Government of Western Australia
Department of Water and Environmental Regulation

Amendment Notice 3

Licence Number	L4504/1981/17
Licence Holder	South32 Worsley Alumina Pty Ltd
ACN	008 905 155
File Number:	DER2015/002689
Premises	Worsley Alumina Refinery Gestaldo Road COLLIE WA 6225 Lease No 3116/7574
Date of Amendment	16 October 2017

Amendment

The Chief Executive Officer (CEO) of the Department of Water and Environmental Regulation (DWER) has amended the above Licence in accordance with section 59 of the *Environmental Protection Act 1986* as set out in this Amendment Notice. This Amendment Notice constitutes written notice of the amendment in accordance with section 59B(9) of the EP Act.

Date signed: 16 October 2017

Caron Goodbourn

Acting Manager Licensing (process Industries)

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

Amendment Notice

This amendment is made pursuant to section 59 of the *Environmental Protection Act 1986* (EP Act) to amend the Licence issued under the EP Act for a prescribed premises as set out below. This notice of amendment is given under section 59B(9) of the EP Act.

This notice is limited only to an amendment for Category 46 bauxite refining activities, specifically the amendment is to allow the temporary storage of oxalate in Solar Evaporation Pond (SEP).1. No changes to other aspects of the Licence have been requested by the South32 Worsley Alumina Pty Ltd (Licence Holder).

The following guidance statements have informed the decision made on this amendment

- *Guidance Statement: Regulatory Principles (DWER, 2015a)*
- *Guidance Statement: Setting Conditions (DWER, 2015b)*
- *Guidance Statement: Decision Making (DWER, 2016a)*
- *Guidance Statement: Risk Assessment (DWER, 2016b)*

Amendment description

During the Bayer alumina refining process, bauxite ore is broken down through mechanical grinding, heating and mixing with liquid sodium hydroxide to release alumina into solution. This process also generates sodium oxalate ("oxalate"), which forms when the sodium hydroxide bonds with organic material contained within the ore. Oxalate is relatively insoluble and reduces the uptake of alumina into solution and lowers the overall viability of the refining processes. Oxalate is periodically removed from the caustic liquor by binding it with gibbsite, washing the gibbsite and crystallising the oxalate from solution it to form an oxalate cake that can then be disposed of as a waste.

Sodium oxalate is toxic to humans and exposure through inhalation, digestion and ingestion can have potentially acute health impacts (Sciencelab, 2013). It readily forms a white powder when exposed to the wind and it must therefore be stored within secured compounds or treated to render it innocuous. At the Worsley Alumina Refinery, approximately 50,000 tonnes of oxalate is produced each year. The waste oxalate cake has historically being buried in trench pits within consolidated, trafficable parts of the Bauxite Residue Disposal Areas (BRDA). South32 estimate that some 500,000 tonnes of oxalate have been disposed of this way over the life of the premises. In 2014 the areas suitable for oxalate disposal within the BRDA's had reached capacity and an application was made to store oxalate in Solar Evaporation Pond (SEP) 3 on a temporary basis. SEP3 is now approaching capacity and the Licence Holder is seeking to dispose of oxalate into 1 SEP1.

The Licence Holder lodged an application to amend Licence L4504/1981/17 for the Worsley Alumina Refinery on 24 July 2017. Appendix 1 contains a list of the documents that form the application.

The Licence Holder has applied to make the following changes to the Licence:

- Construct of an oxalate tipping area (tip plate) on the banks of SEP1;
- Installation of a oxalate slurry hopper to receive the oxalate cake, sprinklers, an agitator, electrical infrastructure, pumps and a floating slurry release line into SEP1 (see Figure 1 below);
- A pontoon pump for recovery of water and a delivery line from SEP 1 into the hopper (via sprinkler system)

Figure 1: The proposed location of the new hopper in relation to Solar Evaporation Pond 1 (SEP1) and the Refinery Catchment Lake (RCL)

Source: Unnumbered Figure, Oxalate Project Presentation (South32, 2017)

The tipping plate will be constructed using the same design method as the current hopper located near SEP3, as shown in Figure 2 below. The hopper will be placed on a gravel bed underlain by HDPE liner that extends from the bank, into the SEP. The raised tipping plate is constructed to allow the trucks delivering the oxalate from the processing plant to gravity feed the cake into the hopper.

Figure 2: An example of the type of oxalate hopper (photo left) and tipping plate (photo right) that will be constructed for SEP1

Source: Unnumbered Figures, Oxalate Project Presentation (South32, 2017)

Once the oxalate cake is tipped into the hopper water will be drawn from the surface of the SEP via a pontoon pump and conveyed to the hopper via sprinklers as shown in Figure 3. The cake will then be sluiced by an agitator to form as slurry which can then be pumped back out into the SEP. As indicated in Figure 3 below, the oxalate will be submerged under water to manage dust and facilitate slurry reformation upon its eventual recovery from the SEP in the longer term.

Figure 3: An example of the sprinkler operation within the hopper (photo left) and pontoon pump and floating slurry release line (photo right) that is proposed for SEP1

Source: Unnumbered Figures, Oxalate Project Presentation (South32, 2017)

The storage of oxalate in the SEP's in considered as a short to medium term disposal option for the Licence Holder, while a more sustainable disposal option is developed. In 2000 the premises trialled a treating the oxalate through their liquor burner, and although it is still currently used, the rate of oxalate destruction is significantly less than the 80% destruction rate anticipated. The site is currently looking at other methods for oxalate destruction,

including the installation of a biological oxidation plant within the medium term (5-10 years).

The solar evaporation ponds were originally constructed to act as a repository for the refinery's waste acid, which is generated from both cleaning and water treatment sources. SEP 1 has not been used for this purpose and it currently contains water collected from rainfall. This water will be used to form the oxalate slurry in the hopper and to keep the oxalate wet within the pond to stop incidental oxalate dust lift off.

SEP 1 is lined with high density polyethylene (HDPE) and groundwater beneath the pond flows down gradient towards the Refinery Catchment Lake (RCL). Prior to this Amendment Notice being issued, the Licence Holder commissioned a third party to test the liner integrity to determine if the properties of the aged liner are suitable for containing potential pollutants, such as oxalate. As part of this approval, the Licence holder will be required to demonstrate that SEP1 is suitable for oxalate deposition prior to commissioning of the pond.

The amendment also involves alteration to Table 1.2.3 by removing reference to underdrainage pipes beneath the SEP's. During electronic communication with the Licence Holder, DWER was advised that this is an error.

Other approvals

The key regulatory control over the Refinery comes from the Alumina Refinery (Worsley) Agreement Act 1973 (as amended) (Agreement Act) and Ministerial Statement 719 (as amended) issued under Part IV of the EP Act. The current Licence does not include conditions on groundwater as this aspect is regulated via the Agreement Act and Ministerial Statement 719.

The approval to construct the Refinery and associated infrastructure was granted under the Agreement Act. No Mining Proposal exists for the premises.

Amendment history

Table 1 provides the amendment history for L4504/1981/17.

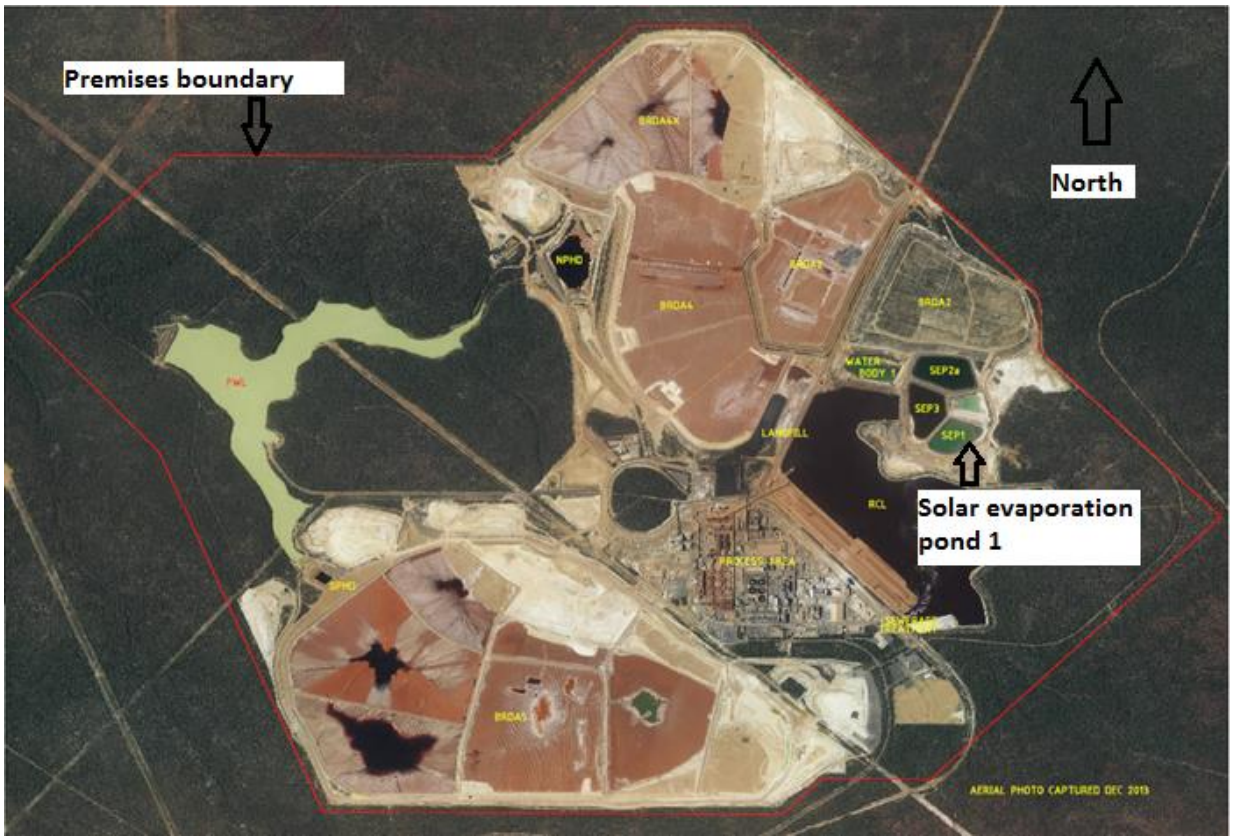
Table 1: Licence L4504/1981/17 amendment history

Instrument	Issued	Amendment
L4504/1981/17	24/09/2015	Licence reissued. Changes made as to the occupier (South32 Worsley Alumina Pty Ltd), reporting dates, categories (Cat 61 liquid waste facility) and administrative changes.
L4504/1981/17	29/04/2016	Licence amended to extend duration in accordance with DER's *Guidance Statement on Licence Duration (November 2014)*.
L4504/1981/17	4/08/2016	Amendment Notice 1 Licence amended to include Minister's Appeal Determination and extend the compliance date of Condition 4.1.1, table 4.1.1 (IR2) until the 30 November 2016.
L4504/1981/17	11/11/2016	Licence amended to include Boiler 5 and Boiler 6 and remove of ambient SO_2 monitoring stations Willis and 303.
L4504/1981/17	28/7/2017	Amendment Notice 2 Licence amended to allow construction and operation of Water Body1 and to consolidate reporting conditions.
L4504/1981/17	16/10/2017	Amendment Notice 3 Licence amended to allow the deposition of sodium oxalate into SEP 1

Location and receptors

The location proposed for SEP 1 is shown in Figure 4 within the Refinery. The Refinery is approximately 15km northwest of Collie on the Darling Plateau within the Augustus (minor) and Brunswick (major) river catchments.

Figure 4: Location of Solar Evaporation Pond 1 (SEP 1) in relation to the premises boundary.



Source: Adapted from Worsley Alumina Refinery Licence L4504/1981/17

The broader Refinery Premises are situated on a topographic divide between two valleys (southern and northern) that contain the wet areas of the refinery (SEP's BDRA's, Northern Valley Catchment Head Dam, Southern Valley catchment Head Dam and the Freshwater Lake) within the upper reaches of the Augustus River catchment.

The distances to residential and sensitive receptors are detailed in Table 2 and the distances to specified ecosystems are detailed in Table 3.

Table 2: Receptors and distance from prescribed premises

Residential and sensitive premises	Distance from the Boundary of the Premises
Single Rural Dwellings:	No rural dwelling within 5 km of the boundary of the premises.
Township of Allanson	Allanson is approximately 11km south of the boundary of the premises.

Table 3: Specified ecosystems

Specified ecosystems	Distance from the Proposed Works
Priority 1 Public Drinking Water Source Area (PDWSA)	SEP1 is approximately 650m west from the Harris River Dam Catchment Area (HRDCA).
Native vegetation	50m to the east

A description of ground and surface water resources is provided in Table 4

Table 4: Groundwater and surface waters

Groundwater and water sources	Distance from the Proposed Works	Environmental Value
Groundwater	Within the vicinity of SEP1 the shallow aquifer is currently between 280-285AHD. The Zersatz and fractured rock aquifer are 15-60mbgl and it is separated from the shallow aquifer by a continuous confining layer. The predevelopment baseline level of groundwater is 15mbgl (between 270 and 275mAHD).	The shallow aquifer originally fed into the upper Reaches of the Augustus River. Shallow Groundwater within proximity of SEP's feeds directly into the RCL which is used for site operations. In the vicinity of the SEP's water from the fractured rock and Zersatz aquifers feed into the RCL and at times of high water level in the RCL is at risk of feeding into the Freshwater Lake. The Freshwater Lake is a source for the Augustus River.
Rights in Water and Irrigation Act 1914	The refinery operational area, including the location of SEP1, is within two surface water catchments and the irrigation districts associated with these catchments in accordance with the Department of Water's Geographic Information System's viewer. These areas are proclaimed under the *Rights in Water and Irrigation Act 1914 as*: •The Brunswick River and Tributaries •Collie River Irrigation District	The water within the premises boundary has no environmental value for irrigation purposes. However, impacted water from within the premises boundary should it reach the Augustus River has the ability to decrease the beneficial uses associate of surface water within the irrigation districts for horticulture, stock watering, recreational and domestic purposes.
Watercourses	The Premises are within the upper reaches of the Augustus River Catchment and the Freshwater Lake within the premises boundary and discharges directly into the Augustus River. The Augustus River flows into the Brunswick River approximately 2.5km north of the Premises boundary. The upper reaches of the Hamilton River run approximately 500m south of the Premises boundary. Ground and surface water flow from the proposed development area is towards the west of the Premises, away from this receptor.	The Augustus River is a freshwater system with a slightly acid pH. The upper reaches of the Brunswick River is dominated by the refinery and state forest and down-stream uses include horticulture, stock watering, recreational and domestic purposes. The Hamilton River flows south into the Wellington Dam and the Collie River.

A description of other environmental values associated with the premises is provided in Table 5 below

Table 5: Other environmental values

Environmental value	Distance from the Proposed Works
Aboriginal Sites of Significance	There are no current or historical sites identified in the construction area.

Risk assessment

Tables 6 and 7 below describe the Risk Events associated with the amendment consistent with the *Guidance Statement: Risk Assessments*. Both tables identify whether the emissions present a material risk to public health or the environment, requiring regulatory controls.

Table 6: Risk assessment for proposed amendments during construction

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		**Potential emissions**	**Potential receptors**	**Potential pathway**	**Potential adverse impacts**				
Cat 46 *Bauxite refining*	Minor civil and construction works including construction of tip plate, installation of hopper, pumps, sprinklers, electrical equipment, pontoon and floating slurry delivery line	**Dust:** from civil and construction activities	Single rural dwelling, closest being 8.1km north-west of WB1	**Air:** transport and dispersion of particulates (fugitive dust)	Amenity impacts	Slight	Rare	Low	Large separation distance (8 km) for there to be minimal to no amenity impacts.
			Nearby native vegetation.	**Air:** transport and dispersion of particulates (fugitive dust)	Deposition on vegetation which may harm plants	Slight	Rare	Low	There is a separation distance of 50m between the 1 and the nearest vegetation. No impacts evident on native vegetation from existing activities, some, as close as 10m to native vegetation.
		Noise: from civil and construction activities	Single rural dwelling, closest being 8.1km north-west of WB1	**Air:** transport and dispersion	Amenity impacts	Slight	Rare	Low	Large separation distance (8 km) for there to be minimal to no amenity impacts. The Environmental Protection (Noise) Regulations 1997apply.
		Sediments: mobilised by stormwater	Augustus River	No pathway— Stormwater runoff surrounding the SEP1 development area reports to a network of diversion channels and v-drains before being re-used in site operations.					No pathway.

Table 7: Risk assessment for proposed amendments during operation

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		**Potential emissions**	**Potential receptors**	**Potential pathway**	**Potential adverse impacts**				
Cat 46 *Bauxite refining*	Contamination of groundwater from seepage from SEP1	**Slurry water**: containing Al_2O_3; Na_2, CO_3, Na_2SO_4.	Soil and Groundwater	Through dam liner and soil to groundwater	Groundwater contamination and migration towards Augustus River.	Moderate	Possible	Medium	SEP1 was designed with a HDPE liner and a permeability coefficient of 1 x 10^{-9} m/s. License holder will be required to demonstrate the liner continues to meet the design specifications for permeability as part of commissioning. Groundwater beneath SEP1 flows directly towards the RCL. Oxalate is relatively insoluble and seepage of slurry water is expected to reduce overtime as the solids mass becomes consolidated within the SEP. Groundwater monitoring is regulated under Ministerial Statement 719 (as amended). No change to existing risk profile. No further assessment required
	Groundwater mounding from seepage from SEP 1	**Slurry water**: containing Al_2O_3; Na_2 CO_3, Na_2SO_4.	Groundwater and vegetation	Through dam liner and soil to groundwater	Groundwater rise causing harm to vegetation as root zone is inundated	Moderate	Possible	Medium	
	Overtopping of SEP 1	**Slurry** containing oxalate, Al_2O_3; Na_2 CO_3, Na_2SO_4	Soil and groundwater	Surface runoff	Localised soil and groundwater contamination	Moderate	Possible	Medium	Operational freeboard is monitored weekly and water transfer between the SEP1, Water Body 1 and the RCL will occur should water level approach the minimum freeboard of 300mm. No change to existing risk

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
									profile. No further assessment.
	Pipeline failures associated SEP1	**Slurry** containing oxalate, Al_2O_3; Na_2CO_3, Na_2SO_4	Soil and groundwater	No Pathway – The tip plate area I will be located on HDPE liner with a gentle incline that will drain any discharge or spill back in to SEP1					No pathway Managed via the existing conditions of the Licence.
	Spills from tip plate and hopper	**Slurry** containing oxalate, Al_2O_3; Na_2CO_3, Na_2SO_4	Soil and groundwater						
	Dust lift off from tipping plate, hopper and surface of SEP1	**Dust:** fine particulates containing oxalate	Single rural dwelling, closest being 8.1km north-west of WB1	**Air:** transport and dispersion of particulates (fugitive dust)	Amenity impacts	Slight	Rare	Low	Large separation distance (8 km) for there to be minimal to no amenity impacts. Existing condition 1.2.6 requires oxalate to be stored wet or submerged in water. No further assessment.
			Nearby native vegetation.	**Air:** transport and dispersion of particulates (fugitive dust)	Deposition on vegetation which may harm plants	Slight	Rare	Low	There is a separation distance of 50m between SEP1 and the nearest vegetation. Existing condition 1.2.6 requires oxalate to be stored wet or submerged in water. No further assessment.
	Odour related issues	Odours	Sensitive premises	Air dispersion	None expected	Slight	Rare	Low	Large separation distance (8 km) resulting in minimal to no amenity impacts.

Risk Event						Consequence rating	Likelihood rating	Risk	Reasoning
Source/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts				
									Existing condition 1.2.6 requires oxalate to be stored wet or submerged in water. No further assessment.
	Risk to wildlife and stock	**Contact:** Stock and wildlife exposed to WB1	Stock and wildlife	**Animal:** direct contact	Harm to wildlife	Slight	Rare	Low	Site has a security fence which will keep out stock and large wildlife like kangaroos. The water contained within SEP has the potential to be caustic and may cause soft tissue damage to birdlife that use the pond. However birds are likely to have a preference for the nearby Freshwater Lake, Augustus and Brunswick Rivers which have other characteristics appealing to birdlife such as insects and fringing vegetation. There is no reported wildlife contact issue with the current operations. No further assessment required

Decision

The Delegated Officer has considered the information contained within the Application and determined that the amendment will not result in a material increase in emissions from the premises. The key emissions associated with the conversion of SEP1 from a waste acid storage dam to an oxalate storage dam, are noise and dust emissions during construction of the tipping plate, installation of the oxalate hopper and associated pumping infrastructure. The Delegated Officer has had regard to the location of the works within the context of the whole of premises activities, the distance sensitive receptors, in the decision not to apply regulatory controls to dust or noise emissions during the construction phase.

The Delegated Officer notes that SEP1 is currently approved for use as a waste acid storage containment facility however considers that while there is no substantial change to the existing risk profile associated with this change in use, the integrity of the liner, in particular the permeability should be retested to ensure the liner continues to meets the original construction design specifications prior to commissioning as an oxalate storage compound. Condition 1.2.15 has been included to give effect to this requirement.

During the assessment of this amendment notice the Licence Holder advised that when the SEP's were constructed around the year 2000, there was no underdrainage layer included within the dam design (South32, 2017b). On this bases amendments to Table 1.2.3 have been amended to remove reference to the slotted under flow pipes infrastructure.

Oxalate dust is considered harmful to human health, and existing Licence Condition 1.2.6 requires the Licence holder to cover the oxalate or maintain it wet or underwater to ensure dust is not generated. The Delegated Officer considers this condition to be adequate to manage any risks posed to off-site receptors from oxalate dust due to the large separation distance. It is noted that the Licence Holder's Oxalate Management Plan (South32, 2017a), includes ambient dust monitoring near the north western corner of the RCL which will identify if dust emissions from a range of sources, and in particular the oxalate storage areas, pose a health and safety risk to on site receptors such as employees. The Delegated Officer has determined that the occupational exposure of site employees to oxalate dust is outside the scope of this Licence and no conditions on this ambient monitoring are included within the Licence.

In summary, the amendment is approved subject to construction and compliance conditions as detailed below.

Licence Holder's comments

South32 was provided with the draft Amendment Notice on 26 September 2017. DWER received email correspondence from the Licence Holder dated 12 October 2017 advising they wish to waive the consultation period and requested the Licence be issued as soon as possible. A second email received from South32 on 12 October 2017 approving an amendment to Table 7, expanding the comments pertaining to the risk to wildlife and stock posed by the oxalate pond water. No further comments were made.

Amendment

1. Definitions of the Licence is amended by the insertion of the red text shown in underline below:

   '**SEP1; SEP2 and SEP3** ' means solar evaporation pond 1, solar evaporation pond 2 and solar evaporation pond 3 as shown in Schedule 1: Map of premises and containment infrastructure;

2. Table 1.2.3 of the Licence is amended by the deletion of the text shown in strikethrough below insertion of red text as shown in underline below:

Table 1.2.3: Containment infrastructure		
Reference and location on Map of premises and containment infrastructure	***Material***	***Requirements***
BRDA 1, 2, 3, 4, 4X and 5	*Bauxite residue, oxalate and controlled liquid waste*	*Low permeability clay lined with liquor collection system installed (pipework and decant) to transport liquor to PHDs. Groundwater underflow collection pipes to collect groundwater and relieve pressure on liners and allow detection of any residue liquor. Groundwater is transported to the PHDs.*
Fresh Water Lake (FWL)	*Uncontaminated surface water and groundwater from within the refinery lease.*	*None.*
Pipehead Dams (PHDs)	*NVPHD – residue liquor from BRDAs 1,2,3,4 & 4X*	*Low permeability clay lined with a chemical grout curtain installed below the earth embankment to prevent downstream migration of high pH residue liquor. Depressurisation bores located upstream to ensure groundwater is directed to bores and not lower parts of the catchment.*
	SVPHD – residue liquor from BRDA 5	
Refinery Catchment Lake (RCL)	*Recirculated process cooling water from Refinery, residue liquor from PHD's and outflow from Sequence Batch Reactor*	*Low permeability clay lined.*
Sewage sludge vessels	*Sewage sludge*	*Enclosed tanks which return sludge leachate to the start of the Sequence Batch Reactor process.*
Solar Evaporation Pond~~s~~ (SEP) ~~1 and~~ 2~~a~~	*Spent sulphuric and hydrochloric acid*	*HDPE lined with a permeability of 10^{-9} ~~and slotted underflow pipes to collect groundwater which may impact on the base of the liners.~~*
SEP 3 and SEP1	*Oxalate*	*HDPE lined with a permeability of 10^{-9} ~~and slotted underflow pipes to collect groundwater which may impact on the base of the liners.~~*

Table 1.2.3: Containment infrastructure		
Reference and location on Map of premises and containment infrastructure	***Material***	***Requirements***
Water Body 1	*Process water and decant water balancing pond*	*HDPE lined with a permeability of 10^{-9} and slotted underflow pipes to collect groundwater and seepage which may impact on the base of the liners.*

3. The Licence is amended by the insertion of the following Condition 1.2.14

1.2.14 *The Licensee must undertake construction works for the conversion of SEP1 into an oxalate storage dam*

(a) at the location shown in Figure 1; and
(b) prior to 30 September 2020.

4. The Licence is amended by the insertion of the following Condition 1.2.15

1.2.15 The Licensee must construct the works for the conversion of SEP1 into an oxalate storage dam according requirements detailed in Column 2 of Table 1.3.5.

Table 1.3.5: Construction requirements	
Infrastructure	***Requirements***
SEP1 liner	*Permeability Coefficient of no less than 1 x 10-9 m/s*
Tippling Plate Liner	*Earthworks beneath the of tipping plate to include a clay not less than 300mm thick and compacted to 96%Peak Converted Wet Density or greater (Hilf) followed.* *The upper layer of the composite liner to consist of HDPE with a minimum thickness of 1.5mm, textured on both side.* *The tipping plate liner to drains towards the SEP1 void*
Tipping Plate	*The tipping plate to include an elevated pad and ramp to allow trucks to offload oxalate direct into the oxalate hopper.*
Tippling plate truck turn around area	*To be located at least 2m away from the toe of SEP1 embankment*
Oxalate hopper	*To be fitted with sprinklers, an agitator, a slurry sump pump, generator, distribution board feed in line and distribution line*
Pontoon and pontoon pump	*Installed onto surface of SEP1 and recovers liquid and conveys it to the oxalate hopper feed in line*
Floating discharge line	*Installed along the surface of SEP1 and discharges oxalate slurry from the hopper distribution line to the SEP1 void area*

5. The Licence is amended by the insertion of the following Condition 1.2.16:

1.2.16 The Licensee must not depart from the requirements specified in Column 2 of Table 1.3.5 except where such departure does not increase risks to the public health, public amenity or the environment.

6. The Licence is amended by the insertion of the following Condition 1.2.17:

1.2.17 Subject to Conditions 1.2.15 and not more than 30 days after completing the construction works required to convert SEP1 into an oxalate storage dam, and prior to commissioning of the same, the Licensee must provide to the CEO certification from a suitably qualified Engineer confirming each item of infrastructure or component of infrastructure specified in Column 1 of Table 1.3.5 has been constructed with no material defects and to the requirements specified in Column 2 of Table 1.3.5.

7. The Licence is amended by the insertion of the following Condition 1.2.18:

1.2.18 Where a departure from the requirements specified in Column 2 of Table 1.3.5 occurs, the Licensee must provide to the CEO a description of, and explanation for, the departure together with the report required by Condition 1.2.17.

Appendix 1: Key documents

	Document title	In text ref	Availability
1	Licence L4504/1981/17 – Worsley Alumina Refinery	L4504/1981/17	accessed at www.dwer.wa.gov.au
2	Material Safety and Data Sheet – Sodium Oxalate MSDS, Sciencelab.com	Sciencelab, 2013	Accessed at: http://www.sciencelab.com/msds.php?msdsId=9927273
3	Oxalate Project Presentation	South32, 2017	
4	Oxalate Management Plan	South32, 2017a	DWER records (A124233)
5	Worsley Alumina Oxalate Application Form	-	DWER records (A438273)
6	Oxalate Project Initial Thoughts	-	DWER records (A438273)
7	SEP 1 Questions- email correspondence	South32, b	DWER records A1504433
8	Ministerial Statement 719	MS 914	accessed at www.epa.wa.gov.au
9	DWER, July 2015. *Guidance Statement: Regulatory principles.* Department of Environment Regulation, Perth.	DWER, 2015a	accessed at www.dwer.wa.gov.au
10	DWER, October 2015. *Guidance Statement: Setting conditions.* Department of Environment Regulation, Perth.	DWER, 2015b	
11	DWER, November 2016. *Guidance Statement: Decision Making*. Department of Environment Regulation, Perth.	DWER 2016a	
12	DWER, November 2016. *Guidance Statement: Risk Assessments*. Department of Environment Regulation, Perth.	DWER 2016b	