior Approvals Specialist

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PROJECT BACKGROUND

The Greenbushes Lithium Operation (**Premises** [redacted] comprises an existing open pit mine and several processing facilities operated by Talison Lithium Australia Pty Ltd (**Talison**). The Premises is located in the Shire of Bridgetown-Greenbushes, approximately 250km south of Perth (Figure 1) and situated to the immediate south of the Greenbushes Townsite.

Talison received approval in 2019 to expand the existing operations under the *Environmental Protection Act 1986* (**EP Act**) and *Environment Protection and Biodiversity Conservation Act 1999* (**EPBC Act**). The expansion (**Project**) involved the merging and expansion of existing mine pits, extension of the waste rock landform (**WRL**), establishment of a new tailings storage facility (**TSF**) and construction and operation of new infrastructure including a new Mine Services Area (**MSA**), a crushing circuit, two new spodumene processing plants and a tailings retreatment plant (**TRP**) (Talison, 2018).

Ministerial Statement (**MS**) 1111 authorises an increase in processing capacity (throughput) from 5 million tonnes per annum (**Mtpa**) to approximately 11.6Mtpa of spodumene ore, and an additional 2.1Mtpa of recovered tailings from Tailings Storage Facility 1 (**TSF1**) will also be reprocessed. The increased processing rate will result in an increase of tailings deposition to approximately 9Mtpa when full production is reached.

Works Approval 6618/2021/1

Works Approval 6618/2021/1 (**W6618/2021/1**) was granted by DWER on 8 March 2022 for construction of a fourth TSF (**TSF4**). TSF4 is a two-cell, centreline TSF, designed to accommodate approximately 68.2 million tonnes (**Mt**) of tailings at an average density of 1.4 tonnes per cubic metre. TSF4 has a starter embankment height of 1,265mRL (equal to 265m Above Height Datum (AHD)). TSF4 has been designed with 5m raises at approximately yearly intervals, with a final crest height of 1,295mRL.

An amendment of W6618/2021/1 was approved on 4 July 2023 to allow for staged construction of the TSF4 Cell 1 starter embankment (Cell 1 starter embankment is comprised of – stage 1a (**Cell 1a**) to 1,261mRL and Cell 1 – stage 1b (**Cell 1b**) to 1,265mRL) (**Cell 1**), and subsequent staged submission of two Critical Containment Infrastructure Reports (**CCIRs**) and two staged periods of Time Limited Operations (**TLO**) for Cell 1. An amendment to allow for the final section of the TSF4 Cell 1 liner to be constructed from bituminous geomembrane material (**BGM**) liner (rather than a clay liner) was approved on 1 September 2023. A final amendment of W6618/2021/1 permitting the TSF4 Cell 2 (**Cell 2**) liner to also be constructed from BGM (rather than a clay liner) was approved on 27 March 2024.

TLO for Cell 1a commenced on 20 January 2024. TLO for TSF4 Cell 1b and Cell 2 commenced in Q3 2024. Condition 8 of W6618/2021/1 authorises Talison to conduct TLO of Cell 1a, Cell 1b and Cell 2 at 1,265mRL until 30 June 2025 or until such time as a licence for that item of infrastructure is granted.

Works Approval 6901/2024/1

Works approval 6901/2024/1 (**W6901/2024/1**) wa[redacted]ed 22 July 2024 for the construction of the first raise of TSF4 Cell 1 and Cell 2 to 1,270mRL and increasing beneficiation to 7.1Mtpa (as per L4247/1991/13). W6901/2024/1 includes 270 days of TLO for the raise of TSF4 Cell 1 and Cell 2 to 1,270mRL. W6901/2024/1 was amended on 11 April 2025 to change the specification of the construction and material used for the embankment raise.

Licence 4247/1991/13

Talison currently holds a Part V EP Act Licence 4247/1991/13 (**L4247/1991/13**) for the Premises authorising 7.1Mtpa beneficiation and 5.2Mtpa tailings deposition. The Licence regulates key beneficiation and tailings deposition infrastructure, as well as support infrastructure including the mine water circuit (**MWC**). TSF4 is licensed to operate at up to 1,265mRL.

L4247/1991/13 has undergone multiple amendments over time. The most recent amendment was granted on 4 September 2025 to include:

- Category 61: Liquid waste facility authorising the acceptance of liquid waste on the premises associated with product storage at the port.

This Licence Amendment Application

This document provides the supporting information for a Licence amendment application (**Application**) to:

- Operate TSF4 Cell 1 and Cell 2 to an embankment height of 1,270mRL (see Attachment 3B1);
- Enable disposal of water treatment plant waste to TSF4 (see Attachment 3B2);
- As TSF1 tailings re-mining is completed, place waste rock in TSF1 to assist with dust control on the residual tailings surface (see Attachment 3B3), form a Run of Mine (**RoM**) to service a proposed ore stockpile in TSF1 (see Attachment 3B10), and to potentially buttress a proposed raise of the TSF4 northern embankment (embankment raise is subject to separate works approval);
- Request an extension to Condition 14 (c) to allow remaining pipeline leak detection works to be completed by 31 March 2027 (see Attachment 3B4);
- Amend Table 12 to:
    - Remove the Biological Oxygen Demand (**BOD**) limit (see Attachment 3B5);
    - Allow for in-field, non-NATA accredited analysis for redox in Clear Water Dam (see Attachment 3B7);
    - Enable pH data for Clear Water Dam to be measured weekly and averaged monthly (see Attachment 3B7);
- Amend Table 19 to allow for in-field, non-NATA accredited analysis for pH in all bores (see Attachment 3B7);
- Amend Table 2 to condition time-bound implementation of a *TSF4 Compliance Plan* to ensure Talison maintains compliance with existing Licence requirements, including for all TSF4 cell 1 and 2 tailings, decant and seepage pipelines:
    - f(i). Equipped with telemetry and pressure sensors to detect leaks and failures;

  - f(ii). Equipped with automatic cut-outs in the event of a pipe failure;
  - f(iii). Equipped with leak moni[redacted] which triggers the related pump/s to automatically shut down in High setpoint is exceeded (see Attachment 3B6).
- Removal of groundwater monitoring bore MB22/01 (no longer able to be safely accessed - see Attachment 3B8).
- Stockpile ore within TSF1 for future blending and/or processing (see Attachment 3B10).

The following attachments specified in *Application form: Works Approval/ Licence/ Renewal/ Amendment/ Registration v16, August 2022* (**Application Form**; DWER, 2022) are provided in this document:

- Attachment 2 (Premises map)
- Attachment 3B (Proposed activities)
- Attachment 5 (Other approvals)
- Attachment 6A (Emissions and discharges)
- Attachment 7 (Siting and location)
- Attachment 8 (Additional information)
- Attachment 10 (Proposed fee calculation)

Talison determined that the remainder of potential Application Form attachments are not required as they remain unchanged from the current Licence or are not relevant to this Application.

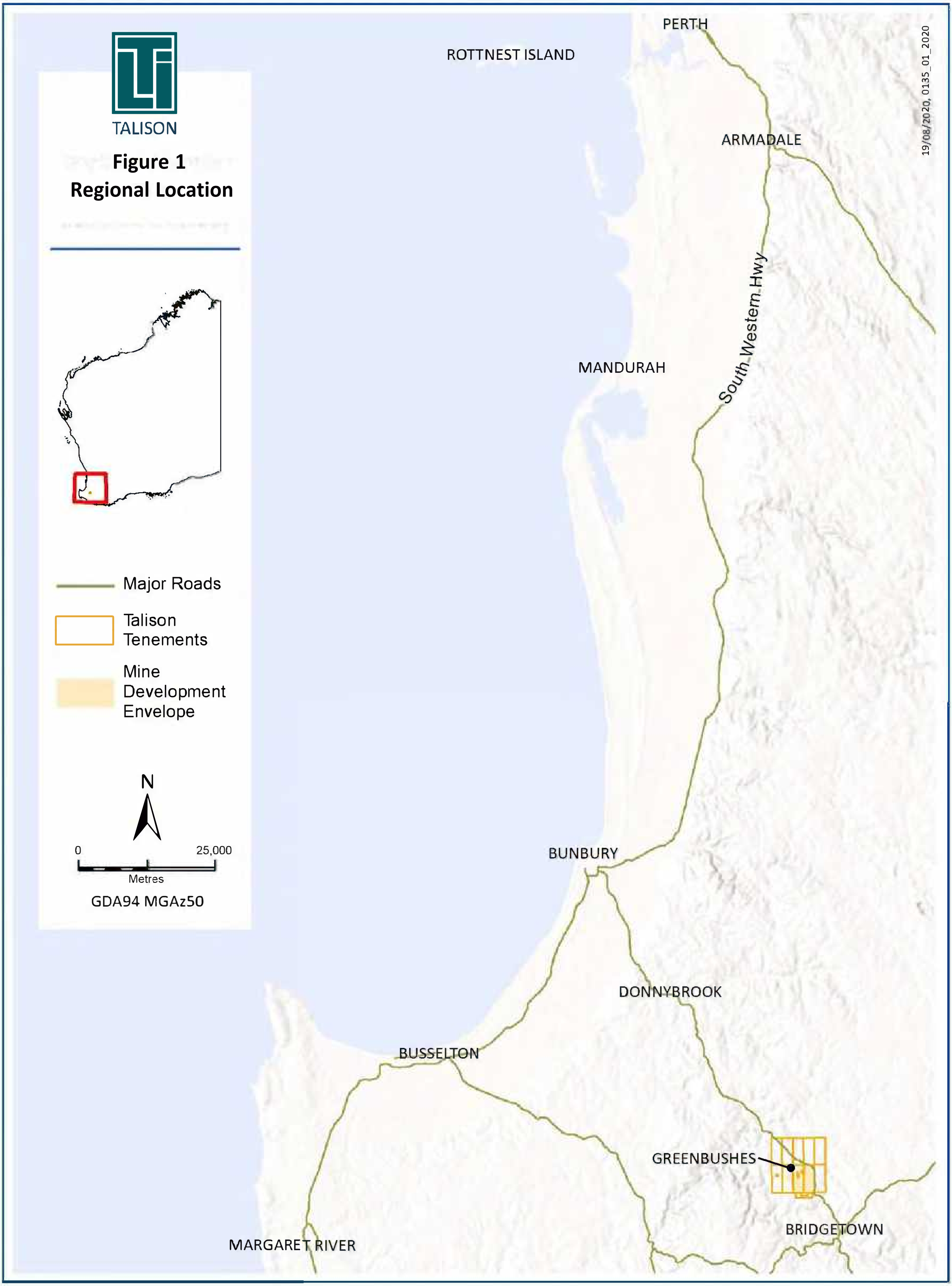


Figure 1
Regional Location

ATTACHMENT 2: PREMISES MAP

The prescribed premises boundary will not cha[redacted]part of this Application. The location of infrastructure relevant to this Application is shown in Figure 2.

Internal Ref: I:\Projects\2025\0159_00_2025_TSF1 re-mini ng zone 5 WA\TSF1 Re-mini ng

GREENBUSHES OPERATIONS

TALISON PREMISES BOUNDARY

- Talison Premise Boundary
- GAM Premises Boundary
- Dams

Road Type

- Mine Haul Road
- Mine Service Vehicles
- Public Roads

Datum: GDA2020
Projection: MGA Zone 50

LOCALITY MAP

0 0.35 0.7 1.4 Kilometers

SCALE: 1:25,000 @ A3

FIGURE 2

TALISON LITHIUM

ATTACHMENT 3B: PROPOSED ACTIVITIES

[redacted]

The construction and TLO (and in the case of TSF4 Cell 1 and 2, operation) of the infrastructure and equipment relating to the Application has been assessed by DWER in line with *Guideline: Risk Assessments (DWER 2020)* as documented in the relevant assessment report for each works approval and L4247/1991/13.

This Application does not require a change to the Prescribed Premises Categories or throughputs listed in L4247/1991/13.

3B1 TSF4 Cell 1 and Cell 2 lift to 1,270mRL

The embankment height of TSF4 Cell 1 and Cell 2 has been raised to 1,270mRL as approved under W6901/2024/1, amended on 11 April 2025. CCIR reports for each cell have been prepared to satisfy Condition 8 and 9 of W6901/2024/1 and submitted to DWER (Attachments 8A and 8B) and TLO has commenced. This Licence amendment seeks to amend L4247/1991/13 enable operation of TSF4 Cell 1 and 2 to:

a) An embankment height of 1,270mRL;
b) A pond height authorised to 1,269.1mRL to allow for 0.9m freeboard; and
c) A tailings beach height authorised to 1,269.7mRL (0.3m below crest elevation).

The design of TSF4 has not changed from what was approved in W6618/2021/1 and W6901/2024/1 and therefore no other design or operational changes to TSF4 Cell 1 or 2 are requested as part of this Application. TSF4 design information relevant to the operation of TSF4 is included in the Sections below for completeness and to address the requirements of *IR-F28 Application form annex: Category checklist (tailings storage facilities).*

3B1.1 TSF4 General Information

TSF4 is located within tenements M01/6 and M01/7 to the south of the existing TSFs and covers an area of approximately 230ha. The southern embankment of TSF1 forms the majority of the northern boundary of the facility, and the eastern embankment of TSF4 has been aligned with the TSF1 eastern embankment (Figure 2). TSF4 has been designed to utilise the existing topography and adjacent TSF1 where possible. TSF4 is divided into two cells with a dividing embankment, Cell 1 (a & b) and Cell 2. Additional linear infrastructure (tracks and pipelines) will be established to transport tailings to the facility and return decant to the Mine Water Circuit (**MWC**). The TSF4 detailed design report is included as Attachment 8C (GHD, 2021a). An Addendum to the 2021 TSF4 design report has been included as Attachment 8D (GHD, 2024a) and outlines details of the revised liner design and embankment geometry for TSF4 Cell 1a and Cell 2. Attachments 8C and 8D are to be read in conjunction.

The stability, consequence category and hazard rating of TSF4 have been assessed within the Mining Proposal approved under the *Mining Act 1978* (**Mining Act**; WA).

3B1.2 TSF4 Detailed Design

TSF4 has been designed in accordance with the [redacted] Practice for Tailings Storage Facilities in Western Australia (Department of Mines and Petroleum 2013) and the ANCOLD (2019) guidelines. The GHD (2021c) detailed design report included detail relevant to the facility at its maximum height of 1,295mRL and the indicative storage capacity for each lift (Figure 3).

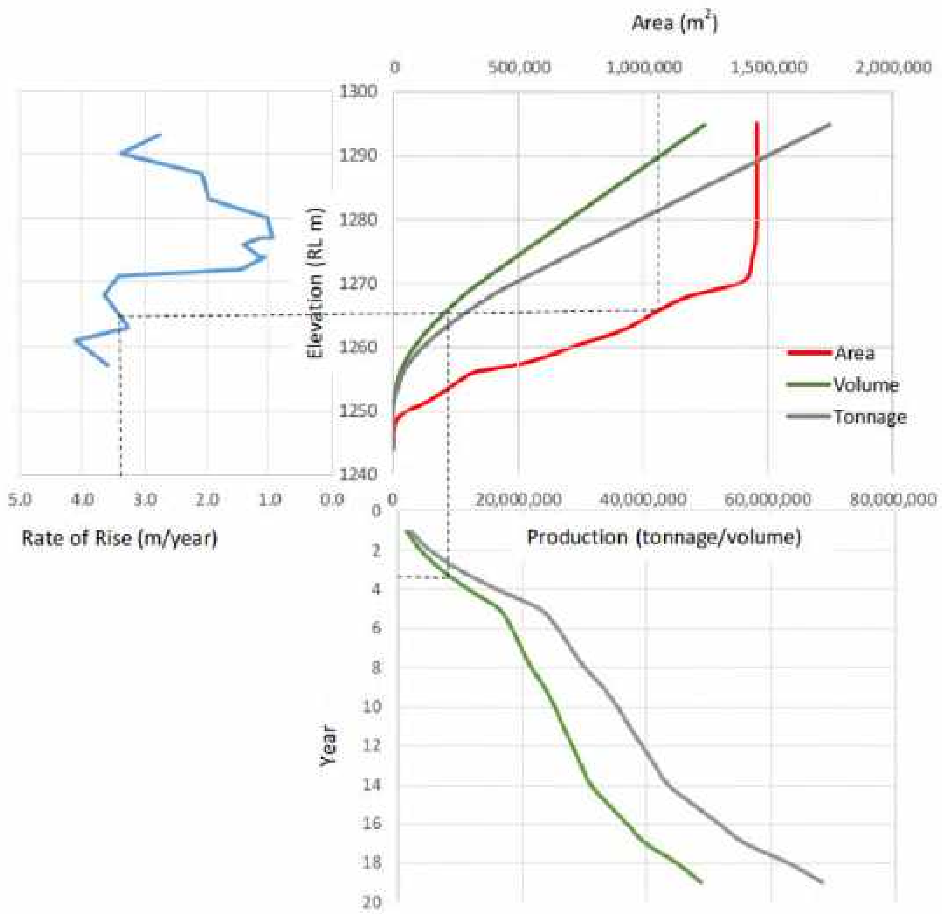


Figure 3: Indicative storage capacity curve

Detailed design information was provided as part of W6618/2021/1 (and subsequent amendments) for assessment under Part V of the EP Act. Detailed design information presented below has been summarised to include only information related to potential emissions and discharges during operations and therefore considered relevant to this Application.

The TSF4 design is outlined in the figures listed below:

- Figure 4 – BGM Sections and Details
- Figure 5 – Cell 1 General Arrangement
- Figure 6 – Cell 2 General Arrangement

- Figure 7 – Cell 1 Embankment Cross Section
- Figure 8 – Cell 2 Embankment Cross Section
- Figure 9 – Cell 1 Foundation Preparation – Clay and BGM Liner
- Figure 10 – Cell 2 Foundation Preparation - BGM Liner
- Figure 11: TSF4 Layout and Drainage (unchanged)
- Figure 12 – Cell 1 Divider Embankment Cross Section

3B1.2.1 Embankments

Perimeter Embankment

The 1,270mRL perimeter embankment raise is constructed from mine waste rock and BGM subgrade. The downstream slope is constructed from mine waste rock at a minimum of 3(H):1(V) slope. The upstream slope has 5m wide BGM subgrade material on the face at a minimum of 3(H):1(V) slope. A sand tailings platform has been placed internally to the 1,265mRL elevation at some locations to provide a foundation to construct the 1,270mRL raise and allow for a working space to tie in the BGM liner. Locations where the 1,270mRL perimeter embankment has been constructed on pre-existing tailings (i.e. sand tailings platform) include:

- Cell 1 and Cell 2 southern starter embankment;
- Cell 1 northeastern corner; and
- Cell 2 northwestern embankment.

These are discussed in Section 3B.1.3 and perimeter embankment geometry for the RL 1,270m lift is provided in Table 1.

Table 1: Perimeter embankment geometry

TSF4	Embankment Section	Crest Width	Upstream Slope	Downstream Slope	Sand Tailings Platform
Cell 1	North	Minimum 7.5m	3:1 fill slope Minimum 300mm thick subgrade	Key into existing TSF1 slope Mine waste rock	May be required in small segments
	East	31.5m	3:1 fill slope Minimum 5m wide subgrade	3:1 fill slope Mine waste rock	20m wide crest width 3:1 fill slope
	South	31.5m	3:1 fill slope Minimum 5m wide subgrade	3:1 fill slope Mine waste rock	20m wide crest width 3:1 fill slope
Cell 2	North	Minimum 7.5m	3:1 fill slope Minimum 300mm thick subgrade	Key into existing TSF1 slope Mine waste rock	May be required in small segments

TSF4	Embankment Section	Crest Width	Upstream Slope	Downstream Slope	Sand Tailings Platform
	West	56.4m	3:1 fill slope Minimum 5m wide subgrade	3:1 fill slope Mine waste rock	20m wide crest width 3:1 fill slope
	South	31.5m	3:1 fill slope Minimum 5m wide subgrade	3:1 fill slope Mine waste rock	20m wide crest width 3:1 fill slope

Divider Embankment

A cross section for the dividing starter embankment for Cell 1 is provided in Figure 12.

The 1,270mRL divider embankment raise has been constructed using centreline construction with a combination of mine waste rock and BGM subgrade. The Cell 1 upstream slope is constructed from mine waste rock at a minimum of 3(H):1(V) slope. The Cell 2 upstream slope has a 5m wide BGM subgrade material on the face at a minimum of 3(H):1(V) slope. Similar to the perimeter embankment, a 20m wide sand tailings platform made from selected materials from TSF2 was placed to assist in construction of the divider embankment.

3B1.2.2 Sand tailings Platform

A 20m wide tailings sand platform made from selected tailings materials recovered from TSF2 forms the foundation of the toe portion of the embankment raise. It will provide a foundation to construct the 1,270mRL raise and allow for a working space to tie in the BGM liner. The remainder of the embankment raise will extend onto the existing starter embankment. A typical cross-section of a sand tailings platform is show in Figure 4.

Tailings segregation during deposition has been observed in TSF2 at the Project, and materials from the 'outer tailings beach' have been identified as suitable material for the foundation of the 1,270mRL raise (GHD, 2024a). Laboratory modelling and testing was undertaken to determine tailings strength and suitability for use in the sand tailings platform. Modelling confirmed that the stability factor of safety for long-term, short-term and post-seismic conditions for all the modelled sections in TSF4 are equal to or greater than the appropriate Australian National Committee on Large Dams requirements (GHD, 2024a).

Selected tailings materials were placed to form the tailings sand platform on which the toe portion of the embankment raise will be founded. Even distribution and gradation was achieved through handling and spreading of the tailings sand material. Prior to construction of the 1,270mRL raise, a trial was undertaken to confirm the planned layer thickness, moisture content, and number of passes required to achieved designed properties assigned to the tailings on which the raise will be constructed.

3B1.2.3 BGM Liner

The facility construction to date includes a combination of engineered low permeability clay liner (part of Cell 1) and Bituminous Geomembrane (**BGM**) liner (the remainder of Cell 1 and all of Cell 2) to reduce seepage. The embankment raise to 1,270mRL includes a BGM liner. The BGM is anchored in a trench in the clay core where the BGM has not been installed (Cell 1) or joined to the existing BGM with a minimum 200mm wide seam 500mm from the crest. The BGM was rolled out to a minimum of 4m past the toe of the 1,270mRL raise embankment. Bidum A64 cushion geotextile was placed on the BGM and the 1,270mRL raise embankment constructed on top of the cushion. Internal toe drains below the liner reduce foundation pressures and collect any seepage from under the liner. The tie-in details for the BGM to clay core and BGM to BGM are shown in Figure 4.

3B1.2.4 Stability & Water Balance

Information relating to stability and water balance is provided in the Detailed Design report (GHD, 2021) for the design of the facility to 1,295mRL. No impacts on the water balance and stability are expected due to the works proposed in this Application.

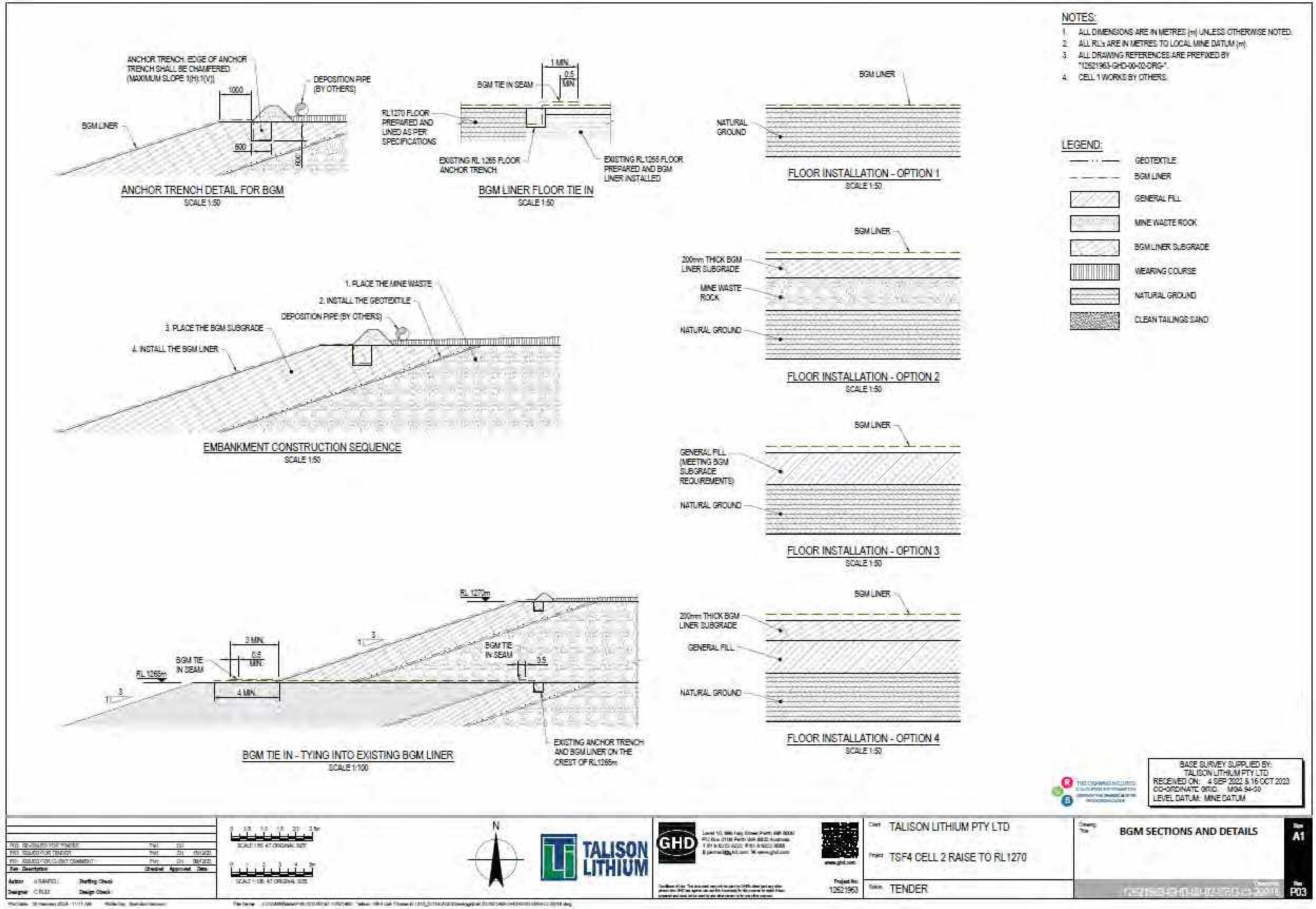


Figure 4 BGM sections and details

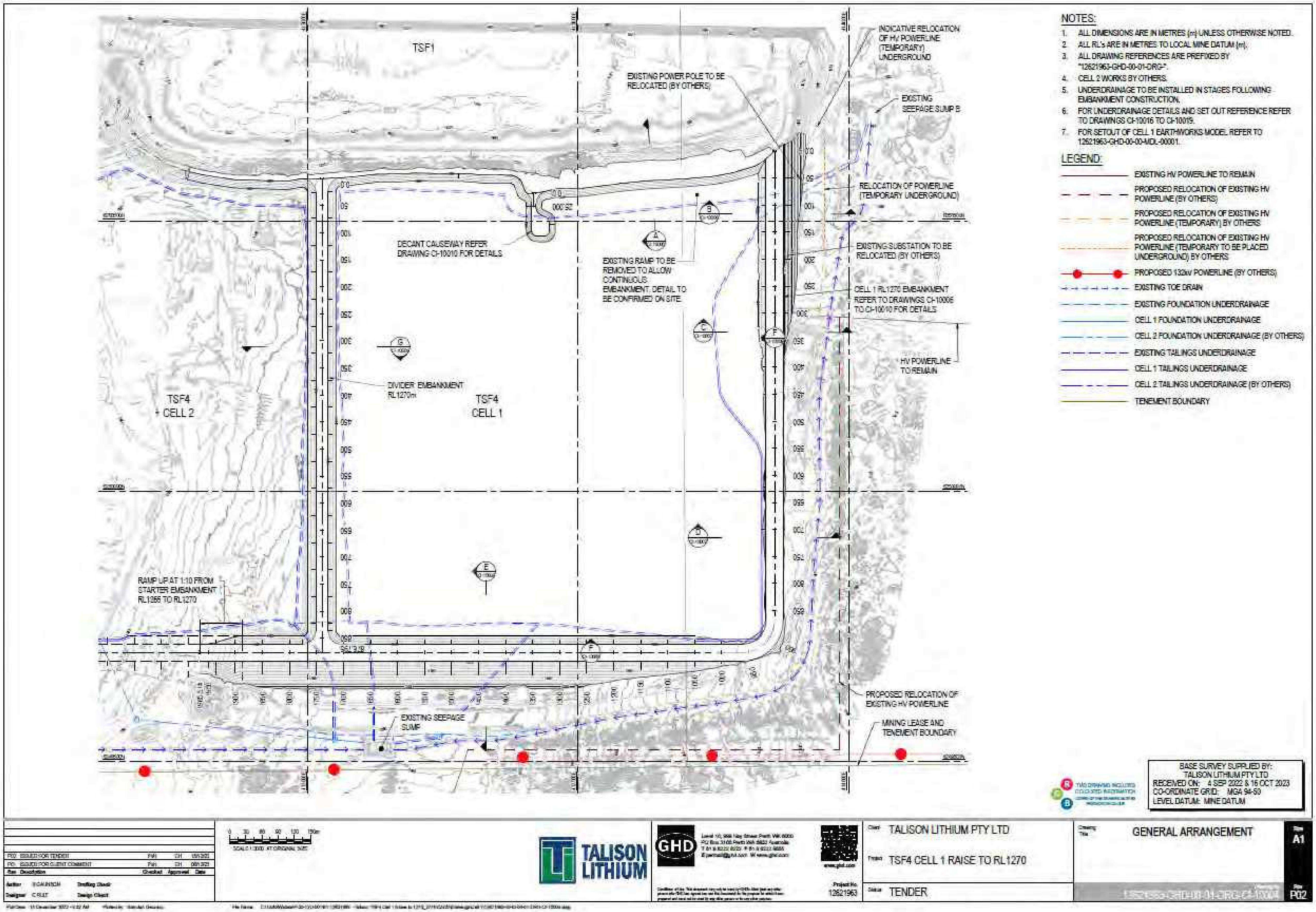


Figure 5: Cell 1 General Arrangement

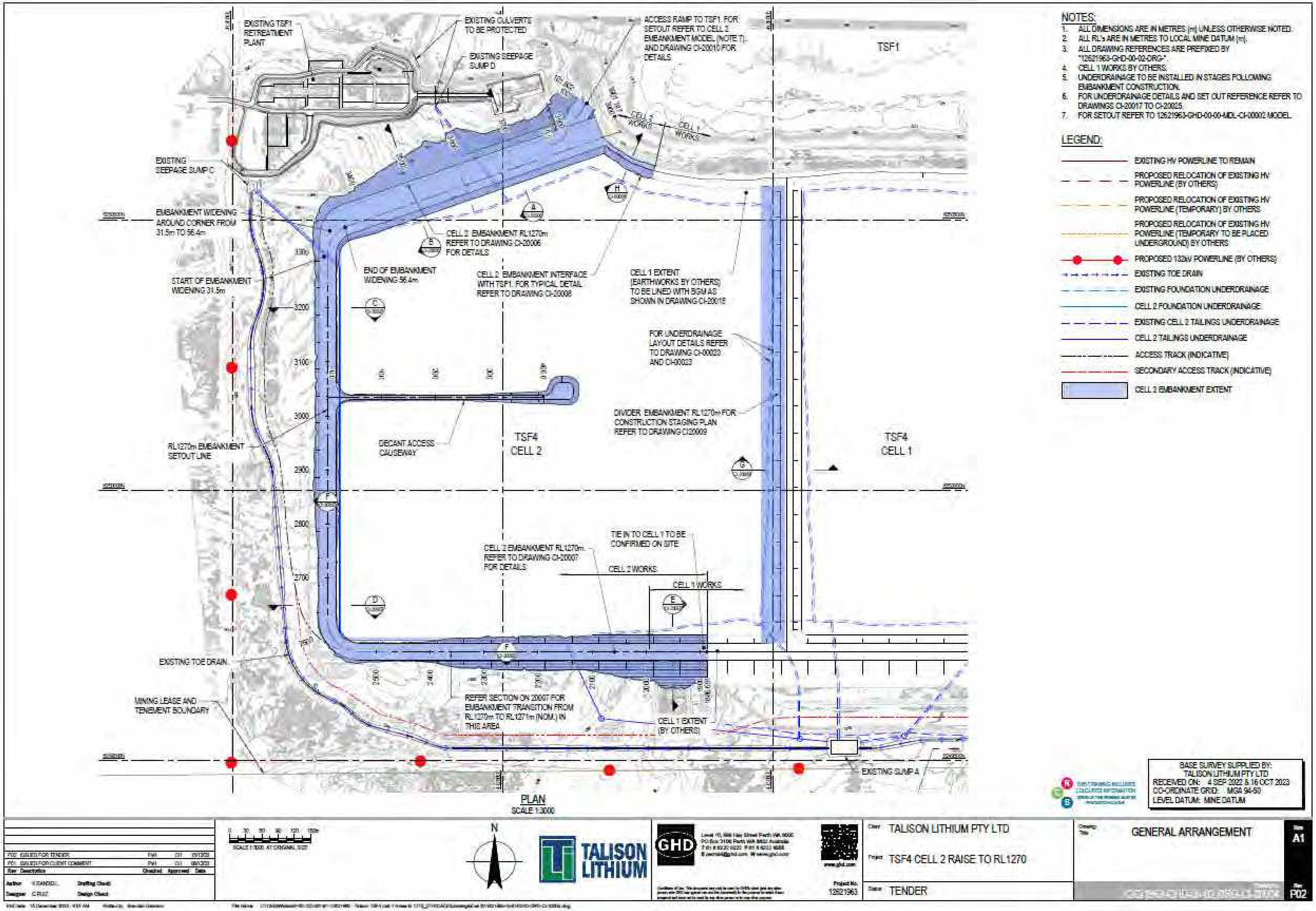


Figure 6: Cell 2 General Arrangement

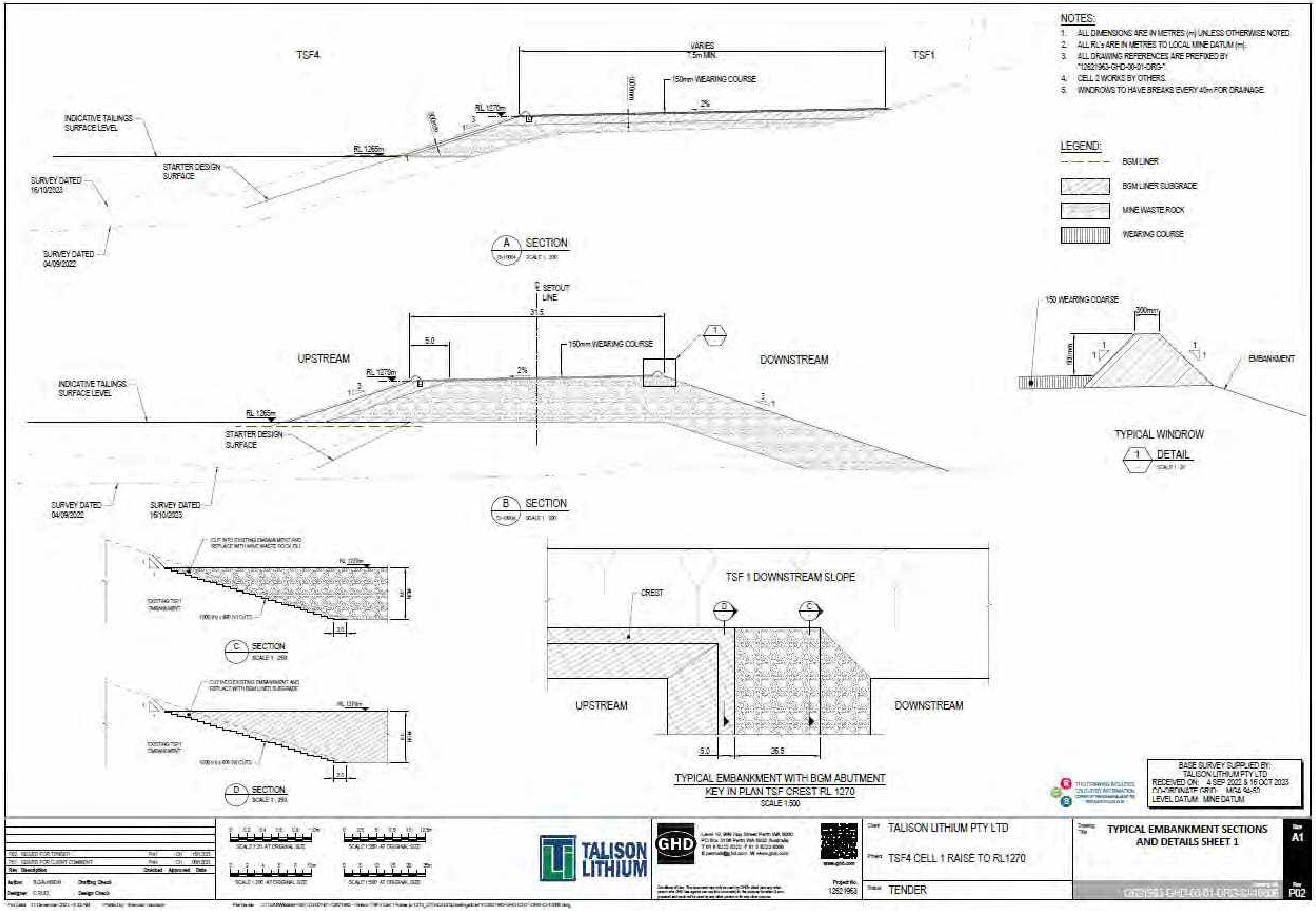


Figure 7: Cell 1 Embankment Cross Section

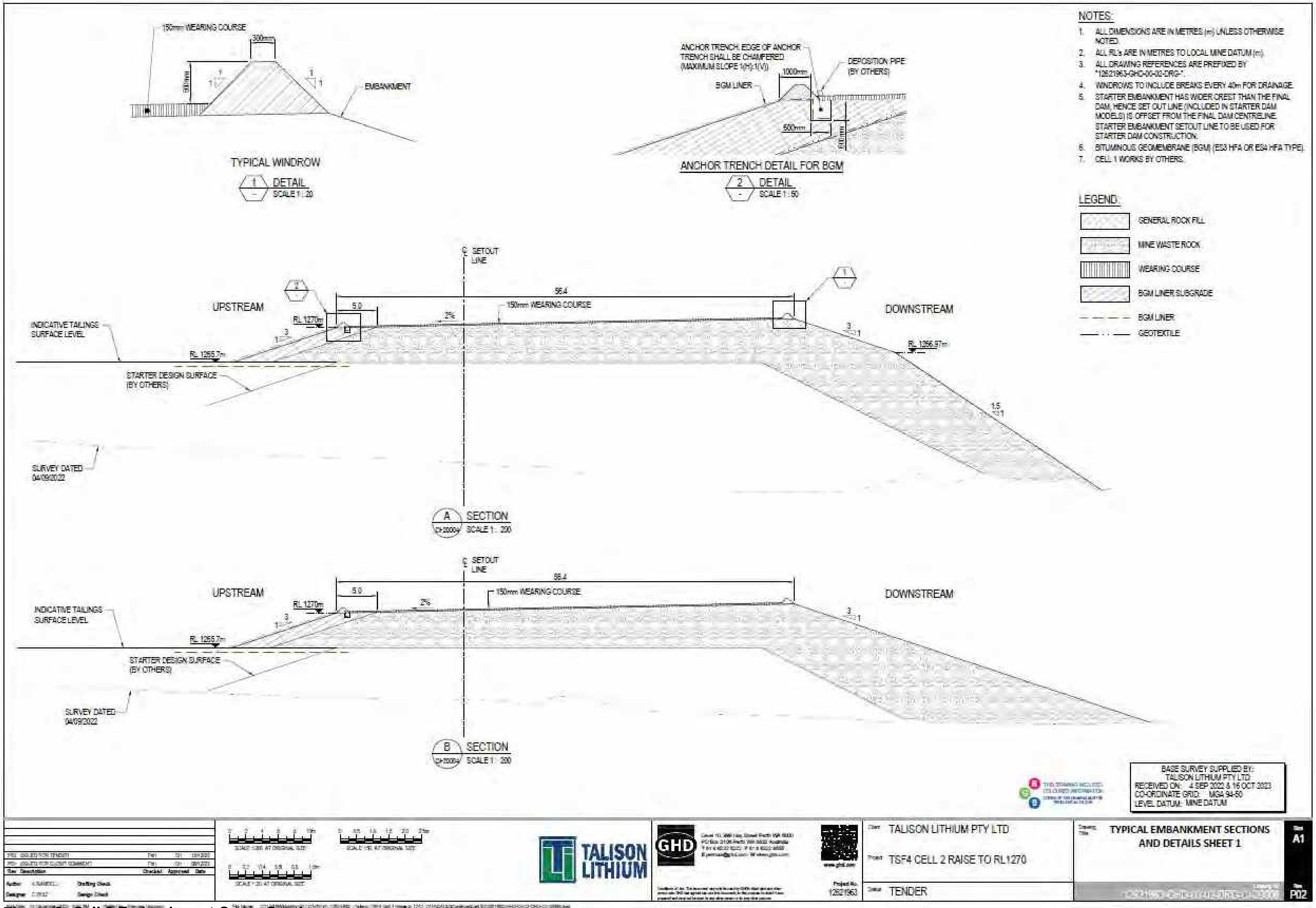


Figure 8: Cell 2 Embankment Cross Section

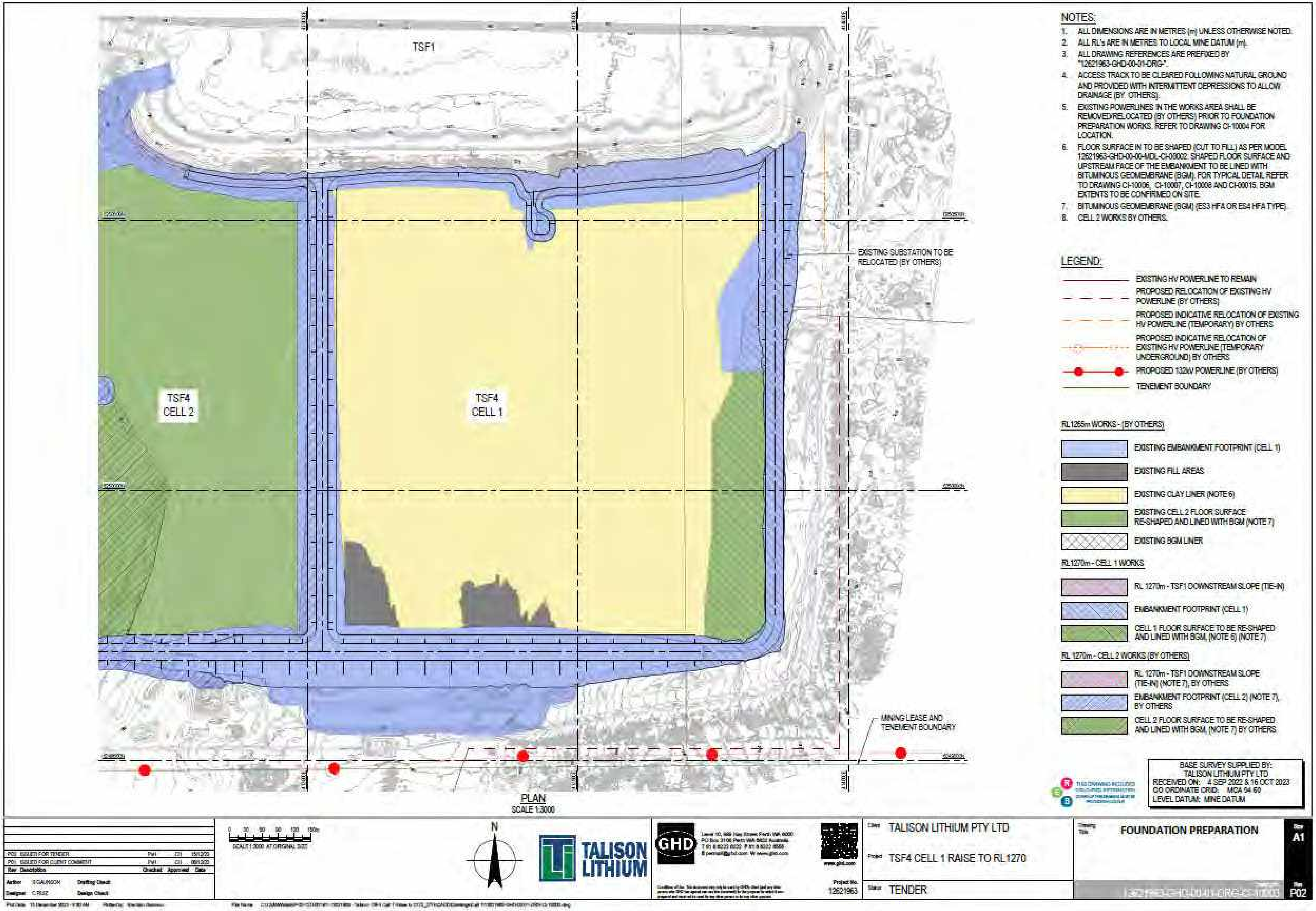


Figure 9: Cell 1 Foundation Preparation – Clay and BGM Liner

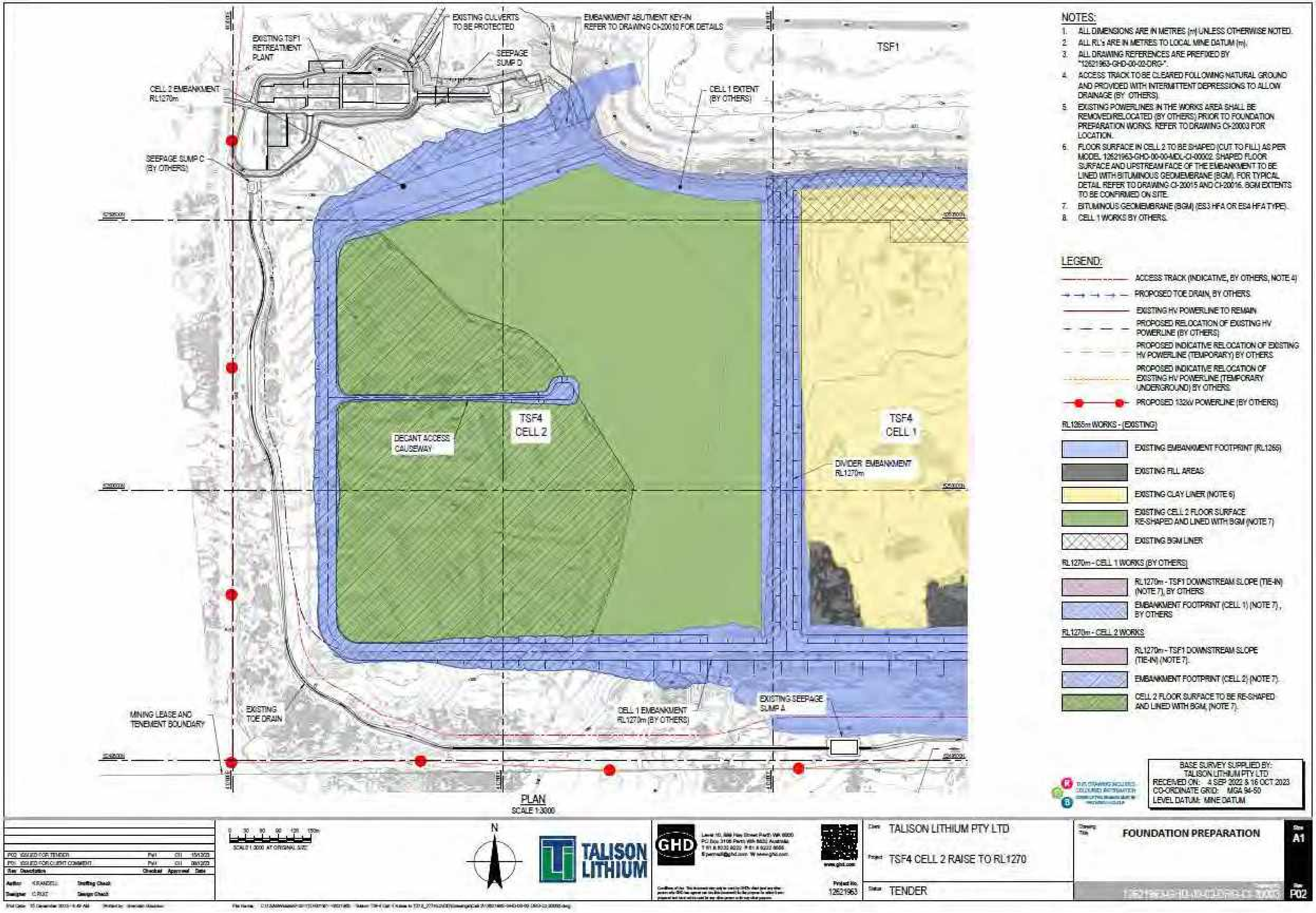


Figure 10: Cell 2 Foundation Preparation - Clay and BGM Liner

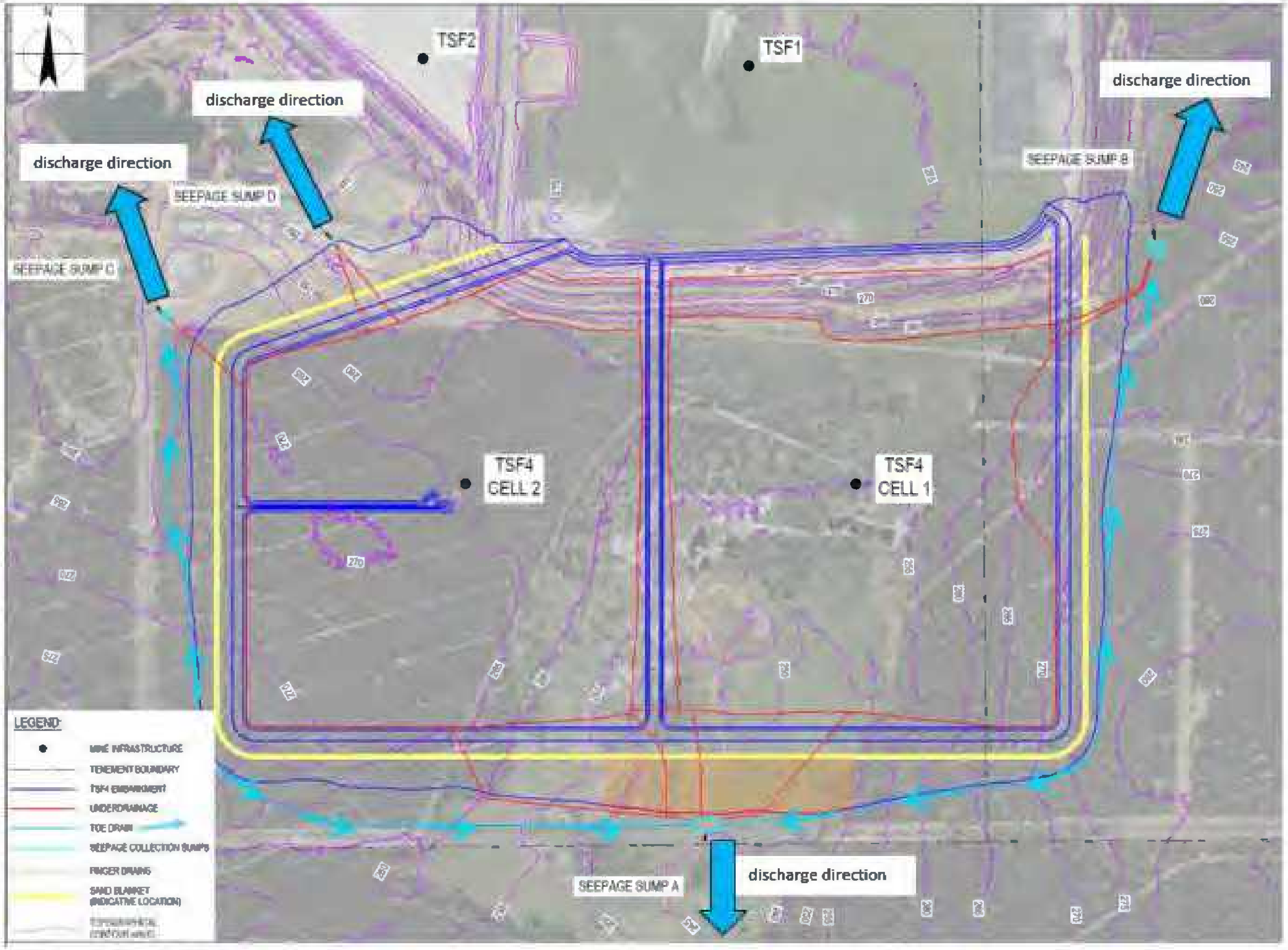


Figure 11: TSF4 Layout and Drainage (unchanged)

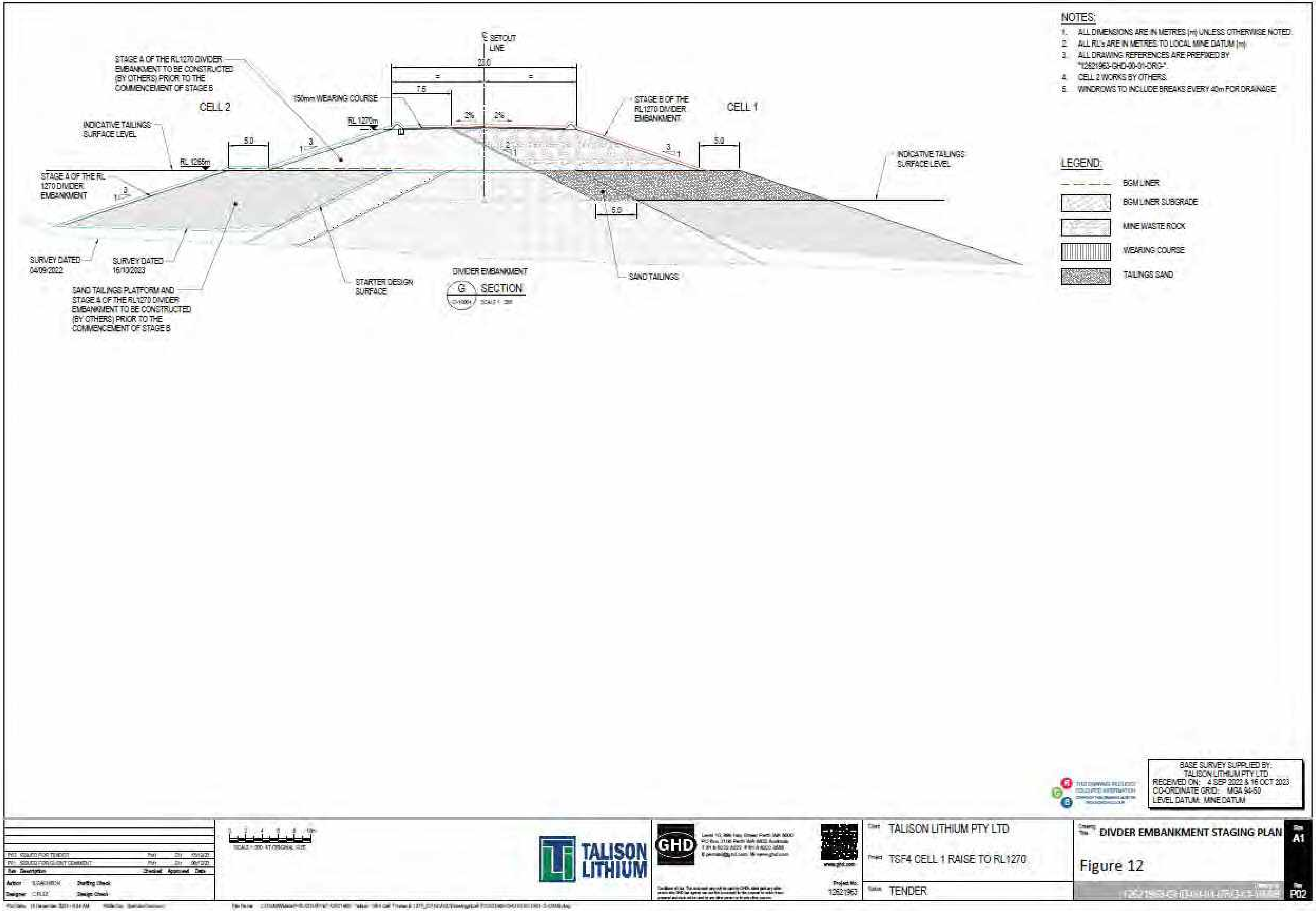


Figure 12: Cell 1 Divider Embankment Cross Section

3B1.3 Operations

DWER has already assessed and approved seepage and drainage risks associated the TSF4 at the full design height of 1,295mRL under W6618/2021/1. Additionally, TSF4 Cell 1 and 2 have both been operational since Q3 2024, during construction of the raise to 1,270mRL (either under TLO or the Licence).

The embankment raise to 1,270mRL for Cell 1 was completed in March 2025 and for Cell 2 in June 2025. W6901/2024/1 allowed Cell 1 to operate to 1,270mRL under TLO during construction of the raise on Cell 2, and then both cells to operate concurrently to 1,270mRL during the assessment of this LAA. A CCIR has been submitted for the raise of both cells to 1,270mRL.

CCIRs for Cell 1 and Cell 2 have been completed and have been submitted to DWER to demonstrate compliance. The CCIRs are attached as Attachment 8A and 8B.

The following sections provide a summary of the operational aspects of the TSF4 Cell 1 and 2 raise from 1,265mRL to 1,270mRL.

3B1.3.1 Tailings Deposition

Tailings will be deposited sub-aerially from a slurry ring main with multiple spigots, located on the perimeter embankment of the TSF4. In Cell 1, tailings will be deposited from three sides - South, West and East. This will control the decant pond against the northern embankment, adjacent to TSF1. In Cell 2, the tailings will be deposited from around the full perimeter of the cell to centralise the decant pond. Decant infrastructure will comprise skid mounted pumps. For Cell 1, the decant infrastructure will be located on an access ramp constructed from the north i.e. the TSF1 external face. For Cell 2, access will be via a causeway from the western perimeter embankment. Water will be pumped via pipelines to Clear Water Dam (**CWD**) for inclusion in the mine water circuit (**MWC**).

Spigots will be installed approximately every 60m along the tailings distribution pipe, with longer gaps for the corner spigots to avoid tailings build-up. Spigot off-takes and valve assemblies will discharge into conductor pipes to deliver tailings to the beach level to reduce embankment erosion.

The chosen deposition strategy will cycle through the perimeter spigots, promote densification and control the location and extent of the decant pond. The initial deposition will target filling in any low-lying areas. The decant strategy will maximise the return of water/minimise the pond footprint as far as possible to reduce seepage, and desiccation of the tailings. Water management at the site will ensure that adequate freeboard is maintained at all times.

3B1.3.2 TSF4 Description of Processes

A number of elements are specifically relevant to the operation of TSF4, including:

- The underdrainage system to collect seepage from the facility;
- Toe drains to collect runoff from the embankment and surrounding external catchment areas;
- Decant return water pipeline and pumps; and

- Pipeline corridors between the Chemical Grade Plant 3 (**CGP3**) and Chemical Grade Plant 4 (**CGP4**) Plant areas, the TRP, the Centralised Tailings Pump Station (**CTPS**) and the TSFs.

3B1.3.3 Underdrainage system

The underdrainage system comprises:

- Upstream toe drains above and below the clay liner that discharge directly into the seepage collection sumps via collector pipework; and
- Sand drainage blanket downstream of the clay core that discharges through the mine waste outer shell to the perimeter toe drain which reports to the seepage collection sumps.

Additional gravel finger drain outlets to the sand blanket along the southern boundary; seepage is collected by twin collector pipes that discharge into the seepage collections sumps. The first internal toe drain is positioned below the liner and is included to reduce foundation pressures and collect any seepage from under the liner. The second internal toe drain is located above the liner to reduce the amount of saturated tailings near the external embankments, lower the phreatic line and control pressures on the liner and against the core. Segregated sandy tailings deposited adjacent to the embankment were identified to be potentially liquefiable if saturated. As the embankments will be raised by centreline methods, the upstream toe of each raise will extend over the tailings beach by approximately 6m from the crest (Figure 7 and Figure 8). The intent of the underdrainage is to drain this sandy tailings material, reduce the phreatic surface and reduce potential for liquefaction.

The underdrainage system (Figure 13 and Figure 14) comprises twin slotted flexible drain coil pipes or similar buried in trenches along the upstream toe of the embankment, located a minimum 3m from the toe. The trenches will be graded to ensure a continuous cross fall towards the outlet pipes and backfilled with gravel (geofabric wrapped) (Figure 15 and Figure 16). Outlet pipes have been constructed at low points along the perimeter embankments (Figure 17 and Figure 18). These pipes will feed into seepage collection sumps. There are two outlets for each section of drain. The underdrainage system has been designed to have capacity to drain the seepage flow estimated in the seepage analysis and the flow captured in the seepage collection sumps will be pumped back into the storage and from there into the MWC.

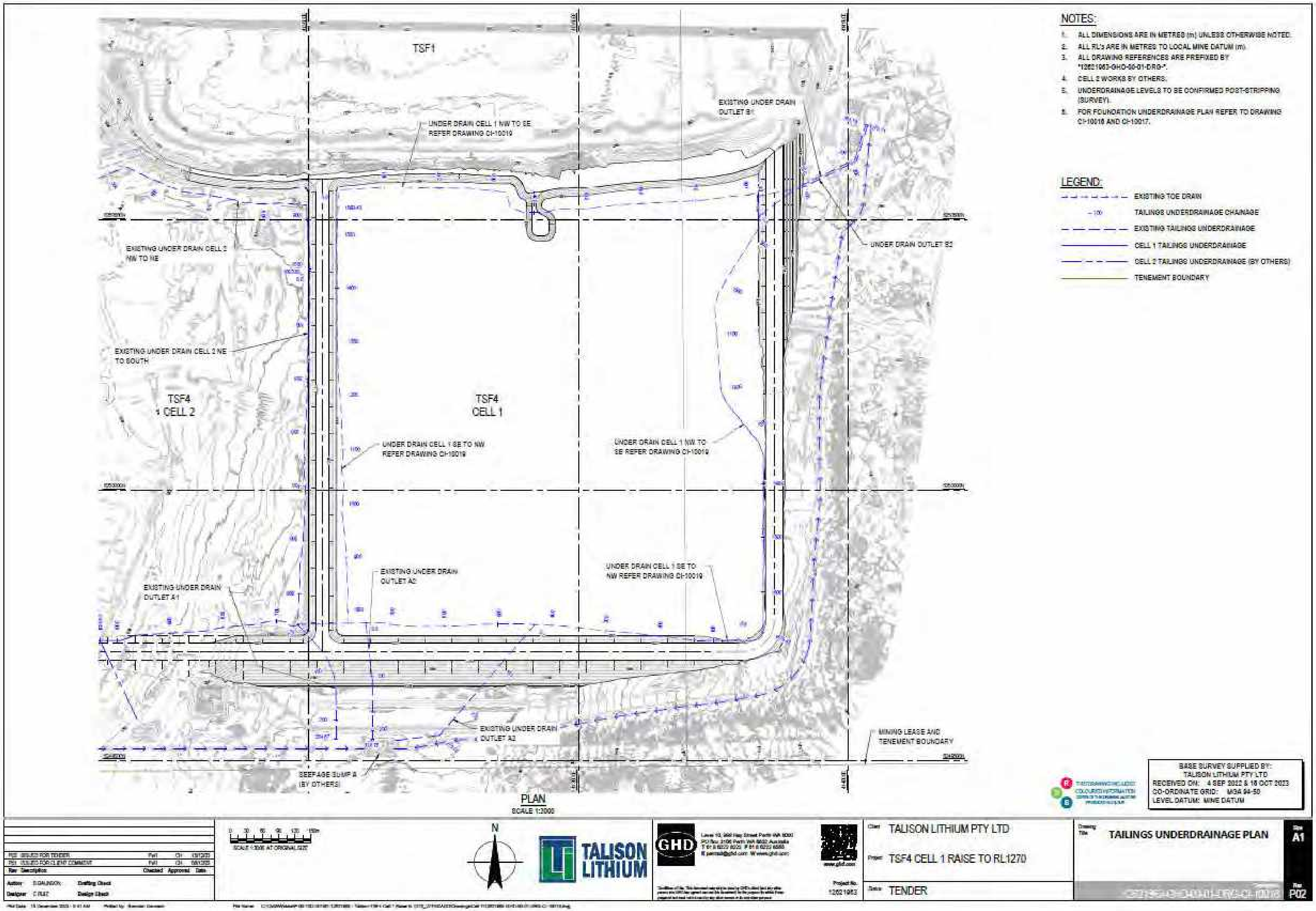


Figure 13: Cell 1 Tailings Underdrainage Plan

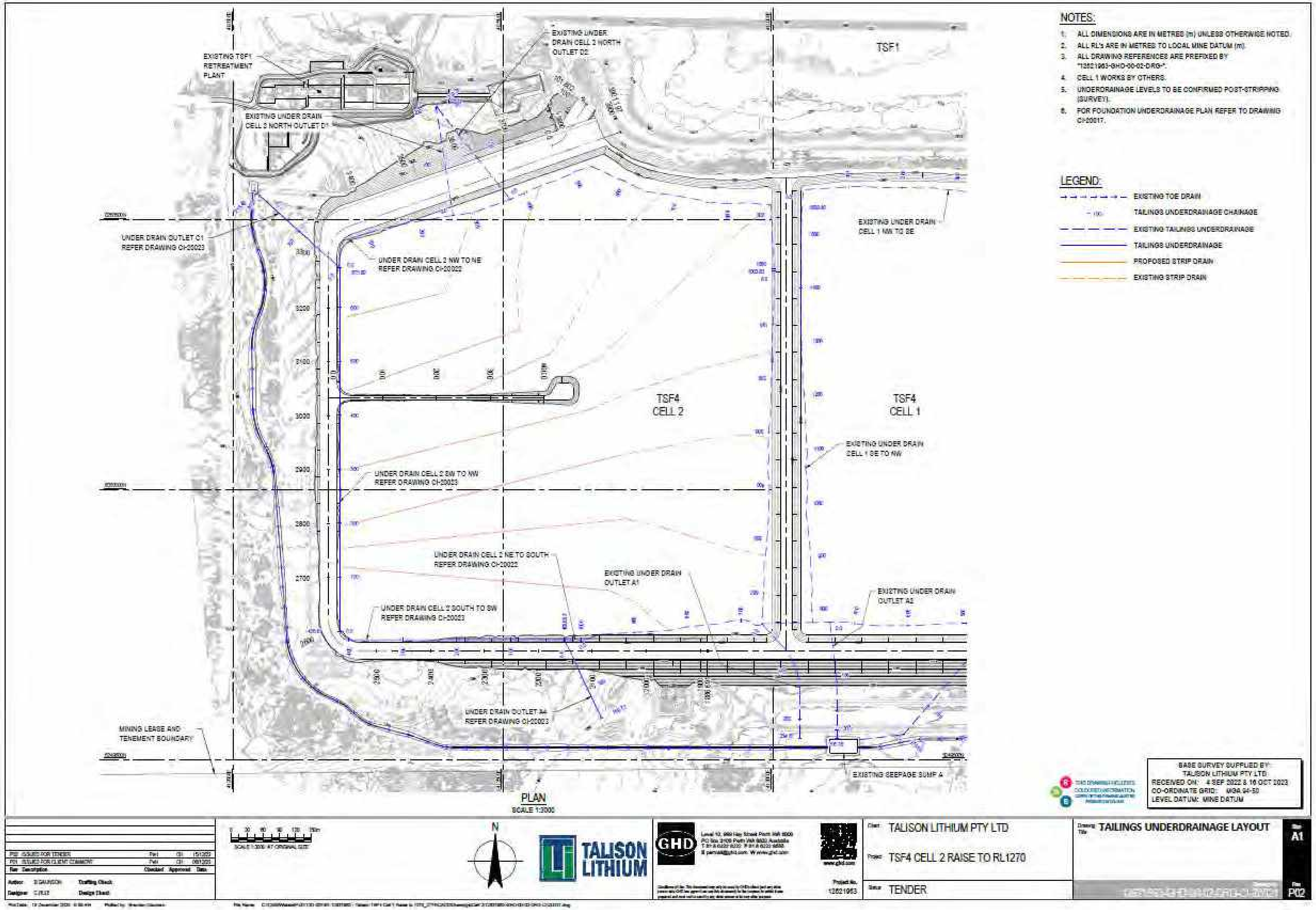


Figure 14: Cell 2 Tailings Underdrainage Plan

For TSF4 Cell 1 and Cell 2, the underdrainage system comprises:

- A tailings underdrainage system installed above the clay/BGM liner that discharge directly into the seepage collection sumps via collector pipework;
- A foundation underdrainage system installed below the clay/BGM liner that discharges directly into the seepage collection sumps via collector pipework;
- A sand drainage blanket beneath the downstream mine waste rock that discharges through the mine waste outer shell to the perimeter toe drain which reports to the seepage collection sumps; and
- Additional gravel finger drains along the southern boundary. The gravel finger drain seepage is collected by twin collector pipes (Draincoil DN160) that discharge into the seepage collection sumps.

The foundation underdrainage system is positioned below the liner (clay and BGM) to reduce foundation pressures and collect any seepage from under the liner. The tailings underdrainage system is located above the liner to reduce the amount of saturated tailings near the external embankments, lower the phreatic surface and control pressures on the liner and against the core.

3B1.3.4 Toe Drains and Catchment Areas

Downstream toe drains have been installed to collect runoff from the embankment and surrounding external catchments (Figure 17), as well as seepage from the underdrainage system and the sand drainage blanket (Figure 17), which will be returned to the MWC via seepage collection sumps. The eastern toe drain will be directed around the underdrainage sump to low-lying areas located east of TSF1. As Floyds WRL in this area expands, runoff is expected to become trapped in this location at which point the drain will be directed to the seepage sump. The southern seepage collection sump will accommodate the runoff collected by the southern section of the toe drain (GHD, 2021a). Downstream toe drains (Figure 11) have been installed to collect runoff from the embankment and surrounding external catchments (Figure 19), as well as seepage from the underdrainage system and the sand drainage blanket (Figure 22 and Figure 23) which will be returned to the MWC via seepage collection sumps. The eastern toe drain will be directed to Sump B. The southern seepage collection sump will accommodate the runoff collected by the southern section of the toe drain (GHD, 2021a).

3B1.3.5 Seepage Collection Sumps

Four seepage collections sumps are included at low points along the embankment toe. The north-east and north-west outlets from the underdrainage system are captured by Sumps B and C, respectively, while southern outlets are connected via a series of inspection pits to a combined seepage Sump A. The northern drains are fed to a temporary concrete Sump D.

The seepage sumps were sized to accommodate approximately 2-3 hours of seepage from the facility. Sump A, is equipped with valves which can be closed in event of water level in sump rising to maximum level or in case of pump failure. Sump B has been constructed with significantly more capacity than required and the pumping system has built-in redundancy to prevent overflow. The risk of overflow is further mitigated with provision of a diesel standby pump as well as manual values on the underdrainage outlet pipes that can be closed in the unlikely scenario that all three pumps are not operational.

[redacted]

The northwest seepage Sump D is located in the TRP area and will be replaced when the Plant is closed.

The sumps will also accommodate runoff from the perimeter embankment toe drain and include an additional allowance for a 10% Annual Exceedance Probability (**AEP**) 24- hour storm event as defined by the Bureau of Meteorology (**BoM**). Four seepage collections sumps have been included at low points along the final embankment toe. The north-east and north-west outlets from the underdrainage system is captured by Sumps B and C, respectively, while southern outlets are connected via a series of inspection pits to a combined seepage Sump A. The northern drains are fed to a concrete Sump D.

The seepage sumps were sized to accommodate the anticipated seepage from the facility. Valves are included as part of the sump infrastructure.

The sumps will also accommodate runoff from the perimeter embankment toe drain and include an additional allowance for a 10% Annual Exceedance Probability (**AEP**) 24-hour storm event as defined by the Bureau of Meteorology (**BoM**).

Sump A is fitted with automatic valves which are programmed to close automatically if the water level in the sumps increase above a maximum elevation or if there is a pump failure.

Sump B (GHD, 2021) was designed for the final embankment height and include runoff from the perimeter embankment for a 10% AEP 24-hour storm event. Sump B received a total of ~900m^3 from the combined underdrainage. Sump B has significantly excess capacity (~2,250m^3) and has been constructed to accommodate for approximately 2.5 times the design requirements.

The seepage recovery system for Sump A is currently being equipped with a remotely operated electric pump. Sump A is also equipped with a diesel back up pump to prevent overflows as well as level sensors and flow meters. The level sensors/indicators are fitted with ‘low’, ‘high’ and ‘high-high’ operating alarm levels. The duty pump will operate under normal conditions (between the ‘low’ and ‘high’ water levels). The standby pump will provide additional capacity when the level sensors indicated that the ‘high’ water level is reached. If at any time the ‘high-high’ water level is reached, an alarm will alert the control room and operators sent to investigate. Manual valves have been installed on the underdrainage outlet pipes where they discharge into Sump A which the operators can close in the unlikely event that the sump reaches its “high-high” level and the pumping system is not operational. In the event of a power/instrumentation failure the standby diesel pump will be utilised. Flow meters will also alert the control room in the event of a pipe burst and the system will be shut down to prevent spilling. The proposed system has system has built-in redundancy as each of the three pumps has been sized to individually cater for the design flow. Sump B has a diesel powered pump due to its location and lack of permanent power in this part of the mine. Talison undertake regular inspections of Sump B and utilise information from the Sump monitoring network to ensure effective water management.

Both Sumps C and D are fitted with manual valves. Sump C is not typically used for normal operating seepage, but will be primarily used for rain events. Whereas, Sump D will be used to manage operating seepage flow and will not be used for increased flow during rain events.

3B1.3.6 Decant Return

A water balance model was developed to determine the volumes of rainfall captured, supernatant liquor released, decant water removed as the tailings settle, seepage collected for reuse and evaporation from the decant ponds. The water balance model was used to calculate the volume of water within the TSF4 over time and under a range of climatic conditions. The decant water is returned to the mine water circuit for reuse.

A water balance model was developed to determine the volumes of rainfall captured, supernatant liquor released, decant water removed as the tailings settle, seepage collected for reuse and evaporation from the decant ponds. The water balance model was used to calculate the volume of water within the TSF4 over time and under a range of climatic conditions. The decant water is returned to the mine water circuit for reuse.

To maintain the required operating pond level, average decant return rates were calculated for average (median) rainfall conditions, with various return rate calculations from Financial Year (FY) 19 to FY38 as outlined in Table 2. A water balance model was developed to determine the volumes of rainfall captured, supernatant liquor released, decant water removed as the tailings settle, seepage collected for reuse and evaporation from the decant ponds. The water balance model was used to calculate the volume of water within the TSF4 over time and under a range of climatic conditions. The decant water is to be returned to the process plant for reuse.

To maintain the normal operating pond level of one third of the total tailings beach area, average decant return rates were calculated for average (median) rainfall conditions. The resulting decant rates are summarised in Table 2.

Table 2: Decant return rate to maintain normal operating pond level under average (median) rainfall conditions

Year Item	Average decant return rate (m^3/h)
FY19-FY25Dry year	800m^3/h541
FY26-FY33Average year	300m^3/h561
FY34-FY36Wet year	750m^3/h641
FY37-FY38	800m^3/h

Given the variation in decant return rates required for wet and dry conditions, the return system has been designed to operate at a flow rate of 1,800m^3/hour. This is based on the maximum wet decant rate with an allowance for a 1:1000 year flood event.

The design decant pumping system is greater than the average decant rate at a 6.5m/yr RoR.

The volume of water available for return (as supernatant) in Cell 1 and Cell 2 is expected to be higher due to using BGM liner instead of clay liner, lowering seepage losses to the environment. If it is assumed that the replacement of the clay liner with BGM retains 100% of the seepage previously lost to the environment (~0.023 m^3/year/m^2), the decant rate is expected to increase by a maximum of 4m^3/hour. This represents an increase of only 0.25% of the maximum decant rate in a wet year and therefore substituting the clay liner with BGM has not impacted the design of the decant infrastructure.

The return water pipeline corridor to CWD runs along the TSF2 buttress then crosses Maranup Ford Road.

The capacity of the Cell 1 and Cell 2 decant pumps were designed as per the rates estimated from the water balance, taking into account both wet years and redundancy. The pumps are skid mounted, driven by a diesel engine and have self-priming capabilities. A suction pipe is supported by floats which keeps the coarse screen above the consolidated tailings and prevents suction intake of tailings during operation.

The Cell 1 pipeline will initially extend to the temporary decant location in the centre of the cell where the pond can be pumped from the east side of the cell. Once the Cell 1 starter capacity is reached, the pond is expected to have migrated to its final location against the TSF1 embankment, where it can be accessed via a short access ramp.

The Cell 2 pipeline will initially extend to the centre of the cell. Two flexible pipelines have been included to access the separate ponding areas. In subsequent raises, the two ponds are expected to merge into one and a single pipeline will run along a decant accessway.

3B1.3.7 Pipelines

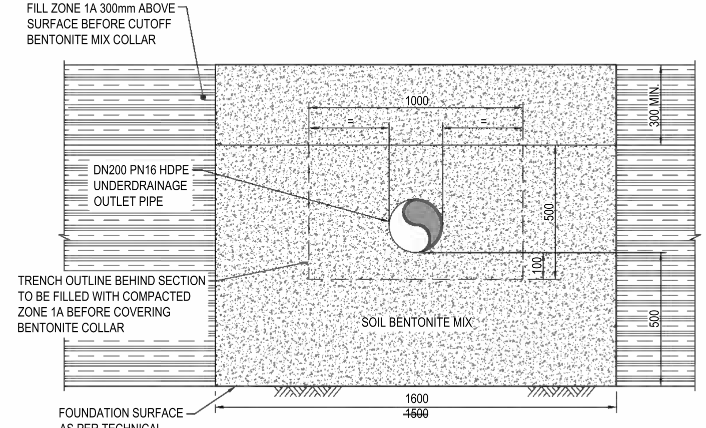
Pipeline corridors have been established between the CGP3 and CGP4 Plant areas, the TRP, the Central Tailings Pump Station and the TSFs. The pipeline corridors comprise tailings lines from all processing plants, including the CGP3 and CGP4 thickeners once operational. The pipelines run on top of the 1,270mRL bench all the way around the west and south buttress to the Central Tailings Pump Station, which is situated adjacent to the TRP Run of Mine (**ROM**) pad. Tailings are directed from the booster station to TSF4 (Figure 15). Return water pipelines run from TSFs to the MWC.

Tailings and return water pipelines are high density polyethylene (**HDPE**) and installed within an earthen/rock bund, with the exception of a few pipelines located within the plant areas in pipeline corridors. As pipelines already run alongside the western buttress of TSF2, a catchment berm has already been established in this location to control the risk of release in the event of a pipeline leak. The berm will capture leaks in this section of the pipeline corridor. All tailings and return water pipelines have leak detection.

Physical inspections of tailings pipelines are undertaken at least once per shift as one of the recurring operational tasks for the process plant operators.

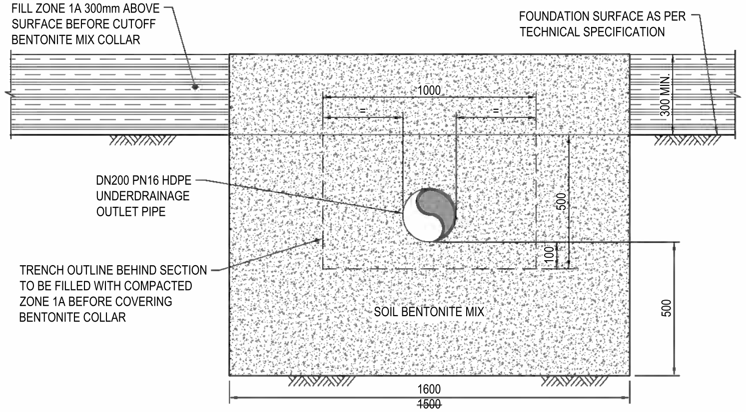
Construction of the pipelines is authorised under Works Approvals W6283/2019/1 and W6618/2021/1).

[redacted]



TYPICAL SOIL BENTONITE MIX CUTOFF (ABOVE GROUND)

SCALE 1:10



TYPICAL SOIL BENTONITE MIX CUTOFF (UNDER GROUND)

SCALE 1:10

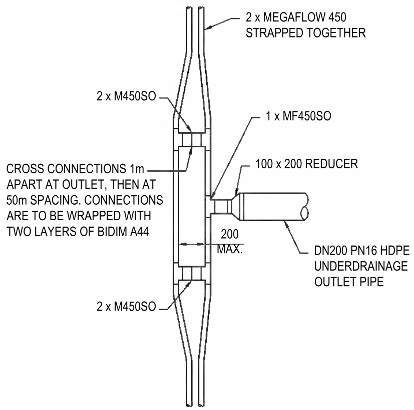
NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES (mm) UNLESS OTHERWISE NOTED.
2. ALL RL's ARE IN METRES TO LOCAL MINE DATUM (m).
3. FOR ARRANGEMENT OF OUTLETS IN CUT, REFER TO DRAWING 61-37226-C060.

LEGEND

- GENERAL ROCK FILL
- MINE WASTE ROCK
- CLEAN TAILINGS SAND
- SELECT MINE WASTE ROCK
- SOIL BENTONITE MIX
- CLAY LINER
- WEARING COURSE
- ZONE 1A
- ZONE 1B
- ZONE 2B (GRAVEL)

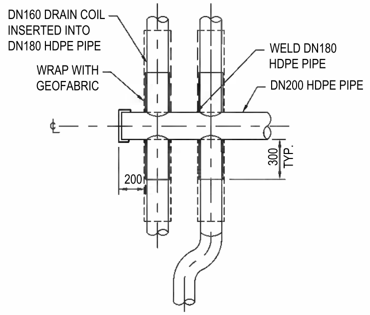
BASE SURVEY SUPPLIED BY:
TALISON LITHIUM PTY LTD
RECEIVED ON: 28 JULY 2021
CO-ORDINATE GRID: MGA 94-50
LEVEL DATUM: MINE DATUM



MEGAFLO OUTLET PLAN ARRANGEMENT

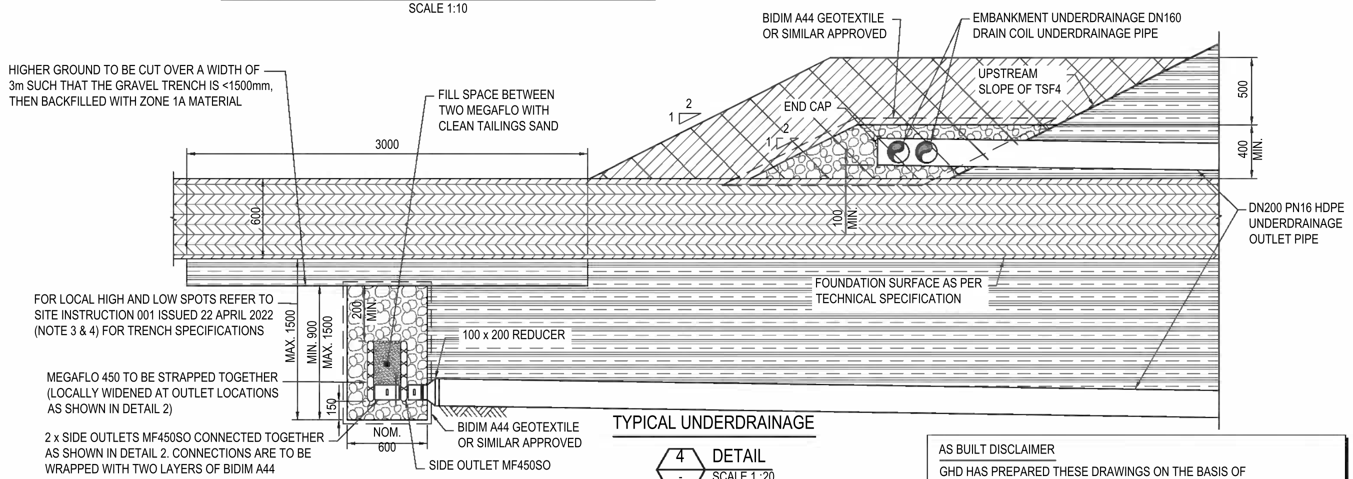
2 DETAIL

SCALE 1 :20



TYPICAL CONNECTION DETAIL DRAINCOIL TO OUTLET PIPE

SCALE 1:20



TYPICAL UNDERDRAINAGE

4 DETAIL

SCALE 1 :20

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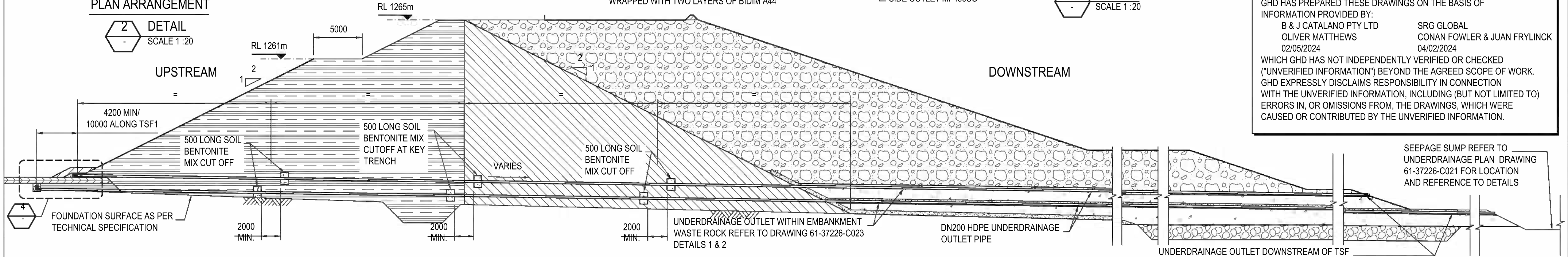

PERIMETER EMBANKMENT UNDERDRAINAGE - TYPICAL SECTION AT OUTLET LOCATION - OUTLET IN FILL (NOTE 3)

NOTE: DECANT RETURN PIPE NOT SHOWN

SCALE 1:200

0 2000 4000 6000 8000 10000mm
SCALE 1:200 AT ORIGINAL SIZE

AS CONSTRUCTED

No	Revision	Drawn	Job Manager	Project Director	Date
5	AS CONSTRUCTED, FOR CELL 1 ONLY	BG	JF	CH	25/06/24
4	REFERENCE TO OUTLET IN CUT INCLUDED	BG	ppCH	CH	20/12/22
3	DRAINCOIL CONNECTION DETAIL ADDED	BG	ppCH	CH	15/11/22
2	RE-ISSUED FOR CONSTRUCTION	BG	GB	CH	14/06/22
1	RE-ISSUED FOR CONSTRUCTION	BG	GB	ppGB	18/03/22

Note: * indicates signatures on original issue of drawing or last revision of drawing

0 100 200 300 400 500mm
SCALE 1:10 AT ORIGINAL SIZE

0 200 400 600 800 1000mm
SCALE 1:20 AT ORIGINAL SIZE

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Drawn	B. GAUNSON	Designer	H. VARA
Drafting Check	S. HORTON	Design Check	J. PHILLIPS
Approved (Project Director)	C. HOLMES		
Date	19/01/2022		
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Client: TALISON LITHIUM PTY LTD

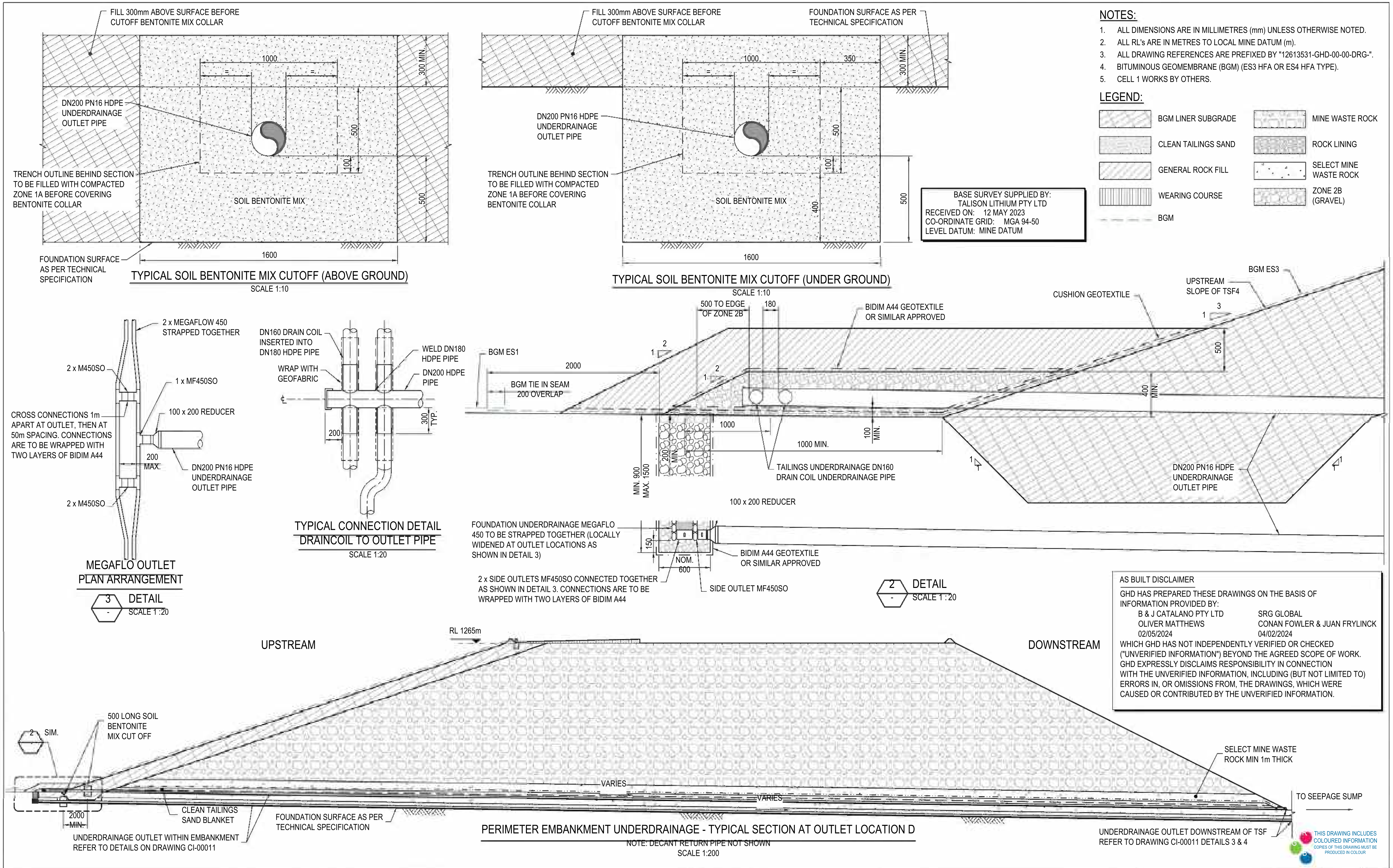
Figure 15: Cell 1 underdrainage

Project: TSF4 CELL 1

Title: UNDERDRAINAGE SECTIONS AND DETAILS

Original Size: A1 | Drawing No: 61-37226-C022 | Rev: 5

Plot Date: 25 June 2024 - 2:15 PM Plotted by: Brendan Gaunson Cad File No: C:\12d\SW\data\P-00-12D-001\61-12574082 - Talison TSF4 Starter Construction_2823\CADD\Drawings\As Con RL1265 (Cell 1)\61-37226-C022.dwg



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4. BITUMINOUS GEOMEMBRANE (BGM) (ES3 HFA OR ES4 HFA TYPE).
5. CELL 1 WORKS BY OTHERS.

LEGEND:

- BGM LINER SUBGRADE
- CLEAN TAILINGS SAND
- GENERAL ROCK FILL
- WEARING COURSE
- BGM
- MINE WASTE ROCK
- ROCK LINING
- SELECT MINE WASTE ROCK
- ZONE 2B (GRAVEL)

BASE SURVEY SUPPLIED BY: TALISON LITHIUM PTY LTD
RECEIVED ON: 12 MAY 2023
CO-ORDINATE GRID: MGA 94-50
LEVEL DATUM: MINE DATUM

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Rev	Description	Checked	Approved	Date
C02	AS CONSTRUCTED, FOR CELL 2 ONLY	SW	CH	04/07/24
C01	ISSUED FOR CONSTRUCTION	SW	CH	31/07/23

Author B.GAUNSON — Drafting Check J.VALE
Designer S.WALDEK — Design Check T.MASOCHA
Plot Date: 2 July 2024 - 1:04 PM — Plotted by: Brendan Gaunson

SCALE 1:10 AT ORIGINAL SIZE — SCALE 1:200 AT ORIGINAL SIZE — SCALE 1:20 AT ORIGINAL SIZE

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Project No. 12613531

Client: TALISON LITHIUM PTY LTD
Project: TSF4 CELL 2
Status: AS CONSTRUCTED

Drawing Title: UNDERDRAINAGE SECTIONS AND DETAILS SHEET 2

Figure 12: Cell 2 underdrainage

Figure 16: Cell 2 underdrainage

Size A1
12613531-GHD-00-00-DRG-CI-00010
Rev C02

NOTES:

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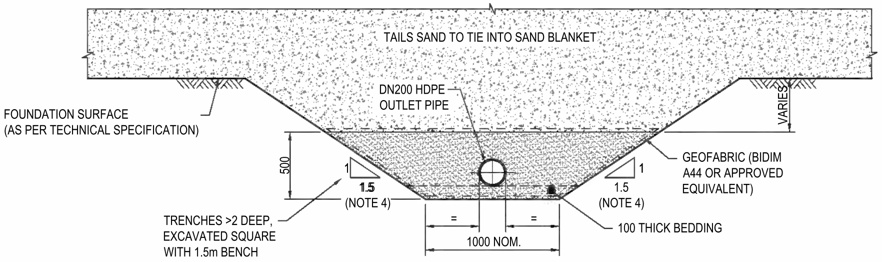
3. ALL LEVELS, LENGTHS AND GRADES ARE INDICATIVE ONLY AND SHALL BE CONFIRMED AFTER STRIPPING.
4. CUT SLOPES TO BE CONFIRMED ON SITE.

LEGEND:

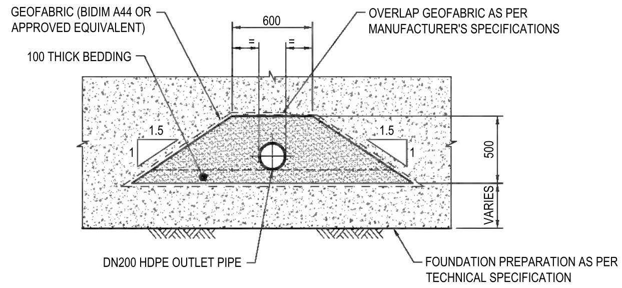
CLEAN TAILINGS SAND

SELECT MINE WASTE ROCK



DETAIL 1
SCALE 1 : 20

UNDERDRAINAGE OUTLET UNDER WASTE ROCK - IN CUT



DETAIL 2
SCALE 1 : 20

UNDERDRAINAGE OUTLET WITHIN EMBANKMENT WASTE ROCK - IN FILL

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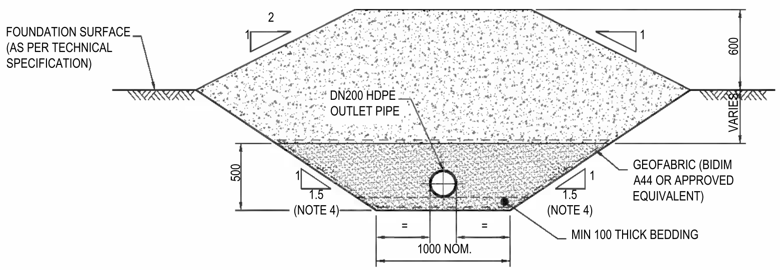
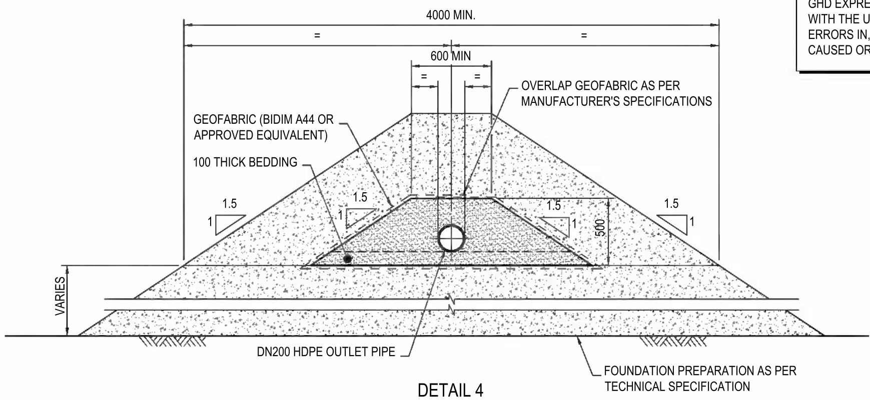


DETAIL 3
SCALE 1 : 20

UNDERDRAINAGE OUTLET WITHIN FUTURE FOOTPRINT - IN CUT



DETAIL 4
SCALE 1 : 20

UNDERDRAINAGE OUTLET WITHIN FUTURE FOOTPRINT - IN FILL

AS CONSTRUCTED

No	Revision	Drawn	Job Manager	Project Director	Date
4	AS CONSTRUCTED, FOR CELL 1 ONLY	BG	JF	CH	25/06/24
3	GEOTEXTILE SHOWN TO SECTIONS IN CUT AND DETAIL CLARIFIED	BG	ppCH	CH	20/12/22
2	HOLD RELEASED	BG	ppCH	CH	15/11/22
1	RE-ISSUED FOR CONSTRUCTION	BG	GB	ppGB	18/03/22
0	ISSUED FOR CONSTRUCTION	BG	GB	CH	19/01/22

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0 200 400 600 800 1000mm
SCALE 1:20 AT ORIGINAL SIZE

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Drafting Check S. HORTON | Design Check J. PHILLIPS
Approved (Project Director) C. HOLMES
Date 19/01/2022
Scale 1:20
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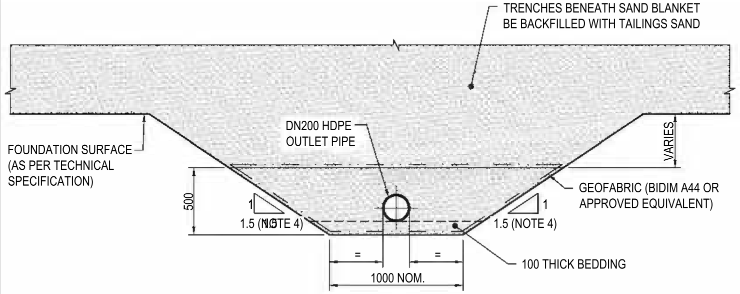
Client TALISON LITHIUM PTY LTD
Project TSF4 CELL 1
Title UNDERDRAINAGE OUTLET DETAILS

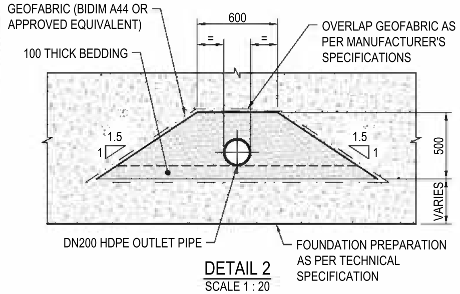
Figure 17: Cell 1 underdrainage outlets

Original Size A1 Drawing No: 61-37226-C023 Rev: 4

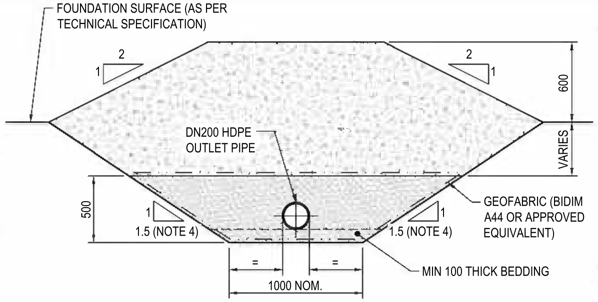
Plot Date: 25 June 2024 - 2:16 PM Plotted by: Brendan Gaunson Cad File No: C:\12d\SW\data\P-00-12D-001\61-12574082 - Talison TSF4 Starter Construction_2823\CADD\Drawings\As Con RL1265 (Cell 1)\61-37226-C023.dwg



DETAIL 1
SCALE 1 : 20
UNDERDRAINAGE OUTLET UNDER WASTE ROCK - IN CUT



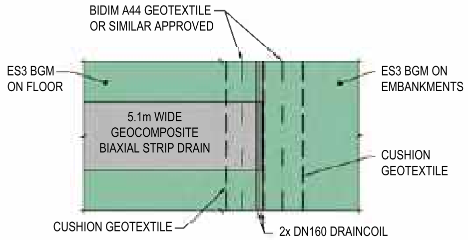
DETAIL 2
SCALE 1 : 20
UNDERDRAINAGE OUTLET WITHIN EMBANKMENT WASTE ROCK - IN FILL



DETAIL 3
SCALE 1 : 20
UNDERDRAINAGE OUTLET WITHIN FUTURE FOOTPRINT - IN CUT

NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES (mm) UNLESS OTHERWISE NOTED.
2. FOR SELECT MINE WASTE ROCK AND CLEAN TAILINGS AND DETAILS REFER TO TECHNICAL SPECIFICATION .
3. ALL LEVELS, LENGTHS AND GRADES ARE INDICATIVE ONLY AND SHALL BE CONFIRMED AFTER STRIPPING.
4. CUT SLOPES TO BE CONFIRMED ON SITE.
5. BITUMINOUS GEOMEMBRANE (BGM) (ES3 HFA OR ES4 HFA TYPE).
6. STRIP DRAINS SHALL BE TIED INTO THE TAILINGS UNDERDRAINAGE AS PER DRAWINGS CI-00023.
7. CELL 1 WORKS BY OTHERS.

LEGEND:
- BGM LINER SUBGRADE
- CLEAN TAILINGS SAND
- GENERAL ROCK FILL
- MINE WASTE ROCK
- ZONE 2B (GRAVEL)
- SELECT MINE WASTE ROCK
- BGM (IN PLAN)
- BGM



STRIP DRAIN TIE-IN DETAIL (NOTE 6)
SCALE 1:200

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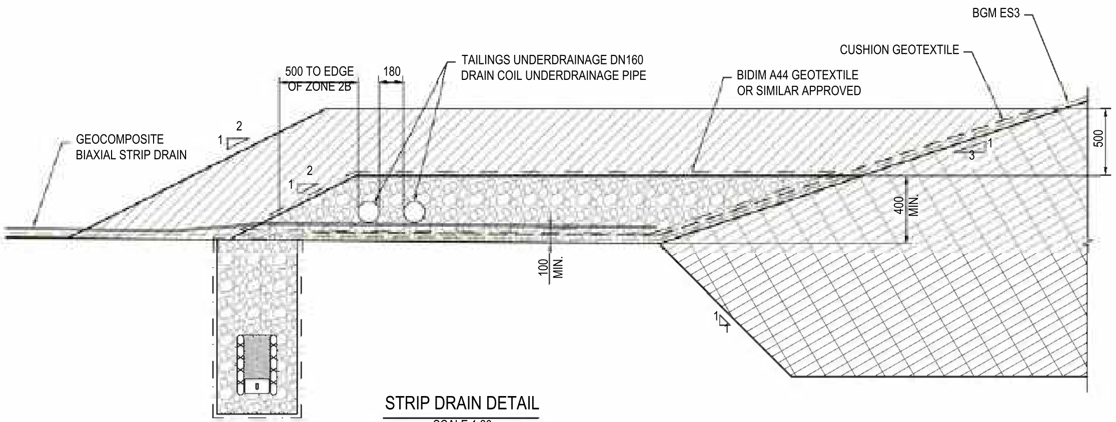
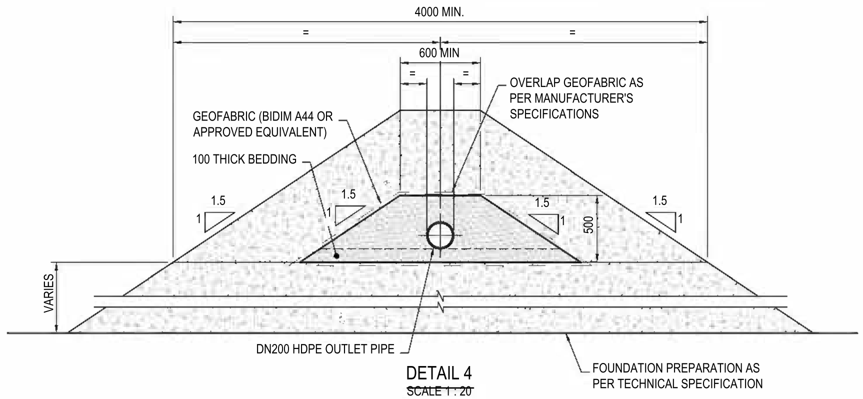


STRIP DRAIN DETAIL
SCALE 1:20



DETAIL 4
SCALE 1 : 20
UNDERDRAINAGE OUTLET WITHIN FUTURE FOOTPRINT - IN FILL

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Rev	Description		Checked	Approved	Date
C02	AS CONSTRUCTED, FOR CELL 2 ONLY		SW	CH	04/07/24
C01	ISSUED FOR CONSTRUCTION		SW	CH	31/07/23

Author B.GAUNSON Drafting Check J.VALE
Designer S.WALDEK Design Check T.MASOCHA

0 0.2 0.4 0.6 0.8 1.0m
SCALE 1:20 AT ORIGINAL SIZE
0 2 4 6 8 10m
SCALE 1:200 AT ORIGINAL SIZE

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Project No. 12613531

Client TALISON LITHIUM PTY LTD
Project TSF4 CELL 2
Status AS CONSTRUCTED

Drawing Title UNDERDRAINAGE ... ION AND DETAILS SHEET 2

Figure 18: Cell 2 Underdrainage outlets

Size A1
12613531-GHD-00-00-DRG-CI-00011
Rev C02

Plot Date: 2 July 2024 - 1:04 PM Plotted by: Brendan Gaunson
File Name: C:\12d\SW\data\P-00-12D-001\61-12574082 - Talison TSF4 Starter Construction_2823\CADD\Drawings\As Con RL1265 (Cell 2)\12613531-GHD-00-00-DRG-CI-00011.dwg

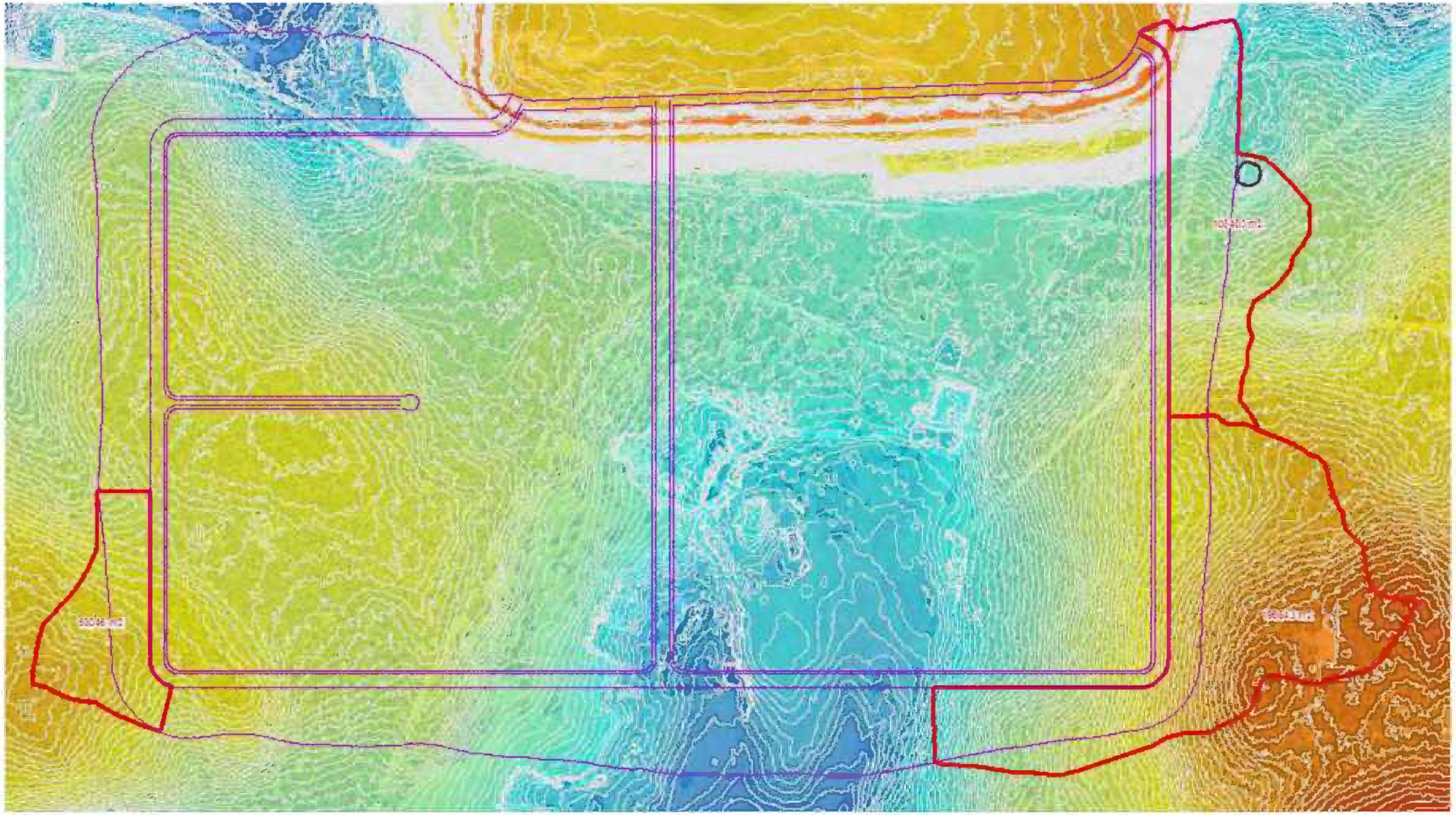


Figure 19: External catchment areas for surface water collection into the toe drain

Note: This figure shows an older TSF4 design footprint

Figure 20: Tailings pipeline discharge into TSF4 and decant return pipeline

3B1.3.8 TSF4 Staging/Phases

Construction

TSF4 has been and will continue to be constructed in stages. The design comprises a 20m high starter embankment, followed by six lifts of 5m to raise the dam from the starter embankment crest elevation (1,265mRL) to the final crest elevation (1,295mRL). The cell 1 starter embankment was constructed in two stages; Cell 1a and Cell 1b. Cell 1a involved the construction of the starter embankment height to <1,261mRL, followed by Cell 1b to the final starter embankment height of 1,265mRL. Cell 2 final starter embankment height (1,265mRL) was constructed via a single stage process.

The 2021 GHD detailed design report was submitted as a supporting document for the TSF4 Works Approval (W6618/2021/1; approved 8 March 2022) and describes the general construction process at each staged raise until the maximum embankment height (1,295mRL) is reached.

Sections of the 1,270mRL raise of the perimeter and divider embankments of TSF4 Cell 1 and 2 were constructed using centreline raising methodology (GHD, 2023a; Attachment 8E). This methodology requires the upstream toe of the embankments to be constructed on a sand tailings platform, while the remainder of the raise will extend onto the existing starter embankment.

All areas of the raise were lined with BGM liner.

Figure 21 shows the area (in green) where the upstream toes of the embankment were constructed on sand tailings for geotechnical support. The white hatch area in Figure 21 represents areas where the Starter Embankment was raised using centreline method (i.e. the existing, approved 1,265mRL starter embankment), and the plum hatch area represents the total 1,270mRL embankment footprint. Detailed key construction materials and construction methodology are described in Section 2 and Section 3 of the Technical Specifications, (GHD, 2023a; Attachment 8E).

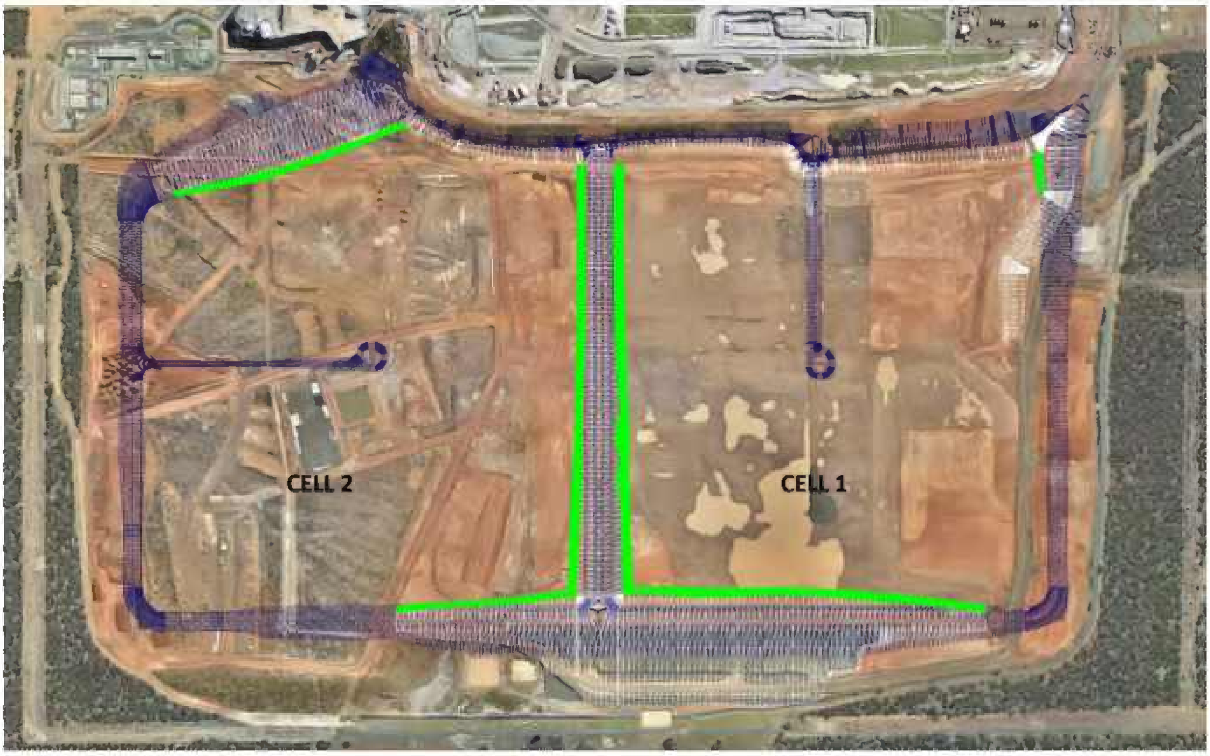


Figure 21: Cell 1 and 2 1,270mRL embankment raise

(green - areas where upstream embankment toe will be constructed on sand tailings; white hatch - areas where Starter Embankment will be raised using centreline method; plum hatch total 1,270mRL embankment footprint)

Staged Construction

Due to construction delays, it was determined that a staged construction methodology would be required for TSF4 in order to meet timeframes for tailings deposition. A revised report summarising the changes to the TSF4 design and operation due to staged construction was completed (GHD, 2023a; Attachment 8E). A works approval amendment was approved on 1 September 2023 under W6618/2021/1 for staged construction of the facility.

Construction of TSF4 was undertaken under the supervision of a suitability accredited engineer and in accordance with industry standards and guidelines. Specific construction activities and staging are outlined in the sections below.

Commissioning, Compliance Reporting and Time Limited Operations

The starter embankment of TSF4 was constructed and commissioned in three stages:

- Stage 1a: construction of Cell 1a to 1,261mRL;
- Stage 1: construction of Cell 1 to 1,265mRL; and
- Stage 2: construction of Cell 2 to 1,265mRL.

The CCIR for Cell 1a was submitted on 1 December 2023, where TLO commenced in January 2024. Construction of Cell 2 and Cell 1b to 1,265mRL has been completed, with the CCIRs lodged in June and August 2024, respectively.

Raise of TSF4 Cell 1 and 2 to 1,270mRL

Construction of the TSF4 Cell 1 and 2 raise to 1,27[redacted]luded:

- Sand tailings platform placed in Cell 1 to 1,265mRL along the divider embankment and a small section in the northeast corner of the perimeter embankment;
- Cell 1 portion of the divider embankment constructed to 1,270mRL;
- Sand tailings platform placed in Cell 2 to 1,265mRL along the divider embankment and a small section of the perimeter embankment on the north west corner; and
- Cell 2 portion of the divider embankment constructed to 1,270mRL.

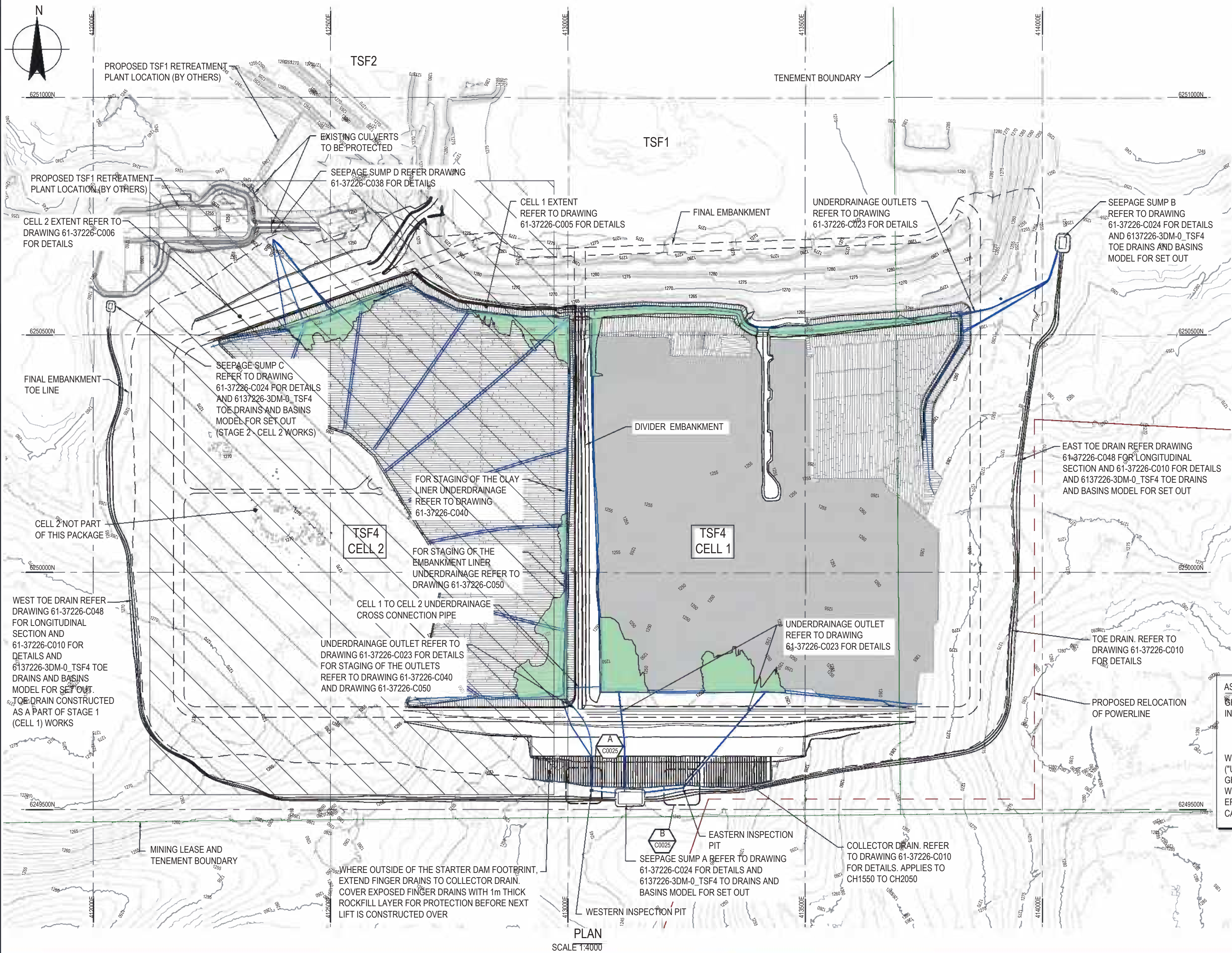
Construction of the embankment raise from 1,265mRL to 1,270mRL was approved under W6618/2021/1 and completed in June 2025. TLO commenced for Cell 1 in March 2025 and Cell 2 in June 2025. CCIR's have been submitted for both Cell 1 and 2.

3B1.4 TSF4 Emission/Discharge points

Emissions and discharges points remain unchanged from W6618/2021/1. The figures showing potential seepage pathways from TSF4 (without controls) into surface water (Figure 21) and groundwater (Figure 22) have been provided below as aligned with the requirements of the Tailings Storage Facility checklist. Further information on emissions and discharges including proposed controls and identifying whether any variations from existing approvals are required are provided in Attachment 6A.

The emission and discharge points are presented in:

- Figure 20 – Tailings pipeline discharge into TSF4 and decant return pipeline;
- Figure 22 – TSF4 Cell 1 seepage recovery system;
- Figure 23 – TSF4 Cell 2 seepage recovery system;
- Figure 24 – Potential seepage pathway into surface water flow without controls;
- Figure 25 – Surface water storage facilities (as per Licence L4247/1991/13);
- Figure 26 – Potential seepage pathway into shallow groundwater flow without controls; and
- Figure 27 – Potential seepage pathway into deeper basement groundwater flow without controls.



PLAN
SCALE 1:4000

NOTES:

1. ALL DIMENSIONS ARE IN METRES (m) UNLESS OTHERWISE NOTED.
2. REFER TO DRAWING 61-37226-C022 TO 61-37226-C025 FOR UNDERDRAINAGE DETAILS.
3. ALL RL's ARE IN METRES TO LOCAL MINE DATUM (m).
4. UNDERDRAINAGE LEVELS TO BE CONFIRMED POST-STRIPPING (SURVEY).
5. FOR SETOUT REFER TO 61-37226-3DM-1_TSF 4 UNDERDRAINAGE.
6. DRAWING TO BE PRINTED IN COLOUR.
7. UPSTREAM UNDERDRAINAGE TO BE PROVIDED FOR BOTH THE EMBANKMENT (ABOVE CLAY LINER) AND BELOW THE CLAY LINER. FOR THE ARRANGEMENT OF THE LINER AND UNDERDRAINAGE INTERFACE REFER TO DRAWING 61-37226-C039.
8. FOR CLAY LINER UNDERDRAINAGE LONGITUDINAL SECTIONS REFER TO DRAWINGS 61-37226-C040 TO 61-37226-C048. FOR EMBANKMENT UNDERDRAINAGE LONGITUDINAL SECTIONS REFER TO DRAWINGS 61-37226-C050 TO 61-37226-C056.

LEGEND:

- PROPOSED 132kV POWERLINE (BY OTHERS)
- EXISTING HV POWERLINE TO REMAIN
- PROPOSED RELOCATION OF EXISTING HV POWERLINE BY OTHERS.
- CLAY LINER UNDERDRAINAGE
- FUTURE CLAY LINER UNDERDRAINAGE
- EMBANKMENT UNDERDRAINAGE
- FUTURE EMBANKMENT UNDERDRAINAGE
- FINAL EMBANKMENT TOE LINE
- BGM LINER
- EARTHWORKS FILL AREAS

AS BUILT DISCLAIMER

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RECEIVED ON: 28 JULY 2021
CO-ORDINATE GRID: MGA 94-50
LEVEL DATUM: MINE DATUM

AS CONSTRUCTED

No	Revision	Drawn	Job Manager	Project Director	Date
5	AS CONSTRUCTED, FOR CELL 1 ONLY	BG	JF	CH	25/06/24
4	CELL 2 MODEL UPDATED, STAGING INTERFACE CLARIFIED	BG	ppCH	CH	20/12/22
3	LAYOUT AND MODEL REFERENCE AMENDED, HOLD AMENDED	BG	ppCH	CH	15/11/22
2	COLLECTOR DRAIN AND OUTLETS ALIGNMENT UPDATED	BG	ppCH	CH	15/08/22
1	RE-ISSUED FOR CONSTRUCTION	BG	GB	ppGB	18/03/22

Note: * indicates signatures on original issue of drawing or last revision of drawing

0 40 80 120 160 200m
SCALE 1:4000 AT ORIGINAL SIZE

TALISON LITHIUM

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DO NOT SCALE

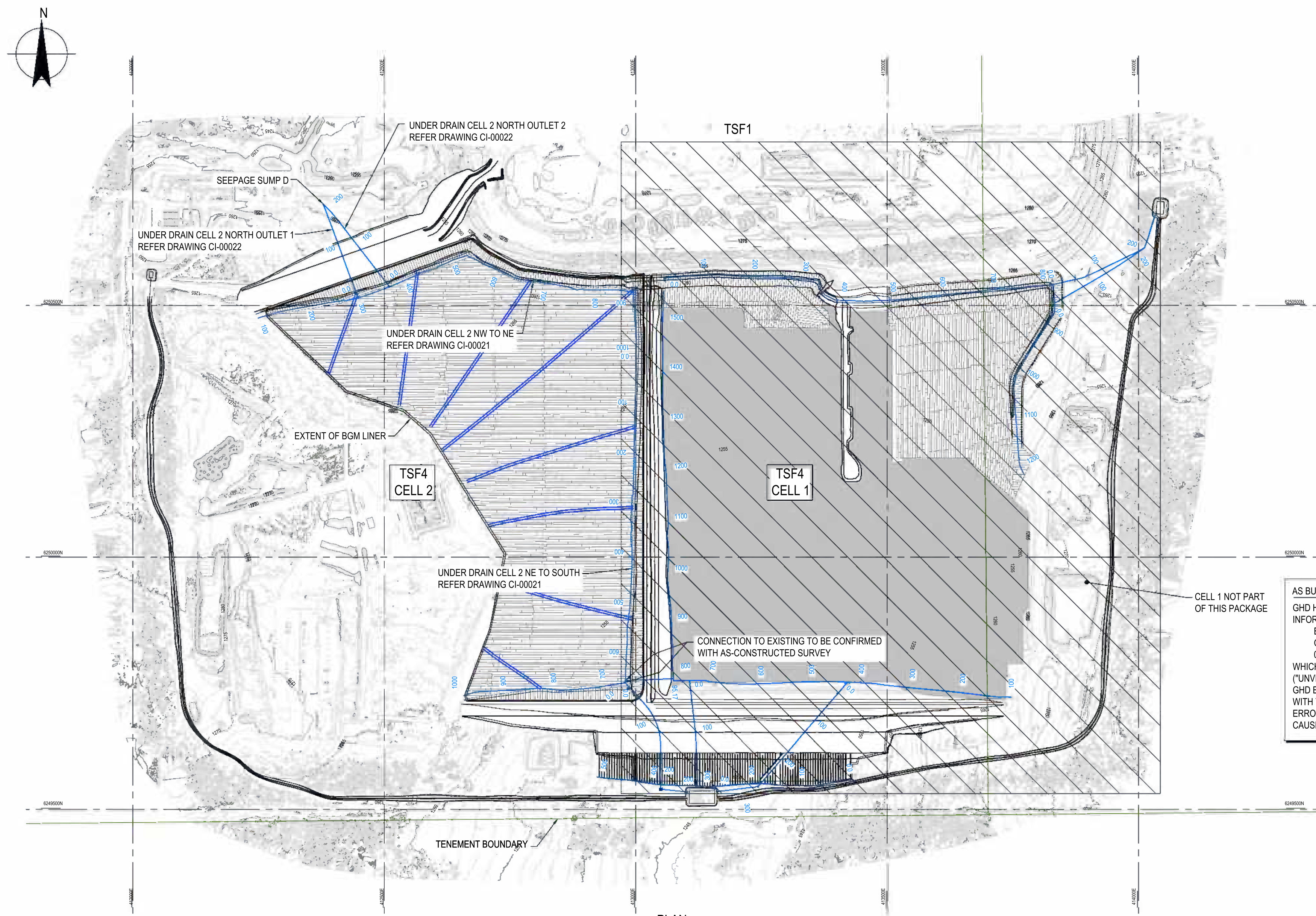
Drawn	B. GAUNSON	Designer	H. VARA
Drafting Check	S. HORTON	Design Check	J. PHILLIPS
Approved (Project Director)	C. HOLMES		
Date	19/01/2022		
Scale	1:4000	This Drawing must not be used for Construction unless signed as Approved	

Client
Project
Title

Figure 22: Cell 1 Seepage Recovery System

Original Size A1 | Drawing No: **61-37226-C021** | Rev: 5

Plot Date: 25 June 2024 - 2:15 PM Plotted by: Brendan Gaunson Cad File No: C:\12d\SW\data\P-00-12D-001\61-12574082 - Talison TSF4 Starter Construction_2823\CADD\Drawings\As Con RL1265 (Cell 1)\61-37226-C021.dwg



PLAN
SCALE 1:4000

NOTES:

1. ALL DIMENSIONS ARE IN METRES (m) UNLESS OTHERWISE NOTED.
2. ALL RL's ARE IN METRES TO LOCAL MINE DATUM (m).
3. ALL DRAWING REFERENCES ARE PREFIXED BY "12613531-GHD-00-00-DRG-".
4. FOR FOUNDATION UNDERDRAINAGE SECTIONS REFER DRAWINGS CI-00021 TO CI-00022.
5. FOR FOUNDATION UNDERDRAINAGE 3D MODEL REFER 12613531-GHD-00-00-MDL-CI-00001.
6. BITUMINOUS GEOMEMBRANE (BGM) (ES3 HFA OR ES4 HFA TYPE).
7. CELL 1 WORKS BY OTHERS.

LEGEND:

- CELL 2 FOUNDATION UNDERDRAINAGE
- STRIP DRAIN (CELL 2)

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CO-ORDINATE GRID: MGA 94-50
LEVEL DATUM: MINE DATUM

Rev	Description		Checked	Approved	Date
C02	AS CONSTRUCTED, FOR CELL 2 ONLY		SW	CH	04/07/24
C01	ISSUED FOR CONSTRUCTION		SW	CH	31/07/23

Author B.GAUNSON · Drafting Check J.VALE
Designer S.WALDEK · Design Check T.MASOCHA

0 40 80 120 160 200m
SCALE 1:4000 AT ORIGINAL SIZE

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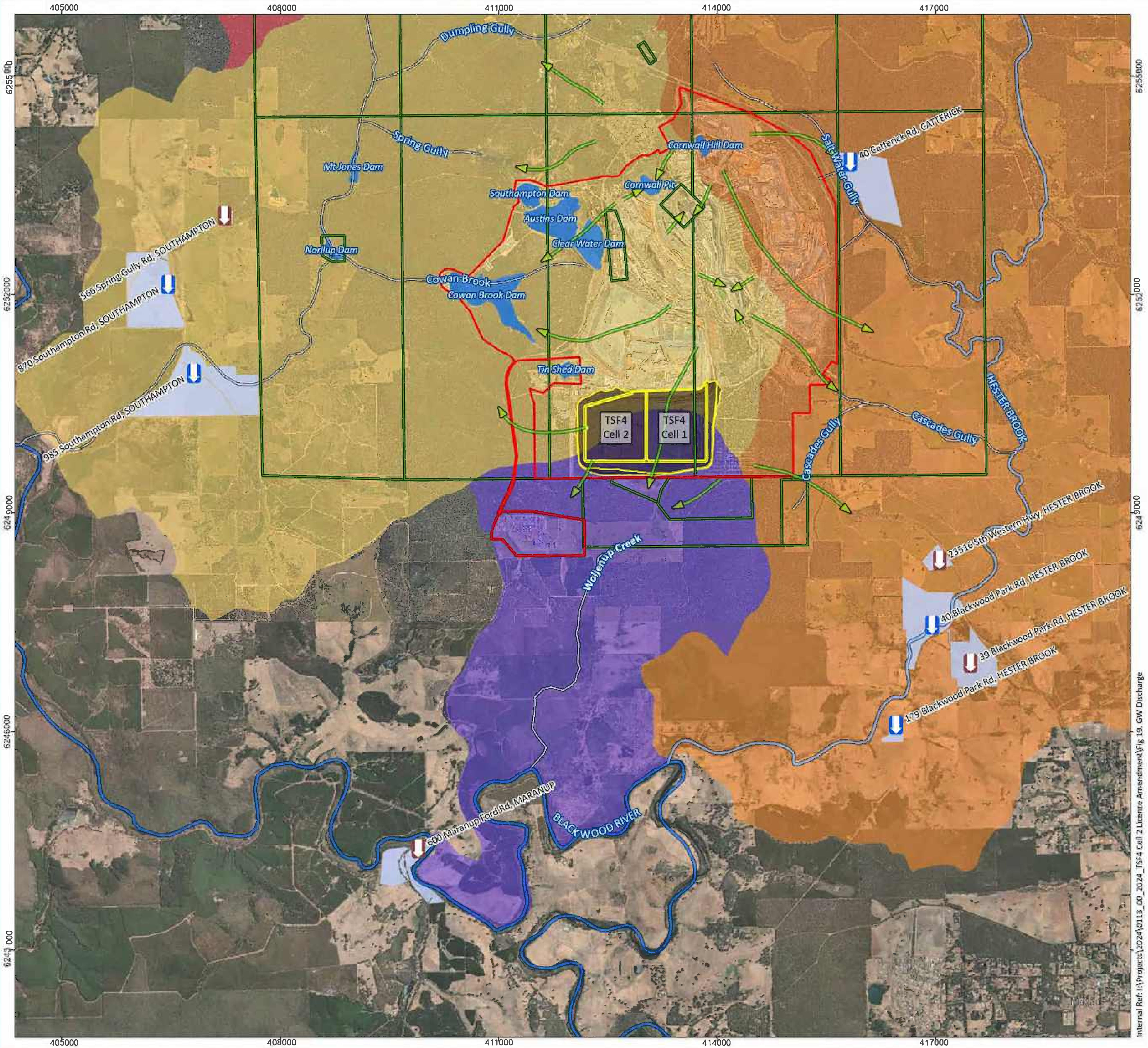
Client: TALISON LITHIUM PTY LTD
Project: TSF4 CELL 2
Project No. 12613531
Status: AS CONSTRUCTED

Drawing Title: FOUNDATION UNDERDRAINAGE LAYOUT

Figure 23: Cell 2 seepage recovery system

Size A1
Drawing No. 12613531-GHD-00-00-DRG-CI-00020
Rev C02

Plot Date: 2 July 2024 - 1:10 PM Plotted by: Brendan Gaunson
File Name: C:\12d\SW\data\P-00-12D-001\61-12574082 - Talison TSF4 Starter Construction_2823\CADD\Drawings\As Con RL1265 (Cell 2)\12613531-GHD-00-00-DRG-CI-00020.dwg



GREENBUSHES OPERATIONS

POTENTIAL SEEPAGE PATHWAYS INTO SURFACE WATER FLOWS WITHOUT CONTROL

- Groundwater Flow Direction
- Talison Premises Boundary (as per W6832/2021/1)
- Talison Tenements
- TSF4 embankment
- Dams
- Bore on Property

Groundwater Users

- Domestic Groundwater Use Bore
- Stock & Irrigation Groundwater Use Bore

Water Course

- Blackwood River
- Hester Brook
- Minor

Subcatchment Areas

- Balingup Brook Catchment
- Hester Brook Catchment
- Norilup Creek Catchment
- Woljenup Creek

Datum: GDA94
Projection: MGA Zone 50

LOCALITY MAP

0 0.75 1.5 3 Kilometers

SCALE: 1:50,000 @ A3

FIGURE 24

TALISON LITHIUM

GREENBUSHES OPERATIONS

Surface water storage facilities (as per L4247/1991/13)

- Talison Premises Boundary (as per L4247/1991/13)
- TSF4 embankment
- Greenbushes Townsite
- Dams

Internal Ref: I:\Projects\2024\0113_00_2024_TSF4 Cell 2 Licence Amendment\Fig 20. Water Storage Facilities

Datum: GDA94
Projection: MGA Zone 50

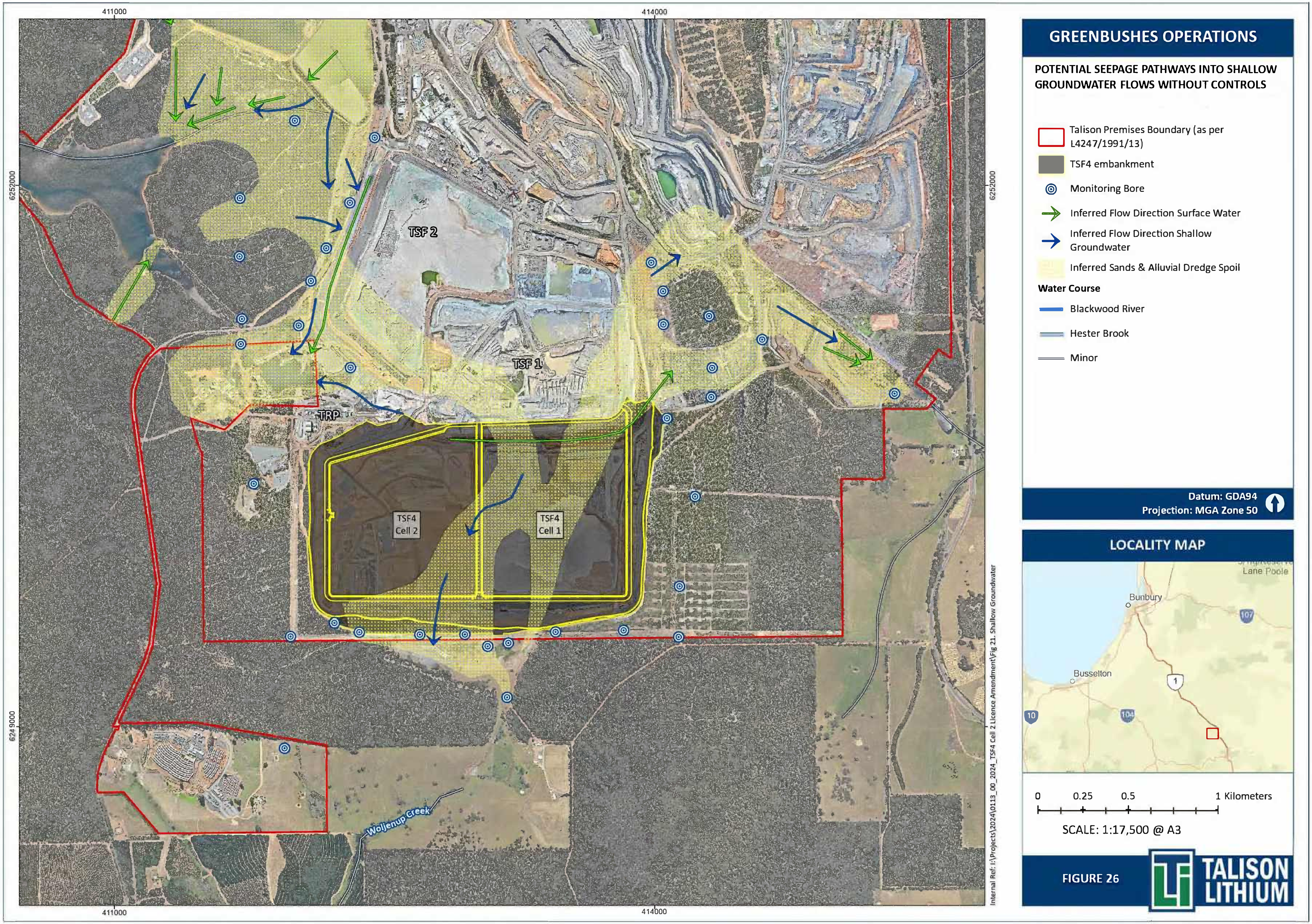
LOCALITY MAP

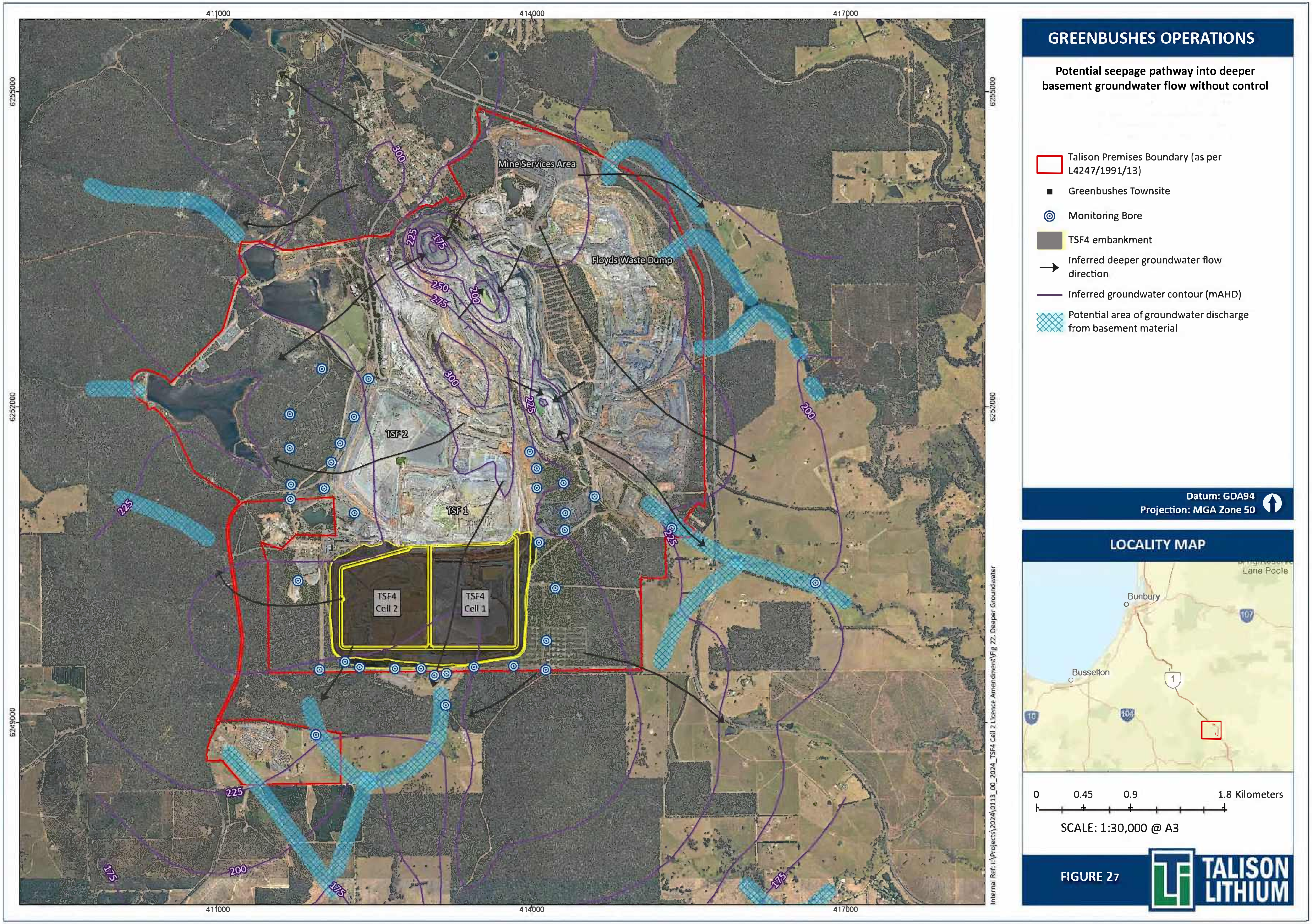
0 0.45 0.9 1.8 Kilometers

SCALE: 1:30,000 @ A3

FIGURE 25

TALISON LITHIUM


GREENBUSHES OPERATIONS
POTENTIAL SEEPAGE PATHWAYS INTO SHALLOW GROUNDWATER FLOWS WITHOUT CONTROLS
Talison Premises Boundary (as per L4247/1991/13)
TSF4 embankment
Monitoring Bore
Inferred Flow Direction Surface Water
Inferred Flow Direction Shallow Groundwater
Inferred Sands & Alluvial Dredge Spoil
Water Course
Blackwood River
Hester Brook
Minor
Datum: GDA94
Projection: MGA Zone 50
LOCALITY MAP
Bunbury
Busselton
Lane Poole
0 0.25 0.5 1 Kilometers
SCALE: 1:17,500 @ A3
FIGURE 26
TALISON LITHIUM
TSF 2
TSF 1
TRP
TSF4 Cell 2
TSF4 Cell 1
Woljenup Creek
411000
414000
6252000
6249000
Internal Ref: I:\Projects\2024\0113_00_2024_TSF4 Cell 2 Licence Amendment\Fig 21. Shallow Groundwater


GREENBUSHES OPERATIONS
Potential seepage pathway into deeper basement groundwater flow without control
Talison Premises Boundary (as per L4247/1991/13)
Greenbushes Townsite
Monitoring Bore
TSF4 embankment
Inferred deeper groundwater flow direction
Inferred groundwater contour (mAHD)
Potential area of groundwater discharge from basement material
Datum: GDA94
Projection: MGA Zone 50
LOCALITY MAP
Bunbury
Busselton
Lane Poole
0 0.45 0.9 1.8 Kilometers
SCALE: 1:30,000 @ A3
FIGURE 27
TALISON LITHIUM
Mine Services Area
Floyds Waste Dump
TSF 2
TSF 1
TSF4 Cell 2
TSF4 Cell 1
411000
414000
417000
6255000
6252000
6249000
300
225
175
250
275
200
Internal Ref: I:\Projects\2024\0113_00_2024_TSF4 Cell 2 Licence Amendment\Fig 22. Deeper Groundwater

3B1.5 Project Phasing Applicable to TSF4 Cells 1 and 2 (embankment at 1,270mRL)

The timing of project phases relevant to TSF4 Cells 1 and 2 embankment at 1,270mRL are detailed in Table 3 below.

Table 3: Completed and estimated timing of TSF4 Cell 1 and Cell 2 (embankment at 1,270mRL)

Project Phase	Timing	Prerequisites/Requirements
Construction/Time Limited Operation		
Cell 1 (embankment to 1,270mRL) construction completed	Q1, 2025 *Complete*	In compliance with Condition 2, W6901/2024/1.
Cell 2 (embankment to 1,270mRL) construction completed	Q2, 2025 *Complete*	In compliance with Condition 2, W6901/2024/1.
Cell 1 (embankment to 1,270mRL) CCIR submission	Q1, 2025 *Complete*	Within 90 calendar days of completion of construction in compliance with Condition 8, W6901/2024/1. In compliance with Condition 9, W6901/2024/1.
Cell 2 (embankment to 1,270mRL) CCIR submission	Q2, 2025 *Complete*	Within 90 calendar days of completion of construction in compliance with Condition 8, W6901/2024/1. In compliance with Condition 9, W6901/2024/1.
Cell 1 (embankment to 1,270mRL) TLO Commencement	Q1, 2025 *Underway*	After CCIR approval, or 45 days after submission of the CCIR (Condition 12, W6618/2021/1).
Cell 2 (embankment to 1,270mRL) TLO Commencement	Q3, 2025 *Underway*	After CCIR approval, or 45 days after submission of the CCIR (Condition 12, W6618/2021/1).
Cell 1 (embankment to 1,270mRL) TLO completion	Q1, 2026	For a period of 270 days or until inclusion of TSF4 Cell 1 onto the Licence.
Cell 2 (embankment to 1,270mRL) TLO completion	Q1, 2026	For a period of 270 days or until inclusion of TSF4 Cell 2 onto the Licence.
Operations		
Cell 1 (embankment to 1,270mRL) operations commencement	Q1, 2026	After inclusion of TSF4 Cell 1b onto the Licence.
Cell 2 (embankment to 1,270mRL) operations commencement	Q1, 2026	After inclusion of TSF4 Cell 2 onto the Licence.

3B1.6 Emission / Discharge Points

Emissions and discharges points remain uncha[redacted]m W6618/2021/1. The figures showing potential seepage pathways from TSF4 (without controls) into surface water (Figure 24) and groundwater (Figure 26 and Figure 27) have been provided below as aligned with the requirements of the Tailings Storage Facility checklist. Further information on emissions and discharges including proposed controls and identifying whether any variations from existing approvals are required are provided in Attachment 6A.

3B2 Disposal of water treatment plant waste to TSF4

Lithium waste (clarifier underflow effluent) from the water treatment plant facility (**WTF**) is currently dewatered via centrifuge to create a spadable lithium waste product (Spadable Waste) that is removed from site for disposal by a third-party waste management contractor. Talison proposes to dispose of the lithium waste to TSF4 as either a clarifier underflow effluent (Clarifier Effluent) or dewatered Spadable Waste. The proposed change will be implemented within the approved deposition rates of the L4247/1991/13 (deposition rate is not affected by the proposed change to activities). Environmental Geochemistry International (**EGIEGI**) were engaged by Talison to undertake an assessment of the geochemical characteristics of, and risk associated with, disposal of tailings and Spadable Waste into TSF4 (EGI, 2025).

The purpose this assessment was to further develop a conceptual hydrogeochemical model of the site (i.e., source-pathway-receptors in relation to seepage from mine waste landforms), with focus on:

- Storage of tailings/waste rock in TSF1 (refer to Section 3B3 below); and
- Disposal of Spadable Waste with tailings in TSF4 to assess whether spadable waste disposal to TSF4 materially increases environmental risk from seepage. The following information relevant to disposal of spadable water treatment plant waste to TSF4 is taken from EGI (2025). Information relevant to placement of waste rock material in TSF1 for dust suppression is discussed in Section 3B3.

Two sludge samples were subject to multi-element assay and de-ionised water leaching at a solid water ratio of 1:5 (GHD 2024). They exhibited the following characteristics:

- Significant element enrichment was limited to arsenic and iron;
- Water quality that may result from short term contact was likely to be moderately alkaline, highly saline, and have negligible to low concentrations of most metals and metalloids with the exception of slightly elevated concentrations of aluminium, antimony, arsenic, molybdenum and nickel;

- Existing tailings decant and leach water from TSF1 and TSF4 contain contaminants of potential concern (**CoPCs**) exceeding human health [redacted]ronmental guidelines (Al, Sb, As, Cd, Cs, Li, Mn, Rb, Tl, U, V, Zn). Spadable lithium waste contains similar CoPCs, but at generally lower concentrations than TSF materials therefore are not expected to significantly change seepage source terms. The ratio of Spadable Waste to maximum tailings deposition last year was 1:6,500. As the ratio of Spadable Waste (or Clarifier Effluent) to tailings is unlikely to exceed (conservatively) 1:1,000 for any given day of deposition, the addition of Spadable Lithium Waste is not expected to change the leachate characteristics of TSF4;
- Seepage chemistry will continue to be driven primarily by TSF tailings water;
- Existing mitigation measures – including engineering controls and an established monitoring network – are considered adequate to manage seepage; and
- The residual water quality impact risk to off-site receptors is assessed as low, with risks considered manageable under the current control measures.

EGI (2025) assesses disposal of Spadable Waste rather than Clarifier Effluent. Talison has evaluated the chemical composition of Clarifier Effluent against the tailings decant which is also deposited to TSF4 and found that the concentration of CoPC's is broadly similar. While the chemical composition of both Spadable Waste and Clarifier Effluent is different, neither present an increase in concentration of CoPC's above what is present in the existing tailings decant. On this basis, disposal of Clarifier Effluent or Spadable Waste to TSF4 does not present an increased environmental risk.
The controls are unchanged from what was assessed and approved by DWER for W6618/2021/1 (which also approved TLO). Talison does not consider additional controls are warranted and has not included further discussion of the emissions and discharge risks associated with the proposed addition of Spadable Waste or Effluent Sludge to TSF4.

3B3 Waste Rock Placement and Ore Storage in TSF1

Operation of TSF1 is administered under Licence L4247/1991/13 primarily as an emergency discharge location for tailings. To date, Talison has utilised approximately two thirds of the emergency discharge allocation. Additional storage of tailings in TSF1, other than emergency discharge, is not currently authorised. As the tailings consolidate and dry, the surface of tailings stored within TSF1 is a potential source of dust emissions.

Talison proposes that ore is stockpiled within the TSF1 footprint (refer Attachment 3B10). This would require a RoM constructed from waste rock, not currently authorised by the Licence.

A potential future raise of TSF4 (subject to separate works approval) would require buttressing of the TSF4 northern embankment by waste rock placed within TSF1. The reason for this is that the current TSF4 design (GHD 2021a) assumed that TSF1 would be recommissioned for tailings storage, raised, and that the TSF1 southern embankment would support the TSF4 northern embankment – this recommissioning of TSF1 has not proceeded. Talison therefore requires that the Licence authorises waste rock placement in TSF1, so that application for works approval of a TSF4 raise utilising a northern embankment waste rock buttress within TSF1 may be submitted to DWER for assessment.

Placement of waste rock (and ore) within TSF1 will assist with control of dust emissions from the residual tailings surface. [redacted]

EGI (2025) undertook an assessment of the geochemical characteristics of, and risk associated with, waste rock being placed within TSF1 to determine whether disposing waste rock to TSF1 materially increases environmental risk. The assessment utilised a conceptual hydrogeochemical model of the site (i.e., source-pathway-receptors in relation to seepage from mine waste landforms and TSFs), to assess whether the placement of tailings and NAF waste rock in TSF1 materially increases environmental risk from seepage. The key considerations of the report are summarised in the following sections.

3B3.1 Water Quality

The following information is taken from EGI (2025) unless otherwise stated.

TSF1 is currently being re-mined with the material being treated in the Tailings Retreatment Plant (TRP) and tailings from that operation (together with tailings from the other processing plants being disposed in TSF4. Water quality data from monitoring bores surrounding the TSFs was reviewed by EGI for the period (April 2018 – June 2025). The following key observations were noted:

- Groundwater across the site was generally circumneutral to slightly acidic, with the exception of MB17/04I (TSF1/2 western embankment) which ranged from moderately to strongly acidic (min. pH 3.6) and MB20/01I (south-west of TSF1/2) which ranged from slightly acidic to moderately acidic (min. pH 4.4);
- While not directly measured (converted from TDS), EC ranged from low (0.12dS/m) to very high (15.83dS/m), with the highest concentrations (>10dS/m) noted in wells to the west of TSF1/2 (MB01/11, MB17/04I, MB17/04D, and MB97/02);
- Sulphate was generally low, with one slightly elevated result (454mg/L) reported at MB22/23S (south-east of TSF4);
- Generally low metals results, with some slightly elevated to elevated concentrations for:
    - Aluminium: slightly elevated results (max. 2.84mg/L) south of TSF1 (MB22/01S, MB22/01I, MB22/01D), west of TSF4 (MB20/01S, MB20/01I), and south of TSF4 (MB22/23S, MB22/23I, PB22/01S);
    - Arsenic: slightly elevated results (max. 0.23mg/L) east of TSF1 (MB01/11), along the west TSF1/2 embankment (MB17/04D, MB17/06S, MB17/06I, MB16/06D), west of TSF1/2 (MB3, MB97/01) and south-east of TSF4 (MB22/23D);
    - Cadmium: slightly elevated results (max. 0.0004mg/L) south and west of TSF4 (MB20/01D, PB22/01S);
    - Cobalt: slightly elevated results (max. 0.16mg/L) across the majority of monitored locations;
    - Copper: slightly elevated results (max. 0.12mg/L) across the majority of monitored locations;

- o Iron: slightly elevated results across the majority of monitored locations. Elevated results (max. 120mg/L) located [redacted] west TSF1/2 embankment (MB17/02S, MB17/02I, MB17/04I, MB17/04D, MB17/05, MB17/06S, MB97/04), WRD seepage (MB20/04D), and south of TSF1/4 (MB22/01S, MB22/01D);
- o Lithium: slightly elevated results (max. 2.8mg/L) along the west TSF1/2 embankment (MB17/02S);
- o Manganese: slightly elevated results (max. 9.3mg/L) to the west of TSF1/2 (MB01/11, MB17/04D, MB97/02) and in the WRD seepage (MB20/04D);
- o Nickel: slightly elevated results (max. 0.17mg/L) across the majority of monitored locations; and
- o Uranium: occasional slightly elevated results (max 0.04mg/L) at various locations (MB01/1, MB17/06S, MB17/06I, MB17/06D, MB20/04S, MB20/04I, MB22/01I, MB3).

Overall, the results show the potential influence of some acidic or saline drainage from the existing tailings facilities or another mine source, particularly along the TSF1/2 western embankment. Slightly elevated to elevated concentrations of Al, As, Fe, Li, and Mn were also noted in these locations, and may be indicators of seepage that has been adversely influenced by tailings storage.

3B3.2 Conceptual Site Model

The relevant aspects of the conceptual site model (**CSM**) presented EGI (2025) were focussed on characterising the geochemical risk profile associated with seepage generation and transport pathways from TSF1 and TSF4. Key determinations for the risk assessment were to evaluate the potential for contaminant release (source), mechanisms of potential contaminant migration (pathways), and potential end-use environmental or human receptors.

TSF1 has been used for deposition of mine tailings material from the mining and processing of pegmatite and tantalum ore, deposited using piped slurry methods. The facility is unlined, and the embankments are formed of interlayered rockfill (cobbles of dolerite and waste rock) and earth-fill (very stiff residual soil) (GHD, 2021a). The tailings materials stored in TSF1 have the potential to impact the surrounding receiving environment through mobilisation of seepage into the surface water and groundwater systems (GHD, 2023e).

TSF1 shallow seepage water collection drains and ponds area around the perimeter of TSF1 capture seepage to be pumped back into the mine water circuit (**MWC**). The TSF1 surface discharges will not migrate into areas off the mine site operational boundary (GHD, 2023e).

The groundwater flow directions (see Figure 29) indicate that seepage which migrates into the subsurface beneath TSF2 will tend to follow the westerly flow paths. TSF4 seepage can be expected to flow south and west. TSF1 flow paths are blocked by TSF2 to the west and TSF4 to the south.

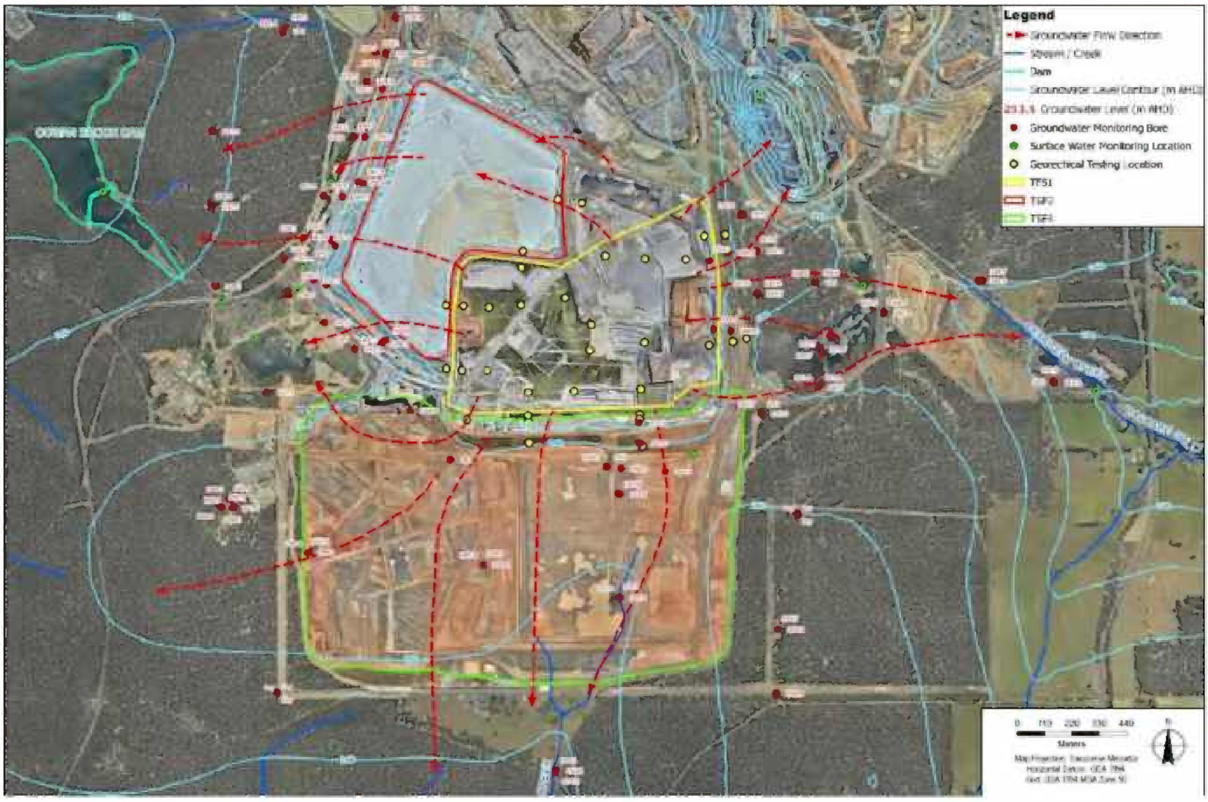


Figure 28: Groundwater flow directions (from GHD 2023c)

3B3.3 Source-Pathway-Receptor Linkages

The key identified source, pathway, receptor linkages for the TSF area (GHD, 2023f) are shown in Figure 29.

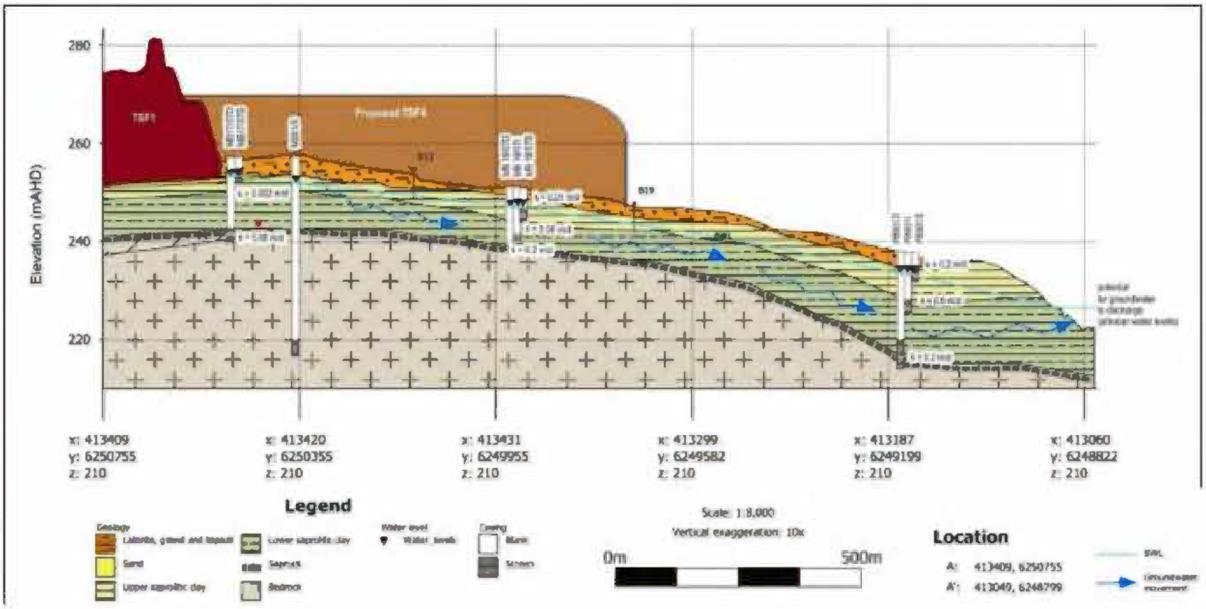


Figure 29: Conceptual site model for TSF area (from GHD 2023f)

Source

Existing tailings decant and leach water from TSF1 and TSF4 containing contaminants of potential concern (CoPCs) exceeding human health and environmental guidelines (Al, Sb, As, Cd, Cs, Li, Mn, Rb, Tl, U, V, Zn).

NAF waste rock and spadable lithium waste placed into TSF1 will contain similar CoPCs, but at generally lower concentrations than TSF materials. Not expected to significantly change seepage source terms.

Pathways

Surface water:

- Surface/shallow seepage discharges into collection drains and seepage ponds, which is then captured and pumped back into MWC. No migration beyond operational boundary.

Groundwater:

- Northern and western subsurface seepage flows are captured within the MWC. No migration beyond the operational boundary; and
- Southern and the eastern groundwater flow paths indicate potential for migration of subsurface seepage off site towards Woljenup and Cemetery Creeks respectively, where impacted groundwater has the potential to discharge into the creeks as surface water flow.

Receptors

Sensitive receptors associated with Woljenup and Cemetery Creeks, where groundwater may discharge:

- Aquatic environments: aquatic organisms and ecological processes in creeks, rivers, and dams;
- Primary production: irrigation and stock watering using surface water and groundwater;
- Potable use: surface water and groundwater accessed for drinking; and
- Recreational use: creeks, rivers, and dams used for recreation.

3B3.4 Mitigation & Management

Whilst the addition of waste rock and spadable waste into TSF1 is not expected to significantly change seepage source terms, the proposed additional mitigation measures for managing the proposed deposition materials (NAF waste rock and spadable lithium waste) are as follows:

Material segregation

- Where waste rock may be placed within a TSF it will be limited to NAF waste rock material.

Where WTF waste is placed into a TSF it will be limited to relatively geochemically benign spadable waste. The following existing controls remain:

TSF1 design

- Shallow seepage captured in drains and ponds and returned to the MWC;

- Groundwater (north and west) flows internally into Cowan Brook Dam and the pit within operational boundary; and
- Off-site pathways (south and east) remain under ongoing assessment, with no current impacts to receiving environment identified.

TSF4 design

- Composite liner system (clay liner & BGM);
- Underdrainage and perimeter drains to manage seepage; and
- Network of lined sumps with pump-back to MWC.

Monitoring network

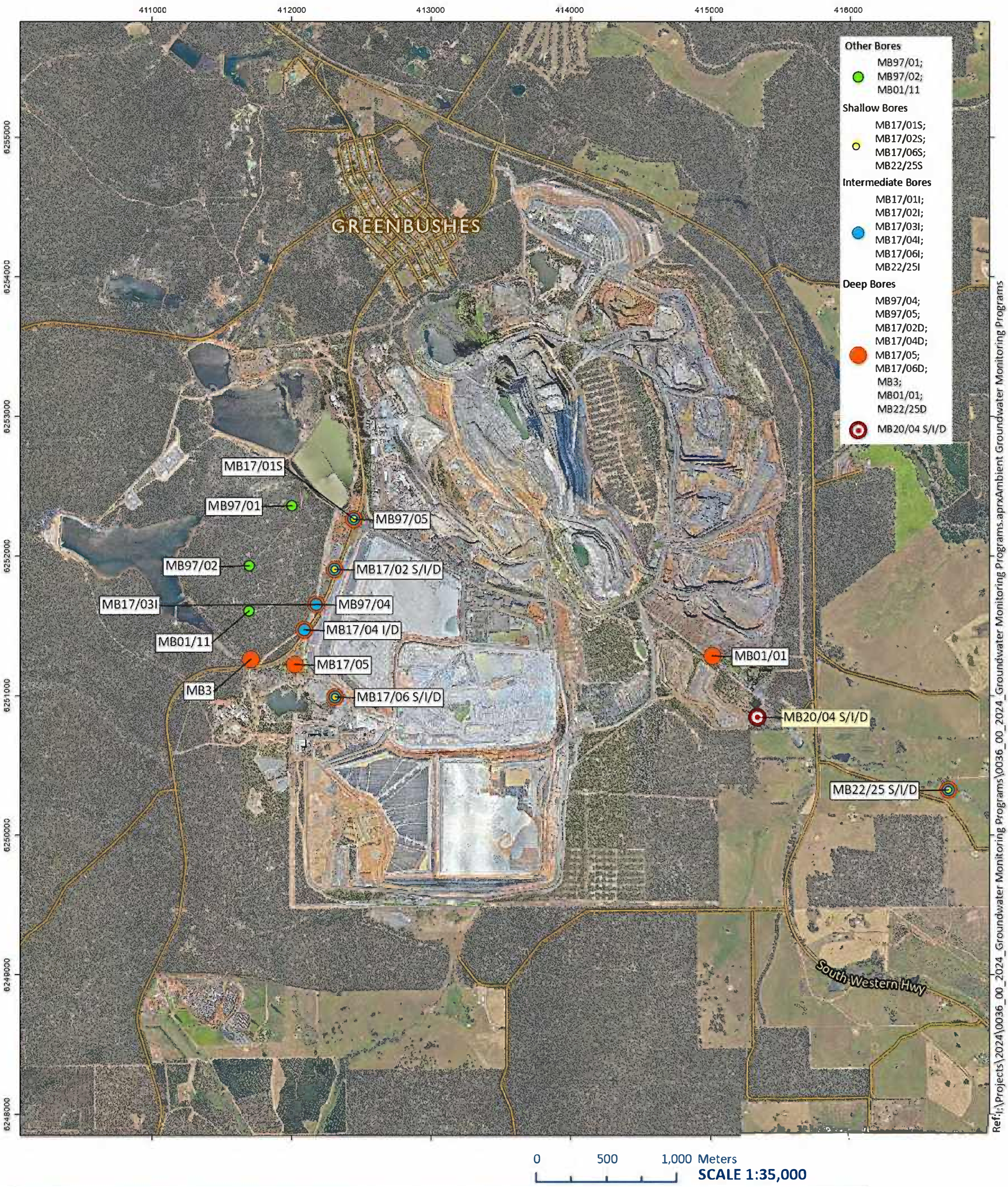
- Established groundwater and surface water monitoring network in place. Network considered adequate for early detection of changes, however an annual water quality review targeted at potential Acid Rock Drainage impacts would be beneficial; and
- Licence-based monitoring has identified localised seepage impacts (e.g., acidic groundwater bores west of TSF1/2), however no measured impacts to the receiving environment.

Risk Profile

Based on the information reviewed, storage of additional NAF waste rock and spadable waste within TSF1/4 is unlikely to have a material impact on the overall seepage water quality risk profile of the facilities. Key findings are:

- Waste rock will be non-acid forming and spadable WTF waste is not likely to produce adverse contact water quality in circum-neutral conditions and thus either material is not expected to increase seepage contaminant loads or significantly worsen seepage quality;
- Seepage chemistry is driven primarily by TSF tailings water, with some indicators of potential acidic, saline, and metalliferous drainage. Key COPCs include Al, As, Fe, Li, Mn, U;
- Mitigation measures – including engineering controls, and an established monitoring network – are considered adequate to manage seepage; and
- The residual water quality impact risk to off-site receptors is assessed as low to moderate, with risks considered manageable under the current and planned control measures.

On this basis, the proposed activities do not present an increased environmental risk rather they reduce the potential risk of dust lift-off from consolidated and dry tailings. Talison does not consider additional controls are warranted and has not included further discussion of the emissions and discharge risks associated with the proposed capping of TSF1 with waste rock for dust suppression.



TALISON LICENCE
Figure 30: Groundwater Monitoring Programs

Datum: GDA94
Projection: MGA Zone 50

TALISON LITHIUM

EGI3B4 Pipeline Leak Detection Plan

Tailings and return water pipelines are high den[redacted]ethylene (**HDPE**) and installed within an earthen/rock bund to provide control in the event of spillage with the exception of a few sections of pipelines located within the plant areas in pipeline corridors. As pipelines already run alongside the western buttress of TSF2, a catchment berm has been established in this location to control the risk of release in the event of a pipeline leak. The berm will capture leaks in this section of the pipeline corridor. The following mitigation measures have been implemented to mitigate emissions risks:

- Pipeline corridors within earthen bunds;
- During a leak event, tailings or process water will drain to sedimentation basins or to existing Sump 3 (as per current licence L4247/1991/13), then returned to MWC; and
- Pipeline inspections at least once per shift and action taken to remediate.

Talison has also developed and implemented (in part) a Pipeline Leak Detection Plan (**PLDP**). Implementation of the plan is required under Condition 14 of L4247/1991/13, with condition 14 (c) specifying the plan must be implemented by 1 July 2025.

The PLDP evaluates the environmental risk of each pipeline based on several factors including the pipeline contents, presence of secondary containment infrastructure and use status. Talison has made substantial progress towards implementing the PLDP, focusing on higher risk pipelines first. However, there have been significant changes to pipeline infrastructure at Talison, driven largely by:

- Redirection of tailings from Tailings Storage Facility 2 **(TSF2)** to the newly commissioned Central tailings pumping station **(CTPS)** and Tailings Storage Facility 4 **(TSF4)**; and
- Decommissioning of several redundant pipelines.

As a consequence, Talison has completed a review of all pipelines on site and updated the leak detection plan. To date, Talison has undertaken Civil and Electrical investigations of existing pipeline leak detection infrastructure and substantially completed the design of the required electrical and mechanical design. These steps are required prior to procurement of the required equipment with mechanical components expected to be procured between Q1 and Q3 2026 and installed thereafter. Electrical works are scheduled to be undertaken in parallel with installation of the mechanical works however they will take longer. Project completion is scheduled for March 2027.

Talison therefore requests an extension to the completion date for this works to 31 March 2027.

Talison will complete an ongoing program to risk assess new pipelines installed subsequent to the development of this plan, to determine if leak detection and bunding is required.

3B5 Removal of BOD for Wastewater Disposal

Condition 24 of L4247/1991/13 includes a requirement that the Biochemical Oxygen Demand (**BOD**) of wastewater is less than 10mg/L prior to being discharged to TSF4. BOD is a measure of the oxygen required by microorganisms to breakdown organic material, it is an indicator of the level of organic material in water and, in this case, the effectiveness of wastewater treatment. High BOD can result in depleted dissolved oxygen levels which may impact aquatic organisms. WWTP effluent BOD can fluctuate and, in some instances, may be above 10mg/L for short periods of time. Sampling and lab analysis of BOD can take a number of weeks for a result to be received. Measured BOD above 10mg/L has a significant lag and as such the current Licence condition is ambiguous.

TSF4 is Critical Containment Infrastructure and is designed to contain the materials disposed within. Any perceived environmental risk associated with disposal of effluent with BOD levels above 10mg/L in TSF4 are mitigated through containment and dilution.

The Department of Health set a BOD level of 20mg/L during commissioning of the WWTP and later removed the limit as operations were approved. In this case, measuring and managing wastewater disposal on the basis of BOD does not reduce the environmental risk of this activity beyond what is achieved through containment of the effluent to within TSF4, and is not practicable as BOD is not continuously monitored. On this basis Talison requests that the BOD limit be removed.

The control measures implemented at TSF4 to prevent seepage are adequate to mitigate the emission risk to downstream receptors from tailings and remain unchanged from what was assessed and approved by DWER for L4247/1991/13. The risk pathway for the seepage of WWTP effluent was identified in the risk assessment of the decision report (2012/0071641) for L4247/1991/13 as having a low risk and that the proposed controls were sufficient to mitigate the risk. Removal of monitoring and reporting requirements for BOD are not expected to materially change the risk profile of this activity, particularly in relation to seepage. The change will not affect any other risks associated with the WWTP. On this basis, Talison does not consider additional or different controls are required and has not included further discussion of the emissions and discharge risks associated with the proposed activities.

The proposed change to Table 12, WWTP outlet prior to discharge, is shown in Table 4.

Table 4: Proposed Change to Table 12, WWTP outlet prior to discharge

Monitoring point reference, as shown in Figure 2 of Schedule 1	Parameter	Limit	Unit	Averaging period	Frequency
WWTP outlet prior to discharge, as depicted Figure 16 of Schedule 1.	E. coli	1	cfu/100 mL	Spot sample	Monthly[2] Sample collection and preservation as per AS/NZS 5667.1. Analysis as per AS/NZS 5667.10 and conducted by a laboratory with NATA accreditation.
	Thermotolerant coliforms	-			
	~~BOD~~	~~10~~	mg/L		
	Total Suspended Solids	10			
	Total Nitrogen	15			
	Total Phosphorous	2			

Monitoring point reference, as shown in Figure 2 of Schedule 1	Parameter	Limit	Unit	Averaging period	Frequency
	Total Dissolved Solids	-			
	pH[1]	6.5 – 8.5	pH units	N/A	Continuous
	Residual chlorine	0.2 – 2.0	mg/L		
	Turbidity	2	NTU		
	Cumulative volumetric flow	187.5~~0~~	m^3/day	Daily	

Condition 13, Table 8, Wastewater Treatment Plant (c) requires that:

Treated effluent that does not meet discharge limits listed in Table 11 is to be stored in the treated effluent buffer storage tank prior to:

i. *removal by a licensed Controlled Waste Carrier for disposal to a premises authorised by the department to accept the waste; or*
ii. *re-circulation back through the WWTP;*

Talison notes that continuous monitoring is undertaken only of:

- pH;
- Residual chlorine;
- Turbidity; and
- Cumulative volumetric flow.

It’s not possible to store treated effluent in the buffer storage tank in response to a reported exceedance of parameter that is sampled monthly for external laboratory analysis. That is, the exceedance occurred some time prior to being made known to Talison, by which time the water quality is likely to have recovered to the design specifications. Talison agrees with the Licence approach of increasing sampling frequency of a monthly parameter to weekly in the event of an exceedance (as per Table 12 Note 2); the current Condition 13, Table 8, Wastewater Treatment Plant (c), however, may be interpreted as contradicting this arrangement. Talison proposed changes to Condition 13, Table 8, Wastewater Treatment Plant (c) are presented in Table 5.

Table 5: Proposed Changes to Condition 13, Table 8, Wastewater Treatment Plant (c)

Approved	Proposed	Rationale
Treated effluent that does not meet discharge limits listed in Table 11 is to be stored in the treated effluent buffer storage tank prior to: *i. removal by a licensed Controlled Waste Carrier for disposal to a premises authorised by the department to accept the waste; or* *ii. re-circulation back through the WWTP;*	*Where a continuously sampled parameter of treated effluent ~~that~~ does not meet discharge limits listed in Table 8a, treated effluent is to be stored in the treated effluent buffer storage tank prior to:* *i. removal by a licensed Controlled Waste Carrier for disposal to a premises authorised by the department to accept the waste; or* *ii. re-circulation back through the WWTP;*	Continuous monitoring is undertaken only of pH, residual chlorine, turbidity, and cumulative volumetric flow. It's not pragmatic to store treated effluent in the buffer storage tank in response to a reported exceedance of parameter that is sampled monthly for laboratory analysis.

3B6 Amendment to Condition 2 Table 2 – TSF4 Cell 1 and Cell 2

Condition 2, Table 2: TSF4 cell 1 and cell 2 requires:

The underdrainage system to have:

> (d)iii. Level sensors and automatically activated standby pump if high water levels are reached (at Sump B);
>
> (d)iv. Two electric pumps on duty/standby configuration, additional diesel standby pump, level sensors (low, high, high-high), flow meter and manual shut off valves installed (at Sump C);
>
> (d)v. Two submersible pumps on duty/standby configuration (at Sump D); and
>
> (d)vii. Seepage pond sumps to be equipped with remotely operated pumps.

All tailings, decant and seepage pipelines to be:

> (f)i. Equipped with telemetry and pressure sensors to detect leaks and failures;
>
> (f)ii. Equipped with automatic cut-outs in the event of a pipe failure; and
>
> (f)iii. Equipped with leak monitoring which triggers the related pump/s to automatically shut down in High setpoint is exceeded.

TSF4 does not currently comply with these conditions and Talison is implementing a plan (*TSF4 Compliance Plan*) to rectify these non-compliances.

There is one diesel-powered pump operational at Sump B, and no electricity supply to Sump B capable of automatically or remotely activating a pump. The current Mine plan requires that Sump B is backfilled with waste rock (subject to approval under Part V of the EP Act of a revised TSF4 design) as it is situated within the approved WRL footprint. It is planned that Sump B will be subsumed by Floyds WRL in H2 2026 or H1 2027. Installation of a sta[redacted]ump or electricity-supply infrastructure is therefore not proposed as any further improvements would need to be decommission in the short term or would be destroyed by Floyds WRL. This precludes the installation and operation of an automatically or remotely operated pump at Sump B. A water level gauge is installed in Sump B.

Talison considers that twice-daily inspections will be sufficient in the short- to medium-term (i.e. until EP Act Part V approval of a revised TSF4 design is obtained and alternative underdrainage management operational) to identify if the Sump B pump fails and/or high operating level (**HOL**) is exceeded. If this occurs, additional temporary pumping capacity will be installed and operated until the primary pump is operational and the water level has returned to < HOL. Twice-daily inspections of the Sump B water level and installation of back-up pumping will adequately manage risk associated with potential overflow of Sump B in the short- to medium-term. It is therefore not currently necessary for Sump B to be fitted with level sensors and automatically activated standby pump, or remote pump operation. In the event that revision of the TSF4 design and filling of Sump B is not authorised or otherwise does not proceed, Talison will implement more permanent engineering controls, such as a stand-by pump, to supplement the administrative controls (i.e. inspections).

Talison considers that the provisions of (d)iv exceed that required to reduce to an acceptable level environmental risk associated with potential Sump C overflow. Sump C does not currently receive underdrainage flows and is unlikely to do so until the Cell 2 tailings surface reaches an elevation of 1,275mRL, projected to occur in December 2026. It is currently fitted with one diesel-powered pump.

When flows into Sump C eventually do occur, level sensors and twice-daily inspections will identify if the sump level exceeds HOL. If this occurs and the water level continues to rise or does not lower, inflows to the sump will be turned off using underdrainage shut-off valves. Depending on the quantity and duration of excessive underdrainage flows to Sump C, additional temporary pumping capacity may be installed to allow shut-off valves to be opened and Sump C water levels to lower. In the unlikely event that Sump C were to overflow, it would drain to Sump A. It is therefore not necessary for Sump C to be permanently fitted with standby pumps.

One land-based diesel pump is currently fitted to Sump D, with relatively minor (well within pump capacity) underdrainage flows into Sump D. Talison considers that, under normal circumstances, operation of a single pump, with twice-daily inspections, will maintain the Sump D water level below HOL and reduce to an acceptable level environmental risk associated with potential Sump D overflow. Talison notes that, in the unlikely event of an overflow, any potential Sump D overflow would report to TSF2 Sump 3 (i.e. the MWC) via the TSF2 southern embankment toe drain.

Should the quantity of underdrainage flows to Sump D exceed the capacity of the Sump D pump, additional temporary or permanent pumping capacity will be installed as required. It is therefore not necessary for Sump D to be fitted with a second pump at this point in time.

Remote sump pump operation has limited potential to reduce environmental risk and is not proposed by Talison to be implemented.

For sub-conditions f(i-iii) the automatic pump shut-off of tailings pumps would require all upstream processing infrastructure to shut down, which would cause settling and blockages in pipelines and risk equipment damage.

A practicable solution is that leakage or failure of the incoming tailings flows to TSF4 will trigger an alarm at a continuously monitored control room and immediate investigation of the event. Shutdown of upstream infrastructure can be appropriately controlled and repairs effected as required.

Talison projects that compliance with Conditions 2(d)i-viii and (f)i-iii, with the exceptions discussed above, can be achieved by 31 December 2026. To avoid non-compliance with the amended licence, Talison proposes that these requirements of Condition 2 are replaced with a condition to implement the *TSF4 Compliance Plan*, as set out in Table 6.

Table 6: Proposed Changes to Condition 2, Table 2: TSF4 cell 1 and cell 2

Approved	Proposed	Rationale
(d) Underdrainage system: i. Freeboard on seepage ponds (Sump A, Sump B and Sump C) to allow for 10% annual exceedance probability 24-hour event; ii. Automatic valve shut off (at Sump A) in case of water level exceedance or pump failure; iii. Level sensors and automatically activated standby pump if high water levels are reached (at Sump B); iv. Two electric pumps on duty/standby configuration, additional diesel standby pump, level sensors (low, high, high-high), flow meter and manual shut off valves installed (at Sump C); v. Two submersible pumps on duty/standby configuration (at Sump D) vi. Operators are required to undertake regular	(d) Underdrainage system: i. Freeboard on seepage ponds (Sump A, Sump B and Sump C) to allow for 10% annual exceedance probability 24-hour event; ii. One pump each at Sump C and D iii. Operators are required to undertake regular inspections of Sump B, C and D to ensure that pumps are working adequately; iv. Sufficient standby back-up pumps must be available for rapid deployment should primary sump pumps fail; and v. Implementation by 31 December 2026 of the *TSF4 Compliance Plan*, which requires the underdrainage system to have: 1. Automatic valve shut off (at Sump A) in case of water level exceedance or pump failure; and 2. Level sensors (low, high, high-high), flow meter and manual shut off valves installed at Sump C.	It is not possible to comply with the current (L4247/1991/13 4 September 2025) conditions until ongoing rectifications works have been completed. Talison projects that these works can be completed by 31 December 2026. Environmental risk during the implementation period will be managed by the licensed monitoring program and associated management triggers / actions / controls.

inspections of Sump C and D to ensure that pumps are working adequately; vii. Seepage ponds sumps to be equipped with remotely operated pumps; and viii. Sufficient standby back up pumps must be available for rapid deployment should primary sump pumps fail;		
(f) All tailings, decant and seepage pipelines to be: i. Equipped with telemetry and pressure sensors to detect leaks and failures; ii. Equipped with automatic cut-outs in the event of a pipe failure; and iii. Equipped with leak monitoring which triggers the related pump/s to automatically shut down in High setpoint is exceeded.	(f) Implementation by 31 December 2026 of the *TSF4 Compliance Plan*, which requires tailings, decant and seepage pipelines to be: i. Equipped with telemetry and flowmeters or pressure sensors to detect leaks and failures. Leak detection flowmeters to trigger alarms at continuously monitored control room(s) in the event a differential flow measurement is detected; ~~ii. Equipped with automatic cut-outs in the event of a pipe failure;~~ and ii~~i~~. Bunded to provide secondary containment; and which requires decant and seepage pipelines to be: iii. Equipped with automatic cut-outs in the event of a pipe failure.	It is not possible to comply with the current (L4247/1991/13 4 September 2025) conditions until ongoing rectifications works have been completed. Talison projects that these works can be completed by 31 December 2026. Environmental risk during the implementation period will be managed by the licensed monitoring program and associated management triggers / actions / controls.

Note that bunding of pipelines provides short term containment in the event of leaks, overflows and/or failure.

3B7 Amendment to Tables 12 and 19 of the L4247/1991/13

Condition 24, Table 12 of L4247/1991/13 currently does not allow for redox potential (Eh) in Clear Water Dam to be measured using in-field, non-NATA accredited analysis.

This Application seeks to amend Table 12 to allow for Redox Potential (Eh) in Clear Water Dam to be able to be measured using calibrated in-field, non-NATA accredited analysis. Field measurement of the in-situ water body provides a more accurate Redox potential (Eh) measurement as the sample is collected in 'real time' and the sample has not bee[redacted]d to the atmosphere in a different way to the water body. Real time water quality measurements of the Clear Water Dam also provide for rapid intervention if required.

Condition 32, Table 19 equally does not allow for in-field, non-NATA accredited analysis for pH in groundwater bores. This Application seeks to amend Table 19 to allow for calibrated in-field, non-NATA accredited analysis for pH in all groundwater bores. This will allow for calibrated in-situ measurement of pH - which may otherwise change in samples physically removed from their surroundings.

In addition, due to the relatively low volume of CWD and the operational regime of water constantly being added from the decant and removed for the raw water supply, there is a short detention time for water being held in the dam. As a consequence, CWD pH can vary significantly over a short time period, which can result in the spot sample being outside of the Licence range (pH6-9). Under the current licence requirements, part A and B notification to DWER is required for every weekly pH exceedance, which may incur a significant administrative effort by both Talison and DWER for little or no environmental benefit. Talison proposes that pH is measured weekly and averaged monthly for reporting against the limits. This would smooth out the high and low pH events, and result in fewer non-compliances requiring reporting while having no impact on CWD water quality.

3B8 Removal of Groundwater Monitoring Bore MB22/01

Under condition 32 of L4247/1991/1e, Talison is required to monitor ambient groundwater quality from several monitoring bores identified in Table 19. Due to expansion of Floyds WRL and other construction and operational activities in the vicinity, it is becoming difficult to safely access groundwater bore MB22/01S/I/D for sampling. Consistent with the approved Floyds WRL expansion, MB22/01S/I/D will be overtopped with waste rock material in the next 1-2 years. MB22/01S/I/D provides down stream water quality data which is also captured through monitoring of MB20/04 and MB22/08 bores east / southeast of the Premises.

Talison considers the monitoring data from MB22/01/S/I/D on average represents that captured through monitoring of MB20/04 and M22/08 and is therefore not essential to monitoring downstream impacts to groundwater. To avoid unnecessary safety risks associated with monitoring from this point, Talison proposes that MB22/01S/I/D is removed from the Licence (Table 19). MB20/04 and MB22/08 will continue to provide downgradient groundwater monitoring. Talison expects that this proposed change will result in no change to the environment while reducing risks to personnel safety.

3B9 Condition 2 Table 2: Austins Dam

Condition 2, Table 2: Austins Dam does not accurately reflect certain aspects of operation of Austins Dam. Talison's proposed amendments and rationale are presented in Table 7.

Table 7: Proposed Changes to Condition 2, Table 2: Austins Dam

Approved	Proposed	Rationale
(a) Process water directly from Clear Water Dam; (b) Treated process water from the Reverse Osmosis Water Treatment Plant and Arsenic Remediation Unit (via the water treatment facility); and (c) Clean and potentially contaminated stormwater runoff from areas adjacent to dam.	(a) Process water directly from Clear Water Dam; (b) Treated process water and effluent from the Reverse Osmosis Water Treatment Plant and Arsenic Remediation Unit (via the water treatment facility); ~~and~~ (c) Clean and potentially contaminated stormwater runoff from areas adjacent to dam; and (d) water pumped from Salt Water Gully	Effluent from the WTP and ARU is treated in the Water Treatment Facility. Talison seeks to add SWG Dam to the MWC to increase security of our water supply. Contaminant concentrations of the SWG-sourced water (including but not limited to Li, As and Rb) are lower than the water currently in Austins dam.

The introduction of surface water from SWG will assist Talison to limit the build up of Li and As in the mine water circuit. A review of the available water quality data set for Austins dam and SWG shows that there is approximately 1:20 the concentration of Li in SWG and approximately 1:40 the concentration of As in Austins than SWG. As these are two key contaminants of potential concern that are known to be concentrating in the mine water circuit, the introduction of SWG water into the circuit will dilute concentrations of these analytes at the operations.

3B10 Ore Stockpile within Tailings Storage Facility #1

Talison proposes to stockpile ore within TSF1 from mid-2026. A conceptual general arrangement of the TSF1 Ore Stockpile (**TSF1OS**) is shown at Figure 31. The stockpile size, based on the concept design, is approximately 9,000,000 loose cubic metres.

Talison is planning to deposit into the TSF1OS from mid-2026 to ~2032. Post-2032, Talison will start to reclaim stockpiled ore for processing and/or blending with mined ore. Talison will draw down on the stockpile from ~2032 for the remainder of the life of mine.

Ore will be deposited into the TSF1OS in one 'lift' with the batter slopes at the angle of repose – that is, no berms will be constructed on the batters and the slopes will not be mechanically graded/formed. The proposed maximum height of the TSF1OS is 1,282mRL, level with the authorised maximum embankment height, and to tie into roads on and around the TSF1 embankments.

A 'skyway' constructed from waste rock will run around the perimeter and into the central section of the Stockpile (refer orange arrows on Figure 31), provide access to tip heads and for other purposes. Ore will be tipped into the green areas shown in Figure 31.

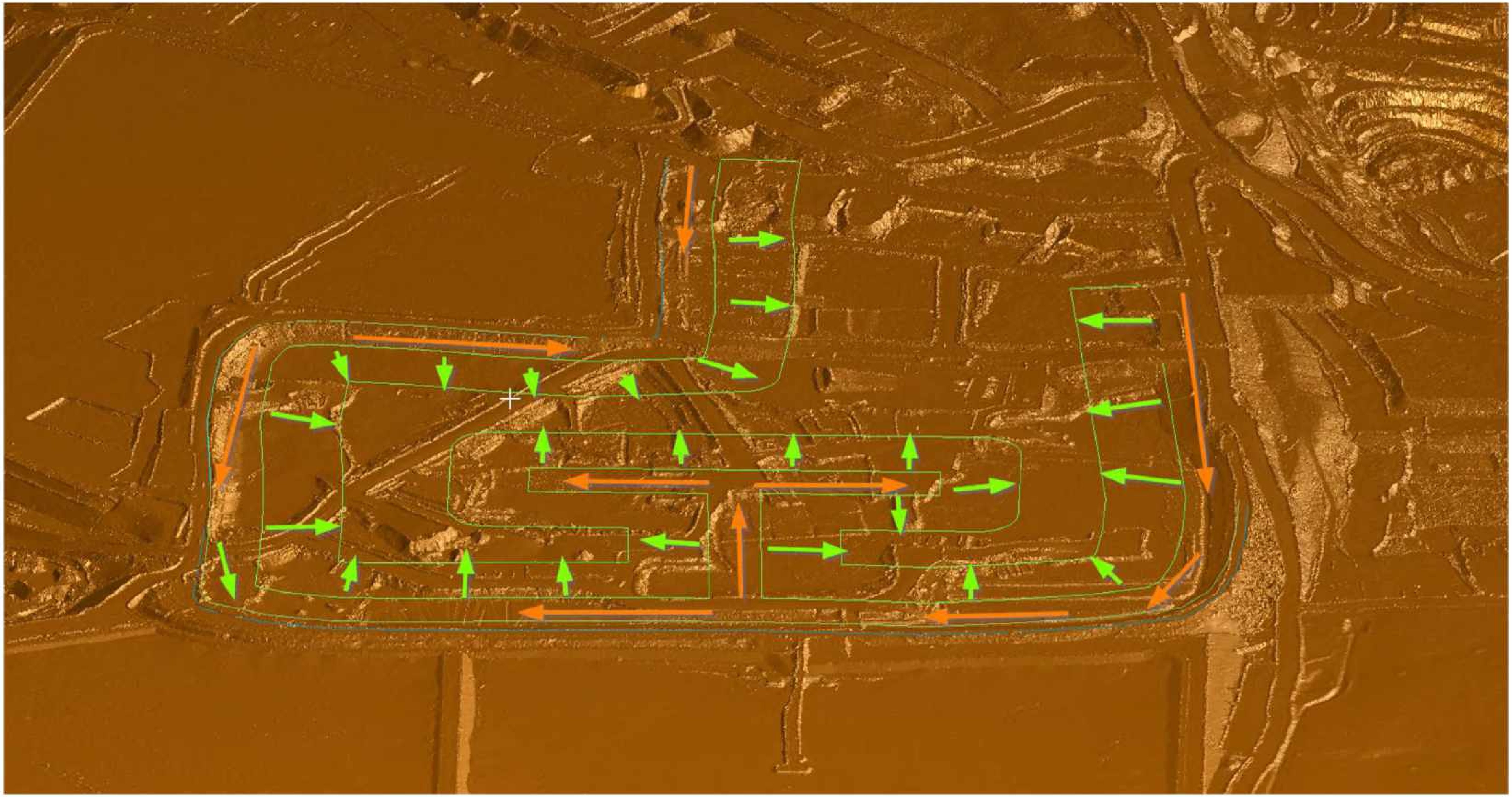


Figure 31: Tailings Storage Facility #1 Ore Stockpile General Arrangement

A geotechnical investigation (cone penetrometer testing (**CPT**)) is scheduled for Q1 2026, with the objective of determining loading by the ore stoc[redacted] the TSF1 tailings and embankments. The stockpile concept design will be further developed and refined with consideration given to the CPT results.

ATTACHMENT 5: OTHER APPROVALS AND CONSULTATION

5.1 Environment Protection and Biodiversity Cons[redacted] *Act 1999* (Cth)

The Project, including TSF4, was determined to be a controlled action under the EPBC Act, given the likelihood of it having a significant impact on one or more Matters of National Environmental Significance. In November 2019, Talison received Commonwealth environmental approval under EPBC 2018/8206. Permit to Clear Native Vegetation CPS 5056/2 (purpose permit) was also assessed and approved pursuant to the EPBC Act under EPBC 2013/6904.

An additional EPBC Referral and Amendment were submitted in June 2024. This Application is consistent with both EPBC instruments and the pending EPBC Referral/Amendment. The proposed activities in this application occur in areas that were approved as part of EPBC 2018/8206 and are not required to be approved under the pending EPBC Referral submitted in June 2024. On this basis, the proposed activities area considered to be approved under the EPBC Act.

5.2 *Environmental Protection Act 1986* (WA), Part IV

Talison referred the Project, including TSF4, to the Environmental Protection Authority (**EPA**) and approval was granted on 19 August 2019 under Ministerial Statement 1111 (**MS 1111**). Modification to the Development Envelope (**DE**) was later sought under Section 45c of the EP Act and approved on 6 April 2020. A further expansion of the MS 1111 DE and inclusion of a Worker's Village was approved under s45C on 15 May 2023.

In June 2024, an additional s45C application was submitted for further expansion of the MS 1111 DE and a minor increase in approved clearing area. The activities being assessed under the s45C application are not associated with the activities within this Application.

The Prescribed Premises boundary sits entirely within the existing MS 1111 DE and this Application is entirely consistent with the s45C.

5.3 *Environmental Protection Act* (WA), Part V

Native Vegetation Clearing Permits

In addition to MS 1111 which authorises clearing of up to 350ha of native vegetation, clearing for approved mining activities is undertaken under Permit to Clear Native Vegetation CPS 5056/2 (purpose permit). The permit authorises clearing of no more than 120ha across M01/6, M01/7, M01/16, G01/1 and G01/2. This Application does not require any additional land clearing.

Works Approvals and Licences

The Premises operates in accordance with L4247/1991/13 (including amendment notices). In addition, Works Approval applications (**WAA**) have been lodged for regulated infrastructure such as TSFs, CGPs and water management infrastructure. Works Approval applications have been approved for construction of CGP3, CGP4, TRP, TSF4, WWTPs, and the Cowan Brook Dam embankment raise.

Works Approval W6901/2024/1 (amended on 11/04/2025) is the specific approval for the construction works to raise TSF4 Cell 1 to a cres[redacted] of 270m Australian Height Datum (**AHD**) (1,270mRL mine datum). CCIRs TSF4 Cells 1 and 2 at a crest height of 1,270mRL have been approved.

5.4 *Mining Act 1978* (WA)

Mining activities dating back to 1991 and covering the key current disturbance areas have been approved under the *Mining Act 1978* (**Mining Act**). Activities approved include open mine pits, ore and waste stockpiles, RoM pads, processing facilities, TSFs, water storages, a Mine Access Road and support infrastructure.

TSF4 was approved to be constructed and operated to full design height (1,295mRL) under Reg ID 102901 on 10 January 2022. A Proforma for Notification of Minor Changes to a Mining Proposal was submitted to the Department of Mines, (**DMPE**) on 16 May 2023, detailing changes to the Cell 1 starter embankment height (staged construction) and the TSF4 rate of rise (Talison, 2023a). A further amendment under the Mining Act to TSF4 was approved under Reg ID 119573 in August 2023 to permit use of BGM liner for a portion of Cell 1 (Talison, 2023b). An additional amendment (under Reg ID 121397) to use a BGM liner for all of TSF4 Cell 2 was approved by DMPE on 8 December 2023. An updated MCP was submitted to DPME in September 2023 (Revision 6) and is currently under assessment.

This Application is consistent with these Mining Act approvals.

5.5 Other Approvals

The activities associated with the Application have been considered under the following legislation with no specific approvals required:

- Rights in Water and Irrigation Act 1914 (WA);
- Aboriginal Heritage Act 1972 (WA);
- Environmental Protection (Noise) Regulations 1997 (WA);
- Contaminated Sites Act 2003 (WA); and
- Biodiversity Conservation Act 2016 (WA).

5.6 Stakeholder Consultation

Talison maintains ongoing and extensive stakeholder consultation in relation to ongoing operations and the Project. The town of Greenbushes is immediately adjacent to the mine and was developed partly in response to the minerals present. The strong relationship with the community is reflected in the number and extent of activities involving the local community. As the TSF4 embankment raise is part of an already approved structure and location and does not involve any additional accommodation or workshop facilities, consultation to date has primarily focused on regulatory authorities, surrounding land holders and the immediate community.

The embankment raise from 1,265mRL to 1,270mRL is part of a staged embankment construction that will increase the tailings storage capacity for TSF4 Cell 1 and 2 to accommodate planned production over the next few years. Without the increase in capacity, production would cease or be significantly curtailed. Talison has engaged with DMPE and DWER specifically regarding the ongoing approval requirements for TSF4, including this application. [redacted]lder engagement relevant to the subject activities of this application is summarised in Table 8.

5.7 Stakeholder Consultation Plan

Talison will continue to consult with stakeholders and maintain consultation records in their Stakeholder Engagement Plan throughout construction and operation of the premises.

It is anticipated that this Application will be advertised for public comment as per DWER’s normal procedure.

Table 8: Stakeholder Engagement Register referencing information relevant to this Application

Stakeholder	Date/Time	Consultation type	Purpose of consultation	Stakeholder comments/issues
Government Stakeholders				
DBCA	07/07/2017	Meeting	Site closure & final land use - options for final land use and closure discussed.	Continue discussions regarding closure and final land use
DBCA	03/08/2017	Meeting	Meeting with DBCA to progress historic rehabilitation handback and closure criteria.	Progress closure criteria for the historic areas of the Site.
Multiple state government agencies	07/11/2017	Presentation	Discussion on change of tenure with multiple government agencies.	Continue to progress with discussions with relevant agencies.
DMIRS (now DMPE)	15/01/2018	Meeting	Discussed approval requirements for the planned expansion under the *Mining Act 1978* - MP & MCP.	MP required for whole of expanded mine in accordance with 2016 guidance. Updated MCP required for submission with the MP.
DBCA	07/02/2018	Meeting	Meeting with DBCA to discuss change of land tenure.	Progressed discussion relating to the proposed land tenure changes.
DEMIRS	27/02/20	Site Visit	MP and MCP.	Visit to existing operations including pits, TSFs, ROM, Floyds WRL, Austins and Southampton water bodies, Cowan Brook Dam. Inspection of proposed expansion areas.
DEMIRS	06/07/20	Meeting	TSF2, TSF 4 and Mine pit design.	Discussed a range of issues relating to TSF buttress, WRL design.

Stakeholder	Date/Time	Consultation type	Purpose of consultation	Stakeholder comments/issues
Communities, Employees and Contractors	September 2020	A paper survey was distributed to residents within the townsites of Greenbushes and North Greenbushes. An electronic copy of the survey was distributed to Talison employees and major contractors using company emails (Talison, 2020a; Appendix A).	As part of Talison's stakeholder engagement activities, Talison has undertaken a community perception survey to (inter alia): Gain an understanding of the community's view of how Talison should prepare for mine closure.	There was overwhelming support from the local community for land within the DE to support the following PMLUs: • Retaining water bodies for future recreation; • Maintaining the Cornwall open pit as a tourist drawcard; • Exploring the possibility of utilising existing infrastructure for alternative industries; and Ensuring remaining disturbed surfaces were safe, stable and supported a native vegetation cover.
DBCA/DWER/DPLH	Pre-2021	Meetings/Emails	Post-closure pit use	Backfilling of pit is unlikely as extent of resource is still unknown. The current plan is that pit voids will not be used for recreational purposes post-closure.
DBCA/DWER/BBG	Pre-2021	Meetings/Emails	Post-closure dam use	The community has indicated that freshwater dams should be retained. BBG has an interest in water bodies that abut its bird conservation wetland. Decision on which dams might be retained still to be made.

Stakeholder	Date/Time	Consultation type	Purpose of consultation	Stakeholder comments/issues
DBCA	12/01/2021	Phone call	Excising portion of state forest to develop the MAR.	DBCA to seek guidance on the DBCA requirements for MAR excision.
DBCA	27/04/2021	Meeting	Discussion on excision of MAR from State Forest. Potential engagement of Shire as contractor to construct the road. Public safety aspects of explosives and batching facility. Explosives contractor (Orica) may require lease from DBCA. DBCA to provide feedback Formal excision application required. DBCA has a Construction Conservation Management Plan, will provide guidance.	Excision can take up to 5 years from the DBCA. DBCA needs to have access to fire tracks etc. Talison to provide DBCA: • Disease Hygiene Management Plan (**DHMP**); • Eucalyptus relicta report; and • MAR design to minimise impact on State Forest.
DBCA	16/09/2021	Email	Present revised SF20 Excision MoU to DBCA for review and comment	DBCA advised Talison of proposed addition of ‘Schwenke’s’ area.
DBCA	25/11/2021	Meeting	Discuss proposed addition of ‘Schwenke’s’ area and identify	DBCA advised that Talison consider excising the MAR corridor initially as this is more urgent than excision of the complete Addition Area. Talison is likely to follow this excision strategy.

Stakeholder	Date/Time	Consultation type	Purpose of consultation	Stakeholder comments/issues
			suitable Addition Area to further the SF20 excision process.	
DWER	4/8/22	Meeting	TSF4 CCIR Strategy and Timing.	DWER advised the target for CCIR assessment is 10 working days and will endeavour to achieve this for TSF4. Discussed staging the CCIR for TSF1 Cell 1. DWER to consider and provide advice on approach and if WA amendment required to enable this.
DWER/JTSI	27/4/23	Meeting	Monthly Approvals Update. Talison advised DWER & JTSI that the proposed starter embankment height will be less than the approved 265mAHD.	Discussed approvals requirement related to the staging of TSF4 embankment. Advice from DWER that a works approval amendment will be required.
DEMIRS	16/5/23	Letter (email)	Advise DEMIRS of a non-significant change to Reg ID 115689 (staged construction of Cell 1).	DEMIRS advised 19/6/23 that no further information required; additional tenement conditions to be recommended.
DWER/JTSI	22/6/23	Meeting	Monthly Approvals Update. Talison advised DWER & JTSI of a proposal to partially line TSF4 Cell 1 with BGM as a contingency against delays to clay liner construction caused by rain.	Advice from DWER: • CCIR that does not match the approved clay liner would be non-compliant. • Works approval amendment required. DWER will refer application to DEMIRS for advice on stability.

Stakeholder	Date/Time	Consultation type	Purpose of consultation	Stakeholder comments/issues
DEMIRS	26/6/23	Meeting	Discuss proposal to partially line TSF4 Cell 1 with BGM as a contingency against delays to clay liner construction caused by rain.	Talison proposed to advise DEMIRS of a non-significant change to Reg ID 115689 (partial BGM lining of TSF4 Cell 1). Talison to provide DEMIRS with TSF4 Cell 1 BGM Design and Risk Assessment Report for geotechnical review when finalised.
DWER	3/7/23	Meeting	Discuss proposal to partially line TSF4 Cell 1 with BGM, temporary storage of tailings from TSF2 in TSF1 and approvals approach.	Talison to make application to amend the works approval as proposed, ensure application is supported by appropriate technical assessment of the implications of the change for the facility and environment. DWER would assess and, if appropriate, approve applications following due process.
DWER	26/10/23	Meeting	Monthly Approvals Update. Talison proposed a Part V approvals strategy and pathway.	DWER reviewed proposal and on 8 November 2023 emailed a proposed approvals pathway for TSF4 (and other proposals requiring assessment under Part V of the EP Act).
DWER	23/11/23	Meeting	Monthly Approvals Update. Talison proposed Part V approvals strategy and pathway.	Talison proposed Part V approvals strategy and pathway based on and aligned with that proposed on 8 November 2011 by DWER. DWER communicated at the meeting that it appeared to be sound and practicable.
DEMIRS (now DMPE)	10/03/25	Meeting	Mining Act Approvals Overview	The current status of mining approvals was discussed, including the transition to an Approvals Statement. Talison proposed to incorporate updates in the next revision of the MCP to align with new guidelines (prior to the Amendment Act being implemented) to assist with transition.
DWER/JTSI	05/06/25	Meeting	Monthly Approvals Update.	Advice from DWER:

Stakeholder	Date/Time	Consultation type	Purpose of consultation	Stakeholder comments/issues
			Talison advised DWER & JTSI of a proposal to use waste rock for dust suppression in TSF1 and TSF2, and to buttress the TSF4 northern embankment.	• Proposal will need to be assessed, and the Licence amended.
Community Stakeholders (landholders, employees, and other residents)				
Community	2013	Survey	Community views on post-closure land uses	Community favours returning most of the Site to state forest. Water bodies are viewed as a resource that should be retained. Artificial landforms are valued as part of the evolution of mining history and are viewed as something that can be incorporated into the Greenbushes historic precinct in future.
Community (in conjunction with BBG)	2014	Survey	Community views on post-closure land uses	While it was acknowledged that use of the active mine pit post mine closure is a very long-term concept (>20 years), the BBG requested that any ideas should be documented with the MCP. Due to the long period of time before closure and handover, and the likely changes in mining practice and technologies, specific recommendations are not made yet regarding the proposals within this MCP. The following ideas were proposed during the community workshops/survey: • Pit (once filled with water) becomes a lake for recreational use (i.e. motorised water sports); and

Stakeholder	Date/Time	Consultation type	Purpose of consultation	Stakeholder comments/issues
				• Connective wetland areas to be developed that incorporate Schwenkes, Southampton and Austin's water bodies with the existing TSF water bodies. Areas that currently exist as Floyds WRL dump and proposed dump expansion be redeveloped into a boulder landscape/adventure area
Communities, Employees and Contractors	September 2020	A paper survey was distributed to residents within the includes the townsites of Greenbushes and North Greenbushes. An electronic copy of the survey was distributed to Talison employees and major contactors using company emails (Talison, 2020a; Appendix A).	As part of Talison's stakeholder engagement activities, Talison has undertaken a community perception survey to (inter alia): Gain an understanding of the community's view of how Talison should prepare for mine closure.	There was overwhelming support from the local community for land within the DE to support the following PMLUs: • Retaining water bodies for future recreation; • Maintaining the Cornwall open pit as a tourist drawcard; • Exploring the possibility of utilising existing infrastructure for alternative industries; and Ensuring remaining disturbed surfaces were safe, stable, and supported a native vegetation cover.
Greenbushes Community (Discovery Centre)	Pre-2021	Meetings/Emails	Inclusion of historic features from the active mining area into the	Will be raised at a time closer to closure when it is clear what features will remain which could be accessed by the public.

Stakeholder	Date/Time	Consultation type	Purpose of consultation	Stakeholder comments/issues
			Discovery Centre historic mining precinct.	
Community member	30/3/21	Meeting	Concerns around TSF4 WAA Notification Process.	CM raised concerns that her neighbour had received a letter from DWER in regard to the TSF4 works approval and that they had not. Talison called back, explained that they had not been identified as a sensitive receptor by Talison or DWER. Talison explained the risk mitigation practices applied to the design, construction and operation of the TSF particularly in regard to managing seepage. CM stated that there were a number of small vulnerable frog species on certain parts of their property that they were concerned would be impacted. Talison reassured them that the risk of TSF4 impacting groundwater at their property was very low. CM was happy with outcome of the conversation.
Landholder 1 & Community Member	7/12/21	Meeting	Concerns about TSF4	Concerns listed by CM and Landholder included: water quality, water quantity, emergency preparedness/implications for dam burst, dust and noise. A copy of the TSF4 WAA and a copy of the water level monitoring conducted in the bores south of TSF1 were left on the premises and attendees discussed the implication of TSF4 on these items. CM and Landholder indicated they would be putting in a submission to DWER on the proposal and Talison encouraged them to participate in the stakeholder engagement process with DWER.
Community member	14/12/21	Phone call	Queries about TSF4	Community member (**CM**) asked: • What will TSF4 be lined with? • Is it earthquake proof?

Stakeholder	Date/Time	Consultation type	Purpose of consultation	Stakeholder comments/issues
				• When will construction start? • How long will it take to build TSF4?
Landholder 2	15/12/21	Meeting	Discuss water monitoring	Landholder was interested in additional water quality information and operation of the TSF4 underdrainage / seepage collection system. Talison advised Landholder that they would be given access to some sand; Landholder was very pleased with this update. Landholder indicated they would support the installation of bores on their property if they got the sand and additional info requested.
Landholder 2	25/3/22	Phone Call	Concerns Around TSF4 Monitoring Commitments and Water Supply.	Talison called Landholder to discuss the installation of monitoring bores on their property. Landholder advised they had not yet appealed the TSF4 Works Approval and that if Talison emailed DWER indicating Talison's intention to have the TSF4 Works Approval amended to include this program they would not appeal the decision. Talison agreed to this and on Tuesday 29/03/2022 advised DWER.
Landholder 1	31/3/22	Phone Call	Request for bore installation on Property.	Talison called Landholder to request installation of monitoring bore on property. Landholder indicated they did not want the bore installed and they were in negotiation with Talison to purchase the property and Talison could wait until that has gone through.
	August 2022	Community Perception Survey	Identify perception of and trust in Talison and Greenbushes Operations. Impacts experienced.	Stakeholders are interested in Talison's plans for the mine and associated infrastructure when mine closure occurs, including whether pits will be filled in and whether the accommodation camps will be made available for general sale/rental.

Stakeholder	Date/Time	Consultation type	Purpose of consultation	Stakeholder comments/issues
			The ways in which Talison can best engage with stakeholders.	
Landholder 2	3/9/22	Phone Call	TSF4 Works Approval Concerns & Appeal.	Landholder noted TSF4 Works Approval did not reference an agreed monitoring program on their property. Talison advised they would not be installing a solar pump and piping on the property and would continue to monitor water volumes and quality. In the event of any material impact Talison would look into options to reduce the impact on the landholder at that time. The landholder indicated if that was Talison's position they would be appealing the TSF4 Works Approval Decision.
	February 2023	Targeted stakeholder engagement program	To understand the concerns and perceptions of stakeholders with a focus on stakeholders within the primary area of influence. Most engagements were in-person, with some supplementary teleconferences and email feedback. The in-person engagements were undertaken using the following engagement methods: • Drop-in sessions; • Open house;	Stakeholders are interested in Talison's plans for the mine and associated infrastructure when mine closure occurs, including whether pits will be filled in and whether the accommodation camps will be made available for general sale/rental.

Stakeholder	Date/Time	Consultation type	Purpose of consultation	Stakeholder comments/issues
			• Focus groups; and • Interviews.	
Landholder 1, Landholder 2	28/3/23	Phone Calls	Notification of entry to take TSF4 Works Approval water samples	Landholders had no objections.
Landholder 1	24/7/23	Phone Call	Discuss notice of Licence amendment. Noise complaint, follow up from 2022 stormwater event.	Queried whether 2022 incident involving emission of water from TSF4 construction had been reported to DWER – TLA as advised will be reported in 2023 AER. Landholder advised he will report it to DWER in response to the Licence amendment. Complained his dam no longer has Koonacs in it, blames TLA. Complained about TSF4/Camp noise. TLA installed noise monitor, collected data.
Landholder 1	24/7/23	Phone Call	Discuss notice of Licence amendment. Noise complaint, follow up from 2022 stormwater event.	Queried whether 2022 incident involving emission of water from TSF4 construction had been reported to DWER – TLA as advised will be reported in 2023 AER. Landholder advised he will report it to DWER in response to the Licence amendment. Complained his dam no longer has Koonacs in it, blames TLA. Complained about TSF4/Camp noise. TLA installed noise monitor, collected data.
BBG	Three-year project	Collaboration under a Federal government grant	Rehabilitation	Development of historic water bodies into passive recreation areas for use by the community and to attract water birds. BBG is interested in including active mine site water bodies in the long-term.

Stakeholder	Date/Time	Consultation type	Purpose of consultation	Stakeholder comments/issues
Landowner 1	2024	Various	Obtain access to property (dam) for water monitoring	Access denied to property for water monitoring.
Grow Greenbushes Incorporated	3/4/24	Email	Request for Talison to present information on Environmental Approvals Amendment for WW6618 TSF4 liner.	Grow Greenbushes sent an email: • to check that that Noise and Dust annual report would be presented at the April meeting of Grow Greenbushes on Thursday April 4 as previously arranged; • Reminder that Grow Greenbushes group wanted further information on Talison's impact on groundwater and water • Sent details of a DWER call for public submission on Talison's amendment to W6618 referring to the change from clay to BGM liner for the TSF4. Talison confirmed the presentation of the Noise and Dust annual report, confirmed that information would be presented on water and groundwater use and further information on the amendment would also be provided at the Grow meeting in April. Resident satisfied.
Grow Greenbushes Incorporated	4/4/24	Presentation	Presented information on approvals amendments (incl. TSF4).	Talison presented information on approval amendments.
Shire of Bridgetown-Greenbushes	11/4/24	Meeting	Presented information on approvals amendments (incl. TSF4).	Talison presented information on Talison Expansion Project and Approvals as part of monthly update.
Shire of Bridgetown-Greenbushes	5/5/24	Meeting	Presented information on approvals amendments (incl. TSF4).	Talison presented information on Talison Expansion Project and Approvals as part of monthly update.

Stakeholder	Date/Time	Consultation type	Purpose of consultation	Stakeholder comments/issues
Landholder 1	31/5/24	Phone Call	Phone call and email to stakeholder regarding Noise and Water complaints. Also provided update on RMS relocation, TSF4 wall lift and Village WWTP expansion	Follow-up phone call and email regarding complaints regarding noise and water. Provided bore level data in response to complaint regarding low dam levels on property being linked to construction of TSF4. Bore data suggested depression in groundwater levels was regional, and linked to low rainfall over summer period. Also provided update on TSF4 wall lift.
Shire of Bridgetown-Greenbushes	7/6/24	Meeting	Presented information on approvals amendments (incl. TSF4).	Talison presented information on Talison Expansion Project and Approvals as part of monthly update.
Landowner 1	19/8/24	Phone call	Phone call to advise of revised Part V licence and granting of WA6901.	No objections to licence/works approval.

ATTACHMENT 6A: EMISSIONS AND DISCHARGES [redacted]

Talison currently holds Licence L4247/1991/13 for the Premises, which allows a tailings deposition rate of 5.2Mtpa. There are no proposed increases to the tailings deposition rate as part of this Application.

Talison has identified that the following amendments either do not introduce new or different emissions and discharge risks or result in a material change to existing emissions/discharges or the controls. On this basis, Talison deems further discussion of emissions in relation to the following activities is not warranted:

- Enable disposal of spadable water treatment plant waste to TSF4;
- Request an extension to Condition 14 (c) to allow remaining pipeline leak detection works to be completed by 31 March 2027;
- Amend Table 12 to remove the Biological Oxygen Demand (BOD) limit;
- Amend Table 2 to condition time-bound implementation of a *TSF4 Compliance Plan*;
- Removal of groundwater monitoring bore MB22/01; and
- Amend Table 12 and Table 19 to allow for in-field, non-NATA accredited analysis for redox in Clear Water Dam, and pH in all bores.

The following proposed activities are expected to impact emissions and discharges and require further discussion:

- Operate TSF4 Cell 1 and Cell 2 to an embankment height of 1,270mRL;
- Enable storage of waste rock in TSF 2; and
- Stockpile ore within TSF1.

Potential emissions and discharges from operation of TSF4 to a height of 1,265mRL were assessed by DWER and documented in the decision report for L4247/1991/13. This application is seeking licence to operate TSF4 at the embankment height (and hence deposition level) of 1,270mRL Cell 1 and Cell 2. Operational risks of TSF4 at 1,270mRL were assessed to enable TLO in W6901/2024/1. DWER conducted a risk assessment to evaluate approval of TLO for TSF4 at 1,270mRL in decision report DER2024/000099. Subsequent changes to seepage containment design were assessed in decision report APP-0026509 to support an amendment to W6901/2024/1.

Talison has re-assessed the potential emissions resulting from the proposed amendment to support this application, a summary provided in Table 9. No additional potential emissions and discharges are expected to occur from the operation of TSF4 to a height of 1,270mRL that haven't already been assessed and approved by DWER in support of W6901/2024/1.

Table 9: Assessment of potential emissions and discharges

<table>
<tr><th>Source / Activity</th><th>Potential Emission</th><th>Potential Pathways and Impact</th><th>Controls</th><th>Further discussion required?</th></tr>
<tr><td colspan="4">Operation</td><td></td></tr>
<tr><td rowspan="3">Changes to previously assessed seepage risk due to requested changes to seepage controls (i.e. embankment core permeability and liner specification changes)</td><td rowspan="3">TSF4 seepage water contaminated with metals/metalloids</td><td>Increased seepage through base and embankments causing groundwater contamination and mounding and impacting the root zones of native vegetation</td><td rowspan="2"><u>Existing conditions (W6901/2024/1):</u>
Condition 2: design construction (for lining with BGM); and
Condition 3: monitoring well installation.</td><td rowspan="3">No further discussion required.
As per decision report APP-0026509:
The delegated officer has considered the requested changes to the design are largely administrative, given the previous design reports and current design drawings on the works approval. It is noted that whilst the original design report (GHD, 2021) considered and specified the clay core as the main seepage abatement control (through the embankments), the updated design to include the BGM liner (which has a lower specified permeability) meets the intent of the clay core design.
Talison is not proposing any change to the seepage control design as part of this licence amendment.</td></tr>
<tr><td>Increased seepage through base and embankments causing groundwater contamination and mounding</td></tr>
<tr><td>Seepage through base and embankments causing contamination of surface water</td><td><u>Existing conditions (W6901/2024/1):</u>
Condition 2: construction requirements (for lining with BGM);
Condition 3: monitoring well installation (additional monitoring bore adjacent to SW23-02);
Condition 4 and 17: groundwater monitoring;
Condition 5 and 18: surface water monitoring; and
Condition 11 – derivation of DAF derived values.</td></tr>
</table>

<table>
<tr><th>Source / Activity</th><th>Potential Emission</th><th>Potential Pathways and Impact</th><th>Controls</th><th>Further discussion required?</th></tr>
<tr>
<td rowspan="2">TSF4 Cell 1 and Cell 2 operation to 1,270mRL</td>
<td rowspan="2">Tailings and contaminated water (metals/metalloids)</td>
<td>Seepage through base and embankments causing groundwater contamination and mounding</td>
<td rowspan="2"><u>Existing controls for TSF4 (W6618/2021/1)</u>

Existing liners including a mixture of clay liner engineered with permeability of $<1x10^{-9}$m/s and bituminous geomembrane liner. BGM liner has requirements/specifications for installation as detailed in W6618/2021/1;
Underdrainage system;

Upstream toe drains above and below the engineered clay or BGM liner discharging directly into seepage collection sumps;
Sand drainage blanket downstream of clay core, discharging to toe drain, reporting to collection sumps; and
Gravel finger drain outlets to sand blanket along southern boundary; seepage collected by twin collector pipes, discharging into collection sumps.

Toe drains;

Collecting seepage from underdrainage system and sand drainage blanket.

Collection sumps;

Four seepage collection sumps have been installed at low points along the embankment toe;
They are equipped with valves which close automatically in the event of water level in the sump rising to a maximum level or in case of pump failure;
They are sized to accommodate 3 hours of seepage from the facility, run-off from the perimeter embankment toe drain and an additional 10% annual exceedance probably 24-hour storm event; and
Daily inspections of integrity and sufficient capacity of collection sumps.

All seepage recovery systems equipped with remotely operated pumps and standby and/or back up pumps to prevent overflows;
Captured seepage and decant is returned to the mine water circuit;
Operated with a decant pond size of approximately $300m^2$ Additional proposed controls (this embankment lift);
A seepage monitoring and management plan;
Installation of new BGM liner along the embankment lift to 1,270mRL, to be tied into the existing liner for the embankment at 1,265mRL.;
BGM liner to have permeability of $<1.0 \times 10^{-14}$m/s;
BGM liner properties are included in Appendix 1. Minimum BGM installation specifications to include:

The panels shall overlap 20cm (minimum) for seaming. Ends and overlaps must be welded on a homogeneous and continuous basis, leaving 10 - 30mm bitumen bead along the seam;
Quadruple overlaps due to the alignment of 4 strips are prohibited;
Immediately prior to covering the BGM shall be inspected for defects, tears, holes or damage; and
Tears, holes, blisters, and other defects shall be repaired with patches made of the same BGM, and extend a minimum of 200mm beyond the edge of defects.

Subgrade for BGM liner to have:

minimum 300mm thickness on embankments;
be free from angular material (i.e. sharp rocks), vegetation, tree roots and stumps; and
have less than 3% organic material.

Construction of seepage collection systems (above liner drainage) and connecting to existing system;
Construction of underdrainage systems (subsoil drainage below BGM liner) including sumps;
Extension of toe drains; and
Seepage, underdrainage and decant pumped to the mine water circuit
Installation of vibrating wire piezometers in the embankments (minimum pressure rating of 350kPa).

<u>Monitoring points surrounding TSF4 (L4247/1991/13)</u>

Shallow, intermediate and deep groundwater monitoring bores surrounding TSF4: MB22/01, MB22/08, MB20/01, MB20/03, MB22/21, MB22/22, MB22/23, PB22/01;
Annual ecological monitoring at surface water locations surrounding the site including sampling locations along Woljenup Creek;
Water balance monitoring for TSF4 Proposed additional monitoring;
</td>
<td rowspan="2">Further discussion required for TSF4 Seepage and Water management.
Seepage from TSF4 has been assessed for all raises to final height. A TSF4 Seepage Assessment, consisting of series of additional geological and hydrogeological studies/assessments, has been undertaken.</td>
</tr>
<tr>
<td>Seepage through base and embankments causing contamination of surface water</td>
</tr>
</table>

Source / Activity	Potential Emission	Potential Pathways and Impact	Controls	Further discussion required?
			Additional groundwater monitoring bores along TSF4 southern perimeter embankment; and • Monitoring to the north of Jones Dam and two additional surface water monitoring locations.	
		Overtopping of TSF4 and discharge to land/surface water causing poor vegetation health/death and surface water contamination	Existing controls TSF4 (L4247/1991/13) • 0.9m freeboard, allowing for storage of an extreme storm event (1 in 100 year 72 hours, 217mm); • Installation of new vibrating wire piezometers for the embankment lift; and • Daily visual inspection of freeboard.	**No further discussion required.** There is no change to the TSF4 that would affect freeboard proposed as part of this licence amendment.
		Increased risk of pipeline leak/rupture and direct discharge to land/surface water causing vegetation poor health/death and surface water contamination	Existing controls for TSF4 (L4247/1991/13) • All tailings, decant and seepage pipelines to be: o equipped with telemetry[1] and pressure sensors to detect leaks and failures; o equipped with automatic cut-outs in the event of a pipe failure; and o provided with secondary containment sufficient to contain any spill for a period of time equal to the time between inspections. • Constructed according to Australian Standards AS/NZS 2033-2008, AS/NZS 4130-2018, AS 4131-2010 for installation of polyethylene pipe systems, pipes for pressure applications and polyethylene compounds for pressure and fittings; • Pipes shall be placed and installed in accordance with the manufacturer's specifications; and • All pipes shall be surveyed and inspected prior to placement of backfill.	**No further discussion required.** This licence application seeks to change the requirement for telemetry as part of the leak detection infrastructure. The requested changes are discussed in 3B9 and are not expected to impact the risk profile for pipeline leak/rupture.
	Mine water circuit contaminated water (metals/metalloids)	Further seepage through base and embankments causing increased groundwater contamination and mounding	Existing controls (L4247/1991/13) • Clear water dam has an underdrainage system and seepage cut off trench (this water is then returned to the same dam); • Water from clear water dam is treated with a reverse osmosis plant and arsenic remediation unit; and • Annual ecological monitoring in surface waters surrounding the site. Specified actions to reduce seepage risk from the mine water circuit (L4247/1991/13) This included the requirement for Talison to: • Produce an emissions management plan for Clear Water Dam; • Provide a detailed water balance for all inputs and outputs for Clear Water Dam; and	**No further discussion required.** No change to management of seepage from the mine water circuit is proposed in this Application.

Source / Activity	Potential Emission	Potential Pathways and Impact	Controls	Further discussion required?
		Seepage through base and embankments causing contamination of surface water	• Submit a proposal for a revised annual ecological assessment for impacts to downstream sensitive surface water receptors.	
		Overtopping and discharge to land/surface water causing poor vegetation health/death and surface water contamination	<u>Existing controls (L4247/1991/13)</u> • Freeboard to allow for a 1% annual exceedance probability 72-hour event; • Cowan Brook Dam: 0.5m plus additional Freeboard to allow for a 1% annual exceedance probability 72-hour event; and • Visual marker installed along embankment for freeboard monitoring. <u>Monitoring (L4247/1991/13)</u> • There is a requirement for water balance monitoring of the mine water circuit including daily freeboard inspections.	**No further discussion required.** The proposed operation of TSF4 at 1,270mRL is expected to have no or minimal impact on the seepage and decant return. The mine water circuit is predicted to have sufficient capacity and is unlikely to overtop in the near term.
Waste rock storage in TSF2	Dust	Air / Windborne pathway	<u>Existing conditions (L4247/1991/13)</u> • Condition 2 – Infrastructure and equipment requirements (updated in this application); • Condition 10 – Installation of dust monitors and meteorological station; • Condition 29 – Ambient air quality monitoring; • Condition 30 – Meteorological monitoring; • Condition 31 – Ambient air quality and meteorological trigger and limit values; • Condition 37 – Product and tailings sampling requirements; and • Condition 38 – Management action for trigger value exceedance event. The following dust management controls (dust suppression, limited vehicle movements) will be implemented during storage of waste rock material: • Activities and management actions will be planned with consideration to existing conditions, weather forecast and real-time dust monitoring program; • Waste rock will be stored during late winter and spring, at times where risk of dust emission is expected to be low due to rainfall; • Dust suppressing stabilisers will be applied on appropriate surfaces, including (but not limited to) mulch, soft rock, vegetated cover (i.e., rye grass) and spray-on dust suppressants (i.e., Gluon); • Water carts will be operated during dry, windy conditions and during summer months, targeting high risk areas; • Non-essential activities will be ceased during excessively windy, high-risk conditions, if dust cannot be adequately controlled; • Speed limit will be maintained at 30km/hour;	**No further discussion required.** No change to dust management activities are proposed. Some dust may be emitted during haulage and placement of waste rock. Emissions would be the same or similar to placement in a WRL. The placement of waste rock in TSF2 will reduce dust lift-

Source / Activity	Potential Emission	Potential Pathways and Impact	Controls	Further discussion required?
			• Ambient air quality and meteorological monitoring will continue to be undertaken in accordance with licence L4247/1991/13; • Management actions in the event that a trigger value is exceeded will be undertaken in accordance with licence L4247/1991/13; and • The TARP will be implemented as required by licence L4247/1991/13.	off from the tailings surface and result in an overall reduction in dust risk.

	Contaminated seepage	Direct infiltration through base and embankments of impacting groundwater and surface water.
		Migration of contaminated water offsite causing adverse impacts to ecosystem health and human health.
			• Waste rock placement must:
			  o not occur in the same area as tailings mining and must be clearly separated;
			  o Be graded towards a stormwater collection sump, which is pumped to the decant pond; and
			  o Maintain a minimum freeboard consistent with the relevant licence conditions.
			• Waste rock is dry, NAF and generally has lower concentrations of CoPCs than TSF materials;
			• Waste rock will be segregated and stored strategically:
			  o Segregation of elevated-sulphide/arsenic-bearing material; and
			  o Co-disposal of higher Acid and/or Metalliferous Drainage (**AMD**) risk material with calcite-rich neutralising material.
			• TSF Design;
			  o Working decant system;
			  o Shallow seepage captured in drains and ponds and returned to the MWC;
			  o Groundwater (north and west) flows internally into Cowan Brook Dam and the pit within operational boundary; and
			  o Off-site pathways (south and east) remain under ongoing assessment, with no current impacts to receiving environment identified.
			• Monitoring Network;
			  o Established groundwater and surface water monitoring network in place;
			  o Network considered adequate for early detection of changes; and
			  o Annual water quality review targeted at potential Acid Rock Drainage impacts.
			Licence-based monitoring has identified localised seepage impacts (e.g., acidic groundwater bores west of TSF1/2), however no measured impacts to the receiving environment.
				No further discussion required
				Waste rock geochemical risk has been assessed by EGI (2025) as less than that of tailings. The waste rock material has much larger particle size, is not as mineralised and does not tend to generate leachates at such high concentrations as tailings. No additional risk of contaminated seepage is expected from the placement of waste rock over the tailings surface.

	Contaminated stormwater runoff	Contaminated stormwater runoff impacting groundwater and surface water Migration of contaminated stormwater offsite causing adverse impacts to ecosystem	Minimum, conditionally required freeboard for TSF1 and TSF2 will be maintained. Waste rock will be graded towards a collection sump: • Water from the sump will be pumped into the MWC; and • Mobile pumping gear (i.e., skid-mounted diesel pump, of suitable size) will be maintained on standby for stormwater pumping. Additional pumping equipment will be implemented to manage excess water during extreme storm events.	**No further discussion required.** Given placement of waste rock material follows the same grade and the minimum freeboard will be maintained the proposed amendment is not expected to change the risk of contaminated stormwater runoff.

Source / Activity	Potential Emission	Potential Pathways and Impact	Controls	Further discussion required?
		health and human health.		
	Tailings overtopping	Unintentional discharge of Tailings resulting in direct / indirect contamination of groundwater and surface water	• Placement of waste rock material will be within the current tailings deposition rate and limits; • For TSF1, tailings deposition will not exceed pre-mining tailings elevation, estimated to be between 1,277mRL to 1,278mRL; • Tailings elevation will be confirmed via survey prior to and as deposition and backfilling progresses; • A minimum freeboard of one metre will be maintained; and • The TSF1 northern causeway will always remain at least one metre higher than the deposited tailings elevation.	**No further discussion required.** No change to tailings volumes and / or deposition rates proposed in this Application.
TSF1 Ore Stockpile	Contaminated water (metals/metalloids)	Seepage through TSF1 base and embankments causing groundwater contamination and mounding	Ore and waste rock will be graded towards a collection sump: • Water from the sump will be pumped into the MWC; and • Mobile pumping gear (i.e., skid-mounted diesel pump, of suitable size) will be maintained on standby for stormwater pumping. Additional pumping equipment will be implemented to manage excess water during extreme storm events. Seepage to the east retained by Cemetery Dam and pumped back to MWC Seepage to the west retained by TSF2 eastern toe drain and seepage recovery sumps and pumped back to MWC Existing conditions (L4247/1991/13): • Condition 32: Ambient groundwater quality monitoring. o East, Southeast – MB20/03, MB20/04, MB22/08, MB22/25 o West, Northwest – MB17/01, MB17/02, MB17/03, MB17/04, MB17/05, MB17/06, MB97/04, MB97/05	Risk associated with potential seepage and/or runoff of contaminated water from the TSF1OS is assessed at 6A1 Contaminated Seepage
		Seepage through TSF1 base and embankments causing contamination of surface water	Ore and waste rock will be graded towards a collection sump: • Water from the sump will be pumped into the MWC; and • Mobile pumping gear (i.e., skid-mounted diesel pump, of suitable size) will be maintained on standby for stormwater pumping. Additional pumping equipment will be implemented to manage excess water during extreme storm events. Seepage to the east retained by Cemetery Dam and pumped back to MWC Seepage to the west retained by TSF2 eastern toe drain and seepage recovery sumps and pumped back to MWC Existing conditions (L4247/1991/13): • Condition 23: Monitoring of point source emissions to surface water. o East, Southeast – Cemetery o West, Northwest – Discharge from Cowan Brook Dam to Norilup Dam, Seepage flow from Cowan Brook Dam • Condition 24: Process monitoring – water quality o West, Northwest – Cowan Brook Dam	

Source / Activity	Potential Emission	Potential Pathways and Impact	Controls	Further discussion required?
		Contaminated stormwater runoff impacting surface water Migration of contaminated stormwater offsite causing adverse impacts to ecosystem health and human health.	Minimum, conditionally required freeboard for TSF1 and TSF2 will be maintained. Ore and waste rock will be graded towards a collection sump: • Water from the sump will be pumped into the MWC; and • Mobile pumping gear (i.e., skid-mounted diesel pump, of suitable size) will be maintained on standby for stormwater pumping. Additional pumping equipment will be implemented to manage excess water during extreme storm events. Existing conditions (L4247/1991/13): • Condition 23: Monitoring of point source emissions to surface water. o East, Southeast – Cemetery o West, Northwest – Discharge from Cowan Brook Dam to Norilup Dam, Seepage flow from Cowan Brook Dam • Condition 24: Process monitoring – water quality o West, Northwest – Cowan Brook Dam	
	Dust	Air / Windborne pathway	Existing conditions (L4247/1991/13) • Condition 2 – Infrastructure and equipment requirements (updated in this application); • Condition 10 – Installation of dust monitors and meteorological station; • Condition 29 – Ambient air quality monitoring; • Condition 30 – Meteorological monitoring; • Condition 31 – Ambient air quality and meteorological trigger and limit values; • Condition 37 – Product and tailings sampling requirements; and • Condition 38 – Management action for trigger value exceedance event. The following dust management controls (dust suppression, limited vehicle movements) will be implemented during storage of waste rock (RoM and Skyway construction) and ore: • Activities and management actions will be planned with consideration given to existing conditions, weather forecast and real-time dust monitoring program; • Water carts will be operated during dry, windy conditions and during summer months, targeting high risk areas; • Non-essential activities will be ceased during excessively windy, high-risk conditions, if dust cannot be adequately controlled; • Speed limit will be maintained at 30km/hour; • Ambient air quality and meteorological monitoring will continue to be undertaken in accordance with licence L4247/1991/13; • Management actions in the event that a trigger value is exceeded will be undertaken in accordance with licence L4247/1991/13; and • The TARP will be implemented as required by licence L4247/1991/13.	Risk associated with potential seepage and/or runoff of contaminated water from the TSF1OS is assessed at 6A2 Dust

6A1 Contaminated Seepage and Runoff

Potential TSF4 Seepage

The following information was provided previously in an application to amend the Licence (submitted in December 2023) and an application to construct the TSF4 lift to 1,270mRL. TSF4 works proposed in this Application do not include changes to existing seepage collection and are not expected to result in increased seepage or risk to the surrounding environment. The embankment raise included construction of seepage collection systems above the liner drainage that connect to the existing systems, and underdrainage systems, including sumps (GHD, 2023a).

The information below has been included for completeness and to satisfy the requirements of the checklist for tailings storage facilities.

Seepage from TSF4 has the potential to cause groundwater mounding, which can occur as a result of saturation of the unsaturated zone beneath the tailings storage infrastructure. The consequences of groundwater mounding include localised inundation and water logging of surrounding vegetation. TSF4 seepage also has the potential to change groundwater quality, which can affect downstream users of groundwater as well as interact with surface water. Seepage into surface water flow could alter water quality at fauna habitats that immediately surround the Premises and contaminate surface water receptors to the south of TSF4 such as Woljenup Creek.

A seepage assessment was undertaken to estimate seepage flows and determine drainage infrastructure that will be required to collect all seepage flows from the operation of TSF4 at final height (1,295mRL). Details are outlined in the Sections below and Attachment 7 which provides siting and location details.

TSF4 Seepage Modelling (Clay liner)

The following section has been extracted from the TSF4 Detailed Design Report (GHD, 2021; Attachment 8A), TSF4 Supporting information for the staged commissioning (GHD, 2023b; Attachment 8C), and the TSF4 Cell 1 BGM Liner Design Report (GHD, 2023c; Attachment 8D).

Seepage analysis was undertaken for a clay-lined facility, and results are included in Figure 32 to Figure 37. The seepage analyses show that an upstream toe underdrainage system prevents a high phreatic surface developing against the perimeter embankment and has a major impact on controlling seepage under the embankments.

Typical seepage model results are presented in Figure 33 showing flux rates for the four design sections. The under-core flow is largely caught by the downstream drainage systems which report to the external drain. The external drain flows into sumps A, B, C and D for return into the MWC. These flux rates and representative lengths were used to calculate total drain flows and seepages as outlined below.

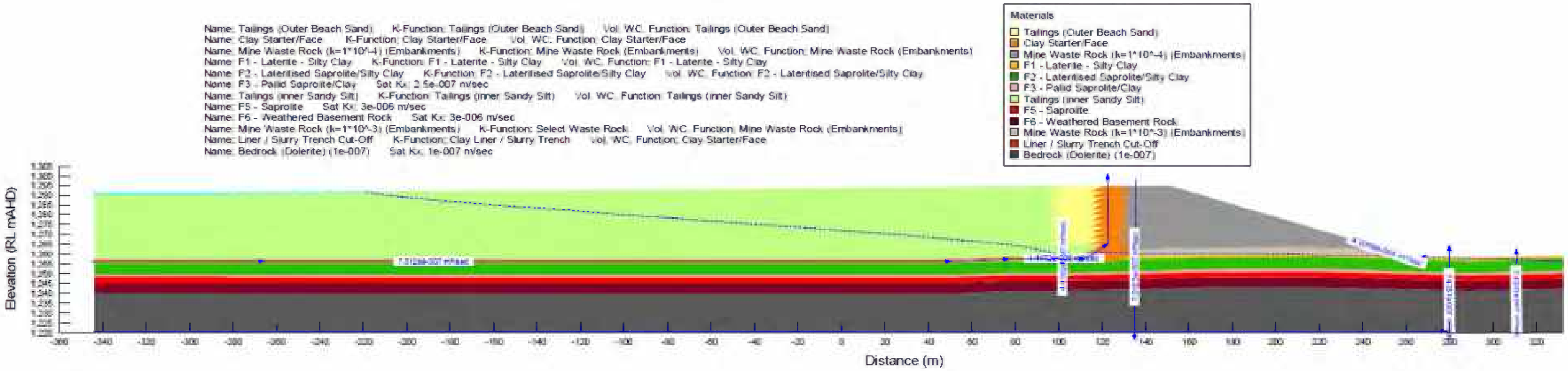


Figure 32: Lined Cell 1 Seepage analysis – North East Final Height

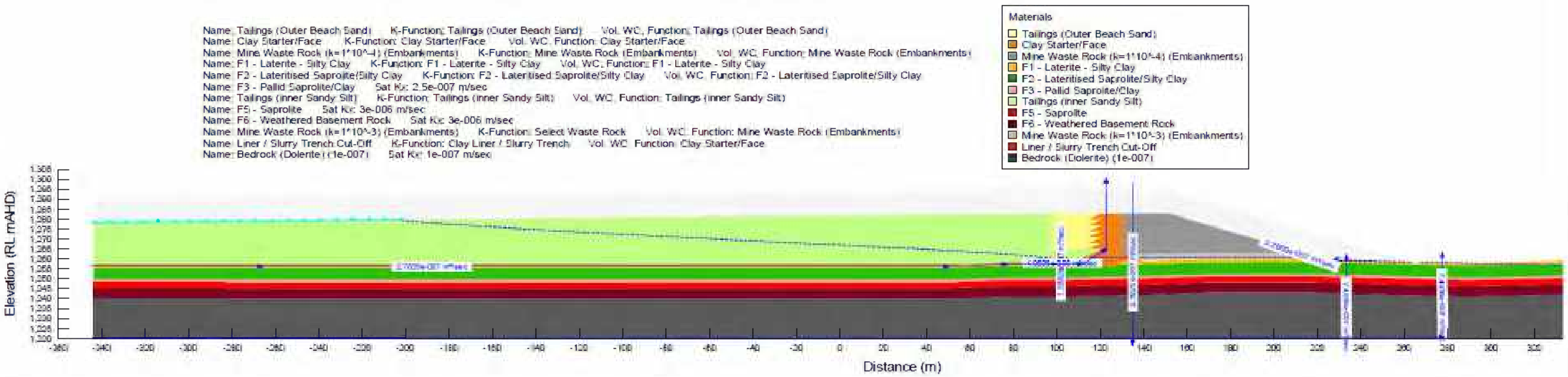


Figure 33: Lined Cell 1 Seepage analysis – East Wall 25m Height

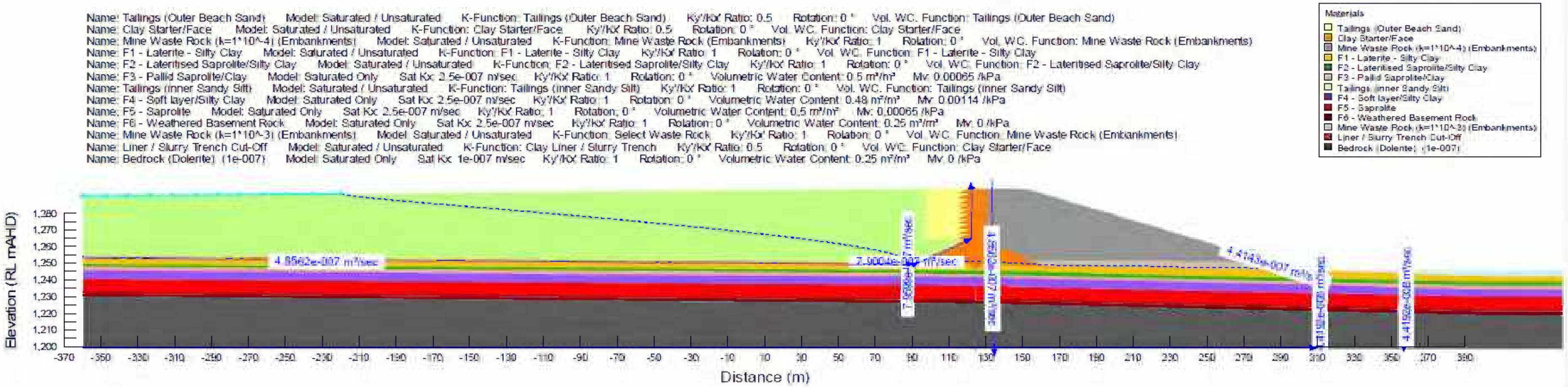


Figure 34: Lined Cell 1 Seepage Analysis – South Wall Final Height

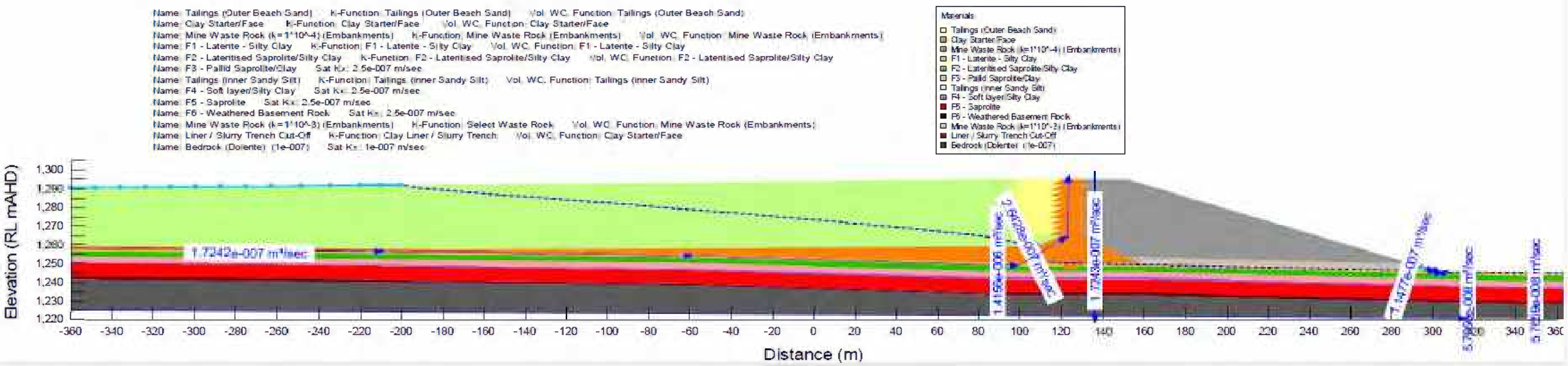


Figure 35: Lined Cell 2 Seepage analysis – South Wall Final Height

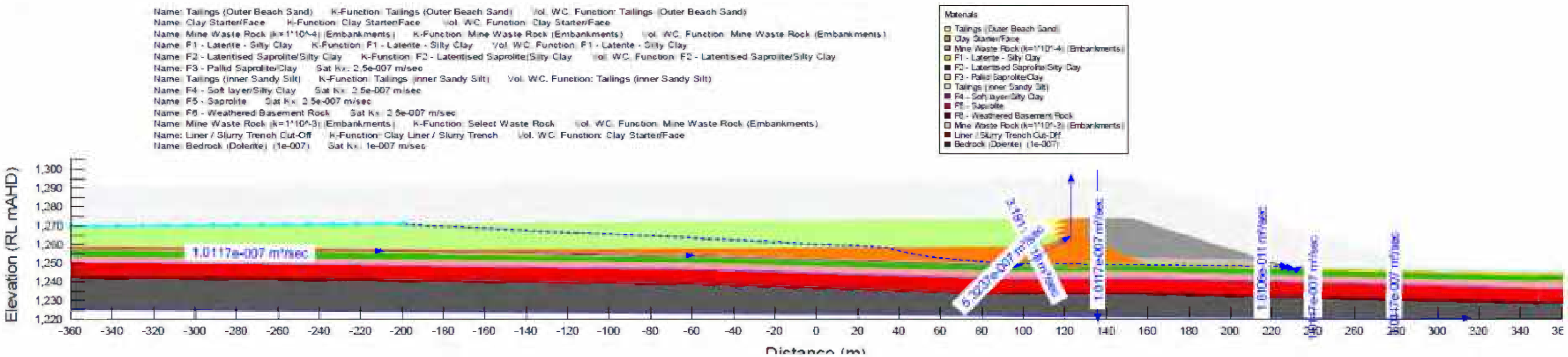


Figure 36: Lined Cell 2 Seepage analysis – West Wall 25m Height

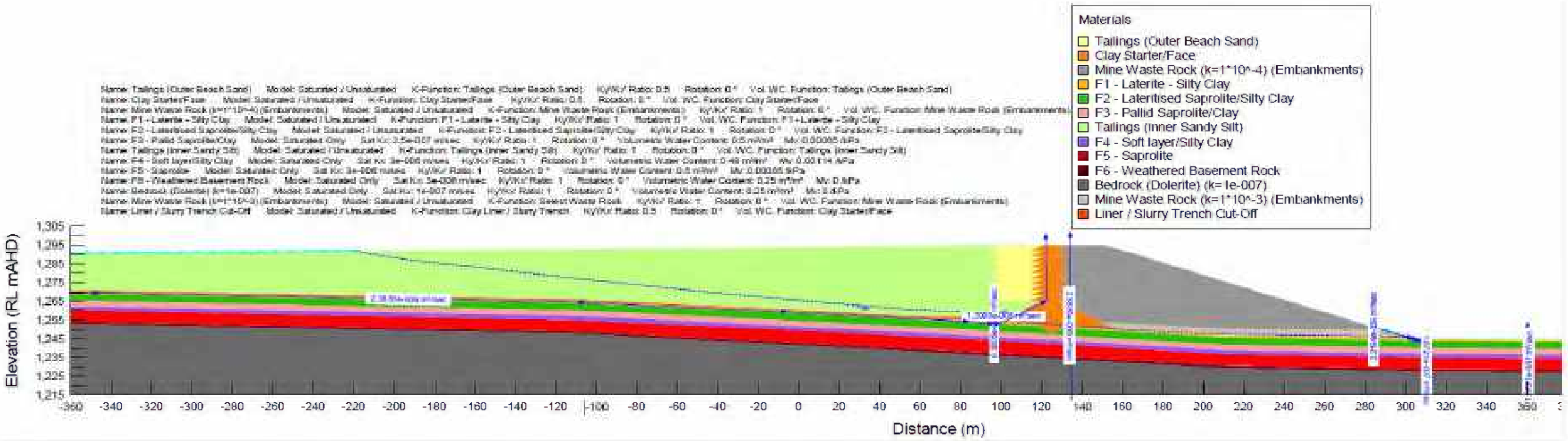


Figure 37: Lined Cell 2 Seepage analysis – North West Final Height

Table 10: Flux rates m^3/sec/m (Clay)

Section	Internal drains	External drain	Bypassing drainage
Cell 1 North east final dam	1.9 e^{-06}	4.2 e^{-08}	7.4 e^{-07}
Cell 1 North east 25m high wall (1)	9.0 e^{-07}	1.4 e^{-15}	7.5 e^{-07}
Cell 1 South final dam	1.6 e^{-06}	4.4 e^{-07}	4.4 e^{-08}
Cell 2 South final dam	1.7 e^{-06}	1.1 e^{-07}	5.8 e^{-08}
Cell 2 West 25m high wall (1)	5.3 e^{-07}	1.6 e^{-11}	1.0 e^{-07}
Cell 2 North west final dam	6.7 e^{-07}	2.1 e^{-06}	1.7 e^{-07}

(1) *Section analysed to represent the final dam geometry, where located on the hill*

Table 11: Seepage Flow rates per wall (m^3/year)

Section and representative perimeter length		Internal drains (2)	External drain (2)	Bypassing drainage
Cell 1 North east final dam	500m	80,000 B	700 B	11,700
Cell 1 North east 25m high wall (1)	550m	18,000 B	5,700 B	13,000
Cell 1 South final dam	800m	70,000 A	11,100 A	1,100
Cell 2 South final dam	700m	68,000 A	2,500 A	1,300
Cell 2 West 25m high wall (1)	800m	13,000 C	400 C	2,500
Cell 2 North west final dam	800m	26,000 D	53,200 D	4,200
Total	**4,150m**	**275,000**	**73,600**	**33,800**

(1) Section analysed to represent the final dam geometry, where located on the hill

(2) Letters denote external sumps that receive these flows

Seepage flows bypassing the drainage systems that migrate to the north west will be collected in the existing Sump 3 collection system whilst flows to the north east flow will flow into Vultan's Dam. Both of these structures are sunk below the water table and thus collect seepage which is returned to the MWC. Seepage to the west is into the TSF3/Tin Shed catchment which is also part of the MWC.

As the Floyds WRL in this area expands, runoff is expected to become trapped in this location at which point the drain will be directed to the seepage sump. The southern seepage collection sump will accommodate the runoff collected by the southern section of the toe drain (GHD, 2021).

The estimated seepage is considered to be conservative due to:

- Integration of seepage from the models used equal or higher sections even where the dam heights will be less than those modelled. The seepage rates are expected to be significantly lower during the earlier raises;
- Hydraulic conductivity applied conservative parameters from each foundation layer;
- Calculations were for the full stage of TSF which created maximum head whereas in reality the storage will fill slowly;

- The facility will usually have one cell drying, however the calculations assumed both cells operating with ongoing input of water; and
- Clay infill to the lower parts of the storage were ignored for seepage calculations.

The seepage losses past the TSF4 perimeter toe were estimated to be 33,800m^3/y (Table 11). The facility in total has an approximate tailings area of about 1,500,000m^2. The seepage rate from the facility equates to about 23mm/yr. This is less than the tolerable seepage rate as described in Water Quality Protection Note 27 (DWER, 2013) of 30mm/yr.

The material permeabilities for the foundation, embankment and tailings were assumed based on the site investigations (GHD, 2019a; GHD, 2019b). Actual seepage flows will be monitored using flow meters and the seepage analysis updated based on the monitoring data from the initial filling of TSF4.

The models are based on steady state conditions. This assumes that there has been sufficient time and sufficient flow of water to create the flow patterns modelled.

Transient models were run for the southern section to observe the development of potentially contaminated seepage over time. These showed negligible seepage past the core after 12 years and at least 20 years to develop the full seepage pattern, both these times assuming the dam started full at the outset, thus not including development time associated with the 15-year filling period. At the end of TSF filling, there is no further addition of tailings water, the decant ponds are drained and seepage rates significantly reduce.

Modelling of the movement of metals did not include a clay liner design and indicated the capacity to adsorb metals within the clayey soil under TSF4. Further studies outlined in Section 7.2 have been undertaken to confirm the capacity of the clay adsorption. The effect of BGM liner is discussed further below.

Partial/Complete Bituminous Geomembrane Liner

A revised design of TSF4 included a change to BGM liner for part of Cell 1 (approved under an amendment to W6618/2021/1 on 1 September 2023) and for all of Cell 2 (approved under an amendment to W6618/2021/1 on 27 March 2024). The sections below address the change in seepage due to the change to BGM liner (GHD, 2024a; Attachment 8B).

Vertical Seepage

The permeability of BGM is 6 x 10^{-14}m/s (manufacturers specifications in accordance with ASTM E 96) which is four orders of magnitude lower than the 1 x 10^{-9}m/s permeability of the clay liner. The decrease in permeability is equivalent to a reduction of 99% in theoretical Darcy flux through the containment system.

To determine the actual reduction in vertical seepage through a BGM containment system, an allowance for construction defects was calculated. The BGM surface mass ranges from 4.85 to 6.4kg/m^2 (manufacturers specifications in accordance with ASTM D5261) and is not prone to the formation of wrinkles and is in good contact with the subgrade once installed. Assuming five defects per hectare with a defect area of 1cm^2 and using Giroud and Bonaparte's equation for calculating the rate of leakage through geomembranes due to circular defects for large heads, the vertical seepage is reduced by 97% when the clay liner is replaced with BGM that is installed in accordance with a robust quality management plan.

Based on the calculated seepage and using the Darcy flux equation, the normalised permeability of the BGM for 5 x 1cm^2 defects per hectare is 1.7 x 10^{-13}m/s.

Replacing the clay liner with BGM in Cell 2 therefore reduces the seepage by 97% and replacing 12.8ha of the 64.3ha clay liner with BGM will reduce the total vertical seepage from Cell 1 by 4%. Allowing for defects in the installation of both clay and BGM liner, BGM has a significantly lower conductance and therefore seepage will be no greater than from a 600mm clay liner and BGM may represent a significant reduction in seepage to the environment.

Lower underdrainage

The design of lower underdrainage, which is located below either the clay or the BGM, was based on seepage modelling using the GeoStudio SEEP/W software package. The seepage modelling was undertaken for steady state conditions for the final embankment height (1,295mRL) and the results of the SEEP/W modelling for the lower underdrainage for a clay liner and BGM liner are summarised in Table 12 and Table 13 respectively. The locations of the modelled underdrainage sections are shown in Figure 38.

Table 12: Summary of Cell 1 and Cell 2 seepage modelling - clay liner

Item	Unit	Cell 1 Representative Section			Cell 2 Representative Section		
		NE (Full height)	NE (25m high)	S (Full height)	S (Full height)	NW (25m high)	NW (Full height)
Flux to underdrains	m^3/s/m	4.2 x 10^{-8}	3.3 x 10^{-7}	4.4 x 10^{-7}	1.2 x 10^{-7}	1.6 x 10^{-8}	2.1 x 10^{-6}
Representative length	m	500	550	800	700	800	800
Flow to underdrains	m^3/s	2.1 x 10^{-5}	1.8 x 10^{-4}	3.5 x 10^{-4}	8.0 x 10^{-5}	1.3 x 10^{-5}	1.7 x 10^{-3}
Flow to underdrains	m^3/year	663	5,666	11,137	2,534	406	53,152
Total	**m^3/year**	**17,466**			**56,092**		

Table 13: Seepage modelling summary - combined clay and BGM liner (Cell 1) and BGM liner (Cell 2)

Item	Unit	Cell 1 Representative Section			Cell 2 Representative Section		
		NE (Full height)	NE (25m high)	S (Full height)	S (Full height)	NW (25m high)	NW (Full height)
Flux to underdrains	$m^3/s/m$	1.38×10^{-9}	3.27×10^{-7}	4.41×10^{-7}	3.44×10^{-9}	4.83×10^{-10}	6.32×10^{-8}
Representative length	m	500	550	800	700	800	800
Flow to underdrains	m^3/s	6.91×10^{-7}	1.8×10^{-4}	3.53×10^{-4}	2.41×10^{-6}	6.52×10^{-7}	5.06×10^{-5}
Flow to underdrains	m^3/year	22	5,673	11,128	76	21	1,595
Total	**m^3/year**	**16,822**			**1,692**		

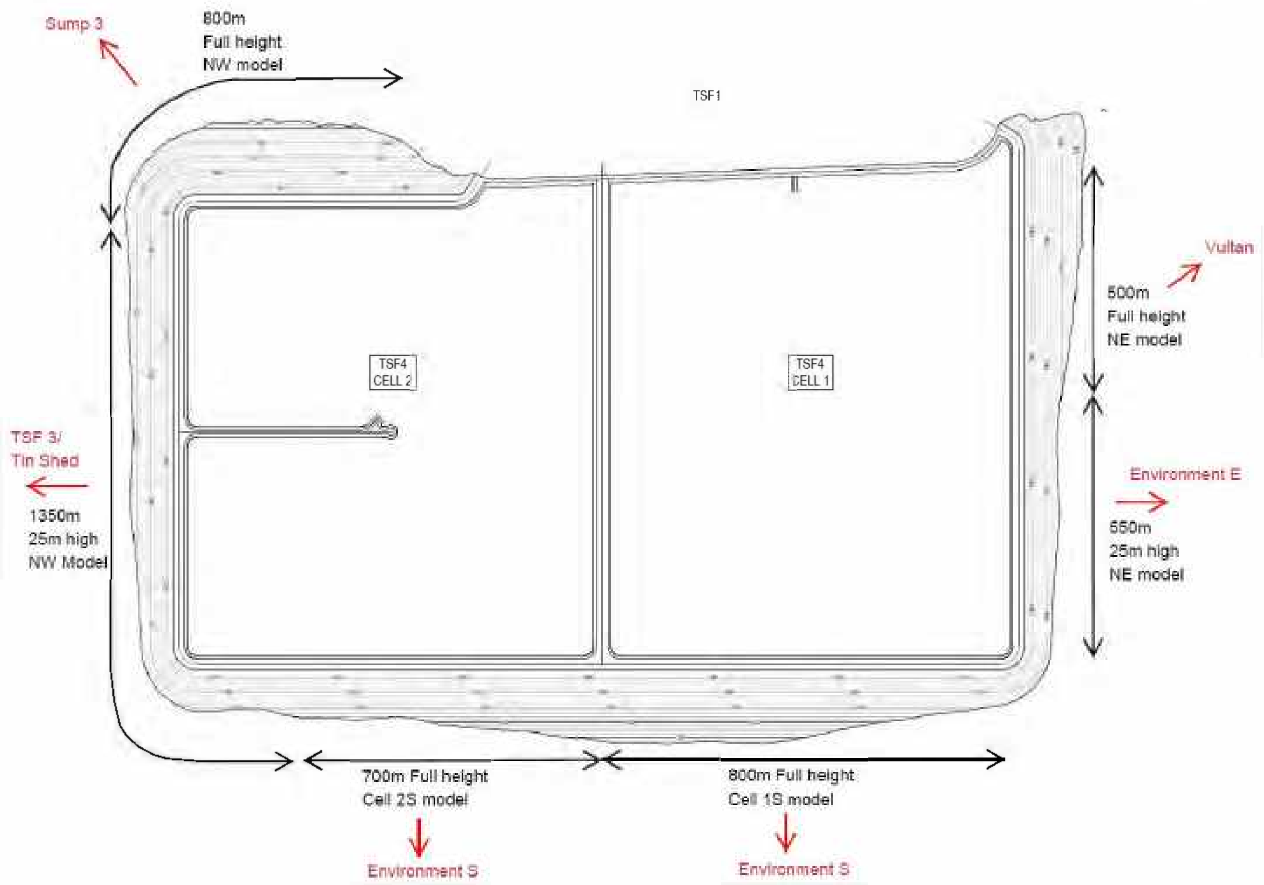


Figure 38: Modelled Sections of External Walls

Note: This figure shows an older TSF4 design footprint

The clay liner underdrainage consists of two MEG450G Megaflo drains and was designed to collect and drain the seepage through a clay liner. The capacity of the clay liner underdrainage is 71,000m^3/year which is greater than the anticipated seepage for both a clay liner and a combined clay and BGM liner.

Partially replacing the clay liner with BGM will reduce the vertical seepage through for Cell 1 by 4%, increases the redundancy of the clay liner underdrainage and will improve the performance of the clay underdrainage. Replacing the clay liner with BGM will reduce the vertical seepage through Cell 2 by 96%, increases the redundancy of the lower underdrainage and will improve the performance of the lower underdrainage.

Upper underdrainage

The required capacity of the upper underdrainage, located above the clay/BGM liner, was calculated from the outputs of the GeoStudio SEEP/W software package seepage models. The seepage modelling for the upper underdrainage was undertaken for the same conditions, height, and sections as the stability modelling. The BGM liner was modelled as an impervious boundary to create the most conservative drainage scenario. The results of the upper seepage modelling for a clay liner and a BGM liner for Cell 1 and Cell 2 are summarised in Table 14 and Table 15 respectively. The locations of the modelled sections are shown in Figure 39.

Table 14: Summary of Cell 1 and Cell 2 drainage modelling - clay liner

Item	Unit	Cell 1 Representative Section			Cell 2 Representative Section		
		NE (25m high)	S (Full height)	NE (25m high)	S (Full height)	NW (25m high)	NW (Full height)
Flux to underdrains	$m^3/s/m$	1.8×10^{-6}	1.2×10^{-6}	1.59×10^{-6}	1.68×10^{-6}	5.32×10^{-7}	6.68×10^{-7}
Representative length	M	1,340	470	1,400	1,290	750	1,250
Flow to underdrains	m^3/s	2.53×10^{-3}	5.64×10^{-4}	2.22×10^{-3}	2.17×10^{-3}	3.99×10^{-4}	8.35×10^{-4}
Flow to underdrains	$m^3/year$	79,831	17,781	70,024	68,340	12,592	26,334
Total	**$m^3/year$**	**167,635**			**107,266**		

Table 15: Drainage modelling summary - combined clay and BGM liner (Cell 1) and BGM liner (Cell 2)

Item	Unit	Cell 1 Representative Section			Cell 2 Representative Section		
		NE (25m high)	S (Full height)	NE (25m high)	S (Full height)	NW (25m high)	S (Full height)
Flux to underdrains	$m^3/s/m$	3.72×10^{-6}	1.2×10^{-6}	1.59×10^{-6}	3.07×10^{-6}	7.01×10^{-7}	3.21×10^{-6}
Representative length	m	1,340	470	1,400	1,290	750	1,250
Flow to underdrains	m^3/s	4.99×10^{-3}	5.64×10^{-4}	2.23×10^{-3}	3.97×10^{-3}	5.26×10^{-4}	4.01×10^{-3}
Flow to underdrains	$m^3/year$	157,340	17,786	70,199	125,299	16,580	126,538
Total	**$m^3/year$**	**245,326**			**268,417**		

The total tailings seepage for Cell 1 when the clay liner is replaced with BGM is 245,326m^3/year at full height of 1,295mRL. The underdrainage system has been sized to accommodate a flow of 497,568m^3/year, which exceed the calculated full height seepage.

Furthermore, partially replacing the Cell 1 clay liner with BGM has increased the seepage retained above the BGM but the tailings underdrainage has sufficient capacity to drain the additional retained seepage at full height and does not impact the performance of the tailings underdrainage.

In Cell 2, changing the clay liner for BGM increased the upper underdrainage collected and discharged to the recovery sumps from 107,266m^3/year to 268,417m^3/year. The underdrainage system has been sized for the design minimum gradient of 0.5% and design flow of 28.4m^3/hour providing an annual flow of 497,568m^3, which exceeds the calculated full height seepage.

Figure 39: Locations of Seepage Modelling Sections

<u>Rate of Rise</u>

The increased RoR resulting from deposition of all tailings to TSF4 initially is not expected to impact seepage from, or the stability of, TSF4 (GHD, 2024a). The TSF4 design is based on the coarser tailings adjacent to the embankments being effectively drained by the underdrainage at full height and mitigating the risk of static or seismic liquefaction of the tailings. The capacity of the underdrainage system is greater than the transient increase in seepage due to the increased RoR and therefore the increased RoR is not expected to affect the performance of the underdrainage. As the geotechnical conditions are unchanged, the RoR is not expected to impact the stability or design of TSF4.

The increased RoR may result in a delay in the draining of the tailings. GHD (2024a) assessed the potential impact on stability if the underdrainage did not perform as designed assuming undrained behaviour and liquefaction of the all the tailings. GHD's (2024a) supplementary stability assessment confirmed that TSF4 meets the stability requirements (FoS=1.76) in this conservative and unlikely scenario. With regards to the stability of the downstream slope, stability modelling has confirmed that the failure surface does not intercept the tailings. Therefore, the stability of the downstream slope is not impacted by ROR in Cell 1b and 2.

TSF4 Seepage Assessment Studies

Seepage assessment has not changed from W6618/2021/1. The information below has been previously provided but is required by the checklist. A TSF4 Seepage Assessment, consisting of series of additional geological and hydrogeological studies/assessments, has been undertaken in response to conditions and commitments for W6618/2021/1 and approval of TSF4 under the Mining Act (Reg ID 102901). Figure 40 lists the supporting reports and how they interrelate. Relevant findings from the completed studies are incorporated into the sections below.

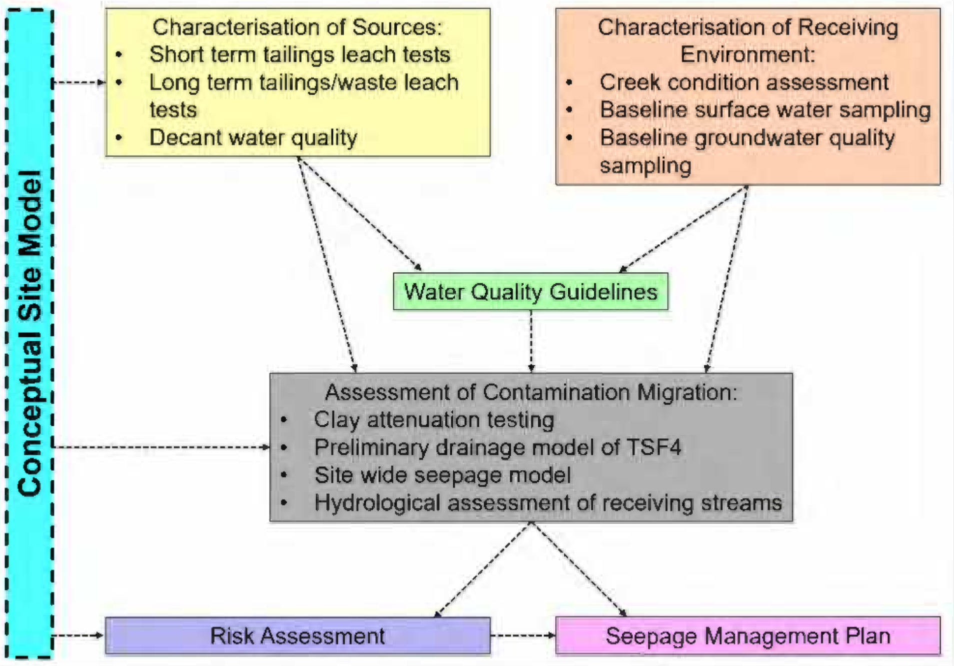


Figure 40: TSF4 Seepage Assessment Supporting Reports

Tailings characterisation

A number of waste rock and tailings characterisation studies have been undertaken throughout the Project to understand the potential for generation of AMD from operations and to develop suitable management processes where required. A further materials characterisation assessment was undertaken by GHD (2019c) to assess the potential for tailings and waste rock to generate AMD. This study was provided with the works approval application for TSF4 and the findings were summarised within the supporting document (Talison, 2023e).

Further testing of tailings material has been undertaken to characterise the leaching of CoPCs from tailings material to inform seepage modelling and the risk assessment (GHD, 2023g; Attachment 8I). Tailings from TSF2 were sampled, including individual tailings streams from Chemical Grade Plant 1

(**CGP1**), Chemical Grade Plant 2 (**CGP2**), Technical Grade Plant (**TGP**) and the TRP. The key findings from short-term tailings leaching tests were as follows:

- Metal concentrations decrease through leaching events, indicating that residual decant within the pores is the primary CoPC source in tailings leachate and is subject to flushing during leach testing; and
- The strong downward trend in concentrations during leaching events indicates that tailings solids should not contribute to dissolved metals concentrations above the relevant guidelines post-closure (GHD, 2023h; Attachment 8I).

Long-term leach testings of tailings (i.e. drum kinetic tests – providing data from a controlled environment) was undertaken from 2022-2025. EGI (2025) reviewed the kinetic leach testing results and found:

- In the shorter term may have the following characteristics: moderately alkaline with moderate concentrations of sulphate and elevated concentrations of arsenic, antimony, lithium, and uranium and slightly elevated concentrations of aluminium, molybdenum, nickel and zinc; and
- In the medium to longer term may have the following characteristics: slightly alkaline with low concentrations of sulphate and although there may be attenuation of most metals and metalloids to lower concentrations, in the longer-term arsenic may remain at elevated concentration.

Long term monitoring of tailings decant and groundwater bores will continue to provide useful background information.

Water quality

According to the *TSF4 Seepage Assessment – Groundwater Model Update and Site Assessment* report (GHD, 2023k), ~80% of the seepage from TSF4 is expected to migrate southwards and be collected by Sump A, which is immediately adjacent to TSF4's southern embankment. Without continuous pump back to the MWC, seepage collected at the sump would overflow directly into the upper reaches of Woljenup Creek (recirculation back into the MWC will continue after closure until the water is of suitable quality to be released to the environment).

The potential impacts of CoPCs contained within the flow releases from Sump A was the focus of this assessment and could be mitigated to a reasonable degree through natural dilution processes. The following observations are noted from monthly dilution factor averages at site 01 and the confluence of Blackwood River and Woljenup Creek:

- Dilution factors peak in the winter months of June to September and are lowest in the summer months of January to March;
- On average, the moderate climate-change scenario generated dilution factors 40-50% higher than the more extreme scenario; and
- Dilution factors generally increased with each passing decade in both climate change scenarios.

Monitoring the water quality of Jones Dam has been undertaken since May 2022 as a condition of the TSF4 Works Approval (W6618/2021/1). It is noted from these results that:

- Aluminium concentrations exceeded ecological and potable site specific guidelines (GHD, 2023f).
- Copper concentrations exceeded the ecological site specific guidelines.
- Manganese concentrations exceeded the drinking water and irrigation site specific guidelines.

Aluminium and manganese are considered CoPCs sourced from the tailings decant and leachate, however, copper is not.

The following observations are noted from the monthly dilution factor averages at Jones Dam:

- Dilution factors during the summer months (i.e., December to April) are less than 2.0 indicating the Sump A discharge is greater than the catchment runoff; and
- Dilution factors in February often drop to near 1.0 indicating that the flows are predominantly from Sump A.

Given the low levels of dilution of sump discharges into Jones Dam during summer, management measures for the discharge of TSF4 impacted water from Sump A following closure will need to consider the water quality requirements of this user and/or possibly provide an alternative source of water. The drainage into Sump A will continue to be returned to the MWC after closure until such time as the water is of suitable quality and quantity to accommodate implementation of appropriate management strategies to attenuate this discharge. Such measures could include a constructed wetland, infiltration pits or similar.

Tailings Leach Testing

Tailings from TSF2 were sampled – including individual tailings streams from CGP1, CGP2, TGP and TRP. The testing was undertaken to characterise the leaching behaviour of CoPC from tailings material. Key findings from the leaching tests were as follows:

- Metal concentrations decrease through leaching events, indicating that residual decant within the pores is the primary CoPC source in tailings leachate and is subject to flushing during leach testing; and
- The strong downward trend in concentrations during leaching events indicates that tailings solids should not contribute to dissolved metals concentrations above the relevant guidelines post-closure.

No change is expected from the addition and operation of TSF4 cell 1b and 2 to the Licence.

Short Term Tailings Leach Testing Results

Short term LEAF leach testing of tailings solids material from four locations within TSF2 where active tailings deposition is ongoing was undertaken to characterise the leaching potential of the tailings material (GHD, 2023h; Attachment 8J). Cumulative leaching test results (LEAF 1314), which best simulate infiltration of rain and leaching of metals, indicates the following:

- Metal concentrations decrease in the four samples (CGP1, CGP2, TGP and TRP) from the initial leaching event through subsequent leaching events, indicating that the residual decant within the pores is subject to flushing from the tailings during leach testing;
- The strong downwards trend in concentrations during the leaching events and analysis of the final leach events (8^{th}/9^{th}) supports that the tailings solids should not contribute to dissolved metals at concentrations above the relevant guidelines (freshwater aquatic and drinking water) once the residual decant is flushed from the pore spaces; and
- Acidic and saline conditions were observed in one sample (TRP), the cause of which is not clear but which may reflect decant evaporative concentration.

No change is expected from the addition and operation of TSF4 Cell 1b and 2 to the Licence L4247/1991/13.

Long-Term Tailings Kinetic Leach Testing

Long term kinetic leach testing was conducted over an 18-month period through simulation of rainfall on homogenous tailings samples. Decant water samples were taken weekly for the first month of sampling, and then at fortnightly intervals. The results were compared against site specific water quality guidelines and freshwater ecology protection guidelines, and indicated the following:

- Tailings leaching results were initially mildly alkaline and brackish with elevated metals concentrations with that of the decant waters. In the two months following, the tailing leach waters became neutral and fresh with lower dissolved metals concentrations, the occurrence of which inferred to reflect the flushing of the decant (ore process water) from the tailings pore spaces;
- Following the flushing, a negligible risk for acid generation and occurrence of saline drainage is indicated (neutral pH, low sulphate, low salinity);
- The concentration of Cadmium (Cd), Caesium (Cs), Molybdenum (Mo), Uranium (U), Vanadium (V) and Zinc (Zn) did not return leaching results above drinking water and freshwater ecology guidelines and, consequently these metals should not require management to reduce risks posed to the receiving environment; and
- The leaching concentrates of Arsenic (As), Aluminium (Al), Lithium (Li), Tin (Sb), Rubidium (Rb) and Thallium (Tl) were above one or more of the relevant guidelines, and the analysis of the trends indicates the concentrations are likely to persist above guidelines for a period estimated to be greater than a decade.

The long-term kinetic leach testing is continuing to observe longer term trends in persistent COPCs.

Site-wide Groundwater Model and Seepage Assessment

A site-wide three-dimensional numerical groundwater flow and transport model was developed to assess potential seepage from TSF4 (GHD, 2023k). The objective of the assessment was to characterise:

- The changes to groundwater levels and interaction with surface water bodies, including TSF drainage systems;
- The fate and transport of CoPCs derived from TSF4 seepage; and
- The duration that TSF4 drainage and seepage will require management post closure.

TSF4 seepage, drains and timeframes were the primary focus of the study, however other TSFs and Floyds WRL were also included in the model configuration to generate predictive simulations of the collective seepage from these facilities. Modelling of contaminant transport included Arsenic (as a low mobility metal) and Lithium (as a high mobility metal); these are considered to be 'end members' due to their respective mobilities and therefore representative of the range of other CoPCs. They are also the two key CoPCs known to leach from waste rock and tailings at Greenbushes. This assessment was part of the predictive work on contaminant migration (referred to as 'Site wide seepage model' in Figure 40.

Modelled groundwater head contours are provided for different post-closure periods. The Groundwater Model Update and Site Assessment identified that the predicted extent of seepage plumes with concentrations of As and Li above the site-specific guidelines is contained to areas within the footprint of TSF4 (Figure 41) at all times. This is due to the low permeability of liners and underlying saprolitic clays and the high adsorption capacity of the saprolitic clays underlying TSF4 (refer to Section 6 of the GHD (2023k) Groundwater Model Update and Site Assessment).

The addition of the operation of TSF4 cell 1b and 2 to the Licence does not alter the above.

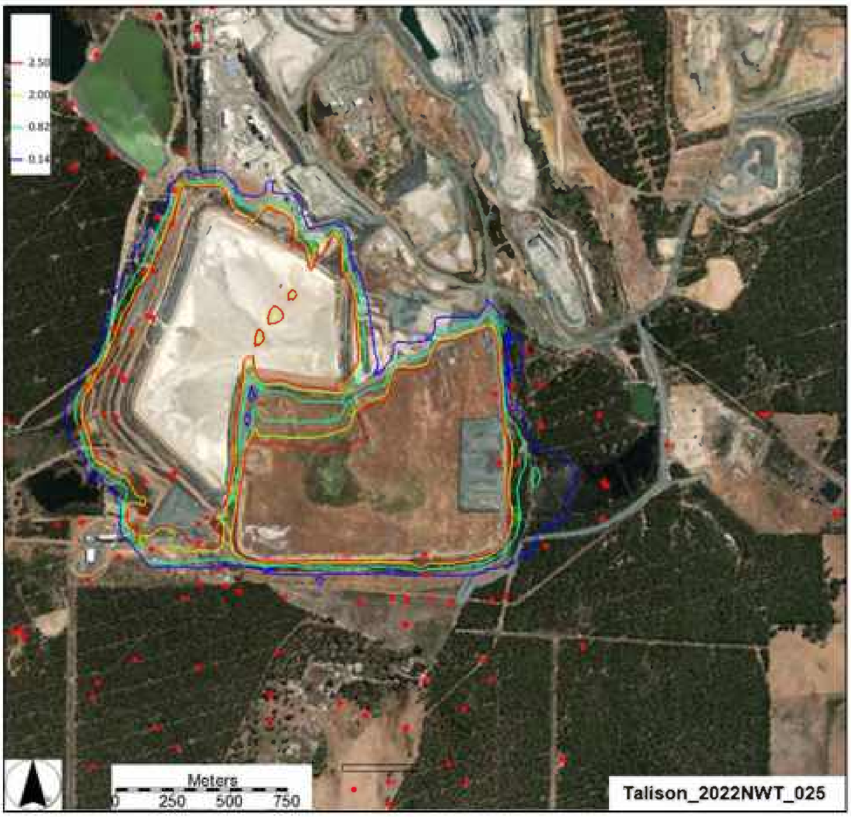


Figure 41: Modelled Lithium concentrations around existing TSFs

TSF4 Cell 1 and Cell 2 Time Limited Operations performance

Seepage

The TSF4 Cell 1a TLO Report (GHD, 2024c) summarises the performance of TSF4 Cell 1a during TLO, which commenced on 20 January 2024. Condition 15(b) of W6618/2021/1 requires Talison summarise the environmental performance of all infrastructure as constructed or installed (as applicable), including records dealing the total seepage from TSF4, including the volume of seepage not captured by seepage management infrastructure.

Total water collected from TSF4 Cell 1a was considered to include decant from the supernatant pond and seepage collected by the underdrainage system (which is recycled and returned to the decant pond) (GHD, 2024c). All collected seepage from TSF4 Cell 1a was therefore recorded as decant returned to CWD. This volume of water returned to CWD recorded for TLO from 19 January 2024 to 22 June 2024 was 2,514,200m^3.

A water balance was prepared on a volume basis (considering both solids and water), using data provided by Talison as detailed in the TSF4 Cell 1a TLO Report (GHD, 2024c). A summary of the water balance inflows and outflows for the review period is presented in Table 16.

The balance represents uncollected seepage, amounting to 3,600m^3. This equates to ~2.2cm/year/m^2 and aligns with the anticipated design seepage rate for the clay lined TSF4 facility of 2.3cm/year/m^2 (GHD, 2024c).

Table 16: TSF4 Cell 1a Water Balance Summary (19 January to 22 June 2024) (GHD, 2024e)

Parameter	Volume (m^3)
Inflow	
Slurry volume	3,770,000
Sand platform	441.400
Rainfall	132,000
Total inflow	**4,343,000**
Outflow	
Decant return	2,514,200
Survey volume	1,768,600
Evaporation	57,000
Total outflow	**4,339,800**
Balance (uncollected seepage)	***3,600***

The TSF4 Cell 1b and 2 TLO Report GHD (2025b) identifies that the total seepage collected from TSF4 comprises decant from the supernatant pond as well as seepage collected by the underdrainage system, which is recycled and returned to the decant pond. All collected seepage from TSF4 is therefore recorded as decant to Clear Water Dam and flow data is recorded by Pump 1 (PP62) and Pump 2 (PP32). The volume of seepage returned t[redacted]ecorded from TSF4 Cell 1 (Including Cell 1a and 1b) commissioning on 18 July 2024 to 16 May 2025 as measured by Pump 1 and Pump 2 is 7,057.8m^3 and that recorded from TSF4 Cell 2 from 2 October 2024 to 11 July 2025 is 50.5m^3.

A water balance model was developed for TSF4 Cell 1 and Cell 2 to confirm the volume of seepage not captured by the seepage management infrastructure. This model was based on the conceptual water balance included in the TSF4 design report as illustrated in Figure 42.

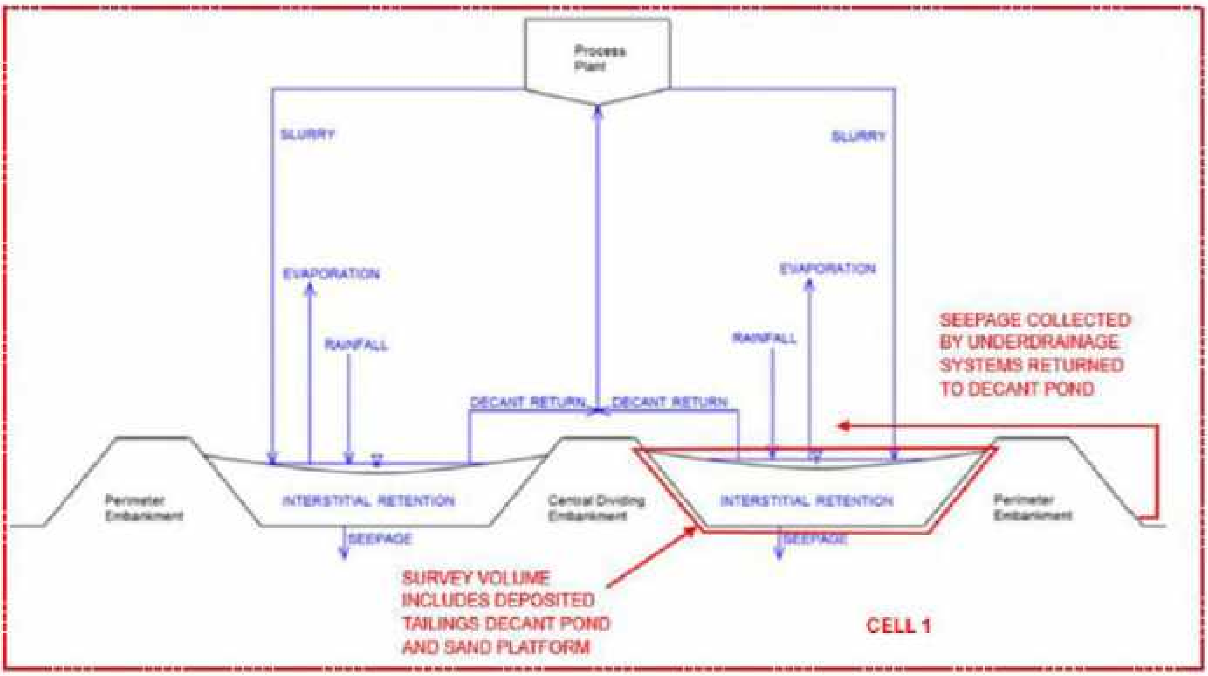


Figure 42: TSF4 Water Balance Schematic

<u>Groundwater Monitoring</u>

Analysis of groundwater monitoring results obtained during TLO of TSF4 Cell 1a indicates that water and tailings management at TSF4 are not likely to be impacting groundwater at all depths and locations, with the possible exception of:

- PB001S - Lithium exceeded the potable use guideline (0.007mh/L) in two (2) samples in the shallow bore and all samples in the intermediate and deep depths. Lithium also exceeded the non-potable use guideline (0.14mg/L) in one (1) sample in the shallow bore, with exceedances ranging from 0.004 to 0.19mg/L. Continued monitoring at this location will indicate whether this result is indicative of an emerging trend. An investigation is currently underway as per the Seepage Management Plan.

Groundwater monitoring was undertaken at six groundwater monitoring locations, with three of the six locations dry (groundwater level below base of monitoring bore/saprolitic profile) (GHD, 2024c). Water quality monitoring data indicated that a number of CoPCs exceeded adopted guidelines, however this was deemed to reflect natural background level due to:

- Insufficient seepage travel times for TSF4 seepage to migrate within the saprolitic aquifer and impact the monitoring bores;
- The lack of geochemical signature consistent with TSF4 seepage source within the monitoring bores; and
- The findings of a previous site wide study that indicating and supporting the distribution of low-level metal concentrations as naturally occurring background concentrations (GHD, 2024c).

Groundwater monitoring was also conducted during TLO for Cell 1b and 2. For the duration of the baseline and TLO period, there was insufficient groundwater present to collect a sample from all nested bores at three (3) locations:

- MB22/21 (southwest corner of TSF4);
- MB22/22 (southeast corner of TSF4); and
- MB22/08 (eastern embankment of TSF4).

As groundwater monitoring data could not be collected from these locations, baseline conditions at these locations could not be established.

Monitoring for TLO commenced in the month of August 2024, the month after deposition into Cell 1b commenced (first tailing deposition occurred 18 July 2024). TLO monitoring has continued at the required monitoring frequency and data presented in this report continues until 30 April 2025. The monitoring of baseline ambient conditions (required by condition 5) formally commenced in the month of March 2024 and continued until July 2024. Earlier monitoring was performed at some locations prior to the commencement of formal baseline monitoring; this historical data is included in this report to inform the interpretive summary where relevant.

Proposed TSF4 Seepage Controls

Infrastructure Design: Seepage control

A number of seepage control elements have been included in the design of TSF4. These include:

- Lining of the embankment and floor of TSF4 (engineered clay and BGM liner);
- Underdrainage system;
- Seepage collection sumps; and
- Decant return.

Further details relating to the design of TSF4, including specific seepage control elements, are provided in Attachments 8A, 8B and 8C.

Current Licence Conditions for Seepage Control

Conditions 26 and 27 within the Licence are in place to manage potential seepage at the Premises, relevant to existing infrastructure at the site.

Under condition 26 of the Licence, Talison is required to undertake monthly monitoring of the water balance for TSF4 to confirm assumptions of the preliminary water balance. As a minimum, the following parameters are to be monitored:

- The volume of tailings deposited in each cell of TSF4;
- Site rainfall;
- Site evaporation;
- Decant water recovery volumes;
- Volume of recovery from seepage sumps; and
- Estimate of seepage losses.

Condition 27 of the Licence outlines that Talison are to ensure that evaporation rate measurements (required under condition 26(c)) are undertaken using a method that includes as a minimum, measurement of wind direction, air temperature, and humidity and calculation of open water evaporation, using an on-site weather station and evaporation pan.

More broadly, the Licence Conditions address facilities that support for the operation of TSF4. Monitoring requirements under the Licence include the volumes of seepage water recovered, water quality within CWD and ambient groundwater quality downstream of CWD around Norilup Dam.

Seepage Management Plan

Talison will continue to implement a Seepage Management Plan (Talison, 2025; **SMP**) at the Premises. The revised SMP is provided as Attachment 8F.

As a requirement of Condition 15 of W6618/2021/1, Talison must submit to the DWER CEO a report within 30 days of the completion of TLO or before expiration of the works approval, whichever comes sooner. The TLO report must include a SMP under Condition 16(e), including updated seepage modelling and trigger values for groundwater and surface water monitoring. The final version of the SMP was submitted to DWER under Condition 16(e) alongside the TSF4 Cell 1a TLO report. Key objectives for managing seepage and/or drainage from TSF4 that are incorporated into the SMP include:

- Maintain the groundwater quality attributable to TSF4 seepage below the Water Quality Guideline (WQGs) at the mine premises boundary (i.e., background/baseline may be higher, such as Li for potable WQG of 0.007 mg/L); and
- Maintain the surface water quality in Woljenup Creek attributable to TSF4 seepage and/or drainage below a defined baseline quality threshold.

The overarching strategy to manage seepage and drainage to meet these objectives is to monitor and provide a contingency framework for action should monitoring and assessment indicate that:

- The distribution of TSF4 seepage impacts within the subsurface varies significantly from the modelled predictions;

- Groundwater triggers are activated (i.e., concentrations nearing or exceeding modelled predictions); [redacted]
- Groundwater limits are exceeded (i.e., concentrations nearing or exceeding WQGs);
- Changes in quality in Woljenup Creek attributed to TSF4 seepage/discharge and/or where surface water triggers are exceeded (i.e., concentrations nearing or exceeding baseline quality threshold); and
- Seepage/drainage from TSF4 poses unacceptable risks to receptors and where surface water limits are exceeded (i.e., concentrations nearing or exceeding WQGs).

Where monitoring indicates that groundwater triggers are exceeded, the key seepage management practices incorporated into the SMP include:

- Assess source(s) of impacts to groundwater (e.g., diffuse seepage, spillage, pipe failure event, etc.) and remediate the source (if possible);
- Confirm extent and magnitude of the TSF4 impacts to groundwater via:
  - Increasing the frequency of monitoring along seepage pathway;
  - Installing additional monitoring bores positioned downgradient of the impacted monitoring bores (if required/possible);
  - Refining the modelling based on monitoring data and updating the predictions (if required);
- Update risk assessment (source-pathway-receptor) based on monitoring and modelling outcomes, which should include:
  - Comparing the Contaminants of Potential Concern (**CoPC**) concentrations in groundwater against the WQGs;
  - Presenting the pathway(s) for migration of impacts and beneficial groundwater uses which may be impacted;
  - Characterising the fate of impacted groundwater (including an understanding of attenuation in the subsurface); and
  - Adjusting the monitoring program further to characterise/confirm extent of impacts.

Where CoPC concentrations in Woljenup Creek can be attributed to TSF4 and exceed the baseline quality threshold (i.e., triggers), the following works should be undertaken:

- Identify the TSF4 source (e.g., spills, leakage from pipe work/sumps, uncontrolled seepage discharge, etc.) and monitor the source;
- Increase the monitoring frequency in Woljenup creek;
- Assess the dilution/attenuation affects which may occur as TSF4 impacted waters migrate down Woljenup Creek;
- Identify specific receptors which may be impacted; and
- Present an understanding of risks to the receptors (human health and the environment).

Where the groundwater risk assessment and CoPC concentrations in Woljenup Creek can be attributed to TSF4 and indicates unacceptable risk to human health and/or the environment, or where groundwater WQG limits are exceeded upgradient of receptors (i.e., concentrations upgradient of receptors nearing or exceeding WQGs), undertake remedial works, which could include:

- Remediation of source of seepage;
- TSF4 source/discharge mitigation;
- Installation of groundwater abstraction bores positioned in areas to intersect and capture impacted groundwater;
- Optimisation of TSF4 tailings deposition to reduce duration, extent, and storage of decant; and
- Seepage capture through interception trenches/schemes and pumping back to the MWC.

Summary

No change to the design of TSF4 and relevant seepage controls as approved under W6618/2021/1 are proposed as part of this Application.

Talison expects that potential residual seepage from the 1,270mRL embankment raise at TSF4 will be managed through the seepage control infrastructure incorporated into the TSF4 design, the current licence conditions and implementation of the SMP.

Potential TSF1 Ore Stockpile Seepage

The use of waste rock to construct various other landforms at the Premises, including TSF4, has previously been assessed and approved by DWER. It is not discussed further here.

Ore AMD potential and risk was assessed by GHD (2019c). The GHD (209c) AMD assessment report is included as Attachment 8J. 17 samples of pegmatite ore, which are representative of the material proposed to be stockpiled atTSF1, were analysed. A table of laboratory geochemical analytical results, a subset of the GHD (2019c) study, is included as Appendix A. Mean values for the pegmatite ore geochemical parameters analysed are listed in Table 17.

Table 17: Pegmatite Ore Geochemistry Analytical Results (GHD, 2019)

Geochemical Parameter	Pegmatite Ore Mean Value
Acid Neutralising Capacity (**ANC**) as $CaCO_3$ (kg H_2SO_4/t equivalent)	0.3
ANC as H_2SO_4 (% $CaCO_3$)	3.1
Net acid generation (**NAG**) (pH 4.5)	0.05
NAG (pH 7.0)	10.1
Sulfate as SO_4^{2-} (mg/kg)	50
Sulfate as SO_4^{2-} (%)	0.02
Sulfide as S (%)	0.01
Sulfur - Total as S (%)	0.01

Geochemical Parameter	Pegmatite Ore Mean Value
Maximum potential acidity (**MPA**) (calc)	0.2
Net Acid producing potential (**NAPP**) (calc)	-2.9

Table 17 shows that with respect to the acid-base accounting, the pegmatite ore data show a strong negative NAPP, which supports that the buffering capacity exceeds the acid production potential.

Pegmatite ore sulphide concentrations were below the laboratory practical quantitative limits (**PQL**), as expected from a low-sulphide ore body. Of the 56 metals analysed in the ore samples, a total of 13 metals were enriched relative to the with elevated Global Abundance Index (GAI) (close or above and index of 3)).

GHD (2019c) also reported that Pegmatite ore data predominantly plotted within the region deemed as “Non-Acid-Forming” (15 samples). One ore sample was classified as “Uncertain” and one sample as “Potentially Acid-Forming” (Figure 43). The laboratory data and Pegmatite ore sample classification supports that the pegmatite ore has excess ANC to buffer any potential acid generation (MPA).

There is a moderate risk that leaching from pegmatite ore of some metals may occur under neutral pH conditions (eg: As, Sb, Li, Rb). The risk of acidic conditions prevailing in the ore material was considered very low supporting that conditions should not be conducive for leaching of metals at elevated concentrations other than As, Sb, Li, and Rb.

Concentrations of major-ions, derived through di-ionised leachable analysis of ore, is presented in Table 18. Total dissolved solids (**TDS**) was low, with a maximum of 25 mg/L and mean of 17 mg/L. Dissolved major ions were dominantly comprised of alkalinity (mean of 17 mg/L).

Table 18: Ore Speciated Major and Total Ion Concentrations (mg/L)

	Na	Ca	K	Mg	S as SO_4	Cl	Alkalinity ($CaCO_3$)	TDS
Mean	2.3	2.2	1.2	0.5	1.2	0.5	9.0	17.0
Pegmatite Ore GX14412	1.25	0.5	0.5	0.5	0.5	0.5	3	7
Pegmatite Ore GX26452	2.5	4	2	0.5	1	0.5	14	25
Pegmatite Ore GX28462	3	2	1	0.5	2	0.5	10	19

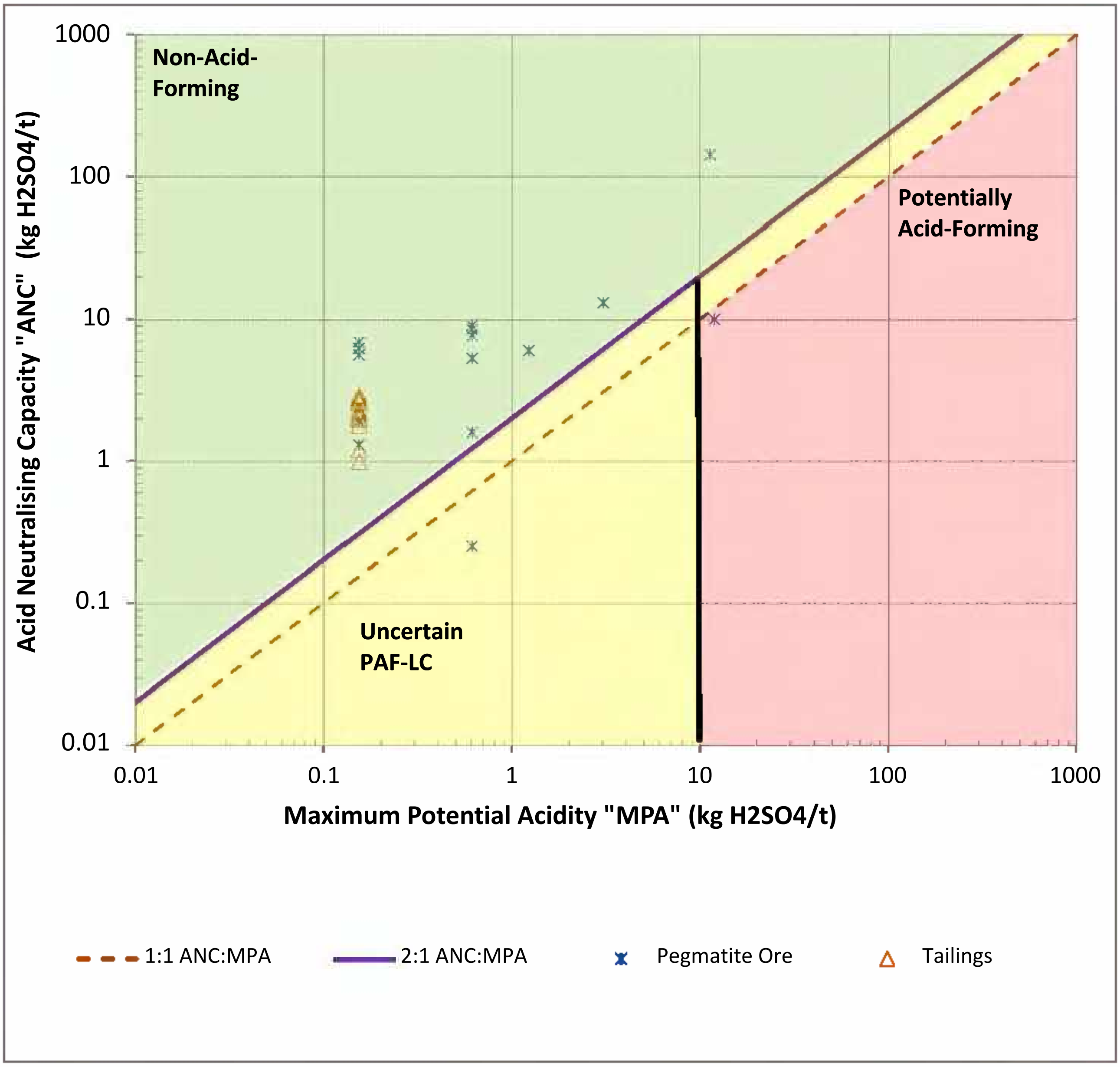


Figure 43: **ANC vrs MPA for pegmatite ore and tailings**

GHD (2019c) considered the low concentrations of leachable constituents supports that readily dissolvable minerals (eg: halite, gypsum) which may contribute do not occur at elevated concentrations within the pegmatite ore. In addition, given the low concentrations of sulphides, which will be buffered by calcite identified within the ore, contributions from dissolved sulphate and carbonate should be commensurately low. The risk of adverse impacts to surface water and groundwater by saline drainage of the ore was therefore considered by GHD (2019c) to be low.

Radioactivity above the limit of reporting (0.5 Becquerels per gram (**Bq/g**)) was reported by GHD (2019c) for the pegmatite ore, with an average 1.3 Bq/g. This activity marginally above the reference activity of 1 Bq/g, which is a level considered to warrant the application of IAEA Basic Safety Standards (WA Radiological Council, 2009). GHD (2019c) considered that the ore radioactivity levels were below that which pose an unacceptable risk and require on site management.

Controls

GHD (2019c) recommended that stockpiled pegmatite should be managed to limit potential impacts of the small number of leachable metals on groundwater and surface water systems which may be in hydraulic connection with the stockpiled ore.

The TSF1OS will be graded towards a collection sump, with water collected by the sump pumped into the MWC. Potential seepage to the east will be retained by Cemetery Dam and pumped back to the MWC. Potential seepage to the west will be intercepted by the TSF2 eastern toe drain and seepage recovery sumps, and pumped back to MWC. Potential seepage to the south will be constrained by TSF4, which is BGM-lined. Groundwater modelling does not indicate significant seepage to the north of TSF1.

Monitoring conditioned by L4247/1991/13 is sufficient to identify potential impacts of the TSF1OS on groundwater and surface water potentially hydraulically connected to the stockpiled ore (refer Table 9.

Summary

The risk of potential seepage from TSF1 impacting groundwater and surface water can be reduced to an acceptable level by capturing seepage and runoff in a sump at the stockpile, with seepage potentially bypassing the TSF1OS sump being intercepted by drains, dams and sumps further down-gradient (on-Premises). Potential groundwater surface water impacts of the TSF1OS would be detected by the existing Licence water monitoring program.

6A2 Dust

Dust is known (air quality monitoring, visual monitoring, anecdotal, modelling) to be generated from the dry tailings surfaces in the Premises' TSFs. The TSF1OS is also likely to generate dust emissions under certain conditions (i.e. dry and windy).

The waste rock used for constructing the TSF1 RoM and the ore to be stockpiled will not have been processed, including crushing. They have a significantly higher rocky and coarse fraction, and significantly lower fine fraction, than tailings solids, which have undergone several stages of crushing (refer Figure 44, which shows that >20% of waste rock particles are>80mm in size, comparable with the -pre-crushing ore to be stockpiled). Fremantle Metallurgy (2025; Attachment 8L) reported that Premises tailings are significantly finer, with P80 values in the range of 190-225µm and P50 values around 110-130 µm. Dust lift-off from the TSF1OS is therefore likely to be significantly lower than from the surface of tailings currently stored within TSF1.

Controls

Construction of a RoM from waste rock and stockpiling of pegmatite ore on TSF1 will reduce dust emissions from TSF1, similarly to the application of waste rock on TSF2 propose elsewhere in this document.

Air quality will continue to be monitored and the Air Quality TARP implemented in accordance with the Licence. Controls are detailed at Table 9.

Summary

Air quality monitoring and implementation of the Air Quality TARP in accordance with the Licence, in conjunction with applying waste rock and/or ore to the TSF1 and TSF2 surfaces, should result in continued improvement in air quality and fewer unacceptable impacts.

Talison notes that four air quality exceedances at the Licence monitor were attributable to Talison operations in the 2024-2025 reporting period, a 100% decrease compared to the previous monitoring period. This supports the efficacy the monitoring program and of TARP implantation.

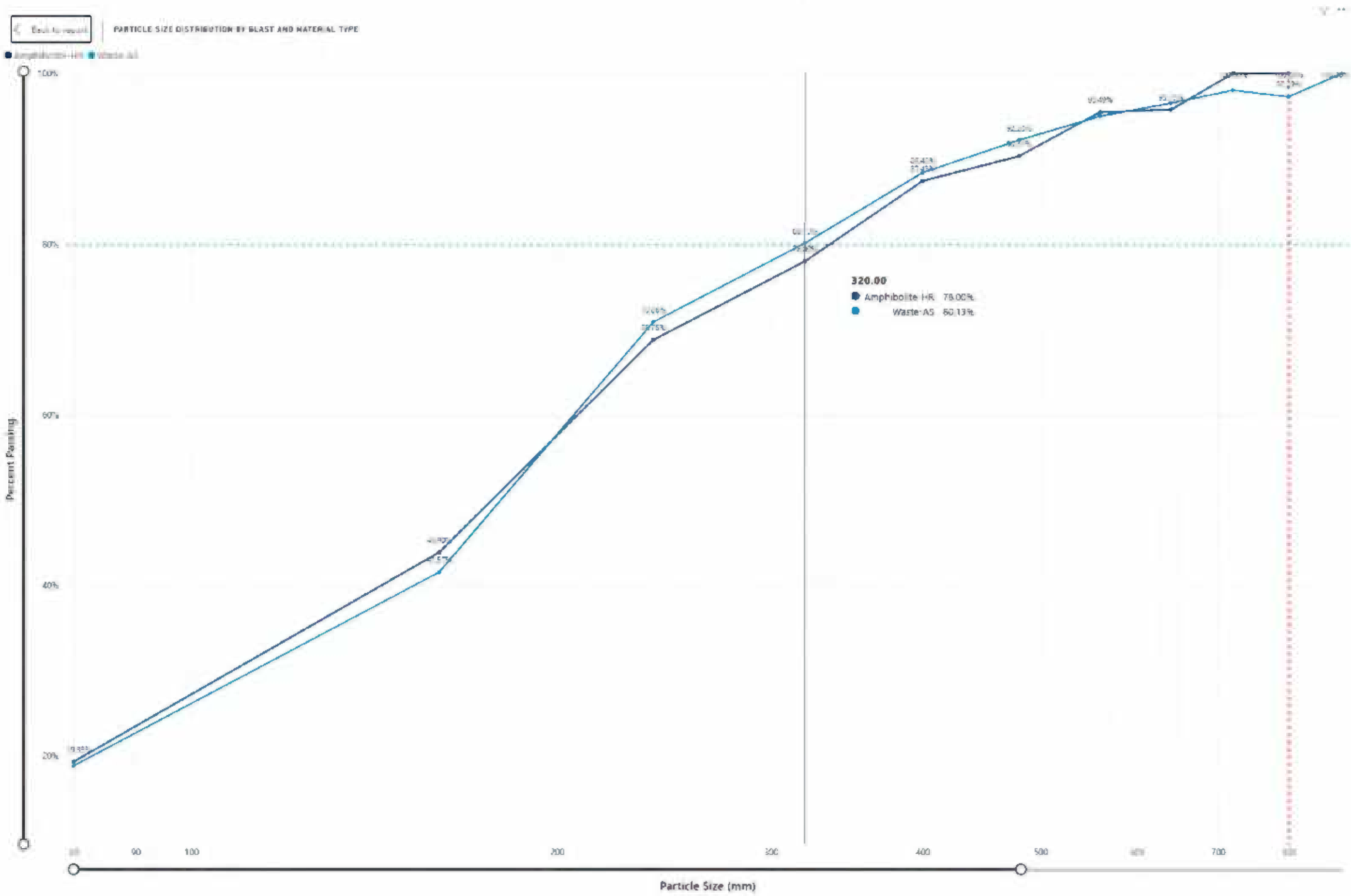


Figure 44: Waste Rock Particle Size Distribution

[redacted]

ATTACHMENT 7: SITING AND LOCATION

The Greenbushes Mine is situated on the top p[redacted]e southern section of the Darling Scarp, approximately 250km south of Perth and 80km south-east of Bunbury. The main ore body is orientated north-northwest to south-southeast and lies along a ridgeline that rises to approximately 1,320mRL.

A detailed description of the biological and physical environment of the Project is contained within the Environmental Review Document prepared for the EPA's assessment of the expansion Project (the scope including the establishment of TSF4) (GHD, 2018). Additionally, detailed information on the siting and location of the Project has been provided in the Cell 1a Licence Amendment (submitted in December 2023) and was also provided during the assessment of W6618/2021/1. This Application, being an application to incorporate an approved piece of infrastructure (TSF4 Cell 1) to be constructed to 1270mRL, does not change the siting or location information, and no changes to potential emissions and discharges are proposed. Further information has therefore not been included in this Application.

7.1 Geology and Soils

Geology and soils have not changed from W6618/2021/1. The information below has been previously provided but is required by the checklist.

A site wide hydrogeological investigation (GHD, 2019b) and TSF4 geotechnical investigation (GHD, 2019a) were completed by GHD. These reports were included as supporting documents and the findings were included in the original TSF4 Works Approval Application (2 November 2021; 2021b). Subsequent to this work, additional studies have been undertaken; relevant information is summarised below.

TSF4 Subsurface Permeability

Hydraulic conductivity testing has been completed on the various units underlying the TSF4 footprint, including tests at various depths for the saprolitic clay profile and for the underlying saprock/weathered basement aquifer. Results were reported in the TSF4 works approval application supporting document (GHD, 2021b).

Further testing has been undertaken of the clays underlying TSF4 to derive the attenuation factors for key CoPCs within the clays (GHD, 2023g; Attachment 8G). Ten core samples were collected across five locations for attenuation capacity testing. Sample locations aimed to optimise spatial distribution on an east-west transect and a north-south transect across TSF4. Both shallow and deeper samples were selected from the saprolitic profile.

Key findings from the attenuation testing were as follows:

- Arsenic was absorbed more readily than Rb, with Li being least adsorbed. Some lithium appears to be already adsorbed to the clays tested, as desorption of lithium was observed in 100% de-ionised water solutions in all samples; and
- Adsorption of Arsenic, Rubidium and Lithium does not seem to decrease, proportionally, at higher concentrations.

Adsorption coefficients were calculated and used in groundwater modelling to model the transmission of CoPCs through saprolites due to their adsorptiv[redacted]y.

7.2 Hydrology

The information provided below is taken from GHD (2023i) and is provided for context. No additional impacts to hydrology are expected from operating Cell 1 and Cell 2 TSF4 at 1,270mRL.

Woljenup Creek Hydrological Assessment

The Woljenup Creek watercourse originates within the TSF4 footprint on the southern boundary of the Mine and drains in a southerly direction. It discharges to the Blackwood River approximately 5km downstream of the DE.

No flow data exists for Woljenup Creek sub-catchment. Due to its small size, it is expected that it contributes significantly less flow to the Blackwood River than the Norilup and Hester Brook Sub-catchments. Catchment flows have been modelled before and after construction of TSF4 and for two climate scenarios. The modelling indicates annual flows of between 44 and 65ML/yr (for different climate scenarios) of streamflow at Jones dam (located about 750m downstream of TSF4) after construction of TSF4.

Surface water samples obtained from Woljenup Creek indicate the following generalised water quality for Woljenup Creek:

- Spatially variable chloride concentrations ranging from 120 to 750mg/L;
- Relatively neutral Ph with a range from to 7.4 to 8.3;
- Li concentrations ranging from <5 up to 21µg/L; and
- As concentrations ranging from 1 to 2µg/L.

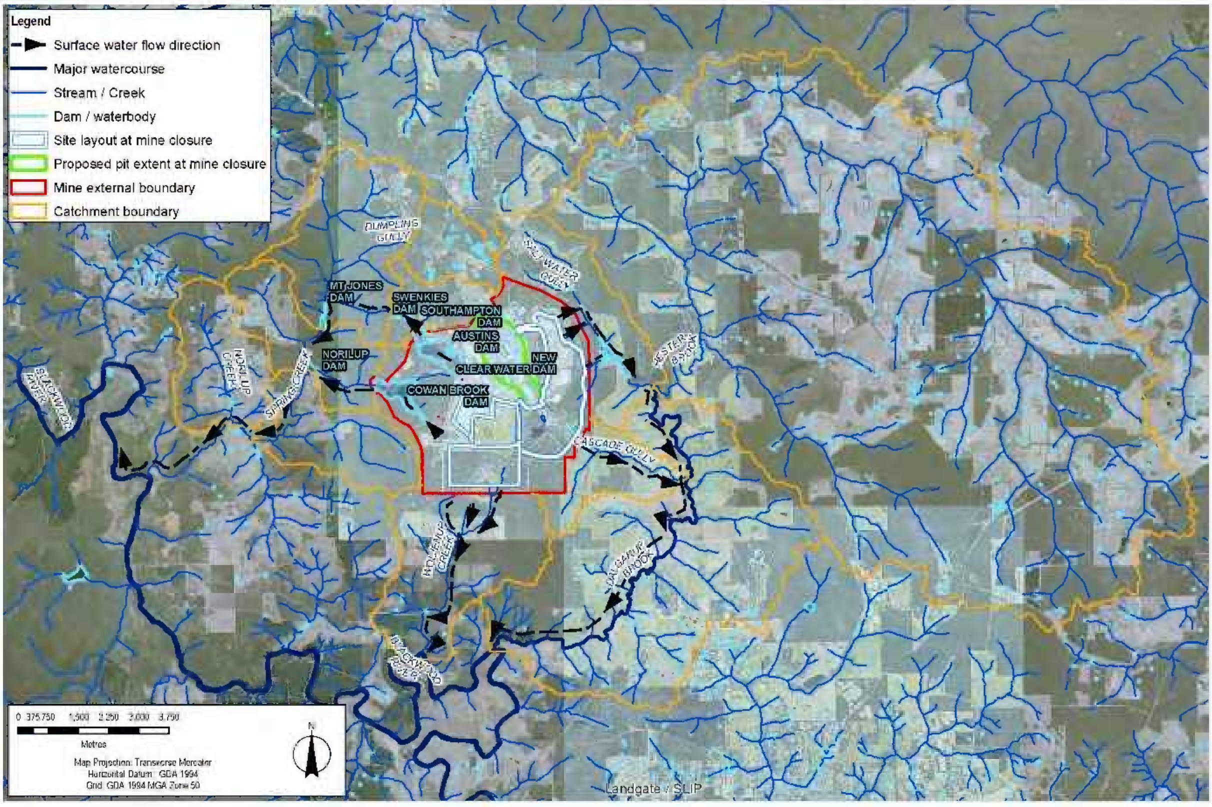


Figure 45: Site surface water catchments

Note: This figure shows an older Mine External boundary

Woljenup Creek hydrology was assessed as part of the TSF4 Seepage Assessment (GHD, 2023i; Attachment 8H). The purpose of the report was to:

- Assess the dilution of any CoPCs released downstream of TSF4 to the Woljenup Creek; and
- Assess potential hydrological impact on Jones Farm Dam (SW20-02).

Woljenup Creek is a tributary of Blackwood River and flows in a southerly direction, with TSF4 located on the upper reaches of the said creek. Figure 46 shows the alignment of the creek's main channel and the extents of its contributing catchment. The same figure also denotes the four sites where GHD undertook water quality sampling on 13 July 2022.

Jones Dam is a farm dam located on the main channel of Woljenup Creek at Chainage ~770. The dam is one of the surface water monitoring locations (i.e., location ID SW20/02) stipulated by the DWER in W6618/2021/1. As depicted in Figure 47, construction of TSF4 will reduce the dam's contributing catchment area by ~47% (from 256ha to 135ha). Talison purchased the property containing Jones Dam in late 2025.

A shallow but continuous streamflow was observed upstream of Site 1 (Chainage ~1600) on 28 February 2023. However, flow was also noted to quickly dissipate when passing through the wetland immediately downstream of Site 1. These observations suggest that:

- Streamflow is likely persistent throughout the year, considering that February 2023 is the driest month over the preceding 12 mon[redacted]rding to the nearby Bridgetown weather station (station no. 009617); and
- Streamflow may occur subsurface (as baseflow) or express onto the creek bed (as surface flow) depending on topography and geology (i.e. groundwater discharge as evidenced at MB23 monitoring bore where artesian conditions are noted).

Stepped increases in catchment area occur where tributaries of the creek connect into the main channel. The total catchment area of Woljenup Creek at its confluence with the Blackwood River (at Chainage ~5,270) is ~1,220ha. Discharge from each catchment was estimated using the Australian Water Balance Model (**AWBM**). GHD (2023i) considered the catchment modelling conservative (i.e., results in lower discharges) since calibration was undertaken over a period when the catchment was more forested and had less clearing.

The AWBM model simulated flows for the entire Woljenup Creek catchment through ensembles of sixteen future climate sequences over the period following mine closure (i.e., start of 2044) up to the end of the century (i.e., end of 2099). Modelled median average annual discharge ranged from 68mm/year with a relatively flat long-term trend over the simulation period, to 49mm/with a gradual decreasing trend, depending on the BoM greenhouse gas scenario. Modelled daily rates indicate that streamflow within Woljenup Creek is highly seasonal, with peak flow occurring in winter and orders of magnitude larger than summer flow. The simulated flows approach zero during late summer in most cases.

Modelled streamflow reduction to Jones Dam is summarised in Figure 47, which assumes median climate conditions across the simulated period. The reduction in catchment area is expected to result in a corresponding reduction in annual discharges to the Jones Dam by ~41-59ML/year.

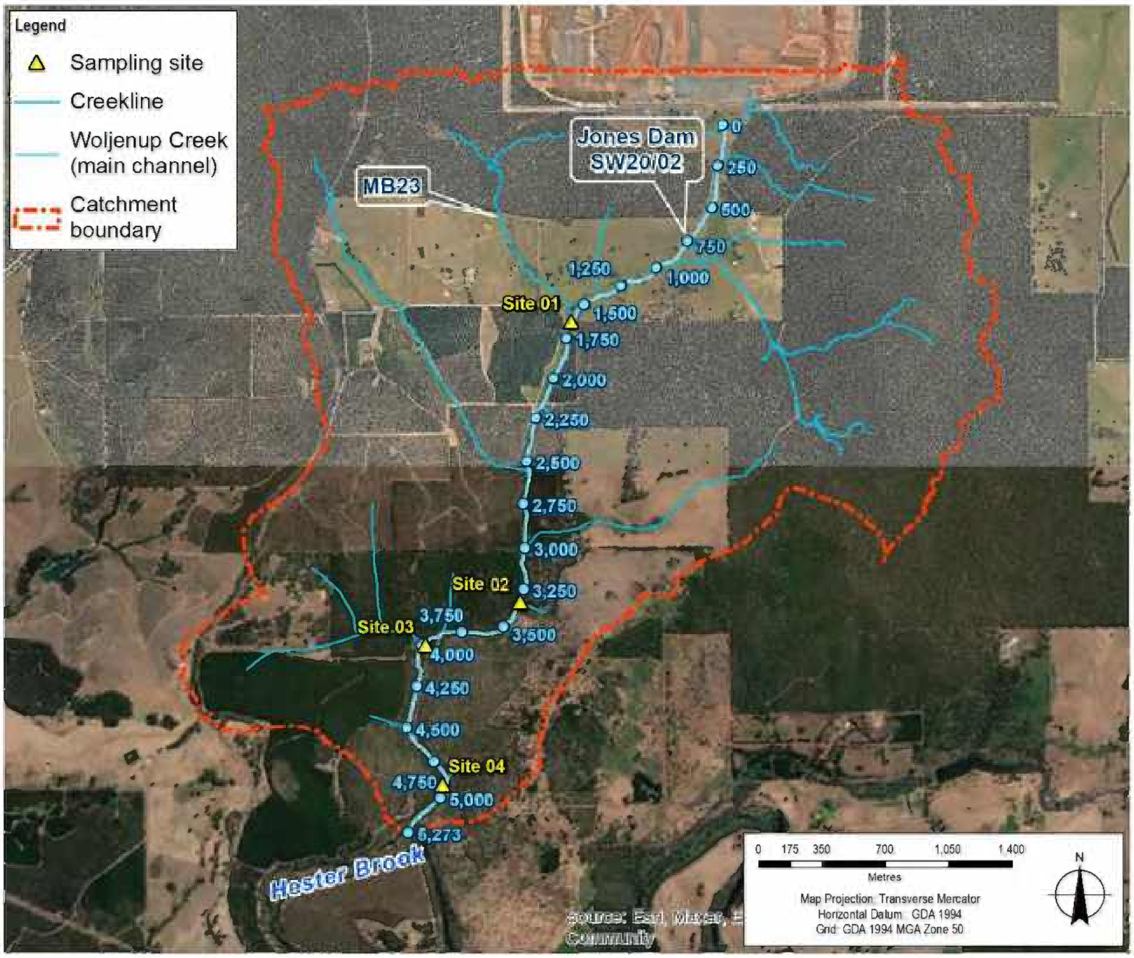


Figure 46: Woljenup Creek alignment and overall catchment boundary

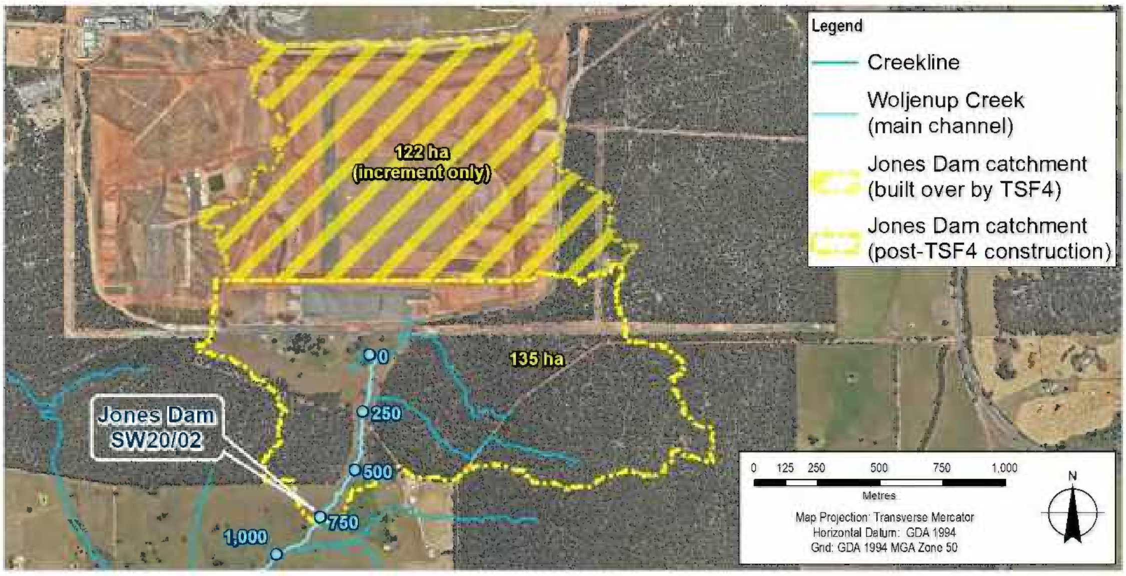


Figure 47: Jones Dam catchment extents pre and post-construction of TSF4

Table 19: Summary of Median Simulated Annual Streamflow (ML/yr)

Phase	Catchment Area (Ha)	RCP 4.5	RCP 8.5
Pre-TSF4 Streamflow	256	124	85
Post-TSF4 Streamflow	135	65	44
Difference	**121**	**59**	**41**

An assessment of the storage capacity of Jones Dam was made based on dimensions derived from recent aerial photography, the May 2022 LiDAR dataset, and typical farm dam design criteria. The basic dimensions of the impoundment behind Jones Dam are depicted in Figure 48. Estimates of the embankment dimensions are as follows:

- Embankment length ~35m.
- Dam reach ~60m.
- Upstream bank slope ~45%.
- Downstream bank slope ~10%.
- Spillway level ~1,219.6mRL.
- Assuming the lowest point corresponds with the middle of the embankment, the embankment height is ~2.9m.

Assuming that the dam reservoir geometry is equivalent to a triangular pyramid, the dam impoundment capacity at crest level is therefore ~1,000m^3, or 1ML, and that at spillway level is 650m^{3,} or 0.65ML. It is also noted that the lowest water level measured in the dam using historical LiDAR data is ~1,218.9mRL, which indicates that the dam is often at or near capacity.

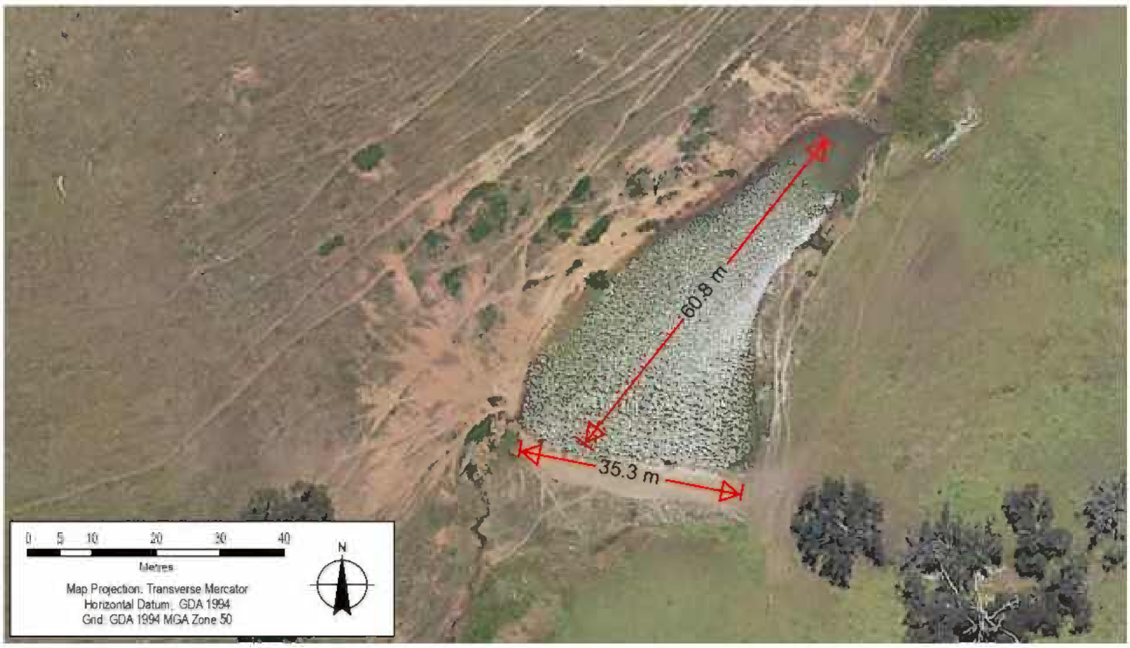


Figure 48: Indicative Dimensions of Jones Dam

Comparison of the estimated dam capacity of Jones Dam of 0.65ML to the simulated streamflows in Table 19 indicates that the capacity will be 1.5% of the median annual streamflow of 44ML/yr under the worst-case climate-change scenario. This indicates that the dam will remain at, or near, capacity for most of the time with possible drawdowns during very dry periods. It should be noted that, based on the conceptual hydrogeological model (GHD, 2023j; Attachment 8I), the dam is located in an area where groundwater is inferred to discharge and the reduction in catchment area is not expected to impact this baseflow.

Baseline Groundwater Monitoring (ongoing)

The laboratory analysis of groundwater samples from five monitoring bores in and around the TFS4 footprint indicates that metal concentrations were identified in two of the monitoring locations that were relatively elevated (e.g., arsenic, ~0.04mg/L, and lithium, up to ~2mg/L). These two bore locations are remote from any influence of mining impacts and given that the bores exhibit a water quality signature differing from the mine-seepage impacts (major-ion signature), the elevated metal concentrations are considered to reflect the background groundwater quality associated with the mineralised geological setting (GHD, 2023j).

The addition and operation of TSF4 cell 1b and 2 to the Licence does not alter the above.

Tailings Leach Testing

Tailings from TSF2 were sampled – including individual tailings streams from CGP1, CGP2, TGP and TRP. The testing was undertaken to characterise the leaching behaviour of CoPC from tailings material. Key findings from the leaching tests were as follows:

- Metal concentrations decrease through leaching events, indicating that residual decant within the pores is the primary CoPC source in tailings leachate and is subject to flushing during leach testing; and
- The strong downward trend in concentrations during leaching events indicates that tailings solids should not contribute to dissolved metals concentrations above the relevant guidelines post-closure.

No change is expected from the above work completed in support of the TSF4 planning and investigations.

Short Term Tailings Leach Testing Results

Short term LEAF leach testing of tailings solids material from four locations within TSF2 where active tailings deposition is ongoing was undertaken to characterise the leaching potential of the tailings material (GHD, 2023h; Attachment 8K). Cumulative leaching test results (LEAF 1314), which best simulate infiltration of rain and leaching of metals, indicates the following:

- Metal concentrations decrease in the four samples (CGP1, CGP2, TGP and TRP) from the initial leaching event through subsequent leaching events, indicating that the residual decant within the pores is subject to flushing from the tailings during leach testing;

- The strong downwards trend in concentrations during the leaching events and analysis of the final leach events (8th/9th) supports that the tailings solids should not contribute to dissolved metals at concentrations above the relevant guidelines (freshwater aquatic and drinking water) once the residual decant is flushed from the pore spaces; and
- Acidic and saline conditions were observed in one sample (TRP), the cause of which is not clear but which may reflect decant evaporative concentration.

No change is expected from the above work completed in support of the TSF4 planning and investigations.

Conceptual Groundwater Model of TSF4

A conceptual groundwater model for TSF4 was developed by GHD (2023f) based on drilling, hydraulic and monitoring information. The purpose of the model was to present aquifer and clays continuity, groundwater flow direction, groundwater discharge locations and surface water flows. The conceptual model is shown in cross section at two scales in Figure 49 and Figure 50.

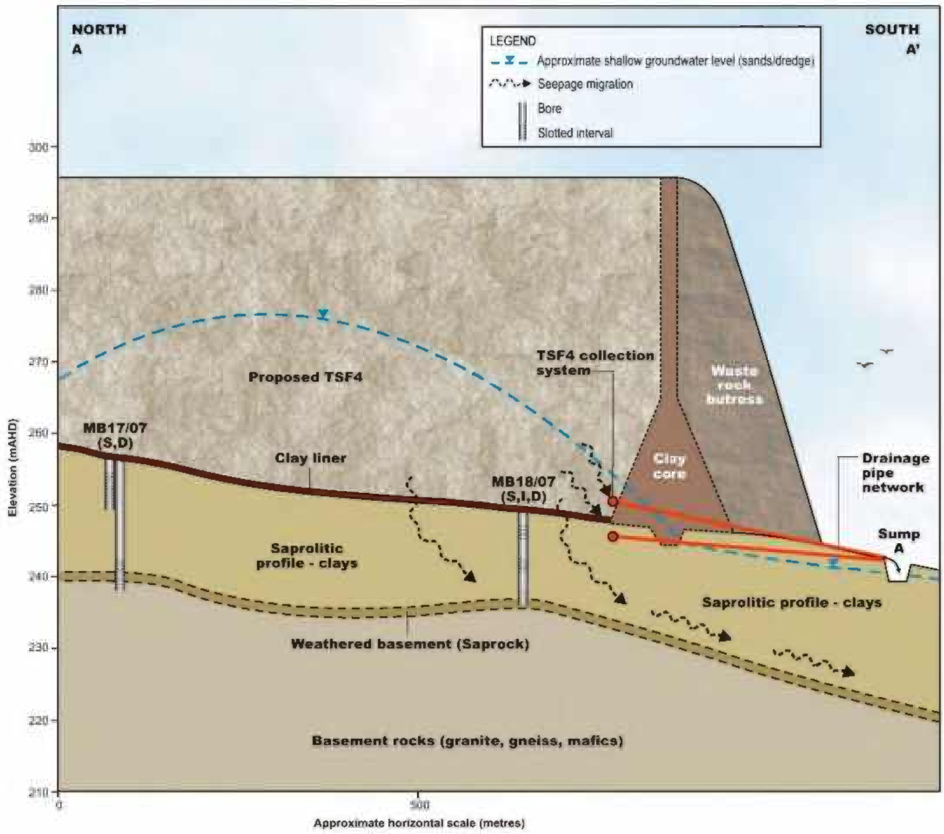


Figure 49: Hydrogeological cross section through TSF4 Section depicting localised drainage and seepage pathways

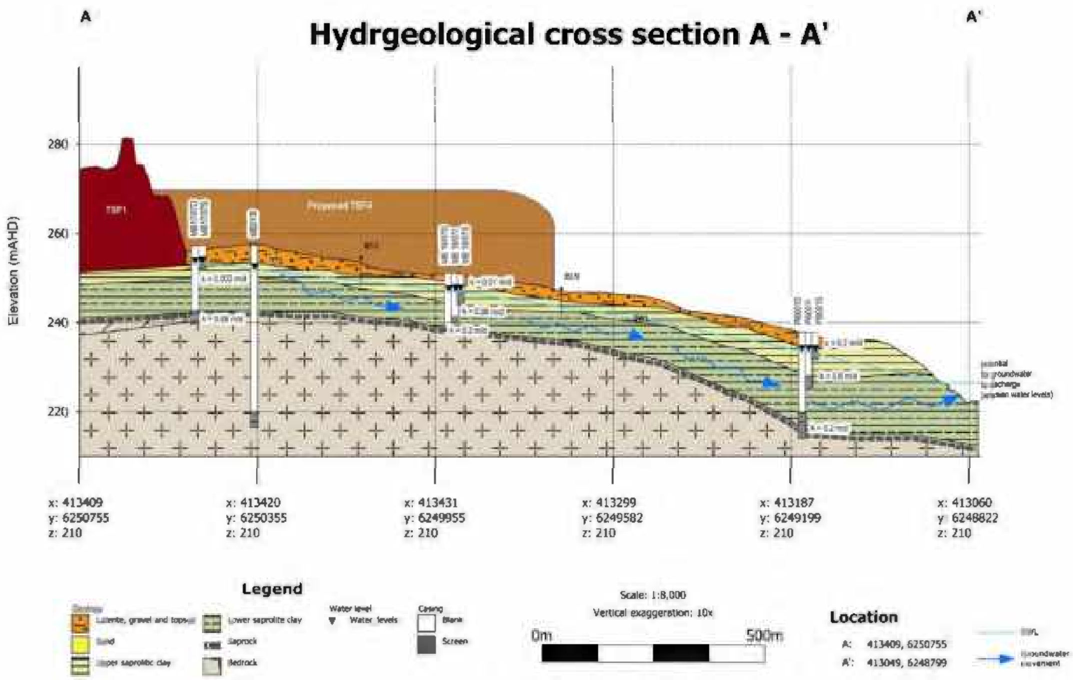


Figure 50: Hydrogeological cross section through TSF4 Section depicting offsite seepage pathways

The hydrogeological setting of TSF4 was derived from monitoring well sterilisation boreholes logs, and from monitoring water levels and groundwater quality. The hydrogeological profile in the area where TSF4 is to be constructed comprises:

- A discontinuous surface layer of sands and lesser lateritic/ferricrete loams, ~1m to ~3m thick. Within the footprint of the TSF4, the sands have been excavated and removed, but remain in areas outside the TSF4 footprint;
- Low permeability saprolitic clays (highly oxidised bedrock) with an average thickness of ~20m and which are deemed as continuous beneath the TSF4 footprint and the wider mine-site area, underlain by;
- A low/moderate permeability 'saprock' transitional zone of weathered bedrock of ~2m to ~4m thickness, underlain by; and
- Very low permeability fresh bedrock (not oxidised) (GHD, 2023f).

As the work underpinned approval for TSF4 to full height, no change is expected from the above work associated with the 270mAHD raise.

Groundwater Levels and Migration Direction

The groundwater levels within the saprolitic profile below the TSF4 area are on average ~7m below ground level. Where sands remain (i.e., outside the TSF4 footprint), shallow perched groundwater levels may prevail following winter rains (GHD, 2023f).

Groundwater flow directions indicate that any TSF4 derived seepage which migrates through the engineered clay liner beneath the TSF footprint into the underlying hydrogeological profile should migrate in two directions, primarily southwards into the Woljenup catchment (~80% of the seepage), with lesser flow towards the northwest and into the Cowan Brook Dam catchment (~20% of the seepage) (GHD, 2023f).

The observed groundwater levels indicate that a downwards hydraulic head potential (up to 10m) exists over the natural topographically elevated areas on the western flank of the TSF4 footprint. The elevated hydraulic head potential should promote groundwater migration into the deeper geological profile and migration towards the remaining central and eastern areas of the TSF4 footprint where relatively neutral potential hydraulic head is indicated. Importantly, an upwards hydraulic head potential is indicated ~750m to the south of the toe of the TSF4, where artesian flow is observed in nested monitoring bores (GHD, 2023f).

The 270mAHD raise does not alter the above.

TSF4 Seepage Migration and Discharge

Impacted seepage which migrates through the engineered clay liner will seep into the underlying saprolitic profile. The presence of backfilled sterilisation boreholes beneath TSF4 (approximately 400 holes) potentially provides a preferential pathway for a TSF4 derived seepage, to migrate through the saprolitic clays into the underlying saprock layer. The local-scale flow and transport modelling indicates that the small increases in metal concentrations will be transmitted by a small increase in flow (2.5% of TSF4 seepage captured and transmitted by borehole), and consequently the increase in mass and flux of metals into the aquifer is considered negligible. GHD (2023f) calculated groundwater velocities indicate that the groundwater flow will move slowly through the saprolitic clays (0.5m/year), slightly quicker in the underlying saprock horizon (3m/year), with low groundwater velocities inferred to flow through the bedrock (0.02 to 0.4m/year).

Where seepage migrates through the saprolitic clays, the long residence time provides the opportunity for attenuation of metals derived from TSF4 seepage, through adsorption and ion-exchange reactions prior to groundwater discharge. Where seepage migrates through the saprock, the shorter residence times, and lower clay component indicates the unit will have less opportunity to attenuate metals (GHD, 2023f).

The southerly groundwater flow path (80% of flow beneath TSF4 footprint) indicates that any TSF4 seepage impacts, will migrate for a distance of ~750m downgradient of TSF4, where the observed artesian groundwater levels (MB23, S, I, D) support that groundwater and any seepage impacts that are not attenuated along the groundwater flow path, may discharge into the receiving environment of the Woljenup Creek line (GHD, 2023f).

The north-westerly groundwater flow path (20% of flow beneath TSF4 footprint) indicates that any TSF4 seepage impacts will migrate ~100-200m downgradient of TSF4, where the any seepage impacts that are not attenuated along the groundwater flow path, may discharge into the drainage line associated with Tin Shed Dam (upper catchment of the Cowan Brook dam) (GHD, 2023f).

The 1,270mRL raise does not alter the above.

Baseline Groundwater Monitoring (ongoing)

The laboratory analysis of groundwater samples from five monitoring bores in and around the TFS4 footprint indicates that metal concentrations were identified in two of the monitoring locations that were relatively elevated (e.g., arsenic, ~0.04mg/L, and lithium, up to ~2mg/L). These two bore locations are remote from any influence of mining impacts and given that the bores exhibit a water quality signature differing from the mine-seepage impacts (major-ion signature), the elevated metal concentrations are considered to reflect the background groundwater quality associated with the mineralised geological setting (GHD, 2023f).

The 1,270mRL raise does not alter the above.

Site-wide Groundwater Model and Seepage Assessment

A site-wide three-dimensional numerical groundwater flow and transport model was developed to assess potential seepage from TSF4 (GHD, 2023h). The objective of the assessment was to characterise:

- The changes to groundwater levels and interaction with surface water bodies, including TSF drainage systems;
- The fate and transport of CoPCs derived from TSF4 seepage; and
- The duration that TSF4 drainage and seepage will require management post closure.

TSF4 seepage, drains and timeframes were the primary focus of the study, however other TSFs and Floyds WRL were also included in the model configuration to generate predictive simulations of the collective seepage from these facilities. Modelling of contaminant transport included Arsenic (as a low mobility metal) and Lithium (as a high mobility metal); these are considered to be 'end members' due to their respective mobilities and therefore representative of the range of other CoPCs. They are also the two key CoPCs known to leach from waste rock and tailings at Greenbushes.

This assessment was part of the predictive work on contaminant migration (referred to as 'Site wide seepage model' in Figure 40). Modelled groundwater head contours are provided for different post-closure periods. The Groundwater Model Update and Site Assessment identified that the predicted extent of seepage plumes with concentrations of As and Li above the site-specific guidelines is contained to areas within the footprint of TSF4 (Figure 51) at all times. This is due to the low permeability of liners and underlying saprolitic clays and the high adsorption capacity of the saprolitic clays underlying TSF4 (refer to Section 6 of the GHD (2023h) Groundwater Model Update and Site Assessment).

The 1,270mRL raise does not alter the above.

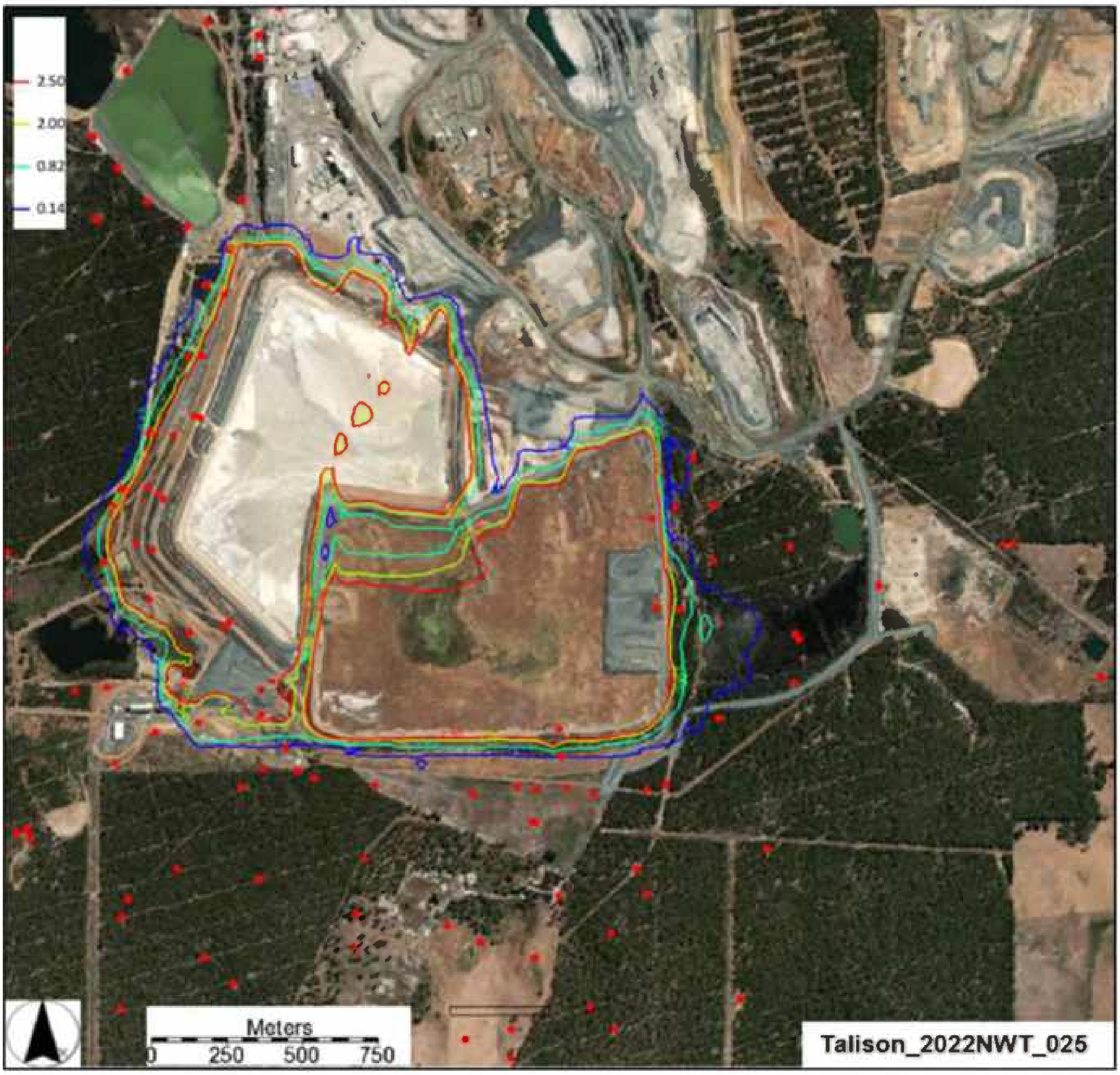


Figure 51: Modelled Lithium concentrations around existing TSFs

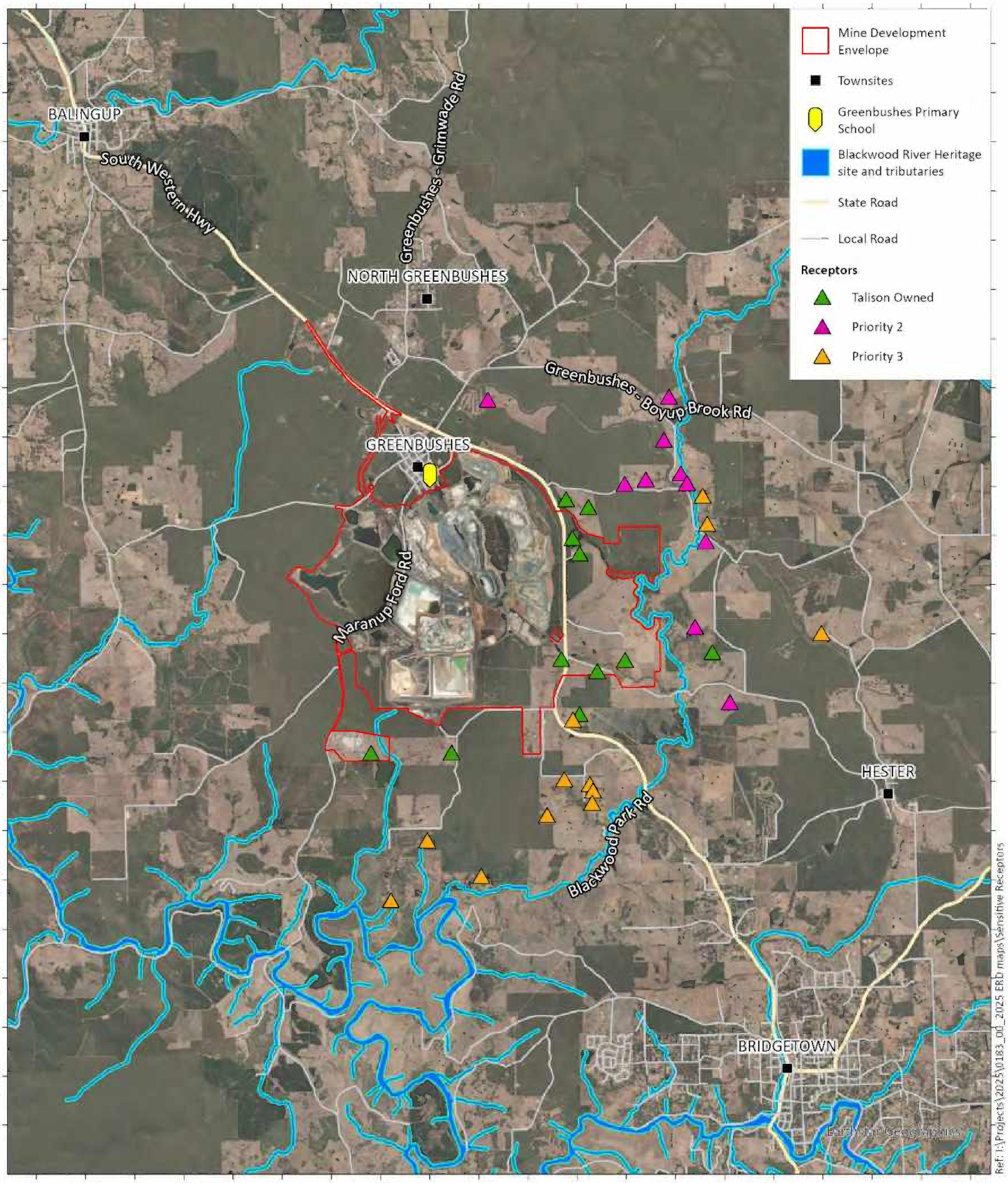
7.3 Sensitive Receptors

Sensitive receptors have been identified based on [redacted]e and survey results to identify receptors that may be sensitive to noise, dust and water impacts from the operation of TSF4. Receptor distances from the prescribed activity were identified in the W6618/2021/1 Decision Report. In addition to managing emissions and discharges, adopting continuous improvement actions and communicating with the community, Talison continues to negotiate to purchase nearby residences or reach agreement with landholders. The most recent assessment of sensitive receptors for TSF4 was completed in the W6901/2024/1 decision report, with the sensitive receptors and distance from the prescribed activity summarised in Table 20 remaining unchanged for this licence amendment application.

Sensitive receptors around the mining operations are shown in Figure 52 sensitive receptors downgradient of TSF4 are shown in Figure 53 and Figure 53.

Table 20: Sensitive human and environmental receptors and distance from prescribed activity

Receptors	Distance from prescribed activity
Human Receptors	
Town of Greenbushes (approximately 200 residences)	Premises are immediately south of town, with TSF4 ~3.2km south of the town.
Residential dwellings south of TSF4	The closest residential dwellings to TSF4 are: • K: Lot 504 on Plan 73712 (Talison owned) - ~1.3km south-west of TSF4 • J: Lot 11888 on Plan 162545 (Talison owned) - ~1.1km south of TSF4 • I: Lot 5220 on Plan 136672 - ~1.0km south of TSF4
Downstream water users (surface and groundwater)	The distance to closest down hydraulic gradient groundwater user is 3.2km southeast for stock/irrigation and 3.6km southeast for domestic purposes.
Residents and water users to the west and east	Multiple, min <1km from Premises boundary/TSF4
Environmental receptors	
Blackwood River and associated tributaries, including Woljenup Creek The drainage line, Woljenup Creek and Blackwood River are listed under the *Aboriginal Heritage Act 1972.*	TSF4 is constructed over the upper reaches of Woljenup Creek. The creek flows from immediately south of TSF4 and approximately 5 km to the Blackwood River.
Groundwater	Shallow and deep aquifer below and around TSF4 footprint.
Cowan Brook, Norilup Dam and Norilup Brook (water quality and ecology)	At the western edge of the premises boundary (offsite). Seepage from Cowan Brook Dam flows into Cowan Brook and into Norilup dam.
Greenbushes State Forest Hester State Forest Threatened/priority flora and fauna	*These receptors have been addressed in the EPA Report and are regulated under Part IV. Therefore, these environmental receptors were not considered.*



SENSITIVE RECEPTORS
Figure 52

0 1,000 2,000m
SCALE 1:100,000
Datum: GDA2020, Projection: MGA Zone 50

TALISON LITHIUM

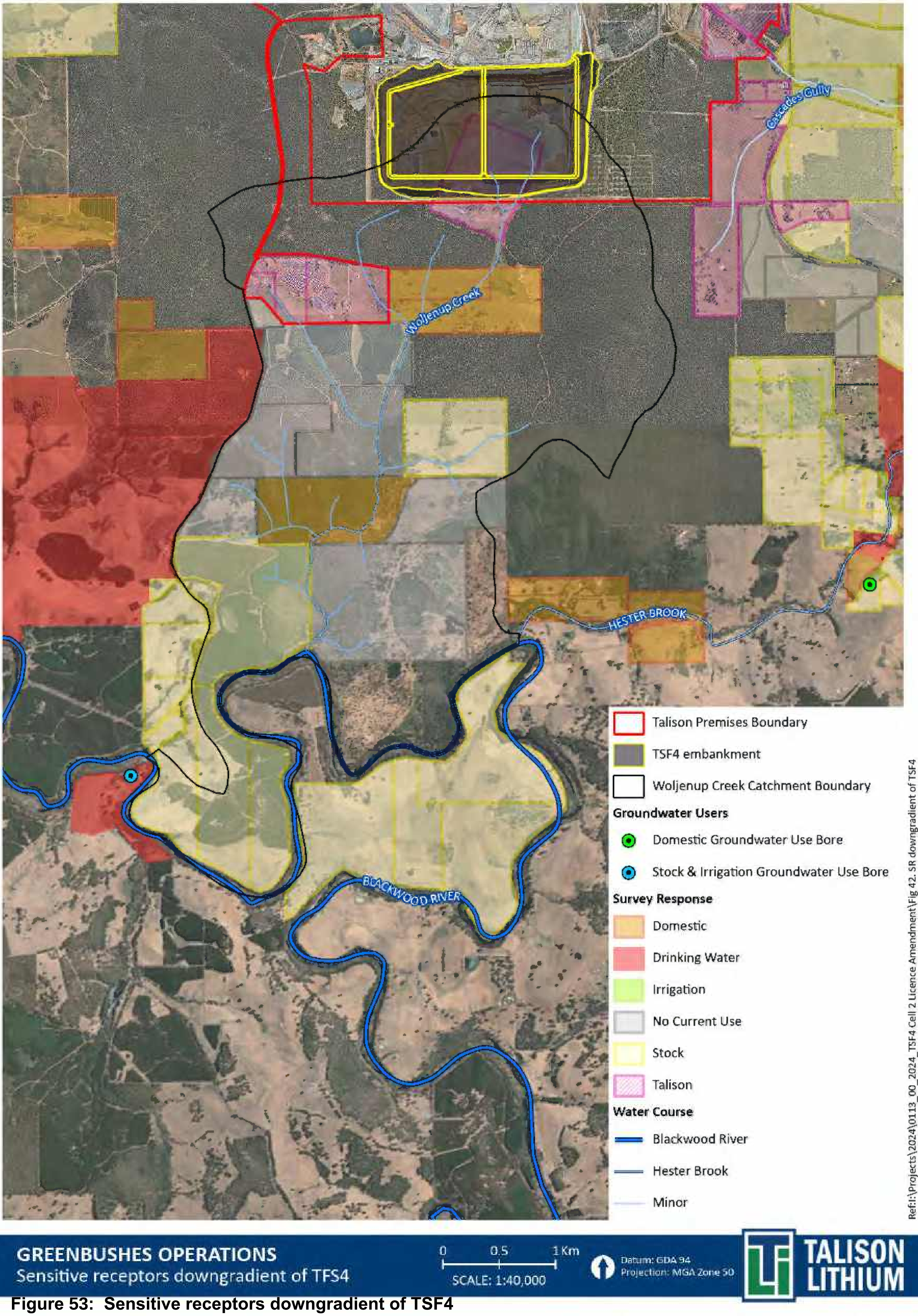


Figure 53: Sensitive receptors downgradient of TSF4

ATTACHMENT 8: ADDITIONAL INFORMATION

The following documents have been included [redacted]ional information/for reference for this Application as Attachments to this document:

8A. TSF4 Cell 1 Construction 270mAHD Critical Contamination Infrastructure Report

8B. TSF4 Cell 2 Construction 270mAHD Critical Contamination Infrastructure Report

8C. TSF4 Detailed design report (GHD 2021a)

8D. TSF4 Addendum to detailed design report (GHD 2024a)

8E. TSF4 Supporting information for Staged commissioning (GHD 2023a)

8F. Seepage Management Plan (Talison 2025)

8G. TSF4 Seepage Assessment – Clay attenuation testing of saprolitic profile beneath TSF4 (GHD 2023g)

8H. TSF4 Seepage Assessment - Woljenup Creek Hydrological Assessment (GHD 2023i)

8I. TSF4 Seepage Assessment - Conceptual Hydrological Model (GHD 2023j)

8J. TSF4 Seepage Assessment - Short-term LEAF testing (GHD 2023h)

8K. Talison Leaching Study: Stage 2 AMD Testing Results (GHD 2019c)

8L. Talison Lithium Greenbushes Particle Size Distribution and Rheology Testwork (Fremantle Metallurgy 2025)

ATTACHMENT 10: PROPOSED FEE CALCULATION

The proposed fee for the licence amendment is [redacted] and was determined using the Industry Licencing System Fee Calculation (https://www.wa.gov.au/government/publications/works-approval-and-licence-amendment-fee-calculator).

The fee was determined using the premises category with the largest fee units (Category 5), using the following inputs:

- Prescribed Premises Category: Category 5: Processing or beneficiation of metallic or non-metallic ore;
- Capacity Range: More than 5,000,000 tonnes per year; and
- Fee Units: 450.

GLOSSARY

Term	Meaning
AEP	Annual Exceedance Probability
ANCOLD	Australian National Committee on Large Dams
ANZG	Australian and New Zealand Guidelines
Application	Licence Amendment application
Application Form	*Application form: Works Approval / Licence / Renewal / Amendment / Registration v16, August 2022*
AQIA	Air Quality Impact Assessment
ARU	Arsenic Remediation Unit
AS	Australian Standard
AWBM	Australian Water Balance Model
BGM	Bituminous Geomembrane Material
BOD	Biological Oxygen Demand
BoM	Bureau of Meteorology
CCIRs	Critical Containment Infrastructure Reports
Cell 1a	Cell 1 Stage 1a (<1,261mRL embankment height)
Cell 1a Licence Amendment	Licence Amendment to L4247/1991/13 submitted to DWER in October 2023 for the inclusion of TSF4 Cell 1a (1,261mRL), the Village WWTP, an EDP for tailings and increase in tailings depositions to 5.2Mtpa.
Cell 1b	Cell 1 Stage 1 (1,265mRL embankment height)
Cell 1b & 2 Licence Amendment	This Application for a Licence Amendment to L4247/1991/13 for the inclusion of TSF4 Cell 1b and 2 (1,265mRL).
CGP1	Chemical Grade Plant 1
CGP2	Chemical Grade Plant 2
CGP3	Chemical Grade Plant 3
CGP4	Chemical Grade Plant 4
Checklist	Category Checklist: Tailings Storage Facilities (DWER, 2023).
CM	Community Member
CoPCs	Contaminants of Potential Concern
Cth	Commonwealth
CTPS	Centralised Tailings Pump Station

Term	Meaning
CWD	Clear Water Dam
DBCA	Department of Biodiversity, Conservation and Attractions
DE	Development Envelope
DMIRS	Department of Mines, Petroleum and Exploration
DMP	Dust Management Plan
DMPE	Department of Energy, Mines, Industry Regulation and Safety
DoH	Department of Health
DWER	Department of Water and Environmental Regulation
EDP	Emergency Dump Pond
EP Act	*Environmental Protection Act 1986*
EPA	Environmental Protection Authority
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
ETA	Environmental Technologies and Analytics
FoS	Factor of Safety
FY	Financial Year
Ha	Hectare
HDPE	High density polyethylene
JTSI	Department of Jobs, Tourism, Science and Innovation
m^3	Cubic meter
m^3/h	Cubic metres per hour
Mg	Milligrams
Mining Act	*Mining Act 1978*
mm	Millimetre
Mm^3	Cubic millimetre
MOL	Maximum operating level
mRL	Metres in Relative Level
MS	Ministerial Statement
MSA	Mine Services Area
Mt	Million tonnes

Term	Meaning
Mtpa	Million tonnes per annum
MWC	Mine Water Circuit
PACL	Poly-aluminium chloride
PM_{10}	Particulate Matter with an Aerodynamic Diameter of 10
Premises	Talison Lithium Mine
Project	Expansion
ROM	Run of Mine
RoR	Rate of Rise
SMP	Seepage Management Plan
Spadable Waste	Solid material that is dry and firm enough to be managed and handled using a spade
SS3	Seepage Sump 3
Talison	Talison Lithium Australia Pty Ltd
TARP	Trigger Action Response Plan
TEOM	Tapered element oscillating microbalance
TGP	Technical Grade Processing Plant
TLO	Time Limited Operations
TRP	Tailings Retreatment Plant.
TSF	Tailings Storage Facility
TSF1	Tailings Storage Facility #1
TSF2	Tailings Storage Facility #2
TSF3	Tailings Storage Facility #3
TSF4	Tailings Storage Facility #4
TSP	Total Suspended Particulates
Village	Permanent Accommodation Village
Village WWTP	Accommodation Village Wastewater Treatment Plant
WA	Western Australia
WMP	Water Management Plan
WQGs	Water Quality Guidelines
WRL	Waste Rock Landform

Term	Meaning
WWTP	Wastewater Treatment Plant
Zone 1A	The Clay Zone
µg	microgram

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APPENDICES

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Appendix A: Pegmatite Ore Geochemical Laboratory Analytical Results (GHD 2019c),

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	Al (%)	Sb (ppm)	As (ppm)	Ba (ppm)	Be (ppm)	Bi (ppm)	B (%)	Cd (ppm)	Cs (ppm)	Ca (%)	Ce (ppm)	Cr (III+VI) (ppm)	Co (ppm)
Abundance in Earths crust	8.23	0.2	1.8	425	2.8	0.01	0	0.15	3	4.15	66.5	100	25
Min	7.4	13.1	7.5	5.0	0.8	0.4	0.0	0.0	62.9	0.0	0.0	7.0	0.2
Max	9.8	196.5	249.0	10.0	843.0	155.0	0.0	8.1	836.0	0.6	0.8	30.0	83.4
Mean	8.4	43.6	61.6	6.2	98.1	11.3	0.0	0.9	372.5	0.2	0.3	14.5	6.2
Pegmatite Ore GX11253	9.15	16	13.5	5	5.81	1.04	0.005	0.01	250	0.09	0.04	9	0.8
Pegmatite Ore GX14345	8.19	15.2	9.7	5	12.65	0.36	0.02	0.28	152	0.11	0.15	26	0.4
Pegmatite Ore GX14412	8.13	14.85	20.3	5	14.8	6.29	0.005	0.14	62.9	0.02	0.01	30	0.3
Pegmatite Ore GX14713	8.28	13.5	10	5	44.9	2.84	0.04	0.01	558	0.09	0.08	13	0.8
Pegmatite Ore GX15033	7.36	91.9	7.5	5	0.84	3.96	0.005	0.36	129	0.06	0.03	15	0.2
Pegmatite Ore GX15359	8.43	15	196	5	843	155	0.005	8.05	473	0.6	0.4	15	0.3
Pegmatite Ore GX15446	8.97	29.3	44.5	5	9.24	3.3	0.005	0.26	262	0.06	0.04	16	1.8
Pegmatite Ore GX23701	8.1	13.1	72.4	5	25.3	2.9	0.005	0.38	226	0.53	0.82	11	83.4
Pegmatite Ore GX24439	8.33	13.45	14.9	5	10.3	1	0.005	0.21	97.2	0.09	0.11	15	0.6
Pegmatite Ore GX26212	9.76	43.9	51.4	10	175.5	1.19	0.005	0.69	356	0.24	0.16	7	1.3
Pegmatite Ore GX26452	7.95	37	89.1	10	72.2	2.79	0.01	0.45	486	0.48	0.41	13	3.1
Pegmatite Ore GX27274	7.86	44.7	26.1	10	67.5	0.62	0.005	0.28	586	0.48	0.53	22	5.6
Pegmatite Ore GX27707	9.18	66.1	249	5	63.2	1.43	0.04	0.96	545	0.36	0.72	13	2.9
Pegmatite Ore GX28141	8.7	196.5	37.2	5	138.5	1.22	0.01	0.91	779	0.3	0.74	7	0.6
Pegmatite Ore GX28462	8.03	54.4	83.9	10	107	0.45	0.03	0.92	836	0.37	0.58	10	1.9
Pegmatite Ore GX44965	7.42	62.7	62.7	5	48.1	4.58	0.02	0.38	209	0.16	0.23	8	0.9
Pegmatite Ore UGDD198518	9.63	13.75	59.2	5	29.3	3.9	0.01	0.61	326	0.11	0.08	17	0.3

	Cu (ppm)	Exch. Mg	F (ppm)	Ga (ppm)	Ge (ppm)	Au (ppm)	Hf (ppm)	In (ppm)	Fe (%)	La (ppm)	Pb (ppm)	Li (ppm)	Mn (ppm)
Abundance in Earths crust	60	#N/A	#N/A	19	1.5	0.004	3	0.25	5.63	39	14	20	950
Min	1.2	0.0	70.0	37.3	0.0	0.0	0.1	0.0	0.2	0.3	0.7	11700.0	198.0
Max	14.8	0.2	2100.0	108.5	0.1	0.0	1.0	0.1	1.3	0.3	13.0	22900.0	2300.0
Mean	4.2	0.1	474.4	53.5	0.0	0.0	0.4	0.0	0.7	0.3	5.5	17170.6	535.4
Pegmatite Ore GX11253	3.6	0.01	70	63.7	0.025	0.001	0.3	0.021	0.49	0.25	3	20900	230
Pegmatite Ore GX14345	2.9	0.03	150	40.3	0.05	0.001	0.5	0.017	0.48	0.25	4.5	18600	239
Pegmatite Ore GX14412	3.9	0.01	170 50.7	50.7	0.025	0.001	0.1	0.0025	0.28	0.25	0.7	22800	198
Pegmatite Ore GX14713	1.2	0.01	170	40.3	0.05	0.001	0.1	0.012	0.44	0.25	13	11700	373
Pegmatite Ore GX15033	2	0.02	70	41.4	0.05	0.0005	0.1	0.007	0.24	0.25	2.7	19850	241
Pegmatite Ore GX15359	2.3	0.01	1080	108.5	0.07	0.0005	0.2	0.054	0.83	0.25	3.1	18200	2300
Pegmatite Ore GX15446	1.4	0.01	120	48.5	0.025	0.001	0.2	0.036	0.51	0.25	6.5	15700	296
Pegmatite Ore GX23701	14.8	0.24	300	42.3	0.05	0.002	0.6	0.021	1.32	0.25	1.7	18500	437
Pegmatite Ore GX24439	3.1	0.04	80	40	0.05	0.0005	0.1	0.019	0.62	0.25	1.7	20400	320
Pegmatite Ore GX26212	4.1	0.07	190	58.6	0.025	0.001	0.2	0.037	0.7	0.25	5.9	22900	578
Pegmatite Ore GX26452	7.9	0.12	830	44.5	0.025	0.002	0.4	0.033	1	0.25	7	15050	401
Pegmatite Ore GX27274	9.1	0.19	260	40	0.025	0.001	0.2	0.023	1.11	0.25	6.7	15600	382
Pegmatite Ore GX27707	4.2	0.09	850	48	0.05	0.001	0.7	0.066	1.25	0.25	6.5	13050	703
Pegmatite Ore GX28141	2.2	0.03	700	74.9	0.05	0.002	1	0.058	0.78	0.25	9.8	12000	599
Pegmatite Ore GX28462	2.2	0.11	2100	49.7	0.06	0.001	0.9	0.096	1.09	0.25	7.8	13400	591
Pegmatite Ore GX44965	3.8	0.03	350	37.3	0.025	0.0005	0.3	0.035	0.64	0.25	5.7	17550	617
Pegmatite Ore UGDD198518	1.9	0.01	270	81.1	0.05	0.001	0.3	0.038	0.77	0.25	6.9	15700	596

	Hg (ppm)	Mo (ppm)	Ni (ppm)	Nb (ppm)	P (Total) (ppm)	K (%)	Re (ppm)	Rb (ppm)	Sc (ppm)	Se (ppm)	Si (%)	Ag (ppm)
Abundance in Earths crust	0.09	1.2	84	20	1000	2.09	0.0007	90	22	0.05	28	0.08
Min	0.0	0.9	0.9	1.3	180.0	0.1	0.0	171.0	0.1	0.5	34.1	0.0
Max	0.0	5.3	11.9	80.5	4650.0	3.2	0.0	3040.0	2.8	0.5	37.6	1.8
Mean	0.0	2.0	4.1	27.4	976.5	1.3	0.0	1811.8	1.1	0.5	35.7	0.3
Pegmatite Ore GX11253	0.0025	1.87	1.2	4.6	280	0.87	0.001	1060	0.4	0.5	35.6	1.03
Pegmatite Ore GX14345	0.0025	5.28	1.6	59.9	380	0.95	0.001	1250	0.4	0.5	36.2	1
Pegmatite Ore GX14412	0.0025	5.15	7.8	1.3	180	0.07	0.001	171	0.1	0.5	37.6	0.03
Pegmatite Ore GX14713	0.0025	1.65	0.9	13.8	750	3.16	0.001	2860	0.5	0.5	35.5	0.02
Pegmatite Ore GX15033	0.0025	2.02	1.2	11.5	270	0.67	0.001	1260	0.1	0.5	37	0.03
Pegmatite Ore GX15359	0.0025	1.39	1.4	6.9	4650	0.7	0.001	1600	1.1	0.5	35.6	0.48
Pegmatite Ore GX15446	0.0025	2.31	1.4	21.6	590	2.06	0.001	2730	0.7	0.5	36	0.07
Pegmatite Ore GX23701	0.0025	1.56	7.2	8.4	270	0.37	0.003	740	2.8	0.5	34.8	0.12
Pegmatite Ore GX24439	0.006	1.24	2.8	3.1	290	0.56	0.001	760	0.5	0.5	37.3	0.11
Pegmatite Ore GX26212	0.0025	0.94	3.2	42.7	640	1.47	0.001	1670	1.5	0.5	34.5	1.76
Pegmatite Ore GX26452	0.0025	1.48	9.1	28.1	710	1.53	0.001	2210	2	0.5	36.3	0.07
Pegmatite Ore GX27274	0.0025	2.5	11.9	17.1	750	1.98	0.001	2420	2.3	0.5	35.9	0.01
Pegmatite Ore GX27707	0.0025	1.69	5.2	47.3	1610	1.41	0.001	1890	1.5	0.5	34.8	0.06
Pegmatite Ore GX28141	0.0025	0.94	2.6	60	1780	2.06	0.001	3030	1.4	0.5	34.3	0.18
Pegmatite Ore GX28462	0.0025	1.38	4.9	80.5	1330	1.94	0.001	2880	1.9	0.5	35.1	0.07
Pegmatite Ore GX44965	0.0025	1.7	3.5	40	1210	0.99	0.001	1230	0.8	0.5	36.9	0.005
Pegmatite Ore UGDD198518	0.0025	1.71	3.6	18.5	910	1.7	0.001	3040	0.8	0.5	34.1	0.06

	Na (%)	Sr (ppm)	SO_4^{2-} (mg/kg)	S2− (%)	S2− as S (%	S (%)	Ta (ppm)	Te (ppm)	Tl (ppm)	Th (ppm)	Sn (ppm)	Ti (%)
Abundance in Earths crust	2.36	0.04	N/A	N/A	N/A	N/A	2	0	0.85	9.6	2.3	0.56
Min	0.2	0.9	50.0	0.0	0.0	0.0	10.0	0.0	1.5	0.1	14.4	0.0
Max	2.0	18.3	50.0	0.0	0.0	0.0	142.5	0.0	30.9	2.7	95.9	0.1
Mean	0.9	6.5	50.0	0.0	0.0	0.0	57.7	0.0	16.7	1.0	31.1	0.0
Pegmatite Ore GX11253	0.48	2.8	50	0.005	0.005	0.005	33.1	0.025	10.45	1.04	27.3	0.0025
Pegmatite Ore GX14345	0.57	2.3	50	0.005	0.005	0.005	110.5	0.025	11.45	0.96	30	0.0025
Pegmatite Ore GX14412	0.16	0.9	50	0.005	0.005	0.005	14.95	0.025	1.49	0.05	17.7	0.0025
Pegmatite Ore GX14713	1.43	4.4	50	0.005	0.005	0.005	27.9	0.025	27.1	1.2	14.4	0.0025
Pegmatite Ore GX15033	0.18	2.6	50	0.005	0.005	0.005	138	0.025	12.1	0.79	15.9	0.0025
Pegmatite Ore GX15359	0.46	3.8	50	0.005	0.005	0.005	12.1	0.025	12.75	2.3	48.7	0.006
Pegmatite Ore GX15446	1.23	2.9	50	0.005	0.005	0.005	55.6	0.025	27.5	0.84	18.5	0.0025
Pegmatite Ore GX23701	0.59	13.9	50	0.01	0.005	0.005	25.9	0.025	8.27	0.51	18.3	0.055
Pegmatite Ore GX24439	0.46	3.2	50	0.005	0.005	0.005	9.97	0.025	7.2	0.4	16.5	0.005
Pegmatite Ore GX26212	0.58	12.3	50	0.005	0.005	0.005	142.5	0.025	14.15	0.93	41.6	0.014
Pegmatite Ore GX26452	0.95	6.2	50	0.01	0.005	0.005	74.4	0.025	18.3	0.93	27.5	0.0025
Pegmatite Ore GX27274	0.62	7.6	50	0.01	0.005	0.005	48.2	0.025	20.9	0.36	18.4	0.034
Pegmatite Ore GX27707	2.04	7.7	50	0.01	0.005	0.005		0.025	17.7	0.69	45.8	0.024
Pegmatite Ore GX28141	1.77	13.2	50	0.005	0.005	0.005		0.025	27.7	2.67	39.6	0.01
Pegmatite Ore GX28462	0.98	18.3	50	0.01	0.005	0.005		0.025	25.6	1.53	95.9	0.029
Pegmatite Ore GX44965	0.75	4.5	50	0.01	0.005	0.005	82.7	0.025	10.25	1.05	22.7	0.008
Pegmatite Ore UGDD198518	1.81	3.2	50	0.005	0.005	0.005	32	0.025	30.9	1.29	30	0.0025

	W (ppm)	U (ppm)	V (ppm)	Y (ppm)	Zn (ppm)	Zr (ppm)
Abundance in Earths crust	1.25	2.7	120	33	70	165
Min	0.7	0.3	0.5	0.1	1.0	0.3
Max	1160.0	5.1	22.0	2.0	83.0	5.8
Mean	78.7	2.0	4.8	0.7	24.9	2.1
Pegmatite Ore GX11253	11.1	0.8	0.5	0.2	1	1.1
Pegmatite Ore GX14345	4.4	1.5	2	0.8	14	2.9
Pegmatite Ore GX14412	0.7	0.5	1	0.05	3	0.25
Pegmatite Ore GX14713	9.1	1.3	1	0.1	13	1.1
Pegmatite Ore GX15033	1.3	2.3	1	0.05	6	0.5
Pegmatite Ore GX15359	4.1	4.6	1	0.7	51	0.9
Pegmatite Ore GX15446	24.7	1	1	0.05	5	0.8
Pegmatite Ore GX23701	1160	1	22	1.5	27	3
Pegmatite Ore GX24439	1.8	0.3	1	0.1	12	0.6
Pegmatite Ore GX26212	8.2	1.6	5	0.2	20	0.9
Pegmatite Ore GX26452	9.7	1.8	11	0.8	30	2.2
Pegmatite Ore GX27274	50.3	0.6	14	1.4	18	1.2
Pegmatite Ore GX27707	21.3	2.7	8	2	57	5.1
Pegmatite Ore GX28141	8.1	4.7	2	1.8	44	5.8
Pegmatite Ore GX28462	13.6	2.2	8	1.7	83	4.9
Pegmatite Ore GX44965	7.7	5.1	2	0.3	25	2.3
Pegmatite Ore UGDD198518	1.5	1.9	1	0.1	15	2

[redacted]

Attachment 8A
TSF4 Cell 1 Construction 270mAHD Critical Contamination Infrastructure Report

[redacted]

Attachment 8B
TSF4 Cell 2 Construction 270mAHD Critical Contamination Infrastructure Report

[redacted]

Attachment 8C

TSF4 Detailed design report (GHD, 2021a)

[redacted]

Attachment 8D
TSF4 Addendum to detailed design report (GHD, 2024a)

[redacted]

Attachment 8E
TSF4 Supporting information for Staged commissioning (GHD, 2023a)

[redacted]

Attachment 8F

Seepage Management Plan (Talison,2025)

[redacted]

Attachment 8G
TSF4 Seepage Assessment – Clay attenuation testing of saprolitic profile beneath TSF4 (GHD, 2023g)

[redacted]

Attachment 8H
TSF4 Seepage Assessment - Woljenup Creek Hydrological Assessment (GHD, 2023i)

[redacted]

Attachment 8I

TSF4 Seepage Assessment - Conceptual Hydrological Model (GHD, 2023j)

[redacted]

Attachment 8J

TSF4 Seepage Assessment - Short-term LEAF testing (GHD, 2023h)

[redacted]

Attachment 8K

Talison Leaching Study: Stage 2 AMD Testing Results (GHD, 2019c)

[redacted]

Attachment 8L
Talison Lithium Greenbushes Particle Size Distribution and Rheology Testwork (Fremantle Metallurgy 2025)