Government of Western Australia
Department of Water and Environmental Regulation

Amended Works Approval

Works approval number	W4661/2010/1
Works approval holder	Alcoa of Australia Ltd
ACN	004 879 298
Registered business address	181-205 Davy Street BOORAGOON WA 6154
DWER file number	2010/004167-1
Duration	28/06/2010 to 27/12/2024
Date of amendment	7 April 2022
Premises details	Pinjarra Refinery South Western Highway, OAKLEY, WA 6208 Legal description - Lot 19 on Diagram 44739, Part of Lot 109 on Diagram 60089, Part of Lot 151 on Plan 10914, Lot 221 and Lot 222 on Plan 302638, Part of Lot 251 and Lot 252 on Plan 35963 As defined by the premises map in Schedule 1

Prescribed premises category description **(Schedule 1, *Environmental Protection Regulations 1987*)**
Category 46: Bauxite refining: premises (other than premises within paragraph (b) of category 5) on which alumina is produced from bauxite refining.

This amended works approval is granted to the works approval holder, subject to the attached conditions, on 7 April 2022, by:

Clarrie Green
Digitally signed by Clarrie Green
Date: 2022.04.07 12:29:54 +08'00'

Clarrie Green
A/MANAGER, PROCESS 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
25/06/2010	W4661/2010/1	Works approval granted.
25/06/2015	W4661/2010/1	Works approval holder-initiated amendment to extend duration from 27 June 2015 to 27 June 2016
23/06/2016	W4661/2010/1	Works approval holder-initiated amendment to extend duration from 27 June 2016 to 27 December 2016 (Amendment Notice 1)
23/12/2016	W4661/2010/1	Works approval holder-initiated amendment to extend duration from 27 December 2016 to 27 December 2020 (Amendment Notice 2)
25/10/2017	W4661/2010/1	Works approval holder-initiated amendment to remove decommissioned groundwater monitoring bores (Amendment Notice 3)
23/12/2020	W4661/2010/1	Works approval holder-initiated amendment to extend duration from 27 December 2020 to 27 December 2024
7/04/2022	W4661/2010/1	Works approval holder-initiated amendment to change Condition 1 Table 1 – Pumping station requirements

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.	Wick drains	Prefabricated Vertical Drain Colbonddrain CX1000 or equivalent installed at 4 m centres between the surface and base of the existing residue deposit within RSA1SE.	Schedule 1 Figure 2 Remaining phase 2 portion (RSA 1E)
2.	Sub-liner drainage	Minimum 500 mm layer of residue sand between the surface of the existing residue deposit within RSA1SE, and the synthetic liner.	Schedule 1 Figure 2 Remaining phase 2 portion (RSA 1E)
3.	De-liquoring bores	A minimum of three de-liquoring bores designed to reduce hydrostatic pressure and remove alkaline water from the existing RSA1SE residue deposit. Installed with pumps which direct recovered water to the perimeter drain.	Schedule 1 Figure 2 Deliquoring bore
4.	Dust control	A 60m x 60m triangular pitch spacing sprinkler system must be installed which covers the surface extent of RSA1SE The internal and external RSA1SE embankment walls shall be applied with dust suppressant or planted with grass.	Schedule 1 Figure 2 New sprinkler /RSA 1E Sprinkler lateral
5.	Perimeter drain	Constructed with a minimum base width of 1 m and grade of 1V:1000H. Lined with a minimum 1.5 mm thick Solmax 460-9000 series synthetic HDPE liner (or equivalent) that is part of, or connected to the RSA1SE synthetic liner.	Schedule 1 Figure 2 New HDPE lined perimeter drain
6.	Perimeter drain pipe	A minimum of two NB 450, PN 12.5 HDPE pipelines directing water to the RSA1N perimeter drain.	Schedule 1 Figure 2 Perimeter drain pipe

	Infrastructure	Design and construction / installation requirements	Infrastructure location
7.	Residue delivery pipeline	A NB 400 carbon steel standard weight pipe header pipeline with a valve station, and a DN 400, PN 12.5 HDPE discharge pipe for delivery of residue into RSA1SE.	Schedule 1 Figure 2 Temp mud line
8.	Pumping station	Comprises three separate systems for the decant, sub-liner and under drainage. The sub-liner and under drainage system will each consist of a submersible pump located in a vertical concrete well liner with minimum diameter of 1800 mm and a concrete base. The above ground diesel pump will be located on a sand pad. The pump must be installed within a sound attenuating enclosure. The works approval holder must conduct noise validation of the diesel pump during the Factory Acceptance Test (FAT). Noise validation of the diesel pump must demonstrate that noise emissions do not exceed 72 dB(A) at 7 m, prior to ongoing operation of the diesel pump.	Schedule 1 Figure 2 and Figure 4

2. The works approval holder must:

(a) construct and/or install the critical containment 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 2.

Table 2: Critical containment infrastructure design and construction / installation requirements

	Infrastructure	Design and construction / installation requirements	Infrastructure location
1.	RSA1SE embankment raise	Constructed via the upstream construction method in accordance with the design in Schedule 1 Figure 3. Constructed using residue sand compacted to achieve an average compaction of 92% Dry Density Ratio at a moisture content equivalent to -1% to +3% of the Optimal Moisture Content as determined by the Modified Method AS 1289 (or equivalent), and no compaction result below 90% of Modified Dry Density. Embankment crest constructed to a maximum height of 50 mAHD. Embankment crest a minimum of 8 m width with minimum 3% slope toward the inner embankment. Outer embankment slopes shaped to 1Vertical:4Horizontal Inner embankment slopes shaped to 1Vertical:3Horizontal Embankment raise height a maximum of 7.3 m above the crest of the existing RSA1 embankment wall. Embankments must have sufficient storm surge capacity to contain a 72 hour, 1:100 Annual Recurrence Interval rainfall event above the normal operating pond.	Schedule 1 Figure 2 New sand embankment walls
2.	RSA1SE synthetic liner	The surface of RSA1SE, embankments and perimeter drains shall be lined with a minimum 1.5 mm thick Solmax 460-9000 series synthetic HDPE liner (or equivalent). Weld seams shall be used to join the liner with seam integrity to be tested in accordance with ASTM D6392, ASTM D5641 and GRI GM6. Liner shall be tied into existing RSA 1 North and RSA1 South liners. The installed liner shall be subject to membrane sheet inspection and destructive testing.	Schedule 1 Figure 2 Above liner/RSA 1E liner extents
3.	Under drainage	Comprises a minimum 700 mm layer of residue sand installed over top of the synthetic liner which surrounds a DN 100, Class SN 20 perforated pipe with a polypropylene Geotextile Sleeve collector pipe (or equivalent), connected to a DN 110 (or larger), PN 12.5 HDPE header transfer pipe linked to the pumping station.	Schedule 1 Figure 2 Underdrainage system

Compliance reporting

3. The works approval holder must within 60 calendar days of each item of infrastructure and/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.

4. The Environmental Compliance Report required by condition 1, must include as a minimum the following:

(a) certification 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.

5. 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.

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

(a) certification by a suitably qualified and experienced tailings design or 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) records of all quality assurance/control testing undertaken;

(d) photographic evidence of the installation of the infrastructure; and

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

Operations phase

Commencement

7. The works approval holder may only commence operating 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 5 meets the requirements of that condition; or

(b) where at least 30 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; and

(c) where a licence for that item of infrastructure is granted in accordance with Part V of the Environmental Protection Act 1986 and subject to the conditions of that licence.

Records and reporting (general)

8. 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.

9. 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 2; and

(b) complaints received under condition 8.

10. The books specified under condition 9 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 3 have the meanings defined.

Table 3: Definitions

Term	Definition
ACN	Australian Company Number
ASTM D5641	ASTM D5641/ D5641M Standard Practice for Geomembrane Seam Evaluation by Vacuum Chamber
ASTM D6392	ASTM D6392 Standard Test Method for Determining the Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods
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.
DWER	Department of Water and Environmental Regulation
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).
GRI GM6	GRI Test Method GM6 - Practice for Pressurised Air Channel Test for Dual Seamed Geomembranes

Term	Definition
premises	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.
RSA	Residue storage area
suitably qualified and experienced tailings design or geotechnical engineer	means a person who: (a) holds an engineering degree; and (b) has a minimum of five years' experience working in the area / field of design engineering and certification of tailings storage facilities.
operating	refers to the operation of the infrastructure and equipment, identified under this works approval that is authorised for that purpose, through the deposition of residue into RSA1 SE, 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

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

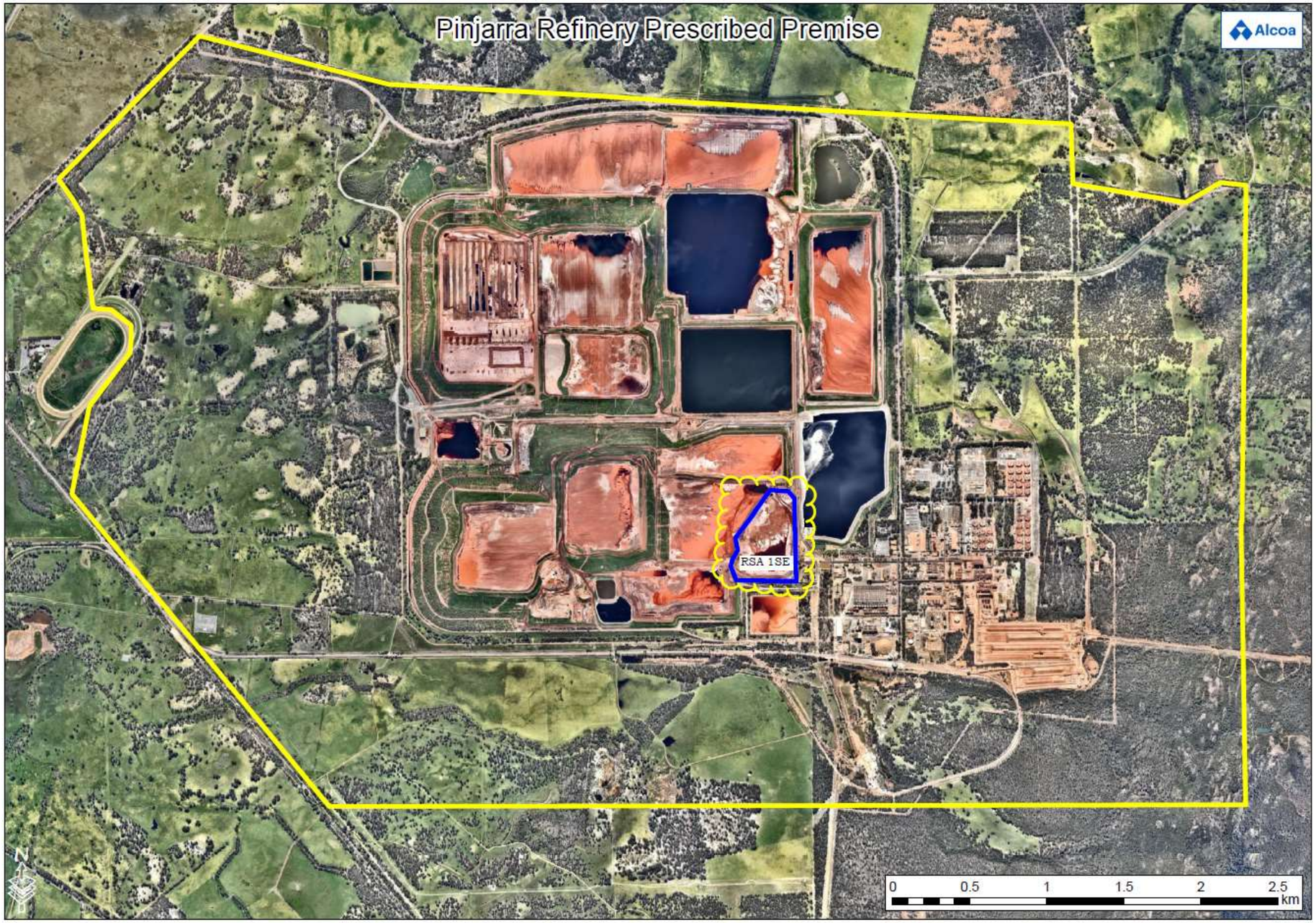


Figure 1: Map of the boundary of the prescribed premises and location of RSA1SE within the premises boundary

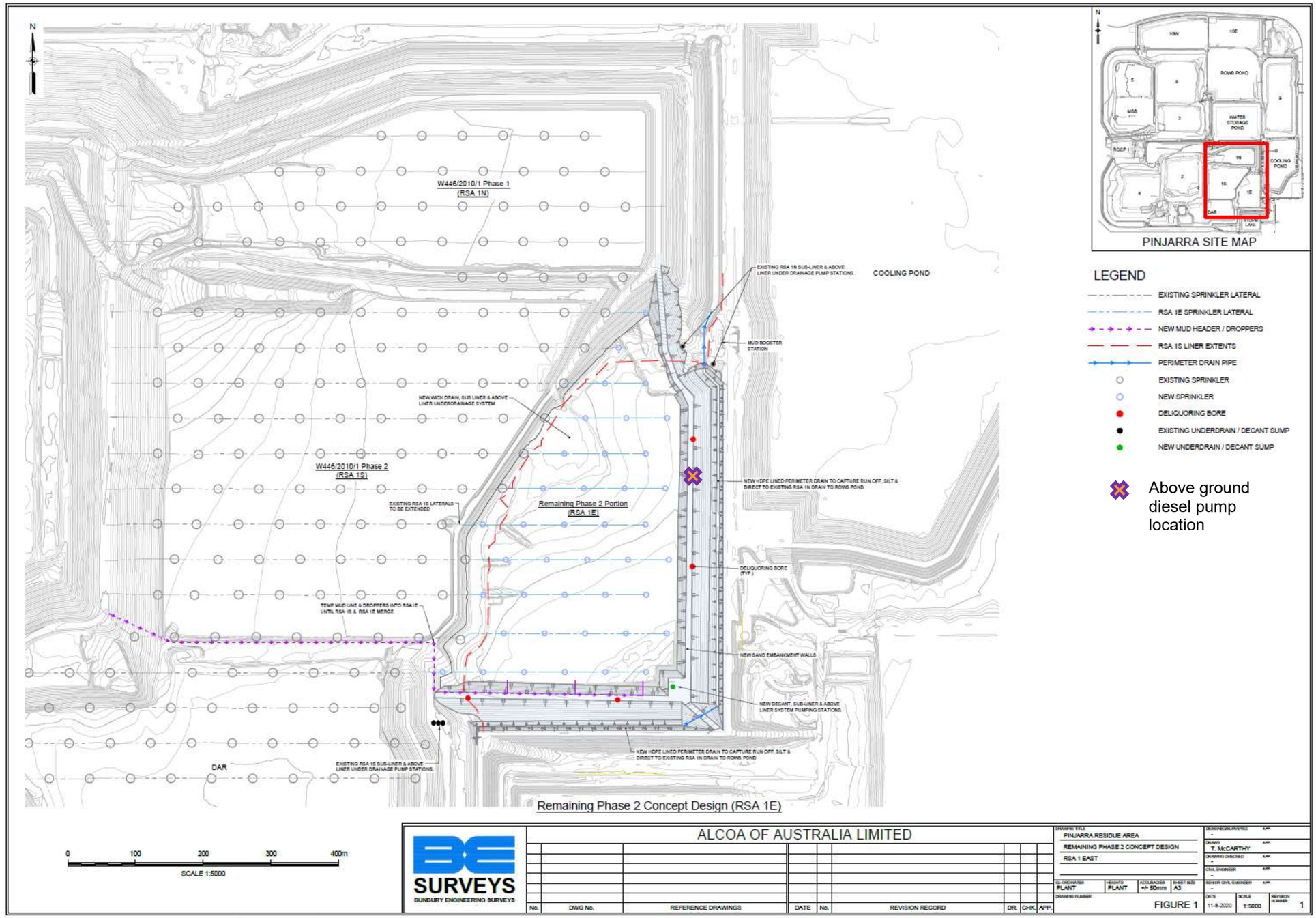
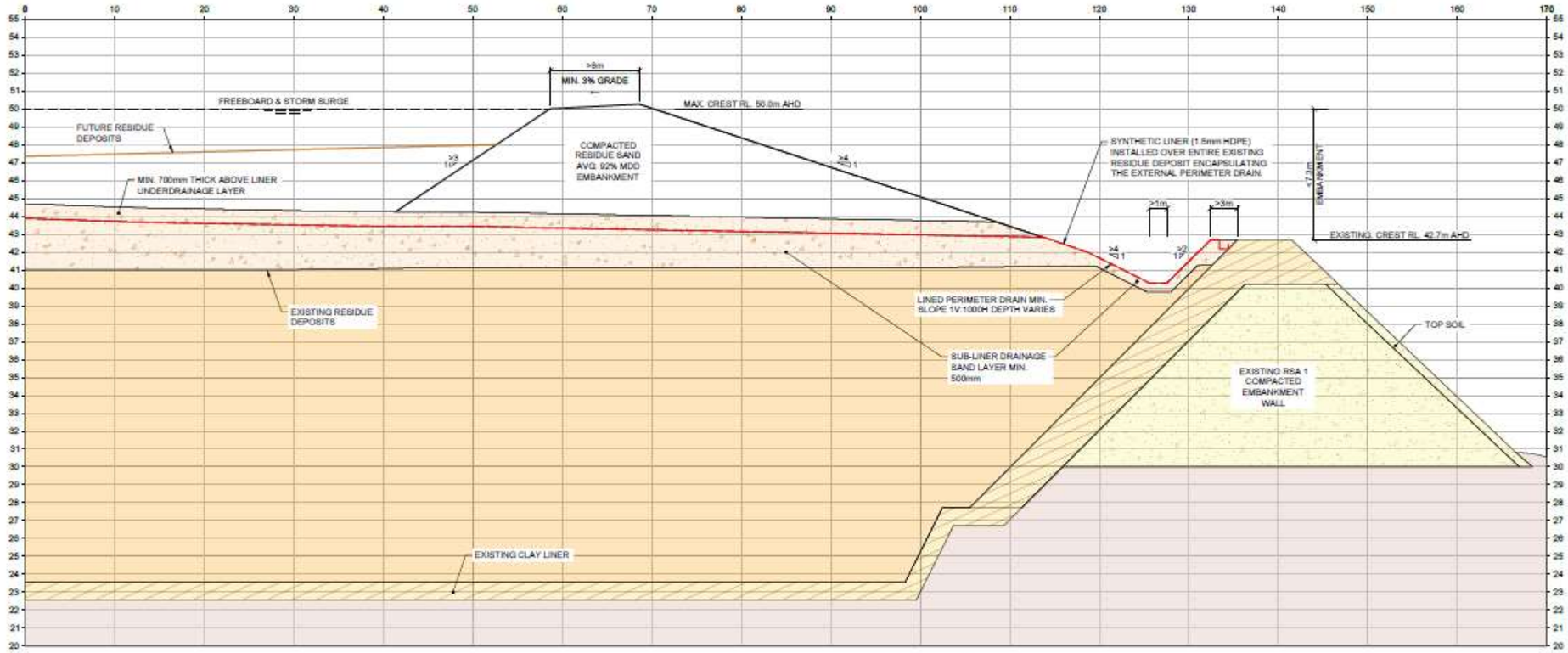


Figure 2: Map of the infrastructure locations and works area



RSA 1SE SOUTH & EAST WALL CROSS SECTION (1H:2V)

NOTES

1. DESIGN PARAMETERS (WALL HEIGHT & SLOPES) TO BE DETERMINED BY GEOTECNICAL ANALYSIS

SURVEYS
BUNBURY ENGINEERING SURVEYS

ALCOA OF AUSTRALIA LIMITED

No.	DWG No.	REFERENCE DRAWINGS	DATE	No.	REVISION RECORD	DR.	CHK.	APP.

DRAWING TITLE: PINJARRA RESIDUE AREA
RSA 1 SOUTH EAST
FIGURE 3
EMANKMENT DESIGN SECTION

DRAWN: T. McCARTHY
DRAWING NUMBER: PJ-RES-1E-20264
DATE: 15-12-20
SCALE: 1:500
SHEET SIZE: A3
ACCURACY: +/- 50mm

Figure 3: RSA1SE embankment design

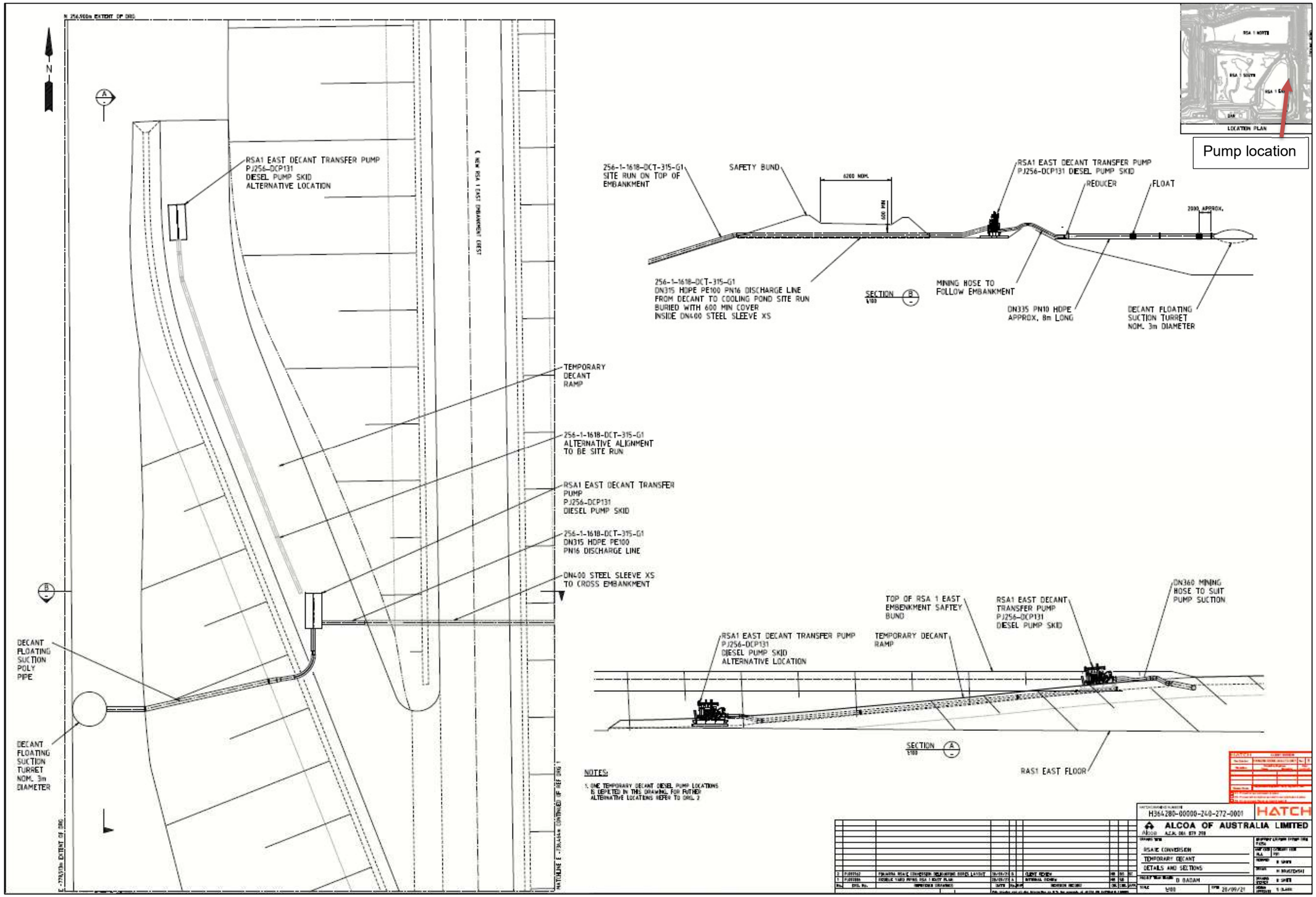


Figure 4: Above ground decant pump – construction details and location (drawing number PJ097884 – Rev B)