Government of Western Australia
Department of Water and Environmental Regulation

Decision Report

Application for Licence Amendment

Division 3, Part V *Environmental Protection Act 1986*

Applicant:	**Pilbara Ports Authority**
ACN/ABN:	**94 987 448 870**
Licence Number:	**L4432/1989/14**
File Number:	**DER2014/0000636**
Premises:	**Eastern Operations**
	Portion of Lot 6098 on Plan 35618 **PORT HEDLAND, WA 6721**
Date of report:	**30 May 2019**
Status of Report	**Final**

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Definitions of Terms

Term	Definition
AACR	Annual Audit Compliance Report
AER	Annual Environment Report
Amended Licence	means Licence 4432/1989/14 as amended 30 May 2019
AS4156.6–2000	Australian Standard AS4156.6–2000: Determination of Dust/moisture Relationship for Coal.
Assigned level	means noise level not to be exceeded at receiving premises, defined by Part 2, Division 1 of the *Environmental Protection (Noise) Regulations* 1997
BAM	Beta Attenuation Monitor
dB	decibel, a unit of measurement of sound level
Clean Fill	As defined by the *Landfill Waste Classification and Waste Definitions 1996* (as amended April 2018)
Delegated Officer	An officer under section 20 of the EP Act.
DES	Dust Extraction System
DEM	Dust Extinction Moisture which is the moisture content expressed as a percentage of the product at which the Dust Number 10 derived from the Australian Standard AS4156.6-2000: *Coal preparation, Part 6: Determination of Dust/moisture Relationship for Coal,* or alternative approved standard as approved by the CEO.
DJTSI	Department of Jobs, Tourism, Science and Innovation
DoH	Department of Health
DWER	Department of Water and Environmental Regulation
EPA	Environmental Protection Authority
EP Act	means the *Environmental Protection Act 1986*
HVAS	High Volume Air Sampler
HRA	refers to the Department of Health's *Port Hedland Air Quality Health Risk Assessment for Particulate Matter* released in January 2016
Licence Holder	Pilbara Ports Authority
Moisture Content	means the ratio of the mass of water in a sample to the mass of solids in the sample, expressed as a percentage. In equation form: $$w = \frac{m_1 - m_2}{m_1} \times 100$$ Where: w = moisture content of sample; m1 = initial mass, in grams, of the test portion; and m2 = mass, in grams, of the test portion after drying
Mtpa	Million tonnes per annum
Noise	means unwanted sound and is defined in the EP Act to include vibration of any frequency, whether transmitted through air or any other physical medium
Noise Regulations	*Environmental Protection (Noise) Regulations 1997*

PM	Particulate Matter
PM_{10}	Used to describe particulate matter that is smaller than 10µm in diameter.
Premises	is defined in the EP Act to mean residential, industrial or other premises of any kind whatsoever and includes land, water and equipment
Reviewed Licence	means Licence L4432/1989/14 as amended on 18 August 2016 following a full risk-based review of the Premises
Risk Event	As described in *Guidance Statement: Risk Assessment*
Trial	means a test period during which the Licence Holder loads or unloads a new bulk granular material, not specified in Table 6 Schedule 2 of this Licence, at the Premises, in accordance with Conditions 2 to 7 inclusive.
$\mu g/m^3$	micrograms per cubic metre

1. Background

The Pilbara Ports Authority (Licence Holder) holds Licence L4432/1989/14 for a Category 58 premises under the *Environmental Protection Act 1986* (EP Act) for the Eastern Operations port facility (Eastern Operations). The Port of Port Hedland is heavily used, predominantly for the export of iron ore.

The Licence Holder has held this licence since 2010, with the previous licence holder being P & O Automotive General Stevedoring Pty Limited. The Licence Holder is a Port Authority established by section 4 of the *Port Authorities Act 1999* (PA Act). Eastern Operations is a port controlled and managed by the Licence Holder under the PA Act. The land upon which Eastern Operations is situated on port land under the PA Act, meaning land vested in, or acquired by a port authority.

This Licence previously included the Utah facility on the western side of the Port Hedland Harbour at Finucane Island and Eastern Operations on the eastern side of the Port Hedland Harbour. As part of the Western Australian State Government's consideration of port asset divestment the Licence Holder submitted a licence application to create a new standalone licence for the Utah facility and an amendment to Licence L4432/1989/14 for the regulation of Eastern Operations only.

On 18 August 2016, the Department of Environment Regulation (DER, now Department of Water and Environmental Regulation, or DWER[1]) published a full risk-based review and assessment of all Category 58 activities at the Premises in accordance with the Department's Regulatory Framework as described in the *Guidance Statement: Regulatory Principles* (DWER, July 2015).

The Reviewed Licence (L4432/1989/15) issued on 18 August 2016, has subsequently been amended to incorporate the Licence amendment applications detailed below (section 1.1, 1.2 and 1.3). Changes to Licence conditions as a result of these amendments are specified in Attachment 1 and the Amended Licence is set out in Attachment 2.

1.1 Amendment March 2018

On 17 March 2017, the Licence Holder submitted an application to amend the Licence to alter the prescribed premises boundary to enable an increase in storage space for rotainers, which are used in the transport of copper concentrate from the mines to the Eastern Operations and onto vessels in port. The proposed extension area would only be used once the existing storage area reaches its capacity. Additionally, the application sought several administrative changes in relation to the Licence conditions of L4432/1989/14.

While the application was under assessment, DWER Officers undertook a compliance inspection for Eastern Operations on 1 and 2 May 2017, as part of the Department's scheduled compliance inspection program. Following the inspection, a request sent by the Licence Holder on 25 May 2017, seeking several changes to the description and operation details for the premises and described in the Licence.

This Decision Report incorporates a risk assessment for the activities proposed in the amendment application received on 17 March 2017 and considers administrative amendment requests received 25 May 2017. The risk assessment of all Category 58 activities undertaken for the Licence issued 18 August 2016 has been updated and the Decision Report amended to reflect current operations at the Premises.

No works or operational changes are proposed in relation to this licence amendment. The full

[1] DWER was formed on 1 July 2017, through the amalgamation of the Department of Water (DoW), Department of Environment Regulation (DER) and the Office of the Environmental Protection Authority (OEPA). DER is only referred to in this Decision Report when discussing correspondence and reference documents issued by, or to the former department.

risk-based review and assessment provided in this Decision Report has been amended to better reflect current operations at the Premises and improve monitoring and reporting requirements.

1.2 Amendment April 2018

On 28 November 2017, the Licence Holder submitted an application to amend the Licence to authorise the handling of up to 610,000 tonnes per year of spodumene concentrate and increase the total authorised throughput at the Premises to 1.17 million tonnes per annum (Mtpa). The Licence Holder proposes to load spodumene concentrate as either a fine, coarse or blended product into vessels using Rotabox system. The Rotabox system will be transported to the Premises in lidded containers loaded from enclosed stockpiles in Wedgefield, approximately 5.5 km from the Premises.

No changes to infrastructure or equipment at the Premises are proposed in relation to this licence amendment.

This Decision Report incorporates a risk assessment for the activities proposed in the amendment application received on 28 November 2017. The risk assessment of all Category 58 activities has been updated and the Decision Report amended to reflect current operations at the Premises.

1.2.1 Exclusions

Emissions and discharges from spodumene stockpiles located beyond the Premises boundary at Wedgefield are not directly associated with the Primary Activity of bulk material loading/unloading onto vessels and are therefore out of scope for this assessment. Public safety impacts associated with additional vehicle movements required as part of this amendment are also beyond the scope of the EP Act and therefore have not been considered within this Decision Report.

1.3 Amendment May 2019

This amendment has been initiated by DWER for the addition of Trial conditions, which allow the Licence Holder to handle new bulk granular materials not previously assessed and authorised in the Existing Licence, in a test scenario.

Port Authorities are increasingly diversifying the type of materials handled at their premises. Trial conditions are intended to provide operational flexibility for ports and minimise impacts to economic growth where it can be demonstrated that any risk to public health, amenity and the environment is minimised to an acceptable level. DWER's decision making is provided in section 7.7 and supported by the *Guideline: Port Authority Trial Shipments – Category 58 and 58A* published on the Department's website.

2. Overview of Eastern Operations

The Eastern Operations is a bulk loading and unloading facility. It comprises three berths (Berth 1, Berth 2 and Berth 3) located within the Port Hedland Harbour. Berth 1 and Berth 2 are used to load copper concentrate from three sheds onsite or from half height containers directly into the ship's hold using a crane and Rotabox system. Loading of copper occurs for approximately 30 percent of the time. Berth 1 and Berth 2 are also used for loading general cargo and cement in bulker bags. Berth 1 is also used for fuel transfers. Berth 2 is also used for loading ammonium nitrate in bulker bags. Berth 3 is used for fuel transfers and loading of salt. Berth 3 is not part of this licence.

2.1 Infrastructure

Eastern Operations, as it relates to Category 58 activities, is detailed in Table 1 with reference to the Site Plan (attached to the Amended Licence in Attachment 2).

Table 1. Eastern Operations Category 58 infrastructure

	Infrastructure	Plan reference
1	Berth 1 and Berth 2	Premises Map: Berth 1 and Berth 2 respectively
2	Sandfire copper container storage area	Premises Map: Sandfire copper container storage area
3	Supplementary Sandfire copper container storage area	Premises Map: Supplementary Sandfire copper container storage area
4	Metals X copper storage shed	Premises Map: Metals X copper storage shed
5	Newcrest copper storage shed	Premises Map: Newcrest copper storage shed
6	Supplementary Newcrest copper storage shed	Premises Map: Supplementary Newcrest copper storage shed
7	Outload conveyors and transfer chutes, including: Static conveyors – BC01, BC02, BC02A, BC03, CV21, CV12, CV10, CV09, CV07, CV06, CV05, CV04 Mobile conveyors - MC01 and MC02	Premises Map: BC01, BC02, BC02A, BC03, CV21, CV12, CV10, CV09, CV07, CV06, CV05, CV04, MC01, MC02
8	Ship loader and conveyors and transfer chutes, including CV01, CV02 and CV03	Premises Map: Shiploader, CV01, CV02 and CV03
9	Copper sumps	Premises Map: Copper Sump

The following stakeholders have been identified to own and/or operate equipment for material loading at the Eastern Operations.

Table 2. Stakeholders and equipment

Facility/Equipment	Owner	Operator
BC01, BC02, BC02A, CV12, CV21	Newcrest	Qube
BC03, CV01, CV02, CV03, CV04, CV05, CV06, CV07, CV09, CV10, MC01, MC02	PPA	Qube
MAFI truck	Qube	Qube
Crane	Qube	Qube
Rotabox attachment	Qube	Qube
Metals X Copper Storage Shed and associated sump	Metals X Limited (Metals X)	Metals X /Qube
Newcrest Copper Storage Shed and associated sump	Newcrest	Newcrest/Qube
Supplementary Newcrest Storage Shed	Newcrest	Newcrest/Qube

2.2 Operational Aspects

Copper and spodumene concentrates are the only bulk granular materials loaded to or from ships at Eastern Operations. Cement and ammonium nitrate are handled but are not subject to the licence due to the method of handling. Copper concentrate is transported from the Telfer Gold Mine (TGM) for Newcrest Mining Limited (Newcrest), from the Nifty Copper Operations for Metals X and from the DeGrussa Copper-Gold Project for Sandfire Resources.

Berth 1 and Berth 2 is used to load copper concentrate from three sheds onsite. Metals X operates one shed and Newcrest operates the other two sheds. Newcrest and Metals X stockpile copper concentrate within the sheds prior to ship loading via a covered and shrouded conveyor system.

Road trains offload in the larger Newcrest shed, and product can be transferred to the smaller shed via a conveyor system if required. The large shed and small shed have storage capacities of 30,000 tonnes and 3,500 tonnes respectively.

Metals X transport copper concentrate product from the Nifty Copper Operations. On arrival to the storage facility, trucks enter the shed enclosure through a roller door on the south eastern wall and exit via a roller door in the north western wall. The material is tipped from the truck on an elevated platform, to the shed floor with roller doors closed. The shed has a nominal storage capacity of 18,500 tonnes.

Berth 1 and Berth 2 is used by Sandfire Resources to load copper concentrate directly from half height containers into the ship's hold using a crane and Rotabox system. The copper concentrate for this operation is loaded and sealed in half height containers at the DeGrussa Mine site prior to transport to the Eastern Operations. The containers are stored in the copper container storage area after site delivery and prior to loading.

Spodumene concentrate will be sourced from Altura's Pilgangoora Lithium Project mine site and Pilbara Mineral's Pilgangoora mine site.

Table 3 Spodumene concentrate

Logistics	Pilbara Minerals	Altura
Tonnes per annum	360,000 tonnes	220,000 tonnes
Tonnes per parcel	15,000 to 30,000 tonnes	10,000 to 15,000 tonnes
Truck deliveries to PPA	7 Trucks rolling circuit – Bulk Triple Road Train	7 Trucks rolling circuit – Bulk Triple Road Train
Shipping movements per annum	12-15	22
Ship loading duration	Approximately 55 hours	Approximately 66 hours

Both the Pilbara Minerals and Altura spodumene concentrate are handled in a similar manner with both undergoing processing at mine site prior to being transported and stored in enclosed stored facilities in Port Hedland. From the storage facility in Port Hedland it is transported to the Premises in Rotaboxes.

When the Rotaboxes arrive at the Premises they are lifted and lowered directly into the hold of the ship (at Berths 1 and 2). When in the hold of the ship the lid is lifted and the Rotabox rotated 180 degrees to empty all contents. Once empty the Rotabox is rotated upright and the lid closed. Empty Rotaboxes are transported back to the respective Port Hedland storage facilities.

The Licence Holder coordinates all operations at the Eastern Operations including all material handling systems. The Licence Holder is the owner and occupier of the Premises for the purposes of holding a licence under Part V of the EP Act.

The Premises has the capacity to operate 24 hours a day, seven days a week.

3. Legislative Context

3.1 Part IV of the EP Act

The Environmental Protection Authority (EPA) has not formally assessed Eastern Operations and there is no Ministerial Statement relating to its construction or operation. Ministerial Statement No. 788 was published for the Utah Facility on 4 March 2009. There are no conditions of this Statement that relate to Eastern Operations.

3.1.1 Environmental Protection Authority – Bulletin No. 2 – Port Hedland Noise and Dust

The EPA released Environmental Protection Bulletin No. 2 – Port Hedland Noise and Dust, January 2009 because of concerns of health effects to residents within the town of Port Hedland from particulate matter smaller than 10 microns in diameter (PM_{10}) arising from sources such as dust. The EPA formed a view that a coordinated government and industry approach to the development and execution of an integrated government and industry strategy (with explicit emission reduction strategies and explicit exposure reduction strategies) was required with strong and inclusive governance arrangements.

This review of the Eastern Operations has had regard to the EPA Bulletin No. 2 on the environmental factors relating to noise and dust.

3.2 Department of Mines, Industry Regulation and Safety

The project is considered a 'mining operation' under the *Mines Safety and Inspection Act 1994* and has been registered since 24 June 1994 under the project name Port Hedland Ports (Project Code J01715) owned by Pilbara Ports Authority. The registration covers Port Hedland Berth 1 – Eastern Operations, registered as site code S0004558.

3.3 The Port Hedland Dust Management Taskforce

The State Government established the Port Hedland Dust Management Taskforce (the Taskforce) in May 2009 to review existing reports and develop an integrated dust management plan for Port Hedland. The Taskforce is coordinated by the Department of Jobs, Tourism, Science and Innovation (DJTSI) and includes a range of industry and government members including DWER.

The Taskforce issued the *Port Hedland Air Quality and Noise Management Plan* (Management Plan) in 2010 to manage planning conflict between industrial growth and adjacent residential areas. Relevant to this report, the Management Plan recommended:

- adoption of interim air management criteria of 70 µg/m^3(24-hour average) with allowance for 10 exceedances per calendar year at Taplin Street (residential street in Port Hedland); and
- the establishment of a State Environmental Policy for Port Hedland to monitor and manage noise using *Environmental Protection (Noise) Regulations 1997* (Noise Regulations) regulation 17 exemptions where appropriate. This included the development of a cumulative noise model, defining the noise sensitive zones, clarifying planning measures and clarifying building standards.

3.3.1 2016 Report to Government

On 9 August 2017, DJTSI released the *Port Hedland Dust Management Taskforce Report to Government (August 2016)* (the Taskforce Report) for public comment. Recommendations of the Taskforce Report applicable to DWER and the regulation of industry in Port Hedland include:

- The current interim guideline of 24-hour PM_{10} of 70 µg/m^3 (+10 exceedances to accommodate natural events) continues to apply to residential areas of Port Hedland

and that measures should be introduced to cap the number of permanent residents in dust affected areas of Port Hedland;

- implementation of a coordinated risk-based review and assessment for all port facilities in Port Hedland licensed under Part V of the EP Act;
- development and implementation of dust management guidelines for bulk handling port premises licensed under Part V of the EP Act;
- oversight of the ambient air quality monitoring network including data verification, storage and publication. The monitoring network will continue to be maintained and operated by the Port Hedland Industries Council (PHIC); and
- assessment of unacceptable noise levels and assess whether additional controls can be introduced as part of its coordinated risk-based review of all port facilities.

Key Finding: DWER has had regard to the proposed approach outlined in the Taskforce Report from Taskforce members and notes that it is currently being considered by the Government.

DWER will implement the recommendations of the Government following consideration of the Taskforce Report which may include future reviews of the Premises.

3.3.2 Health Risk Assessment

The Department of Health (DoH 2016) released the *Port Hedland Air Quality Health Risk Assessment for Particulate Matter* dated January 2016 (HRA). The report provides the final health risk assessment for Port Hedland.

The HRA found that concentrations of PM_{10} over 70 µg/m^3 are associated with morbidity and mortality and is associated with increased levels of acute and chronic respiratory and cardiovascular health effects (DoH 2016). In addition for Port Hedland, the HRA found that modelling scenarios indicated that the level of risk between the lower PM_{10} concentrations of 50 µg/m^3 and the interim criteria of 70 µg/m^3 was not discernible for the current population levels in Port Hedland. Therefore the HRA determined that to manage the potential impacts on human health from dust, the interim criteria of 24-hour average of 70 µg/m^3 PM_{10} with 10 exceedances per annum would be appropriate to manage the risk in residential areas in Port Hedland (DoH 2016).

The HRA noted that despite good dust management practices, weather events and local sources of dust (such as the spoil-bank) can result in exceedances above the interim criteria. It was found that in the West End of Port Hedland the risk from PM_{10} may be up to twice as high than for those living in South Hedland. The HRA noted that the application of the interim criteria to residential areas west of Taplin Street will also require land use planning restrictions, and that a long term planning strategy may offer a tool for gradually moving residential areas from the port operational area (DoH 2016).

The HRA notes that it should not be the only source of information guiding decisions and must be combined with other studies including the noise model, the air quality model and the source apportionment model (see page 10 of the HRA).

Key Finding: DWER notes the recommendation in the HRA including the use of planning controls as a primary mechanism for managing impacts upon the residential population of the West End.

DWER also notes that interim guideline criteria for impacts on human health from dust have only been applied to those residents east of Taplin Street and that a recommendation in the Taskforce report includes it potentially being applied to all residential areas of Port Hedland for a suggested period of five years.

4. Site and Operational History

4.1 Works Approvals

4.1.1 W5122/2012/1

Works approval W5122/2012/1 - Berth 1 and 2 Sandfire Shipping Container Load Out Facility, was issued on 19 April 2012 for the storage of copper concentrate in sea containers and the loading of copper concentrate into the hull of the ships directly from sea containers.

4.1.2 W5146/2012/1

Works approval W5146/2012/1 - Port Hedland Berth 1, was issued 23 August 2012 for the upgrade of facilities used by Newcrest Mining including an existing unused copper concentrate shed and construction of a new conveyor and associated infrastructure for the loading of copper concentrate.

4.2 Previous Licence Amendments[2]

Licence L4432/1989/14, version 14 issued 10 October 2013 was most recently amended on 19 February 2015. Relevant to Eastern Operations, the amendment included the removal of Category 86 as DWER determined that the loading of copper concentrate from sealed containers using the Rotabox equipment was not an enclosed system.

An improvement condition was detailed on a previous version of the licence (L4432/1989/11). This condition (condition 20) required the Licence Holder to implement an environmental improvement plan (EIP) by 1 April 2011 to reduce emissions from Berth 1 on the premises that can be achieved over a two-year period. An EIP was submitted in accordance with condition 20. The licence also required several plans to be developed and implemented as part of the EIP including:

- Stormwater and Wastewater Management Plan
- Incident Management
- Marine Sediment Sampling and Analysis Plan
- Air Quality Monitoring and Reporting

The Berth 1 EIP - Final Report submitted by the Licence Holder on 4 April 2014 provided detail on the implemented actions. This report has been considered in the assessment of risk outlined in section 6.

As part of the EIP, the Licence Holder undertook a Human Health and Environmental Risk Assessment (HHERA). The results were provided with the EIP submitted in April 2011 (PHPA 2011).

The HHERA included the assessment of dust emissions, groundwater and offsite aquatic

[2] This Decision Report is limited to the assessment of applications identified in section 1. This section refers only to those Licence amendments issued prior to that issued on 18 August 2016.

ecosystem impacts from Eastern Operations premises. Findings of this assessment are discussed in section 4.6.6 and have been considered in the assessment of risk to public health and the environment in section 6. However, as DWER has not analysed the adequacy of monitoring and modelling reported in the HHERA for this assessment, the consideration of the results has been undertaken in the context of this limitation.

4.3 Compliance Inspections

The DWER has undertaken inspections on four occasions during the previous four years. A summary of these inspections is provided below:

- Inspection undertaken 11/06/2012: An Environmental Field Notice was issued by the then Department of Environmental Conservation (DEC) in relation to spilled material being identified below the conveyor system (CV10 and BC03). DEC requested the removal of excess material. The Licence Holder responded 29 June 2012 by letter advising that the material had been removed. No further action was required.
- Inspection undertaken 12/06/2013: No non-compliances were noted in the report.
- Inspection undertaken 2/05/2014: One non-compliance was noted relating to condition 1.2.4 ("The Licence Holder shall immediately recover or remove and dispose of spills of environmentally hazardous materials outside an engineered containment system."). The inspection report details that the spills and impacted areas were not remediated immediately (not within 48 hours). No further action was required.
- Inspection undertaken 15/10/2014: No non-compliances were noted in the report.

4.4 Annual Audit Compliance Reports

Annual Audit Compliance Reports (AACR) and Annual Environmental Reports (AER) have been submitted in accordance with Condition 5.2.2 of Licence L4432/1989/14 during the period from 1 January 2012 to December 2016. Following the issue of the Reviewed Licence the requirement to submit an Annual Environmental Report was removed and the Licence Holder submitted an AACR only. These reports are discussed in the sections that follow.

4.4.1 2016/17 Report

The Reviewed Licence was issued on 18 August 2016 during the reporting period to separate the Eastern Operations and Utah Point operations into two licensed premises.

The Licence Holder declared only an administrative non-compliance with Licence conditions as the Dust Monitoring Report for the period 1 January 2017 to 31 March 2017, was sent three days after the due date of 30 April 2017.

4.4.2 2015/16 Report

The Licence Holder declared non-compliance with Condition 3.5.1 following delays in two surface water monitoring events with one being outside the reporting period. Results indicate no licence limits were exceeded. There was no discharge of surface water offsite and no adverse environmental impacts observed.

4.4.3 2015 Report – 1 January 2015 to 30 June 2015

The annual reporting period changed from 1 January until 31 December to 1 July until 30 June in the following year through the Licence amendment to incorporate the operation of Stockyard 2 at the Utah Point operations (issued on the 19 February 2015). To ensure a continuous period of reporting, the Licence Holder submitted an annual compliance report for the six month period finishing 30 June 2015.

The Licence Holder did not declare any non-compliances with any condition of the Licence.

4.4.4 2014 Report

An AER and AACR compliance review and report was undertaken by DER, dated 6 May 2015 for the 2014 reporting period. No non-compliances or issues were noted in the report.

Key observations within the AER include the following. The Licence Holder reported 204 environmental incidents which fell within the categories of discharges to water and to land. Most incidents related to small scale hydrocarbon or product spills to land. No significant spills were reported to impact the marine environment, with the largest spill incident being a 1600 litre diesel spill to the Utah facility Stockyard 2 ring road. This was reported in the AACR.

The total number of target exceedances recorded at the Licence Holder's boundary network was 652 in 2014 with 95 attributed to the Licence Holder operations. Twelve of these exceedances were recorded at the Eastern Operations premises with the remainder recorded at the Utah facility. Total exceedances were reported as a 38 per cent increase from 2013 attributed to the increase in throughput and the commissioning of Stockyard 2 at the Utah facility.

4.4.5 2013 Report

Key observations within the AER/AACR include the following:

- The Licence Holder reported 170 environmental incidents which fell within the categories of discharges to water, land and hazardous materials spills. Most incidents related to small scale spills.
- The total number of target exceedances recorded at the Licence Holder boundary network was 661 in 2013, with 78 attributed to the Licence Holder operations and 17 of these recorded at the Eastern Operations premises area. The remainder of exceedances were recorded at the Utah facility.
- Through the AACR, the Licence Holder self-reported non-compliance with conditions relating to small scale spills and discharges. No issues or concerns noted.

4.4.6 2012 Report

Key observations within the AER include the following:

- The total number of target exceedances recorded at the boundary network was 178 in 2012, with 22 attributed to the Licence Holder's operations.

4.5 Compliance History Review

There is no history of prosecution issued under the EP Act by DWER to the Licence Holder for the Eastern Operations facility. On 11 June 2012, an Environmental Field Notice (EFN 3080) was issued in response to the build-up of copper and manganese under conveyors. Later inspections undertaken on 12 June 2013 did not find any non-compliances and the incident was closed later that year.

On 1 and 2 May 2017, DWER Officers undertook a compliance inspection for Eastern Operations and the Utah facility as part of the Department's scheduled compliance inspection program. During the inspection DWER Officers became aware that the Licence Holder may accept bulk granular material onto the premises prior to knowing the moisture content. In addition, several discrepancies between the dust control infrastructure and equipment used at the premises and detailed in the Licence were observed.

DWER's Incident and Complaints Management System (ICMS) is the system used to record complaints received and non-compliances requiring investigation. Following a review of ICMS there is no record of a complaint received from a member of the public or business directly relating to the Eastern Operations facility in at least the past 24 months. However, a number of

general dust complaints have been noted for Port Hedland.

4.6 Modelling and Monitoring Data

4.6.1 Dust Monitoring Data

Ambient air quality monitoring is undertaken in Port Hedland through a network of monitoring stations within the Town of Port Hedland. Monitoring is coordinated through the PHIC and real-time monitoring reported on their website.

The HRA noted that the reported PM_{10} levels at the West End of Port Hedland (Taplin, Kingsmill and Richardson) for the 2011-2014 period were found to be above the interim criteria levels assigned to areas east of Taplin Street (70 µg/m^3 over a 24-hour average) for 16 per cent of the sampled days, compared with 3 per cent and 2 per cent at South Hedland and Yule River respectively (DoH 2016, p 26).

A summary of Taplin Street exceedances is provided below.

- 2012-2013 period - 17 exceedances at Taplin Street monitoring station with two confirmed to be attributed to industry;
- 2013-2014 period - six exceedances at Taplin Street with three confirmed to be attributed to industry;
- 2014-2015 period – 10 exceedances at Taplin Street with seven confirmed to be attributed to industry;
- 2015-2016 period – 10 exceedances at Taplin Street with five confirmed to be attributed to industry; and
- 2016-2017 period – one exceedance at Taplin Street reported to be attributed to natural events and/or third parties.

The use of Taplin Street alone as a benchmark for air quality impacts due to operations at the Premises is limited as emissions may be masked by dust sources closer to Taplin Street. The HRA noted that the reported PM_{10} levels at the West End of Port Hedland (Taplin, Kingsmill and Richardson) for the 2011-2014 period were found to be above the interim criteria of 70 µg/m^3 (24 hour average) at 16 per cent of the sampled days, compared with 3 per cent and 2 per cent at South Hedland and Yule River respectively.

4.6.2 Dust Levels and Throughput

Following a review of monitoring data at all Port Hedland monitoring locations, DWER has determined that there is no clear correlation between overall throughputs handled at Port Hedland and PM_{10} concentrations measured at ambient air quality monitoring stations. Figure 1 shows that PM_{10} concentrations, as measured at local monitoring stations, have not increased or changed significantly despite increases in throughput by all Port Hedland port operators. However, much of this growth has been the result of increases to iron ore exported throughputs at other operators such as BHP's Port Hedland Operations and Fortescue Metal Group's Anderson Point.

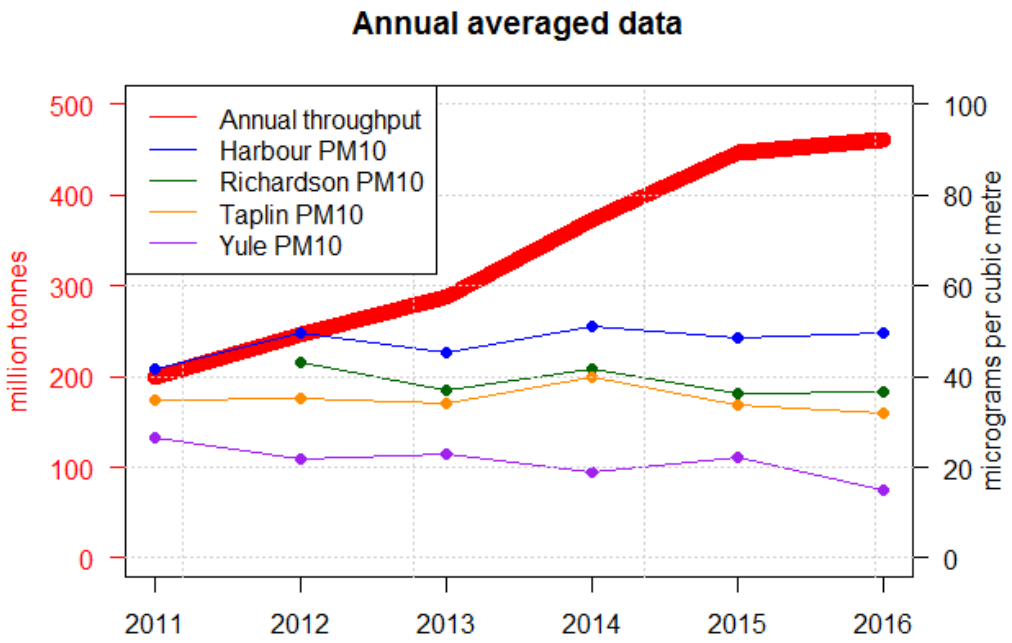

Figure 1. Total annual throughput at Port Hedland (all ports) versus ambient air quality (PM_{10})

4.6.3 Dust Boundary and Moisture Content Monitoring

The Licence Holder undertakes boundary monitoring at two locations for $PM_{10,}$ as detailed in Table 4 below and is required to receive product with a moisture content above the DEM level.

Between 22 August 2016 and 31 December 2017, the Licence Holder has reported that 100% of all product received has had a moisture content above the DEM level on arrival. Due to the wet processing of the three types of copper concentrates received at the Premises, moisture contents across the quarterly reporting periods has remained consistent.

Previous licence conditions required the Licence Holder to target PM_{10} to below 80 µg/m^3 over a 24 hour period at four boundary monitoring locations that continuously monitor ambient air quality (particulates). Consistent with the Port Hedland Taskforce Management Plan, targets were also set to ensure that ambient PM_{10} concentrations at Taplin Street remained below 70 µg/m^3 over any 24 hour period.

A review of monitoring data for Eastern Operations for the 2012 to 2014 period has been undertaken. The Licence Holder has indicated that on 11 (2012), 17 (2013) and 12 (2014) occasions previous targets set out by the Licence (PM_{10} at 80 µg/m^3 over a 24 hour period) were attributed to port operations.

For the 2012 to 2014 period the Licence Holder was not required to undertake and report on boundary exceedances for PM_{10} against data reported for Taplin Street or other ambient monitoring data in Port Hedland.

Following a risk-based review of the Licence, DWER determined that the monitoring of copper in PM_{10} was also required at two boundary monitors located between Eastern Operations and nearby receptors. To allow for the transition from the use of Beta Attenuation Monitors (BAM) to High Volume Air Samplers (HVAS), the Licence Holder was required to comply with interim monitoring conditions in Table 4 below.

Table 4 Ambient air quality monitoring at Eastern Operations

Location	Parameter	Averaging Period	Reportable Event	Frequency	Method
M10 and M11, shown through Schedule 4, Figure 2.	Cu as PM_{10} (µg/m^3)	24 hour average	>1 µg/m^3	One 24 hour sample every sixth day, plus at least one 24 hour sample during a ship loading of copper	AS3580.1.1 AS3580.9.6
	Particles as PM_{10} (µg/m^3)	24 hour average	>145 µg/m^3		

On 21 November 2016 and 20 February 2017, the Licence Holder notified DWER that HVAS monitors were in place.

Since the installation of dust monitors, the Licence Holder advised DWER of six Reportable Events that occurred over the period of November 2016 and 31 December 2017. On two occasions in 2016 the Licence Holder demonstrated that Premises activities were not likely to be significantly contributing to ground level concentrations, as no bulk granular material was loaded in the 24 hour monitoring period (PPA, 2016). The Licence Holder reported that while the Premises did contribute to Reportable Events, exceedances were the result of offsite and background sources.

Two Reportable Events were recorded in 2017 in relation to copper as PM_{10} exceeding criteria (1 µg/m^3 over a 24 hour averaging period) at boundary monitor M10. Copper concentrate was being loaded onto a vessel and in-loaded during both exceedances and all products had a moisture content above the DEM level. Winds during both events were also variable although monitor M10 was placed downwind of shiploading for some time during on both occasions. In each case copper concentrations measured at monitor M11 were low at 0.62 µg/m^3 and 0.12 µg/m^3.

The third Reportable Event in 2017 occurred on 16 December and related to an exceedance of PM_{10} trigger criteria (145 µg/m^3) at M11 (186 µg/m^3). There were no vessels being loaded at this time and winds placed the M11 monitor downwind of an unsealed maintenance yard. Taplin Street also recorded an exceedance of the interim criteria (24-hour PM_{10} of 70 µg/m^3) on this date with a PM_{10} concentration of 81 µg/m^3) recorded over the 24 hour period suggesting that external sources were the cause of elevated dust levels.

4.6.4 Port Hedland Dust Campaign using LiDAR

DWER undertook a short term dust monitoring campaign in Port Hedland from February 2017 to June 2017. The campaign was undertaken using conventional monitoring methods for particles with an equivalent aerodynamic diameter smaller than 10 micrometres (µg) (PM_{10}) as well as a Light Detection and Ranging (LiDAR) instrument.

The objective of the campaign was to determine the origins and movement of dust contributing to impacts experienced in and around Port Hedland and to assess the suitability of applying LiDAR technology.

The initial findings of the study have been published in the DWER *Mapping dust plumes at Port Hedland using a LiDAR, February 2018* (Port Hedland LiDAR Report). The major findings of the study are reported as follows:

- During the study period, there were three PM_{10} exceedances to the 70 µg/m^3 24-hour PM_{10} guideline at the Harbour monitoring suite, two exceedances at both the Richardson and Kingsmill sites and one exceedance recorded at Taplin Street. There was also one exceedance at the background site.
- PM_{10} concentrations generally decrease as the distance from the port area increased.

- The $PM_{2.5}$ to PM_{10} particle ration profile indicates that the majority of dust was not due to combustion but coarser in nature indicating dust lift-off from wind or mechanical processes.
- The NEPM PM_{10} annual average standard of 25 µg/m^3 was exceeded at Taplin Street every year from 2011 to 2016 with 2017 likely to also exceed the annual standard.
- Directional analysis indicated that the majority of particle loading to all monitoring sites originated from a southerly direction.
- There was a high correlation between the LiDAR backscatter and the concentrations determined by the particle monitors which provided a measure of confidence that the LiDAR was providing a valid representation of atmospheric particle loading.

A review of the Port Hedland LiDAR Report and PM_{10} 24 hour exceedances (Appendix A), PM_{10} one hour concentrations greater than 200 µg/m^3 (Appendix B) and selected events recorded by the LiDAR during the campaign (Appendix C) has been undertaken. Nearby port operations at Nelson Point, Finucane Island and Anderson Point were found to be significant contributors to dust emissions as identified by LiDAR imagery. A review of these LiDAR images identified that ship loading is the most significant source of dust from the Premises. However, the Premises did not appear to be a significant source of dust when viewed alongside other nearby port operations.

4.6.5 Stormwater Monitoring

Licence L4432/1989/14 requires that the Licence Holder monitor the concentration of total recoverable hydrocarbons (or total petroleum hydrocarbon (TPH) prior to the February 2015 licence amendment) in stormwater discharged to the harbour through discharge pipes on the periphery of the Berth. In accordance with licence L4432/1989/14 monitoring is undertaken opportunistically as rainfall permits.

Results provided from 2011 to 2014 by the Licence Holder show that concentration of TPH ranged from less than detectable to 0.690 mg/L being below the limit of 15 mg/L specified in the licence.

The Licence Holder also voluntarily monitors the concentration of copper, chromite and manganese in stormwater discharged to the harbour. Results from 2011 to 2014 show that levels of copper, chromite and manganese have decreased since 2011. There is no applicable standard relevant to the level of these contaminants in stormwater discharged to the marine environment.

4.6.6 Noise Monitoring and Modelling

In February 2014, the PHIC undertook a cumulative environmental noise study (*Port Hedland Cumulative Environmental Noise Study*) involving the modelling of the scenarios of current operations, foreseeable future operations and the ultimate capacity of the Port Hedland area. Noise emissions from activities undertaken at Berth 1 were included in the study (PHIC 2014). The study found that for most facilities investigated the current noise level in Port Hedland exceed the Noise Regulations (PHIC 2014).

4.6.7 Groundwater Monitoring

The groundwater assessment undertaken as part of the 2011 HHERA included discussion on results from groundwater monitoring undertaken every two months since 2004 beneath the premises.

> "*Variable concentrations of dissolved metals have been reported in the groundwater beneath the site with no specific trends identified over time or spatially across the site. This suggests that operations on the premises have not significantly (such that there is*

any statistical significance) impacted the quality of groundwater beneath the site, via leaching of metal concentrates from the premises" (PHPA 2011).

The dissolved metal concentrations in the groundwater were found to be on average lower than the 95% species protection guideline levels for marine waters in the *Australian Water Quality Guidelines for Fresh and Marine Water Quality* (ANZECC 2000). The site has been classified as contaminated under the *Contaminated Sites Act 2003* (CS Act) and dissolved metal groundwater concentrations discussed further in section 4.7.

4.6.8 Sediment and Marine Ecosystem Health Monitoring

The sediments of the Port of Port Hedland have been widely sampled for heavy metals over the last two decades including areas adjacent to the Premises, in other areas of the harbour and at reference sites. Some of these investigations have been undertaken to assess the suitability of ocean disposal of sediments in accordance with the requirements of the *National Assessment Guidelines for Dredging* (DEWHA 2009).

A sediment and marine ecosystem health assessment was undertaken as part of the 2011 HHERA and includes discussion and comparisons on the results of marine sediment and biota health investigations undertaken in 2005 and 2009 (PHPA 2011).

The 2009 investigation sampled at nine locations adjacent to Berths 1 and 2 and at increasing distance from the Premises. Sediment and oysters (biota) were analysed for levels of copper, selenium, cadmium, mercury, nickel and zinc.

It was found that metal concentrations were significantly higher near Berth 1 than in the transition sites further away (except for bioavailable forms of arsenic). The only metals for which concentrations rapidly decreased with distance from the Berth 1 were copper and manganese, the latter being previously handled at Berth 1. The concentration of metals tested in biota was also higher at the Berth 1 sample sites when compared to the control sites.

Comparison between 2005 and 2009 monitoring results showed there was a reduction in metal concentration in both the sediment and biota. The Licence Holder attributes this to the improvements in copper concentrate handling and the continued dredging adjacent to Berth 1 which removes the more contaminated sediment from the impacted area.

No significant impacts beyond Berth 1 were identified in the studies conducted.

More recent sediment sampling undertaken in 2014 (Worley Parsons Consulting 2014) in several locations aligning Berth 1, 2 and Berth 4 at the Utah Facility showed arsenic, copper, chromium and nickel concentrations exceeding screening levels set by DEWHA (2009).

Arsenic, chromium and nickel concentrations were within the range of previously recorded values in 2012 and copper concentration was significantly lower. In summary, the assessment found all trace metals were low except those that occur naturally at high levels in the area (i.e. arsenic, copper, chromium and nickel).

4.7 Contaminated Sites

Portion of Lot 6098 on Plan 35618, known as the Port Hedland Port (including but not limited to Eastern Operations) was classified as contaminated (remediation required) under the CS Act. The land use of the site is restricted to commercial/industrial use.

Manganese and hydrocarbons were found to be present in soils. Hydrocarbons (such as diesel), arsenic and manganese were present at elevated concentrations in groundwater in the southern and central areas of the site. The prescribed premises area is located to the north-west portion of the lot.

Marine sediments adjacent to Berths 1 and 2 have copper and lead present in sediments at

concentrations exceeding Interim Sediment Guidelines-High as published in DWER's *Assessment and management for contaminated sites* (2014).

Other than for analytical testing or remediation, groundwater abstraction is not permitted at this site because of the nature and extent of groundwater contamination.

Large portions of the site have not been subject to soils or groundwater investigations for the purposes of classification under the CS Act.

5. Location and Siting

5.1 Siting Context

Eastern Operations is located within the Port of Port Hedland which is the world's largest tonnage port for bulk materials export. The Port of Port Hedland is currently utilised for the bulk loading of material, predominately iron ore, by BHP Billiton Iron Ore, Fortescue Metals Group with Roy Hill currently commissioning port infrastructure. Table 5 details the current port operators within Port Hedland.

Table 5 Port of Port Hedland operators (Category 58 and 58A premises)

Operator	Bulk Granular Material	Scale of operation
BHP Billiton Iron Ore	Iron ore	Allocated capacity 290 Mtpa Four berths at Nelson Point Four berths at Finucane Island
Fortescue Metals Group	Iron ore	Allocated capacity 175 Mtpa Five berths at Anderson Point
Roy Hill Infrastructure	Iron ore	Allocated capacity 55 Mtpa Two berths at South West Creek
Utah facility	Iron ore, manganese ore	Allocated capacity 21.35 Mtpa Single berth at Utah Point
Dampier Salt	Salt	Allocated capacity 75,000 tonnes per day Utilises single berth (Berth 3)
Eastern Operations	Copper concentrate	Throughput approximately 500,000 tonnes per annum - Two berths in Port Hedland (Berth 1 and 2)

Eastern Operations is situated on the eastern side of Port Hedland Harbour, as detailed in Figure 2 below.

Figure 2. Aerial image of Eastern Operation located on the eastern side of Port Hedland Harbour

In addition to port operations, many other industrial activities are undertaken in Port Hedland including a variety of light and service industries at the Wedgefield Industrial Estate which is located approximately five kilometres (km) south.

5.2 Residential and Sensitive Premises

Table 6 Receptors and distance from prescribed activity

Residential and Sensitive Premises	Distance from Prescribed Activity
Closest residential - short term residence (Pier Hotel) (Retail/commercial zone)	Distance from sheds = approximately 60 metres (m) to the east Distance from ship loader = approximately 350 m to the north east
Closest residential - long term residence (Residential zone)	Distance from ship loader = approximately 910 m to the north east Distance from sheds = approximately 680 m to the north east
Taplin Street (ambient monitoring site) (Residential zone)	Distance from ship loader = approximately 2,220 m to the north east Distance from sheds = approximately 2,000 m to the north east

The Town of Port Headland reported in the HRA a permanent population of 4,590 people in 2012/13 and a larger population of fly-in-fly-out workers (DoH 2016, p 11).

The closest residential area to Eastern Operations is the West End, shown in Figure 3 below (DoH 2016, p 5).

Figure 3 – Aerial image of Eastern Operation (circled) showing West End

5.3 Specified Ecosystems

Table 7 Specified ecosystems

Sensitive ecosystems	Distance from Prescribed Premises
Port Hedland Harbour – marine ecosystem	Located within the marine ecosystem – moderate level of ecological protection (DoE, 2006) Mangrove community located to the south west approximately 500-650 m (also located to the south 1,270 m)

5.4 Groundwater and water sources

Table 8 Groundwater and water sources

Groundwater and water sources	Distance from Prescribed Premises	Environmental Value
Groundwater	Depth to groundwater encountered at approximately 2.9 to 4.4 m (based on information provided by the Licence Holder (EIP dated 06/04/11). No bores located within 0.9 km of premises (based on available GIS dataset – WIN Groundwater Sites).	Water is not used for potable or industrial use.

5.5 Soil Type

The Eastern Operation is established on reclaimed land. The area consists of sandy clay to approximately 3 m, above limestone that lies at a depth of 3 m to approximately 9.75 m (DoW 2013).

5.6 Meteorology

DWER's Air Quality branch has analysed five-minute averaged data for Taplin Street, for the period spanning 25 January 2012 to 24 December 2014. Taplin Street is located approximately 2.2 km east from the Eastern Operation. The following wind rose (Figure 4) provides the annual wind direction and strength for this period at the Taplin Street site.

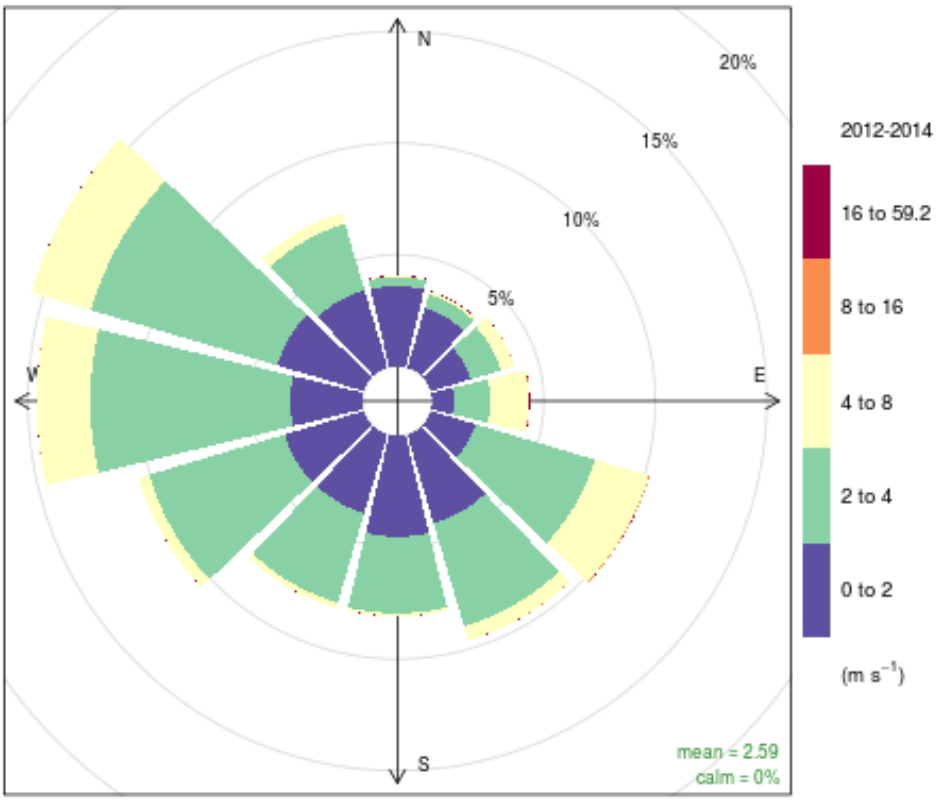

Figure 4. Wind Rose Taplin Street, Port Hedland

5.6.1 Regional Climatic Aspects

Port Hedland is located in a semi-arid environment. Rich mineral content is reflected in the red soil and dust (DoH, p 12).

The Port Hedland region has dominant annual wind direction consisting of north-westerly during the summer months and south-easterly during the winter months. Spring also shows high north-westerly dominance.

5.6.2 Rainfall and Temperature

The Bureau of Meteorology provides the mean rainfall and maximum temperature for Port Hedland (mean maximum temperature 1948-2016 and mean rainfall 1942-2016). The Port Hedland region is warm to hot all year round with rainfall predominantly over the December to

July period.

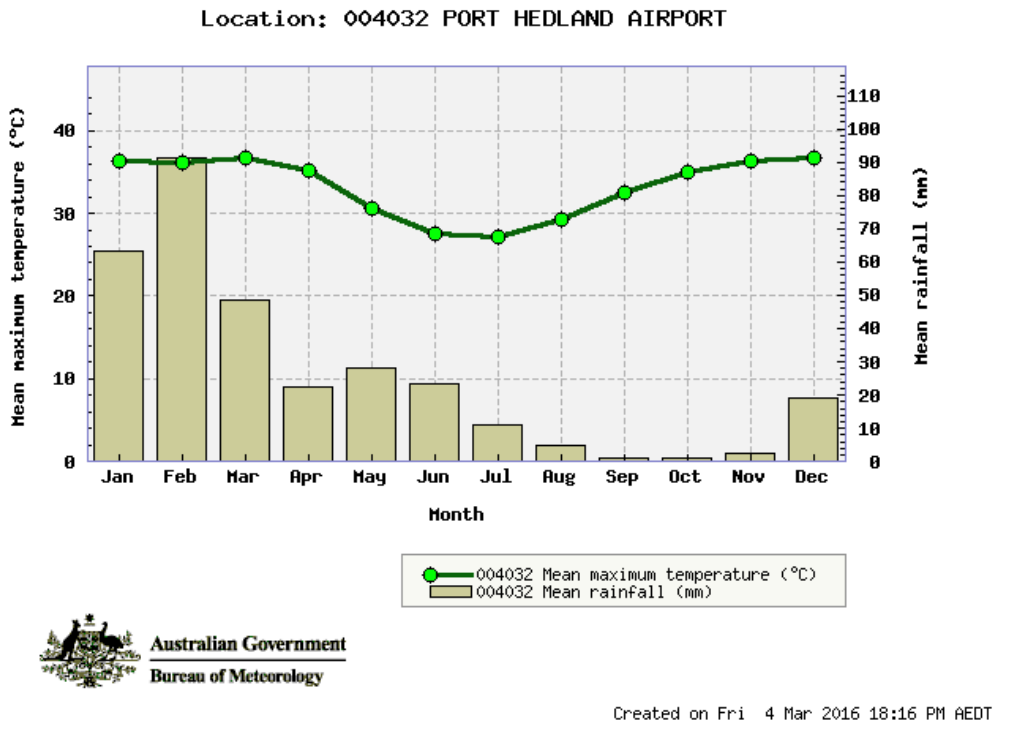

Figure 5. Mean temperature and rainfall Port Hedland

6. Risk Assessment

6.1 Determination of Emission, Pathway and Receptor

In undertaking its risk assessment, DWER will identify all potential emissions pathways and potential receptors to establish whether there is a Risk Event which requires detailed risk assessment.

To establish a Risk Event there must be an emission, a receptor which may be exposed to that emission through an identified actual or likely pathway, and a potential adverse effect to the receptor from exposure to that emission. Where there is no actual or likely pathway and/or no receptor, the emission will be screened out and will not be considered as a Risk Event. In addition, where an emission has an actual or likely pathway and a receptor which may be adversely impacted, but that emission is regulated through other mechanisms such as Part IV of the EP Act, that emission will not be risk assessed further and will be screened out as outlined in Table 9 .

The identification of the sources, pathways and receptors to determine Risk Events are set out in Table 9 below.

Table 9 Identification of emissions, pathway and receptors during operation

Risk Events						**Continue to detailed risk assessment**	**Reasoning**
Prescribed premises activities	**Sources/ Activities**	**Potential emissions**	**Potential receptors**	**Potential pathway**	**Potential adverse impacts**		
Category 58 Bulk material loading or unloading	Storage and loading of copper and spodumene concentrates	**Dust** associated with the handling of bulk material using hoppers, conveyance systems and ship loaders (chute and Rotabox system).	Pier Hotel – located 60 m east of Eastern Operations Closest zoned residential premises – 910 m to the north east	Air/wind dispersion	Impacts to public health and amenity	Yes	Refer to section 6.3
		Noise associated with additional vehicle movements, mobilisation of loading infrastructure and operation of dust control equipment.	Pier Hotel – located 60 m east of Eastern Operations Closest zoned residential premises – 910 m to the north east	Air/wind dispersion	Impacts to amenity	Yes	Refer to section 6.4

	Storage and loading of copper concentrates	**Odour** associated with the handling of copper concentrates using hoppers, conveyance systems and ship loaders.	Pier Hotel – located 60 m east of Eastern Operations Closest zoned residential premises – 910 m to the north east	Air/wind dispersion	Impacts to public amenity	Yes	Refer to section 6.5
	Direct discharges to surface water (spills) and discharges from stormwater/wash water runoff following spodumene and copper concentrate loading activities.	**Discharge** of water contaminated with bulk granular materials to the harbour waters.	Benthic, mangrove and seagrass communities in the Port Hedland Inner Harbour.	Direct discharge	Marine environment: Reduced water quality from increased sedimentation or toxicity resulting in declining ecosystem health.	Yes	Refer to section 6.5
	General site activities.	**Seepage** of stormwater contaminated with bulk product to groundwater that is later expressed in the marine environment.	Benthic, mangrove and seagrass communities in the Port Hedland Inner Harbour.	No pathway.	Marine environment: Reduced water quality from increased sedimentation or toxicity resulting in declining ecosystem health.	No	No pathway to groundwater exists as all storage and handling areas are sealed. Copper concentrate handled at Eastern Operations is also insoluble.

6.2 Consequence and Likelihood of Risk Events

A risk rating will be determined for risk events in accordance with the risk rating matrix set out in Table below.

Table 10 Risk rating 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

DWER will undertake an assessment of the consequence and likelihood of the Risk Event in accordance with Table 11 below.

Table 11. Risk criteria table

Likelihood		**Consequence**		
The following criteria has been used to determine the likelihood of the Risk Event occurring.		**The following criteria has been used to determine the consequences of a Risk Event occurring:**		
			Environment	**Public health* and amenity (such as air and water quality, noise, and odour)**
Almost Certain	The risk event is expected to occur in most circumstances	Severe	• **onsite impacts**: catastrophic • **offsite impacts local scale**: high level or above • **offsite impacts wider scale:** mid-level or above • Mid to long-term or permanent impact to an area of high conservation value or special significance^ • Specific Consequence Criteria (for environment) are significantly exceeded	• Loss of life • **Adverse health effects:** high level or ongoing medical treatment • Specific Consequence Criteria (for public health) are significantly exceeded • **Local scale impacts:** permanent loss of amenity
Likely	The risk event will probably occur in most circumstances	Major	• **onsite impacts**: high level • **offsite impacts local scale**: mid-level • **offsite impacts wider scale**: low level • Short-term impact to an area of high conservation value or special significance^ • Specific Consequence Criteria (for environment) are exceeded	• **Adverse health effects:** mid-level or frequent medical treatment • Specific Consequence Criteria (for public health) are exceeded • **Local scale impacts**: high level impact to amenity
Possible	The risk event could occur at some time	Moderate	• **onsite impacts**: mid-level • **offsite impacts local scale**: low level • **offsite impacts wider scale**: minimal • Specific Consequence Criteria (for environment) are at risk of not being met	• **Adverse health effects:** low level or occasional medical treatment • Specific Consequence Criteria (for public health) are at risk of not being met • **Local scale impacts:** mid-level impact to amenity
Unlikely	The risk event will probably not occur in most circumstances	Minor	• **onsite impacts**: low level • **offsite impacts local scale**: minimal • **offsite impacts wider scale**: not detectable • Specific Consequence Criteria (for environment) likely to be met	• Specific Consequence Criteria (for public health) are likely to be met • **Local scale impacts:** low level impact to amenity
Rare	The risk event may only occur in exceptional circumstances	Slight	• **onsite impact**: minimal • Specific Consequence Criteria (for environment) met	• **Local scale**: minimal to amenity • Specific Consequence Criteria (for public health) met

^ Determination of areas of high conservation value or special significance should be informed by the *Guidance Statement: Environmental Siting.*
* In applying public health criteria, DWER may have regard to the Department of Health's *Health Risk Assessment (Scoping) Guidelines*
.

6.3 Risk of Dust Impact Analysis

6.3.1 Description of Risk Event

Fugitive dust generated from loading of copper concentrate and spodumene concentrate into vessels which migrates to Port Hedland residences and other sensitive land users at sufficient concentrations to cause health and amenity impacts.

6.3.2 Identification and General Characterisation of Emission

National and international occupational and environmental health databases (United States Environmental Protection Agency, Agency for Toxic Substances and Disease Registry, International Programme on Chemical Safety (US); National Institute for Occupational Health and Safety, National Occupational Health and Safety Commission) were used to review toxicology profiles of all profiles of all inorganic analytes and the general hazards of the main components of copper concentrate (copper, lead, arsenic and cobalt) and spodumene (lithium, muscovite and crystalline silica).

Copper concentrates

Fugitive dust from loading copper concentrate is composed of particles of various sizes including PM_{10}, comprised of copper sulfide which also contains low levels of lead, arsenic and cobalt.

- Copper is not considered a carcinogen or toxic however excessive copper in humans is believed to cause liver and kidney damage.
- Lead has been classified as a probable human carcinogen. Health effects associated with exposure to inorganic lead and compounds include neurotoxicity and development delays and hypertension. Impact on children is more significant.
- Arsenic is classified as a carcinogen. Longer term effects of inhalation may cause circulatory and peripheral nervous disorders and increased the risk of lung cancer.
- Cobalt is not considered a carcinogen or toxic. Excessive cobalt may cause nausea, vomiting, thyroid dysfunction and vision disturbance.

All other analytes are metals and as such are not biodegradable and accumulate through food chains where the toxicity is expressed. The analysis of dust samples undertaken for the HHERA (PHPA 2011) reveal very low levels of these other analytes. They are not considered individually but rather as the contribution to the hazard of metal-laden dust from the Premises.

Similarly in this assessment, the risk to health of copper, lead, arsenic and cobalt are not assessed separately but rather as a cumulative impact on ambient particulate matter (as PM_{10}) to determine the level of consequence of the risk to public health.

Spodumene concentrates

The hazards associated with fugitive dust from loading spodumene concentrates are heavily influenced by the particle size, with the smaller particles representing a greater level of risk to human health. The following hazards have been identified within spodumene concentrate dust.

- Crystalline silica is a known human lung carcinogen when inhaled at occupational exposure levels. Three types of crystalline silica are scheduled as Group 1 carcinogen by International Agency for Research on Cancer (IARC) – quartz, cristobalite and tridymite.
- Muscovite (mica) is mainly an irritant to the eyes and skin. More serious irritation of the mucous membrane and lung damage is associated with work places following years of exposure. Irritation is mostly due to the physical properties (i.e. sharpness) of the

particles rather than the chemical composition.

- Radiation from Naturally Occurring Radioactive Material (NORM).

The Department of Health (DOH) has provided general advice to DWER in relation to spodumene stating that "*DOH is not aware of any adverse health effects from spodumene, silica, quartz or mica among the general public. Instead, adverse health effects tend to be limited to work places when significant concentrations of fine dusts are generated from some type of mechanical action on ores containing these compounds"*. Further that "*spodumene concentrate is comprised predominantly of particles that are too large to be inhaled*" (Department of Health, January 2018).

6.3.3 Description of potential adverse impact from the emission

DWER considers the key hazard associated with the Eastern Operations is particulate matter generated through fugitive dust emissions.

Particulate matter has the potential to impact public health and affects both the respiratory and cardiovascular systems following both long and short term exposures. Long term repeated exposure is much more detrimental than short term sporadic exposure. The most severe effects being reduced life expectancy due to long-term exposures (DoH 2016, p 14).

Fugitive dust is comprised of PM which ranges in size from 0.005 to 100 micron (µm). Total Suspended Particulates (TSP) is used to measure fractions below 100 µm. PM_{10} is used to describe all particles that are smaller than 10 µm in diameter.

For Port Hedland, the HRA found that modelling scenarios indicated that the level of risk between PM_{10} concentrations of up to 50 µg/m^3 (NEPM standard) and PM_{10} concentrations up to the interim criteria of 70 µg/m^3 was not discernible for the current population levels in Port Hedland, in part due to the town's small population. The HRA concluded that the interim criteria should provide adequate protection of health and wellbeing (see 3.3.2).

Material assay testing provided as part of the licence amendment application for spodumene concentrate identified a low presence of naturally occurring radioactive material with up to 15 (range 2 - 15) parts per million and 3 (range 2-3) parts per million for Thorium and Uranium respectively indicating that there is a minimal risk to human health from any radioactive component of spodumene.

The Licence Holder has provided a number of spodumene analytical results which indicate the physical characteristics of the material. A summary of the particle size distribution and respirable crystalline silica content is provided in Table 12.

Table 12 Size distribution by wet sieving and laser diffraction for

Sample	Size fraction (by aerodynamic diameter) volume percent				Respirable (PM4) wt% of the bulk material for mineral phase		
	Non-inhalable	Inhalable (PM100)	Thoracic (PM10)	Respirable (PM4)	α-quartz	Cristobalite	Tridymite
Altura Spodumene	100	0	0	0	<0.01	<0.01	<0.01
Pilbara Minerals - HMS Fresh	99.95	0.05	<0.01	<0.01	<0.01	<0.01	<0.01
Pilbara Minerals - Fresh Flotation Concentrate	73.29	26.71	0.82	0.12	0.012	<0.01	<0.01

6.3.4 Air Quality Criteria for Dust

Based on the Management Plan endorsed by the Taskforce, an interim air quality guidance of 24-hour PM_{10} of 70 µg/m^3 (+10 exceedances per calendar year) applied for residential areas of Port Hedland east of Taplin Street.

In considering the Health HRA recommendations, the interim guidance criteria of 24-hour PM_{10} of 70 µg/m^3 at Taplin Street will be continued to be applied in the assessment of risk and controls for the Eastern Operations.

There are no current amenity criteria relevant to the Port Hedland community to quantify the point at which amenity impacts may be perceived. Dust impacts to amenity are the result of cumulative contributions. As no complaints in relation to the Premises have been received in at least the past 24 months, DWER has considered complaints data and submissions received in relation to other port operations nearby when assessing impacts to amenity.

6.3.5 Throughput and Frequency Considerations

Due to the nature of fugitive dust emissions, the concentrations of PM have not been quantified. Consideration has been given to the number of truck movements, tonnages of materials exported and frequency of shipments from the Eastern Operations (Table 13) to provide context into the likely frequency of emissions. Note that activities beyond the Premises, including vehicle movements, are beyond the scope this assessment.

Table 13. Tonnages and frequencies of copper concentrate exports

Period[1]	Throughputs	Number of truck deliveries	Number of ships
2013 calendar year	554,885 tonnes	5,382	46
2014 calendar year	502,251 tonnes	4,066	43
FY2015/16	446,754 tonnes	3,892	30
FY2016/17	438,548 tonnes	3,594	30

Note 1: Reporting periods change from calendar years to financial years due to the change in reporting periods to DWER.

With the addition of spodumene concentrates being handled through the Premises, throughputs are expected to increase from 560,000 to 1,170,000 tonnes per year, which equates to approximately 0.25% of overall bulk material handling in Port Hedland. Truck deliveries are also expected to increase by approximately 5,800 deliveries each year.

As discussed in section 4.6.2, there is not a clear correlation between throughput and dust concentrations at ambient monitors. The majority of bulk handling throughput in Port Hedland has been the result of increases in iron ore exports, which are typically undertaken through open material handling systems and open stockpiles.

6.3.6 Licence Holder Controls

Departmental records as well as information gathered through site visits and compliance inspections have been reviewed to document how fugitive dust emissions from the Eastern Operations are being managed. Table 14 details the infrastructure controls in place to manage fugitive dust.

Management controls are also employed to reduce fugitive dust emissions. Moisture content of copper concentrate is targeted by the Licence Holder to remain above the Dust Extinction Moisture (DEM) and below the Transportable Moisture Limit (TML). A sample of copper

concentrate from each truck delivery to the Premises is tested for moisture content, either before or after arrival to the Premises.

Site wide hygiene practices area also employed. Road sweeper operations are performed daily during periods when copper is delivered to the Premises and when shiploading occurs. The whole conveyor system is cleaned after loading events. The lid at the base of the telescopic chute is closed at the commencement of cleaning to ensure there is no direct discharge of washdown water to the harbour. The loader and excavator are washed prior to exiting sheds in a designated area. Trucks are swept with a broom after unloading and prior to leaving the shed. Recovered material from any clean up procedure is returned to the stockpile or Copper Sumps depending on whether water was used for the clean-up procedure.

Table 14 Proponent Infrastructure controls for dust emissions

Site Infrastructure **Controls for dust**	**Description**	**Operation details**	**Reference to Premises Map**
Metals X Copper Storage Shed	Fully enclosed (vented) shed with separate roller doors for truck entry and exit, a separate roller door for loader access and service and personnel access doors.	Shed doors are closed when: ○ truck is unloading copper concentrate; ○ loader is used for stockpiling activities; and ○ copper concentrate is loaded onto conveyor system via internal hopper.	Figure 1: Premises Map Metals X Copper Storage Shed
	One air/dust extraction filter system for maintenance of negative air pressure during operation.	Air/dust extraction system is in use during all unloading, stockpiling and conveyor loading activities in shed. Air extraction system filter serviced every three months.	
	Ceiling mounted sprinkler network.	The suspended sprinkler system in the shed is used for dust suppression whenever visible dust is observed.	
Newcrest Copper Storage Shed	Fully enclosed (vented) shed with separate roller doors for truck entry and exit, separate roller doors for loader access and service and personnel access doors.	Shed doors are closed when: ○ truck is unloading copper concentrate; ○ loader is used for stockpiling activities; and ○ copper concentrate is loaded onto conveyor system via internal hopper.	Figure 1: Premises Map Newcrest Copper Storage Shed
	Dust bag house systems (one operational, one spare for redundancy). Extracted air is filtered by bag house prior to discharge to the atmosphere.	The operational bag house system is in use for all unloading, stockpiling and conveyor loading activities in sheds. The operational bag house system is inspected quarterly and serviced when required. Dust residue from the bag houses is emptied onto the conveyor system periodically when ship loading occurs.	

<table>
<tr><td></td><td>Ceiling mounted sprinkler network.</td><td>The suspended sprinkler systems in the sheds are used for dust suppression whenever visible dust is observed.</td><td></td></tr>
<tr><td rowspan="2">Supplementary Newcrest copper storage shed</td><td>Fully enclosed (vented) shed with roller doors for loader access and doors for personnel access.</td><td>Shed doors are closed when:
truck is unloading copper concentrate;
loader is used for stockpiling activities; and
copper concentrate is loaded onto conveyor system via internal hopper.</td><td rowspan="2">Figure 1: Premises Map
Supplementary Newcrest copper storage shed.</td></tr>
<tr><td>Shed has a dust bag house system and ceiling mounted sprinkler network.</td><td>The dust bag house system is inspected quarterly and serviced when required.</td></tr>
<tr><td>Conveyors (17 in total)</td><td>
<table>
<tr><th>Conveyor</th><th>Plastic Cover</th><th>Canvas Skirts</th><th>Perspex side guards</th><th>Belly pan</th></tr>
<tr><td>BC01</td><td>•</td><td>•</td><td></td><td>•</td></tr>
<tr><td>BC02</td><td>•</td><td>•</td><td></td><td>•</td></tr>
<tr><td>BC02A</td><td>•</td><td>•</td><td></td><td>•</td></tr>
<tr><td>BC03</td><td>•</td><td>•</td><td></td><td>•</td></tr>
<tr><td>CV01</td><td>•</td><td>•</td><td></td><td>•</td></tr>
<tr><td>CV02</td><td>•</td><td>•</td><td></td><td>•</td></tr>
<tr><td>CV03</td><td>•</td><td>•</td><td></td><td>•</td></tr>
<tr><td>CV04</td><td>•</td><td>• partial</td><td></td><td>•</td></tr>
<tr><td>CV05</td><td></td><td></td><td>•</td><td>•</td></tr>
<tr><td>CV06</td><td>• partial</td><td>• partial</td><td>• partial</td><td>•</td></tr>
<tr><td>CV07</td><td>•</td><td>•</td><td></td><td>•</td></tr>
<tr><td>CV09</td><td>•</td><td>• partial</td><td></td><td>• partial</td></tr>
<tr><td>CV10</td><td>• partial</td><td>• partial</td><td>• partial</td><td>• partial</td></tr>
<tr><td>MC01</td><td>•</td><td>•</td><td></td><td>•</td></tr>
<tr><td>MC02</td><td>•</td><td>•</td><td></td><td>•</td></tr>
<tr><td>CV12</td><td colspan="4">Fully enclosed with metal cowling on both sides</td></tr>
<tr><td>CV21</td><td colspan="4">Fully enclosed with metal cowling on both sides</td></tr>
</table>
</td><td>Mist sprays used to suppress dust from conveyors at head of transfer chutes.
Conveyor belly pans are cleaned as required during and at the end of ship loading.
Conveyors inspected by Licence Holder following clean up to ensure they have been cleaned to requirements of Licence Holder’s internal standard.
Maintain fully sealed rubber covers at the tail ends of CV07 and MC02 in good order to contain dust and spillage.</td><td>Figure 1: Premises Map
BC01, BC02, BC02A, BC03, CV21, CV12, CV10, CV09, CV07, CV06, CV05, CV04, MC02</td></tr>
<tr><td rowspan="3">Transfer Chutes (12 in total) and Ship loader (including 3 transfer chutes and 3 conveyors, CV01-03)</td><td>Canvas or perspex shrouds or covers on static transfer chutes and between static conveyors to mobile conveyors.</td><td>Dust shrouds inspected prior to ship loading operations to ensure proper placement.
Dust shrouds only removed for clean up during or following ship loading operations.</td><td rowspan="3">Figure 1: Premises Map
Ship loader transfer feeders 1 and 2, conveyors CV01-CV03)</td></tr>
<tr><td>Conveyors on ship loader fully enclosed with canvas skirt and steel belly pans.</td><td>Conveyor belly pans are cleaned as required during and at the end of ship loading.
Conveyors inspected by Licence Holder following clean up.</td></tr>
<tr><td>Telescopic chute used for loading into ship’s hold.</td><td>Vacuum truck available at all times during ship loading and used as required to recover copper concentrate spilled.
Head chutes have switches which are activated by</td></tr>
</table>

		blockages and cause all upstream conveyers to stop running.	
	The Dust Extraction System (DES) contains 12 dust/air filters.	DES automatically activated via the CITEC automated control system prior to the outload circuit starting up. This enables extraction of dust arising from the product when transferred between CV02 and CV01 and between CV03 and CV02. DES failure sends a signal to the CITEC automated control system and causes the outload circuit to stop running. DES dust/air filters changed out as required.	
	DES automatic filter clean.	The DES has a vacuum sensing system which causes dust collected in the filters to be disposed of in a spill bin below. It is emptied and cleaned after each shipment.	
Two boundary dust monitors for Cu and PM10	M10 and M11 (Ecotech 3000 HVAS)	One 24 hour sample every sixth day, plus at least one 24 hour sample during a ship loading of copper concentrate.	Figure 2. Dust and Stormwater Monitoring Locations
	Ambient monitoring at Taplin Street (Port Hedland). Targets for Taplin Street based on Port Hedland Dust Management Taskforce.	Operated by Port Hedland Industries Council (PHIC) with data management and maintenance by PHIC. Access agreement between PHIC and Licence Holder.	N/A
Cleaning equipment	Road sweeper and vacuum truck. Designated bunded maintenance area outside copper storage sheds.	Road sweeper is used daily during periods when copper is delivered to the Premises and ship loading occurs. Brooms are used to manually clean the right hand side wheel guard of side tipping trucks to remove copper spillage prior to exiting the copper storage sheds. Loaders and excavators undergo maintenance in designated bunded areas outside the copper storage sheds. Vacuum truck available at all times during ship loading and used as required to recover spillage and empty sumps.	N/A

Bulk loading equipment	Copper concentrate arrives in road trains with covered load or in lidded containers. Storage and stockpiling of copper concentrate in enclosed sheds or in containers in the copper container storage area.	The ground surrounding the copper outload circuit for Metals X and Newcrest products is fully sealed and bunded to contain all spills. The deflector plate on the shiploader is positioned between the berth and the ship to ensure no direct spillage of product into the harbour during loading. Restricted feed speed (Metals X) to prevent spillage and blockages along the outload circuit.	Figure 1: Premises Map Metals X copper storage shed, Newcrest copper storage shed and Sandfire copper container storage area

Additional proposed controls for handling spodumene concentrate

All spodumene concentrate will be loaded into the vessel using a Rotabox system meaning that product will only be exposed to air when within the vessel's hold, minimising the potential for spillage and dust generation. Containers will be cleaned when departing the Wedgefield storage shed to ensure no product is adhering to the outside of containers.

Product moisture content will also be a primary control for the management of dust and is expected to range between 6 and 8% due to the wet processing method used at the mine site. This anticipated moisture content exceeds that DEM level for both coarse (0.5%) and fines products (3.4%).

The Licence Holder has added Lithium to the suite of metals monitored at HVAS located at M10 and M11 as an indicator of spodumene dust.

6.3.7 Key Findings

The Delegated Officer has reviewed the information regarding dust emissions and has found that:

1. Proposed material handling techniques for spodumene (Rotabox system) minimise exposure pathways for dust to reach the nearest sensitive receptors;
2. The concentration of dust generated during the handling of copper and spodumene concentrates at the Premises correlates with the moisture content. Each product has a different DEM Level, which is the moisture level required to effectively extinguish dust;
3. Copper and spodumene concentrates are processed using a wet process. Moisture content analysis of copper concentrates has revealed that product received at the Eastern Operations typically has a moisture content above the DEM level;
4. Copper concentrate is handled within sheds or containers meaning that the most significant source of dust emissions is at the shiploader. This is supported by data gathered from the LiDAR campaign;
5. Dust impacts to amenity were not addressed through the HRA or Taskforce Report for non-residential sensitive land users of the West End;
6. Existing dust levels in Port Hedland are high; and
7. Although iron ore handling has been found to be the most likely significant contributor to dust in Port Hedland's West End, bulk handling of copper and spodumene concentrates may contribute to the overall level of particulate matter.

6.3.8 Consequence

Fugitive dust (existing)

Taking into consideration the relevant factors discussed in this report, in particular the potential for the cumulative PM_{10} consequence criterion (70 µg/m^3 at Taplin Street over a 24-hour period) to be exceeded; and the findings of the Health HRA (refer to section 3.3.2 of this Decision Report), the Delegated Officer considers that the Eastern Operations contributes to the ground level concentrations of PM_{10} at Taplin Street, and that cumulative concentrations of PM_{10} may result in adverse health effects to the community requiring medical treatment. The potential consequence of health impacts from fugitive dust emissions is **major**.

High level impacts to amenity may arise as a cumulative result of Premises activities and surrounding industrial sources. The consequence of impacts to amenity from fugitive dust emissions is considered to be **major**.

Spodumene concentrate and increased throughputs (proposed)

Taking into consideration the relevant factors discussed in this report, in particular the low fines, respirable crystalline silica and mica content of the spodumene concentrate, the Delegated Officer has determined that general fugitive dust as PM_{10} is the primary parameter of concern.

If emissions from the handling of spodumene concentrate at the Premises were considered in isolation fugitive dust would primarily be considered low-level to health and amenity. However, the Delegated Officer acknowledges that increased throughput volumes at the Premises as a result of spodumene concentrate handling are likely to contribute to cumulative concentrations of PM_{10}, which are assessed as having a **major** consequence as detailed above.

Therefore there is no increase in consequence rating as a result of throughput increases from spodumene concentrate handling.

6.3.9 Likelihood of Risk Event

Fugitive dust (existing)

Taking into consideration the tonnages materials handled, offsite processing techniques, methods of handling and infrastructure controls, dust emissions stemming from the Premises are not expected to significantly contribute to the ambient air quality exceeding the relevant criterion in most circumstances. Therefore the likelihood rating is **unlikely** for both impacts to health and amenity.

Spodumene concentrate and increased throughputs (proposed)

Taking into consideration the information presented in this report, if considered in isolation, based on materials handling methods (which are characterised as generating low levels of emissions), the physical properties of the spodumene concentrate and high moisture content, the Delegated Officer has determined that the likelihood of dust emissions from spodumene handling reaching nearby receptors and causing health and amenity as rare.

However, given the increases to the total amount of bulk granular material handled at the Premises, the resulting frequency in dust generating activity at the Premises and the nature of fugitive dust the overall likelihood of the Risk Event at the Premises remains as **unlikely**.

6.3.10 Overall Rating of Dust Impacts

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix () and determined that the overall rating for the risk of fugitive dust emissions is **Medium**.

6.4 Risk of Noise Impact Analysis

6.4.1 Description of Risk Event

Noise emissions from the Premises significantly contributing to exceedances of assigned levels at nearby sensitive receptors.

6.4.2 Identification and General Characterisation of Emission

Noise is generated from the normal operations onsite including noise from machinery, conveyors, vehicles, loading equipment and reverse alarms.

6.4.3 Description of Potential Adverse Impact from the Emission

Noise has the potential to impact on the amenity of the receptor. Where assigned noise levels are exceeded regularly, health impacts may arise from stress and/or lost sleep.

6.4.4 Criteria for Assessment

The criteria for noise is detailed in the Noise Regulations.

6.4.5 Licence Holder Controls

Specific noise criteria and the regulatory approach for Port Hedland premises are currently being considered by DWER given that levels already exceed the Noise Regulation. Eastern Operations will be required to comply with the provisions of the regulatory requirements. As such, assessment of the noise controls is therefore beyond this assessment.

6.4.6 Key Findings

The Delegated Officer has reviewed the information regarding noise emissions and has found:

1. Cumulative noise emissions from all industries in the area do not currently comply with the noise regulations levels at Port Hedland.
2. The 2014 Port Hedland Cumulative Noise Study determined that Eastern Operations as a noise source exceeds a value of 5 dB below that assigned noise level at the noted receptor points (SVT, 2014). Therefore Eastern Operations are a significant contributor to Assigned levels under the Noise Regulations.
3. Noise emissions from:
   (a) vessels within the Port Hedland port;
   (b) rotainer crane reversing alarms; and
   (c) equipment start-up alarms,
   are exempt from the *Environmental Protection (Noise) Regulations 1997*.
4. The greatest impacts are likely to be experienced by residents in the West End.
5. A long term strategy for managing noise impacts has been identified as required to be developed in the Taskforce Report.

6.4.7 Consequence

Due to the type of operations and proximity to noise sensitive receptors the Premises is expected to be a significant contributor to noise in the West End of Port Hedland. The Delegated Officer has determined that Premises activities may have a mid-level impact to amenity in the local area. The consequence of noise emissions has been rated as **moderate**.

Increased throughputs (proposed)

Noise emissions are not expected to increase as a result of increased throughputs as the proposed handling method for spodumene requires the operation of existing infrastructure.

6.4.8 Likelihood of Risk Event

Based on the proximity of the Premises to sensitive receptors, noise emissions may impact upon sensitive receptors at some time. Therefore, the Delegated Officer considers the likelihood of impacts from noise emissions to result in be **possible**.

Increased throughputs (proposed)

Although the noise profile is not expected to increase, the frequency at which noise generating activities are operated at the Premises will become more regular. Therefore there is an increased likelihood of noise exceedances at nearby receptors however, more frequent vehicle movements and operation of the Rotabox system is not likely to result in noise exceedances in most circumstances. Therefore the likelihood of impacts from noise emissions remains as **possible**.

6.4.9 Overall Rating of Noise Impacts

The Delegated Officer has compared the consequence and likelihood ratings described above with the Risk Rating Matrix (Table 10) and determined that the overall rating for the risk of impacts from noise emissions is **Medium**.

Cumulative noise emissions currently exceed the Noise Regulations. Alternative regulatory strategies are required to define new assigned noise levels in the Port Hedland area and to impose requirements to minimise noise emissions. As the risk rating of noise impacts is not considered unacceptable, DWER will consider an alternative regulatory strategy once the recommendations of the Taskforce Report are finalised. This process will be outside of the requirements of the Licence.

6.5 Risk of Odour

6.5.1 Description of Risk Event

Copper concentrates can generate odours that could reach nearby sensitive receptors such as the Pier Hotel, approximately 60 m from the nearest storage shed.

6.5.2 Identification and General Characterisation of Emission

Odour emissions from copper concentrates can give off a slight sulfurous to amine odour. Residual xanthate used as a reagent in ore processing may break down in shipping containers resulting in a rotten cabbage-like odour. Odours are likely to be more significant at higher temperatures.

6.5.3 Description of Potential Adverse Impact from the Emission

Odour has the potential to impact on the amenity of nearby sensitive receptors. The nearest sensitive receptor, the Pier Hotel, offers short-term accommodation to visitors of Port Hedland.

6.5.4 Odour Criteria

There is no criterion for the assessment of odour.

6.5.5 Licence Holder Controls

The Licence Holder has the following controls in place for prevention of impacts to sensitive receptors from odour generation at Eastern Operations:

- Copper concentrate arrives in road trains with covered load or in lidded containers;
- Storage and stockpiling of copper concentrate in enclosed sheds or in containers in the copper container storage area;
- Shed doors remain closed during handling activities; and

- Partially enclosed conveyors used to transfer copper concentrates from the shed to ship loader.

6.5.6 Key Findings

The Delegated Officer has reviewed the information regarding odour emissions and has found:

1. that many controls for the management of fugitive dust emissions can also mitigate the risk of odour reaching nearby sensitive receptors; and
2. the potential for odour generation increases with higher product moisture content and temperatures.

6.5.7 Consequence

Taking into consideration the proximity of Eastern Operations to the nearby receptors and the short-term nature of exposure, there will be low level impacts to amenity from the Eastern Operation's. The consequence rating as a result of Eastern Operation's odour emissions is therefore **minor**.

6.5.8 Likelihood of Risk Event

The site is an intermittent odour source and each product received will have varying levels of odour emissions. Based on handling and storage techniques employed at Eastern Operations the significant odours reaching nearby receptors will probably not occur in most circumstances. The likelihood rating is therefore **unlikely**.

6.5.9 Overall Rating of Odour Impacts

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix (Table) and determined that the overall rating for the risk of odour emissions is **Medium**.

6.6 Risk of Discharge to Water Impact Analysis

6.6.1 Description of Risk Event

Copper and spodumene concentrate may enter the marine environment through contaminated stormwater being discharged directly to the harbour. Materials may also be spilt into the marine environment from the ship loader during loading.

6.6.2 Identification and General Characterisation of Emission

Discharges of stormwater or wash down water to the Port Hedland Inner Harbour may cause increased turbidity and/or contamination of the marine environment. Due to the nature of diffuse sources, the concentrations of material entering the marine environment has not been quantified.

The HHERA indicated elevated concentrations of metals in sediments near Berths 1 and 2. Biota also showed signs of elevated metals near Berths 1 and 2, but biota were not affected (PHPA 2011).

6.6.3 Description of Potential Adverse Impact from the Emission

Sediments and material at the Premises have the potential to contaminate stormwater and be discharged into the marine environment. High loads of sediments in stormwater can impact receiving water quality. It can also cause sedimentation impacting the surrounding mangrove community.

Copper concentrate (existing)

Copper binds easily to sediments, bioaccumulates and is significantly more toxic to fish, crustaceans and algae than to mammals and humans. Sensitivities of marine species can vary greatly from 0.01 mg/L for many invertebrates to 6.0 mg/L for some fish species over a 96 hour exposure period (Yanong, 2013; Stauber et. al, 1996). Other studies have found invertebrate tolerances to range between 0.046 and 4.6 mg/L over a 96 hour exposure period (Prato et. al, 2005; Perez and Beiras, 2009). Marine life exposure for 96 hours at these concentrations is extremely unlikely due to significant dilution factors from tidal movements and the ability for most species to move away from the contaminated area.

Spodumene concentrate (proposed)

Spodumene concentrate is non-toxic and has a very low solubility indicating that the greatest impacts from spodumene entering the marine environment is from sedimentation.

6.6.4 Criteria for Assessment

The Premises is located within the Port Hedland harbour which has been characterised as requiring moderate ecological protection (DoE 2006). Following ANZECC and ARMCANZ Guidelines (2000), the trigger value for this level of protection for assessment of proponent controls for copper is 3.0 µg/L.

No criterion has been assigned for turbidity, iron or manganese as the Port Hedland Inner Harbour is a disturbed environment not expected to be representative of marine ecosystems in the northwest of Australia as described in ANZECC Guidelines.

6.6.5 Licence Holder Controls

The Licence Holder has controls in place for prevention of stormwater contamination and spills of material from berth activities and for the containment of stormwater. Controls are summarized in Table 15.

Table 15. Proponent controls for wash water and stormwater management

Controls for wash water and stormwater	
Site Infrastructure	**Description**
Stormwater drainage	Bunding of the western (front), eastern (back) and the northern edges of Berth 1 and effective sealing of all holes in the berth to ensure capture of all water landing on the berth surface. Stormwater overflow from Berth 1 is directed through sediment pits with filters prior to discharge to harbour as shown on Figure 2. The copper container storage area (P026) consists of a self-contained catchment intercepted by gross pollutant trap prior to discharge to harbour. All ground surrounding the copper outload circuit is sealed to prevent infiltration.
Wastewater containment	Wash water from conveyor system cleaning is contained by bunds surrounding Berth 1. The wastewater is then vacuumed and deposited in the Copper Sumps. Sedimentation build-up of copper concentrate in Copper Sumps is removed and returned to stockpiles. Loaders and excavators are washed in a designated bunded area outside the copper shed. Wastewater treatment system connected to the Metals X copper shed sump for reuse for dust suppression in the shed and for surface irrigation in gardens within the premises. Residual water can be reused for dust suppression within the copper shed.

Vacuum collection system	Vacuum collection truck that deposits all water and slurry from the berth surface and berth sumps to the copper shed sumps.
Bulk loading equipment	Copper concentrate arrives in trucks with covered load or in sealed containers. Storage and stockpiling of copper concentrate in enclosed sheds or in containers in the copper container storage area. The copper outload circuit for Metals X and Newcrest products is fully sealed and bunded to contain all spills. The deflector plate on the shiploader is positioned between the berth and the ship to ensure no direct spillage of product into the harbour during loading. Restricted feed speed (Metals X) to prevent spillage and blockages along the outload circuit.
Cleaning equipment and procedures	Road sweeper is used daily on all trafficable areas. Conveyor system cleaned after each loading event. Loader and excavator are washed prior to exiting shed in designated area. Side tipping trucks are manually cleaned with brooms to remove product from the vehicles prior to exiting the shed. Vacuum truck available for all loading operations to vacuum spills. Recovered copper concentrate from any clean up procedure is returned to the stockpile or Copper Sumps. Lid at base of telescopic chute is closed at commencement of cleaning to ensure no direct discharge of washdown water to the harbor.
Stormwater drainage	Bunding of the front of the berth and effective sealing of all holes in the berth to ensure capture of all water that lands on the berth surface. Stormwater overflow from Berth 1 intercepted by sediment traps prior to discharge to harbour. Berth 2 consists of a self-contained catchment intercepted by gross pollutant trap prior to discharge to harbour. All ground over which stormwater flows within premises is sealed.
Stormwater monitoring	Stormwater monitoring is undertaken opportunistically following sufficient rainfall for copper, manganese, chromium and hydrocarbon content. Analysis of trends in levels of metals monitored enables the effectiveness of controls to be assessed.

6.6.6 Key Findings

The Delegated Officer has reviewed the information regarding discharges to the marine environment and has found:

1. The Port Hedland Inner Harbour is highly modified and zoned for heavy industrial use.
2. The marine environment has already been exposed to extensive maintenance dredging and shipping movements. Remaining existing benthic communities that live in the shallows of the Port Hedland Harbour are likely to be resilient to minor increases in turbidity at localised locations.
3. Copper concentrate handled at Eastern Operations has a very low solubility in water and is therefore less bioavailable to marine organisms.
4. Spodumene concentrate has a very low solubility and is non-toxic suggesting that the most likely impacts will be from increased turbidity.

6.6.7 Consequence

Taking into consideration the toxicity of copper concentrate and the level of disturbance within the Port Hedland harbour, impacts at a local scale are expected to be low level as a result of discharges to water from Eastern Operations. The consequence rating is therefore **minor**.

6.6.8 Likelihood of Risk Event

Taking into consideration the nature of stormwater discharges to the Port Hedland harbour, the risk event could occur at some time and is therefore **possible**.

6.6.9 Overall Rating of Discharges to Water

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix (Table 10) and determined that the overall rating for the risk of fugitive dust emissions is **Medium**.

6.7 Summary of Risk Assessment and Acceptability

The risk items identified in section 6 including the application of risk criteria and the acceptability with treatment are summarised in Table 16 below.

Table 16. Risk rating of emissions

	Emission		Pathway and Receptor	Proponent controls	Impact	Risk Rating (with proponent controls)	Acceptability with treatment (conditions on instrument)
	Type	**Source**					
1.	Dust from handling of copper and spodumene concentrate	Infrastructure and handling process	Air, moving with direction of wind	Infrastructure and management controls.	Amenity and public health	Major consequence Unlikely likelihood **Medium risk**	Acceptable subject to proponent controls conditioned
2.	Noise from infrastructure and operations	Infrastructure and handling process	Air, moving with direction of wind	None specified	Amenity and comfort	Moderate consequence Possible likelihood **Medium risk**	Acceptable subject to application of alternative regulatory strategy outside of the licence.
3.	Odour from handling of copper and spodumene concentrate	Copper & spodumene concentrate product	Air, moving with direction of wind	Infrastructure and management controls	Amenity	Minor consequence Unlikely likelihood **Medium risk**	Acceptable subject to proponent controls conditioned
4.	Discharge to water from contaminated stormwater and material spills	Stormwater (contaminated stormwater)	Direct from infrastructure	Infrastructure and management controls	Impacts on water quality and visibility	Minor consequence Possible likelihood **Medium risk**	Acceptable subject to proponent controls conditioned

7. Determined Regulatory Controls

7.1 Summary of Controls

Regulatory controls have been determined on a risk-based approach for those risks. In addition, the regulatory controls have been updated based on the outcome of the licence amendment application received 28 November 2017.

		Controls			
		7.2 Infrastructure and Equipment	7.3 Moisture content	7.3 & 7.4 Specified Action	7.4 Particulate Monitoring
Risk Items (see Section 6.0)	**1. Dust from copper and spodumene concentrate**	●	●	●	●
	2. Noise from infrastructure and operations	Medium risk. Acceptable subject to application of alternative regulatory strategy outside of the licence.			
	3. Odour from concentrate	●		●	
	4. Discharge to water from contaminated stormwater and material spills	●			

7.2 Specified Infrastructure and Equipment Controls

7.2.1 Dust and Odour Management

The following environmental controls, infrastructure and equipment must be maintained and operated onsite for dust and odour management:

- Fully enclosed sheds with separate roller door for truck entry and exit, separate roller doors for loader access.
- Ceiling mounted sprinkler network.
- Newcrest shed - Two air and dust extraction systems and baghouse systems
- Metals X shed - One air/dust extraction system.
- The doors of all sheds are kept closed when trucks are unloading, loaders and excavators are stockpiling or loading internal hoppers.
- Before loaders or excavators exit the shed the product is washed off in a designated area in the shed.
- Water sprays on transfer chutes.
- Conveyor belly pans are cleaned during and at the ends of ship loading.
- Transfer chutes are partially enclosed.

- Canvas/perspex shrouds on most static transfer chutes and transfer stations between static conveyors to mobile conveyors.
- Dust shrouds only removed for clean up during or following loading operations.
- Transfer chute on ship loader is almost fully enclosed.
- Telescopic chute for loading into ship's hold.
- DES contains 12 dust/air filters that are cleaned monthly.
- DES starts up prior to the conveyors operating.
- DES backwashes the filters to enable dust collection to fall into a downpipe that falls into a bin, which is cleaned during and after each shipment.
- Ship loading stopped when distance between chute end and hatch opening is too great and dust is being generated.
- Vacuum truck to recover copper spilled during out-loading.
- Road sweeper operations performed daily.
- Rotainer boxes remain closed at all times when outside the ships hold.

The infrastructure and equipment including operational requirements that is currently used by the Licence Holder is considered necessary based on the materials handled and the risk to public health and amenity. The condition requires the continued use of the infrastructure and equipment and ensures sufficient regulatory oversight.

7.2.2 Dust and Odour Management Infrastructure and Equipment Amendments – March 2018

Following DWER compliance inspections undertaken on 1 and 2 May 2017 and subsequent correspondence between the Department and the Licence Holder several minor amendments have been made to the infrastructure and equipment specified in the Licence. These amendments are limited to better reflect the operation requirements and descriptions of infrastructure and equipment at the Premises. However, an additional specification based on a risk identified by the DWER for rotainers is detailed below:

- Containers (Rotainer boxes) to remain closed at all times when outside of the vessel's hold, until they are below the deck, unless for the purposes of carrying out product sampling.

The amendments to the dust and management infrastructure and equipment are considered necessary to ensure that they are suitably valid and enforceable and to adequately manage the risk to public health, amenity and the environment.

7.2.3 Wash Water and Stormwater Management

The following environmental controls, infrastructure and equipment must be maintained and operated onsite for wash water and stormwater management:

- Copper concentrate arrives in trucks with covered load or in sealed containers.
- Side tipping trucks are manually cleaned with brooms to remove product from the vehicles prior to exiting the shed.
- Loaders and excavators are washed prior to exiting shed.
- Wash down water from cleaning of loaders and excavators drains to concrete Copper Sumps.
- Sedimentation build-up of copper concentrate in Copper Sumps is removed and

returned to stockpiles.

- Enclosed nature of storage, conveyor system and transfer stations on ship loader.
- Head chute of ship loading infrastructure fitted with blockage alarms.
- Cleaning of whole conveyor system after loading events.
- Availability of vacuum truck for all loading operations to vacuum spills.
- Road sweeper that periodically sweeps the roads entering and exiting the port facility and the sheds internal truck route.
- Recovered material from any clean up procedure is returned to the stockpile or Copper Sumps depending on whether water was used for the clean-up procedure.
- Wash down water from conveyor system cleaning is contained by bunds surrounding Berth 1 and directed to concrete Copper Sumps prior to being vacuumed. The wastewater is then deposited in the copper recycling ponds. No wastewater is discharged from the premises.
- Berth 1 stormwater accumulates in the Berth 1 concrete bunds or overflows to the adjacent catchment area to be directed through sediment pits with filters prior to discharge to the harbour.
- Copper container storage area stormwater drains to a gross pollutant trap allowing solids to settle prior to direct discharge to the harbour.
- All water and slurry from the berth-side drains to landside.

Specified infrastructure requirements are derived from those currently undertaken by the Licence Holder.

The infrastructure and equipment is currently used by the Licence Holder and considered necessary based on the materials handled and the risk to public health and marine ecosystem. The condition requires the continued use of the infrastructure and equipment and ensures regulatory oversight.

7.3 Product Specifications and Monitoring

Bulk granular materials accepted and handled at the premises must be adequately conditioned to reduce the potential for the generation of fugitive dust during unloading, storage, loading and transportation activities. The adequate conditioning refers to the moisture content of material which must be received and maintained at a level above the DEM and, for operational purposes, below the transportable moisture limit (TML) of the product. The DEM number is defined as the moisture content at which the dust number is 10.

The methodology to determine the DEM number is AS4156.6-2000.

7.3.1 Moisture Content Monitoring Amendment – March 2018

Following DWER compliance inspections undertaken on 1 and 2 May 2017 and subsequent correspondence between the Department and the Licence Holder an amendment has been made for material being received to be at or above the DEM Level.

The amendment allows for some additional flexibility based on DWER's understanding of the likelihood of material being delivered below the DEM Level, while still requiring the Licence Holder to take all practicable measures to ensure that material is above the corresponding DEM level. In addition it includes a requirement to not accept the next lot of that material (for the following shipment) until it is known that it has a moisture content at or above the corresponding DEM level. The Licence Holder will also be required to implement mitigation

measures to ensure that the handling of material below DEM level does not result in the generation of visible dust.

7.3.2 Introduction of Spodumene Concentrate and Product Specifications Amendment – April 2018

The physical and mineralogical characteristics of spodumene concentrate are considered to be a primary factor in the Department's determination and acceptability of the risk to public health, amenity and the environment from Licence amendment application submitted in November 2017.

The analytical results for the spodumene concentrates as presented by the Licence Holder through the licence amendment application were stated as being based on "*bench trials and therefore material properties will require further validation after the processing plant is operational* (page 6, *Pilbara Minerals Proposal for Spodumene Concentrate Export through Eastern Operations, Port Hedland, November 2017*).

Based on the above and to ensure that the properties of spodumene concentrate do not materially change and present an unacceptable risk to public health, amenity and the environment a requirement has been added to the Licence requiring a report within 30 days of the first shipment of each spodumene product handled and then every subsequent annual period.

The Report will require an analysis of the particle size distribution, muscovite and respirable silica quartz content and a review of previous sampling and analysis to determine any changes to these properties.

In addition, a requirement has been added for all spodumene concentrate to be at or below the corresponding DEM level for the similar grounds as detailed above (section 7.3.1) – due to it being considered a significant and critical control.

7.4 Point Source Dust Monitoring

Following DWER compliance inspection and consideration of the licence amendment application received on 17 March 2017 a number of point source emissions at the Premises have been identified which have the potential to contribute to total fugitive dust emissions from the Premises. These emission sources primarily relate to dust baghouses stacks which are used to collect dust from within each of the sheds used at the Premises.

A condition has been specified in the Licence for the Licence Holder to undertake point source emission monitoring over one annual period. This monitoring is intended to identify the significance of emissions from the baghouse and the level of contribution to total dust emissions from the Premises.

There is no information to allow an assessment of the significance of emissions from the baghouse stacks and no records of emission rates from stack testing.

To understand the significance of point source stack emissions at the Premises a condition is required to obtain this information. Following the stack emission monitoring the results will be reviewed to determine whether ongoing monitoring or additional regulatory controls will be required.

7.5 Dust Monitoring Requirements

7.5.1 Monitoring requirements

The Reviewed Licence required the Licence Holder to monitor particulates (PM_{10}) through four

real time monitors located on the north, south west and north-west corner of the boundary and at a location 140 m south east of the boundary. On 21 November 2016 and 20 February 2017, the Licence Holder notified DWER that HVAS monitors had been installed as authorised through conditions of the Reviewed Licence.

Changes to the monitoring network have resulted in the monitoring network being capable of measuring the concentration of copper as PM_{10} in ambient air. Changes to monitoring requirements have been made through this amendment (refer to section 4.6.3).

An additional amendment requested by the Licence Holder relates to the dust monitoring changes required through the Reviewed Licence, for the air quality boundary monitoring network. These include changes from BAMs to HVAS and the introduction of an additional parameter – Copper as PM_{10}. Noting that the changes have been made to air quality monitoring infrastructure in accordance with the Reviewed Licence, the requested amendments have been made.

Additional amendments have been made to conditions, requiring the provision of all monitoring data on an annual basis. In addition the requirement for reporting on 1 hour averaging periods for data received at Taplin Street has been changed to 24 hour and annual averaging, consistent with the interim criteria.

Reportable event reporting will continue to be required on a quarterly basis as detailed in Schedule 4 of the Amended Licence. To increase understanding of dust impacts from cumulative sources the Licence Holder will be required to also report on events where particulates at Taplin Street exceed interim criteria (70 $\mu g/m^3$ over a 24 hour period).

Changes have been made for consistency with other port licences and to reduce the monitoring requirements for Taplin Street, thereby reducing the administrative burden on the Licence Holder and DWER. Additional monitoring data on the concentration of ambient copper as PM_{10} will inform DWER's future decision making.

Given that shipping movements for the export of copper concentrate are also limited to approximately 40-50 per year, the frequency of monitoring has been based on one sample every sixth day plus at least one during copper concentrate shiploading. As this change relates to monitoring frequencies only, the risk of emissions does not change.

Reportable event reporting will assist DWER in identifying the possible source, or sources of dust, and will assist in future risk-based decision making.

7.5.2 Monitoring Requirements Spodumene Amendment – April 2018

Lithium has been added to the list of parameters to be monitored over a 24 hour period every sixth day, and at least one 24 hour sample taken during each shiploading event. The purpose of adding lithium as a parameter in ambient air quality monitoring is to provide an indicator of potential dust generation from the spodumene concentrate handling activities at the Premises.

No trigger criteria for Reportable Events relating to ambient lithium (as PM_{10}) have been specified in the Licence.

7.5.3 Monitoring Reports

The Licence Holder will be required to report when levels are greater than 145 $\mu g/m^3$ for PM_{10} (24-hour averaging period) and 1 $\mu g/m^3$ for Cu (24-hour averaging period). The frequency of Reportable Event reporting remains as quarterly under the Amended Licence. Following each Reportable Event the Licence Holder is required to provide information on the remedial measures undertaken (investigation, corrective actions and mitigation).

Reporting frequencies for ambient air quality at Taplin Street have been reduced from bimonthly to annually. The provision of monitoring data at boundary monitors will also need to

be supplied annually.

Monitoring is currently undertaken every sixth day and during shiploading by the Licence Holder. The Licence Holder has advised DWER that action is currently undertaken where PM_{10} is detected at boundary monitors above listed criteria in the Licence.

Taking into consideration the material tonnages handled at the port, methods of handling and infrastructure controls at Eastern Operations and frequency of ship movements as well as meteorological data, significant dust generation and impacts to health are not expected.

Dust propagation at Eastern Operations is considered a medium risk, therefore DWER requires continued particulate and copper monitoring, both as PM_{10}, to be undertaken for Eastern Operations.

DWER requires monitoring of all significant sources of dust emissions within the Port Hedland air-shed given the current ground level concentration of particulate matter. Quarterly notification of Reportable Events will provide DWER additional data to determine whether more adequate risk-based controls will be required.

DWER also notes that monitoring of PM_{10} at Taplin Street is currently undertaken by PHIC, with the Licence Holder being a member of council. In response to the HRA and for DWER to undertake further analysis of ambient dust levels at Taplin Street data is required to be received from the Taplin Street monitoring station.

7.6 Other Licence Changes (Amendment March 2018)

7.6.1 Prescribed Premises Boundary

The Licence Holder has made changes to the general site layout. The proposed storage area for rotainers is a bitumen surface, currently being used as a general laydown area with stormwater directed to existing stormwater infrastructure. There will be no changes in the size of the stormwater catchment area as a result of the change. In addition, the application does not involve any changes to the nature of activity or emissions and discharges at the premises. There is no change in the risk as a result of the changes to the boundary. The prescribed premises boundary has therefore been amended.

7.6.2 Removal of Material Change Conditions

The previous Licence L4432/1989/14 includes conditions requiring notification to the CEO of material changes which occur at the premises. Material Changes have been defined as changes to commodities and amounts handled, changes to site layout and control of ownership. Since the issue of the Reviewed Licence the Licence Holder has submitted one Material Change notification for the Premises on 4 December 2017. This notification related to trialling the removal of container lids to allow product sampling. No further Material Change notifications have been received for the Premises.

Material Change conditions have been removed from the Amended Licence. Most of determinations in response to Material Change notifications received from all ports in Western Australia have been to amend each respective port Licence.

DWER has therefore determined that Material Change conditions should be removed from the Licence. DWER has engaged with the Licence Holder, Department of Transport and other port authorities to develop an appropriate alternative to the previous Material Change provision (refer to Trial conditions – section 7.7).

7.6.3 Other Administrative Changes

The Licence Holder has sought several additional administrative amendments including changes relating to:

- The General Description and description of Infrastructure and Equipment;
- Consolidation of reporting conditions; and
- Licence Definitions – minor changes to definitions.

DWER Officers conducting a compliance inspection on 1 and 2 May 2017 noted that Reviewed Licence conditions 10 and 14, requiring reporting to be provided in a format approved by the DWER, may present some confusion. It was noted that DWER has not provided the approved format or made any specification of the format for the Licence Holder to meet the requirements of the condition. DWER has determined to remove this condition although the Delegated Officer reserves the right to specify an alternative preferred format by which each report is to be submitted from time to time.

7.7 Trial Conditions (Amendment May 2019)

The Delegated Officer has determined that Trial conditions are both conservative and necessary to provide both operational flexibility for the Licence Holder and to better inform future risk assessments of ongoing handling operations by improving data collection. Trial shipments must not extend beyond 12 months in duration or a cumulative throughput of 1 Mtpa per year. Trial shipment conditions are designed to provide sufficient information, through requiring the provision of monitoring data, for DWER to conduct a detailed risk assessment of each trialled product.

Trial conditions restrict the handling of high-risk products such as those that contain elevated concentrations of asbestiform materials, respirable silica or radiation. Wastes, or waste-derived products, with the exception of clean fill, are also not authorised for handling under Trial conditions. The implementation of Trial conditions requires notification 30 days prior to the commencement of the Trial. Notification must be supported by detailed information on the proposed activity, product characteristics, the sensitivity of the receiving environment, potential hazards and the proposed monitoring to be conducted during the Trial.

At any point prior to or during the Trial period, DWER may cease the Trial in the event that the risk is considered to be unacceptable to public health, amenity or the environment; or in the event that the Trial changes from that originally described through Notification of the Trial. This includes, but is not limited to, changes to product specifications/characteristics, materials handling or controls. The Trial may also be ceased if DWER becomes aware of the potential for risk to human health, amenity of the environment that differs from the risks identified in the Notification of the Trial.

Category 58A has been applied through this amendment to authorise the handling and/or loading of new bulk materials classified as salts including evaporites such as gypsum and potash under Trial conditions. This is an administrative amendment that does not increase or change the risk profile associated with bulk material handling at the Premises. The addition of Trial conditions and Category 58A to the Licence does not authorise an increase to the maximum cumulative throughputs at the Premises as authorised by the Existing Licence.

It is the responsibility of the Licence Holder to determine appropriate handling method for each product being trialled following demonstrated consideration given to each hazard associated with the trial product. DWER's decision making processes for determining what products are suitable for trial shipments are further detailed in the *Guideline: Port Authority Trial Shipments – Category 58 and 58A*, which is available at DWER's website (www.dwer.wa.gov.au).

8. Appropriateness of Licence Conditions

The conditions in the Issued Licence in Attachment 2 have been determined in accordance

with DWER's *Guidance Statement: Setting Conditions*.

DWER's *Guidance Statement: Licence Duration* has been applied and the Issued Licence expires on 16 October 2026.

Table 17. Amended licence conditions

Condition Ref	Grounds
Emissions 1	This condition is valid, risk-based and consistent with the EP Act.
Trial Conditions 2, 3, 4, 5, 6 and 7	These conditions are valid and are necessary, risk based for the trialling of new bulk granular materials.
Infrastructure and Equipment 8 and 9	These conditions are valid, risk-based and contain appropriate controls (see section 6).
Product Specifications and Monitoring 10, 11, 12, 13, 14, 15, 16, 17, and 18	These conditions are valid, risk-based and consistent with the EP Act.
Point Source Dust Monitoring 19	This condition is valid, risk-based and consistent with the EP Act.
Dust Monitoring and Reportable Events 20, 21 and 22	These conditions are valid, risk-based and consistent with the EP Act.
Record-keeping 23, 24, 25, 26	These conditions are valid and are necessary administration and reporting requirements to ensure compliance.

DWER notes that it may review the appropriateness and adequacy of controls at any time, and that following a review, DWER may initiate amendments to the licence under the EP Act.

9. Consultation

9.1 Stakeholder Consultation

Submissions made by interested parties during each consultation period described below, along with DWER responses, are provided in Appendix 3.

Amendment April 2018

DWER referred Pilbara Port Authority's application to handle spodumene concentrate and increase throughputs at the Premises on 15 January 2018 to a number of direct interest parties including community stakeholders and government agencies for a 21 day comment period. The Application was also publicly advertised in *The West Australian* on 15 January 2018 and in *The Northwest Telegraph* newspaper on 17 January 2018. The Application was made available for review at the Department's website through the *Community Updates* page for Port Hedland.

At the request of the Town of Port Hedland and DJTSI, DWER extended the comment period end date from 5 February to 28 February 2018.

Amendment May 2019

On 15 February 2019, the DWER initiated amendment to incorporate Trial conditions was

referred to community stakeholders and public authorities for a 21 day comment period. Submissions were received from the Department of Transport and Town of Port Hedland.

9.2 Applicant Comments on Draft Amendments

March 2018

The Licence Holder was provided with the draft Licence and Decision Report on 22 March 2018. Comments received from the Licence Holder have been considered by the Delegated Officer as shown in Appendix 2.

Licence Holder comments to previous Licence versions described in section 1 have been removed from Appendix 2 of this Decision Report for readability. These comments, along with DWER responses, can be made available upon request

May 2019

The Licence Holder was provided with the draft Licence and Decision Report for the Trial Conditions on 2 April 2019. Comments were received from the Licence Holder on 6 May 2019 have been considered by the Delegated Officer.

10. Conclusion

This assessment of the risks of activities on the Premises has been undertaken with due consideration of all factors, including the documents and policies specified in this decision report (summarised in Appendix 1). This assessment was also informed by a site inspection by DWER officers on 1 and 2 May 2017.

Based on this assessment, it has been determined that the Amended Licence will be granted subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

[redacted]

Christine Hass
MANAGER, RESOURCE INDUSTRIES (PORT HEDLAND)
REGULATORY SERVICES
Delegated Officer under section 20 of the *Environmental Protection Act 1986*

Appendix 1: Key Documents

Documents assessed and considered in review:

	Document Title	Availability
1.	Australian and New Zealand Environment and Conservation Council & Agriculture and Resources Management Council of Australia and New Zealand (2000), *Australian Water Quality Guidelines for Fresh and Marine Water Quality.*	Accessed at http://www.environment.gov.au/system/files/resources/53cda9ea-7ec2-49d4-af29-d1dde09e96ef/files/nwqms-guidelines-4-vol1.pdf.
2.	Department of Environment (2006) Pilbara Coastal Water Quality Consultation Outcomes: Environmental Values and Environmental Quality Objectives, March 2006.	Accessed at http://edit.epa.wa.gov.au/EPADocLib/pilbaracoastalwaterquality_Marine%20Report%201.pdf
3.	Department of Environment Regulation (2014) Assessment and management for contaminated sites.	Accessed at http://www.der.wa.gov.au
4.	DER *Guidance Statement on Regulatory principles*, July 2015	Accessed at http://www.der.wa.gov.au
5.	DER *Guidance Statement on Setting conditions*, September 2015	
6.	DER *Guidance Statement on Licence duration*, November 2014	
7.	DER *Guidance Statement on Licensing and works approvals processes*, September 2015	
8.	Department of Environment, Water, Heritage and the Arts (2009) National Assessment Guidelines for Dredging.	Accessed at http://www.environment.gov.au/marine/publications/national-assessment-guidelines-dredging-2009
9.	Department of Health (2018) Referral of a Licence Amendment – Eastern Operations (L4432/1989/14)	DWER records (A1614513)
10.	Department of Health (2016) Port Hedland Air Quality Health Risk Assessment for Particulate Matter, January 2016.	Accessed at http://ww2.health.wa.gov.au/Reports-and-publications/Port-Hedland-Health-Risk-Assessment.
11.	Department of Health (2010) Impact of Dust on Port Hedland, March 2010	Accessed at: http://www.public.health.wa.gov.au
12.	Department of Health (2016) Port Hedland Air Quality Health Risk Assessment for Particulate Matter, January 2016	Accessed at: http://ww2.health.wa.gov.au/Reports-and-publications/Port-Hedland-Health-Risk-Assessment
13.	Department of Health (23 January 2018) – Request for Advice – Amendment to Licence (L4476/1984/12)	DWER records (A1604566)
14.	Department of Planning, Lands and Heritage	DWER records (A1626658)

	(2018) *Environmental Protection Act 1986* – Referral of a Licence Amendment for Comment (Licence L4432/1989/14)	
15.	Department of State Development (2010) - Port Hedland Dust Management Taskforce Port Hedland Air Quality and Noise Management Plan.	Accessed at http://www.dsd.wa.gov.au/
16.	DWER Licence L4432/1989/14 – Port Hedland Port	Accessed at http://www.der.wa.gov.au
17.	DWER Works approval W5122/2012/1 - Berth 1 and 2 Sandfire Shipping Container Load Out Facility,	DWER records
18.	DWER Works approval W5146/2012/1 - Port Hedland Berth 1 and was issued 23 August 2012	DWER records
19.	Department of Environment, Pilbara Coastal Water Quality Consultation Outcomes: Environmental Values and Environmental Quality Objectives, March 2006	Accessed at: http://edit.epa.wa.gov.au/EPADocLib/pilbaracoastalwaterquality_Marine%20Report%201.pdf
20.	DWER (2018) Guideline: Port Authority Trial Shipments – Category 58 and 58A.	Accessed at: https://www.der.wa.gov.au/our-work/licences-and-works-approvals/publications
21.	DWER Compliance Inspection undertaken 11 June 2012	DWER records
22.	DWER Compliance Inspection undertaken 2 May 2014	
23.	DWER Compliance Inspection undertaken 15 October 2014	
24.	Ministerial Statement 559	Ministerial Statement, Report and Bulletin accessed at http://www.epa.wa.gov.au/
25.	Ministerial Statement 783	
26.	Environmental Protection Bulletin No. 2	
27.	Perez and Beiras (2009) The mysid *Siriella armata* as a model organism in marine ecotoxicology: comparative acute toxicity sensitivity with Daphnia magna. Ecotoxicology, Volume 19, Issue 1, pp 196-206.	Accessed at: https://www.ncbi.nlm.nih.gov/pubmed/19757032
28.	Pilbara Ports Authority (2010) Dust Management Leading Practice Guidelines	Available at: https://www.pilbaraports.com.au/
29.	Pilbara Ports Authority (2016) L4432 Dust Monitoring Report: 1 October – 31 December 2016.	DWER records (A1368075)
30.	Port Hedland Air Quality and Noise Management Plan, March 2010	**Error! Hyperlink reference not valid.**Port Hedland Air Quality and Noise Management Plan accessed at http://www.dsd.wa.gov.au/
31.	Port Hedland Community Progress Association (2018) RE: *Environmental Protection Act 1986* – Referral of a Licence Amendment for Comment	DWER records (A1626831)

32.	Port Hedland Industries Council (2014) Port Hedland Cumulative Environmental Noise Study.	Accessed at: http://phic-hedland.com.au/
33.	Port Hedland Industries Council (2018) RE: *Environmental Protection Act 1986* – Referral of a Licence Amendment for Comment	DWER records (A1620336)
34.	Port Hedland Port Authority (2010) Operational Dust Management Plan.	Accessed at https://www.pilbaraports.com.au/
35.	Port Hedland Port Authority (2011) Environmental Licence L4432/1989/12, Environmental Improvement Plan - Appendix A - Human Health and Environmental Risk Assessment.	Accessed at https://www.pilbaraports.com.au/
36.	Prato, Biandolino and Scardicchio (2005) Test for Acute Toxicity of Copper, Cadmium, and Mercury in Five Marine Species. Institute for Coastal Marine Environment, Taranto, Italy.	Accessed at http://journals.tubitak.gov.tr/zoology/issues/zoo-06-30-3/zoo-30-3-8-0508-11.pdf
37.	SVT Engineering Consultants (2014) Port Hedland Cumulative Environmental Noise Study. PHIC and DER.	DWER records
38.	Stauber, Ahsanullah, Nowak, Eriksen and Florence (1996) "Supervising Scientist Report 112: Mount Lyell Remediation - Toxicity assessment of waters from Macquarie Harbour, western Tasmania, using algae, invertebrates and fish", Department of Environment and Land Management; and Supervising Scientist.	Accessed at http://www.environment.gov.au/science/supervising-scientist/publications/ssr/toxicity-assessment-waters-macquarie-harbour
39.	Town of Port Hedland (2018) *Environmental Protection Act 1986* – Referral of a Licence Amendment for Comment – L4432/1989/14 – Pilbara Ports Authority	DWER records (A1628033)
40.	Worley Parsons Consulting (2014) Pilbara Port Authority Sediment Quality Assessment.	DWER records
41.	Yanong (2013) "Use of copper in Marine Aquaculture and Aquarium Systems", University of Florida.	Accessed at http://edis.ifas.ufl.edu/fa165

Appendix 2: Summary of Applicant's Comments on Draft Amendments – April 2018 and May 2019

The Licence Holder was provided with a draft amended Licence and Decision Report on 22 March 2018 for review and comment. The Licence Holder responded on 5 April 2018 with the following comments on the draft Amendment Notice.

Condition	Summary of Licence Holder comments on draft amendment April 2018	DWER response
Condition 8	PPA observes Condition 8 states that "The Licence Holder ***must only accept*** bulk spodumene concentrate if it contains a Moisture Content at or above its corresponding Distinct Bulk Spodumene Concentrate DEM level." For consistency with Condition 5 regarding copper concentrate, PPA requests the wording be updated to "The Licence Holder ***must take all practicable measures to ensure that all*** Spodumene Concentrate received at the Premises contains a Moisture Content at or above its corresponding DEM level."	DWER disagrees with the proposed changes to Condition 8. DWER has assessed the risk of dust from the Premises as being acceptable subject to proponent controls being conditioned on the Licence. The Licence Holder commitment to maintain the moisture content of spodumene concentrates above the DEM level is a key control for the management of dust. The contribution of dust from proposed activities to the existing high ambient dust concentrations in Port Hedland has been assessed as having the potential to result in major consequences for sensitive receptors. To reduce the risk of dust emissions to acceptable levels, DWER has determined that all additional products (spodumene concentrate) to those currently authorised for handling at the Premises must have a moisture content above the DEM level.
Condition 9(b)	Condition 9b is conceptually flawed and not appropriate in its current form as Spodumene Concentrate will not be delivered to the Premises on a regular basis and will not be stored on the Premises. Rather, Spodumene Concentrate will pass through the Premises during discrete export (shipment) events only. PPA advises that containers used to deliver and outload Spodumene Concentrate during each export	DWER acknowledges that the moisture content of spodumene concentrate will be measured at the point of loading containers at the Wedgefield storage facility. Further that the Premises user will supply moisture content data at the completion of

	event will be continually cycled, as there are not enough containers to pre-load an entire shipment's worth of cargo. Proponents have advised that samples will be collected from containers as they are loaded in the Wedgefield storage facility throughout the export event, and sent for moisture testing at the completion of the export event. PPA supports this method and considers it to be the most practical and effective sampling arrangement to produce moisture content results that are representative of the Spodumene Concentrate being exported from PPA's Premises. Accordingly, PPA requests that the wording of Condition 9b be updated to "***within 10 working days of shipment,*** obtain and maintain accurate records from each Premises User in relation to the representative **moisture** content for all ***Spodumene Concentrate*** received at the Premises."	each shipment. Therefore DWER has amended the condition to reflect that data must be obtained within 10 calendar days of the completion of a spodumene concentrate shipment.
Condition 10	PPA accepts the requirement to provide updated Spodumene Concentrate product specifications as described in Condition 10. PPA suggests that the requirement to provide information on an annual basis be addressed in Condition 18b regarding the monitoring report.	Noted. The draft Licence has been amended to include a condition to clarify that DWER requires updated reviews of product quality on an annual basis. Condition 18(b)(iv) requires the submission of product specifications for each Distinct Bulk Spodumene Concentrate as part of annual compliance reporting.
Conditions 16, 17, 18 and 19	PPA notes that Condition 18(b)(v) refers to point source emission monitoring for the annual period concluding 30 June 2019 only. However, Condition 12 was amended to extend the monitoring conclusion date to 31 December 2019. PPA suggests Condition 18(b)(v) be corrected to replace reference to "***30 June 2019***" with "***31 December 2019***" (to encompass all monitoring).	Accepted.
Definitions	PPA notes the inclusion of a definition for "Reputable Laboratory", being a laboratory that is accredited by the National Association of Testing Authorities, Australia (**NATA**). PPA notes that NATA issues accreditations for specific procedures or analyses, not a blanket accreditation to a laboratory. Furthermore, NATA does not provide accreditation for DEM determination for non-coal products, as the Australian Standard AS4156.6-2000 (that the DEM determination process is derived from) is specific to coal preparation. Accordingly, PPA suggests that the definition of "Reputable Laboratory" be removed. Rather, where the term "laboratory" appears in a condition PPA suggests it be	DWER acknowledges that there is no NATA accreditation for the determination of DEM levels for copper or spodumene concentrates. The term Reputable Laboratory has been used to provide DWER with greater certainty that testing will be done at a laboratory that is known to use nationally accredited analysis techniques. Reference to a "Reputable Laboratory" within Condition 10 has been amended to refer to a

	appended with the wording "***that holds a NATA accreditation (where available) for the analysis undertaken***". PPA also notes that there are three terms used throughout the Licence to refer to Spodumene Concentrate, namely: 'Distinct Bulk Spodumene Concentrate', 'Bulk Spodumene Concentrate', and 'Bulk Granular Spodumene Concentrate'. However, only one of these three ('Distinct Bulk Spodumene Concentrate') is listed under Definitions. For simplicity and consistency, PPA requests that the Licence be amended to refer to a single defined term - '***Spodumene Concentrate***'. PPA otherwise accepts the Definitions.	laboratory that holds NATA accreditation for the analysis undertaken. The term "bulk granular spodumene concentrate" has been replaced with "bulk spodumene concentrate". This term is used to describe all spodumene handled in bulk at the premises i.e. that which is not shipped in closed containers. This terminology is consistent with that used in the *Environmental Protection Regulations 1987*. The term "Distinct Bulk Spodumene Concentrate" has been applied to acknowledge that the product specifications vary amongst the different coarse, fines and mixed spodumene concentrate products. As the risk profile of each product can change depending on the proportion of key hazards present, this term has been retained.
Schedule 4: Monitoring	PPA notes the requirement to consider the Taplin Street 24 hour average for Reportable Events at PPA boundary monitors M10 and M11. PPA advises that HVAS are routinely operated every sixth day from 9am to 9am, in addition to a 24 hour period (variable) that aligns with ship-loading. However, the 24 hour average for Taplin Street is calculated from 12am to 12am (midnight to midnight) as per the National Environment Protection (Ambient Air Quality) Measure as amended (Department of the Environment 2016) standard for 1 day averages being calculated from a "calendar day". Furthermore, PPA's HVAS boundary monitors consist of a gravimetric analysis of dust concentration, while the Taplin Street monitor uses the principle of Beta Attenuation to determine dust concentration. For these reasons, the 24 hour average PM10 results produced by HVAS are not directly comparable to the 24 hour average Taplin Street result. PPA can calculate a comparative Taplin Street 24 hour average for the period of any Reportable Events at M10 and M11 HVAS. However, PPA notes that this will not be consistent with the normal Taplin Street 24 hour average that will be reported by PPA under Conditions 14 and 15 and by the Port Hedland Industries Council and other Port Hedland exporters. PPA has previously advised that the HVAS required at boundary monitoring locations M10 and M11 do not produce real time data and therefore cannot produce high level dust alarms, and requested that reference to high level dust alarms be removed from	DWER notes that the 24-hour recording periods at Taplin Street are not the same as averaging periods at HVAS monitors. Therefore consideration should be given to all 24-hour periods at Taplin Street that fall over the period where a Reportable Event was triggered at M10 and M11. For Reportable Events at Taplin Street, all monitoring data collected from M10 and M11 in accordance with Condition 14 (where applicable) must be provided. DWER further acknowledges that PPA may cease the operation of continuous dust monitors and that this monitoring equipment is not specified in the Licence. Provision of information in relation to high level dust alarms at the Premises assists DWER in the determination of the Licence Holder's awareness of local dust events and its ability to react. Therefore references to high level dust alarms and corrective

	Schedule 4 of the Licence. DWER responded to this in Appendix 3 of the Decision Report of the Licence issued/amended/signed on 7 March 2018 was that "*The Licence does not restrict the Licence Holder from operating other sampling equipment that may provide high level dust alarms, for example, E-samplers. In addition corrective actions may be retrospective, reactionary or proactive and do not need to rely on monitoring data alone. Therefore references to high level dust alarms and corrective actions have been retained*". Although the Licence does not restrict PPA from continuing to operate real time air quality monitors, it also does not require this action as a Condition. Accordingly PPA reserves the right to cease continuous monitoring at any time, and objects to the reference to high level alarms in Schedule 4. PPA advises that a "dust forecast tool" is not and has never been used at the East Side Premises. PPA requests reference to a "dust forecast tool" be removed from the list of Corrective and Mitigation measures in Schedule 4.	actions have been retained. DWER acknowledges that in some instances high dust alarms may not be triggered during Reportable Events. The requirement to report on how the Licence Holder responded to a dust forecast tool has been removed from the Licence.
Conditions 2, 3 and 4 - Notification of Material Change	On 30 January 2018 PPA noted an objection to the removal of 'Notification of Material Change' conditions in PPA's response to the draft Licence and Amendment Notice issued by DWER on 24 November 2017. However, PPA notes formal correspondence from DWER (dated 13 February 2018) which indicates that DWER is committed to working with Port Authorities on establishing an alternative to Material Change conditions which is risk based, provides for operational flexibility, and is legally sound and valid and in keeping with DWER's published guidance, including the *Guidance Statement: Setting Conditions* (October 2015). PPA supports the development of an alternative set of conditions to the previous Notification of Material Change suite which are risk based and provide the appropriate level of flexibility as was afforded by the Material Change process. PPA expects that once agreed, these alternate conditions will be included within the current Licence by DWER.	Noted. DWER will continue to work with the Licence Holder and other Port Authorities to develop an appropriate alternative to the previous 'Material Change' provision.

Licence Holder comments on the Decision Report		
Section 4.6.3 Dust boundary and moisture content monitoring	The first sentence under this section states: "*The Licence Holder undertakes boundary monitoring at four locations for PM10 as detailed in Table below and is required to receive product with a moisture content above the DEM level*". PPA notes that boundary monitoring is undertaken at only two locations (not four) and the correct table number (4) is missing in this sentence. As such, PPA requests this sentence is updated as follows: "*The Licence Holder undertakes boundary monitoring at **two** locations for PM10 as detailed in Table **4** below and is required to receive product with a moisture content above the DEM level*".	Noted. Suggested changes adopted.
Section 7.3.6 Licence Holder Controls	PPA management plans form part of PPA's integrated management system which undergoes regular review and continual improvement as required to maintain ISO 14001 certification. This section indicates that DWER reviewed a Port Hedland Port Authority dust management plan dated 2010. Such out-dated information is not appropriate for use in this assessment. PPA can provide DWER an updated dust management plan at any time upon request. This section states in paragraph two: "*The moisture content is tested at the mine site and on arrival to the port. Each truck arriving at the premises with Metals X product is tested for moisture content. During ship loading the Newcrest product is tested every minute.*" PPA suggests the above wording be replaced with: "*A sample of copper concentrate from each truck delivery to the Premises is tested for moisture content, either before or after arrival to the Premises.*" PPA notes the Licence does not contain a requirement to test ship-loading samples, therefore requests this statement be removed from the Decision Report – as per the suggested replacement wording above.	Noted. Suggested changes adopted.

Licence Holder comments on the Decision Report		
Section 8.6.2 Removal of Material Change conditions	This section states: "*On 4 December 2017, the Licence Holder submitted two Material Change notifications for the Premises since the issue of the Reviewed Licence. These notifications have related to the commencement of trial shipments of spodumene and to trial the removal of container lids to allow product sampling*." PPA advises that it has only submitted one notification of Material Change under L4432, for the trial of removal of container lids to allow for copper concentrate sampling prior to ship-loading. PPA notes that a notification of Material Change to trial handling and export of Spodumene run-of-mine ore was submitted for the other Part V licence that PPA holds, L8937, for Utah Point. PPA requests this error be corrected within the Decision Report.	Noted. Corrections to the statement have been made in section 7.6.2.

The Licence Holder was provided with a draft amended Licence and Decision Report on 2 April 2019 for review and comment. The Licence Holder responded on 6 May 2019 with the following comments on the draft Amendment

Condition	Summary of Licence Holder comments on draft amendment May 2019	DWER response
Prescribed Premises	PPA acknowledges and accepts the inclusion of Category 58A Bulk material loading or unloading (salt) into the licence.	Noted
Explanatory notes	PPA acknowledges and accepts the Explanatory notes.	Noted
Condition 3, CEO notification to cease Trial (prior to commencement or during)	PPA acknowledges and accepts Condition 3.	Noted
Conditions 4 and 5, Trial restrictions	PPA acknowledges and accepts Conditions 4 and 5.	Noted
Condition 6, Reporting	PPA acknowledges and accepts Condition 6.	Noted
Condition 7, Ongoing shipments	PPA acknowledges and accepts Condition 7.	Noted
Conditions 10, Product specifications and monitoring	PPA acknowledges and accepts the changes to Condition 10.	Noted
Definitions	PPA acknowledges and accepts the addition of new definitions for *Clean fill* and *Trial*.	Noted
Schedule: General Description	PPA acknowledges and accepts the inclusion of Category 58A Bulk material loading or unloading (salt) into the licence.	Noted
Decision Report	PPA acknowledges and accepts the Decision Report.	Noted

Appendix 3: Summary of Stakeholder Comments on the Application to Handle Spodumene and Increase Throughputs

The table below provides a list of submissions received during the consultation periods provided for the amendment application received 28 November 2017 and the DWER-initiated amendment to authorise Trial conditions. DWER's direct response to each submission is also provided in the table below.

Stakeholder	Comments	DWER response to comment
Amendment April 2018 – Spodumene concentrate and increased overall throughputs		
Department of Health	No objections to application The Department of Health provide no objections to the amendment application on the provision that dust mitigation measures at the Premises satisfy industry best practice to minimise the potential for fugitive dust from the port adversely impacting nearby premises.	Noted. DWER has applied a wide range of regulatory controls to the licence based on the outcome of the risk assessment considered appropriate, site specific and necessary to maintain the risk at an acceptable level. Moisture content against DEM is considered a critical control and reflective of best practice approach which has been applied to the licence. In establishing these regulatory controls the Department has considered the management strategies set out in the *Pilbara Ports Authority, Dust Management Leading Practice Guidelines*.
Port Hedland Industries Council	Support application PHIC also contend that for the last financial year 2016/17 there was the lowest number of exceedances at Taplin Street (3 exceedances for PM_{10}, 24-hour average), while export volumes have been at there highest supporting the fact that industry has continued to reduce their dust emissions.	Noted.
Port Hedland Community Progress Association	Support application While the Port Hedland Community Progress Association supports the application they raises a number of questions, as follows: • *How can the air pollution be contained so that it is not necessary to control/limit/stop more permanent residents,*	Noted. The Department has applied a range of regulatory controls it considers applicable to manage the risk to public health and amenity to an acceptable level.

Stakeholder	Comments	DWER response to comment
Amendment April 2018 – Spodumene concentrate and increased overall throughputs		
	in town due to the air pollution from port activities and its associated health risk to humans, and ensure employees, visitors and community are safe? • *Will the licences be granted temporarily until Lumsden Point is available as an alternative, as per the Pilbara Ports Ultimate Development Plan, and "World's Best Practice?"*	The progression of the Lumsden Point development is a matter for the Pilbara Ports Authority and not for DWER. Refer to section 7.
Department of Planning, Lands and Heritage	No objections to application The Department of Planning, Lands and Heritage also advise that there is one Aboriginal Heritage Site (site 22874) and that the proponent is advised of their requirements of the *Aboriginal Heritage Act 1972*.	Noted.
Town of Port Hedland	Supports application. The Town of Port Hedland provides conditional support, subject to the following: • *All regulatory environmental controls are maintained and the operation remains in compliance with Department of Water and Environmental Regulation licence conditions* • *Constant live monitoring of dust emissions is undertaken on an ongoing basis to ensure that correction actions can be initiated in the event of a breach of the National Environmental Protection Measures (NEPM) standard being detected* • *As per the Town of Port Hedland's Transient Workforce Accommodation Strategy it is recommended that the operation workforce requires to operate the increase in export are housed in permanent town based accommodation*	Noted. DWER has applied a series of regulatory controls in accordance with its Regulatory Framework. These include the implementation of air quality monitoring requirements, outcome-based controls and product specifications to maintain risk at an acceptable level and to ensure an adequate level of regulatory oversight (refer to section 7). In addition, DWER's review of annual compliance reporting will be supplemented by ongoing site inspections by DWER. HVAS monitors operated by the Licence Holder do not have real-time monitoring capabilities. After consideration of Licence Holder controls and product specifications, the Delegated Officer has determined that real-time monitors are not necessary for the Premises. DWER notes the Taskforce Report recommendation to transfer control of the network including data verification, storage and publication to the Department. Should the Taskforce Report be endorsed by Government, DWER will

Stakeholder	Comments	DWER response to comment
Amendment April 2018 – Spodumene concentrate and increased overall throughputs		
		implement the recommendations. DWER considers that the implementation of accommodation strategies is beyond the scope of Part V licensing.
Amendment May 2019 – Addition of Trial conditions		
Department of Transport	The Department of Transport notes that while Trial conditions are working well for other port authorities, any changes to the Licence Holder's licence must be implemented cautiously and assessed on their own merits. The Department of Transport supports the proposed amendments.	Noted. Trial conditions are being implemented on all Port Authority licences based on the consideration of risk presented in this Decision Report and as supported by the *Guideline: Port Authority Trial Shipments – Category 58 and 58A* published on the Department's website. DWER notes that the CEO retains the ability through Trial conditions to cease a Trial in the event that the risk is considered to be unacceptable to public health, amenity or the environment. Alternatively a Trial may be ceased in the event that the Trial changes from that originally described through Notification of the Trial. Trial conditions do not authorise an increase in overall throughputs from the Premises.
Town of Port Hedland	The Town of Port Hedland provided in principal support for the licence amendment on the proviso that the Town be supplied with the pre-amendment risk assessment, that a thorough post trial assessment is completed and supplied to the Town of Port Hedland with an adequate timeframe allowed for the matter to be referred to elected members and a position formed.	Noted. Justification for the implementation of Trial conditions is presented in the *Guideline: Port Authority Trial Shipments – Category 58 and 58A* published on the Department's website and presented to the Town of Port Hedland in the referral letter. All Trial notifications and DWER responses will be published on DWER's website for the duration of each Trial. Following a Trial period, a thorough risk assessment and Licence amendment would be required prior to the Licence Holder handling the trialled product on an ongoing basis. Where an application to continue activities conducted under Trial scenario is received by DWER, the Town of Port Hedland may be consulted for a period of 21 days with a possibility for extension, if time permits.

Attachment 1: Changes to the Reviewed Licence from 18 August 2016 to present

Previous condition	Amendment condition number	Changes made
Licence amendment March 2018		
N/A – General	N/A	Replace term *Licensee* with *Licence Holder*
1 – Environmental Compliance	N/A	Moved to Explanatory Notes section.
2, 3 and 4 – Notification of Material Change	N/A	Deleted condition. Refer to section 7.6.2.
5 and 6 – Infrastructure and Equipment	2 and 3	No change to condition.
7, 8, 9 and 10 – Moisture Content Monitoring and Reporting	4, 5, 6 and 7	*Conditions 4 and 5* – Replace condition 7 (split into two conditions) to acknowledge that the Licence Holder has limited control over the conditioning of product before it enters the Premises. *Condition 6* – Replaces condition 8, administrative changes to condition. *Condition 7* – Management actions introduced for events where product with a moisture content below the DEM level is received. Previous reporting conditions 9 and 10 have been deleted with all reporting requirements presented in Record-keeping conditions.
N/A – new condition	8	Inclusion of dust monitoring at baghouse stack emission points to be conducted quarterly until 30 June 2019.
11, 12, 13 and 14 – Dust Monitoring and Reportable Events	9, 10 and 11	*Condition 9* – Amendments to condition 11 making changes to monitor names and locations. *Condition 10* – Separating monitoring and Reportable Event requirements at Taplin Street. *Condition 11* – Same as former condition 12. Previous Reportable Event condition 13 is deleted with Reportable Event requirements specified wholly in Schedule 4. Reporting frequencies for ambient air quality at Taplin Street

Previous condition	Amendment condition number	Changes made
		have been reduced from bimonthly to annually and during Reportable Events. Previous condition 14 has been deleted and replaced with Record-keeping condition 11, which applies to all monitoring data required through the Licence.
15 – Emissions	1	Administrative change to move condition to the front of the Licence.
Licence amendment 12 April 2018		
Condition 5, 6, 7	5, 6, 7 (no change)	Minor changes made to specify that condition only relates to copper concentrate.
N/A	8, 9, 10, 11 and 12 (inserted)	Conditions specifying minimum standards for spodumene product quality and the requirement for product quality verification to determine any changes to risk.
Condition 8, 9, 10, 11, 12, 13, 14 and 15	13, 14, 15, 16, 17, 18, 19 and 20	Conditions re-numbered due to insertion of Conditions 8 to 11 (above).
Condition 9, Table 4	14, Table 4	Lithium as PM_{10} inserted as a parameter to be monitored and at a frequency of one 24 hour sample every sixth day plus at least one 24 hour sample during each shiploading event.
Schedule 2, Table 7	Schedule 2, Table 7	Insertion of spodumene concentrate at a rate of 610,000 tonnes per year and total throughputs increased from 560,000 tonnes per year (copper concentrate only) to a cumulative total of 1,170,000 tonnes per year.
Schedule 4, Figure 2	Schedule 4, Figure 2	Updated map of dust and stormwater monitoring locations.
Licence amendment May 2019		
N/A	2, 3, 4, 5, 6, 7	The addition of trial conditions 2 to 7 (inclusive) to allow for the handling of new bulk granular materials at the premises that not currently authorised on the Existing Licence.

Previous condition	Amendment condition number	Changes made
Conditions 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 and 20.	8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21 22, 23, 14, 25 and 26	Conditions re-numbered due to insertion of Conditions 1 to 7 (above).

Attachment 2: Amended Licence L4432/1989/14