MID WEST PORTS

25 OCTOBER 2022

# Quarterly Air Quality Monitoring Report

## July – September 2022

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# 1. Introduction

## 1.1 Purpose

Geraldton Port is a Prescribed Premises under the *Environmental Protection Act 1986* and as such operates under an Environmental Licence (L4275/1982/15) administered by the Department of Water and Environmental Regulation (**DWER**). The Environmental Licence sets emission concentration targets and limits for air quality at the prescribed premises boundary.

Mid West Ports Authority (MWPA) undertakes a comprehensive air quality monitoring program to monitor and manage dust emissions associated with the operation of Geraldton Port. The location of the monitoring equipment is shown in **Figure 1**. For additional information on the monitoring program refer to the Air Quality Monitoring Sampling and Analysis Plan.

Condition 4.2.3 of the Environmental Licence requires MWPA to provide a Quarterly Air Quality Monitoring Report to DWER. Table 1 lists the reporting requirements under the Environmental Licence and identifies where this information can be found within this report.

The reporting period for this Quarterly Air Quality Monitoring Report is the inclusive period from 1 July 2022 – 30 September 2022.

TABLE 1 – AIR QUALITY REPORTING REQUIREMENTS

| Condition | Requirement | Relevant Section(s) |
|---|---|---|
| 4.2.3 | Meteorological data and a description of all shiploading and unloading activities occurring the day before, day of and day after manganese loading. | Section 3.2<br><br>Status of manganese shipping |
| 4.2.3 | The three-month rolling average ambient air quality concentration for lead. | Section 3.3<br><br>Emissions of lead presented as TSP for the three months prior to the date of this report. |
| | Target exceedances | Section 2, Section 3 and Appendix B<br><br>An outline of any exceedances of any air quality emission targets or limits set within the licence that occurred during the previous quarter. |
| 3.2.1<br><br>Table 3.2.1<br><br>Note 2 | Continuous monitoring is permitted to include gaps equating to no more than 2 hours in every 24-hour monitoring period as required for the changing of HiVol sampler filter papers. | Section 4<br><br>Overview of incidents resulting in data gaps. |

| Condition | Requirement | Relevant Section(s) |
|---|---|---|
| DWER Letter Ref. 2011-000451 (22 June 2018) | 24-hour averaged PM10 data for every monitor within the air quality monitoring network (not just monitors detecting exceedances). Wind direction and speed data for that 24-hour period.<br><br>Data may be tabulated or presented in figures at MWPAs discretion, provided the information requested above is presented together, for each individual day that an exceedance occurs. | Appendix A |
| | A full description of all activities occurring within the premises that may have caused dust, for that 24-hour period (not just category 58 activities).<br><br>MWPAs assessment of cause for the exceedance, and a clearly justified 'contributed' or 'not contributed' statement. | Table 3 |
| | Presented separately to the above in an Excel Spreadsheet or CSV file, DWER requests all air quality and meteorological time series data as five-minute averages (or next closer), for each site, for the entire quarterly reporting period. | Appendix B |

FIGURE 1 – MWPA AIR QUALITY AND WIND MONITORING NETWORK

FIGURE 2 – MWPA REFERENCE (OFFSITE) AIR QUALITY MONITORING LOCATION

# 2. Real Time Air Quality Summary

Each compliance air quality monitoring station has a TEOM real time air quality monitor which measures dust as $PM_{10}$ (Figure 1). An additional reference offsite air quality monitoring station was commissioned in February 2013 which comprises a BAM real time air quality monitor. This site is located in the suburb of Bluff Point and is adjacent to the navigational aid (Figure 2).

Daily average dust levels have been calculated over a 24-hour period from midnight to midnight and are presented in Appendix B. Table 2 provides a summary of results for the period.

TABLE 2 – PM10 DAILY AVERAGE DUST CONCENTRATIONS, JULY TO SEPTEMBER 2022

| Criteria | Compliance Monitoring Stations | | | | Offsite (BAM Monitor) |
|---|---|---|---|---|---|
| | Berth 1 | Port Way | Connell Road | Lemmon Road | |
| Total Exceedances | 2 | 21 | 17 | 5 | 11 |
| Port Influenced Exceedances[1] | 2 | 12 | 9 | 3 | 0 |
| Average (µg/m³) | 18.9 | 35.1 | 37.4 | 26.5 | 25.1 |
| Maximum (µg/m³) | 90.9 | 119.5 | 80.6 | 69.1 | 74.2 |
| Minimum (µg/m³) | 5.1 | 8.4 | 3.5 | 6.2 | 6.3 |
| No Data (days) | 0 | 0 | 0 | 1 | 19 |

A total of 45 site exceedances were recorded over 37 monitoring days at compliance monitoring stations in this reporting period. 11 exceedances were also recorded at the offsite reference monitor during the period. MWPA uses the EnviroSuite Software to plot an "arc of influence". The software uses the wind direction and speed to project the area of influence up wind of the monitoring station, which helps to identify possible dust sources. A review of Port operations and wind conditions during each 24-hour period (Table 3) established that Port related operations were a contributing factor to 20 of these monitoring days (equalling 26 site exceedances).

5-minute average TEOM data, wind speed and wind direction data has been provided for each target exceedance event during this quarterly period (Appendix A, Figures 9 - 45 (exceedance graphs) and Appendix B (raw data)).

1 Port influenced exceedances require the monitor to be downwind from the Port operations along with the exceeding monitor to be clearly higher than any upwind monitors or the average for that day.

An analysis was undertaken on the percent similarity in concentrations between the offsite monitor and compliance monitors. Results identify the percentage similarity between the compliance monitors and the Offsite monitor.

| | | |
|---|---|---|
| 1. | Berth 1 vs Offsite monitor | 93.1% |
| 2. | Port Way vs Offsite monitor | 40.6% |
| 3. | Connell Road vs Offsite monitor | 28.6% |
| 4. | Lemmon Road vs Offsite monitor | 53.8% |

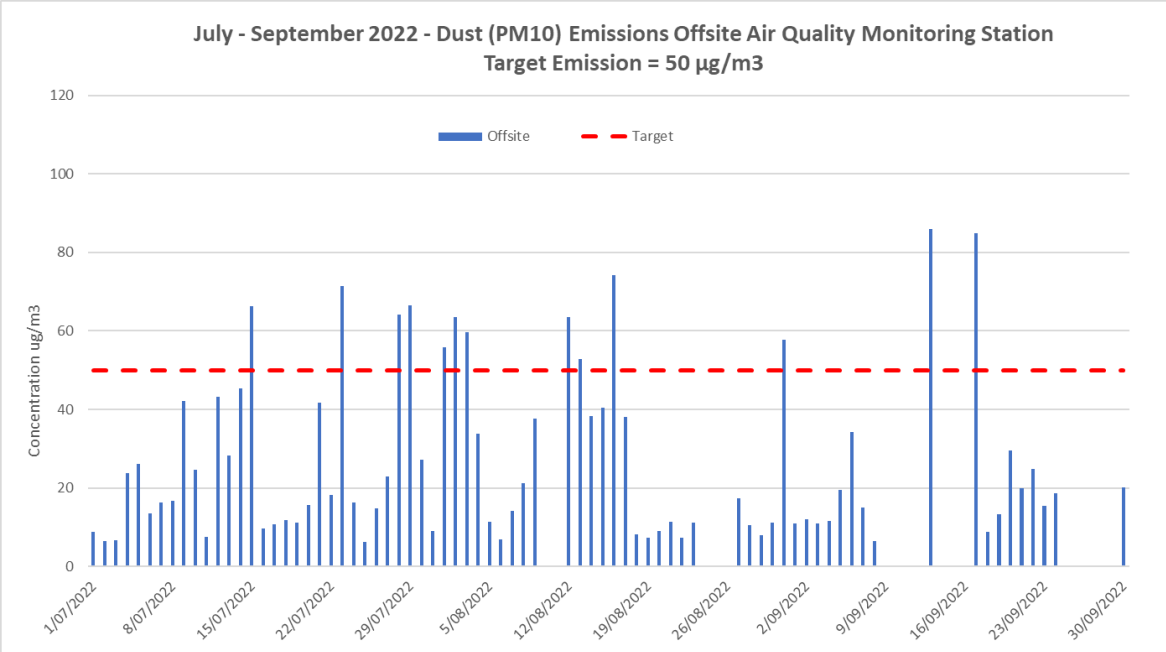



**FIGURE 3 JULY - SEPTEMBER 2022 – DAILY AVERAGE DUST (PM10) RECORDED AT OFFSITE AIR QUALITY MONITORING STATION**

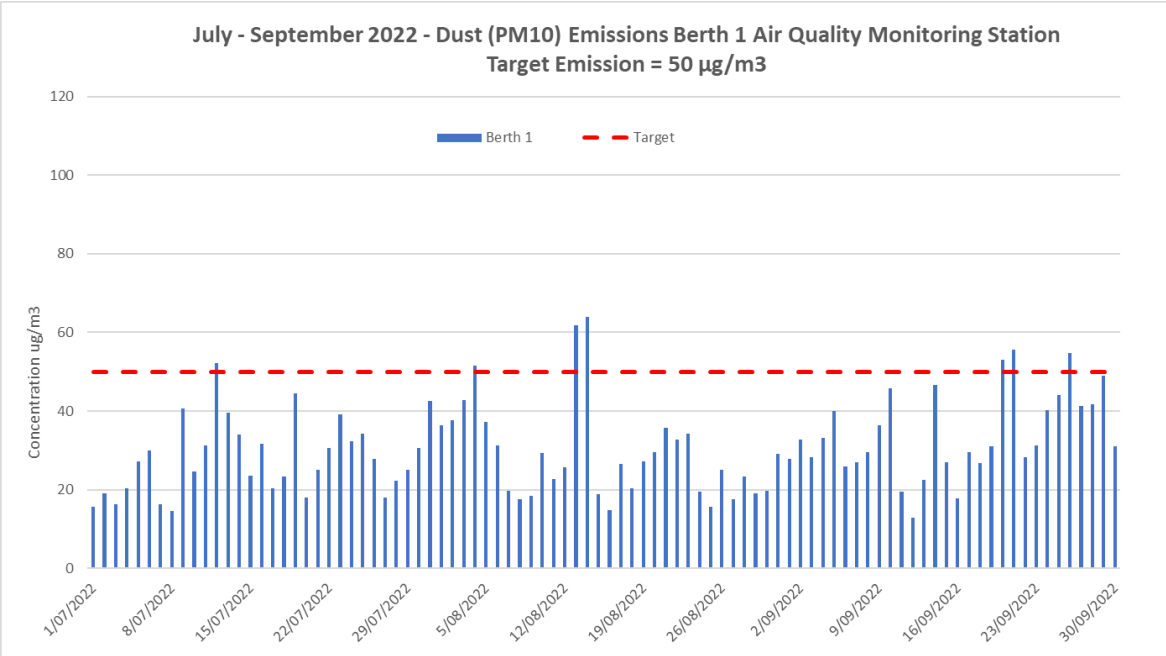



**FIGURE 4 JULY - SEPTEMBER 2022 – DAILY AVERAGE DUST (PM10) RECORDED AT BERTH 1 AIR QUALITY MONITORING STATION**

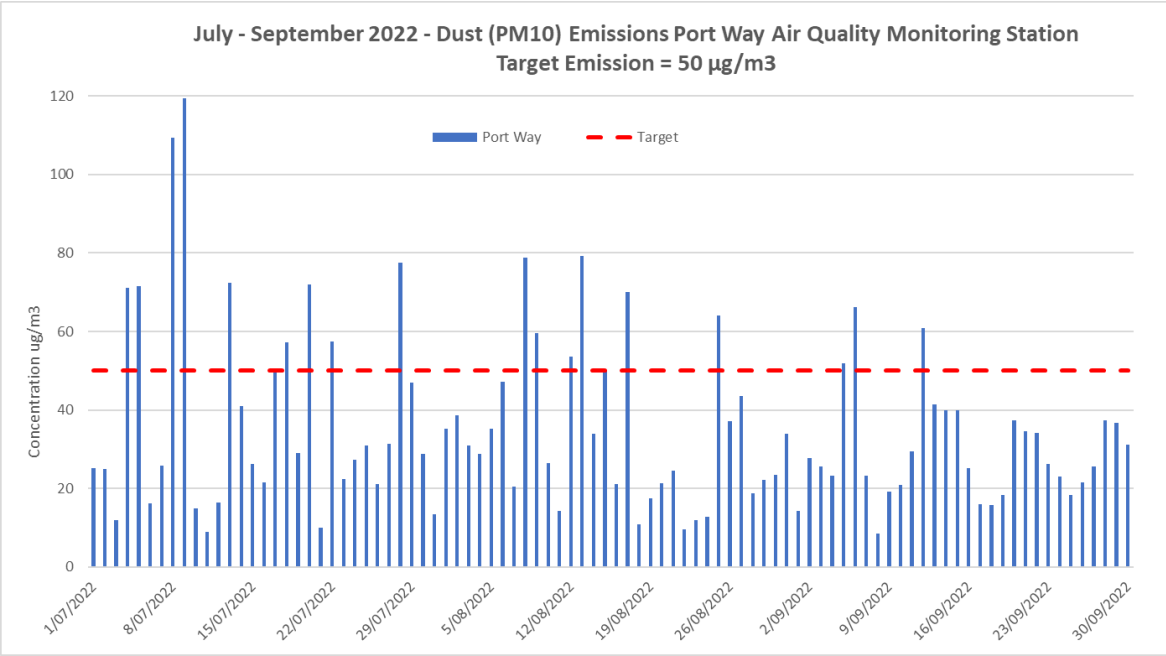



**FIGURE 5 JULY - SEPTEMBER 2022 – DAILY AVERAGE DUST (PM10) RECORDED AT PORT WAY AIR QUALITY MONITORING STATION**

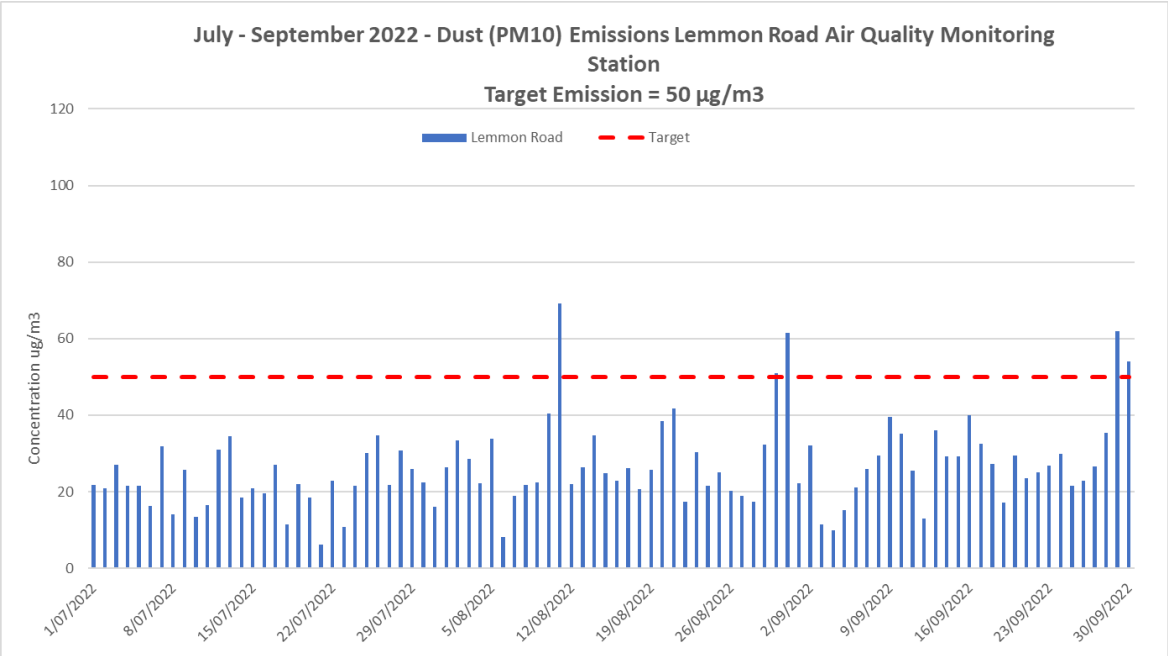



Figure 6 July - SEPTEMBER 2022 – DAILY AVERAGE DUST (PM10) RECORDED AT LEMMON ROAD AIR QUALITY MONITORING STATION

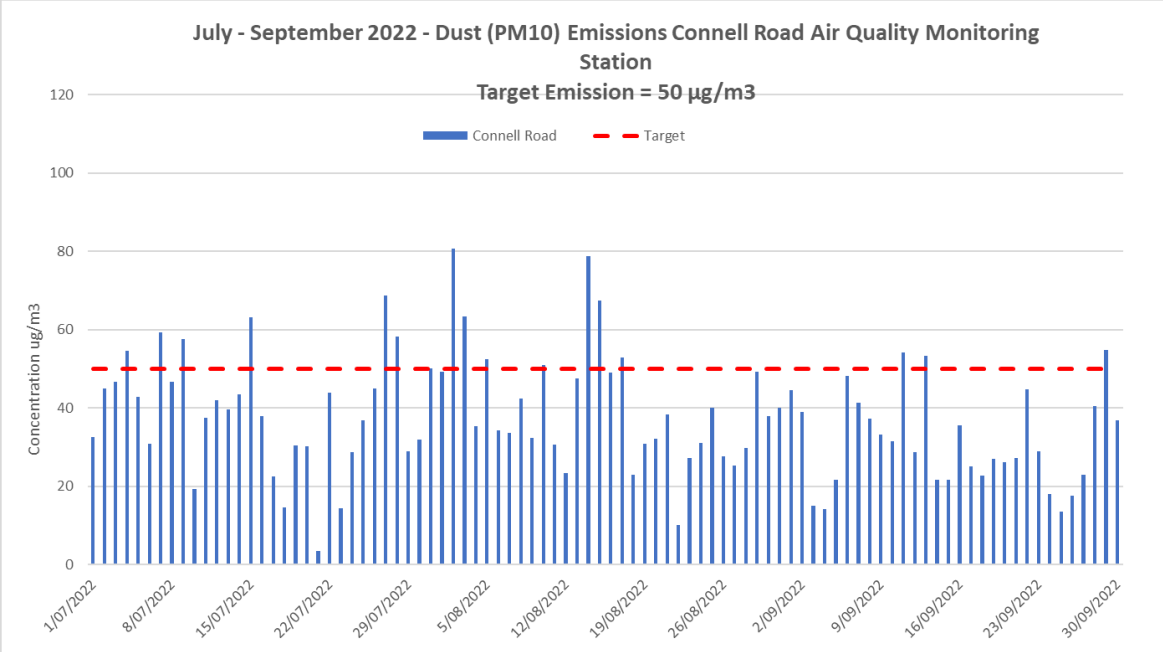



Figure 7 July - SEPTEMBER 2022 – DAILY AVERAGE DUST (PM10) RECORDED AT CONNELL ROAD AIR QUALITY MONITORING STATION

TABLE 3 – PM10 DUST RESULTS JULY - SEPTEMBER 2022

| No. | Target Exceedance Date | Contributed / Not contributed | Description & Prescribed / Operations Activities | Vessel Loading / Unloading | Figure Reference |
|---|---|---|---|---|---|
| 1 | 4/07/2022 | Not Contributed | Port Way (71.3µg/m$^3$) and Connell Road (54.4µg/m$^3$) exceeded on this date. It was observed that grain unloading from the CBH unloading facility was the cause of the Port Way exceedance and therefore the exceedance was deemed to be not Port contributed. | B4: Zircon<br>B6: Fertiliser | Figure 9 |
| 2 | 5/07/2022 | Not Contributed | Port Way (71.2µg/m$^3$) exceeded on this date. It was observed that grain unloading from the CBH unloading facility impacted Port Way monitoring location in the morning and early afternoon. Loading through Berth 3 started in the afternoon and was not the primary cause of the exceedance. | B3: Canola<br>B4: Zircon<br>B6: Fertiliser | Figure 10 |
| 3 | 7/07/2022 | Contributed | Connell Road (59.5µg/m$^3$) exceeded on this date. Wind was light from the East in the morning and variable in the afternoon. The exceedance was likely due to Loading on Berth 3 and Berth 4. | B3: Canola<br>B4: Ilmenite<br>B7: Iron Ore | Figure 11 |
| 4 | 8/07/2022 | Contributed | Port Way (109.3µg/m$^3$) exceeded on this date. As seen in Figure 12 most of the dust measured was from the direction of Berth 3 through which wheat was loaded during the period. | B3: Wheat<br>B4: Garnet<br>B7: Iron Ore | Figure 12 |
| 5 | 9/07/2022 | Contributed | Port Way (119.5.3µg/m$^3$) and Connell Road (58µg/m$^3$) exceeded on this date. Wind was from the North during the morning and afternoon and from the West in the evening. It was observed that grain unloading from the CBH unloading | B3: Wheat<br>B4: Garnet<br>B7: Iron Ore | Figure 13 |

| No. | Target Exceedance Date | Contributed / Not contributed | Description & Prescribed / Operations Activities | Vessel Loading / Unloading | Figure Reference |
|---|---|---|---|---|---|
| | | | facility impacted the Port Way monitor however given the wind direction the exceedance was largely due to Loading on Berth 3 and Berth 4. | | |
| 6 | 13/07/2022 | Contributed | Port Way (72.7µg/m$^3$) exceeded on this date. Figure 14 indicated most of the dust recorded was from a North-Northwest to Northeast direction indicating shiploading through Berth 3 and to a lesser extent Berth 4 contributed to the exceedance. | B3: Wheat<br>B4: Zircon<br>B5: Iron Ore<br>B7: Iron Ore | Figure 14 |
| 7 | 15/07/2022 | Not Contributed | Connell Road (63.0µg/m$^3$) exceeded on this date. Wind was from the West in the morning and early afternoon and from the South-East to East for the rest of the day. Most of the dust measured at Connell Road was from the West to Southwest and not from the Port direction. | B6: Petroleum<br>B7: Iron Ore | Figure 15 |
| 8 | 17/07/2022 | Contributed | Port Way (50.3µg/m$^3$) exceeded on this date. Dust from B3 and Berth 4 loading was observed impacting the Port Way monitor. Loading on Berth 3 and Berth 4 was paused to try to limit dust. | B3: Wheat<br>B6: HMC | Figure 16 |
| 9 | 18/07/2022 | Not Contributed | Port Way (50.3µg/m$^3$) exceeded on this date. As the wind was from the South throughout the day, the exceedance was due to offsite sources. | B3: Wheat<br>B6: HMC<br>B7: Iron Ore | Figure 17 |
| 10 | 20/07/2022 | Contributed | Port Way (72.5µg/m$^3$) exceeded on this date. North to North-Easterly wind in the afternoon coincided with higher dust levels recorded at Port Way. It is likely that grain loading through Berth 3 was the cause of the exceedance. | B3: Wheat<br>B5: Iron Ore<br>B6: HMC<br>B7: Iron Ore | Figure 18 |

| No. | Target Exceedance Date | Contributed / Not contributed | Description & Prescribed / Operations Activities | Vessel Loading / Unloading | Figure Reference |
|---|---|---|---|---|---|
| 11 | 22/07/2022 | Contributed | Port Way (57.6µg/m$^3$) exceeded on this date. Figure 19 shows most of the dust recorded was during the middle of the day when wind conditions were from a Northeast to Northwest direction. Loading through Berth 3 likely contributed to the exceedance. | B3: Wheat<br>B5: Iron ore<br>B6: Copper<br>B7: Iron Ore | Figure19 |
| 12 | 27/07/2022 | Not Contributed | Connell Road (68.6µg/m$^3$) exceeded on this date. Wind was from the East for most of the day with periods from the South West and South. Most of the dust measured was during the period of South Westerly wind. The exceedance deemed to be due to offsite sources. | B3: Wheat<br>B5: Iron Ore<br>B6: Copper | Figure 20 |
| 13 | 28/07/2022 | Contributed | Connell Road (58.3µg/m$^3$) and Port Way(77.5µg/m$^3$) exceeded on this date. The wind was North-easterly and gentle to moderate in intensity in the morning and to North-Westerly in the afternoon. The exceedance at Connell Road was from offsite sources to the North and Northeast of the monitor. Road sweeping in the Materials Storage Area and Grain unloading contributed were observed impacting the Port Way monitor. | B3: Wheat<br>B4: Talc<br>B5: Iron Ore<br>B6: Copper / Zinc | Figure 21 |
| 14 | 31/07/2022 | Contributed | Connell Road (50.0µg/m$^3$) exceeded on this date. The wind was from the East to Northeast and Moderate in intensity throughout the day. Given the wind direction loading at Berth 7 and unsealed areas at the Berth 7 reclaim may have contributed to the exceedance. | B5: Iron Ore<br>B6: Zinc<br>B7: Iron Ore | Figure 22 |

| No. | Target Exceedance Date | Contributed / Not contributed | Description & Prescribed / Operations Activities | Vessel Loading / Unloading | Figure Reference |
|---|---|---|---|---|---|
| 15 | 2/08/2022 | Not Contributed | Connell Road (80.5µg/m$^3$) exceeded on this date. The wind was from the West and Strong in intensity throughout the day. Figure 23 indicates the exceedance was due to offsite sources. | No vessels in Port due to surge | Figure 23 |
| 16 | 3/08/2022 | Not Contributed | Connell Road (63.1µg/m$^3$) exceeded on this date. The wind was from the West and Strong in intensity throughout the day. Figure 24 indicates the exceedance was due to offsite sources of dust. | No vessels in Port due to surge | Figure 24 |
| 17 | 5/08/2022 | Contributed | Connell Road (52.4µg/m$^3$) exceeded on this date. The wind was from the East for most of the day with a period of variable wind in the early afternoon. Loading through Berth 3, Berth 6 and Berth 7 may have contributed to the exceedance. | B3: Wheat<br>B4: Copper<br>B6: HMC<br>B7: Iron Ore | Figure 25 |
| 18 | 8/08/2022 | Not Contributed | Port Way (79.0µg/m$^3$) exceeded on this date. As the wind was from the East and West throughout the day the exceedance was mostly due to offsite sources. | B3: Wheat<br>B4: FHMC / Garnet<br>B6: HMC<br>B7: Iron Ore | Figure 26 |
| 19 | 9/08/2022 | Not Contributed | Port Way (59.3µg/m$^3$) exceeded on this date. As the wind was from the West throughout the day the exceedance was due to offsite sources. | B3: Wheat<br>B6: HMC | Figure 27 |
| 20 | 10/08/2022 | Contributed | Connell Road (51.1µg/m$^3$) exceeded on this date. Wind was from the Southeast to South-Southeast. The exceedance was most likely due to garnet loading through Berth 4. Berth 5 may have contributed. | B3: Wheat<br>B4: Garnet<br>B5: Iron ore<br>B6: Petroleum | Figure 28 |

| No. | Target Exceedance Date | Contributed / Not contributed | Description & Prescribed / Operations Activities | Vessel Loading / Unloading | Figure Reference |
|---|---|---|---|---|---|
| 21 | 11/08/2022 | Contributed | Lemmon Road (69.5µg/m$^3$) exceeded on this date. The wind was from the Southeast throughout the day and gentle intensity. The exceedance was due to Garnet unloading into the BHF Truck Unloader Southeast of the Lemmon Road Monitor. Loading through Berth 4 was paused twice to reduce dust levels. | B3: Wheat<br>B4: Garnet<br>B5: Iron ore<br>B6: Petroleum<br>B7: Iron Ore | Figure 29 |
| 22 | 12/08/2022 | Contributed | Port Way (53.6µg/m$^3$) exceeded on this date. As the wind was from the South East in the early morning and from the North East to East for most of the rest of the day. Wheat loading through Berth 3 was observed impacting Port Way in the evening. Truck unloading in the Bulk Handling Facility also contributed to the exceedance. | B3: Wheat<br>B4: Garnet<br>B5: Iron ore<br>B6: Petroleum<br>B7: Iron Ore | Figure 30 |
| 23 | 13/08/2022 | Contributed | Berth 1 (66.9µg/m$^3$) and Port Way (79.4µg/m$^3$) exceeded on this date. Wind was from the East to Northeast in the morning and from the Northwest to Southwest in the morning. B3 grain loading contributed to the exceedance. The load rate of the grain loading was reduced to reduce dust. | B3: Wheat<br>B6: Petroleum | Figure 31 |
| 24 | 14/08/2022 | Contributed | Connell Road (79.1µg/m$^3$) exceeded on this date. The wind was from the East during the morning and variable for the rest of the day. No dust was observed emanating from the port, but as the monitor was downwind of the port the day counts as an exceedance. | B3: Wheat<br>B6: Petroleum<br>B7: Iron Ore | Figure 32 |

| No. | Target Exceedance Date | Contributed / Not contributed | Description & Prescribed / Operations Activities | Vessel Loading / Unloading | Figure Reference |
|---|---|---|---|---|---|
| 25 | 15/08/2022 | Contributed | Port Way (53.6µg/m$^3$) and Connell Road (67.0µg/m$^3$) exceeded on this date. The wind was from the East to North-East for much of the day. No dust was observed emanating from the port, but as the monitor was downwind of the Port the day counts as an exceedance. | B3: Wheat<br>B6: Petroleum<br>B7: Iron Ore | Figure 33 |
| 26 | 17/08/2022 | Not Contributed | Connell Road (52.6µg/m$^3$) and Port Way(69.8µg/m$^3$) exceeded on this date. The wind was moderate in intensity from the North-West in the morning and from the West to South-West for the remainder of the day. Neither monitoring location was downwind of port operations. The exceedance was due to offsite sources. | B6: Copper | Figure 34 |
| 27 | 25/08/2022 | Not Contributed | Port Way (64.1µg/m$^3$) exceeded on this date. Figure 35 indicates the exceedance was due to dust sources to the East of the Port Way monitor and not Port related. | B4: Zircon<br>B7: Iron Ore | Figure 35 |
| 28 | 30/08/2022 | Not Contributed | Lemmon Road (51.1µg/m$^3$) exceeded on this date. Wind was from the South-East to South-West. Dust levels at the P/Shed E-Sampler indicate that exceedance was due to offsite sources to the South of the Talc Stockpile. | B4: Zircon<br>B6: Copper<br>B7: Iron Ore | Figure 36 |
| 29 | 31/08/2022 | Not Contributed | Lemmon Road (61.4µg/m$^3$) exceeded on this date. Wind was from the South-East to South-West. Dust levels at the P/Shed E-Sampler indicate that exceedance was due to offsite sources to the South of the Talc Stockpile. | B4: Zircon<br>B6: Petrolium<br>B7: Iron Ore | Figure 37 |

| No. | Target Exceedance Date | Contributed / Not contributed | Description & Prescribed / Operations Activities | Vessel Loading / Unloading | Figure Reference |
|---|---|---|---|---|---|
| 30 | 5/09/2022 | Not Contributed | Port Way (51.6µg/m$^3$) exceeded on this date. Wind was gentle to moderate in intensity and from the West throughout the day. The exceedance was due to offsite sources to the West of the Port Way monitor. | B3: Wheat<br>B7: Iron Ore | Figure 38 |
| 31 | 6/09/2022 | Contributed | Port Way (66.3µg/m$^3$) and Berth1 (90.6µg/m$^3$) exceeded on this date. The wind was moderate in intensity and from the West throughout the day. The exceedance at Port Way was due to offsite sources. The exceedance at Berth 1 was due to Gain loading through Berth 3. Loading on Berth 3 was paused once the ship reached a grain stable state to reduce dust levels. | B3: Wheat<br>B7: Iron Ore | Figure 39 |
| 32 | 11/09/2022 | Not Contributed | Connell Road (54.1µg/m$^3$) exceeded on this date. The wind was moderate in intensity and from the South in the morning, from the West through the middle of the day and from the East in the evening. Given the wind direction for the largest part of the day was not from the Port direction the exceedance was due to offsite sources. | B3: Wheat<br>B7: Iron Ore | Figure 40 |
| 33 | 12/09/2022 | Contributed | Port Way (61.1µg/m$^3$) exceeded on this date. Dust levels were high in the morning when Wind was from the North-East. Wheat loading through Berth 3 contributed to the exceedance. The stevedores working on Berth 3 was asked to lower the chutes, but were unable to as the vessel was being trimmed. | B3: Wheat<br>B7: Iron Ore | Figure 41 |

| No. | Target Exceedance Date | Contributed / Not contributed | Description & Prescribed / Operations Activities | Vessel Loading / Unloading | Figure Reference |
|---|---|---|---|---|---|
| 34 | 13/09/2022 | Not Contributed | Connell Road (53.3µg/m$^3$) exceeded on this date. The wind was strong in intensity and from the North-West to South-West throughout the day. As the Connell Road monitor was not downwind of the Port, the exceedance was not due to Port operations. | No vessels in Port due to surge | Figure 42 |
| 35 | 28/09/2022 | Not Contributed | Port Way (50.9µg/m$^3$) exceeded on this date. As shown in figure 43, The Port Way monitor was not downwind of the Port and therefore the exceedance was not due to Port Operations. | B3: Wheat<br>B5: Iron Ore<br>B6: Zinc<br>B7: Iron Ore | Figure 43 |
| 36 | 29/09/2022 | Contributed | Lemmon Road (61.4µg/m$^3$) and Connell Road (54.3µg/m$^3$) exceeded on this date. The wind was from the South in the morning and from East-Southeast for the rest of the day. The Operations Supervisor observed no obvious souse of dust, however as the monitors were downwind of the Port the day counts as an exceedance. | B3: Wheat<br>B5: Iron Ore<br>B7: Iron Ore | Figure 44 |
| 36 | 30/09/2022 | Contributed | Lemmon Road (54.2µg/m$^3$) exceeded on this date. Wind was from the South-East in the morning and from the South to South-West in the afternoon. Grain loading through Berth 3 and dust from Truck and Train unloading may have contributed to the exceedance. | B3: Wheat<br>B6: Crude Oil<br>B7: Iron Ore | Figure 45 |

# 3. High Volume (HiVol) Air Sampling Data

Samples collected from the MWPA HiVol dust monitors were analysed by Analytical Reference Laboratory (ARL) which is a National Associated of Testing Authorities (NATA) accredited facility (NATA Accreditation No. 2377). HiVol samples are collected for 24-hour periods which commence at 12:00 noon. All references to the sample date are presented as the commencement date for the sample period.

A summary of HiVol Data is presented in ***Table 4.***

TABLE 4 – SUMMARY OF HIVOL MONITORING DATA

| Criteria | | Port Way | Connell Road | Lemmon Road | Berth 1 |
|---|---|---|---|---|---|
| $PM_{10}$ | $PM_{10}$ Samples Analysed | 35 | 35 | 35 | 35 |
| | Count $PM_{10}$ > 50 µg/m³ | 2 | 5 | 2 | 2 |
| | Average $PM_{10}$ | 26.9 | 37.4 | 27.5 | 20.9 |
| | Maximum $PM_{10}$ | 66 | 87 | 77 | 70 |
| | Minimum $PM_{10}$ | 5 | 18 | 5 | 5 |
| TSP | TSP Samples Analysed | 49 | 49 | 49 | 49 |
| | Count TSP > 90 µg/m³ | 10 | 37 | 10 | 0 |
| | Average TSP | 66.1 | 118.4 | 68.5 | 37.9 |
| | Maximum TSP | 190 | 240 | 160 | 89 |
| | Minimum TSP | 12 | 52 | 5 | 5 |
| Count Copper as $PM_{10}$ > 1.0 µg/m³ | | 0 | 0 | 0 | 0 |
| Count Lead as $PM_{10}$ > Target [2] | | 0 | 0 | 0 | 0 |
| Count Nickel as $PM_{10}$ > 0.14 µg/m³ | | 0 | 0 | 0 | 0 |

[2] *The target for Lead as PM10 is 2.0 µg/m3 at the northern dust monitor (Connell Road) and 0.5 µg/m3 at all other monitoring stations*

## 3.1 Nickel

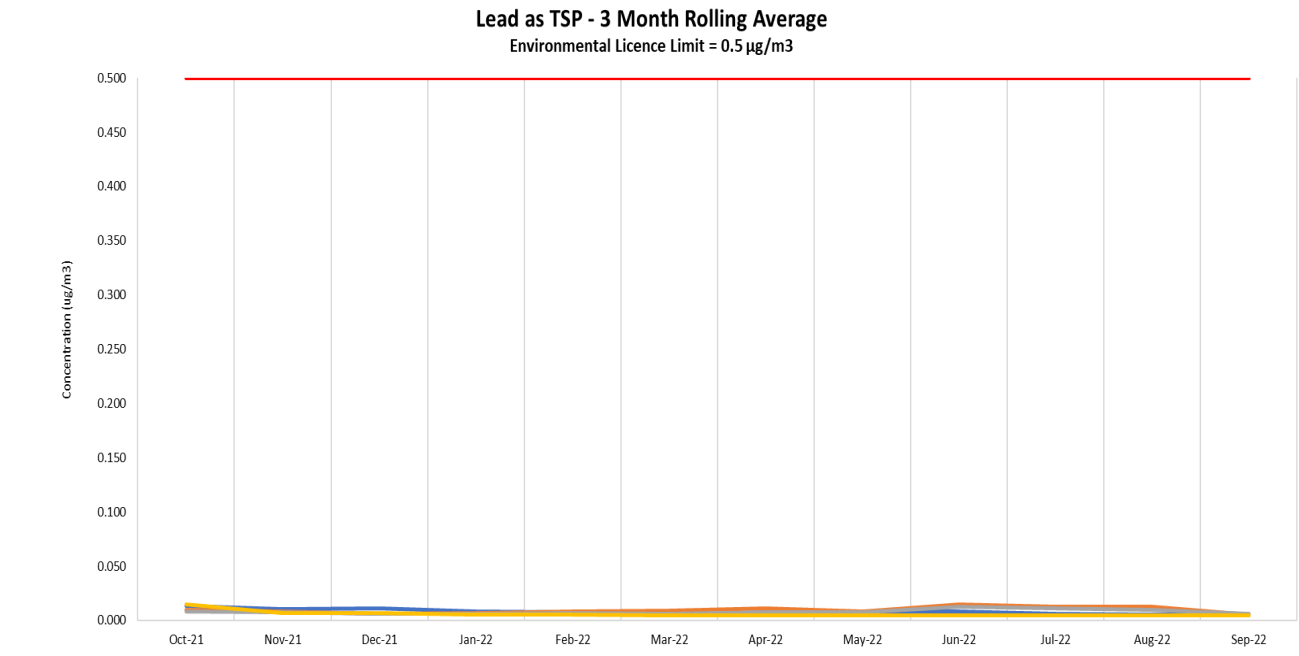
No nickel concentrate shiploading occurred during the reporting period.

## 3.2 Manganese

No manganese concentrate shiploading occurred during the reporting period.

## 3.3 Lead – 3 Month Rolling Average

The MWPA Environmental Licence defines the emission concentration limit for lead as a three-month rolling average concentration of 0.5 µg/m$^3$ (TSP). The rolling average for lead has been calculated as described in Schedule 3 of the Environmental Licence and is presented in ***Figure 8***. All data recorded was significantly lower than the stipulated licence limit.




| | Oct-21 | Nov-21 | Dec-21 | Jan-22 | Feb-22 | Mar-22 | Apr-22 | May-22 | Jun-22 | Jul-22 | Aug-22 | Sep-22 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Port Way | 0.014 | 0.011 | 0.011 | 0.008 | 0.008 | 0.005 | 0.008 | 0.008 | 0.009 | 0.006 | 0.006 | 0.005 |
| Connell Road | 0.009 | 0.008 | 0.006 | 0.006 | 0.008 | 0.009 | 0.011 | 0.008 | 0.014 | 0.012 | 0.012 | 0.006 |
| Lemmon Road | 0.009 | 0.007 | 0.006 | 0.006 | 0.007 | 0.006 | 0.007 | 0.008 | 0.012 | 0.011 | 0.010 | 0.006 |
| Berth 1 | 0.015 | 0.007 | 0.007 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 |
| Lead as TSP - Limit | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |

FIGURE 8 – LEAD 3 MONTH ROLLING AVERAGE (TSP)

# 4. Monitoring Equipment Incidents

All monitoring equipment incidents throughout the quarter are entered into the MWPA incident database (CAMMS) and investigated to determine the cause and identify improvement opportunities.

During the reporting period four incidents occurred in relation to air quality monitoring:

1. IN-26883 - Between 20/07/2022 and 08/08/2022 the Tower 501 Wind Meter gave incorrect wind direction readings. The meter was replaced with a new unit on 08/08/2022. Wind data from the wind meter at Port Way monitoring location was used in the interim.

2. IN-26836 – At 14:20 on 13/09/2022 the residual current devices supplying power to the Lemmon Road compound were tested. The Lemmon Rd unit did not re-start sampling until 17:20. As the period without real time sampling was greater than 2 hours, the sampling day at Lemmon Rd is invalid.

3. IN-26851 – MV Danceflora SW commenced loading zinc on 23 September 1730hrs and completed loading on 24th September 1120 hours. Given this loading period, a concentrate sample was required for 23 September and a post-concentrate needed for 24 September. A Concentrate Sample was completed for the 23 September period; however, a Post-Concentrate Sample was not conducted over the 24 September monitoring period. The Sampler responsible for deploying the sample misunderstood the work instructions.

4. IN-26855 – Multiple days of monitoring data have been lost from the BAM (Background air quality monitor) due to tape failures and missed errors.
August – 5 days of invalid data recorded with 2 days due to tape changeover and 3 days due to tape breakage error.
September - 14 days of invalid data due to tape breakage.

A fault with the BAM unit resulted in recurring tape breakages. New tape was installed as it was thought the breakage was related to the age of the tape installed. The new tape tore in the same manner as the older tape. It was discovered that the roller in the BAM unit was accumulating material which was tearing the tape. The roller was cleaned on multiple occasions to prevent further tape breakages. Higher humidity is thought to have played a role in the material accumulation.

The BAM unit is not an Environmental Licence compliance monitoring station; therefore loss of data is not a non-compliance with the Environmental Licence, however is a non-compliance with the MWPA Air Quality Monitoring SAP.

# 5. Community Complaints

Condition 4.1.4 of the licence requires MWPA to maintain a complaints management system that records the number and details of complaints received concerning the environmental impact of port activities. All community complaints received throughout the quarter were registered in the MWPA incident database (CAMMS) and investigated.

During the reporting period seven complaints were received in relation to dust emissions and one complaint in relation to noise from the off-site monitor.

| Date | Incident Number | Title | Summary of Complaint |
|---|---|---|---|
| 15/07/22 | IN-26781 | Dust Complaint from FBH | Dust complaint received from Fishing Boat Harbour (FBH) pen holder relating to iron ore dust deposition in the Fishing Boat Harbour. |
| 01/08/22 | IN-26805 | Dust Complaint from FBH | Pen holder approached Environmental Advisor opportunistically while in the FBH and complained about dust accumulated on vessel. |
| 01/08/22 | IN-26806 | Noise Complaint – Offsite monitor | While completing monitoring, Environmental Advisor received a complaint from a community member regarding noise from monitoring station in Bluff Point. Complainant lives across the road from the monitor and asked if monitoring unit could be insulated to reduce noise at night. Repairs were made to the unit which reduced vibration and noise. Additionally, door seals have been installed to reduce noise. |
| 10/08/22 | IN-26808 | Dust Complaint from FBH | Pen holder approached Trade Advisor opportunistically while in the FBH and complained about dust accumulated on vessel. |
| 11/08/22 | IN-26810 | Dust Complaint from FBH | FBH pen holder complained about red dust accumulated on vessel and excessive cost to lacquer boat. Complainant concerned with having to clean the boat daily to stop it pitting being an aluminium vessel. The complainant contacted the media who interviewed the pen holder and later interviewed the MWPA CEO. Article was published in the Geraldton Guardian Tuesday 16th August 2022. |
| 02/09/22 | IN-26826 | Dust Complaint from FBH | Dust complaint from FBH received regarding red dust deposition on vessel. |
| 06/09/22 | IN-2683 | Dust Complaint from Marine Terrace | Complaint received regarding grain dust in mechanical workshop on Marine Terrace. Complainant had concerns about contamination of mechanical parts in workshop, customer cars becoming excessively dusty and allergic reaction to grain dust. Grain loading operations on Berth 3 were suspended just prior to the complaint being received which addressed the issue. |
| 28/09/22 | IN-26848 | Dust Complaint from FBH | Complaint regarding dust deposition on personal vehicle parked near the south pens in the FBH. Dust is causing staining to paintwork that requires professional buff and polish from panel beaters to remove. |

# 6. Definitions

| | |
|---|---|
| $PM_{10}$ | Particulate matter smaller than 10 microns |
| TSP | Total Suspended Particulate |
| TEOM | Tapered Element Oscillating Microbalance |
| BAM | Beta Attenuation Monitor |
| HiVol | High Volume Air Sampler |
| Shiploading Event | The MWPA Environmental Licence defines a shiploading event as any shiploading where bulk metal concentrate product is loaded into in a ship or out of a ship |
| WS / WD | Wind Speed / Wind Direction |
| Port Way / PW | Port Way Air Quality Monitoring Station |
| Connell Road / CR | Connell Road Air Quality Monitoring Station |
| Lemmon Road / LR | Lemmon Road Air Quality Monitoring Station |
| Berth 1 / B1 | Berth 1 Air Quality Monitoring Station |
| Offsite | Offsite background reference monitoring station, situated in Bluff Point |
| FBH | Fishing Boat Harbour |

# 7. Appendix

## 8.1 Appendix A – Exceedances of Air Quality Emission Targets

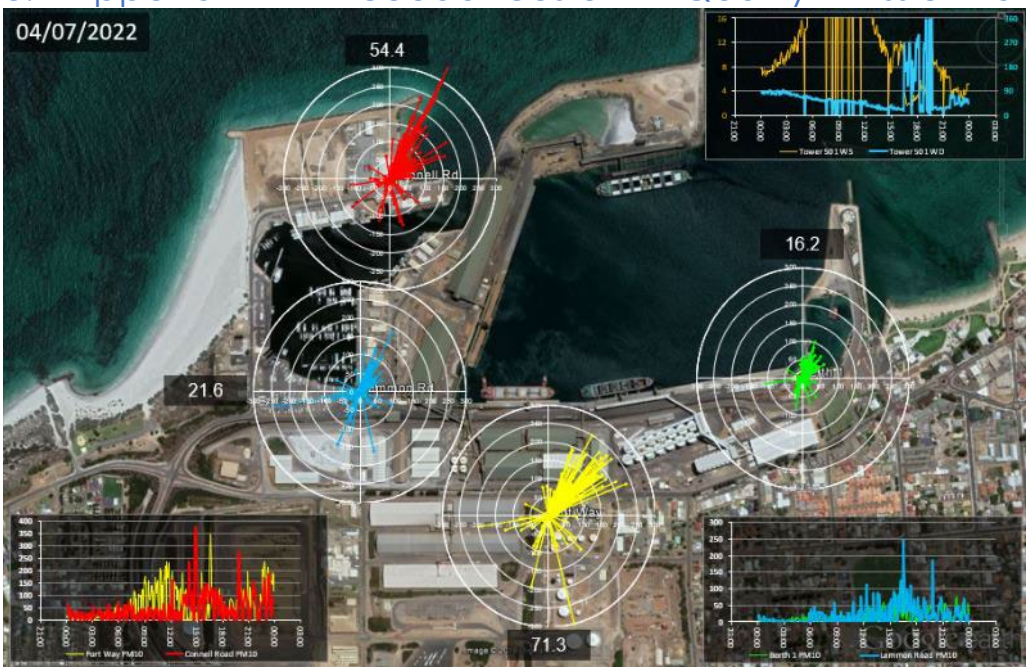



FIGURE 9 – 24-HOUR AVERAGED PM10 DATA FOR 04 JULY 2022

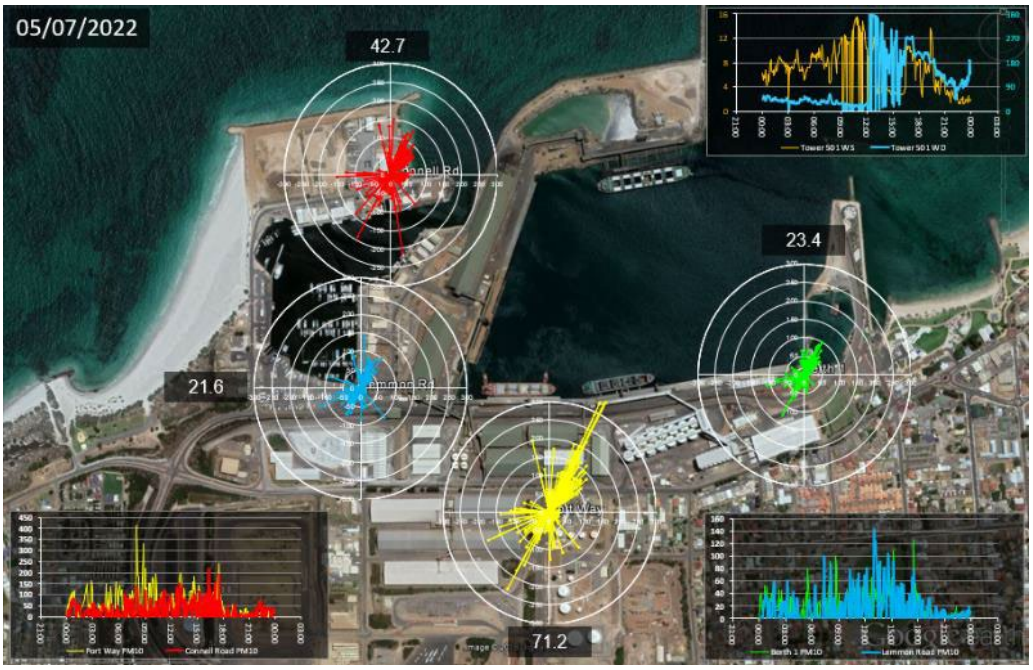



FIGURE 10 – 24-HOUR AVERAGED PM10 DATA FOR 05 JULY 2022

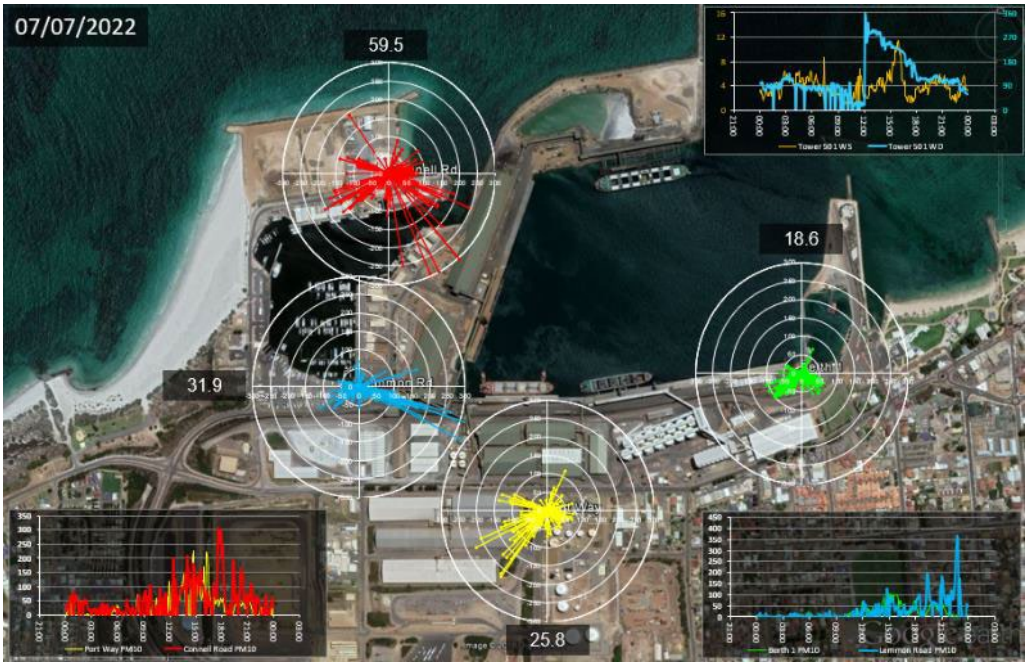



FIGURE 11 – 24-HOUR AVERAGED PM10 DATA FOR 07 JULY 2022

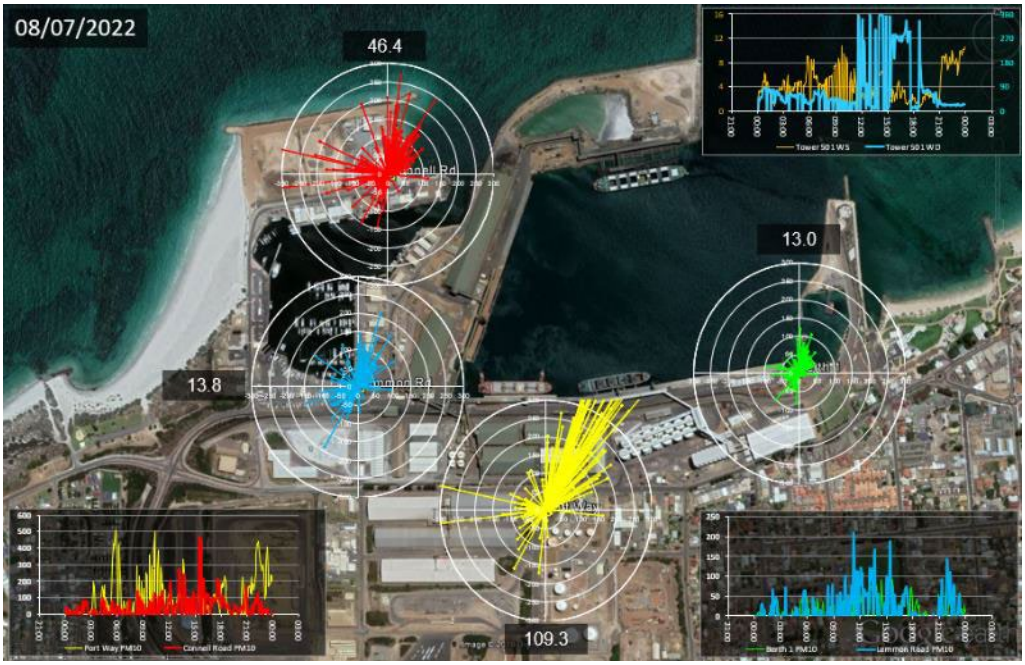



FIGURE 12 – 24-HOUR AVERAGED PM10 DATA FOR 08 JULY 2022

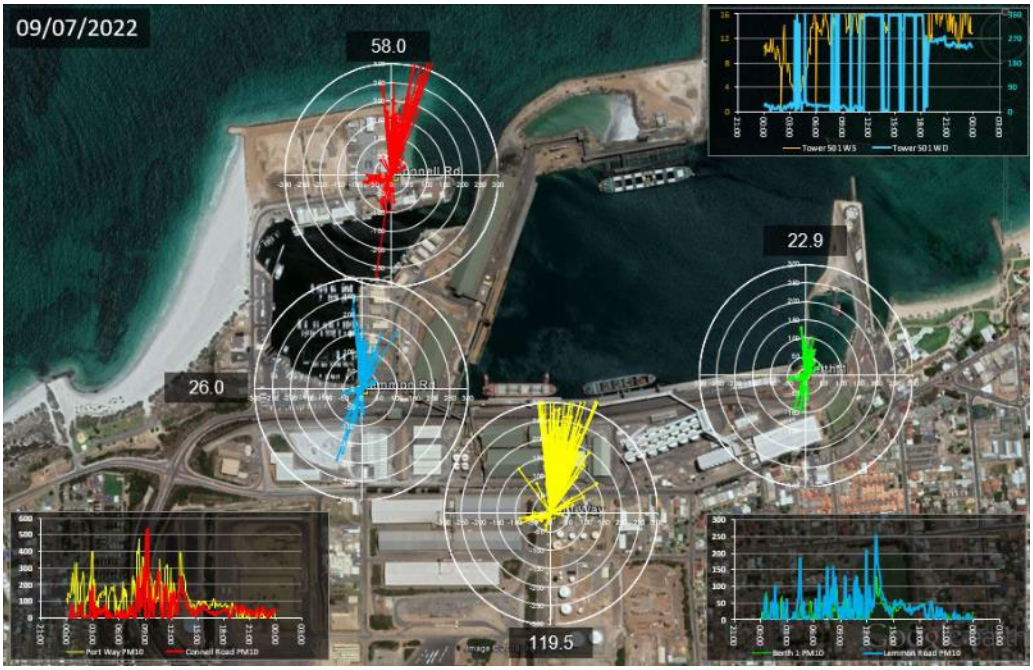



FIGURE 13 – 24-HOUR AVERAGED PM10 DATA FOR 09 JULY 2022

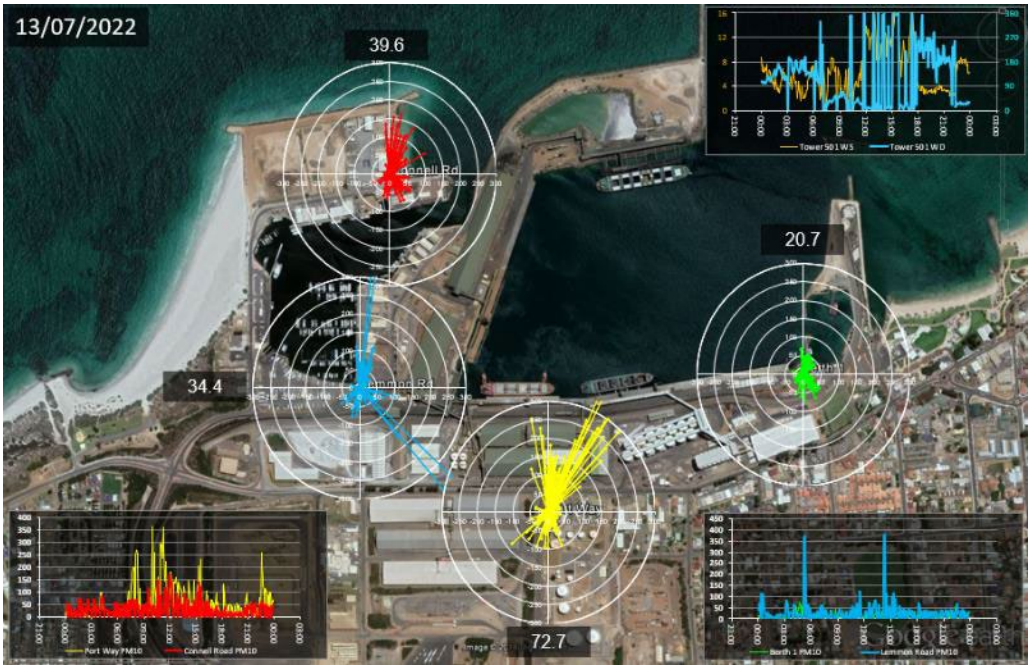



FIGURE 14 – 24-HOUR AVERAGED PM10 DATA FOR 13 JULY 2022

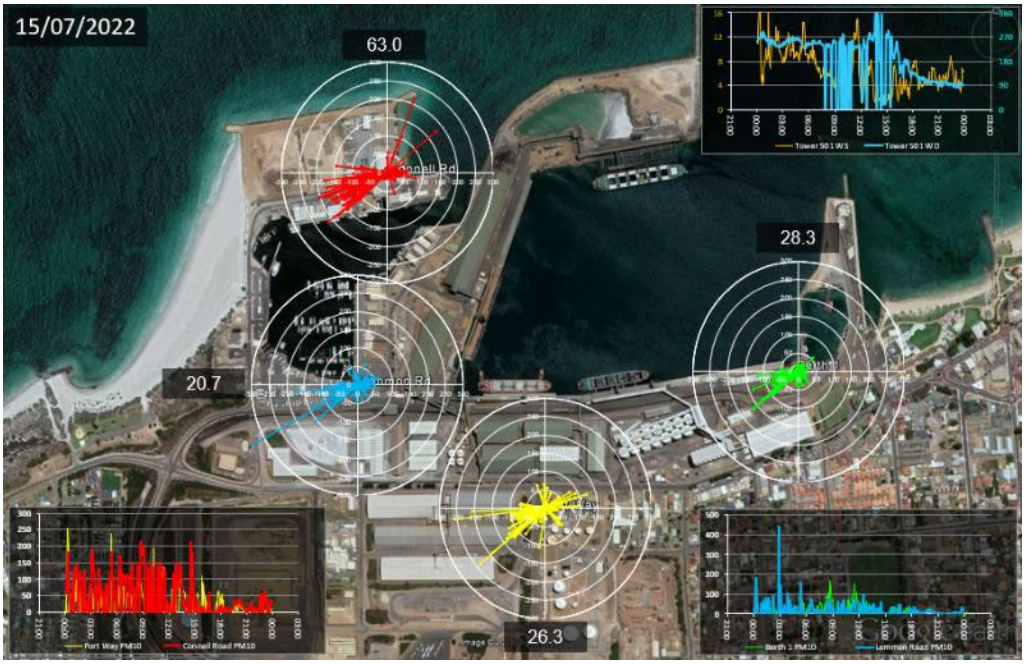



FIGURE 15 – 24-HOUR AVERAGED PM10 DATA FOR 15 JULY 2022

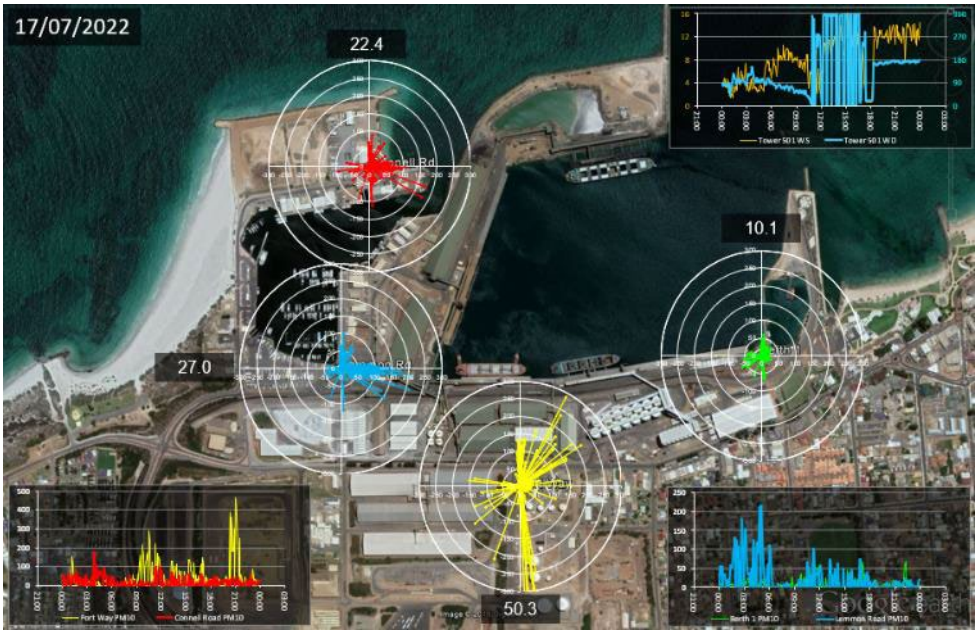



FIGURE 16 – 24-HOUR AVERAGED PM10 DATA FOR 17 JULY 2022

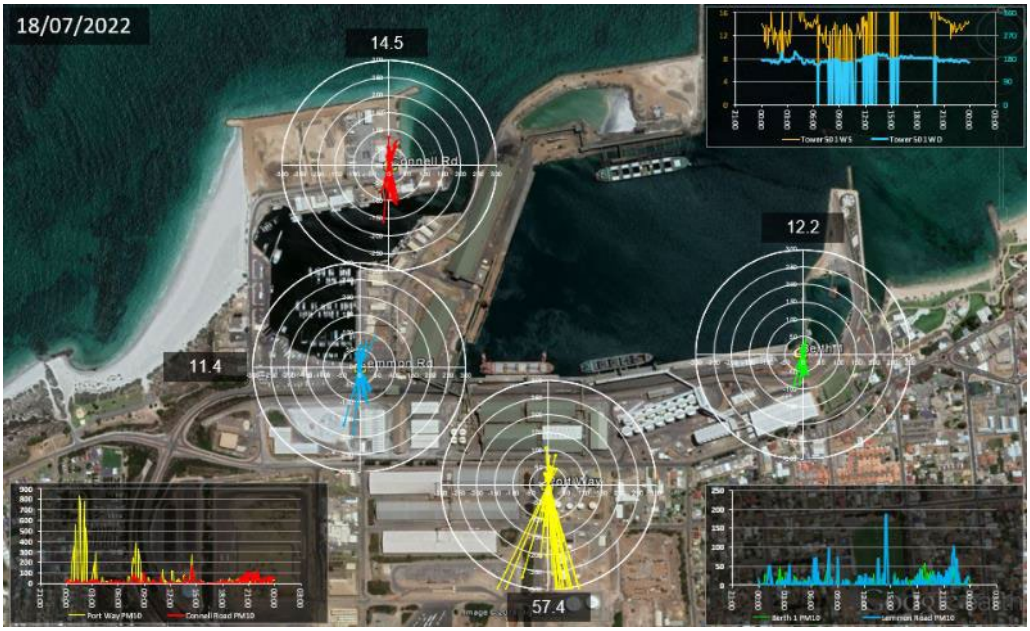



FIGURE 17 – 24-HOUR AVERAGED PM10 DATA FOR 18 JULY 2022

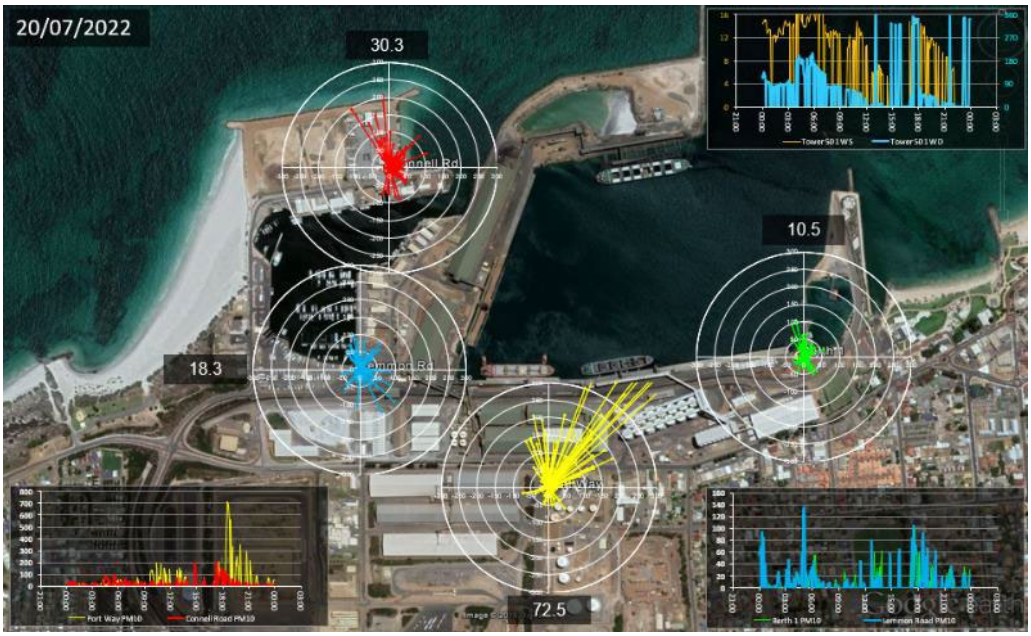



FIGURE 18 – 24-HOUR AVERAGED PM10 DATA FOR 20 JULY 2022 *PORT WAY ANEMOMETER USED FOR WIND DIRECTION DATA

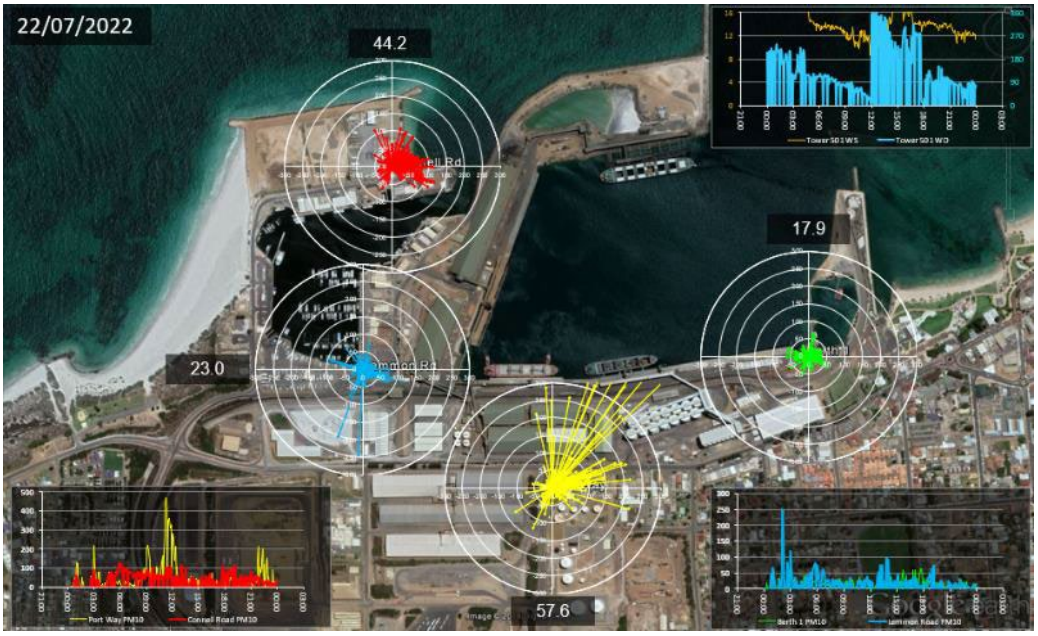



FIGURE 19– 24-HOUR AVERAGED PM10 DATA FOR 22 JULY 2022*PORT WAY ANEMOMETER USED FOR WIND DIRECTION DATA

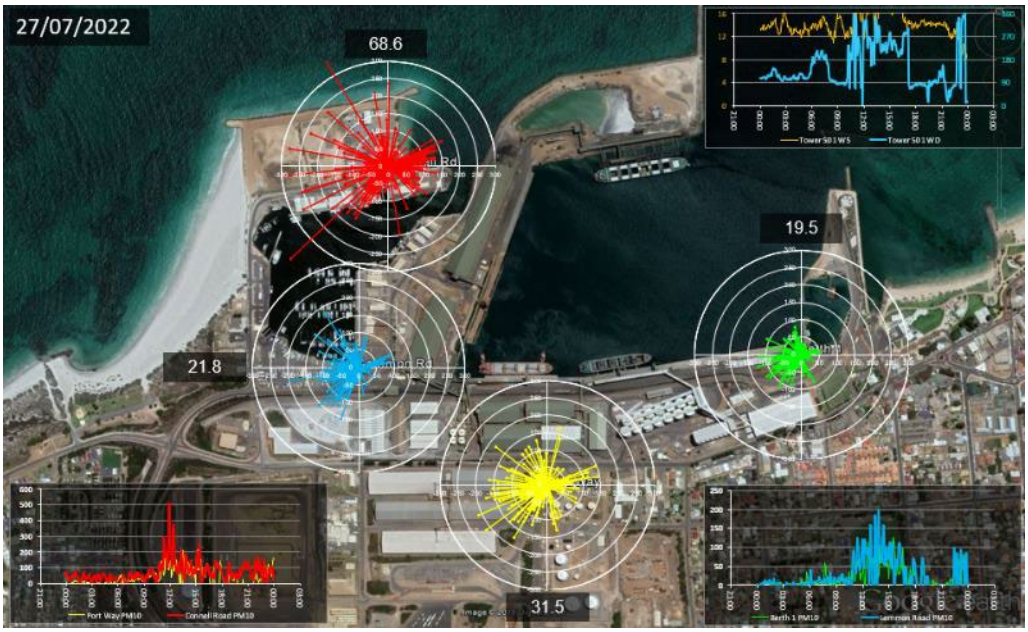



FIGURE 19 – 24-HOUR AVERAGED PM10 DATA FOR 27 JULY 2022*PORT WAY ANEMOMETER USED FOR WIND DIRECTION DATA

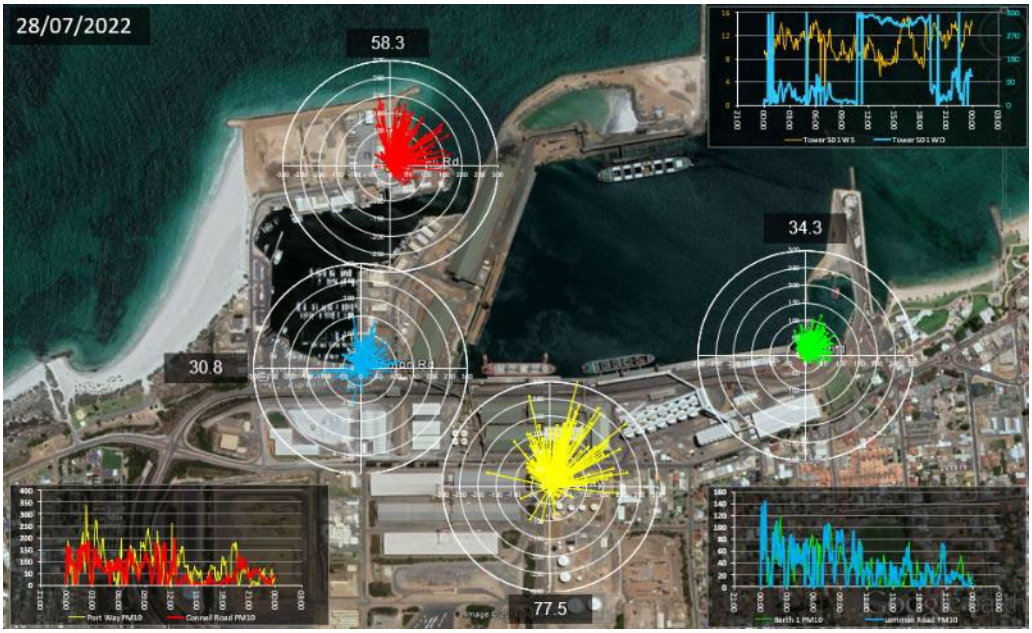



FIGURE 21 – 24-HOUR AVERAGED PM10 DATA FOR 28 JULY 2022*PORT WAY ANEMOMETER USED FOR WIND DIRECTION DATA

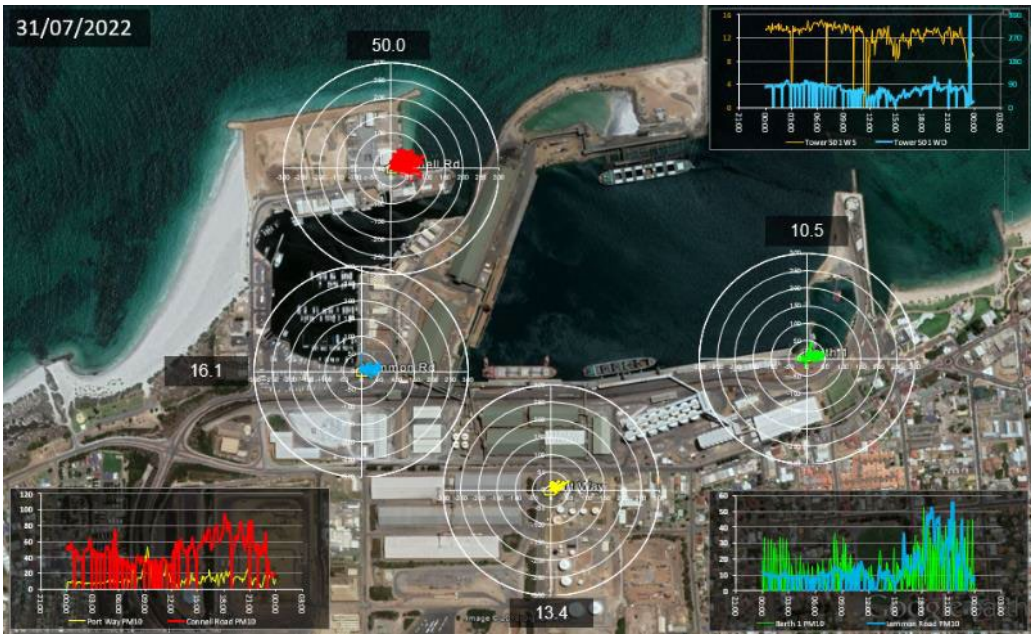



FIGURE 22 – 24-HOUR AVERAGED PM10 DATA FOR 31 JULY 2022*PORT WAY ANEMOMETER USED FOR WIND DIRECTION DATA

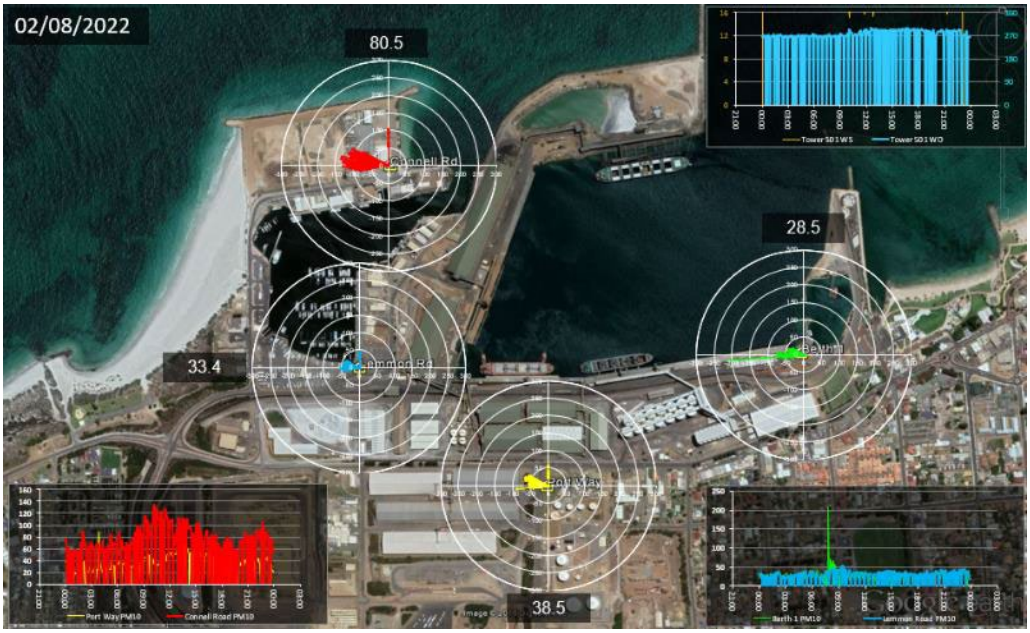



FIGURE 23 – 24-HOUR AVERAGED PM10 DATA FOR 02 AUGUST 2022*PORT WAY ANEMOMETER USED FOR WIND DIRECTION DATA

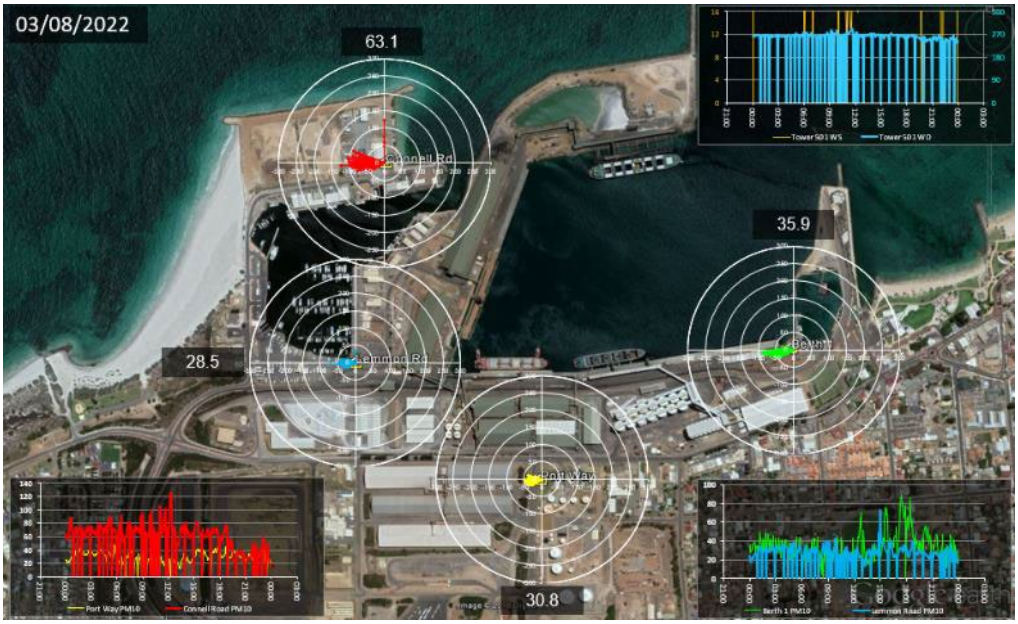



FIGURE 24 – 24-HOUR AVERAGED PM10 DATA FOR 03 AUGUST 2022*PORT WAY ANEMOMETER USED FOR WIND DIRECTION DATA

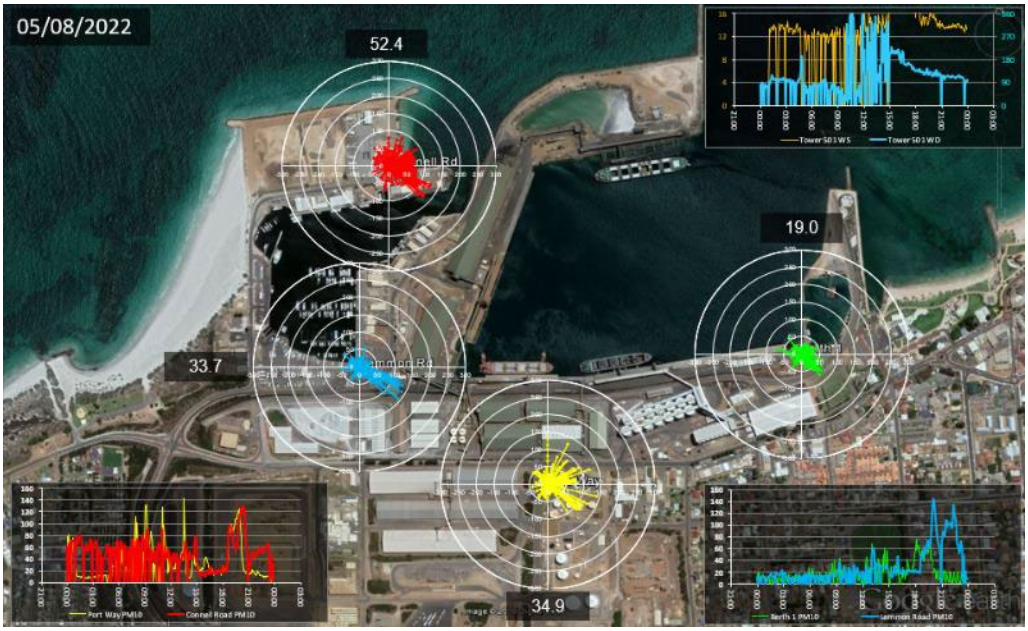



FIGURE 25– 24-HOUR AVERAGED PM10 DATA FOR 05 AUGUST 2022*PORT WAY ANEMOMETER USED FOR WIND DIRECTION DATA

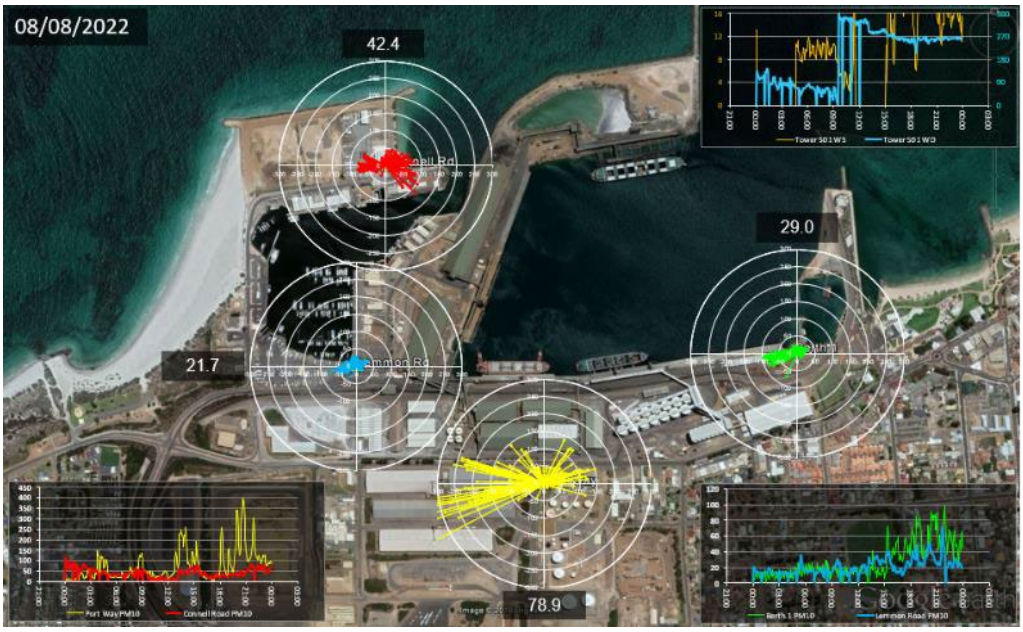



FIGURE 26– 24-HOUR AVERAGED PM10 DATA FOR 08 AUGUST 2022*PORT WAY ANEMOMETER USED FOR WIND DIRECTION DATA

FIGURE 20 – 24-HOUR AVERAGED PM10 DATA FOR 09 AUGUST 2022

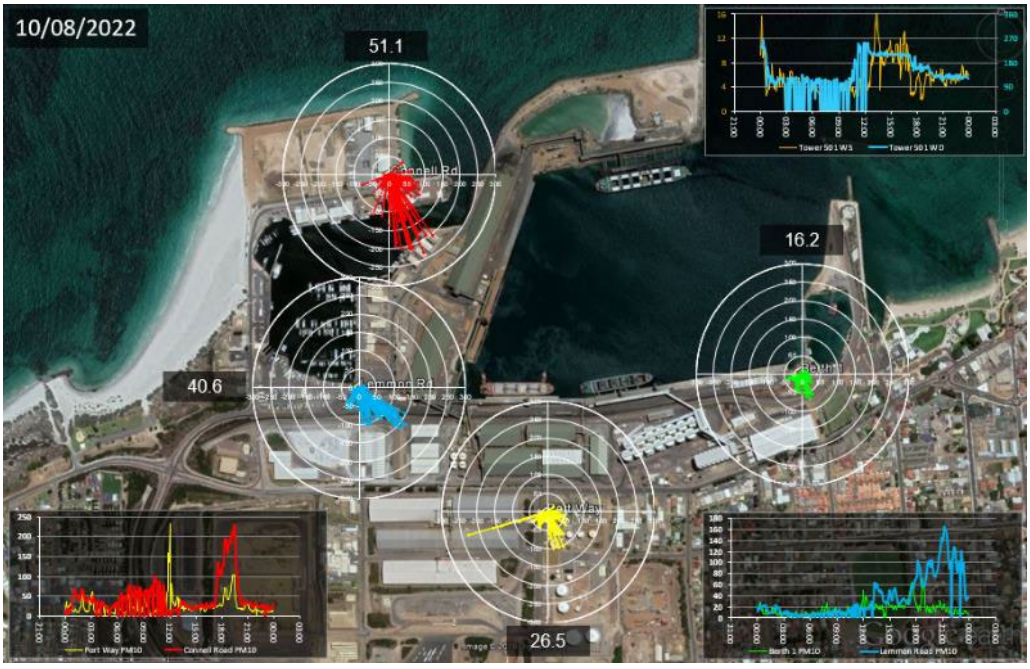



FIGURE 28 – 24-HOUR AVERAGED PM10 DATA FOR 10 AUGUST 2022

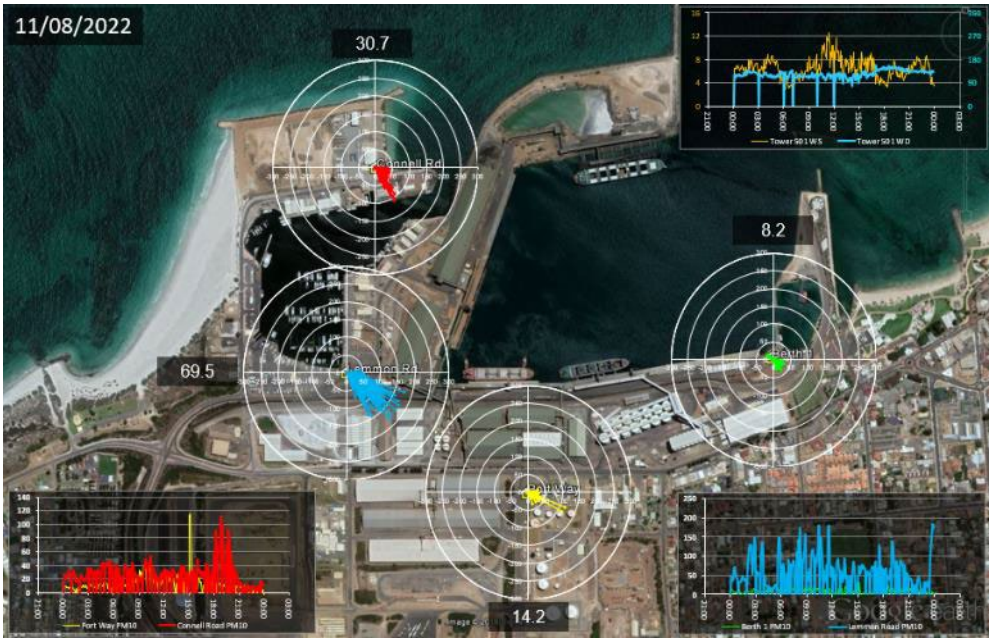



FIGURE 29 – 24-HOUR AVERAGED PM10 DATA FOR 11 AUGUST 2022

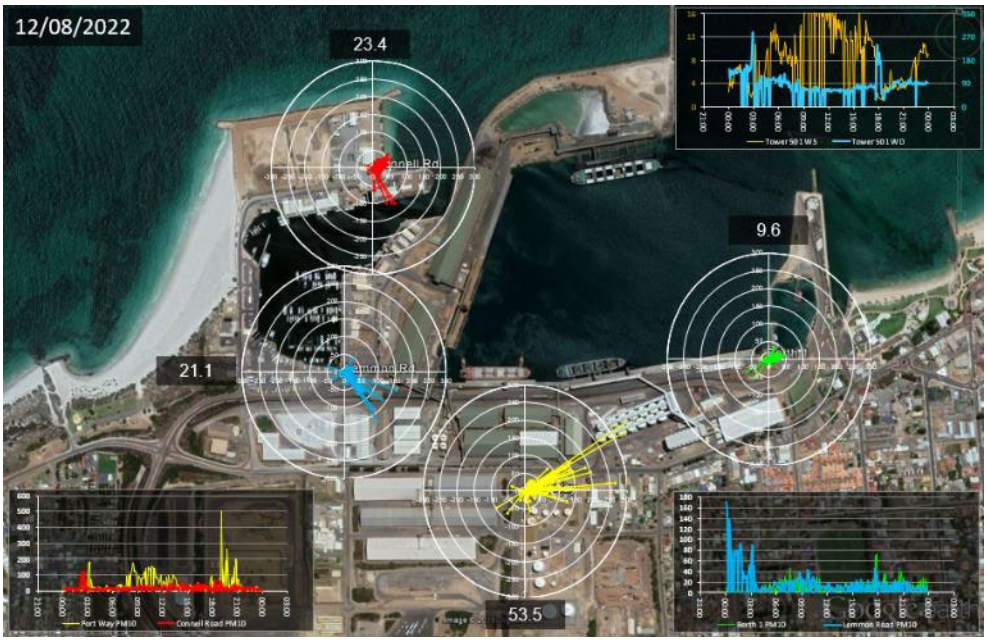



FIGURE 21 – 24-HOUR AVERAGED PM10 DATA FOR 12 AUGUST 2022

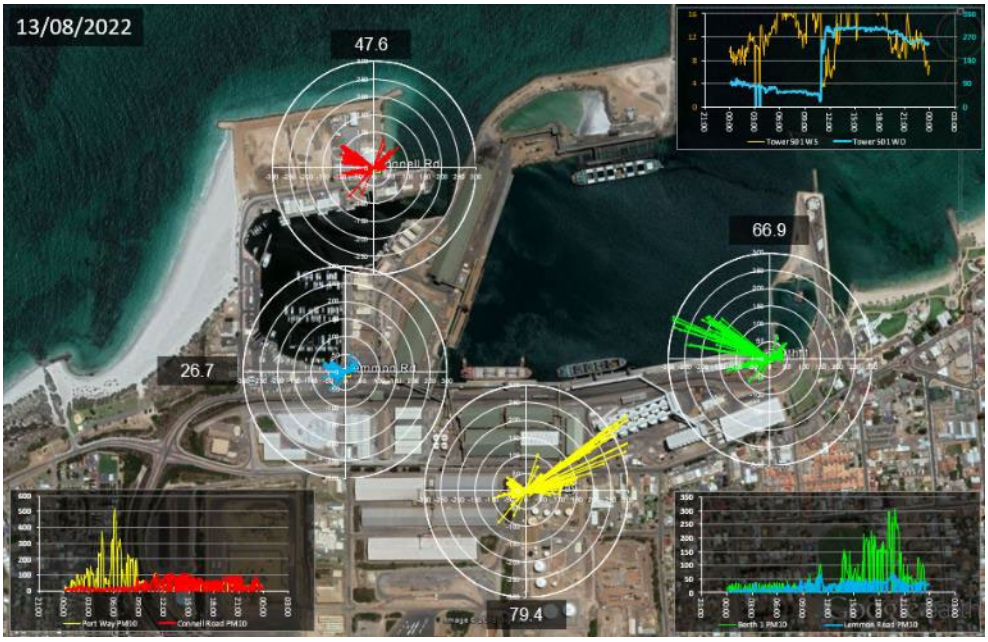



FIGURE 31 – 24-HOUR AVERAGED PM10 DATA FOR 13 AUGUST 2022

FIGURE 22 – 24-HOUR AVERAGED PM10 DATA FOR 14 AUGUST 2022

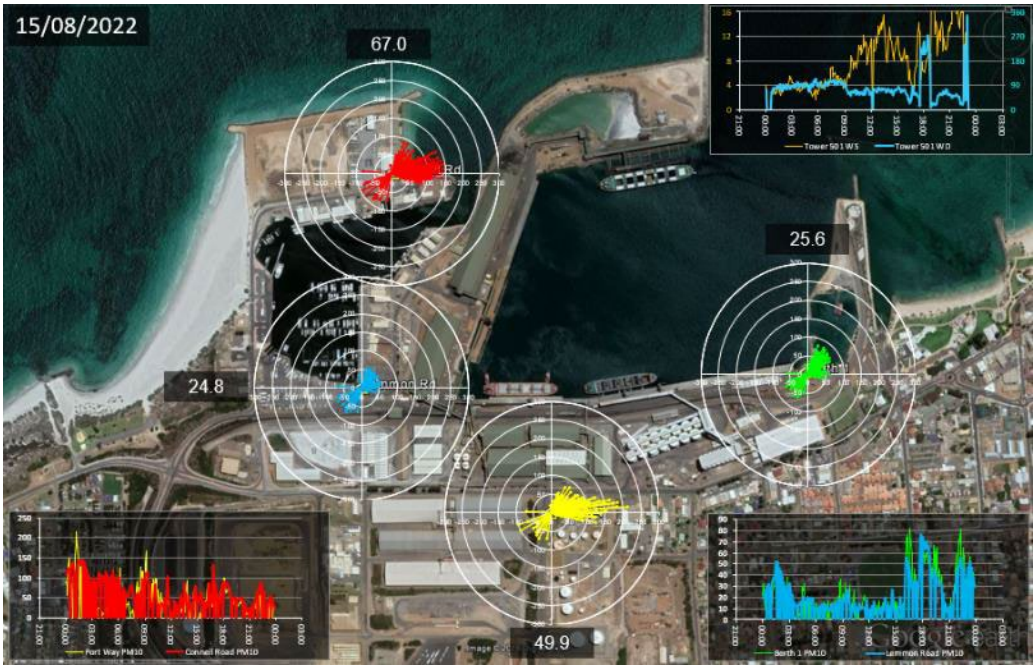



FIGURE 33 – 24-HOUR AVERAGED PM10 DATA FOR 15 AUGUST 2022

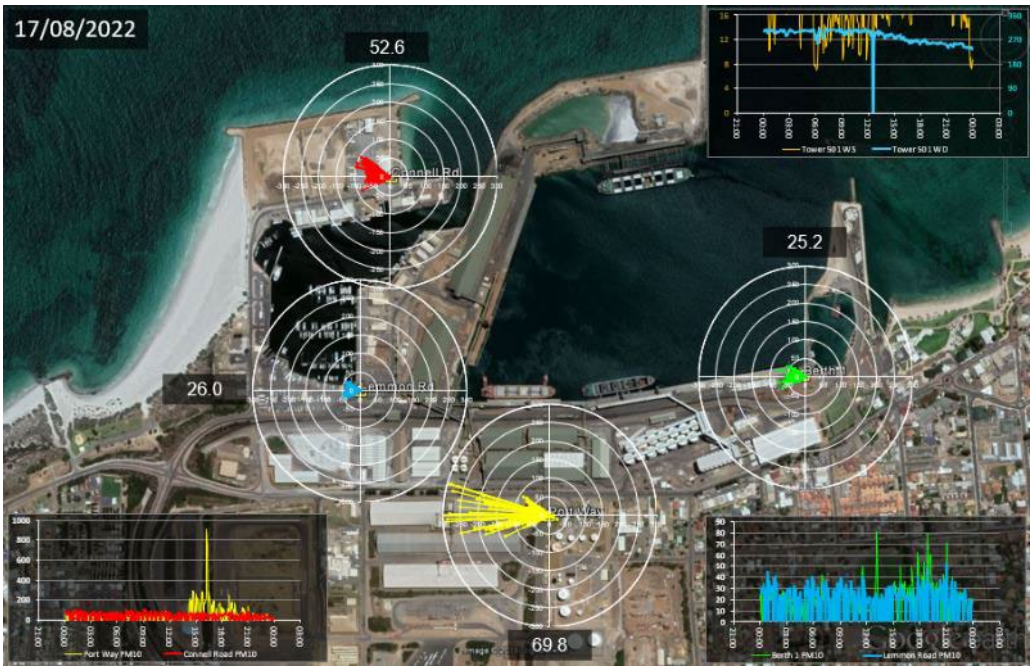



FIGURE 34 – 24-HOUR AVERAGED PM10 DATA FOR 17 AUGUST 2022

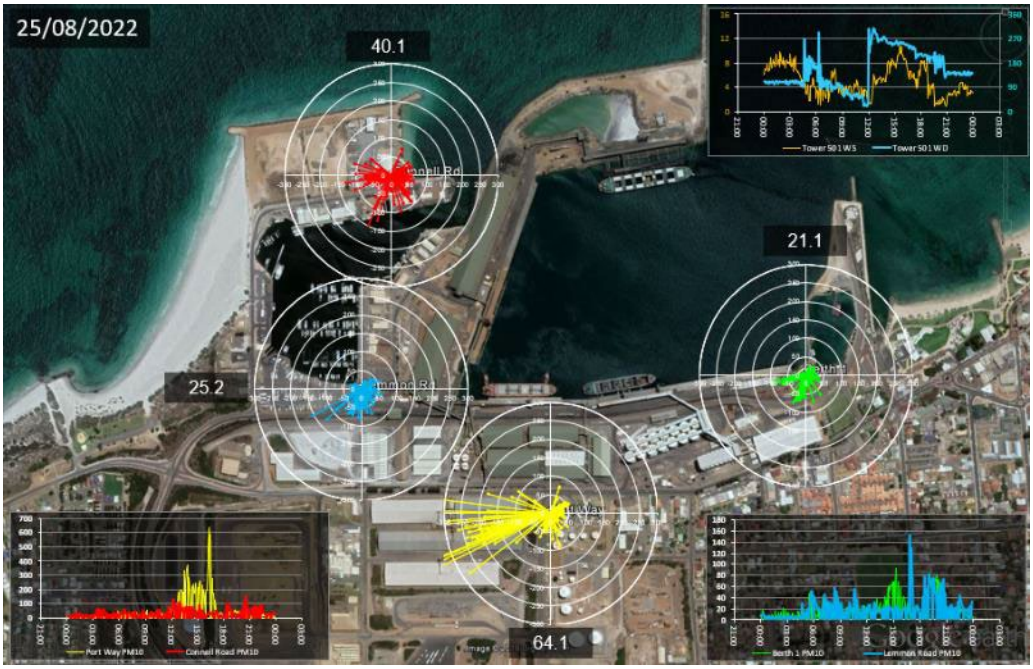



FIGURE 35 – 24-HOUR AVERAGED PM10 DATA FOR 25 AUGUST 2022

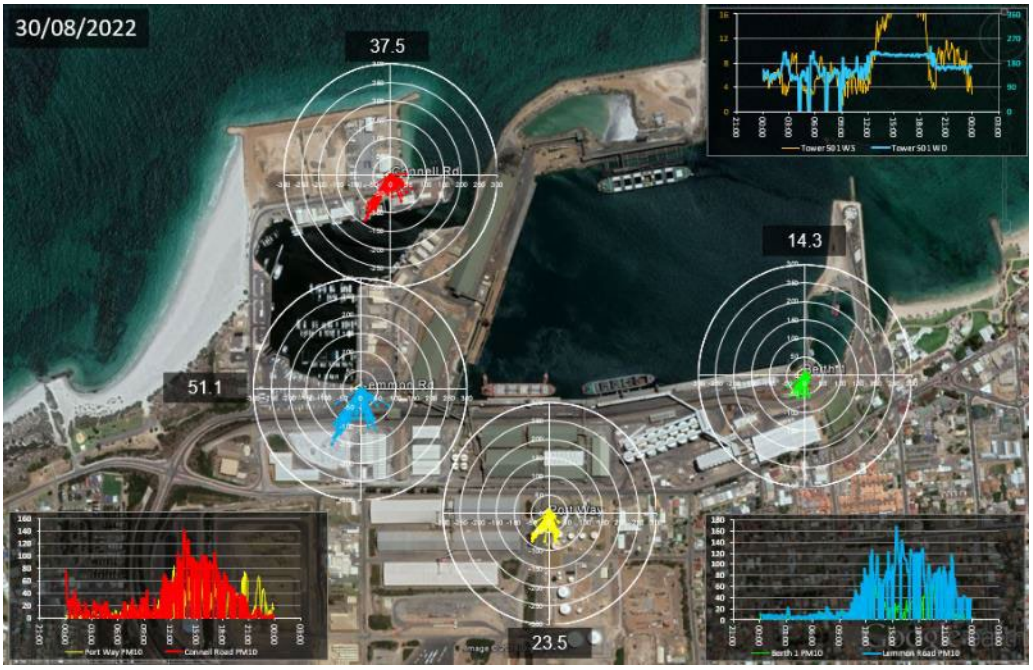



FIGURE 36 – 24-HOUR AVERAGED PM10 DATA FOR 30 AUGUST 2022

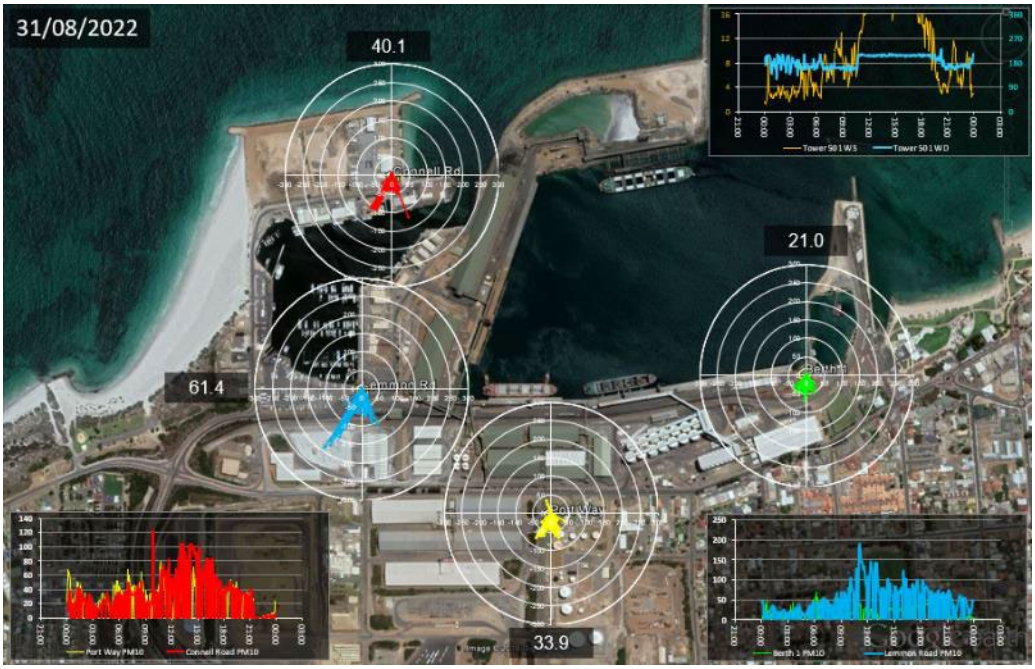



FIGURE 37 – 24-HOUR AVERAGED PM10 DATA FOR 31 AUGUST 2022

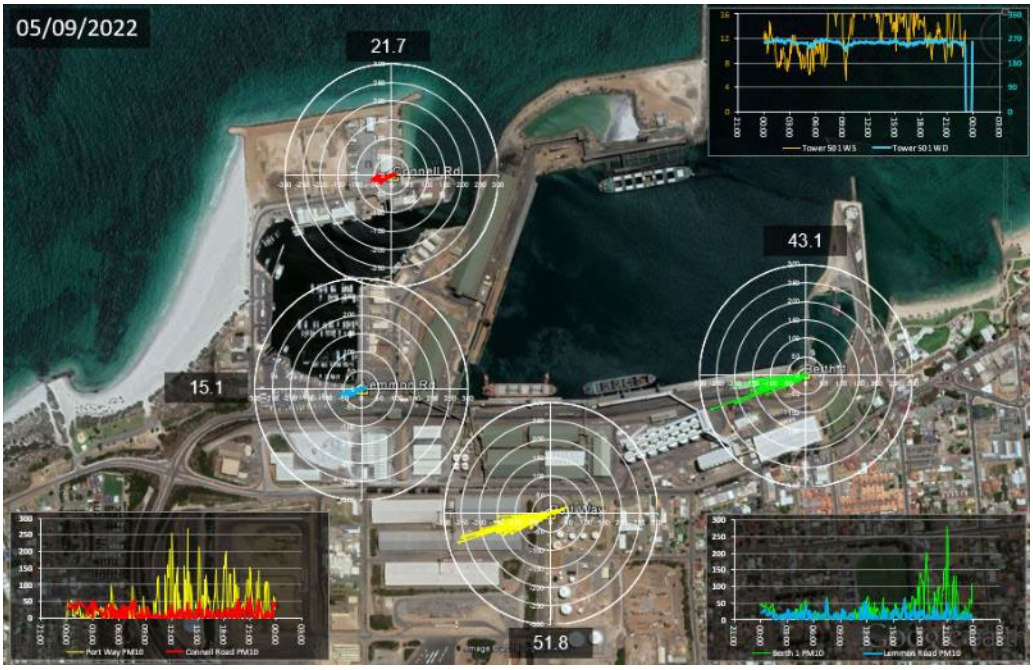



FIGURE 38 – 24-HOUR AVERAGED PM10 DATA FOR 05 SEPTEMBER 2022

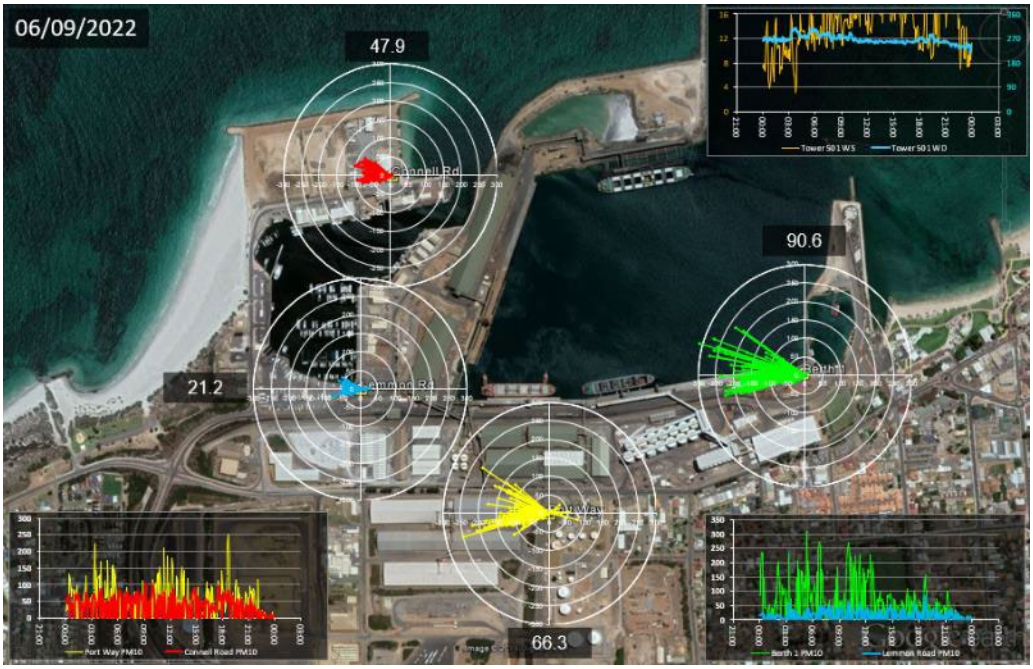



FIGURE 39 – 24-HOUR AVERAGED PM10 DATA FOR 06 SEPTEMBER 2022

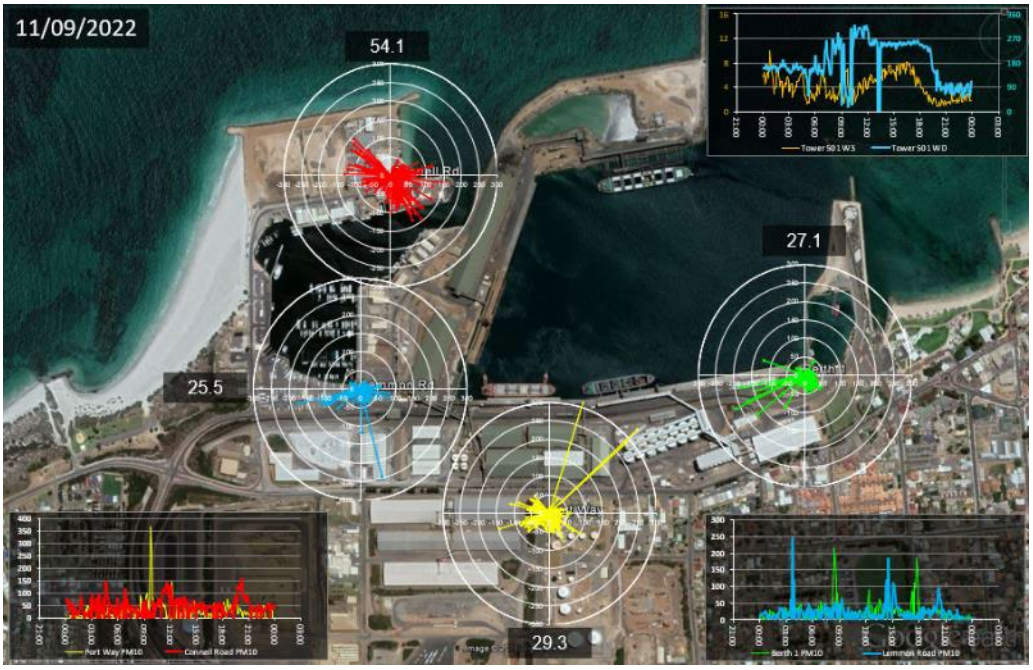



FIGURE 40 – 24-HOUR AVERAGED PM10 DATA FOR 11 SEPTEMBER 2022

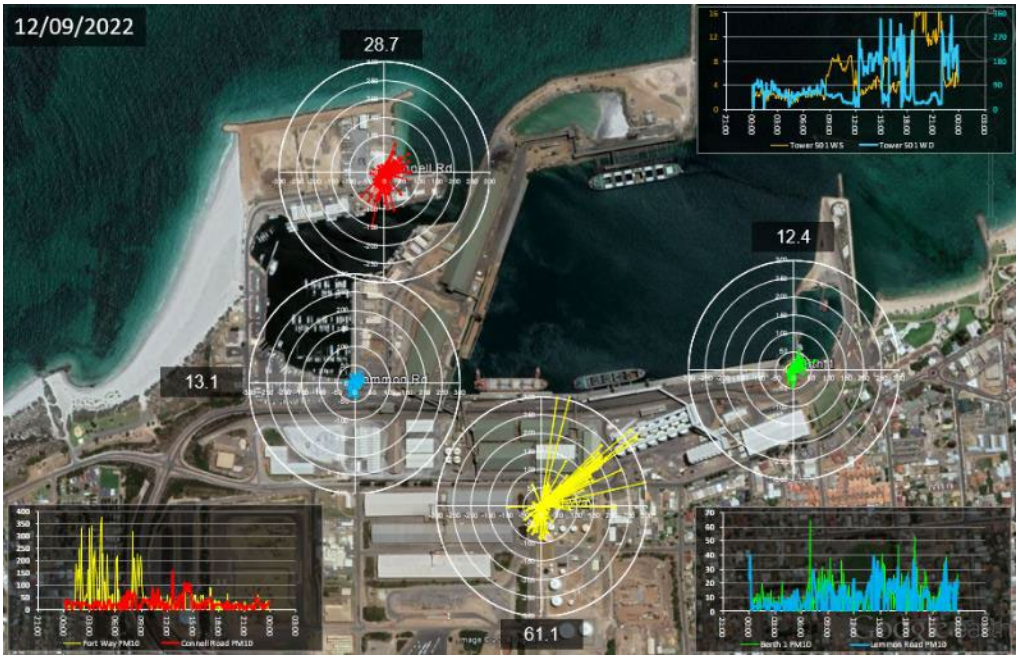



FIGURE 41 – 24-HOUR AVERAGED PM10 DATA FOR 12 SEPTEMBER 2022

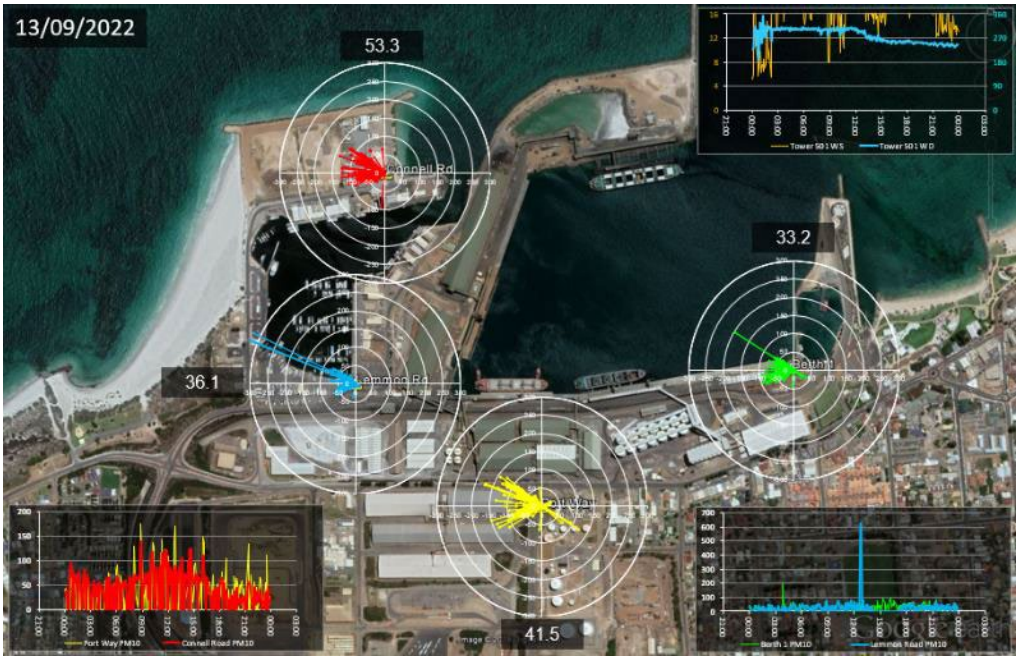



FIGURE 42 – 24-HOUR AVERAGED PM10 DATA FOR 13 SEPTEMBER 2022

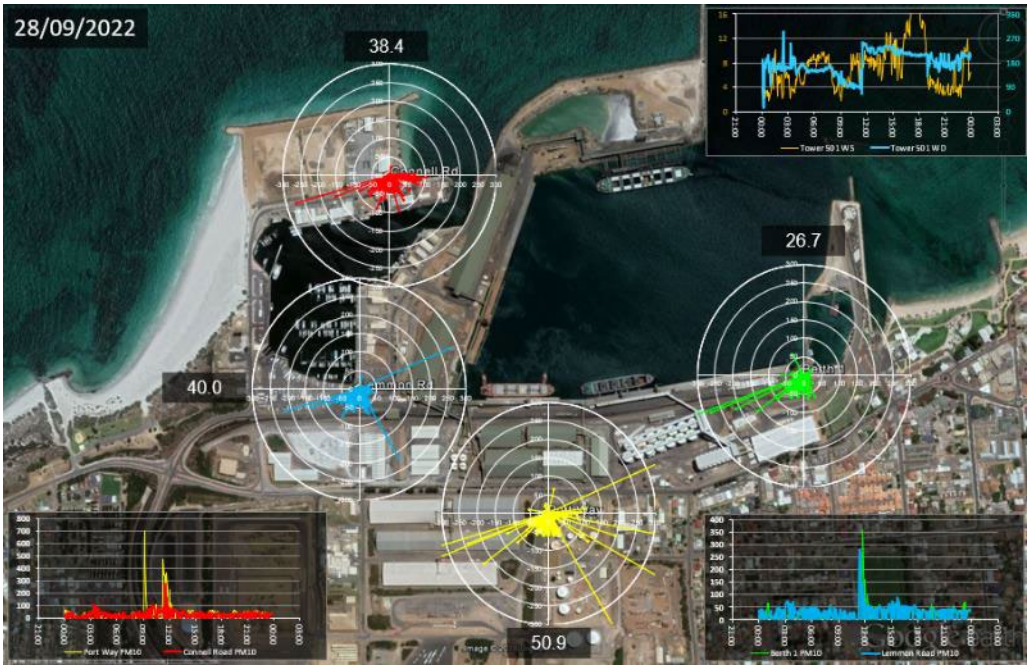



FIGURE 43 – 24-HOUR AVERAGED PM10 DATA FOR 28 SEPTEMBER 2022

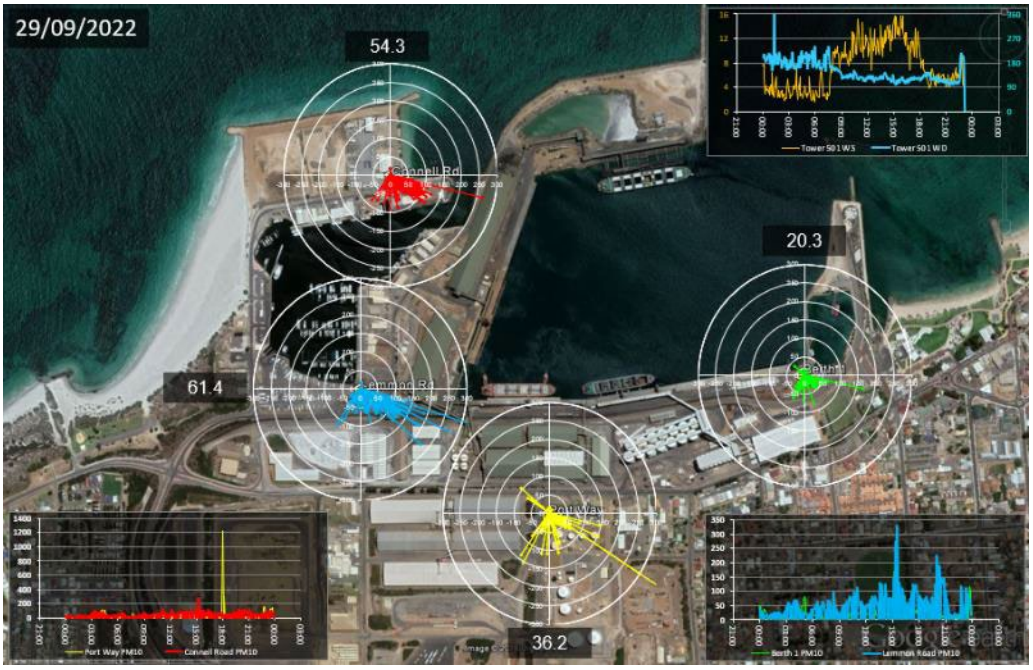



FIGURE 44 – 24-HOUR AVERAGED PM10 DATA FOR 29 SEPTEMBER 2022

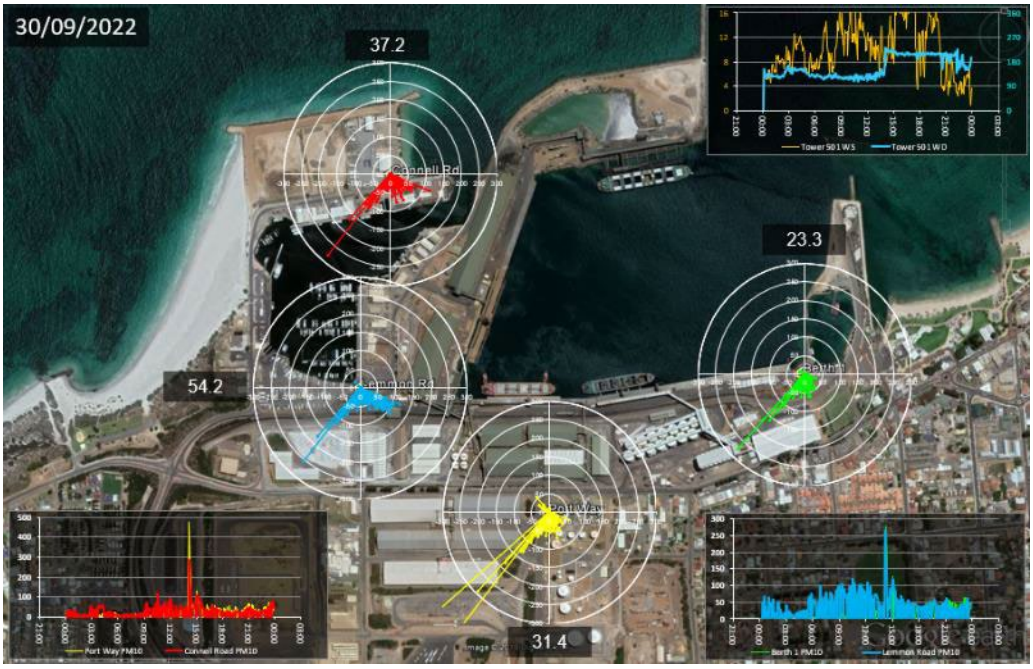



FIGURE 45 – 24-HOUR AVERAGED PM10 DATA FOR 30 SEPTEMBER 2022

## 8.2 Appendix B – TEOM $PM_{10}$ Air Quality Monitoring Results

Air quality and meteorological data in five-minute averages is provided in the PDF document attachments. The Excel spreadsheet has also been attached to the submission.