



Industry Regulation fact sheet

Managing dust in Port Hedland

Port Hedland is the largest bulk handling port in the world, and a major contributor to the Western Australian economy. Historically though, the dusty nature of the products handled through this port, combined with the Pilbara's naturally dusty environment and other anthropogenic factors have cumulatively impacted the ambient air quality in and around the town, the western parts of which are immediately adjacent to industrial activities.

Because of this, in 2009 the Environmental Protection Authority (EPA) raised concerns about the possible impact of dust on the health of Port Hedland's residents. In response, the Western Australian Government established the Port Hedland Dust Management Taskforce (the Taskforce) to coordinate and plan for dust management in the town.

- The Taskforce's plan (detailed in the *Port Hedland Air Quality and Noise Management Plan, 2010*) included the establishment of an interim air quality criterion for the area east of Taplin Street of 70 micrograms per cubic metre ($\mu\text{g}/\text{m}^3$) for dust, or particulate matter, 10 microns in diameter (PM_{10}) and smaller as averaged over a calendar day. This differs from the National Environment Protection (Ambient Air Quality) Measure (NEPM) of 50 $\mu\text{g}/\text{m}^3$. A monitoring network was also established to measure air quality and provide data for an air quality health risk assessment.
- In 2017, the Taskforce finalised the Port Hedland Dust Management Taskforce Report to Government. This followed the completion of the Port Hedland Air Quality Health Risk Assessment for Particulate Matter in 2016, the development of a cumulative air quality model comparison study, and then a public consultation period (concluding in October 2017). The Government has now provided its response to the Taskforce report and representative agencies including the Departments of Water and Environmental Regulation (DWER), Health (DoH), Jobs, Tourism, Science and Innovation (JTSI), Planning, Lands and Heritage (DPLH), and the EPA will continue to have important roles in ensuring the Government's response is enacted.

Ambient air quality monitoring network

Soon after the formation of the Taskforce, the Port Hedland Industries Council (PHIC) established a network of monitoring stations in and around the residential, industrial, commercial and airport precincts of the Port Hedland, South Hedland and Wedgefield. An additional station was placed in the remote location of Yule River, approximately 42 km south-west of Port Hedland to serve as a 'background' or 'regional' dust reference point.

The intention of the network initially was to provide data to inform the health risk assessment. However, it continues to serve the dual purpose of providing real-time, publicly-available air quality information for the community and to inform the ongoing regulation of port operators. The daily and weekly results from the monitoring can be viewed online at: www.phicmonitoring.com.au.

PHIC currently employs an independent consultant to manage and maintain the monitoring network in accordance with the relevant operating Australian and USEPA standards. In addition, full calibration assessments are undertaken on a six-monthly basis.



As part of the Government's response to the Taskforce report, DWER will take responsibility for operating and maintaining the network, with the costs remaining the responsibility of industry.

Over the 2018-19 and 2019-20 periods DWER will facilitate the transfer of the PHIC air quality monitoring network to the Department and establish an appropriate cost recovery arrangement from industry. The Department will review the network to ensure it complies with Australian Standards and that ongoing data collection adequately represent ambient conditions. While the Department will refurbish, operate and maintain the network, the costs associated with this will be shared by all port operators licenced under Part V of the *Environmental Protection Act 1986* under category 58 (*bulk material loading or unloading: premises on which clinker, coal, ore, ore concentrate or any other bulk granular material (other than salt) is loaded onto or unloaded from vessels by an open materials loading system*).

DWER will publish real time monitoring data on the Department's website with trends and further analysis reported annually, once the ambient monitoring network has transferred to DWER.

Health risk assessment and interim guideline for air quality in Port Hedland

As part of the Taskforce's work, a health risk assessment was undertaken and finalised by DoH in 2016. This investigation focused on the potential impacts on human health from PM₁₀ inhalation by residents in Port Hedland. A central issue was whether the interim guideline of 70 µg/m³ represented a greater risk of developing dust related health conditions from dust exposure in comparison to the risk of developing health related conditions from dust exposure under the NEPM (50 µg/m³). The assessment concluded that for the current population size there is no discernible difference in the level of risk between the interim guideline and the NEPM (50 µg/m³). Therefore, the interim guideline of 70 µg/m³, averaged over a 24-hour period from midnight to midnight, should provide a level of protection of health and wellbeing for Port Hedland residents equivalent to the NEPM.

While in principle the NEPM applies to all Australians, in reality it is not met everywhere that people live for various reasons. In some cases, such as in the West End of Port Hedland, these are known as areas of 'non-attainment'. In these cases, a health risk assessment is the tool that determines whether people can continue to live in an area that may be disproportionately impacted by pollutants (natural or man-made), without excess risk to their health and well-being.

The NEPM for ambient air was also determined by risk assessment, finding that 50 µg/m³ 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 risk assessment followed the same risk assessment framework.

The health risk assessment investigated the composition of dust in Port Hedland and determined that metals, asbestos, silica and gases related to combustion were either not detected or were well below existing health guideline and reference levels.

With this in mind, while the health risk assessment refers to the interim guideline lasting for five years from January 2016, this was based on predictions of a population increase which has not eventuated. As such, DoH and DWER support the ongoing application of the interim guideline, provided the composition of dust does not change and the population does not increase.



DWER's LiDAR study

The 2010 Taskforce plan included recommendations for further work on identifying dust levels and sources across Port Hedland. To this end, in 2017, DWER undertook a light detection and ranging (LiDAR) monitoring campaign in Port Hedland (as reported in *Mapping dust plumes at Port Hedland using a LiDAR*, February 2018).

The study helped identify the location of dust sources and the movement of dust plumes in the Port Hedland airshed. It was not intended to demonstrate LiDAR's use as a regulatory tool because of limitations with current forms of the technology, including:

- There is no Australian Standard for the operation of LiDAR equipment;
- Pre-processing of LiDAR monitoring data is required before useable imagery can be developed – so not applicable to a real-time monitoring scenario;
- Although LiDAR and standard air quality monitoring equipment signals matched reasonably well for the Port Hedland campaign, correlations still ranged between 0.55 and 0.77, which limits confidence in the use of the LiDAR as a regulatory tool;
- There are no established, suitable criteria that can be used as limits for ambient PM₁₀ concentrations at individual receptors or along the premises boundary; and
- LiDAR data only provides information on relative dust concentrations that are represented as colours on an image. Each colour represents a range of concentrations within which the actual concentration may sit.

The study has shown that dust from localised industry activities can form narrow plumes, particularly at higher wind speeds or during periods of steady wind direction. Of interest to DWER was that while plumes appear to pass close to an air quality monitor on the LiDAR image, the plume was not always captured by that monitor. Even in areas where the monitors are relatively close together, as they are in Port Hedland's West End, it is clear that dust can impact one monitor and not others, despite all monitors seemingly being upwind of the port activity. This study also shows that peaks in monitoring data are not entirely dependent on wind direction and speed. It mainly depends on the type of industry activity and the specific location of that activity in proximity to a monitor.

Government's response to the environmental and health recommendations of the Taskforce

The current regulatory approach for all port industry activities has considered the information and recommendations in the health risk assessment. It is based on the interim air quality guideline being met in areas east of Taplin Street in order to provide an equivalent level of protection as the NEPM, for the current population. It also relies on planning controls to minimise long-term exposure to high levels of dust in the West End.

The ambient air quality NEPM and accompanying documents, when applied in full, provide for State jurisdictions to implement regulations, policies and programs to achieve, or improve on non-attainment of the NEPM. This includes the potential for planning and development restrictions.

In keeping with the Government's response to the Taskforce report, it is appropriate for DWER to build on its current regulatory approach, with the aim of improving air quality for the whole of Port Hedland (including West End), to at least achieve the interim air quality guideline in all residential areas of Port Hedland.



This planned approach includes:

- Developing and implementing best practice dust management guidelines for bulk handling port premises, designed to reduce emissions from port operators;
- Taking control of the ambient air quality monitoring network, subject to negotiations over the configuration of the network and ensuring any incurred costs are covered by industry in accordance with the 'polluter pays' principle; and
- Implementing a coordinated risk-based review and assessment of all port operator licences, to incorporate more robust regulatory controls in line with the best practice guidelines.

DWER's 'road map' for improved industry practices

As part of the Western Australian Government's 2018/19 Budget, DWER has received additional resources to realise the remaining recommendations of the Taskforce over the next five years. The following nominal timeframe for action has been set:

- 2018/19 – Develop best practice dust management guidelines for port operators. This will take an external consultant approximately one year, involving the benchmarking of current port practices and developing recommendations for significant improvements;
- 2018/19 and 2019/20 – Transfer the Port Hedland Industries Council air quality monitoring network to DWER. All costs for the refurbishment, operation and maintenance of the monitoring network will be absorbed by all port operators holding a licence granted for Category 58 under the *Environmental Protection Act 1986*, through an appropriate cost recovery arrangement. 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;
- 2019/20 – Develop industry-self-assessment criteria, to be implemented through licence conditions, that require port operators to determine performance gaps, and propose strategies for improving current handling practices to comply with the new standards proposed by the best practice guidelines;
- 2020/21 and 2021/22 – Industry to comply with new best practice standards for bulk handling, in conjunction with more robust regulatory instruments and controls and with ongoing monitoring; and
- 2022/23 – Undertake a review of the results to determine if improvement has occurred.

At the completion of the five years, the Department will report on the outcomes of the planned strategy to Government as a resolution to the issue first highlighted by the EPA in 2009. This report will describe the final outcomes, along with any recommendations for required future investigations or assessments (such as a new health risk assessment), and additional regulatory actions should the planned approach not fully meet its aims.

Interim regulatory approach

DWER has proposed a five year plan for the proposed improvements to be finalised. Planning controls will also take a considerable period before changes begin to take effect.

In the interim period, DWER will take a conservative approach to the assessment of any works approval, licence or amendment applications received for premises in the Port Hedland airshed, until the self-assessment stages of the process are completed and submitted.



Applicants will be encouraged to demonstrate no net increase to dust emissions in Port Hedland from port related activities. Where this isn't demonstrated, DWER will consider further controls that may in part serve to offset any increase in dust emissions.

Importantly, any changes to operations in the interim period will still be subject to the best practice dust management guidelines when they are defined, and port operators may be asked retrospectively to address any performance gaps that are identified.

More Information

For further information, please contact the Department of Water and Environmental Regulation on 6364 7600 or email info@dwer.wa.gov.au.

This document is available in alternative formats and languages on request.

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