# **Works Approval**

Works approval number W6364/2020/1

Works approval holder Evolution Mining (Mungari) Pty Ltd

**ACN** 002 124 745

Registered business address 175 Liverpool Street

SYDNEY NSW 2000

**DWER file number** DER2020/000017

**Duration** 10/09/2020 to 09/09/2024

**Date of issue** 10/09/2020

Premises details Mungari Gold Mine

Kundana Road

KALGOORLIE WA 6430

Legal description -

Mining Tenements M15/829 and M15/830

	ribed premises category description dule 1, Environmental Protection Regulations 1987)	Assessed design capacity
	ory 5: Processing or beneficiation of metallic or non-metallic remises on which —	2.5 Mtpa
(a)	metallic or non-metallic ore is crushed, ground, milled or otherwise processed;	
(b)	tailings from metallic or non-metallic ore are reprocessed; or	
(c)	(c) tailings or residue from metallic or non-metallic ore are discharged into a containment cell or dam.	

This works approval is granted to the works approval holder, subject to the attached conditions, on 10 September 2020, by:

# Lauren Fox A/MANAGER RESOURCE INDUSTRIES

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

## Works approval history

Date	Reference number	Summary
10/09/2020	W6364/2020/1	Works approval granted for construction of Tailings Storage Facility (Cell 3 and Cell 4)

## 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**

#### Infrastructure (construction) – tailings storage facilities

- **1.** The works approval holder must:
  - (a) construct the critical containment infrastructure;
  - (b) in accordance with the corresponding design and construction requirements; and
  - (c) at the corresponding infrastructure location(s) as set out in Table 1.

Table 1: Critical containment infrastructure design and construction requirements

	Infrastructure	Design and construction requirements	Infrastructure location
1.	Tailings Storage Facility Cell 3; and Cell 4	<ul> <li>Constructed within M15/829 and M15/830;</li> <li>Storage capacity of 7.5 Mt of tailings material;</li> <li>Storage area of 118 hectares; and</li> <li>Constructed to provide a minimum 0.5 metre total freeboard (including an allowance for a 1% AEP 72 hour rain event) above the normal operating pond.</li> </ul>	As shown in Drawings: 801-137-C3000-002; 801-137-C3000-050; and 801-137-C3000-101, of Schedule 1.
2.	Starter embankment Cell 3; and Cell 4	Stage 1 embankments, including cut-off trench and toe drains constructed as specified in Drawings:  • 801-137-C3000-301;  • 801-137-C3000-302; and  • 801-137-C3000-303, of Schedule 1.	As shown in Drawing 801-137-C3000-101 of Schedule 1.
3.	Seepage control Cell 3; and Cell 4	<ul> <li>Constructed with an in-situ compacted soil liner (minimum 300 mm thick) with a hydraulic conductivity of 5x10<sup>-8</sup> m/s (95% UCL) and maximum hydraulic conductivity of 2x10<sup>-7</sup> m/s.</li> <li>Testing of the compacted soil liner must be completed at a rate of one test per hectare.</li> <li>Constructed as specified in Drawings:         <ul> <li>801-137-C3000-150;</li> <li>801-137-C3000-201; and</li> <li>801-137-C3000-201,</li> <li>of Schedule 1.</li> </ul> </li> </ul>	As shown in Drawing 801-137-C3000-150 of Schedule 1.
4.	Water reclamation Cell 3; and Cell 4	Underdrainage system, decant water system and toe drains and sumps constructed as specified in Drawings 801-137-C3000-500 to Drawings 801-137-C3000-508 of Schedule 1.	As shown in Drawing 801-137-C3000-500 of Schedule 1.

	Infrastructure	Design and construction requirements	Infrastructure location
5.	Embankment raises Cell 3; and Cell 4	Downstream (Stage 2) and centreline (Stage 3) embankments, including cut-off trench, toe drains and sumps constructed as specified in Drawings:  • 801-137-C3000-301;  • 801-137-C3000-302; and  • 801-137-C3000-303, of Schedule 1.	As shown in Drawing 801-137-C3000-900 of Schedule 1.

- **2.** The works approval holder is authorised to:
  - (a) construct embankment raises for Cell 3 and Cell 4 to the construction height; and
  - (b) operate Cell 3 and Cell 4 until the end of Stage 3 to the operating height, as specified in Table 2

Table 2: Staged construction and operating heights

Stages	TSF	Construction height (mRL)	Operating height (mRL)
1	Cell 3 and Cell 4	347.4	347.1
2	Cell 3 and Cell 4	349.1	348.8
3	Cell 3 and Cell 4	350.7	350.4

#### **Infrastructure and equipment (non-CCI)**

- **3.** The works approval holder must:
  - (a) construct and/or install the infrastructure and/or equipment;
  - (b) in accordance with the corresponding design and construction / installation requirements; and
  - (c) at the corresponding infrastructure location; and
  - (d) within the corresponding timeframe,

as set out in Table 3.

Table 3: Design and construction / installation requirements

	Infrastructure	Design and construction / installation requirements	Infrastructure location	Timeframe
1.	Surface water management	Run-off collection channel and collection ponds constructed as specified in Drawings 801-137-C3000-700 and 801-137-C3000- 710 of Schedule 1.	As shown in Drawing 801-137-C3000-700 of Schedule 1.	N/A

	Infrastructure	Design and construction / installation requirements	Infrastructure location	Timeframe
2.	Tailings and Decant Return Pipeline Corridor (TDRT)	Constructed in containment trench or culverts as specified in Drawings 801-137-C3000-800 and 801-137-C3000-821 of Schedule 1.  Telemetered flow meters installed at process plant and at toe of TSF embankment.	As shown in Drawing 801-137-C3000-050 of Schedule 1.	N/A
3.	Monitoring instrumentation	Vibrating wire piezometers and standpipe piezometers constructed as specified in Drawing 801-137-C3000-921 of Schedule 1.	As shown in Drawing 801-137-C3000-900 of Schedule 1.	<ul> <li>Vibrating wire piezometers must be constructed and determined to be operational prior to operation of Stage 1 of Cell 3 and Cell 4.</li> <li>Standpipe piezometers must be constructed and determined to be operational prior to operation of Stage 3 of Cell 3 and Cell 4.</li> </ul>

#### **Compliance reporting**

- **4.** The works approval holder must within 30 calendar days of an item of Critical Containment Infrastructure identified by condition 1 being constructed and/or installed:
  - (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.

- **5.** The Critical Containment Infrastructure Report required by condition 4 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 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;
  - (e) a Quality Control / Quality Assurance Certificate from an independent third party which demonstrates that the in-situ compacted soil liner meets the requirements specified in Table 1.
- **6.** The works approval holder must within 30 calendar days of an item of infrastructure or equipment required by condition 3 being constructed and/or installed:
  - (a) undertake an audit of their compliance with the requirements of condition 3; and
  - (b) prepare and submit to the CEO an Environmental Compliance Report on that compliance.
- **7.** The Environmental Compliance Report required by condition 6 must include as a minimum the following:
  - (a) certification by a suitably qualified geotechnical or civil engineer that the items of infrastructure or component(s) thereof, as specified in condition 3, have been constructed in accordance with the relevant requirements specified in condition 3:
  - (b) as constructed plans and a detailed site plan for each item of infrastructure or component of infrastructure specified in condition 3; and
  - (c) be signed by a person authorised to represent the works approval holder and contains the printed name and position of that person.

#### Construction of groundwater monitoring wells

**8.** The works approval holder must design, construct, and install groundwater monitoring wells in accordance with the requirements specified in Table 4.

Table 4: Infrastructure requirements – groundwater monitoring wells

Infrastructure	Design, construction, and installation requirements	Monitoring well location(s)	Timeframe
Groundwater monitoring wells: MB-08 to MB-15.	Well design and construction:  Designed and constructed in accordance with the Minimum Construction Requirements for Water Bores in Australia and Drawing 801-137-C3000-921 of Schedule 1.	As depicted in Drawing 801-137- C3000-900 of Schedule 1.	Must be constructed, developed (purged), and determined to be operational
	Well screens must target the part, or parts, of the aquifer most likely to be affected by contamination <sup>1</sup> . Where temporary/seasonal perched features are present, wells must be nested, and the perched features individually screened.		prior to the commencement of construction of works specified in condition 1.
	Logging of borehole: Soil samples must be collected and logged		
	during the installation of the monitoring wells.		
	A record of the geology encountered during drilling must be described and classified in accordance with the Minimum Construction Requirements for Water Bores in Australia.		
	Any observations of staining / odours or other indications of contamination must be included in the bore log.		
	Well construction log:		
	Well construction details must be documented within a well construction log to demonstrate compliance with the Minimum Construction Requirements for Water Bores in Australia. 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.		
	Well development:		
	All installed monitoring wells must be developed after drilling to remove fine sand, silt, clay and any drilling mud residues from around the well screen to ensure the hydraulic functioning of the well. A detailed record should be kept of well development activities and included in the well construction log.		
	Installation survey: the vertical (top of casing) and horizontal position of each monitoring well must be surveyed and subsequently mapped by a suitably qualified surveyor.		
	Well network map: a well location map (using aerial image overlay) must be prepared and include the location of all monitoring wells in the monitoring network and their respective identification numbers.		

Note 1: refer to Section 8 of Schedule B2 of the Assessment of Site Contamination NEPM for guidance on well screen depth and length.

**9.** The works approval holder must, within 30 calendar days of the monitoring wells being constructed, submit to the CEO a well construction report evidencing compliance with the requirements of condition 8.

#### **Ambient monitoring (groundwater)**

- **10.** The works approval holder must conduct a groundwater monitoring program in accordance with the requirements specified in Schedule 3 and record the results of all monitoring activity conducted under that program.
- 11. The works approval holder must adhere to the field quality assurance and quality control procedures specified in Schedule 3 for the monitoring required by condition 10.
- 12. All sample analysis must be undertaken by laboratories with current accreditation from the National Association of Testing Authorities (NATA) for the relevant parameters, unless otherwise specified in Schedule 3.

#### Time limited operations phase

#### Time limited operations – commencement and duration

- 13. The works approval holder may only commence time limited operations for an item of critical containment infrastructure identified in condition 1 where the CEO has notified the works approval holder that the Critical Containment Infrastructure Report for that item of infrastructure as required by condition 4 meets the requirements of that condition.
- 14. The works approval holder may only commence time limited operations for an item of infrastructure identified in condition 3 where the Environmental Compliance Report as required by condition 6 has been submitted by the works approval holder for that item of infrastructure.
- **15.** The works approval holder may conduct time limited operations for an item of infrastructure specified in condition 16 (as applicable):
  - (a) for a period not exceeding 180 calendar days from the day the works approval holder meets the requirements of condition 13 or 14 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.*

#### Time limited operations – infrastructure and equipment

**16.** During time limited operations, the works approval holder must ensure that the premises infrastructure and equipment listed in Table 5 and located at the corresponding infrastructure location is maintained and operated in accordance with the corresponding operational requirement set out in Table 5.

Table 5: Infrastructure and equipment requirements during time limited operations

	Site infrastructure and equipment	Operational requirement	Infrastructure location
1.	Tailings Storage Facility Cell 3; and Cell 4	Operational freeboard of 0.3 m.  Methods of operation minimise the likelihood of erosion of the embankments by wave action.	As shown in Drawing 801-137- C3000-050 of Schedule 1.
2.	Tailings and Decant Return Pipeline Corridor (TDRT)	Provided with secondary containment adequate to contain any spill for a period equal to the time between routine inspections.	As shown in Drawing 801-137- C3000-050 of Schedule 1.

### **Time limited operations – monitoring program**

17. The works approval holder must conduct a monitoring program in accordance with the requirements specified in Table 6 and record the results of all monitoring activity conducted under that program.

Table 6: Compliance and performance monitoring

Site infrastructure and equipment	Area	Parameter	Frequency
Tailings and Decant Return Pipeline Corridor (TDRT) as shown in Drawing 801- 137-C3000- 050 of Schedule 1	Tailings Storage Facility Cell 3; and Cell 4  TSF decant system	<ul> <li>Outer perimeter area and embankments</li> <li>Condition of roads and ramps</li> <li>Tailings pipeline integrity</li> <li>Tailing behavior at deposition point</li> <li>Visual check on tailings and water levels versus embankment crest (freeboard)</li> <li>Offtake location</li> <li>Blockage or damage of discharge</li> <li>Monitoring instrumentation</li> <li>Size of supernatant pond</li> </ul>	Daily
	TSF	<ul> <li>Location of supernatant pond</li> <li>Return water pipeline integrity</li> <li>Blockage of decant tower</li> <li>Visual check on decant tower operation</li> <li>Blockage of towers/pipes</li> </ul>	Daily
	underdrainage, toe- drains, and seepage trench	<ul> <li>Visual checks of water level in towers/pipes</li> <li>Visual check of pipeline integrity</li> </ul>	
	TSF basin	<ul><li>Water volume and level</li><li>Tailings beach-head level</li></ul>	Each weekly period

Site infrastructure and equipment	Area	Parameter	Frequency
	Tailings	<ul> <li>Tailings solids (tonnes)</li> <li>Water in tailings (tonnes or m³)</li> <li>Average tailings flow (m³/s)</li> </ul>	Each weekly period
	Water	<ul> <li>Outflow from decant pumps</li> <li>Outflow from toe drain and underdrainage</li> <li>Specific gravity of decant water</li> </ul>	Daily
Monitoring infrastructure as shown in Drawing 801-137-C3000-900 of Schedule 1	Standpipe and vibrating wire piezometers	<ul><li>Standing water level</li><li>Pore-water pressure</li></ul>	Each monthly period

#### Time limited operations – compliance reporting

- 18. 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 the sooner.
- **19.** The works approval holder must ensure the report required by condition 18 includes the following:
  - (a) a summary of the time limited operations, including timeframes and amount of gold bearing ore processed;
  - (b) a summary of the environmental performance of all infrastructure as constructed or installed (as applicable), which includes records detailing the:
    - (i) tailings deposited in Cell 3 and Cell 4;
    - (ii) monitoring conducted in accordance with the monitoring program in condition 17:
    - (iii) groundwater monitoring conducted in line with the groundwater monitoring program in condition 10;
    - (iv) water balance for Cell 3 and Cell 4 for the duration of time limited operations, recording site rainfall; evaporation rate, decant water recovery volumes; volume of tailings deposited and estimated seepage losses.
  - (c) a summary of groundwater monitoring results obtained during time limited operations under condition 10;
  - (d) a review of performance and compliance against the conditions of the works approval; and
  - (e) where the 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)**

- **20.** 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.
- **21.** 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 conditions 1 and 3;
  - (b) any maintenance of infrastructure that is performed in the course of complying with condition 16;
  - (c) monitoring programmes undertaken in accordance with conditions 10 and 17; and
  - (d) complaints received under condition 20.
- **22.** The books specified under condition 21 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 7 have the meanings defined.

**Table 7: Definitions** 

Term	Definition
AEP	means annual exceedance probability.
annual period	a 12 month period commencing from 1 January until 31 December of the same year.
AS/NZS 5667.11	means the Australian Standard AS/NZS 5667.11 (R2016) Water quality – sampling – guidance on sampling groundwater, as amended from time to time.
Assessment of Site Contamination NEPM	means the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended from time to time.
books	has the same meaning given to that term under the EP Act.
CEO	means Chief Executive Officer.
	CEO for the purposes of notification means:
	Director General Department administering the <i>Environmental Protection Act 1986</i> Locked Bag 10 Joondalup DC WA 6919
	info@dwer.wa.gov.au
condition	means a condition to which this works approval is subject under section 62 of the EP Act.
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 <i>Public Sector Management Act 1994</i> 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.
Minimum Construction Requirements for Water Bores in Australia	means the National Uniform Drillers Licensing Committee, Minimum Construction Requirements for Water Bores in Australia (MCR), as amended from time to time.
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.

Term	Definition			
EP Act	Environmental Protection Act 1986 (WA).			
EP Regulations	Environmental Protection Regulations 1987 (WA).			
mgbl	means metres below ground level.			
monthly period	means a one-month period from the first day of a month until the last day of that same month.			
NATA	means the National Association of Testing Authorities.			
premises	means the premises to which this works approval applies, as specified at the front of this works approval 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.			
quarterly period	means a three-month period commencing from day 1 of January, April, July or October.			
RL	means Reduced Level (above sea level).			
suitably qualified	means a person who:  (a) holds a relevant tertiary academic qualification;  (b) has a minimum of five years of experience working in the relevant area/field of expertise; and  (c) holds membership in a relevant professional body.			
TDRT	means tailings and decant return pipeline corridor.			
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.			
TSF	means tailings storage facility.			
UCL	means upper confidence limit.			
WAD	means weak acid dissociable.			
weekly period	means a seven-day period commencing from the Monday of one week until the Monday of the immediately following week.			
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**

The boundary of the prescribed premises is shown in pink in the map below (Figure 1).

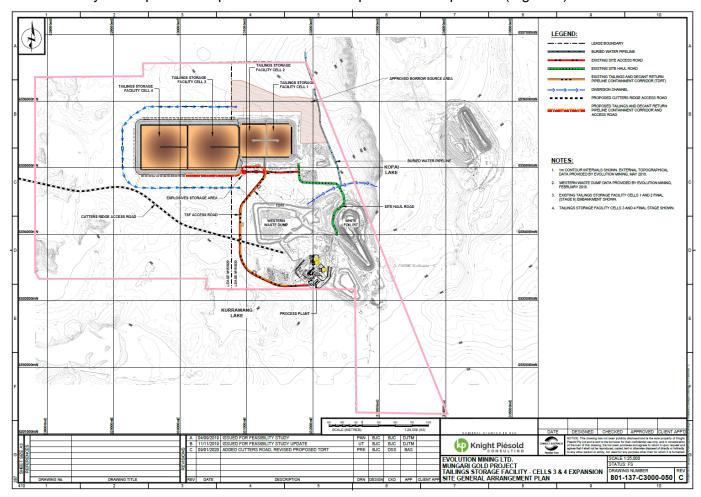
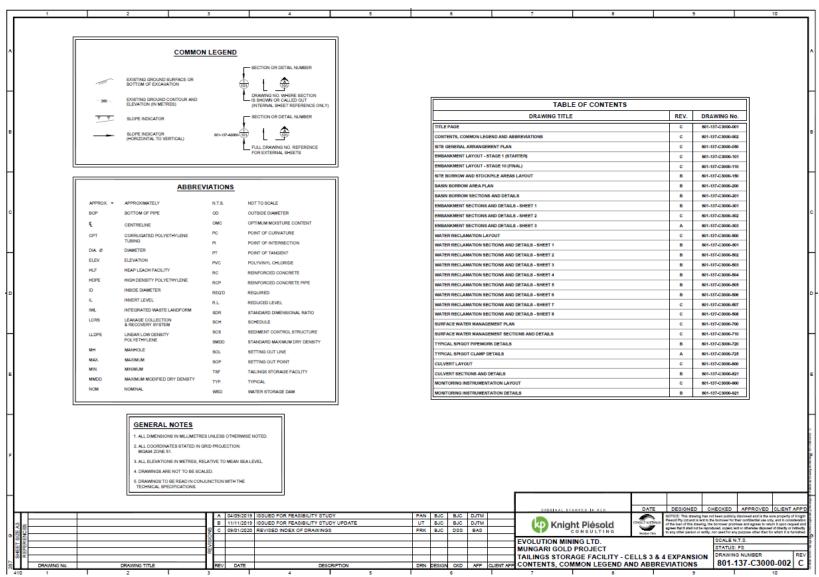
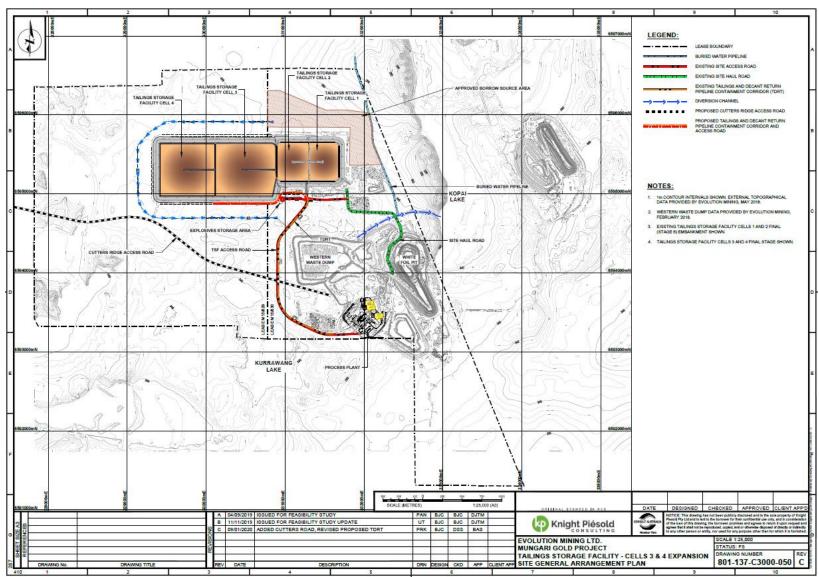
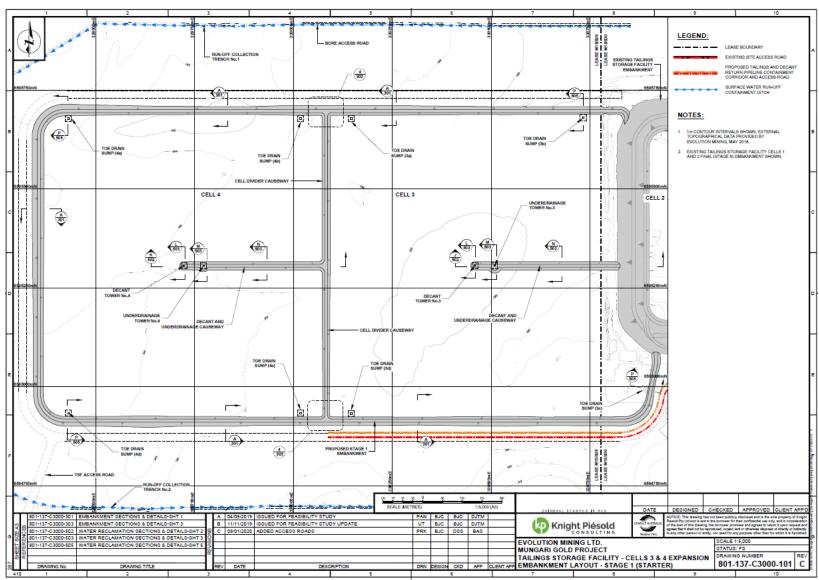


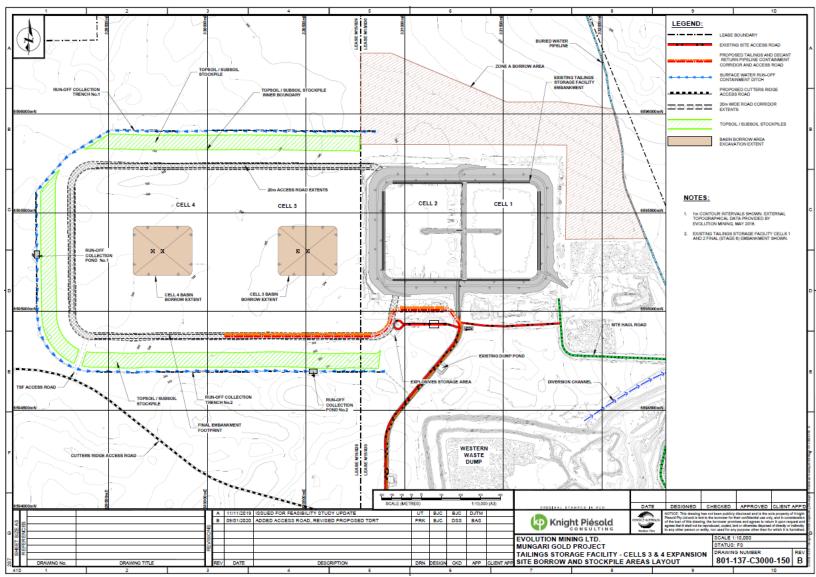
Figure 1: Map of the boundary of the prescribed premises

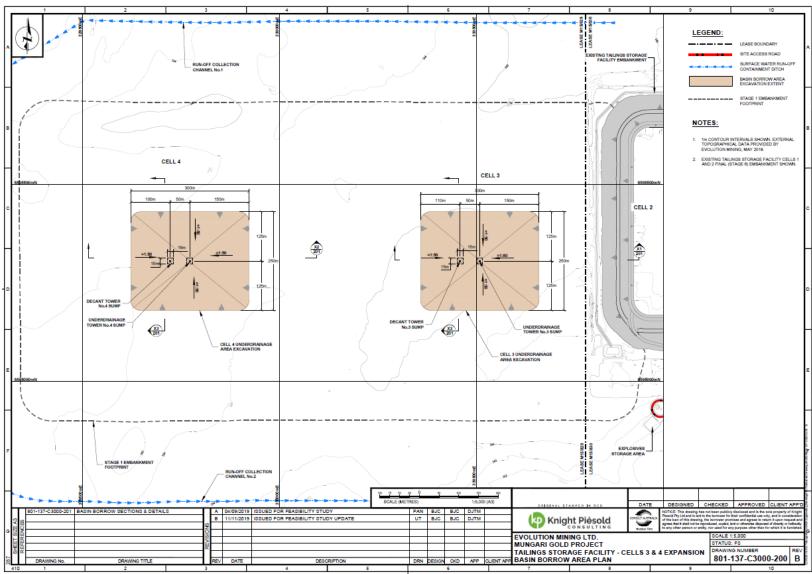
# **Schedule 2: Construction drawings**

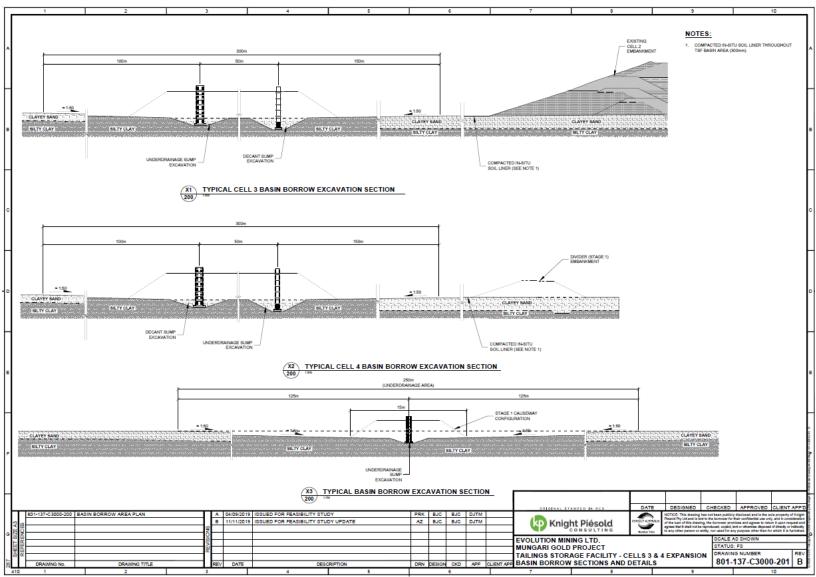


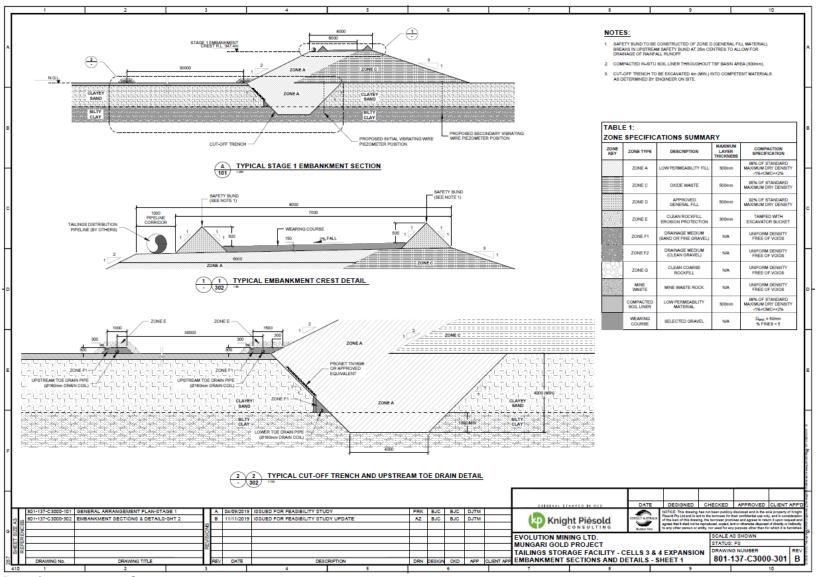


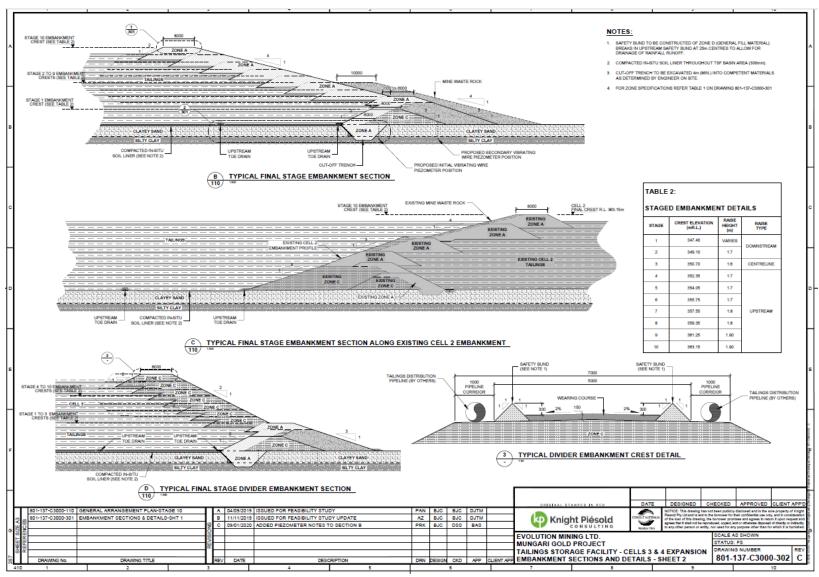


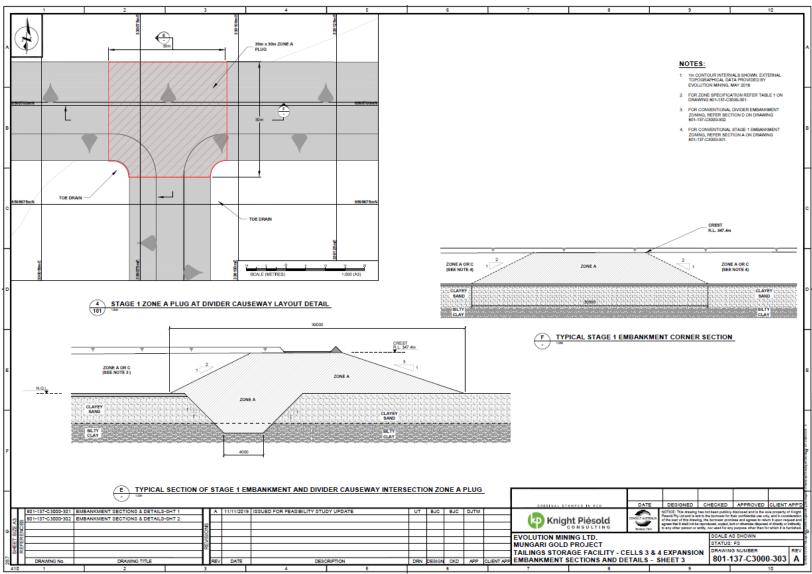


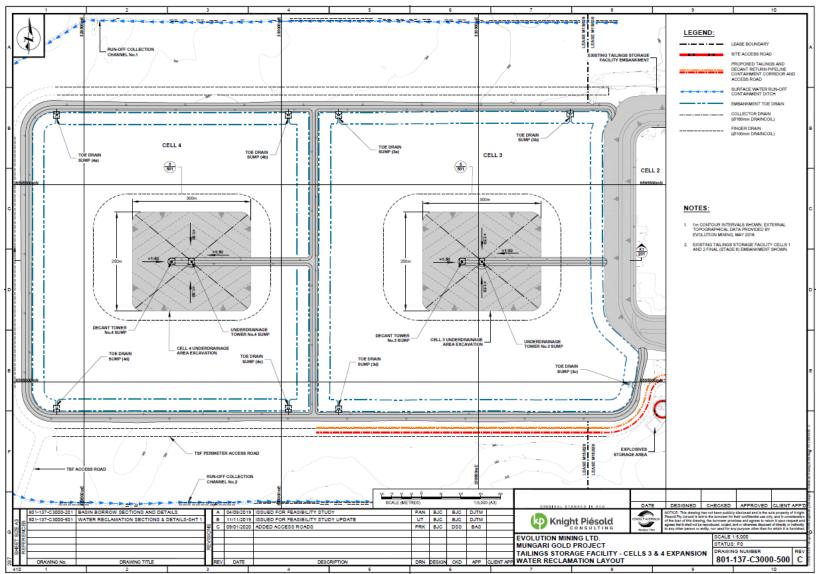


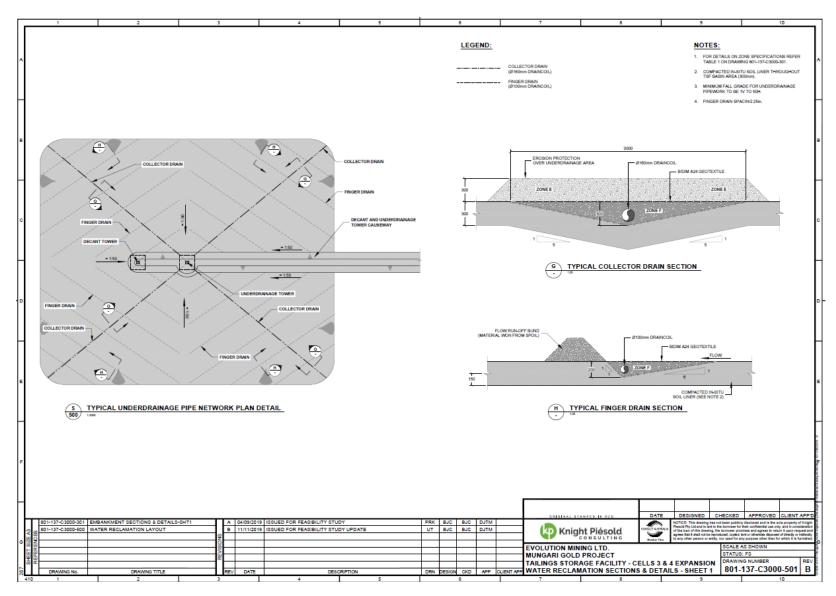


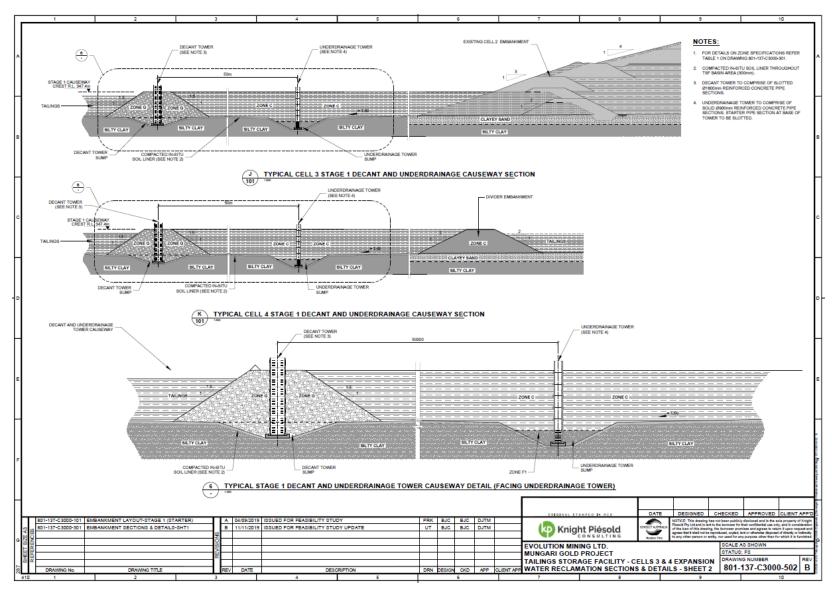


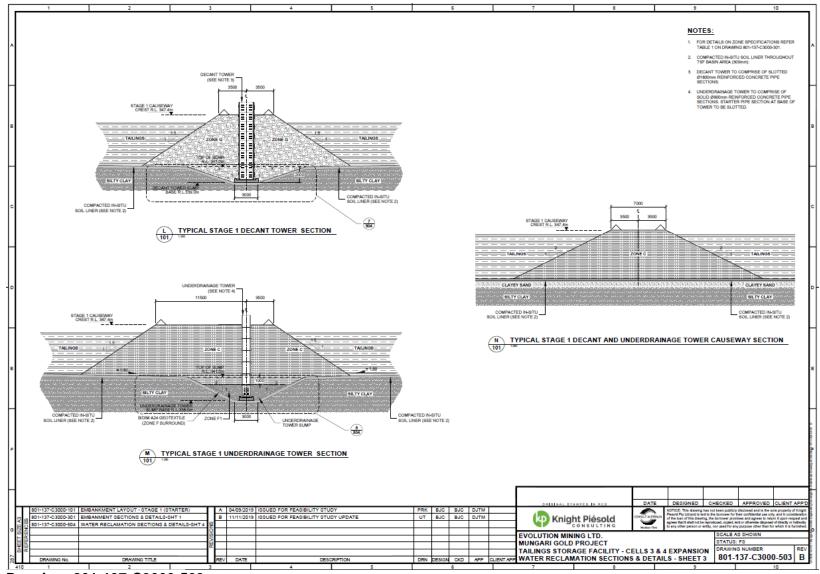


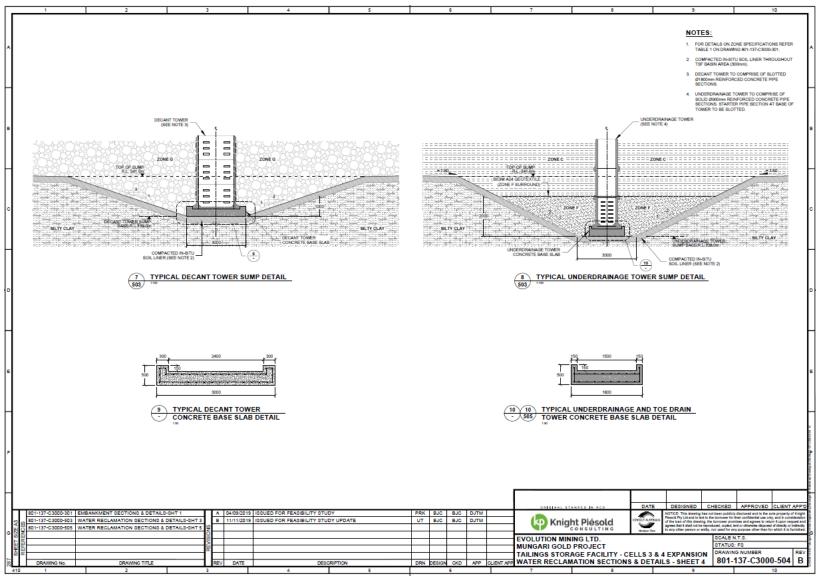


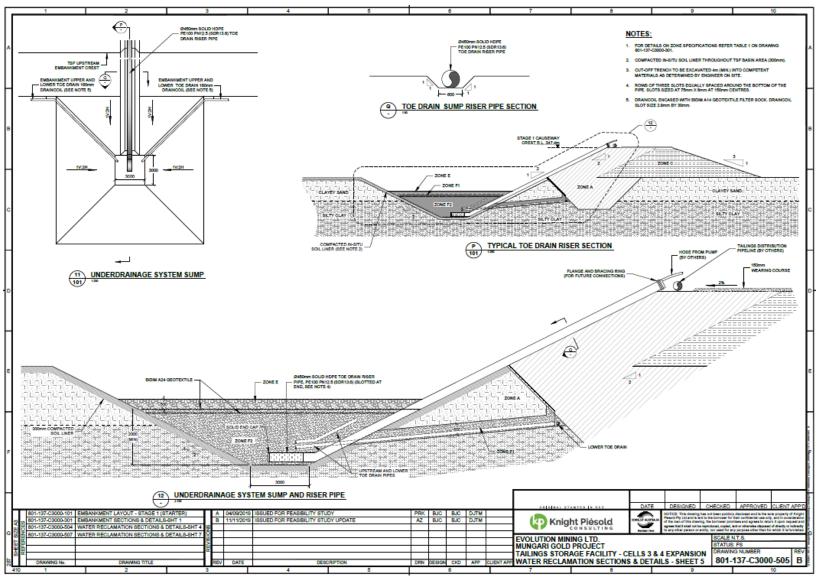


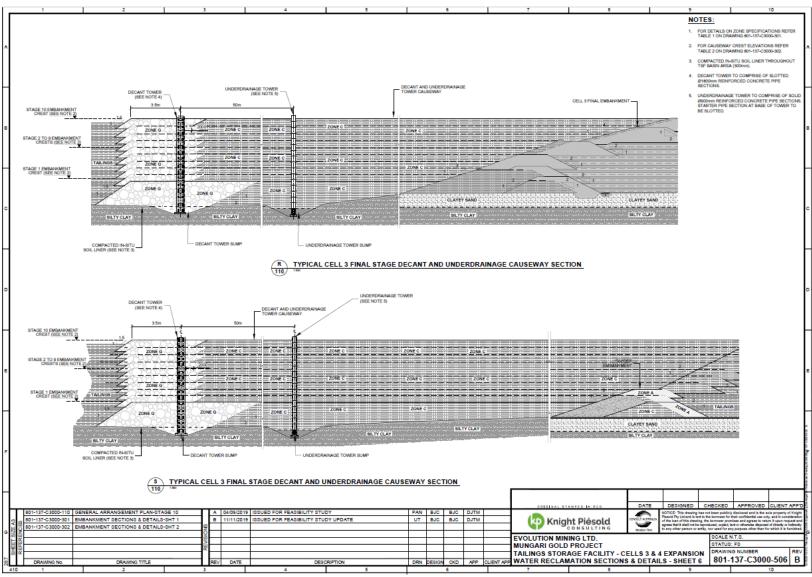


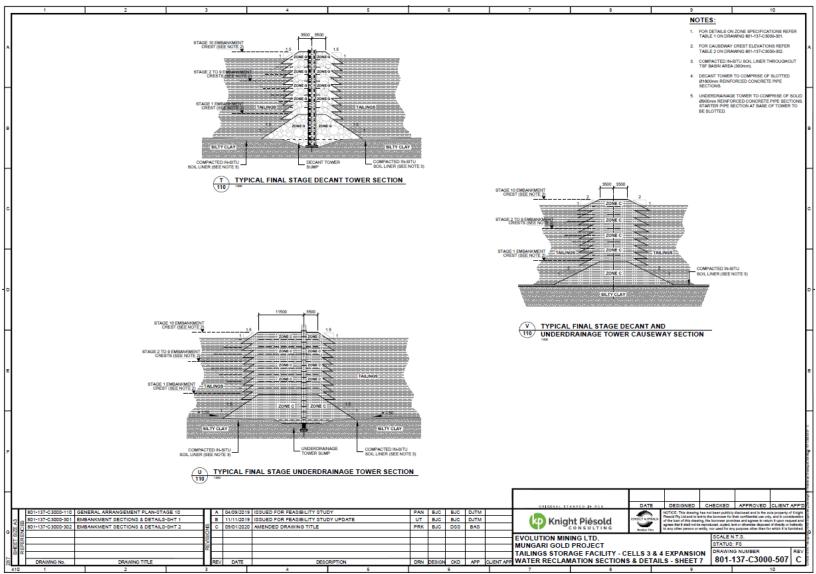


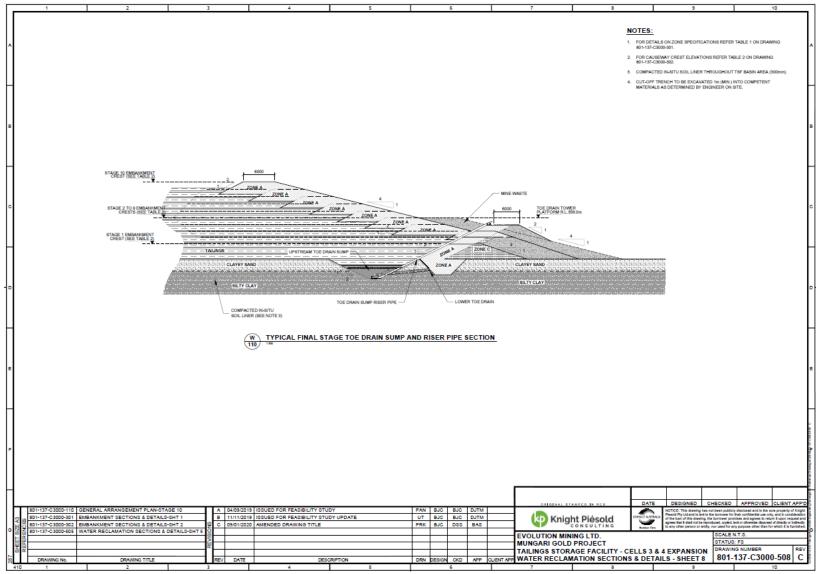


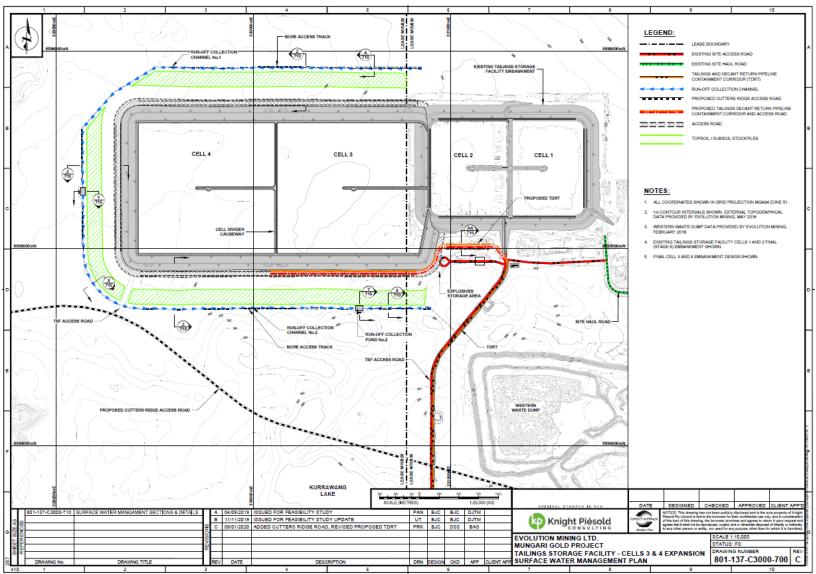


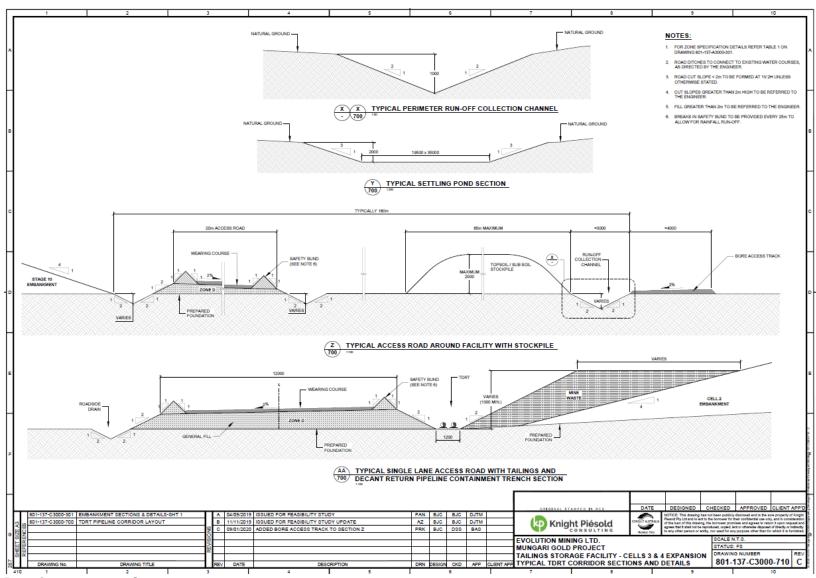


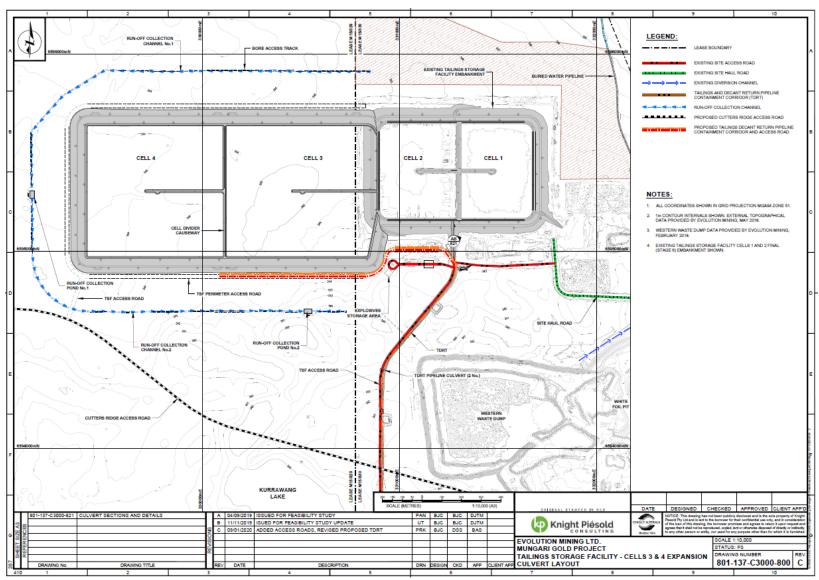


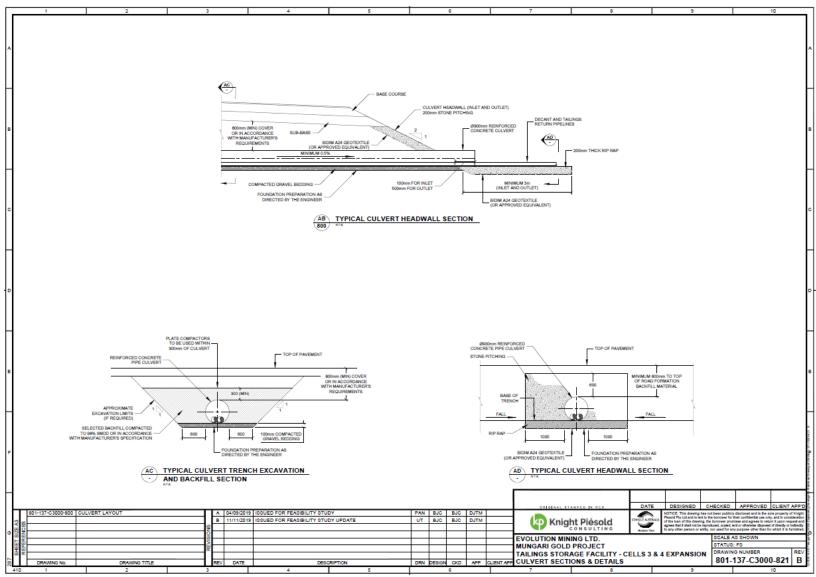


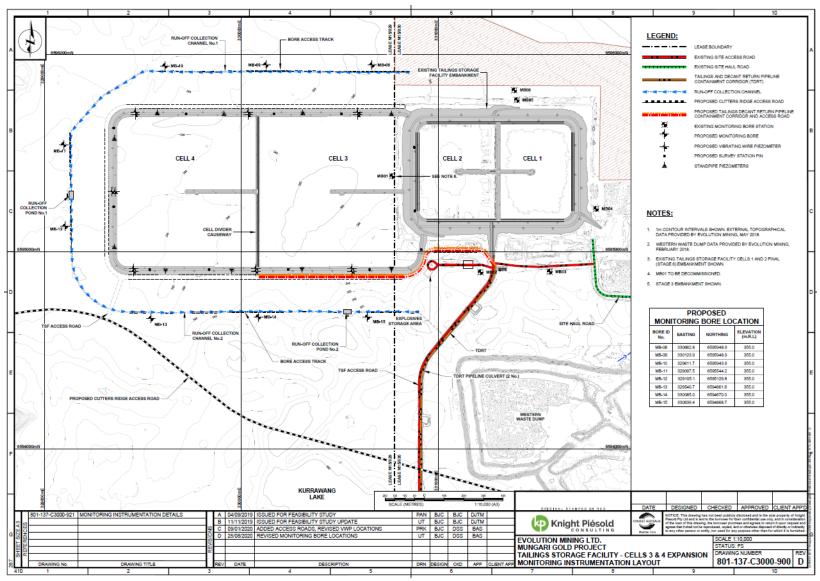


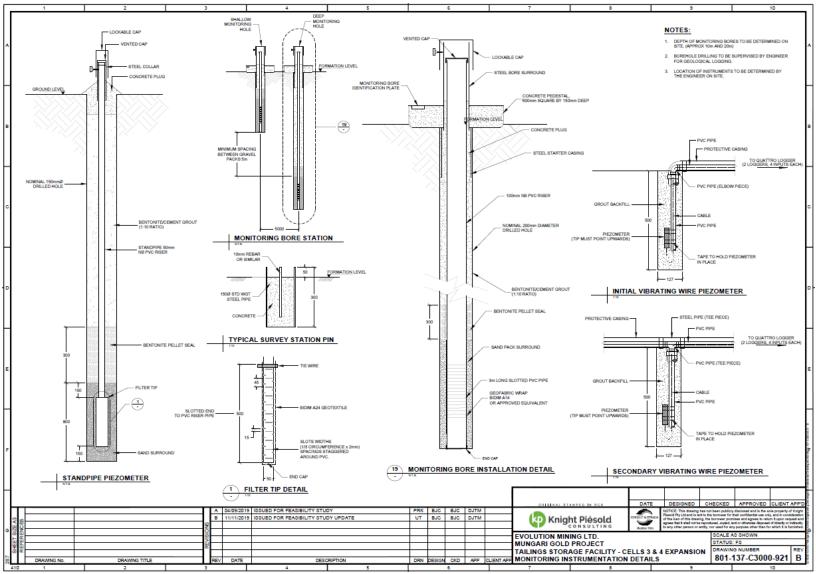












## **Schedule 3: Monitoring**

### **Groundwater monitoring**

**1.** The works approval holder must monitor groundwater for concentrations of the identified parameter(s) in accordance with Table 1.

Table 1: Groundwater monitoring of ambient concentrations

Monitoring well location	Parameter	Unit	Frequency	Method
Monitoring Bores MB-08 to MB-15 as shown on Drawing 801-137-C3000- 900 of Schedule 1.	Standing water level <sup>1</sup>	mgbl	Each monthly period	Spot sample, in accordance with AS/NZS 5667.11.
	pH <sup>1</sup>	pH unit		
	Electrical conductivity 1	μcm/S		
	Total dissolved solids	mg/L		
	WAD cyanide	mg/L	Each quarterly period	
	Total cyanide	mg/L		
	Ca, Mg, Na, K, CO <sub>3</sub> , Cl, SO <sub>4</sub> , Al, As, Cd, Cr, Cu, Fe, Mn, Ni, Zn, Pb, Co	mg/L	Each annual period	

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

### **Quality assurance and quality control requirements**

- 2. The works approval holder must adhere to the following field quality assurance and quality control procedures, as specified in Schedule B2 of the Assessment of Site Contamination NEPM, and must include as a minimum:
  - 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);
    - (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);
  - (ix) arrival time at the laboratory.