



Licence Number	L6744/1996/12
Licence Holder	Southern Ports Authority
Registered business address	Ground Floor 16 Parliament Place West Perth WA 6005
Date of amendment	15 May 2018
Prescribed Premises	Category 58: Bulk material loading or unloading
Premises	Southern Ports Authority Lot 963 on Plan 220558 and Lot 962 on Plan 219848, Inner Harbour – Berth 5 and 8 BUNBURY WA 6230

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.

Date signed: 15 May 2018

Danielle Eyre

Senior Manager, Resource Industries

Regulatory Services (Environment)

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.

The following DWER Guidance Statements have informed the decision made on this amendment:

- *Guidance Statement: Regulatory Principles (July 2015)*
- *Guidance Statement: Setting Conditions (October 2015)*
- *Guidance Statement: Risk Assessment (February 2017)*

Under the existing Licence (L6744/1996/12) the Licence Holder loads and unloads the following bulk materials:

- Bauxite ore
- Coal
- Copper concentrate
- Ilmenite
- Iron concentrate
- Leucoxene
- Medium Zircon Feedstock (MZF)
- Petroleum coke
- Silica sands
- Spodumene
- Synthetic rutile
- Urea
- Zircon
- Mineral sands rutile/synthetic rutile/concentrate (out of Berth 8)

Amendment Description

On 19 May 2017, Southern Ports Authority (the Licence Holder) submitted an application under the EP Act to authorise the bulk loading of up to 100,000 tonnes of alumina hydrate in a one-off shipment from Berth 8 at the Port of Bunbury (the Premises). On 18 December 2017, Amendment Notice 4 was issued authorising a one-off shipment, which was later completed on 30 March 2018.

On 2 May 2018, the Licence Holder submitted an application to amend the Licence to allow further shipments of alumina hydrate following a rapid increase in the demand for the product. The Licence Holder noted in its application that trade of alumina hydrate out of the Premises is only anticipated to allow for this surge in demand and is not likely to be required on an ongoing basis. The Licence Holder estimates that an annual tonnage rate of up to 150,000 tonnes would be anticipated. Therefore the assessment of risk provided in this Amendment Notice is based on the loading of up to 150,000 tonnes of alumina hydrate per annual period on an ongoing basis.

During the first shipment all product was stored offsite prior to being transported by truck to the Berth 8 road hopper to load material directly onto the vessel. An existing closed conveyor system was used to carry the alumina hydrate to the ship loader, which has a telescopic chute. The same loading methodology is proposed for future shipments.

Product will be loaded into the vessel at a maximum loading rate of 2,000 tonnes per hour using existing infrastructure. No construction of new infrastructure is required under the proposal. This additional tonnage will not cause the total throughput of the port to exceed the 75,000 tonnes per day nominal throughput stated within the existing Licence.

Shipment conducted March 2018

A total of 31,265 tonnes of alumina hydrate was loaded out of Berth 8 between 27 and 30 March 2018. In the 24-hour periods prior to, during and following this shipment the Licence Holder operated its air quality monitoring network to measure any ambient particulate matter and aluminium in dust that may have been generated during the shipment.

During the shipment dominant wind directions placed ambient air quality monitors upwind of alumina hydrate handling activities indicating that recorded dust concentrations were likely to be from other sources. However, short-term hourly peaks in particulate matter finer than 10 microns in diameter (PM_{10}) were recorded in the morning of 28 March 2018 at Stirling Street monitor when winds were in an east-north-easterly direction placing Berth 8 approximately 1.3 km upwind of the monitor (maximum peak of $48\mu\text{g}/\text{m}^3$ averaged over one hour). During this same period a 1-hour averaged peak of $48\mu\text{g}/\text{m}^3$ was also identified at the Naval Cadets monitoring location, approximately 2.1 km west-south-west of the upwind alumina hydrate stockpile (SPA, 2018a).

Low concentrations of aluminium were analysed from filter paper on the Stirling Street High Volume Air Sampler (HVAS) during the shipment. A maximum of $3.2\mu\text{g}/\text{m}^3$ was recorded on 27 March 2018 when wind placed the Stirling Street HVAS upwind of Berth 8 activities for the full 24-hour period. Elevated concentrations of sodium, calcium and magnesium were recorded, indicative of sea spray arriving from a west-south-west direction (SPA, 2018b).

Product handled during the first shipment had an averaged moisture content of 5.4% and above the dust extinction moisture (DEM) level of 1.27% (South32, 2018; Jenike & Johanson, 2017). The particle size distribution analysis identified that 2.2% of the product was smaller than $45\mu\text{m}$ in diameter with the majority (97.8%) ranging between 45 and $150\mu\text{m}$ (South32, 2018).

Spillage of product within and from the loading system was observed to be minimal and was cleaned up using road sweepers and vacuum trucks and removed from site.

Location, environmental siting and potential receptors

Table 1 below lists the relevant sensitive land uses and environmental receptors in the vicinity of the prescribed premises.

Table 1: Receptors and distance from prescribed premises

Receptor	Distance from Prescribed Premises
Residential receptor	840m from the Berth 8 ship loader 1,020m from the Berth 8 road hopper 430m from Berth 5
Preston River (Conservation category river that feeds into Vittoria Bay)	Less than 55 m from the premises southern boundary
Vittoria Bay (High conservation value estuary)	Immediately to the east of the premises boundary

Risk assessment

Table 2 below applies a risk assessment to the potential emissions which may arise from the amendment application, according to the *Guidance Statement: Risk Assessments*. The tables identify whether the emissions present a risk to human health or the environment, requiring regulatory controls.

Table 2: Risk assessment for proposed amendments during operation

			Potential Emissions	Potential Receptors	Potential Pathway	Potential Impacts	Continue risk assessment?	Reasoning
Source	Cat 58 Bulk material loading or unloading	Loading of alumina hydrate into vessels	Dust associated with the handling of bulk material using ground hoppers, conveyance systems and ship loaders.	Residential receptors (see Table 1)	Air/wind dispersion	Impacts to public health and amenity	Yes	N/A
			Noise associated with additional vehicle movements, mobilisation of loading infrastructure and operation of dust control equipment.	Residential receptors (see Table 1)	Air/wind dispersion	Impacts to amenity	Yes	N/A
			Stormwater contaminated with bulk product.	Aquatic organisms of Preston River and Vittoria Bay (see Table 1)	Direct discharge	Reduced water quality resulting in declining ecosystem health	Yes	N/A

Risk of Dust Emissions

The key emission arising from loading of alumina hydrate is fugitive dust.

Alumina dust is of low toxicity although dust from handling alumina hydrate can represent a health hazard by increasing the concentration of airborne particulate matter (PM). The respirable fraction (expressed as PM₁₀) has been linked to adverse health impacts on respiratory and cardiovascular systems with the most severe effects resulting from long term, sustained exposure. Alumina hydrate loaded or unloaded using the mobile infrastructure has the potential to cause an increase in PM through fugitive dust emissions.

An approximate maximum of 3% of the ore product is finer than 45 micron and therefore ambient concentrations of respirable dust at nearby receptors are not expected to reach occupational exposure limits of 3 mg/m³ for respirable silica (Safe Work Australia, 2012) during any event.

The DEM of a material represents the moisture content required for the material to emit no dust as determined using Australian Standard *AS4156.6-2000: Coal preparation - Determination of dust/moisture relationship for coal*¹. Alumina hydrate has been analysed under this method and found to have a DEM of 1.27% (Jenike & Johanson, 2017). Within the initial application for the one-off shipment, the moisture content of alumina hydrate received at Berth 8 was expected to be between 7 and 10%. Moisture content monitoring conducted at the ship loader determined that product moisture was 5.4% which, although lower than anticipated, remained above the DEM level.

Other Licence Holder proposed controls include:

- Shielding of the Berth 8 road hopper with a roof and two side walls.
- When trucks are tipping product into the road hopper a baghouse dust collector will be operated.
- Shielding of the berth-facing conveyor (CV04) from wind with side, top and bottom walls.
- The Berth 8 ship loader is connected to a dust collector and the boom is fitted with a shade cloth to reduce dust from loading partially enclosed conveyors CV03, CV02 and CV01.

The Licence Holder also operates a series of ambient air quality monitors near to sensitive receptors and capable of measuring particulate matter as PM₁₀ and Total Suspended Particulate Matter.

Key finding: The Delegated Officer has determined that:

- 1) the first shipment of alumina hydrate is unlikely to have resulted in impacts to the health or amenity of the nearest sensitive receptors, approximately 840 m from Berth 8;
- 2) the ability for finer particulates to lift off during the initial shipment was limited due to the high moisture content and low fraction of fines within the product;
- 3) wind directions during the shipment placed monitors upwind of alumina hydrate handling activities, limiting the certainty of dust control effectiveness.

Due to the low toxicity of alumina hydrate, and the low concentrations of respirable particulates, chronic health effects are not anticipated. Based upon the information provided in the original application and low content of respirable particulates within the alumina hydrate, the consequence of dust impacts is considered to be **minor** as the shipment may result in low

¹ Note: No current test exists for the determination of DEM specific to alumina hydrate. DWER considers the use of AS4156.6-2000 to be an acceptable measure for risk assessment and regulatory purposes.

level impacts to amenity.

The anticipated moisture content of the alumina hydrate product and the implementation of operational controls including the Berth 8 baghouse and conveyor shielding, the assessment of likelihood from handling a one-off alumina hydrate shipment was determined to be rare as impacts were only expected to occur under exceptional circumstances due to proposed Licence Holder controls. As a result of increased shipping volumes and frequencies, the likelihood has increased from rare to **unlikely** although the risk event will probably not occur in most circumstances.

The overall rating for the risk of dust impacts on sensitive receptors during operation is **Medium** based on Licence Holder controls.

Risk of Noise Emissions

Noise from alumina hydrate loading activities will be generated from the additional truck movements, and the operation of conveyors and baghouses used for dust control. Noise has the potential to impact the amenity and comfort of nearby residential receptors. The closest receptor is located approximately 1,020m to the southwest of the Berth 8 road hopper.

Based on results of a cumulative noise modelling report for the Premises (SVT, 2017), it is evident that activities at Berth 8 have the potential to significantly contribute to assigned noise level exceedances at residential receptors under the worst-case scenarios. This means that the predicted noise levels from Berth 8 are within the 5 dB margin of the assigned noise levels defined in the *Environmental Protection (Noise) Regulations 1997* (Noise Regulations).

The Licence Holder has proposed the following controls for noise as a part of the alumina hydrate application:

- Low speed limits and the prohibition on exhaust braking.
- Shielded conveyor galleries.

Based on the information provided in the application and 2017 noise modelling, the consequence of noise impacts from loading at both berths to considered to be **minor** as there is a potential for low-level (one-off) impacts to amenity should assigned levels be exceeded.

Modelling input data also indicates that the Berth 8 ship loader may be a significant contributor to noise under specific weather conditions. The likelihood of assigned noise levels being exceeded increases where both Berths 5 and 8 are being operated simultaneously at night time during periods of light northerly, north-easterly, easterly and south-easterly wind conditions, and a temperature inversion also exists.

The likelihood of alumina hydrate loading activities significantly contributing to noise exceedances is considered to be **rare** based on the low frequency of shipments of alumina hydrate anticipated in the event that throughputs reach 150,000 tonnes per year.

The overall rating for the risk of noise impacts on sensitive receptors during operation is **Low**.

Risk of Discharges to Water

There are no known toxic effects of the alumina hydrate proposed for handling at the Premises to the marine environment. Therefore the risks to the environment from discharges relate largely to suspension of solids in the water column resulting in reduced light.

Stormwater on Berth 8 and in the vicinity of the road hopper is directed into the waste water capture system (WWC). The WWC consists of a series of sumps and sediment traps that lead to a reeded artificial wetland that is likely to further remove suspended solids. Stormwater from the artificial wetland has the potential to overflow into the Preston River during heavy rainfall events and the wetland water level is already high. During the initial shipment the Licence Holder operated a road sweepers and vacuum trucks to remove spilt material from hardstand surfaces, sumps and sediment traps. All spilt material was removed from the Premises. The

Licence Holder will continue to utilise this equipment to prevent access of alumina hydrate to the marine environment.

Based upon the nature of alumina hydrate and the anticipated low volumes likely to enter the marine environment following one shipment, the consequence of material entering the marine environment is **slight**.

Based upon the proposed Licence Holder controls and the requirement for heavy rainfall events the likelihood of impacts to the marine ecosystem is considered to be **rare**.

The consequence and likelihood ratings determined that the overall rating for impacts to water from alumina hydrate handling is **Low**.

Decision

This Amendment Notice authorises the ongoing loading of alumina hydrate using an existing road hopper to telescopic chute system at Berth 8. Licence Holder controls for the loading of alumina hydrate are conditioned on the Licence to ensure that the risks associated with dust and noise emissions are reduced. The Delegated Officer has determined that limits on the annual loading rate for alumina hydrate are not appropriate as the risk associated with the activity can be adequately managed through specifications on product quality and the infrastructure and equipment controls described below.

DWER is also currently undertaking a full risk-based review of the Premises in accordance with its regulatory framework. This risk-based review and assessment is scheduled to be completed in 2018 and will include all prescribed premises activities including activities authorised through this amendment. Changes to the conditions imposed under this Amendment Notice may occur as part of the review.

Regulatory controls

Dust

Existing monitoring conditions will verify that dust controls are effective and will be retained. Conditions 4 and 5 on the Licence have been retained to ensure that the material loading chute remains below the ship's hold at all times during loading alumina hydrate to reduce material drop heights and exposure to wind.

The Licence Holder will continue to be required under existing conditions set out in previous amendment notices to:

- only accept alumina hydrate that contains a Moisture Content above the DEM derived from application of AS4156.6-2000;
- operate the baghouse dust collector at all times when trucks are unloading alumina hydrate into the Berth 8 road hopper;
- ensure the maintenance of conveyor coverings and operation of reverse pulse bag dust collection systems at all conveyor transfer points;
- maintain side, top and bottom covers on conveyor CV04.

The Delegated Officer has determined that through the application of these controls, the risk of dust from the handling of alumina hydrate at Berth 8 is reduced to acceptable levels. The Licence Holder will be required to regularly report to DWER the moisture content of the alumina hydrate shipped to confirm compliance with licence controls.

Noise

Existing conditions requiring the covering of conveyors along Berth 8 have been retained. However, as these are existing controls that have been considered through noise modelling provided, the risk is not expected to reduce.

The risk of noise impacts is low based on the low throughput amounts, which may result in an approximate maximum of five additional shipments per year assuming similar shipping tonnages to the first shipment of alumina hydrate.

Discharges to Water

No further conditions have been applied to the Licence in relation to the protection of the marine environment as the risks are considered acceptable.

Amendment History

Table 3 provides the amendment history for L6744/1996/12.

Table 3: Licence amendments

Instrument	Issued	Amendment
L6744/1996/12	25/09/2015	Licence reissue
L6744/1996/12	29/04/2016	Amendment Notice to extend expiry date Expiry date extended to 29 September 2031
L6744/1996/12	28/09/2016	Amendment Notice 1 Approval of mobile ship loading infrastructure at Berth 5
L6744/1996/12	15/12/2016	Amendment Notice 2 Extension of approval of mobile ship loading infrastructure at Berth 5
L6744/1996/12	07/07/2017	Amendment Notice 3 Authorisation to handle bauxite at Berth 8.
L6744/1996/12	18/12/2017	Amendment Notice 4 Authorisation to handle alumina hydrate at Berth 8 (one shipment only)
L6744/1996/12	15/05/2018	Amendment Notice 5 Authorisation to handle alumina hydrate at Berth 8 (ongoing)

Licence Holder's Comments

The Licence Holder was provided with the draft Amendment Notice on 15 May 2018. On the same day, the Licence Holder replied to DWER noting no comment on the draft provided, waiving the comment period.

Amendment

- Condition 18 of the Licence is amended by the insertion of red text shown in underline below:
 - The Licensee shall provide a report to the CEO specifying the data from the monitoring undertaken in conditions s 17 and 22 quarterly on the following dates: the last day of December, March, June and September in any year.
- The Licence is amended by the deletion of Conditions 21 and 23 shown in strikethrough below:
 - ~~21. The Licence Holder must not load more than one vessel with alumina hydrate.~~

- ~~23. At the completion of the alumina hydrate shipment the Licence Holder must submit to the CEO within 30 days a report providing the following information:~~
- ~~(a) Times and dates of shiploading;~~
 - ~~(b) Moisture Content of the alumina hydrate, as taken from a representative sample; and~~
 - ~~(c) Analysis of monitoring data collected during, and the 24-hour periods either side of the alumina hydrate shipment as required by Table 1 of Condition 17.~~

Appendix 1: Key Documents

	Document Title	In text reference	Availability
1.	ChemAlert (2015) Safety Data Sheet – Hydrated Alumina (Worsley Alumina)	ChemAlert, 2015	DWER records (A1434963)
2.	Jenike & Johanson (2017) Report 70817-1 DEM Test Results for Hydrated Alumina Material.	Jenike & Johanson, 2017	DWER records (A1471944)
3.	Safe Work Australia (2012) Workplace Exposure Standards for Airborne Contaminants.	Safe Work Australia, 2012	Available at: www.safeworkaustralia.gov.au
4.	South32 (2018) Certificate of Analysis B/PK-001	South32, 2018	DWER records (A1664552)
5.	Southern Ports Authority (2018) Verified Ambient Air Monitoring Report prepared 4 April 2018.	SPA, 2018a	DWER records (A1664552)
6.	Southern Ports Authority (2018) Verified Ambient Air Monitoring Report prepared 23 April 2018.	SPA, 2018b	DWER records (A1664552)
7.	SVT Consultants (2017) 2017 Update to the Cumulative Noise Model of Bunbury Port. Prepared for Southern Ports Authority.	SVT Consultants, 2017	DWER records (A1444826)
8.	SVT Consultants (2016) Environmental Noise Impact Assessment of Qube – Bunbury Port Operations	SVT Consultants, 2016	DWER records (A1188760)