

**Alcoa of Australia  
Limited**

**Pinjarra Alumina  
Refinery: L5271/1983  
Amendment Supporting  
Document**



**May 2025**

Version	Description of Changes	Date	Approved by
0	Final Version Issued for release	28/05/25	<div></div>

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## 1. Introduction

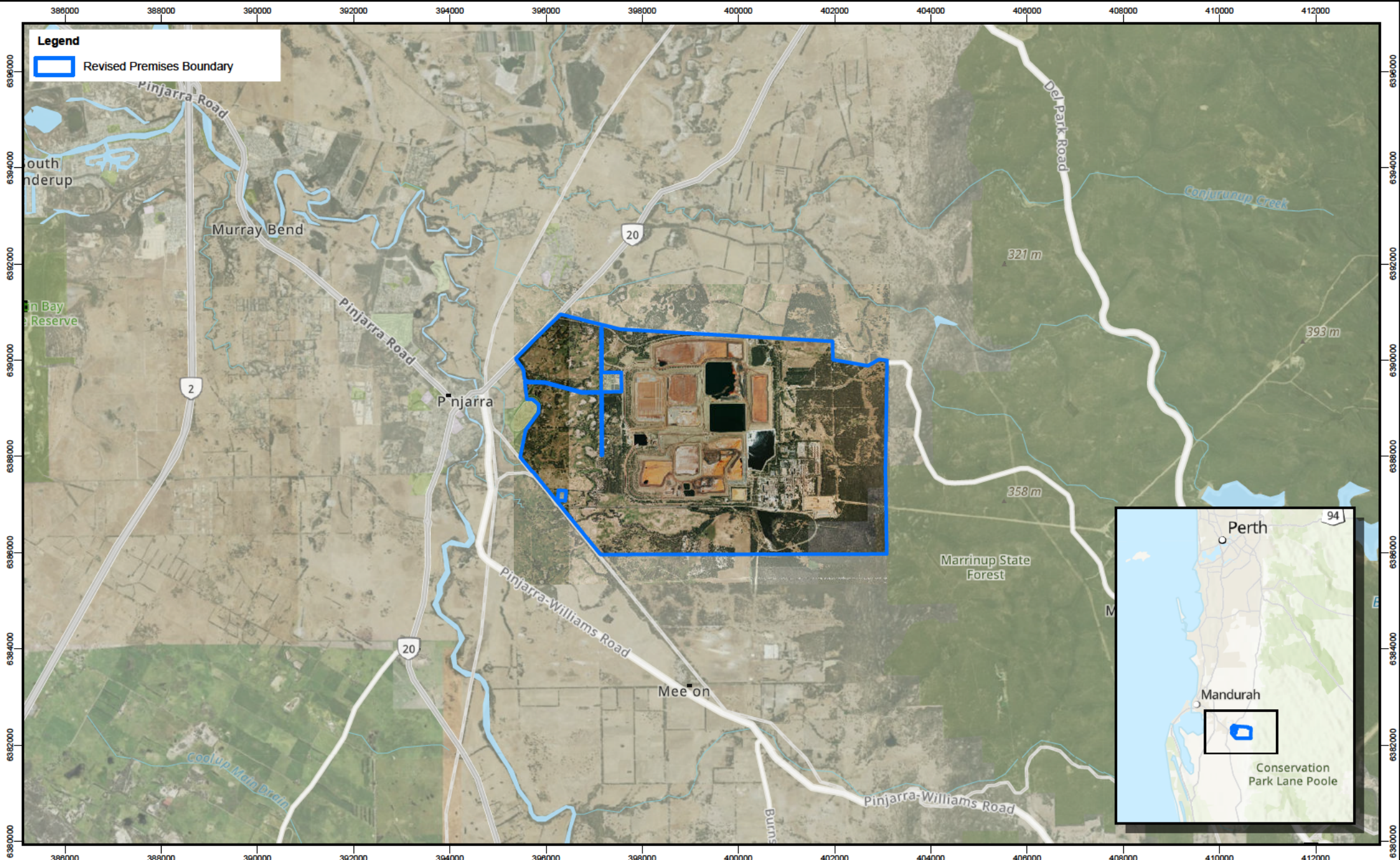
Alcoa of Australia Limited (Alcoa) is the owner and proponent of the Pinjarra Alumina Refinery (Pinjarra Refinery), ~6 km east of Pinjarra and ~80 km south of the Perth Central Business District in Western Australia. The location is shown in Figure 1-1.

Operations at the Pinjarra Refinery are approved under Environmental Licence L5271/1983/14. The approved Prescribed Premises is shown in Figure 1-2.

This supporting document has been prepared to support the following amendments to Environmental Licence L5271/1983/14:

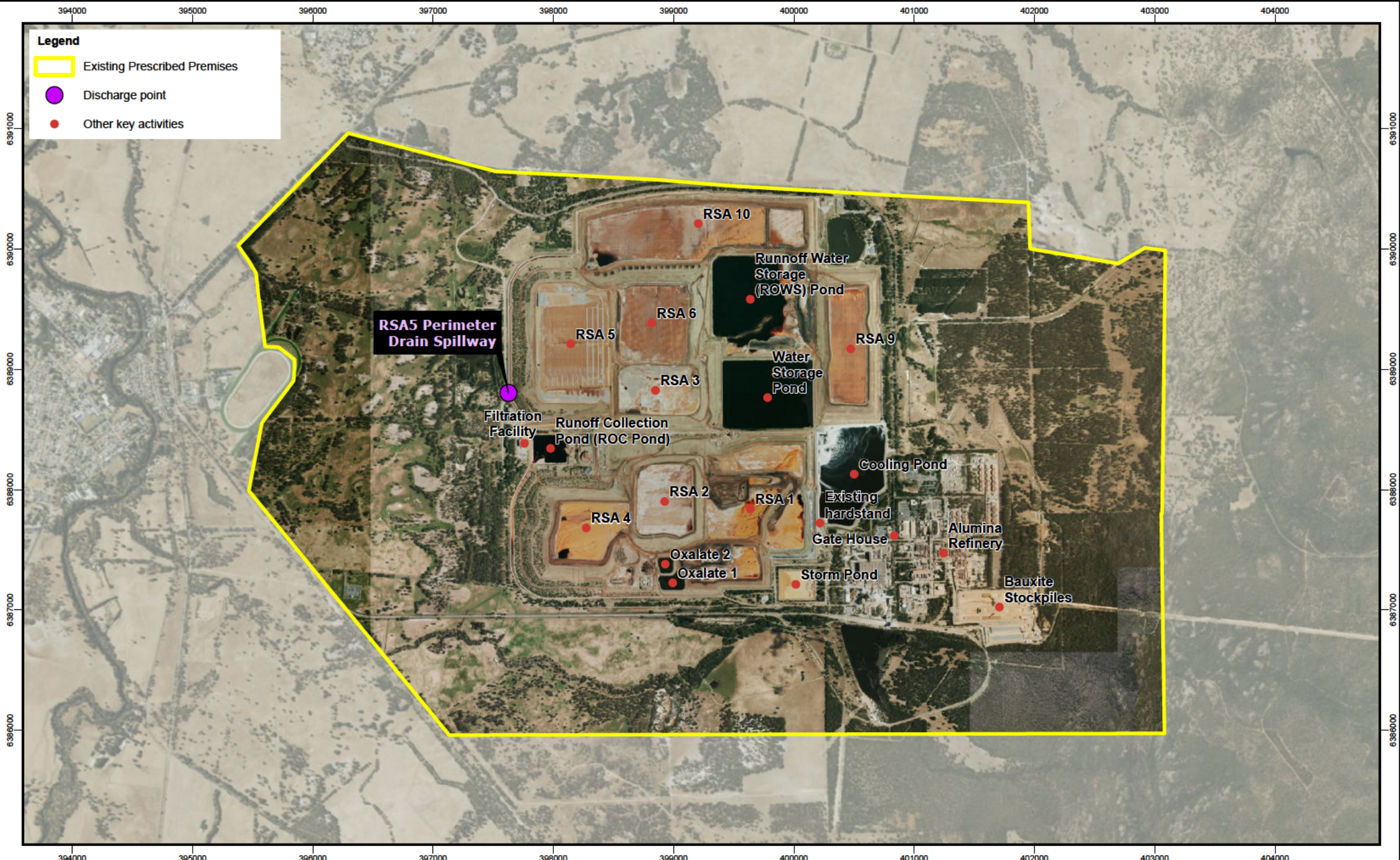
- Update the description of the Prescribed Premises on L5271/1983/14.
- Remove completed construction compliance conditions.
- Clarification of the licence limits for airborne particulates for each monitoring method.
- Allow the acceptance of washwater at the Pinjarra Refinery.
- Allow for spills outside of secondary containment at the Filtration Facility and mandate that these are immediately recovered and disposed of inside the Residue Storage Area (RSA).

The Licence Amendment Application has been prepared in accordance with the requirements of Section 59B of the *Environmental Protection Act 1986* (EP Act) and the Industry Regulation Guide to Licencing (DWER, 2019). This supporting document is Attachment 3B of the Department of Water and Environmental Regulation (DWER) Application Form.



**Legend**  
Revised Premises Boundary

 0 1.25 2.5 5 km Scale: 1:100,000 AGD 1984 AMG Zone 50		<b>L5271/1983/14 Amendment</b>
		<b>Figure 1-1 Location</b>
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## 2. Premises Details

### 2.1 Prescribed Premises Categories

The Prescribed Premises categories on Environmental Licence L5271/1983/14 are shown in Table 2-1.

**Table 2-1: L5271/1983/14 Existing Prescribed Premises Categories**

Prescribed premises category description
Category 46: Bauxite refining
Category 52: Electric power generation
Category 64: Class II or III putrescible landfill site
Category 67: Fuel burning

### 2.2 Land Tenure and Ownership

All land inside the revised Prescribed Premises is freehold land held by Alcoa. Allotments are listed in Section 3.1. The Cooling Pond, where washwater will be accepted is on Lot 151 on Plan 10914 and Lot 501 on DP417051.

### **3. Proposed Licence Amendments**

#### **3.1 Acceptance of Industrial Washwaters**

##### **3.1.1 Transport and Receipt**

Alcoa proposes to receive up to 25,000 kL per annum of industrial washwaters. This accounts for ~0.15% of the ~16.5 GL annual water demand at the Pinjarra Refinery.

Washwater from existing suppliers will be trucked to site in bulk tankers, although intermediate bulk containers or drums may be used in future. Trucks arriving on site must be signed in at the gatehouse. For washwater that is also a controlled waste, Alcoa will ensure that the *Environmental Protection (Controlled Waste) Regulations 2004* (Controlled Waste Regulations) are complied with.

Washwater will be received at the southern end of the at the Cooling Pond. The location of the Cooling Pond is on Figure 3-3 and the location where washwater will be received in on Figure 3-1.

The Cooling Pond has a high density polyethylene (HDPE) liner and currently stores process water for reuse. Water quality in the Cooling Pond is alkaline (average Total Alkalinity of 18.5 g/L and average Total Caustic of 8.4 g/L). Trucks with washwater will reverse park on an existing hardstand adjacent to the embankments. Hoses will be connected and run down the lined Cooling Pond embankment; and tank or container contents will passively flow or be pumped or vacuumed out into the Cooling Pond.

The Cooling Pond has a maximum capacity of ~3.3 GL; however, an operational capacity of ~2.5 GL is maintained to ensure runoff from large rainfall events can be captured. The operational capacity is ~100 times larger than the annual volume of washwater proposed to be received and washwater is unlikely to have a significant effect on process water quality. At operational freeboard a 20 kL load is 0.0025% of the remaining 0.8 GL of freeboard and the 25,000 kL/annum limit is ~3.2% of remaining freeboard. The acceptance of washwater will not result in accidental overtopping of the Cooling Pond.



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AGD 1984 AMG Zone 50

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Alcoa

Author: wang

Rev: A A4

Date Printed: 12/05/2025

L5271/1983/14 Amendment

Figure 3-1 Cooling Pond

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### 3.1.2 Washwater Quality

Alcoa uses flocculants, stabilisers and dewatering aids in bauxite processing. These chemicals are currently manufactured by two suppliers with facilities in the Kwinana Industrial Area. As suppliers change in future, washwater may be accepted from other chemical manufacturers.

Tanks and vats are periodically washed out during manufacturing. The existing supplier captures and reuses washwater to the extent possible, however eventually treats and store washwater in tanks for removal offsite. Washwater contains residues of chemicals used by Alcoa as well as other chemicals produced by the manufacturer.

General information on the classification and treatment of washwater is provided in Table 3-1 and washwater quality in Table 3-2. The Safety Data Sheets (SDSs) from the current chemical supplier is included in Appendix 1.

After treatment, washwater will either be classified as:

- Controlled waste L150 - Industrial Washwaters contaminated with a controlled waste.
- Not a controlled waste.

**Table 3-1: General information on washwater**

Aspect	Information
Hazard ID	Not hazardous
Description	LW1 Anionic Flocculant
Treatment	pH treatment (6 - 9) hydrogen peroxide treatment to remove dissolved polymers Filtration to 1000 µm
Flammability	Not Flammable

**Table 3-2: Washwater Quality**

Analyte	Units	Ecolab	
		Test Result	Specification
pH	-	7.3	6 - 9
EC	µS/cm	180	30,000
TDS	mg/L		
BOD	mg/L	740	
COD	mg/L	2,200	10,000
Total N	mg/L	31	
Total P	mg/L	0.25	
TSS	mg/L	<5	
Oil and Grease in Water	mg/L	<5	

### 3.1.3 Amendment to Condition S1(a)

Third Party producers of chemical flocculants used in alumina refining produce treated industrial washwater which can be used as process water rather than being disposed of to trade waste. Alcoa proposes to accept the treated industrial washwater at the Cooling Pond, which will marginally reduce groundwater and surface water abstraction requirements for processing operations.

Condition S1 sets out waste control conditions at the Pinjarra Refinery. The proposed acceptance of industrial washwater from other premises requires an amendment to Condition S1(a). The Alcoa Booragoon office is also moving to Perth CBD and Condition S1(a) should be amended so that wastes from the new Perth office can be accepted at the Pinjarra Refinery.

The existing condition is shown in *italics* below. Proposed text to be removed is in ~~strikethrough~~ and additional text is in *blue*.

S1(a) *The Licence Holder is permitted to dispose of wastes generated at the premises by the Licence Holder and wastes ~~from the Alcoa Booragoon Office, Alcoa Peel Regional Office, Huntly and Willowdale Minesites, Kwinana and Wagerup refineries, Alcoa Farmlands Operations, and Alcoa Bunbury Port Facility~~ of the types listed in Column 1 of Table 9 at the locations detailed in Column 2 of Table 9. Wastes may only be accepted from the following premises:*

- *Alcoa Booragoon Office*
- *Alcoa Perth Office*
- *Alcoa Peel Regional Office*
- *Huntly and Willowdale Minesites*
- *Kwinana and Wagerup Refineries*
- *Alcoa Farmlands Operations*
- *Alcoa Bunbury Port Facility*
- *Chemical Manufacturers (industrial washwaters only)*

<b>Table 9: Waste Permitted for Disposal</b>	
<b>Column 1</b>	<b>Column 2</b>
<b>Waste Type</b>	<b>Location</b>
<i>Bayer process waste</i>	<i>RSA</i>
<i>Waste meeting acceptance criteria specified for Class II landfills in the document produced by the Department, and titled "Landfill Waste Classifications and Waste Definitions 1996 (as amended from time to time)" and hydrocarbon contaminated wastes</i>	<i>RSA</i>
<i>Asbestos waste</i>	<i>Landfill area within RSA</i>
<i>Hydrocarbon waste oil</i>	<i>Landfill area within RSA</i>
<i>Industrial washwaters contaminated with a controlled waste (L150) or industrial washwaters that are not controlled wastes.</i>	<i>Cooling Pond</i>

## 3.2 Other Amendments

### 3.2.1 Description of the Prescribed Premises

Alcoa has reviewed the properties listed as part of the Prescribed Premises for Environmental Licence L5271/1983/14. The legal names of Alcoa held allotments need to be updated, and certain areas of land not owned by Alcoa should be removed from the Prescribed Premises. No additions to the Prescribed Premises are required.

The Prescribed Premises includes the following freehold allotments:

- Part of Lot 109 on Diagram 60089, held by Alcoa.

- Part of Lot 151 on Plan 10914, held by Alcoa.
- Lot 221 on Deposited Plan 302638, held by Alcoa.
- Lot 222 on Deposited Plan 302638, held by Alcoa.
- Lot 301 on Deposited Plan 35411, held by Alcoa.
- Lot 302 on Deposited Plan 35411, held by Alcoa.
- Part of Lot 501 on Deposited Plan 417051, held by Alcoa.
- Lot 252 on Deposited Plan 35963, held by Alinta Co-Generation (Pinjarra) Pty Ltd (Alinta).

Certificates of title for lots in the Prescribed Premises are provided in Attachment 1A and spatial data in Attachment 2 to the application form. Alcoa holds all allotments apart from Lot 252 on Deposited Plan 35963 where the co-generation plant, in the middle of the Pinjarra Refinery, is located. The co-generation plant is operated under L5271/1983/14 in accordance with the following agreements between Alcoa and Alinta:

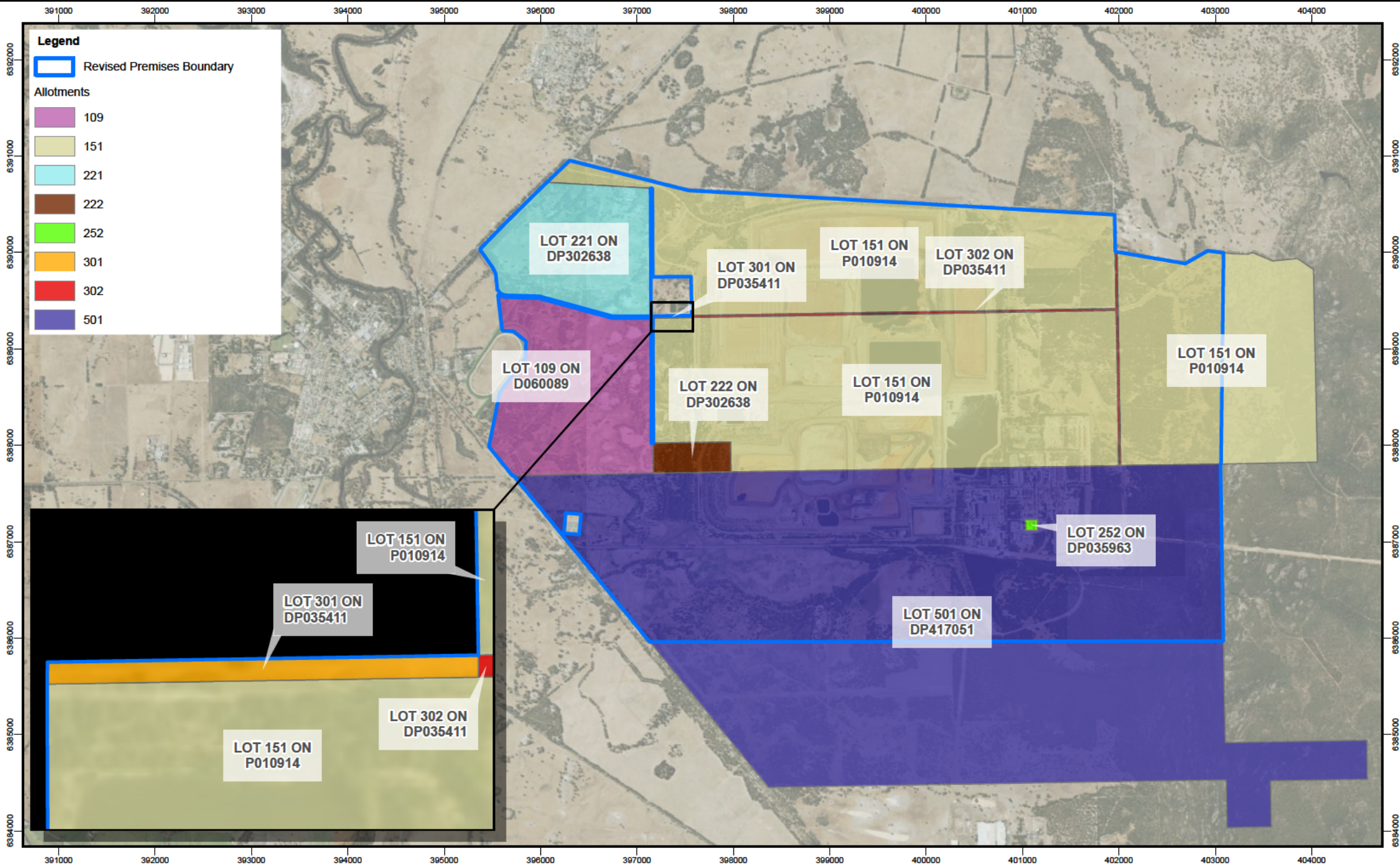
- Steam Supply Agreement.
- Operating and Maintenance Agreement.

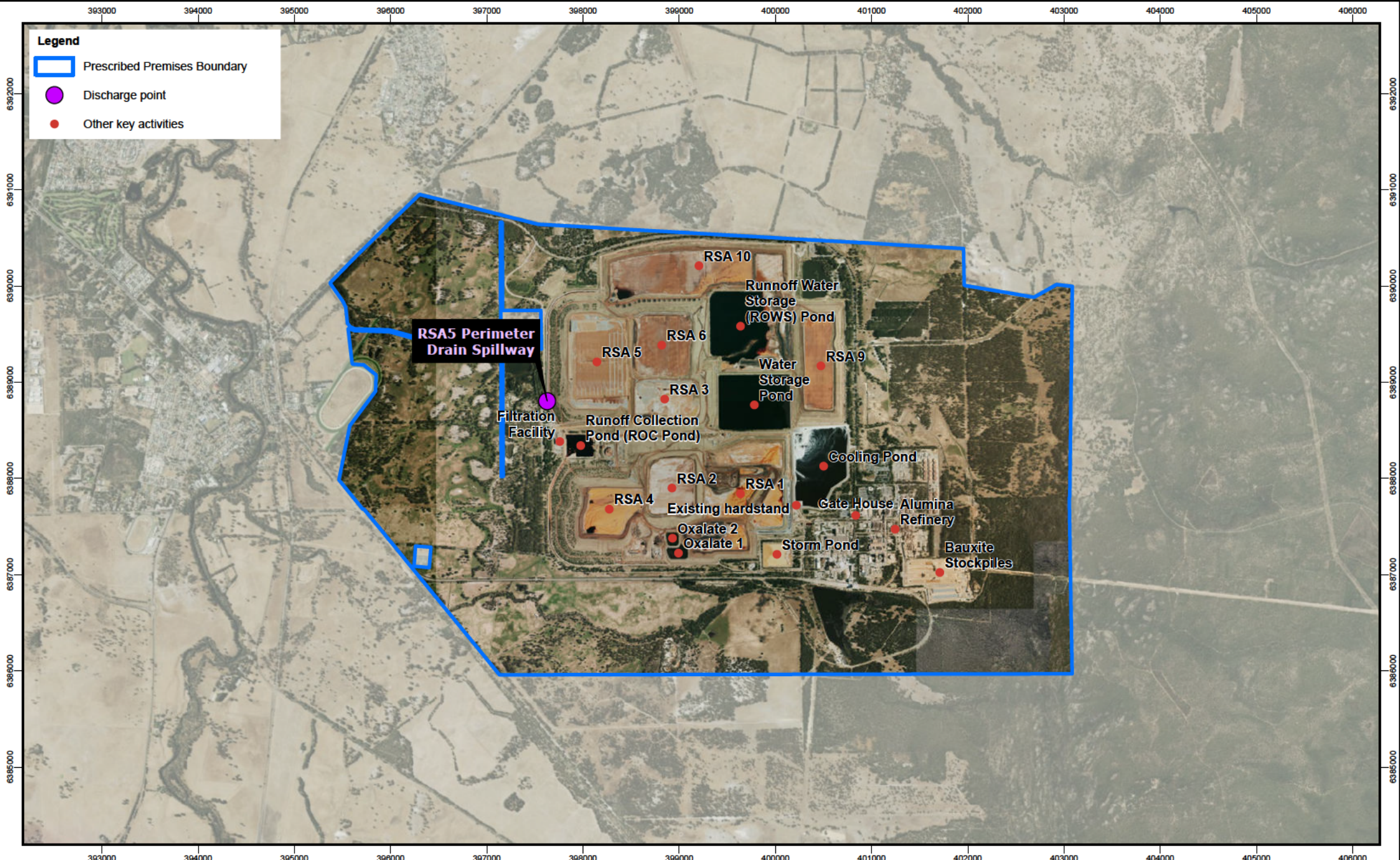
No areas are proposed to be added to the Prescribed Premises. Areas removed include:


- Lot 19 on Diagram 44739. This land is not held by Alcoa and is inside the Prescribed Premises of L5973/1992/12, held by the Water Corporation.
- Road reserves which are not Alcoa-owned land.

The current Prescribed Premises is shown in Figure 1-2. The revised Prescribed Premises with allotments is shown in Figure 3-2. A revised Prescribed Premises map, to replace Figure 1 of Environmental Licence L5271/1983/14 is provided in Figure 3-3. A table to replace Table 12 in Schedule 1 of L5271/1983/14 is below.


<b>Table 12: Premises infrastructure location</b>			
<b>Description</b>	<b>Lot</b>	<b>Plan/Diagram</b>	<b>Locality</b>
<i>Paddock West of RSA</i>	<i>Part of Lot 109</i>	<i>D60089</i>	<i>Pinjarra</i>
<i>RSA and Refinery</i>	<i>Part of Lot 151</i>	<i>P10914</i>	<i>Oakley</i>
<i>Area West of RSA</i>	<i>221</i>	<i>DP302638</i>	<i>Pinjarra</i>
<i>Southwest Corner of RSA</i>	<i>222</i>	<i>DP302638</i>	<i>Oakley</i>
<i>Paddock West of RSA</i>	<i>301</i>	<i>DP35411</i>	<i>Oakley</i>
<i>RSA</i>	<i>302</i>	<i>DP35411</i>	<i>Oakley</i>
<i>RSA and Refinery</i>	<i>Lot 501</i>	<i>DP417051</i>	<i>Oakley</i>
<i>Pinjarra Cogeneration Plant</i>	<i>252</i>	<i>DP35963</i>	<i>Oakley</i>






  
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L5271/1983/14 Amendment

Figure 3-3 Revised Prescribed Premises

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### 3.2.2 Completed Conditions to be Removed

Construction of the RSA5 Perimeter Drain Spillway was approved via a Licence Amendment and not a Works Approval. Conditions WSK1, WSK2 and WSK3 permit the installation of the spillway as follows:

- WSK 1 sets out the location and design requirements.
- WSK 2 requires a compliance audit with WSK 1 and the submission of an audit report to the CEO.
- WSK 3 sets out the requirements for the audit and report in WSK 2.

Construction of the RSA5 Perimeter Drain Spillway was completed on 22/12/2021. The compliance audit report required by condition WSK2 was submitted to DWER on 18 February 2022 within 60 days of the completion of construction and this report met the requirements of Condition WSK 3.

Alcoa reported the completion of the RSA5 Perimeter Drain Spillway in the 2021 to 2024 Annual Environmental Reports. These conditions are completed.

Conditions WSK1, WSK2, WSK3 and associated Figure 2, Figure 3 and Figure 4 are requested to be removed from L5271/1983/14.

### 3.2.3 Amendment to Condition A3

Both continuous monitoring for airborne particulates and annual stack testing is mandated under Environmental Licence L5271/1983/14. There is potential ambiguity over the application of licence limits and exceptions for the results of monitoring under the two methods and a clearer wording is proposed.

Conditions A1 to A15 of L5271/1983/14 set air pollution control conditions:

- Condition A8 requires biannual stack testing of particulate concentrations in the calciner stacks.
- Condition A15 requires continuous monitoring of particulates in the calciner stacks.
- Condition A3 sets limits for particulate concentrations in each calciner stack.
- Condition A4 provides exemptions for compliance with Condition A3.
- Condition A5(a) requires that feed to the calciners is shut down if the limits are exceeded for 60 consecutive minutes.

While Condition A3 does not specify a time period, Condition A5(a) requires that the feed to any calciner should be shut down only if the limit is exceeded for 60 consecutive minutes. As currently worded, Condition A3 appears to be based on the biannual stack testing required under Condition A8 and not the continuous monitoring required under Condition A15.

The condition should be amended to differentiate between stack testing and continuous monitoring results.

The existing condition is shown in *italics* below, with additional text in *blue*.

A3 Subject to Condition A4, the Licence Holder shall not exceed any limit for an emission source specified in Table 2

- i. for monitoring under condition A8.
- ii. for continuous monitoring completed under condition A15(a) for more than 60 consecutive minutes.

<b>Table 2: Licence Limits</b>		
<b>Emission Source(s)</b>	<b>Parameter</b>	<b>Licence Limit</b>
<i>Calciners 1, 2, and 3 as individual emission points</i>	<i>Particulates</i>	<i>250 mg/ m<sup>3</sup>*<sup>x</sup></i>
<i>Calciners 4, 5, 6 and 7 as individual emission points</i>	<i>Particulates</i>	<i>150 mg/ m<sup>3</sup>*<sup>x</sup></i>

\* expressed dry at 0 degrees Celsius and 1.0 atmosphere (101.325 kilopascals)

<sup>x</sup> the addition of diluting gases shall not be used to achieve compliance with emissions limits.

### 3.2.4 Amendment to Condition R1

Condition R1 of L5271/1983/14 mitigates contamination risks from spills at the filtration facility. Under the current wording, any spill outside of the filtration facility secondary containment, however small, is non-compliant. Spills as small as 2L are currently reported to DWER, although the risk of contamination from these events can be appropriately managed through spill recovery and clean-up.

Condition W4(c) requires Alcoa to immediately recover spills of liquid inside or outside low, permeability compounds. In all other areas of the Prescribed Premises apart from the filtration facility, where R1 applies, a small spill is not a non-compliance, unless it is not promptly recovered.

Alcoa requests Condition R1 be amended to refer to secondary containment rather than the containment of run-off drainage and spillage. Small spills at the filtration facility would then be managed under Condition 4(c) which requires immediate recovery.

The existing condition is shown in *italics* below. Proposed text to be removed is in ~~strike through~~ and additional text is in *blue*.

R1 The Licence Holder shall ensure the infrastructure specified in column 1 of Table 11 is maintained and operated in accordance with the requirements in columns 2 and 3 of that table.

Table 11: Operation of Infrastructure Requirements		
Column 1	Column 2	Column 3
Infrastructure	Description	Operational Requirements
Filtration facility	<p>Tanks fitted with high-level alarm systems.</p> <p>Secondary containment</p>	<p><del>Runoff, drainage or spillage is contained and directed into process water systems for reuse.</del> Secondary containment provided for the purpose of containing and directing runoff, drainage or spillage into process water systems.</p> <p>A minimum capacity of 110% of the largest tank or vessel within the filtration facility is maintained.</p>

## **4. Other Approvals and Consultation**

### **4.1 Stakeholder Consultation**

#### **4.1.1 Department of Water and Environmental Regulation**

Alcoa initially raised the proposed amendments with DWER via email in September 2024. A pre-application meeting was held in November 2024.

#### **4.1.2 Other Consultation**

Alcoa has consulted with chemical suppliers over the treatment, amount and classification of washwater as well as compliance with the Controlled Waste Regulations.

## **4.2 Other Approvals, Licences and Permits**

### **4.2.1 Environmental Protection Act 1986 (Part IV)**

Operations at the Pinjarra Refinery were assessed under Part IV of the EP Act. Several Ministerial Statements have been issued after assessment of amendments. The most relevant to this licence amendment application is MS646. No amendments to MS646 are required.

### **4.2.2 Alumina Refinery (Pinjarra) Agreement Act 1969**

The Pinjarra Refinery is subject to the *Alumina Refinery (Pinjarra) Agreement Act 1969*. The proposed amendments do not require approval under this act.

### **4.2.3 Rights in Water and Irrigation Act 1914**

Groundwater and surface water abstraction to support operations at the Pinjarra Refinery is licenced under the *Rights in Water and Irrigation Act 1914* (RIWI Act). The acceptance of washwater will marginally reduce abstraction requirements and no amendments to surface water licences, groundwater licences or the operating strategy are required.

### **4.2.4 Environmental Protection (Controlled Waste) Regulations 2004**

Alcoa is registered on the controlled waste tracking system (#: 3034017) and L150 is already listed in the waste acceptance list. As a receiver of controlled wastes, Alcoa must:

- Provide carriers with controlled waste receipts.
- Provide DWER with a copy of controlled waste tracking forms (CWTFs) or the CWTF number and additional information on the waste received.
- Retain copies of controlled waste tracking forms for at least three years.
- Manage non-compliant loads in consultation with DWER.

## **5. Waste, Emissions and Discharges**

Emissions and discharges are described in Table 5-1.

Table 5-1: Emissions and Discharges

Source of Emission or Discharge	Emission or Discharge Type	Volume and Frequency	Proposed Controls	Location
Process spills at the filtration facility	Leaks and spills of process water	Minor and infrequent spills outside process bunds.  No change to frequency or volume anticipated, condition R1 amendment relates to statutory reporting requirements only.	<ul style="list-style-type: none"> <li>Bunding of processing area.</li> <li>Spill kits provided.</li> <li>Spills to be promptly cleaned up and contaminated soils disposed of in RSA.</li> </ul> <p>No change to frequency or volume anticipated, condition R1 amendment relates to statutory reporting requirements only.</p>	Filtration Facility
Spills of washwater	Leaks and Spills of Washwater	Spill of any size rare outside of hardstands rare	<ul style="list-style-type: none"> <li>Tanks or containers to be emptied on existing hardstand adjacent to Cooling Pond.</li> <li>Hoses to discharge inside Cooling Pond Embankments.</li> <li>Procedure to be followed.</li> </ul>	Cooling Pond
Seepage of washwater from Cooling Pond.	Seepage of process water and washwater	Ongoing if leak is present	<p>None additional:</p> <ul style="list-style-type: none"> <li>Quantity and quality of washwater will not significantly change water quality in Cooling Pond.</li> <li>Cooling Pond is HDPE lined.</li> <li>Groundwater monitoring in accordance with L5271/1983/14.</li> </ul>	Cooling Pond

## **6. Siting and Location**

The Pinjarra Refinery is at the foot of the Darling Scarp on previously cleared land on the Swan Coastal Plain in the Peel Region of Western Australia. There is a ~6,000 ha buffer zone of freehold land around the refinery. The surrounding land use is rural with the main agricultural activities beef cattle and sheep.

An assessment of the Project against the Environmental Siting Guideline (DWER, 2020) is provided in Table 6-1.

Table 6-1: Environmental Siting

Type / Classification	Description	Distance to Premises Boundary	Proposed controls to prevent or mitigate adverse impacts (if applicable)
Sensitive Land Uses / Users	<p>Land ownership and the closest residences are shown in Figure 6-1.</p> <p>The Pinjarra Refinery is on freehold land, owned by Alcoa. Alcoa also owns a ~6,000 ha buffer zone around the Prescribed Premises. The surrounding land use is rural. The Main agricultural activities are beef cattle and sheep.</p> <p>The refinery is ~6 km east of Pinjarra. The closest residential receptors are:</p> <ul style="list-style-type: none"> <li>• R1 – rural property (16 premises in vicinity)</li> <li>• R2 – single rural property</li> <li>• R3 – North Pinjarra Residential Area (99 premises in vicinity)</li> <li>• R4 – Pinjarra townsite north-east side (1 premises in vicinity)</li> <li>• R5 – Pinjarra townsite east side (48 premises in vicinity)</li> </ul> <p>No additional noise, odour, air quality or other impacts are anticipated at potentially sensitive receptors.</p>	<p>R1: ~2.78 km south</p> <p>R2: ~0.57 km northeast</p> <p>R3: ~0.7 km north</p> <p>R4: ~0.57 km east</p> <p>R5: ~0.73 km east</p>	<p>No specific controls as proposed amendments will not contribute to noise, odour air quality or other potential impacts to receptors.</p> <p>Implementation of the existing Environmental Management System (EMS) is sufficient to prevent impacts.</p>
Environmentally Sensitive Areas (ESAs)	<p>ESAs mapped by DWER are shown in Figure 6-2. ESAs in and around the Prescribed Premises are related to defined wetlands and continuous vegetation within 50m of Threatened flora.</p> <p>No direct or indirect impacts are anticipated.</p>	Inside Prescribed Premises.	<p>No specific controls as proposed amendments do not include clearing, and no indirect impacts are expected.</p> <p>Implementation of the existing Environmental Management System (EMS) is sufficient to prevent impacts.</p>

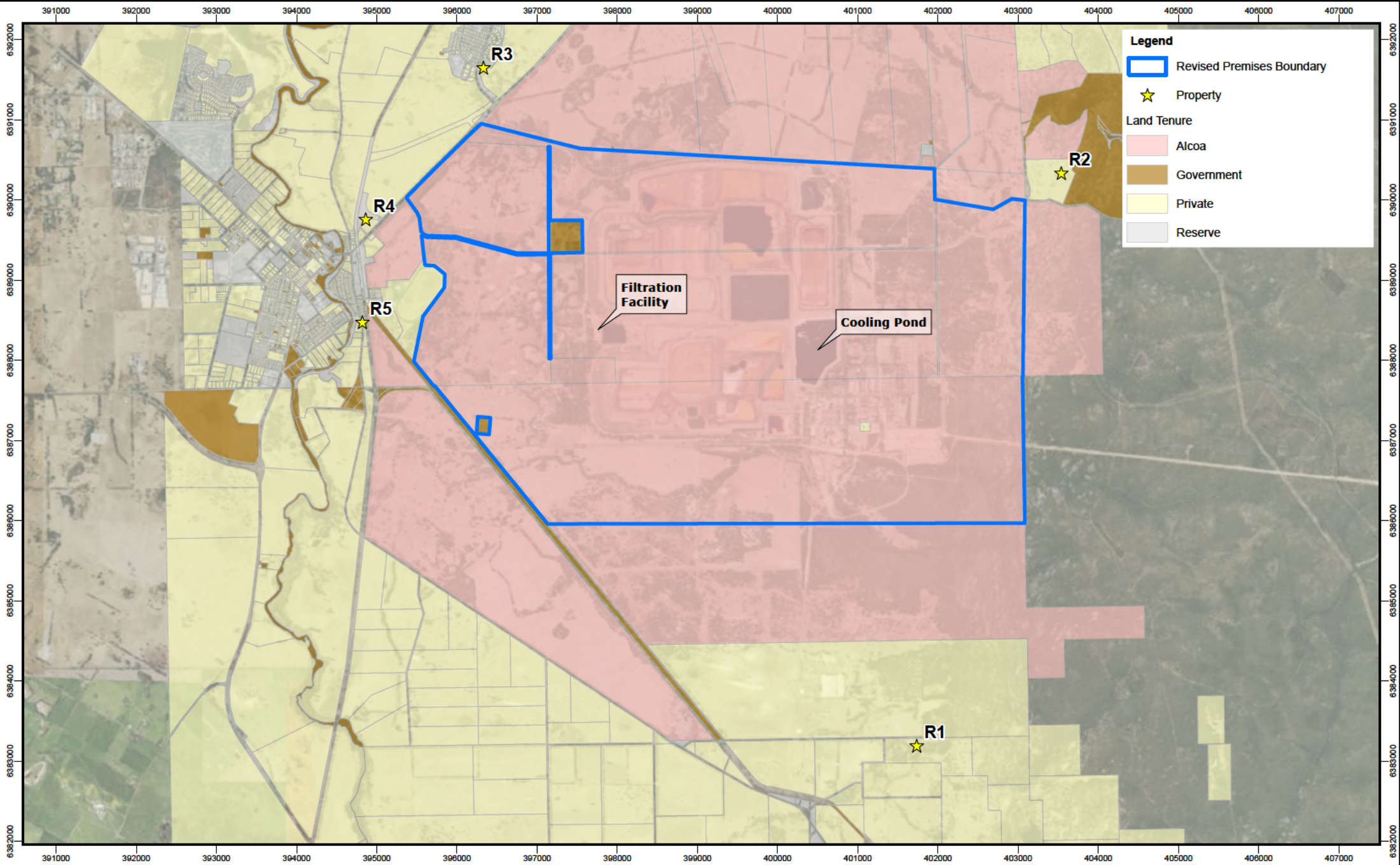
Type Classification /	Description	Distance to Premises Boundary	Proposed controls to prevent or mitigate adverse impacts (if applicable)
Threatened Priority Ecological Communities (TEC / PEC)	<p>DBCA mapping in Figure 6-3 indicates there may be Threatened Ecological Communities inside the Prescribed Premises. The Following TECs have been identified in the Alcoa farmlands (Mattiske, 2012; Focused Vision, 2025):</p> <ul style="list-style-type: none"> <li>• SCP10a Shrublands on dry clay flats - Endangered</li> <li>• SCP3a <i>Corymbia calophylla</i> – <i>Kingia australis</i> woodlands on heavy soils – Critically Endangered.</li> <li>• SCP 3b – <i>Corymbia calophylla</i> - <i>Eucalyptus marginata</i> on sandy clay soils - Endangered</li> </ul> <p>No clearing or ground disturbance is included in the proposed amendments and direct or indirect impacts to TECs, PECs or other native vegetation are not anticipated.</p>	Inside Prescribed Premises.	<p>No specific controls as proposed amendments do not include clearing, and no indirect impacts are expected.</p> <p>Implementation of the existing Environmental Management System (EMS) is sufficient to prevent impacts.</p>


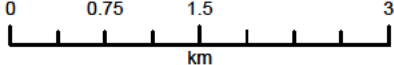

Type Classification /	Description	Distance to Premises Boundary	Proposed controls to prevent or mitigate adverse impacts (if applicable)
Threatened and/or priority flora	<p>Ten conservation significant flora species have previously been recorded within or near the Alcoa Pinjarra farmlands (Mattiske, 2021; Focused Vision, 2025). This includes five species listed under the BC Act and EPBC Act (conservation statuses identical):</p> <ul style="list-style-type: none"> <li>• <i>Anthocercis gracilis</i> – Vulnerable</li> <li>• <i>Diuris purdiei</i> – Endangered</li> <li>• <i>Synaphea</i> sp. Pinjarra Plain – Endangered</li> <li>• <i>Synaphea</i> sp. Fairbridge Farm – Critically Endangered</li> <li>• <i>Synaphea stenoloba</i> – Endangered</li> </ul> <p>And five Priority species:</p> <ul style="list-style-type: none"> <li>• <i>Acacia lasiocarpa</i> var. <i>bracteolata</i> long peduncle variant – Priority 1</li> <li>• <i>Schoenus pennisetis</i> – Priority 3</li> <li>• <i>Cyanothamnus tenuis</i> – Priority 4</li> <li>• <i>Calothamnus graniticus</i> subsp. <i>leptophyllus</i> – Priority 4.</li> <li>• <i>Eucalyptus caesia</i> subsp. <i>magna</i> – Priority 4</li> </ul> <p>DBCA records of Conservation Significant Flora are shown on Figure 6-3.</p> <p>The proposed amendments do not include ground disturbance or clearing of native vegetation. Direct and indirect impacts to flora and vegetation are not anticipated.</p>	Historical records inside Prescribed Premises.	<p>No specific controls as proposed amendments do not include clearing, and no indirect impacts are expected.</p> <p>Implementation of the existing Environmental Management System (EMS) is sufficient to prevent impacts.</p>

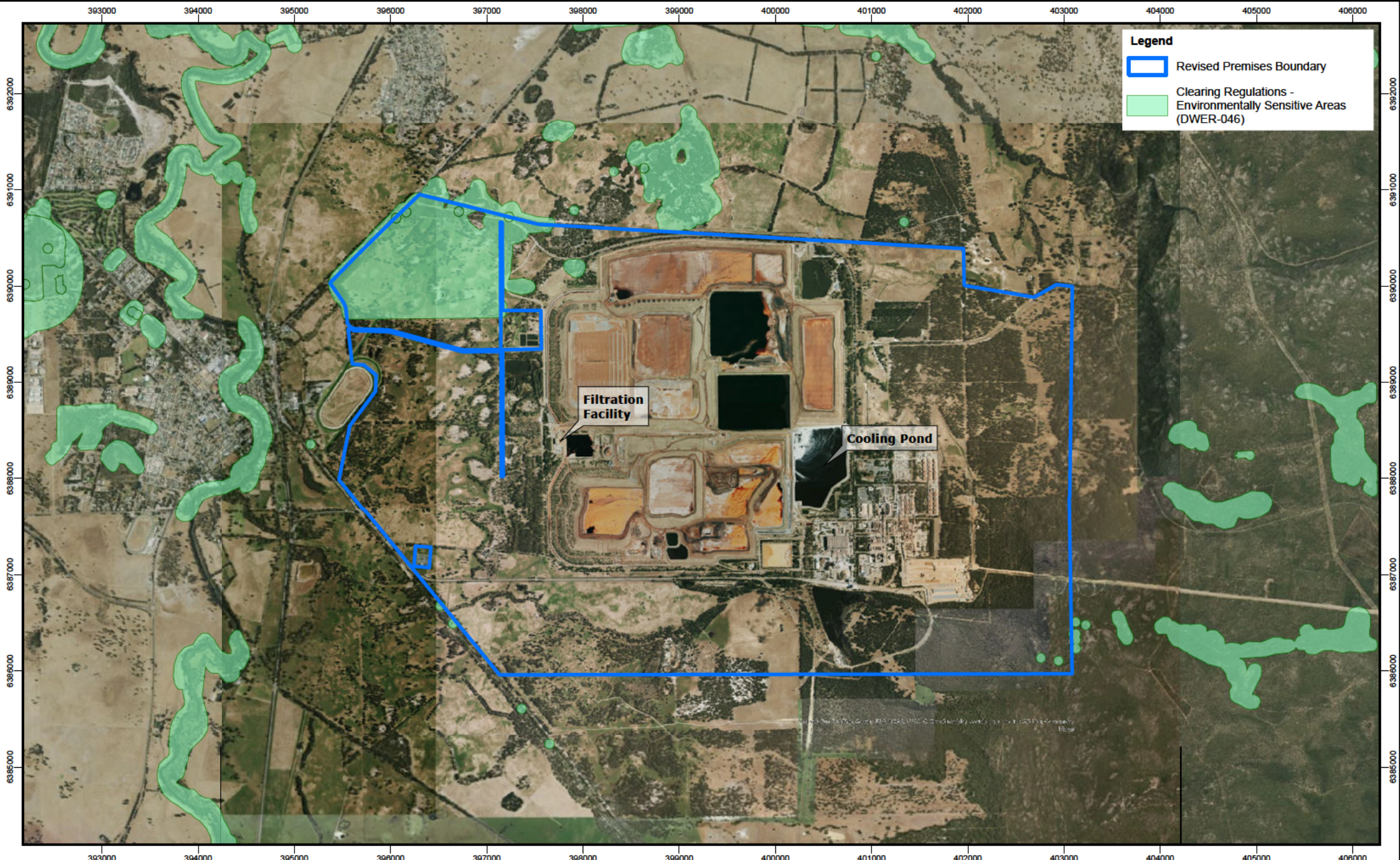
Type Classification /	Description	Distance to Premises Boundary	Proposed controls to prevent or mitigate adverse impacts (if applicable)
Threatened and/or priority fauna	<p>The Pinjarra Refinery was constructed on farmland that had previously been cleared and has limited fauna biodiversity compared to the adjacent Darling Scarp. Seven conservation significant fauna species have been recorded or are likely to occur in and around the Pinjarra Refinery (GHD, 2021):</p> <ul style="list-style-type: none"> <li>• Carnaby's Cockatoo (<i>Calyptorhynchus latirostris</i>) – Endangered.</li> <li>• Baudin's Cockatoo (<i>Calyptorhynchus baudinii</i>) – Endangered.</li> <li>• Forest Red-tailed Black Cockatoo (<i>Calyptorhynchus banksii naso</i>) – Vulnerable.</li> <li>• Common Greenshank (<i>Tringa nebularia</i>) – Migratory.</li> <li>• Peregrine Falcon (<i>Falco peregrinus</i>) – Other specially protected.</li> <li>• Masked Owl (<i>Tyto novaehollandiae novaehollandiae</i>) – Priority 3.</li> <li>• Quenda (<i>Isodoon fusciventer</i>) – Priority 4.</li> </ul> <p>The proposed amendments do not involve any ground disturbance or clearing of habitat. Direct and indirect impacts to fauna are not anticipated.</p>	In and around Prescribed Premises.	<p>No specific controls as proposed amendments do not include clearing, and no indirect impacts are expected.</p> <p>Implementation of the existing Environmental Management System (EMS) is sufficient to prevent impacts.</p>

Type / Classification	Description	Distance to Premises Boundary	Proposed controls to prevent or mitigate adverse impacts (if applicable)
Aboriginal and other heritage sites	<p>Registered and lodged aboriginal heritage sites in and around the Prescribed Premises are shown in Figure 6-4. No direct and indirect impacts are anticipated.</p> <p>A search of the EPBC Act Protected Matters Database on 24 February 2025 indicated there are no world heritage or national heritage sites in or near the Prescribed Premises.</p> <p>Registered and local European heritage sites around the Prescribed Premises are shown in Figure 6-5. There are none inside the Prescribed Premises and several within 1 km of the Prescribed Premises.</p> <p>No disturbance is proposed and direct and indirect impacts to heritage sites are not anticipated.</p>	<p>Registered and lodged aboriginal heritage sites in and near Prescribed Premises.</p> <p>Several European heritage sites near Prescribed Premises.</p>	<p>No specific controls as proposed amendments do not include clearing, and indirect impacts that may diminish the heritage values of the area are not anticipated.</p> <p>Implementation of the existing Environmental Management System (EMS) is sufficient to prevent impacts.</p>
Public drinking water source areas	Pinjarra Refinery is downgradient of the South Dandalup Pipehead Catchment Area, which is shown on Figure 6-6.	~500 m east and upgradient of Prescribed Premises.	<p>No specific controls as proposed amendments do not include clearing or any substantial change to processing, RSA management and chemical use on site.</p> <p>Implementation of the existing Environmental Management System (EMS) is sufficient to prevent impacts.</p>

Type Classification /	Description	Distance to Premises Boundary	Proposed controls to prevent or mitigate adverse impacts (if applicable)
Rivers, lakes, oceans, and other bodies of surface water, etc.	<p>The Murray River is ~1 km west of the Prescribed Premises.</p> <p>The closest RAMSAR Site and Nationally important wetland is the Peel-Yalgorup System, ~10 km east of the Prescribed Premises.</p> <p>Wetlands of the Swan Coastal Plan are shown on Figure 6-7. The Pinjarra Refinery is surrounded by multiple use wetlands to the north, west and south. There is a conservation category wetland in the northwest of the Prescribed Premises and additional conservation category and resource enhancement wetlands immediately north of the Prescribed Premises.</p> <p>No impacts are anticipated due to the proposed amendments.</p>	<p>Murray river - ~1 km west</p> <p>Multiple use and conservation wetlands inside Prescribed Premises.</p>	<p>No change to existing environmental management measures:</p> <ul style="list-style-type: none"> <li>• Spills to be recovered and cleaned up.</li> <li>• Stormwater off processing areas to be captured</li> <li>• RSAs have liners and underdrainage to prevent seepage.</li> </ul>
Acid sulfate soils (ASS)	<p>Approximately half of the Prescribed Premises, including parts of the Cooling Pond has a low to moderate risk of ASS with 3m of the surface according to DWER mapping (DWER-055).</p> <p>The proposed amendment does not include any disturbance of soils or groundwater drawdown. No impacts as a result of ASS are anticipated.</p>	<p>Low to moderate risk of ASS inside Prescribed Premises.</p>	<p>No specific controls as proposed amendments do not include disturbance to any soils or groundwater drawdown.</p>



  <p>Scale: 1:60,000 AGD 1984 AMG Zone 50</p>				<p><b>L5271/1983/14 Amendment</b></p>	
<p>Figure 6-1 Land Use and Sensitive Receptors</p>					
<p>Drawing #: EA1P0030_D006_RevA Fig 6-1</p>		<p>Author: wang</p>			
<p>Date: 12/05/2025</p>		<p>Rev: A    A4</p>		<p>Date Printed: 12/05/2025</p>	
<p>Path: \\auapl-gis.aia.alcoa.com\users\EAApprovals\EA1P0030\Projects\EA1P0030\EA1P0030_LicAmend.aprx</p>					



**Legend**

- Revised Premises Boundary
- Clearing Regulations - Environmentally Sensitive Areas (DWER-046)

**Filtration Facility**

**Cooling Pond**

N

0 0.5 1 2

km

Scale: 1:50,000

AGD 1984 AMG Zone 50

Drawing #: EA1P0030\_D007\_RevA Fig 6-2

Date: 12/05/2025

Author: wang

Date Printed: 12/05/2025

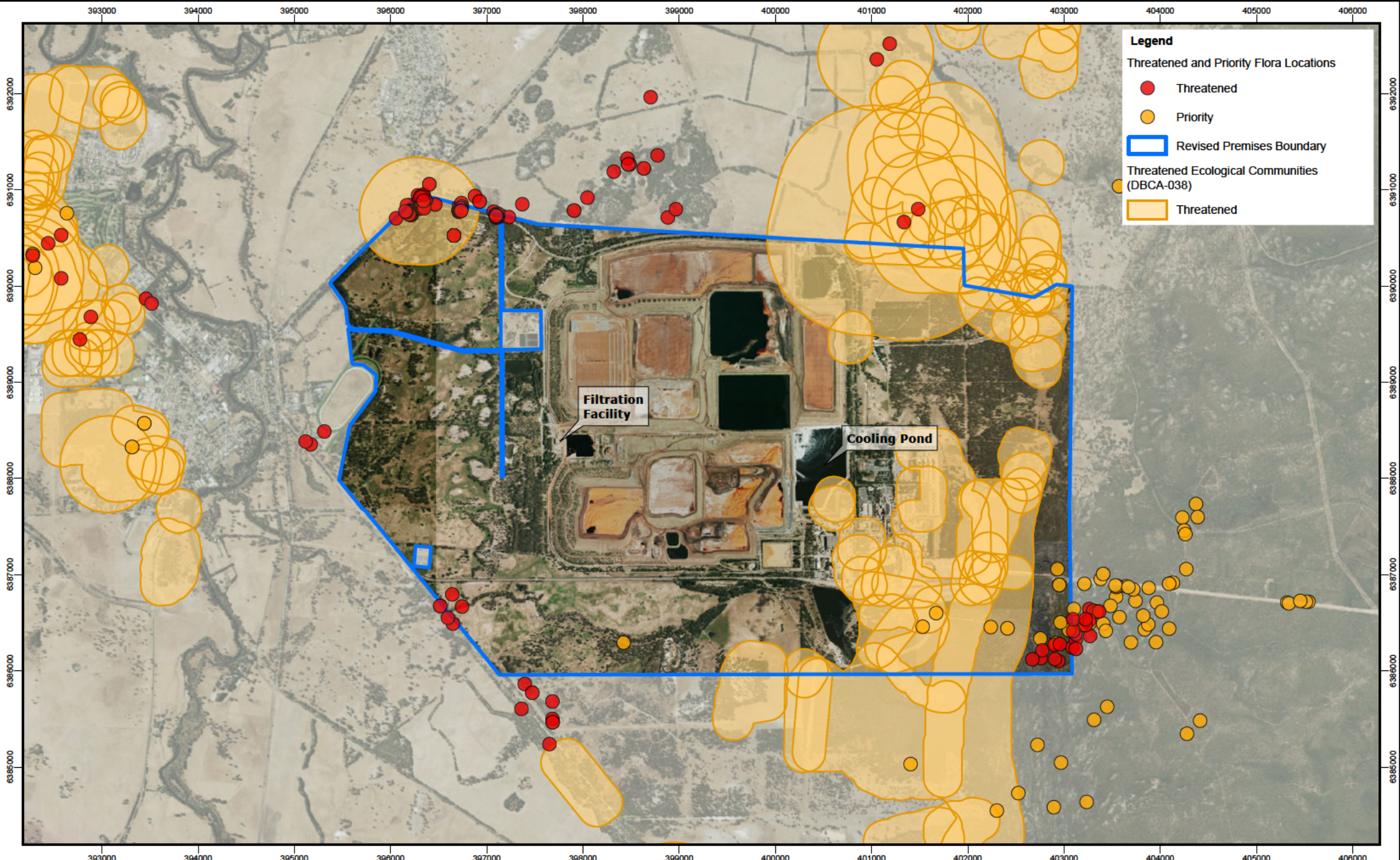
Rev: A

A4

**L5271/1983/14 Amendment**

**Figure 6-2 Environmentally Sensitive Areas**

Path: \\auaplin-gis.aua.alcoa.com\users\EAApprovals\EA1P0030\Projects\EA1P0030\EA1P0030\_LicAmend.aprx



**North Arrow**

**Scale:** 0 0.5 1 2 km

Scale: 1:50,000  
AGD 1984 AMG Zone 50

Drawing #: EA1P0030\_D008\_RevA Fig 6-3

Date: 12/05/2025

**Alcoa**

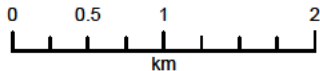
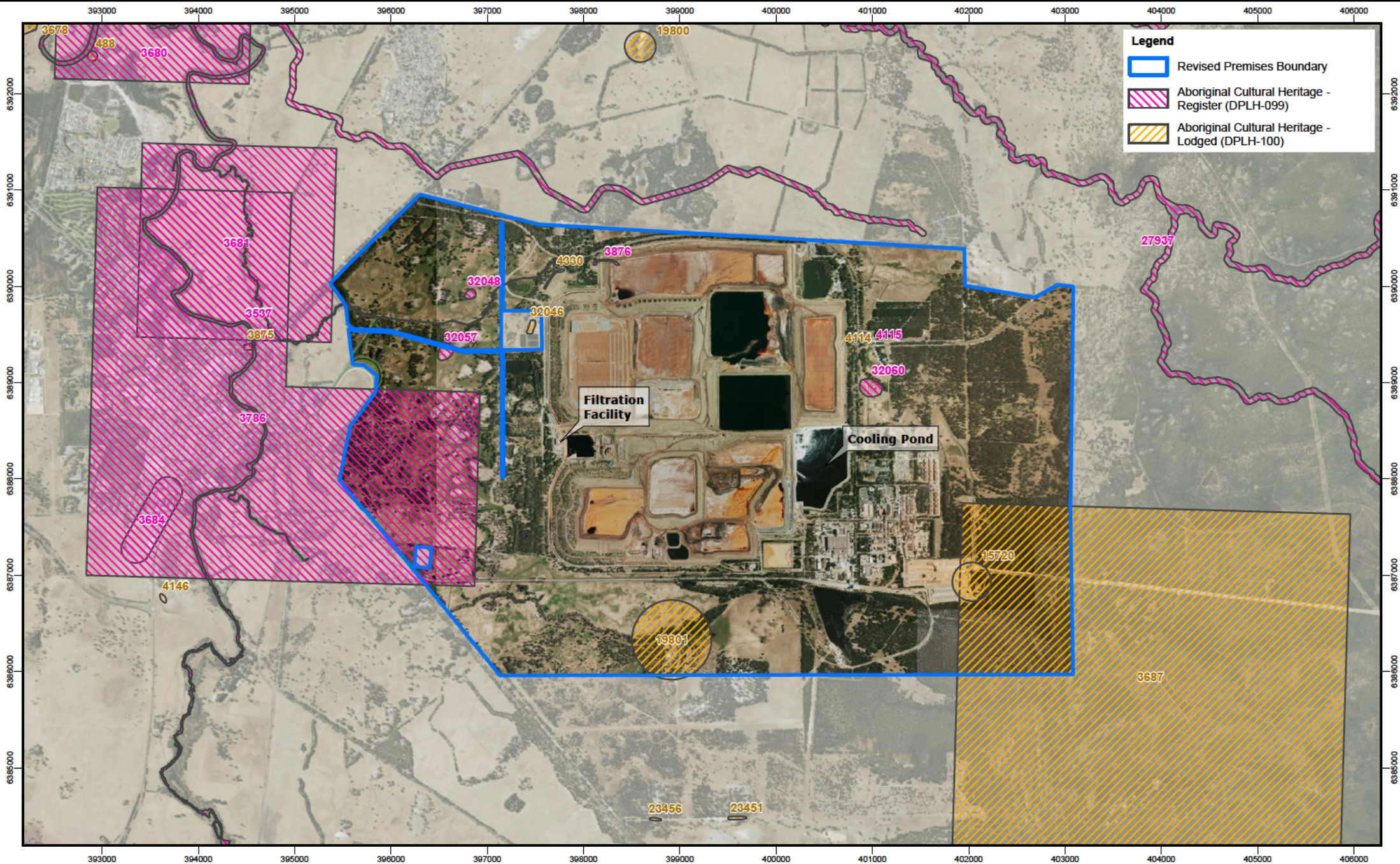
Author: wang

Date Printed: 12/05/2025

**L5271/1983/14 Amendment**

**Figure 6-3 Threatened and Priority Ecological Communities and Flora**

Path: \\auapl-gis.aua.alcoa.com/users\EAApprovals\EA1P0030\Projects\EA1P0030\EA1P0030\_LicAmend.aprx



Scale: 1:50,000  
AGD 1984 AMG Zone 50



L5271/1983/14 Amendment

Figure 6-4 Aboriginal Heritage Sites

Drawing #: EA1P0030\_D009\_RevA Fig 6-4

Date: 12/05/2025

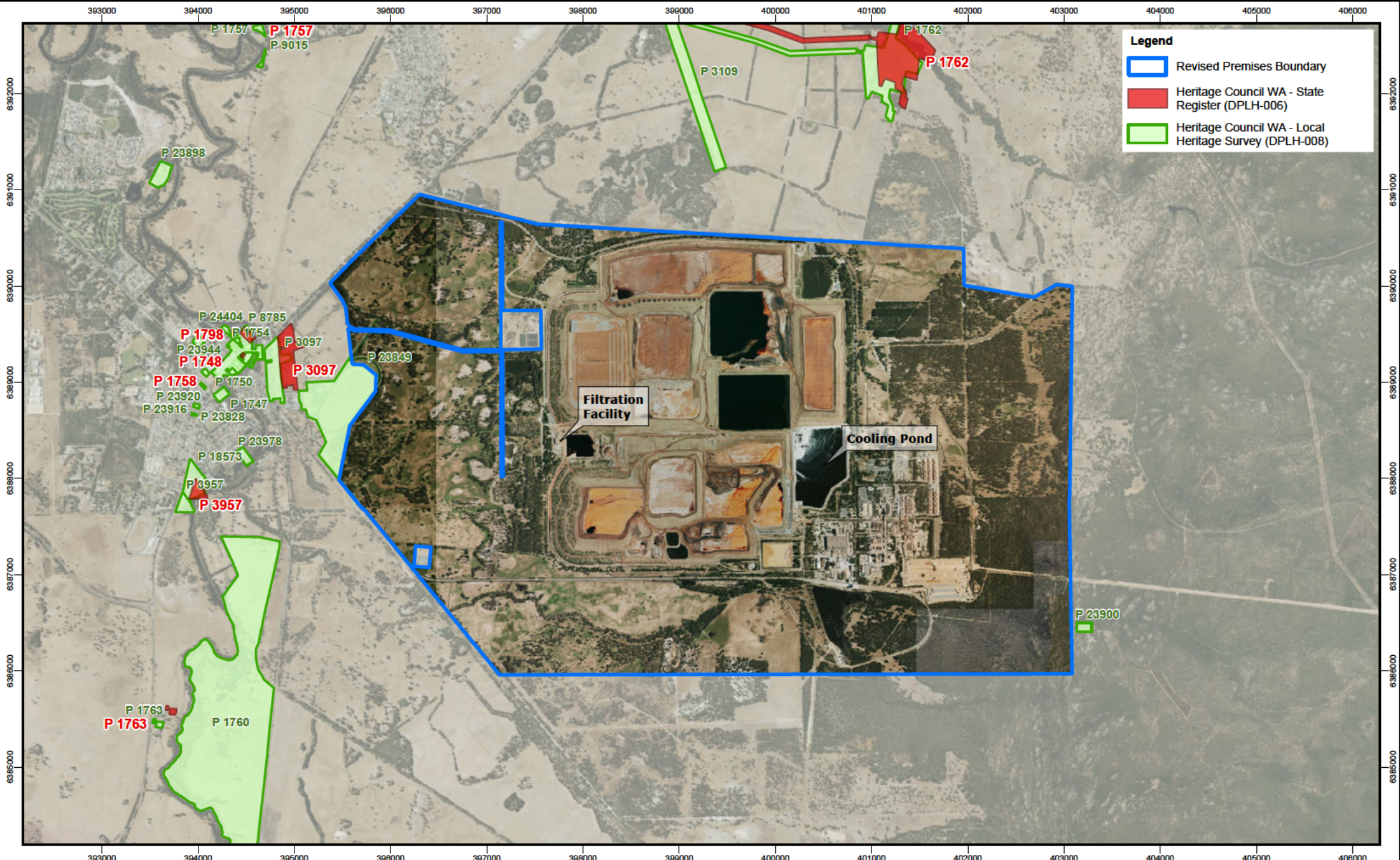
Rev: A

A4

Author: wang

Date Printed: 12/05/2025

Path: \\auaplin-gis.alcoa.com/users/EApprovals/EA1P0030/Projects/EA1P0030/EA1P0030\_LicAmend.aprx



**Legend**

- Revised Premises Boundary
- Heritage Council WA - State Register (DPLH-006)
- Heritage Council WA - Local Heritage Survey (DPLH-008)

N

0 0.5 1 2

km

Scale: 1:50,000

AGD 1984 AMG Zone 50

Drawing #: EA1P0030\_D010\_RevA Fig 6-5

Date: 12/05/2025

Author: wang

Date Printed: 12/05/2025

Rev: A

A4

**L5271/1983/14 Amendment**

**Figure 6-5 European Heritage Sites**

Path: \\auapl-gis.aua.alcoa.com\users\EAApprovals\EA1P0030\Projects\EA1P0030\EA1P0030\_LicAmend.aprx



N

00.512

km

Scale: 1:50,000  
AGD 1984 AMG Zone 50

Drawing #: EA1P0030\_D011\_RevA Fig 6-6

Date: 12/05/2025

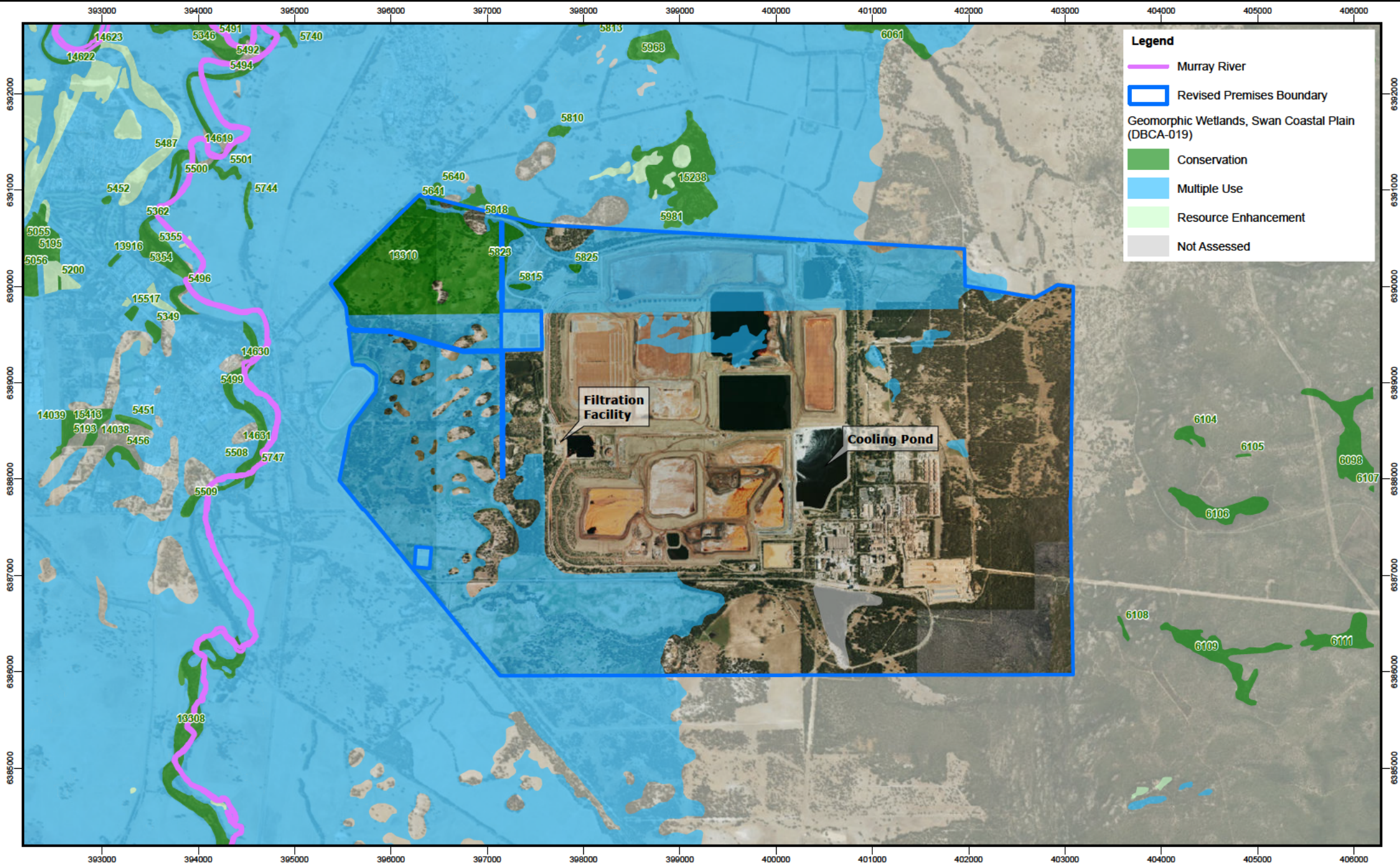
Author: wang

Date Printed: 12/05/2025

L5271/1983/14 Amendment

Figure 6-6 Public Drinking Water Source Areas

Path: \\auapl-gis.aua.alcoa.com\users\EAApprovals\EA1P0030\Projects\EA1P0030\EA1P0030\_LicAmend.aprx



**Legend**

- Murray River
- Revised Premises Boundary

Geomorphic Wetlands, Swan Coastal Plain (DBCA-019)

- Conservation
- Multiple Use
- Resource Enhancement
- Not Assessed

## 7. Risk Assessment

### 7.1 Risk Assessment Overview

A risk assessment of the proposed activities was completed in accordance with the DWER (2020) Guideline for Risk Assessments. Consequence criteria are in Table 7-1, Likelihood criteria in Table 7-2 and the risk matrix in Table 7-3.

**Table 7-1: Consequence Criteria**

Consequence	Consequence Description	
	Environment	Public health* and amenity (such as air and water quality, noise and odour)
Severe	<ul style="list-style-type: none"> <li>Onsite impacts: catastrophic.</li> <li>Offsite impacts local scale: high level or above.</li> <li>Offsite impacts wider scale: mid-level or above.</li> <li>Mid to long-term or permanent impact to an area of high conservation value or special significance<sup>^</sup>.</li> <li>Specific Consequence Criteria (for environment) are significantly exceeded.</li> </ul>	<ul style="list-style-type: none"> <li>Loss of life.</li> <li>Adverse health effects: high level or ongoing medical treatment.</li> <li>Specific Consequence Criteria (for public health) are significantly exceeded.</li> <li>Local scale impacts: permanent loss of amenity.</li> </ul>
Major	<ul style="list-style-type: none"> <li>Onsite impacts: high level.</li> <li>Offsite impacts local scale: mid-level.</li> <li>Offsite impacts wider scale: low level.</li> <li>Short-term impact to an area of high conservation value or special significance<sup>^</sup>.</li> <li>Specific Consequence Criteria (for environment) are exceeded.</li> </ul>	<ul style="list-style-type: none"> <li>Adverse health effects: mid-level or frequent medical treatment</li> <li>Specific Consequence Criteria (for public health) are exceeded.</li> <li>Local scale impacts: high level impact to amenity.</li> </ul>
Moderate	<ul style="list-style-type: none"> <li>Onsite impacts: mid-level.</li> <li>Offsite impacts local scale: low level.</li> <li>Offsite impacts wider scale: minimal.</li> <li>Specific Consequence Criteria (for environment) are at risk of not being met.</li> </ul>	<ul style="list-style-type: none"> <li>Adverse health effects: low level or occasional medical treatment.</li> <li>Specific Consequence Criteria (for public health) are at risk of not being met.</li> <li>Local scale impacts: mid-level impact to amenity.</li> </ul>
Minor	<ul style="list-style-type: none"> <li>Onsite impacts: low level.</li> <li>Offsite impacts local scale: minimal.</li> <li>Offsite impacts wider scale: not detectable.</li> <li>Specific Consequence Criteria (for environment) likely to be met.</li> </ul>	<ul style="list-style-type: none"> <li>Specific Consequence Criteria (for public health) are likely to be met.</li> <li>Local scale impacts: low level impact to amenity.</li> </ul>
Slight	<ul style="list-style-type: none"> <li>Onsite impact: minimal.</li> <li>Specific Consequence Criteria (for environment) met.</li> </ul>	<ul style="list-style-type: none"> <li>Local scale: minimal impacts to amenity.</li> <li>Specific Consequence Criteria (for public health) criteria met.</li> </ul>

<sup>^</sup> For areas of high conservation value or special significance, we will use the Guideline: Environmental siting to inform our decision

\* In applying public health criteria, we may use the Department of Health's Health risk assessment (scoping) guidelines

**Table 7-2: Likelihood Criteria**

Likelihood	Likelihood Description
Almost certain	The risk event is expected to occur in most circumstances.
Likely	The risk event will probably occur in most circumstances.
Possible	The risk event could occur at some time.
Unlikely	The risk event will probably not occur in most circumstances.
Rare	The risk event may only occur in exceptional circumstances.

**Table 7-3: Risk Matrix**

Likelihood	Consequence				
	Slight	Minor	Moderate	Major	Severe
Almost Certain	Medium	High	High	Extreme	Extreme
Likely	Medium	Medium	High	High	Extreme
Possible	Low	Medium	Medium	High	Extreme
Unlikely	Low	Medium	Medium	Medium	High
Rare	Low	Low	Medium	Medium	High

## 7.2 Risk and Impact Assessment

Potential impacts, controls and risk evaluation is presented in Table 7-4. Note that the removal of completed works approval conditions and the clarification of particulate emissions limits in Condition A3 do not affect the existing environmental risks at the Pinjarra Refinery and have not been included in Table 7-4.

Table 7-4: Risk Assessment

Risk Event				Controls	Residual Risk		
Potential Emission	Potential Pathway	Potential Receptor	Potential Adverse Impact		Likelihood	Consequence	Likelihood
Construction and Commissioning							
N/A – No construction or commissioning is proposed or required.							
Changes to Prescribed Premises							
N/A – environmental siting is unchanged. No areas are being added to the Prescribed Premises, however land not held by Alcoa is being excised.							

Risk Event				Controls	Residual Risk		
Potential Emission	Potential Pathway	Potential Receptor	Potential Adverse Impact		Likelihood	Consequence	Likelihood
Change to Condition R1							
Discharges to surface water from contaminated stormwater and material spills	Direct from infrastructure	Soil and groundwater	Groundwater contamination; soil contamination	<p><b>Existing conditions:</b></p> <ul style="list-style-type: none"><li>Runoff, drainage or spillage is contained and directed into process water systems for reuse where possible</li><li>A minimum capacity of 110% of the largest tank or vessel within the filtration facility is maintained.</li></ul> <p><b>Additional Condition:</b></p> <ul style="list-style-type: none"><li>Any runoff, drainage or spillage from within the Filtration facility that is not contained within the designed secondary containment must be promptly recovered upon identification and disposed to an appropriate area(s) within the RSA</li></ul> <p>*Risk is unchanged from Table 15 of most recent licence decision report (DWER, 2017, p. 31).</p>	Unlikely	Moderate	Medium
Accepting Liquid Waste							
Spills of washwater	Direct from bulk tanks or containers	Soil and groundwater	Groundwater contamination; soil contamination	<ul style="list-style-type: none"><li>Tanks or containers to be emptied on existing hardstand adjacent to Cooling Pond.</li><li>Hoses to discharge inside Cooling Pond Embankments.</li><li>Procedure to be followed.</li></ul>	Unlikely	Slight	Low

Risk Event				Controls	Residual Risk		
Potential Emission	Potential Pathway	Potential Receptor	Potential Adverse Impact		Likelihood	Consequence	Likelihood
Overtopping of Cooling Pond	Direct from infrastructure	Soil, groundwater, surface water	Impacts on surface water ecosystems, soil and groundwater.	<ul style="list-style-type: none"> <li>Maintenance of operational freeboard to contain rainfall events provides capacity well in excess of a 20 kL bulk tank of washwater (~40,000 loads would be required to cause overtopping – the proposed 25,000 kL is ~830 loads).</li> <li>Washwater will not be accepted if the Cooling Pond is at risk of overtopping.</li> </ul>	Rare	Slight	Low
Seepage of washwater from Cooling Pond	Direct from infrastructure	Groundwater	Impacts to groundwater	<ul style="list-style-type: none"> <li>Quantity and quality of washwater will not significantly change water quality in Cooling Pond.</li> <li>Cooling Pond has an HDPE liner.</li> <li>Groundwater monitoring in accordance with L5271/1983/14.</li> </ul>	Unlikely	Slight	Low
Odour emissions	Direct from washwater	Nearby residences	Foul odour impacts amenity.	<ul style="list-style-type: none"> <li>None. Cooling Pond sited away from potentially sensitive receptors. Odour impacts not anticipated.</li> </ul>	Rare	Slight	Low

## 8. References

- DWER. (2017). *Decision Report: Application for Licence Amendment L5271/1983/14 - Pinjarra Refinery*. Perth: Department of Water and Environmental Regulation.
- DWER. (2019). *Industry Regulation Guide to Licensing: Activities Regulated Under the Environmental Protection Act 1986 and Environmental Protection Regulations 1987*. Perth: Department of Water and Environmental Regulation.
- DWER. (2020). *Guideline: Environmental Siting: Part V, Division 3, Environmental Protection Act 1986*. Perth: Department of Water and Environmental Regulation.
- DWER. (2020). *Guideline: Risk Assessments: Part V, Division 3, Environmental Protection Act 1986*. Perth: Department of Water and Environmental Regulation.
- Focused Vision. (2025). *Detailed Flora And Vegetation Assessment and Targeted Weed Survey Pinjarra Alumina Refinery Landholdings*. Perth: Focused Vision Consulting Pty Ltd.
- GHD. (2021). *Basic Fauna and Targeted Black Cockatoo Survey: Report for Pinjarra Alumina Refinery*. Perth: GHD.
- Mattiske. (2012). *Flora and Vegetation Assessment Pinjarra Farmlands*. Kalamunda: Mattiske Consulting Pty Ltd.
- Mattiske. (2021). *Detailed Flora and Vegetation Survey for Pinjarra Alumina Refinery ALC2009/010/2021*. Kalamunda: Mattiske Consulting Pty Ptd.

## **Appendix 1: Ecolab Washwater SDS**

**SAFETY DATA SHEET****PRODUCT****LW1****EMERGENCY TELEPHONE NUMBER(S)**

1800 205 506

**1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**PRODUCT NAME : **LW1**APPLICATION : **ANIONIC FLOCCULANT**

COMPANY IDENTIFICATION : Nalco Australia  
2 Drake Avenue  
Macquarie Park NSW 2113  
Australia  
A.B.N. 59 000 449 990  
TEL: +61 2 8870 8100  
FAX: +61 2 8870 8680

EMERGENCY TELEPHONE NUMBER(S) : 1800 205 506  
International: +65 6542 9595 Free call: +800 2537 8747

Date issued : 13.10.2013  
Version Number : 1.2

**2. HAZARDS IDENTIFICATION**

HAZARD CLASSIFICATION :

Not classified as hazardous according to Safe Work Australia. This product is not classified as a dangerous good according to national or international regulations.

## SAFETY PHRASES

S24/25 - Avoid contact with skin and eyes.  
S37/39 - Wear suitable gloves and eye/face protection.

**3. COMPOSITION/INFORMATION ON INGREDIENTS**

CHEMICAL NAME	CAS NO	% (w/w)
Ingredients determined not to be hazardous		100

**4. FIRST AID MEASURES**

EYE CONTACT :

Flush affected area with water. If symptoms develop, seek medical advice.

SKIN CONTACT :

Flush affected area with water. If symptoms develop, seek medical advice.

INGESTION :

If symptoms develop, seek medical advice. DO NOT INDUCE VOMITING. If conscious, washout mouth and give water to drink.

**SAFETY DATA SHEET****PRODUCT****LW1****EMERGENCY TELEPHONE NUMBER(S)**

1800 205 506

**INHALATION :**

Remove to fresh air, treat symptomatically. If symptoms develop, seek medical advice.

**NOTE TO PHYSICIAN :**

Based on the individual reactions of the patient, the physician's judgement should be used to control symptoms and clinical condition.

**5. FIRE FIGHTING MEASURES****FLASH POINT :** Not flammable**EXTINGUISHING MEDIA :**

Not expected to burn. Use extinguishing media appropriate for surrounding fire.

**FIRE AND EXPLOSION HAZARD :**

Not flammable or combustible.

**SPECIAL PROTECTIVE EQUIPMENT FOR FIRE FIGHTING :**

In case of fire, wear a full face positive-pressure self contained breathing apparatus and protective suit.

**SENSITIVITY TO STATIC DISCHARGE :**

Not expected to be sensitive to static discharge.

**6. ACCIDENTAL RELEASE MEASURES****PERSONAL PRECAUTIONS :**

Restrict access to area as appropriate until clean-up operations are complete. Use personal protective equipment recommended in Section 8 (Exposure Controls/Personal Protection). Stop or reduce any leaks if it is safe to do so. Ventilate spill area if possible. Notify appropriate government, occupational health and safety and environmental authorities.

**METHODS FOR CLEANING UP :****SMALL SPILLS:** Soak up spill with absorbent material. Place residues in a suitable, covered, properly labeled container. Wash affected area. **LARGE SPILLS:** Contain liquid using absorbent material, by digging trenches or by diking. Reclaim into recovery or salvage drums or tank truck for proper disposal. Clean contaminated surfaces with water or aqueous cleaning agents. Contact an approved waste hauler for disposal of contaminated recovered material. Dispose of material in compliance with regulations indicated in Section 13 (Disposal Considerations).**ENVIRONMENTAL PRECAUTIONS :**

Prevent material from entering sewers or waterways.

**7. HANDLING AND STORAGE****HANDLING :**

Do not get in eyes, on skin, on clothing. Do not take internally. Use with adequate ventilation. Keep the containers closed when not in use. Ensure all containers are labeled.

**STORAGE CONDITIONS :**

Store in suitable labeled containers. Store the containers tightly closed.

**SAFETY DATA SHEET**

PRODUCT

**LW1**

EMERGENCY TELEPHONE NUMBER(S)

1800 205 506

**8. EXPOSURE CONTROLS/PERSONAL PROTECTION****OCCUPATIONAL EXPOSURE LIMITS**

None of the components have been assigned an exposure standard by Safe Work Australia (Australia) or EPA (New Zealand).

**ENGINEERING MEASURES :**

General ventilation is recommended.

**PERSONAL PROTECTION****RESPIRATORY PROTECTION :**

Respiratory protection is not normally needed.

**HAND PROTECTION :**

NEOPRENE, NITRILE, NATURAL RUBBER OR PVC GLOVES Breakthrough time not determined as preparation, consult PPE manufacturers.

**SKIN PROTECTION :**

Wear standard protective clothing.

**EYE PROTECTION :**

Wear safety glasses with side-shields.

**HYGIENE RECOMMENDATIONS :**

Use good work and personal hygiene practices to avoid exposure. Keep an eye wash fountain available. Keep a safety shower available. If clothing is contaminated, remove clothing and thoroughly wash the affected area. Launder contaminated clothing before reuse. Always wash thoroughly after handling chemicals. When handling this product never eat, drink or smoke.

**SAFETY DATA SHEET****PRODUCT****LW1****EMERGENCY TELEPHONE NUMBER(S)**

1800 205 506

**9. PHYSICAL AND CHEMICAL PROPERTIES**

PHYSICAL STATE	Liquid
APPEARANCE	White Grey
ODOR	None
pH (100 %)	6 - 9
VAPOR PRESSURE	No data available.
VAPOR DENSITY	No data available.
SPECIFIC GRAVITY	1 (25 °C)
DENSITY	No data available.
SOLUBILITY IN WATER	Complete
MELTING POINT	No data available.
BOILING POINT	No data available.
FLASH POINT	Not flammable
LOWER EXPLOSION LIMIT	No data available.
UPPER EXPLOSION LIMIT	No data available.
AUTOIGNITION TEMPERATURE	No data available.

Note: These physical properties are typical values for this product and are subject to change.

**10. STABILITY AND REACTIVITY****STABILITY :**

Stable under normal conditions.

**CONDITIONS TO AVOID :**

Extremes of temperature

**INCOMPATIBLE MATERIALS :**

None known

**HAZARDOUS DECOMPOSITION PRODUCTS :**

Under fire conditions: None known

**HAZARDOUS REACTIONS :**

Hazardous polymerization will not occur.

**11. TOXICOLOGICAL INFORMATION****OVERVIEW OF HEALTH HAZARDS****ACUTE HAZARDS - EYE CONTACT**

No adverse effects expected.

**ACUTE HAZARDS - SKIN CONTACT**

No adverse effects expected.

**ACUTE HAZARDS - INGESTION**

Not a likely route of exposure. No adverse effects expected.

**ACUTE HAZARDS - INHALATION**

**SAFETY DATA SHEET****PRODUCT****LW1****EMERGENCY TELEPHONE NUMBER(S)****1800 205 506**

Not a likely route of exposure. No adverse effects expected.

**CHRONIC HAZARDS :**

No adverse effects expected other than those mentioned above.

**SUMMARY OF TOXICITY INFORMATION****ACUTE TOXICITY DATA :**

No toxicity studies have been conducted on this product.

**SENSITIZATION :**

This product is not expected to be a sensitizer.

**CARCINOGENICITY :**

None of the substances in this product are listed as carcinogens by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP) or the American Conference of Governmental Industrial Hygienists (ACGIH).

For additional information on the hazard of the preparation, please consult section 2 and 12.

**HUMAN HAZARD CHARACTERIZATION**

Based on our hazard characterization, the potential human hazard is: Low

**12. ECOLOGICAL INFORMATION****ECOTOXICOLOGICAL EFFECTS :**

No toxicity studies have been conducted on this product.

**MOBILITY AND BIOACCUMULATION POTENTIAL :**

The environmental fate was estimated using a level III fugacity model embedded in the EPI (estimation program interface) Suite TM, provided by the US EPA. The model assumes a steady state condition between the total input and output. The level III model does not require equilibrium between the defined media. The information provided is intended to give the user a general estimate of the environmental fate of this product under the defined conditions of the models.

If released into the environment this material is expected to distribute to the air, water and soil/sediment in the approximate respective percentages;

Air	Water	Soil/Sediment
<5%	10 - 30%	70 - 90%

The portion in water is expected to be soluble or dispersible.

This preparation or material is not expected to bioaccumulate.

**PERSISTENCY AND DEGRADATION :**

Greater than 95% of this product consists of inorganic substances for which a biodegradation value is not applicable.

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**ENVIRONMENTAL HAZARD AND EXPOSURE CHARACTERIZATION**

Based on our hazard characterization, the potential environmental hazard is: Low

**13. DISPOSAL CONSIDERATIONS**

Dispose of wastes in an approved waste treatment / disposal site, in accordance with all applicable regulations. Do not dispose of wastes in local sewer or with normal garbage.

Triple rinse (or equivalent) all containers and offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

**SPECIAL PRECAUTIONS FOR LANDFILL OR INCINERATION :**

No additional special precautions have been identified.

**14. TRANSPORT INFORMATION**

The information in this section is for reference only and should not take the place of a shipping paper (bill of lading) specific to an order. Please note that the proper Shipping Name / Hazard Class may vary by packaging, properties, and mode of transportation. Typical Proper Shipping Names for this product are as follows.

**LAND TRANSPORT**

Proper Shipping Name :

**PRODUCT IS NOT REGULATED DURING TRANSPORTATION****AIR TRANSPORT (ICAO/IATA)**

Proper Shipping Name :

**PRODUCT IS NOT REGULATED DURING TRANSPORTATION****MARINE TRANSPORT (IMDG/IMO)**

Proper Shipping Name :

**PRODUCT IS NOT REGULATED DURING TRANSPORTATION****15. REGULATORY INFORMATION****AUSTRALIA :****NICNAS**

All substances in this product comply with the National Industrial Chemicals Notification & Assessment Scheme (NICNAS).

**SUSDP SCHEDULE :**

Not Listed

**INTERNATIONAL CHEMICAL CONTROL LAWS****UNITED STATES :**

The substances in this preparation are included on or exempted from the TSCA 8(b) Inventory (40 CFR 710)

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The substances in this preparation are listed on the Domestic Substances List (DSL), are exempt, or have been reported in accordance with the New Substances Notification Regulations.

**EUROPE**

The substances in this preparation have been reviewed for compliance with the EINECS or ELINCS inventories.

**JAPAN**

This product contains substance(s) which are not in compliance with the Law Regulating the Manufacture and Importation Of Chemical Substances and are not listed on the Existing and New Chemical Substances list (ENCS).

**CHINA**

All substances in this product comply with the Provisions on the Environmental Administration of New Chemical Substances and are listed on or exempt from the Inventory of Existing Chemical Substances China (IECSC).

**KOREA**

All substances in this product comply with the Toxic Chemical Control Law (TCCL) and are listed on the Existing Chemicals List (ECL)

**NEW ZEALAND**

All substances in this product comply with the Hazardous Substances and New Organisms (HSNO) Act 1996, and are listed on or are exempt from the New Zealand Inventory of Chemicals.

**PHILIPPINES**

All substances in this product comply with the Republic Act 6969 (RA 6969) and are listed on the Philippines Inventory of Chemicals & Chemical Substances (PICCS).

**16. OTHER INFORMATION**

This product material safety data sheet provides health and safety information. The product is to be used in applications consistent with our product literature. Individuals handling this product should be informed of the recommended safety precautions and should have access to this information. For any other uses, exposures should be evaluated so that appropriate handling practices and training programs can be established to insure safe workplace operations. Please consult your local sales representative for any further information.

**REFERENCES**

Hazardous Substances Data Bank, National Library of Medicine, Bethesda, Maryland (TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man, Geneva: World Health Organization, International Agency for Research on Cancer.

Integrated Risk Information System, U.S. Environmental Protection Agency, Washington, D.C. (TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

Annual Report on Carcinogens, National Toxicology Program, U.S. Department of Health and Human Services, Public Health Service.

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Registry of Toxic Effects of Chemical Substances, National Institute for Occupational Safety and Health, Cincinnati, OH, (TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

The Teratogen Information System, University of Washington, Seattle, WA (TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

REVISED INFORMATION: Significant changes to regulatory or health information for this revision is indicated by a bar in the left-hand margin of the SDS.

Prepared By: Asia Pacific, Regulatory Affairs (RA) Specialist