MOTT MACDONALD

# Proposed Comprehensive Development at Wo Shang Wai, Yuen Long

Quarterly EM&A Summary Report for February 2022 – April 2022 (Rev A)

1 June 2022

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Profit Point Enterprises Limited

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# Executive summary

Mott MacDonald Hong Kong Ltd. ("MMHK") has been commissioned by Heng Shung Construction Co. Ltd. to undertake the Environmental Team (ET) services to carry out environmental monitoring and audit (EM&A) for both pre-construction and construction phases of the Proposed Comprehensive Development at Wo Shang Wai, Yuen Long. From August 2016, the Project Proponent, Profit Point Enterprises Limited, commissioned MMHK to continue the ET services.

This is the 48th Quarterly EM&A Summary report and this report summarises the findings on EM&A during the period from 1 February 2022 to 30 April 2022.

**Exceedance of Action and Limit Levels**

There was no breach of Action or Limit Levels for air quality (1-hr TSP and 24-hr TSP) and noise during the reporting period. However, for water quality, a total of six Action Level exceedances and four Limit Level exceedances were observed. One Limit Level exceedance of dissolved oxygen (DO) was recorded at MP3 in February 2022; one Limit Level exceedance of suspended solids (SS) was recorded at MP3 and two Limit Level exceedances of SS were recorded at MP4 in March 2022; and six Action Level exceedances of pH were recorded at MP3 in April 2022.

Investigations have been carried out to identify the causes of exceedances. From investigation, the contractor has implemented water quality mitigation measures as recommended in the EIA report. With external factors affecting the adjacent environments, such as pond fish culture activities in the fish pond represented by MP3, rainfall, water plant growth, floating dead leaves and localised natural variations in the open ditch, the exceedances were considered not due to the project's construction works.

**Implementation of Mitigation Measures**

Site audits were carried out on a weekly basis during the monitoring period to confirm the implementation of environmental mitigation measures undertaken by the Contractor in the reporting period. The status of implementation of mitigation measures in the site is shown in **Appendix F**.

**Record of Complaints**

There was no record of complaints received in the reporting period.

**Future Key Issues**

Site works scheduled to be commissioned in the coming three months include regular maintenance work for the Wetland Restoration Area including lowering of the water level and removal of unwanted species in the pond. No major construction works will be carried out. Potential environmental impacts due to the activities, including air quality, noise, water quality, ecology and landscape and visual, will be monitored.

Environmental mitigation measures will be implemented on site as recommended and weekly site audits will be carried out to ensure that the environmental conditions are acceptable.

# 1 Introduction

## 1.1 Background

In March 2005, the Project Proponent, Profit Point Enterprises Limited, acquired the development site in Yuen Long at Wo Shang Wai. An Environmental Impact Assessment (EIA) was then carried out under the EIA Ordinance (EIAO), and the Environmental Permit (EP-311/2008) for construction of the comprehensive development in Wo Shang Wai was first granted by EPD on 9 September 2008 and has been subsequently varied, with the current version (EP-311/2008/E) issued by EPD on 19 December 2017.

The Project involves the residential development and associated infrastructure and wetland restoration area and linear landscape area. The construction works under the Environmental Permit commenced on 12 May 2010. The site formation construction works of the Wetland Restoration Area (hereafter WRA) were completed on 15 November 2010, and the WRA was established by October 2012, within 30 months from the commencement of construction as stipulated in the EP. This indicated that planting works as scheduled in the approved Wetland Restoration and Creation Scheme (WRCS; November 2009) were complete, except along the western and southern boundary where the planting is affected by the existing site boundary and noise barrier, and for which a Variation to Environmental Permit (EP-311/2008/C) to defer planting at the location was approved. Consequently, EP (EP-311/2008/D) including specific mitigation measures to minimise certain identified noise impacts during the operation phase was approved. The current valid EP (EP-311/2008/E) comprises varied conditions for the implementation and maintenance of visual and landscape measures, and for the implementation of noise mitigation measures.

Mott MacDonald Hong Kong Ltd. (“MMHK”) has been commissioned by the Contractor, Heng Shung Construction Co. Ltd., to undertake the Environmental Team (ET) services to carry out environmental monitoring and audit (EM&A) for both pre-construction and construction phases of the Proposed Comprehensive Development at Wo Shang Wai, Yuen Long. From August 2016, the Project Proponent, Profit Point Enterprises Limited, commissioned MMHK to continue the ET services.

This report summarises the findings during the period from 1 February 2022 to 30 April 2022.

## 1.2 Project Organization

The organisation chart and lines of communication with respect to the on-site environmental management structure together with the contact information of the key personnel are shown in **Appendix A**.

## 1.3 Environmental Status in the reporting period

During the reporting period, construction works of the Project undertaken include:

- General site maintenance work
- Regular maintenance work for the Wetland Restoration Area (including lowering of the water level and removal of unwanted species in the pond)

There were no major construction works carried out. The general layout plan of the Project site is shown in **Figure 1.1**.

## 1.4 Summary of EM&A Requirements

The EM&A programme requires environmental monitoring of air quality, noise, water quality, ecology and landscape and visual as specified in the approved EM&A Manual.

A summary of impact EM&A requirements is presented in **Table 1.1** below:

**Table 1.1: Summary of Impact EM&A Requirements**

| Parameters | Descriptions | Locations | Frequencies |
|---|---|---|---|
| Air Quality | 24-Hour TSP | ASR1, ASR2A, ASR3, ASR4(1) | Once every 6 days |
| | 1-Hour TSP | ASR1, ASR2A, ASR3, ASR4(1) | 3 times every 6 days |
| Noise | $L_{eq}$, 30min | NSR1, NSR3, NSR5(2), NSR7 | Weekly |
| Water Quality | Dissolved Oxygen (DO), temperature, pH, suspended solids (SS) and Biological Oxygen Demand (BOD) | MP1 to MP6(3) | 3 days per week |
| Ecology | Birds | Within the Project Area and Assessment Area of 500m | Weekly |
| | Dragonflies and Butterflies | Within the Project Area and Assessment Area of 500m | Once per month during March and September to November, and twice per month during April to August |
| | Herpetofauna | Within the Project Area and Assessment Area of 500m | Daytime: Once per month during April to November<br>Night-time: Once per month during March to August |
| | Water quality of Wetland Restoration Area (WRA) | WRA | After filling of WRA with water, monthly for in situ water quality and every six months (end of wet season and end of dry season) for laboratory testing |
| | Site Inspections | Within the Project Area and Assessment Area of 500m | Weekly |
| Landscape and Visual | Auditing of protection of existing trees, the transplanting of existing trees, the creation of new wetland, the planting of new trees and shrubs and other landscape and visual mitigation measures | CM1 to CM10 and OM1 to OM7 within the Project Area | Site inspections once every two weeks during construction phase; once every two months during operational phase |

Notes:
(1) The air quality stations ASR1 and ASR4 were relocated to new locations on 5 June 2018 as the previous locations will be affected by upcoming construction activities. All monitoring data at ASR1 and ASR4 from June 2018 is measured at the new monitoring locations.
(2) The noise impact monitoring station NSR5 was relocated to a new location on 5 June 2018 as the previous location will be affected by upcoming construction activities. All monitoring data at NSR5 from June 2018 is measured at the new monitoring location.
(3) The water quality impact monitoring at MP1 and MP2 have been terminated since July 2012 due to the withdrawal of access rights by the landowner.

The Environmental Quality Performance Limits for air quality, noise and water quality are shown in **Appendix C**.

## 1.5 Recommended Mitigation Measures

The EM&A programme followed the recommended mitigation measures in the EM&A Manual. The EM&A requirements as well as the summary of implementation status of the environmental mitigation measures are provided in **Appendix F**. In particular, the following mitigation measures were brought to attention during the site audits during the reporting period:

**Air Quality**

- Dark smoke emission from equipment/plant should be avoided.

**Noise**

- The noise barriers and hoardings should have no gaps and openings to avoid noise leakage.

**Water Quality**

- Site effluent should be discharged in accordance with the discharge licence.
- The site should be confined and properly maintained to avoid silt runoff.
- Chemicals will always be stored on drip trays or in bunded areas.

**Waste Management**

- The chemical waste storage area should be clearly labelled.
- General refuse should be stored in enclosed bins or compaction units separate from construction and demolition (C&D) and chemical wastes.

# 2 Summary of Monitoring Results

## 2.1 Air Quality Monitoring

Results and graphical plots of 1-hour TSP and 24-hr TSP at the four monitoring locations are summarised and shown in the **Appendix D**. No exceedance of 1-hour and 24-hour TSP (Action or Limit Level) was recorded in the reporting period.

February 2022 was colder and wetter than usual. The monthly mean temperature was 1.9 degrees below the normal figure (15.2 degrees) and the total rainfall reached 168.5 millimetres, which was more than four times the normal of 38.9 millimetres. The total rainfall was the sixth highest on record for February in Hong Kong.

March 2022 was warmer than usual with a mean maximum temperature of 25.0 degrees, 3.1 degrees above normal and highest on record for March in Hong Kong. The month was also wetter than usual with a total rainfall of 92.7 millimetres, about 23 percent above the normal figure (75.3 millimetres).

April 2022 on the other hand, was dry and sunny. The total rainfall (3.5 millimetres) was only about 2 percent of the normal figure (153.0 millimetres) and lowest on record for April. The monthly mean relative humidity was only 73 percent, the lowest on record for April since 1961. The month was also much sunnier than usual, with 191.1 hours of bright sunshine, about 69 percent above the normal figure.

For details of wind speed and direction during the monitoring period, please refer to the respective Monthly EM&A Report.

## 2.2 Construction Noise Monitoring

The construction noise monitoring results and graphical plots are shown in **Appendix D**. No exceedance (Action or Limit Level) of construction noise was recorded in the reporting period.

## 2.3 Water Quality Monitoring

The water quality monitoring results and the graphical plots of the monitoring data are shown in **Appendix D**.

During February 2022, one Limit Level exceedance of DO was recorded at MP3.

During March 2022, three Limit Level exceedances of SS were observed. One Limit Level exceedance of SS was recorded at MP3 and two Limit Level exceedances of SS were recorded at MP4.

During April 2022, six Action Level exceedances of pH were recorded at MP3.

## 2.4 Ecological Monitoring

### 2.4.1 Monitoring of Birds

Monitoring was undertaken following the survey methodology in the EM&A Manual. The WRA was also surveyed during the reporting period as the area became accessible and site formation works for WRA has been completed. A transect was followed in the bird surveys (see **Figure 2.1**).

All bird species of conservation importance and/or wetland dependent were identified and enumerated. Flying birds were not recorded unless they were foraging and associated with the habitat (such as swifts). Further, notable bird observations during other surveys were also recorded.

A summary of the survey data of bird species of conservation importance and/or wetland-dependence recorded is provided in **Appendix E**.

Bird surveys were conducted on a weekly basis. In the survey area (excluding the WRA), a total of 66, 61 and 52 bird species were recorded in February 2022, March 2022 and April 2022 respectively. In each respective month, 32, 32 and 27 of the recorded bird species were of conservation importance and/or wetland-dependence. Within the WRA, a total of 46, 57 and 49 bird species were recorded in February 2022, March 2022 and April 2022 respectively. In each respective month, 22, 26 and 21 of the recorded bird species were of conservation importance and/or wetland-dependence.

In February 2022, two of the three bird target species were recorded within the WRA (high count[1] and mean of the target species respectively): Chinese Pond Heron (4, 1.5) and Little Egret (2, 1.0).

In March 2022, two of the three bird target species were recorded within the WRA (high count and mean of the target species respectively): Chinese Pond Heron (2, 1.0) and Little Egret (3, 1.6).

In April 2022, two of the three bird target species were recorded within the WRA (high count and mean of the target species respectively): Eastern Cattle Egret (2, 0.5) and Little Egret (7, 4.3).

The survey data shows that when compared with the surrounding fishponds which cover a much larger area, the WRA attracts a good number of wetland dependent birds or species of conservation importance. A summary of the survey findings is provided in **Appendix E**.

### 2.4.2 Monitoring of Herpetofauna

Monitoring was undertaken following the survey methodology in the EM&A Manual. No herpetofauna surveys were scheduled in February 2022. One daytime and one night-time herpetofauna surveys were conducted in both March 2022 and April 2022. Further, notable herpetofauna observations during other surveys were also recorded.

In February 2022, no amphibian species nor reptile species were recorded in the Survey Area (excluding the WRA) nor within the WRA during regular surveys. During other surveys, Long-tailed Skink (*Eutropis longicaudata*) was recorded in the Survey Area (excluding the WRA) and Paddy Frog (*Fejervarya limnocharis*) was recorded within the WRA.

In March 2022, three amphibian species and one reptile species were recorded in the Survey Area (excluding the WRA) during regular surveys. Within the WRA, three amphibian species and three reptile species were recorded during regular surveys.

In April 2022, four amphibian species and two reptile species were recorded in the Survey Area (excluding the WRA) during regular surveys while one additional reptile species (Red-eared Slider) was recorded outside regular surveys. Within the WRA, three amphibian species and two reptile species were recorded during regular surveys, while two reptile species (Bowring's Gecko and Common Rat Snake) were recorded outside regular surveys. Bowring's Gecko was recorded both during regular and outside regular surveys.

A summary of the survey findings is provided in **Appendix E**.

### 2.4.3 Monitoring of Dragonflies and Butterflies

In accordance with the EM&A Manual, no odonates and butterfly surveys were scheduled in February 2022. Monitoring of odonates and butterflies was conducted once in March 2022 and twice in April 2022. Further, notable odonate and butterfly observations during other surveys were also recorded.

[1] The “high count” of a species is the highest number of that species recorded during a particular survey within the survey month.

In February 2022, no odonate species nor butterfly species were recorded in the Survey Area (excluding the WRA) nor within the WRA during other surveys.

In March 2022, four odonate species and seven butterfly species were recorded in the Survey Area (excluding the WRA) during regular surveys. Within the WRA, 12 odonate species and 16 butterfly species were recorded during regular surveys. Among the odonate species recorded within the WRA, Blue Sprite (*Pseudagrion microcephalum*) is listed by Fellowes *et al*. as of "Local Concern" in 2002.

In April 2022, nine odonate species and six butterfly species were recorded in the Survey Area (excluding the WRA) during regular surveys. Within the WRA, 18 odonate species and 20 butterfly species were recorded during regular surveys. Among the odonate species recorded within the WRA, Blue Sprite (*Pseudagrion microcephalum*) and Scarlet Basker (*Urothemis signata signata*) are listed by Fellowes *et al*. as of "Local Concern" in 2002.

A summary of the survey findings is provided in **Appendix E**.

### 2.4.4 Monitoring of Mammals

Monitoring of mammals was conducted concurrently with other surveys.

In February 2022, no mammal species were recorded in the Survey Area (excluding the WRA) nor within the WRA during regular or outside regular surveys.

In March 2022, two mammal species were recorded in both the Survey Area (excluding the WRA) and within the WRA during regular surveys.

In April 2022, two mammal species were recorded in the Survey Area (excluding the WRA) during regular surveys. Within the WRA, two mammal species were recorded during regular surveys. In addition, Leopard Cat scats were found along the EVA of Cell 3 during regular survey, indicating that the species had also used the WRA. This brings the total number of mammal species recorded within the WRA during regular surveys to three.

A summary of the survey findings is provided in **Appendix E**.

### 2.4.5 Management Activities

#### 2.4.5.1 Vegetation Management

Vegetation management activities undertaken at the WRA primarily involved the removal of excess grass, shrubs and tree branches. These removals included but were not limited to *Leucaena leucocephala*, *Macaranga tanarius*, *Ficus macrocarpa*, *Rhaphiolepis indica*, *Lantana camara*, *Mimosa* sp., *Pennisetum* sp*., Ipomea* sp., *Bidens alba* and *Paederia foetida*.

Excessive branches along the emergency vehicle access (EVA) were trimmed and broken and fallen branches were cleared. Fallen leaves along the EVA of Cell 3 and Cell 4 were swiped aside and formed piles of plant material on both sides of the EVA. These piles were used to attract herpetofauna.

#### 2.4.5.2 Wildlife Management

Excessive vegetation along the EVA and pond bunds was gradually cleared to uncover the soil and road surface. Red Imported Fire Ant nests along the EVA and pond bunds were treated with approved pesticide.

Mitigation actions have been carried out in the WRA during the survey period to increase the WRA utilization by birds. Mitigation actions include controlling vegetation and water level of Cells 1 to 4.

## 2.5 Landscape and Visual Monitoring

The audit was undertaken with references to the specific mitigation measures recommended in Section 10.2 of the EM&A Manual and the audit results are summarized in **Table 2.1**.

Representative photos showing the implementation of mitigation measures are presented in **Appendix G**.

**Table 2.1: Construction Audit Summary on Landscape and Visual**

| Area of Works | Items to be Monitored |
|---|---|
| Works Area | The boundaries of the works area have been established on site in accordance with the contract documents and approved plans (EP), and the limit of current heavy construction activity is now confined to within the site hoardings (North side of the site / access road) and the noise barriers (other sides of the site). Minor works such as horticultural maintenance of the planting and transplanted trees, and boundary fence repair was proceeding along the Royal Palms - Palm Springs boundary. (Photo 1 in **Appendix G**)<br>No construction works were observed to have exceeded the site boundaries. No construction was carried out at the wetland restoration area after 15 November 2010. |
| Protection of all trees and woodland blocks to be retained | Trees retained within the site along the northeast boundary, beside wetland restoration area, have been identified and protected by temporary protective fencing. |
| Streams | The works site is partly encircled by a berm / perimeter channel to intercept surface water and prevent it from washing off into any of the neighbouring sites. Surface water is collected within the site in a temporary drainage channel. Gravels beds and barriers have been installed to filter site runoff; sedimentation ponds have been provided to enable primary treatment before discharge to mains drains. |
| Clearance of existing vegetation | Site clearance was completed prior to the commencement of construction. |
| Transplanting of trees | Tree transplanting has been completed, with the trees relocated to various points within the planting strip along the southern boundary of the site, outside the noise barrier. Most of the trees continue to re-establish well. |
| Topsoil stripping | Suitable pond bund and soil material which had been excavated and stockpiled from the original site, has now been re-used within the landscape works.<br>Dust suppression measures are active along all internal site access tracks. |
| New buildings | No new permanent buildings have been constructed on site. |
| Boundaries | Hoardings have been erected along most of the boundaries of the site. Installation of new screen fence between the future residential sites and the constructed wetland restoration areas is complete. Fence has been painted green to match with the surrounding vegetated environment. (Photo 1 in **Appendix G**) |
| Noise Barrier | Noise barriers have been installed along the southern and western boundaries of the site in accordance with the Environmental Permit (EP-311/2008/E) requirements. Their design complies with the mitigation requirements, with upper 6 to 7m portion of the barrier being made from a translucent material with green tinted (to match with the environment). Supporting GMS structure, likewise, has been painted green. (Photo 3 in **Appendix G**). |
| Night-time lighting | No night-time works were reported to have been carried out during the monitoring period. |
| Landscape and wetland treatments | Continuous belt of screen planting along the southern and western boundaries of the site has been completed. The formation, soiling and water control structures of the wetland restoration area have been completed. (Photo 3 in **Appendix G**)<br>The wetland areas have been established and the ponds are seasonally filled with rainwater. Planting of areas around the WRA cells has been completed. No construction was carried out at the wetland restoration area after 15 November 2010. (Photo 2 in **Appendix G**) |
| Soiling, etc. | The soil placement and grading for each of the wetland restoration area has been completed. Refilling of holes from whole tree removal works has been completed. |
| Plant supply | The plant material used in the Advance Planting Strip and in the WRA are all commonly available species and came from commercial sources.<br>Transplanted reeds (*Phragmites australis*) at the wetland habitat came from the temporary holding nursery onsite. |
| Planting | Planted tree species are all from the approved list.<br>Seedling trees and shrubs have been established at the margins of the wetland cells. Some invasive species and undesirable exotic species have been found during site inspection; removal of these species should be undertaken on a regular basis. |

| Area of Works | Items to be Monitored |
|---|---|
| Establishment Works | The advance planting, the compensatory planting and transplanted trees are generally being maintained by the landscape sub-contractor in accordance with the specification to ensure that the contract requirements are met.<br>Removal of overgrown weeds, unplanned tree seedlings and invasive climbers in the space behind screen noise barrier needs to be undertaken on a monthly basis as they may inhibit the advance planting.<br>Red imported fire ant (RIFA) nests were observed along the maintenance path of the WRA area. A sign of RIFA spreading throughout the WRA area was observed throughout the reporting period. To avoid water contamination, it is recommended to keep monitoring for the spread of RIFA nests during the wet seasons. Eradication of all the nests should be undertaken in the earlier part of the dry seasons.<br>Presence of termites on some trees (i.e. T26) was also observed in April 2022 and application of pesticides was recommended.<br>Regular removal of invasive species (i.e. apple snails, *Leucaena leucocephala*, *Mikania micrantha, Mimosa pudica, Bidens alba, Ludwigia erecta*, *Sesbania cannabina*, etc.) in WRA should be undertaken.<br>The growth of shrubs / seedlings on the north side of WRA remains fair. |

# 3 Environmental Site Inspection and Audit

## 3.1 Site Inspection

The ET carried out construction phase weekly site inspections on 11, 18 and 25 February 2022; 2, 11, 16 and 25 March 2022; and 1, 8, 14, 22 and 29 April 2022. All observations have been recorded in the site inspection checklist and passed to the Contractor together with the appropriate recommended mitigation measures where necessary.

## 3.2 Solid and Liquid Waste Management Status

The Contractor has been registered as a chemical waste producer for the Project. Construction and demolition (C&D) material sorting was carried out on site. A sufficient number of receptacles were available for general refuse collection.

As advised by the Contractor, no inert C&D material (i.e. broken concrete/ big boulders) were generated on site and sent to a sorting facility for recycling into rockfill. No metals were generated and collected by registered recycling collector. No paper/cardboard packing and no plastics were generated on site and collected by registered recycling collector. No chemical waste was generated and collected by licensed chemical waste collector. No other types of wastes (e.g. general refuse) were generated on site and disposed of at public landfill facility.

The Contractor is advised to maintain on site waste sorting and recording system and maximize reuse / recycling of C&D wastes, whenever these are generated.

# 4 Report on Non-compliance and Complaints

## 4.1 Record on Non-compliance of Action and Limit Levels

### 4.1.1 Record of Non-compliance

There is no breach of Action or Limit Levels for Air Quality and Noise monitoring in the reporting period.

A total of six Action Level exceedances and four Limit Level exceedances for Water Quality were recorded during the reporting period. These are described as follows:

- February 2022: one Limit Level exceedance of DO was recorded at MP3.
- March 2022: three Limit Level exceedances of SS were observed. One Limit Level exceedance of SS was recorded at MP3 and two Limit Level exceedances of SS were recorded at MP4.
- April 2022: six Action Level exceedances of pH were recorded at MP3.

### 4.1.2 Constructional Impacts on Water Quality

In order to determine the constructional impacts on water quality, the suspended solids level, which is a good indicator of the quality of effluent from construction site, is selected for assessment. The average value of suspended solids (SS) for water quality monitoring stations (MP3 – MP6) during baseline monitoring and construction phase monitoring for the reporting period are listed in **Table 4.1** below.

**Table 4.1: Comparison of Monitoring Data of Suspended Solids**

| Monitoring Stations | Average Levels of Suspended Solids (mg/L) | | Within 130% of mean value of Baseline data? |
|---|---|---|---|
| | During Baseline Monitoring | During Construction Phase Monitoring for the reporting period | |
| MP3 | 49.5 | 28 | Yes |
| MP4 | 36.9 | 30 | Yes |
| MP5 | 47.7 | 33 | Yes |
| MP6 | 54.1 | 38 | Yes |

The average levels of suspended solids (SS) during the reporting period were within (i.e. below) 130% of the baseline values at MP3, MP4, MP5 and MP6. The above statistics show that the water quality at these locations during the reporting period had not worsened when compared with the baseline condition.

### 4.1.3 Exceedance Investigations

**Water Quality**

From investigation, the Contractor has implemented water quality mitigation measures as recommended in the EIA report, including:

- Temporary drainage channels were provided to collect the surface runoff generated within the project site; and
- Installation of barrier at the drainage channels to intercept site runoff and pump the wastewater to the sedimentation tanks as primary treatment prior to treatment by wastewater treatment facilities (AquaSed), which will ensure all site runoff is treated to satisfactory quality before discharging into the northern ditches.

The possible causes of exceedances have been investigated and reported to the IEC during construction phase monitoring. The exceedance investigations have also been included in the monthly EM&A reports and some of them are extracted and summarised in **Table 4.2**. The causes of some of the exceedances were unknown but all of them were considered not related to the project. For details, please refer to the relevant monthly EM&A reports.

**Table 4.2: Summary of Exceedance Investigations**

| Descriptions of exceedances | Possible causes | Exceedance related to project? |
|---|---|---|
| Exceedance of DO in February 2022, exceedance of SS in March 2022, and exceedance of pH in April 2022 at MP3 | At MP3, exceedance of the Limit Level of DO was observed on 21 February 2022; exceedance of the Limit Level of SS was observed on 16 March 2022 and exceedance of the Action Level of pH was observed on 19, 21, 23, 25, 27 and 29 April 2022.<br>As understood, the fish pond near the site (represented by MP3) is separated from the open ditch by the pond bund (since commencement of construction phase EM&A monitoring in May 2010) and from the construction site by the WRA (since it was completed in November 2010). No direct discharge from the project site to the fish pond was observed.<br>Mitigation measures for water quality protection, including the provision of wastewater treatment facilities (including sedimentation tank and AquaSed) and proper drainage system that separates from the WRA, have been implemented. No adverse impact on the fish pond near the site was observed, including on the days with exceedance of water quality parameters.<br>From AFCD's Environmental Management of Pond Fish Culture guidelines of its Series of Good Aquaculture Practice, it is noted that for good water quality DO levels should be maintained above 4 mg/L. The exceedance level recorded at MP3 was 6.6 mg/L which is well above this value. In addition, on the day of DO exceedance, aerators were observed, mitigating the low DO level. DO levels had been seen to drop between 10 and 14 February 2022. Even though aeration practices were already in place on 16 and 18 February 2022, the DO level reached its Limit Level on 21 February 2022 and gradually picked up from then after.<br>On the day of SS exceedance in March 2022, the water body was observed to be a slightly muddy in appearance at MP3 with some floating litter. It is noted that SS exceedance was also detected at MP4 on the same date, where floating litter and dead leaves were also observed.<br>According to the results of the baseline water quality monitoring conducted prior to the commencement of construction works, the pH recorded at MP3 ranged from 7.7 to 8.6. The recorded pH exceedances (7.6 - 7.7) are therefore considered to be very close to / within the range of natural variations at this location. It is also noted from AFCD's Environmental Management of Pond Fish Culture (EMPFC) guidelines from its Series of Good Aquaculture Practice that the pH level of fishpond water should be between 6 and 8.5. The recorded values are well within the guideline recommendations. Nevertheless, aerators were observed on most of the days with pH exceedance. Aerators help reduce alkalinity and remove excess carbon dioxide, thus improving water quality and stabilizing pH levels. | No. It is concluded that the exceedance was likely due to natural variations and external factors such as litter and pond fish culture activities in the fish pond represented by MP3, which are not related to project construction activities. |
| Exceedance of SS at MP4 on 7 and 16 March 2022 | The Hong Kong Observatory (HKO) records indicate that up to 10mm of rainfall were recorded at the project site on 7 March 2022. The rainfall may have caused surface runoff from all sources near the open ditch. It is believed that the runoff increased the turbulence and thus resulted in higher SS inside the ditch water on 7 March 2022, when SS exceedance was recorded.<br>Also, on the days of SS exceedances, the water body at MP4 was observed to be slightly muddy, with water plant growth, floating dead leaves and litter. An increased amount of water plant growth was observed on 16 March 2022, resulting on a particularly high BOD level recorded at MP4. SS levels were also high at MP5 and | No. It is concluded that the exceedances recorded at MP4 were likely due to localized natural variations and external factors such as rainfall, water plant growth, floating dead leaves and litter, which are not related to project construction activities. |

| Descriptions of exceedances | Possible causes | Exceedance related to project? |
|---|---|---|
| | MP6 on the days of the SS exceedances at MP4, although no exceedances were recorded upstream.<br>As presented in the weekly site inspections checklists, no observation regarding discharge of muddy water was recorded in March 2022. It is possible that the water plant growth and litter may have impeded the normal flow of ditch water resulting in localised accumulations of SS. | |

## 4.2 Record on Environmental Complaints Received

There was no new record of complaints received in the reporting period.

## 4.3 Follow-up Actions Taken

**Non-compliance**

Although it is considered that the exceedances were not related to the Project, the Contractor was reminded to implement water quality mitigation measures in accordance with the recommendations stated in Sections 5.6.1 to 5.6.4 of the EIA Report as far as practicable. Regular spot checks would be conducted on the nearby discharge by the Contractor and the Contractor would inform ET about the findings for investigation.

It was also advised that the operation condition of the Wastewater Treatment Facilities should be checked regularly to ensure proper functioning of the plant and good quality of effluent discharge.

**Complaints**

Not applicable for this reporting period.

# 5 Future Key Issues

## 5.1 Construction Works for the Coming Months

Site works scheduled to be commissioned in the coming three months involve regular maintenance work for the Wetland Restoration Area (including lowering of the water level and removal of unwanted species in the pond). No other major construction works have been scheduled.

## 5.2 Key Issues for the Coming Months

Key issues to be considered in the coming three months include:

- Provision of water spraying or dust suppression chemical to prevent generation of dust from activities on-site and the haul road during dry weather conditions;
- Provision of wheel washing facilities at vehicle exit point;
- Generation and treatment of site surface runoffs and wastewater from activities on-site and during wet weather conditions;
- Sorting, recycling, storage and disposal of general refuse and construction waste from activities on-site; and
- Management of chemicals and avoidance of oil spillage on-site and to the drainage.

## 5.3 Conclusions and Recommendations

### 5.3.1 Conclusions

The EM&A programme as recommended in the EM&A Manual has been undertaken in the reporting period.

Monitoring of Air Quality, Noise, Water Quality, Ecology and Landscape and Visual impacts due to the Project was underway. In particular, the 1-hr TSP, 24-hr TSP, noise level (as $L_{eq}$) and water quality parameters (such as pH, DO, turbidity and SS) under monitoring have been checked against established Action and Limit Levels.

There was no breach of Action or Limit Levels for Air Quality and Noise during the reporting period.

As for Water Quality, Action Level exceedances of pH and Limit Level exceedances of DO and SS were recorded during the reporting period. However, investigations into the exceedances concluded that these were not related to the Project and may have been due to external factors including natural variations, rainfall and water plant growth.

### 5.3.2 Recommendations

With considerations on the construction activities and environment, the following recommendations were provided:

**Air Quality**

- All stockpiles should be covered by tarpaulin or kept wet by water spraying;
- All vehicles should be washed to remove any dusty materials before leaving the construction sites;
- The portion of road leading the construction site that is within 30m of a designated vehicle entrance or exit should be kept clear of dusty materials;
- During the dry season, sufficient water spraying should be provided at haul road to reduce dust emission; and

- Ensure proper functioning of the wheel wash facility.

**Noise**

- Mobile plant should be sited as far away from NSRs as possible;
- Plant known to emit noise strongly in one direction should be orientated to direct noise away from the NSRs; and
- The construction activities should be better scheduled to reduce noise nuisance.

**Water Quality**

- Effluent should be discharged in accordance with the discharge licence conditions;
- Soil contaminated with chemicals/oils should be removed from site, and the voids created should be filled with suitable materials; and
- Silt and debris should be removed from the temporary drainage channel regularly.

**Waste Management**

- General refuse should be stored in enclosed bins or compaction units separate from C&D and chemical wastes to minimise odour, pest and litter impacts;
- Reuse the excavated materials as far as practical to reduce the amount of waste disposal;
- C&D waste should be segregated and stored in different containers to other wastes to encourage the re-use or recycling of materials and their proper disposal;
- Ensure drip trays are provided for chemical containers to prevent leakage or soil contamination;
- All plants and vehicles should be properly maintained to prevent oil leakage; and
- Oil stains on soil should be cleared by disposal of contaminated soil.

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## 6.1 List of References

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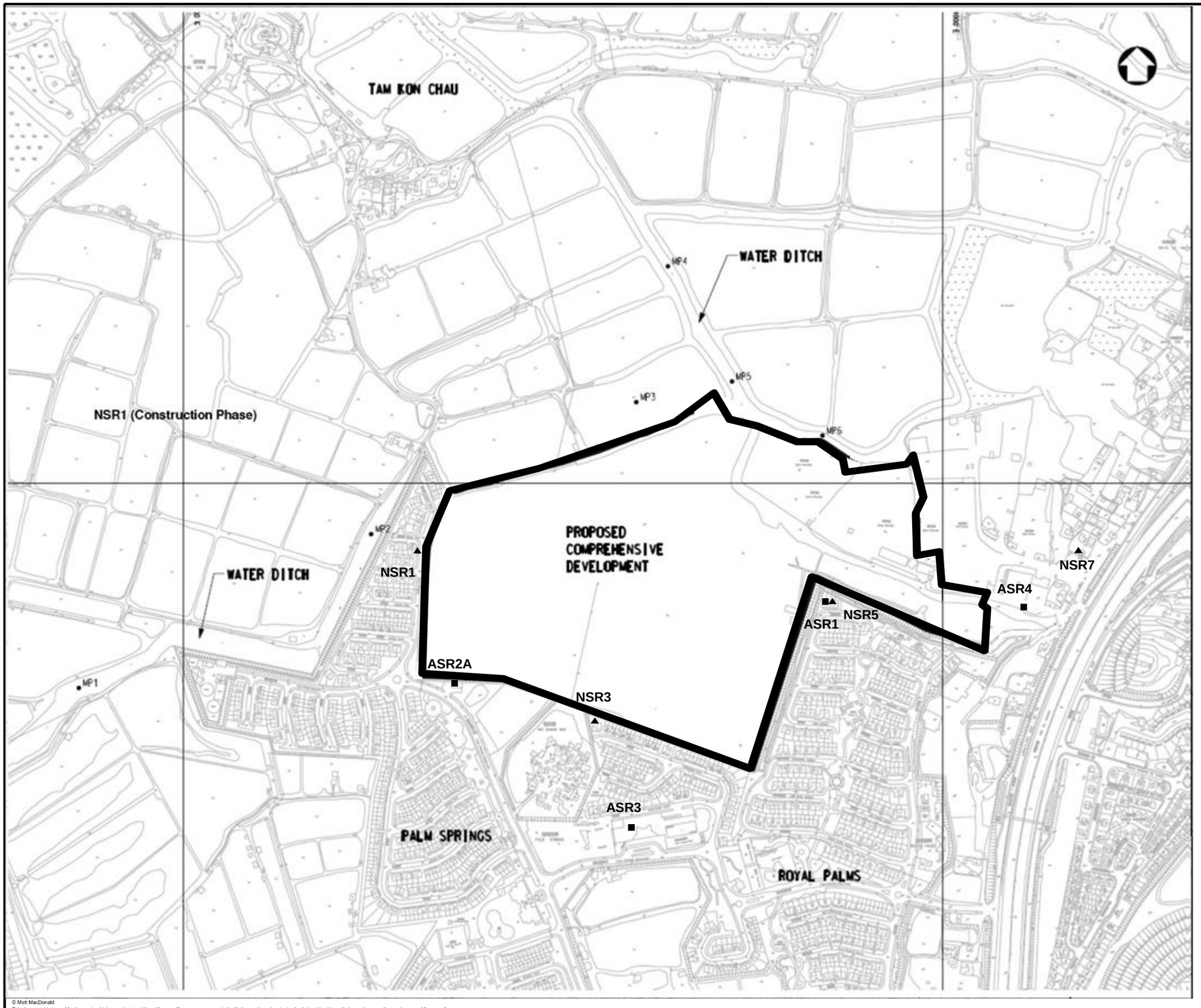
# Figures



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Notes

Key to symbols

- ■ Air Quality Monitoring Stations
- ▲ Noise Monitoring Stations
- ● Water Quality Monitoring Stations
- ━ Site Boundary

Reference drawings

| Rev | Date | Drawn | Description | Ch'k'd | App'd |
|---|---|---|---|---|---|

MOTT MACDONALD
3/F Manulife Place
348 Kwun Tong Road
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T +852 2828 5757
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W mottmac.com

Client

PROFIT POINT ENTERPRISES LIMITED

Project

PROPOSED COMPREHENSIVE DEVELOPMENT AT WO SHANG WAI, YUEN LONG

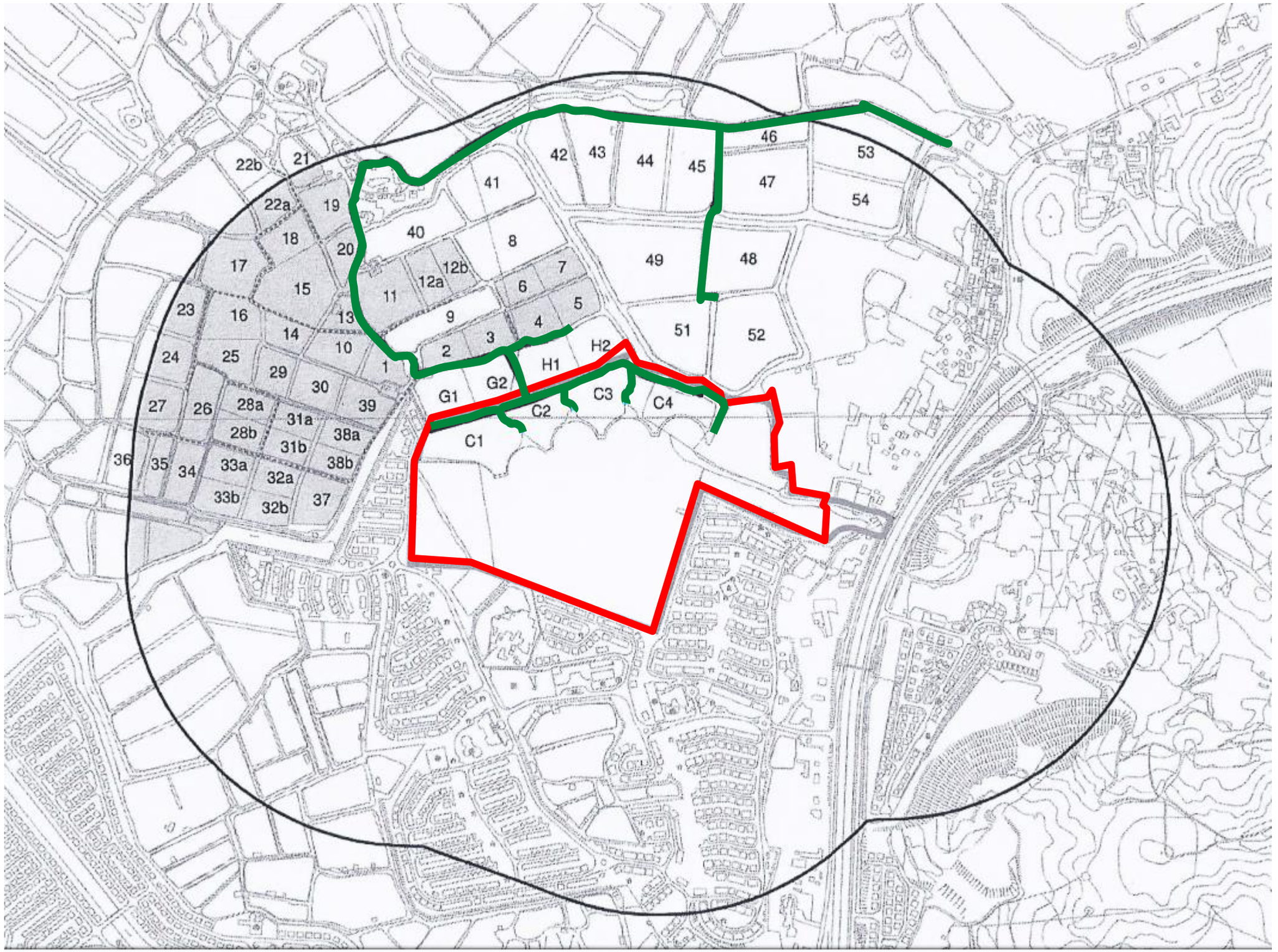
Title

**Locations of Water Quality Monitoring Stations**

| | | | | | |
|---|---|---|---|---|---|
| Designed | | | Eng check | | |
| Drawn | | | Coordination | | |
| Dwg check | | | Approved | | |
| Scale at A1 | | Status | | Rev | |

Drawing Number

Figure 1.1




Notes

Key to symbols

Project Area

Assessment Area

Transect

Reference drawings

| Rev | Date | Drawn | Description | Ch'k'd | App'd |
|---|---|---|---|---|---|


MOTT MACDONALD

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W mottmac.com


Client

PROFIT POINT ENTERPRISES LIMITED

Project

PROPOSED COMPREHENSIVE DEVELOPMENT AT WO SHANG WAI, YUEN LONG

Title

**Survey Area and Transect Walked**

| | | | | | |
|---|---|---|---|---|---|
| Designed | | | Eng check | | |
| Drawn | | | Coordination | | |
| Dwg check | | | Approved | | |
| Scale at A1 | | Status | | Rev | |

Drawing Number

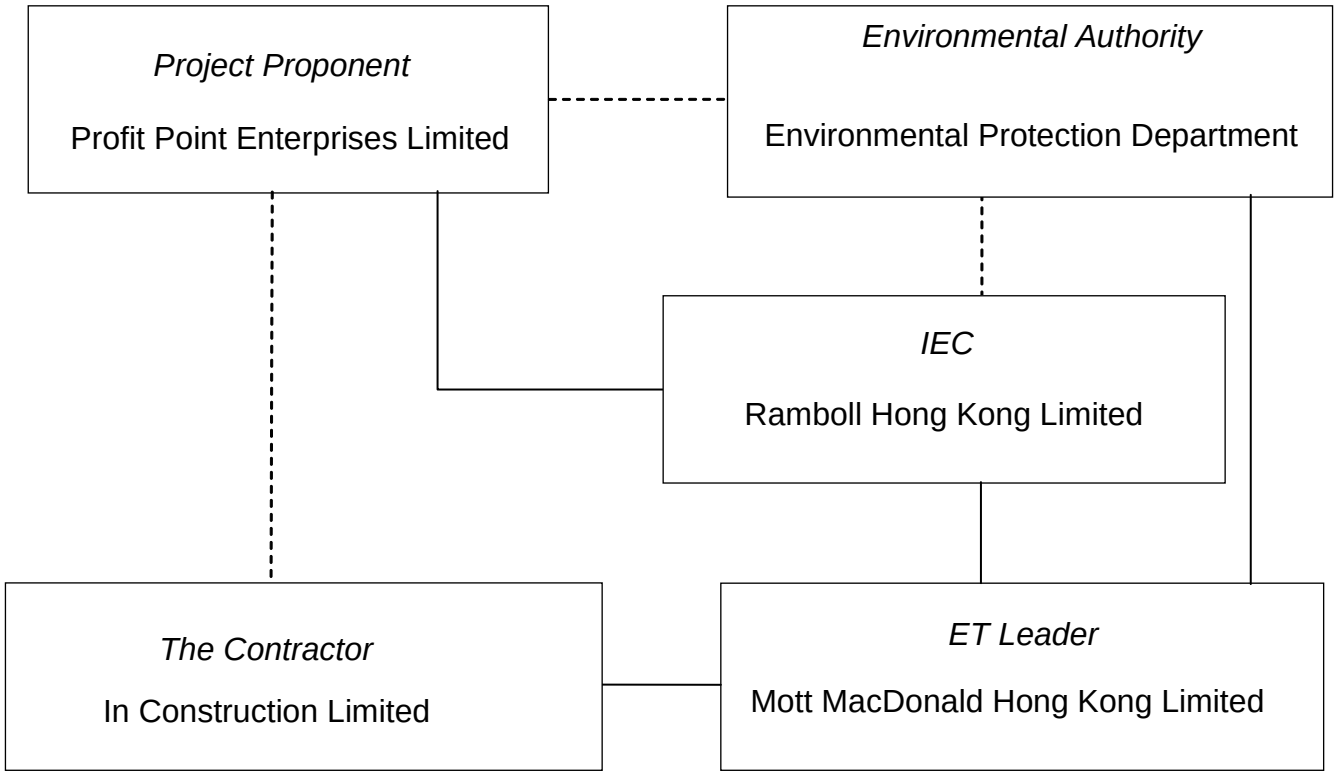
Figure 2.1




F:\425047-Hong Kong\6 0-BIM\02_WIP\01_CV\DRAWING\03_CAD\XREF\MMH-425047-P-A1_TLB-N.dgn DATE: 15/12/2021 TIME: 15:48:46 USER: TSE45790

# Appendices

# A. Project Organization Chart




**Contact information:**

| Company | Position | Name | Telephone |
|---|---|---|---|
| Profit Point Enterprises Limited (Project Proponent) | Project Manager | Ms Stacey Lau | 2281 0112 |
| In Construction Limited (The Main Contractor) | Construction Manager | Mr. Chun Kit Tse | 9400 7007 |
| | Site Agent | Mr. Chi Hei Leung | 6775 1468 |
| | Safety Officer | Mr. Wong Kam Leung | 2710 8663 |
| | Environmental Officer | Mr. Vega T. L. Wong | 6113 2368 |
| Ramboll Hong Kong Limited (Independent Environmental Checker (IEC)) | Independent Environmental Checker | Mr. David Yeung | 3465 2888 |
| Mott MacDonald Hong Kong Ltd. (Environmental Team (ET)) | Environmental Team Leader | Ms. Eugenne Yuen | 2828 5998 |

# B. Tentative Construction Programme (not used)

# C. Action and Limit Levels for Construction Phase

## Air Quality

### Action and Limit Levels for 24-hour TSP

| Monitoring Station | Action Level (μg/m$^3$) | Limit Level (μg/m$^3$) |
|---|---|---|
| ASR1 | 226 | 260 |
| ASR2A | 213 | 260 |
| ASR3 | 205 | 260 |
| ASR4 | 237 | 260 |

### Action and Limit Levels for 1-hour TSP

| Monitoring Station | Action Level (μg/m$^3$) | Limit Level (μg/m$^3$) |
|---|---|---|
| ASR1 | 378 | 500 |
| ASR2A | 357 | 500 |
| ASR3 | 358 | 500 |
| ASR4 | 372 | 500 |

## Noise

### Action and Limit Levels for Construction Noise

| Time Period | Action Level | Limit Level |
|---|---|---|
| NSR1, NSR3, NSR5, NSR7 | | |
| 0700 – 1900 hours on normal weekdays | When one documented complaint is received from any one of the sensitive receivers | 75 dB(A) |

## Water Quality

### Action and Limit Levels for Water Quality

| Parameters | DO in mg/L | | Turbidity in NTU | | SS in mg/L | | pH | |
|---|---|---|---|---|---|---|---|---|
| | Action Level | Limit Level | Action Level | Limit Level | Action Level | Limit Level | Action Level | Limit Level |
| MP1 | 1.23 | 1.17 | 173 | 177 | 231 | 299 | < 5.5 or > 7.5 | < 4.0 or > 8.0 |
| MP2 | 1.04 | 0.89 | 132 | 163 | 170 | 209 | | |
| MP3 | 6.85 | 6.65 | 64 | 67 | 65 | 66 | | |
| MP4 | 3.91 | 3.82 | 60 | 64 | 50 | 53 | | |
| MP5 | 4.13 | 3.87 | 81 | 84 | 66 | 69 | | |
| MP6 | 4.61 | 4.52 | 94 | 96 | 75 | 75 | | |

Notes:
(1) For the Limit Level of DO, 1-percentile of baseline data is adopted as it is greater than 2mg/L. (Refer to Baseline Monitoring Report)

# D. Summary and Graphical Plots of the Monitoring Results

## Air Quality (1-hr TSP)

**Station ASR1**

| Date | Start Time | Finish Time | TSP Concentration ($\mu g/m^3$) | Weather Condition | Action Level ($\mu g/m^3$) | Limit Level ($\mu g/m^3$) |
|---|---|---|---|---|---|---|
| 05-Feb-22 | 9:27 | 10:27 | 23 | Sunny | 378 | 500 |
| 05-Feb-22 | 10:27 | 11:27 | 20 | Sunny | 378 | 500 |
| 05-Feb-22 | 11:27 | 12:27 | 22 | Sunny | 378 | 500 |
| 10-Feb-22 | 9:01 | 10:01 | 34 | Sunny | 378 | 500 |
| 10-Feb-22 | 10:01 | 11:01 | 30 | Sunny | 378 | 500 |
| 10-Feb-22 | 11:01 | 12:01 | 33 | Sunny | 378 | 500 |
| 16-Feb-22 | 8:55 | 9:55 | 53 | Sunny | 378 | 500 |
| 16-Feb-22 | 9:55 | 10:55 | 54 | Sunny | 378 | 500 |
| 16-Feb-22 | 10:55 | 11:55 | 56 | Sunny | 378 | 500 |
| 22-Feb-22 | 8:53 | 9:53 | 47 | Cloudy | 378 | 500 |
| 22-Feb-22 | 9:53 | 10:53 | 44 | Cloudy | 378 | 500 |
| 22-Feb-22 | 10:53 | 11:53 | 45 | Cloudy | 378 | 500 |
| 28-Feb-22 | 8:37 | 9:37 | 31 | Sunny | 378 | 500 |
| 28-Feb-22 | 9:37 | 10:37 | 25 | Sunny | 378 | 500 |
| 28-Feb-22 | 10:37 | 11:37 | 24 | Sunny | 378 | 500 |
| 04-Mar-22 | 9:22 | 10:22 | 64 | Sunny | 378 | 500 |
| 04-Mar-22 | 10:22 | 11:22 | 46 | Sunny | 378 | 500 |
| 04-Mar-22 | 11:22 | 12:22 | 30 | Sunny | 378 | 500 |
| 10-Mar-22 | 8:56 | 9:56 | 14 | Sunny | 378 | 500 |
| 10-Mar-22 | 9:56 | 10:56 | 13 | Sunny | 378 | 500 |
| 10-Mar-22 | 10:56 | 11:56 | 12 | Sunny | 378 | 500 |
| 16-Mar-22 | 8:40 | 9:40 | 22 | Sunny | 378 | 500 |
| 16-Mar-22 | 9:40 | 10:40 | 21 | Sunny | 378 | 500 |
| 16-Mar-22 | 10:40 | 11:40 | 21 | Sunny | 378 | 500 |
| 22-Mar-22 | 8:33 | 9:33 | 47 | Sunny | 378 | 500 |
| 22-Mar-22 | 9:33 | 10:33 | 64 | Sunny | 378 | 500 |
| 22-Mar-22 | 10:33 | 11:33 | 57 | Sunny | 378 | 500 |
| 28-Mar-22 | 8:33 | 9:33 | 26 | Cloudy | 378 | 500 |
| 28-Mar-22 | 9:33 | 10:33 | 33 | Cloudy | 378 | 500 |
| 28-Mar-22 | 10:33 | 11:33 | 34 | Cloudy | 378 | 500 |
| 01-Apr-22 | 8:43 | 9:43 | 42 | Sunny | 378 | 500 |
| 01-Apr-22 | 9:43 | 10:43 | 41 | Sunny | 378 | 500 |
| 01-Apr-22 | 10:43 | 11:43 | 42 | Sunny | 378 | 500 |
| 07-Apr-22 | 8:37 | 9:37 | 30 | Sunny | 378 | 500 |
| 07-Apr-22 | 9:37 | 10:37 | 36 | Sunny | 378 | 500 |
| 07-Apr-22 | 10:37 | 11:37 | 39 | Sunny | 378 | 500 |
| 13-Apr-22 | 13:11 | 14:11 | 26 | Sunny | 378 | 500 |
| 13-Apr-22 | 14:11 | 15:11 | 25 | Sunny | 378 | 500 |
| 13-Apr-22 | 15:11 | 16:11 | 23 | Sunny | 378 | 500 |
| 19-Apr-22 | 14:01 | 15:01 | 18 | Cloudy | 378 | 500 |
| 19-Apr-22 | 15:01 | 16:01 | 19 | Cloudy | 378 | 500 |
| 19-Apr-22 | 16:01 | 17:01 | 18 | Cloudy | 378 | 500 |
| 22-Apr-22 | 9:24 | 10:24 | 21 | Sunny | 378 | 500 |
| 22-Apr-22 | 10:24 | 11:24 | 21 | Sunny | 378 | 500 |
| 22-Apr-22 | 11:24 | 12:24 | 18 | Sunny | 378 | 500 |
| 27-Apr-22 | 8:32 | 9:32 | 42 | Sunny | 378 | 500 |
| 27-Apr-22 | 9:32 | 10:32 | 40 | Sunny | 378 | 500 |
| 27-Apr-22 | 10:32 | 11:32 | 40 | Sunny | 378 | 500 |
| | | Min. | 12 | } for | | |
| | | Max. | 64 | } reporting | | |
| | | Average | 33 | } period | | |

## Air Quality (1-hr TSP)

### Station ASR2A

| Date | Start Time | Finish Time | TSP Concentration ($\mu g/m^3$) | Weather Condition | Action Level ($\mu g/m^3$) | Limit Level ($\mu g/m^3$) |
|---|---|---|---|---|---|---|
| 05-Feb-22 | 13:23 | 14:23 | 19 | Sunny | 357 | 500 |
| 05-Feb-22 | 14:23 | 15:23 | 21 | Sunny | 357 | 500 |
| 05-Feb-22 | 15:23 | 16:23 | 20 | Sunny | 357 | 500 |
| 10-Feb-22 | 12:56 | 13:56 | 33 | Sunny | 357 | 500 |
| 10-Feb-22 | 13:56 | 14:56 | 27 | Sunny | 357 | 500 |
| 10-Feb-22 | 14:56 | 15:56 | 32 | Sunny | 357 | 500 |
| 16-Feb-22 | 13:05 | 14:05 | 61 | Sunny | 357 | 500 |
| 16-Feb-22 | 14:05 | 15:05 | 56 | Sunny | 357 | 500 |
| 16-Feb-22 | 15:05 | 16:05 | 54 | Sunny | 357 | 500 |
| 22-Feb-22 | 12:58 | 13:58 | 49 | Cloudy | 357 | 500 |
| 22-Feb-22 | 13:58 | 14:58 | 48 | Cloudy | 357 | 500 |
| 22-Feb-22 | 14:58 | 15:58 | 48 | Cloudy | 357 | 500 |
| 28-Feb-22 | 13:07 | 14:07 | 23 | Sunny | 357 | 500 |
| 28-Feb-22 | 14:07 | 15:07 | 21 | Sunny | 357 | 500 |
| 28-Feb-22 | 15:07 | 16:07 | 21 | Sunny | 357 | 500 |
| 04-Mar-22 | 13:20 | 14:20 | 60 | Sunny | 357 | 500 |
| 04-Mar-22 | 14:20 | 15:20 | 50 | Sunny | 357 | 500 |
| 04-Mar-22 | 15:20 | 16:20 | 32 | Sunny | 357 | 500 |
| 10-Mar-22 | 13:07 | 14:07 | 22 | Sunny | 357 | 500 |
| 10-Mar-22 | 14:07 | 15:07 | 20 | Sunny | 357 | 500 |
| 10-Mar-22 | 15:07 | 16:07 | 19 | Sunny | 357 | 500 |
| 16-Mar-22 | 13:00 | 14:00 | 21 | Sunny | 357 | 500 |
| 16-Mar-22 | 14:00 | 15:00 | 22 | Sunny | 357 | 500 |
| 16-Mar-22 | 15:00 | 16:00 | 22 | Sunny | 357 | 500 |
| 22-Mar-22 | 13:08 | 14:08 | 58 | Sunny | 357 | 500 |
| 22-Mar-22 | 14:08 | 15:08 | 71 | Sunny | 357 | 500 |
| 22-Mar-22 | 15:08 | 16:08 | 65 | Sunny | 357 | 500 |
| 28-Mar-22 | 13:00 | 14:00 | 27 | Cloudy | 357 | 500 |
| 28-Mar-22 | 14:00 | 15:00 | 30 | Cloudy | 357 | 500 |
| 28-Mar-22 | 15:00 | 16:00 | 34 | Cloudy | 357 | 500 |
| 01-Apr-22 | 13:20 | 14:20 | 46 | Sunny | 357 | 500 |
| 01-Apr-22 | 14:20 | 15:20 | 46 | Sunny | 357 | 500 |
| 01-Apr-22 | 15:20 | 16:20 | 45 | Sunny | 357 | 500 |
| 07-Apr-22 | 12:53 | 13:53 | 26 | Sunny | 357 | 500 |
| 07-Apr-22 | 13:53 | 14:53 | 37 | Sunny | 357 | 500 |
| 07-Apr-22 | 14:53 | 15:53 | 30 | Sunny | 357 | 500 |
| 13-Apr-22 | 9:15 | 10:15 | 22 | Sunny | 357 | 500 |
| 13-Apr-22 | 10:15 | 11:15 | 20 | Sunny | 357 | 500 |
| 13-Apr-22 | 11:15 | 12:15 | 20 | Sunny | 357 | 500 |
| 19-Apr-22 | 9:19 | 10:19 | 21 | Cloudy | 357 | 500 |
| 19-Apr-22 | 10:19 | 11:19 | 20 | Cloudy | 357 | 500 |
| 19-Apr-22 | 11:19 | 12:19 | 20 | Cloudy | 357 | 500 |
| 22-Apr-22 | 13:17 | 14:17 | 21 | Sunny | 357 | 500 |
| 22-Apr-22 | 14:17 | 15:17 | 21 | Sunny | 357 | 500 |
| 22-Apr-22 | 15:17 | 16:17 | 20 | Sunny | 357 | 500 |
| 27-Apr-22 | 13:04 | 14:04 | 44 | Sunny | 357 | 500 |
| 27-Apr-22 | 14:04 | 15:04 | 41 | Sunny | 357 | 500 |
| 27-Apr-22 | 15:04 | 16:04 | 41 | Sunny | 357 | 500 |
| | | Min. | 19} | for | | |
| | | Max. | 71} | reporting | | |
| | | Average | 34} | period | | |

## Air Quality (1-hr TSP)

**Station ASR3**

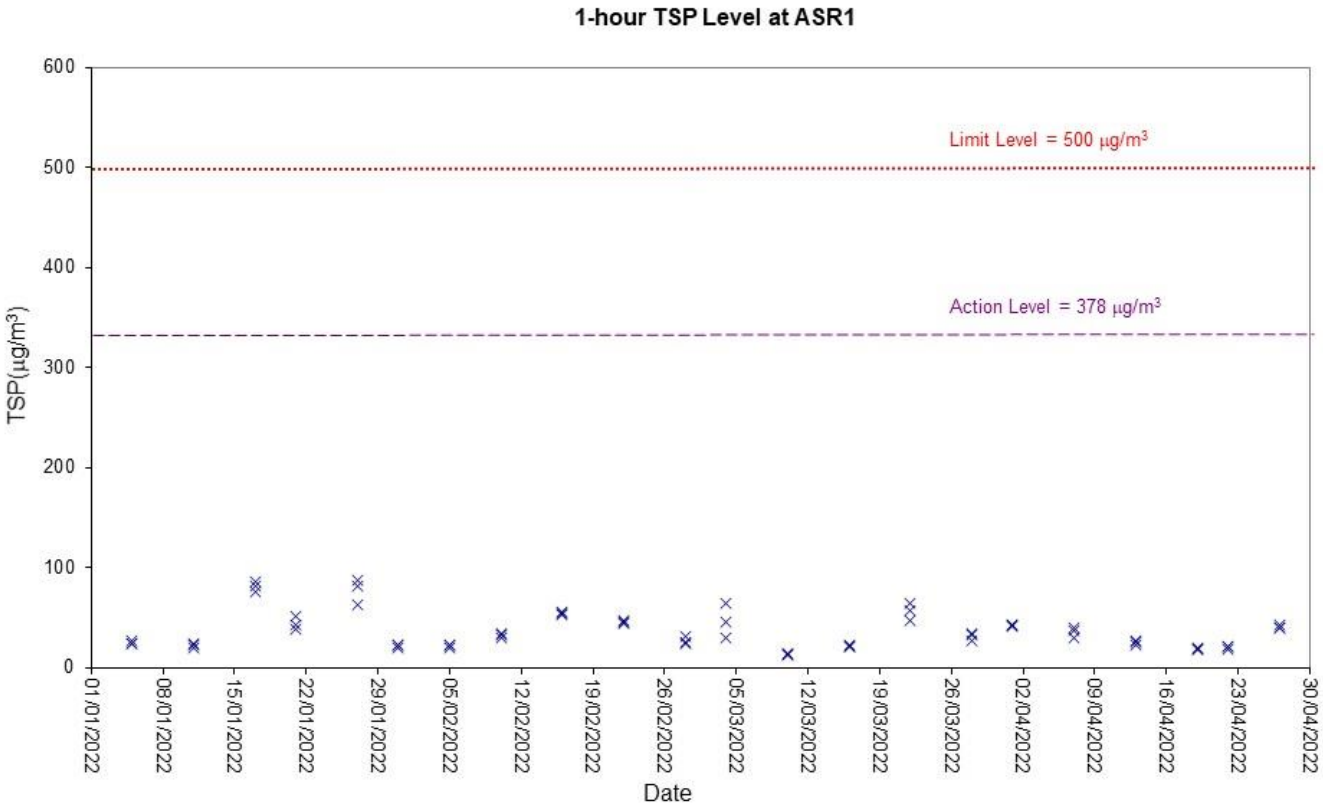
| Date | Start Time | Finish Time | TSP Concentration (μg/m$^3$) | Weather Condition | Action Level (μg/m$^3$) | Limit Level (μg/m$^3$) |
|---|---|---|---|---|---|---|
| 05-Feb-22 | 13:06 | 14:06 | 25 | Sunny | 358 | 500 |
| 05-Feb-22 | 14:06 | 15:06 | 26 | Sunny | 358 | 500 |
| 05-Feb-22 | 15:06 | 16:06 | 22 | Sunny | 358 | 500 |
| 10-Feb-22 | 13:23 | 14:23 | 34 | Sunny | 358 | 500 |
| 10-Feb-22 | 14:23 | 15:23 | 36 | Sunny | 358 | 500 |
| 10-Feb-22 | 15:23 | 16:23 | 31 | Sunny | 358 | 500 |
| 16-Feb-22 | 13:24 | 14:24 | 48 | Sunny | 358 | 500 |
| 16-Feb-22 | 14:24 | 15:24 | 44 | Sunny | 358 | 500 |
| 16-Feb-22 | 15:24 | 16:24 | 38 | Sunny | 358 | 500 |
| 22-Feb-22 | 13:15 | 14:15 | 48 | Cloudy | 358 | 500 |
| 22-Feb-22 | 14:15 | 15:15 | 46 | Cloudy | 358 | 500 |
| 22-Feb-22 | 15:15 | 16:15 | 46 | Cloudy | 358 | 500 |
| 28-Feb-22 | 13:28 | 14:28 | 22 | Sunny | 358 | 500 |
| 28-Feb-22 | 14:28 | 15:28 | 20 | Sunny | 358 | 500 |
| 28-Feb-22 | 15:28 | 16:28 | 19 | Sunny | 358 | 500 |
| 04-Mar-22 | 13:02 | 14:02 | 56 | Sunny | 358 | 500 |
| 04-Mar-22 | 14:02 | 15:02 | 48 | Sunny | 358 | 500 |
| 04-Mar-22 | 15:02 | 16:02 | 32 | Sunny | 358 | 500 |
| 10-Mar-22 | 13:22 | 14:22 | 15 | Sunny | 358 | 500 |
| 10-Mar-22 | 14:22 | 15:22 | 12 | Sunny | 358 | 500 |
| 10-Mar-22 | 15:22 | 16:22 | 12 | Sunny | 358 | 500 |
| 16-Mar-22 | 13:18 | 14:18 | 20 | Sunny | 358 | 500 |
| 16-Mar-22 | 14:18 | 15:18 | 27 | Sunny | 358 | 500 |
| 16-Mar-22 | 15:18 | 16:18 | 20 | Sunny | 358 | 500 |
| 22-Mar-22 | 13:27 | 14:27 | 61 | Sunny | 358 | 500 |
| 22-Mar-22 | 14:27 | 15:27 | 74 | Sunny | 358 | 500 |
| 22-Mar-22 | 15:27 | 16:27 | 70 | Sunny | 358 | 500 |
| 28-Mar-22 | 13:18 | 14:18 | 35 | Cloudy | 358 | 500 |
| 28-Mar-22 | 14:18 | 15:18 | 38 | Cloudy | 358 | 500 |
| 28-Mar-22 | 15:18 | 16:18 | 37 | Cloudy | 358 | 500 |
| 01-Apr-22 | 13:02 | 14:02 | 41 | Sunny | 358 | 500 |
| 01-Apr-22 | 14:02 | 15:02 | 41 | Sunny | 358 | 500 |
| 01-Apr-22 | 15:02 | 16:02 | 41 | Sunny | 358 | 500 |
| 07-Apr-22 | 13:11 | 14:11 | 26 | Sunny | 358 | 500 |
| 07-Apr-22 | 14:11 | 15:11 | 28 | Sunny | 358 | 500 |
| 07-Apr-22 | 15:11 | 16:11 | 31 | Sunny | 358 | 500 |
| 13-Apr-22 | 9:01 | 10:01 | 49 | Sunny | 358 | 500 |
| 13-Apr-22 | 10:01 | 11:01 | 21 | Sunny | 358 | 500 |
| 13-Apr-22 | 11:01 | 12:01 | 47 | Sunny | 358 | 500 |
| 19-Apr-22 | 9:06 | 10:06 | 17 | Cloudy | 358 | 500 |
| 19-Apr-22 | 10:06 | 11:06 | 16 | Cloudy | 358 | 500 |
| 19-Apr-22 | 11:06 | 12:06 | 20 | Cloudy | 358 | 500 |
| 22-Apr-22 | 13:02 | 14:02 | 25 | Sunny | 358 | 500 |
| 22-Apr-22 | 14:02 | 15:02 | 28 | Sunny | 358 | 500 |
| 22-Apr-22 | 15:02 | 16:02 | 26 | Sunny | 358 | 500 |
| 27-Apr-22 | 13:20 | 14:20 | 47 | Sunny | 358 | 500 |
| 27-Apr-22 | 14:20 | 15:20 | 46 | Sunny | 358 | 500 |
| 27-Apr-22 | 15:20 | 16:20 | 44 | Sunny | 358 | 500 |
| | | Min. | 12 | } for | | |
| | | Max. | 74 | } reporting | | |
| | | Average | 35 | } period | | |

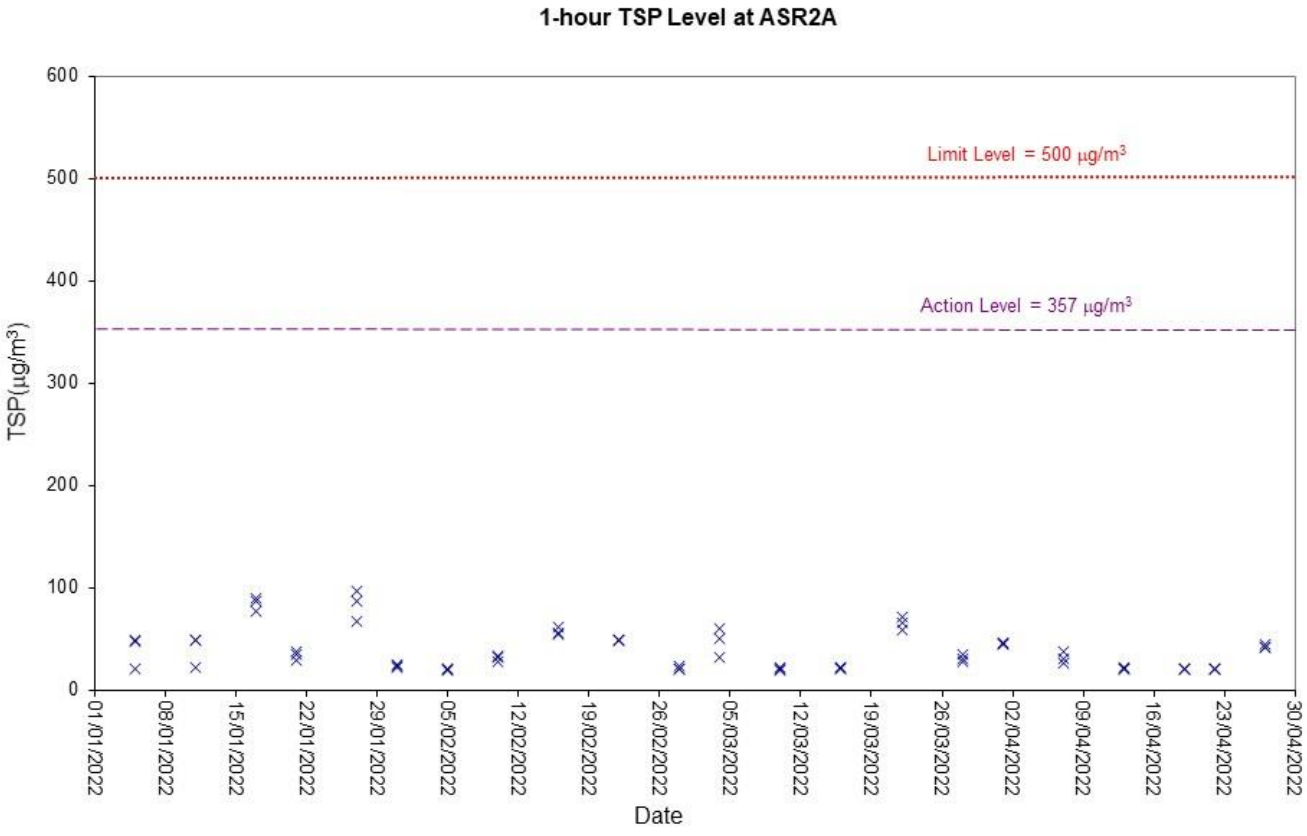
## Air Quality (1-hr TSP)

**Station ASR4**

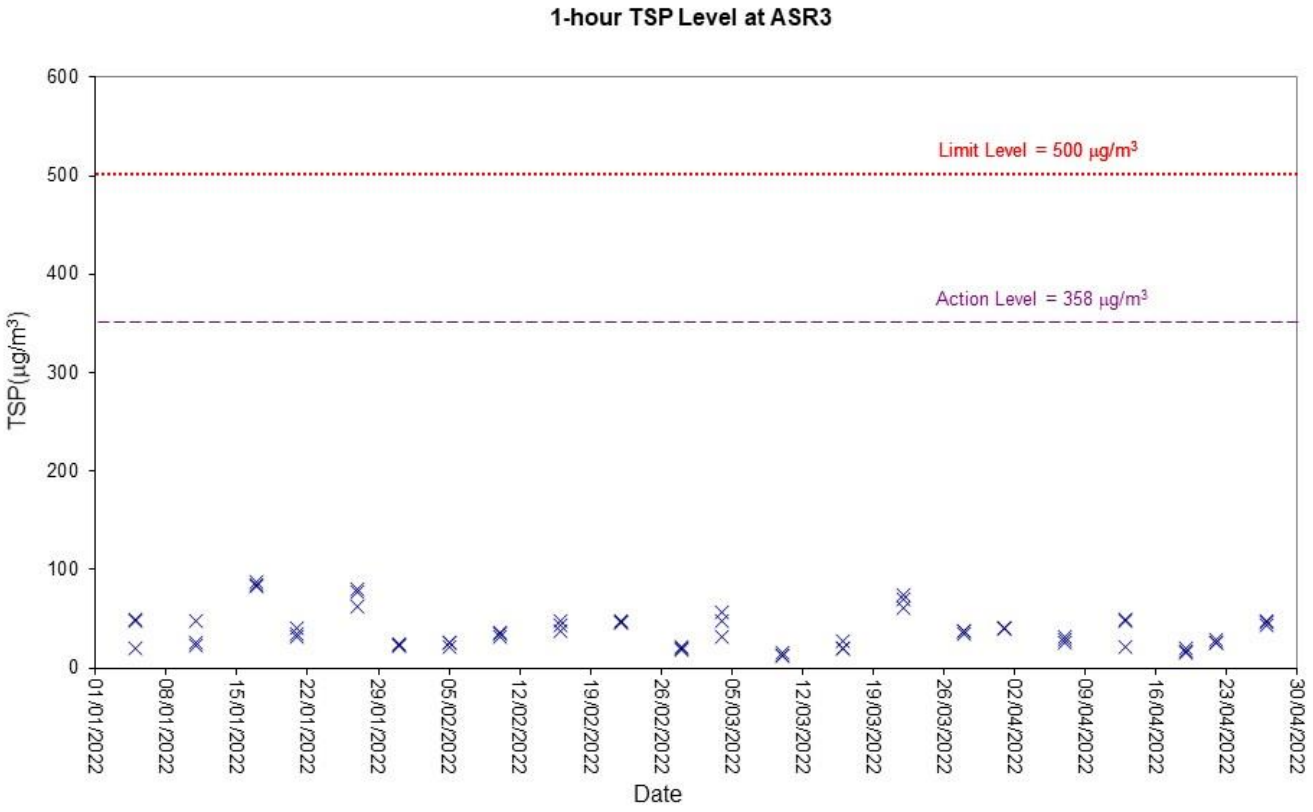
| Date | Start Time | Finish Time | TSP Concentration ($\mu g/m^3$) | Weather Condition | Action Level ($\mu g/m^3$) | Limit Level ($\mu g/m^3$) |
|---|---|---|---|---|---|---|
| 05-Feb-22 | 9:12 | 10:12 | 21 | Sunny | 372 | 500 |
| 05-Feb-22 | 10:12 | 11:12 | 21 | Sunny | 372 | 500 |
| 05-Feb-22 | 11:12 | 12:12 | 19 | Sunny | 372 | 500 |
| 10-Feb-22 | 9:14 | 10:14 | 40 | Sunny | 372 | 500 |
| 10-Feb-22 | 10:14 | 11:14 | 33 | Sunny | 372 | 500 |
| 10-Feb-22 | 11:14 | 12:14 | 39 | Sunny | 372 | 500 |
| 16-Feb-22 | 9:13 | 10:13 | 49 | Sunny | 372 | 500 |
| 16-Feb-22 | 10:13 | 11:13 | 44 | Sunny | 372 | 500 |
| 16-Feb-22 | 11:13 | 12:13 | 40 | Sunny | 372 | 500 |
| 22-Feb-22 | 9:08 | 10:08 | 49 | Cloudy | 372 | 500 |
| 22-Feb-22 | 10:08 | 11:08 | 47 | Cloudy | 372 | 500 |
| 22-Feb-22 | 11:08 | 12:08 | 48 | Cloudy | 372 | 500 |
| 28-Feb-22 | 8:57 | 9:57 | 29 | Sunny | 372 | 500 |
| 28-Feb-22 | 9:57 | 10:57 | 29 | Sunny | 372 | 500 |
| 28-Feb-22 | 10:57 | 11:57 | 26 | Sunny | 372 | 500 |
| 04-Mar-22 | 9:04 | 10:04 | 69 | Sunny | 372 | 500 |
| 04-Mar-22 | 10:04 | 11:04 | 47 | Sunny | 372 | 500 |
| 04-Mar-22 | 11:04 | 12:04 | 32 | Sunny | 372 | 500 |
| 10-Mar-22 | 9:12 | 10:12 | 16 | Sunny | 372 | 500 |
| 10-Mar-22 | 10:12 | 11:12 | 15 | Sunny | 372 | 500 |
| 10-Mar-22 | 11:12 | 12:12 | 13 | Sunny | 372 | 500 |
| 16-Mar-22 | 8:59 | 9:59 | 29 | Sunny | 372 | 500 |
| 16-Mar-22 | 9:59 | 10:59 | 29 | Sunny | 372 | 500 |
| 16-Mar-22 | 10:59 | 11:59 | 28 | Sunny | 372 | 500 |
| 22-Mar-22 | 8:54 | 9:54 | 56 | Sunny | 372 | 500 |
| 22-Mar-22 | 9:54 | 10:54 | 77 | Sunny | 372 | 500 |
| 22-Mar-22 | 10:54 | 11:54 | 73 | Sunny | 372 | 500 |
| 28-Mar-22 | 8:53 | 9:53 | 29 | Cloudy | 372 | 500 |
| 28-Mar-22 | 9:53 | 10:53 | 28 | Cloudy | 372 | 500 |
| 28-Mar-22 | 10:53 | 11:53 | 30 | Cloudy | 372 | 500 |
| 01-Apr-22 | 8:26 | 9:26 | 41 | Sunny | 372 | 500 |
| 01-Apr-22 | 9:26 | 10:26 | 41 | Sunny | 372 | 500 |
| 01-Apr-22 | 10:26 | 11:26 | 40 | Sunny | 372 | 500 |
| 07-Apr-22 | 8:34 | 9:34 | 25 | Sunny | 372 | 500 |
| 07-Apr-22 | 9:34 | 10:34 | 28 | Sunny | 372 | 500 |
| 07-Apr-22 | 10:34 | 11:34 | 30 | Sunny | 372 | 500 |
| 13-Apr-22 | 13:25 | 14:25 | 49 | Sunny | 372 | 500 |
| 13-Apr-22 | 14:25 | 15:25 | 20 | Sunny | 372 | 500 |
| 13-Apr-22 | 15:25 | 16:25 | 48 | Sunny | 372 | 500 |
| 19-Apr-22 | 14:17 | 15:17 | 22 | Cloudy | 372 | 500 |
| 19-Apr-22 | 15:17 | 16:17 | 21 | Cloudy | 372 | 500 |
| 19-Apr-22 | 16:17 | 17:17 | 18 | Cloudy | 372 | 500 |
| 22-Apr-22 | 9:08 | 10:08 | 26 | Sunny | 372 | 500 |
| 22-Apr-22 | 10:08 | 11:08 | 24 | Sunny | 372 | 500 |
| 22-Apr-22 | 11:08 | 12:08 | 22 | Sunny | 372 | 500 |
| 27-Apr-22 | 8:51 | 9:51 | 42 | Sunny | 372 | 500 |
| 27-Apr-22 | 9:51 | 10:51 | 40 | Sunny | 372 | 500 |
| 27-Apr-22 | 10:51 | 11:51 | 29 | Sunny | 372 | 500 |
| | | Min. | 13 | for | | |
| | | Max. | 77 | reporting | | |
| | | Average | 35 | period | | |

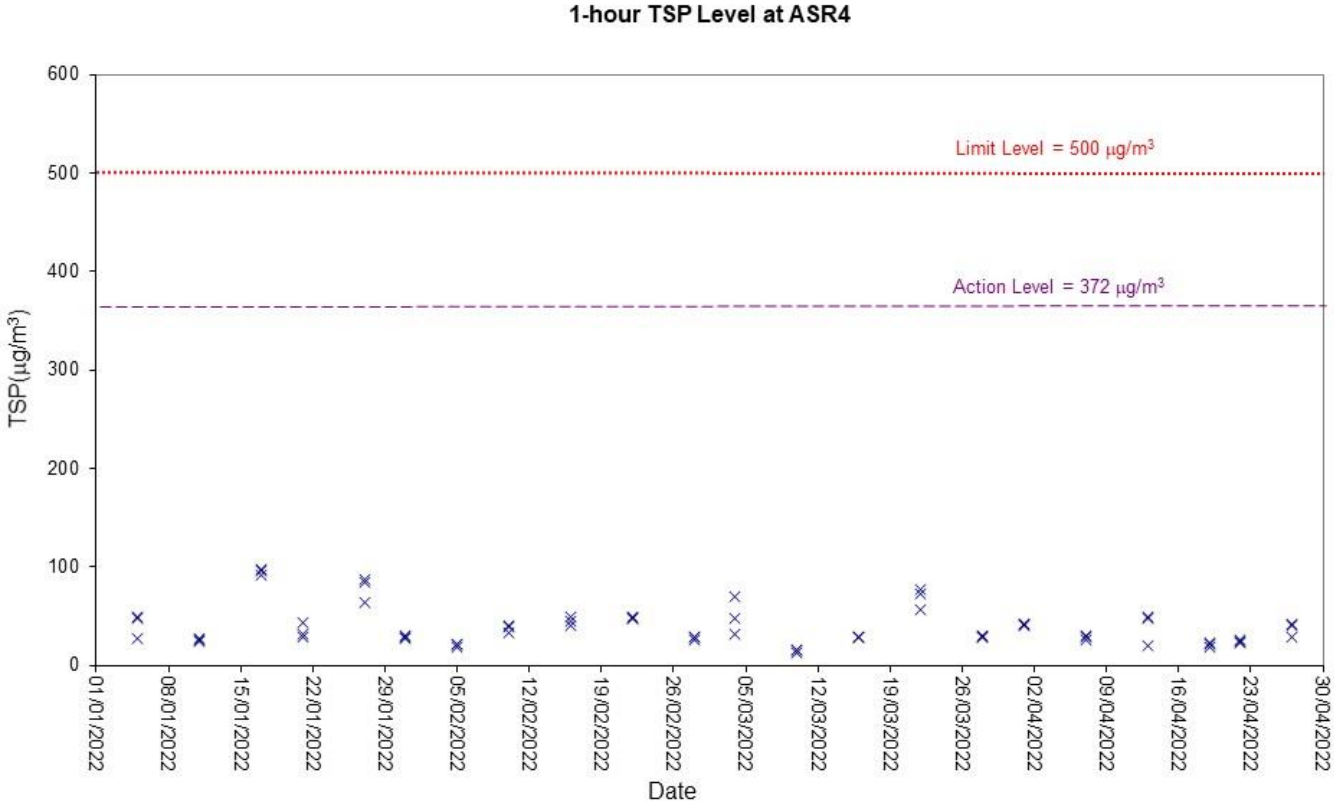
## Air Quality (1-hr TSP)



## Air Quality (1-hr TSP)



## Air Quality (24-hr TSP)

### Station ASR1

| Start | | Finish | | Filter Weight (g) | | Elapsed Time Reading | | Sampling Time (hrs) | Flow Rate ($m^3$/min) | | | Conc. (µg/$m^3$) | Weather Condition | Action Level (µg/$m^3$) | Limit Level (µg/$m^3$) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Time | Date | Time | Initial | Final | Initial | Final | | Initial | Final | Average | | | | |
| 05-Feb-22 | 9:26 | 06-Feb-22 | 9:26 | 2.7362 | 2.7971 | 28378.64 | 28402.64 | 24.00 | 1.2800 | 1.2800 | 1.2800 | 33 | Sunny | 226 | 260 |
| 10-Feb-22 | 9:00 | 11-Feb-22 | 9:00 | 2.7400 | 2.8052 | 28402.64 | 28426.64 | 24.00 | 1.2800 | 1.2800 | 1.2800 | 35 | Sunny | 226 | 260 |
| 16-Feb-22 | 8:54 | 17-Feb-22 | 8:54 | 2.7450 | 2.8895 | 28426.64 | 28450.64 | 24.00 | 1.2800 | 1.2800 | 1.2800 | 78 | Sunny | 226 | 260 |
| 22-Feb-22 | 8:52 | 23-Feb-22 | 8:52 | 2.7381 | 2.7828 | 28450.64 | 28474.64 | 24.00 | 1.2800 | 1.2800 | 1.2800 | 24 | Cloudy | 226 | 260 |
| 28-Feb-22 | 8:35 | 01-Mar-22 | 8:35 | 2.7328 | 2.8097 | 28474.64 | 28498.64 | 24.00 | 1.3300 | 1.3300 | 1.3300 | 40 | Sunny | 226 | 260 |
| 04-Mar-22 | 9:21 | 05-Mar-22 | 9:21 | 2.7428 | 2.8050 | 28498.64 | 28522.64 | 24.00 | 1.3300 | 1.3300 | 1.3300 | 32 | Sunny | 226 | 260 |
| 10-Mar-22 | 8:55 | 11-Mar-22 | 8:55 | 2.7448 | 2.8395 | 28522.64 | 28546.64 | 24.00 | 1.3300 | 1.3300 | 1.3300 | 49 | Sunny | 226 | 260 |
| 16-Mar-22 | 8:39 | 17-Mar-22 | 8:39 | 2.7675 | 2.8363 | 28546.64 | 28570.64 | 24.00 | 1.3300 | 1.3300 | 1.3300 | 36 | Sunny | 226 | 260 |
| 22-Mar-22 | 8:32 | 23-Mar-22 | 8:32 | 2.7474 | 2.8051 | 28570.64 | 28594.64 | 24.00 | 1.3300 | 1.3300 | 1.3300 | 30 | Sunny | 226 | 260 |
| 28-Mar-22 | 8:32 | 29-Mar-22 | 8:32 | 2.7455 | 2.7886 | 28594.64 | 28618.64 | 24.00 | 1.3300 | 1.3300 | 1.3300 | 23 | Cloudy | 226 | 260 |
| 01-Apr-22 | 8:42 | 02-Apr-22 | 8:42 | 2.7418 | 2.8230 | 28618.64 | 28642.64 | 24.00 | 1.3300 | 1.3300 | 1.3300 | 42 | Sunny | 226 | 260 |
| 07-Apr-22 | 8:36 | 08-Apr-22 | 8:36 | 2.7619 | 2.8745 | 28642.64 | 28666.64 | 24.00 | 1.3300 | 1.3300 | 1.3300 | 59 | Sunny | 226 | 260 |
| 13-Apr-22 | 13:10 | 14-Apr-22 | 13:10 | 2.7608 | 2.8571 | 28666.64 | 28690.64 | 24.00 | 1.3300 | 1.3300 | 1.3300 | 50 | Sunny | 226 | 260 |
| 19-Apr-22 | 14:00 | 20-Apr-22 | 14:00 | 2.7583 | 2.8241 | 28690.64 | 28714.64 | 24.00 | 1.3300 | 1.3300 | 1.3300 | 34 | Cloudy | 226 | 260 |
| 22-Apr-22 | 9:23 | 23-Apr-22 | 9:23 | 2.7440 | 2.8117 | 28714.64 | 28738.64 | 24.00 | 1.3300 | 1.3300 | 1.3300 | 35 | Sunny | 226 | 260 |
| 27-Apr-22 | 8:31 | 28-Apr-22 | 8:31 | 2.7545 | 2.8050 | 28738.64 | 28762.64 | 24.00 | 1.3100 | 1.3100 | 1.3100 | 27 | Sunny | 226 | 260 |
| | | | | | | | | | | | Min | 23 | for reporting period | | |
| | | | | | | | | | | | Max | 78 | | | |
| | | | | | | | | | | | Average | 39 | | | |

## Air Quality (24-hr TSP)

### Station ASR2A

| Start | | Finish | | Filter Weight (g) | | Elapsed Time Reading | | Sampling Time (hrs) | Flow Rate ($m^3$/min) | | | Conc. (µg/$m^3$) | Weather Condition | Action Level (µg/$m^3$) | Limit Level (µg/$m^3$) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Time | Date | Time | Initial | Final | Initial | Final | | Initial | Final | Average | | | | |
| 05-Feb-22 | 13:22 | 06-Feb-22 | 13:22 | 2.7686 | 2.8063 | 31474.02 | 31498.02 | 24.00 | 1.2500 | 1.2500 | 1.2500 | 21 | Sunny | 213 | 260 |
| 10-Feb-22 | 12:55 | 11-Feb-22 | 12:55 | 2.7558 | 2.8090 | 31498.02 | 31522.02 | 24.00 | 1.2500 | 1.2500 | 1.2500 | 30 | Sunny | 213 | 260 |
| 16-Feb-22 | 13:04 | 17-Feb-22 | 13:04 | 2.7468 | 2.8527 | 31522.02 | 31546.02 | 24.00 | 1.2500 | 1.2500 | 1.2500 | 59 | Sunny | 213 | 260 |
| 22-Feb-22 | 12:57 | 23-Feb-22 | 12:57 | 2.7476 | 2.7763 | 31546.02 | 31570.02 | 24.00 | 1.2500 | 1.2500 | 1.2500 | 16 | Cloudy | 213 | 260 |
| 28-Feb-22 | 13:06 | 01-Mar-22 | 13:06 | 2.7339 | 2.8001 | 31570.02 | 31594.02 | 24.00 | 1.2100 | 1.2100 | 1.2100 | 38 | Sunny | 213 | 260 |
| 04-Mar-22 | 13:19 | 05-Mar-22 | 13:19 | 2.7476 | 2.8574 | 31594.02 | 31618.02 | 24.00 | 1.2100 | 1.2100 | 1.2100 | 63 | Sunny | 213 | 260 |
| 10-Mar-22 | 13:06 | 11-Mar-22 | 13:06 | 2.7494 | 2.8194 | 31618.02 | 31642.02 | 24.00 | 1.2100 | 1.2100 | 1.2100 | 40 | Sunny | 213 | 260 |
| 16-Mar-22 | 12:58 | 17-Mar-22 | 12:58 | 2.7536 | 2.8179 | 31642.02 | 31666.02 | 24.00 | 1.2100 | 1.2100 | 1.2100 | 37 | Sunny | 213 | 260 |
| 22-Mar-22 | 13:07 | 23-Mar-22 | 13:07 | 2.7414 | 2.8123 | 31666.02 | 31690.02 | 24.00 | 1.2100 | 1.2100 | 1.2100 | 41 | Sunny | 213 | 260 |
| 28-Mar-22 | 12:58 | 29-Mar-22 | 12:58 | 2.7506 | 2.8205 | 31690.02 | 31714.02 | 24.00 | 1.2100 | 1.2100 | 1.2100 | 40 | Cloudy | 213 | 260 |
| 01-Apr-22 | 13:19 | 02-Apr-22 | 13:19 | 2.7424 | 2.8187 | 31714.02 | 31738.02 | 24.00 | 1.2100 | 1.2100 | 1.2100 | 44 | Sunny | 213 | 260 |
| 07-Apr-22 | 12:52 | 08-Apr-22 | 12:52 | 2.7644 | 2.8706 | 31738.02 | 31762.02 | 24.00 | 1.2100 | 1.2100 | 1.2100 | 61 | Sunny | 213 | 260 |
| 13-Apr-22 | 9:14 | 14-Apr-22 | 9:14 | 2.7559 | 2.8430 | 31762.02 | 31786.02 | 24.00 | 1.2100 | 1.2100 | 1.2100 | 50 | Sunny | 213 | 260 |
| 19-Apr-22 | 9:18 | 20-Apr-22 | 9:18 | 2.7596 | 2.8197 | 31786.02 | 31810.02 | 24.00 | 1.2100 | 1.2100 | 1.2100 | 34 | Cloudy | 213 | 260 |
| 22-Apr-22 | 13:16 | 23-Apr-22 | 13:16 | 2.7453 | 2.7994 | 31810.02 | 31834.02 | 24.00 | 1.2100 | 1.2100 | 1.2100 | 31 | Sunny | 213 | 260 |
| 27-Apr-22 | 13:03 | 28-Apr-22 | 13:03 | 2.7421 | 2.7848 | 31834.02 | 31858.02 | 24.00 | 1.1900 | 1.1900 | 1.1900 | 25 | Sunny | 213 | 260 |
| | | | | | | | | | | | Min | 16 | for | | |
| | | | | | | | | | | | Max | 63 | reporting | | |
| | | | | | | | | | | | Average | 39 | period | | |

## Air Quality (24-hr TSP)

### Station ASR3

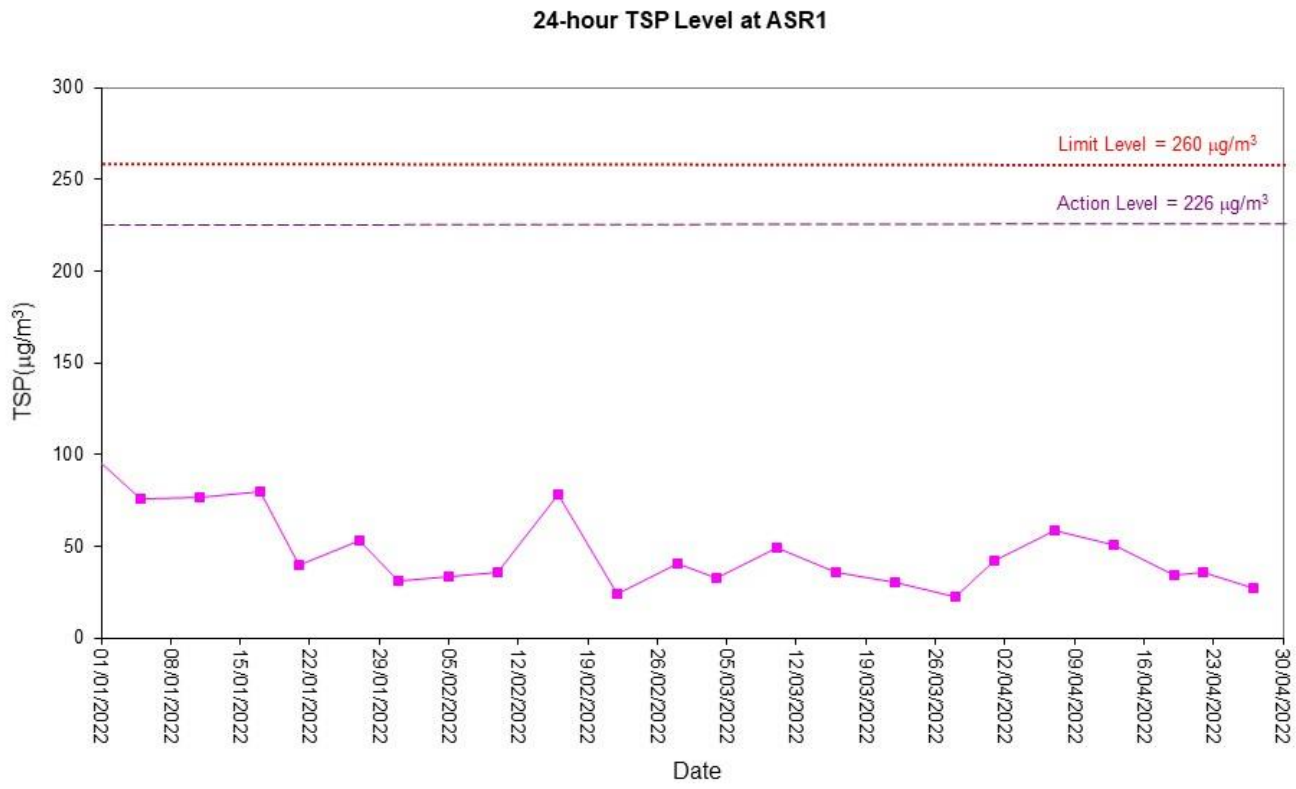
| Start | | Finish | | Filter Weight (g) | | Elapsed Time Reading | | Sampling Time (hrs) | Flow Rate ($m^3$/min) | | | Conc. ($\mu g/m^3$) | Weather Condition | Action Level ($\mu g/m^3$) | Limit Level ($\mu g/m^3$) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Time | Date | Time | Initial | Final | Initial | Final | | Initial | Final | Average | | | | |
| 05-Feb-22 | 13:05 | 06-Feb-22 | 13:05 | 2.7694 | 2.8300 | 22658.92 | 22682.92 | 24.00 | 1.1200 | 1.1200 | 1.1200 | 38 | Sunny | 205 | 260 |
| 10-Feb-22 | 13:22 | 11-Feb-22 | 13:22 | 2.7525 | 2.8581 | 22682.92 | 22706.92 | 24.00 | 1.1200 | 1.1200 | 1.1200 | 65 | Sunny | 205 | 260 |
| 16-Feb-22 | 13:23 | 17-Feb-22 | 13:23 | 2.7339 | 2.7805 | 22706.92 | 22730.92 | 24.00 | 1.1200 | 1.1200 | 1.1200 | 29 | Sunny | 205 | 260 |
| 22-Feb-22 | 13:14 | 23-Feb-22 | 13:14 | 2.7409 | 2.7669 | 22730.92 | 22754.92 | 24.00 | 1.1200 | 1.1200 | 1.1200 | 16 | Cloudy | 205 | 260 |
| 28-Feb-22 | 13:25 | 01-Mar-22 | 13:25 | 2.7410 | 2.8216 | 22754.92 | 22778.92 | 24.00 | 1.1400 | 1.1400 | 1.1400 | 49 | Sunny | 205 | 260 |
| 04-Mar-22 | 13:00 | 05-Mar-22 | 13:00 | 2.7614 | 2.8614 | 22778.92 | 22802.92 | 24.00 | 1.1400 | 1.1400 | 1.1400 | 61 | Sunny | 205 | 260 |
| 10-Mar-22 | 13:21 | 11-Mar-22 | 13:21 | 2.7416 | 2.8245 | 22802.92 | 22826.92 | 24.00 | 1.1400 | 1.1400 | 1.1400 | 50 | Sunny | 205 | 260 |
| 16-Mar-22 | 13:17 | 17-Mar-22 | 13:17 | 2.7415 | 2.8002 | 22826.92 | 22850.92 | 24.00 | 1.1400 | 1.1400 | 1.1400 | 36 | Sunny | 205 | 260 |
| 22-Mar-22 | 13:26 | 23-Mar-22 | 13:26 | 2.7374 | 2.7786 | 22850.92 | 22874.92 | 24.00 | 1.1400 | 1.1400 | 1.1400 | 25 | Sunny | 205 | 260 |
| 28-Mar-22 | 13:17 | 29-Mar-22 | 13:17 | 2.7406 | 2.7921 | 22874.92 | 22898.92 | 24.00 | 1.1400 | 1.1400 | 1.1400 | 31 | Cloudy | 205 | 260 |
| 01-Apr-22 | 13:01 | 02-Apr-22 | 13:01 | 2.7468 | 2.8170 | 22898.92 | 22922.92 | 24.00 | 1.1400 | 1.1400 | 1.1400 | 43 | Sunny | 205 | 260 |
| 07-Apr-22 | 13:10 | 08-Apr-22 | 13:10 | 2.7676 | 2.8725 | 22922.92 | 22946.92 | 24.00 | 1.1400 | 1.1400 | 1.1400 | 64 | Sunny | 205 | 260 |
| 13-Apr-22 | 9:00 | 14-Apr-22 | 9:00 | 2.7435 | 2.8331 | 22946.92 | 22970.92 | 24.00 | 1.1400 | 1.1400 | 1.1400 | 55 | Sunny | 205 | 260 |
| 19-Apr-22 | 9:05 | 20-Apr-22 | 9:05 | 2.7431 | 2.8095 | 22970.92 | 22994.92 | 24.00 | 1.1400 | 1.1400 | 1.1400 | 40 | Cloudy | 205 | 260 |
| 22-Apr-22 | 13:00 | 23-Apr-22 | 13:00 | 2.7456 | 2.8140 | 22994.92 | 23018.92 | 24.00 | 1.1400 | 1.1400 | 1.1400 | 42 | Sunny | 205 | 260 |
| 27-Apr-22 | 13:19 | 28-Apr-22 | 13:19 | 2.7691 | 2.8156 | 23018.92 | 23042.92 | 24.00 | 1.1300 | 1.1300 | 1.1300 | 29 | Sunny | 205 | 260 |
| | | | | | | | | | | | Min | 16 | for | | |
| | | | | | | | | | | | Max | 65 | reporting | | |
| | | | | | | | | | | | Average | 42 | period | | |

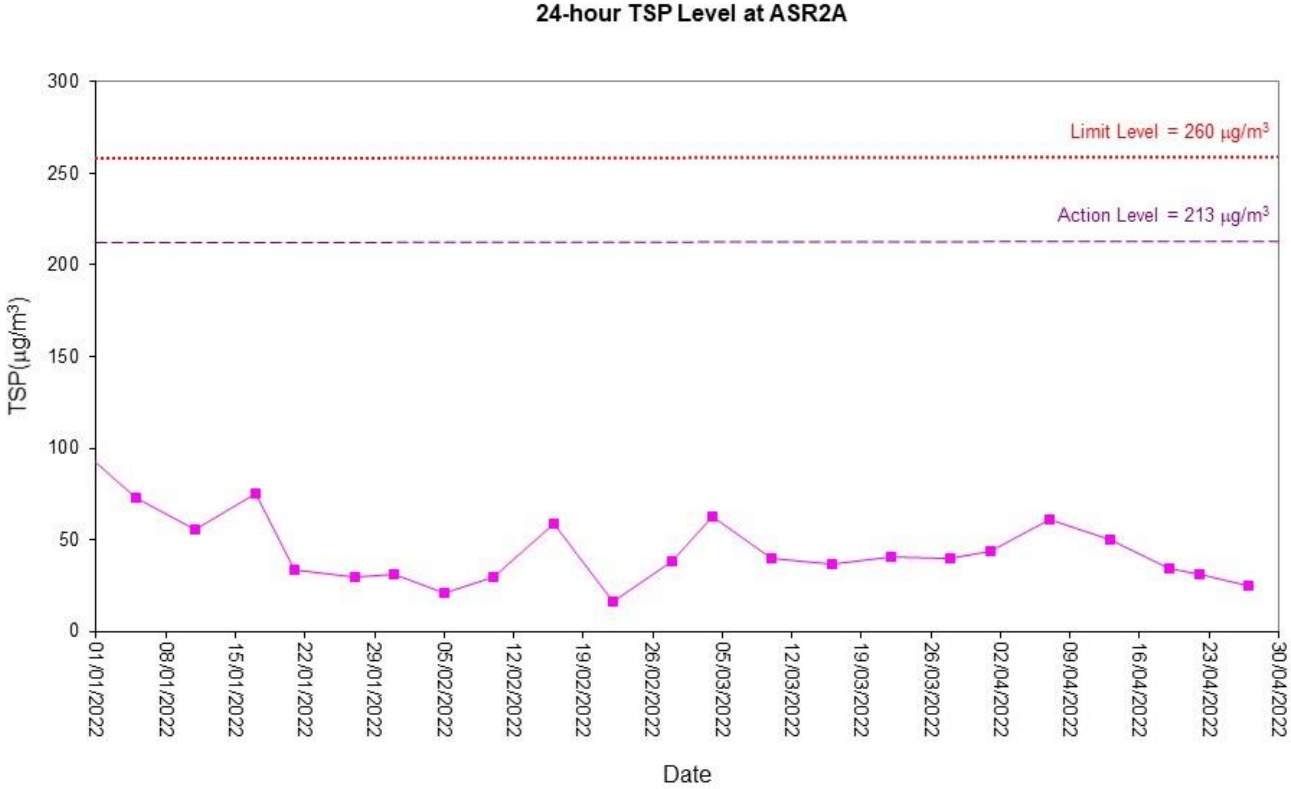
## Air Quality (24-hr TSP)

### Station ASR4

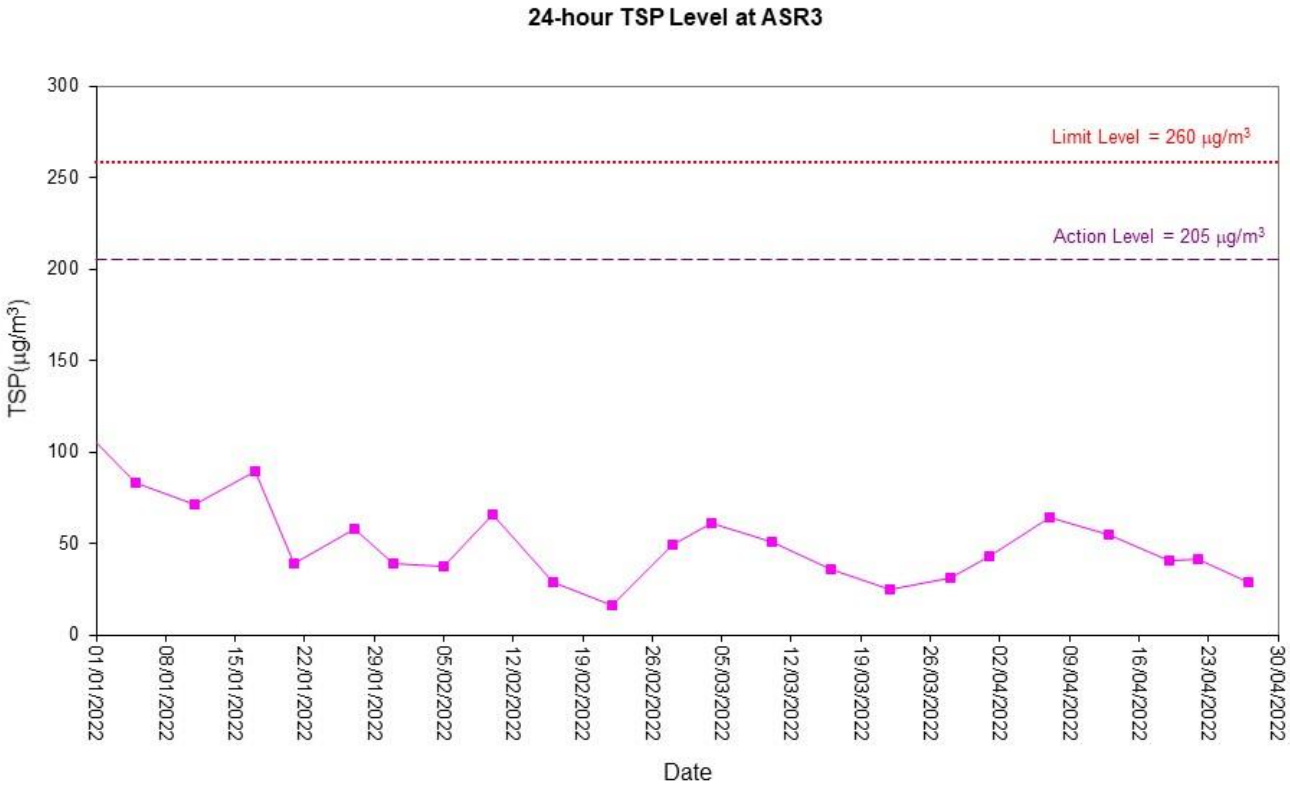
| Start | | Finish | | Filter Weight (g) | | Elapsed Time Reading | | Sampling Time (hrs) | Flow Rate ($m^3$/min) | | | Conc. (µg/$m^3$) | Weather Condition | Action Level (µg/$m^3$) | Limit Level (µg/$m^3$) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Time | Date | Time | Initial | Final | Initial | Final | | Initial | Final | Average | | | | |
| 05-Feb-22 | 9:11 | 06-Feb-22 | 9:11 | 2.7294 | 2.7942 | 30256.54 | 30280.54 | 24.00 | 1.3300 | 1.3300 | 1.3300 | 34 | Sunny | 237 | 260 |
| 10-Feb-22 | 9:13 | 11-Feb-22 | 9:13 | 2.7473 | 2.8162 | 30280.54 | 30304.54 | 24.00 | 1.3300 | 1.3300 | 1.3300 | 36 | Sunny | 237 | 260 |
| 16-Feb-22 | 9:12 | 17-Feb-22 | 9:12 | 2.7404 | 2.8523 | 30304.54 | 30328.54 | 24.00 | 1.3300 | 1.3300 | 1.3300 | 58 | Sunny | 237 | 260 |
| 22-Feb-22 | 9:07 | 23-Feb-22 | 9:07 | 2.7408 | 2.8535 | 30328.54 | 30352.54 | 24.00 | 1.3300 | 1.3300 | 1.3300 | 59 | Cloudy | 237 | 260 |
| 28-Feb-22 | 8:56 | 01-Mar-22 | 8:56 | 2.7277 | 2.7895 | 30352.54 | 30376.54 | 24.00 | 1.3100 | 1.3100 | 1.3100 | 33 | Sunny | 237 | 260 |
| 04-Mar-22 | 9:03 | 05-Mar-22 | 9:03 | 2.7486 | 2.8840 | 30376.54 | 30400.54 | 24.00 | 1.3100 | 1.3100 | 1.3100 | 72 | Sunny | 237 | 260 |
| 10-Mar-22 | 9:11 | 11-Mar-22 | 9:11 | 2.7490 | 2.8430 | 30400.54 | 30424.54 | 24.00 | 1.3100 | 1.3100 | 1.3100 | 50 | Sunny | 237 | 260 |
| 16-Mar-22 | 8:58 | 17-Mar-22 | 8:58 | 2.7510 | 2.8351 | 30424.54 | 30448.54 | 24.00 | 1.3100 | 1.3100 | 1.3100 | 45 | Sunny | 237 | 260 |
| 22-Mar-22 | 8:53 | 23-Mar-22 | 8:53 | 2.7473 | 2.8138 | 30448.54 | 30472.54 | 24.00 | 1.3100 | 1.3100 | 1.3100 | 35 | Sunny | 237 | 260 |
| 28-Mar-22 | 8:52 | 29-Mar-22 | 8:52 | 2.7320 | 2.7570 | 30472.54 | 30496.54 | 24.00 | 1.3100 | 1.3100 | 1.3100 | 13 | Cloudy | 237 | 260 |
| 01-Apr-22 | 8:25 | 02-Apr-22 | 8:25 | 2.7217 | 2.7941 | 30496.54 | 30520.54 | 24.00 | 1.3100 | 1.3100 | 1.3100 | 38 | Sunny | 237 | 260 |
| 07-Apr-22 | 8:53 | 08-Apr-22 | 8:53 | 2.7516 | 2.9008 | 30520.54 | 30544.54 | 24.00 | 1.3100 | 1.3100 | 1.3100 | 79 | Sunny | 237 | 260 |
| 13-Apr-22 | 13:24 | 14-Apr-22 | 13:24 | 2.7780 | 2.9170 | 30544.54 | 30568.54 | 24.00 | 1.3100 | 1.3100 | 1.3100 | 74 | Sunny | 237 | 260 |
| 19-Apr-22 | 14:16 | 20-Apr-22 | 14:16 | 2.7506 | 2.8324 | 30568.54 | 30592.54 | 24.00 | 1.3100 | 1.3100 | 1.3100 | 43 | Cloudy | 237 | 260 |
| 22-Apr-22 | 9:07 | 23-Apr-22 | 9:07 | 2.7405 | 2.8003 | 30592.54 | 30616.54 | 24.00 | 1.3100 | 1.3100 | 1.3100 | 32 | Sunny | 237 | 260 |
| 27-Apr-22 | 8:50 | 28-Apr-22 | 8:50 | 2.7482 | 2.8375 | 30616.54 | 30640.54 | 24.00 | 1.2800 | 1.2800 | 1.2800 | 48 | Sunny | 237 | 260 |
| | | | | | | | | | | | Min | 13 | for | | |
| | | | | | | | | | | | Max | 79 | reporting | | |
| | | | | | | | | | | | Average | 47 | period | | |

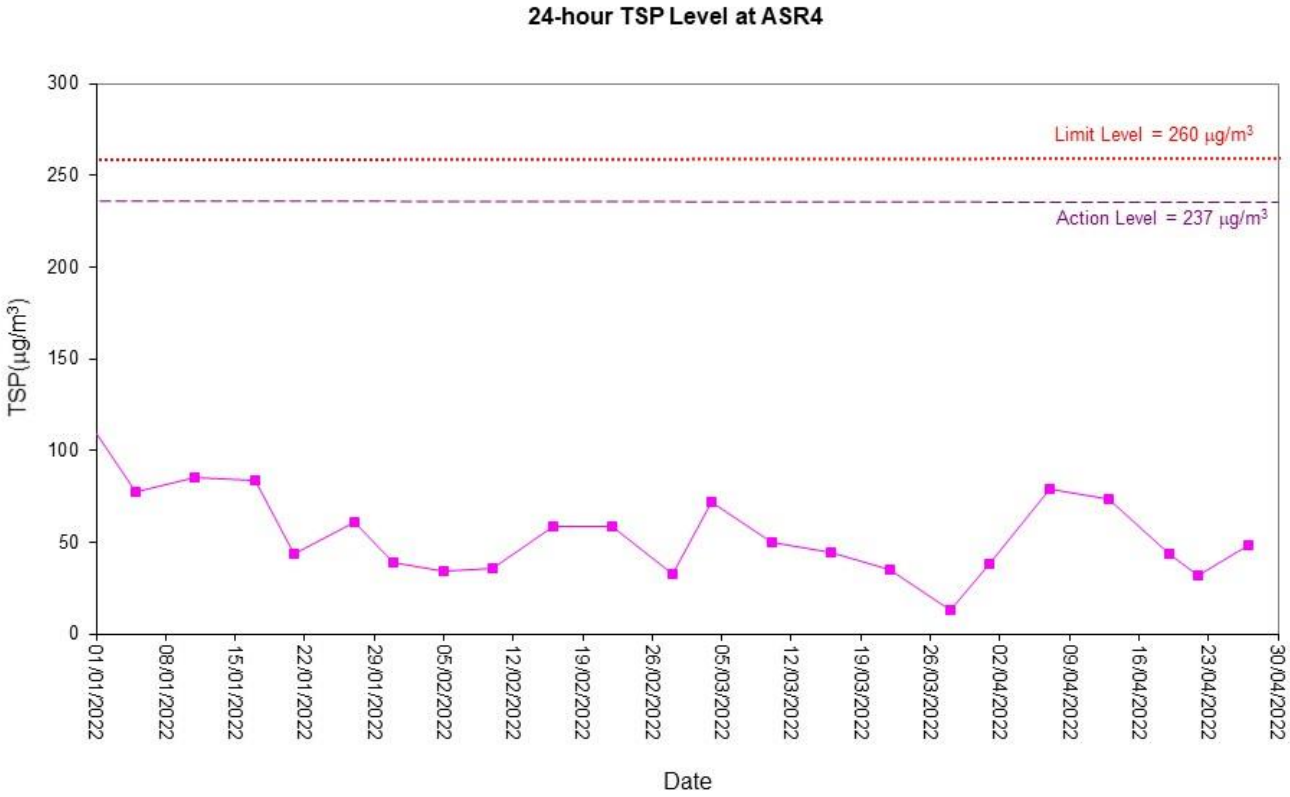
## Air Quality (24-hr TSP)



## Air Quality (24-hr TSP)



## Noise

### Station NSR1

| Date | Start Time | Noise Level for 30 min, dB(A) | | | Wind Speed (m/s) | Weather Condition | Limit Level, dB(A) |
|---|---|---|---|---|---|---|---|
| | | $L_{eq}$ | $L_{10}$ | $L_{90}$ | | | |
| 10-Feb-22 | 11:29 | 48 | 50 | 42 | 0.2 | Sunny | 75 |
| 16-Feb-22 | 11:28 | 49 | 50 | 43 | 0.5 | Sunny | 75 |
| 22-Feb-22 | 11:26 | 49 | 50 | 41 | 0.3 | Cloudy | 75 |
| 28-Feb-22 | 11:23 | 49 | 52 | 43 | 0.3 | Sunny | 75 |
| 10-Mar-22 | 11:28 | 49 | 50 | 44 | 0.3 | Sunny | 75 |
| 16-Mar-22 | 11:25 | 49 | 51 | 42 | 0.2 | Sunny | 75 |
| 22-Mar-22 | 11:18 | 48 | 51 | 41 | 0.3 | Sunny | 75 |
| 28-Mar-22 | 11:16 | 48 | 50 | 40 | 0.4 | Cloudy | 75 |
| 07-Apr-22 | 11:14 | 47 | 49 | 39 | 0.2 | Sunny | 75 |
| 13-Apr-22 | 15:56 | 48 | 49 | 40 | 0.2 | Sunny | 75 |
| 19-Apr-22 | 16:44 | 49 | 53 | 41 | 0.2 | Cloudy | 75 |
| 27-Apr-22 | 11:22 | 51 | 52 | 41 | 0.3 | Sunny | 75 |

### Station NSR3

| Date | Start Time | Noise Level for 30 min, dB(A) | | | Wind Speed (m/s) | Weather Condition | Limit Level, dB(A) |
|---|---|---|---|---|---|---|---|
| | | $L_{eq}$ | $L_{10}$ | $L_{90}$ | | | |
| 10-Feb-22 | 10:47 | 44 | 46 | 42 | 0.3 | Sunny | 75 |
| 16-Feb-22 | 10:48 | 47 | 49 | 41 | 0.6 | Sunny | 75 |
| 22-Feb-22 | 10:45 | 45 | 47 | 40 | 0.3 | Cloudy | 75 |
| 28-Feb-22 | 10:35 | 45 | 46 | 41 | 0.2 | Sunny | 75 |
| 10-Mar-22 | 10:44 | 46 | 49 | 42 | 0.3 | Sunny | 75 |
| 16-Mar-22 | 10:41 | 49 | 51 | 42 | 0.3 | Sunny | 75 |
| 22-Mar-22 | 10:35 | 44 | 48 | 40 | 0.2 | Sunny | 75 |
| 28-Mar-22 | 10:31 | 46 | 49 | 41 | 0.4 | Cloudy | 75 |
| 07-Apr-22 | 10:28 | 47 | 50 | 39 | 0.3 | Sunny | 75 |
| 13-Apr-22 | 15:05 | 45 | 49 | 39 | 0.3 | Sunny | 75 |
| 19-Apr-22 | 15:56 | 47 | 49 | 41 | 0.3 | Cloudy | 75 |
| 27-Apr-22 | 10:36 | 48 | 50 | 42 | 4:48 | Sunny | 75 |

## Noise

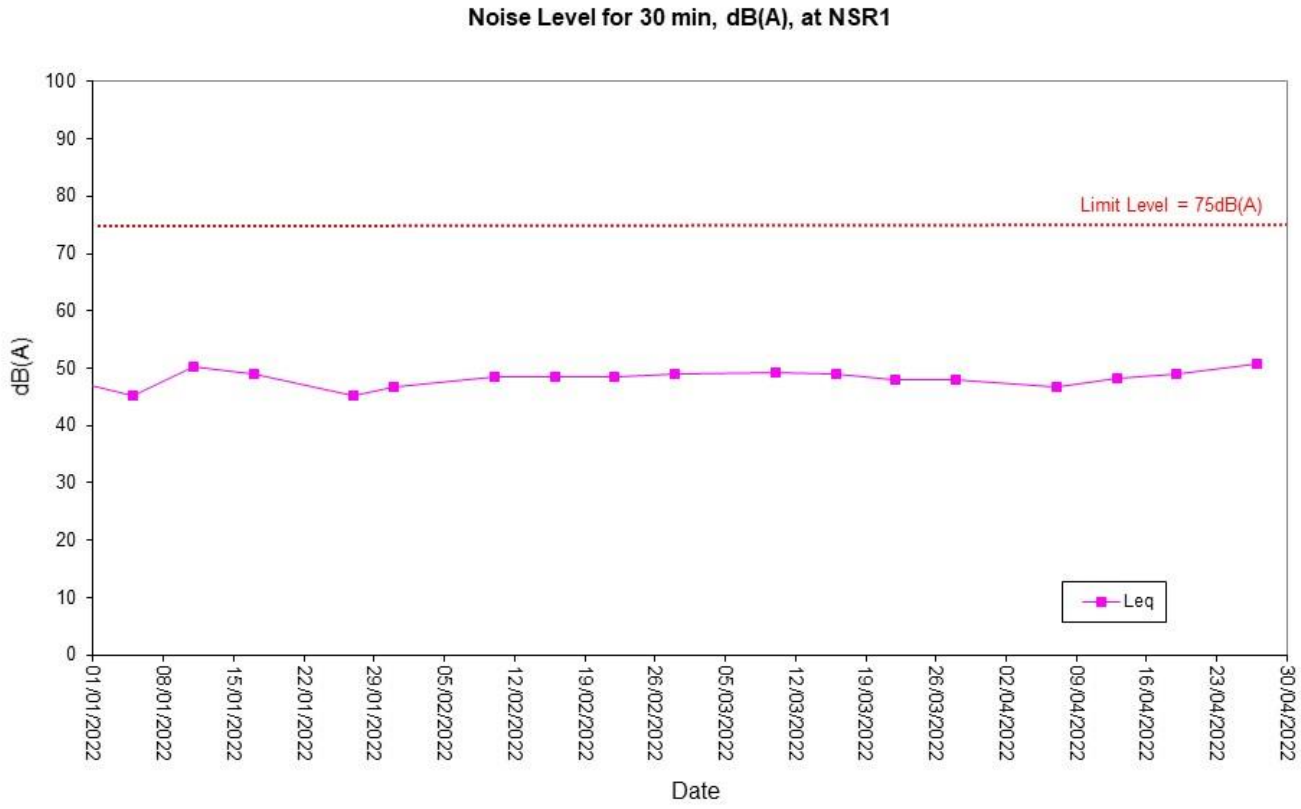
### Station NSR5

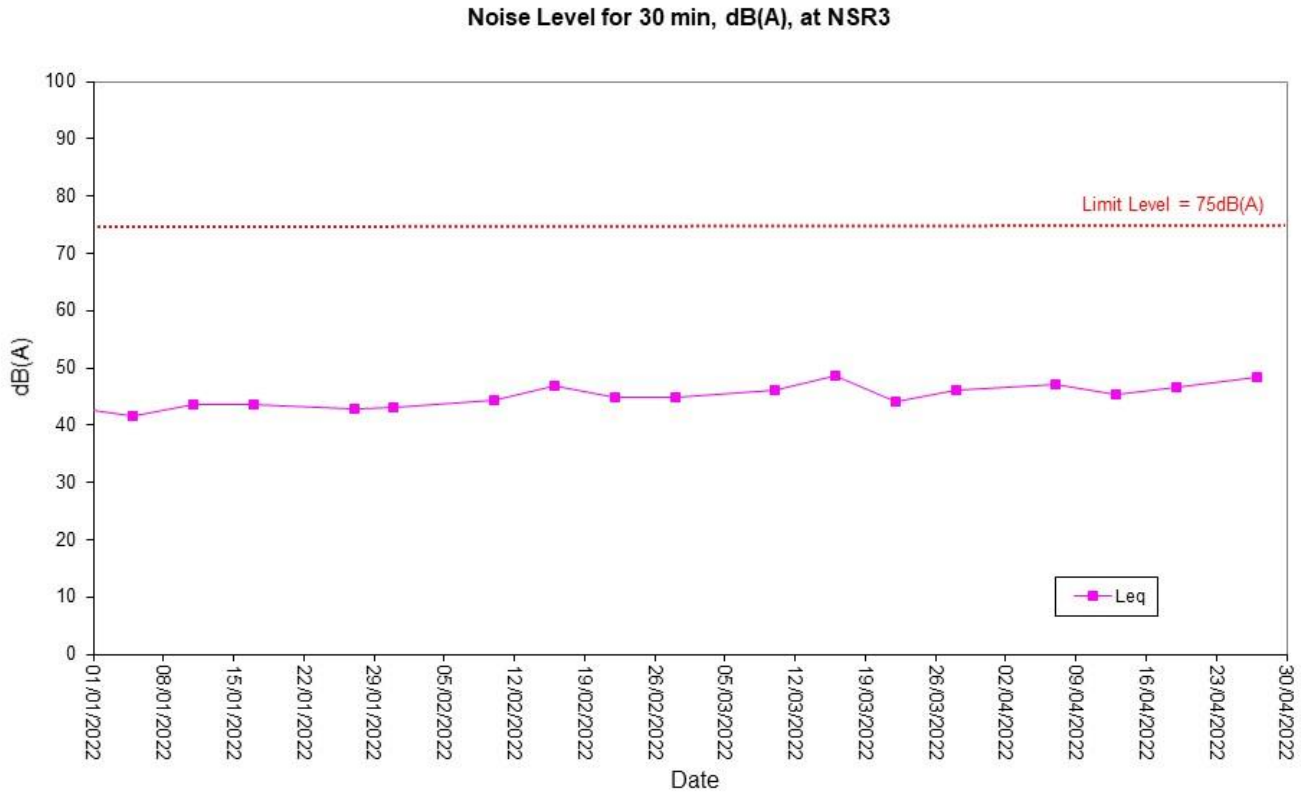
| Date | Start Time | Noise Level for 30 min, dB(A) | | | Wind Speed (m/s) | Weather Condition | Limit Level, dB(A) |
|---|---|---|---|---|---|---|---|
| | | $L_{eq}$ | $L_{10}$ | $L_{90}$ | | | |
| 10-Feb-22 | 10:03 | 49 | 50 | 45 | 0.2 | Sunny | 75 |
| 16-Feb-22 | 10:05 | 51 | 53 | 47 | 0.5 | Sunny | 75 |
| 22-Feb-22 | 9:58 | 49 | 51 | 45 | 0.3 | Cloudy | 75 |
| 28-Feb-22 | 9:44 | 51 | 52 | 46 | 0.3 | Sunny | 75 |
| 10-Mar-22 | 10:01 | 50 | 53 | 46 | 0.3 | Sunny | 75 |
| 16-Mar-22 | 9:54 | 48 | 49 | 45 | 0.2 | Sunny | 75 |
| 22-Mar-22 | 9:47 | 47 | 49 | 44 | 0.2 | Sunny | 75 |
| 28-Mar-22 | 9:44 | 50 | 52 | 46 | 0.5 | Cloudy | 75 |
| 07-Apr-22 | 9:41 | 49 | 50 | 41 | 0.2 | Sunny | 75 |
| 13-Apr-22 | 14:16 | 43 | 46 | 40 | 0.2 | Sunny | 75 |
| 19-Apr-22 | 15:10 | 47 | 49 | 42 | 0.3 | Cloudy | 75 |
| 27-Apr-22 | 9:44 | 50 | 52 | 45 | 0.2 | Sunny | 75 |

### Station NSR7

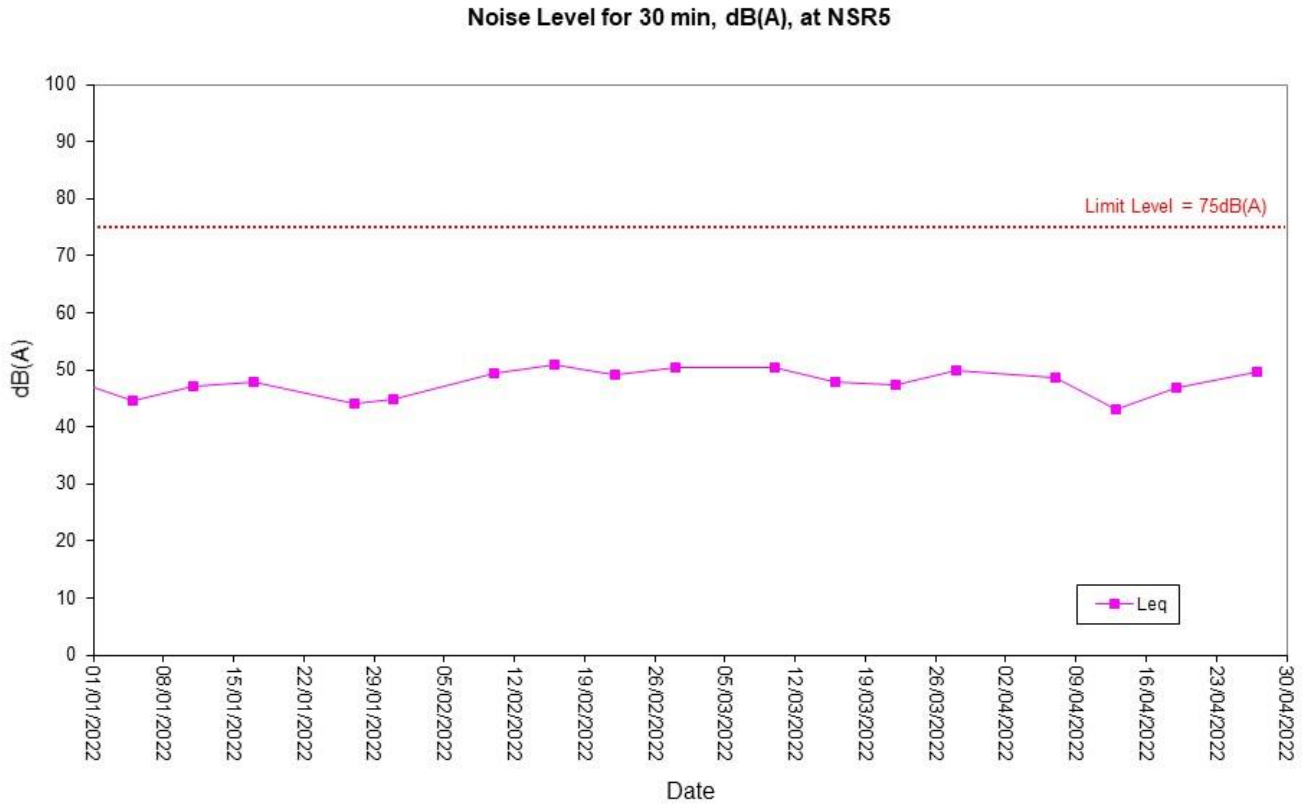
| Date | Start Time | Noise Level for 30 min, dB(A) | | | Wind Speed (m/s) | Weather Condition | Limit Level, dB(A) |
|---|---|---|---|---|---|---|---|
| | | $L_{eq}$ | $L_{10}$ | $L_{90}$ | | | |
| 10-Feb-22 | 9:18 | 66 | 68 | 63 | 0.3 | Sunny | 75 |
| 16-Feb-22 | 9:17 | 66 | 68 | 63 | 0.6 | Sunny | 75 |
| 22-Feb-22 | 9:12 | 68 | 70 | 64 | 0.2 | Cloudy | 75 |
| 28-Feb-22 | 9:00 | 67 | 69 | 64 | 0.2 | Sunny | 75 |
| 10-Mar-22 | 9:16 | 66 | 68 | 64 | 0.4 | Sunny | 75 |
| 16-Mar-22 | 9:03 | 66 | 68 | 63 | 0.3 | Sunny | 75 |
| 22-Mar-22 | 8:58 | 67 | 69 | 64 | 0.3 | Sunny | 75 |
| 28-Mar-22 | 8:57 | 67 | 69 | 64 | 0.4 | Cloudy | 75 |
| 07-Apr-22 | 8:58 | 66 | 67 | 63 | 0.3 | Sunny | 75 |
| 13-Apr-22 | 13:28 | 65 | 67 | 62 | 0.3 | Sunny | 75 |
| 19-Apr-22 | 14:23 | 66 | 68 | 64 | 0.3 | Cloudy | 75 |
| 27-Apr-22 | 8:57 | 65 | 67 | 62 | 0.3 | Sunny | 75 |

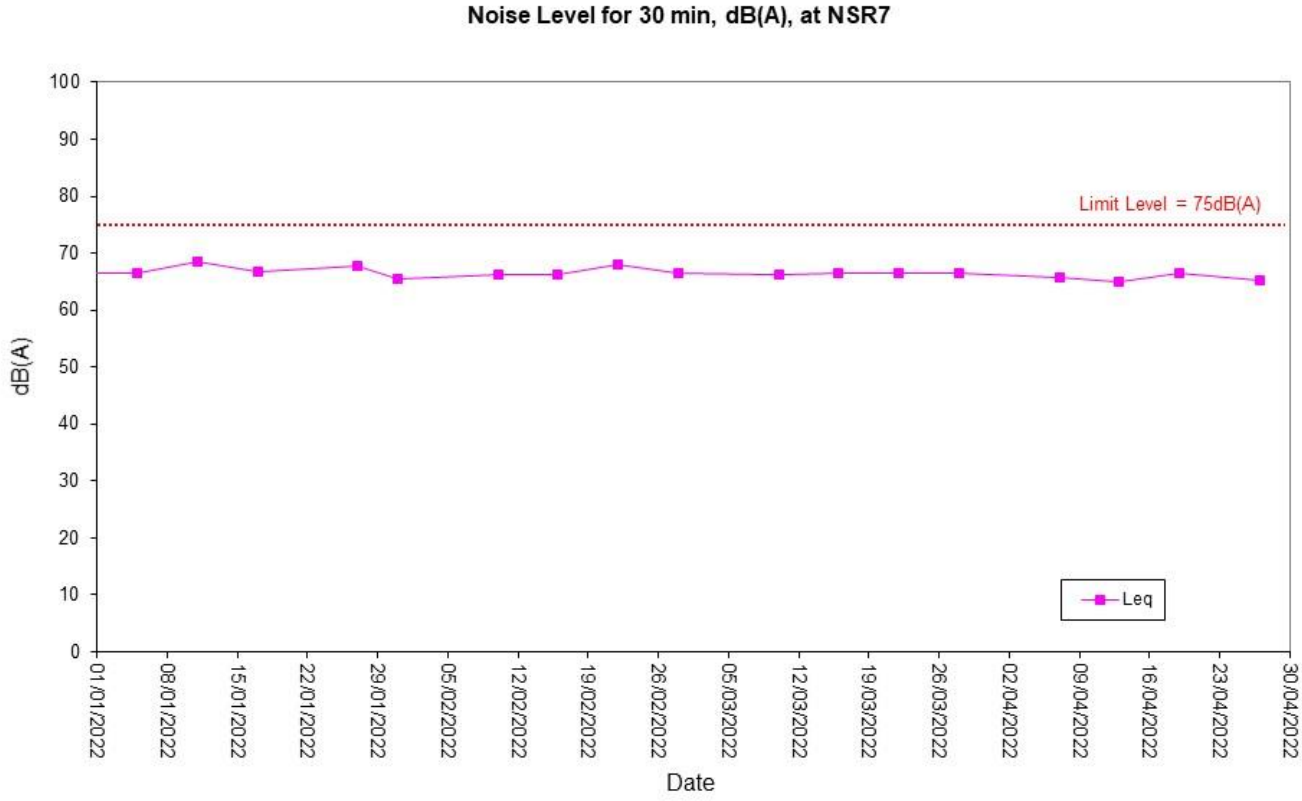
## Noise


Noise Level for 30 min, dB(A), at NSR1
Limit Level = 75dB(A)
Leq
dB(A)
Date
100
90
80
70
60
50
40
30
20
10
0
01/01/2022
08/01/2022
15/01/2022
22/01/2022
29/01/2022
05/02/2022
12/02/2022
19/02/2022
26/02/2022
05/03/2022
12/03/2022
19/03/2022
26/03/2022
02/04/2022
09/04/2022
16/04/2022
23/04/2022
30/04/2022


Noise Level for 30 min, dB(A), at NSR3
Limit Level = 75dB(A)
Leq
dB(A)
Date
100
90
80
70
60
50
40
30
20
10
0
01/01/2022
08/01/2022
15/01/2022
22/01/2022
29/01/2022
05/02/2022
12/02/2022
19/02/2022
26/02/2022
05/03/2022
12/03/2022
19/03/2022
26/03/2022
02/04/2022
09/04/2022
16/04/2022
23/04/2022
30/04/2022

## Noise


Noise Level for 30 min, dB(A), at NSR5
100
90
80
70
60
50
40
30
20
10
0
dB(A)
Limit Level = 75dB(A)
Leq
01/01/2022
08/01/2022
15/01/2022
22/01/2022
29/01/2022
05/02/2022
12/02/2022
19/02/2022
26/02/2022
05/03/2022
12/03/2022
19/03/2022
26/03/2022
02/04/2022
09/04/2022
16/04/2022
23/04/2022
30/04/2022
Date


Noise Level for 30 min, dB(A), at NSR7
100
90
80
70
60
50
40
30
20
10
0
dB(A)
Limit Level = 75dB(A)
Leq
01/01/2022
08/01/2022
15/01/2022
22/01/2022
29/01/2022
05/02/2022
12/02/2022
19/02/2022
26/02/2022
05/03/2022
12/03/2022
19/03/2022
26/03/2022
02/04/2022
09/04/2022
16/04/2022
23/04/2022
30/04/2022
Date

## Water Quality

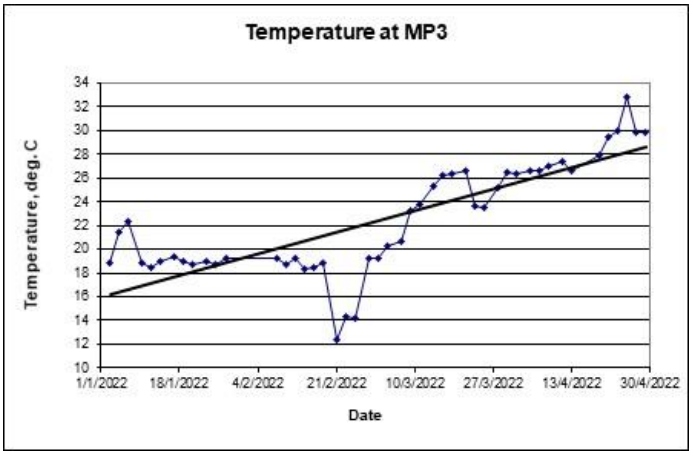
### Monitoring Location MP3

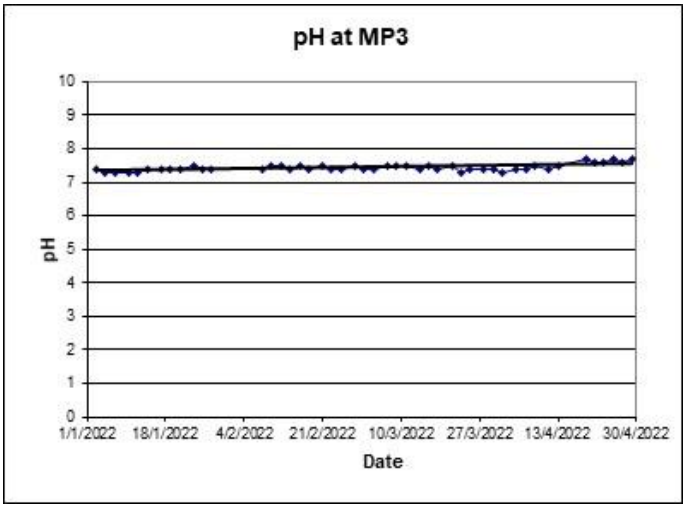
| Monitoring Date | Temp (°C) | pH | Dissolved Oxygen (mg/L) | DO (%) | Turbidity (NT) | BOD (mg/L) | Suspended Solids (mg/L) |
|---|---|---|---|---|---|---|---|
| **MP3** | | | | | | | |
| 08-02-22 | 19.2 | 7.4 | 7.3 | 86.9 | 18.2 | 2 | 17 |
| 10-02-22 | 18.7 | 7.5 | 7.4 | 89.7 | 33.1 | 5 | 33 |
| 12-02-22 | 19.2 | 7.5 | 7.3 | 87.8 | 23.3 | 2 | 25 |
| 14-02-22 | 18.3 | 7.4 | 7.0 | 83.7 | 12.5 | <2 | 13 |
| 16-02-22 | 18.5 | 7.5 | 7.2 | 86.5 | 35.8 | 4 | 41 |
| 18-02-22 | 18.8 | 7.4 | 7.1 | 71.6 | 17.0 | 4 | 18 |
| 21-02-22 | 12.4 | 7.5 | **6.6** | 60.4 | 22.3 | 5 | 19 |
| 23-02-22 | 14.3 | 7.4 | 7.0 | 68.6 | 29.6 | 5 | 27 |
| 25-02-22 | 14.2 | 7.4 | 7.1 | 70.4 | 18.9 | 3 | 22 |
| 28-02-22 | 19.2 | 7.5 | 7.2 | 85.8 | 36.2 | 4 | 35 |
| 02-03-22 | 19.2 | 7.4 | 7.3 | 87.7 | 16.7 | 4 | 27 |
| 04-03-22 | 20.3 | 7.4 | 7.4 | 90.8 | 29.3 | 5 | 32 |
| 07-03-22 | 20.6 | 7.5 | 7.4 | 91.8 | 30.3 | 3 | 39 |
| 09-03-22 | 23.2 | 7.5 | 7.6 | 89.5 | 21.2 | 3 | 22 |
| 11-03-22 | 23.7 | 7.5 | 7.5 | 87.9 | 22.9 | 3 | 29 |
| 14-03-22 | 25.3 | 7.4 | 7.7 | 93.0 | 29.2 | 4 | 49 |
| 16-03-22 | 26.2 | 7.5 | 7.7 | 98.0 | 27.3 | 16 | **71** |
| 18-03-22 | 26.3 | 7.4 | 7.8 | 97.4 | 31.1 | 5 | 28 |
| 21-03-22 | 26.6 | 7.5 | 7.6 | 95.2 | 34.6 | 7 | 38 |
| 23-03-22 | 23.6 | 7.3 | 7.5 | 89.0 | 26.3 | 10 | 26 |
| 25-03-22 | 23.5 | 7.4 | 7.6 | 90.4 | 28.9 | 17 | 17 |
| 28-03-22 | 25.2 | 7.4 | 7.7 | 93.0 | 27.5 | 15 | 16 |
| 30-03-22 | 26.5 | 7.4 | 7.6 | 95.3 | 18.9 | 3 | 16 |
| 01-04-22 | 26.4 | 7.3 | 7.6 | 94.1 | 42.1 | 4 | 35 |
| 04-04-22 | 26.6 | 7.4 | 7.7 | 95.3 | 34.6 | 2 | 35 |
| 06-04-22 | 26.6 | 7.4 | 7.7 | 96.3 | 35.4 | 4 | 30 |
| 08-04-22 | 27.0 | 7.5 | 7.8 | 98.5 | 13.0 | 3 | 12 |
| 11-04-22 | 27.4 | 7.4 | 7.7 | 97.4 | 17.0 | 4 | 25 |
| 13-04-22 | 26.6 | 7.5 | 7.5 | 93.5 | 26.2 | 7 | 21 |
| 19-04-22 | 27.9 | **7.7** | 7.7 | 98.5 | 18.1 | 3 | 12 |
| 21-04-22 | 29.5 | **7.6** | 7.4 | 98.2 | 20.5 | 3 | 33 |
| 23-04-22 | 30.0 | **7.6** | 7.3 | 103.9 | 19.9 | 4 | 18 |
| 25-04-22 | 32.8 | **7.7** | 7.2 | 102.4 | 27.1 | 5 | 26 |
| 27-04-22 | 29.9 | **7.6** | 7.1 | 100.0 | 35.4 | 8 | 47 |
| 29-04-22 | 29.9 | **7.7** | 7.2 | 96.4 | 21.9 | 4 | 21 |
| Average | 23.5 | 7.5 | 7.4 | 90.4 | 25.8 | 5 | 28 |
| Action Level | - | <5.5 or >7.5 | <6.85 | - | >64 | - | >65 |
| Limit Level | - | <4.0 or >8.0 | <6.65 | - | >67 | - | >66 |

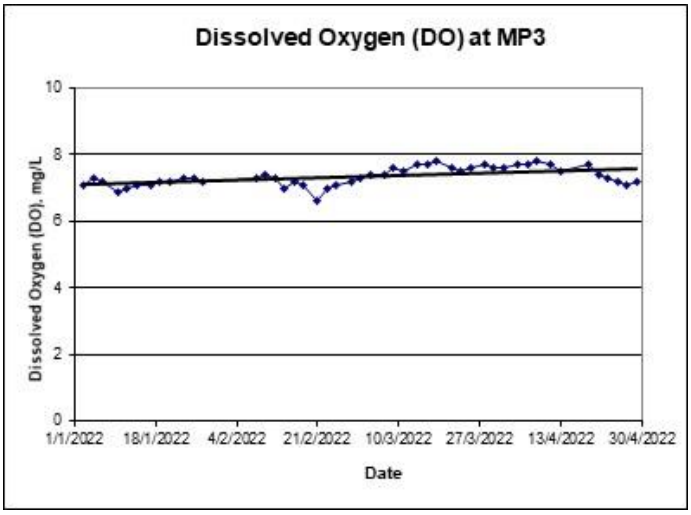
Notes:
(1) <2: Value is too low to indicate (<2mg/L).
(2) For the Limit Level of DO, 1-percentile of baseline data is adopted as it is greater than 2mg/L. (Refer to Baseline Monitoring Report)
(3) Values **Bold** indicate Action Level exceedance.
(4) Values **Underlined and Bold** indicate Limit Level exceedance.

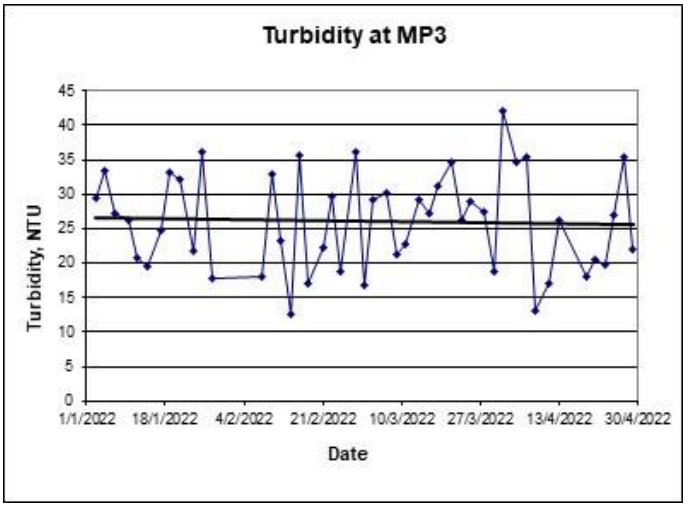
## Water Quality

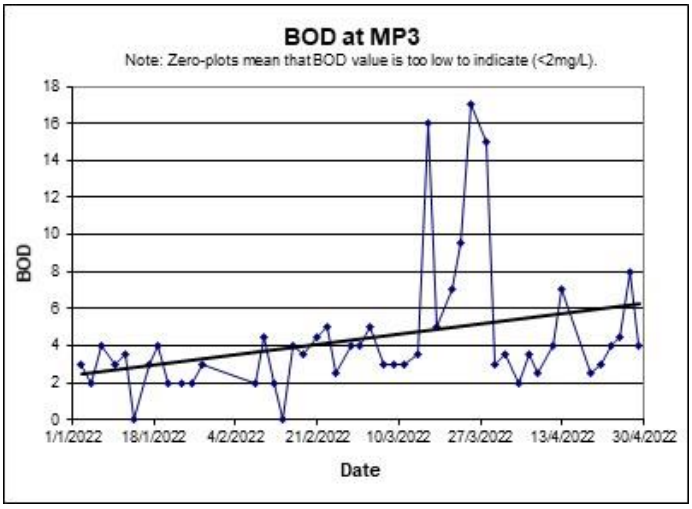
### Monitoring Location MP3

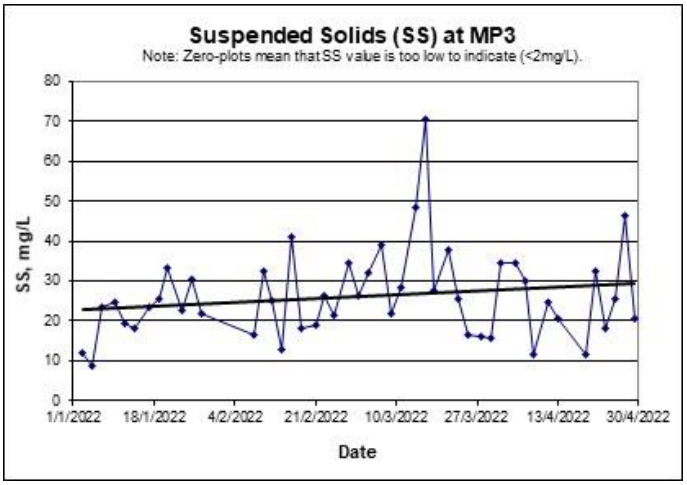


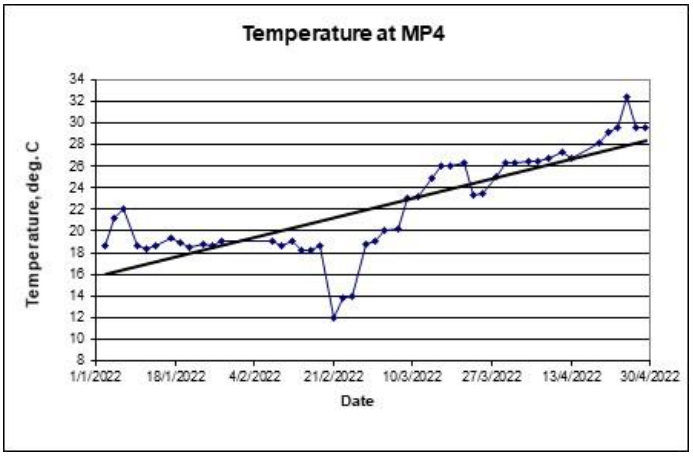
## Water Quality

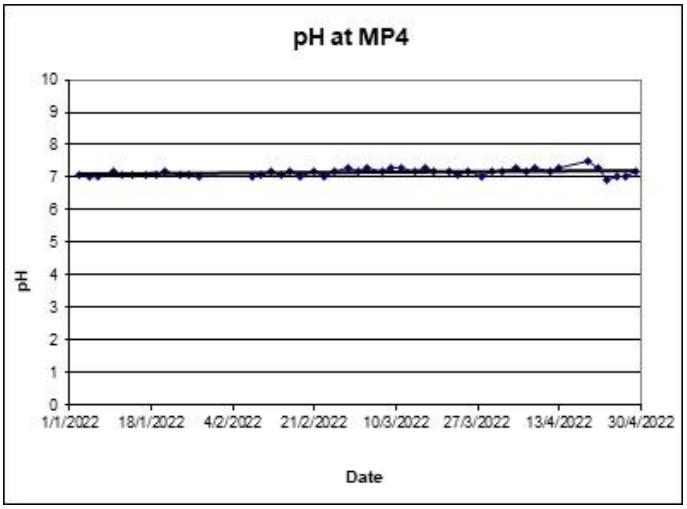
### Monitoring Location MP4

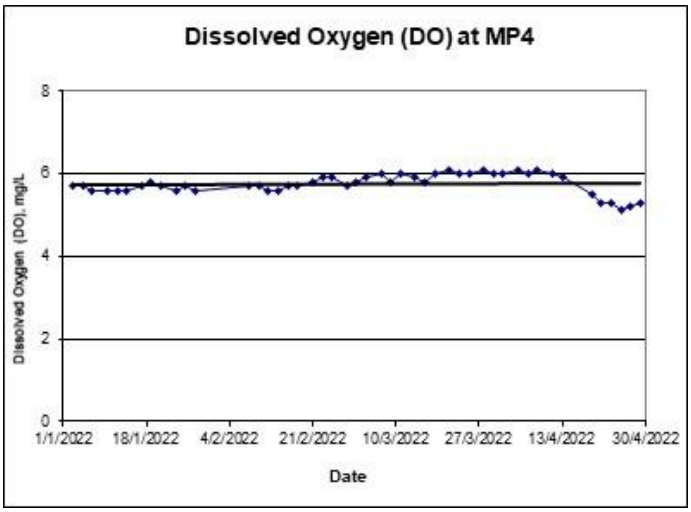
| Monitoring Date | Temp (°C) | pH | Dissolved Oxygen (mg/L) | DO (%) | Turbidity (NT) | BOD (mg/L) | Suspended Solids (mg/L) |
|---|---|---|---|---|---|---|---|
| **MP4** | | | | | | | |
| 08-02-22 | 19.0 | 7.0 | 5.7 | 73.0 | 19.8 | 3 | 17 |
| 10-02-22 | 18.6 | 7.1 | 5.7 | 74.1 | 33.9 | 4 | 36 |
| 12-02-22 | 19.1 | 7.2 | 5.6 | 71.8 | 29.6 | 3 | 26 |
| 14-02-22 | 18.2 | 7.1 | 5.6 | 67.9 | 14.7 | 5 | 13 |
| 16-02-22 | 18.2 | 7.2 | 5.7 | 71.4 | 40.7 | 4 | 38 |
| 18-02-22 | 18.7 | 7.0 | 5.7 | 62.0 | 18.3 | 3 | 22 |
| 21-02-22 | 12.0 | 7.2 | 5.8 | 54.2 | 24.3 | 4 | 20 |
| 23-02-22 | 13.8 | 7.0 | 5.9 | 63.2 | 32.2 | 4 | 31 |
| 25-02-22 | 13.9 | 7.2 | 5.9 | 63.8 | 19.2 | 3 | 20 |
| 28-02-22 | 18.8 | 7.3 | 5.7 | 73.6 | 36.6 | 4 | 33 |
| 02-03-22 | 19.0 | 7.2 | 5.8 | 75.0 | 20.1 | 8 | 28 |
| 04-03-22 | 20.0 | 7.3 | 5.9 | 78.4 | 29.9 | 5 | 31 |
| 07-03-22 | 20.2 | 7.2 | 6.0 | 79.8 | 38.2 | 5 | **54** |
| 09-03-22 | 23.1 | 7.3 | 5.8 | 69.6 | 22.4 | 4 | 24 |
| 11-03-22 | 23.2 | 7.3 | 6.0 | 69.8 | 23.1 | 4 | 26 |
| 14-03-22 | 24.9 | 7.2 | 5.9 | 71.9 | 35.2 | 5 | 39 |
| 16-03-22 | 26.0 | 7.3 | 5.8 | 72.6 | 33.8 | 16 | **69** |
| 18-03-22 | 26.0 | 7.2 | 6.0 | 74.6 | 34.5 | 6 | 32 |
| 21-03-22 | 26.3 | 7.2 | 6.1 | 76.3 | 36.2 | 7 | 40 |
| 23-03-22 | 23.3 | 7.1 | 6.0 | 70.4 | 32.4 | 12 | 26 |
| 25-03-22 | 23.4 | 7.2 | 6.0 | 70.2 | 33.2 | 3 | 20 |
| 28-03-22 | 25.0 | 7.0 | 6.1 | 74.3 | 32.1 | 17 | 25 |
| 30-03-22 | 26.3 | 7.2 | 6.0 | 74.0 | 36.5 | <2 | 38 |
| 01-04-22 | 26.3 | 7.2 | 6.0 | 74.1 | 42.9 | 4 | 42 |
| 04-04-22 | 26.4 | 7.3 | 6.1 | 76.4 | 39.6 | 5 | 45 |
| 06-04-22 | 26.4 | 7.2 | 6.0 | 74.2 | 42.0 | 5 | 39 |
| 08-04-22 | 26.8 | 7.3 | 6.1 | 76.2 | 13.6 | 4 | 13 |
| 11-04-22 | 27.3 | 7.2 | 6.0 | 76.5 | 18.0 | 4 | 19 |
| 13-04-22 | 26.7 | 7.3 | 5.9 | 74.3 | 17.7 | 4 | 28 |
| 19-04-22 | 28.1 | 7.5 | 5.5 | 66.9 | 20.4 | 3 | 19 |
| 21-04-22 | 29.1 | 7.3 | 5.3 | 57.3 | 27.3 | 7 | 33 |
| 23-04-22 | 29.6 | 6.9 | 5.3 | 56.8 | 22.5 | 4 | 21 |
| 25-04-22 | 32.4 | 7.0 | 5.1 | 67.4 | 21.6 | 4 | 22 |
| 27-04-22 | 29.5 | 7.0 | 5.2 | 59.7 | 38.1 | 8 | 35 |
| 29-04-22 | 29.5 | 7.2 | 5.3 | 59.9 | 22.6 | 4 | 22 |
| Average | 23.3 | 7.2 | 5.8 | 70.0 | 28.6 | 5 | 30 |
| Action Level | - | <5.5 or >7.5 | <3.91 | - | >60 | - | >50 |
| Limit Level | - | <4.0 or >8.0 | <3.82 | - | >64 | - | >53 |

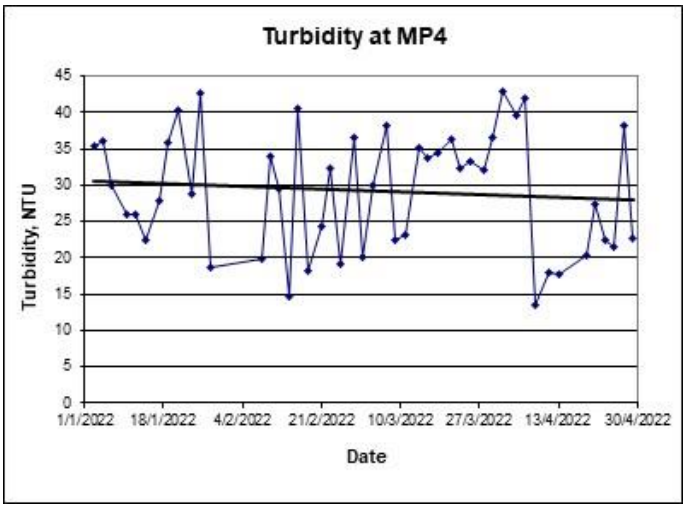
Notes:
(1) <2: Value is too low to indicate (<2mg/L).
(2) For the Limit Level of DO, 1-percentile of baseline data is adopted as it is greater than 2mg/L. (Refer to Baseline Monitoring Report)
(3) Values **Bold** indicate Action Level exceedance.
(4) Values **Underlined and Bold** indicate Limit Level exceedance

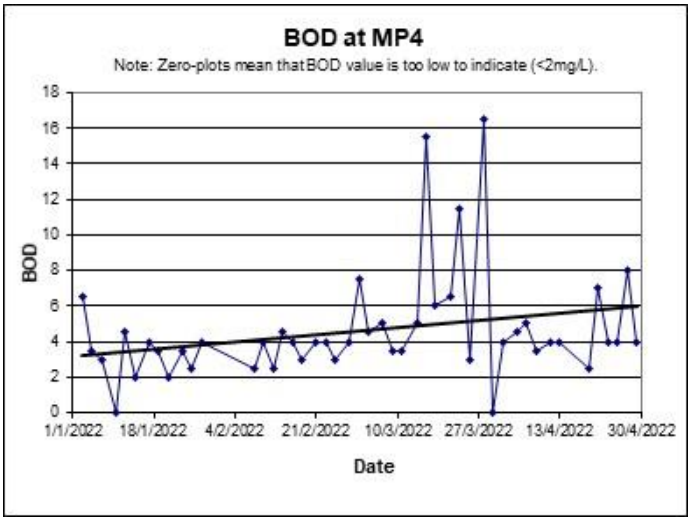
**Monitoring Location MP4**

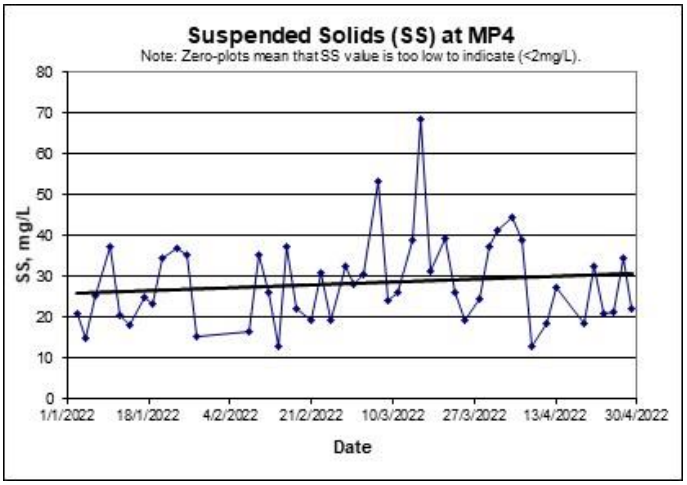


## Water Quality

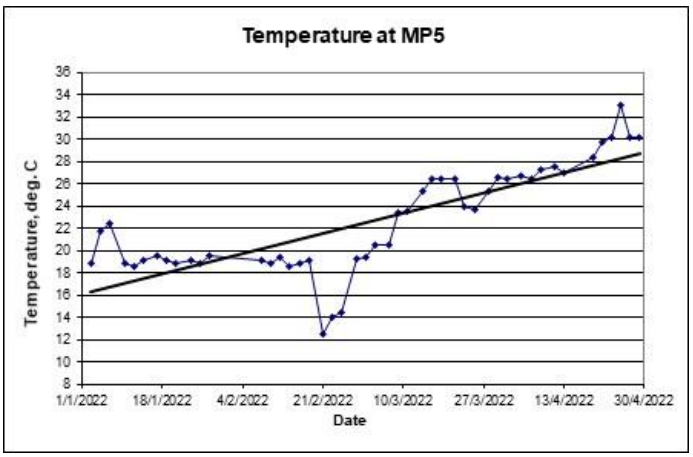
### Monitoring Location MP5

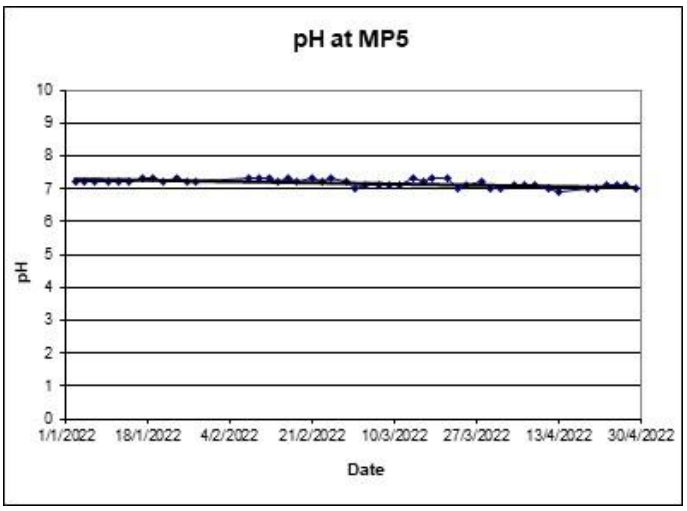
| Monitoring Date | Temp (°C) | pH | Dissolved Oxygen (mg/L) | DO (%) | Turbidity (NT) | BOD (mg/L) | Suspended Solids (mg/L) |
|---|---|---|---|---|---|---|---|
| **MP5** | | | | | | | |
| 08-02-22 | 19.2 | 7.3 | 5.5 | 68.0 | 21.1 | 4 | 24 |
| 10-02-22 | 18.8 | 7.3 | 5.4 | 67.7 | 36.7 | 4 | 36 |
| 12-02-22 | 19.4 | 7.3 | 5.4 | 67.5 | 31.5 | 3 | 31 |
| 14-02-22 | 18.6 | 7.2 | 5.3 | 60.9 | 23.1 | 6 | 24 |
| 16-02-22 | 18.8 | 7.3 | 5.4 | 65.4 | 41.0 | 4 | 37 |
| 18-02-22 | 19.2 | 7.2 | 5.6 | 60.5 | 23.3 | 4 | 30 |
| 21-02-22 | 12.5 | 7.3 | 5.7 | 51.0 | 26.1 | 6 | 26 |
| 23-02-22 | 14.1 | 7.2 | 5.7 | 55.4 | 35.6 | 4 | 33 |
| 25-02-22 | 14.4 | 7.3 | 5.6 | 58.8 | 24.6 | 4 | 22 |
| 28-02-22 | 19.3 | 7.2 | 5.6 | 69.8 | 43.0 | 5 | 38 |
| 02-03-22 | 19.4 | 7.0 | 5.6 | 69.6 | 32.4 | 10 | 35 |
| 04-03-22 | 20.5 | 7.1 | 5.6 | 70.9 | 38.1 | 6 | 40 |
| 07-03-22 | 20.5 | 7.1 | 5.7 | 74.1 | 43.0 | 6 | 40 |
| 09-03-22 | 23.4 | 7.1 | 5.5 | 66.5 | 30.3 | 4 | 35 |
| 11-03-22 | 23.5 | 7.1 | 5.7 | 67.4 | 37.2 | 6 | 40 |
| 14-03-22 | 25.4 | 7.3 | 6.0 | 73.5 | 42.8 | 6 | 41 |
| 16-03-22 | 26.5 | 7.2 | 5.6 | 69.4 | 38.4 | 21 | 59 |
| 18-03-22 | 26.4 | 7.3 | 5.7 | 70.0 | 37.8 | 6 | 30 |
| 21-03-22 | 26.5 | 7.3 | 5.8 | 72.4 | 39.9 | 4 | 27 |
| 23-03-22 | 23.9 | 7.0 | 5.9 | 69.6 | 35.4 | 5 | 31 |
| 25-03-22 | 23.7 | 7.1 | 5.8 | 67.9 | 44.5 | 4 | 32 |
| 28-03-22 | 25.4 | 7.2 | 5.8 | 71.7 | 36.8 | 17 | 22 |
| 30-03-22 | 26.6 | 7.0 | 5.8 | 72.0 | 40.3 | 9 | 37 |
| 01-04-22 | 26.5 | 7.0 | 5.8 | 72.3 | 47.6 | 4 | 49 |
| 04-04-22 | 26.7 | 7.1 | 5.9 | 74.1 | 41.0 | 2 | 43 |
| 06-04-22 | 26.5 | 7.1 | 5.8 | 72.0 | 43.9 | 3 | 39 |
| 08-04-22 | 27.3 | 7.1 | 5.9 | 74.2 | 19.3 | 4 | 17 |
| 11-04-22 | 27.6 | 7.0 | 5.9 | 75.0 | 21.9 | 5 | 20 |
| 13-04-22 | 27.0 | 6.9 | 5.7 | 71.2 | 30.5 | 8 | 27 |
| 19-04-22 | 28.4 | 7.0 | 5.3 | 63.6 | 28.8 | 4 | 29 |
| 21-04-22 | 29.7 | 7.0 | 5.2 | 61.0 | 39.5 | 6 | 39 |
| 23-04-22 | 30.2 | 7.1 | 5.1 | 58.6 | 25.4 | 4 | 23 |
| 25-04-22 | 33.0 | 7.1 | 5.3 | 74.2 | 35.7 | 6 | 31 |
| 27-04-22 | 30.1 | 7.1 | 5.7 | 68.0 | 42.1 | 9 | 41 |
| 29-04-22 | 30.1 | 7.0 | 5.4 | 63.0 | 31.8 | 6 | 27 |
| Average | 23.7 | 7.1 | 5.6 | 67.6 | 34.6 | 6 | 33 |
| Action Level | - | <5.5 or >7.5 | <4.13 | - | >81 | - | >66 |
| Limit Level | - | <4.0 or >8.0 | <3.87 | - | >84 | - | >69 |

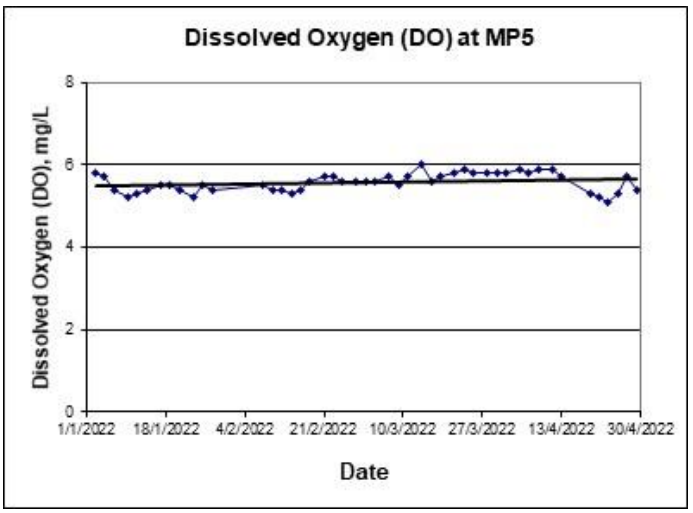
Notes:
(1) <2: Value is too low to indicate (<2mg/L).
(2) For the Limit Level of DO, 1-percentile of baseline data is adopted as it is greater than 2mg/L. (Refer to Baseline Monitoring Report)
(3) Values **Bold** indicate Action Level exceedance.
(4) Values **Underlined and Bold** indicate Limit Level exceedance.

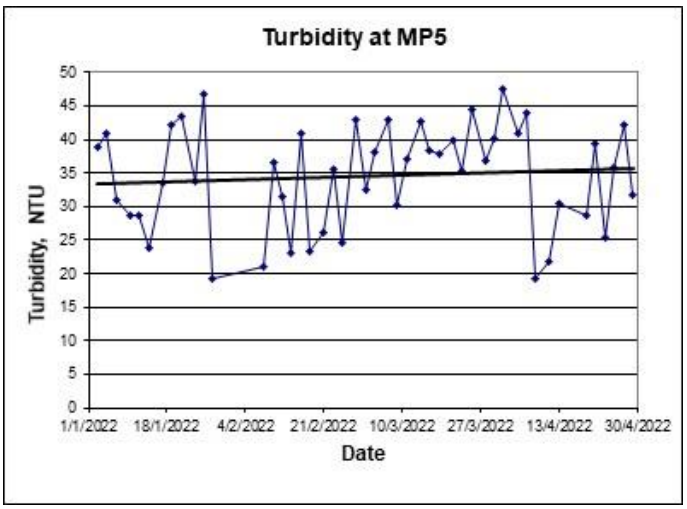
## Water Quality

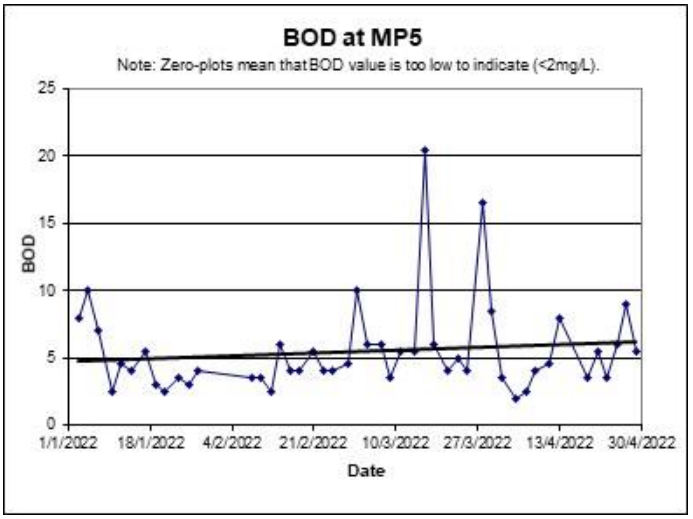
### Monitoring Location MP5

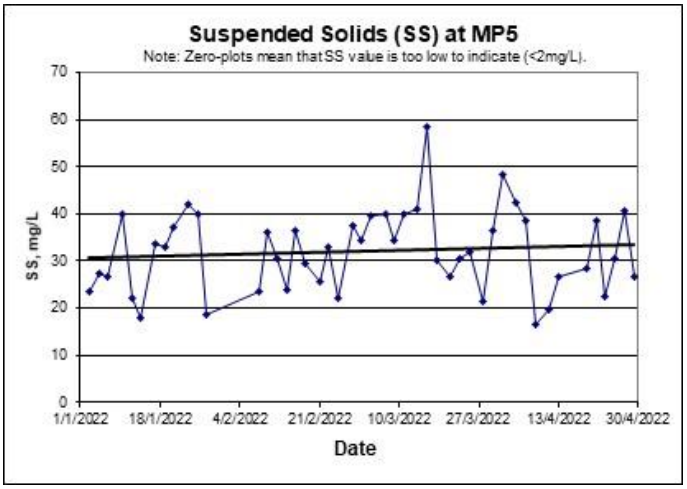


## Water Quality

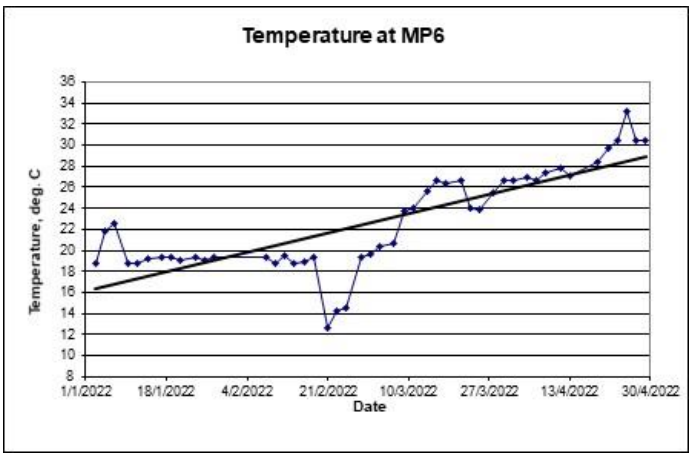
### Monitoring Location MP6

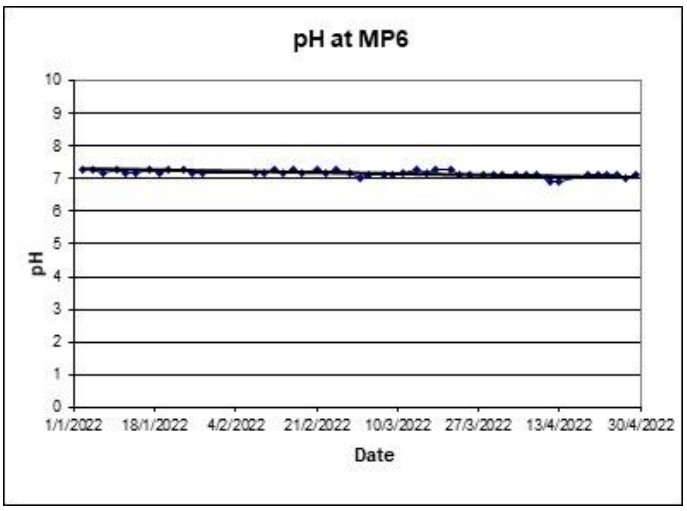
| Monitoring Date | Temp (°C) | pH | Dissolved Oxygen (mg/L) | DO (%) | Turbidity (NT) | BOD (mg/L) | Suspended Solids (mg/L) |
|---|---|---|---|---|---|---|---|
| **MP6** | | | | | | | |
| 08-02-22 | 19.3 | 7.2 | 5.3 | 64.1 | 25.6 | 3 | 28 |
| 10-02-22 | 18.7 | 7.2 | 5.3 | 64.7 | 40.8 | 4 | 44 |
| 12-02-22 | 19.5 | 7.3 | 5.3 | 64.9 | 32.1 | 4 | 40 |
| 14-02-22 | 18.7 | 7.2 | 5.2 | 59.1 | 28.6 | 7 | 25 |
| 16-02-22 | 18.9 | 7.3 | 5.2 | 59.8 | 42.2 | 4 | 39 |
| 18-02-22 | 19.4 | 7.2 | 5.5 | 79.1 | 40.0 | 6 | 50 |
| 21-02-22 | 12.6 | 7.3 | 5.6 | 50.8 | 27.9 | 6 | 30 |
| 23-02-22 | 14.3 | 7.2 | 5.6 | 54.2 | 39.8 | 4 | 36 |
| 25-02-22 | 14.5 | 7.3 | 5.5 | 57.5 | 29.1 | 4 | 31 |
| 28-02-22 | 19.4 | 7.2 | 5.5 | 67.4 | 44.5 | 5 | 36 |
| 02-03-22 | 19.6 | 7.0 | 5.5 | 68.1 | 39.3 | 10 | 38 |
| 04-03-22 | 20.4 | 7.1 | 5.5 | 69.0 | 47.7 | 7 | 62 |
| 07-03-22 | 20.6 | 7.1 | 5.6 | 71.7 | 46.5 | 8 | 49 |
| 09-03-22 | 23.7 | 7.1 | 5.6 | 67.9 | 41.1 | 6 | 46 |
| 11-03-22 | 24.0 | 7.2 | 5.5 | 64.9 | 40.8 | 7 | 42 |
| 14-03-22 | 25.6 | 7.3 | 5.7 | 69.4 | 43.6 | 5 | 46 |
| 16-03-22 | 26.6 | 7.2 | 5.4 | 66.3 | 44.6 | 18 | 48 |
| 18-03-22 | 26.4 | 7.3 | 5.5 | 67.9 | 41.8 | 7 | 33 |
| 21-03-22 | 26.6 | 7.3 | 5.6 | 70.5 | 43.3 | 13 | 37 |
| 23-03-22 | 24.0 | 7.1 | 5.7 | 68.3 | 36.6 | 10 | 29 |
| 25-03-22 | 23.9 | 7.1 | 5.5 | 65.2 | 46.6 | 16 | 41 |
| 28-03-22 | 25.5 | 7.1 | 5.6 | 69.4 | 39.1 | 16 | 28 |
| 30-03-22 | 26.7 | 7.1 | 5.5 | 69.7 | 44.3 | 7 | 37 |
| 01-04-22 | 26.6 | 7.1 | 5.6 | 70.4 | 49.0 | 4 | 49 |
| 04-04-22 | 26.9 | 7.1 | 5.8 | 73.6 | 44.3 | 2 | 42 |
| 06-04-22 | 26.7 | 7.1 | 5.7 | 70.7 | 48.8 | 4 | 50 |
| 08-04-22 | 27.4 | 7.1 | 5.7 | 72.4 | 22.7 | 5 | 21 |
| 11-04-22 | 27.8 | 6.9 | 5.7 | 71.8 | 27.4 | 4 | 29 |
| 13-04-22 | 27.1 | 6.9 | 5.6 | 69.8 | 40.0 | 11 | 31 |
| 19-04-22 | 28.4 | 7.1 | 5.3 | 63.9 | 33.5 | 4 | 36 |
| 21-04-22 | 29.8 | 7.1 | 5.0 | 62.8 | 48.3 | 7 | 48 |
| 23-04-22 | 30.5 | 7.1 | 5.0 | 56.5 | 26.7 | 4 | 24 |
| 25-04-22 | 33.3 | 7.1 | 5.3 | 71.2 | 37.4 | 7 | 30 |
| 27-04-22 | 30.4 | 7.0 | 5.5 | 63.9 | 42.6 | 9 | 38 |
| 29-04-22 | 30.4 | 7.1 | 5.4 | 60.4 | 36.9 | 6 | 32 |
| Average | 23.8 | 7.1 | 5.5 | 66.2 | 38.9 | 7 | 38 |
| Action Level | - | <5.5 or >7.5 | <4.61 | - | >94 | - | >75 |
| Limit Level | - | <4.0 or >8.0 | <4.52 | - | >96 | - | >75 |

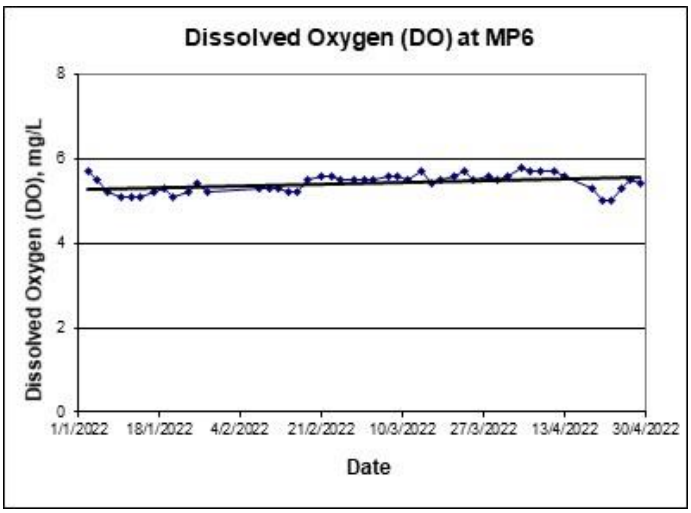
Notes:
(1) <2: Value is too low to indicate (<2mg/L).
(2) For the Limit Level of DO, 1-percentile of baseline data is adopted as it is greater than 2mg/L. (Refer to Baseline Monitoring Report)
(3) Values **Bold** indicate Action Level exceedance.
(4) Values **Underlined and Bold** indicate Limit Level exceedance.

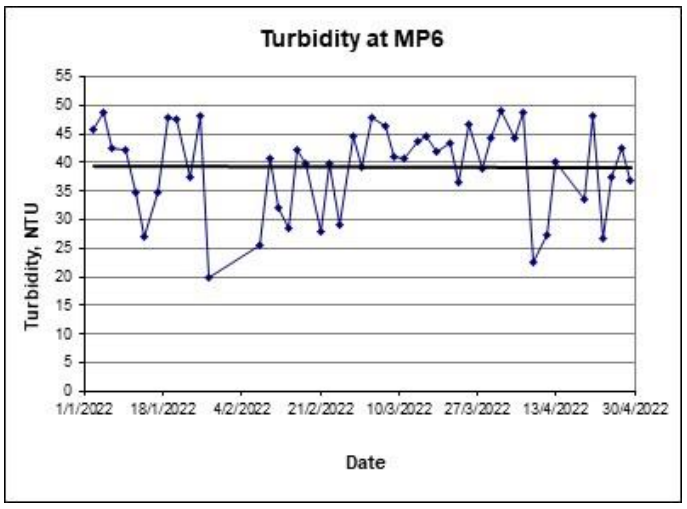
## Water Quality

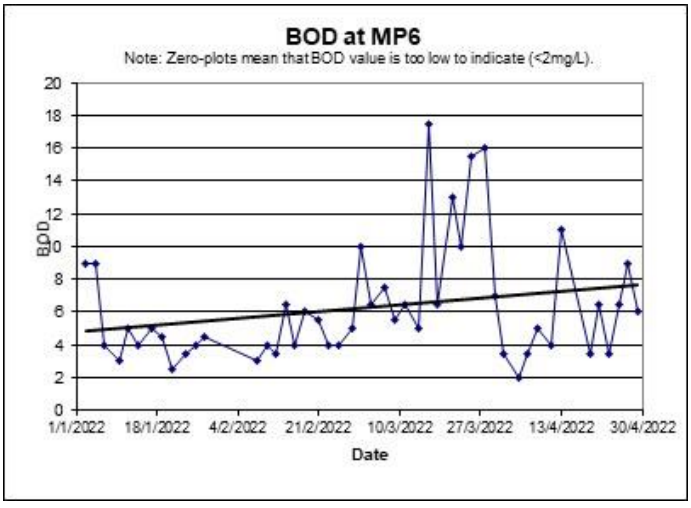
### Monitoring Location MP6

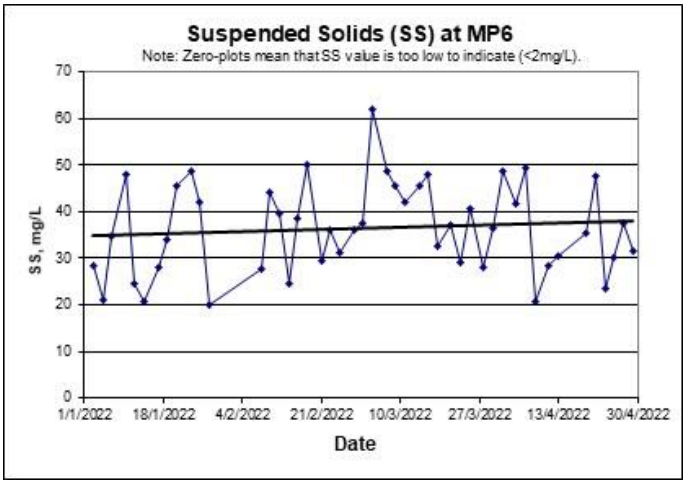


# E. Summary of Ecological Monitoring Results

**Table E1. Summary of bird species of conservation importance and/or wetland-dependence recorded in the Survey Area (excluding the WRA)**

| Species Name[1] | Scientific Name[1] | Wetland Dependence | Conservation Status[2] | Feb 2022 | | Records outside survey[5] |
|---|---|---|---|---|---|---|
| | | | | Occurrence[3] | Mean[4] | |
| Little Grebe | *Tachybaptus ruficollis* | Y | LC | 4 | 15.0 | 0 |
| Great Cormorant | *Phalacrocorax carbo* | Y | PRC | 4 | 45.3 | 0 |
| Grey Heron | *Ardea cinerea* | Y | PRC | 4 | 18.3 | 0 |
| Great Egret | *Ardea alba* | Y | PRC, (RC) | 4 | 29.3 | 0 |
| Little Egret | *Egretta garzetta* | Y | PRC, (RC) | 4 | 38.0 | 0 |
| Eastern Cattle Egret | *Bubulcus coromandus* | Y | (LC) | 1 | 1.8 | 0 |
| Chinese Pond Heron | *Ardeola bacchus* | Y | PRC, (RC) | 4 | 14.8 | 0 |
| Black-crowned Night Heron | *Nycticorax nycticorax* | Y | (LC) | 1 | 1.5 | 0 |
| Black-faced Spoonbill## | *Platalea minor* | Y | Class I, PGC, EN | 3 | 10.8 | 0 |
| Tufted Duck | *Aythya fuligula* | Y | LC | 3 | 2.5 | 0 |
| Western Osprey# | *Pandion haliaetus* | Y | Class II, RC | 1 | 0.3 | 0 |
| Black-winged Kite# | *Elanus caeruleus* | Y | Class II, LC | 1 | 0.3 | 0 |
| Black Kite# | *Milvus migrans* | Y | Class II, (RC) | 2 | 0.5 | 0 |
| Eastern Buzzard# | *Buteo japonicus* | Y | Class II | 1 | 0.5 | 0 |
| White-breasted Waterhen | *Amaurornis phoenicurus* | Y | - | 3 | 2.0 | 0 |
| Black-winged Stilt | *Himantopus himantopus* | Y | RC | 2 | 4.3 | 0 |
| Little Ringed Plover | *Charadrius dubius* | Y | (LC) | 1 | 0.3 | 0 |
| Common Greenshank | *Tringa nebularia* | Y | RC | 1 | 0.5 | 0 |
| Green Sandpiper | *Tringa ochropus* | Y | - | 1 | 0.5 | 0 |
| Wood Sandpiper | *Tringa glareola* | Y | LC | 2 | 1.5 | 0 |
| Common Sandpiper | *Actitis hypoleucos* | Y | - | 4 | 3.3 | 0 |
| Common Snipe | *Gallinago gallinago* | Y | - | 1 | 0.3 | 0 |
| Black-headed Gull | *Chroicocephalus ridibundus* | Y | PRC | 1 | 1.8 | 0 |
| Pied Kingfisher | *Ceryle rudis* | Y | (LC) | 2 | 0.8 | 0 |
| White-throated Kingfisher# | *Halcyon smyrnensis* | Y | Class II, (LC) | 1 | 0.3 | 0 |
| Common Kingfisher | *Alcedo atthis* | Y | - | 4 | 3.3 | 0 |
| Eastern Yellow Wagtail | *Motacilla tschutschensis* | Y | - | 4 | 5.5 | 0 |
| Grey Wagtail | *Motacilla cinerea* | Y | - | 1 | 0.3 | 0 |
| White Wagtail | *Motacilla alba* | Y | - | 4 | 14.8 | 0 |

| Species Name[1] | Scientific Name[1] | Wetland Dependence | Conservation Status[2] | Feb 2022 | | Records outside survey[5] |
|---|---|---|---|---|---|---|
| | | | | Occurrence[3] | Mean[4] | |
| Zitting Cisticola | *Cisticola juncidis* | Y | LC | 2 | 0.5 | 0 |
| Red-billed Starling | *Spodiopsar sericeus* | Y | (RC)* | 1 | 1.8 | 0 |
| Collared Crow | *Corvus torquatus* | Y | LC, NT | 3 | 1.3 | 0 |
| | | | **No. of Species Recorded** | | | **32** |

| Species Name[4] | Scientific Name[4] | Wetland Dependence | Conservation Status[1] | Mar 2022 | | Records outside survey[5] |
|---|---|---|---|---|---|---|
| | | | | Occurrence[2] | Mean[3] | |
| Little Grebe | *Tachybaptus ruficollis* | Y | LC | 5 | 16.0 | 0 |
| Great Cormorant | *Phalacrocorax carbo* | Y | PRC | 4 | 63.0 | 0 |
| Grey Heron | *Ardea cinerea* | Y | PRC | 3 | 8.0 | 0 |
| Great Egret | *Ardea alba* | Y | PRC, (RC) | 5 | 6.6 | 0 |
| Little Egret | *Egretta garzetta* | Y | PRC, (RC) | 5 | 34.6 | 0 |
| Eastern Cattle Egret | *Bubulcus coromandus* | Y | (LC) | 1 | 1.6 | 0 |
| Chinese Pond Heron | *Ardeola bacchus* | Y | PRC, (RC) | 5 | 14.2 | 0 |
| Black-crowned Night Heron | *Nycticorax nycticorax* | Y | (LC) | - | - | V |
| Black-faced Spoonbill## | *Platalea minor* | Y | Class I, PGC, EN | 4 | 4.8 | 0 |
| Tufted Duck | *Aythya fuligula* | Y | LC | 3 | 6.6 | 0 |
| Black Kite# | *Milvus migrans* | Y | Class II, (RC) | 2 | 0.6 | 0 |
| Eastern Buzzard# | *Buteo japonicus* | Y | Class II | 1 | 0.2 | 0 |
| White-breasted Waterhen | *Amaurornis phoenicurus* | Y | - | 5 | 2.4 | 0 |
| Common Moorhen | *Gallinula chloropus* | Y | - | 2 | 0.6 | 0 |
| Black-winged Stilt | *Himantopus himantopus* | Y | RC | 3 | 8.8 | 0 |
| Pied Avocet | *Recurvirostra avosetta* | Y | RC | 2 | 1.0 | 0 |
| Little Ringed Plover | *Charadrius dubius* | Y | (LC) | 2 | 0.6 | 0 |
| Common Redshank | *Tringa totanus* | Y | RC | 1 | 0.2 | 0 |
| Common Greenshank | *Tringa nebularia* | Y | RC | 2 | 0.4 | 0 |
| Green Sandpiper | *Tringa ochropus* | Y | - | 3 | 0.8 | 0 |
| Wood Sandpiper | *Tringa glareola* | Y | LC | 3 | 2.4 | 0 |
| Common Sandpiper | *Actitis hypoleucos* | Y | - | 5 | 4.2 | 0 |
| Pied Kingfisher | *Ceryle rudis* | Y | (LC) | 4 | 1.8 | 0 |
| White-throated Kingfisher# | *Halcyon smyrnensis* | Y | Class II, (LC) | 1 | 0.4 | 0 |
| Common Kingfisher | *Alcedo atthis* | Y | - | 5 | 1.8 | 0 |
| Eastern Yellow Wagtail | *Motacilla tschutschensis* | Y | - | 5 | 8.2 | 0 |
| Grey Wagtail | *Motacilla cinerea* | Y | - | 1 | 0.2 | 0 |
| White Wagtail | *Motacilla alba* | Y | - | 5 | 6.6 | 0 |
| Red-throated Pipit | *Anthus cervinus* | N | LC | 1 | 0.4 | 0 |
| Zitting Cisticola | *Cisticola juncidis* | Y | LC | 2 | 1.0 | 0 |

| Species Name[4] | Scientific Name[4] | Wetland Dependence | Conservation Status[1] | Mar 2022 | | Records outside survey[5] |
|---|---|---|---|---|---|---|
| | | | | Occurrence[2] | Mean[3] | |
| White-shouldered Starling | *Sturnia sinensis* | Y | (LC) | 3 | 1.2 | 0 |
| Collared Crow | *Corvus torquatus* | Y | LC, NT | 2 | 1.0 | 0 |
| | | | | **No. of Species Recorded** | | **32** |

| Species Name[4] | Scientific Name[4] | Wetland Dependence | Conservation Status[1] | Apr 2022 | | Records outside survey[5] |
|---|---|---|---|---|---|---|
| | | | | Occurrence[2] | Mean[3] | |
| Little Grebe | *Tachybaptus ruficollis* | Y | LC | 4 | 7.3 | 0 |
| Grey Heron | *Ardea cinerea* | Y | PRC | 2 | 1.3 | 0 |
| Great Egret | *Ardea alba* | Y | PRC, (RC) | 4 | 18.5 | 0 |
| Intermediate Egret | *Egretta intermedia* | Y | RC | 1 | 0.3 | 0 |
| Little Egret | *Egretta garzetta* | Y | PRC, (RC) | 4 | 20.5 | 0 |
| Eastern Cattle Egret | *Bubulcus coromandus* | Y | (LC) | 1 | 0.5 | 0 |
| Chinese Pond Heron | *Ardeola bacchus* | Y | PRC, (RC) | 4 | 11.5 | 0 |
| Black-crowned Night Heron | *Nycticorax nycticorax* | Y | (LC) | 3 | 1.8 | 0 |
| Black-faced Spoonbill## | *Platalea minor* | Y | Class I, PGC, EN | 1 | 0.8 | 0 |
| Black Kite# | *Milvus migrans* | Y | Class II, (RC) | 1 | 0.3 | 0 |
| White-breasted Waterhen | *Amaurornis phoenicurus* | Y | - | 3 | 2.0 | 0 |
| Common Moorhen | *Gallinula chloropus* | Y | - | 3 | 3.0 | 0 |
| Black-winged Stilt | *Himantopus himantopus* | Y | RC | 3 | 4.8 | 0 |
| Pied Avocet | *Recurvirostra avosetta* | Y | RC | 2 | 2.8 | 0 |
| Common Greenshank | *Tringa nebularia* | Y | RC | 3 | 2.3 | 0 |
| Marsh Sandpiper | *Tringa stagnatilis* | Y | RC | 2 | 2.5 | 0 |
| Green Sandpiper | *Tringa ochropus* | Y | - | 1 | 0.3 | 0 |
| Wood Sandpiper | *Tringa glareola* | Y | LC | 3 | 2.5 | 0 |
| Common Sandpiper | *Actitis hypoleucos* | Y | - | 4 | 3.8 | 0 |
| Whiskered Tern | *Chlidonias hybrida* | Y | - | 3 | 13.8 | 0 |
| Pied Kingfisher | *Ceryle rudis* | Y | (LC) | 2 | 0.8 | 0 |
| White-throated Kingfisher# | *Halcyon smyrnensis* | Y | Class II, (LC) | 1 | 0.3 | 0 |
| Common Kingfisher | *Alcedo atthis* | Y | - | 4 | 2.5 | 0 |
| Eastern Yellow Wagtail | *Motacilla tschutschensis* | Y | - | 4 | 4.8 | 0 |
| White Wagtail | *Motacilla alba* | Y | - | 4 | 3.8 | 0 |
| White-shouldered Starling | *Sturnia sinensis* | Y | (LC) | 4 | 4 | 0 |
| Collared Crow | *Corvus torquatus* | Y | LC, NT | 3 | 2.8 | 0 |
| | | | | **No. of Species Recorded** | | **27** |

(1) Follows the List of Hong Kong Birds (ver. 2020-03-10)
(2) Conservation status follows that of *Fellowes et al*. (2002) and Bird Life International listing (2017). Letters in parentheses indicate that the assessment is on the basis of restrictedness in breeding and/or roosting sites rather than in general occurrence. (*Fellowes et al*. 2002)

(3) Indicates number of surveys recorded within each month of the reporting period.
(4) Refers to the mean number of individuals recorded in each survey in the Survey Area (excluding the WRA).
(5) Includes observations during other surveys and/or site visits.
## Bird tagged with '##' is Category I protected under terrestrial wildlife state protection.
# Birds tagged with '#' are Category II protected under terrestrial wildlife state protection.
* Red-billed Starling is considered by Fellows et al (2002) to be of Global Concern. Since publication, however, the global population estimate has been revised and the species is not now considered globally threatened. A listing of Regional Concern (RC) based on the importance of the large roosts present near Deep Bay, is considered to be more appropriate. (Wetland Restoration Plan, Mott, 2008). Red-billed Starling is now listed as Least Concern by IUCN. (IUCN, 2016)

**Table E2. Summary of bird species of conservation importance and/or wetland-dependence recorded in the WRA**

| Species Name[1] | Scientific Name[1] | Wetland Dependence | Conservation Status[2] | Feb 2022 | | Records outside survey[5] |
|---|---|---|---|---|---|---|
| | | | | Occurrence[3] | Mean[4] | |
| Little Grebe | *Tachybaptus ruficollis* | Y | LC | 1 | 0.8 | 0 |
| Great Cormorant | *Phalacrocorax carbo* | Y | PRC | 1 | 0.5 | 0 |
| Grey Heron | *Ardea cinerea* | Y | PRC | 3 | 1.5 | 0 |
| Purple Heron | *Ardea purpurea* | Y | RC | 2 | 0.5 | 0 |
| Great Egret | *Ardea alba* | Y | PRC, (RC) | 3 | 1.0 | 0 |
| Little Egret | *Egretta garzetta* | Y | PRC, (RC) | 3 | 1.0 | 0 |
| Chinese Pond Heron | *Ardeola bacchus* | Y | PRC, (RC) | 3 | 1.5 | 0 |
| Eurasian Teal | *Anas crecca* | Y | RC | 1 | 0.3 | 0 |
| Western Osprey# | *Pandion haliaetus* | Y | Class II, RC | 1 | 0.3 | 0 |
| Black Kite# | *Milvus migrans* | Y | Class II, (RC) | 2 | 1.5 | 0 |
| Eastern Imperial Eagle## | *Aquila heliaca* | Y | Class I, GC | 1 | 0.3 | 0 |
| White-breasted Waterhen | *Amaurornis phoenicurus* | Y | - | 2 | 0.5 | 0 |
| Common Moorhen | *Gallinula chloropus* | Y | - | 4 | 2.8 | 0 |
| Green Sandpiper | *Tringa ochropus* | Y | - | 1 | 0.8 | 0 |
| Wood Sandpiper | *Tringa glareola* | Y | LC | 2 | 1.3 | 0 |
| Common Snipe | *Gallinago gallinago* | Y | - | 1 | 0.3 | 0 |
| Pied Kingfisher | *Ceryle rudis* | Y | (LC) | 2 | 1.3 | 0 |
| White-throated Kingfisher# | *Halcyon smyrnensis* | Y | Class II, (LC) | 1 | 0.3 | 0 |
| Common Kingfisher | *Alcedo atthis* | Y | - | 2 | 0.8 | 0 |
| Eastern Yellow Wagtail | *Motacilla tschutschensis* | Y | - | 2 | 1.3 | 0 |
| White Wagtail | *Motacilla alba* | Y | - | 3 | 2.3 | 0 |
| Oriental Reed Warbler | *Acrocephalus orientalis* | Y | - | 1 | 0.3 | 0 |
| | | | **No. of Species Recorded** | | | **22** |

| Species Name[4] | Scientific Name[4] | Wetland Dependence | Conservation Status[1] | Mar 2022 | | Records outside survey[5] |
|---|---|---|---|---|---|---|
| | | | | Occurrence[2] | Mean[3] | |
| Little Grebe | *Tachybaptus ruficollis* | Y | LC | 1 | 0.2 | 0 |
| Great Cormorant | *Phalacrocorax carbo* | Y | PRC | 1 | 0.2 | 0 |
| Grey Heron | *Ardea cinerea* | Y | PRC | 1 | 0.2 | 0 |
| Great Egret | *Ardea alba* | Y | PRC, (RC) | 4 | 2.2 | 0 |
| Little Egret | *Egretta garzetta* | Y | PRC, (RC) | 4 | 1.6 | 0 |

| Species Name[4] | Scientific Name[4] | Wetland Dependence | Conservation Status[1] | Mar 2022 | | Records outside survey[5] |
|---|---|---|---|---|---|---|
| | | | | Occurrence[2] | Mean[3] | |
| Chinese Pond Heron | *Ardeola bacchus* | Y | PRC, (RC) | 3 | 1.0 | 0 |
| Great Bittern | *Botaurus stellaris* | Y | RC | 1 | 0.2 | 0 |
| Black-crowned Night Heron | *Nycticorax nycticorax* | Y | (LC) | - | - | V |
| Black Kite# | *Milvus migrans* | Y | Class II, (RC) | 3 | 0.6 | 0 |
| Eastern Buzzard# | *Buteo japonicus* | Y | Class II | 1 | 0.2 | 0 |
| White-breasted Waterhen | *Amaurornis phoenicurus* | Y | - | 3 | 2.2 | 0 |
| Common Moorhen | *Gallinula chloropus* | Y | - | 5 | 2.0 | 0 |
| Green Sandpiper | *Tringa ochropus* | Y | - | 4 | 1.2 | V |
| Wood Sandpiper | *Tringa glareola* | Y | LC | 3 | 1.4 | V |
| Common Sandpiper | *Actitis hypoleucos* | Y | - | 1 | 0.2 | 0 |
| Pacific Swift | *Apus pacificus* | N | (LC) | 1 | 0.6 | 0 |
| Pied Kingfisher | *Ceryle rudis* | Y | (LC) | 4 | 1.4 | 0 |
| White-throated Kingfisher# | *Halcyon smyrnensis* | Y | Class II, (LC) | 1 | 0.4 | 0 |
| Common Kingfisher | *Alcedo atthis* | Y | - | 4 | 1.0 | 0 |
| Sand Martin | *Riparia riparia* | Y | - | 1 | 1.2 | 0 |
| Eastern Yellow Wagtail | *Motacilla tschutschensis* | Y | - | 4 | 3.2 | 0 |
| Grey Wagtail | *Motacilla cinerea* | Y | - | 1 | 0.2 | 0 |
| White Wagtail | *Motacilla alba* | Y | - | 5 | 2.6 | 0 |
| Oriental Reed Warbler | *Acrocephalus orientalis* | Y | - | 1 | 0.2 | 0 |
| Chinese Penduline-Tit | *Remiz consobrinus* | Y | RC | 1 | 2.8 | 0 |
| Collared Crow | *Corvus torquatus* | Y | LC, NT | 1 | 0.4 | 0 |
| | | | | **No. of Species Recorded** | | **26** |

| Species Name[4] | Scientific Name[4] | Wetland Dependence | Conservation Status[1] | Apr 2022 | | Records outside survey[5] |
|---|---|---|---|---|---|---|
| | | | | Occurrence[2] | Mean[3] | |
| Little Grebe | *Tachybaptus ruficollis* | Y | LC | 1 | 0.3 | 0 |
| Great Egret | *Ardea alba* | Y | PRC, (RC) | 3 | 0.8 | 0 |
| Intermediate Egret | *Egretta intermedia* | Y | RC | 1 | 0.3 | 0 |
| Little Egret | *Egretta garzetta* | Y | PRC, (RC) | 4 | 4.3 | 0 |
| Eastern Cattle Egret | *Bubulcus coromandus* | Y | (LC) | 1 | 0.5 | 0 |
| Black-crowned Night Heron | *Nycticorax nycticorax* | Y | (LC) | 1 | 0.3 | 0 |
| Black Kite# | *Milvus migrans* | Y | Class II, (RC) | 2 | 0.5 | 0 |
| White-breasted Waterhen | *Amaurornis phoenicurus* | Y | - | 3 | 1.0 | 0 |
| Common Moorhen | *Gallinula chloropus* | Y | - | 3 | 1.8 | 0 |
| Common Greenshank | *Tringa nebularia* | Y | RC | 4 | 2.3 | 0 |
| Green Sandpiper | *Tringa ochropus* | Y | - | 1 | 0.3 | 0 |
| Wood Sandpiper | *Tringa glareola* | Y | LC | 2 | 1.5 | 0 |

| Species Name[4] | Scientific Name[4] | Wetland Dependence | Conservation Status[1] | Apr 2022 | | Records outside survey[5] |
|---|---|---|---|---|---|---|
| | | | | Occurrence[2] | Mean[3] | |
| Common Sandpiper | *Actitis hypoleucos* | Y | - | 4 | 3.5 | 0 |
| White-throated Kingfisher# | *Halcyon smyrnensis* | Y | Class II, (LC) | 1 | 0.5 | 0 |
| Common Kingfisher | *Alcedo atthis* | Y | - | 1 | 0.8 | 0 |
| Eastern Yellow Wagtail | *Motacilla tschutschensis* | Y | - | 3 | 5.0 | 0 |
| White Wagtail | *Motacilla alba* | Y | - | 3 | 1.0 | 0 |
| Zitting Cisticola | *Cisticola juncidis* | Y | LC | 1 | 0.3 | 0 |
| Chinese Penduline-Tit | *Remiz consobrinus* | Y | RC | 1 | 1.8 | 0 |
| White-shouldered Starling | *Sturnia sinensis* | Y | (LC) | 2 | 0.8 | 0 |
| Collared Crow | *Corvus torquatus* | Y | LC, NT | 1 | 0.3 | 0 |
| | | | **No. of Species Recorded** | | | **21** |

(1) Follows the List of Hong Kong Birds (ver. 2020-03-10)
(2) Conservation status follows that of Fellowes *et al*. (2002) and BirdLife International listing (2017). Letters in parentheses indicate that the assessment is on the basis of restrictedness in breeding and/or roosting sites rather than in general occurrence. (Fellowes *et al*. 2002).
(3) Indicates number of surveys recorded within each month of the reporting period.
(4) Refers to the mean number of individuals recorded in each survey in the WRA.
(5) Includes observations during other surveys and/or site visits.
## Bird tagged with '##' is Category I protected under terrestrial wildlife state protection.
# Birds tagged with '#' are Category II protected under terrestrial wildlife state protection.

## Table E3. Summary of herpetofauna monitoring in the Survey Area (excluding the WRA)

| Species Name | Scientific Name | Conservation Status[1] | Feb 2022 | | Records outside surveys[4] |
|---|---|---|---|---|---|
| | | | Occurrence[2] | Mean[3] | |
| **Amphibian** | | **No. of Species Recorded** | **0** | | |
| No surveys in February 2022 | | | | | |
| | | | **Occurrence[2]** | **Mean[3]** | |
| **Reptiles** | | **No. of Species Recorded** | **1** | | |
| Long-tailed Skink | *Eutropis longicaudata* | - | - | - | V |

| Species Name | Scientific Name | Conservation Status[1] | Mar 2022 | | Records outside surveys[4] |
|---|---|---|---|---|---|
| | | | Occurrence[2] | Mean[3] | |
| **Amphibian** | | **No. of Species Recorded** | **3** | | |
| Asian Common Toad | *Bufo melanostictus* | - | 2 | 7.0 | 0 |
| Paddy Frog | *Fejervarya limnocharis* | - | 1 | 2.0 | 0 |
| Brown Tree Frog | *Polypedates megacephalus* | - | 1 | 1.0 | 0 |
| | | | **Occurrence[2]** | **Mean[3]** | |
| **Reptiles** | | **No. of Species Recorded** | **1** | | |
| Bowring's Gecko | *Hemidactylus bowringii* | - | 1 | 8.0 | 0 |

| Species Name | Scientific Name | Conservation Status[1] | Apr 2022 | | Records outside surveys[4] |
|---|---|---|---|---|---|
| | | | Occurrence[2] | Mean[3] | |
| **Amphibian** | | **No. of Species Recorded** | **4** | | |
| Asian Common Toad | *Bufo melanostictus* | - | 1 | 6.0 | 0 |
| Gunther's Frog | *Hylarana guentheri* | - | 2 | 4.0 | 0 |
| Brown Tree Frog | *Polypedates megacephalus* | - | 1 | 1.0 | 0 |
| Asiatic Painted Frog | *Kaloula pulchra pulchra* | - | 1 | 0.5 | 0 |
| | | | Occurrence[2] | Mean[3] | |
| **Reptiles** | | **No. of Species Recorded** | **3** | | |
| Red-eared Slider | *Trachemys scripta elegans* | - | - | - | V |
| Bowring's Gecko | *Hemidactylus bowringii* | - | 1 | 12.5 | 0 |
| Many-banded Krait | *Bungarus multicinctus multicinctus* | - | 1 | 0.5 | 0 |

(1) Conservation status follows that of Fellowes *et al*. (2002), Chan *et al*. (2005) and Karsen *et al*. (1998).
(2) Indicates number of surveys recorded within the reporting period.
(3) Refers to the mean number of individuals recorded in the reporting period (excluding the WRA)
(4) Includes observations during other surveys and/or site visits.

## Table E4. Summary of herpetofauna monitoring in the WRA

| Species Name | Scientific Name | Conservation Status[1] | Feb 2022 | | Records outside surveys[4] |
|---|---|---|---|---|---|
| | | | Occurrence[2] | Mean[3] | |
| **Amphibian** | | **No. of Species Recorded** | **1** | | |
| Paddy Frog | *Fejervarya limnocharis* | - | - | - | V |
| | | | Occurrence[2] | Mean[3] | |
| **Reptiles** | | **No. of Species Recorded** | **0** | | |
| No surveys in February 2022 | | | | | |

| Species Name | Scientific Name | Conservation Status[1] | Mar 2022 | | Records outside surveys[4] |
|---|---|---|---|---|---|
| | | | Occurrence[2] | Mean[3] | |
| **Amphibian** | | **No. of Species Recorded** | **3** | | |
| Asian Common Toad | *Bufo melanostictus* | - | 1 | 3.0 | 0 |
| Gunther's Frog | *Hylarana guentheri* | - | 1 | 0.5 | 0 |
| Ornate Pygmy Frog | *Microhyla fissipes* | - | 1 | 2.5 | 0 |
| | | | Occurrence[2] | Mean[3] | |
| **Reptiles** | | **No. of Species Recorded** | **3** | | |
| Bowring's Gecko | *Hemidactylus bowringii* | - | 1 | 3.5 | 0 |
| Long-tailed Skink | *Eutropis longicaudata* | - | 1 | 0.5 | 0 |
| Reeve's Smooth Skink | *Scincella reevesii* | - | 2 | 2.0 | 0 |

| Species Name | Scientific Name | Conservation Status[1] | Apr 2022 | | Records outside surveys[4] |
|---|---|---|---|---|---|
| | | | Occurrence[2] | Mean[3] | |
| **Amphibian** | **No. of Species Recorded** | | **3** | | |
| Asian Common Toad | *Bufo melanostictus* | - | 1 | 3.0 | 0 |
| Gunther's Frog | *Hylarana guentheri* | - | 2 | 2.0 | 0 |
| Ornate Pygmy Frog | *Microhyla fissipes* | - | 1 | 2.0 | 0 |
| | | | Occurrence[2] | Mean[3] | |
| **Reptiles** | **No. of Species Recorded** | | **3** | | |
| Bowring's Gecko | *Hemidactylus bowringii* | - | 1 | 6.0 | V |
| Long-tailed Skink | *Eutropis longicaudata* | - | 1 | 0.5 | 0 |
| Common Rat Snake | *Ptyas mucosus* | - | - | - | V |

(1) Conservation status follows that of Fellowes *et al*. (2002), Chan *et al*. (2005) and Karsen *et al*. (1998).
(2) Indicates number of surveys recorded within the reporting period.
(3) Refers to the mean number of individuals recorded in the reporting period in the WRA
**(4)** Includes observations during other surveys and/or site visits.

## Table E5. Summary of mammal monitoring in the Survey Area (excluding the WRA)

| Species Name | Scientific Name | Conservation Status[1] | Feb 2022 | | Records outside surveys[4] |
|---|---|---|---|---|---|
| | | | Occurrence[2] | Max [3] | |
| **Mammal** | **No. of Species Recorded** | | **0** | | |
| No records in February 2022 | | | | | |

| Species Name | Scientific Name | Conservation Status[1] | Mar 2022 | | Records outside surveys[4] |
|---|---|---|---|---|---|
| | | | Occurrence[2] | Max [3] | |
| **Mammal** | **No. of Species Recorded** | | **2** | | |
| Short-nosed Fruit Bat | Cynopterus sphinx | - | 1 | 1 | 0 |
| Japanese Pipistrelle | *Pipistrellus abramus* | - | 1 | 2 | 0 |

| Species Name | Scientific Name | Conservation Status[1] | Apr 2022 | | Records outside surveys[4] |
|---|---|---|---|---|---|
| | | | Occurrence[2] | Max [3] | |
| **Mammal** | **No. of Species Recorded** | | **2** | | |
| Short-nosed Fruit Bat | *Cynopterus sphinx* | - | 1 | 1 | 0 |
| Japanese Pipistrelle | *Pipistrellus abramus* | - | 1 | 2 | 0 |

(1) Conservation status follows that of Fellowes *et al*. (2002) and Shek (2006).
(2) Indicates number of surveys recorded within the reporting period.
(3) Refers to the maximum number of individuals recorded in the reporting period (excluding the WRA).
(4) Includes observations during other surveys and/or site visits.

## Table E6. Summary of mammal monitoring in the WRA

| Species Name | Scientific Name | Conservation Status[1] | Feb 2022 | | Records outside surveys[4] |
|---|---|---|---|---|---|
| | | | Occurrence[2] | Max [3] | |
| **Mammal** | **No. of** | **Species Recorded** | **0** | | |
| No records in February 2022 | | | | | |

| Species Name | Scientific Name | Conservation Status[1] | Mar 2022 | | Records outside surveys[4] |
|---|---|---|---|---|---|
| | | | Occurrence[2] | Max [3] | |
| **Mammal** | **No. of** | **Species Recorded** | **2** | | |
| Short-nosed Fruit Bat | *Cynopterus sphinx* | - | 1 | 6 | 0 |
| Japanese Pipistrelle | *Pipistrellus abramus* | - | 1 | 6 | 0 |

| Species Name | Scientific Name | Conservation Status[1] | Apr 2022 | | Records outside surveys[4] |
|---|---|---|---|---|---|
| | | | Occurrence[2] | Max [3] | |
| **Mammal** | **No. of** | **Species Recorded** | **3** | | |
| Short-nosed Fruit Bat | *Cynopterus sphinx* | - | 1 | 3 | 0 |
| Japanese Pipistrelle | *Pipistrellus abramus* | - | 1 | 7 | 0 |
| Leopard Cat* | *Prionailurus bengalensis* | - | 1 | 1 | 0 |

(1) Conservation status follows that of Fellowes *et al*. (2002) and Shek (2006).
(2) Indicates number of surveys recorded within the reporting period.
(3) Refers to the maximum number of individuals recorded in the reporting period in the WRA
(4) Includes observations during other surveys and/or site visits.
(5) '*' The presence of the species was indicated by the scats found within the WRA

## Table E7. Summary of dragonfly and butterfly monitoring in the Survey Area (excluding the WRA)

| Species Name | Scientific Name | Conservation Status[1] | Feb 2022 | | Records Outside Surveys[4] |
|---|---|---|---|---|---|
| | | | Occurrence[2] | Mean[3] | |
| **Odonate** | | **No. of Species Recorded** | **0** | | |
| No surveys in February 2022 | | | | | |
| | | | Occurrence[2] | Mean[3] | |
| **Butterfly** | | **No. of Species Recorded** | **0** | | |
| No surveys in February 2022 | | | | | |

| Species Name | Scientific Name | Conservation Status[1] | Mar 2022 | | Records Outside Surveys[4] |
|---|---|---|---|---|---|
| | | | Occurrence[2] | Mean[3] | |
| **Odonate** | | **No. of Species Recorded** | **4** | | |
| Common Bluetail | *Ischnura senegalensis* | - | 1 | 3.0 | 0 |
| Yellow Featherlegs | *Copera marginipes* | - | 1 | 5.0 | 0 |
| Asian Amberwing | *Brachythemis contaminata* | - | 1 | 1.0 | 0 |
| Wandering Glider | *Pantala flavescens* | - | 1 | 4.0 | 0 |
| | | | Occurrence[2] | Mean[3] | |
| **Butterfly** | | **No. of Species Recorded** | **7** | | |
| Common Sailor | *Neptis hylas hylas* | - | 1 | 1.0 | 0 |

| Species Name | Scientific Name | Conservation Status[1] | Mar 2022 | | Records Outside Surveys[4] |
|---|---|---|---|---|---|
| | | | Occurrence[2] | Mean[3] | |
| Dark Brand Bush Brown | *Mycalesis mineus mineus* | - | 1 | 3.0 | 0 |
| Red-base Jezebel | *Delias pasithoe pasithoe* | - | 1 | 1.0 | 0 |
| Small Cabbage White | *Pieris rapae crucivora* | - | 1 | 41.0 | 0 |
| Tailed Jay | *Graphium agamemnon agamemnon* | - | 1 | 1.0 | 0 |
| Common Mime | *Chilasa clytia clytia* | - | 1 | 1.0 | 0 |
| Great Mormon | *Papilio memnon agenor* | - | 1 | 1.0 | 0 |

| Species Name | Scientific Name | Conservation Status[1] | Apr 2022 | | Records Outside Surveys[4] |
|---|---|---|---|---|---|
| | | | Occurrence[2] | Mean[3] | |
| **Odonate** | **No. of Species Recorded** | | **9** | | |
| Orange-tailed Sprite | *Ceriagrion auranticum ryukyuanum* | - | 2 | 4.0 | 0 |
| Common Bluetail | *Ischnura senegalensis* | - | 2 | 51.0 | 0 |
| Yellow Featherlegs | *Copera marginipes* | - | 1 | 1.0 | 0 |
| Asian Amberwing | *Brachythemis contaminata* | - | 2 | 7.0 | 0 |
| Pied Percher | *Neurothemis tullia tullia* | - | 1 | 0.5 | 0 |
| Green Skimmer | *Orthetrum sabina sabina* | - | 2 | 2.5 | 0 |
| Wandering Glider | *Pantala flavescens* | - | 1 | 2.0 | 0 |
| Variegated Flutterer | *Rhyothemis variegata arria* | - | 2 | 4.0 | 0 |
| Saddlebag Glider | *Tramea virginia* | - | 1 | 0.5 | 0 |
| | | | Occurrence[2] | Mean[3] | |
| **Butterfly** | **No. of Species Recorded** | | **6** | | |
| Dark Brand Bush Brown | *Mycalesis mineus mineus* | - | 1 | 0.5 | 0 |
| Pale Grass Blue | *Pseudozizeeria maha serica* | - | 2 | 6.0 | 0 |
| Red-base Jezebel | *Delias pasithoe pasithoe* | - | 2 | 1.5 | 0 |
| Small Cabbage White | *Pieris rapae crucivora* | - | 2 | 8.0 | 0 |
| Common Grass Yellow | *Eurema hecabe hecabe* | - | 1 | 2.0 | 0 |
| Common Mormon | *Papilio polytes polytes* | - | 2 | 2.5 | 0 |

(1) Conservation status follows that of Fellowes *et al*. (2002), Lo & Hui (2004), Tam *et al*. (2011) and Young & Yiu (2002).
(2) Indicates number of surveys recorded within the reporting period.
(3) Refers to the mean number of individuals recorded in the reporting period (excluding the WRA)
(4) Includes observations during other surveys and/or site visits.

## Table E8. Summary of dragonfly and butterfly monitoring in the WRA

| Species Name | Scientific Name | Conservation Status[1] | Feb 2022 Occurrence[2] | Feb 2022 Mean[3] | Records Outside Surveys[4] |
|---|---|---|---|---|---|
| **Odonate** | **No. of Species Recorded** | | **0** | | |
| No surveys in February 2022 | | | | | |
| | | | **Occurrence[2]** | **Mean[3]** | |
| **Butterfly** | **No. of Species Recorded** | | **0** | | |
| No surveys in February 2022 | | | | | |

| Species Name | Scientific Name | Conservation Status[1] | Mar 2022 Occurrence[2] | Mar 2022 Mean[3] | Records Outside Surveys[4] |
|---|---|---|---|---|---|
| **Odonate** | **No. of Species Recorded** | | **12** | | |
| Wandering Midget | *Agriocnemis pygmaea* | - | 1 | 2.0 | 0 |
| Orange-tailed Sprite | *Ceriagrion auranticum ryukyuanum* | - | 1 | 5.0 | 0 |
| Common Bluetail | *Ischnura senegalensis* | - | 1 | 3.0 | 0 |
| Blue Sprite | *Pseudagrion microcephalum* | LC | 1 | 1.0 | 0 |
| Asian Amberwing | *Brachythemis contaminata* | - | 1 | 2.0 | V |
| Pied Percher | *Neurothemis tullia tullia* | - | 1 | 4.0 | V |
| Green Skimmer | *Orthetrum sabina sabina* | - | 1 | 3.0 | 0 |
| Wandering Glider | *Pantala flavescens* | - | 1 | 1.0 | 0 |
| Pied Skimmer | *Pseudothemis zonata* | - | 1 | 1.0 | 0 |
| Variegated Flutterer | *Rhyothemis variegata arria* | - | - | - | V |
| Evening Skimmer | *Tholymis tillarga* | - | 1 | 1.0 | V |
| Dingy Dusk-darter | *Zyxomma petiolatum* | - | 1 | 1.0 | 0 |
| | | | **Occurrence[2]** | **Mean[3]** | |
| **Butterfly** | **No. of Species Recorded** | | **16** | | |
| Dark Brand Bush Brown | *Mycalesis mineus mineus* | - | 1 | 5.0 | 0 |
| Long-tailed Blue | *Lampides boeticus* | - | 1 | 1.0 | 0 |
| Pale Grass Blue | *Pseudozizeeria maha serica* | - | 1 | 1.0 | 0 |
| Lesser Grass Blue | *Zizina otis* | - | 1 | 3.0 | 0 |
| Red-base Jezebel | *Delias pasithoe pasithoe* | - | 1 | 1.0 | 0 |
| Indian Cabbage White | *Pieris canidia canidia* | - | 1 | 1.0 | 0 |
| Small Cabbage White | *Pieris rapae crucivora* | - | 1 | 8.0 | 0 |
| Lemon Emigrant | *Catopsilia pomona pomona* | - | 1 | 1.0 | 0 |
| Common Grass Yellow | *Eurema hecabe hecabe* | - | 1 | 3.0 | 0 |
| Three-spot Grass Yellow | *Eurema blanda hylama* | - | 1 | 1.0 | 0 |
| Common Mime | *Chilasa clytia clytia* | - | 1 | 2.0 | 0 |
| Red Helen | *Papilio helenus* | - | 1 | 2.0 | 0 |
| Common Mormon | *Papilio polytes polytes* | - | 1 | 2.0 | 0 |
| Paris Peacock | *Papilio paris* | - | 1 | 2.0 | 0 |
| Chinese Dart | *Potanthus confucius confucius* | - | 1 | 1.0 | 0 |
| Banana Skipper | *Erionota torus* | - | 1 | 1.0 | 0 |

| Species Name | Scientific Name | Conservation Status[1] | Occurrence[2] | Apr 2022 Mean[3] | Records Outside Surveys[4] |
|---|---|---|---|---|---|
| **Odonate** | **No. of Species Recorded** | | **18** | | |
| Orange-tailed Sprite | *Ceriagrion auranticum ryukyuanum* | - | 1 | 0.5 | 0 |
| Common Bluetail | *Ischnura senegalensis* | - | 2 | 4.5 | 0 |
| Blue Sprite | *Pseudagrion microcephalum* | LC | 1 | 0.5 | 0 |
| Yellow Featherlegs | *Copera marginipes* | - | 1 | 0.5 | 0 |
| Regal Pond Cruiser | *Epophthalmia elegans* | - | 1 | 1.5 | 0 |
| Asian Pintail | *Acisoma panorpoides* | - | 1 | 0.5 | 0 |
| Blue Dasher | *Brachydiplax chalybea flavovitta ta* | - | 1 | 1.5 | 0 |
| Asian Amberwing | *Brachythemis contaminata* | - | 1 | 1.0 | 0 |
| Crimson Darter | *Crocothemis servilia servilia* | - | 1 | 0.5 | 0 |
| Pied Percher | *Neurothemis tullia tullia* | - | 1 | 2.5 | 0 |
| Green Skimmer | *Orthetrum sabina sabina* | - | 2 | 7.0 | 0 |
| Wandering Glider | *Pantala flavescens* | - | 1 | 3.0 | 0 |
| Pied Skimmer | *Pseudothemis zonata* | - | 1 | 0.5 | 0 |
| Variegated Flutterer | *Rhyothemis variegata arria* | - | 2 | 6.5 | 0 |
| Evening Skimmer | *Tholymis tillarga* | - | 1 | 0.5 | 0 |
| Saddlebag Glider | *Tramea virginia* | - | 2 | 2.5 | 0 |
| Scarlet Basker | *Urothemis signata signata* | LC | 1 | 0.5 | 0 |
| Dingy Dusk-darter | *Zyxomma petiolatum* | - | 1 | 0.5 | 0 |
| | | | **Occurrence[2]** | **Mean[3]** | |
| **Butterfly** | **No. of Species Recorded** | | **20** | | |
| Blue-spotted Crow | *Euploea midamus midamus* | - | 1 | 0.5 | 0 |
| Great Egg-fly | *Hypolimnas bolina kezia* | - | 1 | 1.0 | 0 |
| Dark Evening Brown | *Melanitis phedima muskata* | - | 1 | 0.5 | 0 |
| Dark Brand Bush Brown | *Mycalesis mineus mineus* | - | 1 | 1.0 | 0 |
| Common Five-ring | *Ypthima baldus baldus* | - | 1 | 0.5 | 0 |
| Long-tailed Blue | *Lampides boeticus* | - | 2 | 1.5 | 0 |
| Pale Grass Blue | *Pseudozizeeria maha serica* | - | 2 | 5.5 | 0 |
| Tiny Grass Blue | *Zizula hylax* | - | 2 | 3.0 | 0 |
| Tailless Line Blue | *Prosotas dubiosa* | - | 2 | 1.5 | 0 |
| Common Hedge Blue | *Acytolepis puspa* | - | 1 | 0.5 | 0 |
| Dark Cerulean | *Jamides bochus bochus* | - | 1 | 0.5 | 0 |
| Red-base Jezebel | *Delias pasithoe pasithoe* | - | 2 | 2.0 | 0 |
| Small Cabbage White | *Pieris rapae crucivora* | - | 1 | 5.0 | 0 |
| Common Grass Yellow | *Eurema hecabe hecabe* | - | 1 | 0.5 | 0 |
| Three-spot Grass Yellow | *Eurema blanda hylama* | - | 1 | 1.0 | 0 |
| Common Bluebottle | *Graphium sarpedon sarpedon* | - | 1 | 0.5 | 0 |
| Common Mime | *Chilasa clytia clytia* | - | 1 | 0.5 | 0 |
| Common Mormon | *Papilio polytes polytes* | - | 1 | 0.5 | 0 |
| Paris Peacock | *Papilio paris* | - | 1 | 0.5 | 0 |
| Dark Swift | *Caltoris cahira* | - | 1 | 0.5 | 0 |

(1) Conservation status follows that of Fellowes *et al*. (2002), Lo & Hui (2004), Tam *et al*. (2011) and Young & Yiu (2002).
(2) Indicates number of surveys recorded within the reporting period.
(3) Refers to the mean number of individuals recorded in the reporting period in the WRA
(4) Includes observations during other surveys and/or site visits.

# F. Environmental Mitigation Measures - Implementation Status

## Air Quality – Recommended Mitigation Measures

| Air Quality Mitigation Measures during construction | Implementation Status |
|---|---|
| • access roads should be sprayed with water or dust suppression chemical to maintain the entire road surface wet or paved; | ✓ |
| • every stock of more than 20 bags of cement or dry PFA should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides; | N/A |
| • de-bagging, batching or mixing process should be carried out in sheltered areas during the use of bagged cement; | N/A |
| • use of effective dust screens, sheeting or netting to be provided to enclose dry scaffolding which may be provided from the ground floor level of the building or if a canopy is provided at the first-floor level, from the first-floor level, up to the highest level (maximum four floors for this Project) of the scaffolding where scaffolding is erected around the perimeter of a building under construction; | N/A |
| • dump trucks for material transport should be totally enclosed using impervious sheeting; | ✓ |
| • any excavated dusty materials or stockpile of dusty materials should be covered entirely by impervious sheeting or sprayed with water so as to maintain the entire surface wet, and recovered or backfilled or reinstated within 24 hours of the excavation or unloading; | ✓ |
| • dusty materials remaining after a stockpile is removed should be wetted with water; | ✓ |
| • the area where vehicle washing takes place and the section of the road between the washing facilities and the exit point should be paved with e.g. concrete, bituminous materials or hardcore or similar; | ✓ |
| • the portion of road leading only to a construction site that is within 30m of a designated vehicle entrance or exit should be kept clear of dusty materials; | ✓ |
| • stockpile of dusty materials to be either covered entirely by impervious sheeting, placed in an area sheltered on the top and the 3 sides; or sprayed with water so as to maintain the entire surface wet; | ✓ |
| • all dusty materials to be sprayed with water prior to any loading, unloading or transfer operation so as to maintain the dusty material wet; | ✓ |
| • vehicle speed to be limited to 10 kph except on completed access roads; | ✓ |
| • every vehicle should be washed to remove any dusty materials from its body and wheels before leaving the construction sites; | ✓ |
| • the load of dusty materials carried by vehicle leaving a construction site should be covered entirely by clean impervious sheeting to ensure that the dusty materials do not leak from the vehicle; and | ✓ |
| • the working area of excavation should be sprayed with water immediately before, during and immediately after (as necessary) the operations so as to maintain the entire surface wet. | ✓ |
| **Odour mitigation measures** | |
| • all malodorous excavated material should be placed as far as possible from any ASRs; | N/A |
| • the stockpiled malodorous material should be removed from site as soon as possible; and | N/A |
| • the stockpiled malodorous material should be covered entirely by plastic tarpaulin sheets. | N/A |

## Noise – Recommended Mitigation Measures

| Noise Mitigation Measures during construction | Implementation Status |
|---|---|
| • only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction works; | ✓ |
| • machines and plant that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; | ✓ |
| • plant known to emit noise strongly in one direction should, where possible, be orientated to direct noise away from the NSRs; | ✓ |
| • silencers or mufflers on construction equipment should be utilised and should be properly maintained during the construction period; | ✓ |
| • mobile plant should be sited as far away from NSRs as possible; | ✓ |
| • material stockpiles and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities; | ✓ |
| • air compressor and hand-held breaker should be fitted with valid noise emission labels during operation; and | N/A |
| • The Contractor shall at all times comply with all current statutory environmental legislation. | ✓ |
| *Selection of quieter plant and working methods*<br>The Contractor shall obtain particular models of plant that are quieter than standards given in GW-TM. The list of assumed quieter plants can be found in the Table 4–14 of the EIA report. The Contractor shall select from the available models achieving the assumed sound levels while making reference to the GW-TM and BS5228: Part 1: 1997 | ✓ |
| *Use of Noise Barriers*<br>Noise barriers are proposed along the site boundary to block the direct line of sight from the most affected NSRs to the major noise contribution construction phases. The height of the noise barriers ranged from 9-10m. The noise barriers shall be built before the commencement of construction works in order to ensure protection to nearby NSRs. The noise barrier should have a surface density of at least 10kg/$m^2$ or material providing equivalent transmission loss. The noise barriers and hoardings should have no gaps and openings to avoid noise leakage. | ✓ |

## Water Quality – Recommended Mitigation Measures

| Water Quality Mitigation Measures during construction | Implementation Status |
|---|---|
| • The site should be confined to avoid silt runoff to the site; | ✓ |
| • No discharge of silty water into the storm drain and drainage channel within and the vicinity of the site; | ✓ |
| • Any soil contaminated with chemicals/oils shall be removed from site and the void created shall be filled with suitable materials; | P |
| • Stockpiles to be covered by tarpaulin to avoid spreading of materials during rainstorms; | ✓ |
| • Suitable containers shall be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport; | ✓ |
| • Chemical waste containers shall be labelled with appropriate warning signs in English and Chinese to avoid accidents. there shall also be clear instructions showing what action to take in the event of an accidental; | ✓ |
| • Storage areas shall be selected at safe locations on site and adequate space shall be allocated to the storage area; | ✓ |
| • Any construction plant which causes pollution to the water system due to leakage of oil or fuel shall be removed off-site immediately; | N/A |
| • Spillage or leakage of chemical waste to be controlled by using suitable absorbent materials; | N/A |
| • Chemicals will always be stored on drip trays or in bunded areas where the volume is 110% of the stored volume; and | ✓ |
| • Regular clearance of domestic waste generated in the temporary sanitary facilities to avoid waste water spillage. | ✓ |

| Water Quality Mitigation Measures during construction | Implementation Status |
|---|---|
| • Temporary sanitary facilities to be provided for on-site workers during construction; | ✓ |
| • Temporary drainage channel and associated facilities will be provided to collect the surface runoff generated within the Project Area during the construction phase; | ✓ |
| • Sandbags or silt traps will need to be placed to avoid silt runoff to the drainage channel draining the water in the northern ditch. Draining of the ditches should avoid rainy weather; and | ✓ |
| • Excavated soil which needs to be temporarily stockpiled should be stored in a specially designated area and provided with a tarpaulin cover to avoid runoff into the drainage channels. | ✓ |

## Waste Management – Recommended Mitigation Measures

| Waste Management Mitigation Measures during construction | Implementation Status |
|---|---|
| *Site Clearance Waste* | ✓ |
| • The major construction works of Wo Shang Wai is in the development of residential buildings and other associated facilities (club house, tennis courts, etc.). The amount of site clearance works will be limited with the exception of the excavated materials. The thin layer of vegetation removed can be stored and reused for landscaping. | |
| *Excavated Materials* | ✓ |
| The intention is to maximize the reuse of the excavated materials on-site as fill materials. | |
| *Imported Filling Material* | ✓ |
| The excavated/imported filling material may have to be temporarily stockpiled on-site for the construction of road embankment and foundation of viaduct substructure. Control measures should be taken at the stockpiling area to prevent the generation of dust and pollution of stormwater channels. However, to eliminate the risk of blocking drains in the wet season, it is recommended that stockpiling of excavated materials at during wet season should be avoided as far as practicable. | |
| *Construction and Demolition Materials* | ✓ |
| Careful design, planning and good site management can minimise over-ordering and generation of waste materials such as concrete, mortars and cement grouts. The design of formwork should maximise the use of standard wooden panels so that high reuse levels can be achieved. Alternatives such as steel formwork of plastic facing should be considered to increase the potential for reuse. | |
| The Contractor should reuse any C&D material on-site. C&D waste should be segregated and stored in different containers to other wastes to encourage the re-use or recycling of materials and their proper disposal. | ✓ |
| *Chemical Waste* | N/A |
| For those processes which generate chemical waste, it may be possible to find alternatives which generate reduced quantities or even no chemical waste, or less dangerous types of chemical waste. | |
| Containers used for the storage of chemical wastes should: | |
| • be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition, and securely closed; | ✓ |
| • have a capacity of less than 450 litres unless the specification has been approved by the EPD; and | ✓ |
| • display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the Regulations. | ✓ |
| The storage area for chemical wastes should: | |
| • be clearly labelled and used solely for the storage of chemical waste; | P |
| • be enclosed on at least 3 sides; | ✓ |
| • have an impermeable floor and bunding, of capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in that area whichever is the greatest; | ✓ |
| • have adequate ventilation; | ✓ |
| • be covered to prevent rainfall entering (water collected within the bund must be tested and disposed as chemical waste if necessary); and | ✓ |
| • be arranged so that incompatible materials are adequately separated. | ✓ |

| Waste Management Mitigation Measures during construction | Implementation Status |
|---|---|
| Disposal of chemical waste should: | |
| • be via a licensed waste collector; and | N/A |
| • be to a facility licensed to receive chemical waste, such as the Chemical Waste Treatment Facility which also offers a chemical waste collection service and can supply the necessary storage containers, or | N/A |
| • to be reuser of the waste, under approval from the EPD. | N/A |
| *General Refuse*<br>Should be stored in enclosed bins or compaction units separate from C&D and chemical wastes. The Contractor should employ a reputable waste collector to remove general refuse from the site, separate from C&D and chemical wastes, on a regular basis to minimise odour, pest and litter impacts. Burning of refuse on construction sites is prohibited by law. | P |
| **Disposal of Excavated Sediment at Sea** | |
| The requirements and procedures for excavated sediment disposal are specified under the ETWB TCW No. 34/2002 and PNAP 252. The management of the excavation, use and disposal of sediment is monitored by Fill Management Committee, whilst the licensing of marine dumping is the responsibility of the Director of Environmental Protection (DEP). | N/A |
| The excavated sediment would be loaded onto barges or other appropriate vessel and transported to the designated marine disposal site. Category L sediment and Category M sediment passing the biological test would be suitable for disposal at a gazetted open sea disposal ground. Category M sediment failing the biological test and Category H sediment passing the biological test would require confined marine disposal. | N/A |
| During transportation and disposal of the dredged sediment, the following measures should be taken to minimize potential impacts on water quality: | N/A |
| • Bottom opening transport vessels should be fitted with tight fitting seals to prevent leakage of material. Excess material should be cleaned from the decks and exposed fittings of vessels before the vessel is moved. | N/A |
| • Monitoring of the barge loading should be conducted to ensure that loss of material does not take place during transportation. Transport barges or vessels should be equipped with automatic self-monitoring devices as specified by the DEP. | N/A |

## Ecology – Recommended Mitigation Measures

| Ecology Mitigation Measures during construction | Implementation Status |
|---|---|
| *Clear Definition of Site Limit* | |
| Clear definition of the site limit should be provided in order to minimize and confine the disturbance during the construction period, especially the northern limit of the Site which is adjacent to fishponds within the Conservation Area (CA) zone and are considered to be ecological sensitive receivers. | ✓ |
| During wetland construction stage the WRA boundary will be delineated using a temporary hoarding in order to reduce disturbance to off-site habitats and wildlife. During the establishment phase this hoarding will be replaced with a 1 m high chain-link fence in order to reduce disturbance to the WRA through access by humans and dogs, and a hoarding will be established around the residential construction site. | N/A (WRA construction completed) |
| *Dust and Noise Suppression and Avoidance of Water Pollution* | |
| Good site practices of dust and noise suppression should be strictly implemented to ensure that disturbance is minimized to acceptable levels. Mitigation measures for the off-site disturbance impacts on the fishponds in the CA include hoarding at the northern site boundary during construction of the WRA to reduce noise and dust impacts to the adjacent habitats. Through the use of quieter plant and temporary/movable noise barriers, the noise level would be reduced significantly to an acceptable level. Hoarding at the northern boundary should be replaced with a 1 m high chain-link fence following construction and the WRA will then act as a buffer between the existing wetland areas and the residential part of the site until construction is completed. Hoarding will be retained between the WRA and ongoing construction work to avoid visual disturbance and reduce noise and dust emissions. Pollution of watercourses and sedimentary runoff will be minimized by good site practice, especially the containment of water and sediment within the site for removal. | ✓ |

| Ecology Mitigation Measures during construction | Implementation Status |
|---|---|
| These standard noise and air and water quality site practices are considered to be effective measures for minimizing the disturbance impact during the construction period. | |
| *Planning of Construction Schedule* | |
| The construction of the proposed project should be scheduled in phases. Because mitigation is preferably carried out in advance of the main works rather than after the completion of works, the construction of the WRA will commence at the start of the project. Construction work within the WRA is scheduled to take place in a single wet season, followed by 1.5 years of wetland establishment. During the wetland establishment period no noisy work will be undertaken within the WRA to minimize the disturbance to off-site habitats and wildlife. | N/A (WRA construction completed) |
| *Reusing Onsite Materials* | |
| Soil and plants on-site should be reused (e.g. used as fill material) as far as practical. Stock piles of these reusable materials should be stored in an appropriate area on-site. In particular, the re-use of the wetland soils and topsoil should be considered. | ✓ |
| *Construction of the Wetland Restoration Area*<br>The WRA will be operational within 2.5 years from the commencement of construction (1 year for site formation and 1.5 years for establishment) and will compensate for the predicted ecological impacts of the proposed development. | ✓ |

## Landscape and Visual – Recommended Mitigation Measures

| Landscape and Visual Mitigation Measures during construction | Implementation Status |
|---|---|
| CM1 - The construction area and contractor's temporary works areas should be minimised to avoid impacts on adjacent landscape. | ✓ |
| CM2 - Screening of construction works by hoarding / noise barriers. | ✓ (see Appendix G Photo 1 & 3 *) |
| CM3 - Reduction of construction period to practical minimum. | ✓ |
| CM4 - Topsoil, where identified, should be stripped and stored for re-use in the construction of the soft landscape works, where the soil material meets acceptable criteria and where practical. The Contract Specification shall include storage and reuse of topsoil as appropriate. | ✓ |
| CM5 - Hydroseeding or sheeting of soil stockpiles with visually unobtrusive material (in earth tone). | ✓ |
| CM6 - Advance screen planting of noise barriers | ✓ (see Appendix G Photo 3 *) |
| CM7 - Control night-time lighting and glare by hooding all lights. | N/A |
| CM8 - Ensure no run-off into streams adjacent to the Project Area. | ✓ |
| CM9 - Protection of existing trees on boundary of site shall be carefully protected during construction. Detailed Tree Protection Specification shall be provided in the Contract Specification. Under this specification, the Contractor shall be required to submit, for approval, a detailed working method statement for the protection of trees prior to undertaking any works adjacent to all retained trees, including trees in contractor's works areas. (Tree protection measures will be detailed at S16 and Tree Removal Application stage). | ✓ |
| CM10 - Trees unavoidably affected by the works shall be transplanted where practical. Trees should be transplanted straight to their destinations and not held in a nursery. A detailed Tree Transplanting Specification shall be provided in the Contract Specification, if applicable. Sufficient time for necessary tree root and crown preparation periods shall be allowed in the project programme. | ✓ |

Legend:
✓ Implemented
× Not implemented
P Partially implemented
N/A Not applicable
* Representative photos showing the implementation of mitigation measures are presented in Appendix G

# G. Landscape and Visual Audit Photos


Photo 1: The Construction works have been screened by hoarding / noise barriers. (CM2)


Photo 2: The wetland areas have been established and the ponds are seasonally filled with rainwater (OM4)


Photo 3: Advance screen planting of noise barrier has been undertaken (CM6, OM2)