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:	**L8937/2015/1**
File Number:	**DER2015/002837**
Premises:	**Utah Point Multi-User Bulk Handling Facility** **Portion of Lot 370 on Plan 35619** **PORT HEDLAND, WA 6721** **Certificate of Title Volume LR3118 Folio 753**
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Definitions of terms

Term	Definition
Ambient noise	means the noise present at the time of measurement from all sources
Amended Licence	The licence issued under Part V, Division 3 of the EP Act and currently in force
Applicant	refer to Licence Holder
Application	refers to the application received on 17 March 2017 to amend the Licence under s54 of the EP Act
AS 4156.6 – 2000	Australian Standard AS 4156.6 – 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*
ATSDR	Agency for Toxic Substances and Disease Registry
Cr III	trivalent chromium
Cr VI	hexavalent chromium
dB	decibel, a unit of measurement of sound level
dB(A)	A-weighted decibel, a unit of measurement of sound level weighted to reflect the frequency response of the human ear
Decision Report	This document
Delegated Officer	An officer under section 20 of the EP Act
DEM	Dust extinction moisture
DER	The former Department of Environment Regulation (now DWER)
DoH	Department of Health
DWER	Department of Water and Environmental Regulation
EPA	Environmental Protection Authority
EP Act	*Environmental Protection Act 1986*
FEL	Front end loader
HRA	Port Hedland Air Quality Health Risk Assessment for Particulate Matter (published by DoH, January 2016)
HVAS	High volume air sampler
Issued Licence	The current licence (L8937/2015/1) provided in Attachment 2 of this Decision Report.

$L_{AS\ 1}$	means a sound level, determined as an $L_{A\ Slow}$ value, exceeded for 1% of the time period over which the level is determined.
$L_{AS\ 10}$	means a sound level, determined as an $L_{A\ Slow}$ value, exceeded for 10% of the time period over which the level is determined.
$L_{AS\ max}$	means a maximum sound level, determined as a $L_{A\ Slow}$ value
$L_{A\ Slow}$	means the reading in decibels (dB) obtained using the A frequency weighting characteristic and the S time weighting characteristic on the sound level meter as defined by Part 1 of the *Environmental Protection (Noise) Regulations* 1997.
Licence Holder	Pilbara Ports Authority
mbgl	metres below ground level
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-emitting proposal	a proposal that will result in noise emissions beyond the notional boundary of the Premises where the operations will be located.
PHIC	Port Hedland Industries Council
PM	Particulate matter
PM_{10}	Used to describe particulate matter that are 10 micrometres in diameter or smaller.
the Premises	Utah Point Multi-User Bulk Handling Facility as defined in Schedule 1 of the Amended Licence.
Primary Activities	is defined in the DER *Guidance Statement: Risk Assessments* to include the primary activities which fall within the description of the category of prescribed premises in Schedule 1 to the EP Regulations.
Reviewed Licence	The licence issued under Part V, Division 3 of the EP Act and in force prior to the commencement of the review of the Application (amended 18 August 2016).
Risk Event	As described in *Guidance Statement: Risk Assessment*
TSP	Total suspended particulates

1. Background

The Pilbara Ports Authority (Licence Holder) holds Licence L8937/2015/1 for a Category 58 premises under the EP Act for the Utah Point Multi-User Bulk Handling Facility (the Premises). The Licence Holder is a port authority established under section 4 of the *Port Authorities Act 1999* (PA Act). The land upon which the Premises is situated is port land under the PA Act, meaning land vested or acquired by a port authority.

The Licence Holder previously held a single licence (L4432/1989/14) for the operation of two ship loading facilities, through the Premises on the western side of the Port Hedland harbour at Finucane Island and Eastern Operations on the eastern side of the Port Hedland harbour, adjacent to the Port Hedland townsite.

As part of the Western Australian State Government consideration of port asset divestment a licence amendment application was submitted for Eastern Operations and a new licence application was submitted for Utah Point Multi-User Facility to create two separate licensed premises.

The former Department of Environment Regulation (now Department of Water and Environmental Regulation, or DWER[1]) conducted a full risk-based review and assessment of all Category 58 activities at the Premises for both facilities in accordance with the Department's Regulatory Framework as described in the *Guidance Statement: Regulatory Principles* (DWER, July 2015). Following the assessment on 18 August 2016, Licence L8937/2015/1 was issued for the Utah Point Multi-User Facility and the existing L4432/1989/14 was amended to only include Eastern Operations.

The Licence (L8937/2015/1) issued on 18 August 2016 (the Reviewed Licence), has subsequently been amended to incorporate a Licence amendment application detailed below (section 1.1). Changes to Licence conditions are specified in Attachment 1 and the amended Licence set out in Attachment 2.

1.1 Amendment 2020

On 17 March 2017, the Licence Holder submitted an Application to amend Licence L8937/2015/1 to authorise the handling of up to 3 million tonnes per annum (Mtpa) of spodumene ore. The Application also sought to make the changes to authorised materials handled at the Premises as detailed in Table 1.

Table 1: Requested changes to authorised throughput amounts exported from the Premises

Commodity	Throughput (annual)
Iron ore	Increase from 21,350,000 tonnes to **24,100,000** tonnes
Manganese ore	Decrease from 2,000,000 to **1,100,000** tonnes
Chromite ore	No change from existing authorised throughputs of **350,000** tonnes
Spodumene ore	**Up to 3,000,000 tonnes**
Total throughput (aggregate of all ores)	Increase from 21,350,000 tonnes to **24,100,000** tonnes

Spodumene ore has been sourced from Mineral Resources Limited's Pilgangoora Project and brought into the Premises as run of mine ore (crushed to smaller than 50mm in diameter) under previous Material Change conditions (refer to section 4.2.1). Other junior

[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.

miners may deliver spodumene ore in the future although no fines product will be handled at the Premises.

The increase in total export throughput and the introduction of spodumene ore at the Premises will be achieved through existing infrastructure and no changes to infrastructure or equipment are proposed. Requested changes to throughputs for individual ore types exceed requested total combined Premises throughput increases. This is to allow for changes in market demands for each ore type with the Licence Holder advising that total throughputs (for all products combined) are not expected to exceed 24.1 Mtpa.

From the time of the Licence Holder's application to amend the Licence, spodumene ore has been handled through the Premises under 'Material Change' conditions specified in the Reviewed Licence (refer to section 4.2.1 below). The Licence Holder has loaded 4,251,094 tonnes of spodumene into vessels between 14 April 2017 and 30 June 2019. Results of ambient air quality monitoring during this period is provided in section 4.9.

This Decision Report incorporates a risk assessment for the activities proposed in the amendment application received on 17 March 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.

Key determination: In its application the Licence Holder has also provided modelled dust emissions for projected future growth at the Premises to 26.5 Mtpa. This throughput amount is based on 'Material Change' conditions of the Reviewed Licence that authorise throughput exceedances of up to 10% above throughputs specified in the Licence. These conditions have been removed from the Licence and the higher throughput amount is not authorised through the Amended Licence and has not been considered in the risk assessment in section 7.

Projected future growth above 24.1 Mtpa may be assessed at a later date. The Licence Holder will be encouraged to demonstrate no net increase to dust emissions from the Premises due to any further increase in throughputs. Where this is not demonstrated, DWER will consider further controls that may in part serve to offset any increase in dust emissions.

Further discussion on Material Change conditions is provided in section 4.2.1.

DWER initiated amendment – Trial conditions

In addition to the requested changes to the Reviewed Licence described above, this amendment also applies to the addition of Trial conditions. Trial conditions allow the Licence Holder to handle new bulk granular materials not previously assessed and authorised in the Reviewed Licence, in a test scenario and replace the former 'Material Change' conditions.

Port Authorities are handling increasingly diverse types of materials in response to growing trade markets. 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 8.5.5 and supported by the *Port Authority bulk handling trials Category 58 and 58A* published on the Department's website.

2. Overview of the Premises

The Premises is a multi-user bulk commodity berth and storage facility located on the eastern shore of Finucane Island within the Port of Port Hedland. The facility comprises two stockyards and one berth. Stockyard 1 and Wharf 4 were commissioned in 2011 under works approval W4520/2009/1 and Stockyard 2 was commissioned in 2014 under works

approval W5201/2012/1.

2.1 Infrastructure

Infrastructure at the Premises, as it relates to Category 58 activities, is detailed in Table 2 and with reference to the Premises map (attachment in the Issued Licence).

Table 2: Premises Category 58 infrastructure

	Infrastructure	Plan reference
1	Sealed ring road stockyard 1 and stockyard 2 (elevated for ring road to stockyard 1)	Premises Map: Ring Road (Stockyard 1) Ring Road (Stockyard 2).
3	Bunkers	Premises Map: Bunker 1-13, 21, 22
4	Radial stackers	Premises Map: Radial stacker 1-5, 8-13, 21, 22
5	Stockpiles	Premises Map: Stockpile (SP) 1-13, 21 and 22
6	Feed hoppers	Premises Map: Stockyard 1 – 6 mobile feed hopper trains. Stockyard 2 – 2 fixed feed hoppers
7	Conveyor system	Premises Map: CV 01, CV 02, CV 03, CV 04, CV 05, CV 06, CV 07
8	Transfer stations	Premise Map: Transfer Station 1, Transfer Station 2, Transfer Station 3, Transfer Station 4
9	Shiploader	Premises Map: Shiploader
10	Wharf 4	Premises Map: Wharf 4 (272 metres long to accommodate Panamax and small Cape Size vessels, including Cavotec system (vacuum-based mooring system) and other associated facilities and services.)
11	Stockyard 1 truck wash	Premises Map: SY1 truck wash
12	Stockyard 2 dry sweep	Premises Map: SY2 dry sweep area
13	Stormwater containment ponds	Premises Map: Stormwater recirculation pond, SY2 north pond, SY2 south pond.

2.2 Exclusions to the Premises

An easement is located between Wharf 4 and the main Utah Facility to allow BHP Billiton Iron Ore Pty Ltd (BHP) to access its infrastructure. The infrastructure is an overhead conveyor feeding iron ore from Finucane Island to BHP's berths A and B located to the south of Wharf 4.

The easement effectively separates the two portions of the Premises with a limited access corridor (gated vehicle access crossing) in place at the northern end and the Licence Holder maintains and operates the aerial conveyor system (CV 05) at the southern end (CV 05 crosses under the BHP conveyor).

These exclusions to the prescribed premises boundary are reflected in the Premises Map.

2.3 Operational aspects

Material arrives at the Premises via road trains and is side tipped over bunkers along the ring roads. There are approximately 550 truck movements per day and the proposed increase in throughput will result in approximately 65 additional road trains (equalling at total of approximately 605 per day). The Premises operates 7 days per week 24 hours per day.

Material is stacked via radial stackers at bunkers 1-5, 8-13, 21 and 22, with front end loaders (FEL) and excavators used to rearrange stockpiles. No radial stackers are used at bunkers 6 and 7, where material is built into a stockpile via FELs. Material is then reclaimed via FEL and placed via a feed hopper onto a conveyor. Conveyors and transfer stations move material along the outload circuit to the ship-loader, where it is loaded into a ship's hold via dribbler chute.

The Licence Holder coordinates operations at the Premises. Through a Common User Agreement and direct lease arrangements a number of entities own and/or operate infrastructure at the Premises (Table 3) including:

- Atlas Iron at Stockyard 2 and parts of Stockyard 1;
- Consolidated Minerals at part of Stockyard 1;
- Mineral Resources Limited (and related entities) at part of Stockyard 1; and
- Qube - undertakes stevedoring operations at the Premises.

Table 3: Facility/Infrastructure ownership and operation

Facility/infrastructure	Owner	Operator
Wharf and Cavotec system	PPA	PPA
Shiploader	PPA	Qube
Outload conveyor	PPA	Qube
Stockyard conveyor	PPA (SY1) Atlas Iron (SY2)	Qube
Transfer stations	PPA (TS01, TS02, TS03) Atlas Iron (TS04)	Qube
Radial stackers	Qube (SY1) Atlas Iron (SY2)	Qube
Bunkers	Qube (SY1) Atlas Iron (SY2)	Qube
Ring roads	PPA (SY1) Atlas Iron (SY2)	PPA (SY1) Atlas Iron (SY2)
Office, workshops, sample stations	PPA (SY1) Atlas Iron (SY2)	PPA (SY1) Atlas Iron (SY2)

Information on the bulk granular material assessed and exported from Utah facility is set out in Table 4 below. Other suppliers of each bulk material type may deliver product to the Premises in the future and only in accordance with conditions of the Issued Licence. However, and in accordance with s.53 of the EP Act, in the event that the composition of new bulk granular materials to be handled at the Premises has the potential to alter the nature or volume of waste (including dust) emitted from the Premises, a licence amendment would be required.

Table 4: Bulk granular materials assessed and exported from the Premises[1]

	Bulk Material	Bulk Material Owner
Export	Iron ore	Atlas Iron, Mineral Resources Limited (and related entities)
	Manganese ore	Consolidated Minerals, Mineral Resources Limited
	Chromite ore[2]	Consolidated Minerals

	Bulk Material	Bulk Material Owner
	Spodumene ore	Mineral Resources Limited

Note 1: As assessed at the time of Licence amendment (Issued Licence).

Note 2: Chromite ore has not been handled at the Premises since 2014.

Bulk granular material is handled using the infrastructure described in Table 5 below.

Table 5: Infrastructure used for handling of current and proposed bulk granular material[1]

Infrastructure	Iron ore	Manganese Ore	Chromite Ore	Spodumene Ore
Road train side tipping to bunkers (1-13, 21, 22)	●			●
Road train side tipping to bunkers (3-10)		●		
Road train side tipping to bunker 6 and 7	●	●	●	●
Stacker to stockpiles (1-5, 8-13, 21, 22)	●			●
Stacker to stockpiles (3-10)		●	●	
Stockpiles 1-13 at stockyard 1 and 21-22 at stockyard 2	●	●	●	●
Reclaiming - FEL to mobile feed hopper trains (6) at stockyard 1	●	●	●	●
Reclaiming - FEL to fixed feed hoppers at stockyard 2	●			●
Conveyor – CV01, CV03, CV05 CV06, CV07	●	●	●	●
Conveyor – CV02, CV04	●			●
Transfer Station – TS1, TS2, TS3, TS4	●	●	●	●
Transfer Station – TS4	●			●
Shiploader	●	●	●	●
Accessible trafficable areas	●	●	●	●

Note 1: Infrastructure depicted in Schedule 1 of the Amended Licence

Key note: Characteristics of each ore can change significantly between different ore types, which can in turn alter the volume and nature of emissions. Similarly the handling methods employed at the Premises for each ore type can affect the volume of emissions.

The risk assessment provided in this Decision Report takes into account the methods of handling used for the types of ores handled as specified in Tables 4 and 5. Changes to handling methods and/or ore types may change conclusions made through the risk assessment.

The Delegated Officer notes that the export of chromite ore from the Premises ceased in March 2014. However, at the request of the Licence Holder, chromite ore has been risk assessed in this Decision Report in the event that handling resumes.

3. Legislative context

3.1 Part IV of the EP Act

The Premises has been assessed by the Environmental Protection Authority (EPA).

3.1.1 Ministerial Statement 788

Ministerial Statement 788 was issued on 4 March 2009 for the Utah Point Berth Project. There are no conditions directly related to management or control of emissions and discharges, however within Schedule 1 of the Ministerial Statement and the summary of the key proposal characteristics, operational emissions relating to dust, noise and stormwater management are specified.

On 14 December 2015 a section 45C amendment under the EP Act (changes to proposal) was issued by the EPA removing dust and noise suppression and stormwater management from Schedule 1 of the Ministerial Statement. Conditions for the regulation of these emissions and discharges were removed from Ministerial Statement 788 due to existing management, monitoring and reporting requirements under the Part V licence.

3.1.2 Environmental Protection Authority Report 1311

The EPA assessment of Utah Point (Utah Point Berth Project (Stage B) [UPBP]) released on 12 January 2009 (report 1311) was undertaken for the construction and operation of the facility. The EPA considered that the key environmental factors for the UPBP were:

- mangrove (habitat loss);
- air quality (dust); and
- noise.

A brief summary of each key environmental factor is discussed below.

Mangrove (habitat loss)

Mangrove habitat loss was considered through the construction of the UPBP. A Mangrove Management Plan (MMP) was developed to include mangrove health surveys, monitoring of water quality, sediment deposition and fugitive dust within the mangrove community and assessment of potential changes in soil salinity associated with the construction of the bunds.

Air Quality (dust)

Dust was considered through the operation of the UPBP with particulate matter (PM) sized 10 micrometres (µm) or less (PM_{10}), chromite ($FeCR_2O_4$) and manganese oxide (MnO_2) being assessed.

The EPA report noted that the air quality impact modelling undertaken by the Licence Holder suggested that the proposal may improve local air quality as the stockpiles would be moved further away from the westernmost end of Port Hedland. However, it was also mentioned that the *National Environmental Protection (Ambient Air Quality) Measure* (NEPM) standard for PM_{10} (50 µg/m^3) was still likely to be exceeded due to the port operations, naturally high background levels, and other sources.

The EPA considered that air quality would be subject to regulation through licensing under Part V of the EP Act, which could have regard for air quality limits for dust.

Noise

The EPA considered that noise emissions comprised of traffic noise and operational noise.

Traffic noise occurs due to the use of road trains to transport the ore to UPBP. Based on noise modelling undertaken by the Licence Holder, it was predicted that improvements to noise levels from vehicular traffic would be achieved for the town of Port Hedland (residential West End) through a change to the transport route. An overall change to noise levels was predicted to increase by up to 3.5 decibels (dB), which is considered to be barely perceptible.

The EPA noted that the Licence Holder was committed to instituting noise control treatment to those affected dwellings.

Operational noise was considered from the use of FELs at the wharf and stockpile areas, conveyors, screening plant and equipment, transfer towers and hoppers. Based on noise modelling undertaken by the Licence Holder, it was predicted that noise emissions would be improved at noise sensitive receptors on the basis that significant noise sources would be located further away from the township to Utah Point.

3.1.3 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 (at the same time as EPA report 1311), as a result of concerns of health effects to residents within the town of Port Hedland from 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 ultimately resulted in the creation of the Port Hedland Dust and Noise Management Taskforce (see section 3.3).

3.2 Department of Mines, Industry Regulation and Safety

The Premises area 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 4 – Utah Point, registered as site code S0023400 operation commenced 30 September 2010 for the commodities iron, manganese and chromium (iron, specifically iron ore commodity group).

3.3 Port Hedland Dust and Noise Management Taskforce

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

3.3.1 Government response to the 2016 Taskforce Report

On 15 October 2018, the McGowan Government released its response to the 2016 Port Hedland Dust Taskforce Report endorsing recommendations made in the Taskforce Report.

In doing so the Government endorsed multiple strategies to both reduce ambient dust impacts and minimise receptor exposure in the West End of Port Hedland. This includes the Government's position that an air guideline value of 24-hour PM10 of 70 µg/m3 (excluding natural events) applies where people live on a permanent basis; and that measures should be introduced to cap (and if possible, reduce) the number of permanent residents in dust-affected areas.

The Port Hedland air guideline value was derived using established human health risk assessment techniques and assumptions as further described in section 3.3.2, and is

considered to be protective of the health of a 'general population' within the defined area, provided that the number of permanent residents remains largely unchanged into the future.

For its part, DWER is responsible for implementing two key Government-endorsed recommendations, including:

- Developing and implementing a dust management guideline for bulk handling port premises; and
- Taking over control of the operation and maintenance of the Port Hedland ambient air quality monitoring network.

The second part of the Government's broader position on dust management relates to proposed planning changes prohibiting new residential development and other sensitive land uses, including aged care and child care premises, west of Taplin Street.

To give effect to this, the Western Australian Planning Commission (WAPC) is considering an Improvement Plan and Improvement Scheme designed to achieve the land use outcomes of the Taskforce recommendations (DJTSI, 2018).

The Department of Planning, Lands and Heritage (DPLH) is in the process of consulting on the proposed Improvement Scheme No.1 (Figure 1) to provide an outline of the strategic intentions for the West End (DPLH, 2020). The consultation period ends 3 July 2020.

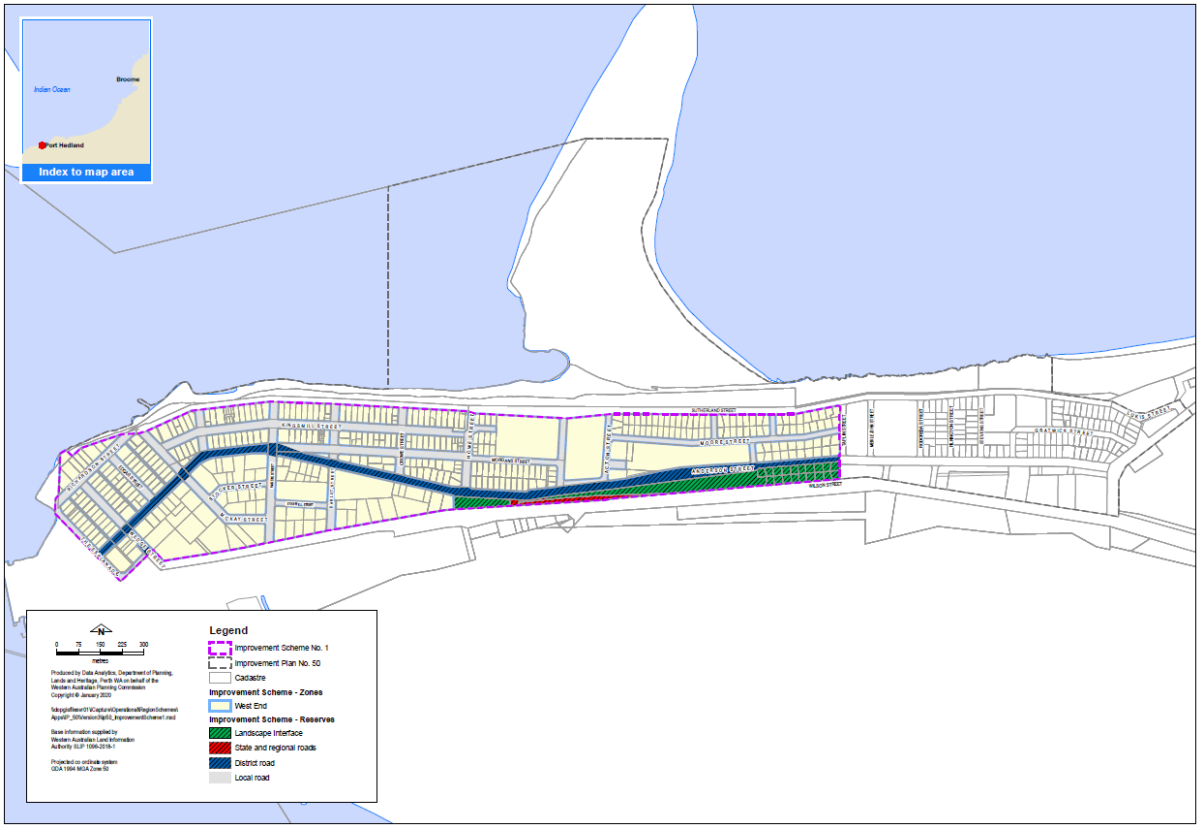

Figure 1: Proposed Port Hedland West End Improvement Scheme No. 1 (Source: DPLH 2020)

In August 2019, the Government introduced the concept of an industry-funded voluntary buyback scheme for Port Hedland. The proposed buyback scheme is separate to, but supports the endorsed Taskforce recommendations relating to restricting population growth in the West End of the Port Hedland peninsula. The intention is to provide residents in the West End the opportunity to relocate from areas subject to the improvement plan.

Key findings relevant to DWER's regulation of Category 58 premises (bulk handling) is

provided below.

Key findings: The Delegated Officer also notes the Government's position that the interim guideline of 24-hour PM_{10} of 70 µg/m^3 (excluding natural events), hereon referred to as the air guideline value, shall continue to apply to all residential areas of Port Hedland.

DWER will implement the commitments made by the Government in its response to the Taskforce Report. Specifically it will develop a dust management guideline for bulk handling port premises and implement the guidelines through Industry self-assessments and licence reviews.

3.3.2 Health Risk Assessment

The Department of Health (DoH) released the *Port Hedland Air Quality Health Risk Assessment for Particulate Matter* (HRA) in January 2016. The outcomes of the HRA were the basis for the Government-endorsed Taskforce recommendation that the current interim guideline of 24-hour PM_{10} of 70 µg/m^3 (excluding natural events) continues to apply to residential areas of Port Hedland and that measures should be introduced to cap (and if possible, reduce) the number of permanent residents in dust-affected areas of Port Hedland.

The HRA considered the cumulative impact of all dust sources on the population of Port Hedland and the findings and recommendations apply to all industry and other sources of dust in Port Hedland. The information in this section should be read in conjunction with the HRA and DoH's *Port Hedland – Fact Sheet* and not taken to apply solely to port operations at the Premises.

The report provides the final health risk assessment for Port Hedland. DoH also published the Port Hedland – Fact Sheet, which provides the summary findings of the study as follows:

- The HRA identifies that PM_{10} concentration in ambient air decreases with increasing distance from the Port.
- During the period of the assessment, areas of Port Hedland closer to the port experienced dust exceedances (dust levels greater than 70µg/m^3) more frequently than areas further away. The greatest number of exceedances in Port Hedland was recorded in the West End.
- Patterns of dust exceedances (dust levels greater than 70 µg/m^3) dominate the West End of Port Hedland during the winter and spring. Dust sources during these periods are predominantly from the direction of the port and resources industry. However, bare earth, regional dust storms and seasonal scrub fires also contribute to exceedances at particular times of the year and in response to certain meteorological conditions.
- The HRA confirms that there is sufficient evidence that increased levels of dust exposure can have an adverse impact on human health in Port Hedland over the long term. This is consistent with the broader scientific literature on the effects of dust on human health.
- The majority of the public health burden of dust in Port Hedland is associated with PM_{10} concentrations over 70 µg/m^3. These effects may be independent of any $PM_{2.5}$ effects although this is not clear, due to the small population.
- Nevertheless, there is no immediate or acute health risk to the Port Hedland community – however the focus must now be on minimising peoples' exposure to dust.

- The number of affected individuals is very low, but only because the Port Hedland population is small (~5000 people).
- The HRA considered a number of dust exposure scenarios. One scenario of importance explores the health impact of the highest dust levels on the population. It asks the question: what adverse health outcomes are forecast if the whole population (~5000 people) of Port Hedland were exposed to the levels of dust experienced in the West End? The important health outcomes were predicted to be as follows:
    - Increase in long term mortality (premature death),
        - **1** additional death **per year** in areas that frequently exceed 70 µg/m^3
    - Cardiovascular disease
        - **1** additional death **every 3 years** in areas that frequently exceed 70 µg/m^3
    - Increase in hospital admissions associated with:
        - Respiratory disease for people over 65 years of age
            - **2** additional admissions **per year** in areas that frequently exceed 70 µg/m^3
        - Pneumonia and bronchitis.
            - **1** additional admission **per year** in areas that frequently exceed 70 µg/m^3
        - Increase in emergency room attendance for pre-existing respiratory conditions i.e. asthma, between 15 - 65 years of age
            - **3** additional admissions **per year** in areas that frequently exceed 70 µg/m^3
- Two other important exposure scenarios asked the questions what adverse health outcomes are forecast if the whole population (~5000 people) of Port Hedland were exposed to levels of dust:
    - not greater than 70 µg/m^3 , and
    - not greater than 50 µg/m^3

    The important health outcomes were predicted to be as follows:
    - Increase in long term mortality (premature death),
        - **1** additional death every **3 years** for both scenarios.
    - Cardiovascular disease
        - **1** additional death every **10 years** for both scenarios.
    - Increase in hospital admissions associated with:
        - Respiratory disease for people over 65 years of age
            - **1** additional admission every **2 years** in areas not exceeding 70 µg/m^3
            - **1** additional admission every **3 years** in areas not exceeding 50 µg/m^3
        - Pneumonia and bronchitis
            - **1** additional admission every **4 years** in areas not exceeding 70 µg/m^3
            - **1** additional admission every **5 years** in areas not exceeding 50 µg/m^3
    - Increase in emergency room attendance for pre-existing respiratory conditions i.e. asthma, between 15 - 65 years of age

- **1** additional admission **per year** for both scenarios.

- Based on the outcomes of these scenarios the HRA concluded that 70 µg/m^3 for PM_{10} provided a similar level of protection to the current population of Port Hedland as would the national standard for PM_{10} of 50 µg/m^3. This is because the population size and make-up influence the outcome; if the population were more than doubled and with more people that are more vulnerable, the health outcomes would be more prominent and demanding of more immediate regulatory control.

4. Site and operational history

4.1 Works approvals

4.1.1 W4520/2009/1

Works Approval W4520/2009/1 – Utah Point Berth Project, was issued 28 May 2009 for a category 58 premises. The works approval related to the construction of Stockyard 1, open loading system and berth 4, road access and associated services and facilities. An environmental management plan was developed for commissioning and submitted to the Department on 26 July 2010. The then DER provided a response authorising commissioning on 9 August 2010.

4.1.2 W5201/2012/1

Works approval W5201/2012/1 Utah Berth Facility Stockyard 2 Interim Development was issued on 13 December 2012. The works approval related to an interim development of Stockyard 2, which would be followed by the completion of an automated materials loading system. On 27 February 2014 a compliance document was provided by the works approval holder stating that the Premises was constructed in accordance with conditions of the works approval. The former DER acknowledged receipt of the compliance document on 8 July 2014.

4.2 Historical amendments to the Licence

An improvement condition was previously detailed on L4432/1989/14. Condition 4.1.1 required the Licence Holder to implement an Environmental Improvement Plan (EIP). The EIP was defined in section 1 of the former licence as the document title “Utah Point Berth Facility Stockyard 2 – Environmental Improvement Plan – Dust Management (143-LAH-EN-APP-0001), Revision 1” Atlas Iron Limited (12/01/2015).

The EIP related to Stockyard 2 and included seven improvement areas including:

1. improve product management;
2. improve dust suppression;
3. improve air quality monitoring and adaptive management;
4. conduct and validate dust modelling;
5. treat and maintain open areas;
6. upgrade and maintain roads and berm; and
7. implement an automated system.

The Licence Holder has reported that all but the final improvement are either scheduled or have been completed.

The Licence Holder has requested that the requirement for the final improvement relating to the implementation of an automated system rather than the current use of FELs be removed.

DWER has considered the current infrastructure and use of FELs for potential to generate fugitive dust emissions in this assessment. All improvements except for the automated system have been included in the Amended Licence.

4.2.1 Material Change notifications

Prior to this latest assessment to amend, Licence L8937/2015/1 included conditions requiring notification to the CEO of material changes which occur at the Premises. Material Changes are defined as changes to the description provided in Schedule 2 of the Licence including Material Change examples provided.

Table 6 summarises Material Change notifications submitted by the Licence Holder for the Premises.

Table 6: Material Change notifications

Date	Summary of Notice of Material Change	DWER response
17/03/2017	Notice of Material Change for trial shipments of up to 550,000 tonnes of lump spodumene material from late March 2017 to 30 June 2017. The trial shipment was anticipated to result in up to two shipments per month, each exporting around 100,000 tonnes of spodumene. An example of a Material Change in Schedule 2 of the Reviewed Licence is new commodities.	Notification noted. Licence amendment (this Application) lodged for the ongoing shipment of spodumene.
3/07/2017	Notice of Material Change for the continuation of the trial shipments of spodumene material from 30 June to 30 September 2017. An example of a Material Change in Schedule 2 of the Reviewed Licence is new commodities.	Notification noted. Licence amendment (this Application) lodged for the ongoing shipment of spodumene.
11/07/2017	Notice of Material Change relating to excess of the bulk material exported at the Premises then those assessed and detailed in Schedule 2 of the Licence. An example of a Material Change in Schedule 2 of the Licence is throughput increases exceeding 10%. The Licence Holder advised DWER that on 27 June 2017 that throughputs exceeded the authorised amounts plus 10% (23.485Mtpa). For the remaining four days of the annual period an additional 110,332 tonnes of bulk granular material were exported through the Premises. In submitting the notification the Licence Holder identified that no Reportable Events occurred between June 27 and 30 when throughput exceedances were occurring.	Notification noted. Licence amendment (this Application) lodged for the ongoing shipment of spodumene.
28/09/2017	Notice of Material Change for the continuation of the trial shipments of spodumene material from 30 September to 31 December 2017. An example of a Material Change in Schedule 2 of the Reviewed Licence is new commodities.	Notification noted. Licence amendment (this Application) lodged for the ongoing shipment of spodumene.
4/12/2017	Notice of Material Change for the continuation of the trial shipments of spodumene material from 1 January to 31 March 2018.	Notification noted. Licence amendment (this Application) lodged for the ongoing shipment of spodumene.
19/03/2018	Notification to temporarily relocate dust monitor M5 for the purpose of avoiding damage to the monitor during nearby	Notification noted. Licence Holder advised that the

	construction work.	relocation of the dust monitor does not increase the risk of emissions or discharges from the Premises and is not a Material Change as defined by Schedule 2 of the Licence.
29/03/2018	Notice of Material Change for the continuation of the trial shipments of spodumene material from 1 April to 30 June 2018.	Notification noted. Licence amendment (this Application) lodged for the ongoing shipment of spodumene.
28/06/2018	Notice of Material Change for the continuation of the trial shipments of spodumene material from 1 July to 30 September 2018. Total spodumene throughputs in the 2017/18 annual period reached 3.6 million tonnes. The Licence Holder notified the Department that an average of three shipments per month will continue out of the Premises with each shipment being approximately 110,000 tonnes.	Notification noted. Licence amendment (this Application) lodged for the ongoing shipment of spodumene.
12/09/2018	Notice of Material Change for the continuation of the trial shipments of spodumene material from 1 October 2018 to 31 December 2018. The total export of Spodumene through Utah Point in FY2017/18 reached 3,592,280 tonnes over 35 shipments.	Notification noted. Licence amendment (this Application) lodged for the ongoing shipment of spodumene.
7/12/2018	Notice of Material Change for the continuation of the trial shipments of spodumene material from 1 January 2019 to 31 March 2019	Notification noted.
21/03/2019	Notice of Material Change for the continuation of the trial shipments of spodumene material from 1 April 2019 to 30 June 2019	Notification noted.
18/06/2019	Notice of Material Change for the continuation of the trial shipments of spodumene material from 1 July 2019 to 30 September 2019	Notification noted.
27/09/2019	Notice of Material Change for the continuation of the trial shipments of spodumene material from 1 October 2019 to 31 December 2019	Notification noted.

Key Finding: Material Change notifications received by DWER in relation to Primary Activities have resulted in the need for licence amendments as the changes had required thorough risk assessment. Therefore DWER's experience with the Licence Holder's application of the Material Change conditions has not matched the original intent of the condition, which was to authorise operational flexibility for matters that are likely to result in insignificant environmental risk.

Subsequently and based on the outcomes of the risk assessment detailed in this Decision Report, the Delegated Officer has removed the conditions (former conditions 2 to 4) from the Licence.

Alternative conditions have been applied to the Amended Licence to authorise trial shipments of additional products where it can be demonstrated that environmental and public health risks can be appropriately managed. Monitoring data collected during the trial shipments will be used to better inform a risk assessment for ongoing shipments of the trialled product. Trial

conditions are further discussed in section 8.5.4.

4.3 Compliance inspection

DWER has undertaken compliance inspections on six occasions since 2012. The following summary of inspections is provided below.

- Inspection undertaken 11 June 2012: An Environmental Field Notice was issued by the then Department of Environmental Conservation (DEC, now DWER) in relation to excess iron and manganese ore being identified below the conveyor system in front of the sample station at Utah Point. DEC requested the removal of excess iron ore and manganese ore near the sample station. The Licence Holder responded 29 June 2012 by letter advising that iron ore and manganese ore had been removed. No further action was required.
- Inspection undertaken 12 June 2013: No non-compliances were noted in the inspection report.
- Inspection undertaken 2 May 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 October 2014: No non-compliances were noted in the inspection report.
- Inspection undertaken 1 May 2017: Discussed below in section 4.5.
- Inspection undertaken 31 October 2018: Discussed below in section 4.5.

4.4 Annual Audit Compliance Reports

Annual Audit Compliance Reports (AACR) and Annual Environmental Reports (AER) have been submitted in accordance with former 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 2018/19 Report

The Licence Holder declared a non-compliance with Licence conditions relating to the following:

- Data capture not meeting requirements for 90% availability at monitors M7 in Q3 2018/19 (83.4%) and M5 in Q4 2018/19 (77.1%). Low data capture was the result of a 5-day cyclone shutdown, power interruptions, temperature sensor failure and flow and tape issues. The Licence Holder responded to issues by replacing all twelve batteries to improve power reliability and temporarily replacing faulty monitors.
- Hydraulic oil discharged directly to the Port Hedland Inner Harbour on six occasions with discharges ranging between 15 mL and 450L (see section 4.5.1).
- Four incidence of process water potentially containing iron ore product discharged into harbour waters, three of which were minor in volume with the fourth being an approximate 1,500L discharge from the CV07 shiploading conveyor.

- Discharges of process water to cleared areas on five occasions occurred as a result of ST7 sump overflow.

Non-compliances relating to low monitoring equipment availability are not expected to have resulted in environmental impact.

4.4.2 2017/18 Report

The Licence Holder declared a non-compliance with Licence conditions relating to the following:

- On seven occasions the moisture content of material received at the Premises not being above the DEM level for each product. An additional 15 days in the annual period were identified where the moisture content of product being loaded onto vessels did not meet the moisture content requirements for each product. Further discussion is provided in section 4.8.2.
- Data capture for boundary monitors (PM_{10} and metals speciation) did not achieve the compliance rate of 90% averaged over each 24 hour period, primarily due to power supply interruptions. The Licence Holder has amended contractual arrangements with monitoring equipment contractors to improve dust monitor performance. In addition, DWER has amended the Reviewed Licence to clarify the definition of continuous that would allow for minor interruptions that would are commonly expected in monitoring equipment performance.
- Biodegradable hydraulic oil was discharged from the Licence Holder's vessel mooring system on six occasions with discharges ranging between 2L and 200L (further discussion in section 4.5.1).
- Six incidents of between 50 and 300L of process wash water containing iron ore sediment being discharged to the Port Hedland Inner Harbour (further discussion in section 4.5).

4.4.3 2016/17 Report

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

The Licence Holder declared a non-compliance with Licence conditions as product that did not have a moisture content at or above the dust extinction moisture (DEM) level was accepted onto the Premises. Further, that the Licence Holder did not have knowledge of the product's moisture content level prior to receiving the product (refer to section 4.5.2).

The Licence Holder also declared non-compliance with reporting conditions of the Licence following an incident where approximately 1 litre of biodegradable hydraulic oil was discharged to the marine environment as a result of a hose failure on Berth 4. In accordance with the Reviewed Licence, the incident required an investigation record to be provided to DWER by 15 November 2016, however this was not sent until 23 November 2016. DWER later determined the incident to be unlikely to cause environmental harm and the non-compliance to be administrative in nature.

4.4.4 2015/16 Report

The Licence Holder declared non-compliance with former 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.

4.4.5 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.

4.4.6 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. Majority of incidents related to small scale hydrocarbon or ore spills to land. No significant spills were reported to impact the marine environment (the largest spill incident being a 1600 litre diesel spill to the Stockyard 2 ring road). This was reported in the AACR.
- Total number of dust target exceedances recorded at Licence Holder's boundary network was 652 in 2014 with 95 attributed to the Licence Holder operations. This was reported as a 38 per cent increase from 2013 with it being stated to relate to the increase in throughput and the commissioning of Stockyard 2.

4.4.7 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. Majority of incidents related to small scale spills.
- Total number of dust target exceedances recorded at the Licence Holder's boundary network was 661 in 2013, with 84 attributed to the Licence Holder operations. (Note there was a change to monitoring equipment in 2013).
- Through the AACR, the Licence Holder self-reported non-compliance with condition relating to small scale spills and discharges. No issues or concerns noted.

4.4.8 2012 Report

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

4.5 Compliance history check

The DWER Incident and Complaints Management System (ICMS) is the system used to record complaints received and non-compliance requiring investigation. Following a review of ICMS there have been no complaints received from members of the public or surrounding operators relating to the Premises.

Several incidents have been recorded in ICMS that have been reported to DWER by the Licence Holder within 21 days of each incident, and within AACRs. Most incidents relate to the discharge of sediment-laden washdown water to the Port Hedland Inner Harbour from the ST7 sump. To address the ongoing incidents the Licence Holder has installed an earthen bund to contain sump overflows and divert any potential discharges to sealed PPA land where washdown water can evaporate and seep to groundwater with dried sediment

recovered by road sweeper.

In addition, the Licence Holder has installed a fixed vertical pipe from wharf surface level up to CV06 level to trial the effectiveness of dry vacuuming towards the tail end of CV06. The trail will continue into April 2020 and will reduce water usage and flow through ST7 to avoid overflow. If the vacuum pipe trial prevents the discharge of washwater to the Inner Harbour, the Licence Holder will proceed to install additional vacuum pipes to enable even more cleaning with reduced water usage.

The Licence Holder notes that since the installation of the earthen bund around sump ST7 and along the premises boundary in late June 2019, there have been no process water emissions offsite from this area.

Further incidents include dust settling on nearby vegetation and reports of non-compliance against ore moisture content conditions specified on the Licence.

There is no history of prosecution or formal statutory compliance/enforcement notices issued under the EP Act by DWER to the Licence Holder for the Premises.

4.5.1 Hydraulic oil discharges

The Licence Holder has notified DWER of 14 releases of 'biodegradable' hydraulic oil from mooring infrastructure between 1 July 2017 and 31 December 2019. Volumes discharged during seven of the incidents have ranged between 15mL and 200 L directly to the Port Hedland Inner Harbour. According to the Licence Holder's observations rapidly dispersed in the marine environment. On 9 February 2019, approximately 450 L of hydraulic oil was discharged from mooring infrastructure. The Licence Holder responded to this single incident by deploying a skimming recovery vessel to limit the spread of the discharged oil.

Following each spill of the hydraulic oil from mooring infrastructure, the Licence Holder stops or controls the source by isolating the relevant piece of equipment before any attempt to contain or recover spilt oil. Due to its buoyancy the manufacturer considers it can be easily skimmed from the water surface. However, the Licence Holder's ability to recover oil spilt to the Inner Harbour is limited by access due to vessel safety and wind, water and tidal conditions. Where possible, spills of hydraulic oil on land are contained using a sausage bund and recovered using absorbent material.

Mooring equipment is then either replaced or repaired before it is used again to prevent recurrence. Hydraulic mooring systems undergo routine inspections and maintenance every eight weeks and in accordance with manufacturer specifications to minimise the risk of failure.

Investigation of the oil product (Plantohyd 46) identified that it is made of greater than 90% vegetable esters that readily breakdown in the presence of water. The product is classed as a 'biodegradable' oil, meaning greater than 60% of the product can degrade over a period of 28 days as determined by measuring the amount of organic carbon that has been converted to carbon dioxide. In accordance with Organization for Economic Cooperation and Development (OECD) test 301B, the oil sample is tested in a controlled environment of 25°C and introduced to a mixed population of micro-organisms.

DWER's assessment of risk associated with discharges to the marine environment is provided in section 7.5.

4.5.2 Environmental Field Report 3196

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 accepts bulk granular material onto the Premises prior to knowing the moisture

content.

Environmental Field Report (EFR) 3196 was issued under section 58 of the EP Act on 6 June 2017 to the Licence Holder's Chief Executive Officer (CEO) to require the provision of measures undertaken to comply with the condition 7 of the Licence amended August 2016, which states:

"The Licence Holder shall only accept bulk granular material detailed in Table 4 in Schedule 2, to the Premises, if it contains a Moisture Content at or above the dust extinction moisture (DEM) level derived from application of AS4156.6-2000."

On 28 July 2017, the Licence Holder responded to the Environmental Field Report noting that suppliers have been notified of requirements to supply product with moisture content above the DEM level for that product. The Licence Holder also maintained its commitment to the monitoring and reporting of product moisture content.

4.5.3 Site inspection 31 October 2018

A site inspection was conducted on 31 October 2018 to assess operational compliance with Reviewed Licence conditions. During the site visit, winds were strong presenting a good opportunity for DWER officers to identify key dust sources and assess the effectiveness of controls detailed later in the risk assessment for dust (refer to Table 27). Out-loading was identified as a key source of visible dust as a result of movement of FELs and slumping of stockpiles as FELs removed product for transport to the hoppers. In addition, water sprays operating at out-loading hoppers appeared to have limited effectiveness once product was dropped from height, above water sprays.

Water sprays at all bunkers (excluding Bunkers 6 and 7) were observed to be effective for managing visible dust at in-load.

Key finding: Based on the information gathered during the site inspection, the Delegated Officer notes that the operation of FELs on unsealed areas and out-loading via an open hopper is likely to present the greatest source of dust emissions from the Premises. Throughput increases will result in greater FEL activity and hopper usage, which is likely to result in increased dust emissions where no additional management controls are applied. However, the potential for impacts to receptors in the West End from Premises dust emissions is only possible where the wind provides a pathway.

4.6 Dust modelling data

Revised dust dispersion modelling was undertaken as part of the Application to increase Premises throughputs, provided in the *Pilbara Ports Authority, Utah Point Air Quality Assessment Update, 16 March 2017*.

The report grouped dust impacts into the three categories:

1. dust emissions from key sources at the Premises, in isolation of all other emission sources;
2. dust emissions from key sources at the Premises and existing air quality background (based on Port Hedland Industries Council Cumulative Air Model, 2012); and
3. cumulative impacts that consider dust emissions from the Premises, background and third parties.

A dispersion model was developed based on three operational scenarios for each of the above categories, including:

- existing authorised throughput at the Premises – 21.35Mtpa,
- the proposed throughput at the Premises (the Application) – 24.1Mtpa; and

- potential future throughput at the Premises – 26.5Mtpa.

The emission inventory used for the dispersion model included emissions rates associated with the following sources:

- Material loading from FEL
- Material unloading from:
  - bunkers; and
  - stackers
- Material transfers:
  - by conveyors
  - transfer stations
- Ship loaders
- Wind erosion from stockpiles and open areas.

The revised model identified that stacking/truck in-loading and FEL reclaiming activities were the most significant sources of dust at the Premises followed by wind erosion from stockpiles.

Figure 2 below compares anticipated ambient dust concentrations in Port Hedland for both current and proposed future throughputs. Licence Holder modelling indicates that under worst case scenarios, increases to throughputs are not expected to result in significant changes to overall ambient dust concentrations. Given the uncertainties associated with modelling, it is difficult to confirm if the modelling has accurately measured the effectiveness of proposed controls. As such, DWER has taken a precautionary approach to the assessment of this risk. It is noted that the modelling assumes that proposed additional controls (greater availability of water cart at stockyards) will reduce dust emissions generated by FELs by an additional 25%.

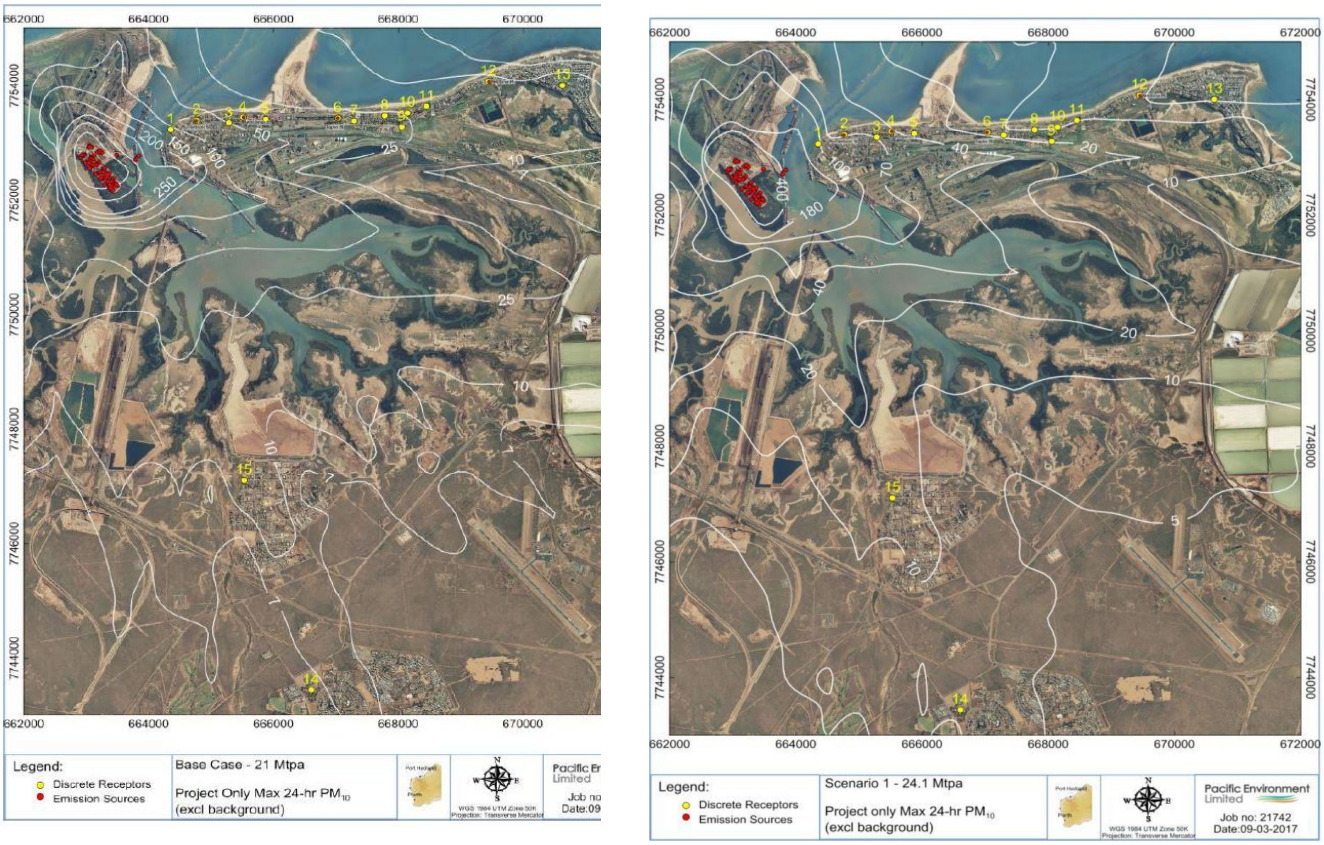

Figure 2: Maximum non-cumulative 24 hour PM_{10} concentrations from the Premises for existing throughputs (21Mtpa) and 24.1Mtpa scenarios (PEL, 2017)

When cumulative impacts from other nearby industry are factored into modelling it is evident that maximum 24 hour PM_{10} concentrations will exceed 70mg/m^3 in the West End as a result of Category 58 activities (Figure 3).

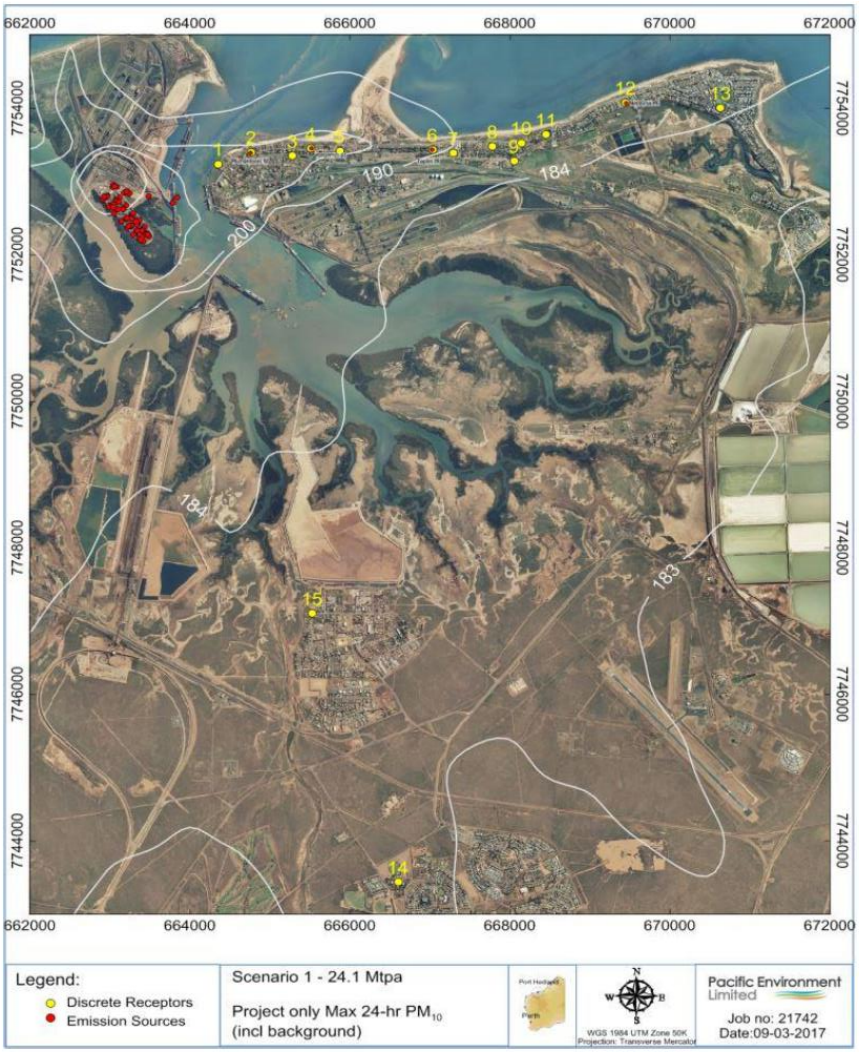

Figure 3: Maximum cumulative 24 hour PM_{10} concentrations (PEL, 2017)

According to modelling, the number of air guideline value exceedances at Taplin Street is not expected to increase beyond historical trends. When compared to the greater 26.5Mtpa cumulative scenario (potential future throughput), Table 7 does show a slight increase in the number of exceedances at Taplin Street for the 24.1Mtpa cumulative scenario. PPA has explained that this can be due to rounding differences and is supported by the lower annual average for PM_{10} under the 24.1Mtpa scenario.

Table 7: Ambient dust concentrations at Taplin Street during the three throughput scenarios

24-hour concentrations of PM_{10}	Project in isolation			Project + Background			Cumulative		
	21.35Mtpa	24.1Mtpa[1]	26.5Mtpa	21.35Mtpa	24.1Mtpa	26.5Mtpa	21.35Mtpa	24.1Mtpa[1]	26.5Mtpa
Maximum	31	**12**	12	191	**191**	191	202	**201**	202
99th percentile	13	**10**	9	59	**59**	59	79	**82**	81
95th percentile	8	**8**	7	39	**39**	38	65	**62**	62

90th percentile	6	**6**	6	35	**34**	35	56	**56**	55
70th percentile	3	**3**	3	28	**28**	28	44	**44**	44
Annual average	2.5	**2.3**	2.3	24.4	**24.0**	24.1	36.8	**37.1**	36.6
Exceedances (70µg/m^3)	0	**0**	0	1	**1**	1	7	**8**	7

Note 1: Based on revised modelling provided to DWER October 2019 (Environmental Technologies & Analytics (2019)

4.6.1 Dust modelling emission estimates

A comparison has been undertaken on the emission estimates of Category 58 premises in Port Hedland based on total emissions per tonne of material handled at each of the facilities.

The below emission estimates for this Application have been provided by the Licence Holder. The emission estimation process included an assumption that 10% of ore would be classified as having a low moisture content with a corresponding increase in the emission rate on a kilogram per tonne (kg/t) basis (Environmental Technologies & Analytics (2019).

- Annual emissions for the Premises (24.1 Mtpa) = 17.42 g/Tonne
- Annual emissions for the Premises (26.5 Mtpa) = 16.81 g/Tonne

Emission estimates for other port facilities are detailed in the PHIC-commissioned *Port Hedland Cumulative Air Model: Peer Review Report to the Cumulative Air Modelling Subcommittee, March 2016* (Air Assessment, 2016) and are provided below:

- Annual emissions for BHP (270 Mtpa) = 3.2 – 3.6 g/Tonne
- Annual emissions for FMG (175 Mtpa) = 5.8 g/Tonne
- Annual emissions for Roy Hill (55 Mtpa) = 7.9 g/Tonne

As shown above there is a marked difference in emission estimates between the Port Hedland port facilities. This could be due to a number of factors including the use of different emission estimate techniques (site specific emission estimates versus National Pollution Inventory) and the nature of operations at each of the facilities. For example, it is noted that at the Utah Point Multi-User Facility there is heavier reliance on FELs, which have the potential to generate more dust than bucket wheel reclaimers. In addition, it is understood that some other port facilities are able to condition ore onsite with moisture as well as direct ship a large proportion of material, avoiding double handling from stockpiling and reclaiming prior to ship loading, which could reduce overall emission estimates.

Key findings: The Delegated Officer notes that:

1) the estimated emission rates per tonne of material handled at the Premises is much higher than other Port Hedland port facilities, resulting in a modelled footprint similar to other much larger port facilities;
2) there are a number of residential premises west of Taplin Street, which is approximately 3.3 km to the east of the Premises;
3) there is significant uncertainty with regards to fugitive dust emissions and the effectiveness of controls assumed in modelling, particularly around the effectiveness of water cart and stockpile cannon availability reducing Premises emissions by 25%. Therefore modelling cannot be used as a standalone quantitative analysis or forecast tool for actual emissions from the Premises;

4) modelling for the 26.5 Mtpa scenario was undertaken by PPA given its assumption that previous Material Change conditions that allow for an exceedance of throughputs by 10% would continue to be applied; and

5) The allowance of throughput exceedances under Material Change conditions was initially designed to allow for scenarios of marginal increases in production on an ad hoc basis as opposed to ongoing premises expansion.

The Delegated Officer has determined that Material Change conditions present an unacceptable risk (refer to section 4.2.1) and therefore has removed these conditions from the Amended Licence. Therefore this Decision Report assesses the risks associated with emissions and discharge from handling 24.1 Mtpa only.

Revised modelling data was submitted to DWER in October 2019 to demonstrate that the additional controls originally proposed in the Application would result in no net increase in predicted ground level concentrations at any receptor east of the Hospital monitoring site, including at the Taplin Street monitoring site. Revised modelling has not resulted in a change to the conclusions made above.

4.6.2 Limitations of air quality modelling

It is important to note that air quality modelling represents a simplification of the actual physical conditions and modelling is inherently uncertain in its ability to accurately estimate ground level concentrations of particulate matter. Real world dust concentrations are also impacted by many other sources that are not included in the modelling and variations in emissions simply due to day to day variations in weather conditions can be much larger than incremental changes in the Licence Holder's emissions.

In addition, estimates of emissions used in modelling are themselves based on calculations rather than direct measurements of emissions. While the Licence Holder did in some cases conduct emissions model calibration, the limited number of measurements that were taken at the time of testing mean that emissions estimates may not account for the variation in emissions. Modelling can however be useful for comparing scenarios and determining the relative change in emissions under those scenarios.

It is clear that the modelled exceedances of the air guideline value measured in Table 7 do not correspond to the actual exceedances experienced in the last four years, which are higher than estimated (refer to section 4.7.3). This is possibly a consequence of limited information on background concentration estimates that also include fugitive emissions from non-port sources including both natural and anthropogenic sources, and which can be highly variable from year to year. Historical monitoring indicates that these other sources may significantly contribute to the high ambient PM_{10} concentrations experienced at Port Hedland.

Finally, it is important to note that modelling conclusions are based on an analysis of concentrations at Taplin Street, which is a significant distance from the largest emission sources.

4.7 Ambient air quality monitoring

Ambient air quality monitoring is undertaken at Port Hedland through a number of monitoring stations within the Town of Port Hedland shown in Figure 4. Monitoring is coordinated through the PHIC and real-time monitoring is reported on the PHIC website.

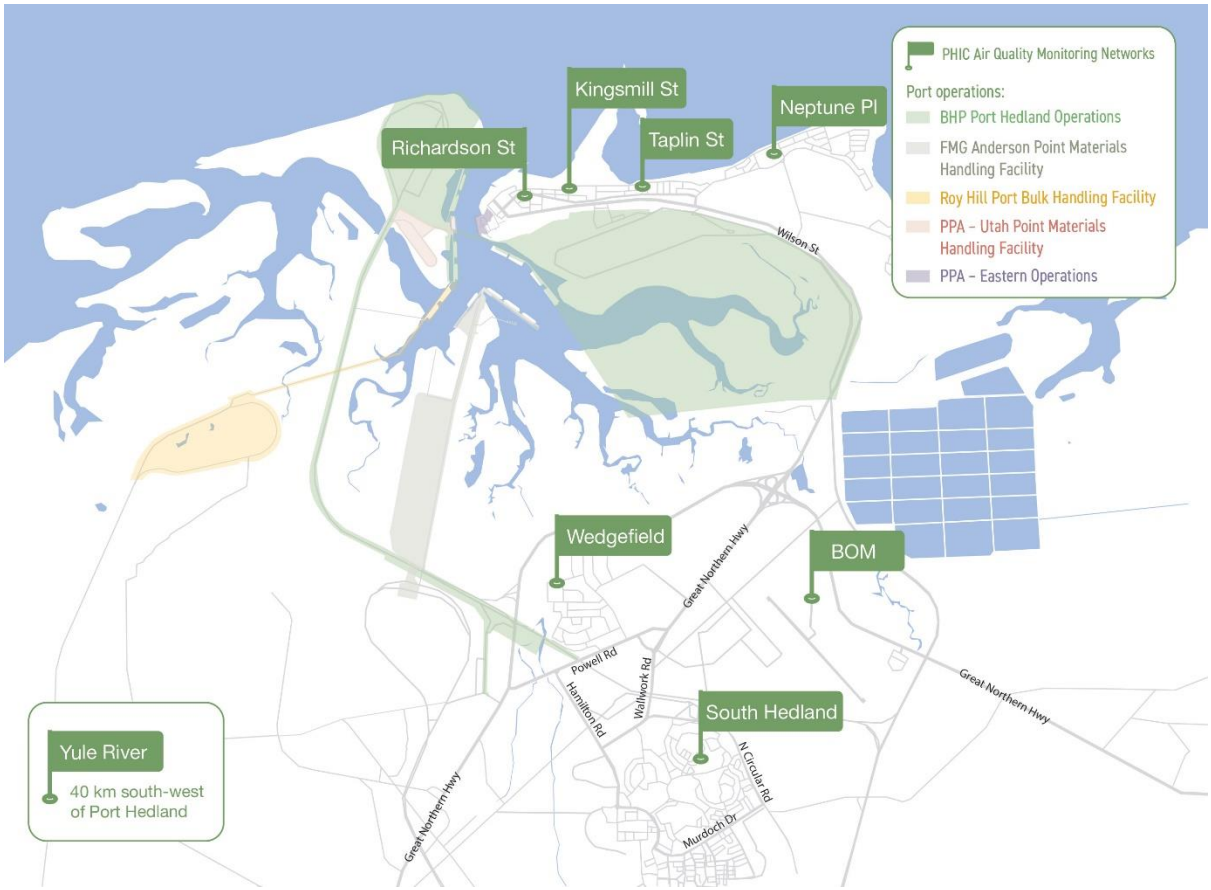

Figure 4: PHIC monitoring locations in Port Hedland

As discussed in section 3.3, the air guideline value (PM_{10} – 70µg/m^3 with a 24 hour averaging period) applies to all residential areas of Port Hedland. Previously, the air guideline value was applied to Taplin Street only, which is located on the eastern border of West End and approximately 3.3km east of the Berth 4 ship loader.

DoH has advised DWER that in principle, the National Environment Protection (Ambient Air Quality) Measure (NEPM) standard (50 µg/m3) applies to all Australians, but it is not met everywhere that people live for various reasons. The Ambient Air Quality NEPM provides for a risk assessment, such as a health risk assessment conducted by DoH, to be used to determine an appropriate alternative – such as in Port Hedland. It should be noted that the NEPM itself was originally determined by risk assessment, finding that 50µg/m^3 was an acceptable 'risk level' based on the composition of dust and the size of the population likely to be affected by dust comprising a large component of combustion particles. The Port Hedland HRA followed the same risk assessment framework.

The air guideline value is applied in Port Hedland in the same way that the NEPM is in other locations. That is, the NEPM guidance publications including the Explanatory Statement clearly outline the operation of the NEPM and identify that the imposition of NEPM ambient air quality standards as boundary or compliance limits is not consistent with the aims and intent of the NEPM. To apply NEPM standards to manage emissions from a single source industrial premises would not be consistent with NEPM implementation guidance.

To clarify, DWER's current regulatory approach for all port industry activities has considered the information in the Port Hedland HRA and Government-endorsed Taskforce recommendations. As per the NEPM standard, the air guideline value applies to the 24 hour average of ambient air quality as measured from midnight to midnight. It is not to be used as a 'real-time' or instantaneous criterion for the management of point source or fugitive dust emissions crossing the boundary of a prescribed premises and entering the ambient

environment.

Specifically, Table 1 of Schedule 2 of the Ambient Air Quality NEPM states that the pollutant PM_{10} has an averaging period of '1 day'. Note (3) following the table defines this as a 'calendar day average'. In air quality measurement as in other forms of measurement and monitoring it is an accepted convention that a calendar day commences at midnight and ends the following midnight. This is also specified in the National Environment Protection (Air Toxics) Measure and in other air quality standards such as the Goldfields Environmental Protection Policy. Air quality standards differentiate between a calendar day average, being the average of each measurement within a continuous 24-hour period from midnight to midnight, and a rolling 24 hour average which may commence at any hour.

The Ambient Air Quality NEPM provides a harmonised national framework for all Australian jurisdictions to monitor and publicly report on common ambient air pollutants. The NEPM aims to guide policy formulation that allows for the adequate protection of human health and wellbeing. It does not compel or direct pollution control measures, or set penalties for non-compliance.

The Ambient Air Quality NEPM standards are based on health evidence of the impacts of air pollutants available at the time the standards are set. They are designed to provide protection to people from the pollutants' adverse human health effects. The standards are also designed to be realistically achievable in the different Australian jurisdictions with a focus on large urban areas, where the majority of Australia's population resides.

The NEPM provides for regulation of individual premises in order to meet the measure in populated areas but specifically states that the measure is not suitable for use as a boundary or compliance limit in regard to those individual premises. Interpretation and implementation of NEPM in the context of regulation of air pollutants is a technically complex and specialised field that requires expertise such as that held within DWER.

4.7.1 Limitations of the ambient monitoring network

It is important to note that the siting of some PHIC air monitoring equipment does not satisfy Australian/New Zealand Standard *AS/NZS3580.1.1: Guide to siting air monitoring equipment*. For example, the ambient air monitor at Neptune Street is located within a few metres of two dwellings and a 1.8 m tall fence, which may restrict airflows in the vicinity of the monitor inlet or absorb some particulate matter affecting results. Other monitors are also located in residential areas with industrial activity and/or obstructions within close proximity to the monitor potentially limiting the reliability of data. However, the data from non-compliant monitors can remain valuable as long as these constraints are kept in mind when analysing the data. It is understood that there are often significant constraints with regard to availability of land or other tenure issues when selecting suitable monitoring locations.

DWER has undertaken a 'strengths and limitations' audit of the air monitoring network and has engaged with both industry and the community on the existing air monitoring network and how the future network could best inform stakeholders. It is considered the monitoring network is generally satisfactory with regard to both the methods and equipment used although there may be opportunity for the slight relocation of some monitors.

In keeping with Government-endorsed Taskforce recommendations, DWER is in the process of acquiring from PHIC the full responsibility for maintenance control of the ambient air quality monitoring network. Any incurred costs are to be covered by port operators holding a Part V licence granted for Category 58 under the EP Act and in accordance with the 'polluter pays' principle.

Once in control of the ambient monitoring network DWER will publish real-time monitoring data on the department's website with trends and further analysis reported annually.

4.7.2 Seasonal variation

In order to demonstrate seasonal variation of average daily PM_{10} concentration at Taplin Street each month, the 2017/18 annual period is shown in Figure 5. Monthly data from the Taplin Street monitor for 2018/19 was reported as being 23.8 µg/m^3 in PHIC's annual report. This was later identified as inaccurate due to equipment fault (see section 4.7.3). Taplin Street data from the 2018/19 period is not presented in any of the figures below.

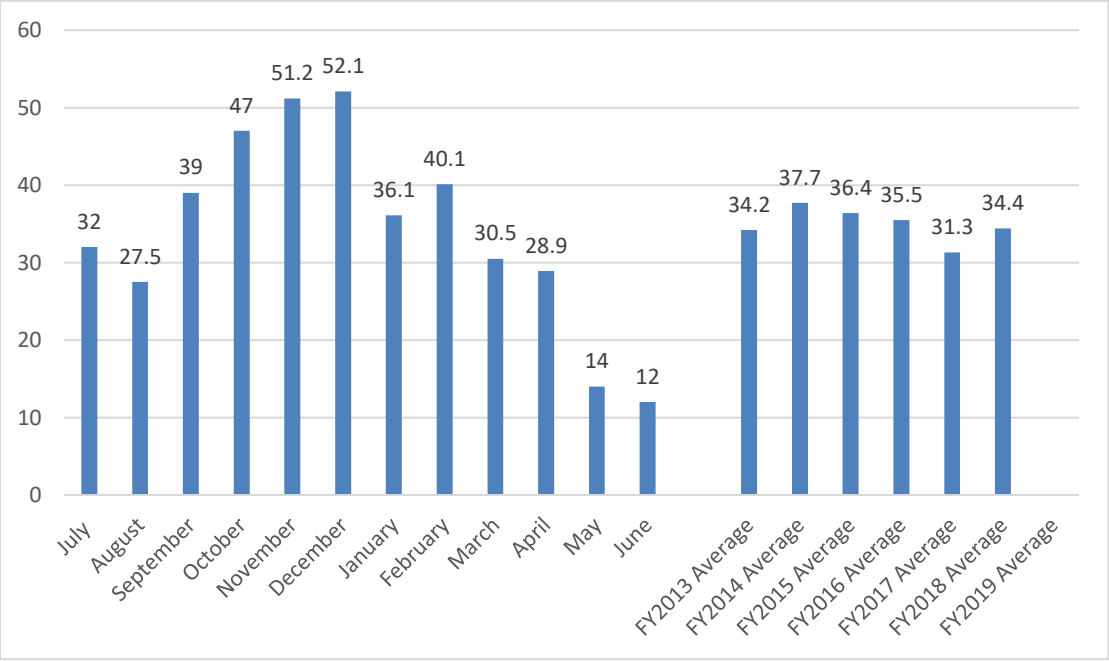

Figure 5: Average daily PM_{10} concentration at Taplin Street (BHP 2018; PHIC 2018)

As shown in Figure 5 there is a wide seasonal variation over the 2017-18 annual period for dust concentrations. The lowest daily averages for PM_{10} are typically recorded in the months May to August, and the highest recorded in summer months (November to March).

While average dust concentrations recorded at the faulty Taplin Street monitor decreased significantly, this trend was not observed at other ambient monitors in Port Hedland, including those located further away from key industrial sources. All other sites recorded an annual PM_{10} concentration increase of 31% from the previous year while a 29% decrease was recorded at Taplin Street. Based on data trends recorded from monitors further away from industrial sources, it is likely that the Taplin Street location also experienced higher PM_{10} concentrations on the previous years.

4.7.3 Exceedances of air guideline value

A summary of Taplin Street exceedances for annual periods are provided below (PHIC Annual Reports).

- 2012-2013 period – 17 exceedances at Taplin Street monitoring station with two reported to be attributed to industry;
- 2013-2014 period – 6 exceedances at Taplin Street with three reported to be attributed to industry;
- 2014-2015 period – 10 exceedances at Taplin Street with seven reported to be attributed to industry;
- 2015-2016 period – 10 exceedances at Taplin Street with five reported to be attributed to industry;
- 2016-2017 period – 3 exceedances at Taplin Street with two reported to be attributed to industrial activity; and
- 2017-2018 period – 9 exceedances at Taplin Street with eight exceedance days reported to be contributed to by local industry (see key findings in this section for further discussion).
- 2018-2019 period – 0 exceedances at Taplin Street (see key findings in this section for further discussion and note below).

The 2018-2019 period marked the first instance of zero days above the air guideline value for a reporting period since the Taplin Street monitor was established. However, monitors both to the west and east of Taplin Street recorded significant increases in the number of days where PM_{10} concentrations exceeded 50µg/m^3 (refer to Table 8). DWER was later advised by PHIC that monitoring data from the Taplin Street monitor is likely to contain errors due to equipment faults.

PHIC has subsequently re-published its 2018-19 annual report, retracting all references to the Taplin Street data.

The HRA found that the number of exceedances of the air guideline value increased with proximity to the West End and that there are also seasonal influences on exceedances. This is supported by preliminary modelling data from 2010, which indicated Nelson Point and Finucane Island operations (which include the Premises and BHP operations) dominate the background levels of particulate matter in the West End.

Since 2013, PHIC has reported annual monitoring data from all ambient and background monitors within the network shown in Figure 4. In each report PHIC has identified the number of incidence at each monitor where PM_{10} concentrations exceed NEPM guidelines and the Port Hedland air guideline value, as detailed in Table 8.

In 2018/19 there was a universal increase in PM_{10} concentrations exceeding NEPM guidelines at both ambient and background monitors along with the single exception of

Taplin Street. Historically the number of exceedances of the air guideline value (and the Ambient Air Quality NEPM) at Port Hedland monitors typically increases with proximity to the West End. For example, in the 2014/15 annual period there were 50 occurrences at the Kingsmill Street monitor where PM_{10} averaged greater than 70µg/m^3, and 156 occurrences greater than the NEPM guideline of 50µg/m^3 over a 24-hour period. By comparison at Taplin Street, there were 10 exceedances of the air guideline value (70µg/m^3) and 48 exceedances of the NEPM guideline (PHIC, 2016).

There also exist significant dust sources near to the Wedgefield monitor, although these sources were not identified as significantly contributing to overall dust concentrations in Port Hedland through DWER's Light Detection and Ranging (LiDAR) campaign conducted in 2017 (refer to section 4.7.6). Industrial activities occurring in Wedgefield are not prescribed under the EP Regulations and are therefore not licensed under Part V of the EP Act. Emissions and discharges from these premises can be regulated by other sections of the EP Act and subsidiary legislation, including the *Environmental Protection (Unauthorised Discharge) Regulations 2004*.

Table 8: Number of exceedances of NEPM and Port Hedland air guideline value for PM_{10} recorded by PHIC ambient monitoring network – 2013 to 2019

Monitoring Station	24hr criteria ($\mu g/m^3$)	Days above criteria						
		FY 2012/13	FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19
Richardson St	50	74	50	79	39	90	143	167
	70	23	9	11	6	Unknown*	Unknown*	Unknown*
Kingsmill St	50	89	98	156	112	83	103	155
	70	29	19	50	46	Unknown*	Unknown*	Unknown*
Taplin St	50	48	48	55	48	27	65	3
	70	**17**	**6**	**10**	**10**	**3**	**9****	**0****
Neptune Pl	50	25	25	67	43	29	15	102
	70	11	8	14	14	Unknown*	Unknown*	Unknown*
Wedgefield	50	157	148	169	150	99	88	165
	70	82	84	59	50	Unknown*	Unknown*	Unknown*
South Hedland	50	24	13	19	12	8	0	11
	70	8	3	6	5	Unknown*	Unknown*	Unknown*
BoM	50	24	10	17	12	7	4	25
	70	10	3	7	2	Unknown*	Unknown*	Unknown*
Yule	50	14	8	18	5	1	8	15
	70	8	3	6	2	Unknown*	Unknown*	Unknown*

* Information not available. PHIC ceased reporting of exceedances of air guideline value in its 2016/17 annual report for all monitors with the exception of Taplin Street.

** See key findings in this section for further discussion.

As part of the HRA it was noted that monitoring undertaken from 2011-2014 concluded that PM_{10} levels at Port Hedland's West End (Taplin, Kingsmill and Richardson street monitors) were higher than areas further to the east of Taplin Street. For the 2011-2014 period monitors recorded dust concentrations above the air guideline value on 16% of the sampled days at Taplin Street, compared with 3% and 2% at South Hedland and Yule River respectively shown in Figure 6.

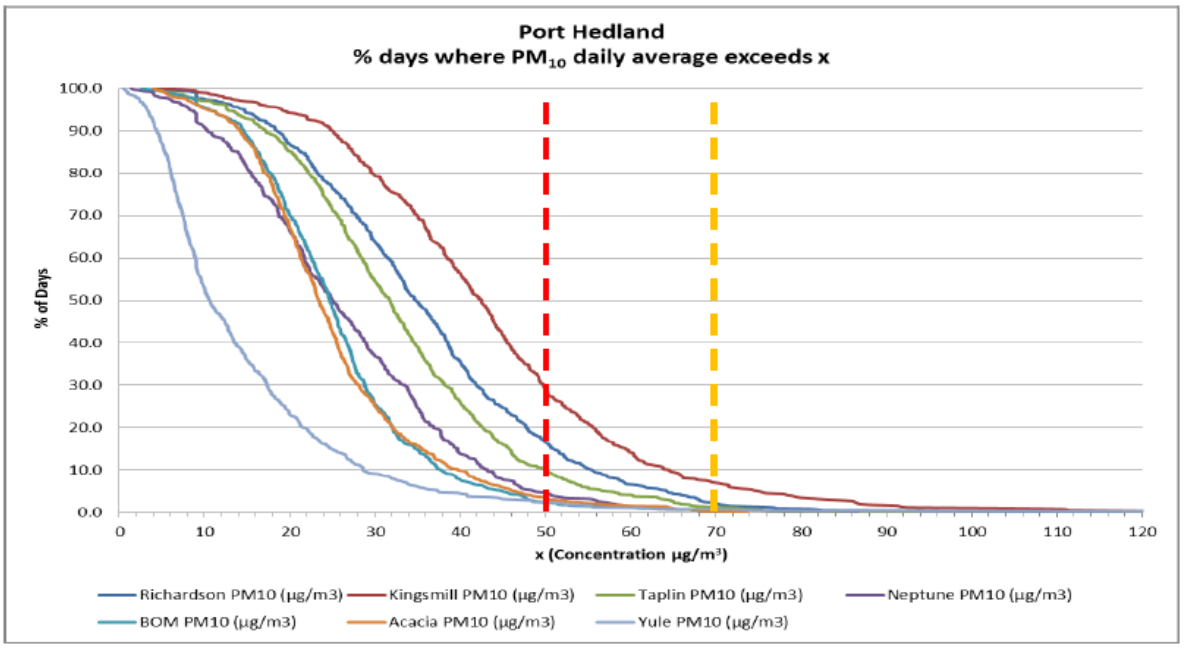

Figure 6: Percentage of days above daily 24-hour average concentrations of PM_{10} for 2012-2013 inclusive (minus regional background and Wedgefield data) (DOH, 2016).

Key finding:

1) There has been a universal increase in PM_{10} concentrations across the Port Hedland peninsula in the 2018/19 reporting period, with the single exception of Taplin Street due to the issues noted below.
2) In November 2019, DWER formally requested from PHIC the network data used as the basis of the 2018/19 PHIC report to conduct further analysis of air quality data.
3) Data was provided 10 February 2020 and DWER was advised by PHIC that the Taplin Street monitor had been inaccurate and under-reporting actual dust levels and that it is possible that there may have been issues with the Taplin Street data from as early as April 2018. It is possible that AGV exceedance counts for both monitoring periods underestimate the actual number of exceedances.
4) PHIC has advised that new monitoring equipment has been installed at Taplin Street in January 2020 and recent monitoring results are now accurate.
5) PHIC has advised DWER that its investigations have identified no errors with monitoring data being captured at other PHIC monitoring locations.
6) PHIC has re-published its *FY2018/19 Port Hedland Ambient Air Quality Monitoring Program Annual Report* to reflect the above.
7) Operation of the network is not currently a requirement under the provisions of the EP Act and the operation and maintenance of ambient monitors is not the direct responsibility of Licence Holders.

The department is now focused on gaining full control and oversight of the Port Hedland network as soon as possible to meet the endorsed Taskforce recommendations (see section 3.3) and provide transparent and accurate air quality information to Port Hedland residents.

4.7.4 $PM_{2.5}$ monitoring data

Particulate matter sized 2.5 microns in diameter and smaller ($PM_{2.5}$) are monitored at two ambient locations in the West End (Richardson Street and Taplin Street), and two background reference locations (BoM and Yule River).

Generally, the finer the particle in ambient air, the greater the ability that particle has to enter

deeper into the lungs. In increasing concentrations, $PM_{2.5}$ can result in greater risk of respiratory and cardiovascular disease. The Department of Health analysed $PM_{2.5}$ data as part of the site specific health risk assessment and identified that bushfires coincided with each exceedance of daily health criteria for $PM_{2.5}$.

The annual average concentration of $PM_{2.5}$ was above AAQ NEPM for monitoring locations in the West End, Taplin and BoM. A comparison of the annual averages of $PM_{2.5}$ from some selected sites are summarised below. The latest 2018 calendar year data for Port Hedland has not been supplied, so comparisons cannot yet be made although the results are likely to be similar to 2017 results.

Table 9: Comparison of $PM_{2.5}$ concentrations in Port Hedland against larger population centres in Western Australia

Year	Richardson	Taplin	BoM – Port Hedland	Perth Metro - Caversham	Perth Metro - South Lake	Perth Regional - Bunbury
2012	6.3	5.6	8.5	7.8	8.9	8.6
2013	5.7	6.1	6.6	7.9	8.0	7.8
2014	8.6	9.3	7.9	8.1	8.1	7.8
2015	8.3	12.0	7.5	8.5	8.8	9.3
2016	5.2	11.4	5.9	7.7	8.0	8.4
2017	9.2*	11.0	6.8	8.5	8.7	8.7
2018	12.3	9.6	8.9	8.0	8.4	8.4

* Less than 75% data recovery for the calendar year.

Key finding: The Delegated Officer notes that:

1) Particles as $PM_{2.5}$, averaged annually and as measured at Taplin Street and Richardson Street monitors, have trended upward slightly since 2012 (Table 9).
2) In recent years $PM_{2.5}$ concentrations in Port Hedland's West End have been greater than that experienced in metropolitan areas of Western Australia and have exceeded NEPM guidelines for annual average $PM_{2.5}$ concentrations (Table 9).
3) It is likely that the composition of finer particulates in Port Hedland is different when compared to urban centres, and this may result in different health outcomes (DOH, 2016).
4) Particles as PM_{10} have formed the basis of DWER's risk assessments as particulate matter sized 10 micron in diameter and smaller (PM_{10}) remains the dominant particle size in Port Hedland's ambient air that presents a risk to human health, noting that $PM_{2.5}$ size fraction of particles is part of the PM_{10} fraction.

4.7.5 Correlation of Port Hedland Port throughput and ambient dust levels

DWER has undertaken a review of annual ambient air quality at Port Hedland and cumulative throughputs of material exported from Port Hedland to determine whether there is any correlation between the two factors. The data in Figures 7 and 8 do not clearly demonstrate a direct correlation between iron ore throughputs at Port Hedland increasing over the years, and more dust in the Port Hedland airshed.

Export tonnages through Port Hedland have increased significantly over the previous decade. However, PM_{10} concentrations measured at Taplin Street, over the same period have not trended in the same way with the number of exceedances of 70 $\mu g/m^3$ (averaged over a 24-hours) remaining relatively stable. This is in part be due to the following factors:

- The department's ongoing risk-based regulation of dust has seen the introduction of more rigorous controls for dust management being mandated through Part V licence conditions.

- Increases in throughput have been largely achieved through the operation of existing infrastructure, meaning that the creation of new dust sources, such as stockyards, has been avoided.
- Many of the additional tonnages from operations near to the West End (not handled within the Premises) are directly shipped from car dumpers at the point of in-loading, avoiding the double handling of ore through stockpiling and reclaiming.
- The monitoring station at Taplin Street is only one measure of dust impacting Port Hedland and other monitoring stations must also be analysed to determine the true levels of dust throughout the township.

Therefore, a correlation between increasing throughputs and PM_{10} concentrations recorded at Port Hedland monitoring locations is not clear based on current data available to the department. Due to a range of other contributing factors, such as seasonal conditions and multiple, variable non-industrial sources, the level of dust recorded at each monitoring station will fluctuate over time. These fluctuations make clear source attribution difficult to determine.

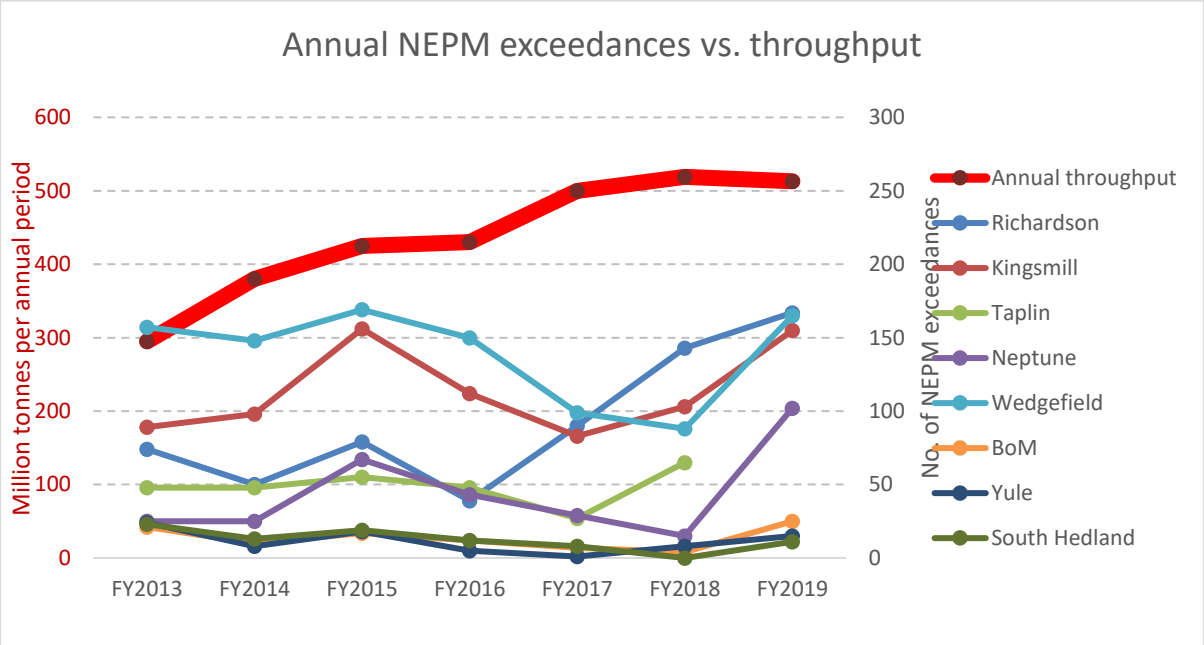

Figure 7: Annual number of days PM_{10} exceeded 50µg/m^3 against Port Hedland throughputs from FY2012/13 to FY2018/19

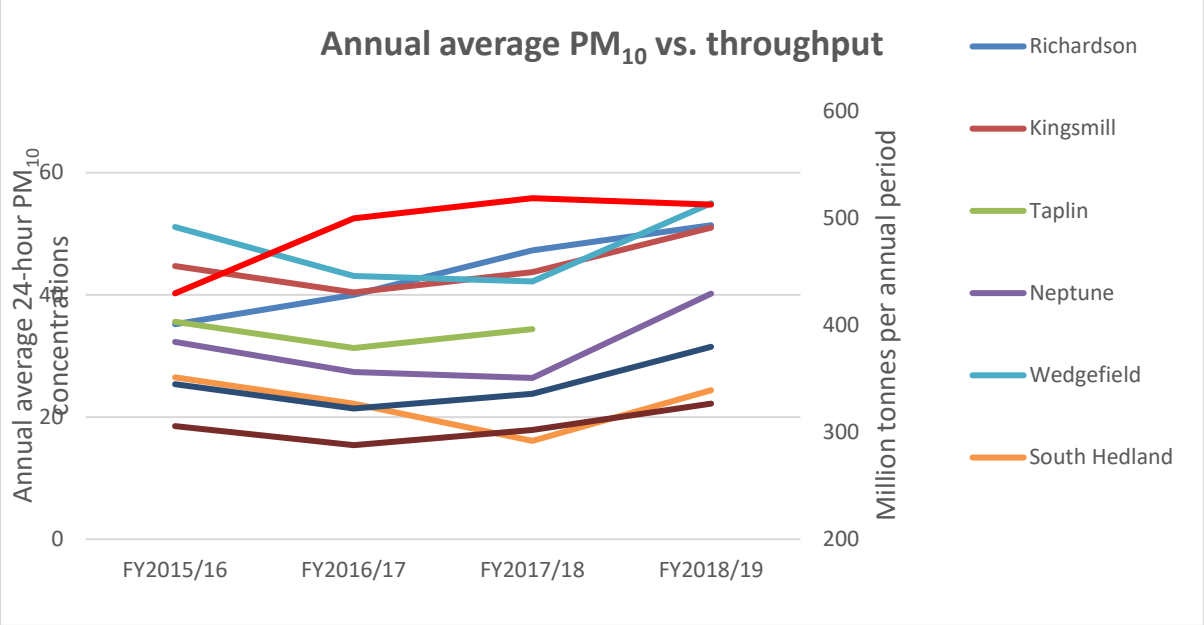

Figure 8: Annual average 24-hour PM_{10} concentrations vs throughput from FY2015/16 to FY2018/19

Much of the port's throughput growth has been the result of increases at other operators' facilities such as BHP and FMG. It would be inaccurate to assume that comparatively small throughput increases at the Utah Point Premises would not have an effect on the airshed, noting the nature of operations, particularly use of trucks for delivery of material and FELs for the movement of material, which increases the likelihood of dust generation.

Key findings: The Delegated Officer notes that improvements to dust management practices are likely to have helped offset some of the expected increases in dust from increasing throughput at Port Hedland. However, dust levels in Port Hedland's ambient air shed, in particular that of the West End, remain of concern from a public health, environmental and amenity perspective – as highlighted by the Dust Taskforce's Report.

Further improvements are required as per the endorsed recommendations of the Port Hedland Dust Taskforce report to Government. Additional information on DWER's response to Taskforce recommendations can be found in the *Industry Regulation fact sheet – Managing dust in Port Hedland*, located on the Department's website.

4.7.6 Light Detection and Ranging (LiDAR) monitoring

The Department carried out a five-month 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 µm (PM_{10}) as well as a LiDAR instrument, which works by emitting a light beam and measuring the backscatter from particles or dust in the air.

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 LiDAR was positioned atop the Town Centre Viewing Tower to allow for a largely unimpeded view of the surrounding landscape with some hard targets such as buildings within the landscape obscuring some of the LiDAR beam.

Figure 9 represents cumulative data over a five month period, highlighting major sources of

dust (showing as red in the image) in and around the Premises within the limits of the LiDAR's line of sight. Physical impediments, whether natural (topographical highpoints) or anthropogenic show as blue, or no colour on the image. Consequently, not all expected dust sources are captured by this image.

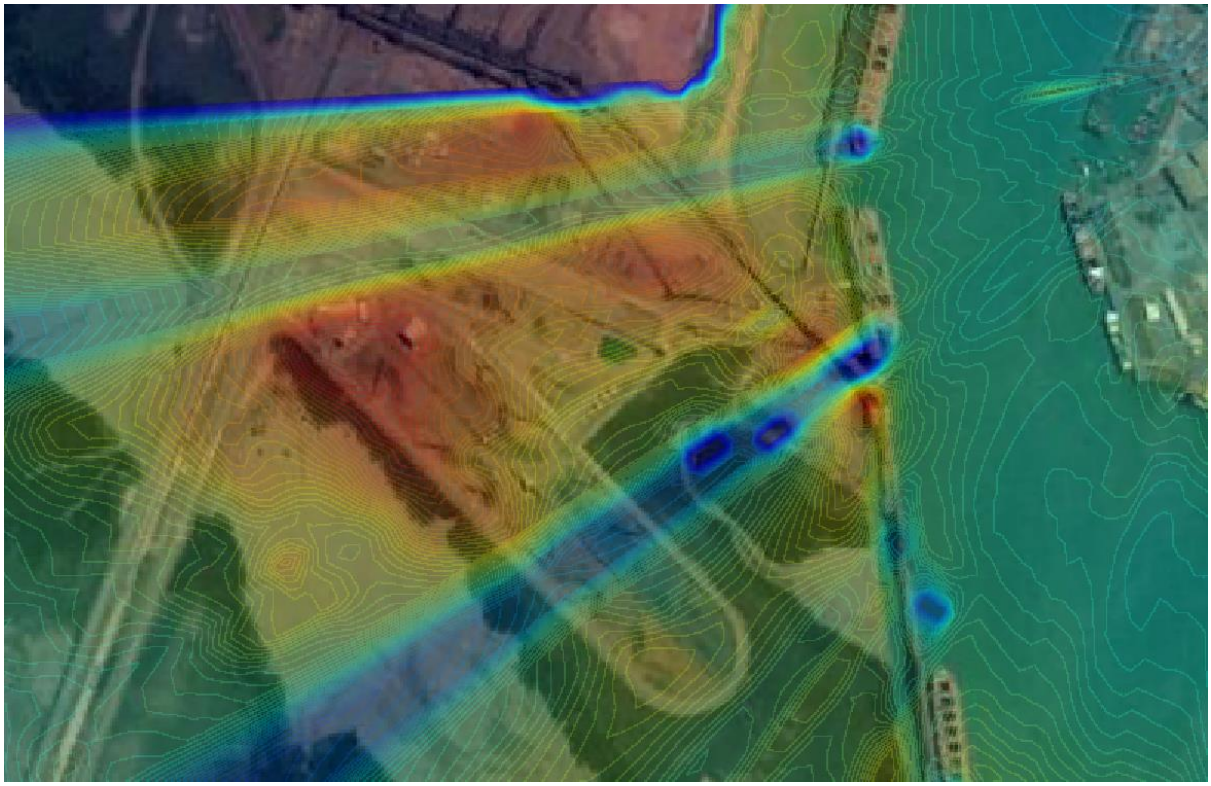

Figure 9: Cumulative LiDAR image for the Premises

The red 'hot spots' in Figure 9 show higher concentrations of dust compared with the bluer shades of colour depicting lower concentrations. Given the image is based on all data from that time period, the high readings could be a result of a few significant events or multiple ongoing events of a less significant nature occurring over the five-month period.

The different colours do not represent specific dust concentrations. However, as detailed in the Department's published report, *Mapping dust plumes at Port Hedland using a LiDAR* (LiDAR Report), the LiDAR data was correlated with data collected from air quality monitoring stations. The LiDAR Report provides a summary of the issues faced in determining the correlation coefficient between the two data sets.

Key finding: Based on the LiDAR study, the Delegated Officer has determined that the Premises is a significant contributor to dust in Port Hedland. Premises dust emissions were most concentrated at ore handling points where ore is dropped from height, for example, reclaimers and stackers, particularly at iron ore stockpiles 1 and 11 to 13 (see Premises map in Schedule 1 of the Licence for site plan).

Other port operators that were nearer to the LiDAR equipment during the monitoring period, and that use similar ore handling methods, were also identified as being significant contributors to dust.

4.7.7 Dust boundary monitoring

The Licence Holder undertakes boundary monitoring for dust as detailed in Table 10 at the locations depicted in Figure 10 below. Boundary monitoring is undertaken at five monitoring locations. At each of these five monitoring locations (M5 to M9) there are monitors used to

measure PM_{10}, including Beta Attenuation Monitors (BAM) and E-samplers, and two High Volume Air Samplers (HVAS) at M8 and M9 used for the measurement of chromium and manganese as PM_{10}.

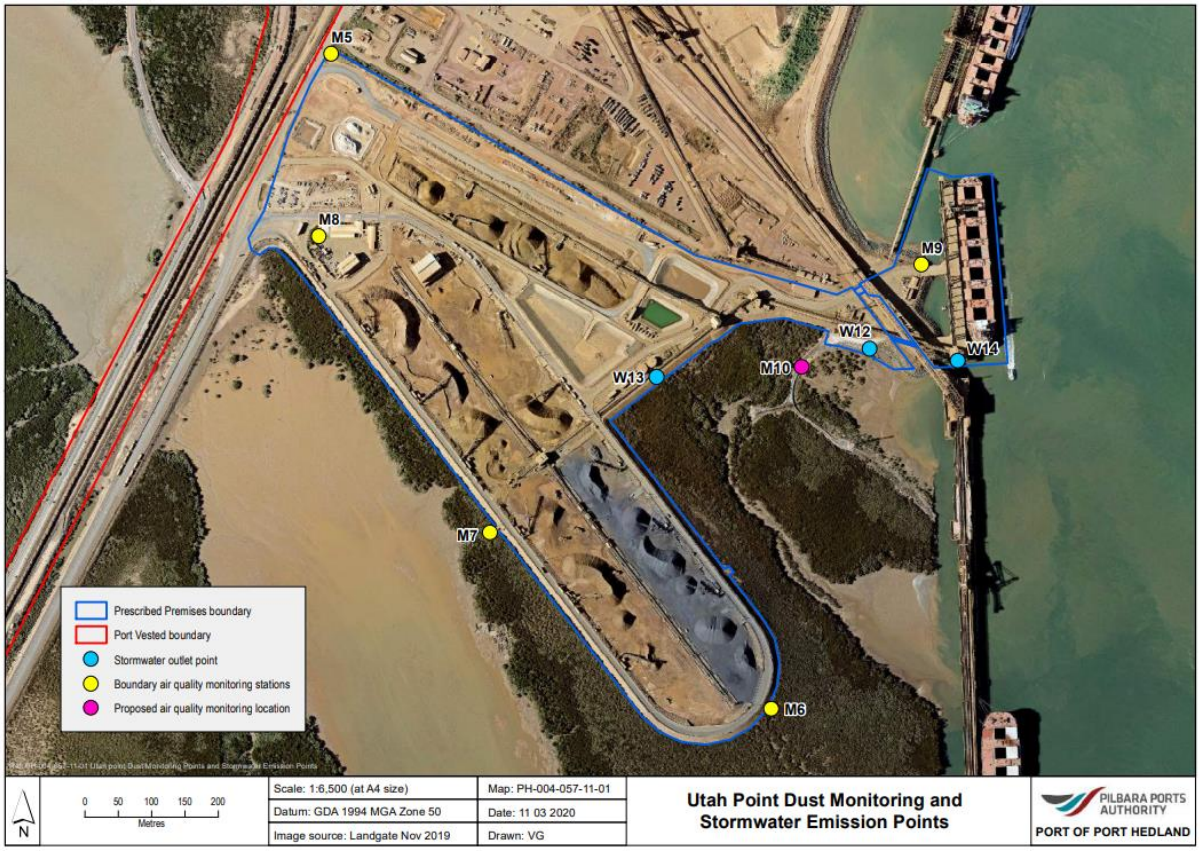

Figure 10: Current (M5 – M9) and proposed (M10) dust monitoring

Targets were developed as an early warning system and have been varied through licence amendments. Under the former Licence (L4432/1989/14) for the combined operations at Eastern Operations and the Premises, the Licence Holder was required to conduct an investigation in the event of target exceedances described in Table 10 to determine root cause/s (i.e. background or operational related exceedance).

Table 10: Air Quality Monitoring undertaken for the Premises

Monitoring Point	Parameter	Reportable Event Criteria	Averaging period	Frequency
Berth 4: M5 North BAM 1020	PM_{10}	≥145 µg/m^3 over a 24 hour average	10 min	Continuous
Berth 4 M6 South E-sampler	PM_{10}	≥145 µg/m^3 over a 24 hour average	10 min	Continuous
Berth 4 M7 West BAM 1020	PM_{10}	≥145 µg/m^3 over a 24 hour average	10 min	Continuous
Berth 4 M8 North Ecotech 3000 HVAS	Cr (III & VI)	≥3.5 µg/m^3	Annual	One 24 hour sample every sixth day
	Mn	≥10 µg/m^3	Any one sample	
		≥3 µg/m^3	Annual	
Berth 4 M9 East Ecotech 3000 HVAS	Cr (III & VI)	≥3.5 µg/m^3	Annual	
	Mn	≥10 µg/m^3	Any one sample	
		≥3 µg/m^3	Annual	

Berth 4 M10 West BAM 1020*	PM_{10}	≥145 µg/m^3 over a 24 hour average	10 min	Continuous
Taplin Street**	PM_{10}	≥70 µg/m^3	24 hours	Continuous
BOM**	PM_{10}	N/A	24 hours	Continuous

* Proposed monitoring station not yet installed.
** Monitoring undertaken through PHIC and provided to the Licence Holder

A review of monitoring data for PM_{10}, chromium and manganese for 2012 through to 2014 period has been undertaken in this assessment.

For the 2013 and 2014 period boundary target exceedances for PM_{10}, 10.6 per cent and 12.7 per cent of these respectively were attributed to the Licence Holder's operational activities. The Licence Holder reported an increase in boundary exceedances from 2012 to 2013 was primarily attributed to upgrades from E-samplers to BAM1020 monitors which are considered far more robust and accurate.

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

Monitoring results for Cr III, Cr VI and manganese indicate that levels are well below the boundary targets.

Key findings: At the time of inspection in October 2018, it was noted that boundary monitors were not sited in accordance with Australian Standard AS3580.1.1 *Methods for sampling and analysis of ambient air – Guide to siting air monitoring equipment*. The Premises is situated on a raised area of reclaimed land above a mangrove community and has limited space. This has resulted in boundary monitors being located off the reclaimed area and air inlets situated at below ground level to the ring road and material handling activities.

When applying management measures against dust conditions at the Premises boundary, the Licence Holder has been reliant on air quality data from existing non-compliant monitors, which may not be optimally located to accurately record dust concentrations. Although not all specifications within the Australian Standard for siting monitoring equipment are achievable or necessary, improvements to the boundary monitoring network are required.

The Licence Holder has proposed to replace monitor M6 with a monitor (M10) located to the east of the Premises where it is able to capture dust from the Premises under conditions that place West End receptors downwind of Primary Activities. The new location will also allow for the monitor to better achieve Australian Standards for siting, in particular through raising the height of the sampling inlet and not being obscured by any other infrastructure.

References to the Australian Standard were removed from the Amended Licence as DWER acknowledges the difficulty in obtaining more appropriate locations and that not all specifications are necessary to record valuable data.

4.8 Reportable Events and moisture content monitoring

As required under the Reviewed Licence, the Licence Holder must submit regular reports on the number of Reportable Events that occurred in each bi-monthly period. The Licence Holder is then required to notify DWER of the corrective actions taken during and proceeding Reportable Events that are attributed to Licence Holder activities. Table 11 presents the criteria on the Reviewed Licence that trigger a Reportable Event.

Table 11: Criteria for Reportable Events

Parameter	Location (as depicted in Figure 10)	Averaging Period	Reportable Event criteria
Particles as PM_{10} (µg/m^3) using BAMs	M5 M7 M10*	24 hour average	≥145 µg/m^3
Particles as PM_{10} (µg/m^3) using an E-sampler	M6	24 hour average	≥145 µg/m^3
Chromium (III & VI) as PM_{10} (µg/m^3)	M8 M9	24 hour average	N/A
		Annual	≥3.5 µg/m^3
Manganese as PM_{10} (µg/m^3)	M8 M9	24 hour average	≥10 µg/m^3
		Annual	≥3 µg/m^3

* Proposed monitoring station not yet installed.

Between the period of 1 July 2016 to 30 June 2018, the Licence Holder recorded 155 Reportable Events for PM_{10} concentrations as shown in Table 12 below.

Table 12: Reportable Events at the Premises from 1 July 2016 to 30 October 2019

Reporting period	Total Reportable Events (Particles as PM_{10})	Attributable to Licence Holder activities[1]
1 July to 31 August 2016	5	3
1 September to 31 October 2016	18	3
1 November to 31 December 2016	15	3
1 January to 28 February 2017	5	1
1 March to 30 April 2017	14	3
1 May to 30 June 2017	21	8
1 July to 31 August 2017	5	0
1 September to 31 October 2017	10	2
1 November to 31 December 2017	11	1
1 January to 28 February 2018	2	1
1 March to 30 April 2018	20	4
1 May to 30 June 2018	29	11
1 July to 31 August 2018	18	3
1 September to 31 October 2018	3	0
1 November to 31 December 2018	6	0
1 January to 28 February 2019	12	3
1 March to 30 April 2019	8	0
1 May to 30 June 2019	26	4
1 July to 31 August 2019	32	14
1 September to 30 October 2019	21	4
Total	***260***	***67***

Note 1: As declared by the Licence Holder.

Through review of the dust monitoring reports, DWER has identified that during each reporting period the Licence Holder has only attributed PM_{10} dust levels to Premises activities where the Premises contribution exceeded the Reportable Event trigger level for PM_{10} of 145µg/m^3. In one instance a Reportable Event was not attributed to Licence Holder activities despite the Premises contribution being calculated as 140µg/m^3, 96.6% of the Reportable Event trigger value. Contribution is calculated based on data from the downwind monitor minus data from the upwind monitor.

Common causes for Reportable Events were identified as dust lift off from stockpiles in high wind conditions, FEL movements on stockyard floors and vehicles kicking up deposited dust

on the ring road. The Licence Holder took corrective actions for all Reportable Events, deploying water cannons and/or the water cart to suppress dust from stockpiles and trafficable areas on each occasion. However, the Licence Holder noted that water cannons were not reaching stockpiles at times where strong wind blew water in the opposite direction.

During the reporting periods the majority of prevailing wind directions were from the north to northeast and southeast to south-south-east placing sensitive receptors either upwind of potential Premises dust sources or beyond the directional range of the wind.

4.8.1 Reportable Events for manganese and chromium

No chromite ore has been handled at the Premises since 2014 and Reportable Event criteria for chromium has not been exceeded since the issue of the Reviewed Licence. Boundary monitoring data shows that chromium (III and VI) is typically measured at below detectable concentrations or in orders of magnitude below Reportable Event criterion (3.5 µg/m^3).

Table 13 shows each Reportable Event for manganese as PM_{10} where greater than 10 µg/m^3 over a 24 hour average was recorded.

Table 13: Reportable Events for manganese 1 July 2016 to 30 October 2019

Reportable Event criteria	Date/s	Manganese as PM_{10}
10 µg/m^3 averaged over 24 hours[1]	21/22 March 2017	19 µg/m^3
	8/9 June 2017	18 µg/m^3
	24/25 December 2017	13 µg/m^3
	24/25 January 2018	14 µg/m^3
	27/28 May 2018	12 µg/m^3
	24/25 June 2018	14 µg/m^3
	19/20 July 2018	15 µg/m^3
	18/19 August 2018	15 µg/m^3
	21/22 August 2019	11 µg/m^3
	14/15 September 2019	11 µg/m^3

Note 1: There is no standard for 24 hour averaging periods for manganese and therefore averaged 24 hour concentrations may be measured over any consecutive 24 hour period.

For the first two 24 hour periods (21 March 2017 and 8 June 2017) where manganese concentrations exceeded trigger criterion, PM_{10} at Taplin Street averaged 22.5 µg/m^3 and 27.7 µg/m^3. On 24 December 2017, elevated dust levels were recorded at Taplin Street (63 µg/m^3) although prevailing winds were north-north west placing other potential dust generating sources upwind of Taplin Street.

During the 24 hour period where manganese as PM_{10} exceeded 10 µg/m^3 on 24 January 2018, the Taplin Street PM_{10} 24 hour (midnight to midnight) average was 60.3 µg/m^3 for 24 January 2018 and 73.3 µg/m^3 for 25 January 2018. However, wind directions placed the Premises upwind of Taplin Street for only 4% of the time during this period. Premises boundary monitors did not measure PM_{10} concentrations greater than Reportable Event trigger criterion during the same period although ambient particulate matter at the boundary was elevated at M9 (142 µg/m^3).

The Licence Holder identified a Reportable Event for dust as PM_{10} over the 24 hour period on 28 May 2018. PM_{10} averaged 218.2 µg/m^3 over the period from midnight to midnight and was deemed by the Licence Holder to be attributable to Premises operations. However, winds were predominantly from the east-south-east making the Premises beyond the wind arc for Taplin Street, which recorded PM_{10} as 12.5µg/m^3 on 27 May 2018 and 8.9µg/m^3 on 28 May 2018.

4.8.2 Moisture content reporting

Quarterly moisture content reports have identified that the Licence Holder was non-compliant with conditions of the Licence that require all bulk granular material accepted at and shipped from the Premises to contain a moisture content at or above the dust extinction moisture (DEM) level.

DWER notes that moisture content of ore received between the periods of 1 October to 31 December 2017 and 1 January to 31 March 2018 improved such that fewer non-compliances were identified in the Quarter 3 reporting period for inbound product. In addition, the moisture content of non-compliant ore increased from a maximum of 0.04% moisture below the DEM level in Quarter 2 of 2017/18 to up to 1.63% below the DEM level in Quarter 3.

The Licence Holder received iron ore with a moisture content below the DEM level either on the date preceding, or on the same day of a Reportable Event on the following nine occasions between 1 July 2016 to 30 June 2019:

- 22 and 23 November 2016;
- 4 and 6 March 2017;
- 15 and 29 September 2017;
- 13 and 26 April 2018;
- 22 May 2018.

In response to further investigation by DWER, Licence Holder advised that suppliers have been reminded of the requirement to ensure that product entering the Premises has a moisture content above the DEM level. Minimum moisture content limits were satisfied at out-loading for each day where wind placed sensitive receptors in Port Hedland's West End downwind of Premises activities.

Lift off from stockpiles and stockyard floors continued to be reported during windy conditions and FEL movement despite moisture contents remaining above DEM in most circumstances. The number of Reportable Events trended downward from the beginning of the 2018/19 annual period when all products were received at the Premises with a moisture content above the respective DEM level. However as the dataset is small, causal correlation cannot be accurately determined.

Key finding: DWER notes that prevailing wind directions placed sensitive receptors upwind of potential dust sources, or beyond the directional range of wind during the vast majority of Reportable Events at boundary monitors.

Based on the information provided to DWER on Reportable Events the Delegated Officer has determined that:

1) based on the available data set, it is likely that Licence Holder activities frequently contribute to Reportable Events and that impacts to sensitive receptors may arise when wind direction is between a WSW and W wind vector (247 and 267 degrees);
2) based on Taplin Street data between 2013 and April 2018, there is no apparent correlation with data recorded at boundary monitors and PM_{10} data recorded at the Taplin Street monitor. This is likely to be due to the significant distance of the Premises to Taplin Street (3,340m to the east). However, the correlation between dust at the Premise boundary and particulate matter in the West End is expected to be greater;
3) the current method of determining whether a Reportable Event trigger criterion has been exceeded and is attributed to site sources warrants review. DWER may undertake this review in the future to ensure consistency across all Port Hedland port operations.

4) iron ore was the most commonly handled ore during the 24 hour periods where Reportable Events were triggered for particulates;

5) iron ore product Iron Valley lump and Iron Valley fines represented the greatest proportion of products received with a moisture content below the DEM level. Mt Webber lump and Abydos lump were also received in a dry state during the period 1 July 2016 to 30 June 2018;

6) all manganese lump and fines received at the Premises had a moisture content above the DEM level; and

7) greater product moisture content may result in a reduction in the number of Reportable Events at boundary monitors although other factors such as wind and vehicle movements are expected to contribute to dust generation from the Premises.

4.9 Spodumene trial monitoring

Delivery of spodumene ore commenced on 5 March 2017 to support trial shipments under Material Change conditions of the Reviewed Licence. Between 14 April 2017 and 30 June 2018, a total amount of 4,277,924 tonnes has been exported from the Premises.

To support the Application for ongoing shipments of spodumene, the Licence Holder undertook air quality monitoring during the trial period from 14 and 17 April 2017. Air quality monitoring parameters measured included PM_{10}, $PM_{2.5}$ and composition of dust at boundary monitors M8 and M9, which are High Volume Air Samplers (HVAS).

A key indicator of spodumene dust is lithium, which is typically found in concentrations of 2 to 4% of overall spodumene ore. Muscovite (mica) and respirable silica (quartz) are known hazards found within spodumene as they can cause lung irritation and respirable silica is a known carcinogen amongst those exposed to occupational levels.

Mica and respirable silica have been monitored/measured during the trial along with lithium to determine the risk to public health. A review of monitoring results has been undertaken showing that:

- Lithium represented as PM_{10} was typically recorded below the limit of laboratory detection and the highest recording was a concentration of 0.022µg/m^3 averaged over one 24 hour period;
- Quartz concentrations in deposition monitoring ranged from below laboratory detection to 166.9µg/cm^2 on 14 April 2017 during a trial shipment;
- Mica in deposition monitoring was detected on two out of 13 monitoring events with the highest reading being 554.9µg/cm^2 on 8 April 2017 when no spodumene ship loading was occurring (indicating that the potential source was not from ship loading but potentially from other spodumene handling practices at in-load); and
- $PM_{2.5}$ mica was below the limit of detection for all samples.

Static monitors were also placed around site infrastructure including hoppers, conveyors, stockpile areas and stackers. Results presented in Table 14 were compared against occupational exposure standards and found to be within safe levels near to the potential sources of dust emissions.

Table 14: Occupational hygiene tests for spodumene ore

Parameter	Respirable dust (PM_{10})	Inhalable dust (PM_{100})	Respirable silica quartz	Asbestos fibres
Maximum recorded concentration	0.1mg/m^3	0.3mg/m^3	0.007mg/m^3	0.01 fibres/mL
Occupational exposure standards[1]	3mg/m^3	10mg/m^3	0.1mg/m^3	0.1 fibres/mL

Note 1: Based on an 8 hour time weighted average exposure level taken from Safe Work Australia's Workplace Exposure Standards for Airborne Contaminants, April 2013.
Source: Health Safety Environment Australia Pty Ltd, 2017

Key finding: The Delegated Officer notes that spodumene ore handled at the Premises during trial shipments had a:

1) low bulk muscovite content of approximately 0.005% by weight;
2) fraction of PM smaller than 4µm (PM_4) that ranged from less than 1% to around 5% by weight;
3) PM_4 quartz component (respirable silica) ranging between 0.01% to 0.672% by weight; and
4) moisture content greater than the DEM level of 2.02% as analysed in accordance with Australian Standard AS4156.6-2000 (Jenike and Johanson, 2017).

4.10 Air quality and amenity

The Australian Concise Oxford Dictionary defines amenity to be the pleasant or useful features or overall pleasantness of a place. As such, the assessment of amenity is intrinsically subjective and it is best assessed against community expectations, reasonably held for that community and at that point in time.

In the context of air quality, amenity impacts are caused by elevated levels of particulate matter or other air pollutants. Katestone (2011) report that commonly noted amenity impacts include:

- short-term reduction in visibility. For example a visible plume may adversely affect the aesthetics of the environment such as scenic view;
- build-up of particulate matter on surface within buildings resulting in increased cleaning;
- soiling of laundry being dried in the open air; and
- build-up of particulate matter on roofs which can flush into rainwater tanks potentially affecting quality (taste) of drinking water or tank capacity.

The most commonly used parameters to measure amenity impacts are total suspended particulates (TSP) and dust deposition. TSP refers to all dust particulates that are suspended in the air, including coarser fractions, while dust deposition refers to the amount of dust deposited over a set period and area.

There are no site specific criteria for TSP or dust deposition criteria that have been established or adopted for the Port Hedland area and no monitoring of these parameters for amenity is currently conducted by PHIC or existing Part V Licence Holders in Port Hedland.

When viewing the amenity criteria of other environmental regulators around the world (Table

15), it is evident that there is significant variability in criteria. This is due to a number of factors including the baseline, or background dust levels in each regional area varying greatly as well as the sensitivities and expectations of local receptors in relation to dust.

Table 15: Dust deposition criteria used in other jurisdictions

Jurisdiction	Standard/objective	Comment
Quebec, Canada	7.5 tonnes/km^2/month (7.5g/m^2/month)	None
Alberta, Canada	53 mg/100cm^2/month (5.3 g/m^2/month)	In residential and recreation areas
	158 mg/100 cm^2/month (15.8 g/m^2/month)	In commercial and industrial areas
New South Wales, Australia	2g/m^2 month	Incremental. 2 g/m2/month corresponds to 67 mg/m2/day
	4 g/m^2/month	Total. 4 g/m2/month corresponds to 133 mg/m2 day
Germany	0.35 g/m^2 /day (10.5 g/m^2/month)	Emission value of PM_{10} for the protection against nuisance or significant disadvantage due to dust fall (non-dangerous dust)

Source: (pg. 150, Katestone, 2011)

To measure the baseline dust deposition level, it is necessary to measure dust levels without all industry operating in the area. For this to be possible, it is likely that dust deposition monitoring of background sites would be required. With regard to TSP, a general correlative ratio with PM_{10} can be determined although an appropriate trigger value for TSP (and dust deposition) that identifies the point at which amenity is likely to be impacted is unknown for Port Hedland.

Other measures commonly used to understand amenity impacts include community surveys and complaint information.

Key finding: The Delegated Officer has considered amenity and reviewed criteria used in other jurisdictions and has found:

1) amenity is intrinsically subjective and linked to a particular community's expectations at a particular point in time;
2) there is significant variation between criteria used across other jurisdictions;
3) there are no site specific amenity criteria for Port Hedland or for the coastal Pilbara region of Western Australia; and
4) the community expectations in Port Hedland, the Pilbara region and the north west of Australia may be different to other parts of the world.

Based on the receipt of several stakeholder complaints and concerns (through submissions) relating to amenity impacts from dust, the Delegated Officer has determined that the Port Hedland community is sensitive to existing ambient dust levels.

4.11 Noise modelling

Noise levels within Port Hedland are currently above the assigned noise levels specified in the Noise Regulations.

Through Works Approval W4520/2009/1 noise criteria were specified for the nearest sensitive receptors, detailed in Table 16 below.

Table 16: Noise criteria (SKM, 2008)

Location	L_{A10} dB(A)	L_{A1} dB(A)	L_{AMAX} dB(A)
Pier Hotel	41	51	61
Esplanade Hotel	41	51	61
Backpackers Hostel[1]	37	47	57
Hospital[1]	32	42	52

Note 1: The Backpackers Hostel and Hospital have closed and are no longer considered highly sensitive noise receptors.
Note 2: Noise criteria represent maximum noise levels for the Premises and do not include background noise levels.

Noise modelling reports provided to the EPA in support of EPA Assessment Report 1311 predicted the worst case noise level for the Utah Point Multi-User facility of between 44 and 48 dB(A) at the Pier Hotel, potentially exceeding the night time L_{A10} assigned level of 46 dB (including influencing factor). The modelling also demonstrated that the relocation of some material handling activities to the western side of the Port Hedland Port (the Premises) would significantly reduce projected noise levels. The EPA noted that much of these noise reductions would be achieved by diverting truck traffic from the West End to the Finucane Island Access Road, adjacent to the Wedgefield Industrial Estate.

Table 17 shows that while noise emissions were reduced as a result of Category 58 activities moving to Utah Point, noise is expected to exceed assigned levels specified in the EP Noise Regulations.

Table 17: Cumulative noise levels modelled at the receptor (SKM, 2008)

	Esplanade dB(A)	**Pier Hotel** dB(A)	**Backpackers**[1] dB(A)	**Hospital**[1] dB(A)
Existing Berth All Noise Sources Untreated (does not include some noise sources decommissioned)	61	56	49	43
Total post Utah facility	58	56	51	36
Reduction from pre Utah facility to post Utah facility	3	0	2	7

Note 1: The Backpackers Hostel and Hospital have closed and are no longer considered highly sensitive noise receptors.

Key finding: Noise levels from the Premises in isolation are within 5 dB of Assigned Levels specified in the EP Noise Regulations. Therefore Delegated Officer has determined that the Premises is a significant contributor to cumulative noise in Port Hedland, as defined by regulation 7(2) of the EP Noise Regulations.

4.12 Contaminated site matters

Portion of Lot 370 on Deposited Plan 35619, known as the Port Hedland port (including but not limited to the Premises), is awaiting classification under the *Contaminated Sites Act 2003*.

5. Consultation

5.1 Department of Health

DWER sought advice from DoH regarding the risks of spodumene concentrates and increased handling throughputs to the health of the Port Hedland community. DoH did not object to proposed activities subject to changes not adding to the current negative impacts of dust in Port Hedland and a positive assessment of modelling by air quality experts within DWER.

Modelling provided by the Licence Holder to support the Application identified that there would be no significant changes to dust levels at Taplin Street. However, and as discussed in section 4.7.1, there is significant uncertainty within modelling such that it cannot be used as a standalone quantitative analysis or forecast tool for actual emissions from the Premises. Therefore DWER has also considered air quality monitoring data and data gathered during trial shipments in its assessment of proposed increases and determination of risk.

5.2 Public consultation

DWER referred PPA's Application on 31 March 2017 to a number of interested parties including community stakeholders and government agencies. The Application was also publicly advertised in *The Northwest Telegraph* newspaper on 5 April 2017 and in *The West Australian* on 3 April 2017. The Application was made available for review at the Department's website.

Concurrent to the stakeholder comment period for the Application, DWER also advertised a licence amendment application submitted by BHP relating to an increase in throughputs at the Port Hedland Port Operations located at Nelson Point and Finucane Island. As a result and given the nature of common issues, a number of submissions were made providing comment on both applications.

Applications resulted in submitters raising a number of common issues. These broadly fit within the following themes:

- DWER's regulatory process and framework;
- regulatory controls which should or could be used to reduce dust levels;
- concerns about impacts to amenity; and
- impacts to land use planning.

In addition, there were two detailed reports submitted relating to a dust monitoring campaign undertaken and economic impacts to businesses and properties in the West End. The matters and statements raised including the reports submitted are summarised in Appendix 4.

DWER has had regard to a total of 10 submissions made in relation to the Application. With the exception of relevant public authorities, the name of submitters has been kept anonymous.

6. Location and siting

6.1 Siting context

The Premises is located within the Port of Port Hedland, which is the world's largest port for bulk materials export by tonnage. The Port of Port Hedland is currently utilised for the bulk loading of material, predominately iron ore by BHP, Fortescue Metals Group and Roy Hill.

Table 18 details current port operators within Port Hedland.

Table 18: 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 with a proposal to export up to 210 Mtpa. Three berths at Anderson Point
Roy Hill	Iron ore	Allocated capacity 60 Mtpa Two berths at South West Creek
Pilbara Ports Authority (Utah Point)	Iron ore, Manganese ore, Chromite ore and Spodumene ore	Allocated capacity 21.35 Mtpa under the Reviewed Licence (proposed for 24.1 Mtpa under this Amended Licence). Single berth at Utah Point
Dampier Salt	Salt	Allocated capacity 75,000 tonnes per day and averaging approximately 3.2Mtpa. Single berth (Berth 3) leased from PPA
Pilbara Ports Authority (Eastern Operations)	Copper and lithium concentrates	Throughput approximately 1,170,000 tonnes per annum Two berths in Port Hedland (Berth 1 and 2)

In addition to port operations, a number of other industrial activities are undertaken in Port Hedland including a variety of light and service industries at the Wedgefield Industrial Estate. The Wedgefield Industrial Estate is located approximately 5 kilometres (km) south of the Premises.

6.2 Residential and sensitive premises

The distances to residential and sensitive receptors are as follows:

Table 19: Receptors and distance from Primary Activities

Residential and sensitive premises	Distance from Primary Activities
Pier Hotel – located east of Utah Point (zoned town centre – retail/commercial Town of Port Hedland Planning Scheme No.5)	670m to the east
Port Hedland Visitors Centre – located east of Utah Point (zoned town centre – retail/commercial Town of Port Hedland Planning Scheme No.5)	800m to the east
Closest residential zoned premises (zoned residential Town of Port Hedland Planning Scheme No.5)	1,200m to the north-east
Taplin Street	3,340m to the east

Residential and sensitive premises	Distance from Primary Activities
(zoned residential Town of Port Hedland Planning Scheme No.5)	
South Hedland residential zoned premises (zoned residential Town of Port Hedland Planning Scheme No.5)	9,300m to the south-east

The Town of Port Hedland reported in the HRA a permanent population of 4,590 people in 2012/13 within Port Hedland and a larger population of fly-in-fly-out workforce. By 2016 the population had declined by approximately 8.9% to 4,180 for the Port Hedland area, which includes the residential area of, and to the east of the West End as well as a small number of residents in the Wedgefield Industrial Area (Australian Bureau of Statistics (ABS), 2016). A greater population resides in the suburb of South Hedland, which in 2016 had a total of 9,471 residents (ABS, 2016a).

The closest residential area to the Premises is the West End, shown in Figure 11 below.

Figure 11: Aerial image of Port Hedland showing West End

6.3 Specified ecosystems

The Premises is situated proximate to the following specified ecosystem:

Table 20: Specified ecosystems

Specified ecosystems	Distance from Prescribed Premises
Port Hedland harbour – marine ecosystem	Within and directly adjacent to the Premises boundary. Moderate level of ecosystem protection*
Public Drinking Water Source Area (PDWSA)	The Premises is not located within a PDWSA
RAMSAR wetland	No RAMSAR wetlands are located within a 30km radius of the Premises.
Geomorphic Wetlands	No geomorphic wetlands are located within a 30km radius of the Premises.
Parks and Wildlife tenure	No Parks and Wildlife managed lands are located

	within a 30km radius of the Premises.
Threatened Ecological Communities and Priority Ecological Communities	There are no threatened ecological communities and priority ecological communities within a 30km radius of the Premises.
Declared Rare flora	There are no declared rare flora species recorded within a 30km radius of the Premises.
Other relevant ecosystem/biological values	**Distance from Prescribed Premises**
Mangrove community (high value ecosystem)#	There are six species of mangroves found in the Port Hedland Harbour. The occurrence of mangrove communities within the Premises is considered to be consistent with distribution patterns observed in similar environments in the Pilbara region. The intertidal mangrove communities provide habitat to a wide range of bird and bat species and marine invertebrates.
Turtle nesting grounds (listed under the EPBC Act)	Nesting grounds are located at Cemetery Beach and Pretty Pool, approximately 4.5km from the shiploader.
Migratory birds (listed under the EPBC Act)	Migratory birds have been sited near to the Premises boundary.

** Department of Environment, Pilbara Coastal Water Quality Consultation Outcomes: Environmental Values and Environmental Quality Objectives, Marc h2006 (DoE 2006).*
# EPA (2001)

6.4 Groundwater and water sources

Table 21: Groundwater and water sources

Groundwater and water sources	Distance from Prescribed Premises	Environmental value
Groundwater is considered brackish	Depth to groundwater encountered at approximately 0.7 – 2.5 metres below ground level (mbgl) (based on information within works approval W4520/2009/1). Variation driven by tidal variation. No bores located within 1km of premises (based on available GIS dataset – WIN Groundwater Sites).	Water is not used for potable or industrial use. Groundwater system linked to marine ecosystem with mangrove community located on the boundary of the Premises boundary.

6.5 Other site characteristics

Table 22: Other factors or sources of concern

Other factors or sources of concern	Location
Mangrove community (high value ecosystem)	Located on the southern and eastern boundary of the prescribed premises

6.6 Soil type

The Premises is located on tidal flats featuring bare sand. The location for the Premises is a

limestone outcrop surrounded by mangrove muds.

6.7 Meteorology

6.7.1 Wind direction and strength

The following wind rose (Figure 12) provides the annual wind direction and strength averaged over the past five years. Wind vectors in the west through to south west place residential receptors in the West End downwind of Premises bulk handling activities at approximately 20% of the time. Winds between the north, east and south vectors are expected to remove the pathway for noise and dust emissions to West End receptors the majority of the time.

Five year averaged wind directions in the south-south east and south east place residents in South Hedland downwind of Premises activities approximately 12% of the time although these residents are at greater distance to Premises activities.

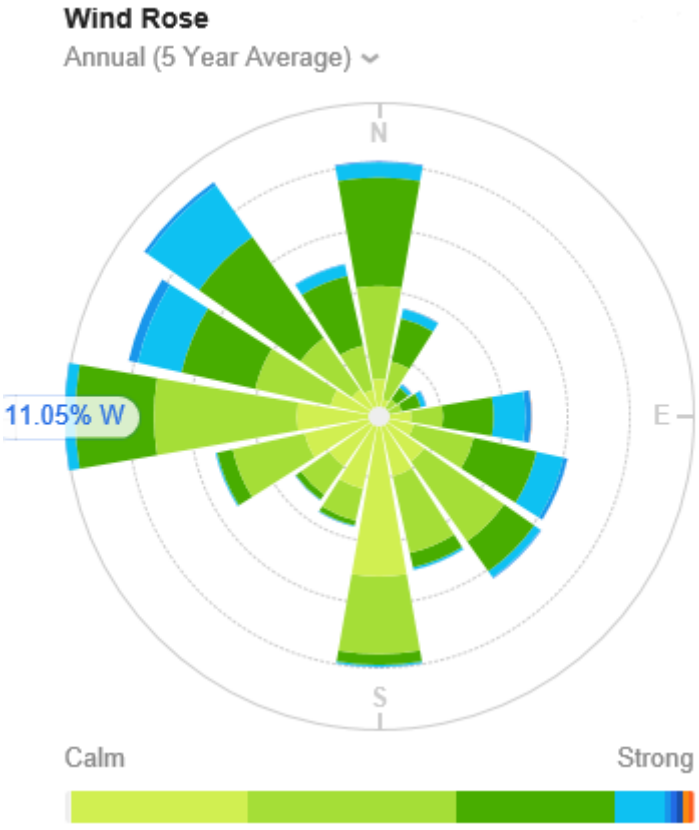

Figure 12: Annual average wind direction and strength in Port Hedland (WillyWeather, 2018)

6.7.2 Regional climatic aspects

Port Hedland is located in a semi-arid environment. Rich mineral content is reflected in the red soil and dust (see HRA page 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.

6.7.3 Rainfall and temperature

The Bureau of Meteorology provides the mean rainfall and maximum temperature for the Port Hedland (mean maximum temperature 1948-2020 and mean rainfall 1942 to 2020). Figure 13 below illustrates that the Port Hedland region is hot to warm all year round with rainfall predominantly over December to July.

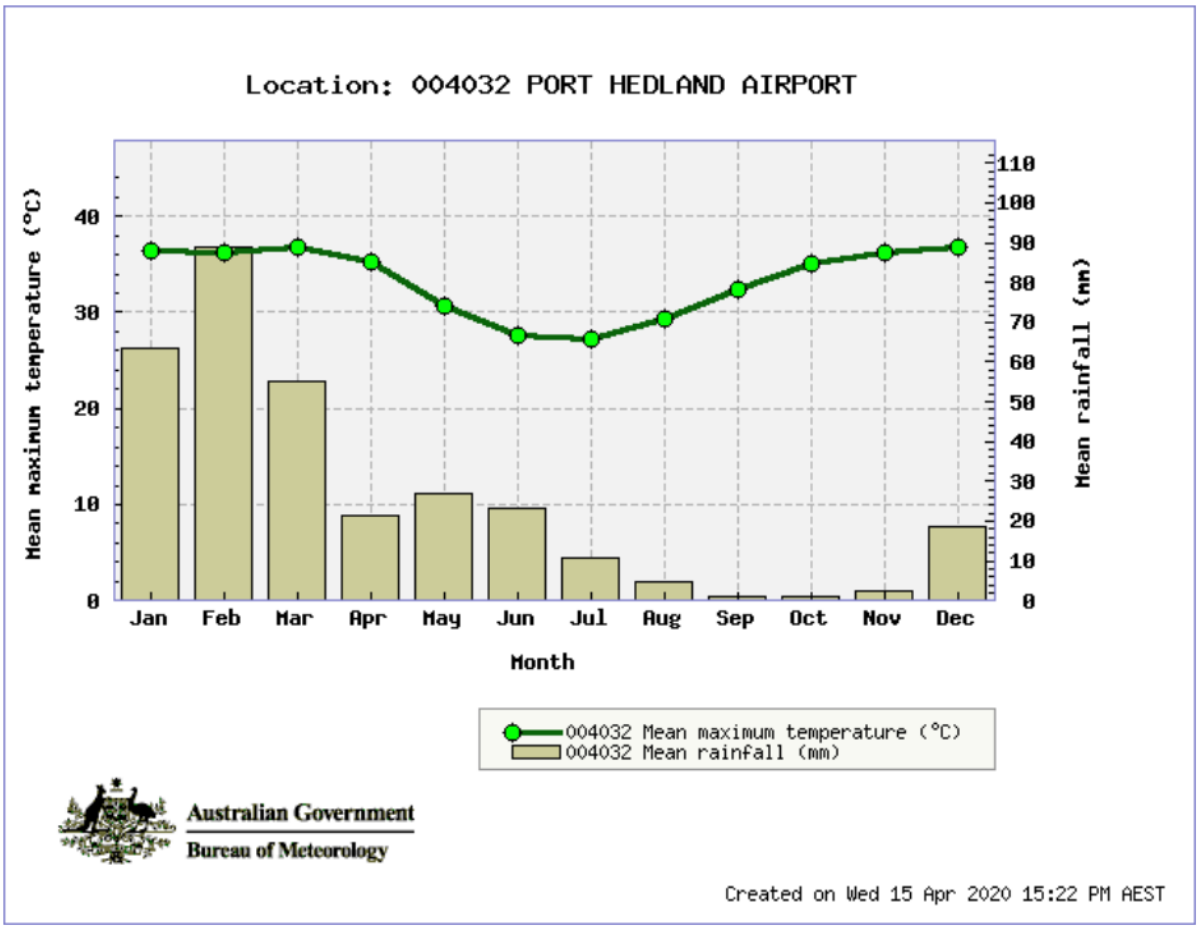

Figure 13: Mean temperature and rainfall Port Hedland

7. Risk assessment

7.1 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 through Table 23.

The identification of the sources, pathways and receptors to determine Risk Events are set out in Table 23 below.

Table 23: Identification of emissions, pathway and receptors during operation

Risk Events						Continue to detailed risk assessment	Reasoning
Sources/Activities		**Potential emissions**	**Potential receptors**	**Potential pathway**	**Potential adverse impacts**		
Category 58 Bulk material loading or unloading	In-loading, stockpiling, reclaiming and loading of all bulk granular materials	**Dust** associated with the handling of bulk material using ground hoppers, conveyance systems and ship loaders.	Pier Hotel – located 670m east of Utah Point Closest zoned residential premises – 1,200m to the north east Residents in South Hedland – located 9,300m to the south east	Air/wind dispersion	Impacts to public health and amenity	Yes	Refer to section 7.3
		Noise associated with additional vehicle movements, mobilisation of loading infrastructure and operation of dust control equipment.	Pier Hotel – located 670m east of Utah Point Closest zoned residential premises – 1,200m to the north east	Air/wind dispersion	Impacts to amenity	Yes	Refer to section 7.4
	Discharges to surface water from stormwater/wash water runoff following bulk material loading activities.	**Discharge** of water contaminated with bulk granular materials to the harbour waters/tidal zone.	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 7.5
	Stockpiling of spodumene, manganese and iron ore.	**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.	Seepage to groundwater (0.7 – 2.5mbgl) and movement to the marine environment	Marine environment: Negligible potential impact.	No	Negligible impacts expected due to the very low solubility and ecotoxicity of spodumene, iron ore and manganese.
	Stockpiling of chromite ore.	**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.	Seepage to groundwater (0.7 – 2.5mbgl) and movement to the marine environment	Marine environment: Reduced water quality resulting in declining ecosystem health	Yes	Refer to section 7.6
	General site activities (other dust sources)	**Dust** associated with haul truck and FEL movements on unsealed areas and sealed ring roads.	Pier Hotel – located 670m east of Utah Point Closest zoned residential premises – 1,200m to the north east	Air/wind dispersion	Impacts to public health and amenity	Yes	Refer to section 7.3
	Shiploading infrastructure	Light emissions from the Premises – berth and ship loader	Flat back turtles (*Natator depressus*) nest at Cemetery Beach and Pretty Pool. In addition three other turtles visit Port Hedland waters. Cemetery Beach is located approximately 4.5km from the berth at Finucane Island.	Artificial light from elevated light sources at the Premises.	Hatchlings have the potential to be impacted by artificial light as it can cause them to become disorientated and change natural behaviours (guided by light).	No	Berth and ship located at the Premises located approximately 4.5km from receptor. In addition, impacts to listed threatened and migratory species can be managed under alternative legislation such as the EPBC Act.

7.2 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 24 below.

Table 24: 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

DER will undertake an assessment of the consequence and likelihood of the Risk Event in accordance with Table 25 below.

Table 25: 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 DoH's *Health Risk Assessment (Scoping) Guidelines.*

7.3 Risk assessment – dust

7.3.1 Description of Risk Event

Fugitive dust generated from vehicle movements on roads, stockpiling and handling of ore at the Premises which migrates to Port Hedland residences and other sensitive land users at sufficient concentrations to cause health and amenity impacts.

7.3.2 Identification and general characterisation of emission

The HRA identifies that the major component of dust arising from port and commercial operations is iron oxide. The HRA concludes, based on the results of monitoring data, that risks associated with other potential contaminants, including metals, silica and asbestos, are negligible.

Fugitive dust emissions from handling and movement of all bulk granular material include points where ore is dropped from height such as at transfer points, ship loaders, from side tipping trucks and where stackers deposit ore onto stockpiles, or where stockpiled ore is reclaimed by FEL.

7.3.3 Description of potential adverse impact from the emission

DWER considers the key hazard associated with the Premises is PM generated through fugitive dust emissions which may impact amenity and public health.

Amenity impacts may arise from the deposition of particulate matter on vehicles, clothing, private infrastructure and equipment resulting in discomfort and/or additional cleaning expenditure. There may also be some disturbance to visual amenity from dust plumes. As discussed in section 4.10, impacts to amenity are perceived differently across individuals and communities.

Particulate matter has the potential to impact public health and affects both the respiratory and cardiovascular systems following both long and short term exposures. Note that there is sufficient evidence to demonstrate that concentrations of PM_{10} over 70µg/m^3 are associated with morbidity and mortality and is associated with increased levels of acute and chronic respiratory and cardiovascular health effects.

The HRA (see page 30) summarised the findings of a comprehensive and detailed hazard assessment by Toxikos of PM_{10} health effects in Port Hedland as follows:

- increase in daily mortality;
- increase in hospital admissions associated with respiratory disease, cardiovascular disease and pneumonia and bronchitis; and
- increase in emergency room attendance for pre-existing respiratory conditions.

National and international occupational and environmental health databases (United States Environmental Protection Agency, Agency for Toxic Substances and Disease Registry (ATSDR), International Programme on Chemical Safety, (US); National Institute for Occupational Health and Safety, National Occupational Health and Safety Commission, (NOHSC)) were used to review toxicology profiles of all materials currently imported or exported at the Premises (iron ore, manganese ore, chromite ore and spodumene). The following profiles have been noted.

Iron ore

Iron ore comprises of lump ore (>6mm diameter) and fines (0.15-6mm) although the emission of finer particles are expected during the handling of iron ore. Iron oxide is not considered toxic or carcinogenic.

The HRA also found that there is no clear evidence of a causal link between iron-oxides and diseases beyond cardiovascular diseases and other health effects associated with generally high ambient PM_{10} concentrations.

When compared to other materials handled at the Premises iron ore is handled in significantly greater tonnages and is therefore expected to be present in the greatest concentrations within total suspended particulates.

Manganese ore

Manganese ore comprises of lumps and fines. Manganese is an essential nutrient however it exhibits neurotoxic effects and respiratory tract irritation if exposure is excessive or prolonged. Studies conducted in 2011 revealed no observed adverse effects levels from manganese dust at 0.123mg/m^3 for those test subjects exposed to dust for 8 hours per day over an average of 127.13 months (10.6 years) (ATDSR, 2012).

Chromite ore

Chromium is an essential nutrient and predominantly exists in two valence states, Cr III and Cr VI. Cr VI is a genotoxic carcinogen. Inhalation increases the risk of lung cancer. The potential for exposure to Cr VI is generally small because it is relatively unstable in the environment converting to Cr III. Lung cancer from Cr VI exposure is almost exclusively from occupational settings (ATDSR, 2012).

Spodumene ore

Risks to health associated with spodumene increase with higher proportions within the product of respirable particles, crystalline silica and muscovite (mica). Crystalline silica is a known human lung carcinogen only at occupational exposure levels. Similarly, mica has the potential to cause scarring of the lungs at occupational exposure levels.

Material assay testing of the product handled identified a low presence of naturally occurring radioactive material within the spodumene ore with concentrations being 3.95 and 2.80 parts per million for Thorium and Uranium respectively indicating that there is a negligible to no risk to human health from the radioactive component of spodumene.

7.3.4 Criteria for assessment

Particulate matter

The Government has adopted the air quality guideline for 24-hour PM_{10} of 70 µg/m^3, excluding natural events, applied to all residential areas in Port Hedland, including those in the West End.

There are no current specific amenity criteria relevant to the Port Hedland community to quantify the point at which amenity impacts may be perceived (refer to section 4.10). Alternative criteria used will include complaint (number and nature) together with stakeholder and community submissions. It is considered that the application of health relevant criteria will also be protective of amenity impacts, especially given that public health is of higher sensitivity than amenity value, noting however, the subjective nature of rating amenity values.

Manganese

The World Health Organization (WHO) has established a provisional guideline for respirable manganese in ambient air (at sensitive receptors) of 0.15 µg/m^3 averaged annually and a guideline for occupational exposure levels of 300 µg/m^3. However, due to limited test studies of the effects of ambient respirable manganese dust on community populations there remains uncertainty about the pulmonary effects of low-level/non-occupational manganese

exposure (WHO, 2001).

There are no relevant guidelines for manganese in ambient air averaged over a 24-hour period.

Chromium

There are no relevant guidelines for chromium in ambient air averaged over a 24-hour period. However, previous versions of the Licence have used 3.5 µg/m^3 as the target value for chromium at the Premises boundary over an annual period. Therefore, in the absence of any alternative, the Amended Licence will continue with this number.

7.3.5 Throughput and frequency considerations

Due to the diffuse nature of fugitive dust, emission concentrations of PM at generation points/sources are not quantifiable. Consideration has been given to the truck movements, as well as the throughput and frequency of the materials exported from the Premises.

Table 26: Throughputs of bulk material handled at the Premises

	Throughput	**Frequency**
Iron ore	*FY2017/18* 15,410,919 tonnes *FY2018/19* 15,184,084 tonnes *Assessed throughput* 24,100,000 tonnes per annual period	*FY2017/18* 130,000 truck and 152 shipping movements *FY2018/19* 120,500 truck and 187 shipping movements Maximum belt speed 5,000 tonnes per hour
Manganese ore	*FY2017/18* 922,010 tonnes exported *FY2018/19* 1,354,277 tonnes *Assessed throughput* 2,000,000 tonnes per annual period	*FY2017/18* 8,000 truck and 15 shipping movements *FY2018/19* 12,500 truck and 17 shipping movements Maximum belt speed 3,000 tonnes per hour
Chromite ore	*FY2017/18* 0 tonnes *FY2018/19* 0 tonnes *Assessed throughput* 350,000 tonnes per annual period	Chromite ore has not been exported since March 2014. In that (calendar) year approximately 250 road trains and 3 shipping movements contributed to the export of 26,771 tonnes. Maximum belt speed 3,000 tonnes per hour.
Spodumene ore (proposed)	*FY2017/18* 3,592,280 tonnes (trial – see section 4.2.1) *FY2018/19* 658,814 tonnes *Assessed throughput* 3,000,000 tonnes per annual period	*FY2017/18* 29,500 truck and 35 shipping movements *FY2018/19* 2,500 truck and 7 shipping movements Maximum belt speed 3,000 tonnes per hour

7.3.6 Licence Holder controls

The Licence Holder has provided the following dust management documentation which outline how fugitive dust emissions from the Premises are being managed:

- Qube, SHEMS Guide, Dust Management Guide, issue 10 July 2013;
- Pilbara Ports Authority's, Dust Management Plan Berth 4, Port of Port Hedland; and
- Pilbara Ports Authority's, PM_{10} Dust Alarm Response Procedure Port of Port Hedland, 11 September 2015.
- The Application and additional controls (shown through row 9 and 10 of Table 27)

This assessment has reviewed these documents and information obtained during site visits and the controls identified have been set out in Table 27 below.

Table 27: Licence Holder infrastructure controls for fugitive dust emissions

	Site Infrastructure	Description	Operation details	Reference to plan
	Controls for dust			
1.	Stockyard	Sealed ring roads around stockyard 1 and 2.	Travel at 20 km per hour or less	Premises Map
		Misters on all radial stackers and at bunkers (excluding Bunker 6 and 7).	Bunker and stacker water sprays operated at all times while tipping or stacking of material. Drop height from radial stacker to surface does not exceed 3 metres.	Premises Map
		In-loading at Bunker 6 and 7	Water cannons operated at Bunker 6 and 7 when a truck is side tipping.	Premises Map
		Four water cannons per stockpile	Water cannons operated at Bunker 6 and 7 when a truck is side tipping. Routinely operated to prevent visible dust lift off. Operation of cannons during in-loading of ore and prior to reclaiming. Routinely means at a minimum sequence to run at least: • every 3 hours during the day; • every 6 hours during the night; or • until small puddles start to form as a result of rainfall or use of cannons. Dust forecast tool is utilised for planning of cannon operation. Cannons operated for wet down of material to be out loaded. Cannons operated via automated system that is centrally managed in the Control Room.	Premises Map
2.	Conveyors	Under belt sprays and belt scrapers. Wind and noise barrier on raised CV06 (above wharf 4). Under belt sprays and	Operation of the under belt sprays whenever visible dust is being generated from operation of conveyors. Belt scrapers automatically operate	Premises Map

	Site Infrastructure	Description	Operation details	Reference to plan
		belt scrapers remove material carried back from the belt.	when the conveyor is running.	
3.	Transfer Stations	Partially enclosed (within shed) with chute spray	Transfer stations partially enclosed (within shed). Chute sprays operated whenever visible dust is being generated through use.	Premises Map: TS1, TS2, TS3, TS4
4.	Shiploader	Shiploader and transfer chute	Enclosed dribbler chute.	Premises Map: CV07/ Shiploader
5.	Dust Monitors[1]	Real time boundary PM_{10} dust monitoring network comprising of M5 (BAM1020), M6 (E-sampler) and M7 (BAM1020)	Continuous. Alarm system with internal trigger values and response procedure in place. If a trigger value is exceeded, an SMS or email notification is sent to the Licence Holder's staff and an investigation is implemented. If investigation finds operational related exceedance, contingency action is taken	Monitoring Locations and Stormwater Discharge Map: M5, M6, M7 and M10 (proposed)
		Two boundary monitors for Cr (III and VI) and Mn. M8 and M9 (Ecotech 3000 HVAS)	One 24 hour sample every sixth day, plus at least one 24 hour sample during a ship loading of chromite ore/manganese ore.	Monitoring Locations and Stormwater Discharge Map: M8 and M9
		Ambient monitoring at Taplin Street (Port Hedland) and Bureau of Meteorology.	Operated by Port Hedland Industries Council (PHIC) with data management and maintenance by PHIC. Access agreement between PHIC and the Licence Holder to be maintained. Target for Taplin Street only.	N/A
6.	Dust Management Tool	Dust management tool that incorporates a forecast of local weather conditions and operational plans for each 12 hour shift.	Dust management ongoing, records of dust management tool kept for each 12 hour shift.	N/A
7.	Truck wash/ dry sweep	Truck wash/dry sweep located at the exit points of the Premises to remove built up material from undercarriage and wheel guards.	Fully contained truck wash facility (including sumps) at Stockyard 1 exit. Manual dry sweep area at Stockyard 2 exit.	Premises Map

	Site Infrastructure	Description	Operation details	Reference to plan
			Every truck exiting the Premises pass through truck wash/dry sweep	
8.	Water cart	Operate when visible dust is generated from trafficable areas. Operate proactively subject to dust forecast tool over a 24 hour period. Operate when visible dust reported by site personnel.		
9.	Water cart (Additional control)	Additional watering of stockyard floors for FELs during reclaiming operations.		
10.	Belt washing sprays (Additional control)	Installation of CV07 sprays on scrapers.		
11.	Recirculation pond and sample station (Additional control)	Sealing of the recirculation pond and sample station area (1,950m^2)		
12.	Chute sprays (Additional control)	Installation of permanent additional dust suppression sprayers at the end of chute hoods on transfer station 1 and 2 for use during manganese export.		

Note 1: The Licence Holder proposes to add lithium, an indicator of spodumene, to the suite of parameters measured during speciation testing of samples collected at Licence Holder operated monitoring stations.

7.3.7 Key findings

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

1. the amount of dust potentially generated during the handling and storage bulk materials at the Premises is expected to negatively correlate with the moisture content of that material;
2. there is limited capacity at the Premises to condition the product once received. The primary control (current) for dust being generated at the facility must therefore be the conditioning of all ore prior to receipt at the Premises to ensure it has a moisture content sufficiently above DEM level so that the DEM level can be achieved throughout stockpiling and loading activities;
3. the nature of the operations at the Premises including the way that material is delivered and handled (road trains and FELs) is different from other Port Hedland port facilities and has greater potential to generate higher dust emissions per total tonne of material handled compared to other handling methods;
4. despite handling much lower tonnages of material compared to larger Port users and being further from sensitive receptors in the West End, modelling results show a comparable impact on ambient dust concentrations in and around Port Hedland's West End. This is also supported by results from the LiDAR campaign (section 4.7.6), which identify the Premises as a significant

contributor to cumulative dust;

5. the major constituent of ambient dust in Port Hedland is iron oxide with particulate matter as PM_{10} being the key parameter of concern, however spodumene, manganese and chromite are all expected to contribute to the overall level of PM in Port Hedland; and
6. dust impacts to amenity were not addressed through the HRA or Taskforce Report for non-residential sensitive land users of the West End.

7.3.8 Consequence

Fugitive dust – with increased throughput (proposed)

Based on the information presented in this Decision Report, the Delegated Officer considers that dust emissions from the Premises contribute to ground level dust concentrations of PM_{10} in the West End of Port Hedland.

Based on historical monitoring data it is clear that the air guideline value at Taplin Street (70 $\mu g/m^3$) has the potential to be exceeded and will be frequently exceeded in other areas closer to the large industrial sources. The Delegated Officer has determined that the Premises contributes to cumulative concentrations of PM_{10} and that cumulative concentrations of PM_{10} may result in adverse health effects to the community requiring occasional medical treatment. In addition, dispersion modelling results indicate that the Premises will contribute to ground level concentrations of PM_{10} at Taplin Street and that cumulative levels of PM_{10} will be similar as a result of the throughput increases. The consequence of impacts to health is therefore **major**.

The Delegated Officer considers that there may be a high level of impacts to amenity experienced by residents and businesses in the West End as a result of dust levels. It is considered that the Premises will contribute to cumulative levels of dust in the West End of Port Hedland. Therefore it is considered the consequence of impacts to amenity from fugitive dust emissions to be **major**.

Spodumene ore (proposed)

Spodumene sized between 31.5 mm and 50 mm in diameter represents approximately 56.7% of the total product while particles 0.063 mm (63 µm) or less account for 0.097% by weight of the overall sample (Nagrom, 2017).

The silica content of the spodumene, represented as silica dioxide (SiO_2), was measured in assay testing to be 73.8% (Nagrom, 2017), although the Delegated Officer recognises that only respirable crystalline forms of silica present a risk to human health. Tests carried out on the spodumene product identified a silica content of 4.14% by weight of the 'respirable only' fraction (Microanalysis Australia, 2017). In addition, mica content of the bulk samples was found to range between 0.005% and 0.20%. Of all PM smaller than 4 µm in diameter, mica represented 10%.

Based on the low respirable crystalline silica and mica content the Delegated Officer has determined that dust impacts from the handling of spodumene at the Premises will primarily be low-level when Premises emissions are considered in isolation of other Port users. Therefore the Delegated Officer considers the consequence of dust from spodumene is likely to be **minor**. However, the Delegated Officer acknowledges that spodumene handling will result in increased overall throughputs at the Premises, which are expected to contribute to cumulative concentrations of PM_{10} and are assessed above.

7.3.9 Likelihood of Risk Event

Fugitive dust – with increased throughput (proposed)

The Delegated Officer initially determined the likelihood of the Risk Event as possible based on the available information at the time of the Reviewed Licence. The assessment of likelihood has since been reviewed by the Delegated Officer based on the following updated information:

- LiDAR imagery identifying the Premises as a major contributor to overall dust levels in the Port Hedland airshed;
- Reportable Events for PM_{10} at boundary monitors where the Licence Holder has contributed to more than 50% of total PM_{10} measured at boundary monitors;
- Inconsistent and insufficient conditioning of some iron ore and manganese products (moisture content);
- Exceedances of the 70 µg/m^3 guideline concentration at the Taplin street monitor (PHIC, 2017); and
- Dispersion modelling provided by the Licence Holder.

Therefore the Delegated Officer has determined that the likelihood of dust emissions migrating to receptors at sufficient concentrations to cause health impacts is **likely**.

In addition the Delegated Officer has determined, the likelihood of impacts to amenity occurring in the West End to be **likely** as justified by submissions received (refer to Appendix 4).

Due to its proximity to significant local sources of dust, the HRA notes that the risk in Port Hedland may be up to twice as high than for those living in South Hedland (DoH, 2016). However, there remains a pathway for dust emitted from the cumulative Port Hedland airshed to which Premises activities contribute to. These other sources include other port operations, cleared areas, natural sources and other industrial activities. Cumulative dust may contribute to high ambient dust in South Hedland above criteria at some time. Therefore the Delegated Officer has assessed the Risk Event likelihood as **possible** for South Hedland.

Spodumene ore (proposed)

The likelihood for dust to be generated from increased iron ore handling is greater than that for spodumene due to the moisture content of spodumene, as measured during trial shipments, recorded as being consistently above the DEM level. 24 hour concentrations of lithium monitored at HVAS monitors M8 and M9 were most commonly found to be below detection levels with the highest recording being 0.022µg/m^3 on 12 July 2017.

However, based on handling methods requiring the operation of open stockpiles and FELs over unsealed areas the Delegated Officer has determined that the likelihood of dust emissions from spodumene handling reaching nearby receptors is **possible** as it could occur at some time.

7.3.10 Overall rating of dust impacts

Fugitive dust – with increased throughput (proposed)

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix (Table 24) and determined that the overall rating for the risk of cumulative fugitive dust emissions is **High** when taking into consideration the total throughputs (all ores) handled at the Premises. However, the increase in overall throughput amounts does not substantially change the risk determined in previous risk assessments.

This is due to the lower dust risk rating associated with spodumene, described below.

Spodumene ore (proposed)

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix (Table 24) and determined that the overall rating for the risk of fugitive dust emissions associated with spodumene handling is **Medium**.

The Delegated Officer has resolved that additional controls will be required as a result of proposed activities due to the potential increases to cumulative PM_{10} concentrations in the West End and at Taplin Street as a result of throughput increases. As the effectiveness of proposed controls to reduce the likelihood of dust emissions is uncertain, additional regulatory controls will be required to reduce risks to acceptable levels.

7.4 Risk assessment – noise

7.4.1 Description of Risk Event

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

7.4.2 Identification and general characterisation of emission

Noise generated from normal operations onsite including noise from road trains unloading and braking, FEL and product movement through conveyors and stackers and reversing alarms on vehicles.

7.4.3 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.

7.4.4 Noise criteria

Noise modelling indicates that noise from the Premises is within assigned levels in the EP Noise Regulations (see Table 16). However, noise levels from the Premises in isolation are within 5 dB of Assigned Levels specified in the EP Noise Regulations and therefore the Premises is a significant contributor to cumulative noise in Port Hedland, as defined by regulation 7(2) of the EP Noise Regulations.

7.4.5 Licence Holder controls

The Licence Holder has the following controls in place to reduce and manage noise emissions:

Table 28: Licence Holder controls for noise

Control	Description
Siting	Location of noisy equipment away from noise sensitive areas
Engineering	Implementation of engineering designs and controls to reduce operational noise including enclosure of equipment and the use of vibration isolation and damping
Mobile plant and equipment	Equipment and machinery with lower noise emissions such as low noise idlers

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 noise reports provided to the EPA in support of EPA Assessment Report 1311 predicted the worst case noise level for the Utah Point Multi-User facility of between 44 and 48 dB(A) at the Pier Hotel (Table 17), potentially exceeding the night time L_{A10} assigned level of 46 dB (including influencing factor).
3) Noise emissions from:
    (a) vessels within the Port Hedland port;
    (b) FEL reversing alarms;
    (c) equipment start-up alarms; and
    (d) trains (no trains are operated within the Premises boundary),

    are exempt from the *Environmental Protection (Noise) Regulations 1997* (EP Noise Regulations).

7.4.6 Consequence

While the noise from the Premises may not be currently readily discernible, under worst-case conditions it is still likely to 'significantly contribute' to cumulative noise at noise sensitive premises, as defined by regulation 7(2) of the EP Noise Regulations. DWER has revised its assessment of consequence from slight to **moderate** as Assigned Levels are already at risk of not being met.

Increased throughputs (proposed)

No additional infrastructure will be operated as a result of the Application. Therefore maximum predicted noise levels will not increase above predicted maximum levels and the consequence remains the same. Increased operation times are expected to effect the likelihood of the Risk Event, discussed below.

7.4.7 Likelihood of Risk Event

As loading rates are not expected to increase at the shiploader, an increase in shipping tonnages is expected to result in greater hours of operation of trucks, FELs, conveyors and ship loading equipment at the Premises.

Therefore the Delegated Officer has determined that the likelihood rating is increased from rare to **unlikely** as there greater potential for predicted maximum noise levels to be reached during worst-case meteorological noise conditions. This is based on the determination that the likelihood of Premises operations causing impacts to amenity on the receptor will still probably not occur in most circumstances.

7.4.8 Overall rating of noise impacts

The Delegated Officer has compared the consequence and likelihood ratings described above with the Risk Rating Matrix (Table 24) and determined that the overall rating for the risk of impacts from noise emissions is **Medium**.

7.5 Risk assessment – discharges to water

7.5.1 Description of Risk Event

Material may enter the marine environment through contaminated stormwater and wash down water runoff from stormwater discharge points. Material may also enter the marine environment directly from spills during ship loading, for example from hydraulic oil discharges from the mooring system (refer to section 4.5.1), or through openings in the wharf (gaps and drainage holes) that allow a direct pathway for spilt ore.

7.5.2 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.

7.5.3 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.

Spills from mooring systems

Mangroves are particularly susceptible to smothering from oil spills, as above ground roots may get blocked limiting the plant's ability to breath (Australian Institute for Marine Science, 2009). Mangrove communities are considered a high value ecosystem as they support a large number of fauna species.

Iron ore, manganese and spodumene

Iron ore, manganese and spodumene are not soluble in water and have low toxicities in the marine environment.

Sampling data from the Recirculation Pond since 2015 has identified typically low, or below detection TRH concentrations with a maximum TRH of 670µg/L. In addition, sediment within the Recirculation Pond is expected to settle over time.

Therefore the greatest impact from discharges of wash water contaminated with these materials is from direct spills during ship loading, which may result in sedimentation and increased turbidity in the water column.

Chromite ore

Chromite ore is typically present in two valance states of chromium (III and VI). Chromium is relatively non-toxic and insoluble when present in the valence state Cr III, as compared to Cr VI. Chromium in the form of Cr III has the ability to rapidly adsorb on iron oxide surfaces, reducing its bioavailability. However, dissolved Cr VI has the potential to have mutagenic, carcinogenic and teratogenic effects on marine species (Oana, 2006).

7.5.4 Criteria for assessment

Spills from mooring systems

Hydraulic oil used in mooring units at the Premises, and discussed in section 4.5.1, have been classed as 'biodegradable' following testing in accordance with OECD 301B.

While considered 'non-toxic' by the manufacturer insufficient evidence was available to DWER to support this conclusion at the time of assessment. Toxicity is a relative term and the severity of impacts from a spill is expected to be correlative to the volume discharged

and the direction of water flow either toward or away from mangrove communities.

Iron ore, manganese and spodumene

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.

Chromite ore

The Premises is located within the Port Hedland Inner Harbour which has been characterised as requiring moderate ecological protection due to the presence of mangrove communities (DoE 2006). Following ANZECC and ARMCANZ Guidelines (as reviewed in 2018) for 90% species protection, trigger values for Cr VI and Cr III are 48.6µg/L and 20µg/L respectively.

7.5.5 Licence Holder controls

This assessment has reviewed the controls set out below in Table 29 and Table 30 and the monitoring set out in Table 31.

Table 29: Licence Holder controls for stormwater management

	Stormwater management		
1.	Stormwater infrastructure for Stockyard 1	Stormwater from Stockyard 1 to be captured on land directed to a stormwater recirculation pond with 50,000m^3 capacity. Lined recirculated pond.	Premises Map
2.	Stormwater infrastructure for Stockyard 2	Stormwater from Stockyard 2 captured on land directed to stormwater settlement sump and ponds. The stormwater settlement pond designed to contain 1 in 10 year 24 hour rainfall event. Stormwater pond connects to the recirculation pond.	Premises Map
3.	Stormwater infrastructure for berth	The wharf is designed to prevent direct drainage of stormwater into the marine environment. The wharf deck is sloped from the front fender line to the back, which is bunded and connected to a contained drainage system. All stormwater is pumped to the recirculation pond.	Premises Map
4.	Stormwater discharge	Storm-water discharge points to be maintained in good repair: • W12 – Stormwater outlet • W13 – Emergency overflow discharge point from recirculation pond • W14 - Controlled discharge point from recirculation pond, activated in the event of rainfall greater than the ponds capacity	Monitoring Locations and Stormwater Discharge Map
5.	Road sweeper	Operate on sealed areas including ring roads and wharf. Used to minimise material build-up on roads and wharf. Used at least twice a day	N/A

Table 30: Licence Holder management controls spills

Management Control	**Description**
Spillage clean up	Any spills contained and cleaned up:

	• During ship loading a vacuum truck is present at all times. • Spillages of ore are cleaned up as soon as possible and returned to either the stockpile or sump.

Table 31: Licence Holder monitoring for surface water

Monitoring	Description
Monitoring	A surface water monitoring program with reference to The Australian and New Zealand Environment Conservation Council (ANZECC) water quality framework.

7.5.6 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 Stormwater Recirculation Pond has a capacity of 50,000L and is connected to a range of prescribed and non- Primary Activity areas. Sampling has identified low TRH concentrations within the pond, which is used also extracted for onsite dust suppression. Only two discharges have occurred via stormwater discharge points W13 and W14. Therefore the greatest risk to the marine environment associated with iron ore, manganese and spodumene handling is from direct spills.
3. Stormwater outlet (W12) is a gross pollutant trap that captures water from areas of the Premises that do not are not used for Primary Activities. In addition this discharge point is inundated at high tide making sampling difficult.
4. 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.
5. Stormwater and washwater contaminated with chromite ore is likely to present the greatest risk from toxic impacts to the marine environment, as iron, manganese and spodumene ores are relatively non-toxic and insoluble.
6. Spills of hydraulic oils are associated with shipping movements generally and have therefore been assessed in relation to the handling of all ores.

7.5.7 Consequence

Spills from mooring systems

Mangroves are particularly susceptible to smothering from oil spills, as above ground roots may get blocked limiting the plant's ability to breath (Australian Institute for Marine Science, 2009). Mangrove communities are considered a high value ecosystem as they support a large number of fauna species.

Approximately one to two thirds of a crude oil spill's mass is lost to evaporation over a 28 day period (Hassanshahian and Cappello, 2013). The hydraulic oil can be described as a light phase hydrocarbon and is expected to break down more rapidly than crude oil. In addition, Port Hedland's very high evaporation rates through much of the year may have a greater degrading effect on the degradation of hydraulic oil than that witnessed in laboratory testing. Significant tidal movements and wind chop are also likely to aid in the degradation of

spills by dispersing oil and increasing its area exposed to the natural oil-degrading bacteria in the marine environment (Hassanshahian and Cappello, 2013).

The magnitude of spill required to cause mangrove death or stress is expected to be significant. A large spill of hydraulic fluid has the potential to cause low level offsite impacts at a local scale, presenting a **moderate** consequence.

Iron ore, manganese and spodumene

The Port Hedland port is a tidal environment with naturally elevated levels of turbidity. Taking into account the relevant factors discussed in this report, it is considered that there may be a minor impact to the marine environment which may result in local off-site impacts on the mangrove community.

Offsite impacts at a local scale are expected to be minimal as the environment at the point of discharge is heavily disturbed from dredging and ongoing shipping movements.

The consequence rating of sediment-laden process water discharges is therefore **minor**.

Chromite ore

During handling of chromite at Stockyard 1, stormwater is contained within an impermeable hardstand. Spillages of chromite ore during shiploading are expected to largely remain in an insoluble state and therefore not become bioavailable. However, there remains a risk that ANZECC criteria will be exceeded for dissolved chromium (III and IV) in the event of a large spill. The consequence rating is therefore **moderate**.

7.5.8 Likelihood of Risk Event

Spills from mooring systems

Although the Licence Holder has committed to ongoing inspections and maintenance of mooring units that are the source of hydraulic oil discharges, these procedures were in place at the time of recent spill events. The determination of likelihood for future spills must therefore be based on the frequency of historic incidents and anticipated increased shipping movements.

A total of 12 spills have occurred over the previous two annual periods. However, the majority of these spills are expected to have dispersed rapidly due to their volume and environmental conditions. As a significant spill has previously occurred from the hydraulic mooring system the likelihood of this recurring at some time is **possible**.

Iron ore, manganese and spodumene

As part of decision making process for the Reviewed Licence, the likelihood rating was initially assessed as unlikely based on Licence Holder controls in place. Following a review of reported incidents relating to stormwater/wash water discharges to the Port Hedland Inner Harbour (refer to section 4.4), the likelihood has been revised from unlikely to **likely** as a numerous discharges have occurred in the past two annual periods with one discharge totalling a maximum of 1,500L.

Chromite ore

Handling of chromite ore at the Premises ceased in March 2014. The chromite stockyard is located on an impervious, bunded hardstand. Therefore the pathway for chromite contaminant to the marine environment stormwater runoff is limited.

Spill events may occur in exceptional circumstances at the shiploader and therefore the likelihood of the Risk Event for chromite ore handling is assessed as **rare**.

7.5.9 Overall rating of direct discharges to water

The Delegated Officer has compared the consequence and likelihood ratings described above with the Risk Rating Matrix (Table 24) and determined that the overall rating for the risk of stormwater/process water discharges and spills to the marine environment is **Medium**.

7.6 Risk assessment – seepage to groundwater

7.6.1 Description of Risk Event

Seepage of stormwater contaminated with bulk materials handled at the Premises to groundwater.

7.6.2 Identification and general characterisation of emission

Groundwater on Finucane Island is saline and it has been identified through a search of DWER's Geographic Information System (GIS) that groundwater in the vicinity of Primary Activities is not abstracted for potable or industrial purposes. Ecological receptors include nearby mangrove communities and other marine organisms at the point of groundwater expression to the Port Hedland Inner Harbour. As iron, manganese and spodumene are insoluble, chromite ore is the only material handled in bulk at the Premises that presents an ecotoxicological risk to receptors.

7.6.3 Description of potential adverse impact from the emission

Contaminated groundwater can impact the mangrove community. Studies of the effects of Cr III indicate that mangroves are potentially chromium-tolerant although little is known about the possible impacts from extended exposure (Rocha et al., 2009). As discussed in section 7.5.3 Cr VI may present potential adverse impacts to marine organisms, including mangroves.

7.6.4 Criteria for assessment

There is no criterion for chromium concentrations in the marine environment as it relates to impacts to mangrove communities. General criteria for the marine environment used in section 7.5.4 have been applied to the risk of seepage to groundwater.

7.6.5 Licence Holder controls

The Licence Holder has the following controls in place for spills of material from onshore activities.

Table 32: Licence Holder controls to minimise groundwater impacts

Management Control	Description
Engineering	An impervious 'geotechnical barrier' installed 500-700mm beneath the surface of the south eastern half of Stockyard 1 (also bunded) to prevent infiltration of manganese or chromite contaminants to groundwater.
Spillage clean up	Any material spills contained and cleaned up: During ship loading a vacuum truck is present at all times. Spillages of ore are cleaned up as soon as possible and returned to either the stockpile or sump. Hydrocarbon spills are controlled, contained and cleaned up

7.6.6 Key findings

The Delegated Officer has reviewed the information regarding seepage to groundwater and has found:

1. Groundwater is not abstracted for potable or industrial purposes.
2. Chromite presents the greatest risk to the receiving environment as it has the potential to contaminate groundwater.
3. Engineering controls put in place by the Licence Holder are greatest at chromite storage locations to address the risk of seepage to groundwater.

7.6.7 Consequence

Groundwater in the area is not considered potable; however ecosystem values include the mangrove community. Taking into account the relevant factors discussed in this Decision Report, it is considered that there may be an impact to groundwater (physical, chemical or biological) which may result in local off-site impacts on the mangrove community and marine organisms near to the berth. Any seepage of toxicants handled at the Premises are expected to be in very low concentrations due to the presence of an impermeable hardstand. Further that these contaminants are expected to dissipate quickly as a result of mixing from tidal movements and are therefore likely to be present in concentrations below ANZECC criteria near to the point of expression.

The consequence rating is therefore **minor**.

7.6.8 Likelihood of Risk Event

Taking into consideration the relevant factors discussed in this Decision Report, in particular the Licence Holder controls in place, the likelihood of causing an impact on groundwater is unlikely to occur.

The likelihood rating is therefore **unlikely**.

7.6.9 Overall rating of seepage to groundwater

The Delegated Officer has compared the consequence and likelihood ratings described above with the Risk Rating Matrix (Table 24) and determined that the overall rating for the risk of seepage to groundwater is **Medium**.

7.7 Summary of risk assessment and acceptability

The risk items identified in section 7 including the application of risk criteria and the acceptability with treatment are summarised in Table 33 below:

Table 33: Rating of Risk Events

	Emission		Pathway and Receptor	Licence Holder controls	Impact	Risk Rating	Acceptability with treatment (conditions on instrument)
	Type	**Source**					
1.	Dust emissions from handling and movement of ore (increased throughputs to 24.1 Mtpa)	Infrastructure and handling process	Air, moving with direction of wind.	Infrastructure and management controls.	Public health and amenity.	Major consequence Likely likelihood **High risk**	Acceptable subject to Licence Holder controls conditioned **and additional regulatory controls**
2.	Dust emissions from handling and movement of spodumene ore	Infrastructure and handling process	Air, moving with direction of wind.	Infrastructure and management controls.	Public health and amenity.	Minor consequence Possible likelihood **Medium risk**	Acceptable subject to Licence Holder controls conditioned
3.	Noise from infrastructure and operations	Conveyors, conveyor drives, stackers, front end loaders, hoppers and ship loaders	Air, moving with direction of wind	Plant/equipment and management controls.	Public health and amenity.	Moderate consequence Unlikely likelihood **Medium risk**	Acceptable subject to the implementation of an alternative regulatory strategy.
4.	Discharge to water from ship mooring systems	Stormwater (hydraulic oil spills)	Direct from infrastructure	Infrastructure and management controls.	Impacts on water quality and visibility	Moderate consequence Possible likelihood **Medium risk**	Acceptable subject to Licence Holder controls conditioned **and improved reporting requirements**
5.	Discharge to water from spills and washwater discharges containing iron, manganese and/or spodumene ores	Stormwater and washwater (contaminated stormwater)	Direct from infrastructure	Infrastructure and management controls.	Impacts on water quality and visibility	Minor consequence Likely likelihood **Medium risk**	Acceptable subject to Licence Holder controls conditioned **and additional regulatory controls and reporting requirements based on increased assessment of likelihood**
6.	Discharge to water from spills and washwater discharges containing chromite ore	Stormwater (contaminate stormwater)	Direct from infrastructure	Infrastructure and management controls.	Impacts on water quality and visibility	Moderate consequence Unlikely likelihood **Medium risk**	Acceptable subject to Licence Holder controls conditioned
7.	Discharge to	Stormwater	Land	Infrastructure	Groundwater quality	Minor	Acceptable

	Emission		Pathway and Receptor	Licence Holder controls	Impact	Risk Rating	Acceptability with treatment (conditions on instrument)
	Type	**Source**					
	land from contaminated stormwater and material spills infiltrating to groundwater	(contaminate stormwater)	infiltration to groundwater.	and management controls.	affected and entry into the marine environment (interface).	consequence Unlikely likelihood **Medium risk**	subject to Licence Holder controls conditioned

8. Regulatory controls

8.1 Summary of controls

A summary of regulatory controls determined to be appropriate for the Risk Events is set out in Table 34. The risks are set out in the assessment in section 7 and the controls are detailed in this section. DWER will determine controls having regard to the adequacy of controls proposed or currently implemented by the Licence Holder. The conditions of the Amended Licence will be set to give effect to the determined regulatory controls.

Table 34: Regulatory controls

		Controls				
		8.2 Infrastructure and Equipment	8.3 Moisture content	8.4 Specified action (monitoring and reporting)	8.5 Throughput Limits	8.6 Monitoring
Risk Items (see section 7)	1. Dust from iron ore, manganese ore, chromite ore and spodumene ore	•	•	•	•	•
	2. Noise from infrastructure and operations	An alternative regulatory strategy will be required beyond Part V licensing.				
	3. Discharge to water from contaminated stormwater, washwater and material spills	•		•		
	4. Seepage to groundwater and into the marine environment	•				

8.2 Specified infrastructure and equipment controls

8.2.1 Existing dust management controls

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

- sealed and maintained ring road around stockyard 1 and 2;
- vehicles to travel at or below 20 km per hour;
- misters on bunkers and radial stackers;
- drop height from radial stackers minimised and chevron or cone pattern stacking;
- four water cannons per stockpile routinely operated to prevent visible dust lift off from stockpile reclaiming activities;
- under belt sprays and belts scrapers on conveyors;
- partially enclosed transfer stations and enclosed dribbler chute on ship loader;

and

- fully contained truck wash facility at Stockyard 1 exit, dry sweep area at Stockyard 2 exit.

Note: The controls listed above are existing at the Premises. Requirements for the operation of water cannons, misting sprays and water cart have been more clearly specified in the Amended Licence to remove ambiguity and ensure consistency with DWER's *Guidance Statement: Setting Conditions*.

Grounds: The existing Licence Holder controls listed above act to contain dust at the source and have been determined to be necessary based on the high level of risk associated with dust emissions from Primary Activities. Placing these controls on the Licence requires the continued use of dust abatement infrastructure and equipment and ensures regulatory oversight.

The determination of visible dust is subjective in nature and is therefore unenforceable. In addition, not all dust that presents a risk to human health is visible. Therefore specified minimum standards relating to the operation of dust control infrastructure have been applied to the Licence.

8.2.2 Wash water and stormwater management

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

- stormwater from Stockyard 1 captured on land directed to a lined stormwater recirculation pond with 50,000m^3 capacity.
- stormwater from Stockyard 2 captured on land directed to stormwater settlement sump and pond. The stormwater settlement pond designed to contain 1 in 10 year, 24-hour rainfall event. Stormwater pond connects to the recirculation pond;
- berth is designed to prevent direct drainage of stormwater into the marine environment through bunding and to contained drainage system;
- stormwater discharge points restricted to:
    - W12 - Stormwater outlet;
    - W13 - Emergency overflow discharge point from recirculation pond; and
    - W14 - Controlled discharge point from recirculation pond, activated in the event of rainfall greater than the ponds capacity; and
- road sweeper which is operated on trafficable areas including ring road and berths and is used at least twice a day.

Note: Specified infrastructure requirements derived from those currently undertaken by the Licence Holder. When water levels within the Recirculation Pond rise to within 300mm of the overflow sump at W13 and/or W14, surface water monitoring is required to occur at a monthly frequency. Discharged water volumes will also need to be calculated based off rainfall data.

Grounds: 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. Specified actions have been applied to the Amended Licence as discussed in section 8.5.1 to address risks to the marine environment associated with chromite ore handling.

Sampling of water within the Recirculation Pond must be taken from the surface layer to ensure that water quality is representative of that potentially discharged.

8.2.3 Dust and water management infrastructure and equipment – amendment 2020

Dust management

Additional infrastructure and equipment conditions have been added to the Amended Licence to require the Licence Holder to maintain a Dust Control Equipment Inventory and for any changes to the inventory not result in a net increase in risk of dust.

Amended Licence conditions for a Dust Control Equipment Inventory ensure that overall dust controls are not reduced, consistent with other category 58 licences in Port Hedland and necessary based on the high risk of dust emissions.

Further controls that have been applied through the Amended Licence include the operation of a water cart where visible dust is generated and water cannons are ineffective; and where vehicle movement has occurred in the hour prior to management trigger criteria being met. Also incorporated to the Amended Licence is the requirement to maintain the availability of dust control infrastructure at a rate at or above 90% when handling ore.

Note: Based on historic reports received by DWER of moisture content not being achieved for iron ore and to a lesser extent manganese, sprays at stackers and at bunkers will be required at all times when handling iron and manganese ores. The operation of under-belt sprays will be required whenever there is carry back of ore. Water cannons and water cart at ore stockpiles will need to be available for operation during in-loading, reclaiming and prior to out-loading to prevent dust lift-off as a result of transport via FELs.

Controls additional to those proposed by the Licence Holder have also been applied to the Licence for the management of ore moisture content (refer to section 8.3) and dust generation from FEL movements.

Wash water and stormwater management

Changes have also been made to include the authorisation of minor spills within the specified emissions section of the Licence. A minor spillage is defined as

“Means a spillage of material or substances that:

a) *can be reasonably expected to not contain chromite and/or hydrocarbons;*

b) *does not enter the marine environment or native vegetation; and*

c) *does not result in an Unreasonable Emission, Pollution, Material Environmental Harm or Serious Environmental Harm.”*

The purpose of inserting this definition to the Amended Licence is to reduce the amount of spill reports received where the spill is unlikely to result in environmental impact. This change follows the large number of spill event reports received by DWER since the issue of the Reviewed Licence where no further action was required following DWER’s determination that impacts were likely to be insignificant or negligible.

An example of a previously reported event includes the discharge of approximately 50 litres of washdown water containing iron ore and spodumene sediment that was overflowed from a sump and onto unsealed ground. Wash water then drained off the Premises and onto a sealed road adjacent to the site where it evaporated and infiltrated into the ground. As both products are inert and have a low leachability, environmental impacts are expected to be negligible.

Note: The Licence Holder will continue to be required to record all spills and for these

records to be made available to DWER on request. The amendment does not apply to discharges to the marine environment, which continue to not be authorised by the Licence. Refer to section 8.5.1 for discussion on specified actions associated with wash water and stormwater discharges.

8.3 Moisture content management, monitoring and reporting

All bulk granular material accepted and handled at the Premises shall be adequately conditioned so to reduce the potential for the generation of fugitive dust during storage, loading, unloading and transportation activities. The adequate conditioning refers to the moisture content of material which must be maintained at or above the DEM level from the point of receipt at the Premises to the time of out loading to a ship. The DEM level is defined as the moisture content at which the dust number is 10.

The methodology to acquire the DEM level is currently AS4156.6 – 2000.

The DEM level is expected to change as product is extracted from different locations in the ore body. Therefore the Licence Holder is required to obtain revised DEM levels at least once per annual period.

The Licence Holder is required to undertake sampling of moisture content to confirm that the material is adequately conditioned. The moisture content must be above the DEM level as the DEM level represents the lowest limit of moisture content. The frequency of monitoring has been based on the season and when elevated levels of dust may be experienced at Taplin Street.

Note: The requirement for Port users (ore producers/mining companies) to achieve DEM is currently required by PPA through contractual arrangements. The Licence Holder is required to obtain the DEM level for all materials and moisture content data for all ore received on the Premises, as measured at the time of dispatch from mine. The Delegated Officer understands that this is currently the most practical approach to achieving adequate DEM concentrations, noting that sample values determined at the mine site do not guarantee that all loads received at the port will reflect this value.

Revised DEM level data can be obtained at any time during the annual period.

Grounds: Maintaining the moisture content of ore at or above the DEM level from the point of receipt at the Premises through to out-loading to a ship is seen as the primary control to reduce the dust generation potential. Moisture content is a critical factor in the generation of fugitive dust. The condition requires the reporting of DEM determination and compliance based on information supplied by Port users. The second part of the condition requires the Licence Holder to confirm that the bulk granular material out-loaded from the Premises contains adequate moisture levels (in comparison to DEM) through sampling and analysis. This allows for a greater degree of certainty that the product is adequately conditioned and can also act to validate the information supplied from Port users.

8.3.1 Moisture content requirements – amendment 2020

Through the process of investigating non-compliances with ore moisture content requirements the Licence Holder has requested that these requirements be revised in part, due to its inability to require Port users to condition ore.

No changes to moisture content requirements have been made. The Licence Holder has a limited ability to increase the moisture content of ore received at the Premises. Stockpile cannons are only likely to increase moisture in the upper layer of stockpiled material and therefore adequate conditioning of ore is necessary to reduce the risk of dust generation during stockpiling and reclaiming.

Note: DWER recognises that the methodology for the determination of a product's DEM level (AS4156.6 – 2000) was originally intended to only be applied to coal. Therefore the

definition of DEM has been amended to include a standard approved by the DWER, should an alternative standard be developed and that is found suitable.

The Licence Holder was required to provide reports on compliance with DEM and any observations on a quarterly basis under the Reviewed Licence. This reporting requirement has been revised to annually through the Amended Licence to align reporting dates. However, the Licence Holder will be required to provide moisture content data for all ore received at the Premises and handled at the time of a Reportable Event exceedance at boundary monitors on a quarterly basis.

Grounds: As discussed in section 7.3.9, the initial risk assessment underestimated the likelihood of dust Risk Events. Based on additional information from moisture content and boundary monitoring, the Delegated Officer has determined the likelihood of dust negatively impacting receptors is likely. Therefore a reduction in dust management controls is not appropriate.

DWER notes that in accordance with section 30(1) of the *Port Authorities Act 1999,* the Licence Holder has legislative power "(c) to control business and other activities in the port or in connection with the operation of the port; and (f) to protect the environment of the port and minimise the impact of port operations on that environment."

8.4 Particulate monitoring requirements

8.4.1 Monitoring requirement

The Licence Holder is required to monitor particulates as PM_{10} through three real time monitors located on the north-west corner and southerly boundaries. Monitoring of manganese and chromium (III and VI) is required at monitoring stations on the west and east side of the Premises. Monitoring is also required to be undertaken at Taplin Street located in the town of Port Hedland (West End).

Note: Boundary monitoring is currently undertaken and reported by the Licence Holder. Action is currently undertaken by the Licence Holder when certain levels of PM_{10} are detected at the Licence Holder's boundary monitoring network.

Monitoring at Taplin Street is currently undertaken by PHIC, with the Licence Holder being a member. The Licence Holder will be required to provide the monitoring results together with a comparison against air guideline value through annual reporting.

Grounds: DWER requires continued monitoring to be undertaken for air quality at the Premises boundary and within the Port Hedland airshed given the current high risk of dust events. Information provided following Reportable Events at boundary monitors and at Taplin Street will assist DWER to identify the possible source, or sources of dust, which will assist compliance determinations and future risk-based decision making.

8.4.2 Particulate monitoring – amendment 2020

Lithium has been added to monitoring parameters listed in the Amended Licence following the Application to load spodumene. There has been no Reportable Event criterion defined in the Amended Licence relating to lithium at this stage.

Amendments have also been applied to the averaging period of PM_{10} concentrations at Taplin Street. This is to ensure the requirements detailed in the Port Hedland Taskforce Noise and Dust Management Plan 2010 are applied and to ensure that a consistent approach is made to all prescribed premises in the area.

The siting of dust monitoring equipment is also acknowledged as not being able to comply with the Australian Standard *AS3580.1.1 Methods for sampling and analysis of ambient air - Guide to siting air monitoring equipment*. Requirements to comply with this specification have been removed whilst requiring the installation of a BAM monitor located 'downwind' of

the Premises when wind is in the direction of sensitive receptors.

This new monitor (M10) will be in replacement of existing monitor M6, which will be removed 12 months from the date of installation of the BAM. From the date of installation of the new monitor and for a period of 12 months, the Licence Holder will be required to review and report on data from both boundary monitors to investigate the impacts to data associated with shifting the downwind monitoring location.

Given that some monitors are positioned below the ground level of the ring road, meteorological data may also inaccurately represent conditions at/from the Premises. Improvements are required to upgrade meteorological equipment at monitoring station M5 to record rainfall and improve compliance with Australian Standard AS3580.14-2014 *Methods for sampling and analysis of ambient air – Meteorological monitoring for ambient air quality monitoring applications*. Proposed boundary monitor M10 will be the only other real-time monitor that maintains compliance with siting standards. Monitor M7 is primarily referred to as a background monitor when wind conditions place receptors in the West End downwind of the Premises. Therefore ambient dust concentrations relevant to an investigation of management trigger alerts will continue to be representative of regional (background) sources when wind is blowing in the direction of sensitive receptors in Port Hedland. Modifications to M7 are not required.

The purpose of improvements to the monitoring network is to ensure that PM_{10} and meteorological data accurately reflects conditions in the immediate vicinity of primary activities.

Monitoring reports

Monitoring reports for Reportable Events are now required to be provided on a quarterly basis as opposed to bi-monthly reporting required by the Reviewed Licence. The Licence Holder will continue to be required to report when PM_{10} concentrations are greater than 145 $\mu g/m^3$ for BAM1020 monitors and E-samplers, but only where wind places sensitive receptors downwind of Premises activities for an extended period during the monitoring period. Manganese reporting is for 3 $\mu g/m^3$ (averaged annually) and 10 $\mu g/m^3$ or any one sample over a 24 hour period.

The Reviewed Licence required the ongoing monitoring of chromium as Cr III and Cr VI. Given the Licence Holder has not handled chromite since March 2014 and PM_{10} concentrations are consistently low or below the limit of detection, this requirement has been removed from the Amended Licence. The Licence Holder will be required to resume monitoring chromium at boundary monitors every sixth day from the date of chromite handling recommencing at the Premises (from the date of the Amended Licence).

In addition, the Reviewed Licence required quarterly reporting of moisture content and bi-monthly reporting of Reportable Events. The Amended Licence aligns reporting dates requiring all monitoring data for moisture content, boundary air quality monitoring and ambient air quality monitoring results to be provided at the same time (quarterly).

As noted in section 4.8 the level of attribution required to trigger corrective action in response to a Reportable Event is not clear in the Reviewed Licence. Therefore the reporting triggers based on attribution levels have been removed from the Licence. The Licence Holder is still required to present findings of the Reportable Event investigation, which includes a determination of the Licence Holder's overall contribution to the event based on an assessment of upwind boundary monitoring data.

An additional requirement has been added to the Licence for the Licence Holder to provide a description of all Primary Activities in the 24 hours preceding the Reportable Event. The Licence Holder will also be required to notify DWER of events where the Taplin Street ambient air quality monitor identifies that PM_{10} exceeds 70$\mu g/m^3$ over a 24-hour period (measured midnight to midnight).

8.5 Other Licence changes (Amendment 2020)

8.5.1 Specified actions

Management triggers

Conditions have been added to the Licence to trigger management actions for dust control in response to elevated short-term PM_{10} concentrations at Taplin Street where the Premises may be a contributing source.

Note: Management actions will only be triggered where the wind direction places the Premises upwind of the Taplin Street monitor for the majority of the recording period and where background monitors, Yule and BoM, are not experiencing PM_{10} concentrations greater than ≥100 µg/m^3 for the same period; and 'upwind' boundary monitors M5 and M7 have a lower PM_{10} concentration than M10 (once installed).

Grounds: Management actions that are responsive to high dust concentrations at the receptor serve to reduce the likelihood of longer-term (24-hour) exposure to PM_{10} concentrations that exceed the air guideline value. These conditions have proven successful in reducing the number of exceedances at Taplin Street since first being implemented on other port operator licences in 2018.

Management trigger criteria is targeted at reducing dust from all premises that may be contributing to dust concentrations at receptors. The arc of influence is small and limits the potential for contribution from outside influences. To ensure that the Licence Holder does not significantly contribute to high dust levels in the interim of the BAM at M10 being installed, management actions will need to be enacted when all other criteria are met. As the monitor at M6 is not downwind of Premises activities during the specified wind conditions, it cannot be considered in management trigger criteria.

It is worth noting that management criteria set against wind arcs is not a perfect solution to responding to Premises impacts on receptors. For example, this method may limit the recording of, and response to dust events occurring at receptors during wind directions beyond the 'arc of influence'. This may occur where dust from the Premises moves in an arcing fashion as wind direction swings. Wind arcs may also not capture impacts from lift-off of settled dust from the Premises that is deposited and/or lifted during wind conditions beyond the arc of influence.

As was identified in DWER's LiDAR report 2017 it is also possible that plumes from the Premises miss the downwind monitor. In such instances it is possible that the Premises could be a significant contributor to ambient concentrations at West End receptors and no dust management measures are triggered.

It is also possible that during high dust events other operations may contribute to high dust levels under the specified wind arcs. In the absence of a suitable alternative management responses, the use of these conditions on all port operating licences works to safeguard against impacts to receptors from high risk events. As the Licence Holder operates in a cumulative air shed where risks associated with dust are assessed as 'high', all contributions to dust concentrations in that wind arc must be addressed.

For these reasons, additional controls for the management of dust from the Premises are required.

Static Stockpile management

Specified actions have been placed on the licence based on the proposed applicant controls submitted as part of the Application received in March 2017. The specified action relates to the sealing of stockpiles that have been left unattended for six weeks or more. The Licence Holder will be required to apply a physical barrier or chemical stabiliser to stockpiles that

have become ‘static’.

A static stockpile refers to any Iron Ore stockpile that has been stacked and not reclaimed for a period of six weeks or more.

Following this six week hold time either a physical barrier or stabilising chemical must be applied to the outer layer of the stockpile or the Licence Holder must be able to demonstrate that the stockpile has a moisture content above the DEM level.

Note: The stockpile restrictions have been applied following the licence amendment application submitted to increase throughput at the Premises. The application of physical barriers or chemical stabilising material is in replacement of the standard operating procedure to apply water to stockpiles via water cannons. Further, the condition does not apply where the Licence Holder can demonstrate that the moisture content of stockpiled material is at or above the specified DEM level.

The specified action also excludes those stockpiles that are 5,000 m^3 or less.

An additional condition has been applied to prevent the movement of stockpiles for the purpose of avoiding the time based restriction.

Grounds: The condition requires the shipping or sealing of drying stockpiles within sufficient time to avoid an increase in ambient PM_{10} concentrations in the West End where there is greater likelihood of health criteria being exceeded due to the area’s proximity to Category 58 activities.

Stockpiles that are 5,000 m^3 or less are expected to have a lower profile that sits below the level of the ring road, which offers a barrier to wind. Smaller stockpiles will continue to have water applied to them by water cannons that are required to be routinely operated across the Premises.

The exclusion of ore that has a moisture content above DEM has been determined by the Delegated Officer to be acceptable on the grounds that the Licence Holder remains compliant with other dust management controls specified on the Licence.

The Delegated Officer has determined it necessary to apply these management actions on the Licence to reduce the assessed ‘High’ risk of dust impacts to sensitive receptors.

Wash water and stormwater management

Risks to the marine environment have been reviewed to consider risks associate with the handling of chromite ore. Although chromite ore has not been handled at the Premises since 2014, the Amended Licence authorises the handling of this product. Therefore conditions have been applied to ensure that following chromite ore shiploading, the berth is washed down and wash water is captured to ensure that it does not enter the recirculation pond from where it may potentially discharge into the environment.

Note: The Licence Holder will be required to monitor the water quality of the recirculation pond on a quarterly basis when a discharge occurs to ensure regulatory oversight of discharges to the Port Hedland Inner Harbour and inform future risk assessments. Water quality will be assessed against ANZECC criteria for chromium (III and VI) and manganese. Lithium and iron are also included in the parameters monitored.

Grounds: Hexavalent chromium in its dissolved state presents a risk to marine species due to its potential mutagenic, carcinogenic and teratogenic effects. Discharge points W12 and W14 allow overflow water to enter the Port Hedland Inner Harbour.

Risks to the marine environment from iron ore, spodumene and manganese have been assessed as medium and can be managed by existing and proposed controls that have been placed on the Licence. As chromite ore is not currently handled at the Premises, monitoring frequency has been set as quarterly as opposed to monthly. Monitoring frequencies may be increased where chromite ore handling recommences, or further risks

are identified.

8.5.2 Throughput limits

Cumulative throughput limits for bulk granular material have been applied to the licence as maximum annual loading throughputs.

Note: The throughput limits are applied following the Application submitted to increase throughput at the Premises.

Grounds: Based on the Licence Holder's activities, the close proximity of sensitive receptors to the Premises and the current high levels of dust within the airshed, the risk from fugitive dust have been demonstrated to be high. While it is noted that the throughput may not always directly correlate to emissions, it is considered appropriate based on the level of risk particularly as product is double handled at the Premises (unloaded, stacked, reclaimed and loaded).

It is further noted that based on modelling submitted by the Licence Holder predicted emissions per tonne of material are much higher at the Premises when compared to other port operators (refer to section 4.6.1). The throughput limits have been based on the current maximum daily throughput at the Premises and the annual total throughput as applied through the Application.

8.5.3 Moisture content definition

The Delegated Officer has considered the supplementary request to change the definition of moisture content and has elected to further clarify the definition. The definition has been changed to become consistent with standards developed by the International Organization for Standardization (ISO). Risks to the environment and human receptors are not altered as a consequence of this change.

8.5.4 Boundary monitoring data review

Boundary monitoring has several important functions. It can be used to measure dust concentrations at the premises, trend data over time, compare data from different locations at the premises in relation to operational dust source emissions, offsite dust emissions entering the premises and background dust levels. The data is also useful to compare with dust concentrations recorded at ambient monitors to explore the relationship between dust levels at the premises and at sensitive receptors. While understanding the limitations of such data analyses, they can provide important insights to inform on site dust management, evaluate the effectiveness of dust controls and to review and optimise current practices of Trigger Action Response Protocols.

Conditions have been added to the Licence to include the review of boundary dust monitoring data through a boundary monitoring data review report. The report will examine PM_{10} data from the boundary monitors M5, M6, M7, M8, M9 and the new monitor M10 over a 12-month time period.

Grounds: The boundary dust monitoring data report is required to demonstrate that the objectives of boundary monitoring relating to PM_{10} emissions are met, specifically to verify the setup and location of the new monitor M10 with regards to its effectiveness in providing data capturing premises' dust source emissions, capturing the effects of dust control actions following elevated dust concentration readings and its usefulness for evaluating premises dust contributions to ambient levels by comparing upwind and downwind monitoring results. In addition the review of the monitoring data will support the evaluation of appropriate trigger action criteria and reportable event criteria.

A minimum timeframe of 12 months is required to ensure that data captured reflects the seasonal conditions that strongly influence dust emissions and their impacts.

8.5.5 Trial conditions

Existing infrastructure and management controls at the Premises have been demonstrated through the spodumene ore handling trial to effectively manage risks associated with the handling of this material. The trial period allowed DWER to obtain reliable and detailed data on product quality and ambient air quality following the implementation of controls presented by the Licence Holder through Material Change notifications. Therefore the Delegated Officer has determined that the addition of trial conditions to the Amended Licence is appropriate and necessary to allow for sufficient data collection that allows for a detailed risk assessment of new products proposed for handling through the Port in the future.

The Delegated Officer has determined that trial shipments not extending beyond 12 months in duration or a cumulative throughput of 10% of total Premises throughputs will provide sufficient information through monitoring data for DWER to conduct a detailed risk assessment of each trialled product.

It is the responsibility of the Licence Holder to determine appropriate handling methods for each product being trialled following demonstrated consideration given to each hazard associated with the trial product. However, DWER reserves the ability to suspend or terminate the trial at any time prior to, or during a trial period where the risk to public health, amenity and the environment is determined by the CEO to be unacceptable or require further, more detailed assessment of the product.

Trial conditions on the Amended Licence prevent the handling of high risk products such as those which contain elevated concentrations of asbestos, respirable silica or radiation. Wastes, or waste-derived products with the exception of clean fill are also not authorised for handling under trial conditions. Based on existing site infrastructure, including the limited ability at the Premises to enclose stockpiles within a shed or transport material within containers/bulka bags, the Licence Holder will also not be permitted to handle any material that has been altered through chemical treatment (flotation, leaching, cyanidation, reaction).

DWER's decision making processes for determining what products are suitable for trial shipments are further detailed in the *Industry Regulation Fact Sheet: Port Authority Trial Shipments* (Category 58 and 58A), which is available at DWER's website (www.dwer.wa.gov.au).

Category 58A has also been applied to the licence to authorise the loading of salt products and other evaporites such as gypsum and potash[2] under trial conditions. The Delegated Officer notes that this is an administrative amendment that does not increase the risk of bulk material handling at the Premises.

No increase in daily throughputs is authorised through the addition of Category 58A or trial conditions to the Amended Licence. As with any other trialled product, should the Licence Holder plan to ship salt on a continued basis, a licence amendment would be required to handle the product beyond the trial period. An assessment would be required following such an application to determine the appropriateness of applying throughput limits. Any tonnages of salt products shipped from the Premises will be included within the total authorised tonnes (24.1Mtpa) listed in the Amended Licence.

The conditions in the Revised Licence have been determined in accordance with DWER's *Guidance Statement: Setting Conditions*.

8.5.6 Other administrative changes

Investigations of biodegradable hydraulic oils being discharged from ship anchoring units

[2] Depending on the method of production/extraction, gypsum and potash products may be better described as evaporites and more closely align with a salt product.

into the Port Hedland Inner Harbour (see section 4.5.1) have identified that reporting timeframes specified in the Reviewed Licence are not in keeping with the EP Act and have limited DWER's ability to respond in a timely fashion. Section 72 of the EP Act requires the Licence Holder to notify DWER as soon as practicable of any discharge of waste not in accordance with Licence conditions and likely to cause pollution or environmental harm, whether discharged as a result of an emergency, accident or malfunction. Therefore conditions relating to the reporting of these incidents have been removed and are superseded by general provisions of the EP Act.

Other administrative changes to the Licence have been made as informed by site inspections by DWER officers on 1 and 2 May 2017 and 31 October 2018. Both inspections identified the need for a number of minor Premises details and operational descriptions to be updated, to reflect current operations.

The requirements to respond to CEO requests within 7 days has been amended to require a response from the Licence Holder within 7 days *unless agreed to with DWER*. This is to ensure a timely response but also allow for instances where time constraints limit the quality of information received. For example, DWER may request unvalidated monitoring data within 7 days and offer a 14 day time limit to allow for data to be validated. Due to the significant community interest in Category 58 activities in Port Hedland, it is not appropriate to provide longer timeframes for information gathering in most instances.

Further, the requirement to obtain a monitoring data recovery rate of at least 90% has been clarified as being 90% over a quarterly period, in line with requirements for *Data Collection and Handling*.

These changes do not increase or decrease the level of risk associated with authorised Premises activities or the regulatory requirements of the Licence Holder to comply with the Licence.

9. Setting conditions

The conditions in the Issued Licence have been determined in accordance with DWER's *Guidance Statement on Setting Conditions*.

DWER's *Guidance Statement on Licence Duration* has been applied and the Issued Licence expires in 20 years from date of issue.

Table 35. Grounds for applied conditions

Condition Ref	Grounds
Emissions 1	This condition is valid, risk-based and consistent with the EP Act.
Trial shipments 2, 3, 4, 5, 6 and 7	These conditions are valid, risk-based and in accordance with DWER's *Guidance Statement: Setting Conditions*. Refer to section 8.5.4 of this Decision Report.
Infrastructure and equipment 8, 9, 10, 11, 12, 13 and 14	These conditions are valid, risk-based and contain appropriate controls (see section 8 of this Decision Report).
Bulk granular material limits 15, 16 and 17	These conditions are valid, risk-based and consistent with the EP Act.
Moisture Content monitoring and reporting 18, 19, 20, 21 and 22	These conditions are valid, risk-based and consistent with the EP Act.
Air quality monitoring and Reportable Events 23, 24, 25, 26 and 27	These conditions are valid, risk-based and consistent with the EP Act.

Specified actions 28, 29, 30, 31, 32, 33 and 34	These conditions are valid, risk-based and consistent with the EP Act.
Stormwater and industrial wash water monitoring 35	This condition is valid, risk-based and consistent with the EP Act.
Record-keeping 36, 37, 38 and 39	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.

10. Applicant's comments on risk assessment

The Applicant was provided with the draft Amended Licence and Decision Report on 9 August 2019 for review and comment. The Licence Holder responded on 18 October 2019 with the following comments on the draft Amended Licence.

Following significant changes to the draft Amended Licence, the Licence Holder was offered another opportunity to provide comment on 6 February 2020.

Comments and DWER responses are provided in Appendix 3.

11. Conclusion

This assessment of the risks of activities on the Premises has been undertaken with due consideration of a number of factors, including the documents and policies specified in this Decision Report. This assessment was also informed by a site inspections by DWER officers in May 2017 and October 2018.

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

Christine Hass

Digitally signed by Christine Hass
Date: 2020.05.11 10:08:52 +08'00'

Christine Hass
Manager, Licensing (Resource Industries)
delegated Officer under section 20 of the *Environmental Protection Act 1986*

11 May 2020

Appendix 1: Key Documents

Documents assessed and considered in review and amendment:

	Document Title	Availability
1.	Air Assessments (2016), Port Hedland Cumulative Air Model: Peer Review Report to the Cumulative Air Modelling Subcommittee, March 2016.	DWER records (A710529)
2.	ATDSR, Toxilogical Profiles, Chapter 3: Toxilogical Profile for Manganese, September 2012.	Accessed at: https://www.atsdr.cdc.gov/toxprofiles/tp151-c3.pdf
3.	ATDSR, Toxilogical Profiles, Chapter 3: Toxilogical Profile for Chromium, September 2012.	Accessed at: https://www.atsdr.cdc.gov/toxprofiles/tp7.pdf
4.	Australian and New Zealand Environment and Conservation Council (ANZECC) and Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ), October 2000, Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Volume 1, Chapters 1-7.	Accessed at: https://www.environment.gov.au/system/files/resources/53cda9ea-7ec2-49d4-af29-d1dde09e96ef/files/nwqms-guidelines-4-vol1.pdf
5.	Australian Bureau of Statistics (2016a) 2016 Census QuickStats: South Hedland. Code SSC51361	Accessed at: www.quickstats.censusdata.abs.gov.au
6.	Australian Bureau of Statistics (2016) 2016 Census QuickStats: Port Hedland. Code SSC51248	www.quickstats.censusdata.abs.gov.au
7.	Australian Institute of Marine Science (AIMS). (2009), Fate and effects of oil and dispersed oil on mangrove ecosystems in Australia.	Accessed at: https://apps.aims.gov.au/metadata/view/32df6034-13ec-44d9-8c17-a20c50d77dd4
8.	BHP (2018) BHP Billiton Iron Ore Pty Ltd – Annual Environmental Report – July 2017 to June 2018.	DWER records (A1724228)
9.	DER Licence L4432/1989/14 – Port Hedland Port	Accessed at: http://www.dwer.wa.gov.au
10.	DER Works Approval W4520/2009/1–Utah Point Berth Project	DWER records
11.	DER Works Approval W5201/2012/1 – Utah Point Berth Facility Stockyard 2 Interim Solution	DWER records
12.	DER *Guidance Statement on Regulatory principles* (July 2015)	accessed at http://www.der.wa.gov.au
13.	DER *Guidance Statement on Setting conditions* (September 2015)	
14.	DER *Guidance Statement on Licence duration* (November 2014)	
15.	DER *Guidance Statement on Licensing and works approvals processes* (September 2015)	
16.	DER Compliance Inspection undertaken 11 June 2012	DWER records
17.	DER Compliance Inspection undertaken 2 May 2014	

18.	DER Compliance Inspection undertaken 15 October 2014	
19.	Department of Environment, Pilbara Coastal Water Quality Consultation Outcomes: Environmental Values and Environmental Quality Objectives, March 2006	Accessed at http://www.epa.wa.gov.au/policies-guidance/pilbara-coastal-water-quality-consultation-outcomes
20.	Department of Health, Impact of Dust on Port Hedland, March 2010	Accessed at http://www.public.health.wa.gov.au
21.	Department of Health, 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
22.	Department of Planning (2017) Town of Port Hedland – Town Planning Scheme No. 5 (District Scheme).	Accessed at: https://www.planning.wa.gov.au
23.	Ministerial Statement 788	Ministerial Statement, Report and Bulletin accessed at http://www.epa.wa.gov.au/
24.	EPA Report 1311	
25.	Environmental Protection Bulletin No. 2	
26.	Environmental Technologies & Analytics (2019) Utah Point Air Quality Modelling.	DWER records (A1833063)
27.	Department of State Development (2010) Port Hedland Air Quality and Noise Management Plan, March 2010	Port Hedland Air Quality and Noise Management Plan accessed at http://www.dsd.wa.gov.au/
28.	Hassanshahian, M. and Cappello, S. (2013) Crude Oil Biodegradation in the Marine Environments. IntechOpen.	Available at: https://www.intechopen.com/books/biodegradation-engineering-and-technology/crude-oil-biodegradation-in-the-marine-environments
29.	Iffla Wade (2017) Port Hedland Amendment Applications by BHP Billiton (L4513/1969) and Pilbara Ports Authority (L8937/2015). Submission received 5 May 2017.	DWER records (A1424349)
30.	Jenike and Johanson, January 2017, Dust Extinction Moisture Testing of Lithium Lump Ore, Report 70650-3.	DWER records (A1396013)
31.	Katestone Environmental Pty Ltd (2011) NSW Coal Mining Benchmarking Study: International Best Practice Measures to Prevent and/or Minimise Emissions of Particulate Matter from Coal Mining.	DWER records (hard copy)
32.	Microanalysis Australia, Respirable alpha-quartz concentration analysis by x-ray diffraction (XRD) using the modified SWeRF method, February 2017.	DWER records (A1396013)
33.	Nagrom, Material Safety Data Sheet – Spodumene Sample, February 2017.	DWER records (A1396013)
34.	Nagrom, 2017, Nagrom Metallurgical Report – Lump Ore A #1 P100 50mm	DWER records (A1402294)
35.	Oana, 2006, Chromium Impact on Marine Ecosystem, University of Agronomic Sciences and Veterinary Medicine of Bucharest.	Accessed at: http://journals.usamvcluj.ro/index.php/veterinary/article/viewFile/2516/2465
36.	Pacific Environment Limited (PEL) (2017) Final Report: Pilbara Ports Authority Utah Point Air	DWER records (A1722824)

	Quality Assessment Update, 16 March 2017.	
37.	PHIC (2018) Annual Report – FY 2017-2018 Port Hedland Ambient Air Quality Monitoring Program. Port Hedland Industries Council.	Accessed at: http://www.phic-hedland.com.au/
38.	PHIC (2016) Annual Report – 2015-2016: Port Hedland Ambient Air Quality Monitoring Program. Port Hedland Industries Council.	Accessed at: http://www.phic-hedland.com.au/
39.	PHIC (2015) Annual Report: Ambient Air Quality Monitoring Report to the Port Hedland Dust Management Taskforce (2014-2015). Port Hedland Industries Council.	Accessed at: http://www.phic-hedland.com.au/
40.	PPA (2017) Draft Dust and Wind Alarm Response Procedure Port of Port Hedland.	DWER records (A1459869)
41.	Rocha, A., Canal, E., Campostrini, E. Reis, F. and Cuzzuol, G., 2009, Influence of chromium in Laguncularia racemosa (L). Gaertn f. physiology. Brazilian Journal of Plant Physiology.	Accessed at: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1677-04202009000200001
42.	Safe Work Australia's Workplace Exposure Standards for Airborne Contaminants, April 2013	Accessed at: https://www.safeworkaustralia.gov.au/system/files/documents/1705/workplace-exposure-standards-airborne-contaminants-v2.pdf
43.	Sinclair Knights Mertz (SKM) (2008) Port Hedland Port Authority – Utah Point Berth Project – Public Environmental Review.	DWER record (2013-0000116769)
44.	TPG + Place Match (2017) Estimates of Adverse Dust-Associated Economic and Social Consequences on the West End of Port Hedland in Western Australia. Submission received 8 May 2017.	DWER record (A1424562)
45.	WillyWeather (2018) Port Hedland Wind Forecast.	Accessed at: https://wind.willyweather.com.au/wa/pilbara/port-hedland.html
46.	World Health Organization (2001) Chapter 6.8 – Manganese.	Accessed at: http://www.euro.who.int/__data/assets/pdf_file/0003/123078/AQG2nd_Ed_6_8Manganese.pdf
47.	World Health Organization (1999) Concise International Chemical Assessment Document 12 – Manganese and its compounds.	Accessed at: http://www.inchem.org/documents/cicads/cicads/cicad12.htm

Appendix 2: Changes to the Reviewed Licence

Reviewed Licence condition (former)	Amendment condition number	Changes made
Licence amendment 2020		
Environmental compliance Condition 1	N/A	Condition removed due to unnecessary duplication with existing requirements of the EP Act.
Notification of Material Change Conditions 2 to 4	N/A	Conditions presented an unacceptable risk (refer to section 4.2.1) and therefore have been removed.
Trial shipments N/A – new conditions	2 to 7	Additional conditions applied to authorise the trial shipment of new products under specific requirements for monitoring, duration, throughput, reporting and restrictions. Refer to *Fact Sheet: Port Authority Trial Shipments* on DWER's website.
Infrastructure and equipment Conditions 5 and 6	8 to 14	Conditions 5 and 6 replaced by condition 8, which combines the two former conditions. Conditions 9 and 10 have been applied to the Amended Licence to ensure that all dust control equipment is maintained and where removed, is replaced with equipment that provides the same or greater levels of dust control. Condition 11 has been applied to ensure that all dust control equipment is available at a minimum rate of 90% of the time at which it is required. Conditions 12, 13 and 14 are new conditions to require the installation of a rainfall gauge at the Premises and improve/install new dust and wind monitoring equipment such that they provide data that better reflects the meteorological and dust conditions in close proximity to the Premises.
Bulk granular material specifications N/A – new conditions	15, 16 and 17	Condition 15 has been applied to specify what materials are authorised for ongoing handling at the Premises, as risk assessed through this Decision Report. Condition 16 limits the throughput amounts of bulk materials handled at the Premises over any 24 hour and annual period.

Reviewed Licence condition (former)	Amendment condition number	Changes made
		Condition 17 has been added to require quarterly reporting whenever throughputs exceed 120,000 tonnes in a 24 hour period.
Moisture content monitoring and reporting Conditions 7 to 11	18 to 22	Former conditions 7, 8, 9, 10 and 11 have been renumbered to conditions 18, 19, 20, 21 and 22. Minor administrative amendments have been made for clarity and consistency with other conditions of the Amended Licence.
Dust monitoring and Reportable Events Conditions 12 to 15	23 to 27	Section heading changed to “Air quality monitoring and Reportable Events”. Former condition 12, now conditions 23 and 24, amended to include speciation monitoring for lithium and meteorological monitoring requirements. Condition 25 and 26 (new conditions) inserted to require the investigation and reporting of M6 monitoring data against the new M10 monitor, once installed. Former conditions 13, 14 and 15 are replaced by condition 27. Reportable Events at the Premises boundary have been redefined as those periods where winds place sensitive receptors in the West End downwind of Premises activities for a cumulative time of 25% of the averaging period. Reporting time frames aligning with quarterly reporting for conditions 17 and 21.
Condition 16	1	Condition relocated to the beginning of the Amended Licence. Text that is ambiguous and duplicative with defences detailed under s74A of the EP Act has been removed.
Specified actions N/A – new conditions	28 to 34	Specified actions have been applied to the Amended Licence for the purpose of reducing risks associated with dust and stormwater. Refer to section 8.5.1.
Stormwater and industrial wash water monitoring N/A – new condition	35	Condition 35 has been applied to the Amended Licence to ensure discharged water quality is known.
Information Conditions 17 to 21	36 to 39	Condition 18 is deleted. Conditions 36 and 39 (former conditions 17 and 20) have been updated to reflect the information requirements of the Amended Licence.

Reviewed Licence condition (former)	Amendment condition number	Changes made
		Condition 38 (former condition 21) has been amended to provide flexibility in the response timeframe to a Departmental Request where requested by the Licence Holder and agreed to by the CEO.
Schedule 2: Primary Activities	Schedule 2	Addition of Category 58A to Table 7. Amendments to the authorised throughputs specified in Table 9. Removal of all reference to Material Change.
Schedule 3: Infrastructure and equipment	Schedule 3	Additional dust control equipment requirements.
Schedule 4: Monitoring	Schedule 4	Section renamed “Quarterly Reporting” Further information requirements applied for periods where Reportable Events occur.
Figure 3: Premises wind vector to Taplin Street N/A – new figure	Figure 3	New figure.
Schedule 5: Boundary monitoring review report	N/A	New schedule.
Schedule 6: Boundary monitoring data format	N/A	New schedule.

Appendix 3: Summary of Applicant's Comments on Draft Conditions

Condition/ Section	Summary of Licence Holder comment	DWER response
Licence number (page 1)	PPA suggests the licence number for this amended licence be amended to read "L8937/2015/2".	Noted. It is DWER's practice to update the licence number only at the time of licence reissue following expiry.

Definitions – AS3580.14-2014	PPA queries whether DWER requires wind data to be compliant to AS3580.14-2014 (the Standard)?
	PPA advises that:
	• PPA currently monitors wind speed and direction at each continuous dust monitor, however this monitoring may not be compliant to the Standard given that:
	  ○ siting of equipment may not be compliant to the Standard, specifically due to height and distance from obstructions; and
	  ○ calibration of instruments (although calibrated annually) may not be compliant to the Standard.
	• PPA can provide DWER with wind data from the monitoring referred to above, noting that it may not be compliant to the Standard.
	• If DWER requires wind data to be compliant to the Standard, then PPA would request a 6 month implementation period, in order to identify and prepare compliant sites, and procure compliant equipment.
		Noted. According to Australian Standard AS3580.14-2014, wind speed and direction recordings may differ significantly from the actual meteorological conditions if equipment is not sited correctly. Meteorological parameters, particularly wind, may vary significantly over distance, even over tens of metres. If DWER is to assess compliance against Reportable Event criteria, it is necessary that at least one wind monitor be sited in accordance with the Australian Standard for measurement heights. While other meteorological monitors should remain, their compliance against standards must documented and acknowledged in data review and interpretation.
		The current height of dust monitor inlets suggests that data received is not likely to accurately reflect localised conditions/dust concentrations from the Premises, particularly at M6, which is intended to be a downwind monitor for West End receptors. The purpose of dust monitors is to identify dust from the Premises and therefore further improvements are required to monitoring equipment.
		Conditions have been added to the Licence to require improvements to meteorological monitoring equipment by 30 September 2020; and for the inlet of non-compliant dust monitors to be raised to above the ground level by 31 December 2020.

Condition/ Section	Summary of Licence Holder comment	DWER response
Definitions – ATS5321-2012	PPA refers to the defined term "ATS5621-2012", and notes that that Standard has been superseded by "AS5621:2013". PPA requests that the reference to the Standard be amended to "AS5621:2013".	Amended.
Definitions – CEO	PPA refers to the defined term "CEO", and notes that a former address for DWER is provided. PPA requests that the address be updated.	Amended.
Definitions – Damp	PPA refers to the defined term "Damp", which PPA notes is used in the following sections of the Draft Licence: o in the defined term "Routinely Operated", which is used in Row 1 of Table 10 in Schedule 3 (in connection with the Site Infrastructure "Stockyard"); and o Row 7 of Table 10 in Schedule 3 (in connection with the Site Infrastructure "Water Carts"). PPA requests that the defined term "Damp" is deleted from the Draft Licence for the following reasons: o The term "Damp" as a measure is subjective. One person's view may vary to another person's view. The measure is therefore not capable of being quantified or of capturing auditable evidence. o The definition of "Damp" refers to "moist to the touch". In order for product to be touched to determine whether it is moist would require personnel to enter into the stockyard area, which contains operating heavy mobile equipment (ie. front end loaders). Personnel interacting with operating heavy mobile equipment in the stockyard area presents an avoidable safety risk to personnel. o PPA considers that the use of the term "Damp" in the Draft Licence (in Rows 1 and 7 of Table 10 in Schedule 3) can be replaced by other measures, as described below in relation to those sections of the Draft Licence.	Noted. It is agreeable that the defined term 'Damp' remains somewhat subjective. The original wording "until small puddles just start to form" has been reinstated with the intent that this means for puddles to form across each localised area of water application. That is, should small puddles start to form around Stockpile 1 and not around Stockpile 2, the operation of water cannons around Stockpile 2 would be required in accordance with conditions of the Licence. Note that the operation of the water cart is required where water cannons are unable to wet the stockyard floor to the point where small puddles start to form and dust is being generated during reclaiming activities and when triggered by management trigger criteria at Taplin Street.
Definitions – Minor Spillage	PPA refers to the defined term "Minor Spillage", and notes the inclusion of the words "to a cleared area of land" within the term. PPA notes that the term "Minor Spillage" is used in the following sections of the Draft Licence:	Noted. Determination of what is an 'Unreasonable Emission', 'Pollution', 'Material Environmental Harm' or 'Serious Environmental Harm' is typically at the discretion of the CEO. This is to safeguard against the

Condition/ Section	Summary of Licence Holder comment	DWER response
	○ Condition 1: Table 2 in connection with Authorised Specified Emissions; and ○ Condition 29 (Record-keeping) PPA requests that the words "to a cleared area of land" be deleted from the term, for the following reasons: ○ The intent of the term is to identify spillages that are "trivial or negligible in nature" and do not result in "an Unreasonable Emission, Pollution, Material Environmental Harm or Serious Environmental Harm". ○ PPA does not consider that a spillage which is "trivial or negligible in nature" and which does not result in "an Unreasonable Emission, Pollution, Material Environmental Harm or Serious Environmental Harm" should fall outside the definition of "Minor Spillage", only for the reason that the spillage does not occur on "a cleared area of land". ○ PPA provides the example of a small amount of iron ore wash down water being spilled from a wharf or conveyor into the harbour. This would be "trivial or negligible in nature" and would not result in "an Unreasonable Emission, Pollution, Material Environmental Harm or Serious Environmental Harm". However, this would not come within the Authorised Specified Emissions in Table 2 of Condition 1, and under Condition 29(b) PPA would not be required to maintain a record of this spillage. ○ With regard to spillages into the harbour, PPA notes that: ○ iron ore, manganese and spodumene are not soluble in water and have low toxicities in the marine environment; and ○ any short-term increase in turbidity due to minor spillage directly to the harbour would be negligible compared to the turbidity caused by tides and 24/7 marine operations. PPA requests that the definition of "Minor Spillage" be amended, by deleting the words "to a cleared area of land", to read as follows: *"means spillage of material or substances that is trivial or negligible in nature and does not result in an Unreasonable Emission, Pollution, Material Environmental Harm or Serious Environmental Harm."*	potential for conflicting risk determinations between the Licence Holder and DWER the condition has been amended to clarify what may be determined a 'minor spillage'. The types of products currently handled at the Premises limits the potential for toxic contaminants to seep to groundwater and seep to the marine environment, assuming hydrocarbons continue to be present only in very low concentrations. However, any discharge to the marine environment that is not trivial in volume should continue to be reported to DWER. All spills should be recorded by the Licence Holder.

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	Supplementary response provided 20 March 2020: PPA does not consider that a spillage which does not result in "an Unreasonable Emission, Pollution, Material Environmental Harm or Serious Environmental Harm" should fall outside the definition of "Minor Spillage", only for the reason that the spillage enters the marine environment or native vegetation. With regard to spillages into the harbour, PPA notes that: • iron ore, manganese and spodumene are not soluble in water and have low toxicities in the marine environment; and • any short-term increase in turbidity due to minor spillage directly to the harbour would be negligible compared to the turbidity caused by tides and 24/7 marine operations • Utah berth is designed to contain all water flows, therefore the occurrence of discharge events is not routine, and PPA would continue to record any events as incidents in PPA's internal incident management system, and take measures to prevent re-occurrence.	Noted. DWER notes that PPA would be required to record all spillage events as incidents in PPA's internal incident management system, and that this would be inspected at the time of inspection. For the reasons above, PPA will continue to be required to report all spillages to the marine environment and native vegetation. No changes made.
Definitions – Routinely Operated	PPA refers to the defined term "Routinely Operated", and requests that the term be amended to revert to the meaning given in Row 1 of Table 6 of Schedule 3 of the existing Licence. Row 1 of Table 6 of Schedule 3 of the existing Licence states: *"Routinely means at a minimum sequence to run at least:* ○ *every 3 hours during the day;* ○ *every 6 hours during the night; or* ○ *until small puddles just start to form as a result of rainfall or use of cannons."* PPA requests that the term "Routinely Operated" be amended: ○ to remove reference to the term "Damp", for the reasons set out above; and ○ to reinsert the word "or" after the words "every 6 hours during the night", otherwise the term lacks meaning.	Amended.

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	That is, PPA requests that the term "Routinely Operated" be amended to read as follows: *"for the purposes of stockyard cannons described in Schedule 2 means to be operated at a minimum frequency of at least:* (a) *every 3 hours during the day;* (b) *every 6 hours during the night;* ***or*** (c) *until* ***small puddles just start to form*** *as a result of rainfall or use of cannons or water carts."*	
	Supplementary response provided 20 March 2020: The definition of "Routinely Operated", which is applicable to water cannons, should not apply to the operation of the water cart. Given the frequency requirement for the operation of water cannons, the water cart (only one water cart operates at the Utah Point facility) will only be operated in circumstances where a water cannon is not operating.	Amended to require the operation of the water cart in the event that management trigger criteria for Taplin Street is observed.
Definitions – Static Stockpile	PPA refers to the defined term "Static Stockpile", and notes that the term is used in Conditions 22 and 23 of the Draft Licence (Static Stockpile management). PPA requests that the term "Static Stockpile" be amended to include a minimum volume, which PPA proposes be 5,000m^3, given that the risk of dust emissions from a stockpile less than this volume is very low, for the following reasons: ○ a stockpile less than 5,000m^3 would be sheltered by the elevated walls of the ring road, which substantially reduces the risk of dust emissions; ○ the stockpile is still subject to the watering requirements under the Licence, which when applied to a small stockpile are likely to cause a high level of moisture infiltration within the stockpile, further reducing the likelihood of dust emissions. PPA requests that the term "Static Stockpile" be amended to read as follows: *"refers to any ore stockpile, with a volume greater than 5,000m^3, that has been stacked and not reclaimed for a period of six weeks or more"*	Noted. For the reasons provided, the definition for 'Static stockpile' has been amended.

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Emissions - 1	PPA refers to the Exclusions/Limitations/Requirements in Column 2 of Table 2, for the Specified Emission "Fugitive dust", which includes the words: "Subject to compliance with: Conditions 2 to 27". PPA notes that Condition 26 is not a condition that minimises dust emissions, but rather refers to capturing stormwater and wash water in connection with chromite. PPA requests that this reference to Condition 26 in Column 2 of Table 2 be deleted, so that Column 2 relevantly states: *"Subject to compliance with:* o *Rows 1 to 8 of Table 10 in Schedule 3; and* o ***Conditions 2 to 25, and 27**."*	Amended.
Emissions - 1	PPA refers to the Exclusions/Limitations/Requirements in Column 2 of Table 2, for the Specified Emission of "Washwater Discharges, stormwater Discharges and Minor Spillage of material related to the Primary Activities on the Premises", which includes the words "Discharge only from the Discharge Points specified in row 12 of Table 10 in Schedule 3". PPA notes that the effect of these words is that a spillage may only constitute an authorised Minor Spillage if it originates from the discharge points specified in row 12 of Table 10 in Schedule 3 (being stormwater discharge points W12, W13 and W14). PPA considers that this would result in unnecessary and excessive reporting of minor spillages which are trivial or negligible in nature, and which do not result in an Unreasonable Emission, Pollution, Material Environmental Harm or Serious Environmental Harm. PPA requests that the words "Discharge only from the Discharge Points specified in row 12 of Table 10 in Schedule 3" be deleted from Column 2 of Table 2, for the reason that a Minor Spillage should be an authorised emission, even though it does not originate from the stormwater discharge points W12, W13 or W14 (for example, an overflow of washdown water from sump ST7 to the adjacent BHP roadway).	Noted. Minor spillages have been separated to a different row acknowledging that Minor Spillages may occur from other sources related to Primary Activities.

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	Given that the other Exclusions/Limitations/Requirements in Column 2 of Table 2, for the Specified Emission of "Washwater Discharges, stormwater Discharges and Minor Spillage of material related to the Primary Activities on the Premises" do not relate to "Minor Spillage", PPA requests that a new row is inserted in Table 2 for Minor Spillages, which are not subject to any Exclusions/Limitations/Requirements.	
Trial shipments – 4	PPA refers to Condition 4 of the Draft Licence, and notes the words "The duration of any trial must not exceed:…". PPA also notes the words in similar Condition 4 of Licence Number L4432/1989/14 (in respect of PPA Eastern Operations), which states "The Trial must cease:…" PPA requests Condition 4 of the Draft Licence be amended to read "The Trial must ~~not exceed~~ cease…" for the reason that the Condition lacks meaning if this amendment is not made.	Amended.
Infrastructure and equipment – 11	PPA seeks to amend Condition of the Draft Licence - See Attachment 1.A (A.1) for supporting information. In summary, PPA refers to the term "Average Monthly Availability" PPA interprets the proposed Condition to refer to equipment being 'available to operate' (that is, capable of operating), however PPA requests that DWER confirm this. In addition, PPA requests that a 12 month implementation timeframe be offered due to the manual operation of some equipment and multiple owners/operators of various equipment making it difficult to calculate availability rates. Twelve months would allow for the introduction of automated equipment and to ensure sprays and cannons are achieving the required availability.	Noted. It is considered that being 'available to operate' (that is, capable of operating) and 'actually operating' when equipment is required to operate to be one and the same. The intent of the definition is for equipment to be considered unavailable if it is not operating when it is required to be operating. This includes planned and unplanned outages and equipment being unavailable due to scheduled maintenance. Further clarification has been provided in the definition. It is accepted that the Licence Holder be required to be able to calculate and achieve the availability rate by 31 December 2020.
Infrastructure and equipment – 13	*Supplementary response provided 20 March 2020:* PPA proposes to upgrade the meteorological equipment at the Utah North (M5) monitor only (see Attachment A1). Given the location of the other sites it will be very difficult to make the required changes to the equipment, particularly the	Amended.

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	installation of a 10m mast for a wind sensor, at M6 and M7. Given the lower elevation of these sites, PPA considers the siting of 10m towers at these locations would be inconsistent with the intent of the AS3580.14-2014. PPA also considers that the limited distance between each of the current monitoring sites does not warrant site specific compliant weather monitoring capabilities.	
Infrastructure and equipment – 14	*Supplementary response provided 20 March 2020:* Utah South M6 and Utah West M7 are located outside the Premises boundary within the natural mangrove areas adjacent to and below the Ring Road at Utah Point. PPA has consulted with its air quality monitoring consultant Ecotech and advises that it is not possible to simply raise the inlet elevations at M6 and M7. PPA notes there are currently no obstructions obscuring the Utah North M5 inlet. [Detailed reasoning provided on DWER record – A1878045].	Noted. DWER accepts that M6 and M7 cannot reasonably and practicably be modified to comply with Australian Standards without further disturbance to mangroves. In addition, that possible modifications to monitor M7 will only achieve an inlet height at approximately 0.5m above the height of the ring road and that existing nearby obstruction (the shipping marker) would remain. Monitor M7 is primarily referred to as a background monitor when wind conditions place receptors in the West End downwind of the Premises. Therefore ambient dust concentrations from regional (background) sources may still be captured when wind is blowing in the direction of sensitive receptors in Port Hedland. Modifications are not required for M7.
	Supplementary response provided 20 March 2020: If DWER's intent is for boundary monitoring stations to be compliant with the Australian Standard and more appropriate to site features (given the limitations - environmental and technical) as noted above, PPA suggests a new monitoring site to replace the Utah South (M6) dust monitor. PPA has investigated possible locations for a dust monitor at Utah Point using the Source-Pathway–Receptor model and proposes a location (M10). PPA also notes that the proposed site of M10 is located directly east of the "high dust sources"	Accepted. Conditions have been placed on the Licence to require the installation of a monitor at location M10 for the eventual replacement of M6. Monitoring at M6 will continue to be required for a period not less than 12 months to allow for a comprehensive and comparable dataset (to M10) to be obtained prior to its removal.

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	PPA would then propose to operate this site in parallel with M6 for not less than 6 months before decommissioning M6. This would also see the M6 E-sampler decommissioned and replaced with the standard BAM1020 at the proposed new site (M10). This will standardise the monitoring equipment at Utah Point and that used at Taplin Street	
Bulk granular material specifications – 15	PPA advises that throughput is tracked via manual data entry into shift logs, which are kept for the following two 12 hour shifts: • day shift between 0600 and 1800; and • night shift between 1800 and 0600 Therefore, PPA is only able to track "daily" throughput for a 0600 to 0600 period, and not for a midnight to midnight period (however, if required PPA could estimate a midnight to midnight throughput value for individual days as requested by DWER). PPA may also seek to have the 24 period start at 0600hrs and finish at 0600hrs the following day to align with PPA data capture and shift times. Using the calendar day as the metric will require significant changes to PPA manual data recording systems and shift changes. PPA suggested changes to the wording to be presented in our formal submission. PPA requests that Condition 13(b) be deleted, and form a separate condition to read as follows: *"In the event that 120,000 tonnes is out-loaded in any 24 hour period from 0600 to 0600, then the Licence Holder must investigate and report in accordance with Schedule 4."* PPA understands such condition would be consistent with licences to other port users.	Noted and accepted with minor amendment. Schedule 4 reporting must be for the two calendar days in which the 24 hour period (0600 to 0600 hours) fell.
Bulk granular material specifications – 16	*Supplementary response provided 20 March 2020:* Condition 18 should read: "In the event that greater than 120,000 wet tonnes is out-loaded in any 24 hour period from 0600 to 0600, then the Licence Holder must investigate and report in	Amended.

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	accordance with Schedule 4 for both calendar days in which each 24 hour period spans."	
Moisture Content monitoring and reporting – 18	PPA refers to Column 3 of Table 3 (Moisture Content monitoring) of Condition 16 of the Draft Licence, which includes the words "Sample per cargo/ship load obtained through automated Sample Station*). PPA advises that while the automated Sample Station is the normal mode of operation, when the automated Sample Station experiences a break down, manual sampling is undertaken (with appropriate safety controls in place). PPA does not consider that it should be non-compliant with Condition 16 for the reason that manual sampling is undertaken in these circumstances. PPA requests that Column 3 of Table 3 be amended by removing reference to the automated Sample Station, alternatively by including reference to manual sampling in circumstances where the automated Sample Station is not functioning.	Noted. Wording has been added to allow for manual sampling in the event that the automated sample station is not functioning. However, in the event that manual sampling is required, it is expected that the determination of moisture content is conducted at a similar frequency to ensure that sampling is representative of the ore being loaded.
Moisture Content monitoring and reporting – 21	PPA refers to Column 4 of Table 3 (Moisture Content monitoring) of Condition 16 of the Draft Licence, where the words "Weight Average" have been deleted. PPA notes that products handled at the Utah Point facility can be blended onsite, therefore when calculating moisture content of a sample per cargo/ship load which is from a blend of multiple products with multiple DEM's, PPA would require a calculation to determine the DEM of the blended product for monitoring purposes. PPA requests that Column 4 of Table 3 be amended to read as follows: *"Weighted Average DEM level based on DEM Level for each material required through Condition 15"* PPA also requests that the defined term "Weighted Average DEM level be reinserted in Table 1 (Definitions).	Amended.
	Supplementary response provided 20 March 2020:	Amended.

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	PPA notes that Column 5 of Table 3 still contains the incorrect reference to "ATS5621-2013". This should be "AS5621-2013", which has already been updated in the Definitions.	
Moisture Content monitoring and reporting – 21	*Supplementary response provided 20 March 2020:* The frequency of moisture samples may vary amongst Products/shipments and therefore PPA requests that Condition 20(c) be amended to read as follows: "at the sample frequency specified in Column 3 and calculated as an average per cargo hold, or as an average per 10,000 tonnes of material" PPA also requests that Column 3 of Table 3 (Moisture Content monitoring) be amended to read as follows: "At least one sample per cargo hold, or at least one sample per 10,000 tonnes of material, obtained through automated Sample Station* or manual sampling at the same or greater frequency"	Amended. This represents a greater frequency of sampling and is acceptable.
Boundary air quality monitoring – 23	PPA refers to Table 4 (Boundary air quality monitoring) in Condition 19, and notes the words "Continuous (10 min)" in Column 4 in connection with the Monitoring Stations "M8 and M9". PPA advises that M8 and M9 are high volume air samplers which are not able to take "continuous" measurements. PPA requests that this reference to "Continuous (10 min)" be deleted are replaced with the words "**a single sample for a 24 hour period**".	Noted. The averaging period for M8 and M9 has been changed to '24 hours'.
Boundary air quality monitoring – 23	PPA also refers to the reference to "Chromium (III & VI)" in Column 2 of Table 4. PPA advises that it has undertaken Chromium analysis since 2011 with no handling of that product for most of that period, therefore PPA has many years of ambient background data. PPA requests that the reference to "Chromium III and VI" be amended, so that monitoring is only required if Chromite is stockpiled and out-loaded through the facility. PPA also queries if the Reportable Event Criteria of ≥3.5 µg/m^3 as an annual average should be applied to:	It is noted that Chromium III and VI has been consistently reported at low levels, well below the annual average limit amount, and frequently below the limit of laboratory detection for 24 hour averaged samples. Monitoring conditions have been amended to require chromium to be monitored only once chromite is next received at the Premises. To clarify, and when monitoring resumes, the Reportable Event Criteria should be applied to the sum of Chromium

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	• Chromium III independently; • Chromium VI independently; and/or • the sum of Chromium III and Chromium VI.	III and VI as PM_{10}.
Boundary air quality monitoring – 23	PPA also refers to the reference to "UN, UN – Old, UW and US" in Column 1 of Table 4. PPA advises that Monitoring Stations "UN", "UW" and "US" are referred to as "M5", "M6" and "M7" respectively. PPA also advises that it no longer has any has monitoring equipment located at Monitoring Stations "UN – Old", as all monitoring equipment was relocated to M5 in 2013 under a previous licence amendment. Accordingly, PPA requests that the reference to "UN, UN – Old, UW and US" in Column 1 of Table 4 be amended to read "**M5, M6 and M7**". PPA also refers to the reference to "Rainfall (mm)" in Column 2 of Table 4 in connection with "UN, UN – Old, UW and US". PPA advises that PPA's current monitoring network does not include rain sensors/gauges, therefore PPA requests an implementation timeframe of 6 months for monitoring rainfall under this condition. PPA also queries whether DWER requires rainfall measurements to be: • obtained at all three monitoring stations M5, M6 and M7, or whether only one monitoring station will be sufficient; • recorded at 10 minute intervals, or whether longer intervals will be sufficient (eg. hourly, 12 hourly or daily totals; • obtained from equipment that is compliant with AS 3580.14-2014 (the Standard).	Noted. Monitoring location references have been amended. Rainfall monitoring requirements have been limited to one monitoring location at the Premises (M5) with rainfall to be averaged over a one-hour period. Rainfall has also formed a requirement of Reportable Event information specified in Schedule 4. Where premises monitoring data is not available, rainfall data measured at the BoM monitoring location should be reported.
Boundary air quality monitoring – 23	PPA can presently provide wind data (speed and direction) for the M5, M6 and M7 sites, noting that it may not be compliant to the Standard. If DWER requires wind data to be compliant to the Standard, then PPA would request a 6 month implementation period, in order to identify and prepare compliant sites, and procure compliant equipment.	Noted. As per DWER response in the second row of this table, the Licence Holder will be required to make improvements to meteorological sensor at M5 such that it complies with AS3580.14-2014 by September 2020. The Licence Holder will be required to submit wind data

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		from the existing BAM and E-sampler monitors noting the level of compliance/non-compliance with Australian Standards.
Boundary air quality monitoring – 23	*Supplementary response provided 20 March 2020:* PPA refers to Table 4 (Boundary air quality monitoring) and requests that Column 3 in respect of "Manganese as PM10 (µg/m3)" for "M8 and M9" be amended, by changing Reportable Event Criteria "≥3 µg/m3 as a 24 hour average" to read "≥3 µg/m3 as an annual average", consistent with Table 11 (Criteria for Reportable Events) at section 4.8 of the Decision Report, and as shown below.	Amended.
Reportable Events – 21	PPA refers to Condition 21, and notes the reference to a wind vector between 247 and 267 degrees. PPA requests that DWER advise which site this wind vector should be measured from (eg. Taplin Street), and that Condition 21 be amended to refer to such site.	DWER confirms that the wind vector should be measured from Taplin Street and the condition has been amended accordingly.
Ambient air quality monitoring - 27	*Supplementary response provided 20 March 2020:* PPA also refers to the reference to "Continuous as 10 minute average" in Column 5 of Table 5, and the reference to "AS3580.9.11" in Column 6 of Table 5. PPA advises that a "continuous" frequency would not be compliant to AS3580.9.11 (for the reason that AS3580.9.11 requires BAM monitoring). In order for the Licence to make clear that "continuous" monitoring is acceptable, notwithstanding the noncompliance to AS3580.9.11, PPA requests that Column 4 of Table 5 be amended by inserting the words "real time dust concentration", with Column 4 to then read as follows: "≥100 µg/m3 PM10 (rolling 1 hour average, **based on real time dust concentration**) at Taplin Street, when wind direction is between 247 and 267° for three or more ten minute periods during the hour, as measured at Taplin Street. Unless where, BOM or Yule River monitoring stations have recorded ≥100 µg/m3 PM10 (rolling 1 hour average, **based on real time dust concentration**) within 3 hours prior to the trigger event."	Noted. Australian Standard AS3580.9.11 clearly states: "*The objective of this Standard is to provide regulatory and testing bodies with a method for **continuously monitoring** suspended particulate matter with an equivalent aerodynamic diameter (EAD) of less than 10 µm in ambient air, providing **near real-time measurement** of mean particle concentration"* This should be taken to mean that monitoring is conducted continuously with data outputs provided in near real-time. That is, data is measured after dust is captured in each ten minute period and therefore close to, but is not a true real time measurement. AS3580.9.11 also allows for mean particle concentration measurements for periods ranging from 10 minutes to 24 hours. Compliance with Australian Standard AS3580.9.11 is therefore achievable.

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Ambient air quality monitoring - 27	*Supplementary response provided 20 March 2020:* PPA have consulted with Ecotech regarding implementing an alarm system to advise site personnel (PPA Operations), when the management trigger criteria is met. Ecotech have noted the following points: • As the management trigger criteria relies on data triggers from up to five different parameters from four different monitoring stations, there is an inherent risk that if any of the stations are experiencing technical problems with any of the data parameters (e.g. issues with data loggers, wind sensors, communications etc.) that this would potentially result in the management trigger alarm not activating. • Due to there being multiple stations with logic rules, the method would involve taking the data from each individual station, pass the data through the report manager to do the logic calculations, then feed it into a 'dummy station' to trigger the alarm off. This is another area for error with the risk of an error in any part of the communications chain leading to the management trigger alarm not activating. • There will always be a 'lag time' of 15 minutes, therefore the alarms will not be in true real time. • The rules will always be based on non-validated data. Ecotech aim to remove obvious faults and maintenance, but the data is non-validated. If during validation we need to apply corrections to any of the data, there may be instances where the rules are broken, but did not trigger based on the non-validated values. Vice versa there may be triggers of the rules that turn out to be incorrect once the data is validated. • The title of the email notification from the alarm is customisable, so that the receiver can differentiate between the management trigger alarm and PPA's existing high-level dust alarms from boundary monitors. However, the SMS notifications from the alarm is NOT customisable, therefore the receiver will not be able to easily tell what type of alarm is being received.	Noted. Trigger alarms rely on data alerts to be received from Taplin Street. In the absence of data from other monitors being automatically input into alerts, manual investigation of monitoring data (boundary and ambient) must be instigated when alerts are received. Although further monitoring data from other monitors may be incorporated into trigger alarms, where this data is not available, a conservative approach should be applied. For example, in the event that BOM or Yule River monitors are not producing data and there are high dust levels experienced at Taplin Street, the Licence Holder should employ management triggers to ensure compliance with Licence conditions. As above, DWER notes that there will be a lag time of approximately, but not less than, 10 minutes between dust concentrations at each monitor and data receipt. This is due to the method used to measure dust and is acceptable. The use of non-validated data for management triggers is also acceptable. Where non-validated data does not result in an alarm, this will need to be recorded as a reason for not instigating management triggers.

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	This is important as the response for PPA boundary monitor high level alarms and the management trigger criteria alarms require different responses from personnel and different reporting requirements. Ecotech have also suggested that if these sorts of alarms are going to be required for multiple licence holders, there will need to be some Research and Development undertaken to decrease the risk of alarms not activating due to the complexities mentioned above. PPA note these limitations and acknowledge the practical limitations, however PPA would continue to investigate processes to meet the objectives of this condition, noting the need for further innovation.	
Dust management – 28	PPA seeks to remove this condition from the Licence - See Attachment 1.A (A.2) for supporting information. In the event that wind direction is between 247 and 267 degrees; and wind speed is equal to or greater than two metres per second, over a 10 minute rolling average, the Licence Holder must: (a) reduce the out-loading rate at the shiploader by no less than 50% of the hourly average loading rate for the previous hour, or to no more than [XX] tonnes per hour where loading did not occur for the duration of the previous hour; [Note: tonnes per hour to be based on 50% of current maximum hourly loading rates] (b) maintain a reduced shiploading rate for a minimum period of 30 minutes; and (c) not return to a normal shiploading rate until such time as wind direction is no longer between 247 and 267 degrees.	DWER notes the below further controls proposed since the receipt of the application: • Improvements to bunker sprays 6 and 7 • Installation of CV07 sprays on scrapers • Sealing of the recirculation pond and sample station area (1,950m^2) • Installation of permanent additional dust suppression sprayers at the end of chute hoods on transfer station 1 and 2 for use during manganese export. During high dust events at Taplin Street it is considered necessary that further controls are implemented to address dust emissions from the Premises (see Condition 27). Conditions requiring shiploading rates to reduce during specific wind conditions have been removed. Note that further controls for the management of significant dust sources at each Port Hedland prescribed premises may be subject to change through the development and implementation of Industry Best Practice Guidelines for Dust Management.

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Dust management – 28	PPA refers to Condition 25 of the Draft Licence, and notes that this Condition will not be required if Condition 24 is deleted, as requested by PPA above. PPA requests that Condition 25 be deleted.	As above.
Specified actions – Management triggers – 29	*Supplementary response provided 20 March 2020:* PPA understands the intent of Condition 26 to be as follows: • If a site investigation is required (due to notification of a management trigger criteria being exceeded), and that investigation identifies visible dust generation, then the requirement under Condition 26 is to immediately control the visible dust emissions. • That is, if "applying additional dust suppression to the source of dust" was not effective in controlling the visible dust emissions, then it would be necessary to "[stop] all activities resulting in visible dust generation". • Conversely, if "applying additional dust suppression to the source of dust" was effective in controlling visible dust emissions, it would not be necessary to "[stop] all activities resulting in visible dust generation".	Noted. The interpretation provided is correct and the condition has been simplified to require the Licence Holder to initiate whatever actions necessary to address the visible dust: *"upon identification of visible dust generation during the site investigation conducted in accordance with part (a) of this Condition, immediately control visible dust emissions."*
Specified actions – Management triggers – 29	*Supplementary response provided 20 March 2020:* PPA notes this is a new condition which was not present in the previous draft licence amendment. PPA notes that there are several other operators and activities within the arc of influence identified in the management trigger (wind direction between 247 and 267 degrees, as measured at Taplin Street) and therefore the management trigger might be triggered without being influenced by emissions from PPA Utah Point operations. On that basis, it would not be reasonable to assume that PPA's operations were responsible for exceedance of the management trigger criteria at Taplin Street, or for PPA to be required to undertake the stated management actions in response to the exceedance. To demonstrate the effectiveness of the controls implemented under Condition 27, PPA requests that this condition also includes a review of boundary monitor data to inform the ongoing implementation of the management action. PPA proposes the use of upstream data from M7 and M5 to assess the concentration of non-	Noted. In its original application the Licence Holder had provided sufficient dust management measures to address high dust levels being experienced by receptors in the West End. However, and at the request of the Licence Holder, these controls were removed for the reasons provided. For the reasons provided in section 8.5.1, conditions requiring management trigger criteria have been retained on the Licence with the additional caveat that downwind monitor M10 (once installed) must record a greater PM_{10} concentration than downwind monitors before management is triggered. The Licence Holder will be required to review boundary monitoring data for a period of 12 months (8.5.4), submitting a report to DWER at the

Condition/ Section	Summary of Licence Holder comment	DWER response
	visible dust (as PM10) entering the Utah Point facility, and to compare this with the data collected at the new M10 to determine the contribution from Utah Point. This would be done in real-time in parallel with the data collection at Taplin Street. That is, if the management trigger criteria at Taplin Street is exceeded, and PPA boundary monitoring shows measurable levels of PM10 arising from the Utah Point facility, then PPA would continue to undertake the management actions. If however, PPA's boundary monitors showed no evidence of PM10 contribution to the airshed at that time, then PPA would cease undertaking the management actions defined under Condition 27. PPA can only reasonably be held accountable for activities within PPA's operational control, and in the absence of any consideration of the boundary monitoring network data to confirm PPA's contribution, there is no reasonable ability to confirm the success of the controls required under Condition 27, or to attribute or apportion the non-visible dust being measured at Taplin Street to PPA's activities. PPA also suggests that the words "and/or Reportable Event criteria" should be removed from the condition, as Reportable Event criteria is triggered for a 24-hour average period from midnight to midnight, and is not based on real time data identified in Table 5, Column 4 – Management trigger criteria. PPA would also suggest "Deluge Cycle" should not be capitalised, as there is no associated definition.	end. Any further consideration of this request at a later date will also consider the results and interpretation of this report.
Specified actions – Management triggers – 30 (continued)	*Supplementary response provided 20 March 2020:* PPA therefore requests a wording change to: In the event that no visible dust can be identified within 20 minutes of the management trigger criteria specified in Condition 24, and a high-level dust alarm is triggered at M6/M10 ~~and/or Reportable Event criteria exceedance notification~~, the Licence Holder must undertake the following management actions: (i) operate all stockyard water cannons on deluge cycle;	Noted. For the reasons above and in section 8.5.1 of this Decision Report, it is not agreeable that the Licence Holder should only apply additional dust controls in the event that PM_{10} triggers Licence Holder internal high dust alarms (400 µg/m^3 averaged over 10 minutes) and management trigger criteria is being exceeded. In the absence of an appropriate alternative approach to managing dust, that is both measurable and objective, the conditions to require management action during high

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	(ii) apply water to all unsealed trafficable areas where vehicle movement has occurred in the previous hour; and (iii) operate transfer station and conveyor dust suppression sprays on all operating equipment if outload cycle is in operation. The primary purpose of including the PPA boundary monitor as a second reference point in determining the non-visible dust is based on the fact that several other facilities which could cause non-visible dust are located between Utah Point and the Taplin Street monitor. These include two BHP Finucane Island loadout berths, the West End of Port Hedland, PPA Eastern Operations and the Dampier Salt loadout facility. The use of PPA's existing M6 or proposed (M10) boundary monitor in combination with existing upstream boundary monitors (M7/M5) will identify whether activities on PPA management site are the source of non-visible dust, and whether the management actions required under Condition 27 have been effective on the premises. Furthermore, the ongoing use of the town water supply (potable water) for the management actions under Condition 27 would be wasteful if it could be shown that PPA activities were not contributing to the non-visible dust that triggered the requirement for the management actions.	dust events in the West End remain. All contributions from the Premises to ambient dust concentrations during these events must be managed appropriately. Management trigger conditions have been placed on the Licence to justify increased throughputs and offset any potential increase in the frequency of high dust emissions that may result. Trigger conditions have been amended to give consideration to upwind and downwind dust data when wind is blowing in the direction of sensitive receptors. Downwind dust data is considered that recorded at proposed monitoring location M10, once installed. To ensure that the Licence Holder does not significantly contribute to high dust levels in the interim of the BAM at M10 being installed, management actions will need to be enacted when all other criteria are met. As the monitor at M6 is not downwind of Premises activities during the specified wind conditions, it cannot be considered in management trigger criteria. From the date of installing the BAM at M10, PM10 data must be collected and reviewed to determine the likelihood of management trigger criteria being met in a 12 month period. The Licence Holder must also determine its estimated contribution during these events when reporting to DWER.
Specified actions – Static Stockpile management – 31	PPA refers to Condition 22 a) where DWER requires that the Licence Holder be able to demonstrate that a stockpile has a moisture content at or above the corresponding DEM Level for that stockpile using the method outlined in ISO3087:2011. PPA notes this is the standard for "Iron ores – determination of the moisture content of a lot", which is not relevant to bulk granular products that are not iron ore. Therefore PPA requests the wording be amended as follows:	Noted and partially accepted. PPA will be able to use an alternative method as approved by the CEO. A record keeping condition has been added to include the requirement to maintain records of moisture content determination for static stockpiles.

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	*"ensure, **and keep records to demonstrate**, that the stockpile contains a moisture content at or above the corresponding DEM Level for that stockpile"*	
Specified actions – Static Stockpile management – 31	*Supplementary response provided 20 March 2020:* PPA notes the wording of Condition 29 (a) includes a requirement for the determination of the stockpile moisture in accordance with ISO3087:2011 which is only relevant to iron ore, not other bulk granular products. PPA again requests the wording to be amended as follows (as requested following draft 1): "ensure, **and keep records to demonstrate**, that the stockpile contains a moisture content at or above the corresponding DEM for that stockpile material"	Noted. Addressed as above.
Stormwater and industrial wash water monitoring – 35	PPA refers to Table 6 (Stormwater and wash water discharge monitoring table) in Condition 28 of the Draft Licence. PPA notes that the Frequency of monitoring in Column 4 of Table 6 is described as "Quarterly when there is a discharge from W12, W13 and/or W14 within the previous 90 calendar days". PPA advises that a discharge from the Recirculation Pond via W13 or W14 is only possible in the days/weeks immediately following a major rainfall event. During the rainfall event itself the pond will not overflow due the relatively small natural catchment. However, following a major rainfall event mobile pumps are used to transfer stormwater from stockyards and sumps into the Recirculation Pond. It is during this period that there is potential for stormwater and wash water to discharge from the Recirculation Pond via W13 or W14. After the weather system has passed and the stockyards and sumps have been emptied, the level of the Recirculation Pond will then continue to drop as the water is recycled for dust suppression, until another major rainfall event occurs. Therefore, PPA does not consider there is any benefit to obtaining a water sample from the Recirculation Pond if there was a discharge within the previous 90 days, as from this point the water level will continue to drop and will not be discharged. Therefore, PPA suggests the frequency be amended to "**Prior to a discharge from W13 or W14**".	Noted. The intent of the condition is to obtain a representative sample of discharged stormwater, acknowledging that discharges may not always be sampled directly. It is noted that contaminant concentrations are likely to change and become less representative of overflow water discharged to the environment. To avoid uncertainty the suggested wording has been amended to state within 48 hours of a discharge. This allows sampling to be undertaken prior to, or within two calendar days following a discharge from W13 or W14. Note that an additional row has been inserted for the measurement of volume, hydrocarbons and suspended solids from the stormceptor located at W12. Volume, hydrocarbons and suspended solids have also been added to the list of sampled parameters measured at discharges from W13 and W14.

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	PPA considers this a reasonable approach to collect a representative sample of water likely to be discharged from the Recirculation Pond. In addition, PPA notes the inclusion of discharge point W12 in Column 4 of Table 6, and advises that discharge point W12 is not connected to the Recirculation Pond. Rather, it is fed by a relatively small catchment containing roadways and laydown, and contains a stormceptor treatment unit to remove any solids and hydrocarbons prior to discharge. PPA requests that the reference to W12 be deleted from Column 4 of Table 6.	
Stormwater and industrial wash water monitoring – 35	*Supplementary response provided 20 March 2020:* **W12** – PPA also advises that the catchment associated with W12 comprises of sealed vehicle traffic roads (access to the berth which is predominantly used for light vehicles, the road sweeper and vacuum trucks), wharf carpark with amenities, an unsealed area with office block (shutdown/overflow offices) and a small unsealed laydown area used for storing equipment components (e.g. new conveyor belts, rollers etc). There is no bulk material storage or bulk material haulage that occurs in this catchment area. **W13 and W14** – PPA advises that since the Utah Point facility was commissioned in 2010 there have only been two known stormwater discharge events (following heavy rainfall events/cyclones). The stormwater recirculation pond capacity is estimated at 50,000 kL at an average ponding height of 2.5m. However, the recirculation pond has a far greater capacity because the overflow pipes (within the pond associated with the discharge pipes for W13 and W14) are located at an approximate height of 5.5m up the internal pond batter wall. The two discharges that did occur were via a discharge pipe to W13, which is designed to drain excess water from the pond to maintain the integrity of the pond walls. PPA also notes that the W14 outlet discharges beneath the berth and W13 is a discharge pipe located on the external facility batter wall above the mangroves (refer to Attachment A9). PPA considers that it would not be practical to install and maintain flow sensors in these locations for the purposes of calculating volume.	Noted. Reference to W12 has been removed from the Licence as it does not relate to primary activities and has a low likelihood of containing pollutants in significant concentrations. Sampling conditions for potential discharges at W12 and W13 have been amended to allow for sampling to be undertaken at the Stormwater Recirculation Pond and ahead of any discharge via overflow pipes. Due to difficulties in determining volume, and based on the low frequency of historic discharges, volume of future discharges may be estimated based on rainfall volume.
Schedule 2	*Supplementary response provided 20 March 2020:*	Amended.

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Table 8 – Infrastructure and equipment	PPA notes that in the first Column of Table 8 ('No.'), Row number 13 is used twice; and for Row 13 in Table 8 ('Stockyard water cart') PPA requests that the word "stockyard" is deleted, as water carts are mobile and are used both inside and outside of stockyards.	
Schedule 2 Table 9 – Annual bulk material tonnages assessed	PPA refers to Table 9 (Annual bulk material volumes assessed) in Schedule 2 of the Draft Licence. PPA notes that in Column 2 of Table 9, the annual volume for Manganese ore has been amended from "up to 2,000,000 tonnes (exported)" to "up to 1,100,000 tonnes (exported)". PPA requests that the annual volume for Manganese ore remain as "up to 2,000,000 tonnes (exported)", for the reason that current and forecast outloads of Manganese ore at the facility exceed 1,100,000 tonnes, and PPA considers 2,000,000 tonnes to be a suitable permitted volume. PPA also refers to the reference to the bulk material "Spodumene ore (lump)" in Column 1 of Table 9. PPA requests that the reference to "Spodumene ore" be amended by deleting the word "(lump)", for the reason that Spodumene ore handled at the facility is not classified as "lump".	Amended. Note that the risk assessment provided in this Decision Report is based on the characteristics of the spodumene presented in the application. The key characteristics referred to are particle size distribution, respirable silica and muscovite content. Should this significantly change for any spodumene ore in-loaded to the Premises, the risk to public health may also change. The Licence Holder has been provided the conditions on the basis that the product quality specified in the application are representative of spodumene ore received to the Premises ongoing. Therefore any defences to dust emissions from spodumene ore provided through the Licence only apply where the product is similar to that applied for within the Application.
Schedule 3 Table 10, Row 1 – Stockyard	PPA refers to Table 10 (Infrastructure and equipment controls) in Schedule 3 of the Draft Licence, and notes that for Row 1 (Stockyard), Column 3 (Operation requirements) has been amended as follows: *"Bunker and stacker sprays operated* *at all times when ore is being tipped into hoppers and stacked* ~~*whenever visible dust is being generated while tipping or stacking of material*~~*."* As noted in Attachment 1A (A.3), Utah Point is a multi-user facility which handles various products derived from a number of small mining operations across the Pilbara, which results in highly variable and discrete cargoes, each with varying needs to minimise dust during handling operations. Some products have very "sticky" characteristics which makes material handling extremely difficult when water is added. With the bunker sprays, there are three transfer points	Amended. DWER understands that some ores have the potential to interfere with belt and transfers when they become too wet. However, controls for the management of significant dust sources at each Port Hedland prescribed premises may be subject to change through the development and implementation of Industry Best Practice Guidelines for Dust Management.

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	immediately downstream which have the potential to become blocked when in-loading some products. For these reasons PPA opposes this change to the Licence as it relates to bunker sprays, and requests the 'Operation requirements' be amended to read as follows: *"Bunker sprays operated whenever visible dust is being generated while tipping ore into hoppers. Stacker sprays operated at all times when ore is being stacked."*	
Schedule 3 Table 10, Row 1 – Stockyard	PPA refers to Table 10 (Infrastructure and equipment controls) in Schedule 3 of the Draft Licence, and notes that for Row 1 (Stockyard), Column 3 (Operation requirements) has been amended as follows: *"Drop height from radial stacker to stockpile is no greater than 3 m ~~minimised to as low as reasonably practicable~~".* PPA advises that the radial stackers at the facility are not capable of achieving a drop height of less than 3 metres to the stockyard floor. PPA requests that that the reference in Column 3 therefore revert to the former wording, namely "Drop height from radial stacker to stockpile is minimised to as low as reasonably practicable".	Partially accepted. The condition has been amended to require the Licence Holder to lower stackers to as low as possible when stacking commences and as low as reasonably practicable at all other times.
Schedule 3 Table 10, Row 1 – Stockyard	*Supplementary response provided 20 March 2020:* PPA requests that reference to "stacker sprays" be deleted from this sentence, given that the operation requirement for stacker sprays in set out in the following sentence ("Stacker sprays operated at all times when ore is being stacked"). That is, PPA requests this Item be amended to read "Bunker operated whenever visible dust is being generated while tipping ore onto hoppers".	Amended.
	Supplementary response provided 20 March 2020: PPA requests that this sentence be amended to read "Water cannons operated at Bunker 6 and 7 when a truck is side tipping, **and visible dust is being generated**", for the reason that Bunkers 6 and 7 do not have automatically operating cannons, but instead Bunkers 6 and 7 have cannons which are manually activated in response to visible dust being generated.	Noted. The use of "visible dust" as a trigger for dust management is based on a subjective determination from operators of what is "visible". In the context of a open handling bulk material loading facility, operators may only identify visible dust when dust generated is greater than what would normally be expected from the activity. It is also possible that dust may not be visible from the point of loading ore into the bunkers. No

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		changes to the condition have been made.
	Supplementary response provided 20 March 2020: PPA notes that "[operation] prior to reclaiming" has the same meaning as "pre-vessel wet down of material prior to it being outloaded" in the sentence following, therefore the reference to "[operation] prior to reclaiming" is unnecessary.	Amended.
	Furthermore, in relation to the reference to "pre-vessel wet down of material prior to it being outloaded", PPA advises that pre-vessel wet downs are only done as required when visible dust is observed and are not done for every vessel. The reason for this is that Utah-Point is a multi-user facility which handles various products derived from a number of small mining operations across the Pilbara, which results in highly variable and discrete cargoes, each with varying needs to minimise dust during handling operations. Some products have very 'sticky' characteristics, which makes material handling difficult when additional water is added and can result for example in clogging of transfer station chutes. Also, to the high moisture content of these 'sticky' products, they do not create a high risk of dust lift-off. PPA therefore requests that the sentence: "pre-vessel wet down of material prior to it being out-loaded" be amended to read: "pre-vessel wet down of material prior to it being out-loaded, where visible dust is being generated". PPA also considers that the requested amendment is suitable given the operation requirements for Routine Operation and dust forecasting. Accordingly PPA requests that the operation requirements for 'Four water cannons per stockpile" (Column 3 of Row 1 of Table 10) be amended to read as follows: "Cannons Routinely Operated to prevent dust lift off. Additional operation of cannons during in-loading. Additional operation of cannons for pre-vessel wet down of material prior to it being out-loaded, where visible dust is being generated. Dust forecast tool is utilised for planning of additional cannon operation."	Noted. The intent of the condition is to prevent dust lift off and not to address dust once it has been generated. The requirement for operators to monitor for visible dust is a subjective assessment prone to variability and human error and delays to equipment start up. To acknowledge the difficulties in handling 'sticky' ore, the condition has only been amended to allow for reclaiming without the wet-down of stockpiles where it can be demonstrated that the ore has a moisture content equal to, or greater than the DEM level for that ore, as determined by out-loaded ore moisture content as measured at the sample station or manual sampling. DWER notes that the measurement of out-loaded ore moisture content is calculated from the sample station, which is located after the ore has been reclaimed. Therefore the Licence Holder may wish to consider as a precautionary measure to wet down material prior to it being out-loaded where there is limited confidence that material meets the moisture content requirements.

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Schedule 3 Table 10, Row 2 – Conveyors	PPA refers to Table 10 (Infrastructure and equipment controls) in Schedule 3 of the Draft Licence, and notes that for Row 2 (Conveyors), Column 3 (Operation requirements) has been amended as follows: *"Operation of the under-belt sprays ~~whenever~~ at all times when:* *a) iron ore or manganese is being transported; and/or* *b) visible dust is being generated through use."* As noted in Attachment 1A (A.3), some products have very "sticky" characteristics which makes material handling extremely difficult when water is added, and furthermore, these products generally do not generate much dust. For this reason PPA opposes the requirement for chute sprays to be operated at all times when loading iron ore and manganese.	Noted. Manganese has been identified as a potentially dusty product due to its brittleness. Therefore the condition has been amended to require under-belt sprays to operate at all times when manganese is handled only. For all other materials the trigger for operating under-belt sprays will be whenever there is carry back. It is noted that improving the specificity of this condition is necessary as the determination of 'visible dust' is both subjective and reliant on a trained operator to identify the dust. Further, it may not be possible for that operator to identify visible dust in close proximity to the source or under certain light conditions.
	Supplementary response provided 20 March 2020: PPA refers to Column 3 of Row 2 ('Conveyors') where it states: "Operation of the under-belt sprays to achieve no carry back of ore". PPA advises that under-belt sprays and belt scrapers are equipment used to reduce the volume of carry back ore on the return belt, however it is practically impossible to completely eliminate carry back. Furthermore, ore carry back at Utah Point has not been identified as a main source of dust from the site, due to relatively low conveyor belt speeds. Accordingly, PPA requests that the sentence "Operation of the under-belt sprays to achieve no carry back of ore" be amended to read "Operation of the under-belt sprays to achieve minimal carry back of ore".	Amended to state: "Operation of the under-belt sprays to minimise the carry back of ore for the purpose of reducing dust".
Schedule 3 Table 10, Row 3 – Transfer stations	*Supplementary response provided 20 March 2020:* PPA refers to the comments above in relation to stockpile cannons, and the variability of ore products handled at the Utah Point facility. For the reasons stated there, PPA requests that this sentence be amended to read as follows: "Chute sprays operated at all times when: a) manganese is being out-loaded; b) **iron ore is being out-loaded and visible dust is being generated;** and	For the reasons outlined in DWER's response to the Licence Holder's comment on the pre-vessel wet down requirements (water cannons), the condition has been amended to state: Chute sprays operated at all times when: a) manganese is being transported; b) iron ore that has a Moisture Content below the DEM level for that ore is being transported;

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	c) visible dust is being generated through use."	and/or c) visible dust is being generated through use.
Schedule 3 Table 10, Row 7 – Water carts	PPA refers to Row 7 (Water carts) of Table 10 (Infrastructure and equipment controls) in Schedule 3 of the Draft Licence, and notes that: ○ Column 2 states that Water carts shall be "Used for dust suppression at stockyard floors 1 and 2"; and ○ Column 3 states that Water carts shall be "Operated to ensure that the stockyard remains Damp at all times during product in-loading and reclaiming to prevent visible dust lift off". PPA advises that: ○ water carts are used for supplementing various dust control activities, not just for wetting stockyard floors. For example, water carts may be used on roads and open areas which are generating visible dust; ○ water cannons are used as a primary measure for dust suppression, whereas water carts are used as a secondary measure. For example, water carts may be used when the water cannons are operating, and further dust suppression is required; or where the water cannons are unavailable; or if personnel are working in the stockyards and preventing water cannons from being operated; ○ the use of water carts in the stockyard is limited to times/places where heavy machinery is not operating. Accordingly PPA requests that: ○ Column 2 be amended to read "**Used to supplement dust suppression**"; and ○ Column 3 be amended to read "**Operated proactively to supplement dust suppression**". PPA also requests that the term "Damp" be deleted, for the reasons set out previously.	Noted. Minor amendments made to note that the water cart operates on other unsealed areas and are a supplementary dust control.
	Supplementary response provided 20 March 2020:	Noted. Minor amendments made.

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	PPA also refers to Columns 2 and 3 of Row 7 and advises that both Stockyard 1 and Stockyard 2 ring roads are sealed, therefore the references to "unsealed" roads are not necessary. Accordingly, PPA requests that: • Column 2 be amended to read "Used for dust suppression on stockyard floors 1 and 2"; and • Column 3 be amended to read "Operated in Stockyard 1 and Stockyard 2 areas to supplement dust suppression from water cannons when dust is observed from reclaiming activities. ~~Operated to achieve compliance with Condition 27(ii).~~ Operated proactively subject to Dust Management Tool, referred to in Row 5, over a 24 hour forecasting period."	
Schedule 3 Table 10, Row 8 – Road sweeper	PPA advises that the road sweeper is currently used regularly as required with a minimum of 5 hours sweeping per day. PPA requests that Column 3 be amended to read: *"Used regularly with a minimum frequency of at least five (5) hours per day".*	Noted. Meteorological considerations have been retained noting that these do not limit the Licence Holder from operating the road sweeper at a greater frequency if required to prevent dust mobilisation.
Schedule 4: Quarterly Reporting	PPA notes that the fourth dot point has been amended as follows: *"time series graphical plots for the Monitoring Stations referred to above on the day/s on which the event occurred ~~(excluding M8 and M9)~~;".* PPA advises that: ○ Monitoring Stations M8 and M9 are high volume air samplers, which do not produce time series data, but instead produce a single sample for a 24 hour period. The sample is tested by a laboratory to determine PM_{10} and metals concentration. ○ PPA can provide indicative wind data from other site Monitoring Stations in time series for the 24 hour period that the HVAS was operated, if required. PPA requests that the existing wording be retained, to read as follows:	Amended. Wind data from other onsite monitors may be used to indicate meteorological conditions for M8 and M9 during Reportable Events.

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	"time series graphical plots for the Monitoring Stations referred to above on the day/s on which the event occurred (excluding M8 and M9);".	
	Supplementary response provided 20 March 2020: PPA suggests some minor amendments to this Schedule as set out below, to clarify the reporting commitments: ~~(c) a description of all Ore Handling Activities which had occurred at the Premises during the Reportable Event and the 24 hours preceding the Reportable Event;~~	Noted. The requirement to report on ore handling activities remains. The ability to investigate the possible causes of dust exceedances events relies heavily on having the understanding of the activities occurring at all port operations, in addition to monitoring data. By obtaining an understanding of common dust contributions, DWER will be able to make informed decisions on its approach to regulating each premises in Port Hedland. To assist in the interpretation of dust data, an additional reporting requirement has been placed in Schedule 4 for the submission of a summary of compliance with Australian Standards for each monitor.
Figure 3 – Premises wind vector to Taplin Street	PPA refers to Figure 3 (Premises wind vector to Taplin Street) in Schedule 4 of the Draft Licence. PPA notes that: o Figure 3 relates to Condition 24, which PPA has requested be deleted; o Figure 3 contains incorrect Monitoring Station names and locations; and o Figure 2 (Monitoring Locations and Stormwater Discharge Map) in Schedule 1 contains the correct monitoring locations. Accordingly, PPA requests that Figure 3 be deleted.	Noted. Figure 3 is also referenced in the Reportable Events condition. Therefore the figure has been retained. The Licence Holder may provide an updated figure if considered necessary to show updated monitoring station references.
New condition	N/A	Note that DWER has inserted the requirement for responsive management action in the event that high PM_{10} concentrations are identified at Taplin Street over a 1-hour period, and where wind direction is predominantly within the Premises arc of influence for that same period. Further justification is provided in section 8.5.1.

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Decision Report		
Definition of terms	PPA request that the terms “Existing Licence” and “Issued Licence” be defined. These terms are currently used throughout the Decision Report and it is unclear if these terms have the same definition or if one is referring the Draft Licence.	Noted. Issued Licence has been defined as the current licence, as provided in Attachment 2. The term ‘Existing Licence’ has been replaced with ‘Reviewed Licence’, which is a defined term in this Decision Report.
	Supplementary response provided 20 March 2020: PPA previously requested that the terms “Existing Licence” and “Issued Licence” be defined. These terms are currently used throughout the Decision Report and it is unclear if these terms have the same definition or if one is referring the Draft Licence.	This has been addressed as above.
1.1	*Supplementary response provided 20 March 2020:* Spodumene ore will be sourced from Mineral Resources Limited’s Pilgangoora Project and will be brought into the Premises in lump form (crushed to smaller than 50mm in diameter). No fines product will be handled at the Premises. PPA requests that this sentence be amended to read as follows: *“Junior miners or proponents will deliver Spodumene ore as run of mine (crushed to smaller than 50mm in diameter). No Spodumene fines product will be handled at the Premises.* *Port Authorities are handling increasingly diverse types of materials in response to growing trade markets.”*	Wording has been amended to note that MRL is the current supplier of spodumene to the Premises although future supply may come from other junior miners.
	PPA requests that this sentence be amended to read as follows: “Junior minors or proponents will deliver Spodumene ore as run of mine (crushed to smaller than 50mm in diameter). No Spodumene fines product will be handled at the Premises. Port Authorities are handling increasingly diverse types of materials in response to growing trade markets.”	Wording has been amended to note that MRL was the most recent supplier of spodumene to the Premises. DWER notes that Port Authorities are handling increasingly diverse types of materials in response to market demands.

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	DWER elected to keep the text “Spodumene ore is currently sourced from Mineral Resources Limited’s Pilgangoora Project.”. This is no longer correct, PPA does not currently handle any spodumene ore.	
2.3	PPA notes that this section reads as though front end loader (FEL) is used to build stockpiles only at bunkers 6 and 7, whereas FELs and excavators may be used to build stockpiles at all bunkers, not just bunkers 6 and 7. At bunkers with a stacker the initial stockpile is created with the stacker, however FELs and excavators may be used to rearrange stockpiles in order store more material.	Noted. Clarification added.
Table 4: Bulk granular materials assessed and exported from the Premises	PPA requests the following amendment: *“Information on the bulk granular material ~~handled~~ assessed and exported from Utah facility is set out in Table 4 below.”* PPA requests that Table 4 does not identify bulk material owners for each bulk material, as it doesn’t relate to Licence conditions, is unnecessary, and may be construed to limit operational flexibility.	Suggested changes to italicised text adopted. Table 4 has been retained to provide detail and context of potential emission sources. There is the potential for a change in bulk material supplier to result in a change to overall emissions from the Premises as material characteristics change from ore source to ore source. The risk assessment provided in this Decision Report takes into account the methods of handling used for the types of ores handled as specified in Tables 4 and 5. Note that the text within the Decision Report does not represent conditions of a licence. However, changes to handling methods and/or ore types may change conclusions made through the risk assessment and amendments to licence conditions may be deemed necessary by the Delegated Officer. DWER invites PPA to provide alternative wording that identifies what ores were assessed while acknowledging that changes to ore characteristics may result in the emissions profile changing.
Table 5: Infrastructure used for handling of	PPA requests that Table 5 be deleted, as it doesn’t relate to Licence conditions, is unnecessary, and may be construed to limit operational flexibility.	Noted. Table 5 has been retained. An understanding of the handling method used for each bulk granular material is critical for the determination of risk. This is because the handling method is a key determining factor

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current and proposed bulk granular material		for emissions and discharges.
	Supplementary response provided 20 March 2020: Some of the information in Table 5 does not reflect the current and proposed operation of the infrastructure used for handling bulk granular material, and in this regard, PPA makes the following comments [and provides a corrected table]: - All product utilises CV05 and CV06 during outload; - All product out-loaded from stockyard 2 utilises TS4; - There is no radial stacker for stockpile 6; and - The hoppers are fixed in Stockyard 2.	Amended.
4.5 – additional questions	1) PPA is unable to confirm the classification of Plantohyd 46 in the German Water Pollution Category. PPA sources Plantohyd 46 that is manufactured in Australia by Fuchs (https://www.fuchs.com/au/en/). Fuchs were unable to provide certification for the product against the German Water Pollution Category and advised that the same product manufactured in Europe has been certified but since this classification is not a requirement or regulation in Australia, a sample of the Australian manufactured product has never been supplied for certification in Germany. Fuchs advised Plantohyd 46 complies with ISO 15380:2016 which specifies the requirements for environmentally acceptable hydraulic fluids. Plantohyd 46 is classified as a hydraulic environmental triglyceride (HETG) as defined in ISO 6743-4:2015, which establishes the detailed classification of fluids of Family H (hydraulic systems) which belong to class L (lubricants, industrial oils and related products).	Noted.
	2) Following a spill of hydraulic oil from the mooring infrastructure (the cavotec systems). PPA staff follow the following steps: • Stop / control the source by isolating the relevant piece of equipment	Noted.

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	• Report the spill verbally to the Landside Operations Coordinator and Vessel Traffic Services tower • Assess whether a recovery effort will be effective in the circumstances – for example spills to the wharf deck can be accessed on foot and are recoverable. However, spills to the harbour can only be accessed by vessel, which depends on conditions such as – whether there is an ore carrier moored at Utah Point berth, wind/water conditions, tide level and movement, etc. • Contain spilt hydraulic oil where possible, using boom or sausage bund • Recover spilt hydraulic oil where possible, using absorbent kitty litter or skimmer • Dispose of waste appropriately • Repair / replace relevant piece of equipment before using again to prevent recurrence	
	3) The cavotec systems undergo routine inspections and maintenance in accordance with manufacturers specifications in order to minimise the risk of failure. This includes: • 8 weekly off line (shutdown) mechanical inspection and routine maintenance • 24 weekly lubrication maintenance	Noted.
	Supplementary response provided 20 March 2020: PPA can confirm that the fixed vertical pipe from wharf surface to CV06 has been installed and dry vacuuming towards the tail end of CV06 and the trial is ongoing. As the Utah Point is a multi-user and multi-product facility PPA, in collaboration with Qube, are required to trial the process over multiple ship loading events to capture different products to determine the overall success. PPA can confirm that	Amendments made.

<table>
<tr><th>Condition/ Section</th><th>Summary of Licence Holder comment</th><th>DWER response</th></tr>
<tr><td></td><td>the trial will continue to April 2020 before the results can be assessed and a decision to proceed with the installation of additional vacuum pipes to enable cleaning with reduced water usage.
PPA has engaged an engineering consultant to review the existing pump and pipe network and recommend upgrade works to avoid the overflow of ST7. The draft review is expected by April 2020, following which the consultant will prepare detailed design and specifications for the works. Once the detailed design and scope is developed PPA will be in a position to estimate a new timeframe for installation.
PPA notes that since the installation of the earthen bund around sump ST7 and along PPA's boundary fence (in that area) in late June 2019 there has been no process water emissions offsite from this area. The last emission caused by a ST7 sump overflow was on 12 June 2019.</td><td></td></tr>
<tr><td>Figure 7 – additional question</td><td>PPA refers to the request for information in connection with Figure 7 at section 4.6.3.
PPA is unable to provide the exact data requested for the following reasons:
Figure 7 shows annual averages in calendar years, whereas PPA currently reports for financial years
"Harbour" is not a PHIC monitor, therefore PPA does not have Harbour data
PPA provides the following updated data (including for "Kingsmill"):
Annual average of PM10 daily averages:<table><tr><td></td><td>FY2015/16</td><td>FY2016/17</td><td>FY2017/18</td><td>FY2018/19</td></tr><tr><td>Richardson</td><td>35.2</td><td>40.0</td><td>47.3</td><td>51.4</td></tr><tr><td>Taplin</td><td>35.6</td><td>31.3</td><td>34.4</td><td>23.8</td></tr><tr><td>Yule</td><td>18.5</td><td>15.4</td><td>17.9</td><td>22.2</td></tr><tr><td>Kingsmill</td><td>44.7</td><td>40.4</td><td>43.7</td><td>51.0</td></tr><tr><td>Port</td><td>430</td><td>500</td><td>519</td><td>513</td></tr></table></td><td>Noted. Additional information has been incorporated into the section following the release of the PHIC annual report for 2018/19. Refer to sections 4.7.2 to 4.7.7.</td></tr>
</table>

Condition/ Section	Summary of Licence Holder comment	DWER response
	Hedland exports (million tonnes)	
Figure 9: Dust monitoring locations	PPA notes that Figure 9 is missing. PPA is able to provide DWER with the relevant Figure if required.	Noted. A figure depicting PHIC monitoring locations has been inserted.
Table 12: Reportable Events for manganese 1 July 2016 to 30 June 2019	PPA notes that HVAS samples are not collected from midnight to midnight as identified in footnote 1 of Table12. The date reported for each sample refers to the date that the sample commenced. The time the sample commenced is usually around 0900 but may alter based on when the vessel commences shiploading. PPA requests that the heading for Column 3 of Table 12 ("Result") be amended to read "Manganese as PM_{10}".	Amended.
4.6.1 – Key findings	*Supplementary response provided 20 March 2020:* PPA notes that the summary reported in the Delegated Officers notes does not make any reference to the Technical Paper prepared by Environmental Technologies & Analytics (2019) which PPA submitted following our review of the previous Draft Amendment (18 October 2019). The Delegate's findings appear to only be drawn from the content of section 4.6 and Table 7. This information was presented in the initial licence Amendment Application (March 2017) and should be updated to include new information presented in PPA's 2019 Response.	Minor amendments made. Revised modelling has not resulted in a change to the conclusions made in the key findings.
4.7	PPA refers to section 4.7. PPA requests that the full citation reference for "Katestone (2011)" be included.	Noted. Full reference provided in Appendix 1.
4.7.3 and 4.7.5	*Supplementary response provided 20 March 2020:* PPA suggest these sections be updated to reflect current issues with Taplin Street and 2018/2019 data.	Amendments made.
4.7.4 – Key findings	*Supplementary response provided 20 March 2020:* PPA notes dot point 2:	Amendments made.

Condition/ Section	Summary of Licence Holder comment	DWER response
	In November 2019, DWER formally requested from PHIC the network data used as the basis of the PHIC report to conduct further analysis of air quality data. This data is yet to be provided. PPA notes that PHIC responded to this request and provided the data on the 10 February 2020. PPA request that the key finding be updated to reflect this.	
Section 4.11 Tables 15, 16 and 17 (noise)	PPA requests that DWER advise the references for the source of the noise levels presented in Tables 15, 16 and 17. PPA refers to the Noise Impact Assessment submitted with the Works Approval application (Utah Point Berth Project Noise Impact Assessment (SKM / Vipac 2007, Document No. 70Q-07-0048-TRP-245064-4)), and notes that: - Table 15 does not include the following note at Table 4.3 of the Noise Impact Assessment: *"Note that the noise criteria presented in Table 4.3 are Design Noise Criteria, i.e. these are the maximum noise levels that the proposed plant can produce alone. They do not include background noise."* PPA requests that this note be included in connection with Table 15. - Table 16 includes noise levels for "Modelled level at receptor", however these noise levels were not included in the Noise Impact Assessment. PPA requests that DWER provides the source of the noise levels provided.	Noted. Additional note has been added. Table 16 was taken from Environmental Assessment Report of W4520/2009/1. The original source is held in hard copy only and not readily accessible. As the table conflicts with information provided in supporting information to the Public Environmental Review (SKM, 2008), Table 16 has been removed.
	Supplementary response provided 20 March 2020: PPA notes that the values presented in Table 17 have changed from the previous Decision Notice. Clarity on the change is requested. PPA refers to the Noise Impact Assessment submitted with the Works Approval application (Utah Point Berth Project Noise Impact Assessment (SKM / Vipac 2007, Document No. 70Q-07-0048-TRP-245064-4)), and notes that: - Table 15 does not include the following note at Table 4.3 of the Noise Impact Assessment:	Noted. The source of the data provided is from the SKM June 2008 report titled *Port Hedland Port Authority: Utah Point Berth Project – Public Environmental Review*. The requested note to Table 15 (now Table 16) has already been made. The title of Table 17 has been amended to "Cumulative noise levels modelled at the receptor".

Condition/ Section	Summary of Licence Holder comment	DWER response
	"Note that the noise criteria presented in Table 4.3 are Design Noise Criteria, i.e. these are the maximum noise levels that the proposed plant can produce alone. They do not include background noise." PPA requests that this note be included in connection with Table 15. - Table 16 includes noise levels for "Modelled level at receptor", however these noise levels were not included in the Noise Impact Assessment. PPA requests that DWER provides the source of the noise levels provided	
Table 26 – additional information provided	PPA provided requested information on the number of tonnages, truck movements and vessels visiting the Premises to update figures provided in section 7.3.5.	Section 7.3.5 updated.
Section 5.1 Department of Health	PPA notes that DWER sought advice from DoH regarding spodumene concentrates and increased handling throughputs. PPA would seek confirmation that DWER also sought advice from DoH regarding the risks of spodumene run of mine.	DWER sought comment from the Department of Health on the Licence Holder's application to: • *increase the total export volume from 21.35 million tonnes per annum (Mtpa) to 24.10 Mtpa; and* • *include Spodumene ore as an approved bulk material with a permitted export volume of up to 3 Mtpa.* DWER provided a link to the application allowing DoH full access to all supporting information received at the time of referral. No comment on the risks of spodumene was provided.
Section 5.2	*Supplementary response provided 20 March 2020:* PPA notes that the Licence Amendment Application lodged by PPA in March 2017 was publicly advertised on 31 March 2017, and this was done concurrently with another amendment application as lodged by BHP. The text indicates that a number of responses were common to both the PPA and BHP applications. The text also notes that a total of 10 submissions were related to PPA's application. For transparency in the approach, PPA would request that the details, ie the scale	Noted. Although the scale of expansion between the two applications was significantly different, the comments received and documented in this report were in relation to both proposals. Of the 29 submissions received during the consultation period for both applications, DWER had regard to a total of 10 submissions made in relation to this Application. It

Condition/ Section	Summary of Licence Holder comment	DWER response
	of the amendment being sought by BHP, be included in this section. The current text provides no context as to the relative differences (10 fold) between the BHP and PPA applications. PPA considers this an important point when attributing the concerns raised by the "common issues" as noted in the section 5.2	is noted that some of these submissions refer to both BHP and Applicant proposals as submitters have noted the cumulative nature of particulates in the context of Port Hedland. Context has been provided in section 5.2.
Section 7.3.5	*Supplementary response provided 20 March 2020:* Manganese ore assessed throughput 658,814 tonnes per annual period. PPA considers this to be two million, as per Table 9 of Schedule 2 of the Draft Licence and request that this table updated.	Amended.
Section 7.4 Risks assessment – noise	PPA notes that the risk rating for noise associated with Utah Point licence operations has increased from low (in the current published L8937 Decision Report) to Medium in this draft. However, PPA does not consider that the proposed amendment would result in an increase in the noise risk to the community. Furthermore, PPA considers that the consequence matrix has been applied inconsistently, in that: • the consequence for noise associated with Utah Point licence operations has increased from insignificant to moderate based on modelling submitted with the works approval which showed the expected levels to be *within* 5 dB of the assigned levels at sensitive receptors; whereas • modelling of Roy Hill's operations show noise likely to reach 5 dB *over* the assigned levels at sensitive receptors, while the consequence applied for noise associated with Roy Hill's operations is also moderate.	Noted. While it is agreeable that noise generated from the Premises is not expected to result in exceedances of Assigned Noise levels at sensitive receptors in most circumstances, using the risk criteria outlined in Table 25, likelihood assessment of 'unlikely' must be applied. The Licence Holder is a significant contributor to Assigned Noise levels as defined by r.7(2) of the EP Noise Regulations. This means that in a cumulative environment such as Port Hedland where noise levels frequently exceed Assigned levels, there is the potential for the Licence Holder to contribute to some exceedances. Therefore the Delegated Officer considered it appropriate to revise the assessment consequence to 'moderate'. The assessment provided in the decision report for L8967/2016/1 (Roy Hill) is beyond scope of this assessment but may be reassessed at a later date. No changes made.
Section 7.5 Risk assessment –	PPA requests that DWER clarify in 7.5.1 what substances section 7.5 refers to – for example this section may relate to discharge of: - bulk granular materials;	Noted. Clarification added to reference all three discharge types listed. Further text has been added to acknowledge that

Condition/ Section	Summary of Licence Holder comment	DWER response
direct discharges to water	- stormwater or wash water containing bulk granular materials; or - other substances such as hydrocarbons (from Cavotec leaks). PPA requests that it is noted in 7.5.2 that any increase in turbidity caused by discharge of bulk granular material is short term and localised, especially compared to the turbidity caused by extreme tidal fluctuations and ongoing shipping operations. Furthermore, sedimentation caused by discharge of bulk granular material is negligible as the sediments would be disturbed by tidal fluctuations and ongoing shipping operations within a timeframe in the order of hours. PPA notes that DWER has increased likelihood of direct discharge to water from Utah Point licence operations causing an environmental impact from unlikely to likely, and that this is based on PPA's history of conservative reporting discharges of any volume. However, PPA has less potential discharge locations compared to other licence holders in Port Hedland (a single berth at Utah Point) and notes that the berth was designed and constructed to contain as much stormwater and washwater as practicable to allow for export of various products, not just inert iron ore. Therefore the potential for discharge from Utah Point to the marine environment is much lower than that from other licence holders in Port Hedland, and PPA considers the likelihood of this risk should remain as unlikely.	shipping movements and tidal influences are expected to increase the background turbidity in the Inner Harbour.
Section 7.5.7	*Supplementary response provided 20 March 2020:* PPA notes that in relation to discussing the consequence of spills from PPA's automatic mooring system, DWER has referred Hassanshahian and Cappello's paper Crude Oil Biodegradation in the Marine Environment (2013). PPA advises that the hydraulic oil that is occasionally discharged from the mooring system (eg from hydraulic line failures and O-ring failures) into the marine environment is Plantohyd 46, which is a light phase hydrocarbon with drastically different properties to crude oil. PPA considers the risk to environment to be Minor.	Noted. Section 7.5.7 acknowledges that the environmental setting and oil properties are different to that which was investigated in the journal article. The section has been amended to the text to further clarify this. The consequence rating is based on a large spill event that has been described as having the potential to cause low-level offsite impacts at a local scale. No changes to the consequence rating are required.
Appendix 5	*Supplementary response provided 20 March 2020:* PPA notes the inclusion of two reports lodged with DWER as part of the public consultation process associated with the proposed amendment to the BHP's Part	Noted. Although submissions are largely directed toward BHP's applications, each submission is relevant to the Application in the context of the cumulative Port Hedland

Condition/ Section	Summary of Licence Holder comment	DWER response
	V (L4513/1969/18) and the PPA's Part V (L8937/2015/1) environmental licence. As noted in section 5.2 of this draft Decision Report, the inclusion of this information reflects the information received during the public consultation process on both these amendments without any context or details associated with the relative nature of the amendments. PPA also notes the TPG+ Place Match Report (March 2017, as listed in Appendix 5) was "produced in support of a submission on a proposed amendment to the Environmental Protection Act Licence L4513/1969/18 (made by BHP Billiton for the export of iron ore from Port Hedland". PPA notes that DWER considers the issues raised by such submissions to be "common" to all amendments lodged at that time (section 5.2 of this draft Decision Report) and therefore applicable to PPA application. PPA would question the reliance of this information in the context of the scope of the two amendments without clear commentary to this point. PPA also notes that this information was not previously included in the draft Decision Report (2019) associated with L8937/2015/1, and the inclusion of Appendix 5 post-dates the issue of BHP amendment to L4513/1969/18). PPA would therefore question the inclusion of Appendix 5 information, unless there is clarity to the reliance and relevance to this information in assessing this application.	airshed, to which the Premises contributes. Appendix 5 has been removed as the issues raised in each submission have been covered in this Decision Report and are predominantly targeted toward BHP's application.

Appendix 4: Summary of Stakeholder Comments on Application

Theme	Submitter	Submission	Summary of Submissions and DWER Response
Regulatory Process and Framework	Submitter	The Department of Environment Regulation (DER) [now Department of Water and Environmental Regulation - DWER[3]] is required to undertake its decision making for applications under Part V, Division 3 of the *Environmental Protection Act 1986* (EP Act) and in accordance with DWER's Regulatory Framework. DWER's Regulatory Framework consists of guidance statements, environmental standards, and guidelines.	Noted. The assessment and subsequent decision-making for this application has been undertaken in accordance with the EP Act and has been guided by DWER's Regulatory Framework. This is reflected in this Decision Report which outlines the policies that have been considered and how they have been applied.
	Submitter	Consistent with DWER's Regulatory Framework, DWER should regulate to prevent or minimise severe and extreme dust impacts (as determined in accordance with DWER's *Guidance Statement: Risk Assessment*) for the West End of Port Hedland. Consistent with source-pathway-receptor model applied by DWER, consideration should be had to the closest sensitive receptor (including the Esplanade Hotel).	Noted. DWER has undertaken the risk assessment in accordance with *Guidance Statement: Risk Assessment* having regard for the receptors in the West End of Port Hedland. However, the public health criteria applied has been based on the currently endorsed *Port Hedland Air Quality and Noise Management Plan, 2010*, and the information and recommendations presented in the Department of Health, *Port Hedland Air Quality Health Risk Assessment for Particulate Matter, 2016*. The Department of Health is the lead agency for public health matters in Western Australia.
	Submitter	Consistent with DWER's Regulatory Framework, DWER should set criteria for dust impacts for amenity in the West End using for example the standards set out in the Kwinana Environmental Protection Policy.	Noted. DWER has considered amenity criteria and notes that there are no currently endorsed criteria for the Pilbara region of Western Australia and criteria that is applied in other jurisdictions varies widely subject to community expectations. Consideration of amenity criteria is documented through section 4.10 of this Decision Report. Subsequently the Department has considered other lines of evidence in informing the risk assessment of amenity impacts as detailed in section 7.3.4 of this Decision Report.
	Submitter	Consistent with DWER's Regulatory Framework, DWER should set criteria for health impacts in the West End, consistent with the rest of Port Hedland and that this is supported by the recommendations made in the *Port Hedland Air Quality Health Risk Assessment for Particulate Matter, 2016* (HRA).	Noted. DWER refers to the Department of Health for the establishment of public health criteria and has considered the information and

[3] References to DER in submissions have been considered as references to DWER.

Theme	Submitter	Submission	Summary of Submissions and DWER Response
			recommendation presented in the HRA. It is noted that the HRA recommended the application of the air guideline value of 24-hour PM_{10} of 70µg/m^3 (+10 exceedances to accommodate natural events) continue to apply at Taplin Street followed by all areas of Port Hedland. A period of 5 years is suggested for this. How the Department has considered the HRA is outlined in sections 3.3 and 7.3 of this Decision Report.
	Submitter	DWER should not make any determination on the licence amendment application until such time as the DWER Port Hedland Dust Monitoring Campaign using LiDAR is completed. This short term monitoring campaign will be essential to understand the risks to the community.	Noted. DWER's short term dust monitoring campaign using LiDAR will be beneficial in informing future decision-making in Port Hedland as it will assist in better understanding the sources and movement of dust within the air-shed. However, it is not considered the only source of information available to the Department when considering the risk to public health and amenity from prescribed premises. A wide range of information has been considered as part of this assessment including (but not limited to) studies undertaken by the Department of Health (HRA), modelling undertaken, monitoring data, history of the Premises (regulatory and complaints etc).
Regulatory controls	Submitter	Port Hedland will become another Wittenoom and State government should ensure that all technologies, best practices and/or physical containment barriers are in place to allow for industry to co-exist with the desired amenity for Port Hedland. State government needs to build upon the 2006 Alcoa precedent of recognising that industry must bear the cost of its own externalities.	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.
	Submitter(s)	All iron ore stockpiles must be located in the designated area of Boodarie and away from the town centre. Further, open stockpiles must be in sheds, similar to ports in Esperance and Geraldton.	Noted. Refer above.
Amenity impacts (including economic)	Submitter	As a result of high levels of iron oxide in dust (caused by industry) corrosion of infrastructure and equipment occurs at much greater rates for properties in the West End of Port Hedland.	Noted. DWER has considered amenity impacts as part of its risk assessment for the Application to increase throughputs at the Premises to 24.1Mtpa. Amenity together with public health risk has resulted in a wide range of additional regulatory controls being applied to the licence to ensure that the residual risk remains at an acceptable level.

Theme	Submitter	Submission	Summary of Submissions and DWER Response
	Submitter	Dust is resulting in significant negative amenity and financial impacts on the West End of Port Hedland resulting from the actual unsightly presence of dust build up on and within buildings, street infrastructure and the like, which adds to the corrosion and premature replacement of equipment and surfaces. These factors are contributing to the depopulation of the West End and the closure of businesses.	Noted. Refer above.
	Submitter(s)	As a result of dust levels cleaning costs are very high. Submitters provided a breakdown of figures in cleaning costs. One business states that they alone have an annual dust cleaning bill in the order of $300,000. This figure does not take into account lost revenue resulting from potential customers not wanting to be in the dust zone. If this were multiplied by all the business and residents affected by the dust, then the annual cleaning cost to the community is in the order of millions each and every year.	Noted. DWER has considered amenity impacts as part of its risk assessment for the Application to increase throughputs at the Premises to 24.1Mtpa. Amenity together with public health risk has resulted in a wide range of additional regulatory controls being applied to the licence to ensure that the residual risk remains at an acceptable level.
Land use planning	Submitter	Concerns with the levels of dust and the impact to land-use planning through restriction proposed and currently applied by planning authorities. This is reported to include restrictions to repairing existing dwellings and further developing 'prime coastal land'. Current planning restrictions include uses such as 'Aged or Dependent Persons Dwellings', 'Single House', 'Child Care Service', and 'Nursing Home' can no longer be approved, as they are considered to be sensitive to potential dust impacts.	Noted. It is noted that the *Port Hedland Dust Management Taskforce 2016 - Report to Government* included a number of recommendations to restrict further population growth in the West End and for ports to continue to reduce dust emissions. In October 2018 the Government determined it necessary to implement a Special Control Area that restricts further sensitive land use construction in the West End. All changes or restrictions to land use planning are outside of DWER's regulatory remit under Part V of the EP Act.
	Submitter	Land values in dust-affected areas of the West End have plummeted well below that of other falls in the Pilbara. This is due to the combination of the issues above, being health fears, the buffer zone and related regulatory uncertainty, along with the destruction of amenity. Mining companies have accelerated this through purchasing properties in the West End and demolishing the buildings, leading to more background dust and a virtual ghost town.	Noted. Refer above.
	Submitter	The "buffer zone" should be removed. Development of the West End of Port Hedland is severely constrained due to the "industrial buffer zone" that has been placed over the precinct due to the dust-covered restrictive planning regulations. There are four key pillars to development: 1) Investors, 2) Bankers and 3) Developers all fear health risks affecting investments and development. This "buffer zone" cripples their respective interests in the West End.	Noted. Refer above.
	Submitter	The objectives of the Town of Port Hedland Local Planning Scheme No. 5 (the Scheme) prepared and gazetted by the Minister for Planning pursuant to the Act is to: *"..encourage an appropriate balance between economic and social development, conservation of the natural environment, and improvements in lifestyle and amenity."*	Noted. DWER undertakes its regulatory functions under Part V of the EP Act for prescribed premises (applicable for this Application).

Theme	Submitter	Submission	Summary of Submissions and DWER Response
		The preservation of amenity of the locality is also a key 'matter for Consideration' in the Scheme for the determination of any development in the Town. Regard must be had to these Local Government objectives as they are a key consideration in the orderly and proper planning for a locality. The gazetted Town of Port Hedland Town Planning Scheme No.5 zones the West End Precinct Town Centre, which includes the ability for sensitive land uses, including multiple dwellings. DWER therefore must have regard for the amenity of the Town in determining the request.	The Department has considered risk to amenity to the West End of Port Hedland which is documented in this Decision Report and consistent with DWER's Regulatory Framework. It should be noted that any changes or restriction to land use planning are outside of DWER's regulatory remit under Part V of the EP Act.
Other	Department of State Development	The Department of State Development supports the PPA application as it represents an important contribution to the State economy and employment in the region. The Inclusion of spodumene in the Pilbara Ports Authority licence will facilitate the development of an important new commodity sector in Western Australia.	Noted.
	Department of Health	On this occasion, the Department of Health (DOH) does not object to the proposed amendments subject to: • A positive assessment of the Pacific Environment Report on the *Pilbara Ports Authority Utah Point Air Quality Assessment Update* by the air quality branch of the Department of Environment Regulation; and • Subject to the proposed throughput in ores not adding to the current negative impacts of dust in the area.	Noted. DWER reviewed the submitted air quality model and considered the methodology used was sufficient and generally consistent with the Port Hedland Cumulative Air Model. The review and considerations of the model and detailed within this Decision Report. The results of the model were considered when determining whether additional regulatory controls would be required.
	Submitter	Support the applications and state that growth and development of the port is an important economic driver for the community and state.	Noted.
	Submitter	Accept that industry must continually strive to improve its operation impacts on the town, whilst continuing to operate and grow in a sustainable and reasonable regulatory environment. On the premise that individual Port user environmental licence conditions continue to be met, supports the principle of allowing all Port users to continue to grow their businesses. This support extends to Pilbara Ports Authority's current licence amendment application to marginally increase capacity from 21.35Mtpa to 24.10Mtpa, and for the inclusion of a new product (Spodumene) to be permitted for export through the facility to a maximum of 3Mtpa.	Noted.
	Submitter	Enquiring about the additional pressure this extra 3 Mtpa will place on our road systems. This additional material should be exported from the Lumsden Point general cargo facility which the PPA and State Government should expedite construction.	Noted. Increases in road traffic outside of the prescribed premises is not within the regulatory remit of Part V of the EP Act and has not been considered as part of this assessment. However it is understood that trucks will be directed to the

Theme	Submitter	Submission	Summary of Submissions and DWER Response
			Premises on Finucane Island rather than through the Town of Port Hedland with access via the Great Northern Highway and Utah Road.

Attachment 2: Issued Licence L8937/2015/1