



Application for Works Approval

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

Works Approval Number W6953/2024/1

Applicant Pilbara Manganese Pty Ltd (PMPL)

ACN 074 106 577

File number DER2024/000346

Premises Woodie Woodie Mine Site

Mining Tenements G45/332, G45/333, G45/334, G45/335, G45/336, G45/37-40, G46/4-5, L46/29, M45/107, M45/429-433, M45/517, M45/600-602, M45/637-641, M45/1218, M46/92-93, M46/108, M46/137, M46/150, M46/161-162, M46/383, M46/384 and G45/279-284.

As defined by the premises maps attached to the issued works approval

Date of report 10 March 2025

Decision Works approval granted

Table of Contents

1. Decision summary	1
2. Scope of assessment	1
2.1 Regulatory framework	1
2.2 Application summary	1
2.3 Overview of the premises	1
2.4 Proposed activity	4
2.5 Design of Paystar in-pit TSF	4
2.5.1 Tailing deposition infrastructure	6
2.5.2 Decant system	8
2.5.3 Tailings physical and chemical properties	8
2.5.4 Monitoring bore network	9
2.6 Commissioning phase	10
3. Legislative context	11
3.1 <i>Mining Act 1978</i>	11
4. Groundwater monitoring and modelling	11
4.1 Groundwater chemistry	12
5. Hydrology and surface water quality	12
6. Risk assessment	13
6.1 Source-pathways and receptors	13
6.1.1 Emissions and controls	13
6.1.2 Receptors	15
6.2 Risk ratings	17
7. Consultation	21
8. Conclusion	22
References	23
Table 1: PIPTSF specification – supplied by applicant	4
Table 2: Proposed applicant controls	13
Table 3: Sensitive human and environmental receptors and distance from prescribed activity	15
Table 4: Risk assessment of potential emissions and discharges from the premises during construction, commissioning and operation	18
Table 5: Consultation	21
Figure 1: Location of Woodie Woodie Manganese Operation	2
Figure 2: Location of proposed Paystar In-Pit Tailings Storage Facility (PIPTSF)	3
Figure 3: PIPTSF and pipeline design and layout	5

Figure 4: Tailings and decant pipeline and discharge locations..... 7
Figure 5: Proposed freeboard profile of PIPTSF..... 8
Figure 6: Overview of Paystar IPTSF – monitoring bore locations..... 10

1. Decision summary

This decision report documents the assessment of potential risks to the environment and public health from emissions and discharges during the construction and operation of the premises. As a result of this assessment, works approval W6953/2024/1 has been granted.

2. Scope of assessment

2.1 Regulatory framework

In completing the assessment documented in this decision report, the Department of Water and Environmental Regulation (the department; DWER) has considered and given due regard to its regulatory framework and relevant policy documents which are available at <https://dwer.wa.gov.au/regulatory-documents>.

2.2 Application summary

On 16 July 2024, Pilbara Manganese Pty Ltd (PMPL, or the applicant) submitted an application for a works approval to the department under section 54 of the Environmental Protection Act 1986 (EP Act).

The application is to undertake construction works relating to the construction and time limited operation of the Paystar In-Pit Tailings Storage Facility (PIPTSF) at the Woodie Woodie Manganese Operation (the premises). The premises is approximately 120 km east of Nullagine, located in the Pilbara region of Western Australia.

The premises relates to the category and assessed production / design capacity under Schedule 1 of the Environmental Protection Regulations 1987 (EP Regulations) which are defined in works approval W6953/2024/1. The infrastructure and equipment relating to the premises category and any associated activities which the department has considered in line with *Guideline: Risk Assessments* (DWER 2020a) are outlined in works approval W6953/2024/1.

2.3 Overview of the premises

The Woodie Woodie Manganese Operation is an existing mining operation owned and operated by Pilbara Manganese Pty Ltd, a wholly owned subsidiary of Consolidated Minerals Pty Ltd (ConsMin), located in the east Pilbara region of Western Australia (Figure 1).

Material is crushed, screened and beneficiated on site at a central processing plant prior to being trucked to Port Hedland for shipment through the Utah Point Bulk Handling Facility.

Processing wastes in the form of tailings are discharged to in-pit tailing storage facilities (IPTSFs).

The applicant is currently licenced to discharge tailings into five IPTSFs: Demon Pit, Dartmoor Pit, Malta Pit, Area 1 Pit, and Homestead Pit (HPTSF).

The Homestead Pit TSF is the active tailings facility at Woodie Woodie however, it is beginning to reach its capacity and the development of a new IPTSF will be required to support ongoing operations. The applicant is seeking approval to construct and operate a new IPTSF in the mined out Paystar pit, located 0.6 km south of the HPTSF within tenement M 45/638 and M 45/601 (Figure 2).

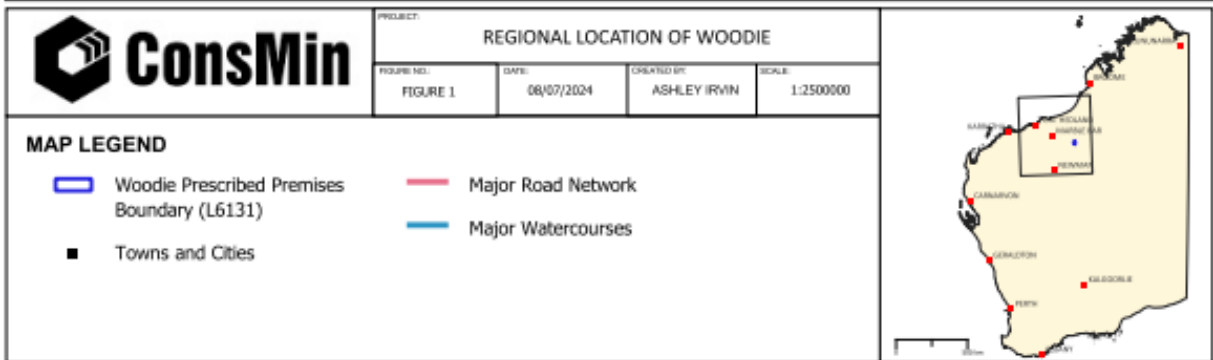
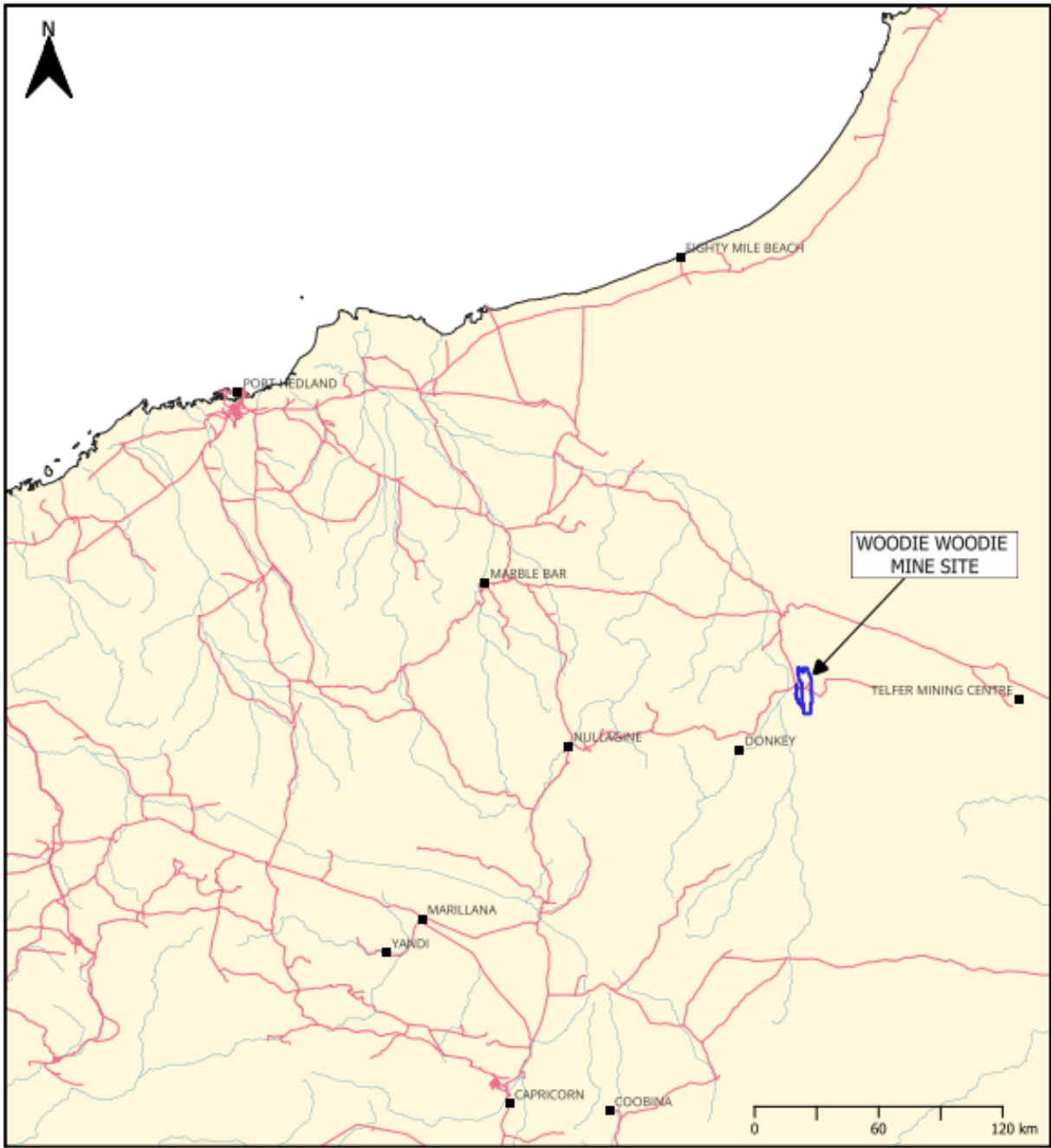


Figure 1: Location of Woodie Woodie Manganese Operation

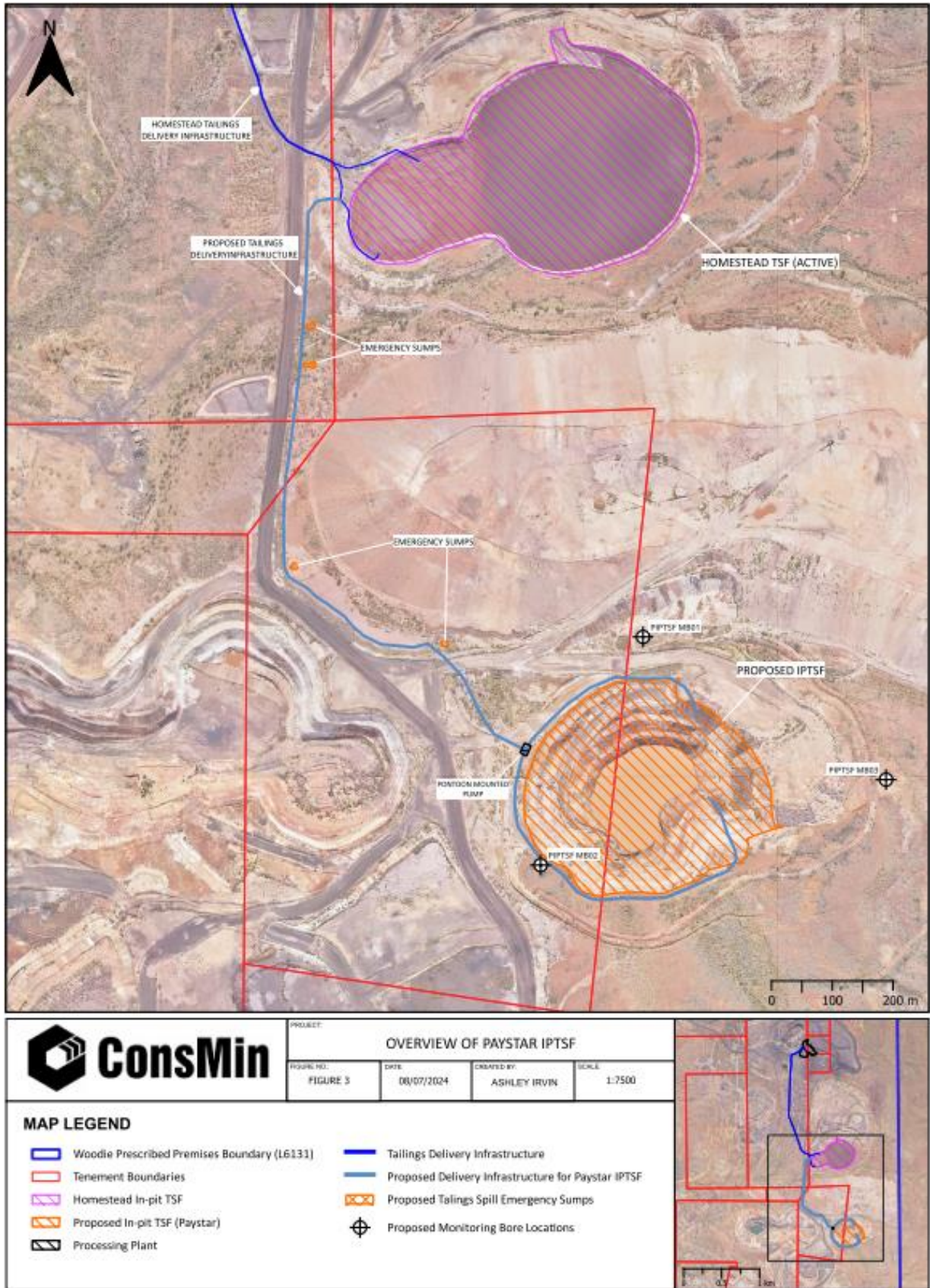


Figure 2: Location of proposed Paystar In-Pit Tailings Storage Facility (PIPTSF)

2.4 Proposed activity

Mining of the Paystar pit ceased in 2019 and a sterilisation report was approved by the Department of Energy, Mines, Industry Regulation and Safety (DEMIRS) in October 2019 to commence backfilling activities. The Paystar pit is surrounded by natural ground surface forming containment embankments on three sides (northern, western and southern), with mine waste on the eastern side.

The applicant proposes to utilise the existing Paystar pit for the storage of future tailings generated at Woodie. The applicant believes that tailings deposition into the mined out Paystar Pit will negate the need for construction of an above ground TSF, reduce additional land disturbance, allow future rehabilitation of an otherwise open pit and improve the visual aesthetics of the landscape.

Proposed construction and initial tailings deposition is projected to commence in Q1 2025, pending approvals.

2.5 Design of Paystar in-pit TSF

The PIPTSF design was prepared in accordance with DEMIRS (2015) '*Guide to the preparation of a design report for tailings storage facilities (TSFs)*', DEMIRS (2013) '*Code of Practice Tailings storage facilities in Western Australia*', and the Australian National Committee on Large Dams (ANCOLD, 2019) '*Guidelines on Tailings Dams – Planning, Design, Construction, Operation and Closure*'. The PIPTSF design is based on:

- Annual tailings production of 0.75 Mtpa
- Tailings deposited at 23% solids
- Minimum PIPTSF design life of 4.6 years with total project life of 15 years
- The final tailings beach level is proposed to be at ~275m AHD, at approximately 1% slope

As an in-pit TSF, PIPTSF does not require construction of external embankments. The applicant classified the in-pit TSF in accordance with the DEMIRS (2013) code, which resulted in a hazard rating of 'Category 3 – Low.' The hazard rating is low as the potential impact to the environment is negligible and there are no external perimeter embankments. Specification of PIPTSF is given in Table 1 and Figure 3.

Table 1: PIPTSF specification – supplied by applicant

Aspect	Paystar Pit	Comments
Crest Height (min.)	RL 275 m	
Crest Height (max.)	RL 280 m	
Base of Pit	RL 225 m	
Pit Wall Angles	Pit Wall: 55° varies greatly Inter-bench	Benches located at typ. RL 230 m, RL 240 m, RL 255 m, RL 275 m and RL 280 m
Facility Area (ha)	9 ha	
Final Tailings Area (ha)	11 ha	
Tailings Fill Height (max.)	Initial Spigot: RL 280 m	Located in west end of pit
Tailings Depth (max.)		Will vary with actual achieved tailings beach slope
Tailings Volume (m ³)	nom. 3.39 Mm ³	4.52 years at 750,000 tpa and a deposited dry density of 1.5 t/m ³

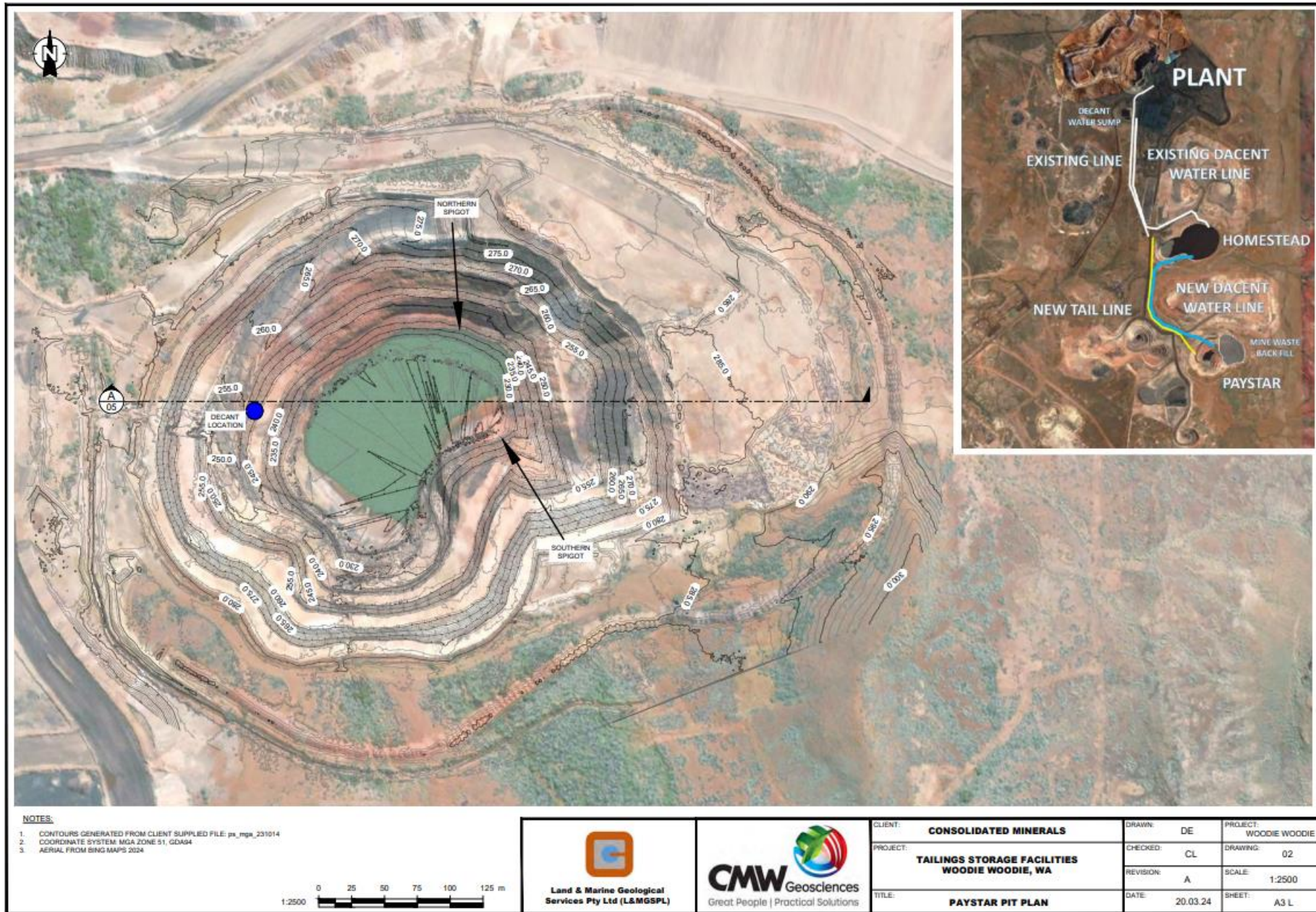


Figure 3: PIPTSF and pipeline design and layout

2.5.1 Tailing deposition infrastructure

Tailings in the form of slurry will be discharged sub-aerially with the initial tailings discharge being from a single open-ended pipe on the northern and southern sides of the facility.

The pipes will be 380 and 680 m in length (north and south lines respectively). Small openings in these pipes will allow continuous discharge as the level of tailings rises. Each discharge spigot is to be separately operated for 2-3 weeks. The applicant states the purpose of this deposition schedule is to prevent eroding of the pit walls and allow the tailings to form a tailings buttress at the toe of the existing mine waste backfill.

Tailings will be delivered to the PIPTSF from the processing plant in a large diameter HDPE pipe installed within existing pipeline corridors. A small extension of the pipeline corridor from the processing plant to the Homestead in-pit TSF (HPTSF) will be required along existing tracks for the establishment of new tailings and return water pipelines for the PIPTSF (Figure 2 and Figure 4).

The applicant indicated that minimal land disturbance will be required to facilitate the construction and ongoing operation of the PIPTSF as the pipeline corridor will be largely constructed within existing tracks and previously disturbed areas. The pipelines will be bound by bund walls within the corridor to prevent tailings discharge into the environment and scour sumps will be located at appropriate distances to capture any spillage.

Pipeline telemetry

The applicant states that the telemetry system for the tailing lines is designed to enhance monitoring and control, ensuring the integrity and efficiency of the tailings delivery process. A flow meter and pressure indication transmitter (PIT) will be installed, connected to a telemetry system. This setup is mirrored in the existing pipeline to the Homestead in-pit TSF.

These instruments will send real-time data to the plant's control and monitoring system, allowing for precise flow rate and pressure monitoring. For the new PIPTSF pipeline, a similar configuration will be implemented, with a flow meter and new telemetry system installed post-booster pump, and all data transmitted to the system.

CCTV cameras will also be installed at the booster pump area to capture any spillage, which the applicant believes will ensure comprehensive surveillance and operational safety.

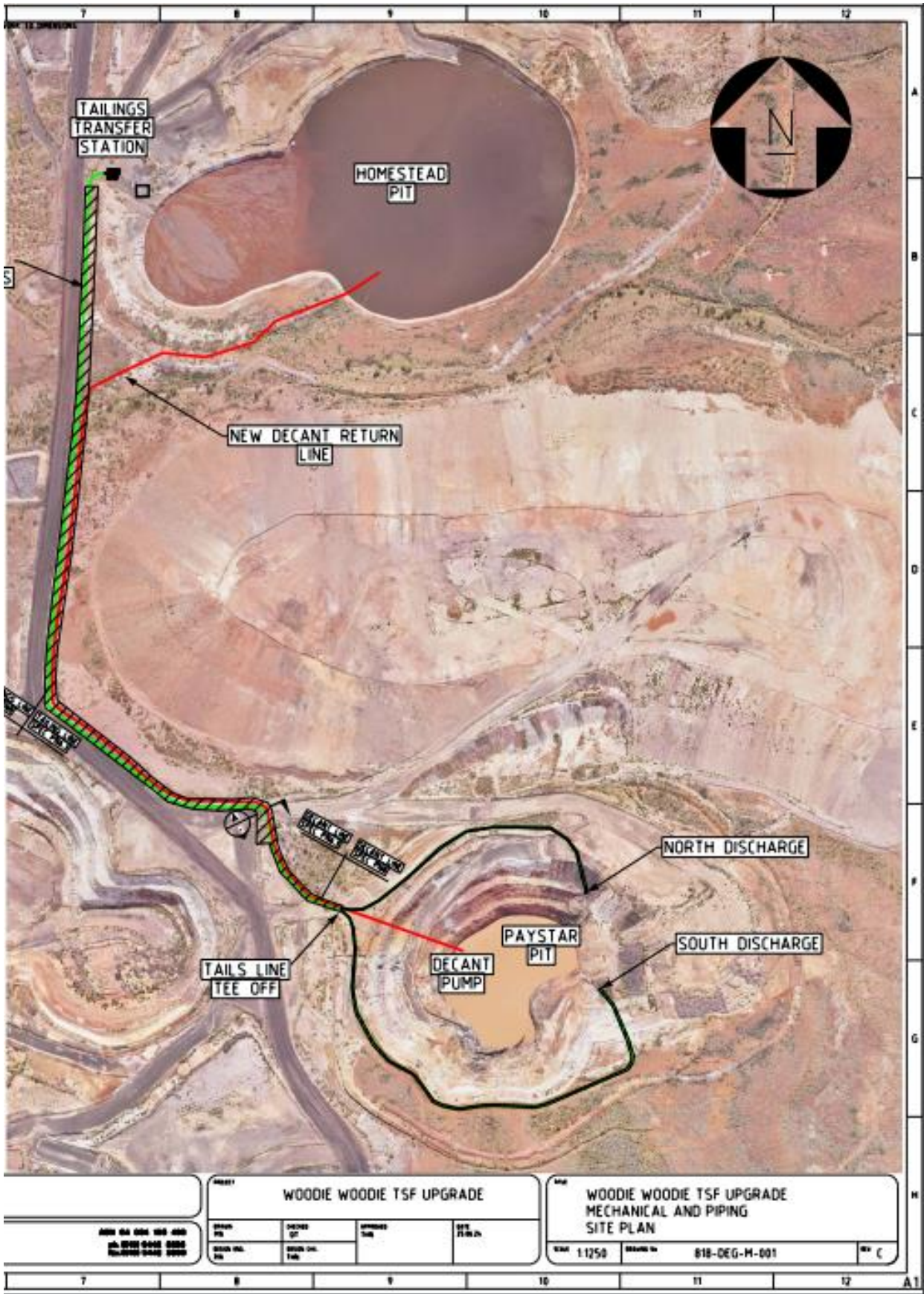


Figure 4: Tailings and decant pipeline and discharge locations

2.5.2 Decant system

Modelling by the applicant shows that initial tailings discharge into the PIPTSF will force the supernatant pond to the west where a pontoon-mounted decant pump will be initially located. As the level of the supernatant pond and tailings rises, the applicant proposes to relocate the decant pump to the northeast, up the haul ramp on the northern side of the pit.

Maintaining the supernatant pond (surface water) to a small size will reduce seepage and evaporation from the pond surface and will therefore assist in optimisation of water recovery and tailings density. Recovered water from the PIPTSF will be pumped to the Homestead TSF, following which it will either be pumped directly to the processing plant or the existing process water pond.

Geotechnical testing of tailings (discussed in section 2.5.3) and a review of the performance of other IPTSF's at Woodie Woodie indicated final in-situ dry densities in the range of 1.5 – 1.6 t/m³ could be achieved, where consolidation of tailings and water recovery is maximised. To help achieve this, the water recovery system, pumps and pipes will be sized for an operating capacity of no less than 200 tph at the maximum static head.

Freeboard

Total freeboard to meet the DEMIRS design requirement is 0.744 m measured from the lowest pit rim elevation. This comprises 0.244 m to store the design storm event of a 1% annual exceedance probability (AEP) 72-hour storm event, plus beach freeboard of not less than 0.2 m and operational freeboard for tailings deposition of 0.3 m (minimum) (Figure 5).

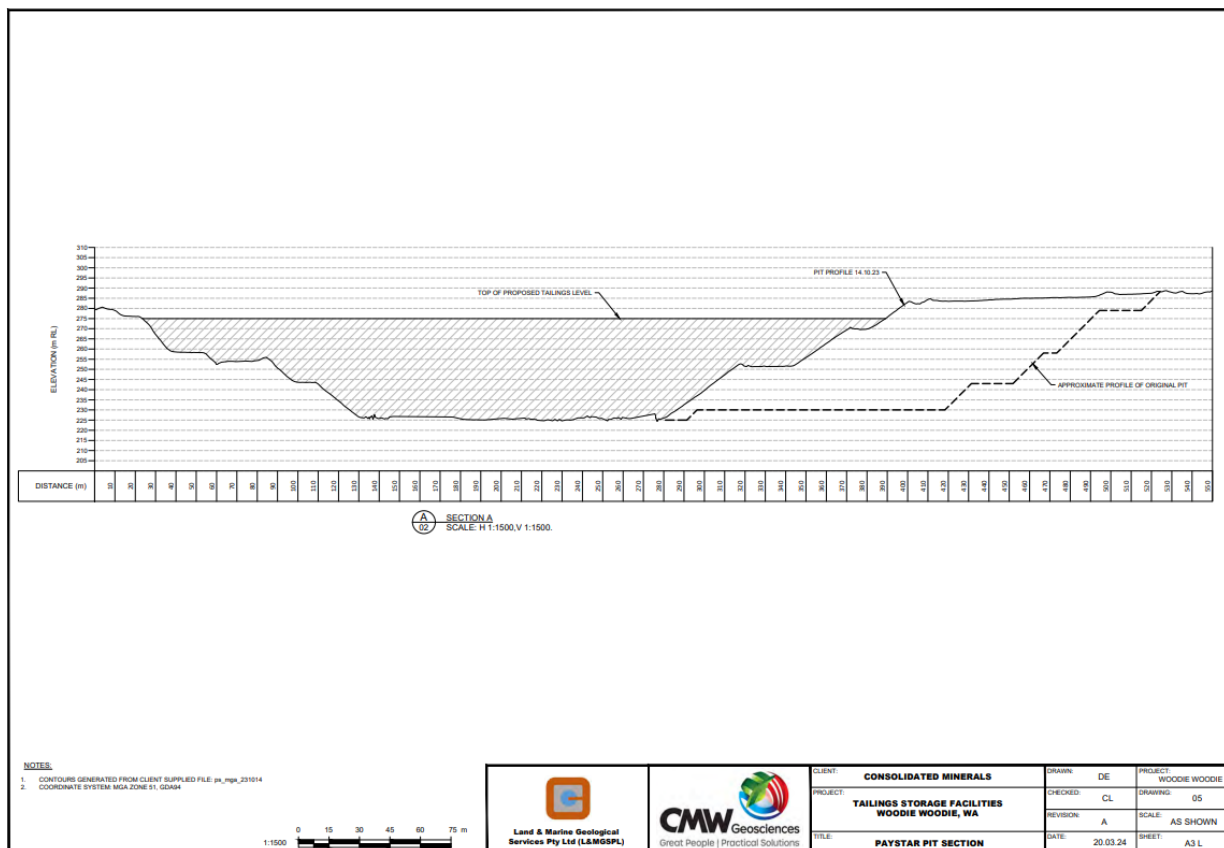


Figure 5: Proposed freeboard profile of PIPTSF

2.5.3 Tailings physical and chemical properties

The waste and ore being mined from pits within Woodie Woodie are predominantly from within the oxidised zone of the regolith. No sulfide mineralisation occurs within the oxidised zone. Only

rarely does ore mineralisation penetrate the fresh rock along fault fissures.

A desktop study was conducted by Graeme Campbell and Associates (Graeme Campbell & Associates Pty Ltd, 2007) based on data from multi-element analysis of tailings solids and existing pit water quality in Homestead pit (formerly known as Camp East pit).

Total sulfur and carbon concentrations in four tailings samples were 0.01% to 0.31%, respectively. These results indicate negligible amounts of acid-forming sulfide minerals and moderate amounts of acid-neutralising carbonate minerals.

The potential for acid generation was rated as extremely low. Enrichments in minor elements are either slight, or non-existent.

Lead concentrations of 1,200 to 1,750 mg/kg represent significant enrichment (when compared to unmineralised soil, regolith, and bedrock). However, the lead was predicted to be present in stable forms associated with clays, sesquioxides and primary-silicates (Graeme Campbell & Associates Pty Ltd, 2007).

Additional geochemical testing of fresh tailings and tailings solids from Homestead pit was undertaken in March 2012 by MBS Environmental to evaluate for seepage of salinity and potential toxicants in neutral mine drainage (MBS Environmental, 2012). The results are summarised below:

- Fresh tailings fluids are characterised by alkaline pH (8.2) and low salinity, with bicarbonate, chloride and sulfate being the major anions and sodium being the dominant cation.
- Fluoride is present at a concentration of 1.7 mg/L, which is below the maximum livestock drinking water value of 2 mg/L.
- Very low concentrations of metals associated with acid mine drainage (aluminum, copper, cobalt, nickel, vanadium and zinc) were present in the tailings fluids.
- Despite slightly elevated concentrations of lead and manganese observed in the tailings solids from the desktop assessment (Graeme Campbell & Associates Pty Ltd, 2007), very low concentrations of these metals were present in soluble forms.
- Slightly elevated concentrations of elements associated with neutral and alkaline mine drainage, notably molybdenum, selenium and uranium were recorded.

Supplementary tailings characterisation from eleven tailings samples collected from eight manganese mining areas (Anomaly, Canyon, Extension Cord, Chutney, Topvar, Radio Hill, Chris D and Cracker) was undertaken by 360 Environmental during 2021 (360 Environmental, 2021).

Results from the 2021 sampling event were found to be consistent with the conclusions drawn from previous geochemical tailings studies and indicate that the tailings composition is NAF and metalliferous risks associated with tailing leachate are low.

Tailings were reported to have a bulk density ranging from 1.25 to 2.18 with the highest bulk densities reported for Anomaly. Particle size distribution indicates the tailings to have a largely sand to silt/clay consistency with 40% to 73% of particles passing a 0.075 mm sieve and 100% passing a 1.18 mm sieve for all samples.

2.5.4 Monitoring bore network

In addition to the existing extensive monitoring bore network throughout Woodie and existing in-pit TSFs, the applicant proposes that three monitoring bores will be installed adjacent to the PIPTSF pit rim, located within the potential flow paths which are controlled structurally and lithologically by fractured rock. The applicant states that the bores will be used to monitor the impacts of tailings deposition on the surrounding groundwater system. The proposed locations

of the monitoring bores are shown in Figure 6.

In accordance with the findings of the hydrogeological assessment (Rockwater, 2024) the bores will be installed around the pit with both shallow and deep monitoring ports.

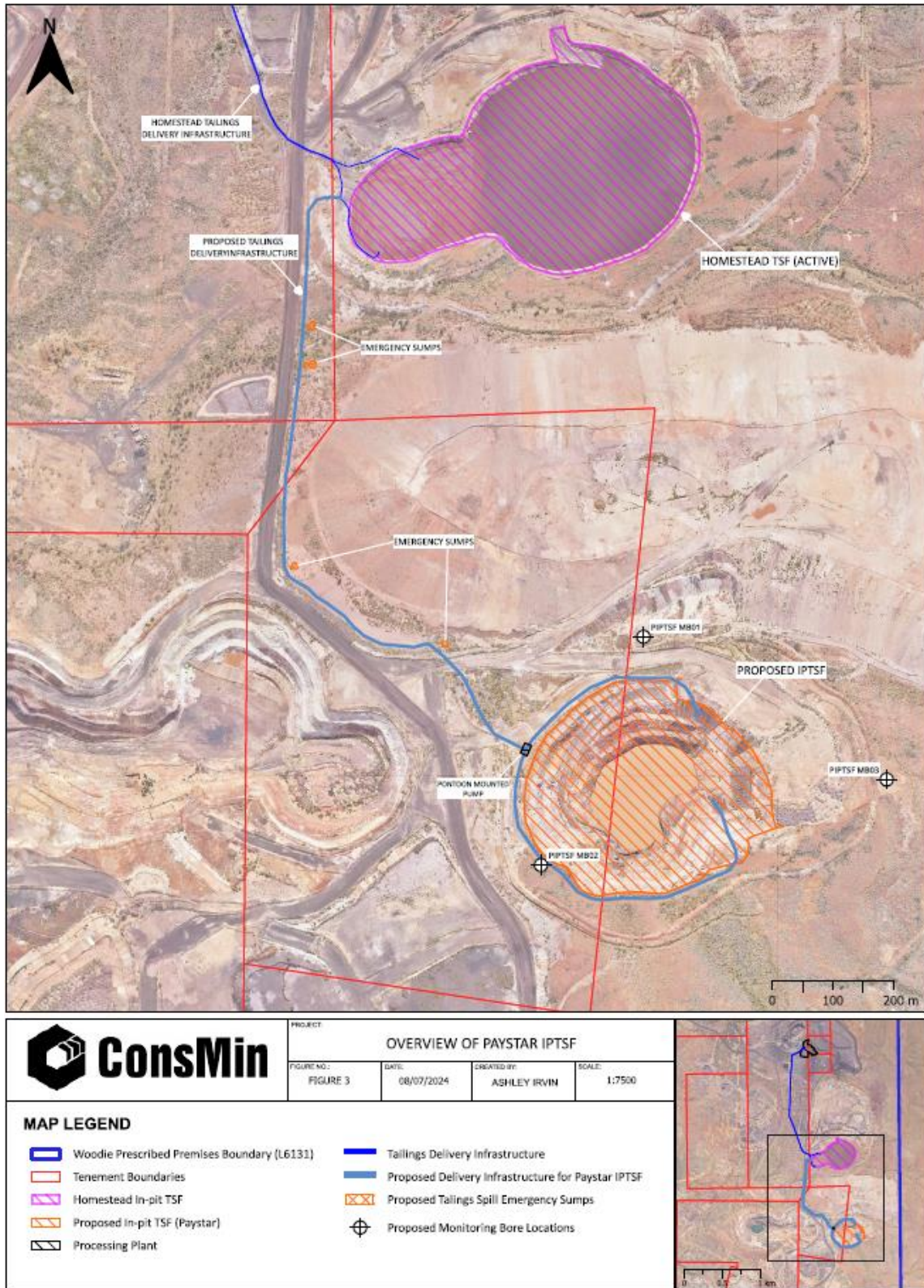


Figure 6: Overview of Paystar IPTSF – monitoring bore locations

2.6 Commissioning phase

Commissioning activities will be required for the implementation of the PIPTSF. Commissioning will be undertaken in two phases:

Phase 1 – Tailings Line Commissioning

Initial testing of the booster pump and pipeline will involve trials to ensure the correct operation of the pump and pipeline integrity under the expected pressure and flow rates. Once initial testing has been complete, full commissioning of the Paystar tailings line will be undertaken to ensure all systems (pump, pipeline, telemetry, CCTV) are fully operational and integrated. The applicant states that any identified issues will be addressed at this stage will be rectified.

Phase 2 – Decant Water Line Commissioning

Initial testing of the decant pump and pipeline will involve trials to ensure the correct operation of the pump and pipeline integrity under the expected pressure and flow rates. Additionally, observations will be made to monitor the clarity of the water at Homestead TSF, and adjustments to the flow rate of the Homestead decant water line will be made as necessary.

Once initial testing has been completed, full commissioning of the Paystar decant line will be undertaken to ensure all systems (pump, pipeline, telemetry) are fully operational and integrated. Any identified issues will be addressed at this stage and rectified.

3. Legislative context

3.1 Mining Act 1978

Assessment of the structural integrity of the pit is not within the scope of this works approval but falls under the responsibilities of the Department of Energy, Mines, Industry Regulation and Safety (DEMIRS) in administering the *Mining Act 1978*.

At the time of writing this report the applicant is yet to request an amendment of mining proposal 120388 to include the Paystar in-pit TSF.

DWER sought technical advice from DEMIRS on 23 August 2024 (comments from DEMIRS are summarized in Table 5) but DEMIRS would not comment on the proposal without corresponding Mining Proposal.

The department notes that the applicant believes PIPTSF to have a hazard rating of 'Low', 'Category 3', based on classification criteria outlined in accordance with the DEMIRS Code of Practice (2013). In accordance with ANCOLD (2019) Guidelines the PIPTSF has been assigned a Severity Level 'Medium' and Consequence Category of 'Low'.

The Delegated Officer notes it is the applicant's responsibility to ensure the mining approvals conditions are met.

4. Groundwater monitoring and modelling

Rainfall in the Woodie mining region is associated with monsoonal troughs or tropical cyclones, with most rain falling from December to March. At Telfer Airport (BoM Station 013030), 100 km to the east of Woodie, the average annual rainfall is 362.1 mm. Annual pan evaporation at Telfer is 3,656 mm. Evaporation exceeds rainfall during every month of the year and the average annual evaporation is an order of magnitude greater than average annual rainfall.

The Woodie corridor is subject to significant faulting. Faults are commonly sealed during the mineralisation events but can be 'cracked' open during subsequent deformation episodes. Therefore, some faults have been found to act as hydraulic barriers and others as conduits to flow with extremely high hydraulic conductivities. Their behaviour cannot be related systematically to a specific orientation.

The pre-mining water table was about 257 m AHD (circa 1950's), with regional groundwater

flow from south to north. Groundwater flow at Woodie is dominated by faults and fractures in the Carawine Dolomite and has been heavily altered due to pit dewatering. Mine-corridor scale hydraulic gradients are typically very flat. The current groundwater level in the vicinity of the Paystar Pit is about 198 m AHD as measured at monitoring bore WWMB08. Within the mine corridor it is as low as 175 m AHD as measured at WWMB05 which is in the vicinity of the Topvar Hub dewatering bores.

4.1 Groundwater chemistry

Data from water samples collected from dewatering discharge sites show the groundwater at Woodie to be slightly brackish, with salinity of 540 to 840 mg/L total dissolved solids (TDS) and of sodium-carbonate type. Water quality sampling results had no exceedances of the Australian Drinking Water Guidelines (NHMRC & NRMCC, 2011) health parameters during the last Woodie triennial aquifer review, however, the hardness and sodium exceeded aesthetic guidelines (Rockwater, 2023).

The Paystar pit lake was sampled in May 2024 and laboratory results indicate that the water is fresher than the groundwater in the vicinity (200 mg/L TDS), has a higher chloride and a somewhat higher potassium content. The applicant believes that the current water in the Paystar Pit is largely derived from rainfall runoff which has interacted with the weathered sediments of the Paterson Formation. Leaching of the weathered clays likely results in a higher potassium, chlorine and sulphate content compared to the groundwater in the aquifer which are more equilibrated with carbonates.

The 2024 water quality results indicate that the dissolved metals concentration in the Paystar Pit is at or below analytical accuracy and meets the requirements of the Australian Drinking Water Guidelines (NHMRC & NRMCC, 2011). The metals concentrations are also below the ANZECC and site-based trigger limits set for the site (Rockwater, 2020 & 2023).

Groundwater modelling conducted by the applicant indicates that the level of mounding within the regional aquifer associated with the planned Paystar IPTSF would be small and localised. The modelling results show that mounding would be in the order of 0.3 to 0.7 m if the current mine schedule is adopted (Scenario 1) and the aquifer level remains within the transmissive Upper Carawine Dolomite, or up to 4.5 m if dewatering is undertaken using dewatering bores at the nearby Chutney Pit (Scenario 2) and the aquifer level lower and is within the somewhat less transmissive Lower Carawine Dolomite.

The applicant believes that dewatering activities occurring concurrently with the tailings deposition will have significant control on the groundwater levels and flow directions. It is also expected that the seepage from the IPTSF would have a similar chemical nature to the native groundwater. Overall, the deposition of tailings into the Paystar pit is expected to have a low level of environmental impact.

5. Hydrology and surface water quality

Woodie is located on the eastern margin of the Oakover Drainage Basin, with the Great Sandy Desert to the east. The Oakover River flows north into the De Grey River and tributaries to the Oakover River in the Woodie area include the Davis River, Warri Warri Creek, Brumby Creek and Woodie Woodie Creek.

Numerous semi-permanent pools and rock holes occur along the Oakover River and its tributaries, indicating a shallow depth to groundwater at these locations.

In accordance with Environmental Licence L6131/1990/13, the applicant has been monitoring surface water quality and sediment quality downstream of dewatering discharge points since 1993. Downstream water quality monitoring sites are located within the Warri Warri, Muddautherra and Brumby ephemeral creek lines, downstream of all sedimentation ponds and are monitored only when water is present during active dewatering discharge.

The most recent Environmental Licence Annual Environment Report (for the period 1 October 2022 to 30 September 2023) reports that the internal water quality target limits were met for all samples collected from the downstream sampling locations (ConsMin, 2023).

Stantec (2024) were engaged by the applicant to undertake a hydrological assessment to support the technical design and approvals for the proposed operation of the PIPTSF. A series of flood assessments have been previously conducted by Cardno (now Stantec) to provide an understanding of the surface water flow throughout the Woodie area based on the 1% AEP and Probable Maximum Precipitation (PMP) rainfall events.

The flood assessment for proposed PIPTSF has found that the existing bunding and diversion system at the site will not provide sufficient surface water management functionality for all storms up to and including the 1% AEP event (Stantec, 2024). To meet the basis of design (BoD) criteria to ensure no overtopping from external flows to the Paystar pit in a 1% AEP event, several earthworks and culverts will be constructed. These plans have been used to develop a 'Proof of Concept' model layout of proposed hydraulic structures.

The flood assessment demonstrated that the proposed 'proof of concept' modifications including bunding, channels and culverts, will divert and manage the flows from the external catchment to the downstream watercourse, preventing any spillage into the proposed PIPTSF in the 1% AEP event.

The applicant proposes removing localised low points detrimentally impacting surface water management across the Paystar Pit and adjacent waste rock dump site, channelling flow through a series of new culverts to prevent backwater effects behind haul roads and subsequent overtopping of the pit and introduce bunding structures to address historical erosion of existing bunding and prevent overtopping at locations where stormwater was previously discharged directly to the pit.

6. Risk assessment

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

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

6.1 Source-pathways and receptors

6.1.1 Emissions and controls

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

Table 2: Proposed applicant controls

Emission	Sources	Potential pathways	Proposed controls
Construction			
Dust	Construction of tailings pipeline, installation of machinery and	Air/windborne pathway causing impacts to ecosystem health	Dust will be managed in accordance with existing standard operating procedures. Water trucks will be used as necessary

Emission	Sources	Potential pathways	Proposed controls
	equipment, and general earthworks		<p>to suppress dust on roads and other operational surfaces.</p> <p>Earthmoving operations will not be conducted during high winds where practicable.</p> <p>Vehicle and machinery traffic will be confined to defined roads and tracks where practicable.</p> <p>Vehicle speed limits shall be imposed and enforced on all roads and tracks.</p>
Noise			Noise managed in accordance with existing standard operating procedures
Hydrocarbon discharge		Overland discharge	<p>Hydrocarbons managed in accordance with existing standard operating procedures.</p> <p>Management of hazardous spills in accordance with DWER Part V Licence L6131/1990/13 conditions.</p> <p>Hydrocarbons managed via relevant legislation and standards (including Australian Standard AS 1940-2004: Storage and handling of flammable and combustible liquids).</p> <p>Standard hydrocarbon management procedures are expected to effectively mitigate the risk of hydrocarbon spills during construction activities.</p>
Operation			
Dust	Deposition of tailings into Paystar IPTSF	Air/windborne pathway causing impacts to ecosystem health	<p>Dust managed in accordance with existing standard operating procedures.</p> <p>Water trucks will be used as necessary to suppress dust on roads and other operational surfaces.</p>
Tailings and contaminated water		<p>Seepage through base of pit and embankments causing impacts to ecosystem health</p> <p>Direct discharge to land from overtopping of TSF causing impacts to ecosystem health</p>	<p>Supernatant pond will be minimised as far as practicable to minimize seepage and optimise water recovery.</p> <p>Inspections of the tailings pipelines, return water lines and embankment freeboards will be undertaken on a daily basis.</p> <p>An adequate freeboard of 0.744m (minimum) will be maintained, which comprises 0.244 m to store the design storm event of a 1% AEP 72-hour storm event, plus beach freeboard of 0.2 m and operational freeboard of 0.3 m (minimum).</p>

Emission	Sources	Potential pathways	Proposed controls
			<p>Water recovery from the TSF will be efficient as to avoid creation of large ponds and long-term ponding of supernatant water over a large area adjacent to the pit walls.</p> <p>Earthworks to remove localised low points around the Paystar pit and adjacent rock waste dump.</p> <p>Bunding of 10 m height to be repaired or constructed along the southern and northern edge of the pit.</p> <p>Channels and four multi-barrel culverts to be constructed under haul roads to divert and manage the flows from the external catchment to the downstream watercourse.</p> <p>An annual water balance will be prepared for the Paystar IPTSF.</p>
Contaminated water	Tailings delivery and return water pipelines and sumps	Pipeline failure/ breach causing impacts to ecosystem health	<p>Implementation of the proposed modifications outlined within the Hydrological Modelling report prepared by Stantec (2024), to ensure external flows into the PIPTSF are minimised.</p> <p>Inspections of the tailings pipelines, return water lines and embankment freeboards will be undertaken on a daily basis.</p> <p>Tailings pipelines equipped with telemetry systems to allow detection of leaks and failures.</p> <p>Pipelines are constructed within banded corridor to prevent discharge to environment.</p>

6.1.2 Receptors

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

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

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

Human receptors	Distance from prescribed activity
The nearest town of Nullagine	<p>Is approximately 120 km West of the Premises.</p> <p>Based on distance, the Delegated Officer does not consider this as a</p>

	receptor.
Environmental receptors	Distance from prescribed activity
Adjacent Vegetation	The proposed IPTSF is situated adjacent to an area of uncleared native vegetation.
Groundwater	Salinity is approximately 500 – 840 mg/L with a pH of 8.1. Depth to groundwater is estimated to be 90 m, with ground level contours ranging from 280 m to 300 m AHD and groundwater levels being approximately 198 m AHD, with some levels being as low as 175 m AHD.
Endangered fauna	Sightings of endangered and threatened bird and mammal species identified within and surrounding vicinity of the mine site
Oakover River	3.2 km east of mine site boundary.

6.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020a) for each identified emission source and considers potential source-pathway and receptor linkages as identified in Section 6.1. Where linkages are in-complete they have not been considered further in the risk assessment.

Where the applicant has proposed mitigation measures/controls (as detailed in Section 6.1), these have been considered when determining the final risk rating. Where the Delegated Officer considers the applicant's proposed controls to be critical to maintaining an acceptable level of risk, these will be incorporated into the works approval as regulatory controls.

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

Works approval W6953/2024/1 that accompanies this decision report authorises construction and time-limited operations. The conditions in the issued works approval, as outlined in Table 4 have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

A licence is required following the time-limited operational phase authorised under the works approval to authorise emissions associated with the ongoing operation of the premises i.e. Category 5 operation of the Paystar in-pit TSF. A risk assessment for the operational phase has been included in this decision report, however licence conditions will not be finalised until the department assesses the licence application.

Table 4: Risk assessment of potential emissions and discharges from the premises during construction, commissioning and operation

Risk events					Risk rating ¹ C = consequence L = likelihood	Applicant controls sufficient?	Conditions ² of works approval	Justification for works approval conditions
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls				
Construction								
Construction of tailings pipeline, installation of machinery and equipment, and general earthworks	Dust	Air/windborne pathway causing impacts to ecosystem health	Adjacent vegetation	Refer to Section 6.1	C = Slight L = Unlikely Low Risk	Y	N/A The emissions during construction activities are short term and not expected to result in any impacts.	N/A
	Noise		Threatened fauna	Refer to Section 6.1	C = Slight L = Rare Low Risk	Y		N/A
	Hydrocarbon discharge	Overland discharge	Adjacent vegetation Soil	Refer to Section 6.1	C = Slight L = Unlikely Low Risk	Y		N/A
Commissioning								
Commissioning of tailings and decant water pipeline	Tailings and contaminated water	Direct discharge to land from pipe leak or rupture causing impacts to ecosystem health	Adjacent vegetation Threatened fauna habitat Oakover River 3.2 km east of mine site boundary	Refer to Section 6.1	C = Minor L = Rare Low Risk	Y	Conditions 1, 3, 4, 6, 7, 8, 9 and 10.	<p>Standard conditions for design and construction of infrastructure as constructed prior to commissioning:</p> <p><u>Condition 1:</u> Infrastructure table specifying design and installation requirements.</p> <p><u>Conditions 3 and 4:</u> Compliance reporting on the construction of infrastructure.</p> <p>Standard conditions for commissioning of infrastructure:</p> <p><u>Condition 6:</u> Requires the commissioning of the pipelines to ensure the emission control infrastructure is functioning as designed.</p> <p><u>Conditions 7 and 8:</u> Groundwater monitoring program as proposed by the applicant, is to allow for a baseline of measurements for comparison with future</p>

Risk events					Risk rating ¹ C = consequence L = likelihood	Applicant controls sufficient?	Conditions ² of works approval	Justification for works approval conditions
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls				
								monitoring that will be required under licence conditions. <u>Conditions 9 and 10</u> : Commissioning reporting requirements
Operation (including time-limited-operations operations)								
Deposition of tailings into Paystar IPTSF	Tailings and contaminated water	Seepage through base of pit causing impacts to ecosystem health	Adjacent vegetation Threatened fauna habitat	Refer to Section 6.1	C = Minor L = Unlikely Medium Risk	Y	Condition 13, 14, 15 and 17.	Standard conditions for time limited operations: <u>Condition 13</u> : Time limited operation requirement and emission limits <u>Condition 14</u> : Authorised discharge point. <u>Condition 15</u> specifies ambient groundwater monitoring and recording requirements to ensure potential seepage impacts are detected / actioned as required to mitigate impacts to receptors. <u>Condition 17</u> : Water balance monitoring including estimate of seepage loss.
		Direct discharge to land from overtopping of TSF causing impacts to ecosystem health	Oakover River 3.2 km east of mine site boundary	Refer to Section 6.1	C = Minor L = Rare Low Risk	Y	Condition 1, 11, 12 and 14	Standard conditions for time limited operations: <u>Condition 1</u> : Infrastructure table specifying design and installation requirements, including bunding and diversion systems for stormwater. <u>Condition 11 and 12</u> : Commencement and duration. <u>Condition 14</u> : Authorised discharge point. The short period of time the infrastructure may be operated under the works approval makes it improbable that the pit could overflow. The Delegated Officer notes that the Oakover River is more than 3 km away and it is unlikely that a pathway exists for tailings or contaminated water to cause significant environmental harm.

Risk events					Risk rating ¹ C = consequence L = likelihood	Applicant controls sufficient?	Conditions ² of works approval	Justification for works approval conditions
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls				
Tailings delivery and return water pipelines and sumps	Contaminated water	Pipeline failure/ breach causing impacts to ecosystem health	Adjacent vegetation Threatened fauna habitat	Refer to Section 6.1	C = Minor L = Unlikely Medium Risk	Y	Condition 13	Standard conditions for time limited operations: <u>Condition 13</u> : Infrastructure table: Specifies controls and monitoring requirements for authorised infrastructure during time limited operations, including daily inspections (when in operation) of pipeline corridor and bunding and weekly inspections of flow meters, telemetry and pressure transmitters.

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

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

7. Consultation

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

Table 5: Consultation

Consultation method	Comments received	Department response
Application advertised on the department's website on 26 August 2024	None received	N/A
Department of Energy, Mines, Industry Regulation and Safety (DEMIRS) advised of proposal 23 August 2024.	<p>DMIRS replied on 11 September 2024 advising that</p> <ul style="list-style-type: none"> • There is no existing or pending Mining Act 1978 (Mining Act) approval for an in-pit TSF at Paystar. • Existing approved (under the Mining Act) in-pit TSFs at the Project are Area 1, Demon, Dartmoor, Malta, and Homestead. • A Mining Proposal (MP) is currently under assessment for the Project; the MP (Reg ID 120388) seeks to consolidate all existing activities at the Project and proposes additional mining areas. The proposed activities include extensions to existing pits and waste rock landforms (WRL) and the development of new pits and WRLs, low grade stockpiles and RoM pads plus additional dewatering requirements. • No additional TSFs are proposed in MP Reg ID 120388. The MP states that tailings will continue to be pumped to, and stored within, the existing Homestead and Demon in-pit TSFs which have sufficient capacity to accommodate tailings associated with implementation of the proposal. • The MP notes that the proposed expansion to the Project was referred under the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act) and the <i>Environmental Protection Act 1986</i> (EP Act) in December 2019 and January 2020, respectively. The Project expansion, as referred under the EPBC Act and EP Act, includes provision for deposition of tailings into three new in-pit TSFs (Airport, Chris D and Chutney). The MP states that these new in-pit TSFs are not essential to continued operations but could offer operational efficiencies, as 	<p>The Delegated Officer notes that the mining proposal 120388 was subsequently approved on 30/01/2025 and that this did not include Paystar in-pit TSF.</p> <p>Discussion with the applicant on 7 February 2025 was that the amendment to MP 120388 was yet to be submitted to DEMIRS.</p> <p>The Delegated Officer notes that the department can grant an instrument before additional approval is granted from another public authority, but that the onus rests with the applicant to ensure full compliance with all approvals prior to construction of the project.</p>

	<p>such PMPL may seek an amendment to the MP to accommodate these in-pit TSFs in the future.</p> <ul style="list-style-type: none"> • Please note it is the tenement holder's responsibility to ensure that mining operations are conducted in accordance with Mining Act approvals and that further approval or amendments are sought under the Mining Act as required. <p>An additional comment was received from DEMIRS on 12 September 2024, that the applicant was going to apply for an amendment of MP 120388 after it is approved. The submission of the amendment was to be in January 2025.</p>	
<p>Applicant was provided with draft documents on 20 February 2025</p>	<p>The applicant provided response to the draft package on 5 March 2025 and requested that the final instrument be issued as soon as possible.</p> <p>The applicant made one suggested change to design and construction and installation requirements of tailings pipeline and return water pipelines (Table 1 or W6953/2024/1) to clarify that pipelines would predominately be constructed within bunded corridors and not buried.</p>	<p>The assessment of this application noted that pipelines are to be constructed within existing bunded corridors. The works approval condition that indicated pipework was to be buried / backfilled was made in error.</p> <p>The Delegated Officer has updated final instrument to reflect that pipelines are to be constructed within bunded corridors.</p>

8. Conclusion

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

References

1. 360 Environmental 2021, *Material Characterisation for In-Pit Tailing Disposal* - Chris D, Chutney and Airport.
2. Consolidated Minerals Pty Ltd. (ConMine) 2023, *Annual Environment Report: Woodie Woodie Manganese Operations*.
3. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
4. Department of Water and Environmental Regulation (DWER) 2020a, *Guideline: Risk Assessments*, Perth, Western Australia.
5. Department of Water and Environmental Regulation (DWER) 2020b, *Guideline: Environmental Siting*, Perth, Western Australia.
6. Graeme Campbell & Associates Pty Ltd. 2007, *Woodie Woodie Project: Desktop Review of Process - Tailings Geochemistry and Implications for In-Pit Containment*.
7. MBS Environmental 2012, *Works Approval Application: In-Pit Tailings Storage Woodie Woodie Manganese Operations East Pilbara, Western Australia*.
8. Rockwater Pty Ltd. 2020, *Woodie Woodie Operation: Groundwater and Surface Water Management Plan*.
9. Rockwater Pty Ltd. 2023, *Woodie Woodie, Detailed Hydrogeological Assessment and Modelling Report*.
10. Rockwater Pty Ltd. 2024, *Paystar IPTSF Groundwater Modelling Assessment*.
11. Stantec Australia Pty Ltd. 2024, *Paystar In-Pit Tailings Storage Facility (IPTSF)*.