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HKPFH Joint Venture

**Contract No.: CV/2013/06
Handling of Surplus Public Fill
(2014-2016)**


**TUEN MUN AREA 38 FILL BANK
QUARTERLY EM&A SUMMARY REPORT
NO.4**

(OCTOBER TO DECEMBER 2014)

Prepared by: _____


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Issue Date: 17 January 2015

Report No.: ENA50079

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20 January 2015

By E-mail and Fax No.: 2695 3944

ETS-Testconsult Limited
8/F, Block B
Veristrong Industrial Centre
34-36 Au Pui Wan Street
Fo Tan, Hong Kong

Attention: Mr. C L Lau

Dear Mr. Lau,

**Re: Contract No. CV/2013/06
Handling of Surplus Public Fill (2014 – 2016)
Quarterly EM&A Summary Report No. 4 (October to December 2014) for the
Tuen Mun Area 38 Fill Bank**

Reference is made to your submission of the draft Quarterly EM&A Summary Report No.4 (October to December 2014) for the TM Area 38 Fill Bank received by E-mail on 17 January 2015 and the subsequent revision on 20 January 2015.

We are pleased to inform you that we have no further comment on the captioned report.

Thank you very much for your attention and please do not hesitate to contact our Jason Lai or the undersigned should you have any queries.

Yours sincerely,



Tony Cheng
Independent Environmental Checker

c.c. CEDD Attn: Mr. Terry Chock / Mr. Louis Chan
HKPFHJV Attn: Mr. Eric Wan

Fax No.: 2714 0113
Fax No.: 2744 6937

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EXECUTIVE SUMMARY

This is Quarterly Environmental Monitoring and Audit (EM&A) Summary Report No.4 prepared by ETS-Testconsult Ltd (ET) for the "Contract No. CV/2013/06 Handling of Surplus Public Fill (2014-2016) – Tuen Mun (TM) Area 38 Fill Bank" (The Project).

This report documents the findings of EM&A Works conducted during the operation phase of Fill Bank at Tuen Mun Area 38 from October to December 2014.

Site Activities

As informed by the Contractor, the site activities in this reporting quarter were as below:

- | | |
|---------------|--|
| October 2014 | <ol style="list-style-type: none">1. Operation of the TM38 Fill Bank.2. Transferring public fill to vessel and delivering to Taishan and other parties.3. Repairing of the damaged cladding of tipping hall.4. Installation of Project Sign Board.5. Decoration of CEDD site office. |
| November 2014 | <ol style="list-style-type: none">1. Operation of the TM38 Fill Bank .2. Transferring public fill to vessel and delivering to Taishan and other parties.3. Repairing of the damaged cladding of tipping hall4. Decoration of CEDD site office5. Construction of New Tipping Hall |
| December 2014 | <ol style="list-style-type: none">1. Operation of the TM38 Fill Bank .2. Transferring public fill to vessel and delivering to Taishan and other parties.3. Repairing of the damaged cladding of tipping hall4. Decoration of CEDD site office5. Construction of New Tipping Hall |

Environmental Monitoring Works

Air Monitoring

No exceedance of Action and Limit levels was recorded for 1-hr and 24-hr TSP monitoring in this quarter.

Marine Water Quality Monitoring

According to the summary of marine water monitoring results, no exceedance of Action and Limit levels was recorded in this quarter.

Noise Monitoring

No exceedance of Action and Limit levels for noise monitoring was recorded in this quarter.

Environmental Complaints, Notification of summons and successful prosecutions

No complaint, notification of summon and prosecution with respect to environmental issue was received in this quarter.

1.0 INTRODUCTION

HKPFH Joint Venture (HKPFH-JV) appointed Environmental Team (ET) of ETS-Testconsult Limited (ETL) to undertake the Environmental Monitoring and Audit (EM&A) for the "Contract No: CV/2013/06 –Handling of Surplus Public Fill (2014-2016) – Tuen Mun (TM) Area 38 Fill Bank" (The Project).

In accordance with the Condition 5 of Part C of Environmental Permit (No.: EP-210/2005/B) (the EP), an EM&A programme as set out in the Project Profile should be implemented. The EM&A programme requires environmental monitoring for air quality, water quality and environmental site inspections for air quality, water quality, landscape and visual, and waste management.

Baseline monitoring was completed in May 2003 by Stanger Asia Ltd. Action and Limit Levels were established for air and water quality parameters based on the baseline monitoring results.

This quarterly report documented the findings of EM&A Works conducted during the operation phase of Fill Bank at Tuen Mun Area 38 from October to December 2014.

2.0 PROJECT INFORMATION

2.1 Work Programme in this Reporting Quarter

Details of work programme are shown in Appendix G.

2.2 Project Organization and Management Structure

The project organization chart is shown in Appendix A.

2.3 Contact Details of Key Personnel

The key personnel contact names and telephone numbers are shown in Table 2.1.

Table 2.1 Contact Details of Key Personnel

Organization	Name of Key Staff	Project Role	Tel. No.	Fax No.
CEDD	Mr. P C Mok Mr. K C Wong Mr. C T Chock Mr. Y F Kwong	Engineer's Representative	2762 5514	2714 0113
IEC (ENVIRON)	Mr Tony Cheng	IEC	3465 2888	3465 2899
Contractor (HKPFH-JV)	Mr. K W Li	Project Manager	9750 6438	2744 6937
ET (ETL)	Mr C. L. Lau	ET Leader	2946 7791	2695 3944

3.0 SUMMARY OF EM&A REQUIREMENTS

3.1 EM&A Programme

The EM&A programme required environmental monitoring for air, marine water and environmental site inspections for air, marine water, landscape and visual, and waste management. 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.

The advice on implementation status of environmental protection and pollution control/mitigation measures is summarized in Section 5 of the Report.

3.2 Monitoring Stations and Parameters

The EM&A Manual designates several locations to monitor environmental impacts in terms of air quality, noise and water quality due to the Project. The description and detailed locations of monitoring stations for air quality, noise and marine water quality are shown in Figures 1, 2 and 3 and relevant sections of this Report.

3.3 Monitoring Methodology and Calibration Details

All monitoring works were conducted and monitoring equipment was calibrated in according with the EM&A Manual.

3.4 Environmental Quality Performance Limits (Action/Limit Levels)

The environmental quality performance limits, i.e. Action/Limit Levels (AL Levels) were derived from the baseline monitoring results. If the measured environmental quality parameters exceed the AL Levels, the respective action plan will be implemented. The AL Levels for each monitoring parameter are given in Appendix E. The event action plan is given in Appendix F.

3.5 Environmental Mitigation Measures

Relevant mitigation measures were recommended in the EM&A Manual for the Contractor to implement. A list of mitigation measures is given in Appendix H.

4.0 MONITORING RESULTS

4.1 Air Quality

In accordance with the EM&A Manual, 1-hr and 24-hr TSP air quality monitoring are to be conducted three times and one time per six days correspondingly. In the reporting quarter, no exceedances of Action and Limit levels were recorded for 1-hr and 24-hr TSP monitoring. The monitoring trend of air quality during the reporting quarter are given in Appendix B.

Major dust sources in the Fill Bank were dump truck traffic and hauling activities.

Table 4.1 presents the number of exceedances recorded in each month of the reporting quarter. The number of monitoring event included regular monitoring events and additional ones.

Table 4.1 Summary of Number of Exceedances for 1-hr and 24-hr TSP Monitoring

Monitoring Parameter	Level of Exceedance	October 2014	November 2014	December 2014
24-hr TSP	No of monitoring events	5	5	6
	Action Level	0	0	0
	Limit Level	0	0	0
1-hr TSP	No of monitoring events	15	15	15
	Action Level	0	0	0
	Limit Level	0	0	0

4.2 Noise

Since Lands Dept did not approve to carry out noise monitoring at their own area where the noise monitoring stations TM-N1 and TM-N2 located due to the security, noise monitoring carried out at two noise monitoring stations TM-RN1 and TM-RN2 (refer to the figure attached) from 18 December 2007.

No exceedance was recorded in this reporting quarter.

4.3 Marine Water Quality

In accordance with the Project Profile, impact marine water quality monitoring was conducted at two control monitoring stations (TM-FC1 and TM-FC2) and two impact monitoring stations (TM-FM1 and TM-FM2) in this quarter.

Impact marine water quality monitoring was conducted three days per week. Measurements were taken at both mid-ebb and mid-flood tides at three depths (i.e. 1m below surface, mid depth and 1m above seabed). The AL Levels are included in Appendix E.

According to the summary of marine water monitoring results, no exceedance of action and limit level was recorded in this quarter. Table 4.2 presents the total number of marine water quality exceedances in the reporting quarter. The trend of marine water quality in the past three months is depicted in Appendix D.

Table 4.2 Total Number of Marine Water Quality Exceedances in this quarter

Parameter	Exceedance Level	October 2014	November 2014	December 2014
Number of monitoring days		12	13	12
Dissolved Oxygen, DO (S&M)	Action	0	0	0
	Limit	0	0	0
Dissolved Oxygen, DO (B)	Action	0	0	0
	Limit	0	0	0
Turbidity	Action	0	0	0
	Limit	0	0	0
Suspended Solids, SS	Action	0	0	0
	Limit	0	0	0

A comparison between the quarterly mean/median of SS and the 1.3 times of the baseline mean was made for each tide at each station. The statistical analysis results are given in Appendix I. Monitoring stations with significant difference ($p < 0.05$) is summarized in Table 4.3.

Table 4.3 Summary of Statistically Significant Results of SS

Monitoring Station		Significant difference?	
		Mid-flood	Mid-ebb
Designated Control Station	FC1	X	X
	FC2	X	X
Designated Monitoring Station	FM1	X	X
	FM2	X	X

5.0 INSPECTION RESULTS

5.1 Implementation Status of Environmental Mitigation Measures

ET conducted weekly site inspections to monitor the Contractor's implementation of environmental mitigation measures.

Air quality was the major environmental issue in the reporting quarter. The Contractor generally implemented most of the environmental mitigation measures in the reporting quarter. Dump truck traffic was the major dust source in the Fill Bank. Generally, the Contractor implemented adequate dust mitigation measures in the reporting quarter including dampening of haul roads, water spraying on the truckloads, during loading and unloading of material and for crushing plant, operation of automatic wheel washing facilities, dampening of fill material prior to handling or stockpiling, etc.

The major noise source was dump truck traffic in the Fill Bank. All site equipment and machinery were well maintained and no noise nuisance was observed during operating.

Drainage channels and wastewater treatment facilities were found maintained in good condition for merit function. The Contractor arranged site workers to clean up the silt and mud regularly.



Although there were a few observations regarding improper handling of oil drums and chemical containers, such as lack of drip tray and accumulated of stagnant water in the drip tray, the Contractor rectified most of these problems. Besides, the Contractor should provide tarpaulin sheets before repairing and maintenance works and also carry out proper cleaning activities immediately after such works.

Overall site area was found tidy and clean. The Contractor was reminded to collect and dispose of the general refuse and other C&D waste in a timely manner.

5.2 Status of Environmental Licensing and Permitting

The status of licences and permits is summarized in Table 5.1.

Table 5.1 Summary of environmental licensing and permit status

Description	Permit No.	Valid Period		Section
		From	To	
Environmental Permit	EP-210/2005/B	08/04/13	---	Issued
Marine Dumping Permit	EP/MD/15-111	01/10/14	31/12/14	Approval for dumping 4,900,000 tons (approximately equal to 2,722,222 cu.m. bulked quantity) of Public Fill (Reclamation Materials) from Tseung Kwan O Area 137 Fill Bank and Tuen Mun Area 38 Fill Bank to designated dumping area at Guanghaiwan of Taishan
Chemical Waste Producer	5296-421-H3555-01	21/01/14	---	Spent battery containing heavy metals and spent lubricating oil
Effluent Discharge License	WT00018973-2014	23/05/14	31/05/19	Discharge of Industrial Trade Effluent arising from public fill reception facilities,
Billing Account for Waste Disposal	7018998	---	---	---

5.3 Advice on Solids and Liquid Waste Management Status

Table 5.2 summarizes data on offsite waste disposal in the quarter.

Table 5.2 Estimated Offsite Waste Disposal in the Reporting Quarter

Waste Type	October 2014	November 2014	December 2014
Public Fill (m ³)	0	0	0
C&D Waste (kg)	0	2690	2340
Chemical Waste e.g. Waste oil (L) / Chemical Waste (kg)	0	0	0

6.0 NON-COMPLIANCE OF THE ENVIRONMENTAL QUALITY PERFORMANCE LIMITS

6.1 Summary of Non-compliance

According to the monitoring results, no action and limit level exceedance was recorded in this quarter.

6.2 Review of the Reasons for and the Implications of Non-compliance

Since no non-compliance was recorded in this quarter, no review was required.

6.3 Summary of Actions Taken

Since no exceedance was recorded in this quarter, no further action was required.



6.4 Summary of Environmental Complaint, Notification of Summon and Successful Prosecution Handling

No complaint, notification of summon and prosecution with respect to environmental issue was received in this quarter.

A summary of environmental complaints and prosecutions was given in Table 6.1.

Table 6.1 Summary of Environmental Complaints and Prosecutions

<i>Period</i>	<i>Complaints logged</i>	<i>Summon served</i>	<i>Successful Prosecution</i>
<i>October 2014</i>	<i>0</i>	<i>0</i>	<i>0</i>
<i>November 2014</i>	<i>0</i>	<i>0</i>	<i>0</i>
<i>December 2014</i>	<i>0</i>	<i>0</i>	<i>0</i>
<i>Cumulative</i>	<i>0</i>	<i>0</i>	<i>0</i>

7.0 COMMENTS, CONCLUSIONS AND RECOMMENDATION

Major activity in the Fill Bank was the import and dumping of fill materials in this quarter. Air quality was the major environmental issue in the Fill Bank. Generally, the Contractor implemented most of the mitigation measures to minimize the dust impact.

No exceedance of action and limit levels was recorded for 1-hr and 24-hr TSP monitoring in the reporting quarter.

According to the marine water monitoring results in this quarter, no exceedance of action and limit level was recorded.

The noise level measured at the monitoring station complied with the Limit Level of 65dB(A). No complaint was received regarding noise issue in this reporting month.

No complaint, notification of summon and prosecution with respect to environmental issue was received in this quarter.

According to the ET weekly site inspection and IEC site audits carried out in this quarter, it was indicated that site practices of the Contractor were generally undertaken in an environmentally acceptable manner and the overall site environmental performance was up to standard.

According to the environmental site inspections performed in the reporting quarter, the following recommendations were provided:

Air Quality

- Ensure the frequency of water spraying on haul roads, unloading areas and stockpiles to be sufficient to suppress the dust sources;
- Provide proper maintenance for the powered mechanical equipment and barges to avoid emission of dark smoke;
- Provide water spraying onto the truckloads during inspection of fill material;
- Conduct road sweeping on all paved haul roads and public roads especially outside and near the site egress by the road sweeper. Undertake water spraying on stockpiling area by water bowser;
- Erect adequate speed limit signs to advise the truck drivers of the speed limit;
- Operate mist spraying systems and automatic water sprinklers in the Fill Bank;
- Implement the dust mitigation measures for the construction activities;
- Designate proper haul roads to ensure effective water spraying; and
- Ensure all vehicles to be washed before leaving the site egress by provision, operation and maintenance of automatic wheel washing facilities.



Noise

- Conduct noisy activities at a farther location from the NSRs.

Water Quality

- Maintain the drainage system, including the trapezoidal channels and permanent desilting chambers regularly; and
- Remove the stagnant water or provide approved pesticides for the stagnant water in the permanent desilting chambers, if any.

Chemical and Waste Management

- Remove waste materials from the site to avoid accumulation regularly;
- Handle and store chemical wastes properly;
- Remove unwanted material in the existing stockpiles and avoid further dumping of such material;
- Provide and maintain sufficient drip trays for diesel drums, chemical containers, chemical waste storage drums and diesel operated generator set;
- Maintain good housekeeping at the workshop area;
- Ensure sufficient tarpaulin sheets are provided to cover drip trays; and
- Avoid soil being polluted during oil filling and equipment maintenance; hence, properly remove and store the contaminated soil, if any.

Landscape and Visual

- Provide hydroseeding on the exposed slopes, on which the final profile has been formed;
- Erect all the site hoarding/chaining fences in accordance with agreed design at proper location; and
- Maintain the hydroseeding slopes in accordance with the Landscape Plan.

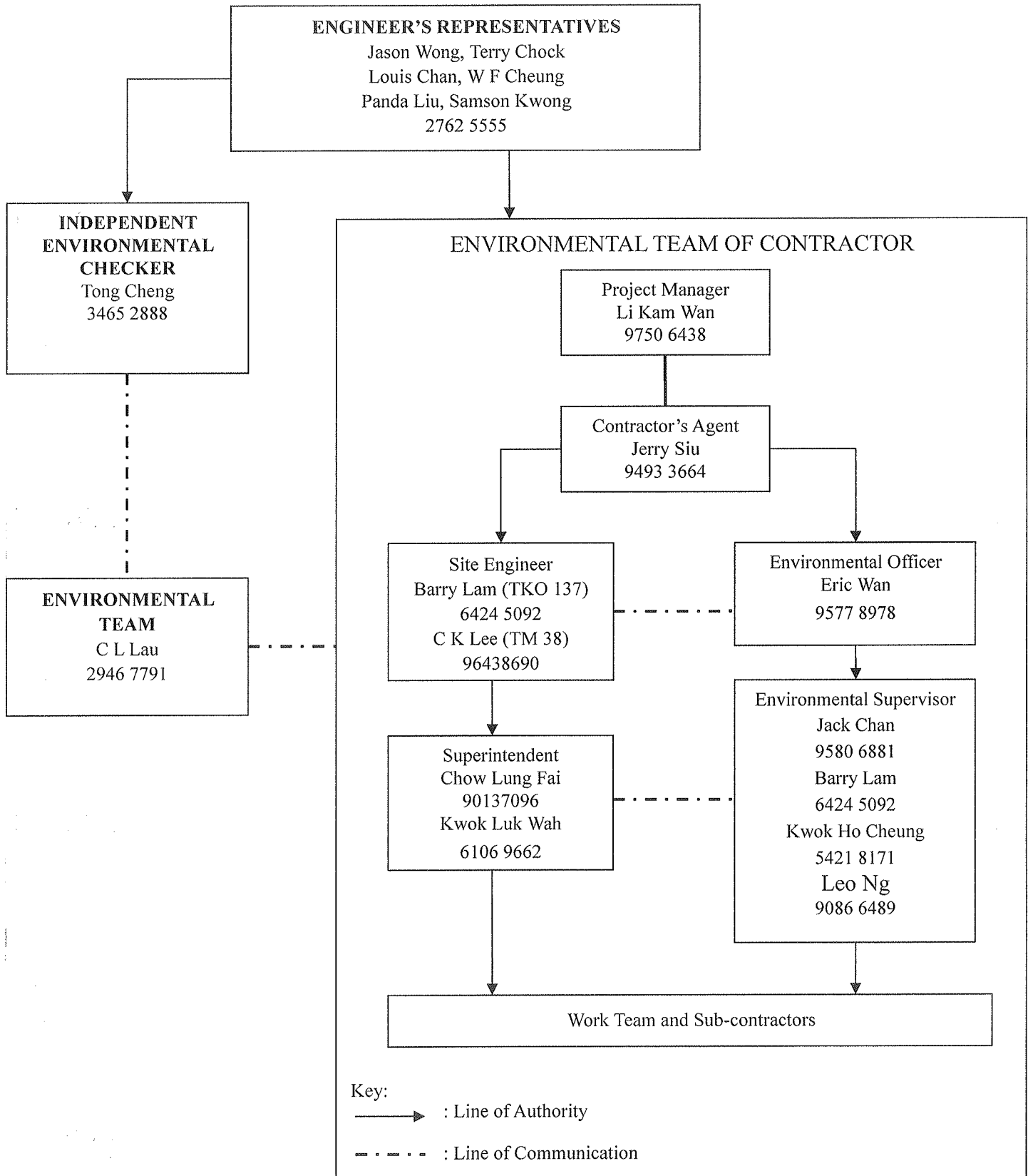
- END OF REPORT -



Appendix A

Organization Chart

Organization Chart and Contact List for Environmental Management Team of Contractor



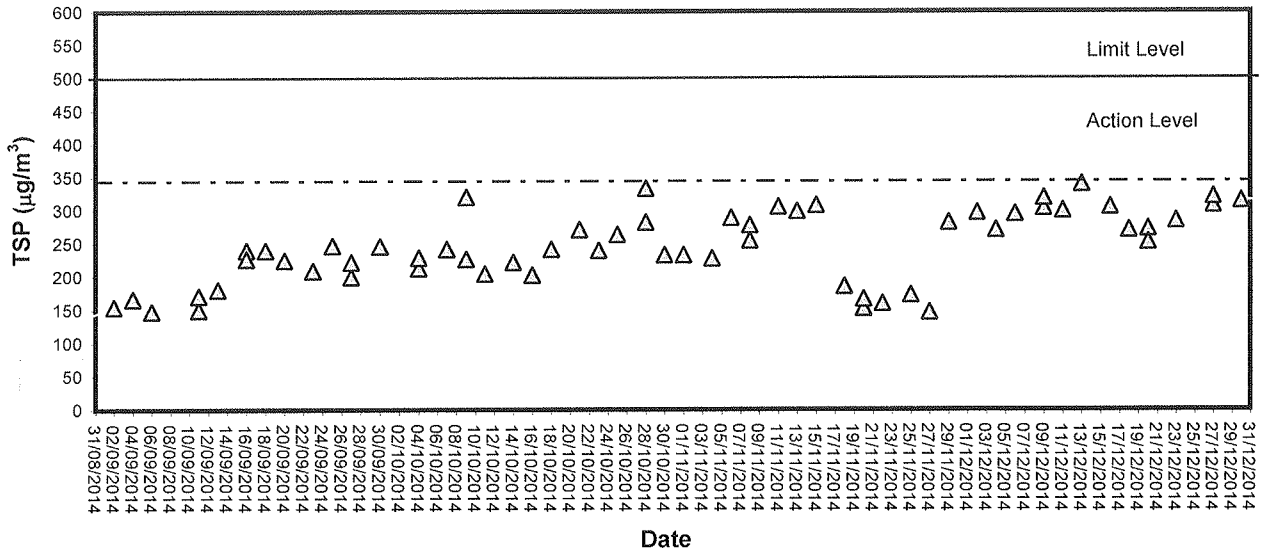


Appendix B

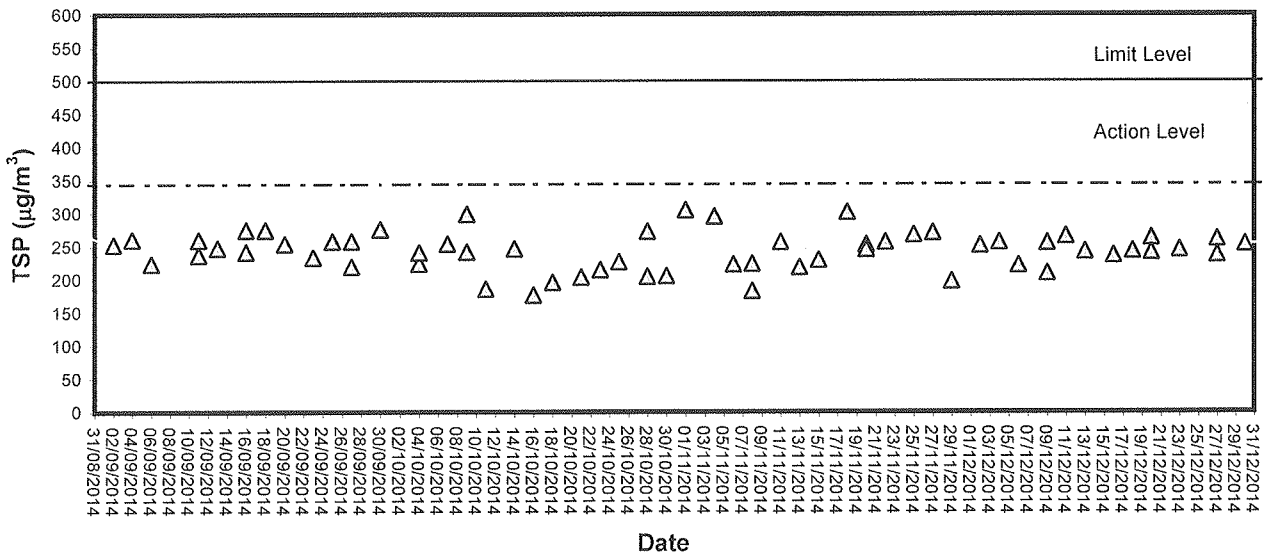
Graphical Plots of Air Quality Monitoring Data

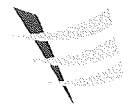


1-hour TSP level at TM-A1

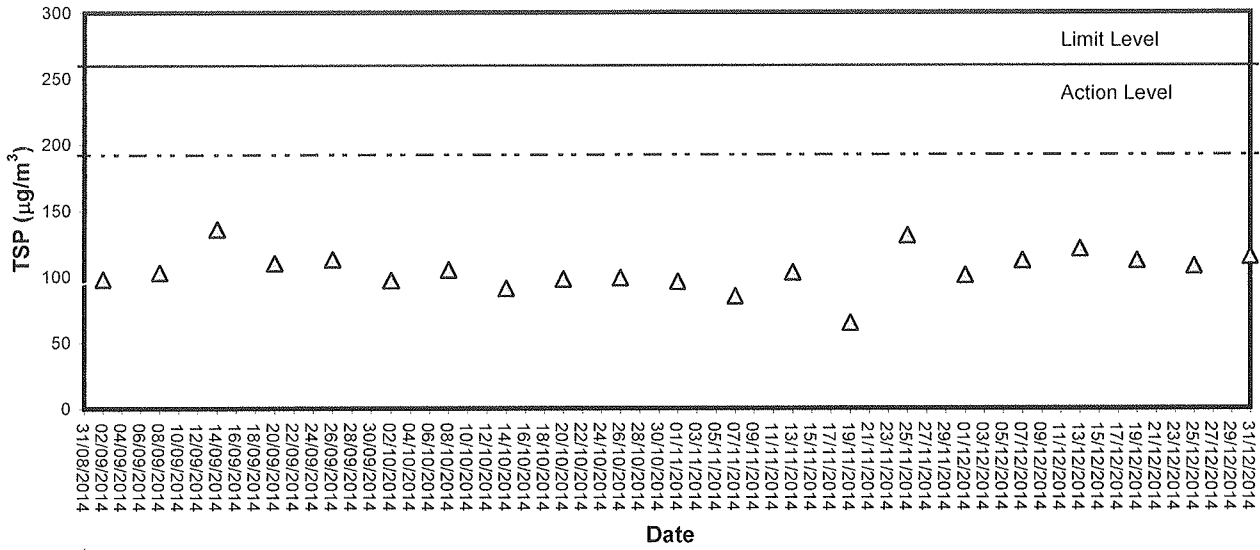


1-hour TSP level at TM-RA2

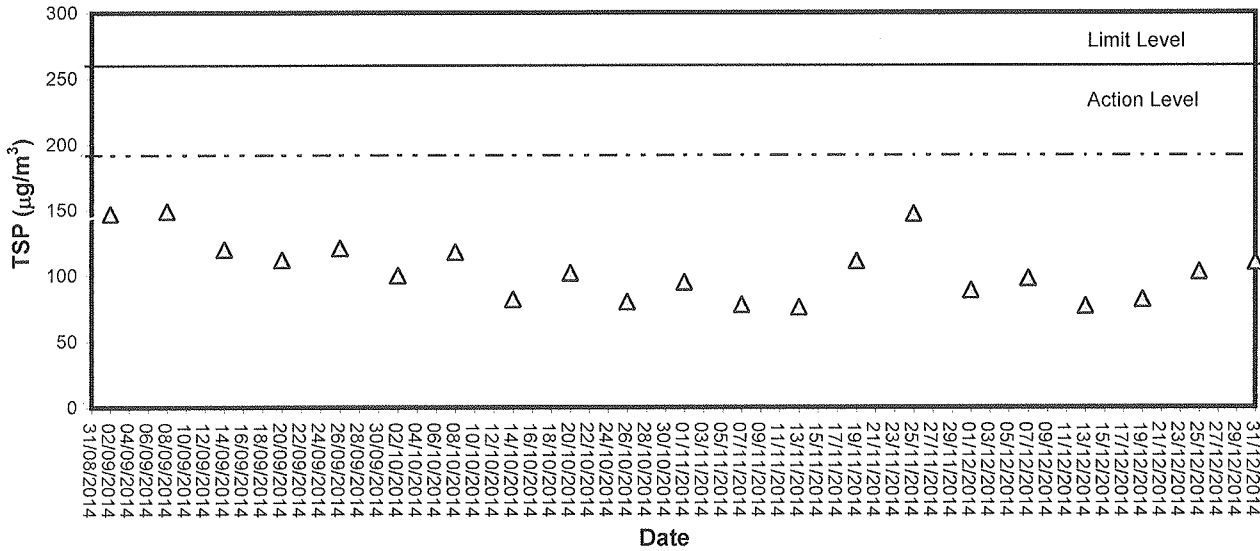




24-hour TSP level at TM-A1



24-hour TSP level at TM-RA2





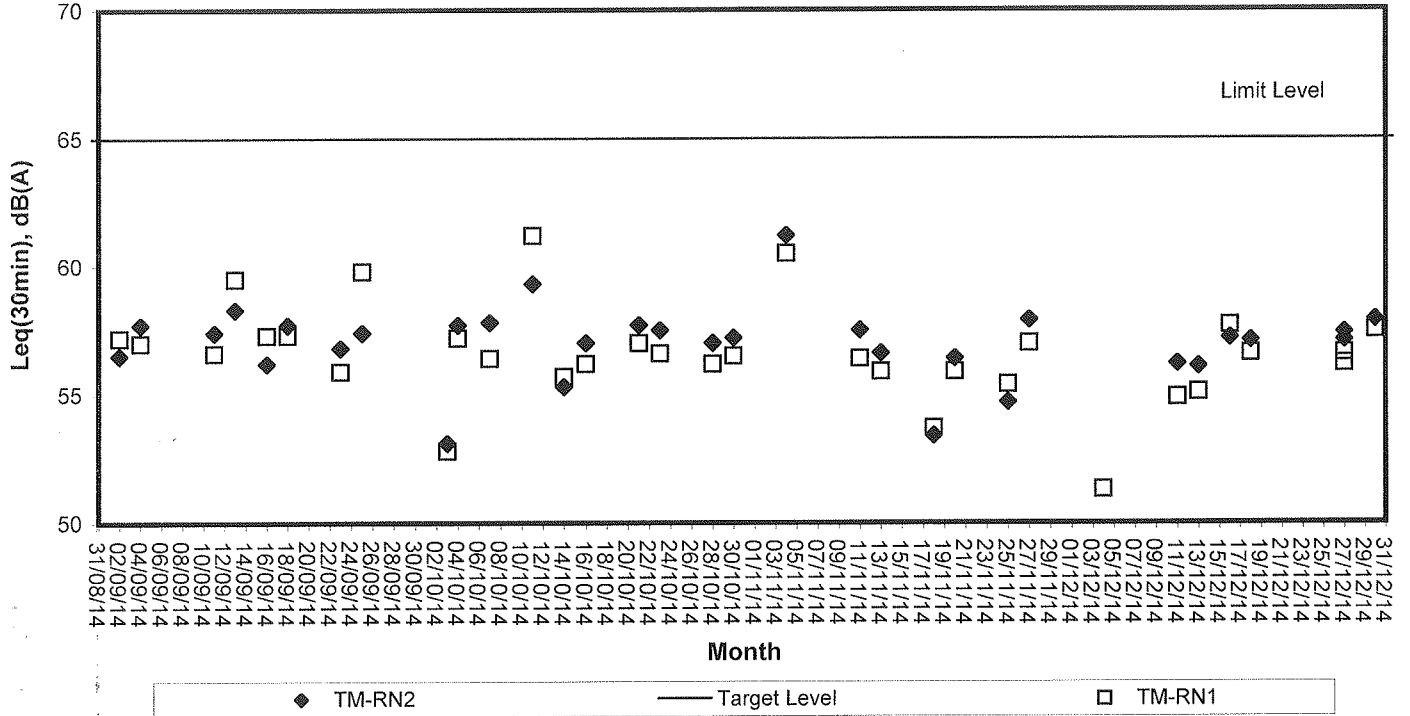
Appendix C

Graphical Plots of Impact Noise Monitoring Data



Noise Monitoring (Day-time)

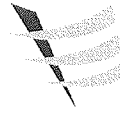
Noise level at TM-RN1 and TM-RN2



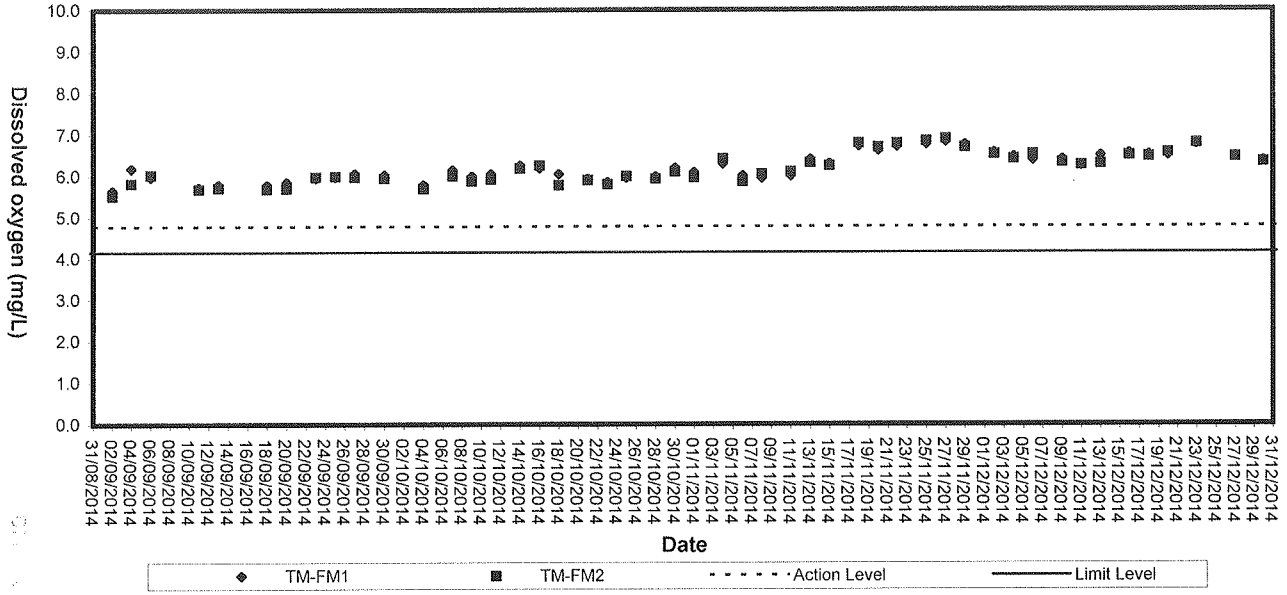


Appendix D

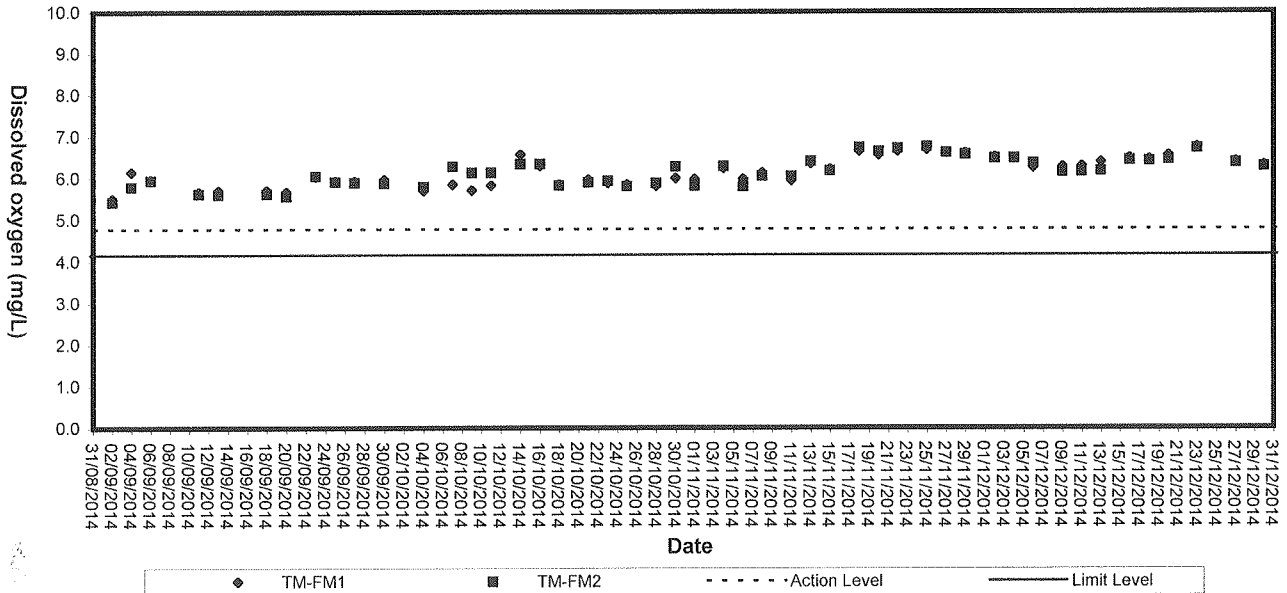
Graphical Plots of Impact Marine Water Quality Monitoring Data



Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide

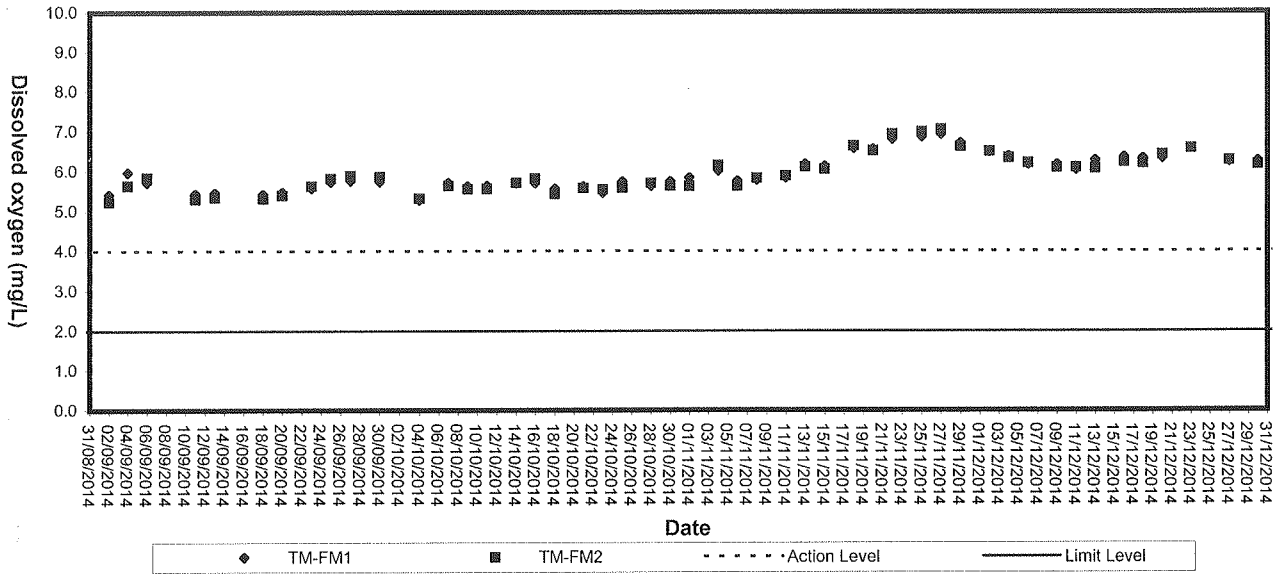


Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide

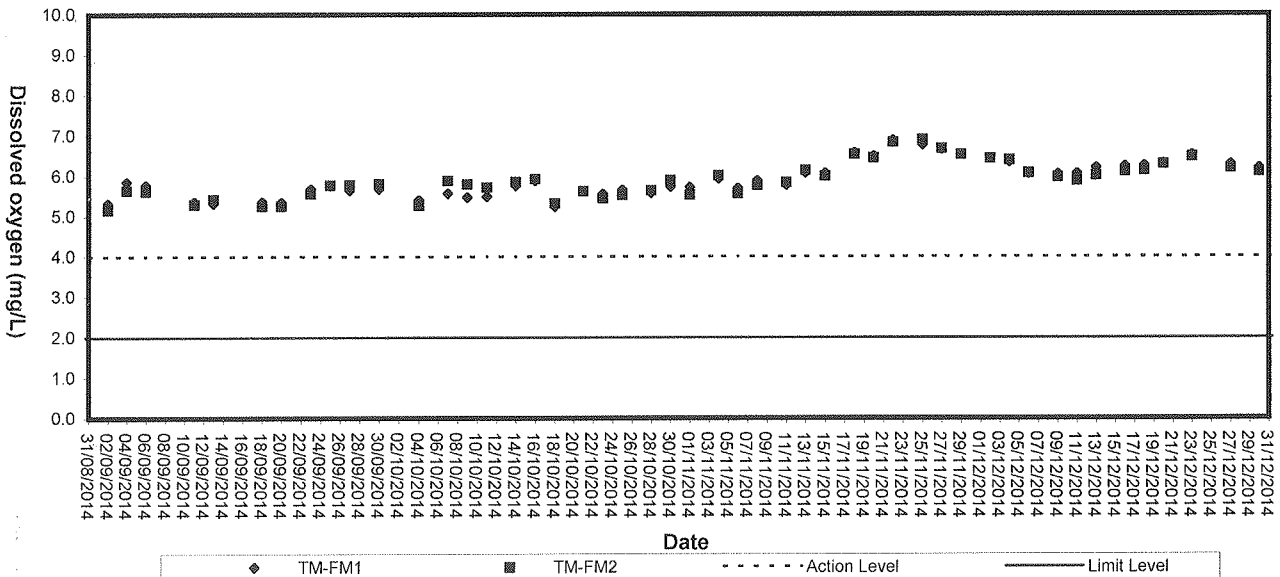


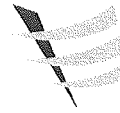


Dissolved Oxygen (Bottom) at Mid-Flood Tide

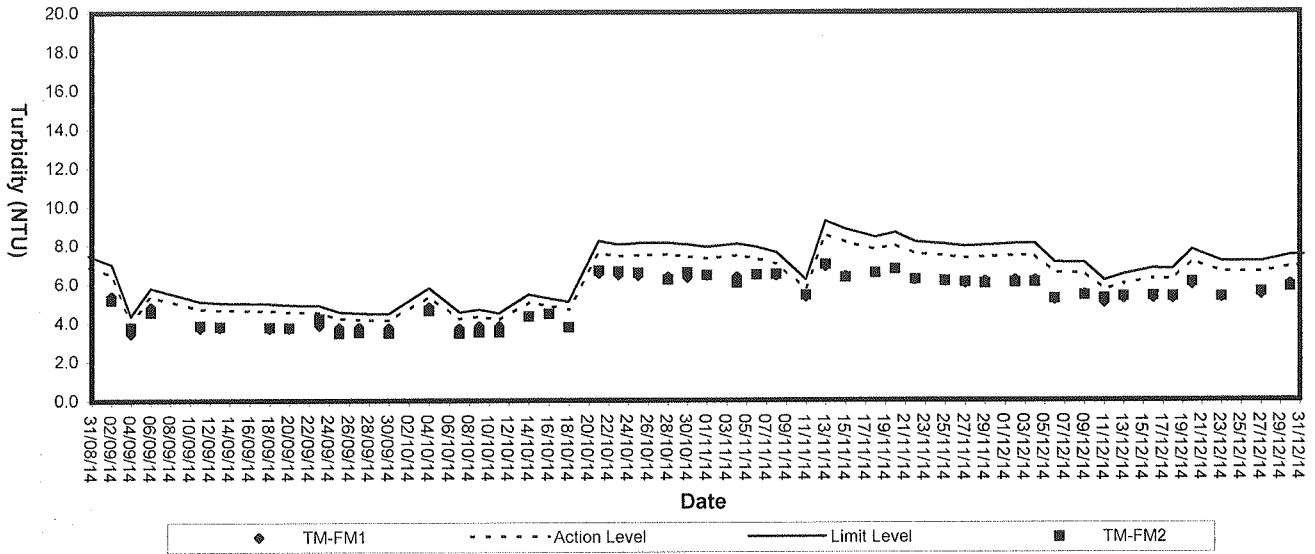


Dissolved Oxygen (Bottom) at Mid-Ebb Tide

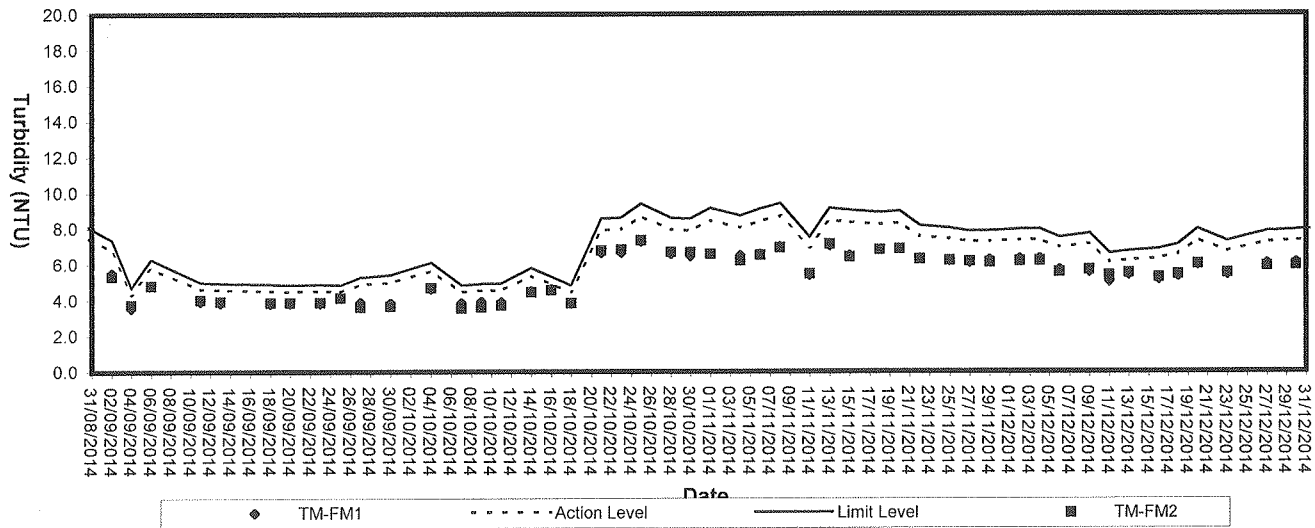




Turbidity (Depth-average) at Mid-Flood Tide

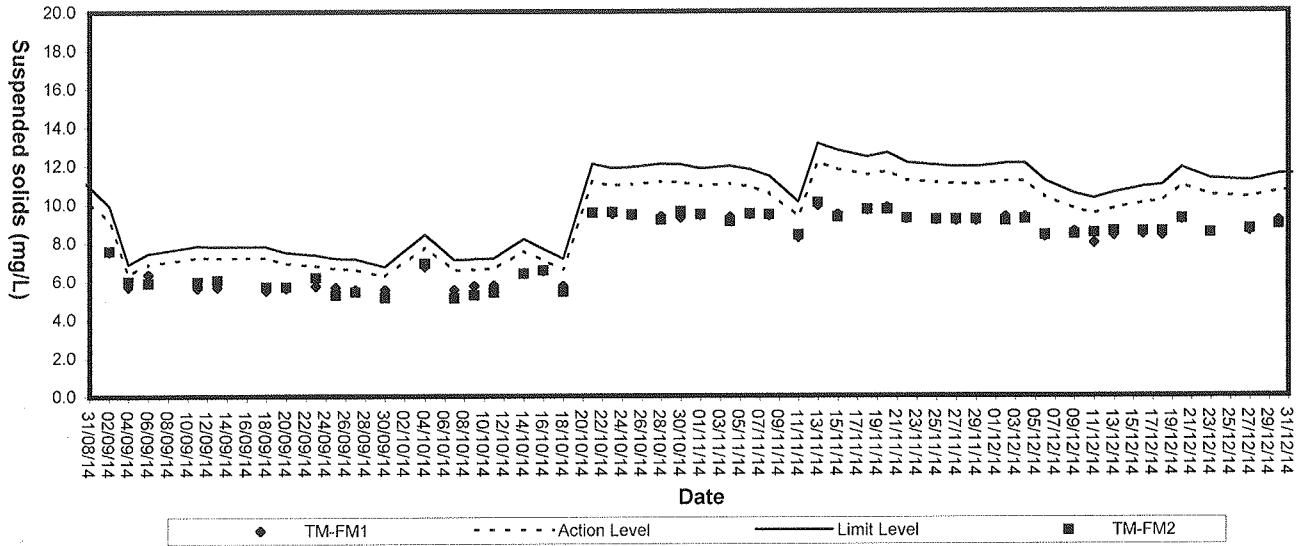


Turbidity (Depth-average) at Mid-Ebb Tide

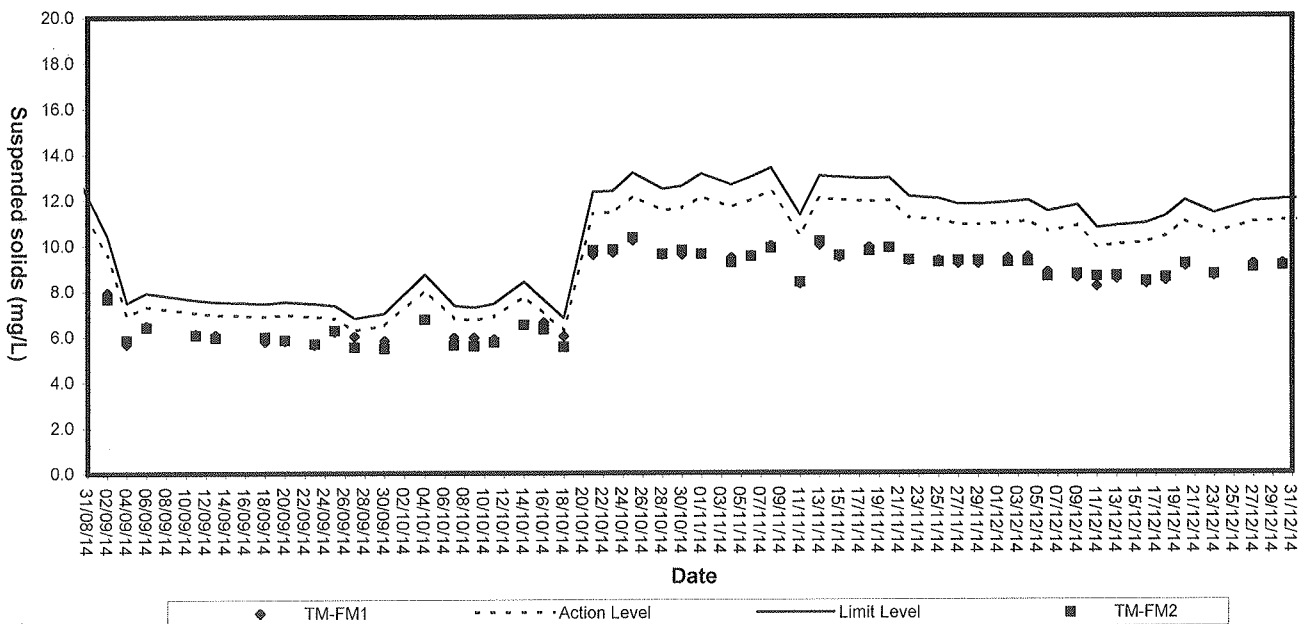




Suspended solids (Depth-average) at Mid-Flood Tide



Suspended Solids (Depth-average) at Mid-Ebb Tide





Appendix E

Environmental Quality Performance (Action / Limit Levels)

Action and Limit Levels for 1-hour TSP and 24-hour TSP Monitoring

Monitoring Location	24-hr TSP ($\mu\text{g}/\text{m}^3$)		1-hr TSP ($\mu\text{g}/\text{m}^3$)	
	Action Level	Limit Level	Action Level	Limit Level
TM-A1	192	260	344	500
TM-A2	192	260	344	500

Action and Limit Levels for Marine Water Quality Monitoring

Parameter	Action Level	Limit Level
DO (mg/L)	<u>Surface & Middle</u> <4.78 mg/L (5%-ile of baseline data) <u>Bottom</u> <4.16 mg/L (5%-ile of baseline data)	<u>Surface & Middle</u> <4.00 mg/L (1%-ile of baseline data) <u>Bottom</u> <2.00 mg/L
SS (mg/L) (Depth-averaged)	>120% of the upstream control station's SS at the same tide on the same day	>130% of the upstream control station's SS at the same tide on the same day
Turbidity (NTU) (Depth-averaged)	>120% of the upstream control station's turbidity at the same tide on the same day	>130% of the upstream control station's turbidity at the same tide on the same day

Action and Limit Levels for Noise Monitoring

Time Period	Action *	Limit *
0700-1900 hrs on normal weekdays	When one documented complaint is received	65 dB(A)



Appendix F

Event-Action Plans

EVENT/ACTION PLAN FOR AIR QUALITY EXCEEDANCE

EVENT	ACTION			ER	Contractor
	ET Leader	IC(E)	ACTION LEVEL		
1. Exceedance for one sample	<ol style="list-style-type: none"> 1. Identify source, investigate the causes of exceedance and propose remedial measures 2. Inform ER, IC(E) and Contractor 3. Repeat measurement to confirm finding 4. Increase monitoring frequency to daily 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by the ET 2. Check contractor's working method 	<ol style="list-style-type: none"> 1. Notify Contractor 	<ol style="list-style-type: none"> 1. Rectify any unacceptable practise 2. Amend working methods if appropriate 	
2. Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> 1. Identify source, investigate the causes of exceedance and propose remedial measures 2. Inform IC(E) and Contractor 3. Repeat measurements to confirm finding 4. Increase monitoring frequency to daily 5. Discuss with IC(E) and Contractor on remedial actions 6. If exceedance continues, arrange meeting with IC(E) and ER. 7. If exceedance stops, cease additional monitoring 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by the ET 2. Check the 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 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing 2. Notify the Contractor 3. Ensure remedial measures properly implemented 	<ol style="list-style-type: none"> 1. Submit proposals for remedial actions to IC(E) within 3 working days of notification 2. Implement the agreed proposals 3. Amend proposal if appropriate 	
1. Exceedance for one sample	<ol style="list-style-type: none"> 1. Identify source, investigate the causes of exceedance and propose remedial measures 2. Inform ER, Contractor and EPD 3. Repeat measurement to confirm finding 4. Increase monitoring frequency to daily 5. Assess the effectiveness of Contractor's remedial actions and keep IC(E), EPD and ER informed of the results 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by the 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 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing 2. Notify the Contractor 3. Ensure remedial measures properly implemented 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance 2. Submit proposals for remedial actions to IC(E) within 3 working days of notification 3. Implement the agreed proposals 4. Amend proposal if appropriate. 	

EVENT/ACTION PLAN FOR AIR QUALITY EXCEEDANCE

EVENT	ACTION			Contractor
	ET Leader	IC(E)	ER	
<p>2. Exceedance for two or more consecutive samples</p>	<ol style="list-style-type: none"> 1. Identify source, investigate the causes of exceedance and propose remedial measures 2. Notify IC(E), ER, EPD and Contractor 3. Repeat measurement to confirm finding 4. Increase monitoring frequency to daily 5. Carry out analysis of contractor's working procedures to determine possible mitigation to be implemented 6. Arrange meeting with IC(E) and ER to discuss the remedial actions to be taken 7. Assess effectiveness of Contractor's remedial actions and keep IC(E), EPD and ER informed of the results 8. If exceedance stops, cease additional monitoring 	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing 2. Notify Contractor 3. In consultation with the IC(E), agree with the Contractor on the remedial measures to be implemented 4. Ensure remedial 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 abated 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedances 2. Submit proposals for remedial actions to IC(E) within 3 working days of notification 3. Implement the agreed proposals 4. Resubmit proposals if problem still not under control 5. Stop the relevant activity of works as determined by the ER until the exceedance is abated

EVENT/ACTION PLAN FOR NOISE EXCEEDANCE

EVENT	ACTION			
	ET Leader	IC(E)	ER	Contractor
Action Level	<ol style="list-style-type: none"> 1. Notify the IC(E) and the Contractor. Carry out investigation. 2. Report the results of investigation to the IC(E) and the Contractor. 3. Discuss with the Contractor and formulate remedial measures. 4. Increase monitoring frequency to check mitigation effectiveness 	<ol style="list-style-type: none"> 1. Review the analysed 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. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing. 2. Notify the Contractor. 3. Require the Contractor to propose remedial measures for the analysed noise problem. 4. Ensure remedial measures are properly implemented. 	<ol style="list-style-type: none"> 1. Submit noise mitigation proposals to IC(E). 2. Implement noise mitigation proposals.
Limit Level	<ol style="list-style-type: none"> 1. Notify the IC(E), the ER, the EPD and the 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 the IC(E), the ER and the EPD the causes & actions taken for the exceedances. 7. Assess effectiveness of Contractor's remedial actions and keep the IC(E), the EPD and the ER informed of the results 8. If exceedance due to the construction works stops, cease additional monitoring 	<ol style="list-style-type: none"> 1. Discuss amongst the ER, the ET Leader and the Contractor on the potential remedial actions. 2. Review the Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly. 3. Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing. 2. Notify the Contractor. 3. Require the Contractor to propose remedial measures for the analysed noise problem. 4. Ensure remedial measures are properly implemented. 5. If exceedances continue, consider what activity of the work is responsible and instruct the Contractor to stop that activity of work until the exceedances is abated. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance 2. Submit proposals for remedial actions to IC(E) within 3 working days of notification. 3. Implement the agreed proposals. 4. Resubmit proposals if problem still not under control. 5. Stop the relevant activity of works as determined by the ER until the exceedances is abated.

EVENT AND ACTION PLAN FOR WATER QUALITY EXCEEDANCE

Event	ACTION			IEC
	ET Leader	Contractor	ER	
<p>Action level being exceeded by one sampling day</p>	<ol style="list-style-type: none"> 1. Identify source(s) of impact; 2. Repeat in-situ measurement to confirm findings; 3. Notify Contractor in writing within 24 hours of identification of the exceedance 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Carry out investigation 6. Report the results of investigation to the Contractor within 3 working days of identification of exceedance and advise contractor if exceedance is due to contractor's construction works 7. Discuss mitigation measures with Contractor if exceedance is due to the construction works within 4 working days 8. Repeat measurement on next day of exceedance if exceedance is due to the construction works 	<ol style="list-style-type: none"> 1. Notify the ER and IEC in writing within 24 hours of identification of exceedance 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Submit investigation report to IEC and ER within 3 working days of the identification of an exceedance 5. Consider changes of working method if exceedance is due to the construction works 6. Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER if exceedance is due to the construction works within 4 working days of identification of an exceedance 7. Implement the agreed mitigation measures within reasonable time scale 	<ol style="list-style-type: none"> 1. Notify EPD and other relevant governmental agencies in writing within 24 hours of the identification of the exceedance 2. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 3. Require contractor to propose remedial measures for the analysed problem if related to the construction works 4. Ensure remedial measures are properly implemented 5. Assess the effectiveness of the mitigation measure 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET 2. Confirm ET assessment if exceedance is due / not due to the works 3. Discuss with ET, ER and Contractor on the mitigation measures 4. Review contractor's mitigation measures whenever necessary to ensure their effectiveness and advise the ER accordingly 5. Supervise the implementation of mitigation measures

EVENT AND ACTION PLAN FOR WATER QUALITY

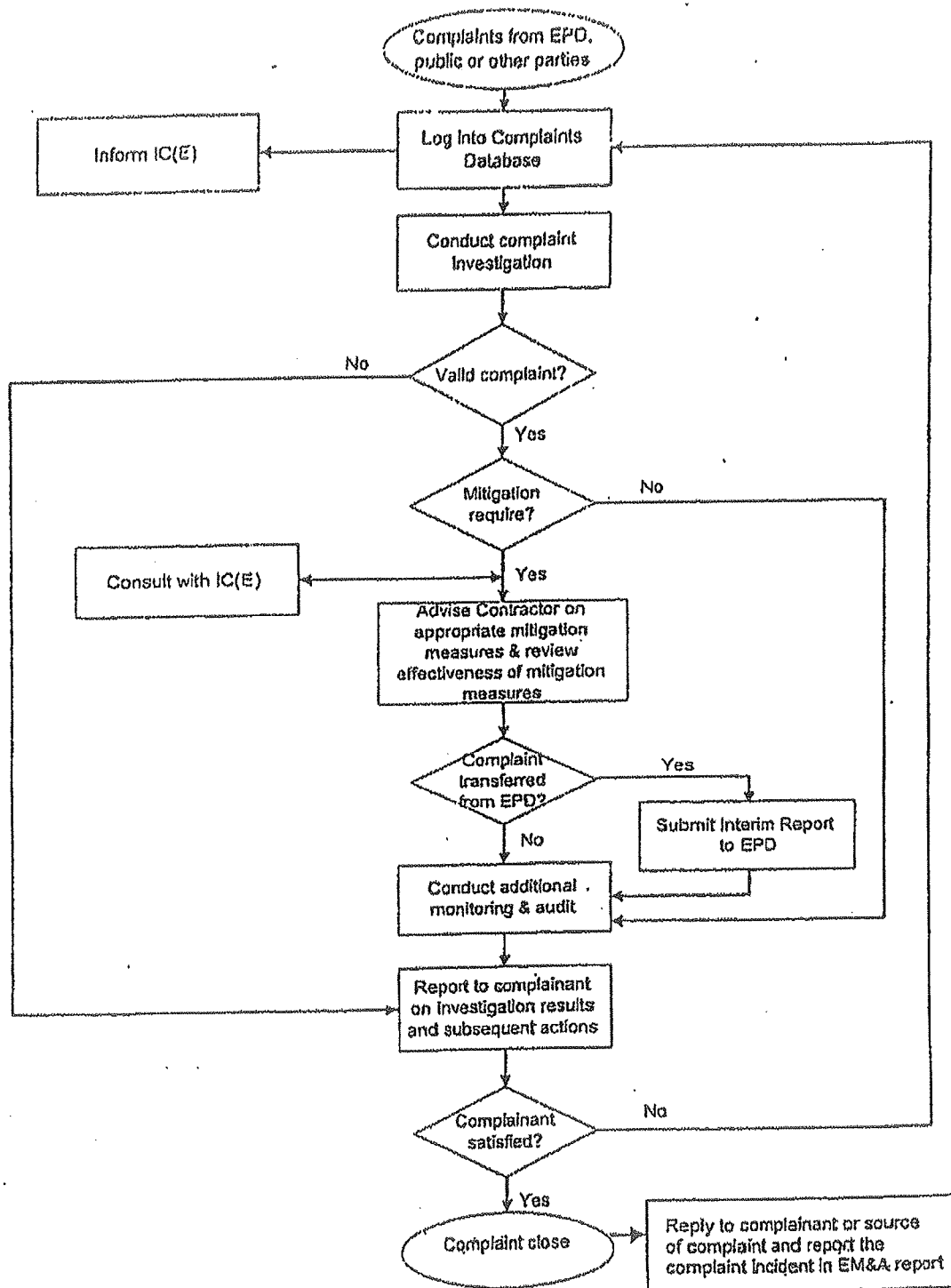
Event	ACTION			
	ET Leader	Contractor	ER	IEC
<p>Action level being exceeded by more than one consecutive sampling days</p>	<ol style="list-style-type: none"> 1. Identify source(s) of impact; 2. Repeat in-situ measurements to confirm findings 3. Notify Contractor in writing within 24 hours of identification 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Carry out investigation 6. Report the results of investigation to the Contractor within 3 working days of identification of exceedance and advise contractor if exceedance is due to contractor's construction works 7. Discuss mitigation measures with IEC and Contractor within 4 working of identification of an exceedance 8. Ensure mitigation measures are implemented; 9. Prepare to increase the monitoring frequency to daily; 10. Repeat measurement on next day of exceedance. 	<ol style="list-style-type: none"> 1. Notify IEC and ER in writing within 24 hours of identification of exceedance 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Submit the results of the investigation to IEC and ER within 3 working days of identification of an exceedance 6. Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER within 4 working days of identification of an exceedance 7. Implement the agreed mitigation measures within reasonable time scale 	<ol style="list-style-type: none"> 1. Notify EPD and other relevant governmental agencies in writing within 24 hours of the identification of the exceedance 2. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 3. Require contractor to propose remedial measures for the analysed problem if related to the construction works 4. Ensure remedial measures are properly implemented 5. Assess the effectiveness of the mitigation measure 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET 2. Confirm ET assessment if exceedance is due / not due to the works 3. Discuss with ET, ER and Contractor on the mitigation measures. 4. Review contractor's mitigation measures whenever necessary to ensure their effectiveness and advise the ER accordingly 5. Assess the effectiveness of the implemented mitigation measures.

EVENT AND ACTION PLAN FOR WATER QUALITY EXCEEDANCE

Event	ACTION			IEC
	ET Leader	Contractor	ER	
Limit level being exceeded by one sampling day	<ol style="list-style-type: none"> 1. Repeat in-situ measurement to confirm findings; 2. Identify source(s) of impact; 3. Notify Contractor in writing within 24 hours of identification of the exceedance 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Carry out investigation 6. Report the results of investigation to the Contractor within 3 working days of identification of exceedance and advise contractor if exceedance is due to contractor's construction works 7. Discuss mitigation measures with IEC, ER and Contractor within 4 working of identification of an exceedance 8. Ensure mitigation measures are implemented; 9. Increase the monitoring frequency to daily until no exceedance of Limit Level. 	<ol style="list-style-type: none"> 1. Notify IEC and ER in writing; within 24 hours of the identification of the exceedance 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Submit the results of the investigation to IEC and ER within 3 working days of the identification of an exceedance 6. Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER within 4 working days of the identification of an exceedance 7. Implement the agreed mitigation measures within reasonable time scale 	<ol style="list-style-type: none"> 1. Notify EPD and other relevant governmental agencies in writing within 24 hours of identification of exceedance 2. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 3. Request Contractor to critically review the working methods; 4. Ensure remedial measures are properly implemented 5. Assess the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET 2. Confirm ET assessment if exceedance is due / not due to the works 3. Discuss with ET, ER and Contractor on the mitigation proposals. 4. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly. 5. Assess the effectiveness of the implemented mitigation measures

EVENT AND ACTION PLAN FOR WATER QUALITY EXCEEDANCE

Event	ACTION			
	ET Leader	Contractor	ER	IEC
<p>Limit Level being exceeded by more than one consecutive sampling days</p>	<ol style="list-style-type: none"> 1. Repeat in-situ measurement to confirm findings; 2. Identify source(s) of impact; 3. Notify Contractor in writing within 24 hours of identification of the exceedance 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Carry out investigation 6. Report the results of investigation to the Contractor within 3 working days of identification of exceedance and advise contractor if exceedance is due to contractor's construction works 7. Discuss mitigation measures with IEC, ER and Contractor; 8. Ensure mitigation measures are implemented; 9. Increase the monitoring frequency to daily until no exceedance of Limit Level for two consecutive days. 	<ol style="list-style-type: none"> 1. Notify ER and IEC in writing within 24 hours of the identification of the exceedance and Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 8. Submit the results of the investigation to IEC and ER within 3 working days of the identification of an exceedance 5. Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER within 4 working days; 6. Implement the agreed mitigation measures within reasonable time scale 7. As directed by the Engineer, to slow down or to stop all or part of the marine work or construction activities. 	<ol style="list-style-type: none"> 1. Notify EPD and other relevant governmental agencies in writing within 24 hours of identification of exceedance 2. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 3. Request Contractor to critically review the working methods; 6. Ensure remedial measures are properly 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. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET 2. Confirm ET assessment if exceedance is due / not due to the works 3. Discuss with ER, ET and Contractor on the mitigation measures. 4. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly. 5. Assess the effectiveness of the implemented mitigation measures.



Contract No. CV/2013/06
 Handling of Surplus Public Fill (2014-2016)

Figure 4
 Environmental Complaint Handling Procedure –
 Tuen Mun Area 38 Fill Bank



東業德勤測試顧問有限公司
 ETS-TESTCONSULT LIMITED



Appendix G

Work Programme

Master Programme of Contract No. CV/2013/06 - Handling of Surplus Public Fill

Site Location : Tuen Mun Area 38 Fill Bank

ID	Activity	Original Duration	Start	Finish
A1240	Take Over	0	23-Jan-14	
A1220	Operation	1100	23-Jan-14	26-Jan-17
A1250	Hand Over to CEDD	0		26-Jan-17
Stage B1 Surveillance System				
A1190	Submission	120	28-Nov-13	27-May-14
A1200	Approval by Engineer	30	28-Nov-13	27-Dec-13
A1210	Installation	7	28-Dec-13	03-Jan-14
A1230	Hand Over to Engineer	64	23-Jan-14	27-May-14
		0		27-May-14



Appendix H

Implementation Schedule of Environmental Mitigation Measures (EMIS)



Environmental Mitigation Implementation Schedule

	Location	Implementation Status		
		Implemented	Partially implemented	Not implemented
Environmental Protection Measures				
Air Quality				
▪ Dust control / mitigation measures shall be provided to prevent dust nuisance.	All areas	√		
▪ Water sprays shall be provided and used to dampen materials.	All areas	√		
▪ All stockpile of aggregate or spoil should be enclosed or covered and water applied in dry or windy condition.	All areas	√		
▪ Any vehicle with open load carrying area used for moving materials which has the potential to create dust shall have properly fitting side and tail boards. Material having the potential to create dust shall not be loaded to a level higher than the side and tail boards, and shall be covered by a clean tarpaulin.	All areas	√		
▪ Unpaved areas should be watered regularly to avoid dust generation.	Site Egress	√		
▪ The designated site main haul road shall be paved or regular watering.	All haul roads	√		
▪ The public road around the site entrance should be kept clean and free from dust.	All areas	√		
▪ Wheel washing facilities including high-pressure water jet shall be provided at the entrance of work site.	Site Egress	√		
▪ Every vehicle shall be washed to remove any dusty materials from its body and wheels before leaving the fill bank.	Site Egress	√		
▪ The temporary slope surfaces shall be covered with impermeable sheet or sprayed with water.	All areas	√		
▪ Vehicle and equipment should be switched off while not in use.	All areas	√		
▪ All plant and equipment should be well maintained e.g. without black smoke emission.	All areas	√		
▪ Open burning should be prohibited.	All areas	√		
Noise Impact				
▪ The approved method of working, equipment and sound-reducing measures (e.g. use of silenced type of equipment, etc.) shall be adapted.	All areas	√		
▪ Only well maintained plant should be operated on-site and plant should be serviced regularly during the site works.	All areas	√		
▪ Powered mechanical equipment (PME) should be covered or shielded by appropriate acoustic materials.	All areas	√		
▪ Air compressors and hand held breakers should have noise labels.	All areas	√		
▪ Machines and plants that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum.	All areas	√		
▪ Noisy equipment and mobile plant shall always be site away from NSRs.	All areas	√		

	Location	Implementation Status			
		Implemented	Partially implemented	Not implemented	Not Applicable
Water Quality					
<ul style="list-style-type: none"> ▪ The existing / realigned intercepting channels and the sand / silt removal facilities shall be used and maintained. ▪ Temporary intercepting drains should be used at the stockpiling area to divert polluted stormwater to the intercepting channels. Earth bunds and sand bay barriers shall be used to assist the diversion of polluted stormwater to the intercepting channels. ▪ The stormwater intercepting system shall be effective to collect of runoff and remove suspended solids before discharge. ▪ The material shall be properly covered to prevent washed away especially before rainstorm. ▪ Unnecessary water retained in receptacles and standing water should be avoided to prevent mosquito breeding. ▪ The temporary slope surfaces shall be covered with impermeable sheet or sprayed with water. ▪ Existing and newly constructed Catchpits, sand and silt removal facilities and intercepting channels shall be maintained, and the deposited silt and grit shall be removed weekly and on a need basis especially at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times. ▪ A wheel washing bay shall be provided at the site exit and wash-water shall have sand and silt settled out or removed before being discharged into storm drains. ▪ The section of construction road between wheel washing bay and the public road shall be paved with concrete, bituminous materials or hardcores to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains. ▪ Sewage from toilets shall be discharged in to a foul sewer, or chemical toilets shall be provided. ▪ The chemical toilets (if use) shall be provided by a licensed contractor, who will be responsible for disposal and maintenance of these facilities. ▪ Tipping halls enclosed with top and 3-side to prevent spillage of material into marine water. ▪ Adequate environmental control measures shall be provided to prevent / avoid dropping of fill material into the sea during the transfer. ▪ A waste collection vessel shall be deployed to remove floating debris. 	All areas	√			
	All areas	√			
	All areas	√			
	All areas	√			
	All areas	√			
	Temporary Slopes	√			
	All areas	√			
	Wheel Washing facility	√			
	Site Egress	√			
	Site Office	√			
	All areas	√			
	All areas	√			
	Along the seafront	√			
	Along the seafront	√			
Landscape and Visual					
<ul style="list-style-type: none"> • The maximum stockpiling height at the fill bank shall be limited to a maximum of +40mPD. • Surface of outer slopes of the Fill Bank shall preferably be hydroseeded. • Stockpile of public fill shall be removed in a sequence to allow the outer hydroseeded to be removed later than other portions as far as practicable. • Casuarina equisetifolia were planted as buffer tree along the northern perimeter of the Site. The height of Casuarina equisetifolia was maintained at least 3m above soil level. • Lighting shall be set to minimise night-time glare. 	All areas	√			
	Completed slopes	√			
	Completed slopes	√			
	Site boundary	√			
	All areas	√			
Waste Management					
Construction Waste Management					
<ul style="list-style-type: none"> • Relevant licence / permits for disposal of construction waste or excavated materials available for inspection. 	All areas	√			

Remark: √ = Implemented, ∇ = Partially Implemented X = Not Implemented N/A = Not Applicable

	Location	Implementation Status		
		Implemented	Partially implemented	Not implemented
Environmental Protection Measures				
<ul style="list-style-type: none"> Excavated material to be generated from construction works to be re-used on-site as far as practicable to reduce off-site disposal. Mud and debris should be removed from waterworks access roads and associated drainage systems. 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. Prior to disposal of C&D waste, recyclable materials should be salvaged for reuse (such as wood and metal) and inert waste utilised as public fill to minimise the quantity of waste to be disposed of to landfill. In order to monitor the disposal of C&D material and solid wastes at public filling areas and landfills, and to control fly-tipping, a trip-ticket system should be included as one of the contractual requirements. <ul style="list-style-type: none"> Any soil contaminated with chemicals/oils shall be removed from site and the void created shall be filled with suitable materials. 	All areas	√		
	All areas	√		
	All areas	√		
	All areas	√		
	All areas	√		
	All areas	√		
Chemical Waste Management				
<ul style="list-style-type: none"> It is required to register as a chemical waste producer if chemical wastes would be produced from the site activities. 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. <ul style="list-style-type: none"> After use, chemical wastes (e.g. cleaning fluids, solvents, lubrication oil and fuel) should be handled according to the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Spent chemicals should be stored and collected by an approved operator for disposal at the Chemical Waste Treatment Facility or other licensed facility in accordance with the Chemical Waste (General) Regulation. Chemical wastes should be separated for special handling and appropriate treatment at the Chemical Waste Treatment Facility. Chemical wastes including waste oil should be stored properly in designated areas, e.g. chemical waste storage area. The designated chemical waste storage area should only be used for storing chemical wastes. 	Waste Storage Area	√		
	Waste Storage Area	√		
	Waste Storage Area	√		
	Waste Storage Area	√		
	Waste Storage Area	√		
	Waste Storage Area	√		
	Waste Storage Area	√		
	Waste Storage Area	√		
The set-up of chemical waste storage area should				
<ul style="list-style-type: none"> Be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition. Be enclosed on at least 3 sides and securely closed. Have an impermeable floor and bunding, of capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in that area, whichever is the greatest. Have adequate ventilation. Be covered to prevent rainfall entering (water collected within the bund must be tested and disposal as chemical waste if necessary). Be arranged so that incompatible materials are adequately separated. Warning panels should be displayed at the waste storage area. 	Waste Storage Area	√		
	Waste Storage Area	√		
	Waste Storage Area	√		
	Waste Storage Area	√		
	Waste Storage Area	√		
	Waste Storage Area	√		
	Waste Storage Area	√		
	Waste Storage Area	√		

Remark: √ = Implemented, ∇ = Partially Implemented, X = Not Implemented, N/A = Not Applicable

	Location	Implementation Status			
		Implemented	Partially implemented	Not implemented	Not Applicable
Environmental Protection Measures					
• Waste storage area should be cleaned and maintained regularly.	Waste Storage Area	√			
• Chemical waste should be transported by a registered chemical waste collector to a facility licensed to receive chemical waste.	All areas	√			
• All generators, fuel and oil storage should be within bundle areas.	All areas	√			
• Oil leakage from machinery, vehicle and plant should be prevented.	All areas		√		
• In the event of chemical waste / dangerous goods / chemicals spillage or leakage, the procedures as outlined in the Spillage Response Plan should be followed.	All areas	√			
• The dangerous goods / chemical spillage or leakage procedures (including equipments) should be in place.	All areas	√			
Good Site Practices					
2.2 Nomination of approved personnel, such as site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site.	All areas	√			
2.3 Training of site personnel in proper waste management and chemical handling procedures should be provided.	All areas	√			
2.4 Good site practices should be adopted to clean the rubbish and litter on a regular basis so as to prevent the rubbish and litter from dropping into the nearby environment.	All areas	√			
2.5 Proper storage and site practices to minimise the potential for damage or contamination of construction materials.	All areas	√			
2.6 The Environmental Permit should be displaced conspicuously on site.	Site Entrance	√			
2.7 Construction noise permits should be posted at site entrance or available for site inspection.	Site Entrance				√
2.8 Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.	All areas	√			
2.9 Chemical storage area provided with lock and located on sealed areas.	Chemical Storage Area	√			
2.10 All chemicals should be placed at the banded area with adequate band capacity (>110% of largest tank).	Chemical Storage Area	√			
2.11 Any unused chemicals or those with remaining functional capacity should be recycled.	All areas	√			
2.12 Regular cleaning and maintenance programme for waste storage area, drainage systems, silt traps, sumps and oil interceptors.	All areas	√			
• To encourage collection of aluminium cans by individual collectors, separate labelled bins should be provided to segregate this waste from other general refuse generated by the workforce.	All areas	√			
• A recording system for the amount of wastes generated, recycled and disposed (including the disposal sites) should be used, e.g. trip ticket system for chemical waste disposal. Quantities could be determined by weighing each load or other suitable methods.	All areas	√			
• A collection area should be provided where waste can be stored and loaded prior to removal from site. An enclosed and covered area is preferred to reduce the occurrence of 'wind blown' light material. If an open area is unavoidable for the storage or loading/unloading of wastes, then the area should be banded and all the polluted surface run-off collected within this area should be diverted into wastewater treatment system.	All areas	√			
• Remove wastes in a timely manner.	All areas		√		



Appendix I

Statistical Analysis of the Trend of Suspended Solids in the Quarter

Statistical Analysis of the Trend of Suspended Solids

For Mid-Flood Tide

Station: TM-FM1

t-test

Group Name	N	Missing	Mean	Std Dev	SE
130% Baseline Mean	12	0	5.9733	1.3518	0.3902
Quarterly Mean	37	0	8.4910	1.2950	0.2129

Result:

Probability that two variances are equal (f-test) = 0.60348

Difference between means = 2.5177 (Std Dev = 1.8878 and SE = 0.4445)
(95% CI : 1.6464 < Diff < 3.389)

t-value of difference = 5.664 (17.5 degrees of freedom)
P = 0.99999 (>0.05)

Conclusion:

There is no statistically significant difference between the groups.

Station: TM-FM2

t-test

Group Name	N	Missing	Mean	Std Dev	SE
130% Baseline Mean	12	0	6.0267	1.1748	0.3391
Quarterly Mean	37	0	8.4838	1.3850	0.2277

Result:

Probability that two variances are equal (f-test) = 0.28755

Difference between means = 2.4571 (Std Dev = 1.9072 and SE = 0.4085)
(95% CI : 1.6565 < Diff < 3.257)

t-value of difference = 6.015 (21.3 degrees of freedom)
P = 1 (>0.05)

Conclusion:

There is no statistically significant difference between the groups.



Statistical Analysis of the Trend of Suspended Solids

For Mid-Flood Tide

Station: TM-FC1

t-test

Group Name	N	Missing	Mean	Std Dev	SE
130% Baseline Mean	12	0	6.6942	1.8839	0.5438
Quarterly Mean	37	0	8.5823	1.3823	0.2272

Result:

Probability that two variances are equal (f-test) = 0.92015

Difference between means = 1.8881 (Std Dev = 2.2855 and SE = 0.5894)
(95% CI : 0.7329 < Diff < 3.0433)

t-value of difference = 3.203 (14.5 degrees of freedom)
P = 0.99701 (>0.05)

Conclusion:

There is no statistically significant difference between the groups.

Station: TM-FC2

t-test

Group Name	N	Missing	Mean	Std Dev	SE
130% Baseline Mean	12	0	6.3067	1.8674	0.5391
Quarterly Mean	37	0	8.3838	1.3298	0.2186

Result:

Probability that two variances are equal (f-test) = 0.93818

Difference between means = 2.0771 (Std Dev = 2.2374 and SE = 0.5817)
(95% CI : 0.937 < Diff < 3.2172)

t-value of difference = 3.571 (14.3 degrees of freedom)
P = 0.99814 (>0.05)

Conclusion:

There is no statistically significant difference between the groups.



Statistical Analysis of the Trend of Suspended Solids

For Mid-Ebb Tide

Station: TM-FM1

t-test

Group Name	N	Missing	Mean	Std Dev	SE
130% Baseline Mean	12	0	7.0008	1.6394	0.4733
Quarterly Mean	37	0	8.6707	1.3069	0.2149

Result:

Probability that two variances are equal (f-test) = 0.85108

Difference between means = 1.6099 (Std Dev = 2.0657 and SE = 0.5197)
(95% CI : 0.6512 < Diff < 2.6886)

t-value of difference = 3.213 (15.3 degrees of freedom)
P = 0.9974 (>0.05)

Conclusion:

There is no statistically significant difference between the groups.

Station: TM-FM2

t-test

Group Name	N	Missing	Mean	Std Dev	SE
130% Baseline Mean	12	0	7.2758	1.5293	0.4415
Quarterly Mean	37	0	8.6541	1.4012	0.2304

Result:

Probability that two variances are equal (f-test) = 0.67259

Difference between means = 1.3783 (Std Dev = 2.0778 and SE = 0.498)
(95% CI : 0.4023 < Diff < 2.3543)

t-value of difference = 2.768 (16.9 degrees of freedom)
P = 0.99426 (>0.05)

Conclusion:

There is no statistically significant difference between the groups.

Statistical Analysis of the Trend of Suspended Solids

For Mid-Ebb Tide

Station: TM-FC1

t-test

Group Name	N	Missing	Mean	Std Dev	SE
130% Baseline Mean	12	0	7.6392	1.5074	0.4351
Quarterly Mean	37	0	8.7054	1.4232	0.234

Result:

Probability that two variances are equal (f-test) = 0.62642

Difference between means = 1.0662 (Std Dev = 2.8859 and SE = 0.4941)
(95% CI : 0.0979 < Diff < 2.0345)

t-value of difference = 2.158 (17.3 degrees of freedom)
P = 0.97812 (>0.05)

Conclusion:

There is no statistically significant difference between the groups.

Station: TM-FC2

t-test

Group Name	N	Missing	Mean	Std Dev	SE
130% Baseline Mean	12	0	6.6950	1.9561	0.5647
Quarterly Mean	37	0	8.4712	1.3679	0.2249

Result:

Probability that two variances are equal (f-test) = 0.9475

Difference between means = 1.7762 (Std Dev = 2.3267 and SE = 0.6078)
(95% CI : 0.5849 < Diff < 2.9675)

t-value of difference = 2.922 (14.2 degrees of freedom)
P = 0.99366 (>0.05)

Conclusion:

There is no statistically significant difference between the groups.



Appendix J
Site General Layout plan

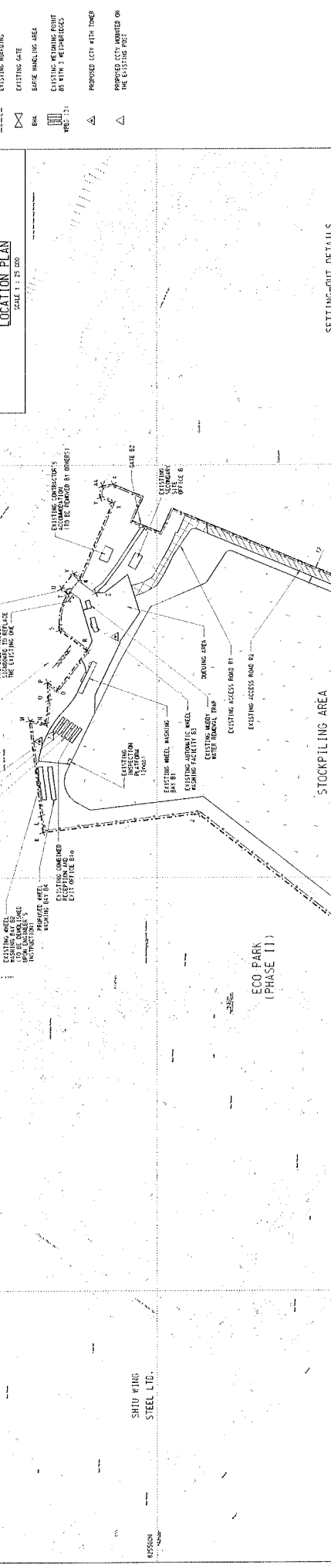
- NOTES:
1. ALL DIMENSIONS REFER TO HORIZONTAL DISTANCE UNLESS OTHERWISE INDICATED.
 2. ALL DIMENSIONS ARE TO BE MEASURED TO THE CENTERLINE OF THE ROAD OR THE CENTERLINE OF THE RIVER UNLESS OTHERWISE INDICATED.
 3. ALL DIMENSIONS ARE IN METERS.

LEGEND

- SITE BOUNDARY
- EXISTING IMPOUNDING
- EXISTING LAKE
- EXISTING REMAINS POINT BY WATER PIERCEMENTS
- PROPOSED CITY WITH TOWER
- PROPOSED CITY WATER ON THE EXISTING POST

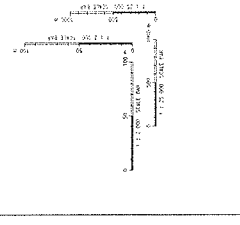


LOCATION PLAN OF THE SITE
SCALE 1:25,000



SETTING-OUT DETAILS

POINT	EASTING	NORTHING
A	81167.467	82551.755
B	81167.786	82552.493
C	81168.706	82553.493
D	81168.970	82557.237
E	81181.754	82490.256
F	81181.435	82491.053
G	81182.125	82494.527
H	81076.413	82520.022
I	81076.474	82544.511
J	81087.522	82545.080
K	81087.328	82542.442
L	81087.328	82542.442
M	81110.030	82565.555
N	81111.570	82503.111
O	81125.520	82487.914
P	81127.232	82484.194
Q	81128.628	82511.481
R	81129.484	82511.481
S	81128.027	82514.591
T	81130.327	82514.591
U	81130.327	82514.591
V	81130.328	82508.518
W	81131.167	82508.622
X	81148.435	82551.956
Y	81148.487	82566.172
Z	81148.487	82571.424
AA	81148.915	82564.665
AB	81150.286	82572.275
AC	81150.286	82572.275
AD	81150.656	82487.946



PROJECT NO. FM10068-16
DATE: 20.5.2015

OFFICE: CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

CEDD CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

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Appendix K

Weather Condition

Extract of Meteorological Observations for Tuen Mun Automatic Weather Station, October 2014

Date	Mean Pressure at M.S.L. (hPa)	Air Temperature			Mean Dew Point Temperature (deg C)	Relative Humidity		
		Max. (deg C)	Mean (deg C)	Min. (deg C)		Max. (%)	Mean (%)	Min. (%)
Oct 1	*****	32.0	28.3	25.9	24.2	89	79	63
Oct 2	*****	32.5	28.7	25.8	25.0	92	81	62
Oct 3	*****	32.9	28.2	24.8	24.6	95	82	55
Oct 4	*****	29.3	26.6	25.0	23.8	94	85	69
Oct 5	*****	32.2	27.1	24.3	20.5	91	69	39
Oct 6	*****	30.5	26.3	22.4	17.7	84	61	39
Oct 7	*****	30.5	26.0	22.9	17.6	80	61	41
Oct 8	*****	30.0	25.8	22.6	17.6	81	62	39
Oct 9	*****	30.9	26.5	22.9	18.1	80	61	40
Oct 10	*****	30.2	26.1	22.8	17.8	77	61	48
Oct 11	*****	32.4	27.7	24.3	18.8	77	59	44
Oct 12	*****	31.6	27.4	24.8	17.6	80	56	40
Oct 13	*****	29.9	25.8	23.1	15.6	70	54	42
Oct 14	*****	29.7	25.6	23.0	15.9	75	56	43
Oct 15	*****	29.2	25.0	21.7	17.2	79	62	47
Oct 16	*****	28.3	25.0	22.9	18.4	82	67	52
Oct 17	*****	29.5	25.0	21.7	18.0	80	66	45
Oct 18	*****	29.5	25.5	21.4	18.9	84	68	42
Oct 19	*****	30.9	26.1	23.6	20.2	82	71	49
Oct 20	*****	30.1	26.3	23.7	21.5	86	75	58
Oct 21	*****	31.9	27.0	23.2	21.4	84	72	51
Oct 22	*****	30.7	27.7	24.2	20.0	87	64	48
Oct 23	*****	26.9	24.0	21.9	20.6	96	82	67
Oct 24	*****	26.6	24.5	22.9	20.5	87	79	67
Oct 25	*****	28.6	25.1	22.8	20.5	90	76	62
Oct 26	*****	29.7	26.1	23.8	21.2	85	75	58
Oct 27	*****	31.9	26.8	24.0	20.9	89	71	42
Oct 28	*****	29.7	25.8	23.8	18.2	75	63	47
Oct 29	*****	28.7	25.7	23.8	19.8	80	70	58
Oct 30	*****	29.7	25.9	23.8	20.7	83	73	58
Oct 31	*****	30.5	25.8	23.4	21.5	88	78	59
Mean	*****	30.2	26.2	23.5	19.8	84	69	51
Maximum	*****	32.9	28.7	25.9	25.0	96	85	69
Minimum	*****	26.6	24.0	21.4	15.6	70	54	39

Extract of Meteorological Observations for Tuen Mun Automatic Weather Station, October 2014

Date	Total Rainfall (mm)	Prevailing Wind Direction (degrees)	Mean Wind Speed (km/h)
Oct 1	1.5	***	*****
Oct 2	0.0	***	*****
Oct 3	0.0	***	*****
Oct 4	2.0	***	*****
Oct 5	0.0	***	*****
Oct 6	0.0	***	*****
Oct 7	0.0	***	*****
Oct 8	0.0	***	*****
Oct 9	0.0	***	*****
Oct 10	0.0	***	*****
Oct 11	0.0	***	*****
Oct 12	0.0	***	*****
Oct 13	0.0	***	*****
Oct 14	0.0	***	*****
Oct 15	0.0	***	*****
Oct 16	0.0	***	*****
Oct 17	0.0	***	*****
Oct 18	0.0	***	*****
Oct 19	0.0	***	*****
Oct 20	0.0	***	*****
Oct 21	0.0	***	*****
Oct 22	0.0	***	*****
Oct 23	6.0	***	*****
Oct 24	0.0	***	*****
Oct 25	0.0	***	*****
Oct 26	0.0	***	*****
Oct 27	0.0	***	*****
Oct 28	0.0	***	*****
Oct 29	0.0	***	*****
Oct 30	0.0	***	*****
Oct 31	0.0	***	*****
Mean	-----	***	*****
Total	9.5	---	-----
Maximum	6.0	---	*****
Minimum	0.0	---	*****

*** unavailable

missing (less than 24 hourly observations a day)

Rainfall measured in increment of 0.5 mm. Amount of < 0.5 m

Extract of Meteorological Observations for Tuen Mun Automatic Weather Station, November 2014

Date	Mean Pressure at M.S.L. (hPa)	Air Temperature			Mean Dew Point Temperature (deg C)	Relative Humidity		
		Max. (deg C)	Mean (deg C)	Min. (deg C)		Max. (%)	Mean (%)	Min. (%)
Nov 1	*****	30.6	25.9	22.4	21.8	92	79	56
Nov 2	*****	28.3	25.3	22.6	19.2	88	70	57
Nov 3	*****	22.7	21.2	20.3	13.2	71	60	54
Nov 4	*****	23.5	22.3	21.0	17.2	80	73	67
Nov 5	*****	26.1	24.0	22.6	19.4	80	75	65
Nov 6	*****	27.8	24.0	21.8	20.3	94	80	60
Nov 7	*****	25.8	22.4	20.1	20.5	97	89	73
Nov 8	*****	21.9	19.6	18.6	18.8	98	95	86
Nov 9	*****	24.4	21.5	18.7	18.0	92	81	71
Nov 10	*****	27.2	22.9	20.9	19.5	92	82	62
Nov 11	*****	27.0	23.4	21.6	19.9	90	81	63
Nov 12	*****	23.6	21.3	17.8	17.8	96	81	69
Nov 13	*****	21.7	18.8	16.8	14.5	95	76	64
Nov 14	*****	24.1	20.3#	18.2	15.0#	80	71#	61
Nov 15	*****	27.1	22.1	19.1	16.9	88	73	48
Nov 16	*****	28.0	22.6	19.1	16.9	93	72	48
Nov 17	*****	24.9	21.1	18.5	13.2	70	61	50
Nov 18	*****	24.6	20.6	17.8	12.6	66	60	51
Nov 19	*****	24.8	20.8	18.2	13.5	81	64	49
Nov 20	*****	26.4	21.9	18.9	16.1	85	71	49
Nov 21	*****	27.7	22.4	19.0	17.3	86	74	51
Nov 22	*****	27.0	22.4	18.7	18.0	90	77	58
Nov 23	*****	27.6	23.4	21.1	18.6	83	75	59
Nov 24	*****	28.8	23.9	20.6	19.0	90	75	56
Nov 25	*****	29.8	24.2	20.4	19.8	91	77	57
Nov 26	*****	26.4	23.3	21.4	19.4	92	79	66
Nov 27	*****	24.4	22.6	21.8	18.9	85	80	70
Nov 28	*****	27.4	24.0	22.2	20.6	88	82	67
Nov 29	*****	26.5	24.4	23.4	21.3	91	83	71
Nov 30	*****	28.2	25.2	23.6	22.7	94	86	74
Mean	*****	26.1	22.6#	20.2	18.0#	87	76#	61
Maximum	*****	30.6	25.9#	23.6	22.7#	98	95#	86
Minimum	*****	21.7	18.8#	16.8	12.6#	66	60#	48

Extract of Meteorological Observations for Tuen Mun Automatic Weather Station, November 2014

Date	Total Rainfall (mm)	Prevailing Wind Direction (degrees)	Mean Wind Speed (km/h)
Nov 1	0.0	***	*****
Nov 2	0.0	***	*****
Nov 3	0.0	***	*****
Nov 4	0.0	***	*****
Nov 5	0.0	***	*****
Nov 6	3.0	***	*****
Nov 7	6.5	***	*****
Nov 8	13.5	***	*****
Nov 9	0.5	***	*****
Nov 10	0.0	***	*****
Nov 11	0.0	***	*****
Nov 12	0.5	***	*****
Nov 13	1.0	***	*****
Nov 14	0.0#	***	*****
Nov 15	0.0	***	*****
Nov 16	0.0	***	*****
Nov 17	0.0	***	*****
Nov 18	0.0	***	*****
Nov 19	0.0	***	*****
Nov 20	0.0	***	*****
Nov 21	0.0	***	*****
Nov 22	0.0	***	*****
Nov 23	0.0	***	*****
Nov 24	0.0	***	*****
Nov 25	0.0	***	*****
Nov 26	0.0	***	*****
Nov 27	0.0	***	*****
Nov 28	0.0	***	*****
Nov 29	0.0	***	*****
Nov 30	0.0	***	*****
Mean	-----	***	*****
Total	25.0#	---	-----
Maximum	13.5#	---	*****
Minimum	0.0#	---	*****

*** unavailable

missing (less than 24 hourly observations a day)

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

Extract of Meteorological Observations for Tuen Mun Automatic Weather Station, December 2014

Date	Mean Pressure at M.S.L. (hPa)	Air Temperature			Mean Dew Point Temperature (deg C)	Relative Humidity		
		Max. (deg C)	Mean (deg C)	Min. (deg C)		Max. (%)	Mean (%)	Min. (%)
Dec 1	*****	23.8	18.2	14.2	15.3	96	83	66
Dec 2	*****	16.9	15.2	13.7	11.9	95	81	72
Dec 3	*****	19.4	17.5	15.1	15.6	98	89	81
Dec 4	*****	17.2	13.4	11.7	10.0	98	81	61
Dec 5	*****	17.1	14.2	11.6	5.7	78	57	45
Dec 6	*****	21.6	17.2	14.0	9.9	76	62	49
Dec 7	*****	18.5	16.8	15.6	11.6	83	71	63
Dec 8	*****	21.1	16.6	13.9	12.5	88	77	57
Dec 9	*****	23.9	19.7	15.9	13.6	84	69	50
Dec 10	*****	21.9	19.8	17.5	15.1	91	75	62
Dec 11	*****	21.0	19.0	16.6	10.4	66	58	50
Dec 12	*****	16.6	14.6	13.3	5.0	67	53	37
Dec 13	*****	19.4	13.8	10.2	0.9	56	42	33
Dec 14	*****	22.3	15.8	12.0	4.7	68	49	32
Dec 15	*****	20.1	17.7	15.1	10.5	76	63	51
Dec 16	*****	19.0	16.6	13.6	3.9	72	44	24
Dec 17	*****	16.4	13.2	10.4	-8.1	31	22	16
Dec 18	*****	15.3	12.8	10.6	-2.0	61	37	26
Dec 19	*****	13.4	11.5	10.2	9.0	97	85	52
Dec 20	*****	20.8	14.7	10.5	6.6	88	60	38
Dec 21	*****	20.7	16.3	13.3	6.4	84	54	35
Dec 22	*****	18.2	13.2	10.0	0.6	62	43	28
Dec 23	*****	15.3	14.1	13.5	7.3	77	64	42
Dec 24	*****	20.9	17.3	13.8	12.5	82	74	64
Dec 25	*****	18.9	16.7	15.0	13.7	98	83	54
Dec 26	*****	17.5	16.1	15.2	14.7	99	92	78
Dec 27	*****	16.5	15.8	14.2	13.8	97	88	81
Dec 28	*****	15.9	13.7	11.3	11.0	98	85	70
Dec 29	*****	19.7	13.2	9.3	5.5	81	62	30
Dec 30	*****	21.7	14.1	8.9	6.8	91	64	35
Dec 31	*****	23.2	15.1	9.7	7.7	88	64	27
Mean	*****	19.2	15.6	12.9	8.5	81	65	49
Maximum	*****	23.9	19.8	17.5	15.6	99	92	81
Minimum	*****	13.4	11.5	8.9	-8.1	31	22	16

Extract of Meteorological Observations for Tuen Mun Automatic Weather Station, December 2014

Date	Total Rainfall (mm)	Prevailing Wind Direction (degrees)	Mean Wind Speed (km/h)
Dec 1	9.0	***	*****
Dec 2	2.5	***	*****
Dec 3	2.5	***	*****
Dec 4	12.5	***	*****
Dec 5	0.5	***	*****
Dec 6	0.0	***	*****
Dec 7	0.0	***	*****
Dec 8	0.0	***	*****
Dec 9	0.0	***	*****
Dec 10	0.0	***	*****
Dec 11	0.0	***	*****
Dec 12	0.0	***	*****
Dec 13	0.0	***	*****
Dec 14	0.0	***	*****
Dec 15	0.0	***	*****
Dec 16	0.0	***	*****
Dec 17	0.0	***	*****
Dec 18	0.0	***	*****
Dec 19	10.0	***	*****
Dec 20	0.0	***	*****
Dec 21	0.0	***	*****
Dec 22	0.0	***	*****
Dec 23	0.0	***	*****
Dec 24	0.0	***	*****
Dec 25	5.5	***	*****
Dec 26	2.0	***	*****
Dec 27	1.0	***	*****
Dec 28	4.5	***	*****
Dec 29	0.0	***	*****
Dec 30	0.0	***	*****
Dec 31	0.0	***	*****
Mean	-----	***	*****
Total	50.0	---	-----
Maximum	12.5	---	*****
Minimum	0.0	---	*****

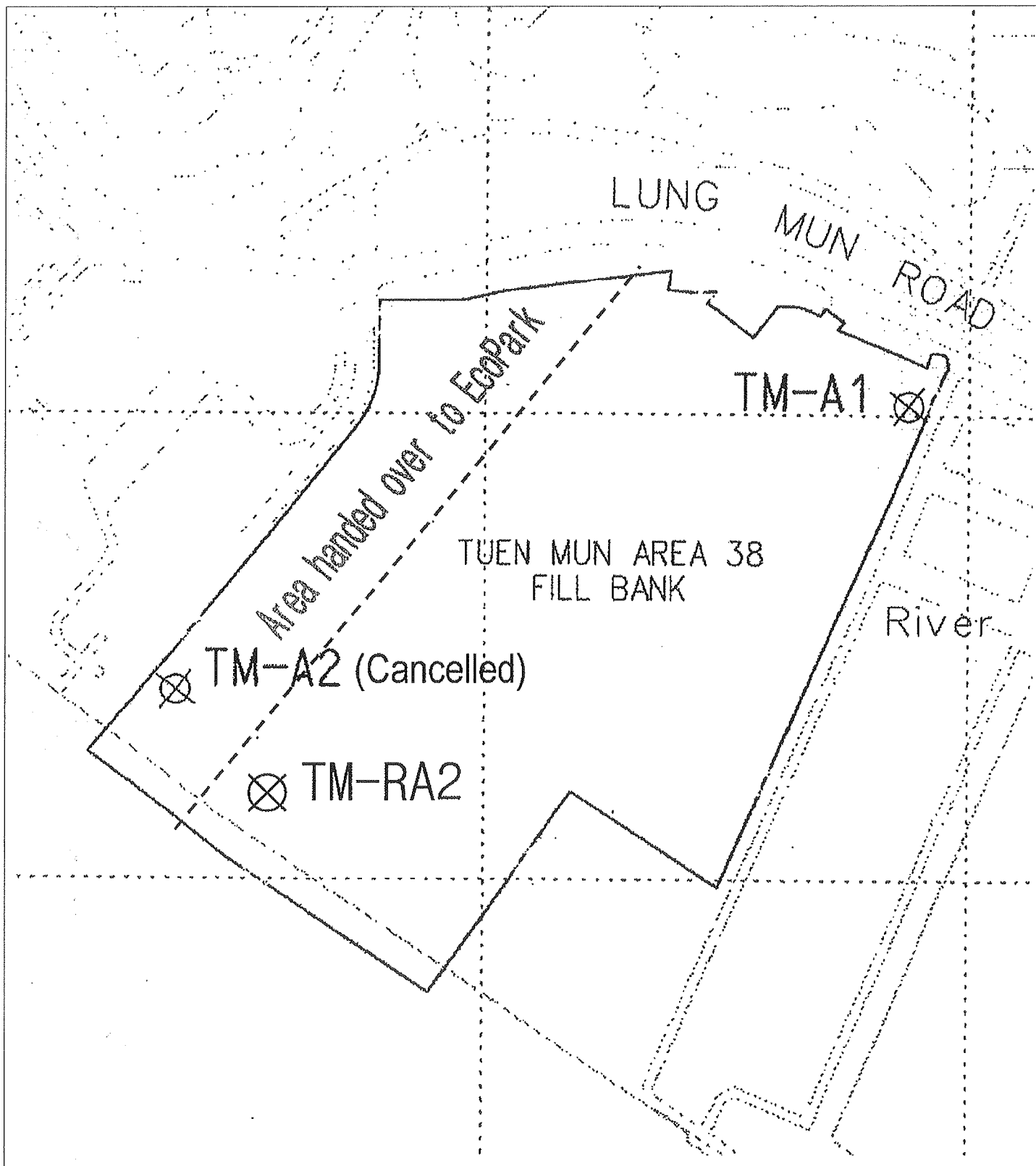
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missing (less than 24 hourly observations a day)

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



Figures

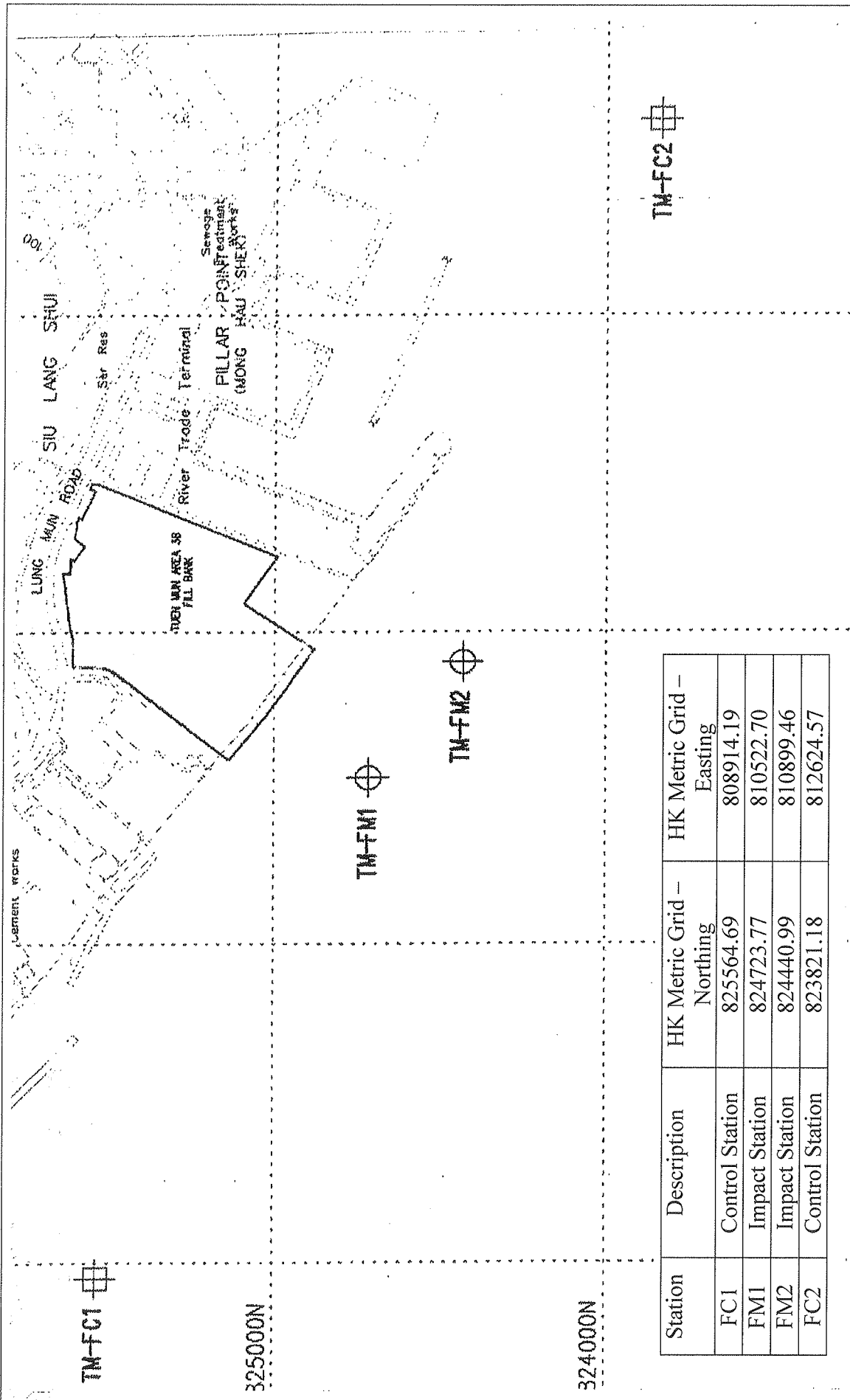


Contract No. CV/2013/06
 Handling of Surplus Public Fill (2014-2016)

Figure 1
 Locations of Air Quality Monitoring Stations –
 Tuen Mun Area 38 Fill Bank



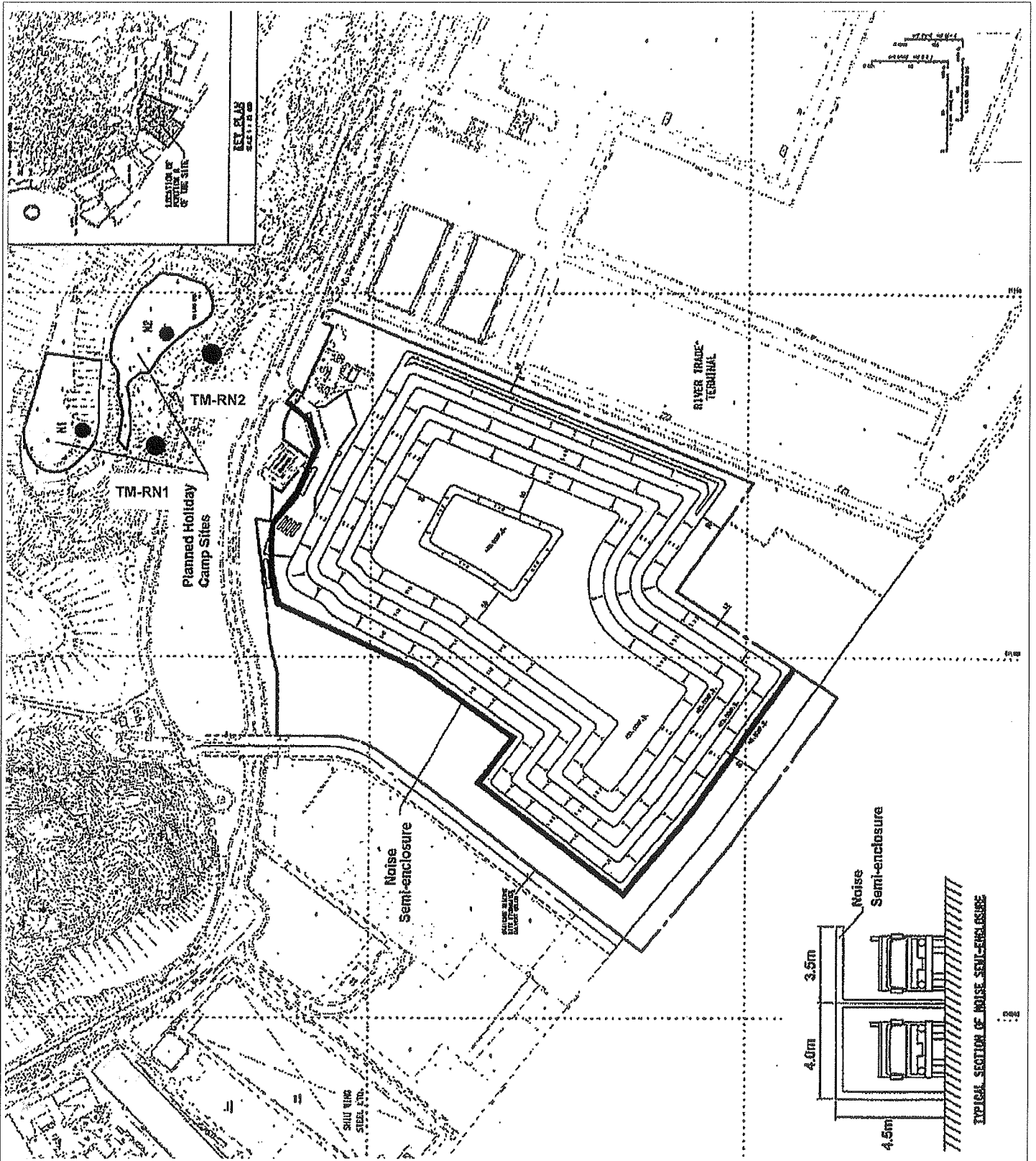
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Station	Description	HK Metric Grid – Northing	HK Metric Grid – Easting
FC1	Control Station	825564.69	808914.19
FM1	Impact Station	824723.77	810522.70
FM2	Impact Station	824440.99	810899.46
FC2	Control Station	823821.18	812624.57

Contract No. CV/2013/06
 Handling of Surplus Public Fill (2014-2016)

Figure 2
 Locations of Water Quality Monitoring Station –
 Tuen Mun Area 38 Fill Bank



Contract No. CV/2013/06
 Handling of Surplus Public Fill (2014-2016)

Figure 3
 Locations of Noise Quality Monitoring Stations –
 Tuen Mun Area 38 Fill Bank



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