

Port of Geraldton Dust Management Plan

Prepared by: Mid West Ports Authority

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DUST MANAGEMENT PLAN

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1 Introduction

1.1 PURPOSE AND SCOPE

The purpose of this Dust Management Plan is to outline the way in which the Mid West Ports Authority (**MWPA**) manages activities such that the impact to surrounding air quality is minimised. This Plan outlines management objectives and targets on which to assess performance for managing air quality and supports compliance with Environmental Licence L4275/1982/15 and other legislation.

The Dust Management Plan has been developed in accordance with the Department of Water and Environmental Regulation (**DWER**) *Guideline: Dust Emissions* (2021); to satisfy the requirements for an Operational Dust Analysis for the Geraldton Port (**the Port**).

All MWPA workers, leaseholders, customers and Port users are required to comply with actions and responsibilities outlined in this Dust Management Plan.

In line with the MWPA Environmental Policy this Dust Management Plan seeks to:

- protect and improve air, land, water and habitat quality within the MWPA's boundary of control, and where practical and feasible, influence beyond those boundaries;
- ensure that commercial arrangements with customers include strong environmental awareness, management actions and performance measures;
- comply with all applicable environmental legislative requirements as a minimum standard, and the guiding principles of ISO 14001, '*Environmental Management Systems*';
- establishing, monitoring, reporting and auditing performance against environmental objectives and targets to ensure MWPA's environmental commitments are met; and
- developing and implementing innovative programs and initiatives to advance environmental stewardship, mitigate impacts and drive continuous improvement.

The scope of this Dust Management Plan applies to all activities occurring within the MWPA prescribed premises boundary (shown in **Figure 1**) and on Port land including:

- storage, handling and road/rail unloading of bulk material products;
- loading of bulk material products to vessels by shiploader and rotainer loading systems;
- unloading (discharge) of bulk material products from vessels;
- construction and demolition activities occurring on Port land;
- ancillary activities such as infrastructure maintenance and waste management; and
- earthworks and roadworks.

This Dust Management Plan excludes the following:

- Activities within the Geraldton Southern Transport Corridor.
- Activities within the rail corridor which are outside the Geraldton Port Terminal boundary.

This Dust Management Plan excludes actions and monitoring associated specifically with occupational health and hygiene management of Port workers. This is described and managed separately under the MWPA Health and Hygiene Management Plan and individual customer programs.

1.2 DEFINITIONS

Term / Abbreviation	Definition
AACR	Annual Audit Compliance Report, requirement of Environmental Licence
BAM	Beta Attenuation Monitor
CAMMS	Database system used by MWPA to record incidents
CBH	Co-operative Bulk Handling – operates Berth 3 grain terminal; owns and operates a grain train unloading facility.
CFD Modelling	Computational Fluid Dynamic modelling – used in wind simulations
DEM	Dust Extinction Moisture
DEMIRS	Department of Energy, Mines, Industry Regulation and Safety
DOT	Department of Transport
DWER	Department of Water and Environmental Regulation
EPA	Environment Protection Agency
FBH	Fishing Boat Harbour
MWPA	Mid West Ports Authority
NATA	National Association of Testing Authorities
NEPM	<i>National Environment Protection (Ambient Air Quality) Measure</i>
PM	Particulate Matter
PSD	Particle Size Distribution
SDS	Product Safety Data Sheet
TEOM	Tapered Element Oscillating Microbalance
The Port	Port of Geraldton
TML	Transportable Moisture Limit
TSP	Total Suspended Particles
WA	Western Australia

2 Background

2.1 EXISTING ENVIRONMENT

2.1.1 Location

The Port is located to the north-west of the city centre of Geraldton, approximately 430 kilometres north of Perth. The Port is located on the northern shores of Point Moore and situated within the south-eastern corner of Champion Bay.

The Port has been operating in its current location since 1924, with the first vessel visiting Champion Bay in 1840. The first export of lead ore occurred in 1849. Significant growth and development of the Port has continued since that time, with the current port layout and infrastructure constructed and commissioned in 2012.

The current layout of the Port consists of seven berths. Berths 1 to 4 are located adjacent to the shoreline, Berths 5 and 6 perpendicular to shore in the western end of the commercial harbour with Berth 7 located at the northern extremity of the harbour. To the west of the commercial harbour is the FBH and supporting industry. To the east is the tug and pilot boat marina. **Figure 1** shows the current layout of the Port.

2.1.2 Climatic Conditions

MWPA maintains two continuous meteorological stations at the Port. The Tower 501 station is located at the western end of Berth 4. For shipping purposes, a second station is located at an offshore location to the north-west of Berth 7, known as Beacon 1. The Beacon 1 site has been in place since 2008, and the Tower 501 site since 2018.

The Tower 501 site is currently used as part of the Envirosuite Database system to assess management actions for dust. Wind roses, illustrating wind patterns and directions, can be generated through the Envirosuite Database system as needed.

Tower 501 wind data demonstrates that the predominant wind patterns experienced in summer range from a south-westerly to south-easterly direction, with the strongest winds coming directly from the south. Much greater variability in wind directions is experienced in winter, where easterly winds are dominant, and the strongest winds experienced from the south-west.



Figure 1 Layout of the Port of Geraldton

2.1.3 Sensitive Receptors

The Port is surrounded by land zoned for industrial, commercial and residential purposes. Sensitive receptors that may be impacted by dust emissions generated from port activities include the FBH to the west, residential properties in the suburbs of Beachlands and Point Moore, and public space facilities such as the Geraldton Foreshore.

In accordance with the DWER *Draft Guideline for Dust Emissions*, MWPA understands that the closer an emission source is to a sensitive receptor, the more stringent controls and management systems need to be to ensure the potential impacts of the emission are acceptable (DWER, 2021).

Locations of sensitive receptors and their proximity to operations at the Port are outlined in **Figure 2** and **Table 1**.

Table 1 Distance of Sensitive Receptors from Port Operations

Sensitive Receptor	Approximate Distance from Geraldton Port Activity					
	Berth 3 (CBH)	Berth 4	Berth 5	Berth 6	Berth 7 (Karara)	Mineral Storage Area
Geraldton Foreshore	700m	1km	1.1km	990m	780m	1km
Beachlands Residential Properties	350m	510m	680m	835m	880m	430m
Point Moore Residential Properties	1.3km	1.1km	960m	1.2km	1.5km	1km
Light Industrial Premises	260m	300m	470m	680m	830m	150m
Fishing Boat Harbour	710m	450m	305m	420m	550m	430m

2.1.4 Regional Air Quality

Air quality monitoring is undertaken by DWER at a number of regional and metropolitan locations within Western Australia (WA) in accordance with the *National Environment Protection (Ambient Air Quality) Measure (NEPM)*. Monitoring of Particulate Matter (PM) at levels of PM₁₀ and PM_{2.5} in Geraldton has been undertaken by DWER since in 2005 and 2019 respectively.

Exceedances of the NEPM daily standards from PM_{2.5} and PM₁₀ have been recorded by DWER in recent years in Geraldton, and are believed to be a result of bushfires, hazard reduction burns and natural events such as windblown regional dust. DWER monitoring shows that elevated particle levels in Geraldton occur predominantly in the afternoons and generally during the drier summer months.

Ambient air quality for Geraldton is updated hourly and is available on the DWER website at <https://www.der.wa.gov.au/your-environment/air/air-quality-index>. Annual reports are also made publicly available on the DWER website - [DWER Air Quality Publications](#).



Figure 2 Sensitive Receptor Locations in Proximity to Geraldton Port

2.2 OPERATIONS DESCRIPTION

2.2.1 Current Operations

MWPA is currently licenced under L4275/1982/15 to a production capacity of 160,000 tonnes per day (loading or unloading) and an annual capacity of 23 million tonnes. The Port is a multi-user port which facilitates the import and export of a range of bulk mineral products. Historical trade by commodity is shown on **Figure 3**.

Iron ore makes up the majority of the trade at the Port, representing approximately 70% of the total bulk handling activities in the 2023/2024 financial year. Operations at the Port occur 24 hours a day, all year round.

Historically, the Port has consisted of many land-based leasehold and product storage areas. All products, with the exception of talc, are stored within sheds in the designated bulk materials storage area; with iron ore product storage sheds located adjacent to Berths 5 and 6.

Material can be delivered to the Port via train (grain and iron ore only), truck or via ship. The Port owns and operates one iron ore train unloader, whilst Karara owns and operates a second iron ore train unloader. CBH also owns and operates a grain train unloading facility. There are several truck unloaders used for unloading various products stored and exported through the Port. Fertiliser and Heavy Mineral Concentrates are imported into WA and vessels are unloaded via crane operated grabs and hoppers or via self-discharging vessels equipped bucket elevators and covered conveyors. The critical infrastructure which relates to port activities and dust management is outlined in **Attachment 1: Critical Infrastructure Related to Dust Emissions**.

Each of the products handled at the Port has unique characteristics in regards to dust generation potential. A summary of bulk granular product characteristics which are currently approved for importing/exporting through the Port is provided in **Attachment 2: Approved Products for Import and Export through Geraldton Port**.

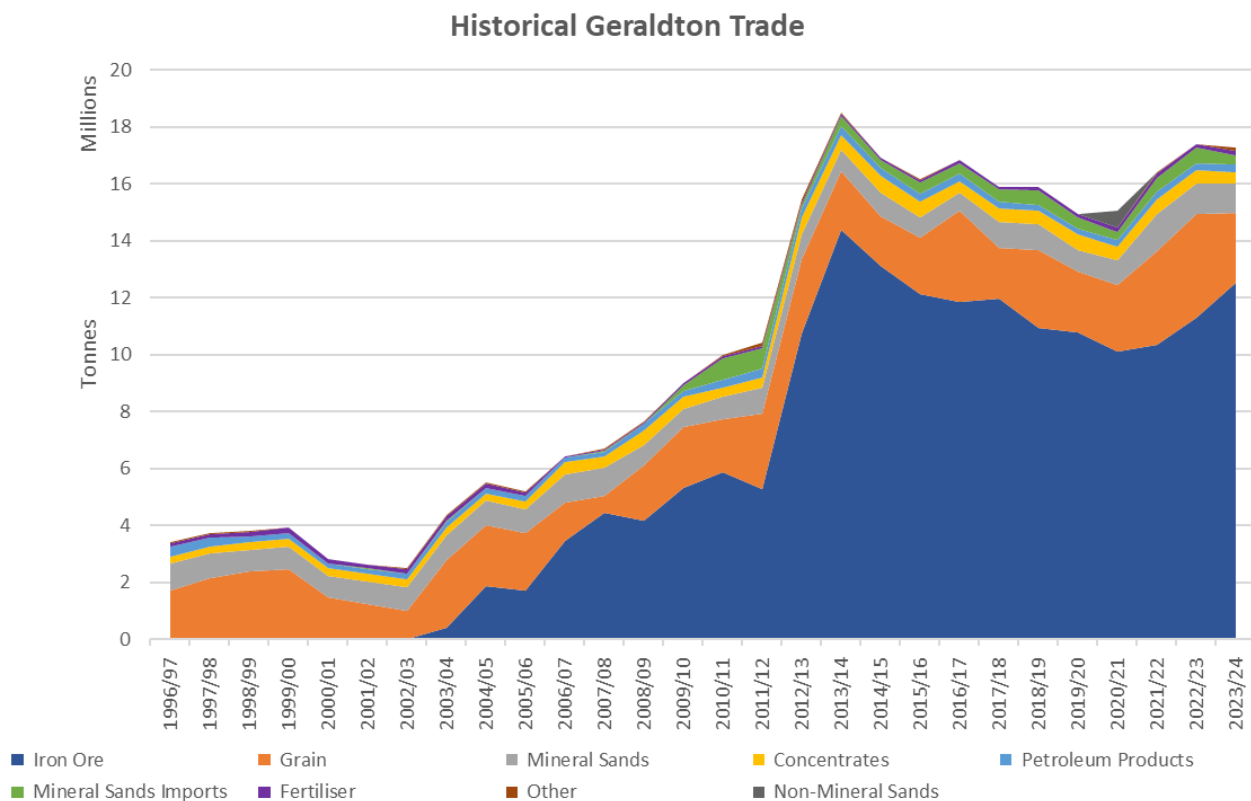


Figure 3 Historical Trade through Geraldton Port by Commodity

2.2.2 Wind Modelling

MWPA has undertaken detailed wind modelling of the Port to improve understanding of wind dynamics and how this is influenced by infrastructure. Computational fluid dynamic (CFD) modelling was used to simulate air flow across the Port and determine the impact of topography, buildings, storage sheds and stockpiles that may impact wind behaviour, and dust emissions accordingly. An example of wind modelling completed is shown in

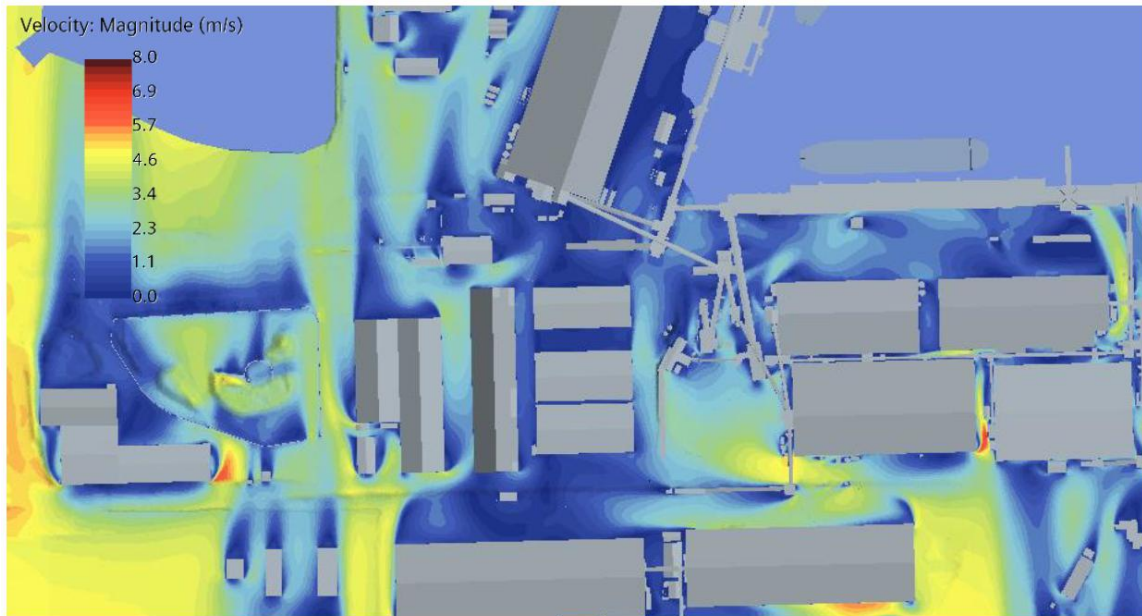


Figure 4, which demonstrates the wind speed and wind tunnelling effects which occur approximately 1.5 metres above ground level during a southerly wind (no wind mitigation measures in place).

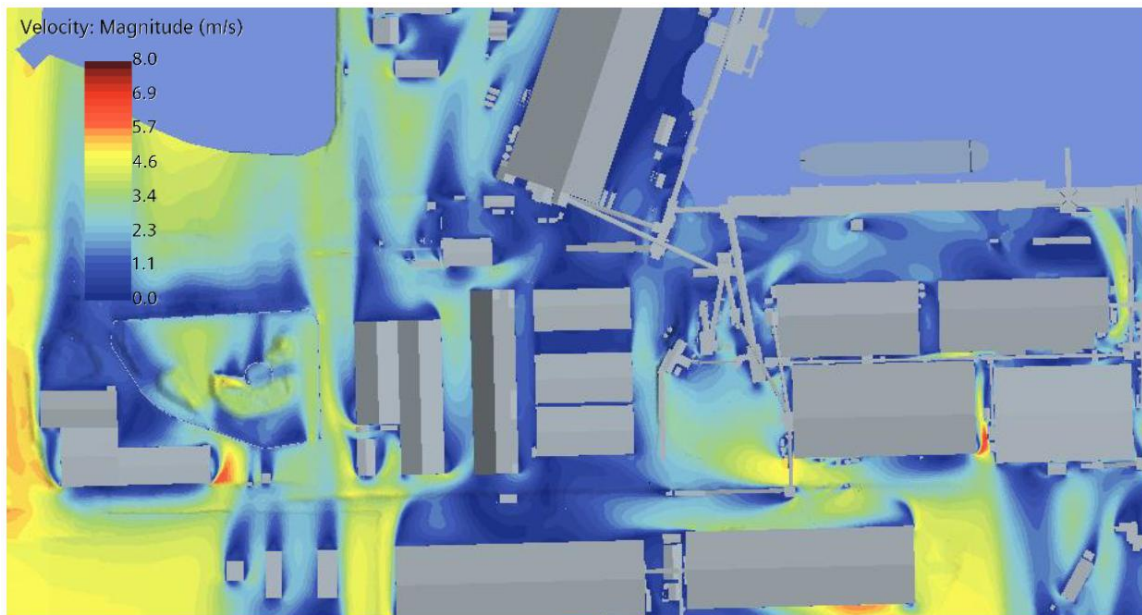


Figure 4 CFD Wind Modelling Completed in 2023

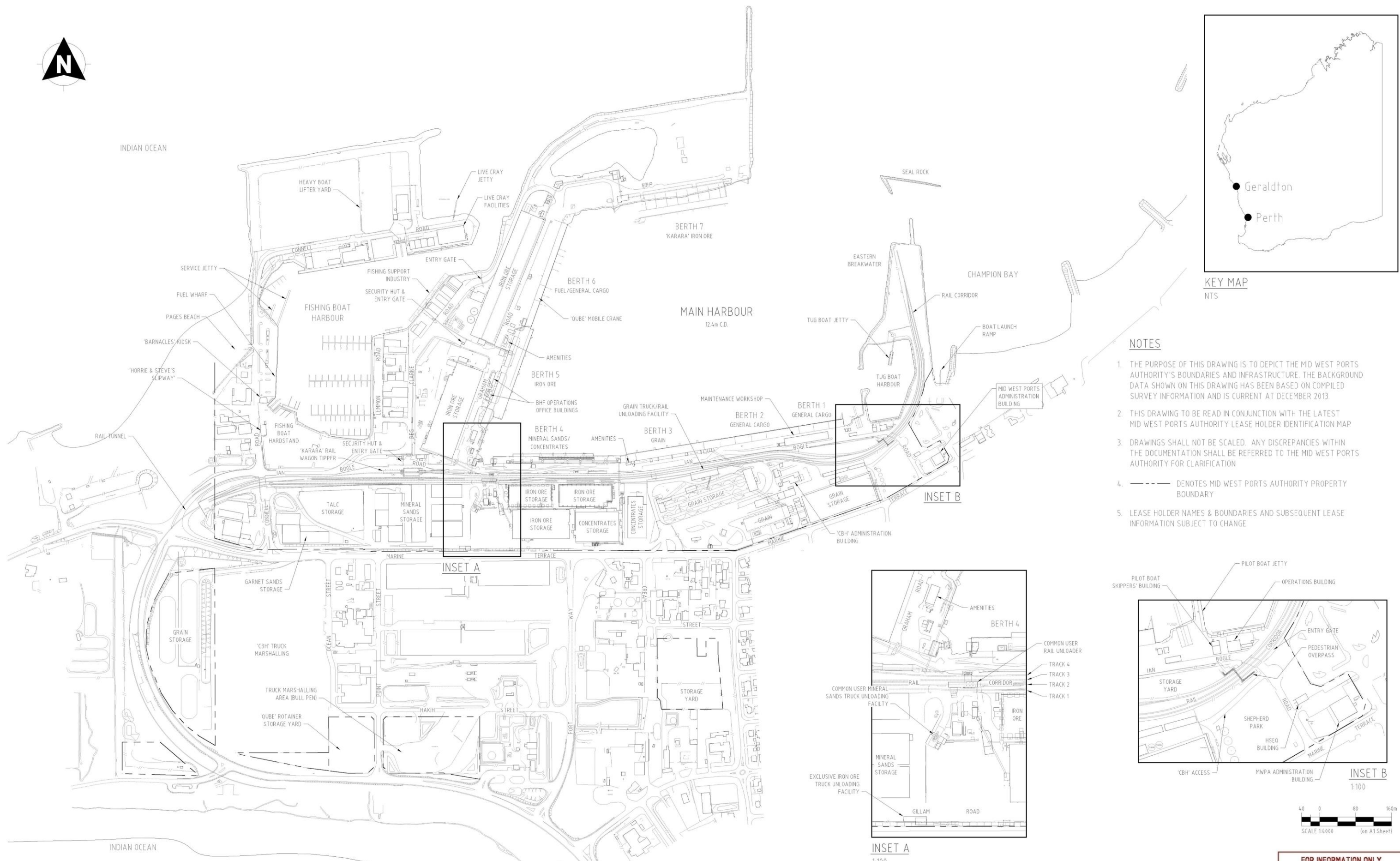
2.2.3 Dust Dispersion Modelling

MWPA conducted detailed wind and dust dispersion modelling for the Geraldton Port in 2022/2023 to inform dust mitigation improvement measures required to improve air quality. This modelling provided greater insight into dust emission sources across the Port, enabling the contribution of each source to surrounding dust concentrations to be quantified.

Outcomes from the modelling were used to inform implementation of specific dust control infrastructure measures in 2023-2024. These included:

- recommissioning of the cascade chute on the Berth 4 shiploader for garnet loading (March 2023);
- construction of the DustTamer™ fence adjacent to the talc stockpile (April 2023);
- upgrades to the dust extraction system on the MWPA common user truck unloader (June 2023); and
- installation of the dry fog system on the Berth 5 shiploader (March 2024).

MWPA remains committed to conducting additional comparative dust modelling prior to any significant change to products, handling methods or throughput volumes being handled at the Port, to ensure dust emissions continue to be minimised.



- NOTES**
1. THE PURPOSE OF THIS DRAWING IS TO DEPICT THE MID WEST PORTS AUTHORITY'S BOUNDARIES AND INFRASTRUCTURE. THE BACKGROUND DATA SHOWN ON THIS DRAWING HAS BEEN BASED ON COMPILED SURVEY INFORMATION AND IS CURRENT AT DECEMBER 2013.
 2. THIS DRAWING TO BE READ IN CONJUNCTION WITH THE LATEST MID WEST PORTS AUTHORITY LEASE HOLDER IDENTIFICATION MAP
 3. DRAWINGS SHALL NOT BE SCALED. ANY DISCREPANCIES WITHIN THE DOCUMENTATION SHALL BE REFERRED TO THE MID WEST PORTS AUTHORITY FOR CLARIFICATION
 4. --- DENOTES MID WEST PORTS AUTHORITY PROPERTY BOUNDARY
 5. LEASE HOLDER NAMES & BOUNDARIES AND SUBSEQUENT LEASE INFORMATION SUBJECT TO CHANGE

MID WEST PORTS AUTHORITY - GERALDTON PORT, WEST END GERALDTON, WA

Figure 5 Critical Infrastructure Layout Map

FOR INFORMATION ONLY.
NOT ISSUED FOR CONSTRUCTION

REVISIONS				REFERENCE DRAWINGS			
REV	DATE	DESCRIPTION	DRN	APP	DRAWING No.	DRAWING TITLE	
B	17.02.20	FBH JETTIES UPDATED. ISSUED FOR INFORMATION	RF	JH	010-G-0074	LEASE HOLDER IDENTIFICATION MAP - AERIAL IMAGE	
A	21.08.14	ISSUED FOR INFORMATION	RF	JG	010-G-0073	LEASE HOLDER IDENTIFICATION MAP	
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3 Compliance Obligations

3.1 PORT AUTHORITIES ACT 1999

MWPA is required by Section 30(1)(f) of the *Port Authorities Act 1999* to “protect the environment of the Port and minimise the impact of port operations on that environment”.

3.2 ENVIRONMENTAL PROTECTION ACT 1986

MWPA holds Environmental Licence L4275/1982/15 issued under Part V of the *Environmental Protection Act 1986* by DWER. This Environmental Licence permits the bulk loading and unloading of granular materials from vessels, specifically:

- Category 58: Bulk material loading or unloading on which clinker, coal, ore, ore concentrate, or other bulk granular material is loaded onto or unloaded from vessels by an open material loading system; and
- Category 58A: Bulk material loading or unloading premises on which salt is loaded onto or unloaded from vessels by an open material loading system.

The following products are currently handled through the Port, including some which are non-regulated under the Environmental Licence (but still present a potential source of dust emissions).

Table 2 Regulated and Unregulated Products handled through the Port

Products regulated under L4275/1982/15	Products not regulated under L4275/1982/15
<ul style="list-style-type: none"> • Coal • Fertiliser (including urea, potash-, phosphate-, and potassium carbonate-based fertiliser) • Clean fill (including non-silica sands, gravel and clay) • Iron ore • Mineral sands (including zircon, ilmenite, rutile and leucoxene) • Garnet • Heavy mineral sands concentrate • Mineral sands concentrate • Manganese ore • Nickel concentrate • Talc • Zinc concentrate • Lead sulphide concentrate • Iron concentrate • Copper concentrate • Lithium direct shipping ore • Spodumene concentrate 	<ul style="list-style-type: none"> • Grains • Petroleum • General cargo • Stockfeed • Livestock • Bagged garnet

Environmental Licence conditions relating specifically to dust emissions management include:

1The licence holder shall operate and maintain all pollution control and monitoring equipment to the manufacturer’s specification or any relevant and effective internal management system.

3 The licence holder must ensure that a dust extraction systems are in operation at truck and rail unloader facilities for regulated bulk products as well as storage sheds for iron ore and metal concentrate products, whenever dust generating activities (including any stockpile disturbance) are being undertaken.

4 The licence holder must:

- a) prior to loading and unloading of regulated bulk granular products, determine and ensure that the bulk granular products are adequately moisture conditioned, such that the moisture content is at or above the associated DEM level for the bulk granular product, as determined by AS 4156.
- b) maintain accurate records of the moisture content of each regulated bulk granular product shipment, excluding mineral sands, garnet, clean fill and fertiliser, as well as the associated DEM level for these regulated bulk granular products; and
- c) where adequate moisture conditioning cannot be practically achieved for a regulated bulk granular product, implement all practical measures to prevent excessive dust emissions during loading and unloading of these regulated bulk granular products.

5 The licence holder must, during the loading and unloading of regulated bulk granular products:

- a) utilise and maintain dust covers and/or wind shields on conveyors;
- b) position the shiploader such that vertical drop heights into the vessel's hold are minimised as much as practicable;
- c) ensure storage shed doors are closed, where practical, during shiploading (excluding operation of external feed hopper facility);
- d) utilise and maintain spill deflector plates and/or wind shields during unloading of products;
- e) monitor and ensure that wind conditions are not causing excessive liftoff and emission of regulated bulk granular products; and

(f) undertake adequate sweeping to remove potential spillages during and/or post-loading or unloading activities.⁷ The licence holder must collect all spillage of regulated bulk granular products within the premises in a manner as to prevent it from accessing the environment.

9 The licence holder must ensure that the loading, unloading, storage and handling of the regulated bulk granular products listed in [Table 1] (Table 3 below) are undertaken in accordance with the corresponding operational requirements[...]

21 The licence holder must ensure that reasonable and practicable measures are taken to ensure that dust generated on the premises does not cross the premises boundary.

Table 3 Extract of Condition 9: Table 1, Summarised for Dust Emission Management

Regulated Bulk Granular Product	Operational Requirement
Mineral sands, Garnet, Lithium direct shipping ore, Spodumene concentrate, Clean fill	<ul style="list-style-type: none"> • Product must be covered or tarped while being transported via haulage trucks at premises. • Garnet must be loaded via cascading chute.

Regulated Bulk Granular Product	Operational Requirement
Talc	<ul style="list-style-type: none"> Product must be covered or tarped while being transported via haulage trucks at premises. Dust suppression must be undertaken during product unloading (from trucks), product stockpiling, and product loading. Additional dust suppression or other dust mitigation measures must be undertaken where fugitive dust emissions are observed from the open stockpile. Open stockpile must be minimised as much as practicable and be no higher than the dust mitigation fence. Dust mitigation fence integrity must be maintained while there is an open stockpile or while there are dust generating activities (including stockpile disturbance) being generated.
Iron ore	<ul style="list-style-type: none"> Product must be covered or tarped while being transported via haulage trucks at premises. Dust suppression system, using either water spray or dry fog, on the conveyor and shiploader must be operational during product loading at Berth 5 and Berth 7, where the product does not meet the relevant dust extinction moisture level.
Copper concentrate, Lead sulphide concentrate, Nickel concentrate, Zinc concentrate, Manganese concentrate, Iron concentrate, Mineral sand concentrate	<ul style="list-style-type: none"> Rotainers must remain closed at all times when outside of a vessel hold. Rotainer tipping within a vessel hold may only occur when the Rotainer is below the level of the vessel deck. Rotainer tipping must occur no more than two metres above the floor of the vessel hold or material level. Dust suppression system, using dry fog, on the vessel hold must be operational during loading of iron concentrate, lead, and nickel. Mineral sand concentrate must contain a product moisture content between 4% and 8.5% w/w, as averaged over each shipment. Iron concentrate must contain a product moisture content between 12% and 17% w/w, as averaged over each shipment. Loading of iron concentrate must only be undertaken between November and April to minimise potential dust liftoff. Loading of iron concentrate must not be undertaken when wind speed is 5 m/s or higher and wind direction is westerly (i.e., between 225 degrees and 337 degrees).

3.3 ENVIRONMENTAL PROTECTION (UNAUTHORISED DISCHARGES) REGULATIONS 2004

Under the *Environmental Protection (Unauthorised Discharges) Regulations 2004*, it is an offence to cause or allow certain materials to enter the environment in connection with a commercial or business activity.

Under regulation 3(1) a person who, in the course of or in connection with a business or a commercial activity, causes or allows dust (or other schedule 1 material) to be discharged into the environment commits an offence.

3.4 LEASEHOLDER OBLIGATIONS

All exporters, importers and leaseholders are required to have procedures in place that outlines environmental controls to be implemented while operating on Port land. Customers have a contractual requirement under their respective Port Services Agreements, Port Access Agreement and Lease Agreements to supply MWPA with a Dust Management Plan.

Exporter, importer and leaseholder Dust Management Plans should document how dust emissions are managed specifically for operations conducted on Port land. Dust Management Plans should address dust management on Port land specifically, including product characteristics, infrastructure and control systems in place for handling bulk materials from truck/train/vessel unloading, shed storage, conveyor systems and shiploading.

A checklist of minimum requirements for Customer and Leaseholder Dust Management Plans is provided in **Attachment 3: Checklist for Developing a Dust Management Plan**.

3.5 LICENCED STEVEDORES

The loading and unloading of vessels must be undertaken by licenced stevedores. MWPA issues stevedoring licences based on the assessment of the companies' past performance, demonstrated qualifications and submission of key environmental and safety management plans.

Stevedores are subject to an independent annual audit which thoroughly examines the systems, processes and procedures each stevedore maintains in order to comply with MWPA requirements and Environmental Licence conditions.

Stevedoring services engaged directly by MWPA are subject to monthly performance review meetings including a detailed review of incidents during that period. Berth hygiene and housekeeping practices are routinely reviewed to ensure sources of fugitive dust are eliminated.

3.6 MWPA OPERATIONS

The common user Berth 6 is managed through the Berth Handover Procedure and supporting checklist which requires MWPA Wharf Supervisors to review berth hygiene and housekeeping practices of stevedores engaged via a Port customer and not under the direct control of MWPA.

MWPA is directly responsible for activities that occur on Berths 4 and 5 and as such developed a suite of operational procedures, checklists and inspection regimes to control and mitigate dust.

3.7 REGULATORY CRITERIA FOR DUST

Regulatory targets for air quality are established within the Port's Environmental Licence as outlined in **Table 4**. Any exceedances identified through monitoring are recorded by MWPA as an incident and reported to DWER in accordance with Environmental Licence conditions. Further detail is provided in **Section 7** (Monitoring) and **Section 10** (Reporting).

Table 4 Regulatory Criteria for Dust

Parameter	Monitoring Point	Regulatory Target	Averaging Period	Source
Particulates as PM ₁₀	B1; LR; PW; CR	50 ug/m ³	10 minutes or less	L4275/1982/15
			24 hour average	NEPC 2016 L4275/1982/15
Lead as PM ₁₀	B1; LR; PW	0.5 ug/m ³	24 hour average	NEPC 2016

Parameter	Monitoring Point	Regulatory Target	Averaging Period	Source
	CR	2.0 ug/m ³	24 hour average	L4275/1982/15
Copper as PM ₁₀	B1; LR; PW; CR	1.0 ug/m ³	24 hour average	L4275/1982/15
Nickel as PM ₁₀	B1; LR; PW; CR	0.02 ug/m ³	Annual rolling average	L4275/1982/15
Manganese as PM ₁₀	B1; LR; PW; CR	0.15 ug/m ³	24 hour average	L4275/1982/15
Lithium as PM ₁₀	B1; LR; PW; CR	-	24 hour average	L4275/1982/15
Deposited Dust *	DML1, DML2, DML3, DML4, DML5, DML6, DML7	4g/m ² 2g/m ²	30 days (max) 30 days (above background)	NSW EPA 2016

Monitoring Stations B1 = Berth 1; LR = Lemmon Road; PW = Port Way; CR = Connell Road

* Depositional dust monitoring is currently completed in addition to licence requirements by MWPA

4 Potential Impacts

4.1 SOURCES OF DUST

Particulate emissions from a wide range of sources can impact upon air quality in proximity to the Port including:

- unloading of bulk products at train and truck unloaders;
- localised port maintenance, construction and excavation activities;
- loading of bulk products via conveyors and shiploaders at Berths 3, 4, 5, and 7;
- loading of metal concentrates and mineral sand concentrates via rotainers at Berth 6;
- unloading of fertiliser and mineral sands at Berth 6 via vessel crane with grab attachment or self-discharging vessel mechanism;
- heavy vehicle movements;
- offsite light industry, road maintenance and construction activities;
- sand bypassing activities occurring at Pages Beach and Connell Road 'Lives Beach'; and
- dust from unsealed surfaces and disturbed ground.

Elevated ambient background dust levels (regional and local scale) can also contribute to particulate levels in proximity to the Port, along with offsite sources, such as suspended aerosol components of sea spray and windblown dust from coastal environments.

4.2 CHARACTERISTICS OF DUST

Airborne particulate matter (**PM**) can be generated through fugitive dust emissions and has the potential to impact public health through both short-term (acute) and long-term (chronic) exposure. Dust emissions can also impact on vegetation, soil and water quality, as well as amenity and social surroundings (DWER, 2021).

PM can be made up of a variety of components including nitrates, sulfates, organic chemicals, metals, allergens (such as fragments of pollen) in addition to soil or dust particles. Airborne PM can also be recorded as a result of bushfires and liquid droplets suspended in air (such as seaspray).

Fugitive dust is comprised of PM which ranges in size from 0.005 to 100 micrometres (μm). Dust particles are typically categorised into different size classes.

- Total Suspended Particles (**TSP**) generally up to 100 μm in diameter.
- PM_{10} is PM with an aerodynamic equivalent diameter (AED) of predominately 10 μm or smaller.
 - Particles with a diameter of 10 μm are captured with 50% efficiency by a monitoring system or reference method. 50% AED 10 μm defines the cut-off for PM_{10} classification.
 - The PM_{10} fraction can also include larger particles (up to 30 μm in diameter) due to the measurement process or natural variability. These larger particles are included because their shape, density, or behaviour in air gives them aerodynamic properties similar to smaller particles.
- $\text{PM}_{2.5}$ is PM with an aerodynamic diameter less than or equal to 2.5 μm .

PM_{10} particles are not visible to the naked eye and are small enough to be inhaled through the nose and throat to enter the lungs. $\text{PM}_{2.5}$ particles can enter deeper into the lungs and potentially enter the bloodstream. It should be noted that PM_{10} also includes a proportion of $\text{PM}_{2.5}$ sized particles, and both are referred to as respirable dust.

TSP is considered nuisance dust rather than dust with an adverse health effect. This is because the particles are large enough to become trapped in the upper respiratory tract and then excreted from the body; they do not penetrate into the lungs. Deposition of TSP on surfaces can lead to soiling and contamination.

The particle size characterisation and composition of the various products handled at the Port is described in **Attachment 2: Approved Products for Import and Export through Geraldton Port**.

4.3 RISK ASSESSMENT

A risk assessment has been completed to identify potential pathways and receptors that may be impacted from various sources of dust emissions at the Port. This is provided in **Table 5**. Risk ratings have been established based on the DWER *Guideline Statement: Risk Assessments* (February 2017) which are included in **Attachment 4: DWER Risk Rating, Consequence Matrix and Likelihood Matrix**

Management actions to mitigate risks identified are outlined in the following sections.

Table 5 Pathways and Receptors Analysis Risk Rating

Source - Pathway - Receptor Analysis							
Potential Emissions	Activity / Sources	Potential Receptors	Potential Pathways	Potential Adverse Impacts	Consequence	Likelihood	Risk Rating
Dust Emissions	Truck and rail in-loading or out-loading Stockpiling of bulk materials (including within storage sheds) Transfer points within the Bulk Handling Facility, shiploaders and other supporting equipment (including hoppers and emissions from vessel hold) Unloading (discharging) of bulk materials from vessels	Residential Light Industry Fishing Boat Harbour Geraldton Inner Harbour Marine environment Foreshore / Recreational Areas	Air / wind dispersion Dust settling on infrastructure or in the marine environment Resuspension of particulates in high wind conditions and severe weather Rainfall and stormwater mobilising settled dust particles and entering stormwater systems	Impacts to human health through inhalation of particulates.	Moderate	Possible	Medium
				Impacts to amenity at nearby sensitive receptors resulting in nuisance dust (visual dust emissions); dust deposition on private property; impacts to public road users; complaints.	Moderate	Likely	High
				Introduction of suspended solids, nutrients or soluble metals to the marine environment.	Minor	Possible	Medium

5 Objectives and Targets

As outlined in the Environmental Management Plan (MWPA, 2025) the key objective for protection of air quality is to “maintain air quality and minimise emissions so that environmental and public amenity values are protected.” The following objectives, targets and performance indicators displayed in **Table 6** have been established to enable the protection of air quality to be achieved.

Table 6 Objectives, Targets and Performance Indicators

No.	Objective	Target	Performance Indicator
01	Dust emissions do not adversely impact public health beyond the prescribed premises boundary.	<ol style="list-style-type: none"> 1. Dust emissions related to Port Operations remain below target levels for PM₁₀ as defined in MWPA Environmental Licence. 2. Dust emissions remain below regulatory targets for metal concentrates as defined in MWPA Environmental Licence. 	Continuous PM ₁₀ monitoring; High-volume air PM ₁₀ sampling for metal concentrates; and Occupational health exposure monitoring.
02	Dust emissions do not adversely impact public amenity beyond the prescribed premises boundary.	No public complaints attributed to dust emissions from Port Operations.	Depositional dust monitoring; and Public Complaints
03	Dust emissions do not adversely impact environmental values beyond the prescribed premises boundary.	No reportable incidents relating to dust emissions which cause pollution to soil or the marine environment.	Reportable incidents recorded in Annual Audit Compliance Report (AACR)
04	Dust emission control measures are adequately considered in Port development plans.	No net increase in dust emissions recorded in compliance monitoring stations beyond the prescribed premises boundary	Continuous PM ₁₀ monitoring

Note: The impact of dust emissions on the health of workers inside the Port’s prescribed premises boundary is managed under the MWPA Health and Hygiene Management Plan and individual customer programs.

6 Implementation Strategy

A range of management actions are implemented at the Port to ensure that objectives and targets for protecting air quality can be met. These are described and summarised in **Table 7**.

6.1 PRODUCT MOISTURE CONDITIONING

Moisture conditioning of bulk granular materials is a key control measure to mitigate dust emissions during product handling and shiploading. Under Condition 4 of the Environmental Licence, all regulated bulk granular products must have a moisture content at or above their Dust Extinction Moisture (**DEM**) level.

Product owners are required to conduct an annual DEM analysis for their products. The results of these analyses must be submitted to MWPA.

DEM analysis must follow the method outlined in Australian Standard AS 4156.6-2000 for granular products. This standard is widely applied to bulk materials across Western Australian ports and is the specified methodology in the Environmental Licence. For lump products, DEM should be calculated using an adapted method based on AS 4156.6-2000, which provides a DEM level based on the moisture correlation between fines (-6.3mm) and full size (+6.3mm) product fractions.

Dry products such as mineral sands, garnet, clean fill, and fertilisers are excluded from these DEM requirements.

Where a products DEM level exceedance the Transportable Moisture Limit (**TML**) or when moisture conditioning is impractical due to the products characteristics (such as high fines content or dry products), alternative dust control methods must be implemented to ensure excessive dust emissions do not occur.

6.2 HANDLING AND LOADING OF METAL CONCENTRATES

There is the potential for significant health and environmental risks as a result of dust emissions during loading of metal concentrates. In 2023/2024 the loading of lead, copper and zinc concentrates was relocated to Berth 6 via rotainer operations, significantly reducing exposure pathways for nearby receptors and the environment.

Spodumene concentrate remains the only metal concentrate¹ product to be loaded over the Berth 4 shiploader.

Specific measures in place for concentrate loading over Berth 4 or via retainers on Berth 6 include the following.

- Wind speed and direction limits are in place for iron concentrate and monitored during the entire shiploading event (refer to wind parameters link on MWPA website; and Loading Packaged Bulk Minerals Procedure). Loading is suspended if wind limits are reached; Time limited loading restrictions for iron concentrate (loading restricted to November – April), based on predominant wind conditions during the summer season.
- Product moisture is carefully maintained and monitored by the product owner to minimise the risk of dust during handling and transfer (refer to Section 6.1).
- Vessel hold fogging must be utilised when loading high risk products on Berth 6 (including nickel, lead and iron concentrate).
- Loading events are supervised continually by MWPA Operations Supervisor.

The requirements for loading of metal concentrates are outlined further in the MWPA Loading Packaged Bulk Minerals Procedure.

¹ Licence L4275/1982/15 defines 'metal concentrate' as copper concentrate, lead sulphide concentrate, nickel concentrate, zinc concentrate, manganese ore, iron concentrate, lithium direct shipping ore and/or spodumene concentrate.

6.3 ASSESSMENT OF NEW PRODUCTS

MWPA has a regulatory requirement to assess the potential environmental, occupational, public health and amenity risks associated with introducing new products into the Port or changing handling methods and locations. As part of adding new products to the Environmental Licence specific details are provided as to where the material will be unloaded, stored and handled. Specific details are also provided on how products are loaded onto or discharged from a vessel.

MWPA assesses new products and handling methods against the requirements of the DWER *Guideline: Port Authority Bulk Handling Trials: Category 58 and 58A*. The Guideline provides a self-assessment tool to determine if a product or handling method is suitable for a Trial Notification or whether the potential for emissions and discharges triggers assessment via a Licence Amendment. The assessment considers risk to human health, the distance of the activity from sensitive receptors and the ecotoxicity of the product specifically with respect to marine environments.

If control measures can be implemented to contain emissions and prevent a pathway to the environment, then the risk is considered low. Low risk products can be introduced to the Port under a 12 month trial period without being formally assessed by DWER. Products successfully handled via a Trial will be added to the Environmental Licence via a streamlined licence amendment process at the end of the 12 month period.

Products that have a residual risk for emissions, due to the nature of the product or handling method chosen, must be added to the Environmental Licence via an amendment allowing DWER to complete a formal assessment prior to the product being introduced to the Port.

Existing customers have an obligation as part of their lease agreements to inform MWPA of any proposed changes to products or infrastructure that may have implications for the Environmental Licence. If Leaseholders enter into Third Party agreements to allow other entities to export materials via their facilities, MWPA must be provided full details of the proposal and product specifications prior to any new ores or concentrates being delivered into the Port.

6.4 MANAGEMENT ACTIONS

The management actions in **Table 7** shall be implemented by MWPA, leaseholders, infrastructure owners and customers to enable dust management objectives to be achieved.

Table 7 Dust Management Actions

Aspect	Dust Management Action	Frequency/Timing	Responsibility
Dust Extraction Systems	Dust extraction systems (including ducting, filtration and baghouses for collection of airborne dust particles) shall be in place and operational on all iron ore and metal concentrate sheds whenever dust generating activities (including stockpile disturbance) are being undertaken within the shed (in accordance with Environmental Licence condition 3).	Whenever dust generating activities are being undertaken	Infrastructure owners and leaseholders
	Dust extraction systems on all iron ore and metal concentrate sheds shall ensure a negative pressure environment when all doors are closed. Note that negative pressure is not maintained when shed doors are open, and so, doors should be closed whenever dust generation may occur.		
	Dust extraction systems shall be in place on conveyors, transfer points and shiploaders as required to minimise excessive dust emissions.	Whenever product movement is occurring on conveyors and shiploading	Infrastructure owners
Dust Suppression Systems	Dust suppression systems (such as dry fog systems and water spray bars) shall be in place and operational on conveyors, transfer chutes and shiploaders to minimise excessive dust emissions.	Whenever product movement is occurring that may generate dust emissions	Infrastructure owners, leaseholders and Stevedores
Maintenance and operation of dust extraction and suppression systems	The operation of dust extraction and suppression systems shall be regularly reviewed by suitably qualified experts to ensure they remain effective at all times in mitigating dust emissions.	Review of extraction system effectiveness to be completed annually	MWPA (Maintenance); Infrastructure owners and leaseholders
	A maintenance program shall be implemented to ensure faults and breakdowns in dust extraction and suppression systems are rectified promptly.	Maintenance program in place at all times when infrastructure is operational	
Conveyors	Dust covers and wind shields shall be maintained on all conveyors in order to contain dust and spillage. Integrated control systems shall be in place to prevent overloading of conveyors and prevent spillages. Berth 5 iron-ore circuit conveyors shall have water spray bars and dry fogger systems operational.	Whenever product movement is occurring	Infrastructure owners; leaseholders and operators
Product Conditioning and Moisture Content Monitoring	Moisture conditioning of products should be undertaken by exporters to achieve a moisture content at or above its corresponding DEM level. Representative analysis of moisture levels shall be undertaken for each shipment and accurate records kept; unless otherwise agreed with MWPA. Records of product moisture shall be provided via pre-shipment forms to MWPA for approval prior to vessel arrival. Where moisture conditioning above DEM is not achievable, alternate methods and controls shall be implemented to prevent excessive dust emissions. Product DEM analysis shall be revised annually (excluding dry products) with reports provided to MWPA.	Moisture conditioning completed prior to entry of product into the Port, and during material handling activities	Customers and Stevedores

Aspect	Dust Management Action	Frequency/Timing	Responsibility
Shiploading	<p>Shiploader booms shall be positioned such that drop heights of product into vessel holds are minimised.</p> <p>Cascade chute must be used at all times for garnet shiploading on Berth 4.</p> <p>Dry Fogging System shall be operational at all times on Berth 5 shiploader when loading iron-ore.</p> <p>Dust suppression on the Berth 7 conveyor and shiploader shall be operational whenever product does not meet DEM.</p> <p>Shed doors should remain closed during shiploading (where practical, excluding operations using external feed hopper facility).</p> <p>Rotainers must remain closed at all times when outside the vessel's hold, until they are below the level of the deck as part of shiploading operations. Tipping of rotainers in the vessel hold is to occur no more than 2m above the floor or product level to prevent dust plumes caused by dropping product from height.</p> <p>Post shipping berth handover procedures shall be implemented to ensure appropriate sweeping and prompt removal of spilt product from berth areas.</p>	At all times during shiploading activities	MWPA; Stevedores
Metal Concentrates	<p>Metal Concentrate storage sheds will have additional controls of door interlock systems to prevent more than one door being open at a time, internal dust suppression systems (such as spray or fogging), rumble strips entry/exit points of storage sheds (Lease 21 and Lease 27) and floor sweeping equipment positioned permanently within sheds to minimise material being tracked outside sheds and lease boundaries.</p> <p>Operational procedures for loading metal concentrates shall be adhered to, including shiploading within maximum product loading rate thresholds, wind parameters and requirement to condition product (moisture) as outlined in MWPA documents; Loading Packaged Bulk Minerals Procedure.</p>	At all times during handling and shiploading of metal concentrates	Metal Concentrate Customers; Stevedores; MWPA
	<p>Vessel-hold dry fogging system must be in place and utilised on Berth 6 whilst loading high risk products including nickel, lead, and iron concentrate.</p> <p>Vessel hold fogging systems shall be operated continually to ensure a blanket of fog is sufficiently generated to prevent dust emissions escaping the hold.</p>	At all times during shiploading of high-risk metal concentrates	Metal Concentrate Customers; Stevedores; MWPA
Discharging product from vessels	<p>Wind shields shall be in place when using self-discharging hopper to unload bulk material from vessels.</p> <p>Discharging vessels using mobile hoppers and grabs shall ensure that hoppers are not overloaded to minimise product spillage and dust generation.</p> <p>Spill deflector plates shall be installed during unloading (discharging) operations to prevent spilt product entering the marine environment.</p>	At all times during vessel discharging	Customers; Stevedores
Roadways and Open Areas	<p>A street sweeper and/or vacuum truck will be used at regular intervals on sealed roadways, around infrastructure and on berths to remove product spillage that has the potential to generate dust or contaminate stormwater.</p> <p>Unsealed open areas and roadways are either sheeted with gravel or appropriate dust suppression applied.</p> <p>Water carts shall be utilised to prevent dust generation when activities are occurring on unsealed or gravel sheeted areas.</p>	Frequency of sweeping commensurate with build-up	MWPA, leaseholders and Stevedores

Aspect	Dust Management Action	Frequency/Timing	Responsibility
Truck and Rail Unloaders	<p>Dust extraction and suppression systems shall be installed and operational on all truck and rail unloaders to prevent the generation of excessive dust emissions.</p> <p>Regular housekeeping and sweeping shall be conducted around truck and rail unloaders to remove residual product spillage and prevent it becoming windblown. Where product is migrating due to vehicle movement either dust suppression or frequent sweeping is to be employed.</p> <p>Sweeping of truck wheels and wheel guards of side tipping trucks shall be undertaken where required to prevent tracking of product outside truck unloader facilities or storage sheds.</p> <p>Grain rail cars shall be covered at all times while in transit.</p> <p>Dust suppression must be undertaken on empty rail wagons at the Karara Dual Wagon Tipper (DWT) prior to leaving the premises.</p>	At all times during truck and rail unloading activities	Infrastructure Owners
Open Stockpiles	<p>Dust suppression shall be applied to prevent the generation of dust from stockpiling of product impacting beyond the lease boundary. Stockpile height and volume shall be minimised as much as practical to prevent excessive dust emissions.</p> <p>Material handling on open stockpiles shall ensure drop heights are minimised.</p> <p>If excessive dust is being generated by machinery movement, the activity should be suspended until wind conditions improve or effective dust suppression can be applied.</p> <p>Shielding measures such as wind barrier fencing shall be implemented to mitigate dust from open stockpiles.</p>	At all times when material is stored in open stockpiles	Customers and Haulage Operators
Truck Movement	<p>All haulage trucks shall be tarped when transporting product within the Port area to ensure dust generation is minimised.</p> <p>Empty haulage trucks shall also be tarped if residual product within the trailer is likely to cause dust emissions.</p>	At all times during haulage within the Port	Haulage Operators and Customers
Inspections	Inspections of lease facilities shall be undertaken at regular intervals to ensure dust control measures are in place and effective.	Annually	MWPA
Changes to Operations	<p>Changes to product composition shall be thoroughly assessed to ensure:</p> <ul style="list-style-type: none"> • environmental, human health and amenity impacts are managed; and • compliance with Environmental Licence requirements. 	Prior to change in product composition being introduced at the Port	Customers to notify MWPA prior to any change
	Changes to infrastructure, handling methods and throughput volumes shall be thoroughly assessed to ensure environmental, human health and amenity impacts are managed.	Prior to change in throughput volume, infrastructure or handling method	MWPA

7 Monitoring

MWPA has a comprehensive air quality monitoring program for the Port to enable assessment of ambient air quality in compliance with Environmental Licence condition 30. Monitoring is conducted in accordance with the Air Quality Monitoring Sampling and Analysis Plan. A summary of the monitoring program is provided in **Table 8**.

MWPA operates a compliance network of four real-time air quality monitoring stations at the premises boundary, each of which contains a Tapered Element Oscillating Microbalance (**TEOM**) and a High Volume Air Sampler. Each of these stations are also equipped with wind, temperature and humidity sensors. The wind data at each monitoring station is used via the monitoring database Envirosuite to calculate arcs of influence. This assists MWPA to identify emission sources when an exceedance may be occurring.

A background air quality monitoring station consisting of a Beta Attenuation Monitor (**BAM**) is established in Bluff Point. This station provides real-time continuous data representing regional conditions.

MWPA also operates a series of mobile e-samplers in strategic locations within the Port. The e-samplers are continuous PM₁₀ monitoring stations and are used to assess the contribution of different activities. The location of air quality monitoring stations is shown on **Figure 6**.

Dust monitoring data is compared to regulatory targets specified within the Environmental Licence L4275/1982/15 and outlined in **Section 3** Compliance Obligations. All results are reported to DWER on a quarterly basis and made available to the public via the MWPA website.

Table 8 Summary of Air Quality Monitoring Program

Objective	Parameter	Frequency	QA/QC	Rationale for Monitoring	Responsibility
Continuous Dust Monitoring TEOM and BAM Stations	PM ₁₀	Continuous; data recorded at 10 minute intervals	Monitoring equipment is calibrated in accordance with manufacturer's specifications in compliance with Environmental Licence conditions 28 and 29	Assess impact on sensitive receptors outside prescribed premises boundary in real-time; assess compliance with DWER Air Quality Index, NEPM guideline and Environmental Licence L4275/1982/15.	MWPA
Continuous Dust Monitoring E-Samplers	PM ₁₀	Continuous; data recorded at 5 minute intervals	Monitoring equipment is calibrated in accordance with manufacturer specifications	Assess contribution of various port related activities to dust generation in real-time.	MWPA
Depositional Dust Monitoring	TSP and metals	Monthly	Monitoring in accordance with AS/NZS 3580.10.1 NATA accredited laboratory analysis	Assess amenity impact of nuisance dust deposition in FBH.	MWPA
High-Volume Air Sampling	Copper, Manganese, Nickel, Lithium and Lead as PM ₁₀	Continuous during shiploading of metal concentrates	Monitoring in accordance with AS/NZS 3580.9.6 NATA accredited laboratory analysis	Assess impact on public health via inhalation of fugitive dust generated from shipping of metal concentrates; assess compliance with regulatory targets defined in Environmental Licence L4275/1982/15.	MWPA



Figure 6 MWPA Air Quality Monitoring Stations

8 Triggers and Corrective Actions

There are expected to be instances when increased dust emissions will occur as a result of equipment malfunction, abnormal weather events and other various process control problems.

In the event that a compliance monitoring station records elevated dust emissions, an alert is issued to MWPA Operations workers via the Envirosuite database system. Corrective actions are then taken in accordance with Managing Dust from Port Operations Work Instruction to identify and address the source of the dust, allowing a return to normal conditions.

Due to the varying nature of wind movement around port infrastructure, there may be times when dust emissions are clearly visible but do not trigger alerts on Envirosuite. MWPA will take action to minimise visible dust emissions during shiploading and product handling.

A detailed description of port activities and actions taken in response to any exceedance or incident involving excessive dust emissions, shall be recorded in the MWPA Operations Supervisors Daily Log. This is to enable assessment on whether the exceedance is influenced by port operations and more importantly, whether management actions for dust are remaining effective. Corrective actions and associated triggers are summarised in **Table 9**.

Table 9 Triggers and Corrective Actions

Trigger	Corrective Actions	Responsibility
PM ₁₀ monitors indicate an exceedance of target levels has occurred or is likely (Envirosuite alert issued).	<ol style="list-style-type: none"> 1. Assess source of dust, wind and weather conditions. 2. Cease dust generating activity until weather conditions change or additional dust control measures are put in place. 	MWPA Operations Supervisors
Public complaint received relating to excessive dust emissions.	<ol style="list-style-type: none"> 1. Assess source of dust, wind and weather conditions. 2. Cease dust generating activity until weather conditions change or additional dust control measures are put in place. 	MWPA Operations Supervisors
Repeat complaints indicate excessive dust emissions are impacting neighbouring businesses or the public.	<ol style="list-style-type: none"> 1. Assess source of dust. 2. Investigate adequacy of control measures. 3. Implement interim dust control measures as necessary until further controls can be put in place. 	MWPA Operations Superintendent MWPA Operations Manager
Product moisture levels below DEM threshold established for effective dust control.	<ol style="list-style-type: none"> 1. Assess impact of shipping material below threshold DEM. 2. Cease handling/shipment of material until moisture can be rectified and/or additional control measures put in place to manage dust generation. 	MWPA Operations Superintendent MWPA Operations Manager

Trigger	Corrective Actions	Responsibility
Visible dust emissions observed during shiploading.	<ol style="list-style-type: none"> 1. Assess product moisture against Dust Extinction Moisture (DEM) level (where applicable) from information provided in pre-shipment forms, on line monitoring (where available), and shipper's post loading moisture results. 2. Ensure all dust suppression systems are active including water sprays and shiploader fogger system (Berth 5). 3. Consider adjusting load rates. 4. Consider ceasing shiploading until product moisture can be rectified by product owner, wind conditions change and/or additional control measures put in place to eliminate dust generation. 	MWPA Operations Superintendent MWPA Operations Manager

9 Stakeholder Consultation

MWPA maintains a strong focus on consulting and communicating regularly with all stakeholders in relation to dust management.

Stakeholder consultation and liaison in relation to dust includes the following.

- Quarterly customer and berth user group meetings.
- Regular meetings between MWPA and customers/leaseholders.
- FBH consultation meetings.
- Stakeholder Consultation Committee meetings held quarterly.
- Meetings as required with regulatory agencies including DWER, DOT and DEMIRS.

Information relating to dust and performance is provided publicly via the MWPA website and social media platforms, to ensure the community is kept informed about port operations and dust control initiatives.

10 Reporting

10.1 REPORTING OF ENVIRONMENTAL INCIDENTS AND PERFORMANCE

All incidents relating to excessive dust emissions shall be recorded by MWPA via CAMMS.

Where an incident is assessed as being a non-compliance with Environmental Licence conditions, or a breach of any regulatory limit, reporting to DWER is undertaken as soon as practical. Reporting will be undertaken by MWPA in consultation with customers and leaseholders where necessary.

In accordance with the DOT Protocol: *Reporting Environmental Breaches in Ports*, certain environmental incidents require reporting to the Minister for Transport, as the Minister responsible for Port Authorities. This is a requirement for any incident that:

- exceeds criteria for lead or nickel by any amount;
- potentially poses a risk to human health or the environment;
- has had significant media exposure or a history of controversial non-compliance;
- is subject to EPA assessment which may have been high profile; and
- is subject to any enforcement action for a breach of licence of ministerial condition.

A summary of incidents and air quality monitoring data is compiled on a quarterly basis and submitted to DWER in accordance with Environmental Licence L4275/1982/15. This is in addition to the Annual Environmental Report which is submitted in August each year. These reports are made publicly available on the MWPA website.

10.2 COMPLAINTS AND FEEDBACK

Any complaints or feedback received by MWPA in relation to dust emissions are recorded as an incident in CAMMS and investigated according to MWPA External Feedback Management Procedure.

All feedback and complaints shall be investigated thoroughly and an assessment completed to determine appropriate course of action. A response is to be provided to the complainant within three business days, or as otherwise agreed between MWPA and the complainant.

All complaints received are reported in Quarterly and Annual Environmental Reports to DWER, in accordance with the Environmental Licence.

11 Attachments

Attachment	Title
1	Monthly Wind Roses from Geraldton Port, Tower 501 Station
2	Critical Infrastructure Related to Dust Emissions
3	Approved Products for Export and Import through Geraldton Port
4	Checklist for developing a Dust Management Plan. Minimum Requirements for Exporters, Importers & Leaseholders Operating at Geraldton Port
5	DWER Risk Rating, Consequence Matrix and Likelihood Matrix Derived from DWER Guidance Statement: Risk Assessment (February 2017)

12 Associated Documents

Document Title
Air Quality Monitoring Sampling and Analysis Plan
Dust Deposition Monitoring Sampling Analysis Plan
Environmental Management Plan
Environmental Policy
External Feedback Management Procedure
Health and Hygiene Management Plan
Loading Packaged Bulk Minerals Procedure
Managing Dust from Port Operations Procedure
Managing Dust from CBH Port Operations Procedure
Pre-shipment Form (Berths 4 and 5)
Pre-shipment Form - Berth 6

Location – Mid West Ports Intranet – [Document Centre](#)

13 Associated Records

Document Title
RAMBOLL Geraldton Port – Wind and Dust Dispersion Analysis Report (A1785249)

14 References

Standard	Title
Australian Standard	AS 4156.6-2000: Coal Preparation, Part 6: Determination of dust/moisture relationship for coal
	AS/NZS 3580.10.1 Methods for sampling and analysis of ambient air, Determination of particulate matter – Deposited matter – Gravimetric method
	AS/NZS 3580.9.6 Determination of suspended particulate matter – PM ₁₀ high volume sampler with size selective inlet – Gravimetric method
	AS/NZS 3580.9.8 Determination of suspended particulate matter – PM ₁₀ continuous direct mass method using a tapered element oscillating microbalance analyser
International Standard	ISO 14001 Environmental Management Systems

Location – SAI Global – <https://www.saiglobal.com/online/>

Act or Regulation
National Environment Protection Council (2016) National Environment Protection (Ambient Air Quality) Measure (NEPC 2016) criteria for PM ₁₀ , PM _{2.5} and lead (Pb)
<i>Port Authorities Act 1999</i>
<i>Environmental Protection Act 1986</i>
Environmental Protection (Unauthorised Discharges) Regulations 2004

Location - Western Australian - <https://www.legislation.wa.gov.au> | Australian - <https://www.legislation.gov.au>

Authority	Resource
DWER	Guideline: Port Authority Bulk Handling Trials: Category 58 and 58A
DWER	Guideline: Dust Emissions - Draft issued for consultation, July 2021
DWER	<i>Guideline Statement: Risk Assessments</i> (February 2017)
DOT	Protocol for Reporting Environmental Breaches in Ports
EPA	Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales 2016

15 Monitoring, Evaluation and Review

This Dust Management Plan will be reviewed regularly in response to the following.

- Addition of new products handled through the Geraldton Port.
- Significant changes to infrastructure, operations and/or dust control equipment.
- In response to issues raised by regulatory agencies or the community.
- In response to additional studies, significant incidents or monitoring information (such as dust/wind modelling).

The Document Custodian is responsible for conducting the review in accordance with **Controlled Documents Review and Approval Process Work Instruction**.

16 Administration

Document Custodian:	Environment Manager
Document Approver:	Chief Environmental Social and Governance Officer
Approval Date:	14 January 2025
Document Review Period:	2 yrs

Attachment 1: Critical Infrastructure Related to Dust Emissions

Infrastructure / Equipment	Description	Operational Purpose	Map Reference
Rail Facilities	3 MWPA-owned rail tracks, including single run-around track, 1 rail unloader with 12 connecting turnouts. In addition, Karara owns a specific rail line and dual carriage rail tipper.	Transport materials from mine site or grain depots to Geraldton Port for export.	Figure 1 – Prescribed Premises Map
Rail Unloaders	MWPA-owned bottom discharge ore dumper; CBH-owned grain discharge facility; Karara-owned dual wagon rail tipper and rotary twin-cell car dumper.	Discharge bulk materials from rail carriages, to enable materials to be transported via conveyors to storage sheds.	Figure 5 – Critical Infrastructure Map
Truck unloaders	MWPA-owned common user truck unloader connected to Berth 4. Lease-owned side tippers or belly dumper design connected to mineral storage area sheds. All are partially enclosed with dust extraction systems.	Discharge bulk materials from trucks, to enable materials to be transported via conveyors to either designated storage sheds or direct to Berth 4 shiploader.	Figure 5 – Critical Infrastructure Map
Mineral Storage Area	Fully enclosed sheds with dust extraction systems for Iron Ore and Concentrates. Load in and load out facilities.	Storage and handling of various bulk granular products in preparation for export via Geraldton Port	Figure 1 – Prescribed Premises Map
Stockpile Storage Area	Designated stockpile area containing concrete flooring and perimeter fence. DustTamer fence to reduce wind velocity and dust lift-off from open stockpile. Water sprays are used on stockpile for dust control.	Storage of talc products	Figure 1 – Prescribed Premises Map
Rotainer Storage Yard	Designated rotainer storage area located on port land (outside of prescribed premises boundary).	Holding facility for storage of product filled rotainer boxes and empty retainers to be used on rotainer loading system managed by a Logistics and Stevedore company under commercial lease agreements.	Figure 5 – Critical Infrastructure Map
Conveyor and Gallery Systems	Enclosed conveyor systems with transfer chutes. Conveyor systems design includes belt skirting, brushes and or scrapers which assist to minimise dust generation and eliminate spillage. Dust extraction systems located in transfer towers with chute angles and heights designed to minimise dust generation. Conveyor misters and water sprayers are located on the iron ore circuit.	Conveyors transport bulk material from truck and train unloaders to storage sheds and/or the shiploader, and from storage sheds to the shiploader. Note: Berth 4 shiploader conveyor (CV04) is only partially enclosed with wind shielding to minimise dust liftoff.	Figure 5 – Critical Infrastructure Map
Dust Extraction Systems	Dust extraction systems which include ducting, filtration, and baghouses for collection of airborne dust particles.	Located at strategic locations across the Bulk Handling Facility, including train and truck unloaders, storage sheds, conveyor transfer towers and shiploader.	Figure 5 – Critical Infrastructure Map
Shiploaders	Luffing, shuttling shiploaders with long travel capacity and dual and redundant luffing winches. Berth 4 shiploader contains boom, articulated chute, cascade chute, concentrate slinger, and dust extractor attachments. Berth 5 shiploader fitted with extended chute with dry fogger system.	Permanent shiploaders located on Berths 3, 4, 5, and 7. Shiploaders are fitted with appropriate attachments (such as dust extractors, water sprays, dry fogger) suited to the specific product handling method and intended to minimise dust emissions.	Figure 5 – Critical Infrastructure Map
Rotainer Loading System	Stevedore-owned rotainer loading system located on Berth 6. System contains sealed 6m containers with automatic lid opening system integrated into unloading system. Vessel hold fogging system when loading high risk products.	Rotainer loading systems used for bulk loading of products from containers into the vessel hold. A Stevedore-owned DSI dry fog system is deployed to suppress dust generated while tipping retainers. This water misting system is used for high risk products including Nickel, Lead and Iron Concentrate.	Figure 5 – Critical Infrastructure Map
Berths	Berths 1 and 2 – operated by MWPA Berth 3 – operated by CBH Berths 4 and 5 – operated by MWPA Berth 6 – multi-user Berth 7 – operated by Karara Sweepers and vacuum trucks used during loading campaigns to capture and remove spillage.	Berths 1 and 2 – multi-purpose (such as cargo, livestock, and fertiliser) Berth 3 – Grain (CBH) Berth 4 – Sands, metals and other minerals Berth 5 – Iron ore, sands and manganese Berth 6 – multi-purpose (such as rotainer loading cargo, fuels, livestock, and fertiliser) Berth 7 – Iron ore (Karara)	Figure 1 – Prescribed Premises Map

Infrastructure / Equipment	Description	Operational Purpose	Map Reference
Hoppers and Grabs	2x mobile hoppers (stored at Berth 6) and grabs which are Stevedore-owned. Spill plates used on berths in association with unloading materials via hopper and grabs to minimise spills into marine environment.	Grabs are used for unloading bulk materials from vessel hold to hopper, where it is loaded into trucks and removed from site. Deflector (spill) plates are deployed to direct spillage onto the berth and prevent discharge to the marine environment.	Figure 1 – Prescribed Premises Map
Roads and Open Areas	Sealed roads with curbing. Unsealed open areas are either sheeted with gravel or dust suppression chemical applied.	Road sweepers operate on trafficable areas, including roads, turn around points and berths to recover spilt materials.	Figure 5 – Critical Infrastructure Map

Attachment 2: Approved Products for Import and Export through Geraldton Port

Product Type	Product	Description (Particle Size - diameter)	Moisture Content	Transport Mode	Storage	Handling Method/s
Export						
Unmodified raw materials	Sands	Fines 0.075–2.36mm	<1%	Truck	Enclosed storage sheds	Bulk via Berth 5 and 4
Physically Treated Raw Materials – Metal Ores	Iron Ore	Includes Fines <8mm Lumps: 6–32mm Pellets: 8–16mm	Fines <4% Lumps <3% Pellets <3%	Rail and Truck	Enclosed sheds with dust extraction	Bulk via Berth 7 and Berth 5
	Manganese Ore	Fines 1–7mm; Lumps 7–36mm	Fines ≥4.9% Lumps ND	Truck	Enclosed sheds with dust extraction (bulk); Rotainer Storage Area	Bulk via Berth 5 Rotainers via Berth 6
Physically Treated Raw Materials	Zircon (including Zircon Concentrates)	Dry, fines ≤0.45mm	Zircon <1% Zircon Cons: 6%	Truck	Enclosed storage sheds	Bulk via Berth 4
	Ilmenite	≤0.45mm	<1%	Truck	Enclosed storage sheds	Bulk via Berth 4
	Rutile	≤0.45mm	<1%	Truck	Enclosed storage sheds	Bulk via Berth 4
	Garnet	≤0.45mm	<1%	Truck	Enclosed storage sheds Bagged	Bulk via Berth 4 Bagged via Berth 6
	Synthetic Rutile	≤0.45mm	<1%	Truck	Enclosed storage sheds	Bulk via Berth 4
	Talc	Aggregate product, typically ≤60mm	<1%	Truck	Stockpile Storage Area	Bulk via Berth 4
	Mineral Sands Concentrates (Monazite)	≤0.45mm	3–8.5%	Truck	No storage on site	Rotainers via Berth 6
	Lithium Direct Shipping Ore	50% of material >4.97mm	1.72%	Truck	No storage on site	Bulk via Berth 4
Chemically Treated Material – Metal Concentrates	Lead Sulphide Concentrate (Heavy Precious Metals)	Fines 0.037–0.15mm	6–10%	Truck	Rotainer Storage Area	Rotainers via Berth 6
	Copper Concentrate	Fines 0.037–0.15mm	9–10%	Truck	Rotainer Storage Area	Rotainers via Berth 6
	Zinc Concentrate	Fines 0.053–0.15mm	9–10%	Truck	Rotainer Storage Area	Rotainers via Berth 6
	Nickel Concentrate	Fines 0.037–0.15mm	9–11%	Truck	Rotainer Storage Area	Rotainers via Berth 6
	Iron Concentrate	Fines ≤0.05mm	12–17%	Truck	No storage on site	Rotainers via Berth 6
	Spodumene Concentrate	2.3% material <PM ₁₀ µm	3.4%	Truck	Enclosed storage sheds	Bulk via Berth 4
Import						
Manufactured Products	Fertilisers including Urea, Soda Ash, Potash, Phosphates (DAP, MAP, MOP)	Granulated products 0.03–20mm	<1%	Truck	No storage on site	Discharge via Berth 6 and Berth 2 using hoppers and grabs
Physically Treated Raw Materials	Coal	Fines <18mm	16%	Truck	No storage on site	Discharge via Berth 6 using electric grabs and hoppers
	Heavy Mineral Concentrate	Dry, fines ≤0.45mm	3–5%	Truck	No storage on site	Discharge via Berth 6 using hoppers and self-discharging vessels (auger/ conveyor system)
Manufactured Products	Fertilisers including Urea, Soda Ash, Potash, Phosphates (DAP, MAP, MOP)	Granulated products 0.03–20mm	<1%	Truck	No storage on site	Discharge via Berth 6 and Berth 2 using hoppers and grabs

Attachment 3: Checklist for Developing a Dust Management Plan

Minimum Requirements for Exporters, Importers and Leaseholders Operating at Geraldton Port

Aspect	Information Required	Check Complete
Operations Description	<p>Description of customer or leaseholder activities at the Port, including:</p> <ul style="list-style-type: none"> product storage and infrastructure areas; material handling methodology; maximum daily tonnage and frequency/number of shipments; site layout plan; and contact details for personnel responsible for dust control. 	
Product Characterisation	<p>Particle Size Distribution (PSD) Analysis, Material Composition and Toxicity Data Fines Content; Respirable Silica and Asbestos Content (% of total product w/w) Dust Extinction Moisture (DEM) Level Analysis in accordance with AS 4156.6-2000 Product Safety Data Sheet (SDS)</p>	
Risk Assessment	<p>Assessment of human health, environmental and amenity risks associated with the product and implemented control measures.</p>	
Dust Management Controls	<p>Outline dust management controls in place at all stages during handling of bulk material through the Port. Controls should include relevant actions from Table 7 Dust Management Actions. Further detailed descriptions should also be provided:</p> <p><i>Dust Extraction and Suppression Systems</i></p> <ul style="list-style-type: none"> Describe location and capacity of extraction and suppression systems across all bulk handling activities, including unloading/loading, storage, conveyor transport and shiploading. Operation and maintenance regime in place for extraction/suppression systems and provision of records to MWPA. <p><i>Product Moisture Management</i></p> <ul style="list-style-type: none"> Describe method for moisture conditioning of product prior to arrival at the Port, moisture analysis, predictive moisture management processes and provision of records to MWPA. Where product moisture management is not possible/preferred, explain other dust control measures in place with supporting information as to why these measures are effective at mitigating dust. <p><i>Product Handling Procedures</i></p> <ul style="list-style-type: none"> Describe product handling procedures and other controls in place to mitigate dust emissions during bulk material handling. <p><i>Copies of relevant dust management procedures shall be included for reference.</i></p>	
Contingency Measures	<p>Outline contingency measures to be taken in event of excessive dust emissions being generated.</p>	
Reporting and Complaints Management	<p>Outline procedures for reporting incidents and complaints involving dust emissions, including actions taken regarding non-compliance with regulatory requirements.</p>	

Attachment 4: DWER Risk Rating, Consequence Matrix and Likelihood Matrix

Derived from DWER guidance Statement: Risk Assessment (February 2017)

Risk Rating Table (Risk = Consequence vs Likelihood)

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

Risk Criteria

Consequence	Environment	Public Health and Amenity (such as air and water quality, noise, and odour)
Severe	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Loss of life Adverse health effects: high level or ongoing medical treatment Local scale impacts: permanent loss of amenity
Major	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Adverse health effects: mid-level or frequent medical treatment Local scale impacts: high level impact to amenity
Moderate	<ul style="list-style-type: none"> onsite impacts: mid-level offsite impacts local scale: low level offsite impacts wider scale: minimal 	<ul style="list-style-type: none"> Adverse health effects: low level or occasional medical treatment Local scale impacts: mid-level impact to amenity
Minor	<ul style="list-style-type: none"> onsite impacts: low level offsite impacts local scale: minimal offsite impacts wider scale: not detectable 	<ul style="list-style-type: none"> Local scale impacts: low level impact to amenity
Slight	<ul style="list-style-type: none"> onsite impact: minimal 	<ul style="list-style-type: none"> Local scale: minimal impacts to amenity

Likelihood	
Almost Certain	The risk event is expected to occur in most circumstances
Likely	The risk event will probably occur in most circumstances
Possible	The risk event could occur at some time
Unlikely	The risk event will probably not occur in most circumstances
Rare	The risk event may only occur in exceptional circumstances