Government of Western Australia
Department of Water and Environmental Regulation

Works Approval

Works approval number	W6972/2024/1
Works approval holder	Greatland Pty Ltd
ACN	108 498 997
Registered business address	Level 3, 502 Hay Street SUBIACO WA 6008
DWER file number	INS-0002947
Duration	20/05/2025 to 20/05/2028
Date of issue	20/05/2025
Premises details	Havieron Project Mining Tenement: M45/1287 East Pilbara, WA 6762 As defined by the premises map in Schedule 1, Figure 1 of this works approval.

Prescribed premises category description (Schedule 1, *Environmental Protection Regulations 1987*)	**Assessed production/ design capacity**
Category 6: Mine dewatering: premises on which water is extracted and discharged into the environment to allow mining of ore.	2,000,000 tonnes per year

This works approval is granted to the works approval holder, subject to the attached conditions, on 20 May 2025, by:

Christine Pustkuchen
Digitally signed by Christine Pustkuchen
Date: 2025.05.20 18:26:52 +08'00'

Manager, Resource Industries

an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

Works approval history

Date	Reference number	Summary of changes
20/05/2025	W6971/2024/1	Works approval granted (APP-0026018).

Interpretation

In this works approval:

(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 works approval:

(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 works approval requires specific conditions to be met but does not provide any implied authorisation for other emissions, discharges, or activities not specified in this works approval.

Works approval conditions

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

Construction phase

Critical containment infrastructure and equipment

1. The works approval holder must construct the critical containment infrastructure:

(a) in accordance with the corresponding design and construction requirements; and

(b) at the corresponding infrastructure location;

as set out in Table 1

Table 1. Critical containment infrastructure design and construction requirements

	Infrastructure	Design and construction requirements	Infrastructure location
1.	Hypersaline water cell (pond) 4	(a) Constructed with compacted layers no greater than 300 mm loose thickness to achieve a dry density ratio of at least 95% modified maximum dry density (b) Constructed with materials that have been screened for Potential Acid Sulfate Soils (PASS) and are non-acid forming. (c) External walls to have a maximum external crest height of 2200 mm (d) Depth of cell to include 900 mm below ground construction to allow for salt accumulation (e) Embankment side slope to be of 1V (Vertical Units):3H (Horizontal Distance) (f) Valve to be fitted to allow for the control / movement of the discharged water between ponds (g) Spillway to be constructed to pond 6, 300 mm above the maximum operating height (or top of water level) (h) Pond to be lined with 1.5mm thickness HDPE liner (i) Water level sensor to be fitted	Schedule 1, Figure 2
2.	Hypersaline water cell (pond) 5	(a) Constructed with compacted layers no greater than 300 mm loose thickness to achieve a dry density ratio of at least 95% modified maximum dry density. (b) Constructed with materials that have been screened for PASS and are non-acid forming (c) External walls to have a maximum external crest height of 2370 mm (d) Depth of cell to include 900 mm below ground	

	Infrastructure	Design and construction requirements	Infrastructure location
		construction to allow for salt accumulation (e) Embankment side slope to be of 1V:3H (f) Valve to be fitted to allow for the control / movement of the discharged water between ponds (g) Spillway to be constructed to pond 6 300m, above the maximum operating height (or top of water level) (h) Pond to be lined with 1.5mm thickness HDPE liner (i) Water level sensor to be fitted	
3.	Hypersaline water cell (pond) 6	(a) Constructed with compacted layers no greater than 300 mm loose thickness to achieve a dry density ratio of at least 95% modified maximum dry density (b) Constructed with materials that have been screened for PASS and are non-acid forming (c) External walls to have a maximum external crest height of 2600 mm (d) Depth of cell to include 900 mm below ground construction to allow for salt accumulation (e) Embankment side slope to be of 1V:3H (f) Pump to be fitted to allow for the control / movement of the discharged water between ponds (g) Spillway to be constructed to pond 4 and 5, 300mm above maximum operating height (or top of water level) (h) Pond to be lined with 1.5mm thickness HDPE liner (i) Water level sensor to be fitted	

2. During construction, the works approval holder must ensure that uncontaminated stormwater is kept separate from contaminated stormwater. Where stormwater has come into contact with a possible source of contamination it should be treated as contaminated and retained on the premises.

Construction of groundwater monitoring bores

3. The works approval holder must design, construct, and install groundwater monitoring bores in accordance with the requirements specified in Table 2.

Table 2. Infrastructure requirements – groundwater monitoring bores

Infrastructure	Design, construction, and installation requirements	Monitoring bore location(s)	Timeframe
Groundwater monitoring bores: HAEPMB05	<u>Bore design and construction:</u> Designed and constructed in accordance with *ASTM D5092/D5092M-16: Standard practice for design and installation of groundwater monitoring bores*. Bore screens must target the part, or parts, of the aquifer most likely to be affected by contamination[1]. Where temporary/seasonal perched features are present, bores must be nested, and the perched features individually screened.	As depicted in Schedule 1, Figure 3: Location of groundwater bores.	Must be constructed, developed (purged), and determined to be operational prior to the commencement of time limited operations of pond 4.
	<u>Logging of borehole:</u> Soil samples must be collected and logged during the installation of the monitoring bores. A record of the geology encountered during drilling must be described and classified in accordance with the Australian Standard Geotechnical Site Investigations AS1726. Any observations of staining / odours or other indications of contamination must be included in the bore log.		
	<u>Bore construction log:</u> Bore construction details must be documented within a bore construction log to demonstrate compliance with *ASTM D5092/D5092M-16*. The construction logs shall include elevations of the top of casing position to be used as the reference point for water-level measurements, and the elevations of the ground surface protective installations.		
	<u>Bore development:</u> All installed monitoring bores must be developed after drilling to remove fine sand, silt, clay and any drilling mud residues from around the bore screen to ensure the hydraulic functioning of the bore. A detailed record should be kept of bore development activities and included in the bore construction log.		
	<u>Installation survey:</u> the vertical (top of casing) and horizontal position of each monitoring bore must be surveyed and subsequently mapped by a suitably qualified surveyor.		
	<u>Bore network map:</u> a bore location map (using aerial image overlay) must be prepared and include the location of all		

Infrastructure	Design, construction, and installation requirements	Monitoring bore location(s)	Timeframe
	monitoring bores in the monitoring network and their respective identification numbers.		

Note 1: refer to Section 7.2 of Schedule B2 of the *Assessment of Site Contamination NEPM* for guidance on bore screen depth and length.

4. Water carts must be available at the premises and used for dust suppression purposes during the construction works authorised under conditions 1 and 3.

Compliance reporting (critical containment infrastructure)

5. The works approval holder must within 30 calendar days of each item of the Critical Containment Infrastructure identified by condition 1 being constructed:

(a) undertake an audit of their compliance with the requirements of condition 1; and

(b) prepare and submit to the CEO a Critical Containment Infrastructure Report on that compliance.

6. The Critical Containment Infrastructure Report required by condition 5 must include as a minimum the following:

(a) certification by a suitably qualified geotechnical or civil engineer that each item of critical containment infrastructure or component thereof, as specified in condition 1, has been built and installed in accordance with the requirements specified in condition 1;

(b) as constructed plans and a detailed site plan showing the location and dimensions for each item of critical containment infrastructure or component thereof, as specified in condition 1;

(c) photographic evidence of the construction / installation of the infrastructure;

(d) be signed by a person authorised to represent the works approval holder and contains the printed name and position of that person.

Compliance reporting (groundwater monitoring bores)

7. The works approval holder must, within 30 calendar days of the monitoring bore being constructed, submit to the CEO a bore construction report evidencing compliance with the requirements of condition 3.

Time limited operations phase

Commencement and duration

8. The works approval holder may only commence time limited operations for an item of critical containment infrastructure identified in condition 1:

(a) where the CEO has notified the works approval holder that the Critical Containment Infrastructure Report for that item of infrastructure as required by condition 5 meets the requirements of that condition; or

(b) where at least 40 business days have passed after the Critical Containment Infrastructure Report for that item of infrastructure as required by condition 5 has been submitted to the CEO.

9. The works approval holder may conduct time limited operations for an item of

infrastructure specified in condition 1:

(a) for a period not exceeding 180 calendar days from the day the works approval holder meets the requirements of condition 8 for that item of infrastructure; or

(b) until such time as a licence for that item of infrastructure is granted in accordance with Part V of the *Environmental Protection Act 1986,* if one is granted before the end of the period specified in condition 9(a).

Time limited operations requirements

10. During time limited operations, the works approval holder must ensure that the premises infrastructure and equipment listed in Table 3 and located at the corresponding infrastructure location is maintained and operated in accordance with the corresponding operational requirement.

Table 3. Infrastructure and equipment requirements during time limited operations

	Site infrastructure and equipment	Operational requirement	Infrastructure location
1.	Hypersaline water cells 4,5 and 6	(a) A minimum freeboard of 0.8 m to be maintained at each cell (b) Each cell to only store: I. mine dewater from boxcut and decline II. treated water from the washdown bay and maintenance workshop oil water separator III. surface water runoff from the boxcut and Waste Rock Landform.	Schedule 1, Figure 2

11. During time limited operations, the works approval holder must ensure stormwater ponding against the perimeter of the embankment does not occur to preserve the integrity and stability of the embankments.

12. During time limited operations, the works approval holder must:

(a) conduct visual inspections of the infrastructure 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

	Site infrastructure and equipment	Inspection type and objective	Frequency
1.	Evaporation ponds (hypersaline water cells) 4, 5 and 6	(a) Visual to confirm no seepage is occurring	Daily
		(b) Visual to determine that operational freeboard, in accordance with condition 10, is maintained	Daily
		(c) Visual to determine embankment integrity	Weekly

Monitoring during time limited operations

13. The works approval holder must conduct a groundwater monitoring program in accordance with the requirements specified in Table 5 and record results of all such monitoring.

14. The licence holder must adhere to the field quality assurance and quality control procedures specified in Schedule 2 for the monitoring required by condition 13.

15. All groundwater sampling must be conducted in accordance with AS/NZS 5667.11

16. All laboratory samples are submitted and tested by a laboratory with current NATA accreditation for the parameters being measured, unless otherwise stated in Table 5.

Table 5. Groundwater monitoring

Monitoring bore location	Parameter	Unit	Frequency	Method
Groundwater monitoring bores HAEPMB05	Standing water level [1]	Meters below groundwater lever (mbgl)	Monthly	Spot sample in accordance with AS/NZS 5667.11
	pH[1]	-		
	Electrical conductivity[1]	µcm/S		
	Total dissolved solids[1]	mg/L		
	Total hardness (as $CaCO_3$)		Six monthly	
	Total alkalinity (as $CaCO_3$)			
	Calcium, Magnesium, Sodium, Potassium, Ammonia, Phosphate, Carbonate, Sulphate, Nitrate Silica, Aluminum, Iron, and Manganese			

Note 1. In field non-NATA accredited analysis permitted

Time Limited Operations Compliance reporting

17. The works approval holder must submit to the CEO a report on the time limited operations within 30 calendar days of the completion date of time limited operations or 30 calendar days before the expiration date of the works approval, whichever is sooner.

18. The works approval holder must ensure the report required by condition 17 includes:

(a) a summary of the time limited operations, including construction timeframes;

(b) a summary of monitoring results obtained during time limited operations under condition 13;

(c) a summary of the environmental performance of all infrastructure as constructed or installed (as applicable) including inspection results obtained in accordance with condition 12;

(d) where the manufacturer's design specifications and the conditions of this works approval have not been met, what measures will the works approval holder take to meet them, and what timeframes will be required to implement those measures

Records and reporting (general)

19. The works approval holder must record the following information in relation to complaints received by the works approval 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 works approval holder to investigate or respond to any complaint.

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

(a) the works conducted in accordance with condition 1 and 3;

(b) any maintenance of infrastructure that is performed in the course of complying with condition 10;

(c) monitoring programmes undertaken in accordance with condition13; and

(d) complaints received under condition 19.

21. The books specified under condition 20 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) be retained by the works approval holder for the duration of the works approval; and

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

Definitions

In this works approval, the terms in Table 6 have the meanings defined.

Table 6: Definitions

Term	Definition
ACN	Australian Company Number
AS/NZS 5667.11	means the Australian Standard AS/NZS 5667.1 *Water quality – sampling – guidance on sampling groundwaters*, as amended.
Assessment of Site Contamination NEPM	means the *National Environment Protection (Assessment of Site Contamination) Measure 1999*, as amended.
books	has the same meaning given to that term under the EP Act.
calendar days	24-period that starts at midnight and ends at 11:59 pm the next day.
CEO	means Chief Executive Officer. CEO for the purposes of notification means: Director General Department administering the *Environmental Protection Act 1986* Locked Bag 10 Joondalup DC WA 6919 info@dwer.wa.gov.au.
critical containment infrastructure	means the items of infrastructure listed in condition 1.
Critical Containment Infrastructure Report	means a report to satisfy the CEO that works of critical containment infrastructure have been constructed in accordance with the works approval.
department	means the department established under section 35 of the *Public Sector Management Act 1994* and designated as responsible for the administration of Part V Division 3 of the EP Act.
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.
Environmental Compliance Report	means a report to satisfy the CEO that the conditioned infrastructure and/or equipment has been constructed and/or installed in accordance with the works approval.
EP Act	*Environmental Protection Act 1986* (WA).

Term	Definition
EP Regulations	*Environmental Protection Regulations 1987* (WA).
monthly frequency	means a one-month period commencing from third of a month until the second of the immediately following month.
NATA	means the National Association of Testing Authorities
PASS	Means potential acid sulfate soils
premises	the premises to which this licence applies, as specified at the front of this licence and as shown on the premises map Figure 1 in Schedule 1 to this works approval.
prescribed premises	has the same meaning given to that term under the EP Act.
time limited operations	refers to the operation of the infrastructure and equipment identified under this works approval that is authorised for that purpose, subject to the relevant conditions.
works approval	refers to this document, which evidences the grant of the works approval by the CEO under section 54 of the EP Act, subject to the conditions.
works approval holder	refers to the occupier of the premises being the person to whom this works approval has been granted, as specified at the front of this works approval.

END OF CONDITIONS

Schedule 1: Maps

Premises map

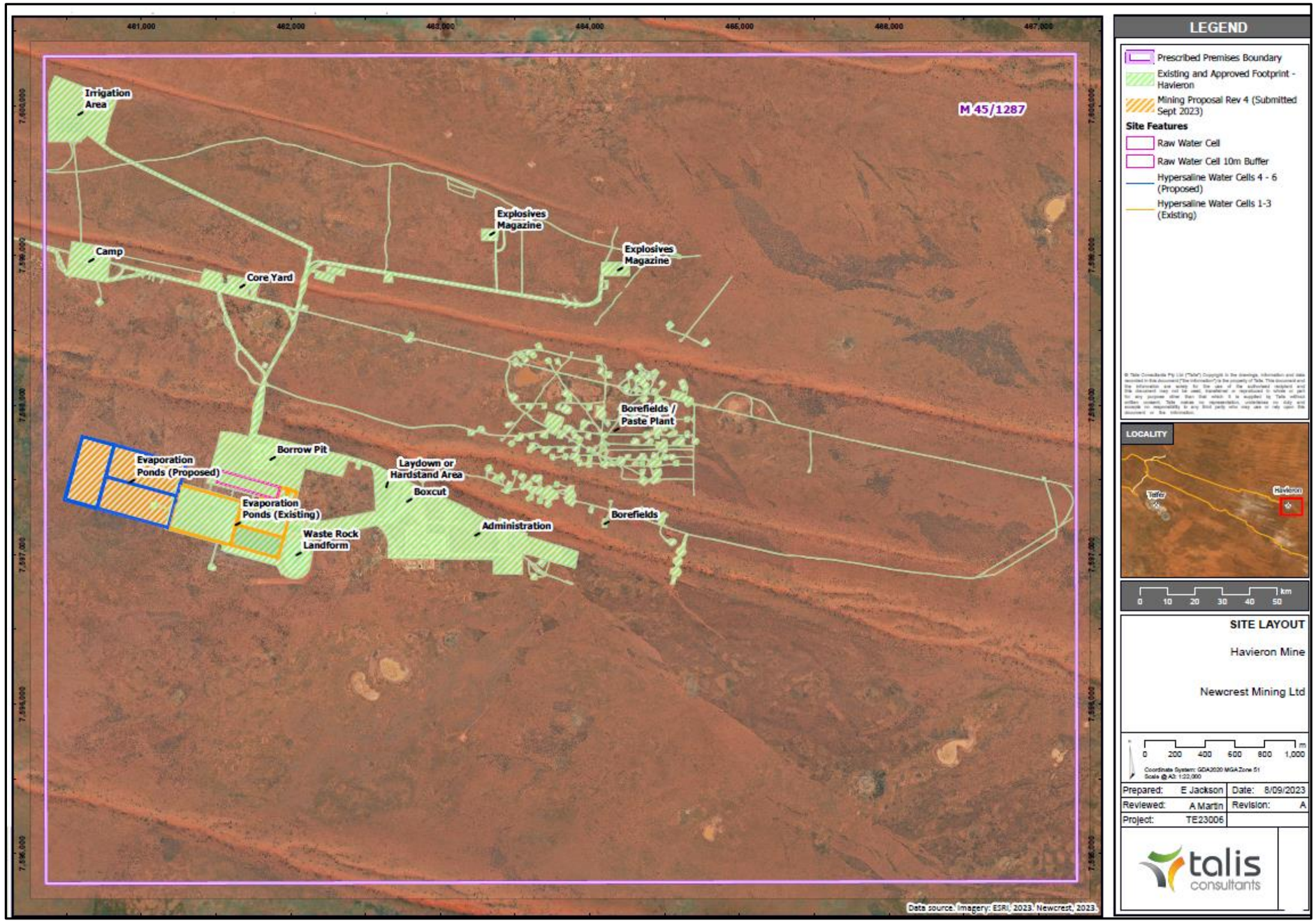

Figure 1: Prescribed premises boundary and general premises layout.

Figure 2: Existing and proposed hypersaline water cells layout at the premises. (Dewatering pipeline is shown as originally constructed, consistent with the premises licence).

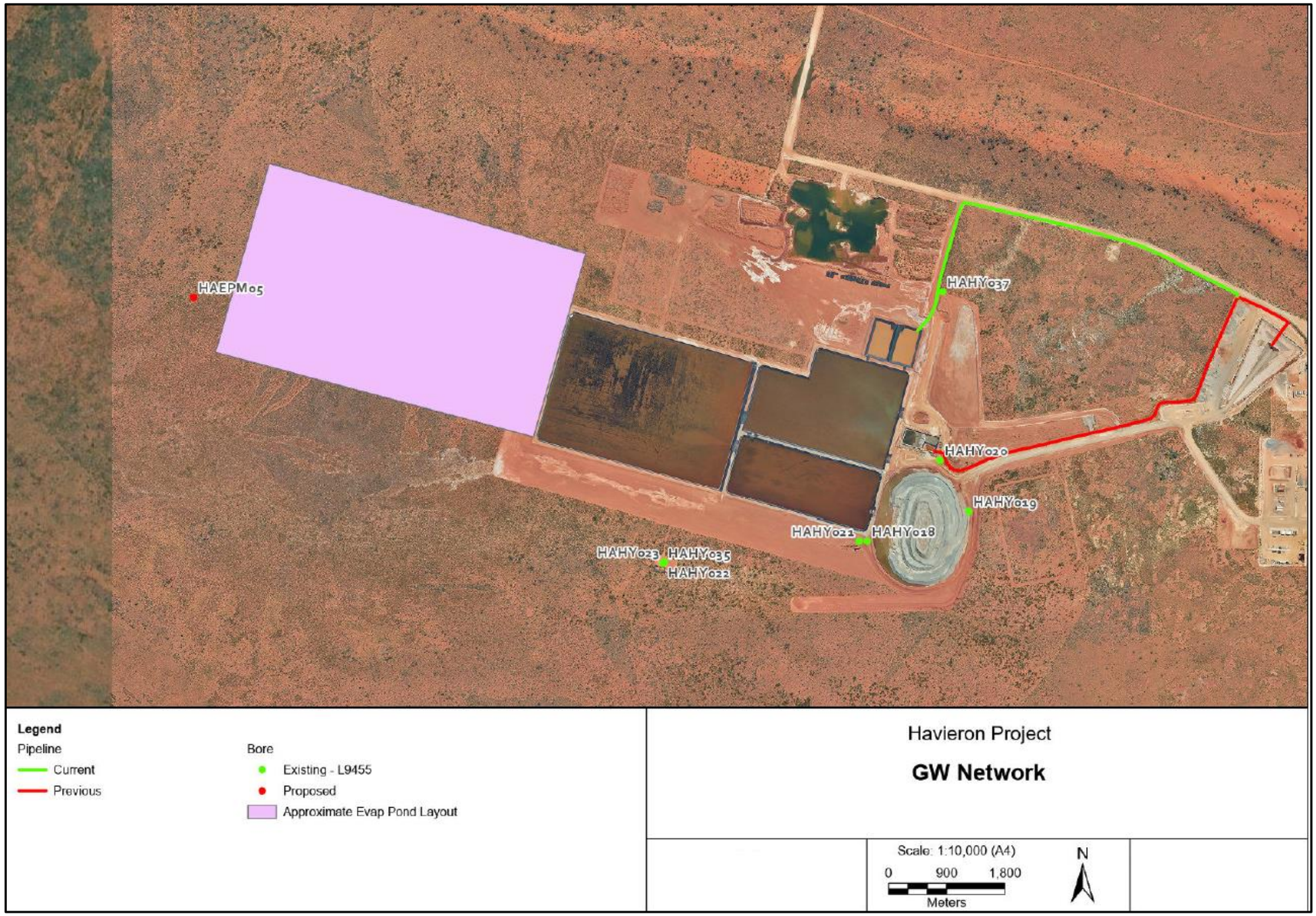

Figure 3: Location of the proposed and existing groundwater bores.

Schedule 2

Quality assurance and quality control requirements

The Works Approval holder must adhere to the following field quality assurance and quality control procedures, as specified in Schedule B2 of the National Environmental Protection (Assessment of Site Contamination) 2011 by the National Environmental Council. Requirements are summarised below:

(a) decontamination procedures for the cleaning of tools and sampling equipment before sampling and between samples;

(b) field instrument calibration for instruments used on site;

(c) blind replicate samples and rinsate blanks must be collected in the field and sent to the primary laboratory to determine the precision of the field sampling and laboratory analytical program;

(d) completed field monitoring sheets / sampling logs for each sample collected, showing:

- (i) time of collection;
- (ii) location of collection;
- (iii) initials of sampler;
- (iv) sampling method;
- (v) field analysis results;
- (vi) duplicate type / location (if relevant); and
- (vii) site observations and weather conditions, and

(e) chain-of-custody documentation must be completed which details the following information:

- (i) site identification;
- (ii) the sampler;
- (iii) nature of the sample;
- (iv) collection time and date;
- (v) analyses to be performed;
- (vi) sample preservation method;
- (vii) departure time from site;
- (viii) dispatch courier(s); and
- (ix) arrival time at the laboratory