



Amendment Notice 3

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	7 July 2017
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: 10 July 2017

Danielle Eyre

Senior Manager – Industry Regulation (Resource 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.

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:

- 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

Bauxite ore

On 18 April 2017, Southern Ports Authority (the Licence Holder) submitted an application under the EP Act to authorise the bulk loading of approximately 1.2 million tonnes per annum of bauxite ore from Berth 8 at the Port of Bunbury (the Premises).

Bauxite ore will be stockpiled approximately 1km from the Premises boundary in a walled bunker where it will be stored for a maximum of 30 days.

Ore is loaded into tipper trucks at the stockpile yard and then transported to the Berth 8 road hopper. An existing closed conveyor system will then carry the ore to the ship loader, which has a telescopic chute. Ore will be loaded into vessels at a maximum loading rate 2,000 tonnes per hour and it is anticipated that shipments will be between 30,000 and 60,000 tonnes each. 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.

Existing infrastructure will be utilised to load bauxite ore into vessels. No construction of new infrastructure is required under the proposal.

Mineral sands

Mineral sands export out of Berth 5 using a mobile ship loader was authorised until 30 June 2017 under Amendment Notice 2 to licence L6744/1996/12. On 26 May 2017 the Licence Holder submitted a secondary request to extend the authorisation of mineral sands handling at the Premises. Recent air quality monitoring and noise modelling has been taken into consideration for the risk assessment associated with the ongoing handling of mineral sands out of Berth 5.

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 1,500m from the bauxite storage bunker
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

Ambient air quality monitoring

Condition 17 of the Licence, as specified in Amendment Notice 1, requires the Licence Holder to monitor ambient particulate matter (PM) at four community monitoring stations and is applicable to the application to authorise ongoing shipments of mineral sands from Berth 5. These monitoring stations are capable of continuously monitoring respirable particulates measured as having a diameter smaller than 10 microns (PM_{10}). The Stirling Street monitor is also equipped with a High Volume Air Samplers (HVAS) that is able to capture Total Suspended Particulates for analysis of metals in ambient air.



Figure 1. Ambient air quality monitoring locations

During the period 1 October to 31 December 2016 a total of 48,648 tonnes of mineral sands were loaded at Berth 5 using the Qube mobile ship loader over three shipments. Particulate levels measured as PM10 at all dust monitoring sites were below the acceptable 24 hour average levels set under National Environment Protection (Ambient Air Quality) Measures (NEPM) during periods of mineral sands loading.

The only day the HVAS was downwind of the loading operations at Berth 5 was on 17 December 2016 when the wind direction was from the east for a brief period in the early morning. During the first three shipments of mineral sands at Berth 5, aluminium, iron and magnesium were identified in maximum concentrations of 7.7, 7.3 and 6.0 $\mu\text{g}/\text{m}^3$ respectively. In the same 24 hour monitoring period titanium and zircon, components of minerals sands, were measured in concentrations in ambient air not greater than 0.11 $\mu\text{g}/\text{m}^3$ and 0.02 $\mu\text{g}/\text{m}^3$ respectively.

Noise modelling

In accordance with Conditions 15 and 16 of the Licence (Amendment Notice 1) the Licence Holder submitted noise modelling for Qube operations at Berth 5 in October 2016 (SVT, 2016). The 2016 report for Qube operations demonstrates that mineral sands loading at Berth 5 may exceed night-time assigned noise level for northerly, northeasterly, easterly and southeasterly wind conditions, when temperature inversions also exist.

A cumulative noise modelling report was later submitted in 2017 for all Port of Bunbury operations (SVT, 2017). Based on results of this report, it is evident that activities at both Berths 5 and 8 have the potential to significantly contribute to assigned noise level exceedances at receptors R2 to R4 (depicted in Figure 2) under the worst case scenarios. This means that the predicted noise levels from each of the two berths are within the 5 dB margin of the assigned noise levels defined in the *Environmental Protection (Noise) Regulations 1997* (Noise Regulations).

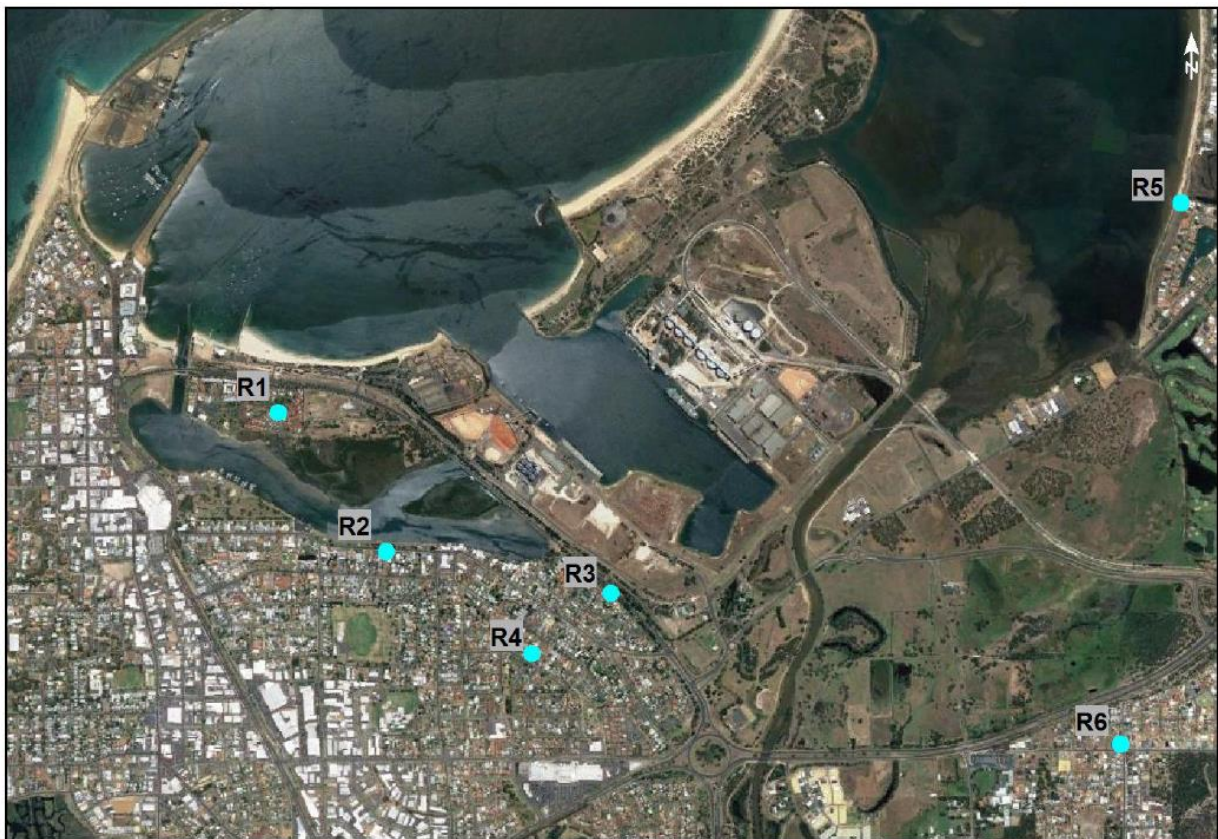


Figure 2: Representative noise sensitive receptor locations selected for modelling

Modelling also suggested that since the recent resurfacing of Koombana Drive there have been significant reductions in traffic noise, which may increase the community's awareness of port operational noise.

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 bauxite ore and mineral sands 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
	Non-prescribed activities	Storage of bauxite	Dust associated with the open-air storage and handling of bauxite material at the offsite storage area.	Residential receptors (see Table 1)	Air/wind dispersion	Impacts to public health and amenity	No	As bauxite ore is stockpiled approximately 1km from the premises boundary prior to transport to Berth 8, stockpiling is not directly related to bulk material loading activities. Therefore the Delegated Officer has determined that stockpiling is not a Prescribed Activity under the <i>Environmental Protection Regulations 1987</i> and is not within scope of this assessment or subject to Licence conditions.

Risk of Dust Emissions

Bauxite ore

The key emission arising from loading of bauxite ore is fugitive dust.

Dust 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. Bauxite ore loaded or unloaded using the mobile infrastructure has the potential to cause an increase in PM through fugitive dust emissions.

Approximately 0 to 6% of the ore product is made up of crystalline silica. Crystalline silica is listed as carcinogenic to humans by the International Agency for Research on Cancer (IARC) with occupational levels of exposure potentially leading to scarring of the lungs (silicosis), autoimmune diseases and lung cancer (IARC, 2009). However, the respirable fraction of crystalline silica is low at 1.6% of those particles considered inhalable (smaller than 100 micron). Ambient concentrations at nearby receptors are not expected to reach occupational exposure limits of 0.1mg/m³ for respirable silica (Safe Work Australia, 2013) during any event.

Naturally occurring radioactive materials can be present in some bauxite ores in very low concentrations. The ore handled at the Premises may contain thorium and uranium in concentrations less than 0.02% and therefore is not considered to present a risk to human or ecological receptors (Alcoa, 2009).

The Licence Holder has proposed the following controls for dust as a part of the application:

- The Berth 8 road hopper is partially sheltered with a roof and two side walls.
- When trucks are tipping product into the road hopper a baghouse dust collector will be operated. In addition the junction between the underground conveyor (CV07) and the rising, enclosed conveyor CV05 is connected to a dust collector to remove PM within the conveyance system.
- The berth-facing conveyor (CV04) is shielded 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 conveyors CV03, CV02 and CV01.
- The telescopic chute is lowered to below the hold of the ship to reduce product drop heights and minimise wind exposure.
- Moisture content of bauxite received at Berth 8 is expected to range between 7 and 10%.

Due to the low toxicity of bauxite ore, and the low concentrations of respirable silica, chronic health effects are not anticipated. Based upon the information provided in the application and nature of the materials being loaded, the consequence of dust impacts is considered to be **moderate**.

The distance between the nearest residential receptors and the Berth 8 ship loader is approximately 840m suggesting a possible pathway for dust to reach receptors. However, proposed Licence Holder controls are expected to reduce the Likelihood of dust impacts from bauxite loading from possible to **unlikely**.

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

Mineral sands

As assessed through Amendment Notice 1, the consequence of dust impacts from mineral sands loading is **moderate**.

Titanium and zircon concentrations in ambient air remained low during all trial shipment monitoring periods. However, weather conditions during these periods placed dust monitors upwind of Berth 5 activities for the majority of the trial period limiting the data available to demonstrate the effectiveness of controls. Due to uncertainty the likelihood remains unchanged as **possible**.

The overall rating for the risk of dust impacts on sensitive receptors during the operation of mobile loading equipment at Berth 5 remains as **Medium**.

Risk of Noise Emissions

Bauxite ore and mineral sands

The ongoing operation of the mobile ship loader at Berth 5 (mineral sands) will result in the generation of noise from additional truck movements and the mobilisation/operation of loading equipment. The nearest receptor to Berth 5 is approximately 430m to the south-west.

Noise from bauxite ore 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.

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

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

Based on the information provided in the application and updated noise modelling, the consequence of noise impacts from loading at both berths to considered to be **moderate** as there is a potential for mid-level impacts to amenity should assigned levels be exceeded.

Based on modelling input data the Berth 5 mobile ship loader and the Berth 8 ship loader may be significant contributors to noise under specific weather conditions. The likelihood of assigned noise levels being exceeded increases where both berths are being operated simultaneously at night time during periods of light northerly, north-easterly, easterly and south-easterly wind conditions, and temperature inversion also exists. Therefore the likelihood rating for Berth 5 mineral sands loading activities is increased from unlikely to **possible**. The likelihood of bauxite ore loading activities significantly contributing to noise exceedances is also considered to be possible based on modelling, which included emissions from the operation of loading infrastructure at Berth 8.

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

Risk of Discharges to Water

Bauxite ore

Ecotoxicity studies on the bauxite ore have shown that amongst freshwater species, the lethal concentration required for a 50% species death rate after a 96 hour exposure period is greater than 100 mg/L (Alcoa, 2009). Therefore the risks to the environment from bauxite ore discharges pertain largely to sedimentation.

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 sediment. 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. The Licence Holder has proposed to regularly operate road sweeper and vacuum trucks to remove spilt material from hardstand surfaces, sumps and sediment traps.

Based upon the nature of bauxite ore the consequence of material entering the marine environment is **minor**.

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 bauxite ore handling is **Low**.

Mineral sands

The risk to the marine environment from mineral sands loading at Berth 5 has already been assessed as acceptable through Amendment Notice 1 following the conditioning of Licence Holder controls. The ongoing operation of mobile ship loading equipment for mineral sands loading at Berth 5 does not increase this risk where existing regulatory controls continue to be applied.

Decision

This Amendment Notice authorises the loading of bauxite ore using an existing road hopper to telescopic chute system at Berth 8. Licence Holder controls for the loading of bauxite ore and mineral sands are conditioned on the Licence to ensure that the risks associated with dust and noise emissions are reduced.

Time and volume limits placed on the Licence through Amendment Notice 1 and later extended in Amendment Notice 2 for the use of mobile shiploading infrastructure at Berth 5 have been removed to authorise ongoing mineral sands loading.

The key emission associated with the proposed amendments (bauxite and mineral sands loading) during operations is dust. Conditions have been applied, removed or not applied based on a risk-based approach, provided above. Redundant conditions 15 and 16 have been removed as requirements to provide noise modelling have been satisfied.

DER 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 late 2017 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

Conditions will be applied to the Licence through this Amendment Notice to control the risk of dust from the introduction of bauxite ore handling at the Premises. Existing monitoring conditions will verify that dust controls are effective and will be retained. Conditions 4 and 5 on the Licence will also be retained to ensure that the material loading chute remains below the ship's hold at all times during loading bauxite ore to reduce material drop heights and exposure to wind. Condition 2 of the existing Licence will be amended to require the operation and maintenance of baghouse dust collection systems along conveyance systems for all products, including bauxite ore.

Through the application of the above controls, the risk of dust from the handling of bauxite ore at Berth 8 is reduced to acceptable levels.

Ongoing mineral sands loading operations do not increase the risk of dust impacts to receptors assuming existing Licence controls continue to be applied. Therefore Condition 8 in Amendment Notice 1 has been removed and conditions for the regulation of dust at Berth 5 will remain on the Licence.

Noise

Maintenance requirements for the covering of existing conveyors along Berth 8 will be applied through this Amendment Notice. However, as these are existing controls that have been considered through noise modelling provided, the risk is not expected to reduce. Additional controls for the management of noise have not been applied through this Amendment Notice as DWER is currently undertaking a full risk-based review of the Licence that will consider the risk of noise from all operations at the Premises.

The Licence Holder is yet to apply for a regulation 17 approval under the Noise Regulations which, if approved, may authorise higher noise levels during periods most conducive to worst case weather scenarios. While this approval would reduce the likelihood of noise exceedances, impacts to sensitive noise receptors are not expected to decrease.

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.

Licence Holder's Comments

The Licence Holder was provided with the draft Amendment Notice on 30 June 2017. No comments were received on the draft Amendment Notice.

Amendment

- The Licence is amended by the insertion of the following Conditions 19 to 20:
 - The Licence Holder must operate the baghouse dust collector at all times when trucks are tipping bauxite ore into the Berth 8 road hopper.*
 - The Licence Holder must maintain side, top and bottom covers on conveyor CV04.*
- Conditions 2, 8, 15 and 16 of the Licence are amended by deletion of the red text shown in strikethrough below:

2. *The licensee shall use and maintain reverse pulse bag dust collection systems at all conveyor transfer points. ~~for dry products.~~*
 8. *~~The Licensee must not use mobile shiploading infrastructure at Berth 5 at the Premises after 31 December 2016 and must not load more than 80,000 tonnes of minerals sands during that time.~~*
 15. *~~The Licensee shall undertake a noise assessment during commissioning of the mobile shiploader at Berth 5 to determine whether the operation of mobile unloading and loading infrastructure exceeds assigned noise levels at nearby residential receptors. The noise assessment should be carried out by a person competent in environmental noise assessment, being a person whose qualifications and experience qualifies them for membership of the Australian Acoustical Society or the Australian Association of Acoustical Consultants.~~*
 16. *~~The Licensee shall provide a report of the findings of the noise assessment detailed in condition 15 to the CEO by 31 October 2016.~~*
3. Attachment 2 of the Licence (Plan of Premises) is replaced by the below:

Attachment 2 – Plan of Premises

The Premises and site infrastructure are shown in the map below. The red line depicts the boundary to the Premises and the yellow line depicts the location of conveyor CV04.



The Department of Environment Regulation does not guarantee that this map is without flaw of any kind and disclaims all liability for any errors, loss or other consequence which may arise from relying on any information depicted. Roads and tracks on land managed by DER may contain unmarked hazards and their surface condition is variable. Exercise caution and drive to conditions on all roads.

L6744/1996/13

**Prescribed
Premises
Boundary**

Legend

□ L6744 Premises Boundary



Produced by George Brown,
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Department of Environment Regulation
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Appendix 1: Key Documents

	Document Title	Availability
1	Alcoa (2009) Material Safety Data Sheet Number 354: Bauxite.	DER records (A1414497)
2	International Agency for Research on Cancer (2009) Silica Dust, Crystalline, in the Form of Quartz or Cristobalite.	Available at: https://monographs.iarc.fr/ENG/Monographs/vol100C/mono100C-14.pdf
3	Safe Work Australia (2013) Workplace Exposure Standards for Airborne Contaminants.	Available at: https://www.safeworkaustralia.gov.au/system/files/documents/1705/workplace-exposure-standards-airborne-contaminants-v2.pdf
4	SVT Consultants (2017) 2017 Update to the Cumulative Noise Model of Bunbury Port. Prepared for Southern Ports Authority.	DER records (A1444826)
5	SVT Consultants (2016) Environmental Noise Impact Assessment of Qube – Bunbury Port Operations	DER records (A1188760)