Government of Western Australia
Department of Water and Environmental Regulation

Works Approval

Works approval number	W5800/2015/1
Works approval holder	Opalvale Pty Ltd
ACN	106 512 896
Registered business address	Level 3, 12 St Georges Terrace PERTH WA 6000
DWER file number	DER2014/003195
Duration	31/08/2015 to 30/08/2026
Date of issue	24/02/2022
Premises details	Salt Valley Road Class II Landfill Chitty Road, HODDYS WELL WA 6566 Legal description - Part of Lot 11 on Deposited Plan 34937 Certificate of Title Volume 2535 Folio 391

Prescribed premises category description **(Schedule 1, *Environmental Protection Regulations 1987*)**	**Assessed design capacity**
Category 64: Class II or III putrescible landfill site: premises on which waste (as determined by reference to the waste type set out in the document entitled "Landfill Waste Classification and Waste Definitions 1996" published by the Chief Executive Officer and as amended from time to time) is accepted for burial	150 000 tonnes per annual period

This works approval is granted to the works approval holder, subject to the attached conditions, on 24 February 2022, by:

Tracey Hassell
Digitally signed by Tracey Hassell
Date: 2022.02.24 16:42:05 +08'00'

Tracey Hassell
A/Senior Manager, Waste Industries

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

Works approval history

Date	Reference number	Summary of changes
27 August 2015	W5800/2015/1	Original works approval issued
22 July 2016	W5800/2015/1	Amendment to give effect to the Minister's determination (068-074/15)
17 August 2017	W5800/2015/1	Amendment Notice 1 - to address compliance matters relating to construction of Cell 1, Stage 1
12 October 2018	W5800/2015/1	Amendment Notice 2 - to give effect to the Minister's determination (023/17)
19 September 2019	W5800/2015/1	Amendment to lower the floor design of Cell 2 and to amalgamate previous amendments into a consolidated works approval
4 November 2020	W5800/2015/1	Amendment for the replacement of leachate aggregate on the landfill perimeter side slopes in the remaining cells within Stage1 with a fine grained protection layer
24 February 2022	W5800/2015/1	Amendment to change the design of cells 3 and 4 and leachate ponds 3 and 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

1. The Works Approval Holder must construct the Critical Containment Infrastructure and manage emissions and discharges from the construction works in accordance with the documentation detailed in Table 1.

Table 1: Construction requirements[1]

Document	Parts	Date of Document
IW Projects Pty Ltd, Opal Vale Salt Valley Road Class II Landfill Works Approval Application Supporting Documentation	All, including Reports, Drawings and Appendices	21 December 2014
Golder Associates, Opal Vale Landfill Technical Studies to Support Design	All, including Drawings and Appendices	22 December 2014
Letter to from IW Projects to Department of Environment Regulation, Subject: Opal Vale Chitty Road Landfill Development – Response to DER Letter 26 March 2015	All, including Reports, Drawings and Appendices	14 March 2015
Letter to from IW Projects to Department of Environment Regulation, Subject: Opal Vale Chitty Road Landfill Development – Response to DER Letter 26 March 2015 and 19 June 2015	All, including Reports, Drawings and Appendices	5 July 2015
Stass (2015a) Stass Environmental, Opal Vale Pty Ltd, Ground Water Assessment, 11 Chitty Road, Toodyay, WA	All, including Drawings and Appendices	July 2015
Stass (2015b) Stass Environmental, Addendum to Opal Vale Hydrogeological Assessment Report July 2015	All, including Appendices	14 July 2015.
Design modifications for the construction of Cell 1 (not applicable to Cells 2 to 6): *IW Projects, Opal Vale Salt Valley Road Landfill Development – Cell 1 Compliance Document Revision 1.*	All, including Appendices	31 October 2016
Design modifications for the construction of Cell 1 (not applicable to Cells 2 to 6): *Golder Associates, Salt Valley Road Landfill Cell 1 and Leachate Ponds 1 and 2 Construction Quality Assurance Validation Report*	All, including Appendices	November 2016

Design modifications for the construction of Cell 2 (only applicable for Cell 2): *IW Projects Pty Ltd, Opal Vale Pty Ltd Proposed Class II Landfill: Landfill Cell 2 Construction*	Drawings OV-C2-01 to OV-C2-11	3 June 2019
Design modifications for the construction of Cell 2, replacing Appendix No. 32 of *IW Projects Pty Ltd, Opal Vale Salt Valley Road Class II Landfill Works Approval Application Supporting Documentation* (only applicable for Cell 2): *Tender OV01/19_RevA: Construction of Landfill Cell 2 and Associated Works at the Salt Valley Road Landfill Facility, Hoddy's Well*	Section 4: Specifications	As emailed to DWER on 2 September 2019
Design modifications for the construction of Cell 2 (only applicable for Cell 2): *Golder Associates Pty Ltd, Cell 2 Design: Salt Valley Road Class Landfill Facility (Document No. 19123998-001-R-Rev1)*	All, including Drawings and Appendices	June 2019
Leachate aggregate replacement on the landfill perimeter sideslopes in the remaining cells within Stage 1 (where progressive aggregate placement has not already undertaken) with a fine grained protection layer. *Talis (2020) Salt Valley Road Class II Landfill Supporting Information Report, August 2020*	All, including Drawings and Appendices	August 2020
Design modifications for the construction of landfill Cells 3 and 4 (only applicable to Cells 3 and 4) and leachate ponds 3 and 4 (only applicable to leachate ponds 3 and 4): *Talis (2021) Construction Quality Assurance Plan: Salt Valley Road Landfill – Cells 3 and 4 Development, Version 3, 13 September 2021* *Talis (2021) Technical Specification: Salt Valley Road Landfill – Cells 3 and 4 Development Version 6, 21 September 2021* *Talis (2022) Memorandum: Salt Valley Road Class II Leachate Evaporation Pond Design, 10 January 2022*	All, including Drawings and Appendices	September 2021

Note 1: Where the details and commitments of the documents listed in condition 1 are inconsistent with any other condition of this Works Approval, the conditions of this Works Approval shall prevail.

2. The Works Approval Holder must implement all recommendations in Table 24 of Section 13 in the report Golder Associates Opal Vale Landfill, Technical Studies to Support Design, Report Number 1417287-001-R-Rev0, 22 December 2014.

3. Prior to commencing construction of combined Cell 3 and 4, and Cells 5 and 6, the Works Approval Holder must:

(a) install surface water diversion devices to divert all up-gradient surface water around the proposed cell and surface water bodies that are up hydraulic gradient of the proposed cell;
(b) pump dry all surface waterbodies that are hydraulically up-gradient of the proposed cell;
(c) install 4 groundwater monitoring bores to a depth of 5 metres below the design base of that cell at equal distances along the boundary of the proposed cell; and
(d) install groundwater level loggers within each groundwater monitoring bore.

4. The Works Approval Holder must construct:

(a) each landfill cell (with the exception of a 6 m x 6 m leachate sump in landfill Cell 1) to ensure that a separation distance of 2m is achieved between the base of the cell and the highest natural elevation of groundwater beneath the cell as demonstrated by groundwater contour plans and landfill cell design drawings; and
(b) the leachate sump in combined landfill Cell 3 and 4 using a geosynthetic clay liner which achieves an equivalent attenuation capacity to a separation distance of 2m between the base of the landfill cell and the highest natural elevation of groundwater beneath that cell.

5. The Works Approval Holder must install and maintain permanent markers along the boundary of the Premises so it can be identified on the ground 1 month prior to the commencement of any construction works.

6. The following works must be subject to construction quality assurance processes in accordance with Level 1 of the Australian Standard AS 3798–2007 Guidelines on earthworks for commercial and residential developments (Standards Australia Limited, 2007):

(a) works undertaken to delineate the extent of uncompacted and saturated material at the base of the quarry pit;
(b) the removal of uncompacted and saturated material prior to placement of compacted fill at the base and/or side slopes of the quarry pit;
(c) landfill cell and leachate pond construction, including liner placement, in accordance with the documentation detailed in Table 1 and in accordance with condition 2.

7. The Works Approval Holder must, at least 1 month prior to the installation of the composite liner, notify the CEO if the maximum depth of soft saturated material at the base of the quarry pit exceeds a depth of 3 m.

8. The Works Approval Holder must ensure that the notification required by condition 7 is accompanied by an updated settlement assessment that:

(a) identifies the depth of soft saturated material at the base of the quarry pit that is present and to be removed; and
(b) re-assesses, based on the depth of soft saturated material at the base of the quarry pit that is present and to be removed, the long term integrity and stability of the landfill, including the tensile strains of the landfill liner.

9. The Works Approval Holder must ensure that where a fine grained protection layer is utilised, the materials must:

(a) not contain organic matter, lumps of clay or other deleterious material;
(b) not contain any other type of putrescible waste;

(c) be constructed with a minimum thickness of 300 mm;
(d) meet the desired particle size distribution specified within the document *Talis (2020) Salt Valley Road Class II Landfill Supporting Information Report, August 2020*, as specified in Condition 1; and
(e) be installed above the cushion geotextile in the landfill cell to the extent shown on the drawings provided within the document *Talis (2020) Salt Valley Road Class II Landfill Supporting Information Report, August 2020*, as specified in Condition 1.

10. Crushed limestone must not be used within the fine grain protection layer.

Monitoring

General

11. The Works Approval 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 measured

12. The Works Approval Holder must ensure that:
(a) quarterly monitoring is undertaken at least 45 days apart; and
(b) six monthly monitoring is undertaken at least 5 months apart.

13. The Works Approval Holder must ensure that all monitoring equipment used on the Premises to comply with the conditions of this Works Approval is calibrated in accordance with the manufacturer's specification.

14. The Works Approval Holder must, where the requirements for calibration cannot be practicably met, or a discrepancy exists in the interpretation of the requirements, bring these issues to the attention of the CEO accompanied with a report comprising details of any modifications to the methods.

Groundwater monitoring

15. The Works Approval Holder must undertake the monitoring of the baseline ambient environmental conditions required under condition 19 in accordance with the specifications in Table 2.

Table 2: Monitoring of ambient groundwater level and quality

Monitoring point reference and location	Parameter	Units	Averaging period	Frequency
Bores installed to comply with condition 3 for Cells 5 and 6.	Standing water level (SWL)	m bgl m bTOC m AHD	Continuous	Continuous by water level data logger and monthly by manual measurements over the period of 1st July to 31st October

Monitoring point reference and location	Parameter	Units	Averaging period	Frequency
				preceding the construction of each cell
SE1, SE2, SE3, SE4, SE5, SE6, SE7, SE8 and SE9	Standing water level (SWL)	m bgl m bTOC m AHD	Spot sample	Quarterly
	pH	-		Six monthly
	Electrical conductivity	µS/cm		
	nitrate-nitrogen	mg/L		
	Total nitrogen			
	Total Potassium			
	Chloride			
	Total dissolved solids			
	Lead			
	Manganese			
	Copper			
	Chromium			
	Nickel			
	Zinc			
	cadmium			
	Ammonia-nitrogen			

Note 1: SWL shall be determined prior to collection of water samples
Note 2: m bTOC means metres below top of casing
Note 3: m bgl means metres below ground level
Note 4: m AHD means metres above Australia Height Datum

16. The Works Approval Holder must ensure that for the monitoring required by Condition 15:

(a) water level data loggers are calibrated prior to installation either by the manufacturer or the user for the conditions expected in the field installation; and

(b) water level data logger readings are checked against manual water level measurements at least monthly and, if required, each water level data logger to be recalibrated and the data corrected for any drift or other errors that have occurred;

(c) data from water level data loggers are adjusted to account for local changes in atmospheric pressure; and

(d) if groundwater levels have not peaked during the specified monitoring period, then monitoring must continue for as long as required to determine the peak.

Fine grained protection layer analysis

17. The Works Approval Holder must undertake the analysis of the fine grained protection layer required under condition 21 in accordance with the specifications in Table 3.

Table 3: Analysis of the fine grained protection layer

Sieve size (mm)	Percent passing (%)	Averaging period	Frequency
19	100	Spot sample	1 sample per 100 m^3
9.5	95-100		
4.75	85-100		
2.36	80-100		
1.18	75-100		
0.6	45-95		
0.425	24-80		
0.3	10-60		
0.15	3-24		
0.075	0-8		

Reporting

18. The works approval holder must, following the construction of each landfill cell and leachate pond;

(a) undertake an audit of their compliance with the requirements of conditions 1, 2, 3, 4, 5, 6 and 7; and

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

19. The Critical Containment Infrastructure Report required by condition 18 must include as a minimum the following:

(a) certification by a qualified civil or structural 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 within documentation specified in condition 1 and in accordance with the requirements specified in conditions 2, 3, 4, 5, 6;

(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 the documentation listed 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) certifies that the sub-grade and liner (including the sump liner in combined Cell 3 and 4) is free of fault or defect, built to the design specification and fit for the intended purpose; and

(f) monitoring data indicating the baseline ambient environmental conditions at the premises prior to and immediately following construction of the landfill cells.

20. The works approval holder must within 4 weeks of placement of the fine grain protection layer and prior to the commencement of waste placement:

(a) undertake an audit of their compliance with the requirements of conditions 9 and 10; and

(b) prepare and submit to the CEO an Environmental Compliance Report on that compliance.

21. The Environmental Compliance Report required by condition 20, must include as a minimum the following:

(a) demonstration that the fine grained material meets the particle size distribution requirements as per Table 3;

(b) demonstration that the method of construction/installation is appropriate and, as a result the design requirements have been met; and

(c) copies of monitoring and testing results for the fine grain protection layer lift installations.

Definitions

In this works approval, the terms in Table 4 have the meanings defined.

Table 4: Definitions

Term	Definition
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
annual period	a 12 month period commencing from 1 September until 31 August of the immediately following year.
averaging period	means the time over which a limit or target 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. 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
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.
EP Act	*Environmental Protection Act 1986* (WA).
EP Regulations	*Environmental Protection Regulations 1987* (WA).
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
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)

Term	Definition
	in Schedule 1 to this works approval.
prescribed premises	has the same meaning given to that term under the EP Act.
Putrescible waste	means waste stream likely to become putrid - including wastes that contain organic materials such as food wastes or wastes of animal or vegetable origin, which readily bio-degrade within the environment of a landfill
Qualified, competent civil or structural engineer	means a person who: a) holds a Bachelor's degree recognised by Engineers Australia; and b) has a minimum of five years of experience working in a supervisory role in civil or structural engineering; and c) is employed by an independent third party external to the Works Approval Holder's business; or is otherwise approved in writing by the CEO to act in this capacity.
quarterly	means the 4 inclusive periods from 1 September to 30 November, 1 December to the last day of February, 1 March to 31 May and 1 June to 31 August
six monthly	means the 2 inclusive periods from 1 September to the last day of February and 1 March to 31 August
Schedule 1	means Schedule 1 of this Works Approval unless otherwise stated
Stage 1	means landfill cells 1 to 6, a maximum of six leachate ponds and a surface water storage dam as depicted in Figure 3, in Schedule 1
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

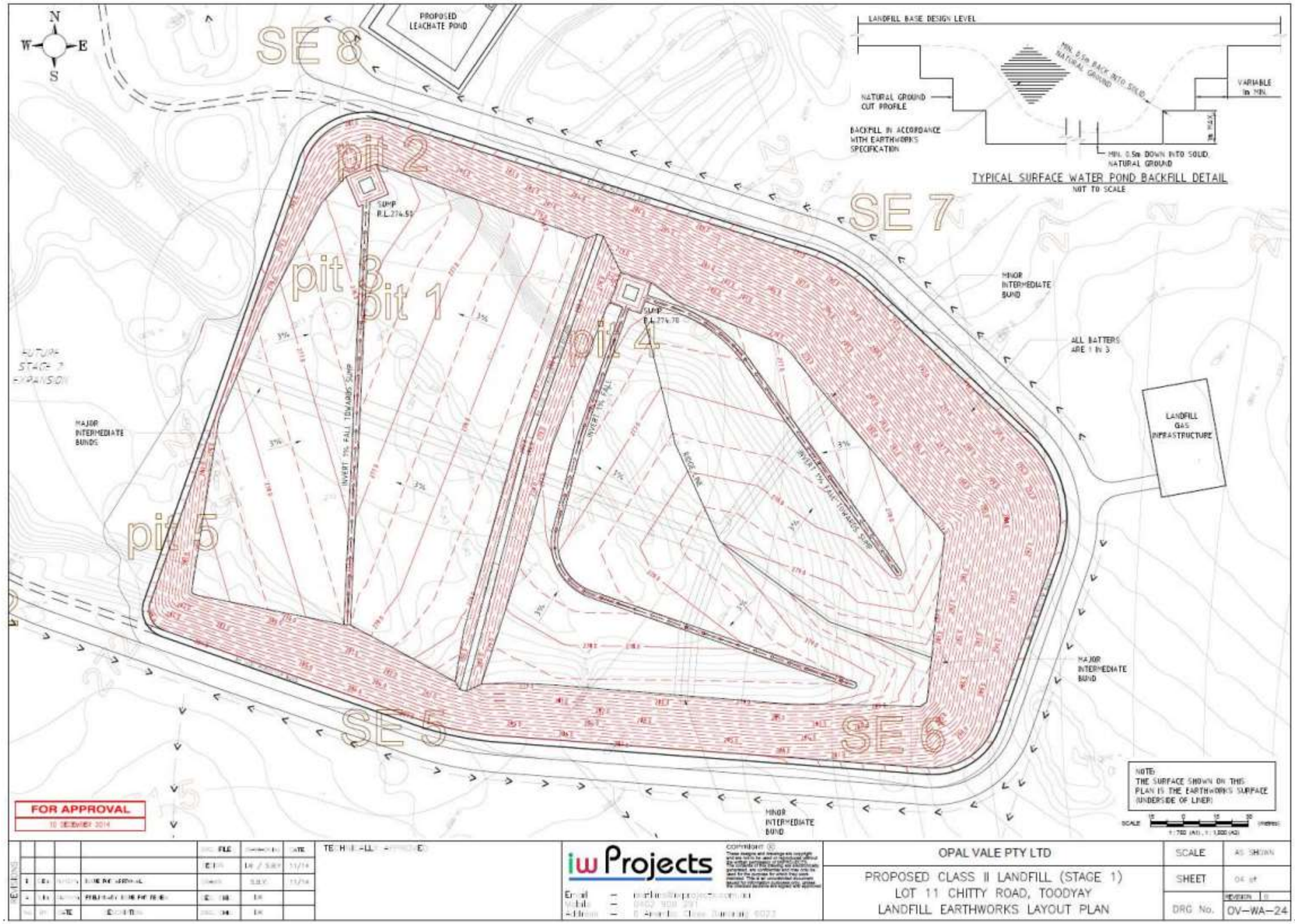


Figure 2: Landfill earthworks layout plan

Figure 3: Stormwater drainage layout plan

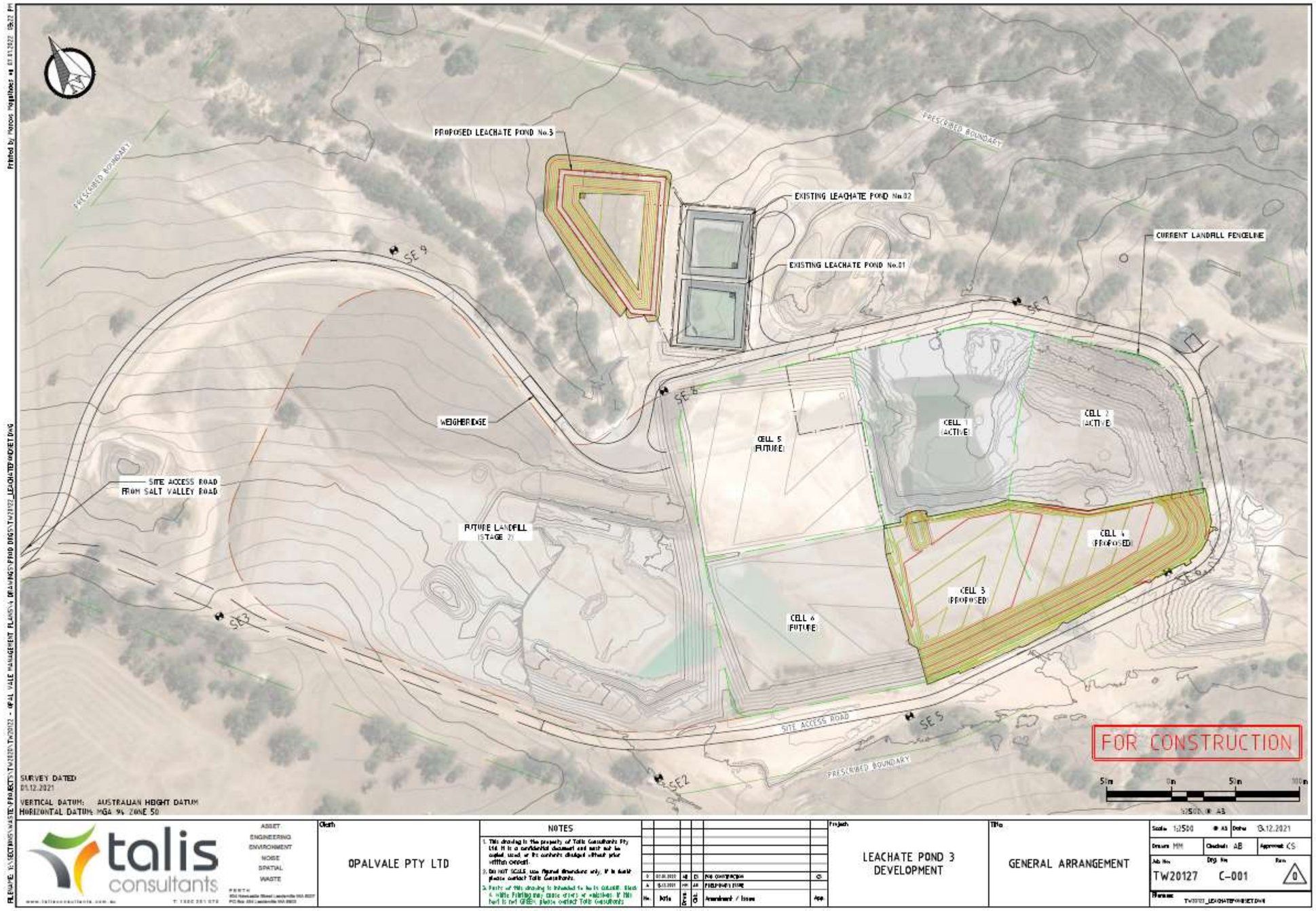
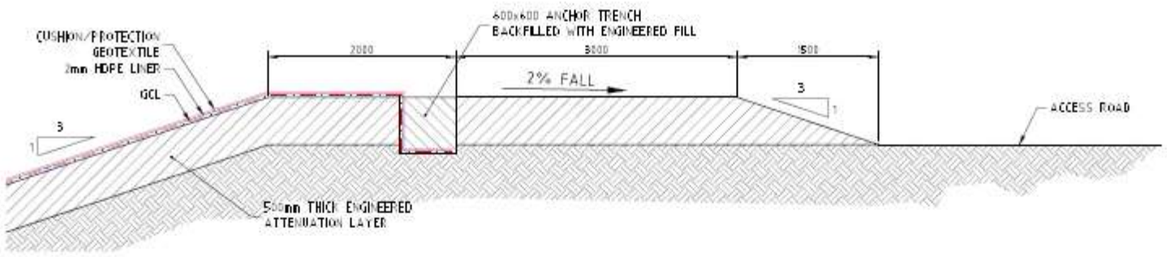
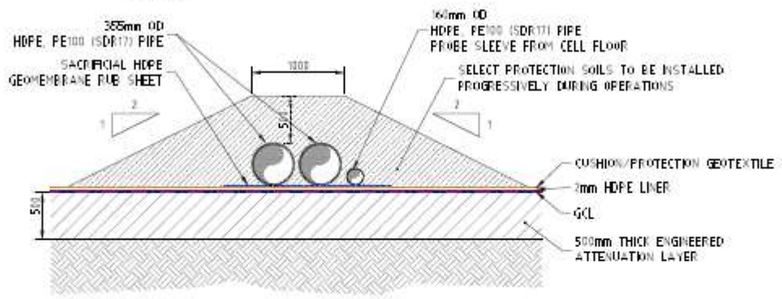


Figure 4: Premises layout – Cell 3/4 and Leachate pond 3 construction

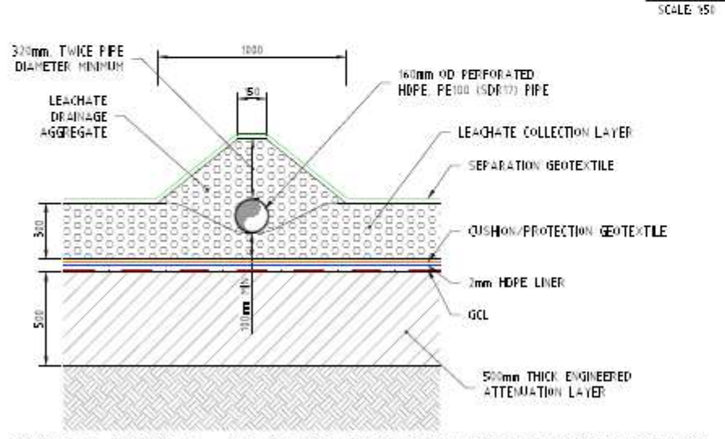
Figure 5: Cell 3/4 construction specifications



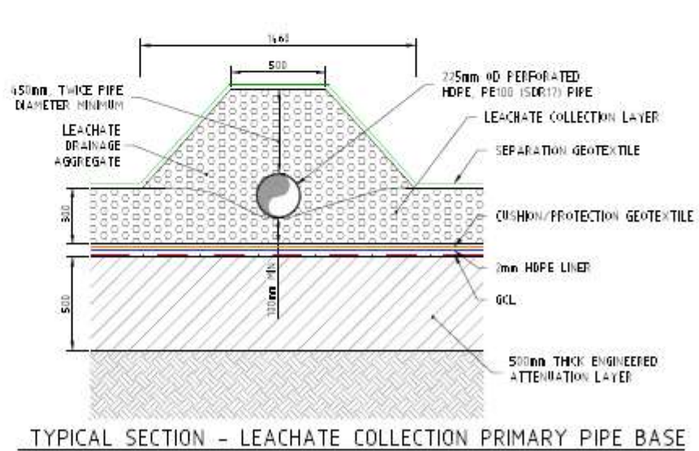
TYPICAL SECTION - BUND ADJACENT TO ACCESS ROAD
SCALE 1:50



TYPICAL SECTION - LEACHATE EXTRACTION RISER
SCALE 1:50



TYPICAL SECTION - LEACHATE COLLECTION SECONDARY PIPE BASE
SCALE 1:5



TYPICAL SECTION - LEACHATE COLLECTION PRIMARY PIPE BASE
SCALE 1:5

LEGEND

- GEOTEXTILE - SEPARATION LAYER
- GEOTEXTILE - CUSHION/PROTECTION
- HDPE LINER
- GCL

TENDER ONLY

talis consultants
ASSET
ENGINEERING
ENVIRONMENT
NOISE
SPATIAL
WASTE

Client: OPALVALE PTY LTD

NOTES

Project: CELL 3 & 4

Title: STANDARD DETAILS SHEET 1 OF 4

Scale: AS SHOWN @ A3 | Date: 24.06.2021
Drawn: AH | Checked: CS | Approved: CS
Job No: TW21027 | Dwg No: C-301 | Rev: B

Figure 6: Cell 3/4 leachate collection specifications

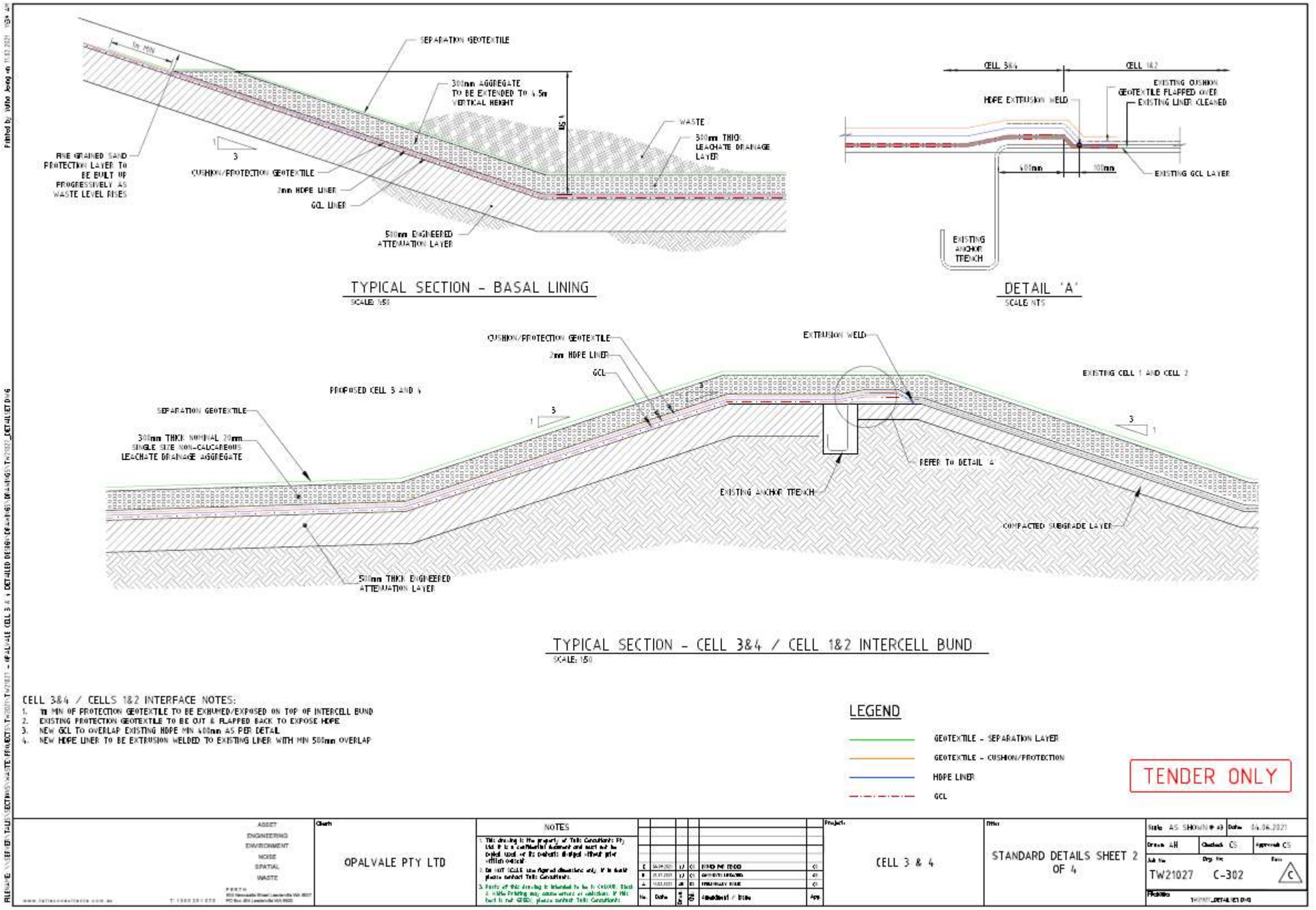


Figure 7: Cell 3/4 liner specifications

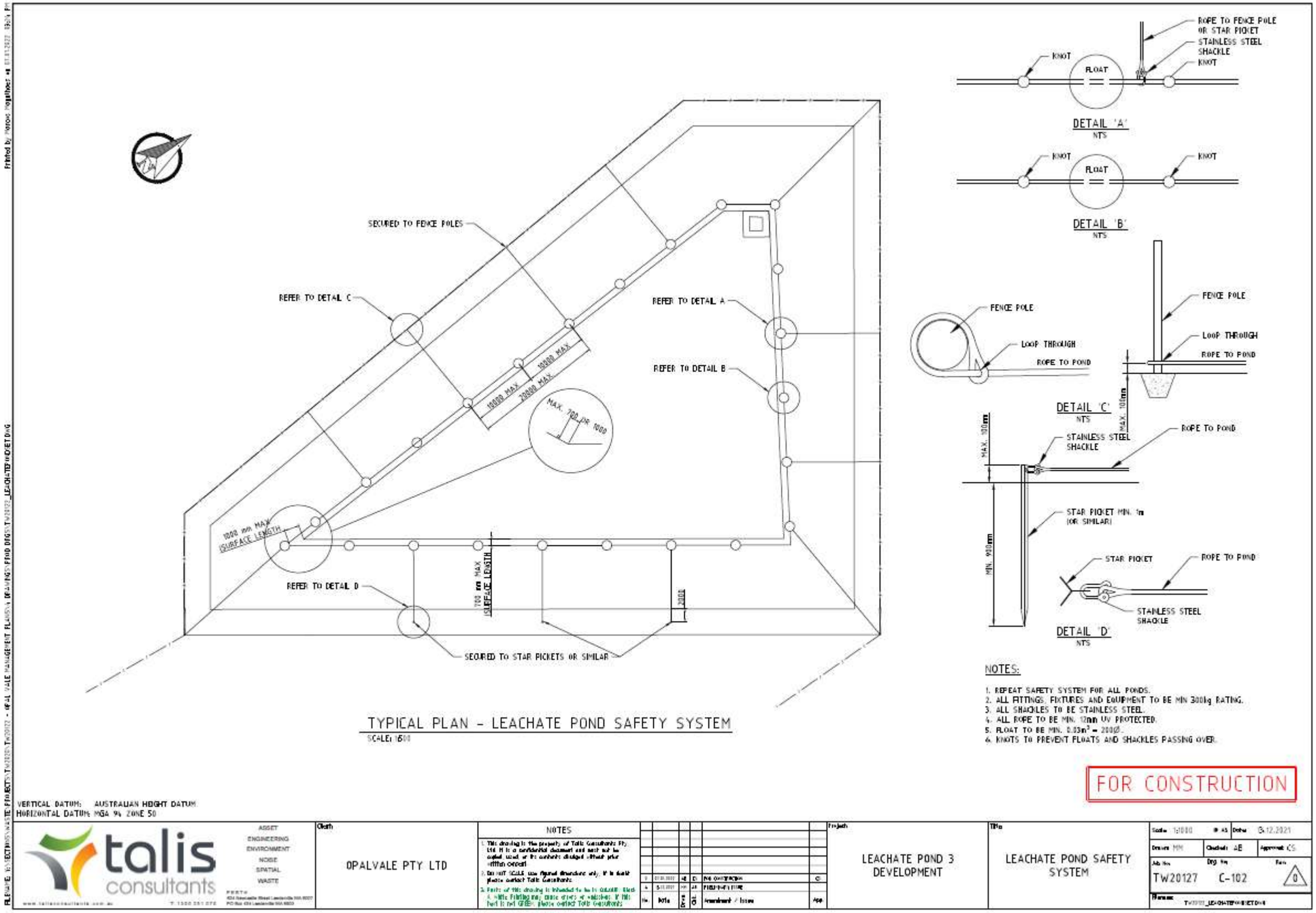
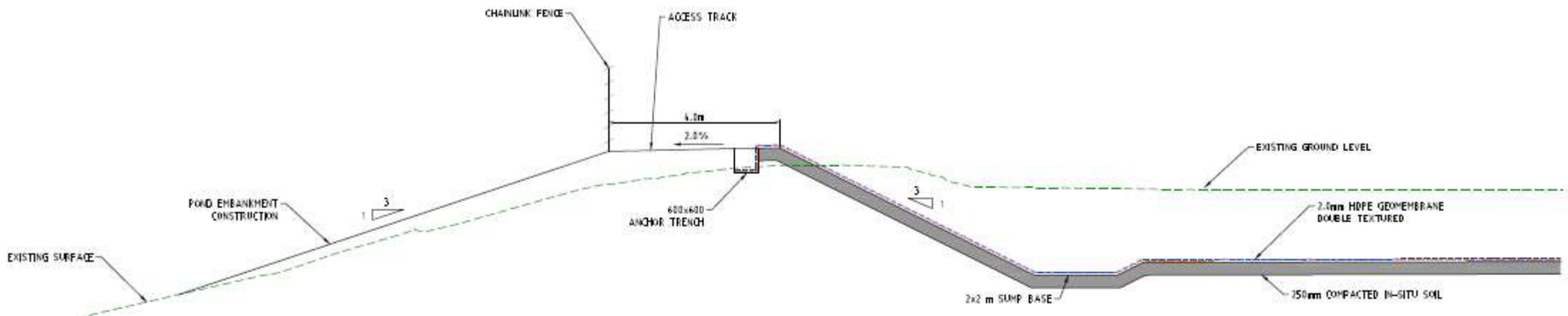
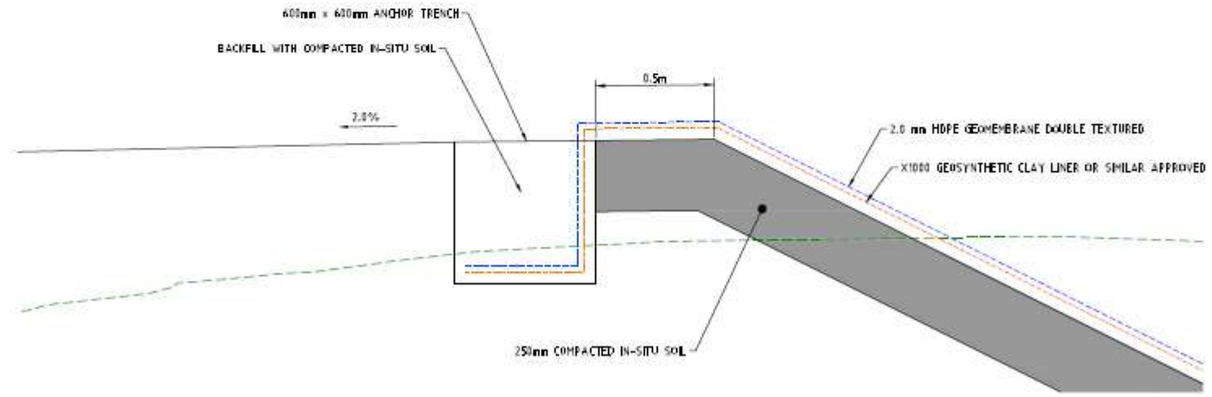


Figure 8: Leachate pond 3 construction specifications



TYPICAL CROSS-SECTION THROUGH POND

SCALE: 1:100



TRENCH AND LINING DETAIL

SCALE: x20

FOR CONSTRUCTION

VERTICAL DATUM: AUSTRALIAN HEIGHT DATUM
HORIZONTAL DATUM: MGA 94 ZONE 50

talis consultants
ASSET ENGINEERING ENVIRONMENT NOISE SPATIAL WASTE
PERTH
T: 1300 551 070

Client: OPALVALE PTY LTD

NOTES
1. This drawing is the property of Talis Consultants Pty Ltd. It is a confidential document and must not be copied, used or its contents divulged without prior written consent.
2. Do not SCALE this figured dimensions only. If in doubt please contact Talis Consultants.
3. Parts of this drawing is intended to be in COLOUR. Black & White Printing may cause parts of selection. If this part is not GREEN please contact Talis Consultants.

No	Date	Drwn	Ck	Amendment / Issue	App
3	27.01.2022	MM	AE	For Construction	CS
2	14.01.2022	MM	AE	Preliminary Issue	CS

Project: LEACHATE POND 3 DEVELOPMENT

Title: TYPICAL DETAILS

Scale: 1:1000 @ A3 | Date: 13.12.2021
Drawn: MM | Checked: AE | Approved: CS
Job No: TW20127 | Dwg No: C-301 | Rev: 0
Filename: TW20127_LEACHATEPONDDET.DWG

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Figure 9: Leachate pond 3 liner specifications

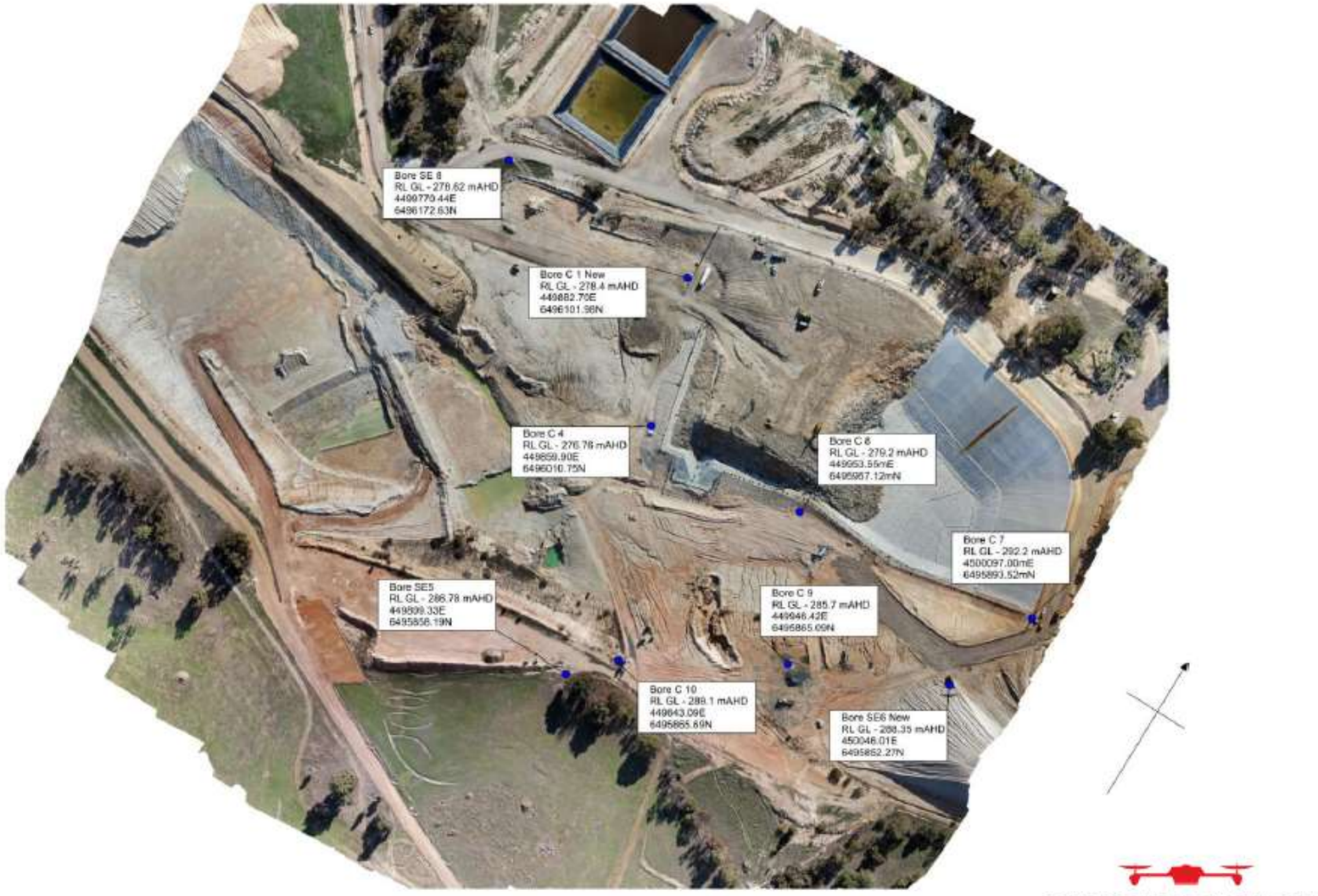

Figure 10: Location bores around the landfill footprint