Government of Western Australia
Department of Water and Environmental Regulation

Works Approval

Works approval number	W6488/2021/1
Works approval holder	Beacon Mining Pty Ltd
ACN	603 853 916
Registered business address	144 Vivian Street, BOULDER WA 6432
DWER file number	DER2020/000654
Duration	14/07/2021 to 13/07/2026
Date of issue	14/07/2021
Premises details	Jaurdi Gold Project Tailings Storage Facility Mining Tenement M16/529 COOLGARDIE WA 6429

Prescribed premises category description (Schedule 1, ***Environmental Protection Regulations 1987***)	**Assessed design capacity**
Category 5: Processing or beneficiation of metallic or non-metallic ore	600,000 tonnes per annual period

This works approval is granted to the works approval holder, subject to the attached conditions, on 14 July 2021, by:

Carmen Standring
Digitally signed by Carmen Standring
Date: 2021.07.14 11:09:06 +08'00'

A/MANAGER, RESOURCE INDUSTRIES
REGULATORY SERVICES

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

Works approval history

Date	Reference number	Summary of changes
14/07/2021	W6488/2021/1	Works approval granted.

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 and equipment

1. 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,

as set out in Table 1.

Table 1: Design and construction / installation requirements

	Infrastructure	Design and construction / installation requirements	Infrastructure location

1.	Pipelines carrying tailings or decant return water	• A pipeline corridor consisting of an earthen bunded trench, a minimum of 1 m deep and capable of contain up to 29% capacity of the maximum pipeline flow. As depicted in Schedule 1, Figure 2
		• A telemetry system with two alarm systems:
		  • 10% variation in flow-visual alarm in processing control room and automatic shutdown of tails pumps after 45 minutes.
		  • 30% variation in flow- visual alarm in processing control room and automatic shutdown of tails pumps after 15 minutes.
			As depicted in Schedule 1, Figure 1 and labelled as:
			Return Water Pipeline Corridor and Tailings Pipeline Corridor

2.	Surface water management infrastructure	Backfilling of approximately the first 600 m of the East Diversion Drain, so that any seepage from the TSF is not intercepted by the drain. Refer to Attachment 5. Construction of two new drains and associated levees – Diversion 1 and 2 as per Schedule 1, Figure 5, cross section labelled Diversion drain and bund.	As depicted in Schedule 1, Figure 3 and labelled as: Diversion 1, Diversion 2 and Backfilled

2. 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,

as set out in Table 2.

Table 2: Critical containment infrastructure design and construction requirements

	Infrastructure	Design and construction requirements	Infrastructure location
1.	Jaurdi Tailings Storage Facility	Embankment walls no higher than 9.6m (394 mRL). As depicted in Schedule 1, Figures 4 and 5 Embankment walls constructed with a compacted clay inner wall of 6m depth and 1x 10^{-9} ms^{-1} permeability. Downstream walls of traffic compacted mine waste and 1x 10^{-7} ms^{-1} permeability. As per Schedule 1, Figure 5 cross section labelled Perimeter Embankment. Embankment wall to include cut off trench of at least 1.5 mbgl and filled with clay of permeability 1x10^{-8} ms^{-1} permeability. As per Schedule 1, Figure 5 cross section labelled Perimeter Embankment. Vibrating Wire Piezometers (VWPs) (x 2) to be installed behind the upstream compacted zone positioned as per Schedule 1, Figure 4. Decant rock ring constructed from geochemically inert hard durable competent rock with a maximum particle size not exceeding 500 mm. Constructed to the dimensions as depicted by Schedule 1, Figure 5 cross section labelled Decant Rock ring. Area beneath and around the decant rock ring to be compacted to a depth of 300mm. Decant water return system capable of pumping at least 90tph and including capacity to recover water from design storm events.	As depicted in Schedule 1, Figure 1 and labelled as: Tailings Storage Facility

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

Table 3: Infrastructure requirements – groundwater monitoring wells

Infrastructure	Design, construction, and installation requirements	Monitoring well location(s)	Timeframe
Groundwater monitoring wells JTSFMB1 JTSFMB2 JTSFMB3 JTSFMB4 JTSFMB5 JTSFMB6 JTSFMB7 JTSFMB8	<u>Well design and construction:</u> Designed and constructed in accordance with *ASTM D5092/D5092M-16: Standard practice for design and installation of groundwater monitoring bores*. Well 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, wells must be nested, and the perched features individually screened. <u>Logging of borehole:</u> Soil samples must be collected and logged	As depicted in Schedule 1, Figure 1: Map of groundwater monitoring well locations and labelled as TSF monitoring interception bores.	Must be constructed, developed (purged), and determined to be operational prior to the commencement of environmental commissioning activities permitted under condition 11.

Infrastructure	Design, construction, and installation requirements	Monitoring well location(s)	Timeframe
	during the installation of the monitoring wells. 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.		
	Well construction log: Well construction details must be documented within a well 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.		
	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.

4. The works approval holder must, within 60 calendar days of the monitoring wells being constructed, submit to the CEO a well construction report evidencing compliance with the requirements of condition 3.

Compliance reporting

5. The works approval holder must within 30 calendar days of an item of infrastructure or equipment required 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 an Environmental Compliance Report on that compliance.

6. The Environmental Compliance Report required by condition 5, must include as a minimum the following:

(a) certification by a suitably qualified geotechnical engineer that the items of infrastructure or component(s) thereof, as specified in condition 1, have been constructed in accordance with the relevant requirements specified in condition 1;

(b) as constructed plans and a detailed site plan for each item of infrastructure or component of infrastructure specified in condition 1; and

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

Critical containment infrastructure report

7. The works approval holder must within 60 calendar days of the Critical Containment Infrastructure identified by condition 2 being constructed:

(a) undertake an audit of their compliance with the requirements of condition 2; and

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

8. The Critical Containment Infrastructure Report required by condition 7 must include as a minimum the following:

(a) certification by a suitably qualified geotechnical engineer that each item of critical containment infrastructure or component thereof, as specified in condition 2, has been built and installed in accordance with the requirements specified in condition 2;

(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 2;

(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; and

(e) monitoring data indicating the baseline ambient environmental conditions at the premises prior to and immediately following construction of the item(s) of infrastructure.

9. The monitoring of the baseline ambient environmental conditions required under condition 8 must be undertaken in accordance with Table 4.

Table 4: Determination of baseline ambient environmental conditions

Parameter	Monitoring location	Unit	Frequency	Averaging period	Method	
					Sampling	Analysis
Standing water levels	Groundwater monitoring wells JTSFMB1 JTSFMB2 JTSFMB3 JTSFMB4 JTSFMB5 JTSFMB6 JTSFMB7 JTSFMB8	mbgl	Once prior to commissioning of TSF	Spot sample	Spot sample in accordance with AS/NZS 5667.11	Field readings
pH – field reading		-				
Conductivity		µS/cm				
Total dissolved solids		mg/L				By laboratories with current accreditation from the National Association of Testing Authorities (NATA) for the relevant parameters
Weak acid dissociable cyanide						
Total cyanide						

Environmental commissioning phase

Environmental commissioning requirements and emission limits

10. The works approval holder may only commence environmental commissioning of an item of infrastructure listed in condition 11 once the Environmental Compliance Report has been submitted for that item of infrastructure in accordance with condition 5 of this works approval.

11. Any environmental commissioning activities undertaken for an item of infrastructure specified in Table 5 may only be carried out:

(a) in accordance with the corresponding commissioning requirements; and

(b) for the corresponding authorised commissioning duration.

Table 5: Environmental commissioning requirements

Infrastructure	Commissioning requirements	Authorised commissioning duration
Pipelines	Pipelines hydrotested. Telemetry calibrated and tested	For a period not exceeding 60 calendar days in aggregate.

Environmental commissioning report

12. The works approval holder must submit to the CEO an Environmental Commissioning Report within 30 calendar days of the completion date of environmental commissioning for each item of infrastructure specified in Table 5.

13. The works approval holder must ensure the Environmental Commissioning Report required by condition 12 of this works approval includes the following:

(a) a summary of the environmental commissioning activities undertaken, including timeframes;

(b) a summary of the environmental performance of each item of infrastructure or equipment as constructed or installed, which at minimum includes records detailing the:

(i) hydro-testing of pipelines; and

(ii) testing the telemetry system; and

(c) a review of the works approval holder's performance and compliance against the conditions of this works approval; and

(d) where they have not been met, measures proposed to meet the manufacturer's design specifications and the conditions of this works approval, together with timeframes for implementing the proposed measures.

Time limited operations phase

Commencement and duration

14. The works approval holder may only commence time limited operations for an item of critical containment infrastructure identified in condition 2:

(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 7 meets the requirements of that condition.

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 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*, if one is granted before the end of the period specified in condition 15(a).

Time limited operations requirements

16. During time limited operations, the works approval holder must ensure that the premises infrastructure and equipment listed in Table 6 and located at the corresponding infrastructure location is maintained and operated in accordance with the corresponding operational requirement set out in Table 6.

Table 6: Infrastructure and equipment requirements during time limited operations

	Site infrastructure and equipment	Operational requirement	Infrastructure location

1.	Pipelines carrying tailings or decant return water	• Pipelines are positioned in a pipeline corridor consisting of an earthen bunded trench, a minimum of 1 m deep and capable of contain up to 29% capacity of the maximum pipeline flow. As depicted in Schedule 1, Figure 2
		• A telemetry system with two alarm systems:
		  ◦ 10% variation in flow-visual alarm in processing control room and automatic shutdown of tails pumps after 45 minutes.
		  ◦ 30% variation in flow- visual alarm in processing control room and automatic shutdown of tails pumps after 15 minutes,
		is functioning correctly during operation of the pipelines.
		• Inspections at least twice daily during operation
			As depicted in Schedule 1, Figure 1 and labelled as:
			Return Water Pipeline Corridor and Tailings Pipeline Corridor

2.	Jaurdi Tailings Storage Facility	• Freeboard of at least 700mm maintained during operation. • Inspections at least daily.	As depicted in Schedule 1, Figure 1 and labelled as: Tailings Storage Facility

17. During time limited operations, the works approval holder must ensure that the emission specified in Table 7, is discharged only from the corresponding discharge point and only at the corresponding discharge point location.

Table 7: Authorised discharge points

	Emission	Discharge point	Discharge point location
1.	Tailings	Jaurdi tailings storage facility	As depicted in Schedule 1, Figure 1 and labelled as: Tailings Storage Facility

Monitoring during time limited operations

18. The works approval holder must monitor emissions during time limited operations in accordance with Table 8.

Table 8: Emissions and discharge monitoring during time limited operations

Discharge point	Parameter	Frequency	Averaging Period	Unit	Method	
					Sampling	Analysis
Jaurdi tailings storage facility	Throughput/ volume	Continuous	Monthly	Tonnes and m^3	N/A	Tonnage calculated from volume discharged (as per meters on tailings pipeline)
	Tailings density	Spot sample	Monthly	% solids	Spot sample in accordance with AS/NZS 5667.11 Spot sample in accordance with AS/NZS 5667.11	By laboratories with current accreditation from the National Association of Testing Authorities (NATA) for the relevant parameters

19. The works approval holder must record the results of all monitoring activity required by condition 18.

20. The works approval holder must monitor the groundwater during time limited operations for concentrations of the identified parameters in accordance with Table 9.

Table 9: Monitoring of ambient concentrations during time limited operations

Parameter	Monitoring location	Unit	Frequency	Averaging period	Method	
					Sampling	Analysis
Standing water levels	Groundwater monitoring wells JTSFMB1 JTSFMB2 JTSFMB3 JTSFMB4 JTSFMB5 JTSFMB6 JTSFMB7 JTSFMB8	mbgl	Monthly	Spot sample	Spot sample in accordance with AS/NZS 5667.11	Field readings
pH – field reading		-				
Conductivity		µS/cm				
pH		-	Quarterly	Spot sample		By a laboratory with current accreditation from the National Association of Testing
Total dissolved solids		mg/L				
Weak acid dissociable						

Parameter	Monitoring location	Unit	Frequency	Averaging period	Method	
					Sampling	Analysis
cyanide						Authorities (NATA) for the relevant parameters
Total cyanide						

21. The works approval holder must record the results of all monitoring activity required by condition 20.

22. The licence holder must not use bores for compliance monitoring as per condition 20 if they are being actively pumped for groundwater or seepage recovery.

23. Monitoring bores being actively pumped for groundwater or seepage recovery must be replaced within 6 months by a monitoring bore constructed to the specifications of conditions 3 and 4 and located within 10m of the bore being replaced.

24. Subject to conditions 25 and 26, the works approval holder must submit to the CEO a written report within 14 days of an exceedance where ambient concentrations:

(a) at the monitoring location listed in Table 10;

(b) for the corresponding parameter in Table 10;

(c) exceed the corresponding trigger value in Table 10;

when monitored in accordance with condition 20.

Table 10: Ambient groundwater quality trigger values

Monitoring location	Parameter	Trigger value
Groundwater monitoring wells JTSFMB1 JTSFMB2 JTSFMB3 JTSFMB4 JTSFMB5 JTSFMB6 JTSFMB7 JTSFMB8	Standing water levels	6 mbgl

25. The works approval holder must, in the event of a parameter in condition 24 exceeding the corresponding trigger value specified in that condition, undertake the management action that corresponds with the relevant parameter within the corresponding timeframe as specified in Table 11.

Table 11: Management actions required in the event of trigger value exceedance

Parameter	Management action	Timeframe
Standing water levels	Commence pumping from bores in the area of the exceedance.	Within 30 days of the exceedance
	Construct a seepage recovery trench at the location shown in Schedule 1, Figure 4, labelled 2m Deep Seepage Recovery Trench. The seepage recovery trench shall be constructed as detailed in Schedule 1, Figure 5, cross section labelled Seepage Recovery Trench – Details. The sump shall be included in the seepage recovery trench at the location shown in Schedule 1, Figure 4, labelled Seepage Recovery Trench 1:50. The sump shall be constructed as detailed in Schedule 1, Figure 5, cross section labelled Seepage Recovery Trench 1:100	Within 90 days of the exceedance

26. The works approval holder must include the following information in the report referred to in condition 24 in relation to any exceedances of any of the trigger values identified in that condition:

(a) the nature, volume, and characteristics of the emissions or ambient concentrations exceedance;

(b) the time and date when the exceedance occurred;

(c) whether any environmental impact occurred as a result of the exceedance and, if so, what that impact was and where the impact occurred;

(d) the details of the management action(s) taken pursuant with condition 25 in response to the exceedance;

(e) the details and result of any investigation undertaken into the cause of the exceedance; and

(f) the details of any action or specified measures that have been taken, or will be taken, to prevent the exceedance occurring again and for the purpose of minimising the likelihood of pollution or environmental harm.

Compliance reporting

27. The works approval holder must submit to the CEO a report on the time limited operations within 60 calendar days of the completion date of time limited operations or 60 calendar days before the expiration date of the works approval, whichever is the sooner.

28. The works approval holder must ensure the report required by condition 27 includes the following:

(a) a summary of the time limited operations, including timeframes and amount of tailings discharged;

(b) a summary of monitoring results obtained during time limited operations under condition 18 and 20.

(c) a review of performance and compliance against the conditions of the works approval and the Environmental Commissioning Report; and

(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)

29. 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.

30. 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 2;

(b) any maintenance of infrastructure that is performed in the course of complying with condition 16;

(c) monitoring programmes undertaken in accordance with conditions 18 and 20; and

(d) complaints received under condition 29.

31. The books specified under condition 30 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 12 have the meanings defined.

Table 12: Definitions

Term	Definition
annual period	a 12 month period commencing from 14 July until 13 July of the immediately following year.
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 *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 2.
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 commissioning	means the sequence of activities to be undertaken to test equipment integrity and operation, or to determine the environmental performance, of equipment and infrastructure to establish or test a steady state operation and confirm design specifications.
Environmental Commissioning Report	means a report on any commissioning activities that have taken place and a demonstration that they have concluded, with focus on emissions and discharges, waste containment, and other environmental factors.
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).
EP Regulations	*Environmental Protection Regulations 1987* (WA).
mbgl	means metres below ground level
mg/L	means milligram per litre

Term	Definition
mRL	means metres
m RL	means metres above the Reduced Level.
µS/cm	means micro Siemen per centimetre
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.
suitably qualified geotechnical engineer	means a person who: • holds a Bachelor of Engineering recognised by the Australian Institute of Engineers; and • has a minimum of five years of experience working in geotechnical engineering including experience in the design of tailings storage facilities.
SWL	means standing water level
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
waste	has the same meaning given to that term under the EP Act.
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 the map below (

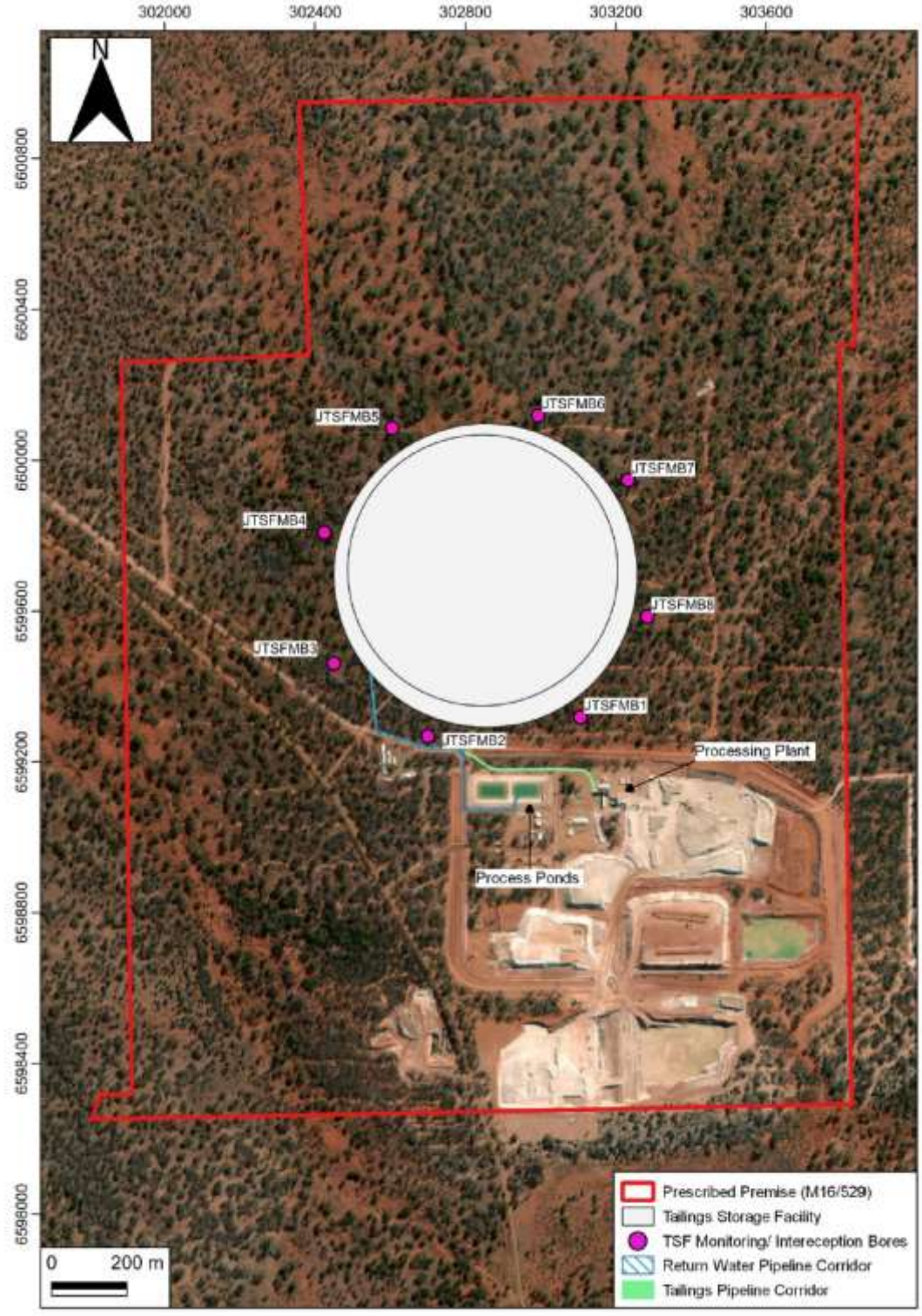


Figure 1).

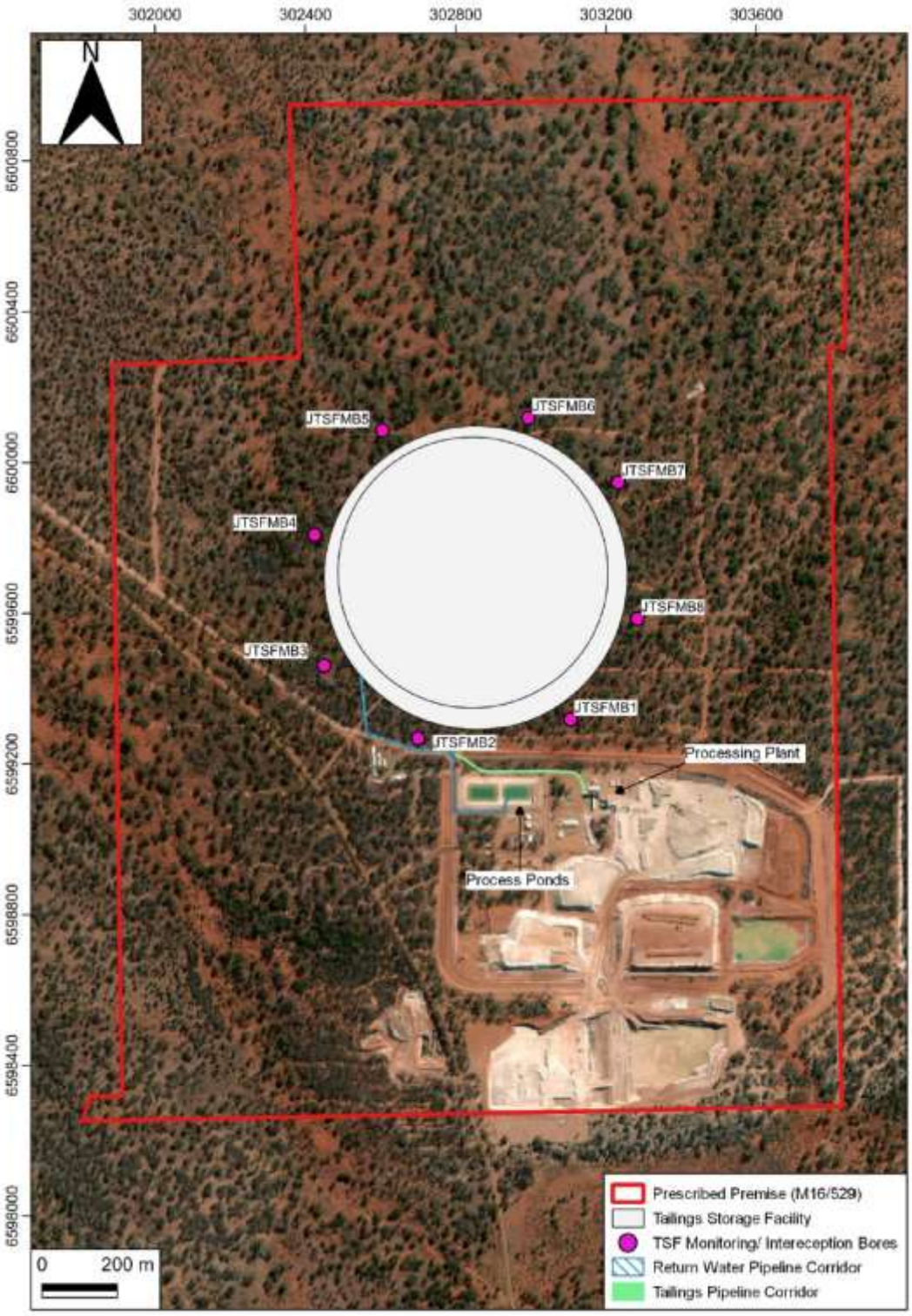


Figure 1: Map of the boundary of the prescribed premises

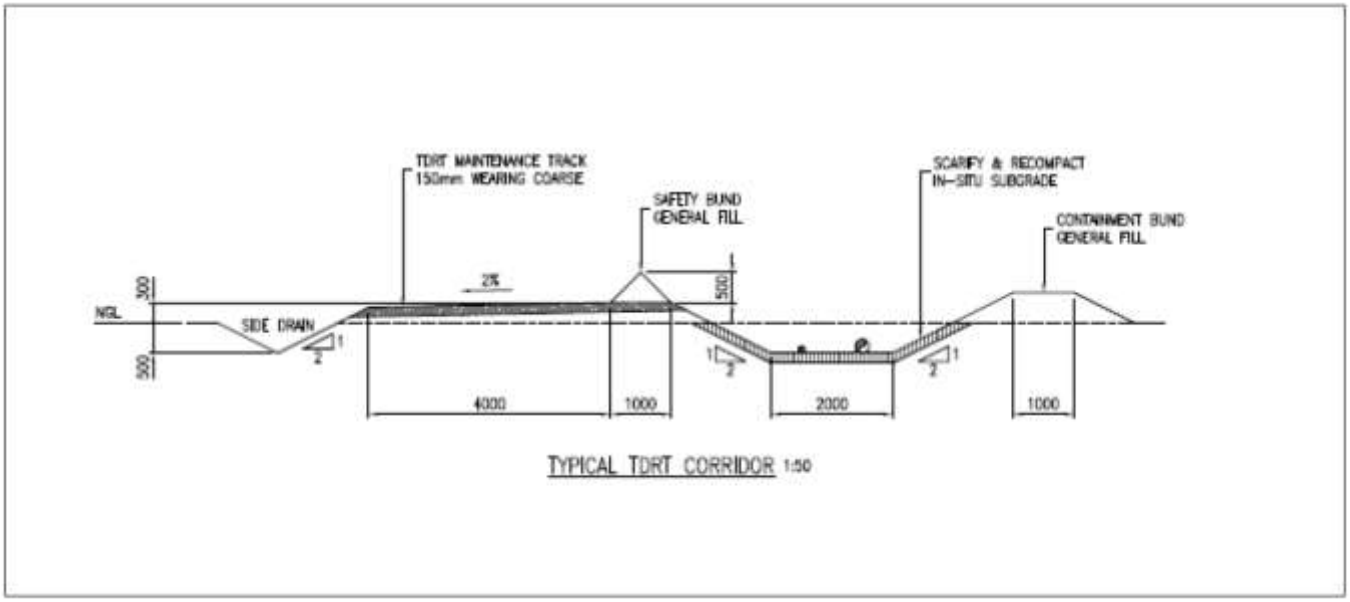


Figure 2: Tailings delivery and return water pipeline corridor design

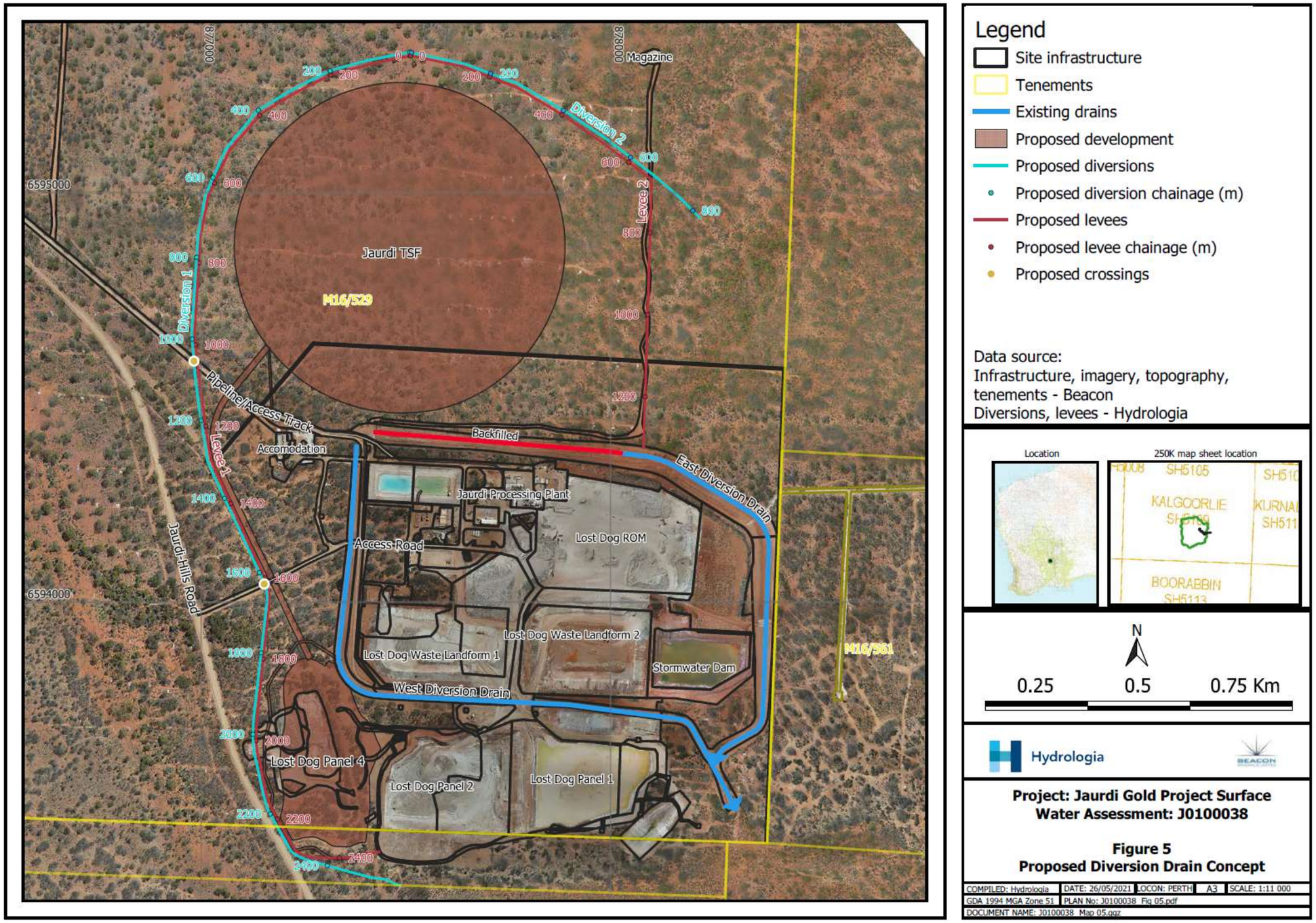


Figure 3: Surface water diversion channels

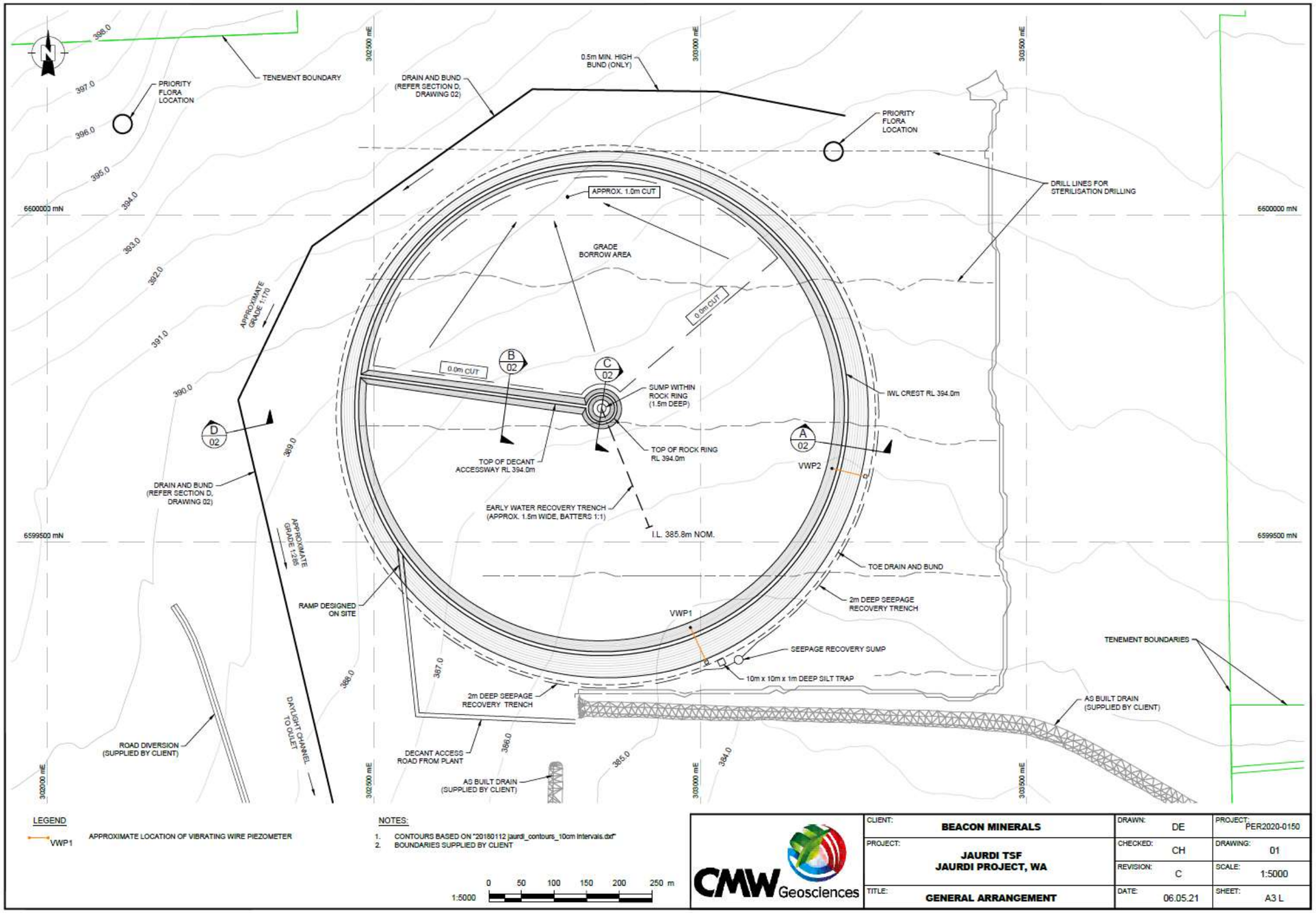
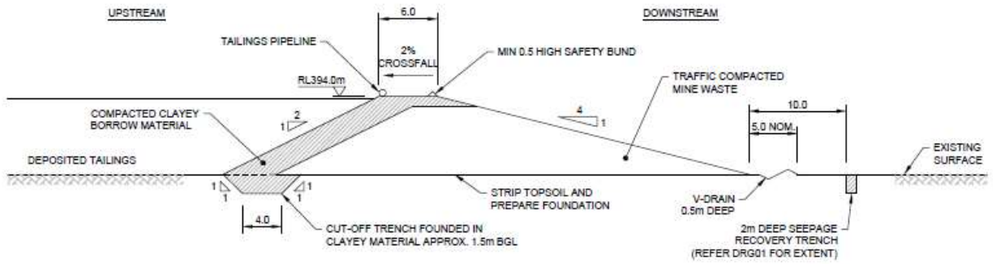
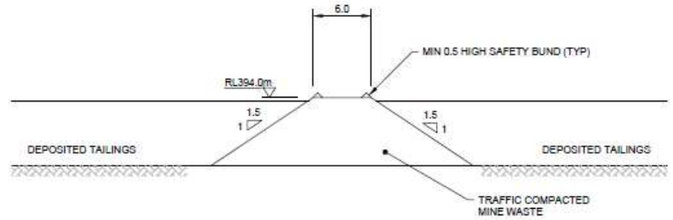


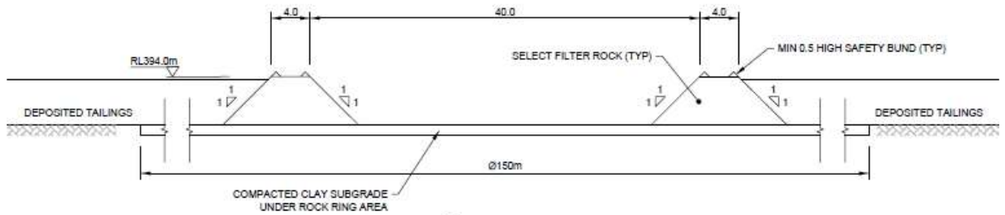
Figure 4: General arrangement of tailings storage facility



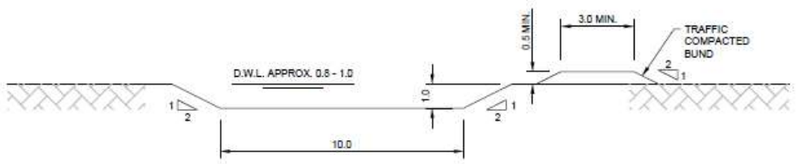
A 01 PERIMETER EMBANKMENT
1:500



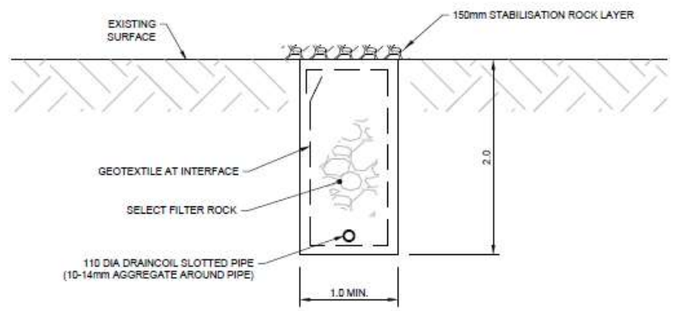
B 01 DECANT ACCESSWAY
1:500



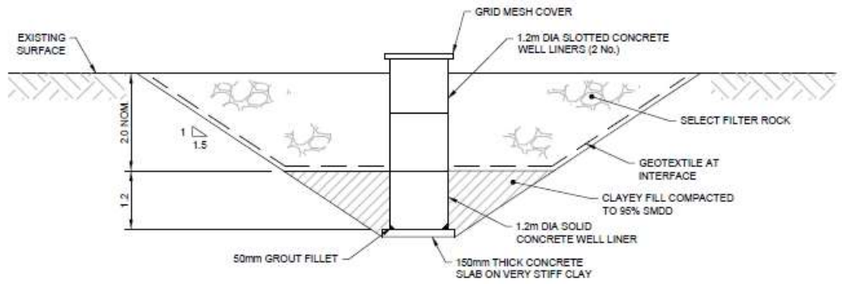
C 01 DECANT ROCK RING
1:500



D 01 DIVERSION DRAIN AND BUND
1:200



SEEPAGE RECOVERY TRENCH - DETAIL
1:50



SEEPAGE RECOVERY TRENCH - DETAIL
1:100

NOTES:

1. ALL DIMENSIONS IN METRES UNLESS SPECIFIED

1:200 0 2 4 6 8 10 m

1:500 0 5 10 15 20 25 m

CMW Geosciences

CLIENT: BEACON MINERALS		DRAWN: DE	PROJECT: PER2020-0150
PROJECT: JAURDI TSF JAURDI PROJECT, WA		CHECKED: CH	DRAWING: 02
		REVISION: A	SCALE: AS SHOWN
TITLE: SECTIONS AND DETAILS		DATE: 04.06.20	SHEET: A3 L

Figure 5: Details of construction