Government of Western Australia
Department of Water and Environmental Regulation

Licence

Licence number	L7815/2001/12
Licence holder	Northern Star (Thunderbox) Pty Ltd
ACN	107 154 727
Registered business address	Level 4, 500 Hay Street SUBIACO WA 6008
DWER Internal number	INS-0001544
Duration	17/10/2024 to 16/10/2035
Date of issue	17/10/2024
Date of amendment	6/02/2026
Premises details	Thunderbox Operations LEINSTER WA 6437 Legal description - Mining tenements L36/155, L36/157, L36/158, L37/61, L37/73, L37/142, L37/166, L37/199, L37/215, L37/216, M36/35, M36/177, M36/421, M36/462, M36/473, M36/494, M36/503, M36/504, M36/512, M36/516, M36/525, M36/527, M36/541, M36/542, M36/582, M36/584, M36/585, M36/586, M36/587, M36/589, M36/599, M36/600, M37/222, M37/339, M37/340, M37/356, M37/357, M37/358, M37/359, M37/360, M37/361, M37/367, M37/368, M37/437, M37/465 and M37/1148 As defined by the premises maps in Schedule 1 (Figures 1 to 3)

Prescribed premises category description (Schedule 1, *Environmental Protection Regulations 1987*)	**Assessed production / design capacity**
Category 5: Processing or beneficiation of metallic or non-metallic ore	7,000,000 tonnes per annual period
Category 6: Mine dewatering	8,000,000 tonnes per annual period
Category 52: Electric power generation	38 MW in aggregate
Category 54: Sewage facility	140 cubic metres per day
Category 57: Used tyre storage	500 tyres
Category 63: Class I inert landfill	5,000 tonnes per annual period
Category 64: Class II or III putrescible landfill site	7,000 tonnes per annual period
Category 73: Bulk storage of chemicals etc.	2,500 cubic metres in aggregate

This licence is granted to the licence holder, subject to the attached conditions, on 6 February 2026, by:

Lauren Edmands

Digitally signed by Lauren Edmands
Date: 2026.02.06 13:28:14 +08'00'

MANAGER, RESOURCE INDUSTRIES
STATEWIDE DELIVERY (ENVIRONMENTAL REGULATION)
Officer delegated under section 20 of the Environmental Protection Act 1986

Instrument history

Date	Reference number	Summary of changes
21/10/2007	L7815/2001/8	Licence re-issue
21/10/2008	L7815/2001/9	Licence re-issue
21/10/2011	L7815/2001/10	Licence re-issue
09/10/2014	L7815/2001/11	Licence re-issue and conversion to REFIRE format
29/01/2015	L7815/2001/11	Licence amendment
05/03/2015	W5794/2015/1	Works approval to move site out of care and maintenance
29/10/2015	L7815/2001/11	Licence amendment to move out of care and maintenance
04/04/2016	L7815/2001/11	Licence amendment to add categories 64 and 85.
11/11/2016	L7815/2001/11	Licence amendment to add Bannockburn tenements and tenements for the connecting haul road and pipeline to Thunderbox as part of the North Eastern Goldfield Operations' Premises. Removal of monitoring bore MB3. Correction to the power plant generators description.
31/10/2017	L7815/2001/11	Amendment notice 1- Licence amendment to authorize construction of stage 6 embankment lift to TSF Cell A.
11/04/2018	L7815/2001/11	Amendment notice 2 - Licence amendment to authorise expansion of TSF Cell A and Cell B to abut the Eastern Waste Dump.
17/09/2018	L7815/2001/11	Amendment notice 3 - Licence amendment to increase category 5 to 3.0 mtpa and to include M36/177 within premises boundary.
26/09/2019	W6181/2018/1	Works Approval to allow construction of lifts 8-15 on TSF's Cell A and B
11/03/2020	L7815/2001/11	Approval to construct and operate two mine dewater storage dams. Amalgamation of amendment notices and licence into one document.
16/04/2021	L7815/2001/11	Amendment to increase the maximum daily throughput of the existing wastewater treatment plant from 75 m^3/day to 120 m^3/day and to allow wastewater discharge to both the waste rock dump and the Tailings Storage Facility (TSF) via the tailings stream. Also included the construction of saline water dam near Thunderbox pit.
28/05/2021	L7815/2001/11	Amendment to allow the installation of a secondary crushing circuit infrastructure at the Thunderbox mill. No change to Category 5 approved throughput.
02/07/2021	W6532/2021/1	Works Approval to allow construction for Thunderbox Mill expansion infrastructure and additional seven 2.5MW gas powered generators.

Date	Reference number	Summary of changes
03/05/2022	W6601/2021/1	Works Approval to construct two additional tailings storage facilities (TSF) Cells C and D on the adjacent eastern boundary of current TSFs Cells A and B at the premises.
29/04/2024	L7815/2001/11	Amendment to include Thunderbox Mill expansion infrastructure and additional seven 2.5MW gas powered generators constructed under W6532/2021/1 onto the licence.
18/09/2024	L7815/2001/11	Amendment to re-commence operation of the Bannockburn pit, including changes to categories 6, 52, 54, 64 and 73.
17/10/2024	L7815/2001/12	Administrative licence renewal.
29/01/2025	L7815/2001/12	Deposition of tailings into the TSF Cell C and D and use of associated infrastructure and monitoring.
6/08/2025	L7815/2001/12	Licence amendment to include: • infrastructure constructed under W6918/2024/1; • category 57 and associated infrastructure; • category 63 and associated infrastructure; and • administrative changes.
6/02/2026	L7815/2001/12	Approval for construction and operation of TSF Cell C & D lift stages 2 and 3, including associated infrastructure and monitoring requirements. Construction and operation of a tailings rehandle pad.

Interpretation

In this licence:

(a) the words ‘including’, ‘includes’ and ‘include’ in conditions mean “including but not limited to”, and similar, as appropriate;

(b) where any word or phrase is given a defined meaning, any other part of speech or other grammatical form of that word or phrase has a corresponding meaning;

(c) where tables are used in a condition, each row in a table constitutes a separate condition;

(d) any reference to an Australian or other standard, guideline, or code of practice in this licence:

  (i) if dated, refers to that particular version; and

  (ii) if not dated, refers to the latest version and therefore may be subject to change over time;

(e) unless specified otherwise, any reference to a section of an Act refers to that section of the EP Act; and

(f) unless specified otherwise, all definitions are in accordance with the EP Act

NOTE: This licence requires specific conditions to be met but does not provide any implied authorisation for other emissions, discharges, or activities not specified in this licence.

Licence conditions

The licence holder must ensure that the following conditions are complied with:

Infrastructure and equipment

1. The licence holder must ensure that the materials listed in Table 1 are only discharged into and/or stored in the corresponding containment infrastructure with the relevant infrastructure requirements and at the locations specified in Table 1.

Table 1: Containment infrastructure requirements and location

Materials	Containment infrastructure	Infrastructure requirements	Infrastructure location
Tailings	TSF cells A, B, C and D	• A minimum top of embankment freeboard of 500mm or containment of a 1-in-100 year 72-hour rainfall event (whichever is greater) must be maintained • Fitted with a seepage collection and recovery system which is used to capture seepage from the TSF • Seepage is returned to the TSF, or pumped back into the mine water circuit • External toe drain • Maintain sufficient pumping capacity of decant system to minimise the size of the decant pond as much as practicable • A diversion drain sized 6m wide by 1 m deep, with a side slope of 2H:1V and silt traps designed to ensure surface water is diverted before reporting to the TSF and natural surface water flow is not impeded. • A berm positioned between the external toe drain and the diversion drain 1m high by 6m wide.	Schedule 1, Figure 4, Figures 20 – 22, and 25
Return tailings water	Thunderbox – Old Process Water Dam and New Process Water Dam	• Lined with 1 mm HDPE to achieve a permeability of at least <1 x 10^{-9} m/s or equivalent • A minimum top of embankment freeboard of 300 mm must be maintained	Schedule 1, Figure 4
Mine dewater	Thunderbox - Mine dewater dam	• Lined with a 0.75 mm UV resistant PVC liner • A minimum top of embankment freeboard of 300 mm must be maintained	Schedule 1, Figure 4

Materials	Containment infrastructure	Infrastructure requirements	Infrastructure location
Mine dewater	Thunderbox - Saline Water Dam	• 60 m x 80 m with a height of 3.8 m • Lined with a 1.5 mm HDPE geotextile liner to achieve a permeability of less than 1 x 10^{-9} m/s • A minimum top of embankment freeboard of 300 mm must be maintained • Fitted with a high water level shut off switch to prevent overtopping • Perimeter of the dam must be fenced • Fauna egress ladders/nets must be maintained at each corner of the turkeys nest	Schedule 1, Figure 4
Mine dewater	Bannockburn - East Dam	• Lined with a 1.5 mm HDPE Geotextile liner • A minimum top of embankment freeboard of 300 mm must be maintained • Fitted with a high water level shut off switch to prevent overtopping • Perimeter of dams must be fenced • Fauna egress ladders/nets must be maintained at each corner of the dams	Schedule 1, Figure 5
	Otto bore operations - Mine dewatering dam	• Lined with a 0.75 mm UV resistant PVC liner • A minimum top of embankment freeboard of 300 mm must be maintained	Schedule 1, Figure 6
Used tyres	Class I landfill facilities (Thunderbox East WRL and Bannockburn East WRL)	• To be buried in batches not exceeding 1000 whole tyres; • a separation distance of at least 100mm of soil between each batch of tyres buried; • All buried tyres to have a final soil cover of at least 500mm; and • A separation distance of at least 2 metres between the base of the landfill and the highest groundwater level must be maintained at all times.	Schedule 1, Figure 23
Tailings, return tailings water, decant	Pipelines	• All pipelines to be bunded or stored within v drains sufficient to contain spillages between routine inspections. • All pipelines must be fitted with flowmeters, telemetry and automatic shutoff systems	Within the premises boundary

2. The licence holder must ensure that the site infrastructure and equipment listed in Table 2 and located at the corresponding infrastructure location is maintained and operated in accordance with the corresponding operational requirement set out in Table 2.

Table 2: Infrastructure and equipment operational requirements

Site infrastructure and equipment	Operational requirement	Infrastructure location
Thunderbox - Ore crushing and screening infrastructure	• Ore and pebble crushing circuit equipment including ROM bins, apron feeder, vibrating grizzly and jaw crusher • Concrete hardstands used beneath all motors, pumps, crushers, drives, screens, and leach tanks. • Water sprays installed on the ROM bins • Cover on ore stockpile • Dust extraction units (bag house) installed on jaw crusher discharge and screen discharge chute	Schedule 1, Figure 7
	• Maintenance of stormwater diversion bund.	Schedule 1, Figure 8
	• Toe drain which is installed around the perimeter of the stockpile/reclaim area to capture laden stormwater.	
Thunderbox - Powerhouse shed	• bunded concrete hardstand to ensure it drains to oil/water separator • Concrete evaporation bund to receive treated water	Power station as labelled in Schedule 1, Figure 7 and 9
Bore field - Fuel storage	• Total storage capacity of 126 m^3 comprised of 4 m^3 tanks at bores and 15 m^3 tanks at pump stations	Schedule 1, Figure 12
Groundwater monitoring bores -- TSFMB08D TSFMB09D, TSFMB10D, TSFMB11D, and TSFMB12D	• Must be maintained in good working order to allow representative groundwater samples to be taken.	Schedule 1, Figure 4
Used tyre storage areas: • Thunderbox Workshop • Thunderbox Tyre Bay • Bannockburn Workshop	• Storage area to be cleared of all vegetation and be used for used tyre storage only; • Total tyres stored at all three storage areas are not to exceed 500 whole tyres at any one time; • To be stored in bundles of 20 whole tyres or less; and • To be stored with at least 3 metres separating each bundle of 20 tyres.	Schedule 1, Figure 23
Tailings rehandle pad	• Utilise water carts to wet down dust generating surfaces during excavation, transport and storage of tailings material on rehandle pad. • Haul trucks must not be overfilled when transporting tailings material. • Spoon drain positioned on the external side of perimeter bund to divert stormwater flows away from pad. • Bunding of external perimeters of rehandle pad shall be maintained to a height of 500 mm above constructed tailings pad with waste rock to prevent interaction with drainage. • Ensure high moisture content of tailings is maintained to limit the ability of the tailings to generate dust.	Schedule 1, Figure 24

3. The licence holder must construct and/or install the infrastructure listed in Table 3, in accordance with;

(a) The corresponding design and construction requirement; and

(b) At the corresponding infrastructure location;

As set out in Table 3.

Table 3: Infrastructure and equipment requirements - Construction

Infrastructure	Design and construction requirements	Infrastructure location
Thunderbox - WWTP	• To be installed in the location outlined within Schedule 1, Figure 10 and Figure 17 • Fixed film submerged aerobic media treatment system. • Splitter box to distribute influent flow between the two fixed film reactor tanks • Submersible pump installed into anaerobic tank 2 of the existing wastewater treatment system to feed a fixed flow to the two fixed film reactor tanks • Tanks equipped with shut off valves to allow 380 mm of free head space • System to be upgraded by installing three additional sludge storage tanks and aerators in accordance with Schedule 1, Figure 10	Schedule 1, Figure 10 and Figure 17
Otto Bore Operations - Mine dewatering dam	• To be fitted with a high water level shut off switch to prevent overtopping; • Fence around perimeter of dam; and • Fauna egress ladders/nets to be installed at each corner of the turkeys nest	Schedule 1, Figure 6
7 interception wells	• To be placed around the periphery of the TSF to mitigate water table mounding and contain leakage at a small distance from the TSF.	To be determined
TSF Cells C and D lift stage 2	• Embankment lift to be constructed to 498.2 m RL. • Divider embankment lift to be raised to 498.2 m RL. • Decant tower lift to be raised to 498.2 m RL. • Underdrainage tower lift to be raised to 498.2 m RL. • Ten new piezometers to be installed to replace decommissioned piezometers from Stage 1. • New perimeter toe drain and berm to be installed to replace decommissioned ones from Stage 1.	Schedule 1, Figures 25 to 30
TSF Cells C and D lift stage 3	• Embankment lift to be constructed to 500.6 m RL. • Divider embankment lift to be raised to 500.6 m RL. • Decant tower lift to be raised to 500.6 m RL. • Underdrainage tower lift to be raised to 500.6 m RL. • Ten new piezometers to be installed to replace decommissioned piezometers from Stage 2.	Schedule 1, Figures 25 to 30

Infrastructure	Design and construction requirements	Infrastructure location
Tailings rehandle pad	• Tailings rehandle pad to be constructed to a minimum height of 500 mm above the natural ground surface. • Bunding to be constructed around the external perimeters of the rehandle pad to a height of 500 mm above the constructed tailings pad with waste rock to prevent interaction with drainage. • Tailings rehandle pad to be graded towards the north-east Thunderbox operational footprint, and existing access road drains to remain in place to manage stormwater runoff. • Spoon drain to be installed on the external side of the perimeter bund to divert stormwater flows away from pad.	Schedule 1, Figure 24

4. When constructing the infrastructure specified in Table 3, the licence holder must not depart from the requirements specified in Table 3 except:

(a) Where such departures are minor in nature and do not materially change or affect the infrastructure; and

(b) Where such departure improves the functionality of the infrastructure and does not increase the risks to public health, public amenity or the environment.

If condition 4(b) applies, then the licence holder must provide the CEO with a list of departures and demonstrate that these have not increased the risk to public health, public amenity or the environment.

5. The licence holder must within 30 days of each item of infrastructure required by condition 3 being constructed:

(a) undertake an audit of their compliance with the requirements of condition; and

(b) prepare and submit to the CEO an audit report on that compliance.

6. The report required by condition 5, must:

(a) be certified by a suitably qualified professional engineer that each item of infrastructure listed in Table 3 meets the corresponding specifications and at the locations set out in Table 3 and has been constructed with no material defects; and

(b) be signed by a person authorised to represent the licence holder and contains the printed name and position of that person within the company.

7. The licence holder must:

(a) undertake inspections as detailed in Table 4;

(b) where any inspection identifies that an appropriate level of environmental protection is not being maintained, take corrective action to mitigate adverse environmental consequences as soon as practicable; and

(c) maintain a record of all inspections undertaken.

Table 4: Inspection of infrastructure and equipment

Scope of inspection	Inspection requirement	Frequency of inspection
Embankment freeboard of containment infrastructure listed in Table 1	Visual inspection to confirm freeboard capacity specified in Table 1 is available	• Weekly during care and maintenance • Daily during operations • TSF C and D inspected at least twice per 12 hour shift
Tailings pipelines	Visual inspection to confirm integrity	• Weekly during care and maintenance • Daily during operations • At least twice per 12-hour shift for pipelines associated with TSF Cells C and D
Return water pipelines		
Dewatering pipelines		• Daily during operations
Wastewater treatment plant pipelines		• Weekly during operations

8. The licence holder must undertake an annual water balance for the TSF cells A and B, and cells C and D. The water balance must as a minimum consider the following:

(a) site rainfall;

(b) evaporation;

(c) decant water recovery volumes;

(d) seepage recovery volumes; and

(e) volumes of tailings deposited.

Waste management

9. The licence holder must immediately recover, or remove and dispose of, spills of environmentally hazardous materials which occur outside an engineered containment system.

10. The licence holder must ensure that, where wastes produced on the prescribed premises are not taken off site for lawful use or disposal, they are managed in accordance with the requirements in Table 5.

Table 5: Management of waste

Waste Type	Management Strategy	Requirements
Inert Waste Type 2	Receipt, handling and disposal of waste by landfilling	• No more than 5000 used tyres to be buried per annual period; • Tyres to be buried in batches of less than 1000 whole tyres; • a separation distance of at least 100mm of soil between each batch of tyres buried; • Disposal of waste by landfilling must only take place within the landfill areas shown in Schedule 1, Figure 23; and • Disposal of waste must be within an area of the landfill that is actively receiving waste rock dumping.

Waste Type	Management Strategy	Requirements
Inert Waste Type 1	Receipt, handling and disposal of waste by landfilling	All waste types • No more than 7,000 tonnes per year of all waste types cumulatively may be disposed of by landfilling within the Class II facility; • Disposal of waste within the Class II facility by landfilling must only take place within the landfill areas shown in Schedule 1, Figure 13 and Figure 15; • Waste must be placed in a defined trench or within an area enclosed by earthen bunds; • The active tipping area must not exceed 30 m in length, 2 m in width and 2 m in height; • Construction, operation and decommissioning of landfill cells can occur within the defined landfill area providing there is no waste within; • 100 m of any surface water body; and • 3 m of the highest level of the water table aquifer.
Putrescible waste		
Clean fill		
Other waste that meets the acceptance criteria for Class II landfills		

11. The licence holder must ensure that cover is applied and maintained on landfilled waste types in accordance with the corresponding cover requirements in Table 6 that sufficient stockpiles of cover are maintained on the premises at all times.

Table 6: Cover requirements

Waste type	Cover material	Cover depth	Timescales
Inert Waste Type 2	Inert and incombustible	100 mm	Within 7 days of tyre disposal
		500 mm	Final soil cover
• Inert Waste Type 1 • Putrescible waste • Clean fill • Other waste that meets the acceptance criteria for Class II landfills		1000 mm	Within three months of the final waste load in each trench

12. The licence holder must ensure that:

(a) all reasonable and practicable measures are taken to ensure that no windblown waste escapes from the landfill areas; and

(b) any windblown waste is collected on at least a monthly basis and returned to the active tipping area or otherwise appropriately contained.

13. The licence holder must implement security measures at the landfill to prevent as far as practical, unauthorised access to the landfill.

Emissions and discharges

Point source emissions to air

14. The licence holder must ensure that where waste is emitted to air from the emissions points in Table 7 and identified on the corresponding map of emission points in Schedule 1 it is done so in accordance with this licence.

Table 7: Emission points to air

Emission point reference	Emission point location	Emission point height (metres)	Source
Carbon regeneration kiln stack	As depicted in Schedule 1, Figure 14	21	Liquified petroleum gas (LPG)
Powerhouse – 21 generators • LPG generators with a single stack • All others with a dual emissions stack		14	• 14 LPG generators • 4 dual fuel generators • 3 diesel generators
Bannockburn – Power Generator	As depicted in Schedule 1, Figure 15	N/A	• Diesel generators with a combined output of up to 200 kV

15. The licence holder must ensure that emissions from the emission points listed in Table 7 for the corresponding parameter do not exceed the corresponding limits listed in Table 8.

Table 8: Cumulative point source emission limits to air

Emission point reference	Parameter	Limit (including units)[1]	Averaging period
Carbon regeneration kiln stack	Arsenic	10 mg/m^3 for each analyte	Minimum 60 minute average
	Antimony		
	Cadmium		
	Lead		
	Mercury		
	Vanadium		

Note 1: All units are referenced to STP dry

Fugitive emissions

16. The licence holder must ensure that prior to, and during any disturbance to the following TSF components, these areas are continually wet down using water sprays, dribble bars or other suitable methods to ensure there is no visible windblown dust:

(a) The surface of the TSF

(b) The onsite roadways in the immediate vicinity of the TSF

(c) TSF embankments

(d) The 'TSF affected area', as denoted by Figure 16 in Schedule 1.

Discharges to land

17. The licence holder must ensure that where waste is discharged to land from the source and discharge points in Table 9, it is done so in accordance with the corresponding requirements listed in Table 9 and the conditions of this licence.

Table 9: Discharge points to land

Source including abatement	Discharge point reference	Discharge point location	Requirements
Treated effluent from the Thunderbox WWTP	Treated Effluent Discharge Point to TSF	As depicted in Schedule 1, Figure 17	If treated effluent is not discharged to the waste dump it will be incorporated into the tailings stream via the existing pipeline network.
Treated effluent from the Bannockburn septic tanks	Bannockburn - Sewage Leach Drain	As depicted in Schedule 1, Figure 15	Alternating discharge to two subsurface leach drains
Mine dewater	Thunderbox – Pit	As depicted in Schedule 1, Figure 18	A minimum freeboard of 5 m must be maintained
	Bannockburn - Pit	As depicted in Schedule 1, Figure 19	
	North Well - Pit	As depicted in Schedule 1, Figure 19	
	Slaughter Yard - Pit	As depicted in Schedule 1, Figure 3	
	Waterloo - Underground	As depicted in Schedule 1, Figure 18	A minimum freeboard of 6 m must be maintained
	Water carts and crushing and screening infrastructure	Within the premises boundary	Discharged only for dust suppression purposes

Monitoring

18. The licence holder must ensure that:

(a) all water samples are collected and preserved in accordance with AS/NZS 5667.1;

(b) all groundwater sampling is conducted in accordance with AS/NZS 5667.11;

(c) all laboratory samples are submitted to and tested by a laboratory with current NATA accreditation for the parameters being measures; and

(d) laboratory sample must be analysed using the appropriate limit of reporting as to allow comparison with relevant environmental guidelines.

19. The licence holder must ensure that:

(a) monitoring is undertaken in each weekly period such that there are at least 4 days in between the days on which samples are taken in successive weeks;

(b) monitoring is undertaken in each quarterly period such that there are at least 45 days in between the days on which samples are taken in successive quarters;

(c) monitoring is undertaken in each six-monthly period such that there are at least 5 months in between the days on which samples are taken in successive periods of six months; and

(d) monitoring is undertaken in each annual period such that there are at least 9 months in between the days on which samples are taken in successive years.

20. The licence holder must monitor emissions in accordance with the requirements specified in Table 10.

Table 10: Monitoring of point source emissions to air

Emission point	Parameter	Units[1]	Averaging period	Frequency[2]	Method
Carbon regeneration kiln stack	Arsenic	mg/m^3	Minimum 60 minutes	Annually	USEPA Method 29
	Antimony				
	Cadmium				
	Lead				
	Mercury				
	Vanadium				
	Particulates				USEPA Method 5 or 17
Power station	Sulphur dioxide (SO_2)	mg/m^3	Minimum 30 minutes	Annually	USEPA Method 6C
	Carbon Monoxide (CO)				USEPA Method 10
	NOx (Nitrogen oxides - NO and NO_2)				USEPA Method 7E
	Particulates				USEPA Method 5 or 17

Note 1: All units are referenced to STP dry
Note 2: Monitoring must be undertaken to reflect normal operating conditions and any limits or conditions on inputs or production

21. The licence holder must monitor tailings decant and ambient groundwater for concentrations of the parameters listed in Table 11:

(a) at the corresponding monitoring location;

(b) in the corresponding unit;

(c) at no less that the corresponding frequency;

(d) for the corresponding averaging period; and

(e) record and investigate results that do not meet any limit specified as set out in Table 11.

Table 11: Monitoring of surface water quality of tailings decant and ambient groundwater

Monitoring point location	Parameter	Limit	Units	Averaging period	Frequency
Monitoring bores: TSFMB08D, TSFMB09D, TSFMB10D, TSFMB11D, and TSFMB12D (shallow and deep)	Standing water level (SWL)	>4	mbgl	Spot sample	Quarterly
	pH[1]	6.0 to 9.0	N/A		
	Total dissolved solids (TDS)	<5000	mg/L		
	Arsenic (As)	<0.5			
	Weak acid dissociable cyanide (WAD CN)	<0.5			
	Antimony (Sb)	N/A	mg/L	Spot sample	Six monthly
	Bicarbonate (HCO_3)				
	Calcium (Ca)				
	Carbonate (CO_3)				
	Cadmium (Cd)				
	Chloride (Cl)				
	Chromium (Cr)				
	Cobalt (Co)				
	Copper (Cu)				
	Iron (Fe)				
	Lead (Pb)				
	Magnesium (Mg)				
	Manganese (Mn)				
	Mercury (Hg)				
	Molybdenum (Mo)				
	Nickel (Ni)				
	Nitrate (NO_3)				
	Potassium (K)				
Monitoring bores: TSFMB08D, TSFMB09D, TSFMB10D, TSFMB11D, and TSFMB12D (shallow and deep)	Selenium (Se)	N/A	mg/L	Spot sample	Six monthly
	Sodium (Na)				
	Sulfate (SO_4)				
	Thallium (Tl)				
	Total cyanide (CN)				
	Zinc (Zn)				
Tailings decant	Weak acid dissociable cyanide (WAD CN)	50	mg/L	Spot sample	Quarterly
	Arsenic[1]	N/A			Weekly

Note 1: In-field non-NATA accredited analysis permitted.

22. The licence holder must, when standing water levels rise higher than 6 mbgl, provide the CEO with the following information:

(a) the monitoring bore location

(b) the measures taken to identify the cause of the exceedance(s); and

(c) the measures taken, or intended to be taken, to prevent a recurrence of the exceedance(s).

23. The licence holder must undertake monitoring in accordance with the requirements specified in Table 12 and record the results of all such monitoring.

Table 12: Process monitoring

Location	Parameter	Units	Averaging period	Frequency	Method
Thunderbox WWTP discharge points	Volume of treated effluent discharged to the Eastern Waste Dump	kL	Annual	Continuous	Flow metering device
	Volume of treated effluent discharged to TSFs				
Bannockburn WWTP leach drain	Volume of treated effluent discharged to the leach drain				

24. The licence holder must record and investigate the exceedance of any descriptive or numerical limit specified in any part of this licence.

Records and reporting

25. The licence holder must record the following information in relation to complaints received by the licence holder (whether received directly from a complainant or forwarded to them by the Department or another party) about any alleged emissions from the premises:

(a) the name and contact details of the complainant, (if provided);

(b) the time and date of the complaint;

(c) the complete details of the complaint and any other concerns or other issues raised; and

(d) the complete details and dates of any action taken by the licence holder to investigate or respond to any complaint.

26. The licence holder must:

(a) undertake an audit of their compliance with the conditions of this licence during the preceding annual period; and

(b) prepare and submit to the CEO by no later than 60 days after the end of that annual period an Annual Audit Compliance Report in the approved form.

27. The licence holder must maintain accurate and auditable books including the following records, information, reports, and data required by this licence:

(a) the calculation of fees payable in respect of this licence;

(b) the works conducted in accordance with condition 3 of this licence;

(c) any maintenance of infrastructure that is performed in the course of complying with conditions 1, 2, 3, 7, 10, 11 and 13 of this licence;

(d) monitoring programmes undertaken in accordance with conditions 8, 20, 21, 22 and 23 of this licence; and

(e) complaints received under condition 25 of this licence.

28. The books specified under condition 27 must:

(a) be legible;

(b) if amended, be amended in such a way that the original version(s) and any subsequent amendments remain legible and are capable of retrieval;

(c) except for records listed in 28(d) be retained for at least 6 years from the date the records were made or until the expiry of the Licence or any subsequent licence;

(d) for those following records, be retained until the expiry of the Licence and any subsequent licence:

(i) off-site environmental effects; or

(ii) matters which affect the condition of the land or waters, and

(e) be available to be produced to an inspector or the CEO as required.

29. The licence holder must submit to the CEO by no later than 60 days after the end of each annual period, an Annual Environmental Report for that annual period for the conditions listed in Table 13, and which provides information in accordance with the corresponding requirement set out in Table 13.

Table 13: Annual Environmental Report

Condition or table	Parameter	Format or form
Condition 7 (Table 4)	Corrective actions taken for infrastructure/equipment not performing as per inspection requirements.	None specified
Condition 8	Water balance	Tabulated data
-	Summary of any failure or malfunction of any pollution control equipment and any environmental incidents that have occurred during the annual period and any action taken	-
-	Actual production throughputs for prescribed premises categories.	Tabulated data
Condition 20 (Table 10)	Air quality monitoring	Tabulated data
Condition 21 (Table 11)	An interpretation of ambient groundwater monitoring data results including comparison to historical trends.	Tabulated ambient groundwater monitoring data results and time series graphs for each monitoring well showing concentrations of all parameters over a 4-year period.
Condition 23 (Table 12)	Process monitoring	Tabulated data

Condition or table	Parameter	Format or form
Condition 25	Summary of complaints	None specified
Condition 26	Compliance	Annual Audit Compliance Report (AACR)

30. The licence holder must ensure that the Annual Environmental Report also contains:

(a) any relevant process, production or operational data; and

(b) an assessment of the information contained within the report against previous monitoring results and licence limits.

31. The licence holder must submit the information in Table 14 to the CEO according to the specifications in that table.

Table 14: Non-annual reporting requirements

Condition or table	Parameter	Reporting period	Reporting date (after the end of the reporting period)	Format or form
-	Copies of original monitoring reports submitted to the licence holder by third parties.	Not applicable	Within 14 days of the CEOs request	As received by the licence holder from third parties.
Condition 11	The Licence holder shall: • Record the location of each batch of used tyres buried within the waste rock landforms; and • Record the number of tyres in each batch buried within the waste rock landforms.			N/A

32. The licence holder must ensure that the parameters listed in Table 15 are notified to the CEO, in accordance with the notification requirements of the table.

Table 15: Notification requirements

Condition or table	Parameter	Reporting requirement[1]	Format or form[2]
Condition 22	Standing Water Level exceeding 6 mbgl	Within 7 calendar days of becoming aware of Standing Water Levels exceeding 6 mbgl	None specified
Condition 24	Breach of any limit specified in the licence	Part A: As soon as practicable but no later than 5pm of the next usual working day. Part B: As soon as practicable.	N1

Note 1: Notification requirements in the licence must not negate the requirement to comply with s72 of the EP Act.
Note 2: Forms are in Schedule 2.

Definitions

In this licence, the terms in Table 16 have the meanings defined.

Table 16: Definitions

Term	Definition
ACN	Australian Company Number
Annual Audit Compliance Report (AACR)	means a report submitted in a format approved by the CEO (relevant guidelines and templates may be available on the Department's website).
annual period	a 12 month period commencing from 1 October until 30 September of the immediately following year.
AS/NZS 5667.1	means the Australian Standard AS/NZS 5667.1 *Water Quality – Sampling – Guidance of the Design of sampling programs, sampling techniques and the preservation and handling of samples*.
AS/NZS 5667.11	means the Australian Standard AS/NZS 5667.11 *Water Quality – Sampling – Guidance on sampling of groundwaters*.
averaging period	means the time over which a limit is measured or a monitoring result is obtained;
books	has the same meaning given to that term under the EP Act.
CEO	means Chief Executive Officer of the Department. "submit to / notify the CEO" (or similar), means either: Director General Department administering the *Environmental Protection Act 1986* Locked Bag 10 Joondalup DC WA 6919 or: info@dwer.wa.gov.au
Clean fill	has the meaning defined in Landfill Definitions
Department	means the department established under section 35 of the *Public Sector Management Act 1994* (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.
discharge	has the same meaning given to that term under the EP Act.
emission	has the same meaning given to that term under the EP Act.
environmentally hazardous material	means material (either solid or liquid raw materials, materials in the process of manufacture, manufactured products, products used in the manufacturing process, by-products and waste) which if discharged into the environment from or within the premises may cause pollution or environmental harm
EP Act	*Environmental Protection Act 1986* (WA)
EP Regulations	*Environmental Protection Regulations 1987* (WA)

Term	Definition
freeboard	means the distance between the maximum water surface elevations and the top of retaining banks or structures at their lowest point
HDPE	means High Density Polyethylene;
Inert Waste Type 1 and Type 2	has the meaning defined in Landfill Definitions
licence	refers to this document, which evidences the grant of a licence by the CEO under section 57 of the EP Act, subject to the specified conditions contained within.
licence holder	refers to the occupier of the premises, being the person specified on the front of the licence as the person to whom this licence has been granted.
mbgl	means metres below ground level
monthly period	means a one-month period commencing from day 1 of a month until the last day of that month.
NATA	means the National Association of Testing Authorities, Australia
NATA accredited	means in relation to the analysis of a sample that the laboratory is NATA accredited for the specified analysis at the time of the analysis
NOx	means oxides of nitrogen, calculated as the sum of nitric oxide and nitrogen dioxide and expressed as nitrogen dioxide
premises	refers to the premises to which this licence applies, as specified at the front of this licence and as shown on the premises map in Schedule 1 to this licence.
prescribed premises	has the same meaning given to that term under the EP Act.
PVC	means Polyvinyl Chloride plastic
quarterly	means the 4 inclusive periods from 1 April to 30 June, 1 July to 30 September, 1 October to 31 December and in the following year, 1 January to 31 March;
Schedule 1	means Schedule 1 of this Licence unless otherwise stated
Schedule 2	means Schedule 2 of this Licence unless otherwise stated
Schedule 3	means Schedule 3 of this Licence unless otherwise stated
Six monthly	means the two inclusive periods 1 October to 31 March and 1 April to 30 September
spot sample	means a discrete sample representative at the time and place at which the sample is taken
STP dry	means standard temperature and pressure (0° Celsius and 101.325 kilopascals respectively), dry

Term	Definition
TSF	means Tailings Storage Facility
USEPA	means United States (of America) Environmental Protection Agency
USEPA Method 5	means the United States (of America) Environmental Protection Agency *Method 5 – Determination of Particulate Matter Emissions from Stationary Sources*
USEPA Method 6C	means the United States (of America) Environmental Protection Agency *Method 6C – Determination of Sulfur Dioxide Emissions from Stationary Sources*
USEPA Method 7E	means the United States (of America) Environmental Protection Agency *Method 7E – Determination of Nitrogen Oxides Emissions from Stationary Sources (Instrumental Analyzer Procedure)*
USEPA Method 10	means the United States (of America) Environmental Protection Agency *Method 10 – Determination of Carbon Monoxide Emissions from Stationary Sources (Instrumental Analyzer Procedure)*
USEPA Method 17	means the United States (of America) Environmental Protection Agency *Method 17 – Determination of Particulate Matter Emissions from Stationary Sources*
USEPA Method 29	means the United States (of America) Environmental Protection Agency *Method 29 – Determination of Metals Emissions from Stationary Sources*
waste	has the same meaning given to that term under the EP Act.
WWTP	means wastewater treatment plant

END OF CONDITIONS

Schedule 1: Maps

Premises maps

The whole of the premises boundary is shown in green in the map below.

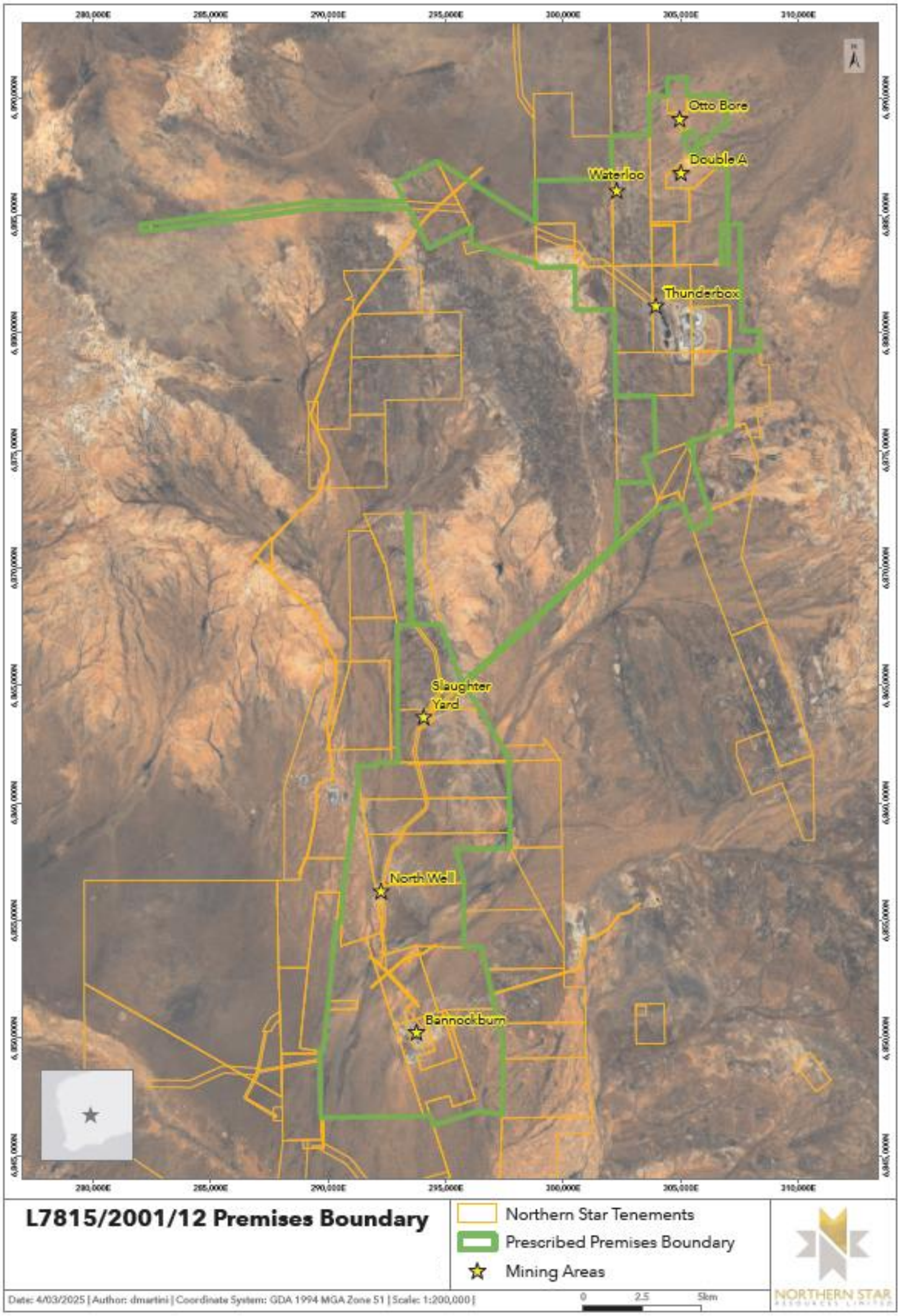


Figure 1: Premises map

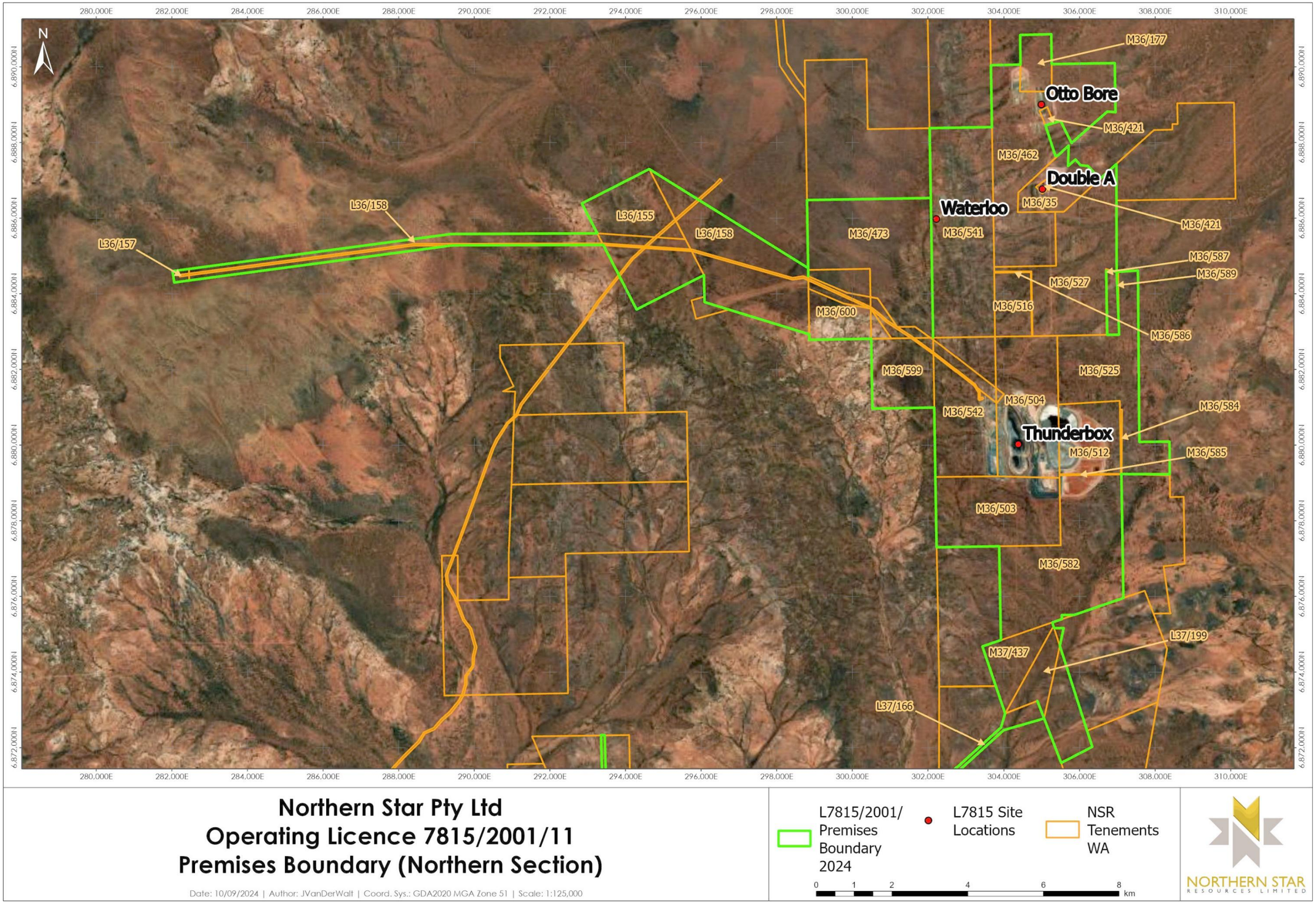


Figure 2: Northern section (Thunderbox operations) of the premises boundary and mining tenements

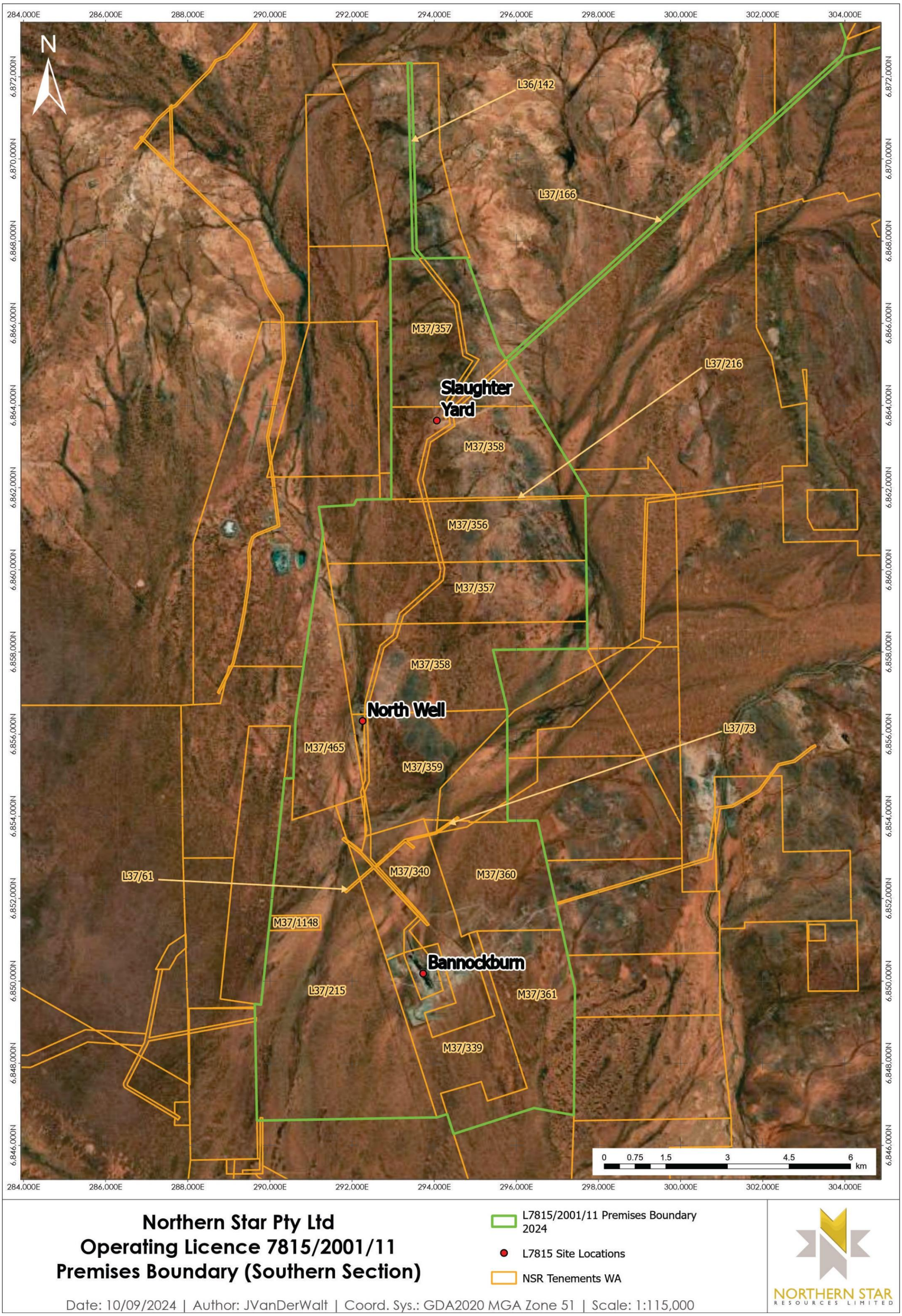


Figure 3: Southern section (Bannockburn operations) of the premises boundary and mining tenements

Maps of monitoring locations and containment infrastructure

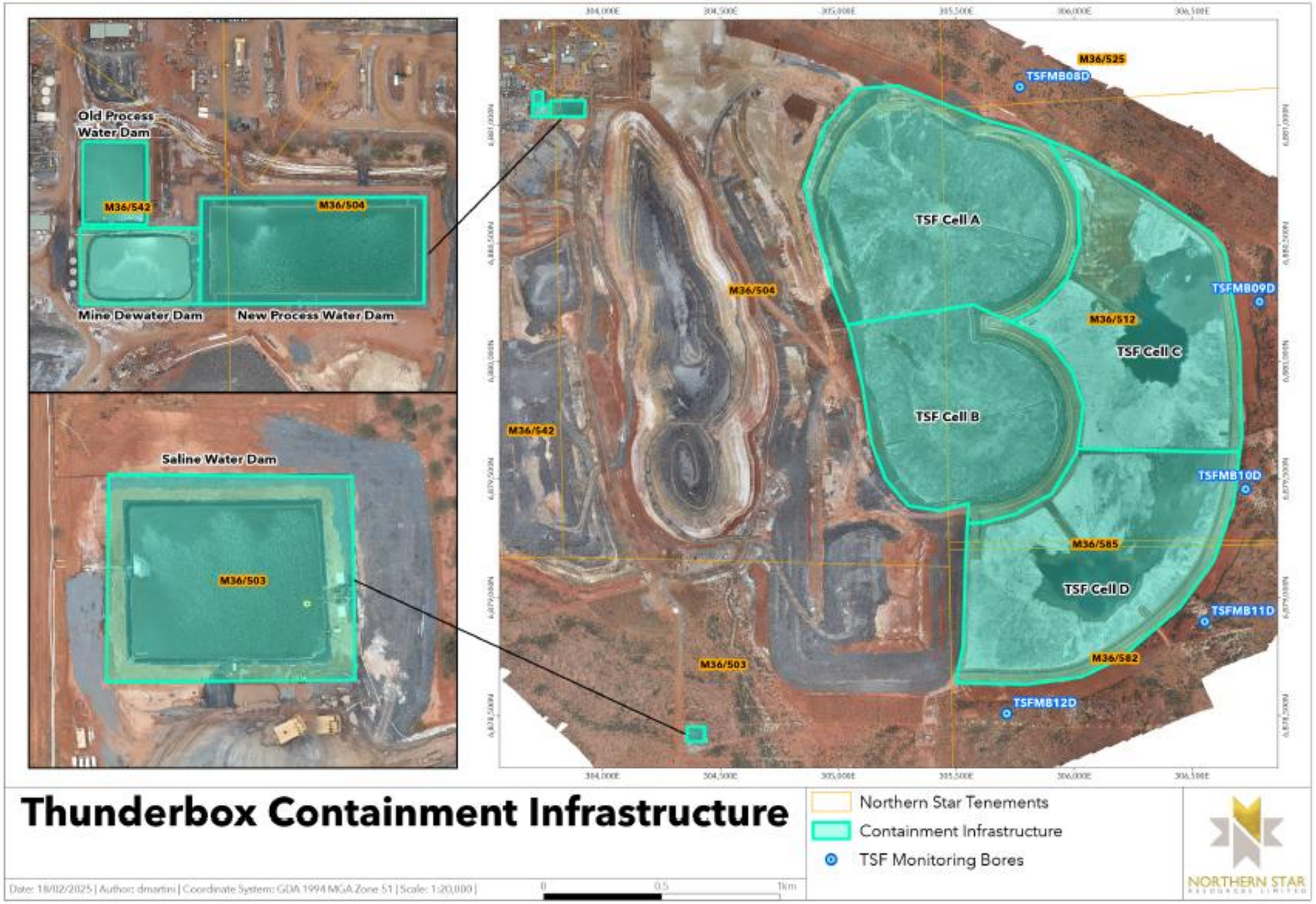


Figure 4: Location of containment infrastructure and TSF groundwater monitoring bores at the Thunderbox operations (northern section of premises)

Figure 5: Location of containment infrastructure at the Bannockburn operations (southern section of premises)

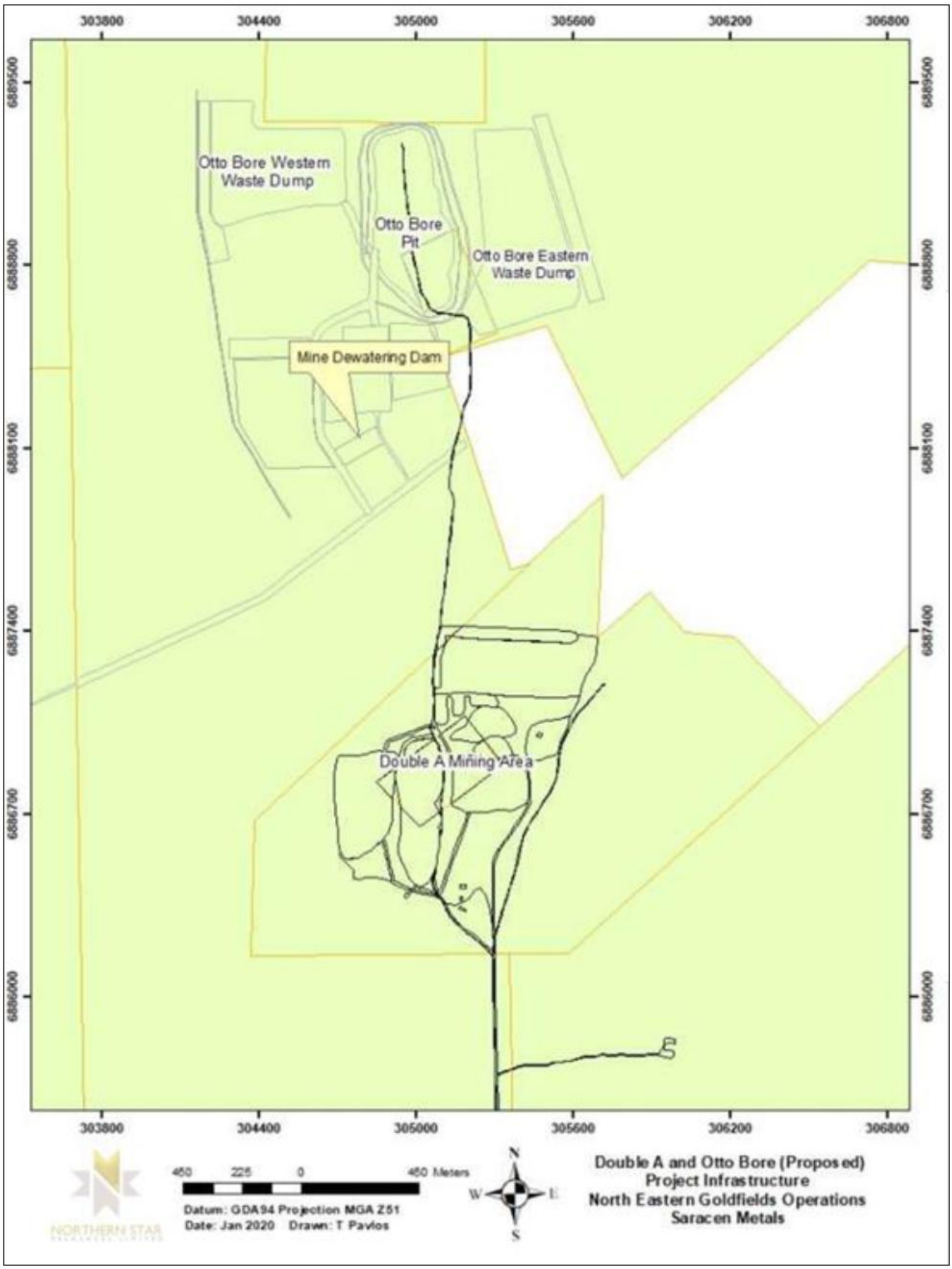


Figure 6: Location of dewatering dam at Otto Bore.

Maps of site infrastructure and equipment

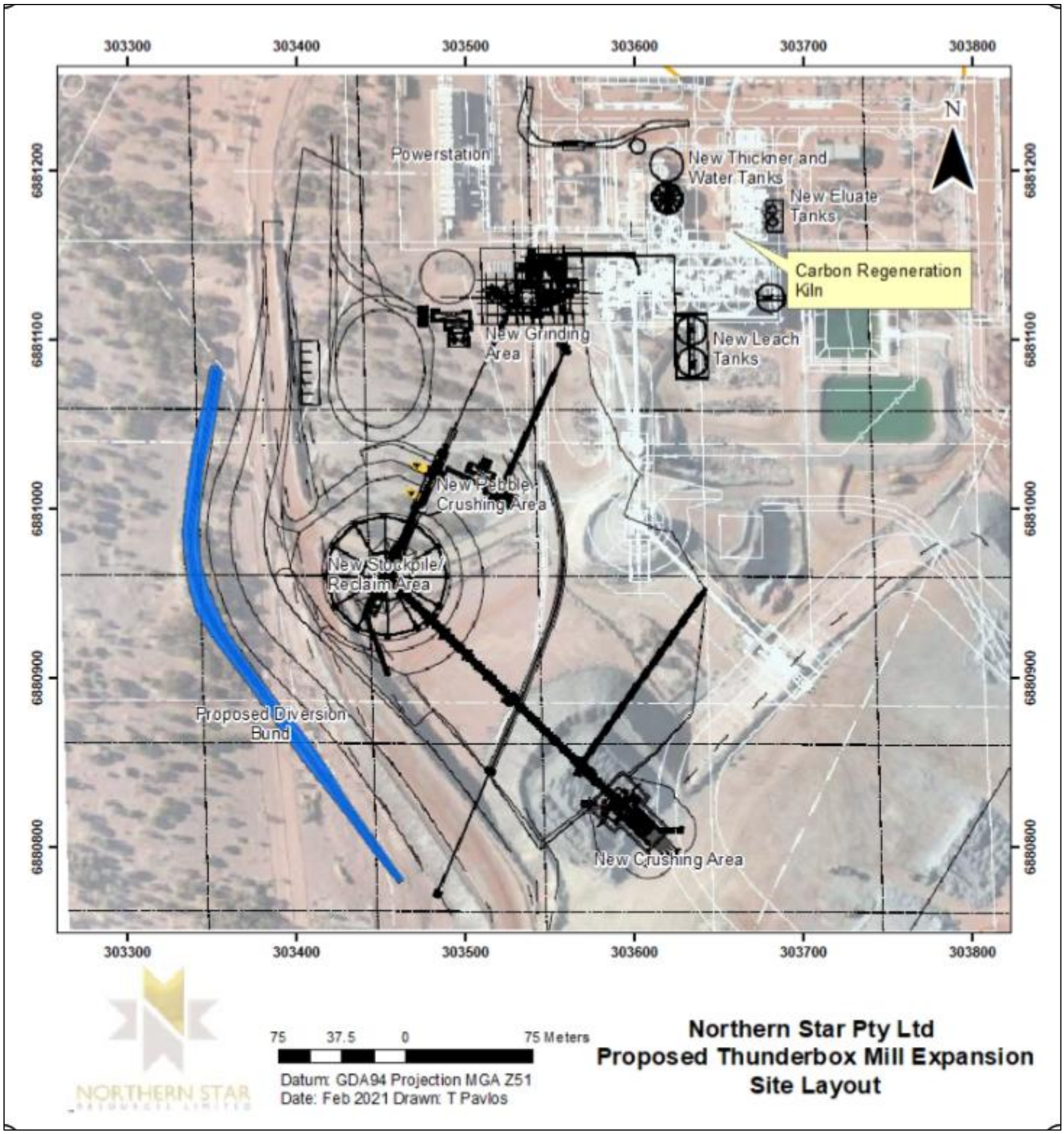


Figure 7: Map of Thunderbox Mill expansion infrastructure layout

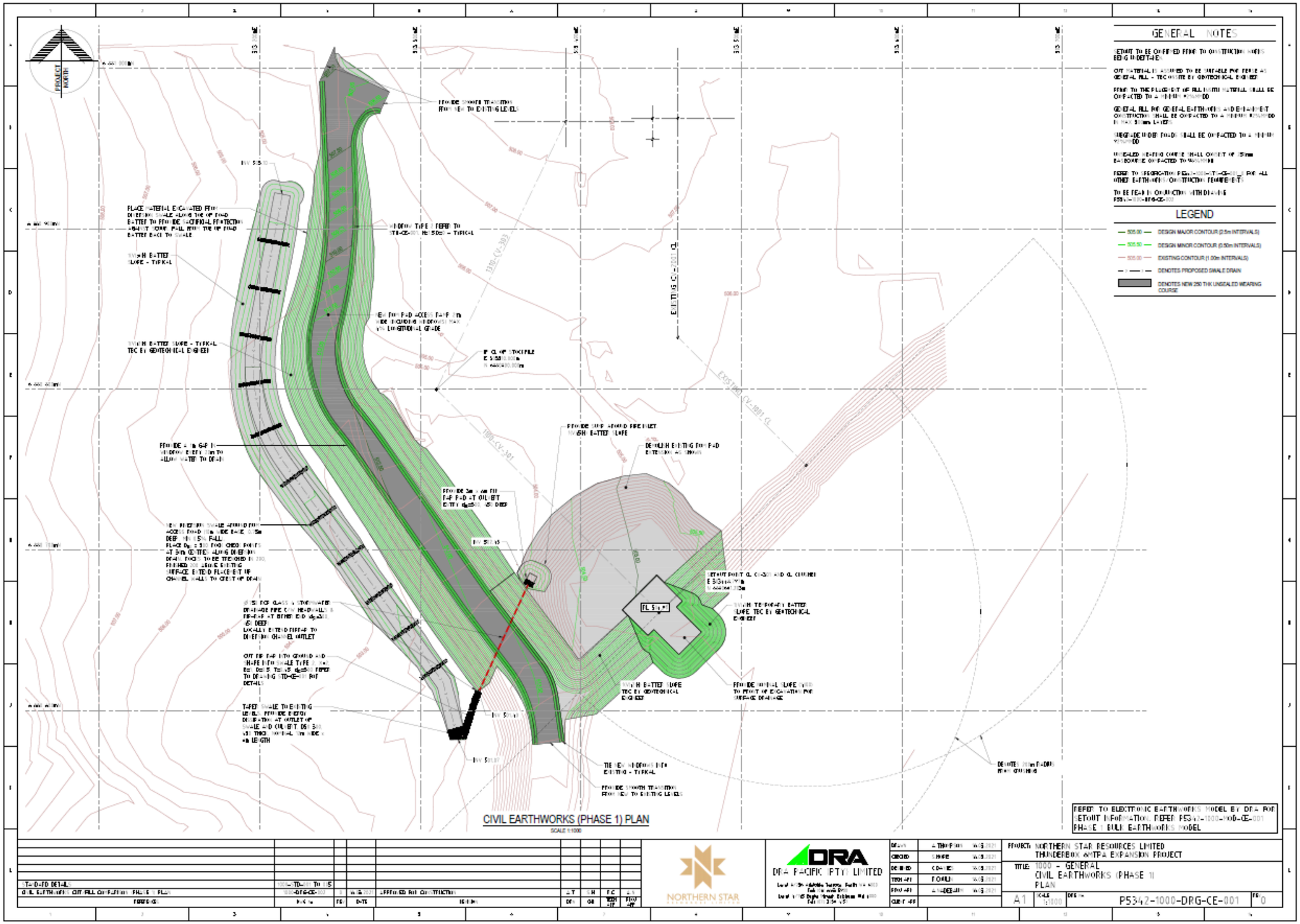


Figure 8: Schematic drawing of the stormwater diversion bund

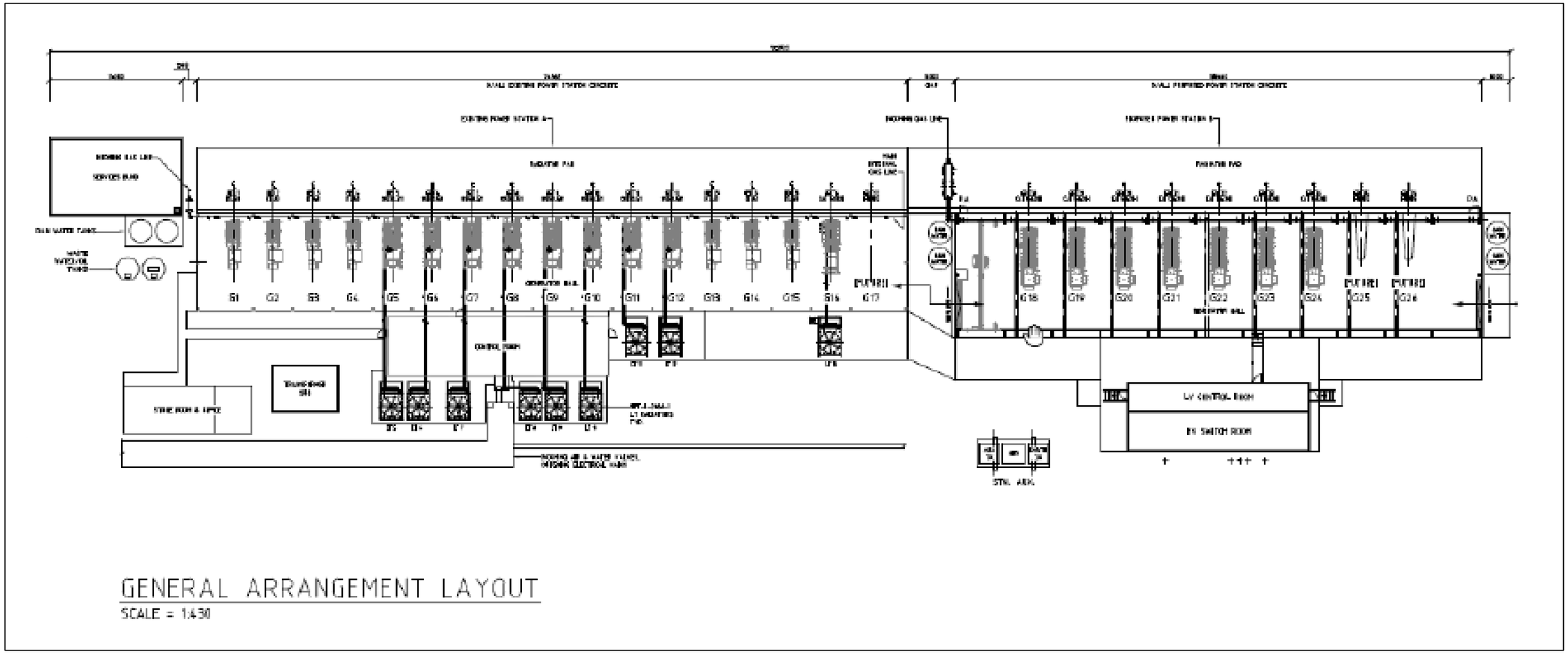


Figure 9: Layout of Thunderbox powerhouse

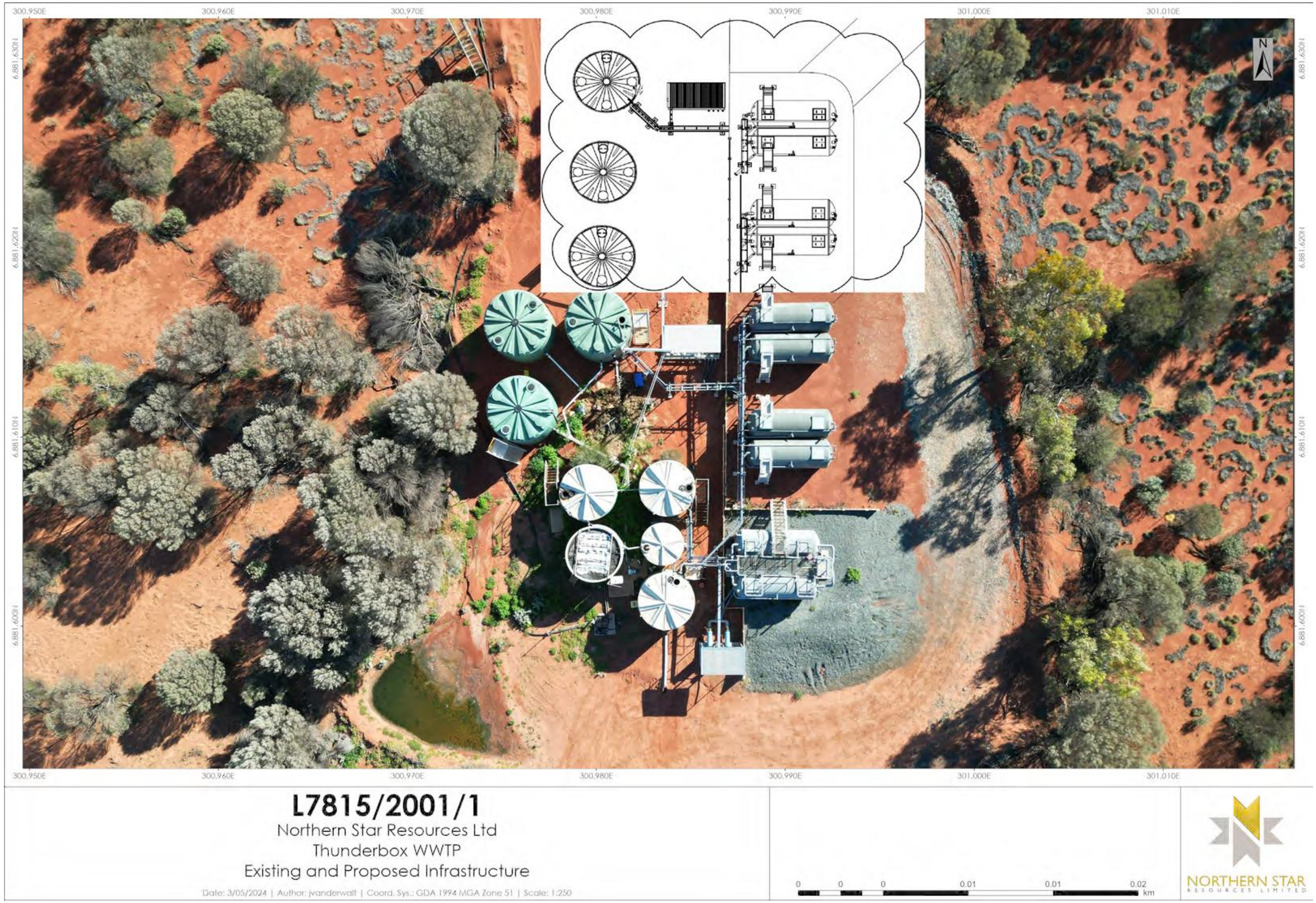


Figure 10: Existing Thunderbox WWTP and additions to the WWTP

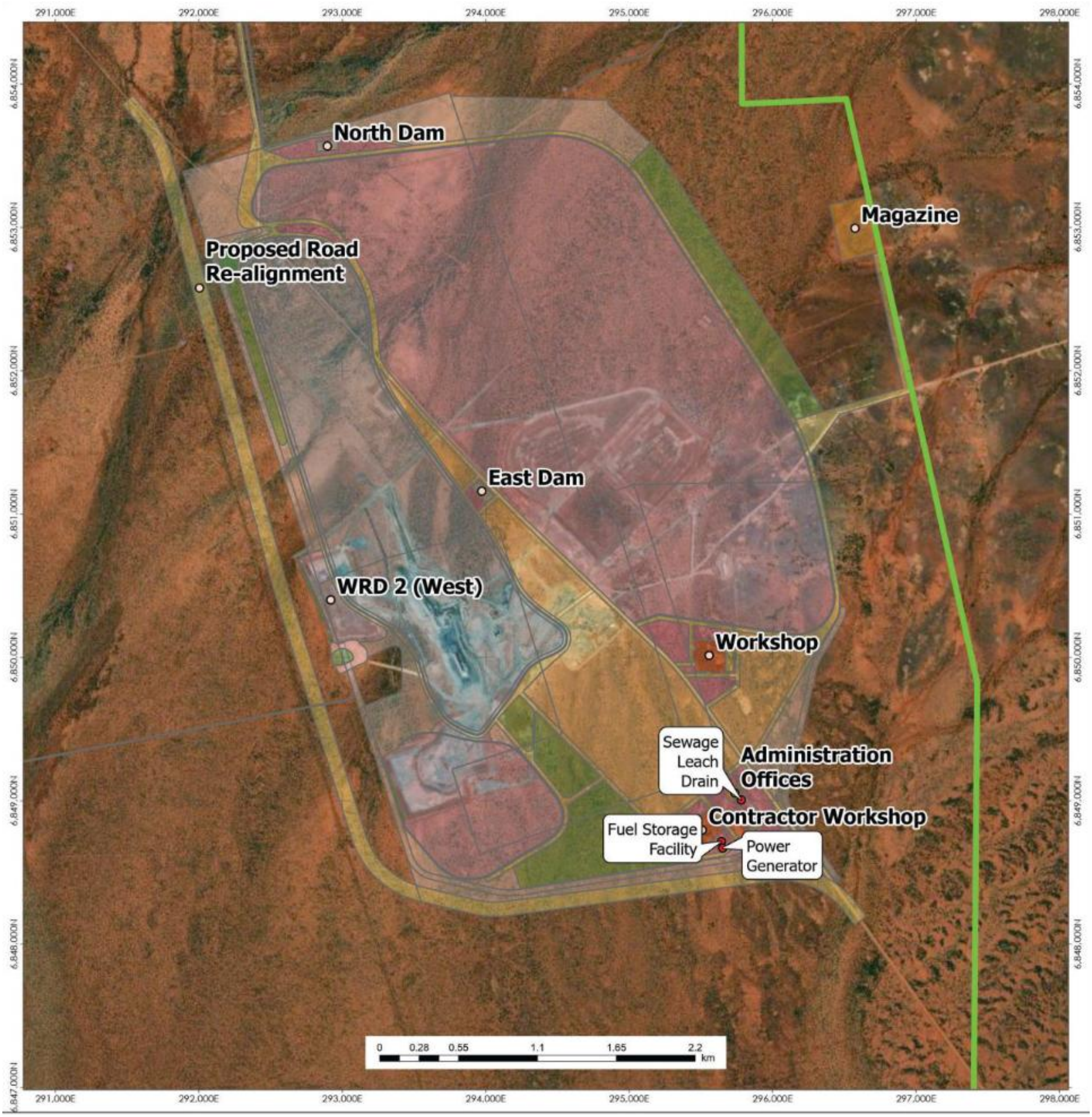


Figure 11: Layout of site infrastructure and equipment at the Bannockburn operations

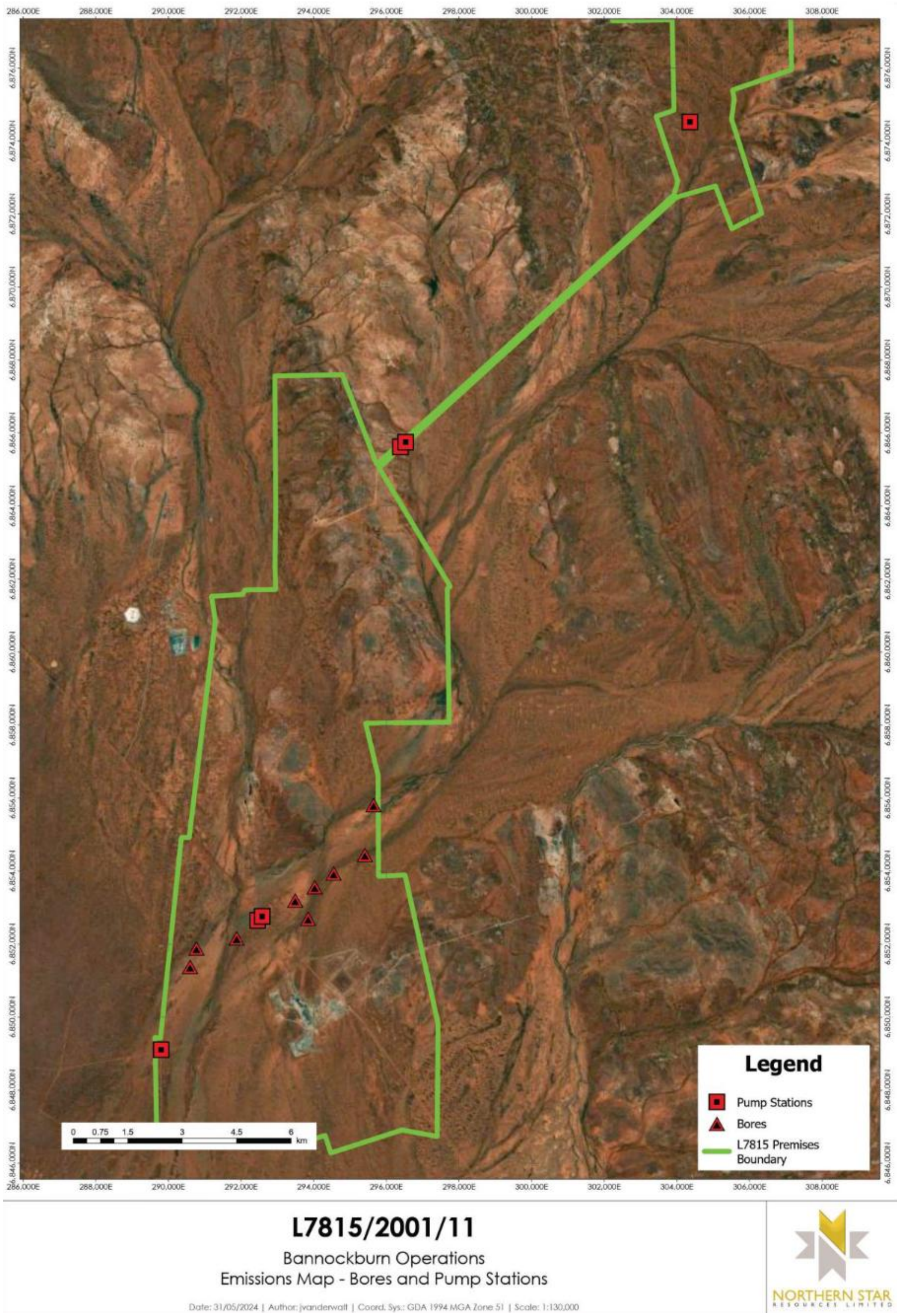


Figure 12: Location of fuel storage tanks servicing the bore field

Maps of emission and discharge points

Figure 13: Location of landfill and discharges to land at the Thunderbox operations

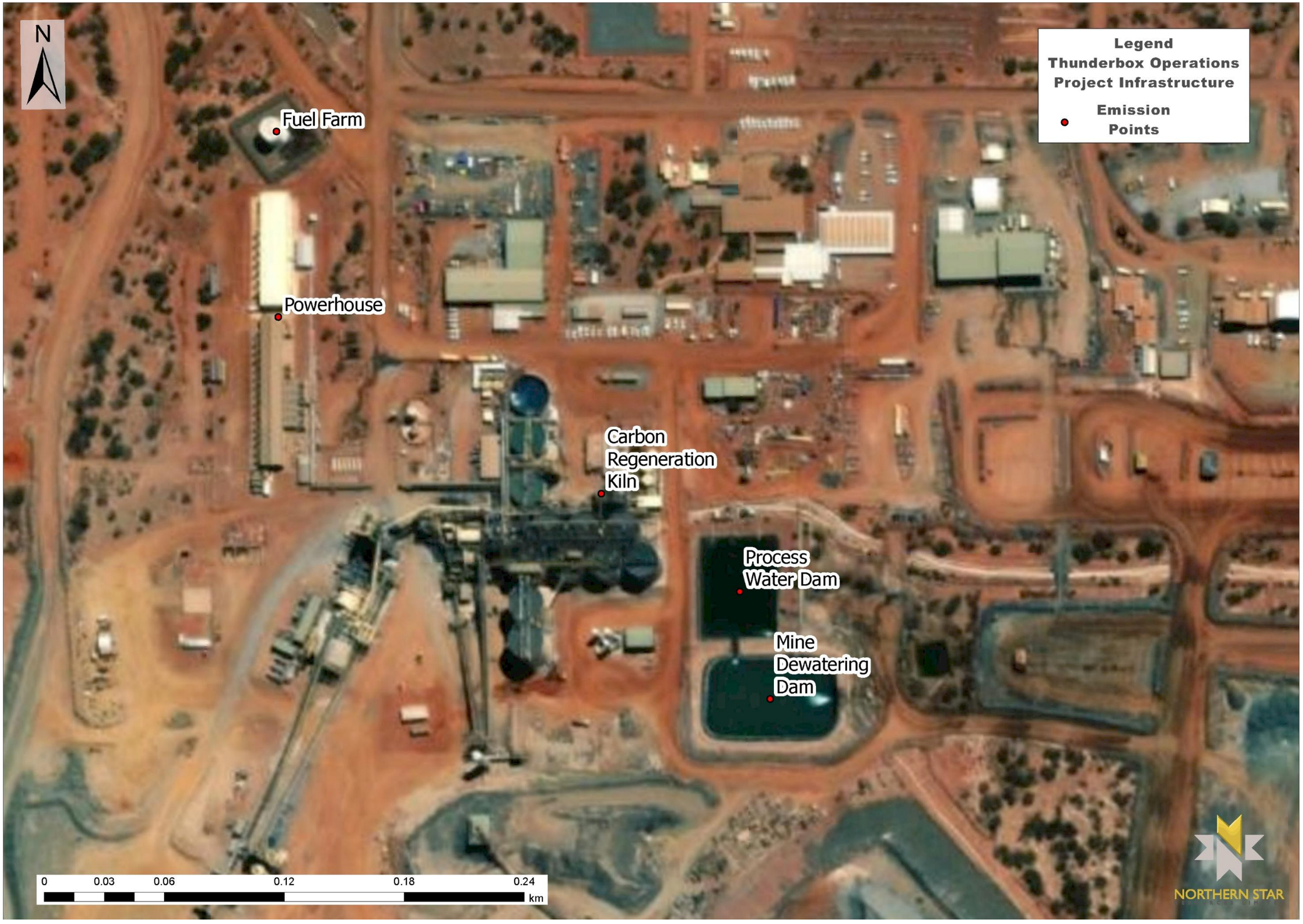


Figure 14: Locations of emission points to air at the Thunderbox operations (carbon regeneration kilns and the powerhouse).

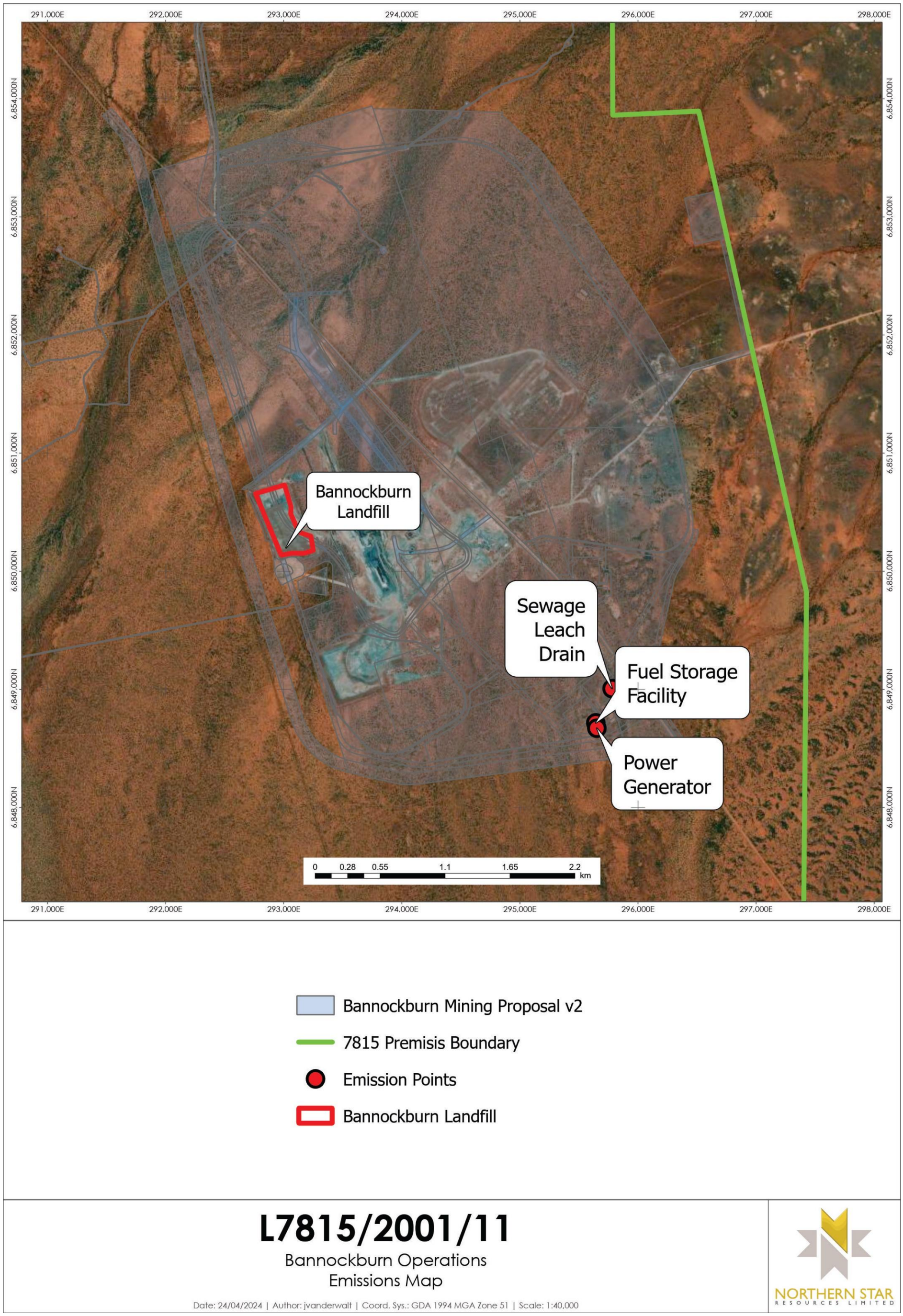


Figure 15: Location of landfill, emission points to air and discharges to land at the Bannockburn operations

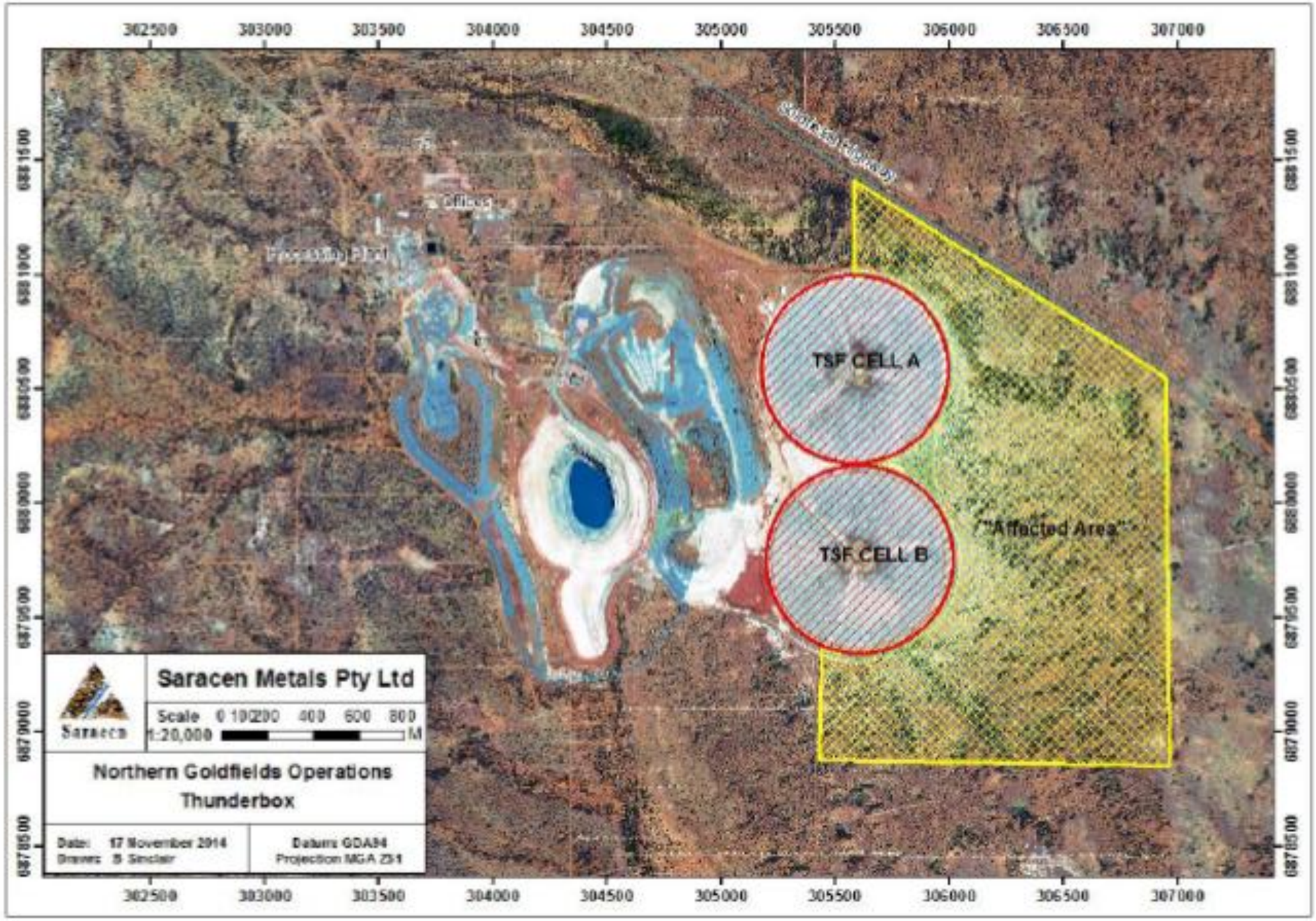


Figure 16: Location of areas subject to fugitive dust controls in condition 16

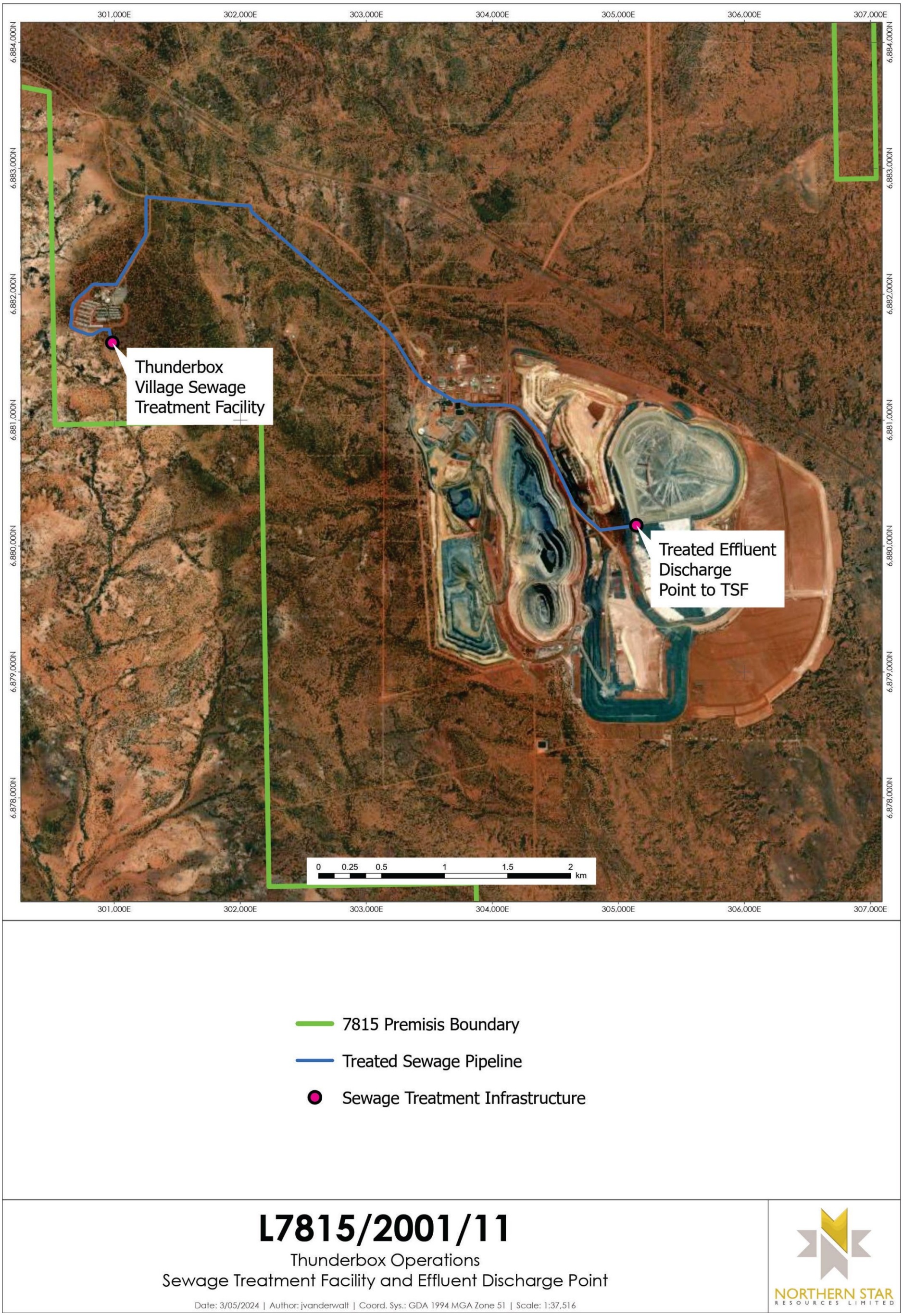


Figure 17: Treated effluent pipelines and discharge points at Eastern Waste Dump and TSF

Figure 18: Location of mine dewatering discharge points at the Thunderbox pit and Waterloo underground

Figure 19: Location of mine dewatering discharge points at the Bannockburn and North Well pits

Figure 20: TSF Cells C and D and associated pipelines

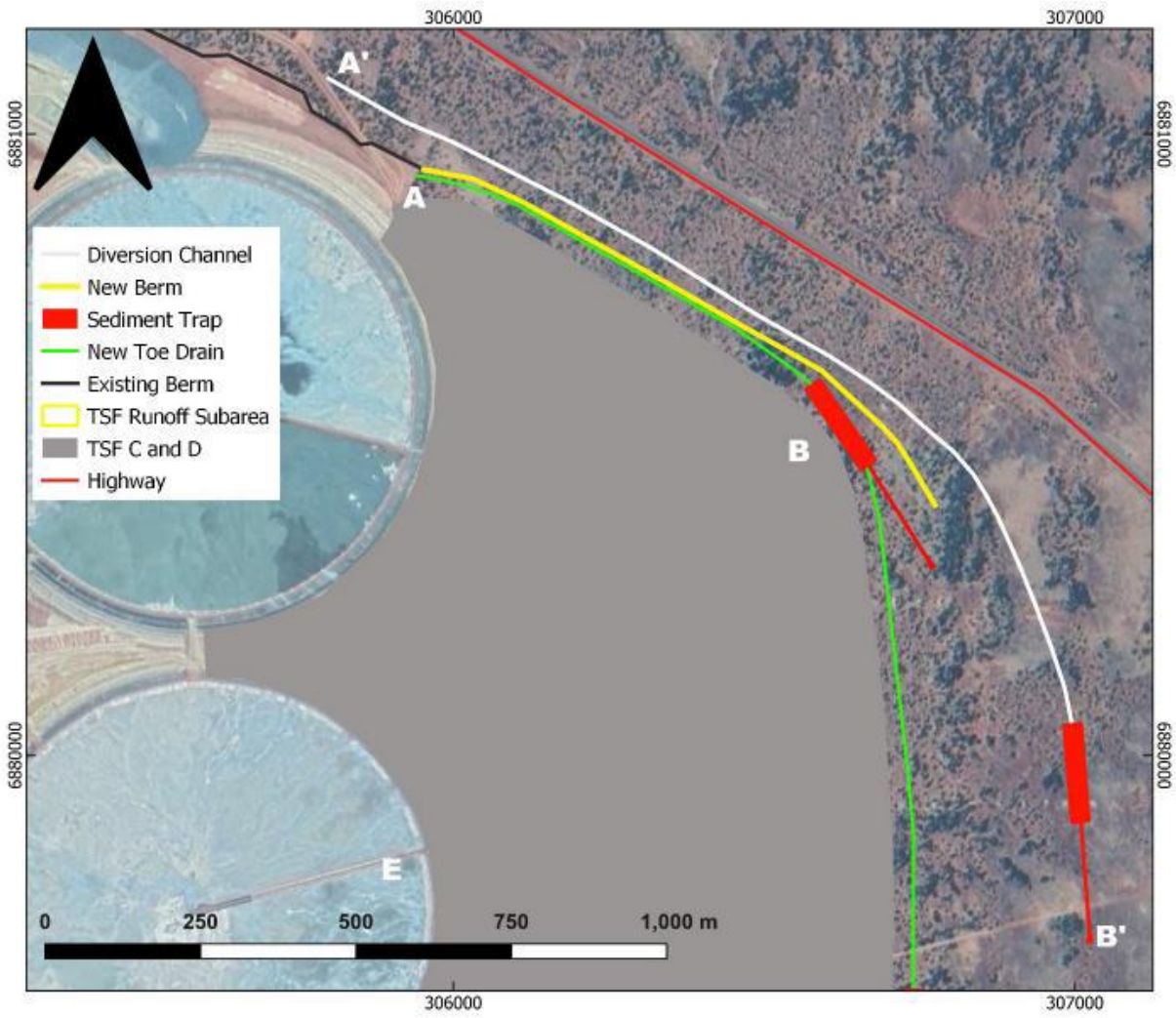


Figure 21: Positions of external toe drain, berm and diversion channel

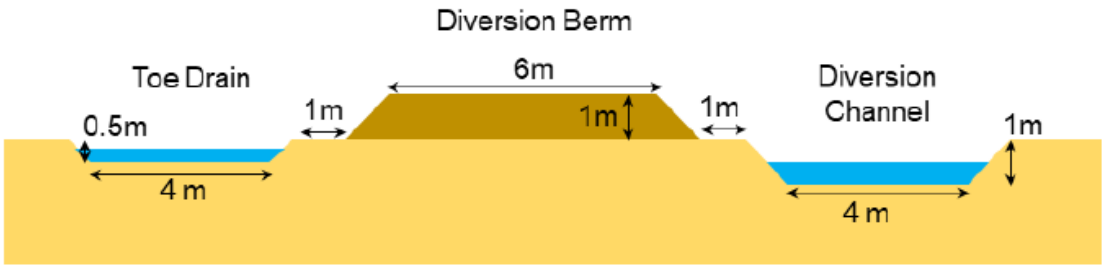


Figure 22: Schematic of toe drain, berm and diversion channel

Figure 23: Location of used tyre storage and Class I landfill facilities

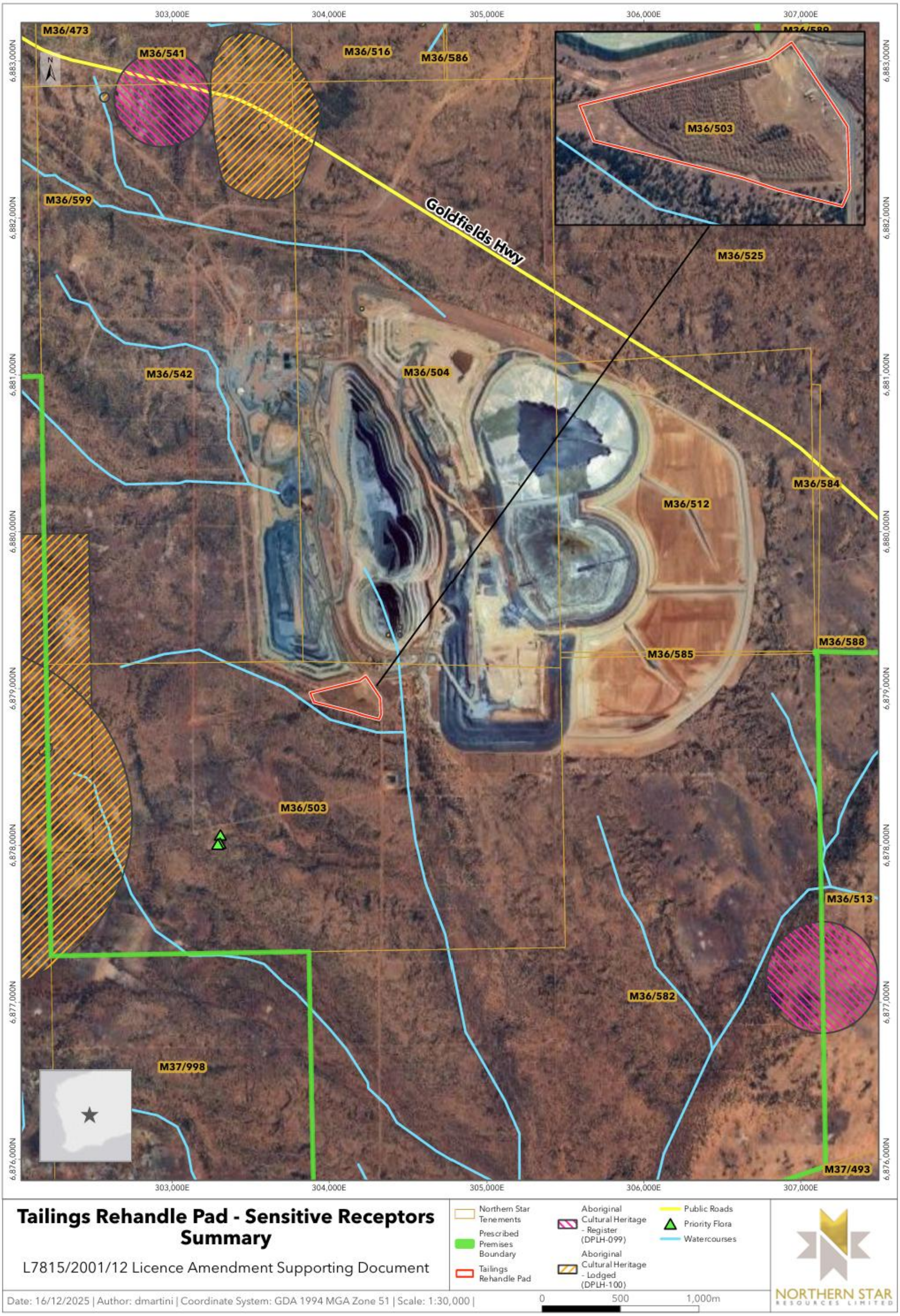


Figure 24: Tailings rehandle pad location and sensitive receptors

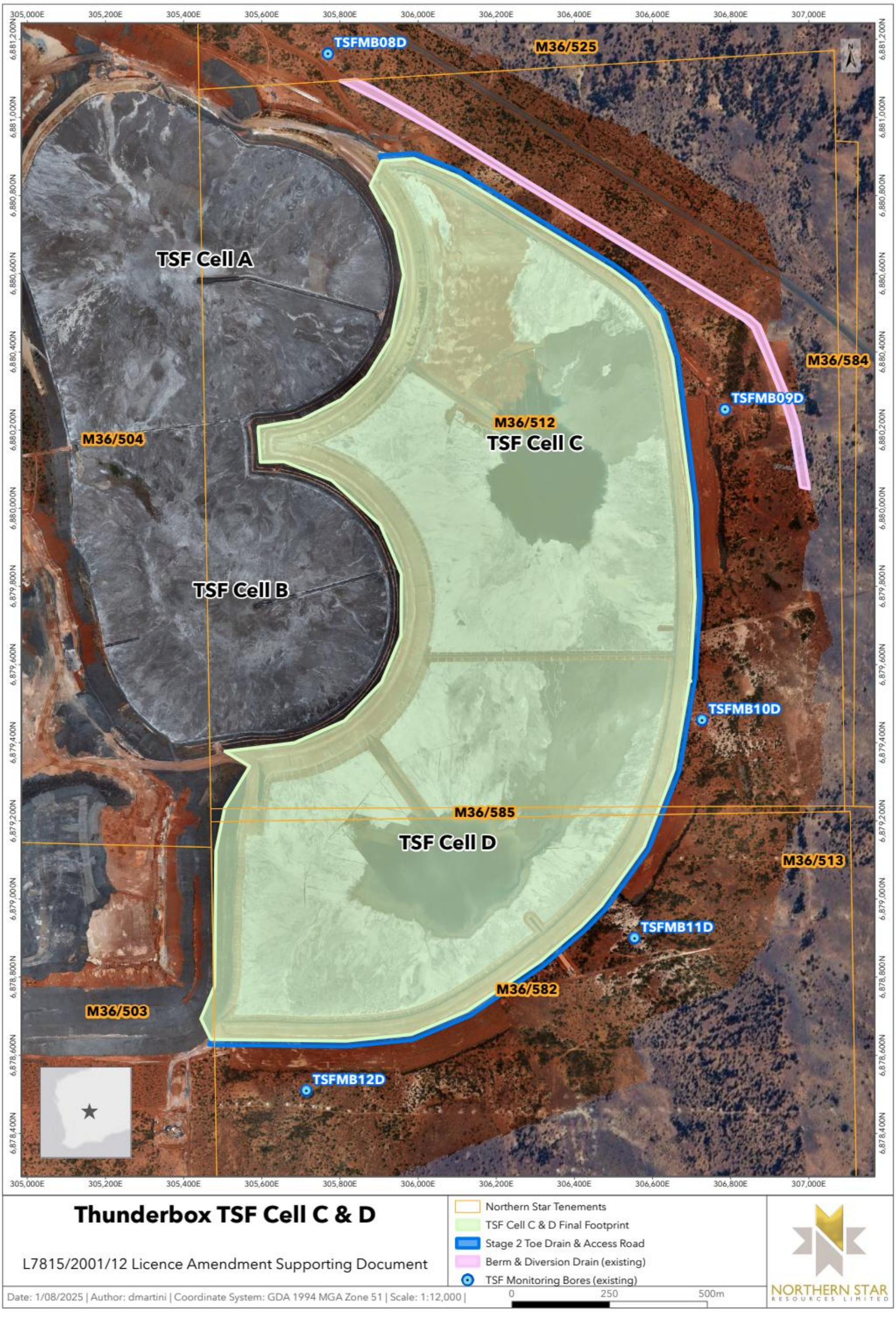
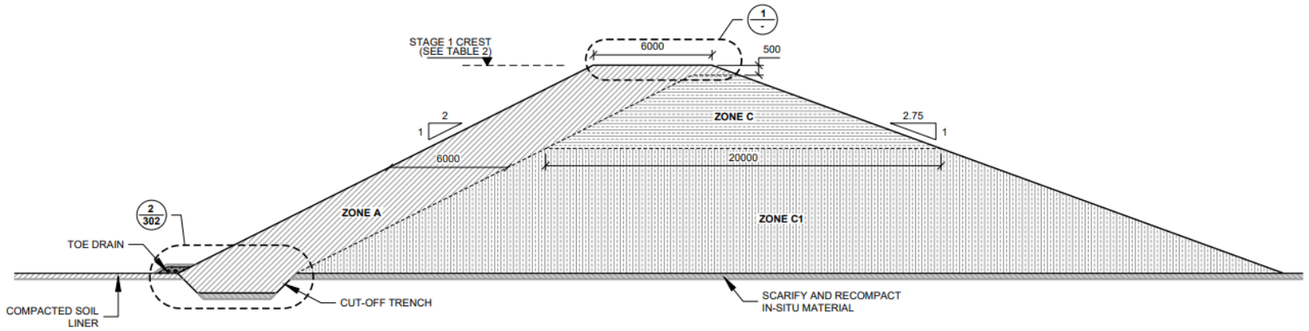
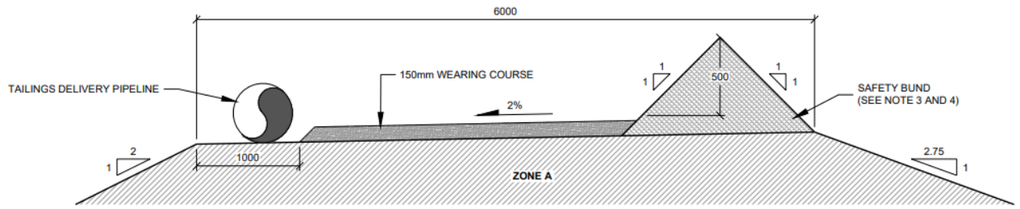


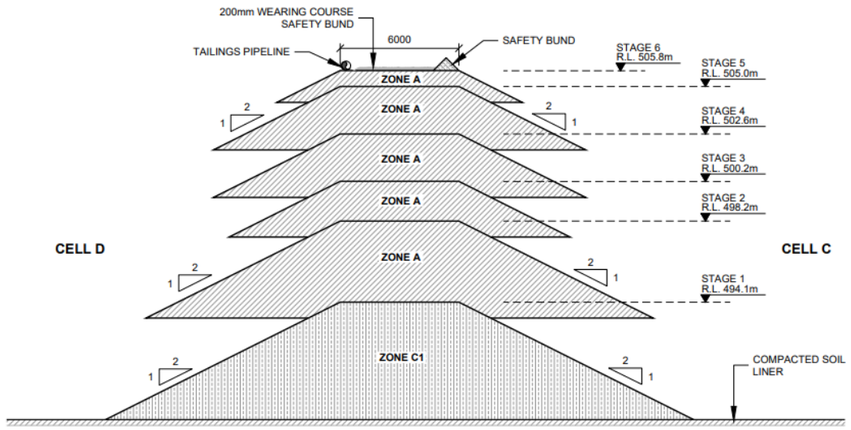
Figure 25: Thunderbox TSF Cells C and D and associated drainage infrastructure



A 110 TYPICAL CELL C AND D DOWNSTREAM EMBANKMENT RAISE (STAGE 1) SECTION



1 303 1 - TYPICAL DOWNSTREAM EMBANKMENT RAISE, CREST DETAIL



B 115 B 110 TYPICAL DIVIDER EMBANKMENT DETAIL

NOTES:

1. EMBANKMENT FOUNDATION PREPARATION SHALL EXTEND 5000mm BEYOND THE TOE OF THE EMBANKMENT.
2. EMBANKMENT FOUNDATION IN THE VALLEY FLOOR WHICH IS DEEMED UNSUITABLE BY THE ENGINEER ON SITE IS TO BE REMOVED AND REPLACED BY ZONE A OR ZONE C MATERIAL.
3. SAFETY BUND MATERIAL TO BE PLACED, TRIMMED AND BUCKET TAMPED.
4. SAFETY BUNDS ARE TO BE INSTALLED (500mm HIGH MIN.) ON THE UPSTREAM CREST WHERE NO PIPELINE EXISTS. BREAKS IN UPSTREAM SAFETY BUNDS AT 50m INTERVALS TO ALLOW FOR DRAINAGE OF RAINFALL RUNOFF.
5. COMPACTED SOIL LINER IN TSF AS FOLLOWS:
   - WHERE IN-SITU MATERIAL IS UNSUITABLE AS COMPACTED SOIL LINER - 300mm IMPORTED SOIL ZONE A MATERIAL.
   - WHERE IN-SITU MATERIAL IS SUITABLE AS COMPACTED SOIL LINER - SCARIFY, MOISTURE CONDITION AND COMPACT IN-SITU MATERIAL (300mm).

TABLE No.1:
ZONE SPECIFICATION SUMMARY

ZONE KEY	ZONE TYPE	ZONE DESCRIPTION	COMPACTION SPECIFICATION	MAXIMUM LAYER THICKNESS	GRADING
	ZONE A	LOW PERMEABILITY FILL	98% SMDD -2% <OMC < +3%	300mm	DMAX=150 %FINES>20 PI>8
	ZONE C	STRUCTURAL FILL BY CONTRACTOR	95%SMDD -3%<OMC<3%	500mm	DMAX=250 %FINES>5 PI>8
	ZONE C1	STRUCTURAL FILL PLACED BY MINING FLEET	UNIFORM DENSITY FREE FROM LARGE CAVITIES	1000mm	DMAX=500
	ZONE D	GENERAL FILL	95%SMDD -3%<OMC< +3%	500mm	N/A
	ZONE E	EROSION PROTECTION	UNIFORM DENSITY FREE FROM CAVITIES	300mm	DMAX=300 %FINES<5
	ZONE F	DRAINAGE MEDIUM	UNIFORM FREE OF CAVITIES	N/A	DMAX<19 %FINE<5
	ZONE G	SELECTED ROCKFILL	5mm < PARTICLE SIZE < 300mm	N/A	DMAX=500 %FINES<5
	EMBANKMENT FOUNDATION	IN-SITU MATERIALS AS APPROVED BY ENGINEER	98% SMDD -2% <OMC < +3%	N/A	N/A
	WEARING COURSE	GRAVEL	UNIFORM DENSITY FREE OF CAVITIES	200mm	DMAX=37.5 %FINES 5-15%
	COMPACTED SOIL LINER	COMPACTED OXIDE MINE WASTE	95%SMDD -3%<OMC<3%	300mm	DMAX=250 %FINES>5 PI>8

TABLE No.2:
EMBANKMENT RAISE STAGING DETAILS

STAGES	EMBANKMENT LEVELS (R.L m)	RAISE HEIGHT (m)
1	494.1	10.1
2	498.2	4.1
3	500.2	2.0
4	502.6	2.4
5	505.0	2.4
6	505.8	0.8

SHEET SIZE A3

REFERENCES

DRAWING No.	DRAWING TITLE
801-296-D3000-110	GENERAL ARRANGEMENT PLAN-STAGE 1
801-296-D3000-115	GENERAL ARRANGEMENT PLAN-STAGE FINAL
801-296-D3000-302	EMBANKMENT SECTIONS & DETAILS - SHEET 2

REVISIONS

REV	DATE	DESCRIPTION	DRN	DESIGN	CKD	APP	CLIENT APP
A	04/06/2021	ISSUED FOR CLIENT REVIEW	SGM	AMM	AMM	DJTM	
B	09/07/2021	ISSUED FOR PERMITTING DESIGN	UT	AMM	AMM	BAS	

ORIGINAL STAMPED IN RED

Knight Piésold CONSULTING

CONSULT AUSTRALIA Member Firm

DATE	DESIGNED	CHECKED	APPROVED	CLIENT APP'D

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NORTHERN STAR RESOURCES LIMITED
THUNDERBOX OPERATIONS
TAILINGS STORAGE FACILITY CELL C/D EXPANSION
EMBANKMENT SECTIONS AND DETAILS - SHEET 1

SCALE AS SHOWN
STATUS: PERMITTING
DRAWING NUMBER 801-296-D3000-301
REV B

Figure 26: Cell C and D lift sections sheet 1

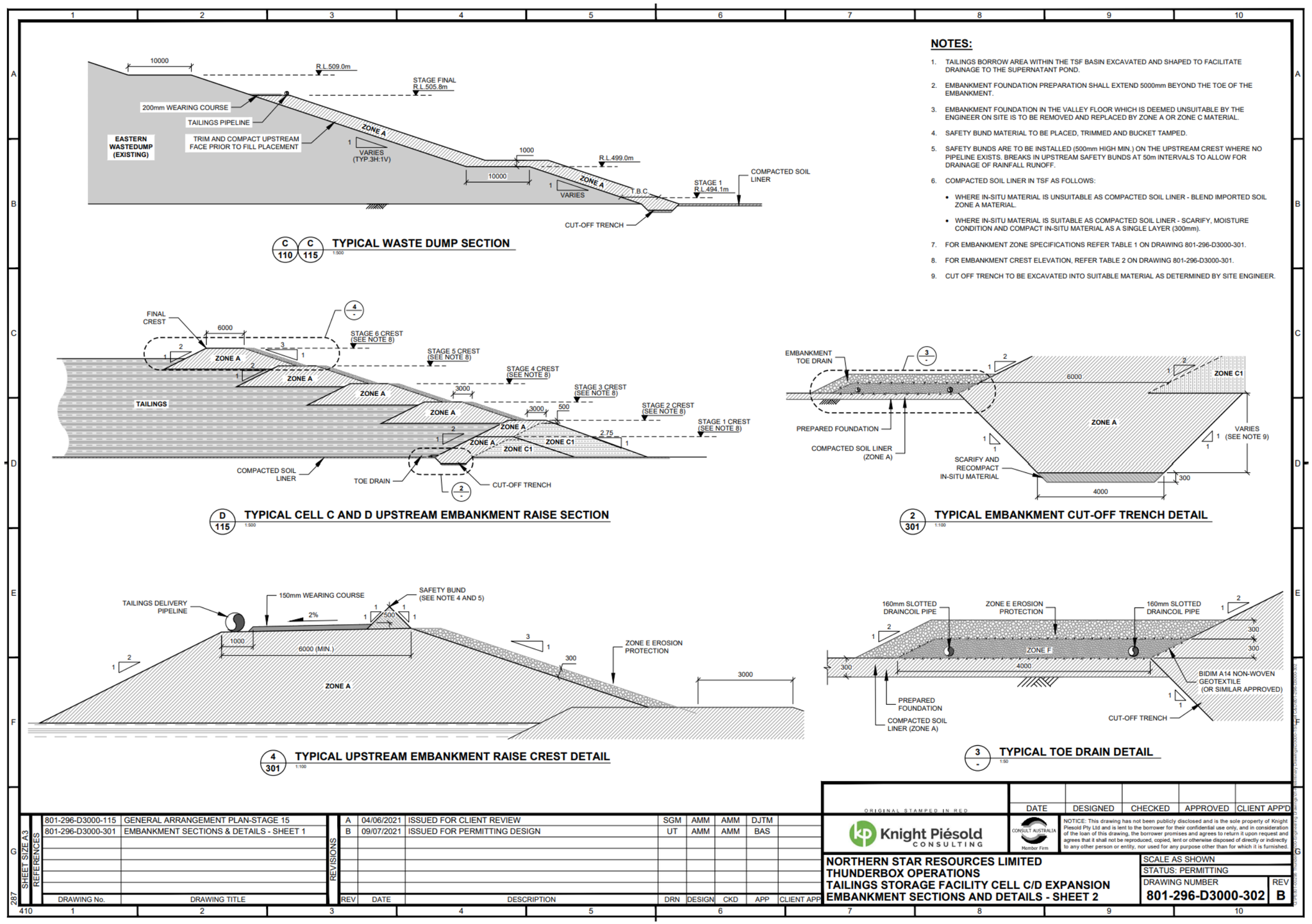

Figure 27: Cell C and D lift sections sheet 2

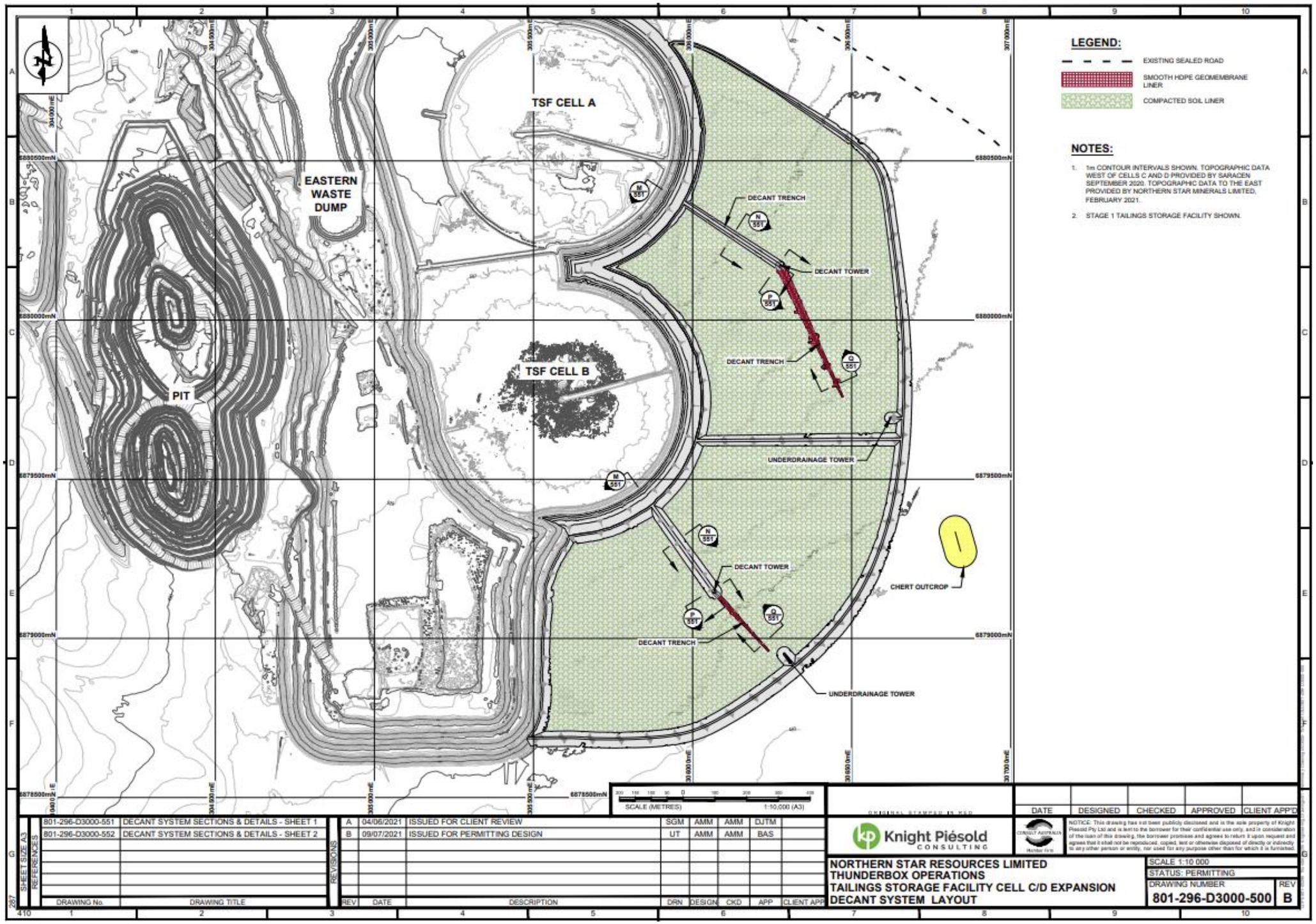

Figure 28: Decant system location and layout

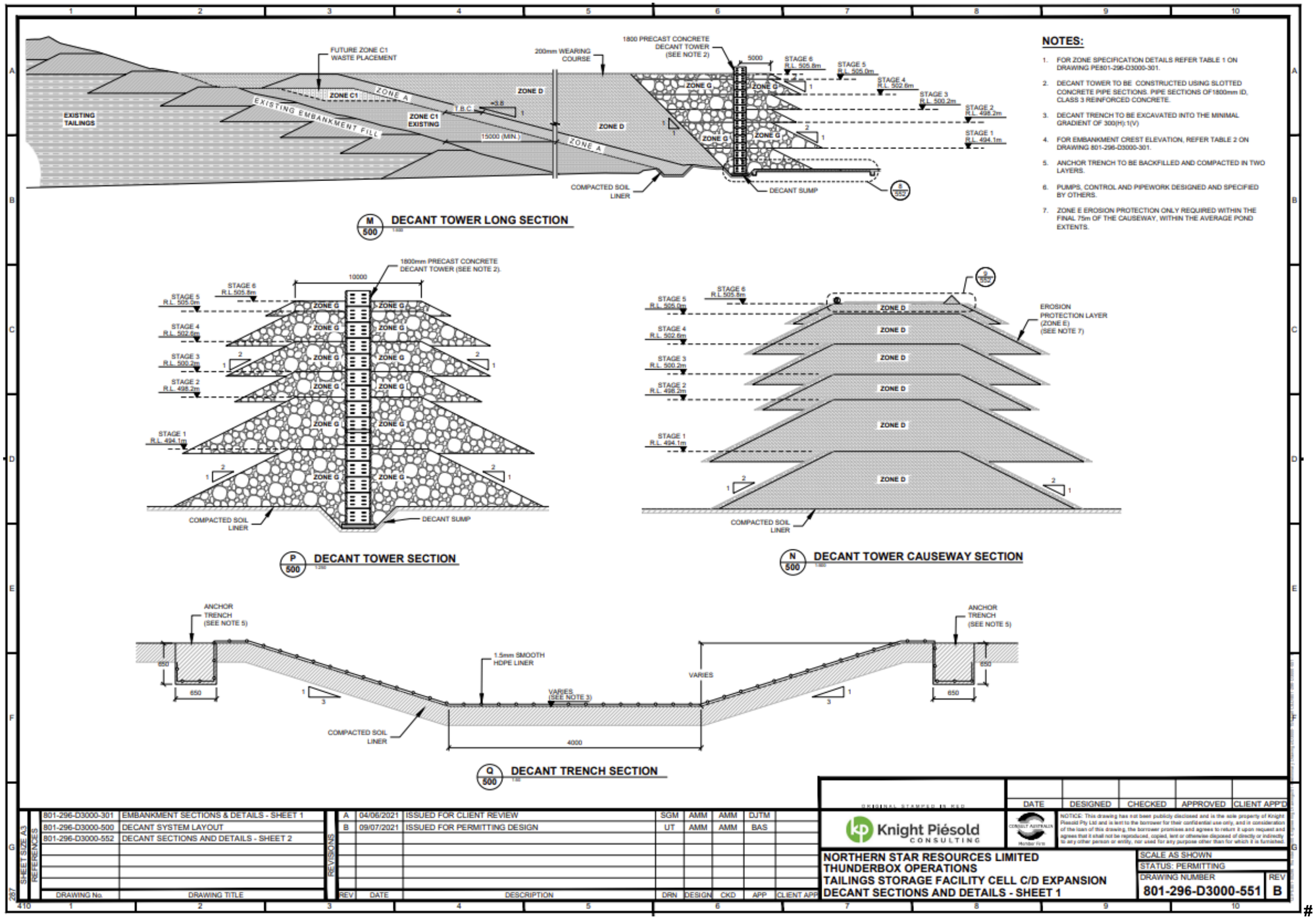

Figure 29: Decant sections and details – sheet 1

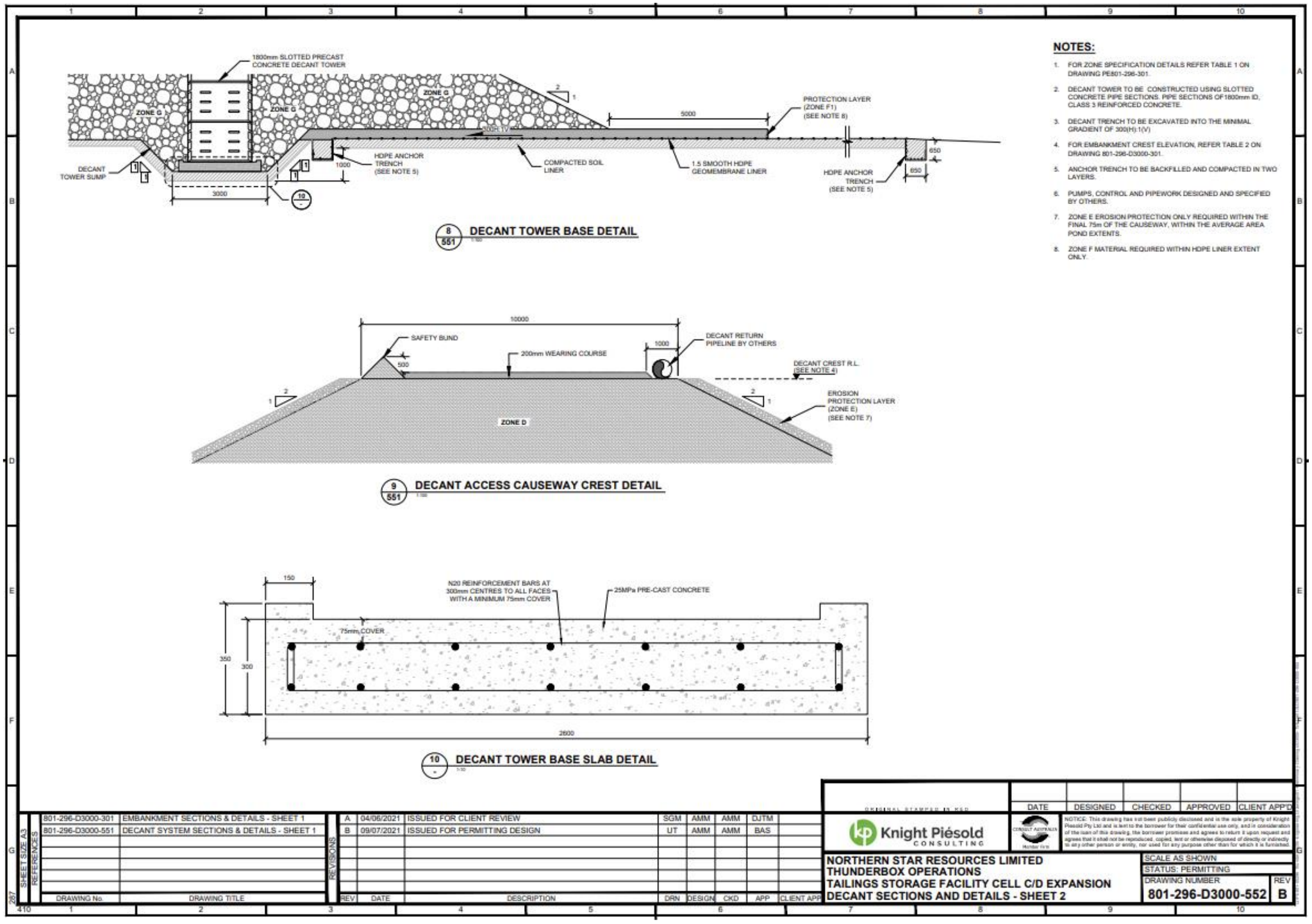

Figure 30: Decant sections and details – sheet 2

Schedule 2: Reporting and notification forms

N1 form

The licence holder is to submit this form in accordance with the requirements of this licence

Government of **Western Australia**
Department of **Water and Environmental Regulation**

Licence: L7815/2001/12 **Licence holder:** Northern Star (Thunderbox) Pty Ltd

Form: N1 **Date of breach:**

Notification of detection of the breach of a limit.

These pages outline the information that the operator must provide.

Units of measurement used in information supplied under Part A and B requirements shall be appropriate to the circumstances of the emission. Where appropriate, a comparison should be made of actual emissions and authorised emission limits.

Part A

Licence number	L7815/2001/12
Name of operator	
Location of premises	
Time and date of the detection	

Notification requirements for the breach of a limit	
Emission point reference/source	
Parameter(s)	
Limit	
Measured value	
Date and time of monitoring	
Measures taken, or intended to be taken, to stop the emission	

Part B

Any more accurate information on the matters for notification under Part A.	
Measures taken, or intended to be taken, to prevent a recurrence of the incident.	
Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission.	
The dates of any previous N1 notifications for the premises in the preceding 24 months.	

Name	
Signature on behalf of licence holder	
Date	