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ATAL-DEGREMONT-CHINA HARBOUR JOINT VENTURE

CONTRACT NO. DC/2013/10 - DESIGN, BUILD AND OPERATE SAN WAI SEWAGE TREATMENT WORKS – PHASE 1

QUARTERLY EM&A REPORT NO. 1

(16 MAY – 31 JULY 2017)

Prepared by: _____
LO, Ting Yi

Certified by: _____
LAU, Chi Leung
Environmental Team Leader

Issued Date: 26 September 2017 *Report No.: ENA75652*

ANEWR

Drainage Services Department
Sewage Services Branch
Harbour Area Treatment Scheme
5/F, Western Magistracy
2A Po Fu Lam Road
Hong Kong

Your reference:

Our reference: HKDSD203/50/104610

Date: 11 October 2017

Attention: Ms Carol Ho

BY EMAIL & POST
(email: carolho@dsd.gov.hk)

Dear Sirs

Agreement No. HATS 02/2016
Services for Independent Environmental Checker (IEC) for
Contract No. DC/2013/10 – Design, Build and Operate San Wai Sewage Treatment Works – Phase 1
Quarterly Environmental Monitoring and Audit Report No.1 (May - July 2017)

We refer to emails of 26 September and 10 October 2017 from ETS-Testconsult Limited attaching the Quarterly Environmental Monitoring and Audit Report No.1 (May - July 2017).

We have no further comment and hereby verify the Quarterly Environmental Monitoring and Audit Report No.1 (May - July 2017).

Should you have any queries, please do not hesitate to contact the undersigned or our Mr Nic Lam on 2618 2831.

Yours faithfully
ANEWR CONSULTING LIMITED

James p.p.

Adi Lee
Independent Environmental Checker

LYMA/LHHN/WCKJ/lhmh

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF APPENDICES

FIGURES

EXECUTIVE SUMMARY

This Quarterly Environmental Monitoring and Audit (EM&A) Report is prepared for Contract No. DC/2013/10 - Design, Build and Operate San Wai Sewage Treatment Works – Stage 1 (the Project) (hereafter referred to as "the Contract"). The Contract was awarded to ATAL-DEGREMONT-CHINA HARBOUR JOINT VENTURE (ADCJV) by the Drainage Services Department (DSD) and ETS-Testconsult Limited was appointed as the Environmental Team (ET) by ADCJV to implement the EM&A program in compliance with the EP and the EM&A Manuals.

According to the Section 25 of the Particular Specification (PS) and the Environmental Permit No. EP-464/2013, an EM&A programme should be implemented in accordance with the procedures and requirements in the EM&A Manual of the approved EIA report (Registration No. AEIAR-072/2003). The scope of monitoring works includes air quality, construction noise, water quality and environmental site audit.

Baseline monitoring was completed in April 2017. Action and Limit Levels were established for air quality, noise and water quality parameters based on the baseline monitoring results.

This is the first Quarterly Environmental Monitoring and Audit (EM&A) Report for the Contract which summaries findings of the EM&A works conducted during the reporting period from 16 May 2017 to 31 July 2017.

Environmental Monitoring and Audit Progress

The quarterly EM&A programme was undertaken in accordance with the EM&A Manual for this Contract. The summary of the monitoring activities in this reporting month is listed below:

- *24-hour TSP Monitoring: 13 Occasions at 2 designated locations*
- *1-hour TSP Monitoring: 39 Occasions at 2 designated locations*
- *Noise Monitoring (Day-time): 13 Occasion at 2 designated locations*
- *Water Quality Monitoring: 33 Occasions at 1 designated location*
- *Weekly Site inspection: 11 Occasions*

Breaches of Action and Limit Levels

Air Quality Monitoring

No exceedance of Action and Limit levels was recorded for 1-hr and 24-hr TSP monitoring in the reporting month.

Noise Monitoring

No exceedance of Action and Limit levels for noise monitoring was recorded in the reporting month.

Water Quality Monitoring

According to the summary of water monitoring results, there was one limit level exceedance of suspended solid at station R1b on 13 June 2017. After investigation, there was concluded that the exceedance was not relevant to this Contract since there was no construction works conducted from 12:00noon on 12 June 2017 to 13:30pm on 13 June 2017 which was unlikely to generate suspended solid and thus deteriorate the water quality at the monitoring station R1b on 13 June 2017. Besides, Tropical Cyclone Warning Signal No.8 was hoisted from 12 to 13 June 2017 and Red Rainstorm Warning Signal was hoisted during water monitoring period on 13 June 2017 which would deteriorate the water quality at the monitoring station R1b on 13 June 2017. The Investigation Reports No. 001 (including the causes of exceedance, action taken and recommendation for mitigation) for Action or Limit Level Non-compliance were provided in **Appendix K**. There was no Action and Limit Level exceedance recorded on other monitoring date at station R1b.

Weekly Site Inspections

In general, performance on environmental mitigation measures implemented was found to be satisfactory in this reporting period. The major findings observed during site inspections are presented in the **Section 3.4.**

Complaint Log

There was no complaint received in relation to the environmental impact during the reporting period.

Notifications of Summons and Successful Prosecutions

There were no notifications of summons or prosecutions received during the reporting period.

Reporting Change

There were no reporting changes during the reporting period.

1 INTRODUCTION

1.1. Basic Project Information

1.1.1. This Quarterly Environmental Monitoring and Audit (EM&A) Report is prepared for Contract No. DC/2013/10 - Design, Build and Operate San Wai Sewage Treatment Works – Stage 1 (the Project) (hereafter referred to as "the Contract"). The Contract was awarded to ATAL-DEGREMONT-CHINA HARBOUR JOINT VENTURE (ADCJV) by the Drainage Services Department (DSD) and ETS-Testconsult Limited was appointed as the Environmental Team (ET) by ADCJV to implement the EM&A program in compliance with the EP and the EM&A Manuals.

1.1.2. The project involves expansion of the preliminary treatment works at San Wai STW from 164,000 m^3/d to 200,000 m^3/d Average Dry Weather Flow, upgrading the preliminary treatment level to CEPT and adding centralized disinfection. The site layout plan is shown in **Appendix A**. For any enquiries, hot line telephone (24 hours) at 9083 0560 was established.

1.1.3. According to the Section 25 of the Particular Specification (PS) and the Environmental Permit No. EP-464/2013, an EM&A programme should be implemented by an independent Environmental Team (ET) in accordance with the procedures and requirements in the EM&A Manual of the approved EIA report (Registration No. AEIAR-072/2003).These documents are available through the EIA Ordinance Register. The construction works of the Contract commenced on 16 May 2017.

1.1.4. The scope of monitoring works includes air quality, construction noise, water quality and environmental site audit. The EM&A requirements for each parameter described in the following sections include:

- *All monitoring parameters;*
- *Monitoring schedules for the reporting month and forthcoming months;*
- *Action and Limit levels for all environmental parameters;*
- *Event/Action Plans;*
- *Environmental mitigation measures, as recommended in the Project EIA study final report; and*
- *Environmental requirements in contract documents.*

1.1.5. As part of the project EM&A program, baseline monitoring was conducted from 21 March 2017 to 15 April 2017 to determine the ambient environmental conditions before the project commence any major construction works and it had been verified by IEC and endorsed by EPD.

1.1.6. This is the first Quarterly Environmental Monitoring and Audit (EM&A) Report for the Contract which summaries the audit findings of the EM&A programme during the reporting period from 16 May 2017 to 31 July 2017.

1.2. Project Organization

1.2.1. The project organization structure and lines of communication with respect to the on-site environmental management structure is shown in **Appendix B**. The key personnel contact names and numbers are summarized in **Table 1.1.**

Table 1.1 Contact Information of Key Personnel

Party	*Position*	*Name of Key Staff*	*Tel. No.*	*E-mail*
Supervising Officer (AECOM Asia Co. Ltd.)	*Resident Engineer*	*Mr. Patrick Leung*	*5222 6561*	*patrick.leung@swstw-aecom.com*
Independent Environmental Checker (ANewR Consulting Limited)	*Technical Director*	*Mr. Adi Lee*	*2618 2836*	*aymlee@anewr.com*
	Senior Environmental Consultant	*Mr. Nic Lam*	*2618 2836*	*nhhlam@anewr.com*
Contractor (ATAL-DEGREMONT-CHINA HARBOUR JOINT VENTURE)	*Environmental Officer*	*Mr. Johnny So*	*9513 8899*	*johnny.so@c302.chechk.com*
	Environmental Supervisor	*Ms Cherry Ye*	*6237 1125*	*cherry.ye@c302.chechk.com*
Environmental Team (ETS-Testconsult Ltd.)	*Environmental Team Leader*	*Mr. C. L. Lau*	*2946 7791*	*env@ets-testconsult.com*

1.3. Construction Programme

1.3.1. A copy of the Contractor's construction programme is provided in **Appendix C**.

1.4. Construction Works Undertaken During the Reporting Period

1.4.1. A summary of the construction activities undertaken during this reporting period is shown below:

- *Piling Foundation (Prebored H-pile)*
- *Piling Foundation (Driven H-pile)*
- *Piling Foundation (minipile)*
- *Portion 5 (Access Road) Works*
- *Drainage Outlet connection (Effluent Connection to the Existing Junction Chamber)*
- *Diversion of Existing Street Lighting and Traffic Signs*
- *Civil Works by ADCJV for HyD's Diversion of Existing Street Lighting and Traffic Sign*
- *Civil Works by ADCJV for WSD's Diversion of Existing Watermains*
- *Civil Works by ADCJV between Site Boundary for WSD's Diversion of Existing Watermains*

2 EM&A Requirement

2.1. Summary of EM&A Requirements

2.1.1. The scope of monitoring works includes air quality, construction noise, water quality and environmental site audit. The EM&A requirements for each parameter described in the following sections include:

- *All monitoring parameters;*
- *Monitoring schedules for the reporting month and forthcoming months;*
- *Action and Limit levels for all environmental parameters;*
- *Event/Action Plans;*
- *Environmental mitigation measures, as recommended in the Project EIA study final report; and*
- *Environmental requirements in contract documents.*

2.2. Monitoring Requirements

2.2.1. Air Quality Monitoring

In accordance with the EM&A Manual, 1-hr and 24-hr TSP air quality monitoring were conducted three times and once per six days correspondingly. Two air monitoring location, ASR1a (晉榮貨櫃服務有限公司) and ASR2a (永康貨櫃服務有限公司) were selected which was shown in **Figure 1**.

2.2.2. Noise Monitoring

Noise levels (L_{eq}, L_{10} and L_{90}) were monitored in the reporting period in accordance with the EM&A Manual. Two noise monitoring stations, NSR1a (晉榮貨櫃服務有限公司) and NSR2a (永康貨櫃服務有限公司) which shown in **Figure 1**, were required to perform impact noise monitoring.

2.2.3. Water Quality Monitoring

Water quality was monitored 3 times per week in the reporting period in accordance with the EM&A Manual at the one alternative water quality monitoring station, R1b (at Tin Shui Wai Nullah) which shown in **Figure 2**.

2.2.4 The equipment, monitoring parameters, frequency and duration, monitoring methodology, monitoring schedule, meteorological information are detailed in the monthly EM&A Reports.

2.3. Action and Limit Levels

2.3.1. The Action and Limit Levels for 1-hr TSP and 24-hr TSP are provided in **Table 2.1**.

Table 2.1 Action and Limit Levels for 1-hr and 24-hr TSP

Air Quality Monitoring Station	*1-hr TSP ($\mu g/m^3$)*		*24-hr TSP ($\mu g/m^3$)*	
	Action Level	*Limit Level*	*Action Level*	*Limit Level*
ASR1a	*309*	*500*	*260*	*260*
ASR2a	*292*	*500*	*228*	*260*

2.3.2. The Action and Limit Levels for construction noise are provided in **Table 2.2**

Table 2.2 Action and Limit Levels for Construction Noise

Time Period	*Action*	*Limit*
0700 –1900 hrs normal weekdays	*When one documented complaint is received*	*75 dB(A)**

Remark: (*)70dB(A) for schools and 65dB(A) for schools during school examination period

2.3.3. The Action and Limit Levels for Water Quality are provided in **Table 2.3**

Table 2.3 Action and Limit Levels for Water Quality

Parameters	***Unit***	***Action***	***Limit***
Turbidity	*NTU*	*19.8*	*20.5*
Dissolved Oxygen	*mg/L*	*1.84*	*1.81*
Suspended Solid	*mg/L*	*17.0*	*17.8*

2.4. Event and Action Plans

2.4.1. The event and action plan is provided in **Appendix G**.

2.5. Mitigation Measures

2.5.1. Environmental mitigation measures for the Contract were recommended in the Approved EIA Report. **Appendix H** lists the recommended mitigation measures and the implementation status.

3 ENVIRONMENTAL MONITORING AND AUDIT

3.1. Air Quality Monitoring Result

3.1.1 No exceedance of Action and Limit levels was recorded for 1-hr and 24-hr TSP monitoring in this quarter. Graphical presentation of 1-hour and 24-hour TSP monitoring results is shown in **Appendix D**. Wind data included wind speed and wind direction was extracted from Wetland Park Station of Hong Kong Observatory and is presented in **Appendix I**.

3.1.2 Generally, 1-hour TSP and 24-hour TSP monitoring results fluctuated well below the Action Level in this reporting period. The major dust source observed near the monitoring stations was mainly from vehicles passing by the container yards and general earth works. It can be concluded that the contractor implemented sufficient dust mitigation measures during this reporting quarter.

3.1.3 Apart from the construction activities, the cargo trunks passing through the container yards (晉榮貨櫃服務有限公司 and 永康貨櫃服務有限公司) would also generate dust since the Ha Tsuen Road was mainly made by soil and sand. A part of 1-hour TSP and 24-hour TSP monitoring results were contributed by the cargo trunks.

3.2. Noise Monitoring Results

3.2.1. No exceedance of Action and Limit Level of noise monitoring results was recorded during the reporting quarter. Graphical presentation of 1-hour and 24-hour TSP monitoring results for the reporting month is shown in **Appendix E**.

3.2.2. The noise monitoring data were found to be lower than the limit level. The major noise source during the monitoring event was the vehicles passing through the container yard entrance and the general earth works inside the construction site.

3.2.3. Since NSR1a and NSR2a were located inside the container yards, the frequency of vehicles moving in and out the container yards would influence the noise monitoring results.

3.3. Water Quality Monitoring Result

3.3.1. According to the summary of water monitoring results, there was one limit level exceedance of suspended solid at station R1b on 13 June 2017. After investigation, there was concluded that the exceedance was not relevant to this Contract since there was no construction works conducted from 12:00noon on 12 June 2017 to 13:30pm on 13 June 2017 which was unlikely to generate suspended solid and thus deteriorate the water quality at the monitoring station R1b on 13 June 2017. Besides, Tropical Cyclone Warning Signal No.8 was hoisted from 12 to 13 June 2017 and Red Rainstorm Warning Signal was hoisted during water monitoring period on 13 June 2017 which would deteriorate the water quality at the monitoring station R1b on 13 June 2017. The Investigation Reports No. 001 (including the causes of exceedance, action taken and recommendation for mitigation) for Action or Limit Level Non-compliance were provided in **Appendix K**. There was no Action and Limit Level exceedance recorded on other monitoring date at station R1b. Graphical presentation of the monitoring results for the reporting month is shown in **Appendix F**.

3.3.2. Generally, the turbidity and suspended solids were found to be lower than the action level. Besides, all results of dissolved oxygen measured in this reporting period were higher than the action level.

3.3.3. Aside from the discharge, weather condition would be a major factor that affects the water quality in Tin Shui Wan Nallah. In rainy day, the soil and other suspended materials were flushed along the shore and entered the Tin Shui Wai Nullah. Besides, the nullah water would flow rapidly and the sand and stones in the nullah bed were upturned. Thus, the water quality would be deteriorated.

3.4. Site Inspection

3.4.1. Site Inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control mitigation measures for the project. The dates of environmental site inspections during the reporting period are listed in **Table 3.1**.

Table 3.1 Environmental Site Inspection Date

May 2017	June 2017	July 2017
19 and 26	02, 09, 16, 23 and 30	07, 14, 21 and 28

3.4.2. Observations for the site inspections within this reporting period are summarized in **Table 3.2**.

Table 3.2 Summary of observation of site inspections

Date	Observations / Reminders	Follow-up Action	Closed Date
19 May 2017	1. Storage of dusty materials without impervious sheet was observed Reminder 1 – The contractor was reminded to provide sandbags for preventing washout of soil/sand.	1. Impervious sheet was provided for covering the dusty materials.	26 May 2017
26 May 2017	1. Stagnant pool in drip trays was observed. Reminder 1 – The contractor was reminded to provide temporary washing facilities with high pressure water jet before the completion of wheel washing bay. Reminder 2 – The contractor was reminded to provide seal between hoarding and the	1. Stagnant pool was cleared inside the drip trays.	02 June 2017

	ground.		
02 June 2017	1. Stagnant pool was observed in the hole on the ground near sediment tank. 2. Chemical container without label was observed.	1. Stagnant pool near sediment tank was cleared. 2. Correct label was displayed on the chemical container.	09 June 2017
09 June 2017	Reminder 1 – The contractor was reminded to increase the frequency of watering in order to prevent dust generation.	--	--
16 June 2017	1. No items were observed.	--	--
23 June 2017	1. Oil Stain was observed on the ground at Portion P1.	1. Oil stains were cleaned.	30 June 2017
30 June 2017	1. Insufficient watering was observed	2. The frequency of watering was improved.	07 July 2017
07 July 2017	1. Oil containers were found without drip tray at Portion P1.	3. The Oil containers were disposed properly.	14 July 2017
14 July 2017	1. Stagnant water was observed.	1. Stagnant water was cleared.	21 July 2017
21 July 2017	1. Stagnant water was observed at a generator and drip tray near area P1.	1. Stagnant water was cleared.	28 July 2017
28 July 2017	1. Storage of dusty materials without impervious sheet was observed. 2. Stagnant water was observed inside the drip tray.	1. Impervious sheet was provided to cover the dusty materials. 2. Stagnant water was cleared inside the drip tray.	04 August 2017

3.5. Advice on the Solid and Liquid Waste Management Status

3.5.1. All types of waste arising from the construction work are classified into the following:

- Construction & Demolition (C&D) Material;
- Chemical Waste;
- General Refuse; and
- Excavated Soil

3.5.2. The quantities of waste for disposal in this reporting period are summarized in the Monthly Summary Waste Flow Table which is shown in **Appendix J**.

3.5.3. To control over the site performance on waste management, the Contractor shall ensure that all solid and liquid waste management works are in full compliance with the relevant license/permit requirements, such as the effluent discharge license and the chemical waste producer registration. The Contractor is also reminded to implement the recommended environmental mitigation measures according to the EM&A Manual based on actual site conditions.

3.6. Discharge License and Results of Effluent Monitoring

3.6.1. Effluent quality was monitored in the reporting quarter in accordance with the EM&A Manual at the discharge point. A discharge license under Water Pollution Control Ordinance was obtained by the Contractor upon commencement of the Project. Self-monitoring would be performed as per the requirement under the discharge license. According to the EM&A Manual, pH, chemical oxygen demand and total suspended solid are required to be analysed at least once every two week.

3.6.2. Effluent water samples were sampled by the Contractor. The dates of environmental site inspections during the reporting period are listed in **Table 3.3**. Since there was no discharging activities were undertaken on May 2017, no effluent monitoring was conducted on May. In July 2017, the effluent discharge monitoring was supposed to be conducted on 29 July 2017. However, there is no water discharged on 29 July 2017 and the water sampling work was then taken on next working day (31 July 2017).

Table 3.3 Effluent Sampling Dates

June 2017	July 2017
10, 20 and 30	15, 18 and 31

3.6.3. The required testing parameter including pH, chemical oxygen demand and total suspended solid were carried out in a HOKLAS laboratory. The methods of chemical oxygen demand and total suspended solid determination follow APHA 19ed 5220 B and APHA 19ed 2540 D respectively.

3.6.4. For effluent quality monitoring as per the discharge license requirement, the parameter complied with the discharge license requirement.

3.7. Implementation Status of Environmental Mitigation Measures

3.7.1. The environmental mitigation measures that recommended in the Environmental Monitoring and Audit Manual covered the issues of dust, noise and waste and they are summarized as following:

Dust Mitigation Measures

a. The working area for the uprooting of trees, shrubs, or vegetation or for the removal of boulders, poles, pillars or temporary or permanent structures should be sprayed with water or a dust suppression chemical immediately before, during and immediately after the operation so as to maintain the entire surface wet;
b. All demolished items (including trees, shrubs, vegetation, boulders, poles, pillars, structures, debris, rubbish and other items arising from site clearance) that may dislodge dust particles should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides within a day of demolition;
c. Vehicle washing facilities including a high pressure water jet should be provided at every discernible or designated vehicle exit point;
d. 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 concrete, bituminous materials or hardcores;
e. Where a site boundary adjoins a road, street, service and or other area accessible to the public, hoarding of not less than 2.4m from ground level should be provided along the entire length of that portion of the site boundary except for a site entrance or exit;
f. Every main haul road (i.e. any course inside a construction site having a vehicle passing rate of higher than 4 in any 30 minutes) should be paved with concrete, bituminous materials, hardcores or metal plates, and kept clear of dusty materials; or sprayed with water or a dust suppression chemical so as to maintain the entire road surface wet;
g. The portion of any road leading only to a construction site that is within 30m of a discernible or designated vehicle entrance or exit should be kept clear of dusty materials;
h. Immediately before leaving a construction site, every vehicle should be washed to remove any dusty materials from its body and wheels;
i. Where a vehicle leaving a construction site is carrying a load of dusty materials, the load should be covered entirely by clean impervious sheeting to ensure that the dusty materials do not leak from the vehicle;
j. The working area of any excavation or earth moving operation should be sprayed with water or a dusty suppression chemical immediately before, during and immediately after the operation so as to maintain the entire surface wet;
k. Exposed earth shall be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shotcrete or other suitable surface stabilizer within 6 months after the last construction activity on the construction site or part of the construction site where the exposed earth lies;

l. Any stockpile of dusty material should be either covered entirely by impervious sheeting; placed in an area sheltered on the top and the 3 sides; or sprayed with water or a dust suppression chemical so as to maintain the entire surface wet.

Noise Mitigation Measures

a. Quiet plants should be used in order to reduce the noise impacts to protect the nearby NSRs.
b. Temporary and Movable Noise Barriers should be used in order to reduce the noise impact to the surrounding sensitive receivers
c. The contractor should site noisy equipment and activities as far from sensitive receivers as practical.
d. Idle equipment should be turned off or throttled down.
e. Construction activities should be planned so that parallel operation of several sets of equipment close to a given receiver is avoided
f. Construction plant should be properly maintained and operated.

Water Quality Mitigation Measures

a. Exposed stockpiles should be covered with tarpaulin or impervious sheets before a rainstorm occurs;
b. The exposed soil surfaces should also be properly protected to minimize dust emission;
c. The stockpiles of materials should be placed in the locations away from the drainage channel so as to avoid releasing materials into the channel;
d. Wheel washing facilities should be provided at site exits to ensure that earth, mud and debris would not be carried out of the works areas by vehicles;
e. Provision of site drainage systems and treatment facilities would be required to minimize the water pollution;
f. A discharge license needs to be applied from EPD for discharging effluent from the construction site;
g. The treated effluent quality is required to meet the requirements specified in the discharge license;
h. Provision of chemical toilets is required to collect sewage from workforce. The chemical toilets should be cleaned on a regular basis;
i. A licensed waste collector should be employed to clean the chemical toilets and temporary storage tank on a regular basis;
j. Illegal disposal of chemicals should be strictly prohibited;
k. Registration as a chemical waste producer is required if chemical wastes are generated and need to be disposed of. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation should be observed and complied with for control of chemical wastes;
l. Disposal of chemical wastes should be carried out in compliance with the Waste Disposal Ordinance. The Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes published under the Waste Disposal Ordinance should be used as a guideline for handing chemical wastes;
m. The impact from accidental spillage of chemicals can be effectively controlled through good management practices.

Waste Management Mitigation Measures

a. Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal;
b. To encourage collection of aluminium cans by individual collectors, separate bins should be provided to segregate this waste from other general refuse generated by the workforce;
c. Any unused chemicals or those with remaining functional capacity should be recycled;
d. Prior to disposal of C&D waste, it is recommended that wood, steel and other metals be separated for re-use and/or recycling and inert waste as fill material to minimize the quantity of waste to be disposed of to landfill;
e. Proper storage and site practices to minimize the potential for damage or contamination of construction materials; and
f. Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste.

4 SUMMARY OF EXCEEDANCE, COMPLAINT, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTION

4.1. Summary of Exceedance of the Environmental Quality Performance Limit

4.1.1. There was no Action and Limit level exceedance of 1-hour and 24-hr TSP monitoring was recorded at station ASR1a and ASR2a during this reporting month.

4.1.2. There was no Action and Limit Level exceedance for noise recorded at station NSR1a and NSR2a during the reporting period.

4.1.3. According to the summary of water monitoring results, there was one limit level exceedance of suspended solid at station R1b on 13 June 2017. After investigation, there was concluded that the exceedance was not relevant to this Contract since there was no construction works conducted from 12:00noon on 12 June 2017 to 13:30pm on 13 June 2017 which was unlikely to generate suspended solid and thus deteriorate the water quality at the monitoring station R1b on 13 June 2017. Besides, Tropical Cyclone Warning Signal No.8 was hoisted from 12 to 13 June 2017 and Red Rainstorm Warning Signal was hoisted during water monitoring period on 13 June 2017 which would deteriorate the water quality at the monitoring station R1b on 13 June 2017. The Investigation Reports No. 001 (including the causes of exceedance, action taken and recommendation for mitigation) for Action or Limit Level Non-compliance were provided in **Appendix K**. There was no Action and Limit Level exceedance recorded on other monitoring date at station R1b.

4.2. Summary of Complaints, Notification of Summons and Successful Prosecution

4.2.1. There were no complaints received during the reporting period.

4.2.2. There were no notifications of summons or prosecutions received during the reporting period.

4.2.3. A summary of environmental complaints, notifications of summons and successful prosecutions was given in **Table 4.1**.

Table 4.1 Summary of Environmental Complaints Notification of Summons and Successful Prosecution

Reporting Period	Cumulative Statistic		
	Complaints	Notifications of summons	Successful prosecutions
The reporting period	0	0	0
From commencement date of construction to end of reporting month	0	0	0

5 COMMENTS, RECOMMENDATIONS AND CONCLUSION

5.1. Comments

5.1.1. According to the environmental site inspection undertaken during the reporting period, the following recommendations were provided:

- The Contractor was reminded to provide appropriate labels for the chemical containers;
- The Contractor was reminded to cover the dusty material with impervious sheet;
- The Contractor was reminded to clear all the stagnant water pools;
- The Contractor was reminded to spray water regularly.

5.2. Recommendations

5.2.1. With implementation of the recommended environmental mitigation measures, the contract's environmental impacts were considered environmentally acceptable. The weekly environmental site inspections ensured that all the environmental mitigation measures recommended were effectively implemented.

5.2.2. The recommended environmental mitigation measures, as included in the EM&A programme, effectively minimize the potential environmental impacts from the Contract. Also, the EM&A programme effectively monitored the environmental impacts from the construction activities and ensure the proper implementation of mitigation measures. No particular recommendation was advised for the improvement of the programme.

5.3. Conclusions

5.3.1. There was no Action and Limit level exceedance of 1-hour and 24-hr TSP monitoring was recorded at station ASR1a and ASR2a during this reporting month.

5.3.2. There was no Action and Limit Level exceedance for noise recorded at station NSR1a and NSR2a during the reporting period.

5.3.3. According to the summary of water monitoring results, there was one limit level exceedance of suspended solid at station R1b on 13 June 2017. After investigation, there was concluded that the exceedance was not relevant to this Contract since there was no construction works conducted from 12:00noon on 12 June 2017 to 13:30pm on 13 June 2017 which was unlikely to generate suspended solid and thus deteriorate the water quality at the monitoring station R1b on 13 June 2017. Besides, Tropical Cyclone Warning Signal No.8 was hoisted from 12 to 13 June 2017 and Red Rainstorm Warning Signal was hoisted during water monitoring period on 13 June 2017 which would deteriorate the water quality at the monitoring station R1b on 13 June 2017. The Investigation Reports No. 001 (including the causes of exceedance, action taken and recommendation for mitigation) for Action or Limit Level Non-compliance were provided in **Appendix K**. There was no Action and Limit Level exceedance recorded on other monitoring date at station R1b.

5.3.4. Environmental site inspections were carried out on 19 and 26 May 2017, 02, 09, 16, 23 and 30 June 2017 and 07, 14, 21 and 28 July 2017. Recommendations on remedial actions were given to the Contractors for the deficiencies identified during the site inspections.

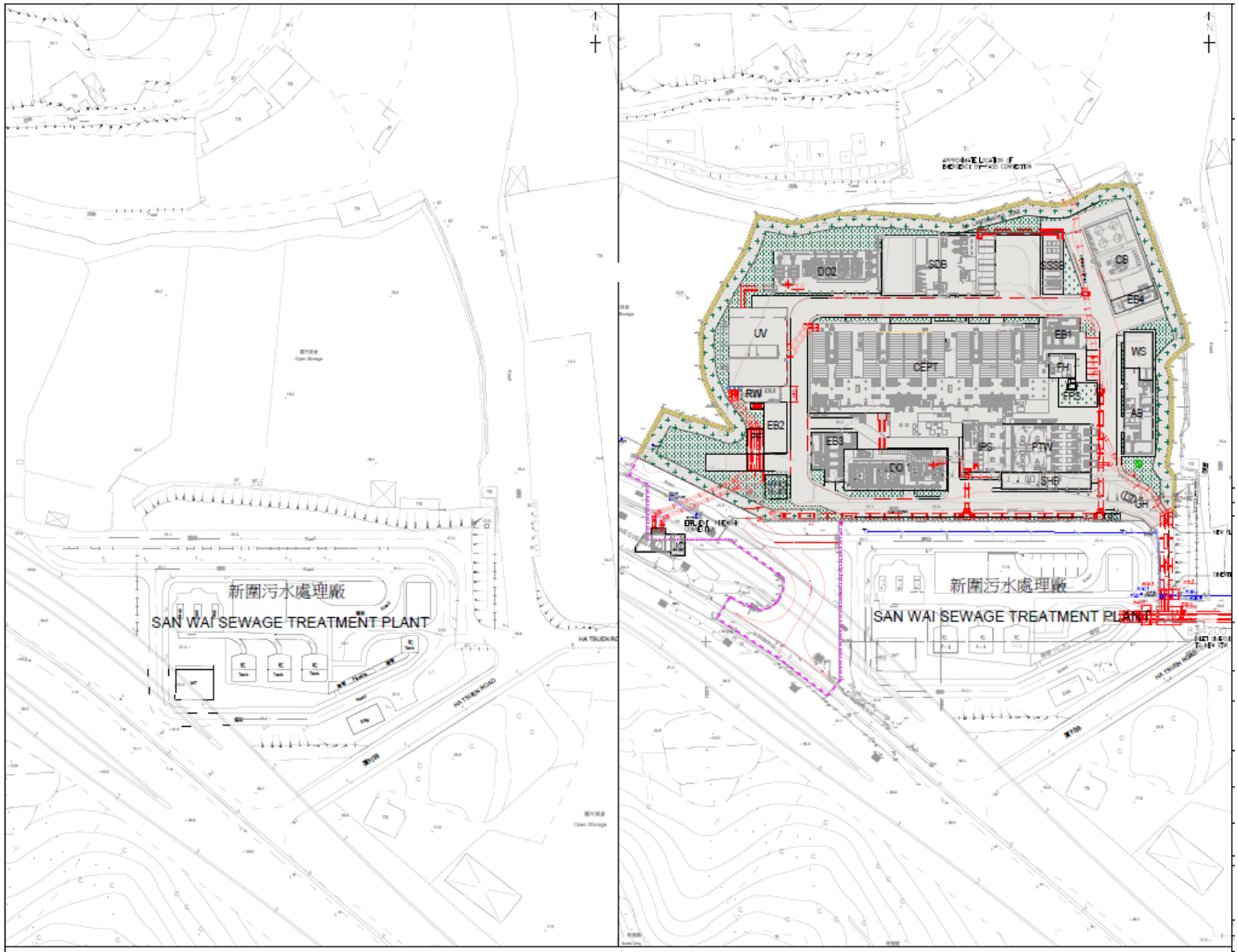
5.3.5. There were no complaints received during the reporting period.

5.3.6. There was no notification of summons and successful prosecution received during the reporting period.

- END OF REPORT -

Appendix A

Location of Works Areas

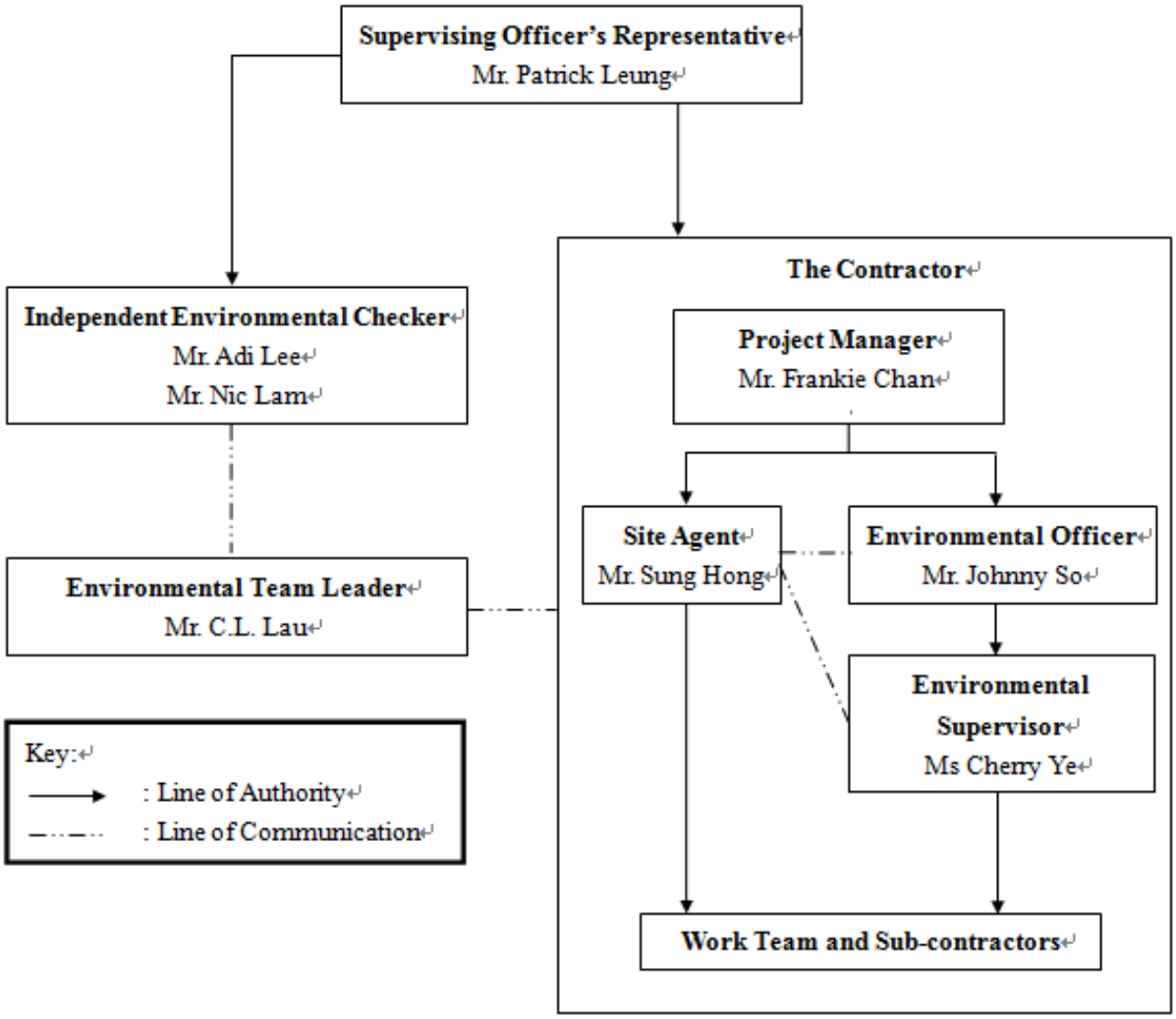


EXISTING SAN WAI SEWAGE TREATMENT WORKS

EXPANDED AND UPGRADED SAN WAI SEWAGE TREATMENT WORKS

Appendix B

Project Organization Chart

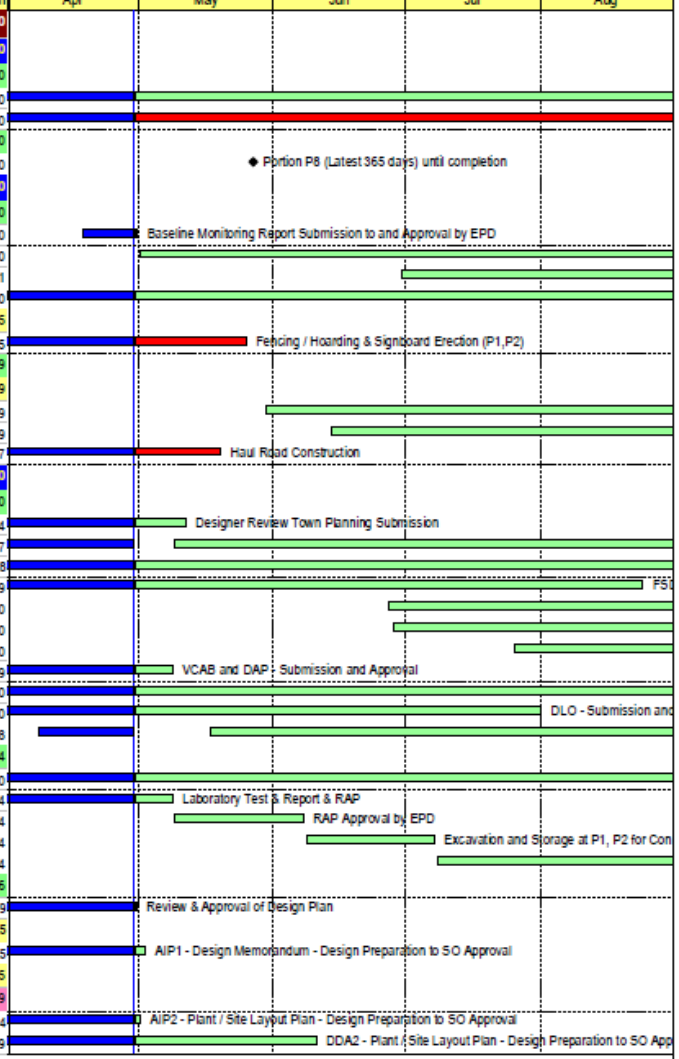

Supervising Officer's Representative
Mr. Patrick Leung
Independent Environmental Checker
Mr. Adi Lee
Mr. Nic Lam
Environmental Team Leader
Mr. C.L. Lau
The Contractor
Project Manager
Mr. Frankie Chan
Site Agent
Mr. Sung Hong
Environmental Officer
Mr. Johnny So
Environmental Supervisor
Ms Cherry Ye
Work Team and Sub-contractors
Key:
: Line of Authority
: Line of Communication

Appendix C

Construction Programme

DATA DATE: 30-Apr-17 | LAYOUT: SW Project PHase 1 Rev 5 (3M 30Apr17) | PAGE 1 OF 6

Activity ID	Activity Name	Original Duration	Start	Finish	Rev 5 BL Start	Rev 5 BL Finish	Slippage Start	Slippage Finish
San Wai Sewage Treatment Works - Phase 1 （Update as of 30 Apr 2017)		1585	27-May-16 A	28-Sep-20	27-May-16	27-Sep-20	0	0
Key Date		1585	27-May-16 A	28-Sep-20	27-May-16	27-Sep-20	0	0
Commencement & Completion of Works		1585	27-May-16 A	28-Sep-20	27-May-16	27-Sep-20	0	0
KD130	Section 1 - Period of Works (FOT P.3 cl 67,71) - Including 1.5 Days Granted EOT	552	27-May-16 A	29-Nov-17	27-May-16	29-Nov-17	0	0
KD160	Section 2 - Period of Works (FOT P.3 cl 67, 71) - Including 1.5 Days Granted EOT	1585	27-May-16 A	28-Sep-20	27-May-16	27-Sep-20	0	0
Possession of Sites		0	27-May-17	27-May-17	27-May-17	27-May-17	0	0
KD240	Portion P8 (Latest 365 days) until completion	0	27-May-17		27-May-17		0	0
Preliminaries & General Requirement		1274	22-Nov-16 A	25-Sep-20	23-Nov-16	25-Sep-20	1	0
Contractor Requirement		1274	22-Nov-16 A	25-Sep-20	23-Nov-16	25-Sep-20	1	0
PS460	Baseline Monitoring Report Submission to and Approval by EPD	28	18-Apr-17 A	30-Apr-17	03-Apr-17	30-Apr-17	-15	0
PS465	Impact Monitoring	1243	01-May-17	24-Sep-20	01-May-17	24-Sep-20	0	0
PS475	Temporary Stockpile at DO2 Area	184	30-Jun-17	30-Dec-17	01-Jul-17	31-Dec-17	1	1
PS485	Site Drainage Plan Implementation	1274	01-Apr-17 A	25-Sep-20	01-Apr-17	25-Sep-20	0	0
Contractor Requirement for Working Area Portion (P1-P2)		129	22-Nov-16 A	25-May-17	23-Nov-16	31-Mar-17	1	-55
PS105	Fencing / Hoarding & Signboard Erection (P1,P2)	129	22-Nov-16 A	25-May-17	23-Nov-16	31-Mar-17	1	-55
Site Establishment		166	24-Dec-16 A	10-Nov-17	24-Dec-16	12-Sep-17	0	-59
Site Establishment for Working Area Portion (P1-P2)		166	24-Dec-16 A	10-Nov-17	24-Dec-16	12-Sep-17	0	-59
PS322	Submission of CSD and CBWD 3D Model in LD3	150	30-May-17	26-Oct-17	01-Apr-17	28-Aug-17	-59	-59
PS323	Submission of Clash Analysis Report	150	14-Jun-17	10-Nov-17	16-Apr-17	12-Sep-17	-59	-59
PS330	Haul Road Construction	50	24-Dec-16 A	19-May-17	24-Dec-16	11-Feb-17	0	-97
Design & Design Checking of Permanent Works		909	27-May-16 A	18-Dec-18	27-May-16	18-Dec-18	0	0
Statutory Submission		845	10-Oct-16 A	18-Dec-18	10-Oct-16	18-Dec-18	0	0
DS120	Designer Review Town Planning Submission	120	10-Oct-16 A	11-May-17	10-Oct-16	06-Feb-17	0	-94
DS160	WSD - Water Supply & Plumbing	540	02-Feb-17 A	17-Jun-18	12-Mar-17	02-Sep-18	38	77
DS165	CLP - Power Supply	681	01-Nov-16 A	16-Jul-18	10-Jan-17	21-Nov-18	70	128
DS170	FSD - GBP with FS Notes and Dangerous Goods (DG)	180	02-Feb-17 A	24-Aug-17	16-May-17	11-Nov-17	103	79
DS173	PCCW - Telephone Lines and Megalink	540	27-Jun-17	18-Dec-18	27-Jun-17	18-Dec-18	0	0
DS174	PCCW - Telephone Lines for CLP Summation Metering	90	28-Jun-17	25-Sep-17	28-Jun-17	25-Sep-17	0	0
DS185	Home Affairs Department Application for Section 1 (ID KD150)	60	26-Jul-17	23-Sep-17	26-Jul-17	23-Sep-17	0	0
DS200	VCAB and DAP - Submission and Approval	90	01-Dec-16 A	08-May-17	01-Dec-16	28-Feb-17	0	-69
DS205	Application for XP and TTMS for diverting traffic onto the Access Road in Portion P5 - Submission and Appr	290	30-Nov-16 A	15-Sep-17	30-Nov-16	15-Sep-17	0	0
DS210	DLO - Submission and Approval of Tree Removal and Transplant Proposals	182	31-Jan-17 A	01-Aug-17	31-Jan-17	31-Jul-17	0	0
DS230	GEO - Submission of DDA28A to SO for onward submission to GEO for Checking Certificate	283	08-Apr-17 A	02-Feb-18	08-Apr-17	15-Jan-18	0	-18
Site Investigation		261	01-Mar-17 A	03-Jan-18	01-Mar-17	10-Dec-17	0	-24
DS334	Pre-drilling for Foundation Works (Remaining Structures)	195	27-Mar-17 A	07-Oct-17	27-Mar-17	07-Oct-17	0	0
DS350	Laboratory Test & Report & RAP	45	01-Mar-17 A	08-May-17	01-Mar-17	14-Apr-17	0	-24
DS360	RAP Approval by EPD	30	09-May-17	07-Jun-17	15-Apr-17	14-May-17	-24	-24
DS370	Excavation and Storage at P1, P2 for Contamination Treatment	30	08-Jun-17	07-Jul-17	15-May-17	13-Jun-17	-24	-24
DS380	Contamination Treatment (Biopile)	180	08-Jul-17	03-Jan-18	14-Jun-17	10-Dec-17	-24	-24
AIP / DDA Submission & Approval		501	27-May-16 A	25-Jan-18	27-May-16	29-Dec-17	0	-26
DS410	Review & Approval of Design Plan	60	26-Jun-16 A	30-Apr-17	26-Jun-16	24-Aug-16	0	-249
Design Memorandum (AIP1 / DDA1)		186	26-Jun-16 A	02-May-17	26-Jun-16	28-Dec-16	0	-125
DS470	AIP1 - Design Memorandum - Design Preparation to SO Approval	186	26-Jun-16 A	02-May-17	26-Jun-16	28-Dec-16	0	-125
Global Design		423	27-May-16 A	24-Jan-18	27-May-16	29-Dec-17	0	-25
Plant / Site Layout & Formation Level w/. GBP (AIP2 / DDA2)		321	27-May-16 A	10-Jun-17	27-May-16	12-Apr-17	0	-59
DG352	AIP2 - Plant / Site Layout Plan - Design Preparation to SO Approval	225	27-May-16 A	01-May-17	27-May-16	06-Jan-17	0	-114
DG390	DDA2 - Plant / Site Layout Plan - Design Preparation to SO Approval	174	21-Oct-16 A	10-Jun-17	21-Oct-16	12-Apr-17	0	-59



Remaining Level of Effort
Actual Level of Effort
Actual Work
Remaining Work
Critical Remaining Work
◆ Milestone

TASK filter: 3 Months Rolling Programme.

CONTRACT NO. DC/2013/10 DESIGN, BUILD & OPERATE
SAN WAI SEWAGE TREATMENT - PHASE 1
MASTER SCHEDULE Rev 5 (30 April 2017)
THREE (3) MONTHS ROLLING PROGRAMME

Date	Revision	Checked	Approved
30-Apr-17	Three (3) Months Rolling Programme		

DATA DATE: 30-Apr-17 | LAYOUT: SW Project PHase 1 Rev 5 (3M 30Apr17) |

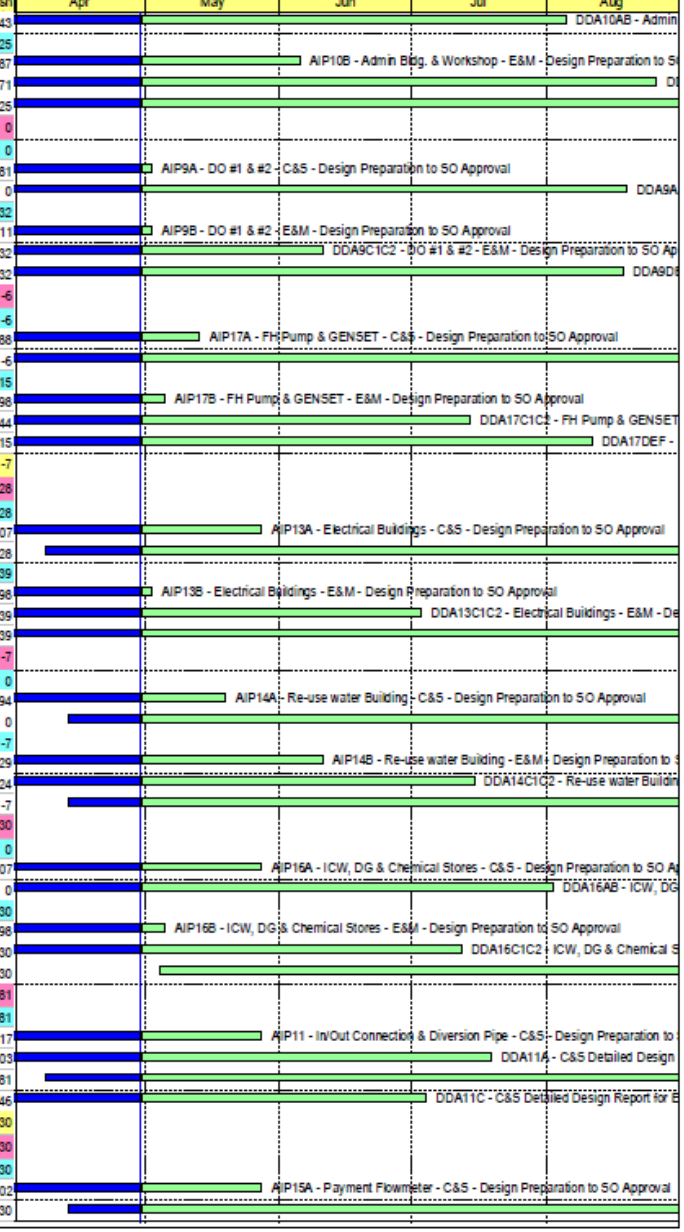
Activity ID	Activity Name	Original Duration	Start	Finish	Rev 5 BL Start	Rev 5 BL Finish	Slippage Start	Slippage Finish
Treatment Process (AIP3 / DDA3)		334	27-May-16 A	10-Jun-17	27-May-16	25-Apr-17	0	-46
DG114	AIP3 - Treatment Process - Design Preparation to SO Approval	251	27-May-16 A	02-May-17	27-May-16	01-Feb-17	0	-90
DG130	DDA3 - Treatment Process - Design Preparation to SO Approval	199	02-Sep-16 A	10-Jun-17	09-Oct-16	25-Apr-17	37	-46
Hydraulic (AIP4 / DDA4)		327	27-May-16 A	12-Jun-17	27-May-16	18-Apr-17	0	-55
DG146	AIP4 - Hydraulic - Design Preparation to SO Approval	251	27-May-16 A	02-May-17	27-May-16	01-Feb-17	0	-90
DG162	DDA4 - Hydraulic - Design Preparation to SO Approval	201	02-Sep-16 A	12-Jun-17	30-Sep-16	18-Apr-17	28	-55
Alternative Permanent Access Road [Section 1] (AIP19 / DDA19)		294	27-May-16 A	29-May-17	27-May-16	16-Mar-17	0	-73
DG227	AIP19 - Access Road (Section 1) - Design Preparation to SO Approval	252	27-May-16 A	02-May-17	27-May-16	02-Feb-17	0	-89
DG260	DDA19 - Access Road (Section 1) - Design Preparation to SO Approval	184	01-Oct-16 A	29-May-17	14-Sep-16	16-Mar-17	-17	-73
Electrical Power Supply System (AIP20 / DDA20ABCD)		297	27-Sep-16 A	20-Jul-17	27-Sep-16	20-Jul-17	0	0
DG1879	AIP20 - Electrical Power Supply System - Design Preparation to SO Approval	171	27-Sep-16 A	10-Jun-17	27-Sep-16	16-Mar-17	0	-86
DG1891	DDA20ABCD - Electrical Power Supply System - Design Preparation to SO Approval	196	03-Feb-17 A	20-Jul-17	06-Jan-17	20-Jul-17	-28	0
Control and Monitoring System (AIP21 / DDA21ABCD)		263	09-Oct-16 A	24-Nov-17	09-Oct-16	26-Sep-17	0	-58
DG1905	AIP21 - Control & Monitoring System - Design Preparation to SO Approval	165	09-Oct-16 A	16-Jun-17	09-Oct-16	22-Mar-17	0	-86
DG1924	DDA21A - Control & Monitoring System (P&ID) - Design Preparation to SO Approval	168	23-Dec-16 A	25-Aug-17	12-Jan-17	28-Jun-17	20	-58
DG1940	DDA21B - Control & Monitoring System (Control Philosophy) - Design Preparation to SO Approval	204	23-Feb-17 A	24-Oct-17	23-Feb-17	29-Aug-17	0	-56
DG1956	DDA21C - Control & Monitoring System (Functional Design Spec) - Design Preparation to SO Approval	188	23-Mar-17 A	24-Nov-17	23-Mar-17	26-Sep-17	0	-58
DG1972	DDA21D - Control & Monitoring System (PLC & SCADA) - Design Preparation to SO Approval	188	23-Mar-17 A	24-Nov-17	23-Mar-17	26-Sep-17	0	-58
Landscaping Works (AIP22 / DDA22)		211	08-Sep-16 A	26-Sep-17	08-Sep-16	04-Jul-17	0	-83
DG1227	AIP22 - Landscaping - Design Preparation to SO Approval	180	08-Sep-16 A	29-May-17	08-Sep-16	06-Mar-17	0	-83
DG1260	DDA22 - Landscaping - Design Preparation to SO Approval	180	06-Jan-17 A	26-Sep-17	06-Jan-17	04-Jul-17	0	-83
General Notes Drawings for Foundation and Civil & Structure (AIP24AB / DDA24AB)		238	12-Aug-16 A	22-Jul-17	12-Aug-16	19-May-17	0	-64
General Notes Drawings for Foundation (AIP24A / DDA24A)		238	12-Aug-16 A	30-May-17	12-Aug-16	06-Apr-17	0	-54
DG3340	AIP24A - Gen. Notes Drawings for Foundation - Design Preparation to SO Approval	182	12-Aug-16 A	05-May-17	12-Aug-16	09-Feb-17	0	-85
DG3375	DDA24A - Gen. Notes Drawings for Foundation - Design Preparation to SO Approval	147	11-Jan-17 A	30-May-17	11-Nov-16	06-Apr-17	-61	-54
General Notes Drawings for Civil & Structure (AIP24B / DDA24B)		200	19-Aug-16 A	22-Jul-17	19-Aug-16	19-May-17	0	-64
DG3655	AIP24B - Gen. Notes Dwgs for Civil & Structure - Design Preparation to SO Approval	200	19-Aug-16 A	13-May-17	19-Aug-16	06-Mar-17	0	-68
DG3690	DDA24B - Gen. Notes Dwgs for Civil & Structure - Design Preparation to SO Approval	150	21-Dec-16 A	22-Jul-17	21-Dec-16	19-May-17	0	-64
Geotechnical Report (AIP25 / DDA25AB)		236	27-Jul-16 A	30-May-17	10-Aug-16	02-Apr-17	14	-58
DG3410	AIP25 - Geotechnical Study - Design Preparation to SO Approval	150	27-Jul-16 A	02-May-17	10-Aug-16	06-Jan-17	14	-116
DG3445	DDA25A - Geotechnical Interpretation Report - Design Preparation to SO Approval	176	10-Sep-16 A	30-May-17	09-Oct-16	02-Apr-17	29	-58
Site Formation & Civil Works (AIP26 / DDA26)		249	25-Aug-16 A	20-Aug-17	25-Aug-16	19-Aug-17	0	0
DG627	AIP26 - Site Formation - Design Preparation to SO Approval	212	25-Aug-16 A	29-May-17	25-Aug-16	24-Mar-17	0	-65
DG660	DDA26 - Site Formation - Design Preparation to SO Approval	218	14-Jan-17 A	20-Aug-17	14-Jan-17	19-Aug-17	0	0
Roadworks (AIP27A / DDA27A)		292	23-Dec-16 A	21-Oct-17	23-Dec-16	08-Sep-17	0	-43
DG1027	AIP27A - Roadworks - Design Preparation to SO Approval	130	23-Dec-16 A	13-Jun-17	23-Dec-16	01-May-17	0	-43
DG1060	DDA27A - Roadworks - Design Preparation to SO Approval	170	23-Mar-17 A	21-Oct-17	23-Mar-17	08-Sep-17	0	-43
Drainage Works (AIP27B / DDA27B)		201	23-Dec-16 A	21-Sep-17	23-Dec-16	09-Aug-17	0	-43
DG927	AIP27B - Drainage - Design Preparation to SO Approval	130	23-Dec-16 A	13-Jun-17	23-Dec-16	01-May-17	0	-43
DG960	DDA27B - Drainage - Design Preparation to SO Approval	170	21-Feb-17 A	21-Sep-17	21-Feb-17	09-Aug-17	0	-43
Boundary Wall & Entrance (AIP28 / DDA28AB)		283	03-Feb-17 A	24-Jan-18	03-Feb-17	29-Dec-17	0	-25
DG1127	AIP28 - Boundary Wall & Entrance - Design Preparation to SO Approval	118	03-Feb-17 A	16-Jun-17	03-Feb-17	31-May-17	0	-16
DG1160	DDA28A - Slopes and Retaining Wall - Design Preparation to SO Approval	134	03-Feb-17 A	12-Jul-17	03-Feb-17	16-Jun-17	0	-25
DG1195	DDA28B - Boundary Wall & Entrance - Design Preparation to SO Approval	196	12-Jul-17	24-Jan-18	17-Jun-17	29-Dec-17	-25	-25
Foundation & Piling Design (AIP29 / DDA29AB)		191	27-May-16 A	03-Jul-17	27-May-16	19-May-17	0	-44
DG427	AIP29 - Piling / Foundation - Design Preparation to SO Approval	190	27-May-16 A	01-May-17	27-May-16	02-Dec-16	0	-149
DG457	DDA29A - Piling / Foundation - Design Preparation to SO Approval (Area 1)	154	03-Jan-17 A	30-May-17	05-Nov-16	07-Apr-17	-59	-53
DG495	DDA29B - Piling / Foundation - Design Preparation to SO Approval (Area 2)	112	28-Jan-17 A	03-Jul-17	28-Jan-17	19-May-17	0	-44
Site Wide Utility (AIP30 / DDA30)		290	02-Oct-16 A	05-Aug-17	02-Oct-16	18-Jul-17	0	-18
DG3480	AIP30 - Site Wide Utility - Design Preparation to SO Approval	135	02-Oct-16 A	27-May-17	02-Oct-16	13-Feb-17	0	-103
DG3515	DDA30 - Site Wide Utility and Security Access Control - Design Preparation to SO Approval	170	02-Feb-17 A	05-Aug-17	30-Jan-17	18-Jul-17	-3	-18
HAZOP Report (DDA31AB)		290	01-Dec-16 A	05-Nov-17	01-Dec-16	18-Oct-17	0	-18
DG3530	DDA31A - HAZOP Study - Design Preparation to SO Approval	204	01-Dec-16 A	10-Jul-17	01-Dec-16	22-Jun-17	0	-18
DG3545	DDA31B - Hazardous Zoning Classification Report - Design Preparation to SO Approval	118	11-Jul-17	05-Nov-17	23-Jun-17	18-Oct-17	-18	-18
ELS / Bulk Excavation		135	22-Jan-17 A	12-Jul-17	22-Jan-17	05-Jun-17	0	-36

DATA DATE: 30-Apr-17 | LAYOUT: SW Project PHase 1 Rev 5 (3M 30Apr17) |

Activity ID	Activity Name	Original Duration	Start	Finish	Rev 5 BL Start	Rev 5 BL Finish	Slippage Start	Slippage Finish
DG3760	EL5 / Bulk Excavation - Design Preparation to SO Approval	135	22-Jan-17 A	12-Jul-17	22-Jan-17	05-Jun-17	0	-36
Miscellaneous Design		217	09-Dec-16 A	14-Jul-17	09-Dec-16	13-Jul-17	0	0
Equipment Schedule (DDA32A)		201	09-Dec-16 A	28-Jun-17	09-Dec-16	27-Jun-17	0	0
DG2012	DDA32A - Equipment Schedule - Design Preparation to SO Approval	201	09-Dec-16 A	28-Jun-17	09-Dec-16	27-Jun-17	0	0
Penstock & Stoplogs Schedule (DDA32B)		179	31-Dec-16 A	28-Jun-17	31-Dec-16	27-Jun-17	0	0
DG3216	DDA32B - Penstock & Stoplogs Schedule - Design Preparation to SO Approval	179	31-Dec-16 A	28-Jun-17	31-Dec-16	27-Jun-17	0	0
Valves and Piping Schedule (DDA32CD)		165	30-Jan-17 A	14-Jul-17	30-Jan-17	13-Jul-17	0	0
DG3222	DDA32CD - Valves and Piping Schedule - Design Preparation to SO Approval	165	30-Jan-17 A	14-Jul-17	30-Jan-17	13-Jul-17	0	0
Painting Schedule (DDA32E)		150	14-Feb-17 A	14-Jul-17	14-Feb-17	13-Jul-17	0	0
DG3228	DDA32E - Painting Schedule - Design Preparation to SO Approval	150	14-Feb-17 A	14-Jul-17	14-Feb-17	13-Jul-17	0	0
Instrument and I/O Schedule (DDA32FG)		141	23-Feb-17 A	14-Jul-17	23-Feb-17	13-Jul-17	0	0
DG3234	DDA32FG - Instrument and I/O Schedule - Design Preparation to SO Approval	141	23-Feb-17 A	14-Jul-17	23-Feb-17	13-Jul-17	0	0
LOT #1 - Building / Facilities Design : CEPT+SF, PTW+IPS+SHB, UV, SDB+SSSB		458	09-Jul-16 A	15-Nov-17	09-Jul-16	04-Nov-17	0	-11
CEPT and System Control Flowmeter Chamber		458	23-Jul-16 A	23-Oct-17	09-Jul-16	09-Oct-17	-14	-14
Civil and Structural Design (AIP6A / DDA6AB)		253	23-Jul-16 A	27-Jul-17	09-Jul-16	27-Jul-17	-14	0
DB1110	AIP6A - CEPT & System Control - C&S - Design Preparation to SO Approval	200	23-Jul-16 A	27-May-17	09-Jul-16	24-Jan-17	-14	-123
DB1123	DDA6AB - CEPT & System Control - C&S - Design Preparation to SO Approval	216	24-Dec-16 A	27-Jul-17	24-Dec-16	27-Jul-17	0	0
Electrical and Mechanical Design (AIP6B / DDA6C1C2DEF)		444	23-Jul-16 A	23-Oct-17	23-Jul-16	09-Oct-17	0	-14
DB1135	AIP6B - CEPT & System Control - E&M - Design Preparation to SO Approval	241	23-Jul-16 A	07-May-17	23-Jul-16	20-Mar-17	0	-48
DB1147	DDA6C1C2 - CEPT & System Control - E&M - Design Preparation to SO Approval	205	31-Aug-16 A	09-May-17	31-Aug-16	23-Mar-17	0	-47
DB4508	DDA6DEF - CEPT & System Control - E&M - Design Preparation to SO Approval	258	25-Jan-17 A	23-Oct-17	25-Jan-17	09-Oct-17	0	-14
Inlet Work, Preliminary Treatment Works, IPS and SHB		355	09-Jul-16 A	17-Jul-17	09-Jul-16	28-Jun-17	0	-18
Civil and Structural Design (AIP5A / DDA5AB)		355	09-Jul-16 A	16-Jul-17	09-Jul-16	28-Jun-17	0	-17
DB1211	AIP5A - PTW, IPS & SHB - C&S - Design Preparation to SO Approval	187	09-Jul-16 A	01-May-17	09-Jul-16	11-Jan-17	0	-109
DB1223	DDA5AB - PTW, IPS & SHB - C&S - Design Preparation to SO Approval	215	26-Nov-16 A	16-Jul-17	26-Nov-16	28-Jun-17	0	-17
Electrical and Mechanical Design (AIP5B / DDA5C1C2DEF)		336	18-Jul-16 A	17-Jul-17	09-Jul-16	09-Jun-17	-9	-37
DB1235	AIP5B - PTW, IPS & SHB - E&M - Design Preparation to SO Approval	167	18-Jul-16 A	02-May-17	09-Jul-16	22-Dec-16	-9	-131
DB1249	DDA5C1C2 - PTW, IPS & SHB - E&M - Design Preparation to SO Approval	210	01-Sep-16 A	29-May-17	10-Sep-16	07-Apr-17	9	-51
DB4524	DDA5DEF - PTW, IPS & SHB - E&M - Design Preparation to SO Approval	196	27-Nov-16 A	17-Jul-17	26-Nov-16	09-Jun-17	-1	-37
UV Disinfection Facilities		377	05-Aug-16 A	15-Nov-17	05-Aug-16	04-Nov-17	0	-11
Civil and Structural Design (AIP7A / DDA7AB)		188	08-Aug-16 A	15-Nov-17	08-Aug-16	16-Oct-17	0	-30
DB1311	AIP7A - UV Facilities - C&S - Design Preparation to SO Approval	159	08-Aug-16 A	05-May-17	08-Aug-16	13-Jan-17	0	-112
DB1325	DDA7AB - UV Facilities - C&S - Design Preparation to SO Approval	145	23-Jun-17	15-Nov-17	25-May-17	16-Oct-17	-30	-30
Electrical and Mechanical Design (AIP7B / DDA7C1C2DEF)		377	05-Aug-16 A	04-Nov-17	05-Aug-16	04-Nov-17	0	0
DB1337	AIP7B - UV Facilities - E&M - Design Preparation to SO Approval	281	05-Aug-16 A	30-May-17	05-Aug-16	12-May-17	0	-18
DB1352	DDA7C1C2 - UV Facilities - E&M - Design Preparation to SO Approval	224	03-Dec-16 A	02-Aug-17	22-Dec-16	02-Aug-17	19	0
DB4540	DDA7DEF - UV Facilities - E&M - Design Preparation to SO Approval	220	30-Mar-17 A	04-Nov-17	30-Mar-17	04-Nov-17	0	0
Sludge Dewatering Building and Sludge Skip Storage Building		366	09-Jul-16 A	24-Jul-17	09-Jul-16	09-Jul-17	0	-15
Civil and Structural Design (AIP8A / DDA8AB)		298	23-Aug-16 A	14-Jul-17	23-Aug-16	16-Jun-17	0	-27
DB1421	AIP8A - SDB and SSSB - C&S - Design Preparation to SO Approval	177	23-Aug-16 A	27-May-17	23-Aug-16	15-Feb-17	0	-101
DB1433	DDA8AB - SDB and SSSB - C&S - Design Preparation to SO Approval	175	11-Dec-16 A	14-Jul-17	24-Dec-16	16-Jun-17	13	-27
Electrical and Mechanical Design (AIP8B / DDA8C1C2DEF)		366	09-Jul-16 A	24-Jul-17	09-Jul-16	09-Jul-17	0	-15
DB1445	AIP8B - SDB and SSSB - E&M - Design Preparation to SO Approval	187	09-Jul-16 A	01-May-17	09-Jul-16	11-Jan-17	0	-109
DB1460	DDA8C1C2 - SDB and SSSB - E&M - Design Preparation to SO Approval	227	15-Sep-16 A	18-May-17	25-Sep-16	09-May-17	10	-8
DB4556	DDA8DEF - SDB and SSSB - E&M - Design Preparation to SO Approval	225	17-Nov-16 A	24-Jul-17	27-Nov-16	09-Jul-17	10	-15
LOT #2 - Building / Facilities Design : AB+WS, DO, CB, FH		418	26-Jun-16 A	23-Sep-17	26-Jun-16	17-Sep-17	0	-6
Chemical Building		341	26-Jun-16 A	15-Aug-17	26-Jun-16	14-Aug-17	0	0
Civil and Structural Design (AIP12A / DDA12AB)		320	17-Oct-16 A	07-Aug-17	07-Sep-16	28-Jul-17	-40	-10
DB2110	AIP12A - Chemical Building - C&S - Design Preparation to SO Approval	150	17-Oct-16 A	27-May-17	07-Sep-16	03-Feb-17	-40	-113
DB2123	DDA12AB - Chemical Building - C&S - Design Preparation to SO Approval	320	31-Jan-17 A	07-Aug-17	31-Jan-17	28-Jul-17	0	-10
Electrical and Mechanical Design (AIP12B / DDA12C1C2DEF)		341	26-Jun-16 A	15-Aug-17	26-Jun-16	14-Aug-17	0	0
DB2135	AIP12B - Chemical Building - E&M - Design Preparation to SO Approval	277	26-Jun-16 A	25-May-17	26-Jun-16	29-Mar-17	0	-57
DB2148	DDA12C1C2 - Chemical Building - E&M - Design Preparation to SO Approval	247	17-Aug-16 A	23-Jun-17	28-Sep-16	01-Jun-17	42	-22
DB4502	DDA12DEF - Chemical Building - E&M - Design Preparation to SO Approval	191	05-Feb-17 A	15-Aug-17	05-Feb-17	14-Aug-17	0	0
Administration Building & Maintenance Workshop		351	01-Sep-16 A	11-Sep-17	01-Sep-16	17-Aug-17	0	-25
Civil and Structural Design (AIP10A / DDA10AB)		220	17-Oct-16 A	05-Aug-17	22-Sep-16	23-Jun-17	-25	-43
DB2221	AIP10A - Admin Bldg. & Workshop - C&S - Design Preparation to SO Approval	131	17-Oct-16 A	27-May-17	22-Sep-16	30-Jun-17	-25	-117

DATA DATE: 30-Apr-17 | LAYOUT: SW Project PHase 1 Rev 5 (3M 30Apr17) |

Activity ID	Activity Name	Original Duration	Start	Finish	Rev 5 BL Start	Rev 5 BL Finish	Slippage Start	Slippage Finish
DB2234	DDA10AB - Admin Bldg. & Workshop - C&S - Design Preparation to SO Approval	153	22-Jan-17 A	05-Aug-17	22-Jan-17	23-Jun-17	0	-43
Electrical and Mechanical Design (AIP10B / DDA10C1C2DEF)		351	01-Sep-16 A	11-Sep-17	01-Sep-16	17-Aug-17	0	-25
DB2273	AIP10B - Admin Bldg. & Workshop - E&M - Design Preparation to SO Approval	190	01-Sep-16 A	05-Jun-17	01-Sep-16	09-Mar-17	0	-87
DB2286	DDA10C1C2 - Admin Bldg. & Workshop - E&M - Design Preparation to SO Approval	256	03-Oct-16 A	26-Aug-17	03-Oct-16	15-Jun-17	0	-71
DB4618	DDA10DEF - Admin Bldg. & Workshop - E&M - Design Preparation to SO Approval	199	22-Feb-17 A	11-Sep-17	31-Jan-17	17-Aug-17	-22	-25
Deodorization Facilities No.1 and No.2		354	13-Aug-16 A	19-Aug-17	29-Jul-16	19-Aug-17	-15	0
Civil and Structural Design (AIP9A / DDA9AB)		237	07-Oct-16 A	19-Aug-17	29-Jul-16	19-Aug-17	-70	0
DB2311	AIP9A - DO #1 & #2 - C&S - Design Preparation to SO Approval	197	07-Oct-16 A	02-May-17	29-Jul-16	10-Feb-17	-70	-81
DB2323	DDA9AB - DO #1 & #2 - C&S - Design Preparation to SO Approval	206	26-Jan-17 A	19-Aug-17	26-Jan-17	19-Aug-17	0	0
Electrical and Mechanical Design (AIP9B / DDA9C1C2DEF)		352	13-Aug-16 A	18-Aug-17	31-Jul-16	17-Jul-17	-13	-32
DB2335	AIP9B - DO #1 & #2 - E&M - Design Preparation to SO Approval	165	13-Aug-16 A	02-May-17	31-Jul-16	11-Jan-17	-13	-111
DB2348	DDA9C1C2 - DO #1 & #2 - E&M - Design Preparation to SO Approval	146	15-Dec-16 A	10-Jun-17	15-Dec-16	09-May-17	0	-32
DB4634	DDA9DEF - DO #1 & #2 - E&M - Design Preparation to SO Approval	173	26-Jan-17 A	18-Aug-17	26-Jan-17	17-Jul-17	0	-32
Street Fire Hydrant Pump Room & GENSET Room		308	01-Sep-16 A	23-Sep-17	01-Sep-16	17-Sep-17	0	-6
Civil and Structural Design (AIP17A / DDA17AB)		306	22-Oct-16 A	23-Sep-17	03-Sep-16	17-Sep-17	-49	-6
DB2411	AIP17A - FH Pump & GENSET - C&S - Design Preparation to SO Approval	165	22-Oct-16 A	13-May-17	03-Sep-16	14-Feb-17	-49	-88
DB2423	DDA17AB - FH Pump & GENSET - C&S - Design Preparation to SO Approval	179	23-Mar-17 A	23-Sep-17	23-Mar-17	17-Sep-17	0	-6
Electrical and Mechanical Design (AIP17B / DDA17C1C2DEF)		273	01-Sep-16 A	11-Aug-17	01-Sep-16	27-Jul-17	0	-15
DB2435	AIP17B - FH Pump & GENSET - E&M - Design Preparation to SO Approval	149	01-Sep-16 A	05-May-17	01-Sep-16	27-Jan-17	0	-98
DB2448	DDA17C1C2 - FH Pump & GENSET - E&M - Design Preparation to SO Approval	176	17-Oct-16 A	14-Jul-17	07-Dec-16	31-May-17	51	-44
DB4648	DDA17DEF - FH Pump & GENSET - E&M - Design Preparation to SO Approval	127	23-Mar-17 A	11-Aug-17	23-Mar-17	27-Jul-17	0	-15
LOT #3 - Building / Facilities Design : EB, RW, DG+ICW, Inlet/Outlet Connection		381	18-Jul-16 A	25-Nov-17	18-Jul-16	18-Nov-17	0	-7
Electrical Building No.1, No.2, No.3, No.4		381	18-Jul-16 A	30-Sep-17	18-Jul-16	01-Sep-17	0	-28
Civil and Structural Design (AIP13A / DDA13AB)		180	24-Oct-16 A	30-Sep-17	14-Aug-16	01-Sep-17	-71	-28
DB3111	AIP13A - Electrical Buildings - C&S - Design Preparation to SO Approval	180	24-Oct-16 A	27-May-17	14-Aug-16	09-Feb-17	-71	-107
DB3123	DDA13AB - Electrical Buildings - C&S - Design Preparation to SO Approval	147	08-Apr-17 A	30-Sep-17	08-Apr-17	01-Sep-17	0	-28
Electrical and Mechanical Design (AIP13B / DDA13C1C2DE)		381	18-Jul-16 A	11-Sep-17	18-Jul-16	02-Aug-17	0	-39
DB3135	AIP13B - Electrical Buildings - E&M - Design Preparation to SO Approval	191	18-Jul-16 A	02-May-17	18-Jul-16	24-Jan-17	0	-98
DB3148	DDA13C1C2 - Electrical Buildings - E&M - Design Preparation to SO Approval	246	16-Sep-16 A	03-Jul-17	21-Sep-16	24-May-17	5	-39
DB4664	DDA13DE - Electrical Buildings - E&M - Design Preparation to SO Approval	161	23-Feb-17 A	11-Sep-17	23-Feb-17	02-Aug-17	0	-39
Re-use Water Building		318	08-Aug-16 A	25-Nov-17	08-Aug-16	18-Nov-17	0	-7
Civil and Structural Design (AIP14A / DDA14AB)		190	21-Nov-16 A	25-Sep-17	19-Aug-16	25-Sep-17	-94	0
DB3210	AIP14A - Re-use water Building - C&S - Design Preparation to SO Approval	180	21-Nov-16 A	19-May-17	19-Aug-16	14-Feb-17	-94	-94
DB3223	DDA14AB - Re-use water Building - C&S - Design Preparation to SO Approval	166	13-Apr-17 A	25-Sep-17	13-Apr-17	25-Sep-17	0	0
Electrical and Mechanical Design (AIP14B / DDA14C1C2DEF)		318	08-Aug-16 A	25-Nov-17	08-Aug-16	18-Nov-17	0	-7
DB3235	AIP14B - Re-use water Building - E&M - Design Preparation to SO Approval	278	08-Aug-16 A	10-Jun-17	08-Aug-16	12-May-17	0	-29
DB3248	DDA14C1C2 - Re-use water Building - E&M - Design Preparation to SO Approval	201	16-Nov-16 A	15-Jul-17	03-Dec-16	21-Jun-17	17	-24
DB4680	DDA14DEF - Re-use water Building - E&M - Design Preparation to SO Approval	220	13-Apr-17 A	25-Nov-17	13-Apr-17	18-Nov-17	0	-7
ICW and DG Store & Chemical Waste Storage Building		317	01-Sep-16 A	07-Sep-17	07-Aug-16	08-Aug-17	-25	-30
Civil and Structural Design (AIP16A / DDA16AB)		176	06-Oct-16 A	02-Aug-17	29-Aug-16	02-Aug-17	-38	0
DB3311	AIP16A - ICW, DG & Chemical Stores - C&S - Design Preparation to SO Approval	165	06-Oct-16 A	27-May-17	29-Aug-16	09-Feb-17	-38	-107
DB3323	DDA16AB - ICW, DG & Chemical Stores - C&S - Design Preparation to SO Approval	145	11-Mar-17 A	02-Aug-17	11-Mar-17	02-Aug-17	0	0
Electrical and Mechanical Design (AIP16B / DDA16C1C2DEF)		317	01-Sep-16 A	07-Sep-17	07-Aug-16	08-Aug-17	-25	-30
DB3335	AIP16B - ICW, DG & Chemical Stores - E&M - Design Preparation to SO Approval	174	01-Sep-16 A	05-May-17	07-Aug-16	27-Jan-17	-25	-98
DB3348	DDA16C1C2 - ICW, DG & Chemical Stores - E&M - Design Preparation to SO Approval	195	30-Nov-16 A	12-Jul-17	30-Nov-16	12-Jun-17	0	-30
DB4694	DDA16DEF - ICW, DG & Chemical Stores - E&M - Design Preparation to SO Approval	127	04-May-17	07-Sep-17	04-Apr-17	08-Aug-17	-30	-30
Inlet & Outlet Connections and Diversion Pipeworks		255	24-Aug-16 A	14-Nov-17	24-Aug-16	25-Aug-17	0	-81
Civil and Structural Design (AIP11 / DDA11)		255	24-Aug-16 A	14-Nov-17	24-Aug-16	25-Aug-17	0	-81
DB3411	AIP11 - In/Out Connection & Diversion Pipe - C&S - Design Preparation to SO Approval	160	24-Aug-16 A	27-May-17	24-Aug-16	30-Jan-17	0	-117
DB3424	DDA11A - C&S Detailed Design Report for Outlet Connection - Design Preparation to SO Approval	130	29-Nov-16 A	19-Jul-17	29-Nov-16	07-Apr-17	0	-103
DB3438	DDA11B - C&S Detailed Design Report for Inlet Connection - Design Preparation to SO Approval	140	08-Apr-17 A	14-Nov-17	08-Apr-17	25-Aug-17	0	-81
DB3452	DDA11C - C&S Detailed Design Report for Emergency Bypass - Design Preparation to SO Approval	140	31-Dec-16 A	04-Jul-17	31-Dec-16	19-May-17	0	-46
LOT #4 - Building / Facilities Design : GH, PF		317	20-Aug-16 A	25-Jan-18	20-Aug-16	25-Dec-17	0	-30
Payment Flowmeter Chamber		317	20-Aug-16 A	25-Jan-18	20-Aug-16	25-Dec-17	0	-30
Civil and Structural Design (AIP15A / DDA15AB)		190	06-Nov-16 A	26-Sep-17	18-Oct-16	26-Aug-17	-19	-30
DB4310	AIP15A - Payment Flowmeter - C&S - Design Preparation to SO Approval	120	06-Nov-16 A	27-May-17	18-Oct-16	14-Feb-17	-19	-102
DB4323	DDA15AB - Payment Flowmeter - C&S - Design Preparation to SO Approval	136	13-Apr-17 A	26-Sep-17	13-Apr-17	26-Aug-17	0	-30

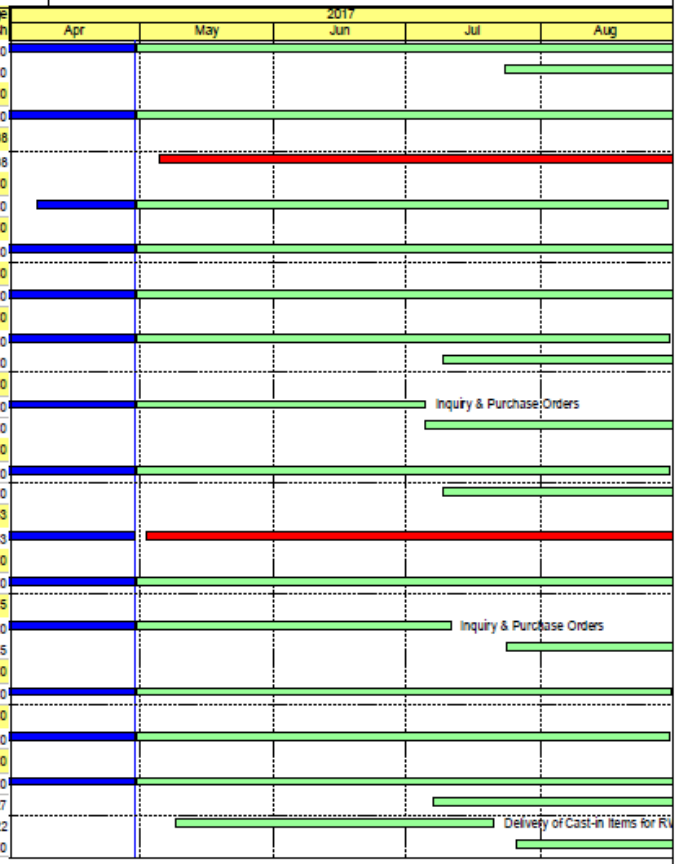


DATA DATE: 30-Apr-17 | LAYOUT: SW Project PHase 1 Rev 5 (3M 30Apr17) |

Activity ID	Activity Name	Original Duration	Start	Finish	Rev 5 BL Start	Rev 5 BL Finish	Slippage Start	Slippage Finish
	Electrical and Mechanical Design (AIP15B / DDA15C1C2DEF)	317	20-Aug-16 A	25-Jan-18	20-Aug-16	25-Dec-17	0	-30
DB4335	AIP15B - Payment Flowmeter - E&M - Design Preparation to SO Approval	266	20-Aug-16 A	30-May-17	20-Aug-16	12-May-17	0	-18
DB4348	DDA15C1C2 - Payment Flowmeter - E&M - Design Preparation to SO Approval	201	25-Nov-16 A	22-Jul-17	03-Dec-16	21-Jun-17	8	-30
DB4740	DDA15DEF - Payment Flowmeter - E&M - Design Preparation to SO Approval	257	13-May-17	25-Jan-18	13-Apr-17	25-Dec-17	-30	-30
	Gatehouse	258	01-Dec-16 A	02-Nov-17	21-Nov-16	26-Oct-17	-10	-7
	Civil and Structural Design (AIP18A / DDA18AB)	150	01-Dec-16 A	02-Nov-17	21-Nov-16	26-Oct-17	-10	-7
DB4411	AIP18A - Gatehouse - C&S - Design Preparation to SO Approval	120	01-Dec-16 A	13-May-17	21-Nov-16	20-Mar-17	-10	-54
DB4424	DDA18AB - Gatehouse - C&S - Design Preparation to SO Approval	100	25-Jul-17	02-Nov-17	19-Jul-17	26-Oct-17	-7	-7
	Electrical and Mechanical Design (AIP18B / DDA18C)	258	14-Jan-17 A	03-Oct-17	14-Jan-17	26-Sep-17	0	-7
DB4473	AIP18B - Gatehouse - E&M - Design Preparation to SO Approval	125	14-Jan-17 A	10-Jun-17	14-Jan-17	18-May-17	0	-23
DB4754	DDA18C - Gatehouse - E&M - Design Preparation to SO Approval	156	24-Apr-17 A	03-Oct-17	24-Apr-17	26-Sep-17	0	-7
	Civil & Structural Works	260	03-Apr-17 A	14-Feb-18	03-Apr-17	28-Nov-17	0	-78
	LOT #1 - Bldg / Facilities Const. (Arch'l & Struct'l) : CEPT+SF, PTW+IPS+SHB, UV, SD	135	30-May-17	12-Oct-17	08-Apr-17	03-Oct-17	-53	-8
	Chemically Enhanced Primary Treatment (CEPT)	90	30-May-17	28-Aug-17	08-Apr-17	06-Jul-17	-53	-53
C51500	Piling Foundation (Prebored H-pile) 177 {D1, D2, E1, E2} + Trial Pile	90	30-May-17	28-Aug-17	08-Apr-17	06-Jul-17	-53	-53
	Inlet Work, Preliminary Treatment Works and Inlet Pumping Station (PTW & IPS)	80	30-May-17	18-Aug-17	08-Apr-17	26-Jun-17	-53	-53
C51200	Piling Foundation (Prebored H-pile) 90 #2-1 {B1} +Trial Pile	80	30-May-17	18-Aug-17	08-Apr-17	26-Jun-17	-53	-53
	UV Disinfection Facility (UV)	101	03-Jul-17	12-Oct-17	08-Jun-17	16-Sep-17	-25	-25
C51900	Piling Foundation (minipile) 75 #3-1 {C1}	101	03-Jul-17	12-Oct-17	08-Jun-17	16-Sep-17	-25	-25
	Sludge Dewatering Building (SDB)	90	06-Jul-17	04-Oct-17	06-Jul-17	03-Oct-17	0	0
C51800	Piling Foundation (Prebored H-pile) 66 {E3}	90	06-Jul-17	04-Oct-17	06-Jul-17	03-Oct-17	0	0
C51810	Piling Foundation (minipile) 10 #1-1 {A1} + Trial Pile	60	06-Jul-17	04-Sep-17	06-Jul-17	03-Sep-17	0	0
	Sludge Skip Storage Building (SSSB)	90	14-Jul-17	12-Oct-17	17-Jun-17	14-Sep-17	-27	-27
C52900	Substructure (rc structure)	90	14-Jul-17	12-Oct-17	17-Jun-17	14-Sep-17	-27	-27
	LOT #2 - Bldg / Facilities Const. (Arch'l & Struct'l) : AB+WS, DO, CB, FH	60	03-Jul-17	01-Sep-17	20-May-17	29-Jul-17	-44	-33
	Administration Building & Maintenance Workshop (AB & WS)	51	03-Jul-17	23-Aug-17	20-May-17	09-Jul-17	-44	-44
C51100	Piling Foundation (mini-pile) 56 #2-2 {B2}	51	03-Jul-17	23-Aug-17	20-May-17	09-Jul-17	-44	-44
	Deodorization Facilities No. 1 (DO 1)	60	03-Jul-17	01-Sep-17	31-May-17	29-Jul-17	-33	-33
C51600	Foundation (optional) 78 #2-3 {B3}	60	03-Jul-17	01-Sep-17	31-May-17	29-Jul-17	-33	-33
	Chemical Building (CB)	60	03-Jul-17	01-Sep-17	31-May-17	29-Jul-17	-33	-33
C52300	Piling Foundation (minipile) 40 #1-2 {A2}	60	03-Jul-17	01-Sep-17	31-May-17	29-Jul-17	-33	-33
	LOT #3 - Bldg / Facilities Const. (Arch'l & Struct'l) : EB, RW, DG, ICW, JC	62	03-Jul-17	03-Sep-17	06-Jun-17	02-Sep-17	-27	0
	Electrical Building No.4 (EB4) CB	35	30-Jul-17	03-Sep-17	30-Jul-17	02-Sep-17	0	0
C52700	Piling Foundation (minipile) 20 #1-3 {A3}	35	30-Jul-17	03-Sep-17	30-Jul-17	02-Sep-17	0	0
	Re-use Water Building (RW)	30	03-Jul-17	02-Aug-17	17-Jul-17	15-Aug-17	14	14
C52000	Piling Foundation (minipile) 17 #3-2 {C2}	30	03-Jul-17	02-Aug-17	17-Jul-17	15-Aug-17	14	14
	Existing Junction Chamber (JC)	50	12-Jul-17	31-Aug-17	06-Jun-17	25-Jul-17	-36	-36
C52190	Substructure (ELS & Bulk excavation)	50	12-Jul-17	31-Aug-17	06-Jun-17	25-Jul-17	-36	-36
	External Works & Miscellaneous	252	03-Apr-17 A	14-Feb-18	03-Apr-17	28-Nov-17	0	-78
C53201	Slope works and Retaining Wall (Eastern Portion)	120	12-Jul-17	09-Nov-17	17-Jul-17	13-Nov-17	5	5
C53220	Drainage Outlet connection (Effluent Connection to the Existing Junction Chamber)	210	19-Jul-17	14-Feb-18	08-Apr-17	03-Nov-17	-103	-103
C53240	Portion 5 (Access Road) Works	240	03-Apr-17 A	28-Dec-17	03-Apr-17	28-Nov-17	0	-29
	E&M Works	690	15-Jul-16 A	10-Sep-18	15-Jul-16	10-Sep-18	0	0
	Procurement	690	15-Jul-16 A	10-Sep-18	15-Jul-16	10-Sep-18	0	0
	Administration Building & Maintenance Workshop (AB & WS)	360	12-Dec-16 A	07-Dec-17	12-Dec-16	06-Dec-17	0	0
EM3125	Inquiry & Purchase Orders	360	12-Dec-16 A	07-Dec-17	12-Dec-16	06-Dec-17	0	0
	Inlet Work, Preliminary Treatment Units and Inlet Pumping Station (PTW & IPS)	480	03-Feb-17 A	21-May-18	04-Jan-17	28-Apr-18	-30	-22
EM3135	Inquiry & Purchase Orders	480	03-Feb-17 A	21-May-18	04-Jan-17	28-Apr-18	-30	-22
	Solid Handling Building (SHB)	320	08-Mar-17 A	22-Jan-18	08-Mar-17	21-Jan-18	0	0
EM3145	Inquiry & Purchase Orders	320	08-Mar-17 A	22-Jan-18	08-Mar-17	21-Jan-18	0	0
	System Control Flowmeter Chamber (SF)	383	17-Aug-16 A	07-Jun-18	17-Aug-16	07-Jun-18	0	0
EM3155	Inquiry & Purchase Orders	379	17-Aug-16 A	30-Aug-17	17-Aug-16	30-Aug-17	0	0
EM3160	Manufacturing & Logistic	333	09-Jul-17	07-Jun-18	10-Jul-17	07-Jun-18	0	0
	Chemically Enhanced Primary Treatment (CEPT)	469	26-Aug-16 A	10-Sep-18	26-Aug-16	10-Sep-18	0	0

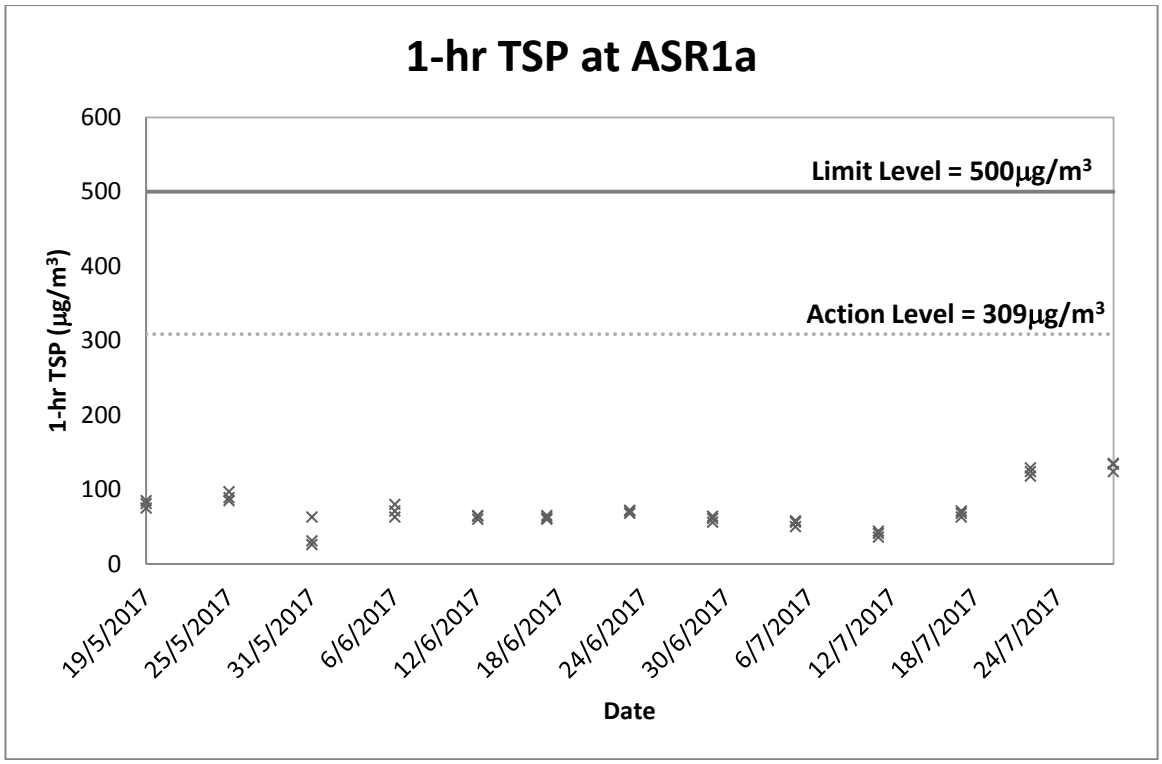
DATA DATE: 30-Apr-17 | LAYOUT: SW Project PHase 1 Rev 5 (3M 30Apr17) | PAGE 6 OF 6

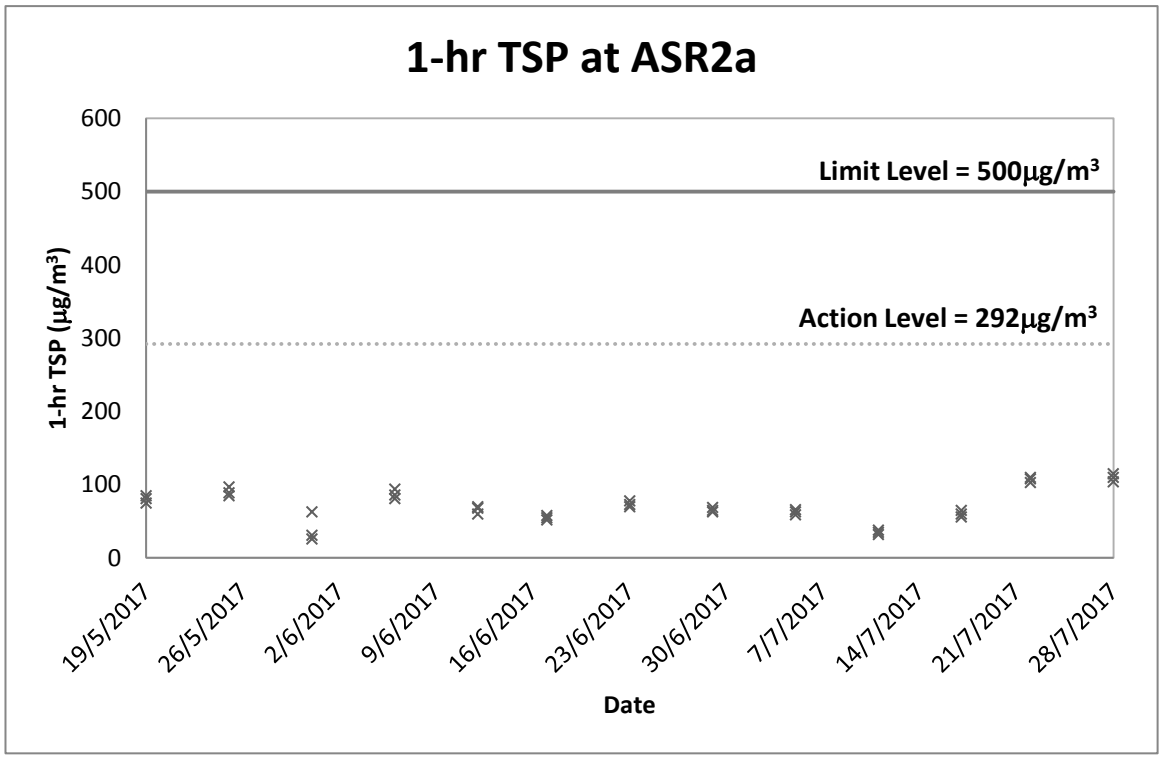
Activity ID	Activity Name	Original Duration	Start	Finish	Rev 5 BL Start	Rev 5 BL Finish	Slippage Start	Slippage Finish
EM3115	Inquiry & Purchase Orders	401	26-Aug-16 A	30-Sep-17	26-Aug-16	30-Sep-17	0	0
EM3120	Manufacturing & Logistic	414	23-Jul-17	10-Sep-18	24-Jul-17	10-Sep-18	0	0
Deodorization Facilities No. 1 & 2 (DO 1 & DO 2)		480	08-Feb-17 A	04-May-18	10-Jan-17	04-May-18	-29	0
EM3165	Inquiry & Purchase Orders	480	08-Feb-17 A	04-May-18	10-Jan-17	04-May-18	-29	0
Street Fire Hydrant Pump Room & GENSET Room (FH)		230	05-May-17	21-Dec-17	18-Jan-17	04-Sep-17	-108	-108
EM3275	Inquiry & Purchase Orders	230	05-May-17	21-Dec-17	18-Jan-17	04-Sep-17	-108	-108
Gatehouse (GH)		145	07-Apr-17 A	30-Aug-17	07-Apr-17	29-Aug-17	0	0
EM3285	Inquiry & Purchase Orders	145	07-Apr-17 A	30-Aug-17	07-Apr-17	29-Aug-17	0	0
SCADA and CMMS Systems		270	03-Feb-17 A	03-Oct-17	06-Jan-17	02-Oct-17	-28	0
EM3330	Inquiry & Purchase Orders	270	03-Feb-17 A	03-Oct-17	06-Jan-17	02-Oct-17	-28	0
Sludge Dewatering Building (SDB)		560	08-Feb-17 A	17-May-18	04-Nov-16	17-May-18	-96	0
EM3175	Inquiry & Purchase Orders	560	08-Feb-17 A	17-May-18	04-Nov-16	17-May-18	-96	0
Payment Flowmeter Chamber (PF)		383	17-Aug-16 A	07-Jun-18	17-Aug-16	07-Jun-18	0	0
EM3205	Inquiry & Purchase Orders	379	17-Aug-16 A	30-Aug-17	17-Aug-16	30-Aug-17	0	0
EM3210	Manufacturing & Logistic	333	09-Jul-17	07-Jun-18	10-Jul-17	07-Jun-18	0	0
Existing Junction Chamber (JC)		206	07-Jan-17 A	01-Jan-18	07-Jan-17	01-Jan-18	0	0
EM3215	Inquiry & Purchase Orders	180	07-Jan-17 A	05-Jul-17	07-Jan-17	05-Jul-17	0	0
EM3220	Manufacturing & Logistic	180	05-Jul-17	01-Jan-18	06-Jul-17	01-Jan-18	0	0
Chemical Building (CB)		405	22-Jul-16 A	21-Apr-18	22-Jul-16	21-Apr-18	0	0
EM3225	Inquiry & Purchase Orders	405	22-Jul-16 A	30-Aug-17	22-Jul-16	30-Aug-17	0	0
EM3230	Manufacturing & Logistic	286	09-Jul-17	21-Apr-18	10-Jul-17	21-Apr-18	0	0
Electrical Buildings (EB1, EB2, EB3 & EB4)		475	03-Feb-17 A	02-May-18	10-Jan-17	29-Apr-18	-24	-3
EM3235	Inquiry & Purchase Orders	475	03-Feb-17 A	02-May-18	10-Jan-17	29-Apr-18	-24	-3
DG Store and Chemical Waste Storage Building (DG)		250	15-Jan-17 A	21-Sep-17	15-Jan-17	21-Sep-17	0	0
EM3255	Inquiry & Purchase Orders	250	15-Jan-17 A	21-Sep-17	15-Jan-17	21-Sep-17	0	0
Sludge Skip Storage Building (SSSB)		222	08-Dec-16 A	20-Dec-17	08-Dec-16	05-Dec-17	0	-15
EM3265	Inquiry & Purchase Orders	215	08-Dec-16 A	11-Jul-17	08-Dec-16	10-Jul-17	0	0
EM3270	Manufacturing & Logistic	149	24-Jul-17	20-Dec-17	10-Jul-17	05-Dec-17	-15	-15
Re-use Water Building (RW)		360	05-Sep-16 A	31-Aug-17	05-Sep-16	30-Aug-17	0	0
EM3195	Inquiry & Purchase Orders	360	05-Sep-16 A	31-Aug-17	05-Sep-16	30-Aug-17	0	0
UV Disinfection Facility (UV)		412	15-Jul-16 A	30-Aug-17	15-Jul-16	30-Aug-17	0	0
EM3185	Inquiry & Purchase Orders	412	15-Jul-16 A	30-Aug-17	15-Jul-16	30-Aug-17	0	0
Cast - In Items		588	24-Feb-17 A	15-Mar-18	01-Feb-17	15-Mar-18	-23	0
EM3520	Inquiry & Purchase Orders	408	24-Feb-17 A	15-Mar-18	01-Feb-17	15-Mar-18	-23	0
EM3550	Delivery of Cast-in Items for SSSB	90	07-Jul-17	05-Oct-17	10-Jun-17	07-Sep-17	-27	-27
EM3605	Delivery of Cast-in Items for RW	73	09-May-17	21-Jul-17	08-Sep-17	19-Nov-17	122	122
EM3610	Delivery of Cast-in Items for DG	75	26-Jul-17	09-Oct-17	27-Jul-17	09-Oct-17	0	0

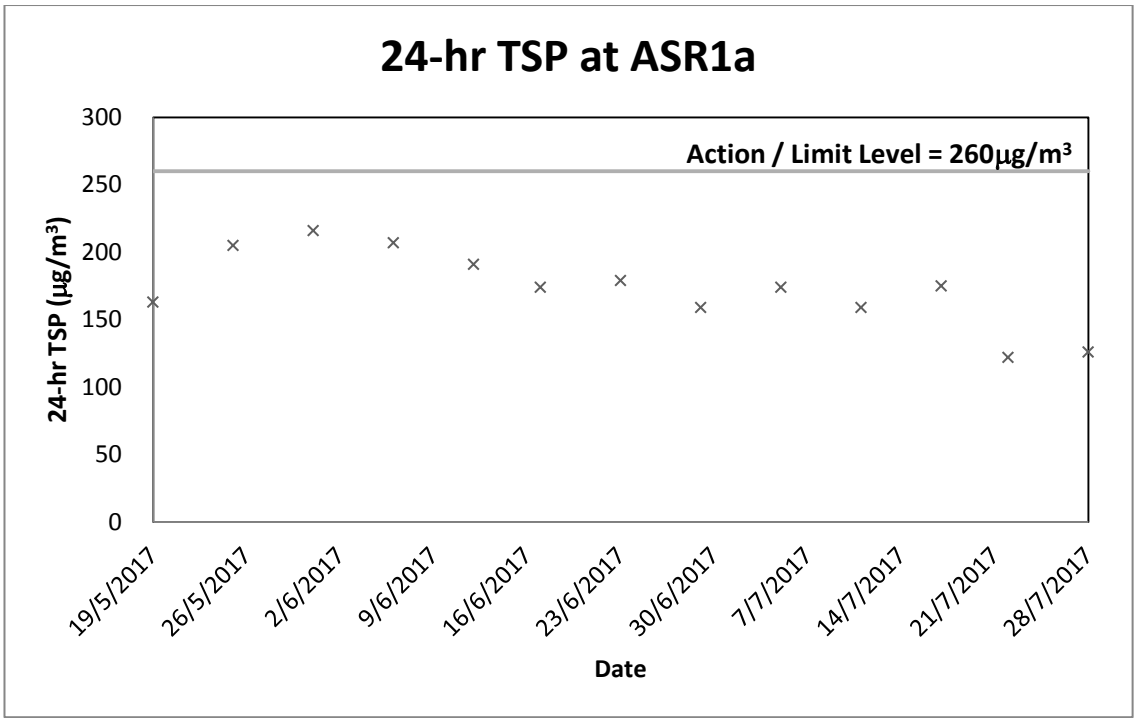


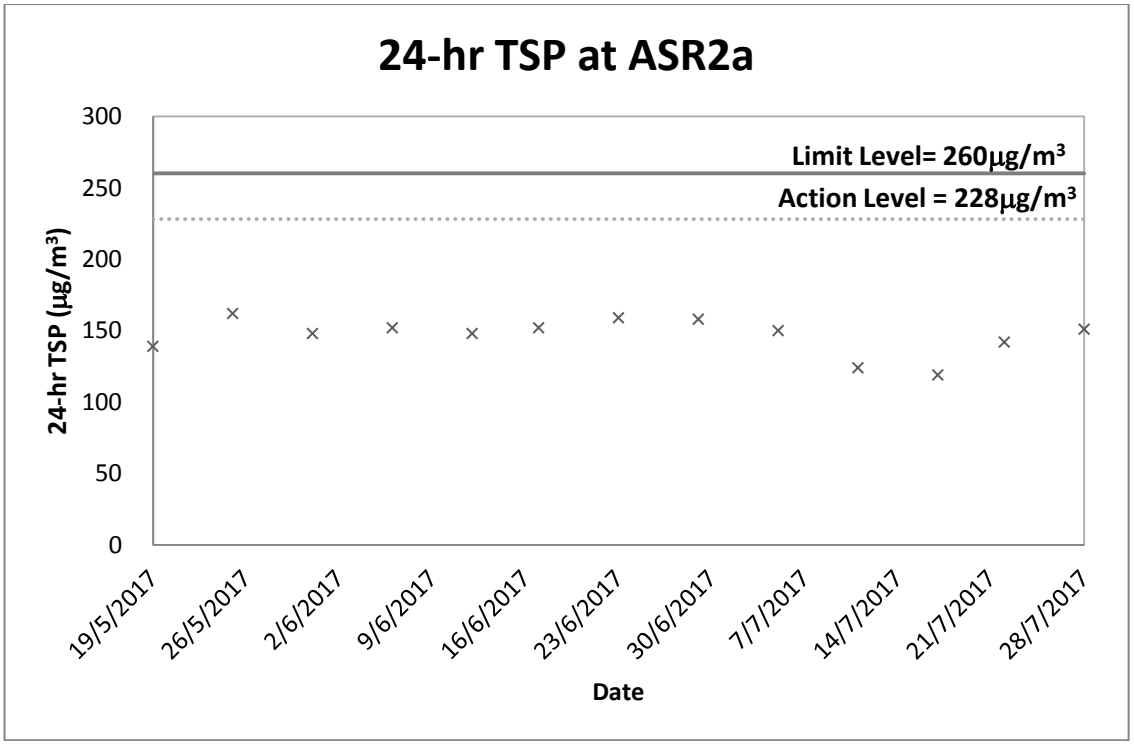
Appendix D

Graphical Plots of Impact Air Quality Monitoring Results


1-hr TSP at ASR1a
600
500
400
300
200
100
0
1-hr TSP (µg/m³)
Limit Level = 500µg/m³
Action Level = 309µg/m³
19/5/2017
25/5/2017
31/5/2017
6/6/2017
12/6/2017
18/6/2017
24/6/2017
30/6/2017
6/7/2017
12/7/2017
18/7/2017
24/7/2017
Date

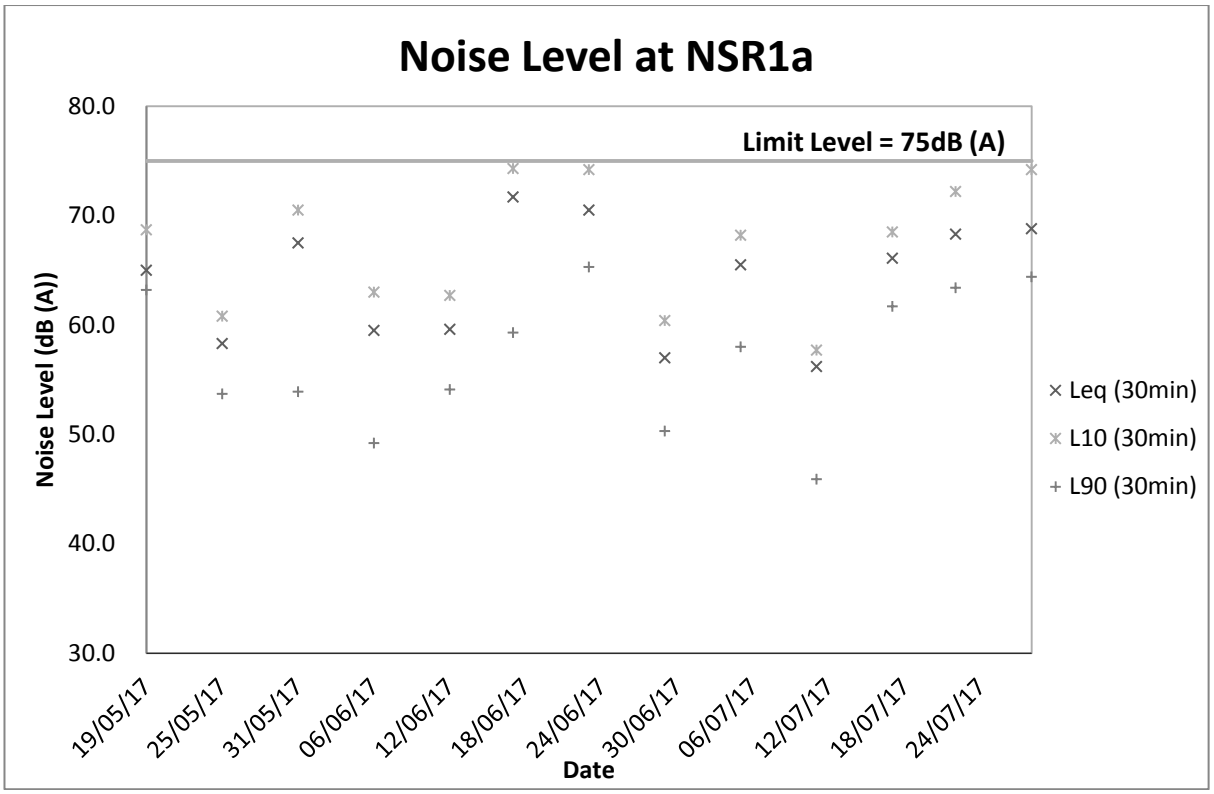

1-hr TSP at ASR2a
600
500
400
300
200
100
0
1-hr TSP (µg/m³)
Limit Level = 500µg/m³
Action Level = 292µg/m³
19/5/2017
26/5/2017
2/6/2017
9/6/2017
16/6/2017
23/6/2017
30/6/2017
7/7/2017
14/7/2017
21/7/2017
28/7/2017
Date

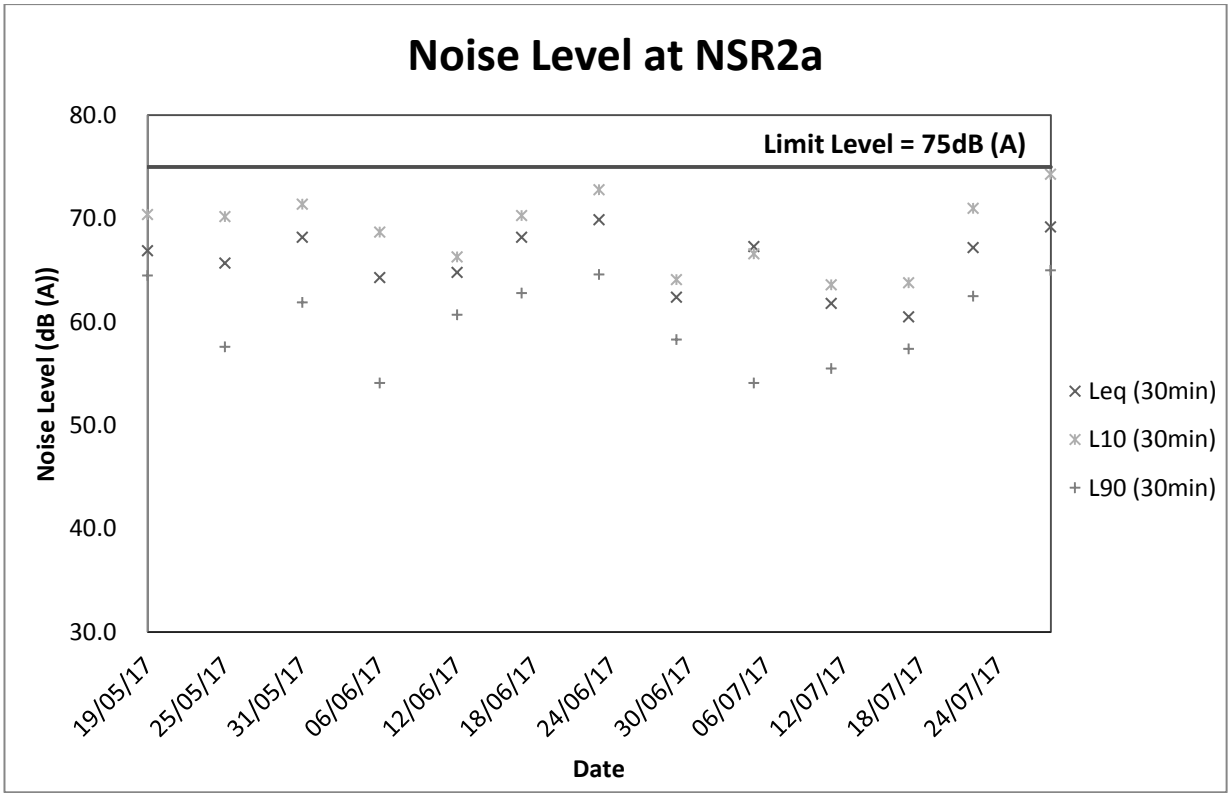

24-hr TSP at ASR1a
Action / Limit Level = 260μg/m³
24-hr TSP (μg/m³)
300
250
200
150
100
50
0
19/5/2017
26/5/2017
2/6/2017
9/6/2017
16/6/2017
23/6/2017
30/6/2017
7/7/2017
14/7/2017
21/7/2017
28/7/2017
Date


24-hr TSP at ASR2a
Limit Level= 260μg/m³
Action Level = 228μg/m³
24-hr TSP (μg/m³)
300
250
200
150
100
50
0
19/5/2017
26/5/2017
2/6/2017
9/6/2017
16/6/2017
23/6/2017
30/6/2017
7/7/2017
14/7/2017
21/7/2017
28/7/2017
Date

Appendix E

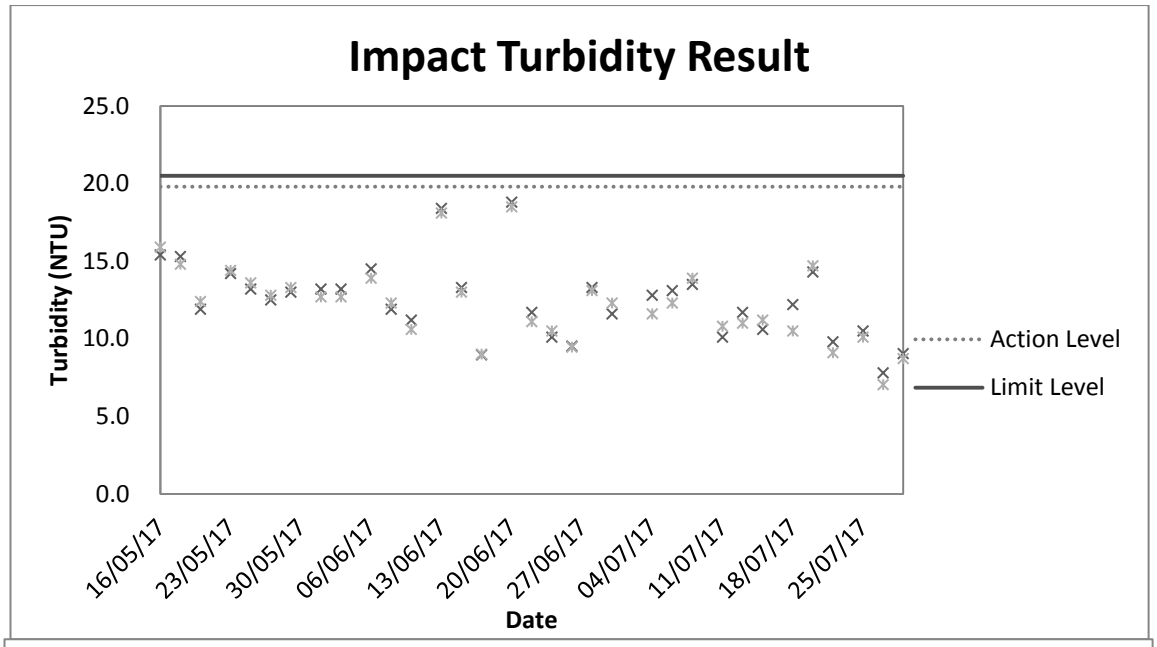
Graphical Plots of Impact Noise Monitoring Data

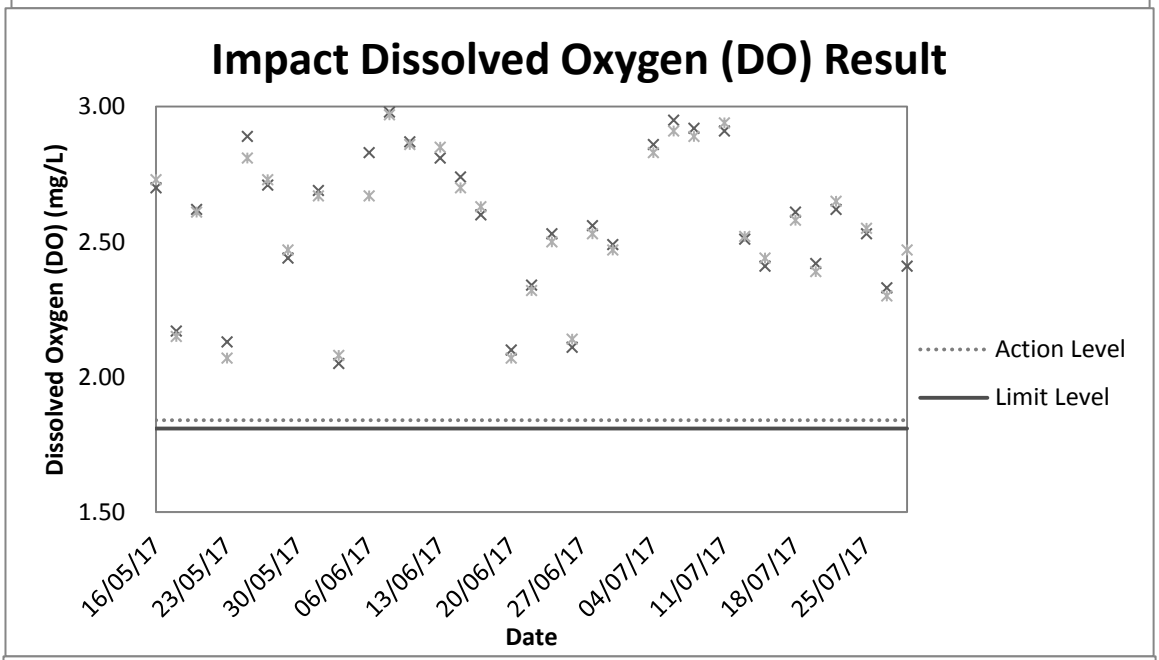

Noise Level at NSR1a
Limit Level = 75dB (A)
Noise Level (dB (A))
80.0
70.0
60.0
50.0
40.0
30.0
19/05/17
25/05/17
31/05/17
06/06/17
12/06/17
18/06/17
24/06/17
30/06/17
06/07/17
12/07/17
18/07/17
24/07/17
Date
Leq (30min)
L10 (30min)
L90 (30min)

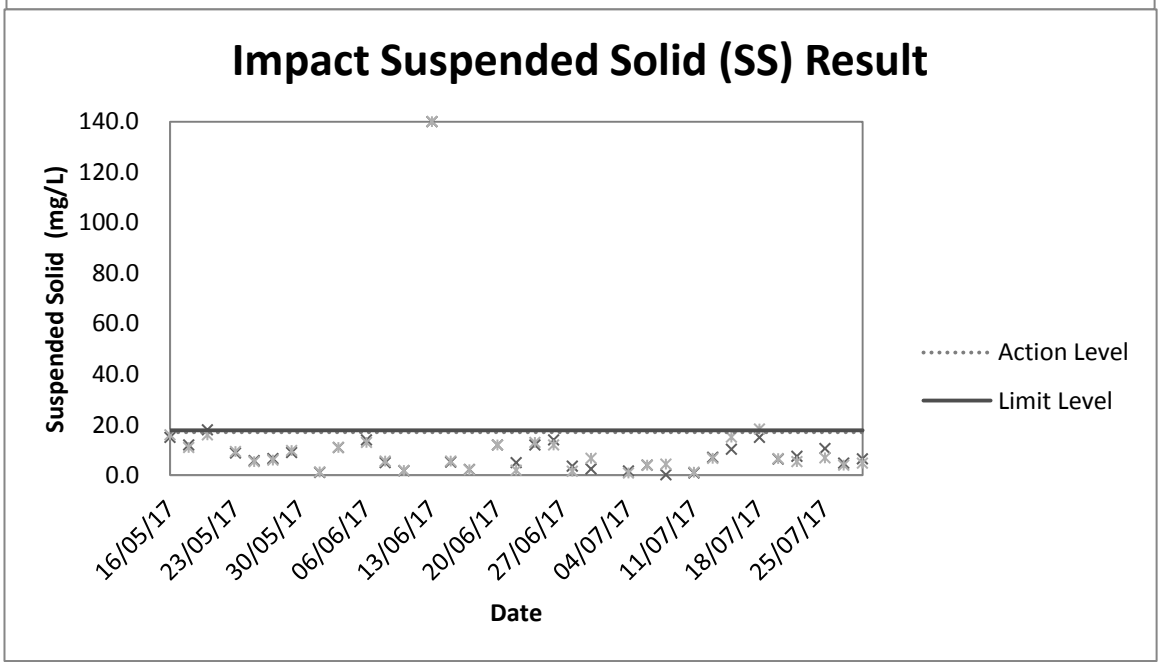

Noise Level at NSR2a
Limit Level = 75dB (A)
Noise Level (dB (A))
80.0
70.0
60.0
50.0
40.0
30.0
19/05/17
25/05/17
31/05/17
06/06/17
12/06/17
18/06/17
24/06/17
30/06/17
06/07/17
12/07/17
18/07/17
24/07/17
Date
Leq (30min)
L10 (30min)
L90 (30min)

Appendix F

Graphical Plots of Impact Water Quality Monitoring Data


Impact Turbidity Result
Turbidity (NTU)
25.0
20.0
15.0
10.0
5.0
0.0
16/05/17
23/05/17
30/05/17
06/06/17
13/06/17
20/06/17
27/06/17
04/07/17
11/07/17
18/07/17
25/07/17
Date
Action Level
Limit Level


Impact Dissolved Oxygen (DO) Result
Dissolved Oxygen (DO) (mg/L)
3.00
2.50
2.00
1.50
16/05/17
23/05/17
30/05/17
06/06/17
13/06/17
20/06/17
27/06/17
04/07/17
11/07/17
18/07/17
25/07/17
Date
Action Level
Limit Level


Impact Suspended Solid (SS) Result
Suspended Solid (mg/L)
140.0
120.0
100.0
80.0
60.0
40.0
20.0
0.0
16/05/17
23/05/17
30/05/17
06/06/17
13/06/17
20/06/17
27/06/17
04/07/17
11/07/17
18/07/17
25/07/17
Date
Action Level
Limit Level

Appendix G

Event and Action Plan

Event and Action Plan for Air Quality (Dust) during Construction Phase

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
Action Level being exceeded for one sample	1. Identify source; 2. Inform IEC and ER; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method.	1. Notify Contractor.	1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
Action Level being exceeded for two or more consecutive samples	1. Identify source; 2. Inform IEC and ER; 3. Repeat measurements to confirm findings; 4. Increase monitoring frequency to daily; 5. Discuss with IEC and Contractor on remedial actions required; 6. If exceedance continues, arrange meeting with IEC and ER; 7. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ER on the effectiveness of the proposed remedial measures; 5. Supervise implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures are properly implemented.	1. Submit proposals for remedial actions to IEC within 3 working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.
Limit Level being exceeded for one sample	1. Identify source; 2. Inform IEC, ER and EPD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor's	1. Check monitoring data submitted by ET and Contractor's working method; 2. Discuss with Contractor on the possible mitigation measures; 3. Review the proposed mitigation	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Check monitoring data and Contractor's working methods; 4. Discuss with IEC and Contractor on potential	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to ER within 3 working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
	remedial actions; 6. Keep EPD and ER informed of the results.	measures submitted by Contractor and advise the ER accordingly.	remedial actions; 5. Ensure remedial actions properly implemented.	appropriate.
Limit Level being exceeded for two or more consecutive samples	1. Identify source; 2. Inform IEC, ER and EPD the causes & actions taken for the exceedances; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily; 5. Investigate the causes of exceedance; 6. Arrange meeting with EPD and ER to discuss the remedial actions to be taken; 7. Assess effectiveness of Contractor's remedial actions and keep EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by ET and Contractor's working method; 2. Discuss with Contractor on the possible mitigation measures; 3. Review the proposed mitigation measures submitted by Contractor and advise the ER accordingly; 4. Supervise the implementation of mitigation measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 4. Discuss with IEC and the Contractor on potential remedial actions; 5. Review Contractor's remedial actions whenever necessary to assure their effectiveness; 6. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to ER within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not resolved; 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

Event and Action Plan for Construction Noise

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
Action level	1. Notify IEC and Contractor; 2. Carry out investigation; 3. Report the results of investigation to the IEC and Contractor; 4. Discuss with the Contractor and formulate remedial measures ; 5. Increase monitoring frequency to check the effectiveness of mitigation measures.	1. Review the analyzed results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analyzed noise problem; 4. Ensure mitigation measures are properly implemented.	1. Submit noise mitigation proposal to IEC; 2. Implement noise mitigation proposals.
Limit level	1. Notify IEC, ER, EPD & Contractor; 2. Identify source; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Inform IEC, ER and EPD the causes and actions taken for the exceedances; 7. Assess the effectiveness of Contractor's	1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analyzed noise problem; 4. Ensure mitigation measures are properly implemented; 5. If exceedances continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is	1. Undertake immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by ER, until the exceedance is abated.

	remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring.		abated.	

Event and Action Plan for Water Quality

Event	Action			
	ET Leader	IEC	ER	Contractor
Action Level being exceeded by one sampling day	1. Repeat in-situ measurement to confirm findings; 2. Identify reasons for non-compliance and sources of impact; 3. Inform IEC and Contractor; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC and Contractor; 6. Repeat measurement on next day of exceedance.	1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation measures.	1. Discuss with IEC on the proposed mitigation measures; 2. make agreement on the mitigation measures to be implemented; 3. Assess the effectiveness of the implemented mitigation measures.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment 4. Consider changes of working methods; 5. Discuss with ET and IEC and propose mitigation measures to IEC and ER; 6. Implement the agreed mitigation measures.
Action Level being exceeded by more than two consecutive	1. Repeat in-situ measurement to confirm findings; 2. Identify reasons for	1. Discuss with ET and Contractor on the mitigation measures; 2. Review	1. Discuss with IEC on the proposed mitigation measures; 2. Make	1. Inform the ER and confirm notification of the non-compliance in writing;

Event	Action			
	ET Leader	IEC	ER	Contractor
sampling days	non-compliance and sources of impact; 3. Inform IEC and Contractor; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC and Contractor; 6. Ensure mitigation measures are implemented; 7. Prepare to increase the monitoring frequency to daily; 8. Repeat measurement on next day of exceedance.	proposals on mitigation measures submitted by Contractor and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation measures.	agreement on the mitigation measures to be implemented; 3. Assess the effectiveness of the implemented mitigation measures.	2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET and IEC and propose mitigation measures to IEC and ER within 3 working days; 6. Implement the agreed mitigation measures.
Limit Level being exceeded by one sampling day	1. Repeat in-situ measurement to confirm findings; 2. Identify reasons for non-compliance and sources of impact; 3. Inform IEC, Contract or and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, ER and	1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation measures.	1. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 2. Request Contractor to critically review the working methods; 3. Make agreement on the mitigation measures to be implemented; 4. Assess the effectiveness of the implemented mitigation measures.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER within 3 working days; 6. Implement

Event	Action			
	ET Leader	IEC	ER	Contractor
	Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Limit Level.			the agreed mitigation measures.
Limit Level being exceeded by more than two consecutive sampling days	1. Repeat in-situ measurement to confirm findings; 2. Identify reasons for non-compliance and sources of impact; 3. Inform IEC, Contractor and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, ER and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Limit Level for two consecutive days.	1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation measures.	1. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 2. Request Contractor to critically review the working methods; 3. Make agreement on the mitigation measures to be implemented; 4. Assess the effectiveness of the implemented mitigation measures; 5. Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the marine work until no exceedance of Limit Level.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER within 3 working days; 6. Implement the agreed mitigation measures; 7. As directed by the ER, to slow down or to stop all or part of the marine work or construction activities.

Appendix H

Implementation Schedule for Environmental Mitigation Measures (EMIS)

Environmental Mitigation Measures	Location	Implementation Status			
		Implemented	Partially implemented	Not implemented	Not Applicable
Air Quality					
• The working area for the uprooting of trees, shrubs, or vegetation or for the removal of boulders, poles, pillars or temporary or permanent structures should be sprayed with water or a dust suppression chemical immediately before, during and immediately after the operation so as to maintain the entire surface wet;	Site Area	√			
• All demolished items (including trees, shrubs, vegetation, boulders, poles, pillars, structures, debris, rubbish and other items arising from site clearance) that may dislodge dust particles should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides within a day of demolition;	Site Area		√		
• Vehicle washing facilities including a high pressure water jet should be provided at every discernible or designated vehicle exit point;	Site Entrance	√			
• 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 concrete, bituminous materials or hardcores;	Site Exit	√			
• Where a site boundary adjoins a road, street, service and or other area accessible to the public, hoarding of not less than 2.4m from ground level should be provided along the entire length of that portion of the site boundary except for a site entrance or exit;	Site Area	√			
• Every main haul road (i.e. any course inside a construction site having a vehicle passing rate of higher than 4 in any 30 minutes) should be paved with concrete, bituminous materials, hardcores or metal plates, and kept clear of dusty materials; or sprayed with water or a dust suppression chemical so as to maintain the entire road surface wet;	Main Haul Road	√			
• The portion of any road leading only to a construction site that is within 30m of a discernible or designated vehicle entrance or exit should be kept clear of dusty materials;	Site Entrance and Exit	√			
• Immediately before leaving a construction site, every vehicle should be washed to remove any dusty materials from its body and wheels;	Site Exit	√			
• Where a vehicle leaving a construction site is carrying a load of dusty materials, the load should be covered entirely by clean impervious sheeting to ensure that the dusty materials do not leak from the vehicle;	--	√			
• The working area of any excavation or earth moving operation should be sprayed with water or a dusty suppression chemical immediately before, during and immediately after the operation so as to maintain the entire surface wet;	Site Area	√			
• Exposed earth shall be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shotcrete or other suitable	Site Area	√			

	surface stabilizer within 6 months after the last construction activity on the construction site or part of the construction site where the exposed earth lies;					
•	Any stockpile of dusty material should be either covered entirely by impervious sheeting; placed in an area sheltered on the top and the 3 sides; or sprayed with water or a dust suppression chemical so as to maintain the entire surface wet.	Site Area	√			
Noise						
•	Quiet plants should be used in order to reduce the noise impacts to protect the nearby NSRs.	Site Area	√			
•	Temporary and Movable Noise Barriers should be used in order to reduce the noise impact to the surrounding sensitive receivers	Site Area	√			
•	Intermittent noisy activities should be scheduled to minimize exposure of nearby NSRs to high levels of construction noise.	Site Area	√			
•	Idle equipment should be turned off or throttled down.	Site Area	√			
•	Construction activities should be planned so that parallel operation of several sets of equipment close to a given receiver is avoided	Site Area	√			
•	Construction plant should be properly maintained and operated.	Site Area	√			
Water Quality						
•	Exposed stockpiles should be covered with tarpaulin or impervious sheets before a rainstorm occurs;	Site Area	√			
•	The exposed soil surfaces should also be properly protected to minimize dust emission;	Site Area	√			
•	The stockpiles of materials should be placed in the locations away from the drainage channel so as to avoid releasing materials into the channel;	Site Area	√			
•	Wheel washing facilities should be provided at site exits to ensure that earth, mud and debris would not be carried out of the works areas by vehicles;	Site Exit	√			
•	Provision of site drainage systems and treatment facilities would be required to minimize the water pollution;	Site Area	√			
•	A discharge license needs to be applied from EPD for discharging effluent from the construction site;	--	√			
•	The treated effluent quality is required to meet the requirements specified in the discharge license;	--	√			
•	Provision of chemical toilets is required to collect sewage from workforce. The chemical toilets should be cleaned on a regular basis;	Chemical Toilet	√			

• A licensed waste collector should be employed to clean the chemical toilets and temporary storage tank on a regular basis;	--	√			
• Illegal disposal of chemicals should be strictly prohibited;	Site Area	√			
• Registration as a chemical waste producer is required if chemical wastes are generated and need to be disposed of. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation should be observed and complied with for control of chemical wastes;	Site Area	√			
• Disposal of chemical wastes should be carried out in compliance with the Waste Disposal Ordinance. The Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes published under the Waste Disposal Ordinance should be used as a guideline for handing chemical wastes;	Site Area	√			
• The impact from accidental spillage of chemicals can be effectively controlled through good management practices.	Site Area	√			
Waste Management					
• Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal;	Site Area	√			
• To encourage collection of aluminium cans by individual collectors, separate bins should be provided to segregate this waste from other general refuse generated by the workforce;	Site Area	√			
• Any unused chemicals or those with remaining functional capacity should be recycled;	Site Area	√			
• Prior to disposal of C&D waste, it is recommended that wood, steel and other metals be separated for re-use and/or recycling and inert waste as fill material to minimize the quantity of waste to be disposed of to landfill;	Site Area	√			
• Proper storage and site practices to minimize the potential for damage or contamination of construction materials; and	Site Area		√		
• Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste.	Site Area	√			

Appendix I

Weather Condition

Daily Extract of Meteorological Observations, May 2017 – Wetland Park

Day	Mean Pressure (hPa)	Air Temperature			Mean Dew Point (deg. C)	Mean Relative Humidity (%)	Total Rainfall (mm)	Prevailing Wind Direction (degrees)	Mean Wind Speed (km/h)
		Absolute Daily Max (deg. C)	Mean (deg. C)	Absolute Daily Min (deg. C)					
01	1012.3	29.6	24.8	20.2	19.8	76	0.0	170	5.7
02	1011.5	30.3	26.2	22.9	22.6	81	0.0	150	5.4
03	1011.1	30.6	27.4	25.3	23.4	79	0.0	150	10.8
04	1011.7	27.5	24.4	22.4	22.9	91	32.0	170	4.8
05	1013.5	29.8	25.9	22.0	22.4	82	0.0	300	3.3
06	1014.5	33.5	27.5	23.9	23.1	78	0.0	170	3.5
07	1014.0	29.8	26.5	24.3	25.3	94	0.0	120	7.2
08	1011.5	29.9	26.4	22.1	23.8	87	22.5	170	8.1
09	1012.2	30.6	26.0	21.8	22.5	82	10.0	060	3.2
10	1013.6	31.5	26.2	23.9	23.9	88	9.5	050	2.2
11	1013.4	31.9	27.0	23.6	23.1	80	0.0	160	4.9
12	1010.7	30.8	27.5	25.1	22.7	76	0.0	320	4.0
13	1010.0	27.0	25.1	23.6	22.8	87	10.0	260	2.0
14	1010.0	31.1	26.5	22.7	23.4	84	0.0	160	4.8
15	1008.3	26.4#	25.2	24.2#	24.1	94	21.0	070	2.8
16	1007.5	27.9	24.9	22.3	21.1	80	4.0	050	6.2
17	1009.5	30.1	25.5	21.7	20.6	76	0.5	070	3.8
18	1011.7	28.2	25.3	23.4	20.0	73	0.5	070	6.5
19	1010.9	26.9#	24.3	22.7#	20.2	78	2.0	080	6.1
20	1008.5	25.3	24.0	22.3	21.4	86	0.0	060	5.6
21	1007.2	26.8	24.9	23.6	21.3	80	0.0	080	11.0
22	1007.7	27.8	25.6	24.9	22.3	82	0.0	080	8.6
23	1007.3	32.0	27.0	24.2	24.8	88	***	050	4.5
24	1006.7	26.5	25.2	23.9	24.3	95	***	330	4.4
25	1008.8	30.0	25.6	23.0	21.8	80	***	350	3.2
26	1010.0	27.3	24.6	22.3	20.2	77	0.0#	070	3.9
27	1009.8	31.4	25.9	22.1	18.5	67	0.0	070	3.8
28	1009.2	32.0	26.8	23.6	19.6	66	0.0	020	4.9
29	1009.5	32.6	27.0	24.2	20.4	69	0.0	070	6.9
30	1009.0	31.0	26.9	23.7	22.9	79	0.0	170	6.0
31	1006.1	33.0	28.1	23.7	24.4	81	0.0	150	6.3

*** *unavailable*

 # data incomplete

Rainfall measured in increment of 0.5 mm. Amount of < 0.5 mm cannot be detected

Daily Extract of Meteorological Observations, June 2017 – Wetland Park

Day	Mean Pressure (hPa)	Air Temperature			Mean Dew Point (deg. C)	Mean Relative Humidity (%)	Total Rainfall (mm)	Prevailing Wind Direction (degrees)	Mean Wind Speed (km/h)
		Absolute Daily Max (deg. C)	Mean (deg. C)	Absolute Daily Min (deg. C)					
01	1002.8	32.2	29.7	27.5	25.7	79	0.0	190	9.5
02	1002.0	32.1	30.1	28.7	26.2	80	0.0	190	8.8
03	1002.1	34.7	30.9	28.8	25.9	76	0.0	190	8.6
04	1003.1	32.8	30.0	28.4	26.5	82	0.0	150	8.3
05	1005.7	33.3	30.2	28.5	26.0	79	0.0	150	12.4
06	1008.7	33.9	30.3	27.8	25.3	75	0.0	160	9.5
07	1009.6	33.6	30.0	26.5	25.3	77	8.0	170	8.0
08	1009.5	34.0	30.0	26.5	24.7	75	0.0	170	6.8
09	1008.8	34.2	29.9	26.6	24.5	73	0.0	170	7.3
10	1007.9	33.7	30.1	27.5	24.9	74	0.0	150	7.8
11	1006.6	34.9	29.9	26.8	25.3	77	0.0	160	5.5
12	1002.5	30.5	27.6	25.6	25.2	87	23.0	090	10.0
13	1005.8	28.2	26.5	24.3	25.2	93	146.0	160	5.8
14	1008.4	29.4	27.2	25.1	25.8	92	19.5	150	2.7
15	1007.2	31.4	29.1	26.6	25.7	82	2.0	160	6.5
16	1004.8	31.1	29.1	25.4	26.0	83	9.0	180	6.6
17	1003.5	26.4	25.3	24.5	24.6	96	113.5	160	2.6
18	1004.4	28.2	26.3	24.5	24.9	92	12.0	150	3.4
19	1004.9	29.8	26.4	25.1	24.9	92	13.5	160	3.8
20	1004.8	28.3	26.1	24.8	25.0	93	21.5	160	3.7
21	1004.9	31.0#	27.5	25.2#	25.7	90	10.0	150	4.7
22	1007.4	32.4	29.3	27.6	25.5#	79#	0.0	150	8.9
23	1007.3	31.8	29.0	26.9	***	***	1.5	150	9.3
24	1005.9	31.9	28.7	26.7	***	***	1.5	150	6.4
25	1006.5	32.2	29.3	26.4	***	***	0.5	150	7.3
26	1008.0	32.8	30.0	27.4	24.9#	72#	0.0	190	8.3
27	1009.1	32.8	29.8	27.7	25.0	76	0.0	190	6.7
28	1009.8	33.1	29.9	27.2	24.1	73	0.0	140	8.0
29	1009.3	33.2	29.3	26.3	25.1	79	0.0	150	5.8
30	1007.4	33.4	29.4	25.4	24.3	75	0.0	170	6.8

*** *unavailable*

 # data incomplete

Rainfall measured in increment of 0.5 mm. Amount of < 0.5 mm cannot be detected

Daily Extract of Meteorological Observations, July 2017 – Wetland Park

Day	Mean Pressure (hPa)	Air Temperature			Mean Dew Point (deg. C)	Mean Relative Humidity (%)	Total Rainfall (mm)	Prevailing Wind Direction (degrees)	Mean Wind Speed (km/h)
		Absolute Daily Max (deg. C)	Mean (deg. C)	Absolute Daily Min (deg. C)					
01	1005.8	32.6	29.1	25.9	24.8	79	7.5	150	6.8
02	1005.4	30.8	27.9	25.9	26.1	90	16.0	150	5.1
03	1005.9	28.8	26.9	25.0	25.6	92	73.5	150	4.0
04	1008.0	30.9	26.6	25.0	25.2	92	14.0	050	4.0
05	1008.9	32.4	28.2	25.2	25.4	86	17.5	090	6.5
06	1007.8	29.6	27.1	25.7	25.6	92	23.0	070	3.8
07	1008.1	31.1	27.1	24.7	24.7	87	43.5	160	6.9
08	1009.6	29.7	27.2	24.9	25.8	92	16.5	140	5.0
09	1009.3	32.4	29.0	27.2	25.6	83	0.5	150	8.8
10	1008.2	32.1	28.6	25.6	25.5	84	0.0	150	6.6
11	1009.8	33.0	29.3	26.1	24.8	78	0.0	160	7.0
12	1010.7	33.6	29.2	25.8	25.4	81	0.0	160	4.5
13	1008.5	33.7	29.5	25.9	25.2	79	0.0	100	5.6
14	1007.2	33.5	29.5	26.2	25.2	79	0.0	110	6.9
15	1007.1	33.3	29.2	26.5	25.4	81	5.0	080	7.8
16	1007.6	29.6	27.2	25.3	25.4	90	30.5	080	7.4
17	1008.6	30.6	26.1	24.3	25.0	94	84.0	060	5.8
18	1011.0	29.4	25.4	24.4	24.7	96	62.0	070	3.4
19	1009.0	32.7	27.9	24.5	25.3	86	6.0	060	5.6
20	1008.3	32.6	28.4	25.7	25.8	86	4.0	080	4.0
21	1009.1	33.1	29.2	26.1	25.4	81	0.0	080	6.9
22	1008.5	33.4	29.6	26.6	25.2	78	0.0	080	6.8
23	1005.5	29.4	27.0	25.6	25.4	91	30.5	330	5.3
24	1005.3	31.6	27.7	25.4	25.8	90	6.0	090	4.1
25	1004.7	33.4	29.2	25.5	25.6	82	0.0	180	4.4
26	1003.9	34.3	29.1	25.1	25.0	80	0.0	150	3.3
27	1003.3	33.3	28.7	26.2	25.6	84	0.0	080	4.2
28	1003.4	35.6	30.5	26.9	24.8	73	0.0	050	5.0
29	999.7	35.7	30.8	26.8	26.3	79	0.0	260	3.7
30	995.7	36.7	32.9	28.7	26.4	70	0.0	300	5.3
31	997.4	34.4	31.5	30.1	26.6	76	0.0	200	8.1

Rainfall measured in increment of 0.5 mm. Amount of < 0.5 mm cannot be detected

Appendix J

Waste Flow Table

Name of Department: DSD

Year: 2017

Project: Design, Build and Operate San Wai Sewage Treatment Works - Phase 1

Contract No.: DC/2013/10

Waste Flow Table

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Broken Broken Concrete (see Note [3])	Reused in the Contract	Reused in other Projects	Disposed as Public Fill (see Note [4])	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note [2])	Chemical Waste	Others, e.g. general refuse
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000 kg)
Jan	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	19.480
Feb	0.005	0.000	0.000	0.000	0.005	0.000	0.000	0.000	0.000	0.000	6.830
Mar	0.000	0.000	0.000	0.000	0.000	1.074	0.000	0.000	0.000	0.000	5.830
Apr	0.248	0.000	0.000	0.000	0.248	0.000	0.000	0.000	0.000	0.000	23.350
May	1.762	0.000	0.000	0.000	1.762	0.000	0.000	0.000	0.000	0.000	1.540
Jun	2.628	0.000	0.000	0.000	2.628	0.030	0.000	0.095	0.000	0.000	12.30
Jul	1.142	0.000	0.000	0.000	1.142	0.066	0.000	0.000	0.000	0.000	4.560
Aug											
Sep											
Oct											
Nov											
Dec											
Total	5.785	0.000	0.000	0.000	5.785	1.169	0.000	0.095	0.000	0.000	73.890

Notes: (1) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.

(2) Plastics refer to plastic bottles/ containers, plastic sheets/ foam from packaging materials.

(3) Broken concrete for recycling into aggregates.

(4) Assumption: The densities of subbase, Rockfill, Soil, Mix Rock and Soil, Reclaimed Asphalt Pave, Slurry are 2.0 ton/m^3; the densities of Building debris is 2.1 ton/m^3; the densities of Broken Concrete is 2.4 ton/m^3.

Appendix K

Investigation Reports on Action Level or Limit Level Non-compliance

Report No. **001**
Monitoring Date **13 June 2017**

The Action and Limit Levels of suspended solids (SS) determined from baseline monitoring data are reproduced below:

Monitoring Parameter	Action Level (AL)	Limit Level (LL)
Suspended Solid (mg/L)	17.0	17.8

Suspended Solid (in mg/L)

Monitoring Station	Monitoring Duration	Result			Level Exceedance
		Trial 1	Trial 2	Average	
R1b	11:38 to 11:49	140	140	140	Limit

Investigation Results:

a) Causes of exceedances

Exceedance was not due to construction works under Contract No. DC/2013/10 because:

- Tropical Cyclone Warning Signal No.8 was hoisted from 12 to 13 June 2017. The soil and other suspended materials were flushed along the shore and entered the Tin Shui Wai Nullah. Therefore, the water quality at R1b was deteriorated and resulted in suspended solids exceedance.
- Red Rainstorm Warning Signal was hoisted during water monitoring period on 13 June 2017. The nullah water was thus flowed rapidly and the sand and stones in the nullah bed were upturned. Thus, the water quality at R1b was deteriorated and resulted in suspended solids exceedance.
- During the above mentioned bad weather on 12 and 13 June 2017, all works were suspended and workers were off-site from 12:00noon 12 June 2017 to 1:30pm 13 June 2017 due to occurrence of the tropical storm, Merbok.
- Besides, a temporary storage pool was established in the lowest position of the construction site for acting as a prior sedimentation tank. Indeed, the surface runoff was first stored in the temporary storage pool and then transferred to the Wetsep for proper treatment prior to discharge. The effluent was thus brought into an acceptable minimum level and also complied with the requirements specified in the discharge license. In addition, there was no water discharge in the morning of 13 June 2017.
- Thus, the exceedance of water samples taken from 11:38 to 11:49am on 13 June 2017 was considered as non-Project related.

b) Action required under the action plan

Refer to Table 4.4 of the EM&A Manual.

c) Action taken under the action plan

1. Not applicable as suspended solids was not measured in-situ;
2. After considered the above mentioned investigation results, it appears that it was unlikely that the suspended solids exceedance was attributed to the work site of this Contract;
3. The exceedance was informed to IEC and Contractors;
4. Monitoring data, all plant, equipment and Contractor's working methods were checked;
5. Mitigation measures and recommendations were provided in item d).
6. Mitigation measures implementation status were shown in the attachment.
7. The water quality monitoring results of 15 June 2017 was shown below:

Test Parameters	Trial 1	Trial 2	Average	Action Level	Limit Level
Turbidity (NTU)	13.3	13.0	13.2	19.8	20.5
Dissolved Oxygen (mg/L)	2.74	2.70	2.72	1.84	1.81
Suspended Solid (mg/L)	5.2	5.6	5.4	17.0	17.8

The results of suspended solid of the water samples collected on 15 June 2017 were under the action limit.

d) ET's conclusions and recommendations for mitigation

- All relevant water quality mitigation measures were checked to be fully implemented including provision of site drainage systems and treatment facilities, maintaining the existing silt trap to ensure good efficiency of wheel wash facilities, complying the requirements specified in the discharge license. The effluent quality report was shown in **Appendix A**. According to the photos below, water overflowed from the discharge point is clean without mud

- The Contractor was reminded to ensure all construction activities that generate wastewater with high concentrations of suspended solids (SS) should be collected to sedimentation tanks or package treatment systems for proper treatment prior to discharge.

e) Contractor's actions to implement the mitigation

- All construction activities that generate wastewater with high concentrations of suspended solids (SS) like wheel washing etc. was collected to sedimentation tanks or package treatment systems for proper treatment prior to discharge.
- All silt removal facilities, channels and manholes was maintained and any deposited silt and grit was removed regularly.

Prepared by:

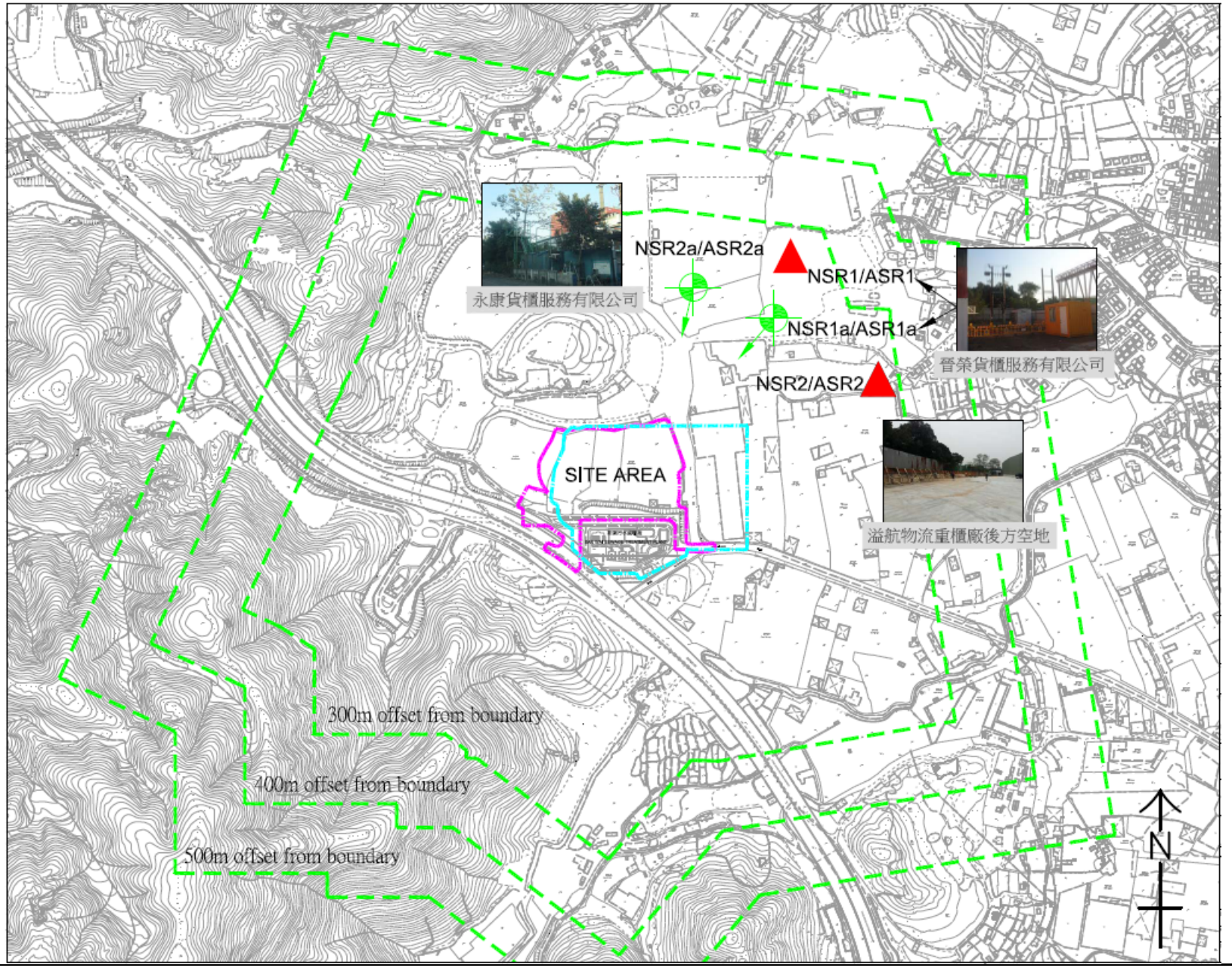
LO, Ting Yi

Certified by:

LAU, Chi Leung
Environmental Team Leader

Figure 1

Locations of Air Quality and Noise Monitoring Stations

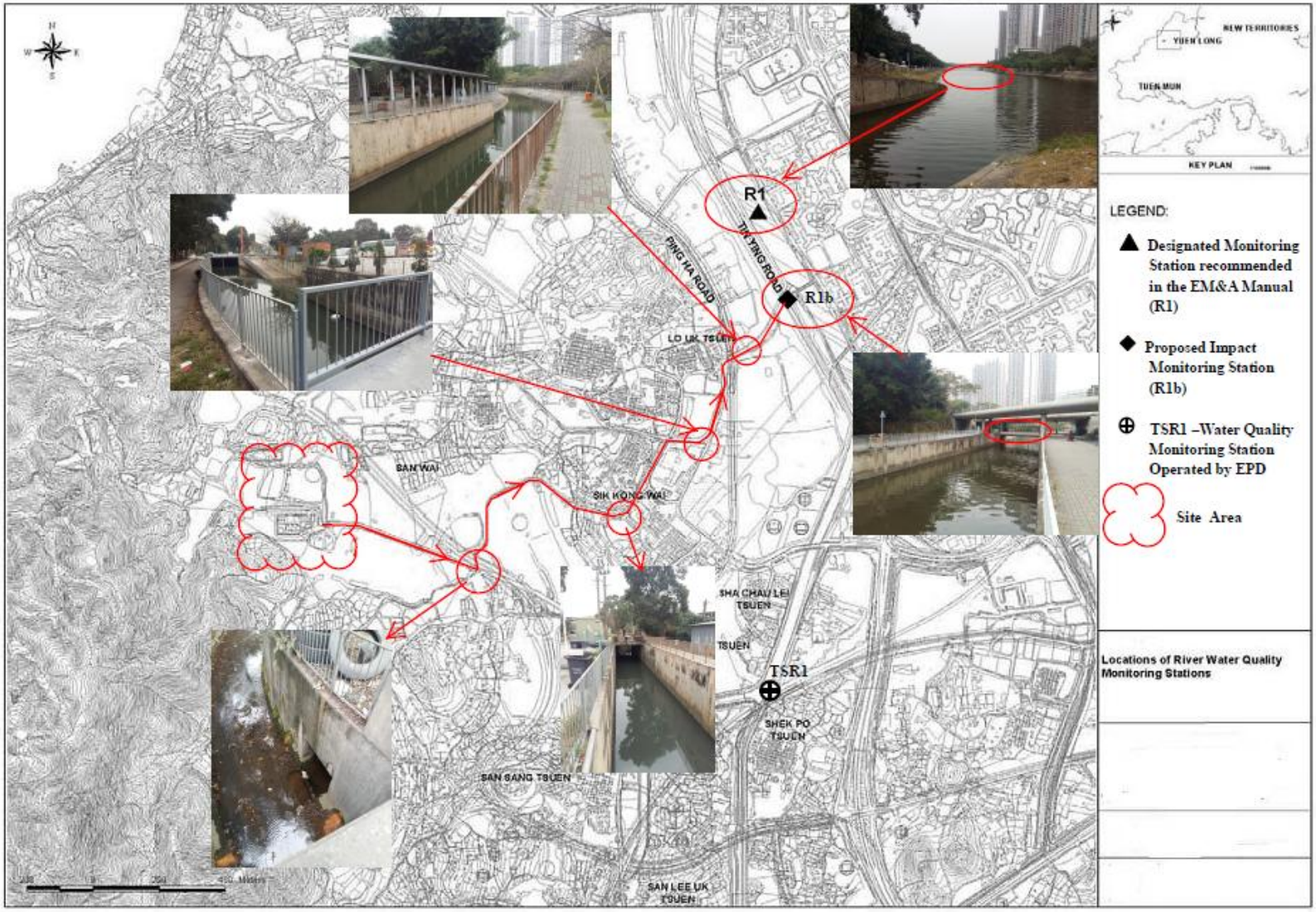


Project: Contract No. DC/2013/10 - Design, Build and Operate San Wai Sewage Treatment Works – Phase 1

Figure 1 Locations of Air Quality and Noise Monitoring Stations

Figure 2

Locations of Water Quality Monitoring Station



Project: Contract No. DC/2013/10 - Design, Build and Operate San Wai Sewage Treatment Works – Phase 1

Figure 2 Locations of Water Quality Monitoring Station