

**Contract No. HY/2012/08
Tuen Mun – Chek Lap Kok Link –
Northern Connection Sub-sea Tunnel
Section**

***Final Environmental Monitoring & Audit (EM&A)
Report***

23 March 2022

Environmental Resources Management

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Final Environmental Monitoring & Audit (EM&A) Report

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Client: DBJV		Project No: 0212330			
Summary: This document presents the Final Environmental Monitoring & Audit (EM&A) Report for Tuen Mun – Chek Lap Kok Link Northern Connection Sub-sea Tunnel Section.		Date: 23 March 2022			
		Approved by: 			
		<i>Mr Craig Reid Partner</i>			
		Certified by: 			
		<i>Dr Jasmine Ng ET Leader</i>			
	Final Environmental Monitoring & Audit (EM&A) Report	VAR	JN	CAR	23/03/22
Revision	Description	By	Checked	Approved	Date
This report has been prepared by Environmental Resources Management the trading name of 'ERM Hong-Kong, Limited', with all reasonable skill, care and diligence within the terms of the Contract with the client, incorporating our General Terms and Conditions of Business and taking account of the resources devoted to it by agreement with the client. We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above.		Distribution <input type="checkbox"/> Internal <input checked="" type="checkbox"/> Public <input type="checkbox"/> Confidential			
		 			

6 April 2022

By Fax (2293 6300) and By Post

AECOM Asia Co. Ltd.
Supervising Officer Representative's Office
No.8 Mong Fat Street, Tuen Mun, New Territories, Hong Kong

Attention: Mr. K P Wong

Dear Mr. Wong,

**Re: Agreement No. CE 48/2011 (EP)
Environmental Project Office for the
HZMB Hong Kong Link Road, HZMB Hong Kong Boundary Crossing Facilities,
and Tuen Mun-Chek Lap Kok Link – Investigation**

**Contract No. HY/2012/08
TM-CLKL – Northern Connection Sub-sea Tunnel Section
Final Environmental Monitoring & Audit (EM&A) Report**

Reference is made to the ET's submission of Final Environmental Monitoring & Audit (EM&A) Report (ET's ref.: "0212330_Final Environmental Monitoring & Audit (EM&A) Report_20220323.doc" dated 23 March 2022) certified by the ET Leader.

Please be informed that we have no adverse comments on the captioned Report.

Thank you for your attention. Please do not hesitate to contact the undersigned or the ENPO Leader Mr. Y. H. Hui should you have any queries.

Yours sincerely,



Brian Tam
Independent Environmental Checker
Tuen Mun – Chek Lap Kok Link

c.c.

HyD	Ms. Sally Choi	(By Fax: 3188 6614)
HyD	Ms. Maggie Lai	(By Fax: 3188 6614)
ERM	Dr. Jasmine Ng	(By Fax: 2723 5660)
DBJV	Mr. Erwin Regalado	(By Fax: 2293 7499)

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TABLE OF CONTENTS

	<i>EXECUTIVE SUMMARY</i>	<i>1</i>
<i>1</i>	<i>INTRODUCTION</i>	<i>6</i>
<i>1.1</i>	<i>BACKGROUND</i>	<i>6</i>
<i>1.2</i>	<i>SCOPE OF THIS REPORT</i>	<i>7</i>
<i>1.3</i>	<i>ORGANIZATION STRUCTURE</i>	<i>7</i>
<i>1.4</i>	<i>SUMMARY OF CONSTRUCTION WORKS</i>	<i>7</i>
<i>1.5</i>	<i>SUMMARY OF EM&A PROGRAMME REQUIREMENTS</i>	<i>11</i>
<i>2</i>	<i>EM&A RESULTS</i>	<i>12</i>
<i>2.1</i>	<i>AIR QUALITY</i>	<i>13</i>
<i>2.2</i>	<i>WATER QUALITY MONITORING</i>	<i>21</i>
<i>2.3</i>	<i>DOLPHIN MONITORING</i>	<i>36</i>
<i>2.4</i>	<i>POST-TRANSLOCATION CORAL MONITORING</i>	<i>42</i>
<i>2.5</i>	<i>EM&A SITE INSPECTION</i>	<i>42</i>
<i>2.6</i>	<i>WASTE MANAGEMENT STATUS</i>	<i>42</i>
<i>2.7</i>	<i>ENVIRONMENTAL LICENSES AND PERMITS</i>	<i>43</i>
<i>2.8</i>	<i>IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES</i>	<i>51</i>
<i>2.9</i>	<i>SUMMARY OF EXCEEDANCES OF THE ENVIRONMENTAL QUALITY PERFORMANCE LIMIT</i>	<i>51</i>
<i>2.10</i>	<i>SUMMARY OF COMPLAINTS, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS</i>	<i>52</i>
<i>3</i>	<i>CONCLUSION AND RECOMMENDATIONS</i>	<i>56</i>

List of Appendices

- Appendix A Project Organization for Environmental Works
- Appendix B Implementation Schedule of Environmental Mitigation Measures (EMIS)
- Appendix C Summary of Action and Limit Levels
- Appendix D Impact Air Quality Monitoring Result in Graphical Presentation
- Appendix E Impact, Post Construction and Operational Water Quality Monitoring Results in Graphical Presentation
- Appendix F Event Action Plan
- Appendix G Summary of Waste Flow Table
- Appendix H Cumulative Statistics on Exceedances, Complaints, Notifications of Summons and Successful Prosecutions

EXECUTIVE SUMMARY

Under *Contract No. HY/2012/08*, Dragages – Bouygues Joint Venture (DBJV) is commissioned by the Highways Department (HyD) to undertake the design and construction of the Northern Connection Sub-sea Tunnel Section of the Tuen Mun – Chek Lap Kok Link Project (TM-CLK Link Project) while AECOM Asia Company Limited was appointed by HyD as the Supervising Officer. For implementation of the environmental monitoring and audit (EM&A) programme under the Contract, ERM-Hong Kong, Limited (ERM) has been appointed as the Environmental Team (ET) in accordance with *Environmental Permit No. EP-354/2009/A*. Ramboll Hong Kong Limited was employed by HyD as the Independent Environmental Checker (IEC) and Environmental Project Office (ENPO). Subsequent applications for variation of environmental permits (VEP), *EP-354/2009/B*, *EP-354/2009/C* and *EP-354/2009/D*, were granted on 28 January 2014, 10 December 2014 and 13 March 2015, respectively.

The construction phase of the Contract commenced on 1 November 2013. The impact monitoring of the EM&A programme, including air quality, water quality, marine ecological monitoring and environmental site inspections were commenced on 1 November 2013.

Termination proposal for construction EM&A programme was approved by EPD on 19 March 2021. The construction phase EM&A programme of the Contract has been terminated since 19 March 2021.

This is the Final EM&A report presenting the EM&A works carried out during the period from 1 November 2013 to 19 March 2021 for the *Contract No. HY/2012/08 Northern Connection Sub-sea Tunnel Section* (the “Contract”) in accordance with the Updated EM&A Manual of the TM-CLK Link Contract. As informed by the Contractor, major activities undertaken during the course of this Contract included:

Construction Activities Undertaken

Land-based Works

Work Area – WA 23

- Sorting of rock material
-

Work Area – WA 18

- Site formation works
 - Site office construction
 - Completion of chain-link fence
 - Site hoarding works
-

Work Area – N6

- CLP substation construction
 - Pile cap construction
 - Land bored piling
-

Portion N-A

- Construction of temporary access
 - Diaphragm wall construction
 - Excavation for north launching shaft
 - Land bored piling works
 - TBM platform construction
-

Construction Activities Undertaken

- Formwork and metal scaffolding works
 - Delivery & assembly of TBM
 - Land-based sheet piling works
 - Box culvert extension
 - Startup of TBM
 - Construction of cross passage tympanum
 - Phase 2 surcharge removal
 - Preparation of stage 2 reclamation
 - Bulk excavation
 - Diaphragm wall construction
 - RC structure
 - Demolition of amenities and workshop
 - ELS removal
 - Road & drainage works
 - Gantry crane removal
-

Portion N-B

- Vibro-compaction
 - Surcharge set up
 - TBM tunnel works
 - Seawall inspection and remedial works
-

Portion N-C

- Vibro-compaction
 - Surcharge set up
 - Set up of slurry treatment plant
 - Surcharge removal
 - Diaphragm wall construction for Ventilation Shaft
 - Excavation for ventilation shaft
 - Construction of capping beam and base slab for Ventilation Shaft
 - Installation of tower crane
 - Modification and maintenance works for slurry
 - TBM tunnel works
 - Shaft structure and backfilling
 - Construction of North Ventilation Building
-

TBM Tunnel

- Excavation of sub-sea tunnel
 - Construction of cross passage tympanum
 - Thrust frame removal
 - Sub-sea tunnel gallery installation
 - Slab construction of tunnel protection enhancement
 - Corbel construction
 - Cross passage lining installation
 - Cross passage construction by pipe jacking
 - Excavation of sub-sea tunnel
 - OVHD construction
 - Parapet wall installation
 - Fireboard installation
 - Construction of overhead ventilation ducts
 - Construction of thermal barrier
 - Construction of walkway corbel & cover
-

Portion S-A

- Deep band drain installation
 - Dewatering deep well installation
 - Jet grouting, CSM ground treatment and diaphragm wall
 - Ground freezing works
 - Bulk excavation
 - Diaphragm wall construction
 - RC structure
-

Construction Activities Undertaken

- ELS removal
 - Diaphragm wall removal
 - E&M platform installation
 - Backfilling
 - Road & drainage works
 - C&C Tunnel RC structure
 - Roofing system installation
 - UU installation
 - Carpark formation
 - Carpark canopies installation
-

Portion S-B

- Road & drainage works
 - UU installation
 - Carpark formation
 - Carpark canopies installation
-

Portion S-C

- Diaphragm wall construction
 - ELS removal
 - STP demolition
 - Cut & cover tunnel RC structure
 - Backfilling
 - Water treatment facilities dismantling
 - UU installation
 - Carpark formation
 - Carpark canopies installation
-

Northern Landfall

- UU installation
 - Carpark formation
 - Hard paving and footpath at Pump Sump Area
 - Reinstatement and defect works for reinstatement at Box culvert
-

Southern Ventilation Building

- Installation of green roof system & chain fence
-

CLP Substation

- Demolition works and backfilling works of CLP substation
-

Marine-based Works

Portion N-A

- Dredging
 - Vertical and sloping seawall construction
 - Reclamation filling
 - Marine sheet piling for box culvert extension
 - Box culvert extension
 - Removal of existing seawall and temporary pontoon installation at River Trade Terminal (RTT)
 - Rock bund deposition for marine sheet pile remedial works
 - Installation of silt curtain
 - Band drain installation
 - Seawall construction and filling works
-

Portion N-B

- Dredging
 - Vertical and sloping seawall construction
 - Reclamation filling
-

Portion N-C

- Dredging
 - Vertical and sloping seawall construction
 - Reclamation filling
 - TBM tunnel works
 - Seawall enhancement works
-

Construction Activities Undertaken	
Portion S-B	
<ul style="list-style-type: none"> • Seawall modification works 	
Portion S-C	
<ul style="list-style-type: none"> • Jetty dismantling works 	

A summary of monitoring and audit activities conducted during the course of this Contract is listed below:

24-hour TSP monitoring	807 sessions
1-hour TSP monitoring	808 sessions
Impact water quality monitoring	456 sessions
Impact dolphin monitoring	158 sessions
Joint environmental site inspection	380 sessions
Post-translocation coral monitoring	4 sessions
Post-construction water quality monitoring	12 sessions
Operational phase water quality monitoring	9 sessions
Operational phase dolphin monitoring	19 sessions

Breaches of Action and Limit Levels for Air Quality

One hundred and twenty two (122) Action Level and fifteen (15) Limit Level exceedances of 1-hour TSP, twelve (12) Action Level and four (4) Limit Level exceedances of 24-hour TSP were recorded for air quality monitoring during the impact monitoring period.

Breaches of Action and Limit Levels for Water Quality

Fifty-eight (58) Action Level of Dissolved Oxygen (Surface and Middle), eighty-three (83) Action Level and eighteen (18) Limit Level exceedances of Dissolved Oxygen (Bottom), twenty-seven (27) Action Level and one (1) Limit Level exceedances of Suspended Solids (SS) were recorded for water quality monitoring during the impact monitoring period.

Dolphin Monitoring

Eleven (11) Action Level and twenty (20) Limit Level exceedances were recorded for impact dolphin monitoring during the impact monitoring period.

Three (3) Limit Level exceedances were recorded for quarterly post-construction (operational) dolphin monitoring data between June 2020 and March 2021.

Post-Translocation Coral Monitoring

No exceedance of Action and Limit Levels was recorded for post-translocation coral monitoring. The results were detailed in the *First to Fourth Quarterly Post-Translocation Coral Monitoring Reports* and were submitted under separate covers.

Environmental Complaints, Non-compliance & Summons

Seventeen (17) environmental complaints and one (1) notification of summons were recorded during the impact monitoring period. There was no successful prosecution recorded.

According to the findings of the Northwest New Territories (NWNT) Traffic and Infrastructure Review conducted by the Transport Department, Tuen Mun Road, Ting Kau Bridge, Lantau Link and North Lantau Highway would be operating beyond capacity after 2016. This forecast has been based on the estimated increase in cross boundary traffic, developments in the Northwest New Territories (NWNT), and possible developments in North Lantau, including the Airport developments, the Lantau Logistics Park (LLP) and the Hong Kong - Zhuhai - Macao Bridge (HZMB). In order to cope with the anticipated traffic demand, two new road sections between NWNT and North Lantau - Tuen Mun - Chek Lap Kok Link (TM-CLKL) and Tuen Mun Western Bypass (TMWB) are proposed.

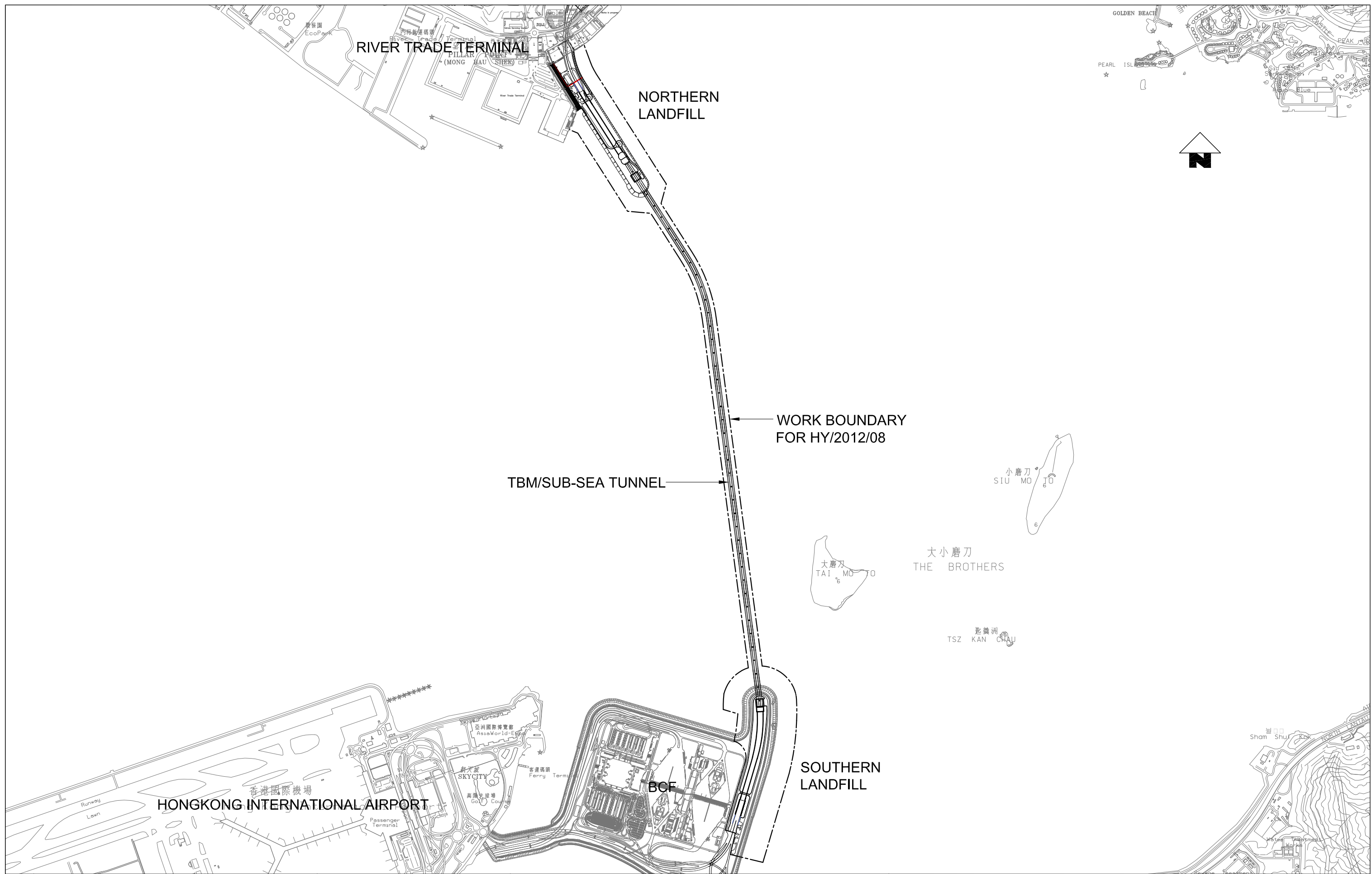
An Environmental Impact Assessment (EIA) of TM-CLKL (the Project) was prepared in accordance with the EIA Study Brief (No. ESB-175/2007) and the *Technical Memorandum of the Environmental Impact Assessment Process (EIAO-TM)*. The EIA Report was submitted under the Environmental Impact Assessment Ordinance (EIAO) in August 2009. Subsequent to the approval of the EIA Report (EIAO Register Number AEIAR-146/2009), an Environmental Permit (EP-354/2009) for TM-CLKL was granted by the Director of Environmental Protection (DEP) on 4 November 2009, and EP variation (VEP) (EP-354/2009A) was issued on 8 December 2010. Subsequent applications for variation of environmental permits (VEP), EP-354/2009/B, EP-354/2009/C and EP-354/2009/D, were granted on 28 January 2014, 10 December 2014 and 13 March 2015, respectively.

Under *Contract No. HY/2012/08*, Dragages - Bouygues Joint Venture (DBJV) is commissioned by the Highways Department (HyD) to undertake the design and construction of the Northern Connection Sub-sea Tunnel Section of TM-CLKL while AECOM Asia Company Limited was appointed by HyD as the Supervising Officer. For implementation of the environmental monitoring and audit (EM&A) programme under the Contract, ERM-Hong Kong, Limited (ERM) has been appointed as the Environmental Team (ET). Ramboll Hong Kong Limited was employed by HyD as the Independent Environmental Checker (IEC) and Environmental Project Office (ENPO).

Layout of the Contract components is presented in *Figure 1.1*.

The construction phase of the Contract commenced on 1 November 2013. The impact monitoring phase of the EM&A programme, including air quality, water quality, marine ecological monitoring and environmental site inspections, were commenced on 1 November 2013.

Termination proposal for construction EM&A programme was approved by EPD on 19 March 2021. The construction phase EM&A programme of the Contract has been terminated since 19 March 2021.



Designed By	PKV		
Drawn By	DAI		
Approved By	SPo		
Date	11SEP2013		
Rev.	Description	Date	Checked
A	FIRST ISSUE	11SEP13	PKV

Main Contractor

Dragages - Bouygues Joint Venture 寶嘉 - 布依格聯營

Client

HIGHWAYS DEPARTMENT

Contractor's Designer

Ove Arup & Partners
Hong Kong Limited

Project

Contract No. HY/2012/08
Tuen Mun - Chek Lap Kok Link -
Northern Connection Sub-Sea Tunnel Section

Drawing Title

Figure 1.1

Drawing no.	TMCLKL8-DBJ-GEN-DWG-00174
Scale	1:25000 © A3
CADD Ref.	TMCLKL8-DBJ-GEN-DWG-00174-DFT-A
Issue Status	DFT (DRAFT)
Revision	A

1.2 SCOPE OF THIS REPORT

This is the Final EM&A Report under the *Contract No. HY/2012/08 Northern Connection Sub-sea Tunnel Section*. This report presents a summary of the environmental monitoring and audit works from 1 November 2013 to 19 March 2021.

1.3 ORGANIZATION STRUCTURE

The organization structure of the Contract is shown in *Appendix A*. The key personnel contact names and contact details are summarized in *Table 1.1* below.

Table 1.1 *Contact Information of Key Personnel*

Party	Position	Name	Telephone	Fax
Highways Department	Engr 24/SD	Ken T.M. Cheng	2762 4062	3188 6614
SOR (AECOM Asia Company Limited)	Chief Resident Engineer	Roger Man	2293 6388	2293 6300
ENPO / IEC (Ramboll Hong Kong Ltd.)	ENPO Leader	Y.H. Hui	3465 2850	3465 2899
	IEC	Brian Tam	9700 6767	3465 2899
Contractor (Dragages - Bouygues Joint Venture)	Quality and Environmental Manager	Erwin Regalado	2507 1732	2293 7499
	24-hour hotline		2293 7330	
ET (ERM-HK)	ET Leader	Jasmine Ng	2271 3311	2723 5660

1.4 SUMMARY OF CONSTRUCTION WORKS

As informed by the Contractor, details of the major works undertaken during the course of this Contract are listed below:

Construction Activities Undertaken
<i>Land-based Works</i>
Work Area - WA 23
<ul style="list-style-type: none">• Sorting of rock material
Work Area - WA 18
<ul style="list-style-type: none">• Site formation works• Site office construction• Completion of chain-link fence• Site hoarding works
Work Area - N6
<ul style="list-style-type: none">• CLP substation construction• Pile cap construction• Land bored piling
Portion N-A

Construction Activities Undertaken

- Construction of temporary access
- Diaphragm wall construction
- Excavation for north launching shaft
- Land bored piling works
- TBM platform construction
- Formwork and metal scaffolding works
- Delivery & assembly of TBM
- Land-based sheet piling works
- Box culvert extension
- Startup of TBM
- Construction of cross passage tympanum
- Phase 2 surcharge removal
- Preparation of stage 2 reclamation
- Bulk excavation
- Diaphragm wall construction
- RC structure
- Demolition of amenities and workshop
- ELS removal
- Road & drainage works
- Gantry crane removal

Portion N-B

- Vibro-compaction
- Surcharge set up
- TBM tunnel works
- Seawall inspection and remedial works

Portion N-C

- Vibro-compaction
- Surcharge set up
- Set up of slurry treatment plant
- Surcharge removal
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- Construction of North Ventilation Building

TBM Tunnel

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- Sub-sea tunnel gallery installation
- Slab construction of tunnel protection enhancement
- Corbel construction
- Cross passage lining installation
- Cross passage construction by pipe jacking
- Excavation of sub-sea tunnel
- OVHD construction
- Parapet wall installation
- Fireboard installation
- Construction of overhead ventilation ducts
- Construction of thermal barrier
- Construction of walkway corbel & cover

Portion S-A

- Deep band drain installation
- Dewatering deep well installation

Construction Activities Undertaken

- Jet grouting, CSM ground treatment and diaphragm wall
 - Ground freezing works
 - Bulk excavation
 - Diaphragm wall construction
 - RC structure
 - ELS removal
 - Diaphragm wall removal
 - E&M platform installation
 - Backfilling
 - Road & drainage works
 - C&C Tunnel RC structure
 - Roofing system installation
 - UU installation
 - Carpark formation
 - Carpark canopies installation
-

Portion S-B

- Road & drainage works
 - UU installation
 - Carpark formation
 - Carpark canopies installation
-

Portion S-C

- Diaphragm wall construction
 - ELS removal
 - STP demolition
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- UU installation
 - Carpark formation
 - Hard paving and footpath at Pump Sump Area
 - Reinstatement and defect works for reinstatement at Box culvert
-

Southern Ventilation Building

- Installation of green roof system & chain fence
-

CLP Substation

- Demolition works and backfilling works of CLP substation
-

Marine-based Works

Portion N-A

- Dredging
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 - Installation of silt curtain
 - Band drain installation
 - Seawall construction and filling works
-

Portion N-B

- Dredging
 - Vertical and sloping seawall construction
 - Reclamation filling
-

Portion N-C

Construction Activities Undertaken

- Dredging
 - Vertical and sloping seawall construction
 - Reclamation filling
 - TBM tunnel works
 - Seawall enhancement works
-

Portion S-B

- Seawall modification works
-

Portion S-C

- Jetty dismantling works
-

The Environmental Sensitive Receivers in the vicinity of the Project are shown in *Figure 1.2*.

The environmental mitigation measures implementation schedule is presented in *Appendix B*.

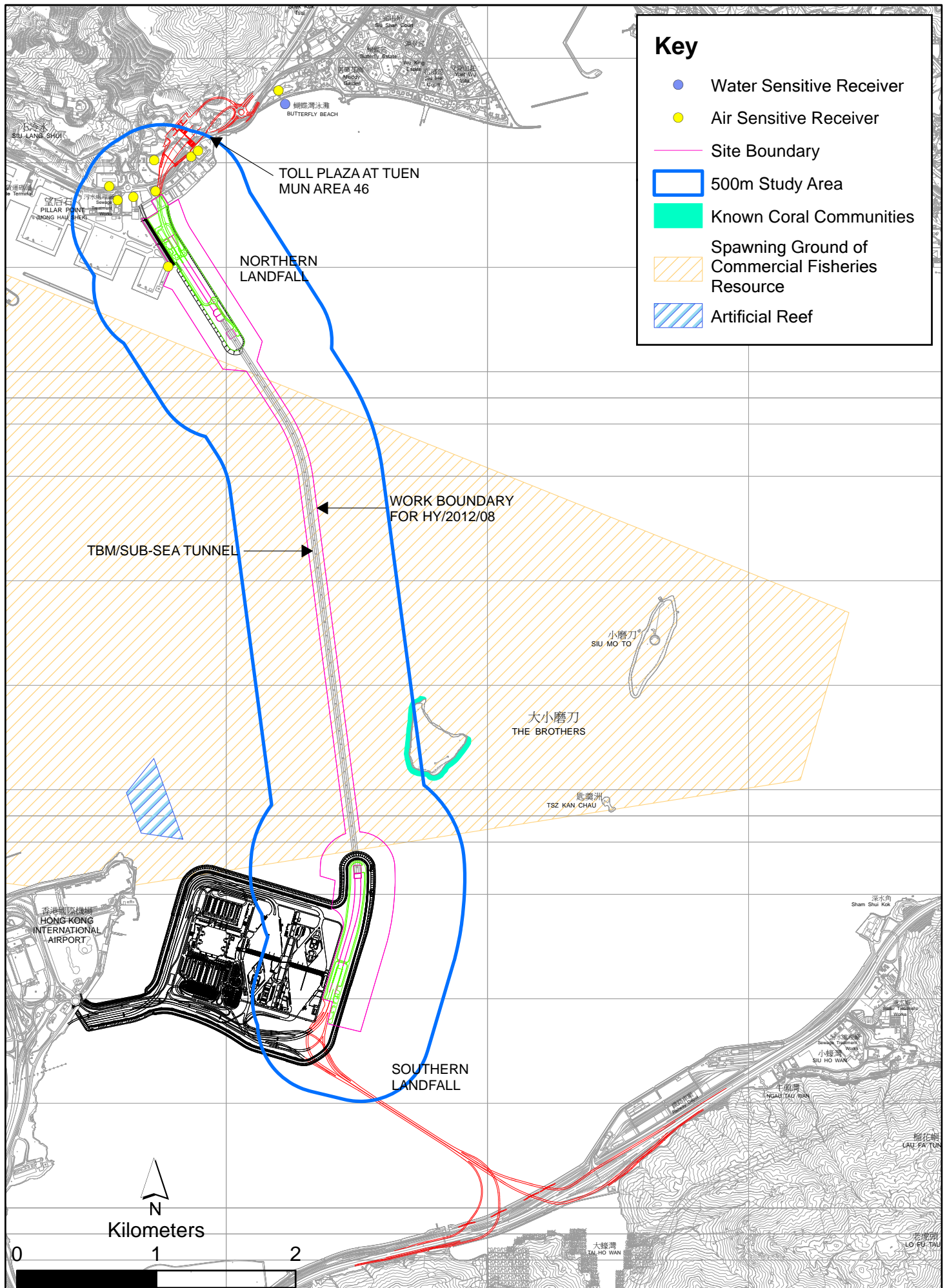


Figure 1.2 Environmental Sensitive Receivers in the vicinity of Contract No. HY/2012/08 Tuen Mun - Chek Lap Kok Link - Northern Connection Sub-Sea Tunnel Section

1.5

SUMMARY OF EM&A PROGRAMME REQUIREMENTS

The EM&A programme required environmental monitoring for air quality, water quality and marine ecology as well as environmental site inspections for air quality, noise, water quality, waste management, marine ecology and landscape and visual impacts. The EM&A requirements and related findings for each component are described in the following sections, which include:

- Monitoring parameters;
- Action and Limit levels for all environmental parameters;
- Event Action Plan;
- Tested environmental impact hypotheses;
- Environmental mitigation measures, as recommended in the approved EIA Report; and
- Environmental requirement in contract documents.

The EM&A programme required environmental monitoring for air quality, water quality and marine ecology as well as environmental site inspections for air quality, noise, water quality, waste management, marine ecology and landscape and visual impacts. The EM&A requirements and related findings for each component are summarized in the following sections.

2.1 AIR QUALITY

2.1.1 Monitoring Requirements and Equipment

In accordance with the Updated EM&A Manual and the Enhanced TSP Monitoring Plan ⁽¹⁾, impact 1-hour TSP monitoring was conducted three (3) times in every six (6) days and impact 24-hour TSP monitoring was carried out once in every six (6) days when the highest dust impact was expected. 1-hr and 24-hr TSP monitoring frequency was increased to three times per day every three days and daily every three days respectively as excavation works for launching shaft commenced on 24 October 2014.

Excavation works for launching shaft were completed and notification of change on air quality monitoring frequency was submitted to EPD on 14 September 2020. 1-hr and 24-hr TSP monitoring frequency was changed to three times per day every six days and daily every six days, respectively, since 14 September 2020.

High volume samplers (HVSs) were used to carry out the 1-hour and 24-hour TSP monitoring in the reporting period at the five (5) air quality monitoring stations in accordance with the requirements stipulated in the Updated EM&A Manual (*Figure 2.1; Table 2.1*). Wind anemometer was installed at the rooftop of ASR5 for logging wind speed and wind direction. Details of the equipment deployed are provided in *Table 2.2*.

Termination proposal for construction EM&A programme was approved by EPD on 19 March 2021. The construction phase EM&A programme of the Contract has been terminated since 19 March 2021.

(1) ERM (2013) Enhanced TSP Monitoring Plan. Submitted on 28 October 2013 and subsequently approved by EPD on 1 November 2013.

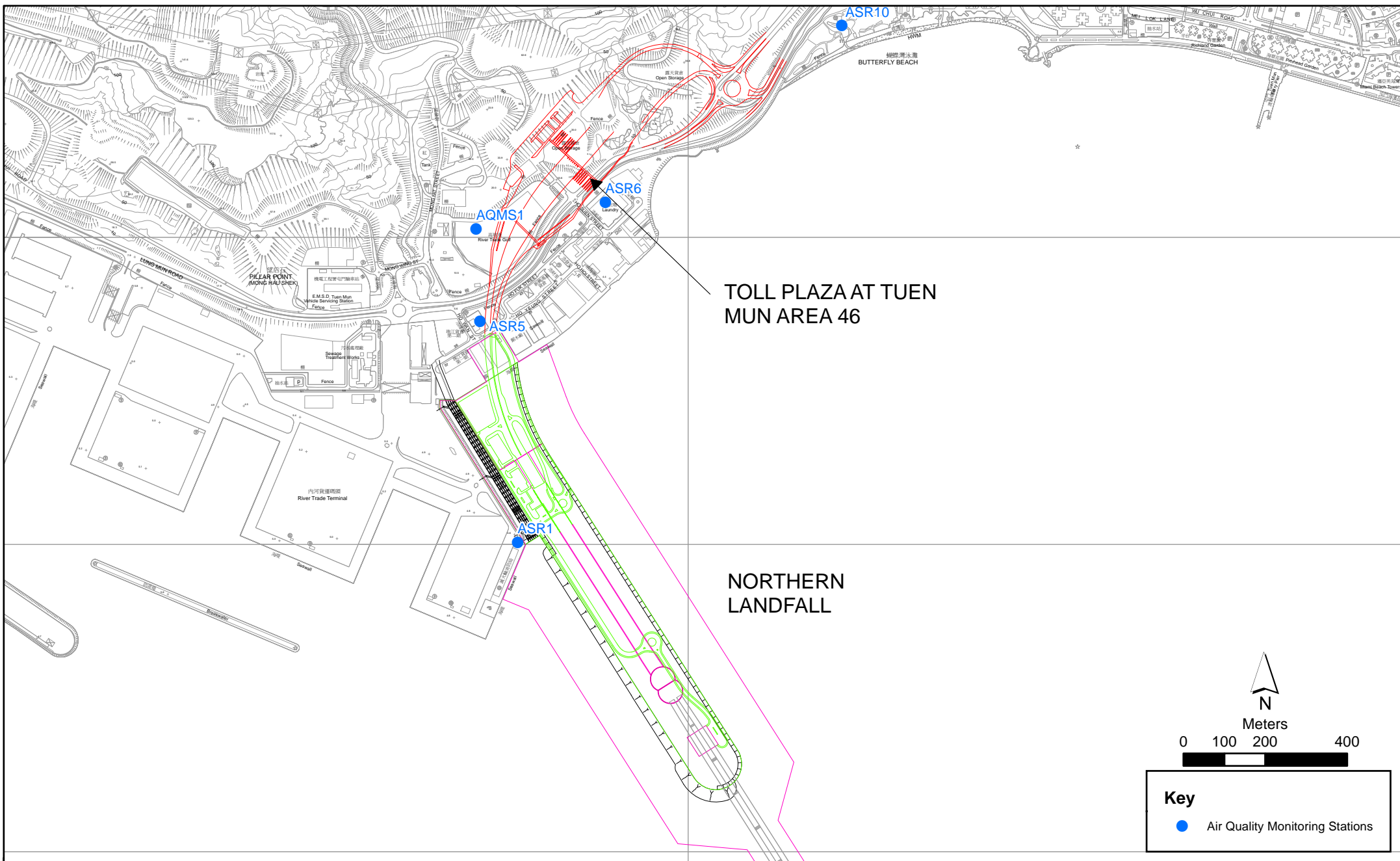


Figure 2.1

Air Quality Monitoring Stations for the Enhanced TSP Monitoring

Table 2.1 *Locations of Impact Air Quality Monitoring Stations and Monitoring Dates during the Impact Monitoring Period*

Monitoring Station	Location	Description	Parameters & Frequency
ASR1	Tuen Mun Fireboat Station	Office	TSP monitoring <ul style="list-style-type: none"> • 1-hour Total Suspended
ASR5	Pillar Point Fire Station	Office	Particulates (1-hour TSP, $\mu\text{g}/\text{m}^3$), 3 times in every 6 days
AQMS1	Previous River Trade Golf	Bare ground	<ul style="list-style-type: none"> • 24-hour Total Suspended
AQMS2/ASR6	Butterfly Beach Laundry	Office	Particulates (24-hour TSP, $\mu\text{g}/\text{m}^3$), daily for 24-hour in every 6 days
ASR10	Butterfly Beach Park	Recreational uses	Enhanced TSP monitoring (commenced on 24 October 2014) <ul style="list-style-type: none"> • 1-hour Total Suspended Particulates (1-hour TSP, $\mu\text{g}/\text{m}^3$), 3 times in every 3 days • 24-hour Total Suspended Particulates (24-hour TSP, $\mu\text{g}/\text{m}^3$), daily for 24-hour in every 3 days

Note:

(1) AQMS2 was relocated and HVS was re-installed at ASR6 (Butterfly Beach Laundry) on 17 January 2014. AQMS2 was then superseded by ASR6 for the impact air quality monitoring. Impact air quality monitoring at ASR6 commenced on 21 January 2014.

Table 2.2 *Air Quality Monitoring Equipment*

Equipment	Brand and Model
High Volume Sampler (1-hour TSP and 24-hour TSP)	Tisch Environmental Mass Flow Controlled Total Suspended Particulate (TSP) High Volume Sampler (Model No. TE-5170)
Wind Meter	MetPak (Model: MetPak II (S/N: 13130002) Davis (Model: Weather Wizard III (S/N: WE90911A30) Davis (Model: Vantage Pro 2 (S/N: AS160104014)
Wind Anemometer for calibration	Lutron (Model No. AM-4201)

2.1.2 *Action & Limit Levels*

The Action and Limit Levels of the air quality monitoring are provided in *Appendix C*.

2.1.3 *Monitoring Schedule for the Impact Monitoring Period*

During the period of impact monitoring, impact 1-hour TSP monitoring and impact 24-hour TSP monitoring were carried out in accordance with the Updated EM&A Manual. The schedules for air quality monitoring were reported in the *First to Eighty-ninth Monthly EM&A Reports*.

2.1.4 *Results and Observations*

The major dust sources during the impact monitoring period included construction activities under the Contract and *Contract No. HY/2013/12* as well as nearby traffic emissions and renovation works undertaken by other contract.

A total of 808 monitoring events for 1-hour TSP and 807 monitoring events for 24-hour TSP were undertaken during the impact monitoring period.

Comparison of EM&A results with baseline monitoring and EIA predictions for 1-hour TSP and 24-hour TSP are summarized in *Tables 2.3 and 2.4* and present graphically in *Appendix D*. The detailed impact monitoring data and meteorological information were reported in the *First to Eighty-ninth Monthly EM&A Reports*.

Table 2.3 Summary of Average Levels of TSP Level of Baseline Monitoring and the Impact Monitoring Period (in $\mu\text{g}/\text{m}^3$)

Monitoring Station	Average Baseline Monitoring	Average Impact Monitoring							
		Nov 2013 - Oct 2014	Nov 2014 - Oct 2015	Nov 2015 - Oct 2016	Nov 2016 - Oct 2017	Nov 2017 - Oct 2018	Nov 2018 - Oct 2019	Nov 2019 - Oct 2020	Nov 2020 - Mar 2021
ASR 1 (1-hr TSP)	125	178	140	112	137	138	126	131	160
ASR 1 (24-hr TSP)	128	101	84	73	83	89	85	83	109
ASR 5 (1-hr TSP)	138	194	162	135	160	167	151	155	179
ASR 5 (24-hr TSP)	167	106	91	79	81	100	91	91	108
AQMS 1 (1-hr TSP)	131	141	124	88	102	99	94	101	129
AQMS 1 (24-hr TSP)	127	86	78	60	60	64	58	61	81
AQMS 2/ ASR 6 (1-hr TSP)	135	163	130	109	131	123	110	113	155
AQMS 2/ ASR 6 (24-hr TSP)	166	94	77	67	70	77	69	68	106
ASR 10 (1-hr TSP)	134	121	88	78	86	87	69	69	103
ASR 10 (24-hr TSP)	129	72	64	58	57	59	50	48	73

Table 2.4 Comparison of Impacts on Air Quality (in $\mu\text{g}/\text{m}^3$) between EIA Prediction, Baseline Monitoring and the Impact Monitoring Period (in $\mu\text{g}/\text{m}^3$)

Monitoring Station	EIA Predicted Maximum	Maximum Baseline Monitoring	Maximum Impact Monitoring							
			Nov 2013 - Oct 2014	Nov 2014 - Oct 2015	Nov 2015 - Oct 2016	Nov 2016 - Oct 2017	Nov 2017 - Oct 2018	Nov 2018 - Oct 2019	Nov 2019 - Oct 2020	Nov 2020 - Mar 2021
ASR 1 (1-hr TSP)	195	182	474	404	283	545	584	646	747	887
ASR 1 (24-hr TSP)	148	173	249	162	125	220	328	237	207	244
ASR 5 (1-hr TSP)	235	211	559	346	293	456	455	425	534	472
ASR 5 (24-hr TSP)	133	249	258	151	138	163	279	196	196	176
AQMS 1 (1-hr TSP)	N/A	196	431	348	231	473	324	311	303	248
AQMS 1 (24-hr TSP)	N/A	211	228	155	112	160	207	127	131	141
AQMS 2/ ASR 6 (1-hr TSP)	226	226	425	309	279	401	335	478	1454	358
AQMS 2/ ASR 6 (24-hr TSP)	153	221	269	133	141	138	178	191	149	185
ASR 10 (1-hr TSP)	189	215	645	251	202	475	816	242	407	246
ASR 10 (24-hr TSP)	112	181	166	130	116	205	250	146	138	121

Maximum 1-hour TSP impact monitoring levels at ASR1, ASR5, AQMS2/ ASR6 and ASR10 and maximum 24-hour TSP impact monitoring levels at ASR1, ASR5 and ASR10 were generally higher than their corresponding EIA predicted maximum levels.

One hundred and twenty two (122) Action Level and fifteen (15) Limit Level exceedances of 1-hour TSP, twelve (12) Action Level and four (4) Limit Level exceedances of 24-hour TSP were recorded for air quality monitoring during the impact monitoring period. Summary of the exceedances is reported in Table 2.5. Actions were taken in accordance with the Event Action Plan as presented in Appendix F. The exceedances were considered not related to this Contract upon further investigation. Detailed investigation reports on

exceedances were presented in *First to Sixth, Thirteenth, Fourteenth, Forty-fifth to Fifty-fourth, Fifty-eighth to Sixty-fifth, Sixty-seventh, Sixty-ninth, Seventy-first to Seventy-fourth, Seventy-seventh, Seventy-eighth, Eightieth, Eighty-second to Eighty-sixth and Eighty-eighth Monthly EM&A Reports.*

Although occasional exceedances were recorded at these stations during impact monitoring period, they were not project-related upon investigation. It also appeared that the construction activities of the Contract did not cause significant impact on air quality with similar average TSP levels between the baseline and impact monitoring. The EIA has concluded that no adverse residual construction dust impacts will occur after implementation of mitigation measures. Thus, the monitoring results are considered to be in line with the EIA prediction.

With the implementation of the monitoring programme for air quality and environmental mitigation measures, the EM&A programme was considered adequate and effective in monitoring and minimizing the potential environmental impacts from the Contract.

Table 2.5 ***Summary of Action Level and Limit Level Exceedance of 1-hour TSP and 24-hour TSP***

Period	Station	Parameter	Number of Action Level Exceedance(s)	Number of Limit Level Exceedance(s)
November 2013	AQMS1	1-hour TSP	1	-
	ASR1	1-hour TSP	1	-
	ASR10	1-hour TSP	-	1
	ASR5	1-hour TSP	2	-
December 2013	AQMS2/ASR6	1-hour TSP	4	-
	ASR1	1-hour TSP	2	-
	ASR10	1-hour TSP	1	-
	ASR5	1-hour TSP	3	1
	AQMS2/ASR6	24-hour TSP	-	1
	ASR1	24-hour TSP	2	-
January 2014	ASR5	24-hour TSP	2	-
	AQMS1	1-hour TSP	1	-
	AQMS2/ASR6	1-hour TSP	1	-
	ASR1	1-hour TSP	3	-
	ASR5	1-hour TSP	2	-
February 2014	AQMS1	24-hour TSP	1	-
	AQMS2/ASR6	1-hour TSP	1	-
March 2014	ASR1	1-hour TSP	1	-
	ASR5	1-hour TSP	1	-
April 2014	ASR10	1-hour TSP	1	-
November 2014	ASR1	1-hour TSP	2	-
December 2014	AQMS1	1-hour TSP	1	-
	ASR5	1-hour TSP	1	-
July 2017	AQMS2/ASR6	1-hour TSP	1	-
	ASR10	1-hour TSP	1	-
	ASR5	1-hour TSP	1	-
August 2017	ASR1	1-hour TSP	1	-
September 2017	AQMS1	1-hour TSP	1	-
	ASR1	1-hour TSP	2	1
	ASR5	1-hour TSP	3	-
October 2017	AQMS2/ASR6	1-hour TSP	1	-
	ASR1	1-hour TSP	2	-
	ASR5	1-hour TSP	1	-
	ASR1	24-hour TSP	1	-
November 2017	ASR10	1-hour TSP	2	1
	ASR5	1-hour TSP	2	-
December 2017	ASR1	1-hour TSP	4	-
	ASR5	1-hour TSP	3	-
	ASR1	24-hour TSP	1	1
	ASR10	24-hour TSP	1	-
	ASR5	24-hour TSP	-	2
January 2018	ASR5	1-hour TSP	6	-

February 2018	ASR1	1-hour TSP	1	-
	ASR5	1-hour TSP	1	-
March 2018	ASR1	1-hour TSP	2	-
April 2018	ASR5	1-hour TSP	1	-
August 2018	ASR1	1-hour TSP	2	-
September 2018	ASR1	1-hour TSP	2	1
October 2018	ASR1	1-hour TSP	2	-
	ASR5	1-hour TSP	1	-
November 2018	AQMS2/ASR6	1-hour TSP	1	-
	ASR1	1-hour TSP	2	-
	ASR5	1-hour TSP	3	-
December 2018	AQMS2/ASR6	1-hour TSP	1	-
	ASR1	1-hour TSP	2	-
January 2019	ASR1	1-hour TSP	1	1
	ASR5	1-hour TSP	4	-
February 2019	ASR1	24-hour TSP	1	-
March 2019	ASR1	1-hour TSP	2	-
May 2019	ASR1	1-hour TSP	2	-
	ASR1	24-hour TSP	1	-
July 2019	AQMS2/ASR6	1-hour TSP	1	-
	ASR1	1-hour TSP	-	1
	ASR5	1-hour TSP	1	-
September 2019	ASR1	1-hour TSP	-	1
October 2019	ASR1	1-hour TSP	3	-
November 2019	ASR1	1-hour TSP	2	2
	ASR5	1-hour TSP	3	1
December 2019	ASR1	1-hour TSP	1	1
	ASR10	1-hour TSP	1	-
	ASR5	1-hour TSP	2	-
March 2020	ASR5	1-hour TSP	1	-
April 2020	ASR1	1-hour TSP	2	1
	ASR5	1-hour TSP	1	-
June 2020	AQMS2/ASR6	1-hour TSP	1	-
August 2020	ASR1	1-hour TSP	1	-
September 2020	AQMS2/ASR6	1-hour TSP	1	1
October 2020	AQMS2/ASR6	1-hour TSP	1	-
	ASR1	1-hour TSP	1	-
	ASR5	1-hour TSP	2	-
November 2020	AQMS2/ASR6	1-hour TSP	1	-
	ASR1	1-hour TSP	1	1
	ASR5	1-hour TSP	1	-
	ASR1	24-hour TSP	2	-
December 2020	ASR5	1-hour TSP	1	-
February 2021	ASR5	1-hour TSP	2	-

2.2 WATER QUALITY MONITORING

The baseline water quality monitoring undertaken by the Hong Kong – Zhuhai – Macao Bridge Hong Kong Projects (HZMB) between 6 and 31 October 2011 included all monitoring stations for the Project. Thus, the baseline monitoring results and Action/Limit Levels presented in HZMB Baseline Monitoring Report ⁽¹⁾ are adopted for this Project.

2.2.1 *Monitoring Requirements and Equipment*

In accordance with the Updated EM&A Manual, impact water quality monitoring was carried out three days per week since November 2013 (*Figure 2.2a; Table 2.6*).

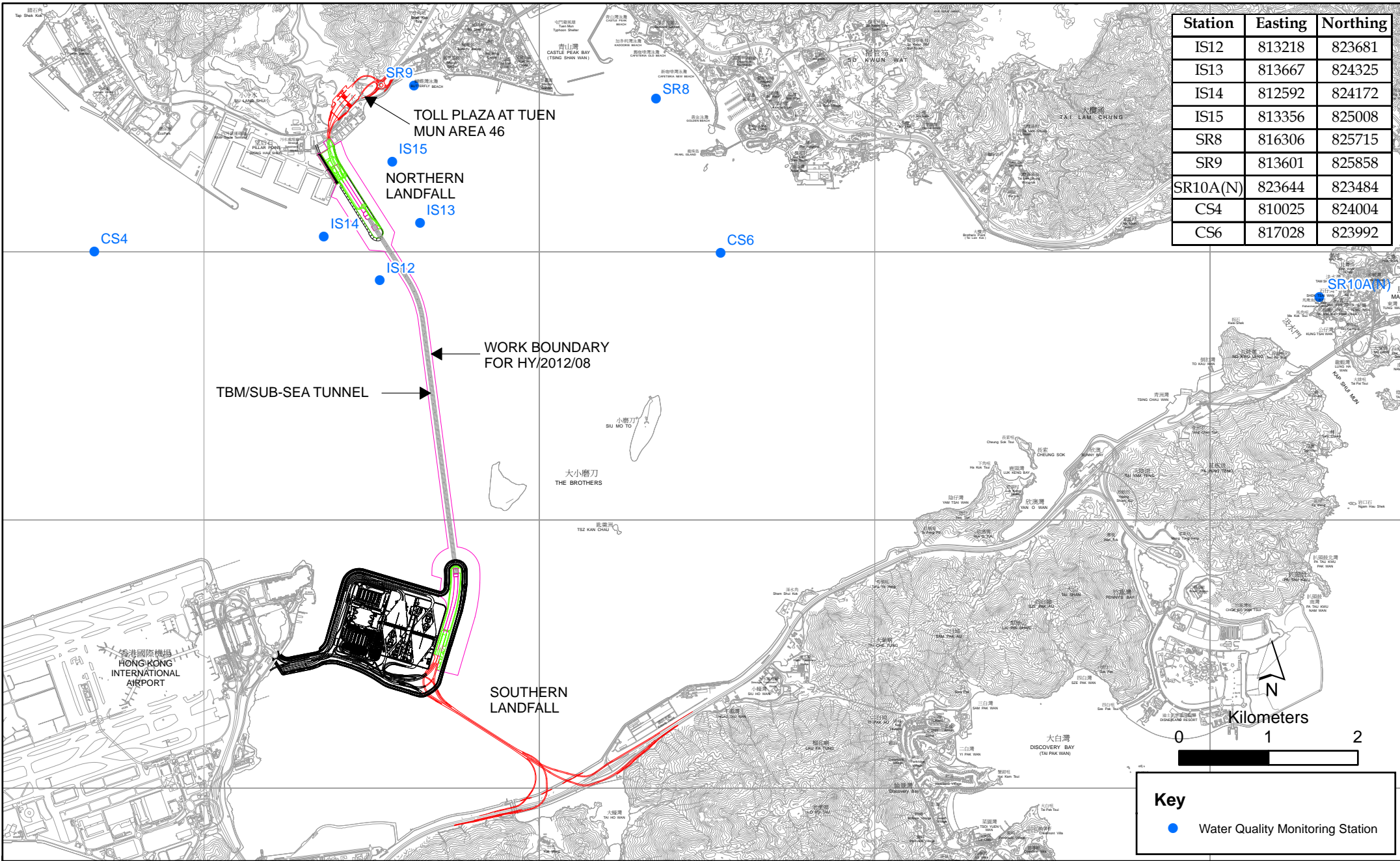
Phase I Reclamation works for the Northern Landfall was substantially completed in December 2014. A proposal letter was sent to EPD on 21 May 2015 to seek approval for the temporary suspension of water quality monitoring. Subsequently, a letter from EPD on 5 June 2015 stated that they have no strong objection to the temporary suspension of the water quality monitoring. Water quality monitoring was suspended from 6 June 2015 effectively.

Marine works for Phase II reclamation commenced on 27 December 2016 and substantially completed in the end of May 2017. Water quality monitoring resumed on 27 December 2016 and was suspended since 30 May 2017.

Seawall block installation for Phase II reclamation commenced on 1 November 2017, impact water quality monitoring was resumed on 1 November 2017.

Seawall enhancement works at Northern Landfall has been completed on 31 December 2017 and water quality monitoring was suspended since 31 December 2017.

(1) Agreement No. CE 35/2011 (EP) Baseline Environmental Monitoring for Hong Kong - Zhuhai - Macao Bridge Hong Kong Projects - Investigation. Baseline Environmental Monitoring Report (Version C). Submitted on 8 March 2012 and subsequently approved by EPD.



Station	Easting	Northing
IS12	813218	823681
IS13	813667	824325
IS14	812592	824172
IS15	813356	825008
SR8	816306	825715
SR9	813601	825858
SR10A(N)	823644	823484
CS4	810025	824004
CS6	817028	823992

Figure 2.2a

Water Quality Monitoring Station

Key

- Water Quality Monitoring Station



Seawall Modification Works at Portion S-B has commenced on 7 January 2019 and temporarily suspended after January 2019 and thus impact marine water quality monitoring resumed on 2 January 2019 and was temporarily suspended after January 2019.

Seawall Modification Works at Portion S-B commenced on 15 April 2019. Impact marine water quality monitoring resumed on 15 April 2019. In accordance with the approved Environmental Review Report dated 21 March 2018 for the Change in Design of Vertical Seawall to Sloping Seawall on Southern Landfall, Updated Impact water quality monitoring programme and water quality monitoring stations IS17, SR7 and IS(Mf)11 specified under the EM&A Manual for HZMB HKBCF project will be adopted (*Figure 2.2b; Table 2.6*). Results of water quality monitoring between April 2019 and June 2019 were adopted from the published EM&A data of *Contract No. HY/2012/07 Tuen Mun-Chek Lap Kok Link – Southern Connection Viaduct Section*.

The Jetty dismantling works commenced on 2 July 2019 and was completed on 11 July 2019. Water quality monitoring was carried out since 2 July 2019.

The Seawall modification works commenced on 12 August 2019 and completed on 30 December 2019. Water quality monitoring was suspended since 30 December 2019.

According to the Updated EM&A Manual, a post-construction water quality monitoring shall be carried out upon completion of all marine-based construction activities. Post-construction water quality monitoring was undertaken three days per week for at least 4 weeks in accordance with the Updated EM&A Manual. The proposal for post-construction water quality monitoring was approved by EPD on 5 March 2020. The post-construction water quality monitoring was conducted between 17 March 2020 and 11 April 2020. Locations of water quality monitoring stations presented in *Figures 2.2a and 2.2b* and in *Table 2.7*.

According to the Updated EM&A Manual, an operational phase water quality monitoring shall be performed monthly during the first year of Project operation at all designated monitoring stations including control stations. The operational phase water quality monitoring shall be ceased after

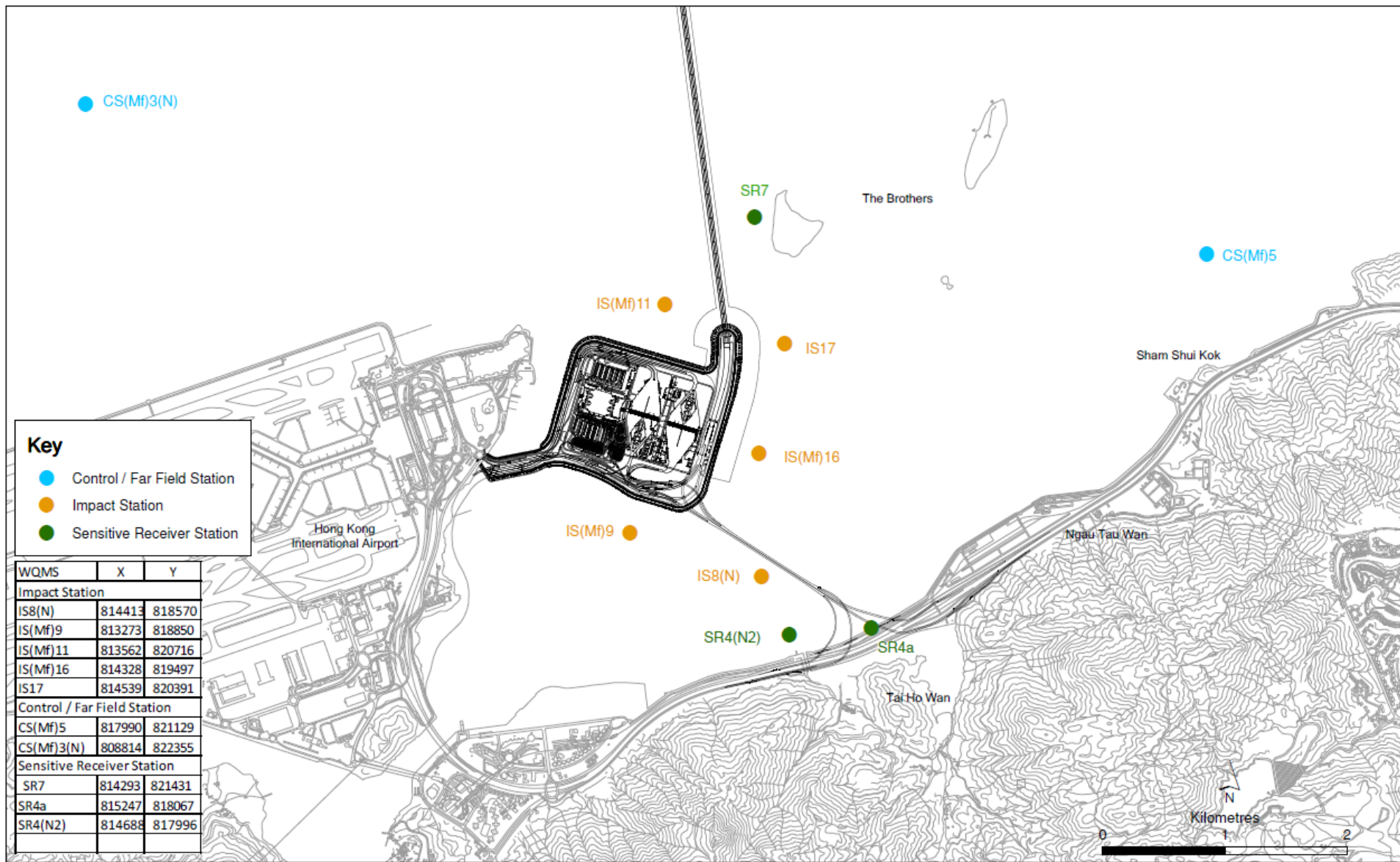


Figure 2.2b

Water Quality Monitoring Stations

the first year of operation of the Project subject to the first year review. Operational phase water quality monitoring commenced in June 2020. Locations of water quality monitoring stations presented in *Figure 2.2c* and in *Table 2.8*.

Table 2.6 *Locations of Impact Water Quality Monitoring Stations and the Corresponding Monitoring Requirements*

Station ID	Type	Coordinates		*Parameters, unit	Depth	Frequency
		Easting	Northing			
IS12	Impact Station	813218	823681	• Temperature (°C)	3 water depths: 1m below sea surface,	Impact monitoring: 3 days per week, at mid-flood and mid-ebb tides during the construction period of the Contract.
IS13	Impact Station	813667	824325			
IS14	Impact Station	812592	824172	• pH(pH unit)	mid-depth and 1m	
IS15	Impact Station	813356	825008	• Turbidity (NTU)	above sea bed. If the water depth is	
CS4	Control / Far Field Station	810025	824004	• Water depth (m)	less than 3m, mid-depth sampling	
CS6	Control / Far Field Station	817028	823992	• Salinity (ppt)	only. If water	
SR8	Sensitive receiver (Gazettal beaches in Tuen Mun)	816306	825715	• DO (mg/L and % of saturation)	depth less than 6m, mid-depth may be	
SR9	Sensitive receiver (Butterfly Beach)	813601	825858	• SS (mg/L)	omitted.	
SR10A	Sensitive receiver (Ma Wan FCZ)	823741	823495			
IS(Mf)11	Impact Station (Close to HKBCF construction site) 8	813562	820716			
IS17	Impact Station (Close to HKBCF construction site)	814539	820391			
SR7	Sensitive receivers (Tai Mo Do)	814293	821431			
IS(Mf)9	Impact Station (Close to HKBCF construction site)	813273	818850			
IS(Mf)16	Impact Station (Close to HKBCF construction site)	814328	819497			
IS8(N)	Impact Station (Close to HKBCF construction site)	814413	818570			
SR4(N2)	Sensitive receiver (Tai Ho Inlet)	814688	817859			
SR4a	Sensitive receiver	815247	818067			
CS(Mf)3(N)	Control Station	808814	822355			

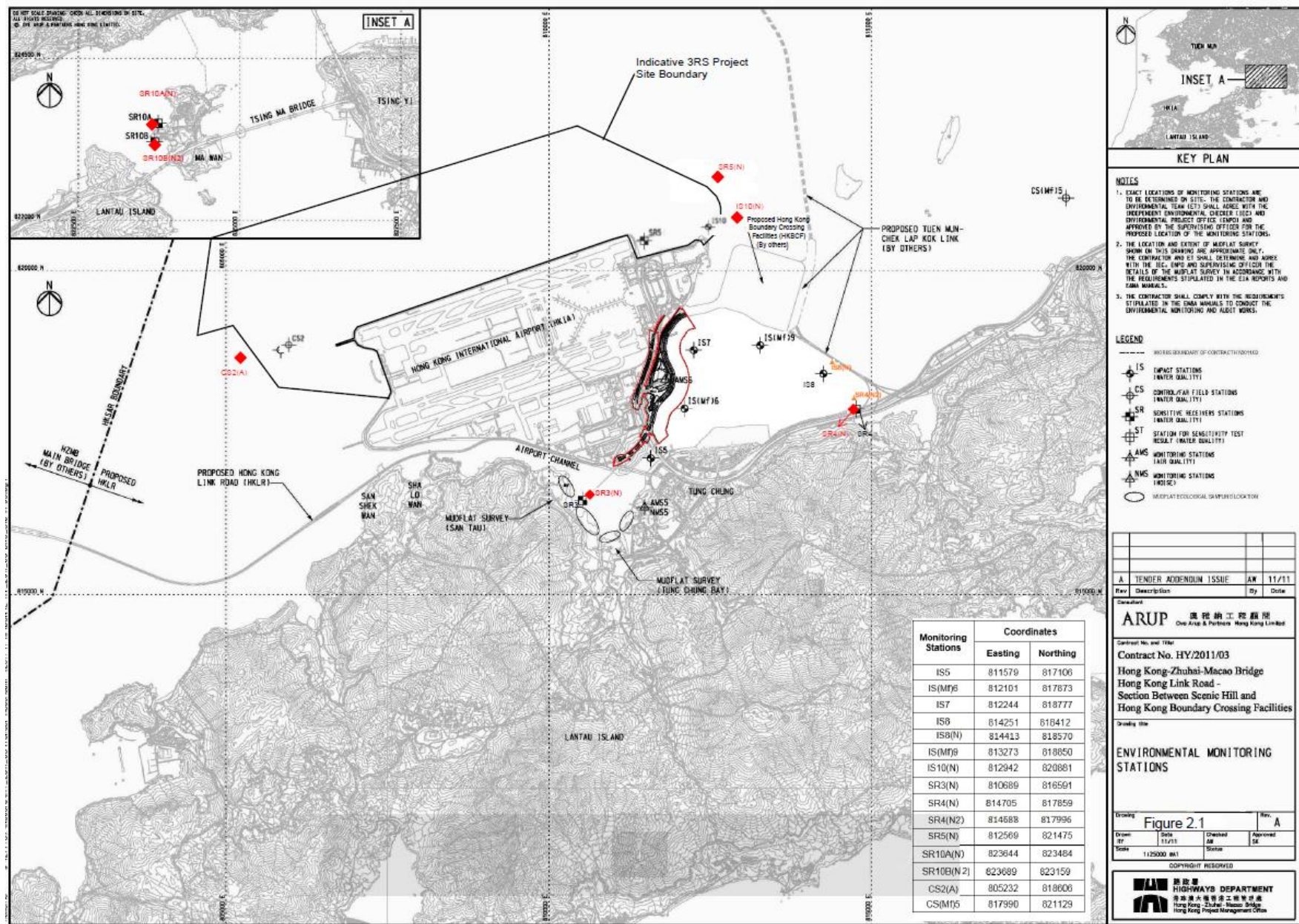


Figure 2.2c

Operational Phase Water Quality Monitoring Stations SR3(N), CS2(A), SR4(N2) & CS(Mf)5

(Source from Contract No. HY/2011/03 EM&A Report)

Environmental
Resources
Management



Station ID	Type	Coordinates		*Parameters, unit	Depth	Frequency
CS(Mf)5	Control Station	817990	821129			

*Notes:
In addition to the parameters presented monitoring location/position, time, water depth, sampling depth, tidal stages, weather conditions and any special phenomena or works underway nearby were also recorded.
Water Quality Monitoring Station CS(Mf)3 was relocated to CS(Mf)3(N) since 2 May 2017.
Water Quality Monitoring Station SR4 was relocated to SR4(N) since 2 March 2018.
Water Quality Monitoring Station SR4(N) was relocated to SR4(N2) since 12 June 2019
Water Quality Monitoring Station IS8 was relocated to IS8(N) since 12 June 2019.

Table 2.7 *Locations of Post-Construction Water Quality Monitoring Stations and the Corresponding Monitoring Requirements*

Station ID	Type	Coordinates		*Parameters, unit	Depth	Frequency
		Easting	Northing			
IS(Mf)11	Impact Station (Close to HKBCF construction site)	813562	820716	• Temperature(°C)	3 water	Post construction monitoring: 3 days per week, at mid-flood and mid-ebb tides for four weeks.
IS17	Impact Station (Close to HKBCF construction site)	814539	820391	• pH(pH unit)	depths:	
				• Turbidity (NTU)	1m	
SR7	Sensitive receivers (Tai Mo Do)	814293	821431	• Water depth (m)	below	
				• Salinity (ppt)	sea	
IS(Mf)9	Impact Station (Close to HKBCF construction site)	813273	818850	• DO (mg/L and % of saturation)	surface, mid-	
IS(Mf)16	Impact Station (Close to HKBCF construction site)	814328	819497	• SS (mg/L)	depth and 1m	
IS8(N)	Impact Station (Close to HKBCF construction site)	814413	818570		above sea bed.	
SR4(N2)	Sensitive receiver (Tai Ho Inlet)	814688	817996		If the water	
SR4a	Sensitive receiver	815247	818067		depth is	
CS(Mf)3(N)	Control Station	808814	822355		less than	
CS(Mf)5	Control Station	817990	821129		3m, mid-	
IS12	Impact Station (Close to TMCLKL construction site)	813218	823681		depth sampling only. If	
IS13	Impact Station (Close to TMCLKL construction site)	813667	824325		water depth less than	

Station ID	Type	Coordinates		*Parameters, unit	Depth	Frequency
		Easting	Northing			
IS14	Impact Station (Close to TMCLK construction site)	812592	824172		6m, mid-depth	
IS15	Impact Station (Close to TMCLK construction site)	813356	825008		may be omitted.	
SR8	Sensitive receiver (Gazettal beaches in Tuen Mun)	816306	825715			
SR9	Sensitive receiver (Butterfly Beach)	813601	825858			
SR10A(N)	Sensitive receiver (Ma Wan FCZ)	823644	823484			
CS4	Control Station	810025	824004			
CS6	Control Station	817028	823992			

***Notes:**

In addition to the parameters presented monitoring location/position, time, water depth, sampling depth, tidal stages, weather conditions and any special phenomena or works underway nearby were also recorded.

Water Quality Monitoring Station CS(Mf)3 was relocated to CS(Mf)3(N) since 2 May 2017.

Water Quality Monitoring Station SR4 was relocated to SR4(N) since 2 March 2018.

Water Quality Monitoring Station SR4(N) was relocated to SR4(N2) since 12 June 2019

Water Quality Monitoring Station IS8 was relocated to IS8(N) since 12 June 2019.

Water Quality Monitoring Station SR10A was relocated to SR10A(N) since 5 March 2020.

Table 2.8 *Locations of Operational Phase Water Quality Monitoring Stations and the Corresponding Monitoring Requirements*

Station ID	Type	Coordinates		*Parameters, unit	Depth	Frequency
		Easting	Northing			
IS(Mf)11	Impact Station (Close to HKBCF construction site)	813562	820716	<ul style="list-style-type: none"> • Temperature(°C) • pH(pH unit) • Turbidity (NTU) 	3 water depths: 1m, below sea	Monthly at each station, at mid-flood and mid-ebb tides during the first year of Project operation.
SR4(N2)	Sensitive receiver (Tai Ho Inlet)	814688	817996	<ul style="list-style-type: none"> • Water depth (m) • Salinity (ppt) 	surface, mid-depth and	
CS2(A)	Control Station	805232	818606	<ul style="list-style-type: none"> • DO (mg/L and % of 	1m	

Station ID	Type	Coordinates	*Parameters, unit	Depth	Frequency
CS(Mf)5	Control Station	817990 821129	saturation) • SS (mg/L)	above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.	

***Notes:**

In addition to the parameters presented monitoring location/position, time, water depth, sampling depth, tidal stages, weather conditions and any special phenomena or works underway nearby were also recorded. With reference to the EM&A Report under Contract No. HY/2011/03, water quality monitoring station SR3 was relocated to SR3(N) since 1 September 2017.

With reference to the EM&A Report under Contract No. HY/2011/03, water quality monitoring station SR4 was relocated to SR4(N) since 1 January 2018.

With reference to the EM&A Report under Contract No. HY/2011/03, water quality monitoring station SR4(N) was relocated to SR4(N2) since 21 August 2019.

With reference to the EM&A Report under Contract No. HY/2011/03, water quality monitoring station CS2 was relocated to CS2(A) since 23 August 2017.

Table 2.9 summarizes the equipment used in the impact, post construction and operational phase water quality monitoring programme.

Table 2.9 Water Quality Monitoring Equipment

Equipment	Model	Qty.
Water Sampler	Kahlsico Water-Bottle Model 135DW 150	1
Dissolved Oxygen Meter	YSI Pro 2030	1
pH Meter	HANNA HI 8314	1
	HANNA HI 9125	1
Turbidity Meter	HACH 2100Q	1
Monitoring Position Equipment	“Magellan” Handheld GPS Model explorist GC DGPS Koden KGP913MK2	4 1
Multi-Parameters	YSI ProDss 18A104824	1
	YSI ProDss 15M100005	1
	YSI ProDss 0001C6A7	1
	YSI ProDss 17H105557	1
	YSI ProDss 17E100747	1
	YSI ProDss 16H104234	1

Equipment	Model	Qty.
	YSI ProDss 16H104233	1
	YSI ProDss 00019CB2	1
Positioning Equipment	Furuno GP-170	1
Water Depth Detector	Lowrance Mark 5x / Garmin Striker 4	1

2.2.2 *Action & Limit Levels*

The Action and Limit Levels of the water quality monitoring are provided in *Appendix C*. The Event and Action plan is presented in *Appendix F*.

2.2.3 *Monitoring Schedule for the Monitoring Period*

Impact, post-construction and operational phase water quality monitoring were carried out in accordance with the Updated EM&A Manual. The schedules for water quality monitoring are reported in the *First to Eighty-ninth Monthly EM&A Reports*.

2.2.4 *Results and Observations*

A total of 456 monitoring events for impact water quality monitoring events, 12 monitoring events for post-construction water quality monitoring and 9 monitoring events for operational phase water quality monitoring were undertaken during the course of the Contract. Results of operational phase water quality monitoring between April and May 2021 were presented in *Ninety to Ninety-first Monthly EM&A Reports* under *Contract No. HY/2012/08*.

Comparison of EM&A results with baseline monitoring are summarized in *Tables 2.10 to 2.14*. The detailed water quality monitoring data were reported in the *First to Eighty-ninth Monthly EM&A Reports* and detailed statistical analysis were represented in the *First to Seventh Annual EM&A Reports*.

Table 2.10 Summary of Averages Level of Surface DO Level of Baseline, Impact and Post-construction Monitoring (in mg/L)

Monitoring Station	Tide	Average Baseline Monitoring	Average Impact Monitoring						Post Construction Monitoring
			Nov 2013 - Oct 2014	Nov 2014 - Oct 2015	Nov 2015 - Oct 2016	Nov 2016 - Oct 2017	Nov 2017 - Oct 2018	Nov 2018 - Oct 2019	
IS12	Mid-ebb	6.1	6.3	7.0	-	7.2	6.5	-	7.2
	Mid-flood	6.1	6.4	7.1	-	7.3	6.6	-	7.1
IS13	Mid-ebb	6.1	6.3	7.0	-	7.2	6.5	-	7.1
	Mid-flood	6.1	6.4	7.0	-	7.3	6.5	-	7.1
IS14	Mid-ebb	6.1	6.3	6.9	-	7.2	6.5	-	7.2
	Mid-flood	6.1	6.4	7.0	-	7.3	6.5	-	7.1
IS15	Mid-ebb	6.1	6.3	6.9	-	7.2	6.5	-	7.1
	Mid-flood	6.2	6.4	7.0	-	7.3	6.5	-	7.1
SR10A	Mid-ebb	6.0	6.4	6.9	-	7.3	6.4	-	6.9
	Mid-flood	6.0	6.4	7.0	-	7.4	6.5	-	6.8
SR8	Mid-ebb	6.2	6.4	6.9	-	7.2	6.5	-	7.1
	Mid-flood	6.2	6.4	7.0	-	7.3	6.6	-	7.1
SR9	Mid-ebb	6.0	6.3	6.9	-	7.2	6.5	-	7.2
	Mid-flood	6.0	6.4	7.0	-	7.3	6.5	-	7.1
IS(Mf)11	Mid-ebb	6.5	-	-	-	-	-	6.6	7.0
	Mid-flood	6.1	-	-	-	-	-	6.6	7.0
SR7	Mid-ebb	6.3	-	-	-	-	-	6.5	7.0
	Mid-flood	6.0	-	-	-	-	-	6.5	7.0
IS17	Mid-ebb	6.4	-	-	-	-	-	6.5	6.9
	Mid-flood	6.1	-	-	-	-	-	6.7	7.0
IS(Mf)16	Mid-ebb	6.3	-	-	-	-	-	6.6	6.9
	Mid-flood	6.3	-	-	-	-	-	6.7	7.0
IS(Mf)9	Mid-ebb	6.6	-	-	-	-	-	6.9	7.1
	Mid-flood	6.5	-	-	-	-	-	6.7	7.1
IS8(N)	Mid-ebb	6.4	-	-	-	-	-	6.7	7.0
	Mid-flood	6.4	-	-	-	-	-	6.7	7.0
SR4(N2)	Mid-ebb	6.1	-	-	-	-	-	6.4	6.9
	Mid-flood	6.3	-	-	-	-	-	6.7	6.9
SR4a	Mid-ebb	5.5	-	-	-	-	-	6.5	6.9
	Mid-flood	5.5	-	-	-	-	-	6.7	6.9

Table 2.11 Summary of Averages Level of Middle DO Level of Baseline, Impact and Post-construction Monitoring (in mg/L)

Monitoring Station	Tide	Average Baseline Monitoring	Average Impact Monitoring						Post Construction Monitoring
			Nov 2013 - Oct 2014	Nov 2014 - Oct 2015	Nov 2015 - Oct 2016	Nov 2016 - Oct 2017	Nov 2017 - Oct 2018	Nov 2018 - Oct 2019	
IS12	Mid-ebb	5.9	6.2	6.9	-	7.3	6.4	-	7.1
	Mid-flood	6.9	6.3	7.0	-	7.4	6.5	-	7.0
IS13	Mid-ebb	6.0	6.2	6.9	-	7.3	6.4	-	7.0
	Mid-flood	6.0	6.3	7.0	-	7.4	6.5	-	7.1
IS14	Mid-ebb	6.0	6.2	6.9	-	7.2	6.4	-	7.1
	Mid-flood	5.9	6.2	6.9	-	7.3	6.4	-	7.0
IS15	Mid-ebb	6.0	6.2	6.9	-	7.3	6.4	-	7.1
	Mid-flood	6.1	6.2	6.9	-	7.4	6.5	-	7.0
SR10A	Mid-ebb	6.0	6.2	6.8	-	7.3	6.4	-	6.8
	Mid-flood	5.9	6.3	6.9	-	7.4	6.5	-	6.7
IS(Mf)11	Mid-ebb	6.1	-	-	-	-	-	6.1	6.8
	Mid-flood	5.9	-	-	-	-	-	6.1	6.8
IS17	Mid-ebb	6.0	-	-	-	-	-	6.1	6.7
	Mid-flood	5.9	-	-	-	-	-	6.3	6.9
IS(Mf)16	Mid-ebb	6.3	-	-	-	-	-	-	-
	Mid-flood	6.1	-	-	-	-	-	-	-
IS(Mf)9	Mid-ebb	-	-	-	-	-	-	7.1	6.6
	Mid-flood	6.2	-	-	-	-	-	7.2	6.8

Table 2.12 Summary of Averages Level of Bottom DO Level of Baseline, Impact and Post-construction Monitoring (in mg/L)

Monitoring Station	Tide	Average Baseline Monitoring	Average Impact Monitoring						Post Construction Monitoring
			Nov 2013 - Oct 2014	Nov 2014 - Oct 2015	Nov 2015 - Oct 2016	Nov 2016 - Oct 2017	Nov 2017 - Oct 2018	Nov 2018 - Oct 2019	
IS12	Mid-ebb	5.9	6.1	6.8	-	7.3	6.4	-	7.1
	Mid-flood	5.9	6.2	6.8	-	7.4	6.5	-	7.0
IS13	Mid-ebb	5.9	6.1	6.7	-	7.3	6.4	-	7.1
	Mid-flood	5.9	6.1	6.8	-	7.4	6.5	-	7.0
IS14	Mid-ebb	5.9	6.0	6.7	-	7.3	6.4	-	7.1
	Mid-flood	5.9	6.1	6.8	-	7.4	6.4	-	7.0
IS15	Mid-ebb	5.9	6.0	6.7	-	7.3	6.5	-	7.1
	Mid-flood	6.0	6.1	6.8	-	7.4	6.5	-	7.1
SR10A	Mid-ebb	5.7	6.1	6.7	-	7.3	6.4	-	6.8
	Mid-flood	5.8	6.1	6.8	-	7.4	6.5	-	6.6
SR8	Mid-ebb	6.0	6.2	6.8	-	7.3	6.5	-	7.2
	Mid-flood	5.8	6.2	6.8	-	7.4	6.6	-	7.1
SR9	Mid-ebb	5.8	6.1	6.8	-	7.3	6.5	-	7.2
	Mid-flood	5.9	6.2	6.9	-	7.4	6.5	-	7.1
IS(Mf)11	Mid-ebb	5.9	-	-	-	-	-	5.8	6.8
	Mid-flood	5.8	-	-	-	-	-	5.9	6.9
SR7	Mid-ebb	6.1	-	-	-	-	-	6.3	7.0
	Mid-flood	5.9	-	-	-	-	-	6.3	6.9
IS17	Mid-ebb	5.7	-	-	-	-	-	5.9	6.8
	Mid-flood	5.8	-	-	-	-	-	6.1	6.9
IS(Mf)16	Mid-ebb	5.9	-	-	-	-	-	6.1	6.9
	Mid-flood	6.0	-	-	-	-	-	6.4	7.0
IS(Mf)9	Mid-ebb	6.6	-	-	-	-	-	6.6	7.1
	Mid-flood	6.7	-	-	-	-	-	6.5	7.0
IS8(N)	Mid-ebb	6.2	-	-	-	-	-	6.4	7.0
	Mid-flood	6.3	-	-	-	-	-	6.6	7.0
SR4(N2)	Mid-ebb	6.0	-	-	-	-	-	6.1	7.0
	Mid-flood	6.2	-	-	-	-	-	6.5	6.9
SR4a	Mid-ebb	5.3	-	-	-	-	-	6.0	6.9
	Mid-flood	5.2	-	-	-	-	-	6.3	6.9

Table 2.13 Summary of Averages Level of Depth-Averaged Turbidity Level of Baseline, Impact and Post-construction Monitoring

Monitoring Station	Tide	Average Baseline Monitoring	Average Impact Monitoring						Post Construction Monitoring
			Nov 2013 - Oct 2014	Nov 2014 - Oct 2015	Nov 2015 - Oct 2016	Nov 2016 - Oct 2017	Nov 2017 - Oct 2018	Nov 2018 - Oct 2019	
IS12	Mid-ebb	10.7	5.1	6.6	-	6.7	7.6	-	5.3
	Mid-flood	9.8	5.1	6.5	-	6.6	8.5	-	5.5
IS13	Mid-ebb	9.2	5.1	6.6	-	6.7	9.6	-	5.6
	Mid-flood	9.5	5.0	6.6	-	6.5	10.3	-	5.4
IS14	Mid-ebb	9.3	5.0	6.7	-	6.7	8.5	-	5.4
	Mid-flood	9.4	5.0	6.6	-	6.6	11.6	-	5.6
IS15	Mid-ebb	9.8	5.1	6.7	-	6.7	6.0	-	5.3
	Mid-flood	9.8	5.1	6.5	-	6.5	11.0	-	4.5
SR10A	Mid-ebb	7.1	4.9	6.5	-	6.6	6.3	-	3.5
	Mid-flood	7.0	4.8	6.4	-	6.5	7.1	-	4.2
SR8	Mid-ebb	11.0	5.0	6.5	-	6.5	7.2	-	5.5
	Mid-flood	10.1	5.0	6.4	-	6.4	7.9	-	5.0
SR9	Mid-ebb	7.2	4.9	6.6	-	6.6	6.3	-	5.0
	Mid-flood	8.5	4.9	6.5	-	6.4	7.5	-	4.4
IS(Mf)11	Mid-ebb	10.7	-	-	-	-	-	5.9	6.4
	Mid-flood	12.9	-	-	-	-	-	7.9	7.7
SR7	Mid-ebb	8.7	-	-	-	-	-	5.5	5.6
	Mid-flood	11.7	-	-	-	-	-	7.3	7.2
IS17	Mid-ebb	9.8	-	-	-	-	-	5.9	8.0
	Mid-flood	12.1	-	-	-	-	-	5.8	6.1
IS(Mf)16	Mid-ebb	8.9	-	-	-	-	-	6.8	7.2
	Mid-flood	11.3	-	-	-	-	-	7.2	6.6
IS(Mf)9	Mid-ebb	8.2	-	-	-	-	-	6.0	6.0
	Mid-flood	10.2	-	-	-	-	-	7.2	8.1
IS8(N)	Mid-ebb	8.4	-	-	-	-	-	7.4	9.2
	Mid-flood	11.9	-	-	-	-	-	6.4	6.2
SR4(N2)	Mid-ebb	8.9	-	-	-	-	-	7.0	9.2
	Mid-flood	10.3	-	-	-	-	-	6.0	6.8
SR4a	Mid-ebb	8.9	-	-	-	-	-	5.8	6.1
	Mid-flood	7.8	-	-	-	-	-	5.8	6.1

Table 2.14 Summary of Averages Level of Depth-Averaged SS Level of Baseline, Impact and Post-construction Monitoring

Monitoring Station	Tide	Average Baseline Monitoring	Average Impact Monitoring						Post Construction Monitoring
			Nov 2013 - Oct 2014	Nov 2014 - Oct 2015	Nov 2015 - Oct 2016	Nov 2016 - Oct 2017	Nov 2017 - Oct 2018	Nov 2018 - Oct 2019	
IS12	Mid-ebb	9.2	5.3	7.7	-	9.1	10.3	-	5.1
	Mid-flood	9.5	5.4	7.7	-	8.8	10.0	-	5.5
IS13	Mid-ebb	10.0	5.2	7.7	-	9.3	10.3	-	5.9
	Mid-flood	10.5	5.2	7.7	-	9.0	12.1	-	5.5
IS14	Mid-ebb	10.4	5.3	7.8	-	8.4	8.6	-	4.9
	Mid-flood	9.7	5.3	7.7	-	8.1	13.7	-	6.2
IS15	Mid-ebb	9.6	5.3	7.7	-	9.1	7.7	-	5.1
	Mid-flood	11.0	5.4	7.6	-	9.0	13.4	-	4.7
SR10A	Mid-ebb	10.3	5.3	7.6	-	8.5	7.4	-	4.2
	Mid-flood	10.2	5.2	7.5	-	8.3	9.8	-	4.8
SR8	Mid-ebb	10.1	5.2	7.6	-	8.4	8.5	-	5.4
	Mid-flood	11.3	5.3	7.5	-	8.3	10.7	-	4.9
SR9	Mid-ebb	8.8	5.2	7.6	-	8.4	7.8	-	4.7
	Mid-flood	9.9	5.3	7.5	-	8.2	10.0	-	4.6
IS(Mf)11	Mid-ebb	9.8	-	-	-	-	-	6.5	6.4
	Mid-flood	10.3	-	-	-	-	-	8.1	7.9
SR7	Mid-ebb	11.4	-	-	-	-	-	6.2	6.2
	Mid-flood	10.4	-	-	-	-	-	8.0	6.8
IS17	Mid-ebb	10.7	-	-	-	-	-	7.2	8.7
	Mid-flood	11.7	-	-	-	-	-	7.0	7.4
IS(Mf)16	Mid-ebb	11.3	-	-	-	-	-	8.1	8.1
	Mid-flood	10.4	-	-	-	-	-	8.2	7.4
IS(Mf)9	Mid-ebb	10.9	-	-	-	-	-	7.6	7.1
	Mid-flood	14.7	-	-	-	-	-	8.3	8.4
IS8(N)	Mid-ebb	11.3	-	-	-	-	-	8.5	11.3
	Mid-flood	13.5	-	-	-	-	-	7.7	7.0
SR4(N2)	Mid-ebb	11.1	-	-	-	-	-	7.4	9.9
	Mid-flood	12.2	-	-	-	-	-	7.6	6.3
SR4a	Mid-ebb	9.1	-	-	-	-	-	6.9	6.9
	Mid-flood	9.8	-	-	-	-	-	6.8	6.4

Fifty-eight (58) Action Level of Dissolved Oxygen (Surface and Middle), eighty-three (83) Action Level and eighteen (18) Limit Level exceedances of Dissolved Oxygen (Bottom), twenty-seven (27) Action Level and one (1) Limit Level exceedances of Suspended Solids (SS) were recorded for water quality monitoring during the impact monitoring period. Summary of the exceedances is reported in *Table 2.15*. Actions were taken in accordance with the Event Action Plan as presented in *Appendix F*. The exceedances were considered not related to this Contract upon further investigation. Detailed investigation reports on exceedances were presented in *Second, Fifth, Forty-ninth, Fiftieth and Sixty-seventh to Seventy-third Monthly EM&A Reports*.

A total of 12 monitoring events were undertaken for post-construction water quality monitoring. Post-construction monitoring results are presented graphically in *Appendix E* and detailed post-construction water quality monitoring data were reported in the *Seventy-Seventh and Seventy-Eighth Monthly EM&A Reports*.

A total of 9 monitoring events were undertaken for operational phase water quality monitoring. Operational phase monitoring results are presented graphically in *Appendix E* and detailed operational phase water quality monitoring data were reported in the *Eightieth to Eighty-Eighth Monthly EM&A Reports*

Table 2.15 ***Summary of Action Level and Limit Level Exceedance of Water Quality Monitoring***

Period	Station	Parameter	Number of Action Level Exceedance(s)	Number of Limit Level Exceedance(s)
December 2013	IS15	SS	1	-
	SR8	SS	1	-
	SR9	SS	1	-
	IS15	SS	1	-
	SR9	SS	1	-
March 2014	IS12	SS	-	1
	IS14	SS	1	-
November 2017	IS12	SS	2	-
	IS13	SS	2	-
	SR8	SS	2	-
	SR10A	SS	1	-
	SR9	SS	1	-
	IS14	SS	1	-
	IS15	SS	1	-
December 2017	IS15	SS	2	-
	SR10A	SS	1	-
	IS14	SS	1	-
May 2019	IS8	SS	1	-
	SR4(N)	SS	1	-
July 2019	IS(Mf)11	Surface & Middle DO	4	-
	IS(Mf)11	Bottom DO	5	11
	IS(Mf)16	Surface & Middle DO	1	-
	IS(Mf)16	Bottom DO	4	1
	IS(Mf)9	Bottom DO	1	-
	IS17	Surface & Middle DO	3	-
	IS17	Bottom DO	11	1
	IS8(N)	Bottom DO	2	1
	SR4(N2)	Surface & Middle DO	1	-
	SR4(N2)	Bottom DO	7	-
	SR4a	Surface & Middle DO	1	-
	SR4a	Bottom DO	7	-
	SR7	Surface & Middle DO	2	-
	SR7	Bottom DO	3	-
August 2019	IS(Mf)11	Surface & Middle DO	6	-
	IS(Mf)11	Bottom DO	7	3
	IS(Mf)16	Surface & Middle DO	2	-
	IS(Mf)16	Bottom DO	2	-
	IS(Mf)9	Surface & Middle DO	1	-
	IS17	Surface & Middle DO	6	-
	IS17	Bottom DO	7	-
	IS8(N)	Surface & Middle DO	2	-

	IS8(N)	Bottom DO	2	-
	SR4(N2)	Surface & Middle DO	4	-
	SR4(N2)	Bottom DO	1	1
	SR4a	Surface & Middle DO	3	-
	SR4a	Bottom DO	6	-
	SR7	Surface & Middle DO	2	-
	SR7	Bottom DO	3	-
	SR7	SS	1	-
September 2019	IS(Mf)11	Surface & Middle DO	4	-
	IS(Mf)11	Bottom DO	3	-
	IS(Mf)16	Surface & Middle DO	1	-
	IS(Mf)9	Surface & Middle DO	2	-
	IS(Mf)9	SS	1	-
	IS17	Surface & Middle DO	5	-
	IS17	Bottom DO	6	-
	IS8(N)	Surface & Middle DO	2	-
	SR4(N2)	Surface & Middle DO	2	-
	SR4(N2)	Bottom DO	3	-
	SR4a	Surface & Middle DO	1	-
	SR4a	Bottom DO	2	-
	SR7	Surface & Middle DO	3	-
	SR7	Bottom DO	1	-
October 2019	SR7	SS	2	-
November 2019	IS(Mf)16	SS	1	-

In general, DO, turbidity and suspended solids levels were varied across the impact monitoring period and these variations were however not consistent throughout the impact monitoring period.

According to the EIA prediction, no SS exceedance was anticipated from this Project at the water sensitive receivers nearby the vicinity of Contract (WSR 22a, WSR 22b and WSR 22c). Although exceedances on depth-averaged SS were recorded in the impact monitoring period, the exceedances were considered not related to this Contract upon further investigation. The impact monitoring results were considered influenced by fluctuation of background regional water quality instead of indicating any unacceptable impacts from this Contract.

During the post-construction water quality monitoring, no non-compliance of the water quality limit for DO, turbidity and suspended solids levels was recorded.

With the implementation of the monitoring programme for water quality and environmental mitigation measures, the EM&A programme was considered adequate and effective in monitoring and minimizing the potential environmental impacts from the Contract.

2.3 *DOLPHIN MONITORING*

2.3.1 *Monitoring Requirements*

Impact dolphin monitoring is required to be conducted by a qualified dolphin specialist team to evaluate whether there have been any effects on the dolphins. In order to fulfil the EM&A requirements and make good use of available resources, Contract No. HY/2012/08 has taken over the responsibility for implementation of dolphin monitoring from HZMB HKLR Contract No. HY/2011/03 since October 2019.

According to the EM&A Manual, Operational Phase Monitoring on dolphin monitoring shall be undertaken based upon the frequency of forty-eight, one-day survey events at a frequency of 2 per month over a period of 24 months following cessation of the construction. Post construction (operational) phase dolphin monitoring commenced since June 2019.

2.3.2 *Monitoring Equipment*

Table 2.16 summarizes the equipment used for the impact dolphin monitoring.

Table 2.16 Dolphin Monitoring Equipment

Equipment	Model
Global Positioning System (GPS)	Garmin 18X-PC Geo One Phottix
Camera	Nikon D90 300m 2.8D fixed focus Nikon D90 20-300m zoom lens
Laser Binoculars	Infinitor LRF 1000
Marine Binocular	Bushell 7 x 50 marine binocular with compass and reticules
Vessel for Monitoring	65 foot single engine motor vessel with viewing platform 4.5m above water level

2.3.3 Monitoring Parameter, Frequencies & Duration

Dolphin monitoring should cover all transect lines in Northeast Lantau (NEL) and the Northwest Lantau (NWL) survey areas twice per month throughout the entire construction period. The monitoring data should be compatible with, and should be made available for, long-term studies of small cetacean ecology in Hong Kong. In order to provide a suitable long-term dataset for comparison, identical methodology and line transects employed in baseline dolphin monitoring was followed in the impact dolphin monitoring.

2.3.4 Monitoring Location

The impact and operational phase dolphin monitoring were carried out in the NEL and NWL along the line transect as depicted in *Figure 2.3*. The co-ordinates of all transect lines are shown in *Table 2.17* below.

Table 2.17 Impact and Operational Dolphin Monitoring Line Transect Co-ordinates

Line No.		Easting	Northing	Line No.		Easting	Northing
1	Start Point	804671	815456	13	Start Point	816506	819480
1	End Point	804671	831404	13	End Point	816506	824859
2	Start Point	805476	820800*	14	Start Point	817537	820220

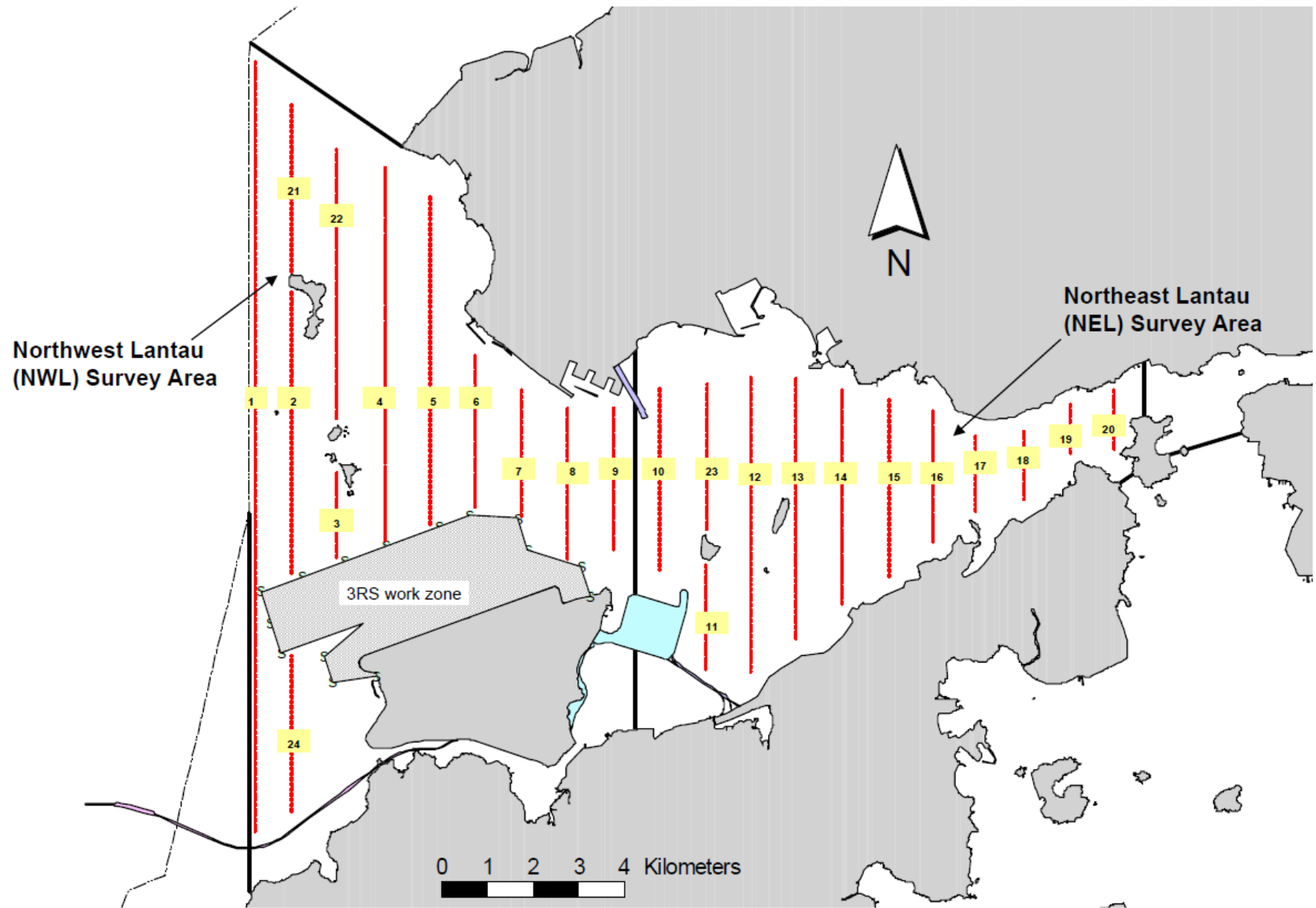


Figure 2.3

Layout of Transect Lines of Dolphin Monitoring in Northwest and Northeast Lantau Areas

Line No.		Easting	Northing	Line No.		Easting	Northing
2	End Point	805476	826654	14	End Point	817537	824613
3	Start Point	806464	821150*	15	Start Point	818568	820735
3	End Point	806464	822911	15	End Point	818568	824433
4	Start Point	807518	821500*	16	Start Point	819532	821420
4	End Point	807518	829230	16	End Point	819532	824209
5	Start Point	808504	821850*	17	Start Point	820451	822125
5	End Point	808504	828602	17	End Point	820451	823671
6	Start Point	809490	822150*	18	Start Point	821504	822371
6	End Point	809490	825352	18	End Point	821504	823761
7	Start Point	810499	822000*	19	Start Point	822513	823268
7	End Point	810499	824613	19	End Point	822513	824321
8	Start Point	811508	821123	20	Start Point	823477	823402
8	End Point	811508	824254	20	End Point	823477	824613
9	Start Point	812516	821303	21	Start Point	805476	827081
9	End Point	812516	824254	21	End Point	805476	830562
10	Start Point	813525	821176	22	Start Point	806464	824033
10	End Point	813525	824657	22	End Point	806464	829598
11	Start Point	814556	818853	23	Start Point	814559	821739
11	End Point	814556	820992	23	End Point	814559	824768
12	Start Point	815542	818807	24*	Start Point	805476*	815900*
12	End Point	815542	824882	24*	End Point	805476*	819100*

Remarks: The coordinates of several starting and ending points have been revised since August 2017 due to the presence of a work zone to the north of the airport platform with intense construction activities in association with the construction of the third runway expansion for

the Hong Kong International Airport. Co-ordinates in red and marked with asterisk are revised co-ordinates of transect line.

2.3.5 *Action & Limit Levels*

The Action and Limit levels of dolphin impact monitoring are shown in *Appendix C*. The Event Action Plan is presented in *Appendix F*.

2.3.6 *Monitoring Schedule for the Monitoring Period*

The dolphin monitoring schedules for the monitoring period are provided in the *First to Eighty-ninth Monthly EM&A Reports*.

2.3.7 *Results & Observations*

A total of 158 and 19 monitoring events for impact dolphin monitoring events and operational phase dolphin monitoring were undertaken during the course of this Contract, respectively. Results of the operational phase dolphin monitoring between April 2021 and August 2021 were presented in *Ninety to Ninety-fourth Monthly EM&A Reports* under Contract No. HY/2012/08. Results of the operational phase dolphin monitoring between September 2021 and May 2022 were/will be presented in *Monthly EM&A Reports* under Agreement No. HMWSD 1/202(EP).

Summary of the average encounter rates of Chinese White Dolphins in NEL and NWL survey areas and comparison of average dolphin group size are shown in *Tables 2.18 and 2.19*.

Table 2.18 *Average Dolphin Encounter Rates*

	Encounter rate (STG) (no. of on-effort dolphin sightings per 100 km of survey effort)		Encounter rate (ANI) (no. of dolphins from all on-effort sightings per 100 km of survey effort)	
	Northeast Lantau	Northwest Lantau	Northeast Lantau	Northwest Lantau
Impact Phase (2018- 19)	0.00	1.42 ± 1.80	0.00	3.62 ± 4.93
Impact Phase (2017- 18)	0.00	2.68 ± 3.04	0.00	9.02 ± 14.63

Impact Phase (2016-17)	0.00	2.35 ± 2.62	0.00	8.57 ± 11.05
Impact Phase (2015-16)	0.00	2.10 ± 1.83	0.00	8.54 ± 8.53
Impact Phase (2014-15)	0.11 ± 0.54	2.54 ± 2.49	0.11 ± 0.54	11.64 ± 14.04
Impact Phase (2013-14)	0.22 ± 0.74	6.93 ± 4.08	0.76 ± 2.59	26.31 ± 17.56
Transitional Phase (2012-13)	1.70 ± 2.26	7.68 ± 4.36	4.75 ± 7.61	27.51 ± 18.06
Baseline Phase (2011-12)	6.05 ± 5.04	7.75 ± 5.69	19.91 ± 21.30	29.57 ± 26.96

Comparison of average daily dolphin encounter rates from six years of impact monitoring phases (November 2013 - October 2019), transitional phase (November 2012 - October 2013) and baseline phase monitoring periods (February 2011 - January 2012). (± denotes the standard deviation of the value)

Table 2.19 Comparison of Average Dolphin Group Size

	Average Dolphin Group Size		
	Overall	Northeast Lantau	Northwest Lantau
Impact Phase (2018-19)	2.52 ± 1.45 (n = 27)	0.00	2.52 ± 1.45 (n = 27)
Impact Phase (2017-18)	3.12 ± 2.86 (n = 42)	0.00	3.12 ± 2.86 (n = 42)
Impact Phase (2016-17)	3.51 ± 2.68 (n = 43)	0.00	3.51 ± 2.68 (n = 43)
Impact Phase (2015-16)	3.73 ± 3.14 (n = 45)	1.00 (n = 1)	3.80 ± 3.14 (n = 44)
Impact Phase (2014-15)	4.24 ± 3.15 (n = 54)	1.00 (n = 1)	4.30 ± 3.15 (n = 53)
Impact Phase (2013-14)	3.76 ± 2.57 (n = 136)	5.00 ± 2.71 (n = 4)	3.73 ± 2.57 (n = 132)
Transitional Phase (2012-13)	3.37 ± 2.98 (n = 186)	2.64 ± 2.38 (n = 22)	3.47 ± 3.05 (n = 164)
Baseline Phase (2011-12)	3.32 ± 2.86 (n = 288)	2.80 ± 2.35 (n = 79)	3.52 ± 3.01 (n = 209)

Comparison of average dolphin group size from six years of impact monitoring phases (November 2013 - October 2019), transitional phase (November 2012 - October 2013) and baseline phase monitoring periods (February 2011 - January 2012). (± denotes the standard deviation of the value)

Eleven (11) Action Level and twenty (20) Limit Level exceedances were recorded for impact dolphin monitoring during the impact monitoring period. Three (3) Limit Level exceedances were recorded for quarterly post-construction (operational) dolphin monitoring data between June 2020 and March 2021. Detailed investigation reports on exceedances were presented in *First to Twenty-ninth Quarterly EM&A Reports*.

According to the baseline results of the approved EIA Report, the dolphin groups were largely sighted near waters around Lung Kwu Chau and Sha Chau. There was no dolphin sighted along the alignment of this Contract. Dolphins are observed heavily utilized area around Lung Kwu Chau and less frequently in the North Lantau region where the works area of this Contract is situated. The monitoring results in the impact monitoring period are considered to be in line with the EIA predictions, and the review of monitoring data suggested that no unacceptable impacts was noted from the marine works under this Contract.

With the implementation of the monitoring programme for dolphin monitoring, the EM&A programme was considered adequate and effective in monitoring and minimizing the potential environmental impacts from the Contract.

2.3.8 Marine Mammal Exclusion Zone Monitoring

Daily 250 m marine mammal exclusion zone monitoring was undertaken during the period of marine works under this Contract. One sighting of the Indo-Pacific humpback dolphin (i.e. Chinese White Dolphin) *Sousa chinensis* was recorded on 20 February 2014 during the exclusion zone monitoring. The dolphin group of three was sighted within the 250 m marine mammal exclusion zone from a dredging barge sighting platform by the marine mammal observer. The marine dredging work was subsequently suspended until the observer has confirmed that the area is continuously clear of dolphin for a period of 30 minutes. The *Dolphin Intrusion Report* is presented in *Appendix J* of the *Forth Monthly EM&A Report*.

Passive Acoustic Monitoring (PAM) was also implemented for the detection of marine mammal when dredging, reclamation or marine sheet piling works were carried out outside the daylight hours under this Contract.

2.4 *POST-TRANSLOCATION CORAL MONITORING*

Four (4) Post-Translocation Coral Monitoring Surveys were conducted on 17 January 2014, 16 April 2014, 24 July 2014 and 23 October 2014 and the results were provided in the *First to Fourth Quarterly Post-Translocation Coral Monitoring Report*. The findings indicated that no Action or Limit Levels exceedances was recorded for coral monitoring as increase in percentage of partial mortality was not detected for both the tagged translocated and natural coral colonies when comparing to the pre-translocation dataset.

2.5 *EM&A SITE INSPECTION*

Site inspections were carried out on weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures under the Contract. A total of 380 site inspections were carried out in the impact monitoring period. Key observations were summarized in the section of *EM&A Site Inspection* in the *First to Eighty-ninth Monthly EM&A Reports*. The Contractor has rectified all of the observations identified during environmental site inspections in the impact monitoring period.

2.6 *WASTE MANAGEMENT STATUS*

Wastes generated during the impact monitoring period include construction wastes (inert and non-inert), imported fill, recyclable materials, chemical waste and marine sediments. The summary of waste generation amount is presented in *Appendix G*.

Waste monitoring and audit programme has been undertaken during the impact monitoring period. Wastes arising from this Contract have been managed in accordance with the recommendations in the EIA Report, the EM&A Manual, the Waste Management Plan and other relevant statutory requirements.

2.7 ENVIRONMENTAL LICENSES AND PERMITS

A summary of the environmental licenses and permits for this Contract is presented in *Table 2.20* below.

Table 2.20 Summary of Environmental Licenses and Permits

License/ Permit	License or Permit No.	Date of Issue	Date of Expiry	License/ Permit Holder	Remarks
Environmental Permit	EP-354/2009/A	08-Dec-10	NA	HyD	Tuen Mun- Chek Lap Kok Link
Environmental Permit	EP-354/2009/B	28-Jan-14	NA	HyD	Tuen Mun- Chek Lap Kok Link
Environmental Permit	EP-354/2009/D	13-Mar-15	N/A	HyD	Tuen Mun- Chek Lap Kok Link
Chemical Waste Registration	5213-422-D2516-01	10-Sep-13	Throughout the Contract	DBJV	-
Chemical Waste Registration	5213-951-D2591-01	25-May-16	Throughout the Contract	DBJV	Southern Landfall
Chemical Waste Registration	5213-422-D2516-02	18-Jan-17	Throughout the Contract	DBJV	Northern Landfall
Construction Dust Notification	363510	19-Aug-13	Throughout the Contract	DBJV	-
Construction Dust Notification	403620	10-Jun-16	Throughout the Contract	DBJV	Southern Landfall
Construction Dust Notification	435068	27-Jun-18	Throughout the Contract	DBJV	Northern Landfall
Construction Dust Notification	435505	12-Jul-18	Throughout the Contract	DBJV	Southern Landfall
Construction Waste Disposal Account	7018108	19-Aug-13	Throughout the Contract	DBJV	Waste disposal in Contract HY/2012/08
Construction Waste Disposal Account	7021715	12-Jan-17	12-Apr-17	DBJV	Vessel disposal
Waste Water Discharge License	WT00017707-2013	18-Nov-13	30-Nov-18	DBJV	For works in site WA18
Waste Water Discharge License	WT00018433-2014	06-Mar-14	31-Mar-19	DBJV	For works in site Portion N6
Waste Water Discharge License	WT00019248-2014	05-Jun-14	30-Jun-19	DBJV	For site Portion N6 and Reclamation Area E
Waste Water Discharge License	WT00025944-2016	15-Dec-16	31-Dec-21	DBJV	Southern Landfall
Waste Water Discharge License	WT00031435-2018	02-Aug-18	31-Aug-23	DBJV	Southern Landfall
Waste Water Discharge License	WT00034060-2019	25-Jul-19	30-Jun-24	DBJV	Northern Landfall (4 Discharge Point)

License/ Permit	License or Permit No.	Date of Issue	Date of Expiry	License/ Permit Holder	Remarks
Marine Dumping Permit	EP/MD/14-072	01-Nov-13	30-Apr-14	DBJV	For Type 1
Marine Dumping Permit	EP/MD/14-071	01-Dec-13	31-Dec-13	DBJV	For Type 1 (dedicated site) and Type 2
Marine Dumping Permit	EP/MD/14-108	01-Jan-14	31-Jan-14	DBJV	For Type 1 (dedicated site) and Type 2
Marine Dumping Permit	EP/MD/14-124	01-Feb-14	28-Feb-14	DBJV	For Type 1 (dedicated site) and Type 2
Marine Dumping Permit	EP/MD/14-140	01-Mar-14	31-Mar-14	DBJV	For Type 1 (dedicated site) and Type 2
Marine Dumping Permit	EP/MD/14-157	03-Apr-14	30-Apr-14	DBJV	For Type 1 (dedicated site) and Type 2
Marine Dumping Permit	EP/MD/15-007	01-May-14	31-May-14	DBJV	For Type 1 (dedicated site) and Type 2
Marine Dumping Permit	EP/MD/15-006	01-May-14	31-Oct-14	DBJV	For Type 1
Marine Dumping Permit	EP/MD/15-026	31-May-14	29-Jun-14	DBJV	For Type 1 (dedicated site) and Type 2
Marine Dumping Permit	EP/MD/15-045	30-Jun-14	29-Jul-14	DBJV	For Type 1 (dedicated site) and Type 2
Marine Dumping Permit	EP/MD/15-061	01-Aug-14	31-Aug-14	DBJV	For Type 1 (dedicated site) and Type 2
Marine Dumping Permit	EP/MD/15-100	20-Oct-14	19-Nov-14	DBJV	For Type 1 (dedicated site) and Type 2
Marine Dumping Permit	EP/MD/15-142	07-Nov-14	31-Jan-15	DBJV	For Type 1 (Open Sea Disposal)
Marine Dumping Permit	EP/MD/17-015	07-May-16	06-Jun-16	DBJV	Southern Landfall
Marine Dumping Permit	EP/MD/17-036	07-Jun-16	06-Jul-16	DBJV	Southern Landfall
Marine Dumping Permit	EP/MD/17-070	07-Aug-16	06-Sep-16	DBJV	Southern Landfall
Marine Dumping Permit	EP/MD/17-086	09-Sep-16	08-Oct-16	DBJV	Southern Landfall
Marine Dumping Permit	EP/MD/17-108	16-Nov-16	15-Dec-16	DBJV	Southern Landfall
Marine Dumping Permit	EP/MD/17-103	16-Dec-16	13-Jun-17	DBJV	Northern Landfall
Marine Dumping Permit	EP/MD/17-121	16-Dec-16	15-Jan-17	DBJV	Northern Landfall
Marine Dumping Permit	EP/MD/17-164	16-Jan-17	15-Feb-17	DBJV	Northern Landfall

License/ Permit	License or Permit No.	Date of Issue	Date of Expiry	License/ Permit Holder	Remarks
Marine Dumping Permit	EP/MD/18-006	07-May-17	06-Jun-17	DBJV	Southern Landfall
Marine Dumping Permit	EP/MD/18-036	21-Oct-17	20-Nov-17	DBJV	Type 1 (Dedicated site) and Type 2 (Confined Marine Disposal)
Marine Dumping Permit	EP/MD/18-087	21-Nov-17	20-Dec-17	DBJV	Type 1 (Dedicated site) and Type 2 (Confined Marine Disposal)
Marine Dumping Permit	EP/MD/18-098	21-Dec-17	20-Jan-18	DBJV	Type 1 (Dedicated site) and Type 2 (Confined Marine Disposal)
Marine Dumping Permit	EP/MD/18-118	21-Jan-18	20-Feb-18	DBJV	Type 1 (Dedicated site) and Type 2 (Confined Marine Disposal)
Marine Dumping Permit	EP/MD/18-125	21-Feb-18	20-Mar-18	DBJV	Type 1 (Dedicated site) and Type 2 (Confined Marine Disposal)
Marine Dumping Permit	EP/MD/18-133	22-Mar-18	21-Apr-18	DBJV	Type 1 (Dedicated site) and Type 2 (Confined Marine Disposal)
Marine Dumping Permit	EP/MD/19-001	24-Apr-18	23-May-18	DBJV	Type 1 (Dedicated site) and Type 2 (Confined Marine Disposal)
Marine Dumping Permit	EP/MD/19-009	28-Jun-18	27-Jul-18	DBJV	Type 1 (Dedicated site) and Type 2 (Confined Marine Disposal)
Marine Dumping Permit	EP/MD/19-024	28-Aug-18	27-Sep-18	DBJV	Type 1 (Dedicated site) and Type 2 (Confined Marine Disposal)
Marine Dumping Permit	EP/MD/19-015	05-Sep-18	04-Mar-19	DBJV	Catepillar Area
Marine Dumping Permit	EP/MD/19-034	28-Sep-18	27-Oct-18	DBJV	SVS
Marine Dumping Permit	EP/MD/19-041	05-Oct-18	04-Nov-18	DBJV	Type 1 (Dedicated site) and Type 2 (Confined Marine Disposal)
Marine Dumping Permit	EP/MD/19-057	05-Nov-18	04-Dec-18	DBJV	Type 1 (Dedicated site) and Type 2 (Confined Marine Disposal)
Marine Dumping Permit	EP/MD/19-063	19-Nov-18	18-May-19	DBJV	Type 1 (Open Sea Disposal)
Marine Dumping Permit	EP/MD/19-083	05-Jan-19	04-Feb-19	DBJV	Type 1 (Dedicated site) and Type 2 (Confined Marine Disposal)
Marine Dumping Permit	EP/MD/19-097	05-Feb-19	04-Mar-19	DBJV	Type 1 (Dedicated site) and Type 2 (Confined Marine Disposal)

License/ Permit	License or Permit No.	Date of Issue	Date of Expiry	License/ Permit Holder	Remarks
Marine Dumping Permit	EP/MD/19-109	05-Mar-19	04-Apr-19	DBJV	Type 1 (Dedicated site) and Type 2 (Confined Marine Disposal)
Marine Dumping Permit	EP/MD/19-121	05-Apr-19	04-May-19	DBJV	Type 1 (Dedicated site) and Type 2 (Confined Marine Disposal)
Marine Dumping Permit	EP/MD/20-001	05-May-19	04-Jun-19	DBJV	Type 1 (Dedicated site) and Type 2 (Confined Marine Disposal)
Marine Dumping Permit	EP/MD/20-013	19-May-19	18-Nov-19	DBJV	Type 1 (Open Sea Disposal)
Construction Noise Permit	GW-RW0691-13	15-Oct-13	14-Apr-14	DBJV	For Dredging and Reclamation Works
Construction Noise Permit	GW-RW0035-13	27-Jan-14	26-Jul-14	DBJV	For Dredging and Reclamation Works
Construction Noise Permit	GW-RW0095-14	10-Feb-14	09-Aug-14	DBJV	For Dredging and Reclamation Works
Construction Noise Permit	GW-RW0822-13	14-Nov-13	10-May-14	DBJV	For works in site WA18
Construction Noise Permit	GW-RS0814-13	15-Nov-13	10-May-14	DBJV	For works in site WA23
Construction Noise Permit	GW-RW0029-14	27-Jan-14	26-Jul-14	DBJV	For Portion N6
Construction Noise Permit	GW-RW0077-14	17-Feb-14	16-Aug-14	DBJV	For Portion N6
Construction Noise Permit	GW-RW0223-14	29-Mar-14	28-Sep-14	DBJV	For works in site Portion N6
Construction Noise Permit	GW-RW0234-14	29-Mar-14	28-Sep-14	DBJV	For Dredging and Reclamation Works
Construction Noise Permit	GW-RS0362-14	11-May-14	10-Nov-14	DBJV	For works in site WA23
Construction Noise Permit	GW-RW0550-14	25-Jul-14	24-Jan-15	DBJV	For Dredging and Reclamation Works
Construction Noise Permit	GW-RS0674-14	18-Sep-14	17-Mar-15	DBJV	For GI works at Southern Landfall
Construction Noise Permit	GW-RW0706-14	29-Sep-14	28-Mar-15	DBJV	For Portion N6
Construction Noise Permit	GW-RW0674-14	18-Sep-14	17-Mar-15	DBJV	For GI Works at Southern Landfall
Construction Noise Permit	GW-RW0970-14	17-Dec-14	14-May-15	DBJV	For Dredging and Reclamation Works
Construction Noise Permit	GW-RS0847-14	11-May-14	10-May-15	DBJV	For works in site WA23
Construction Noise Permit	GW-RW0350-15	14-Jul-15	13-Dec-15	DBJV	For site WA23
Construction Noise Permit	GW-RW0847-14	11-Nov-14	10-May-15	DBJV	For site WA23

License/ Permit	License or Permit No.	Date of Issue	Date of Expiry	License/ Permit Holder	Remarks
Construction Noise Permit	GW-RW0123-15	20-Mar-15	19-May-15	DBJV	For Dredging and Reclamation Works
Construction Noise Permit	GW-RW0150-15	01-Apr-15	30-Sep-15	DBJV	For GI Works at Southern Landfall
Construction Noise Permit	GW-RW0204-15	11-May-15	10-Nov-15	DBJV	For site WA23
Construction Noise Permit	GW-RW0216-15	20-May-15	19-Jul-15	DBJV	For Dredging and Reclamation Works
Construction Noise Permit	GW-RW0140-15	29-Mar-15	28-Sep-15	DBJV	For Portion N6
Construction Noise Permit	GW-RW0311-15	20-Jul-15	19-Oct-15	DBJV	For Dredging and Reclamation Works
Construction Noise Permit	GW-RW1007-15	16-Sep-15	13-Mar-16	DBJV	For GI Works at Southern Landfall
Construction Noise Permit	GW-RW0474-15	29-Sep-15	28-Mar-16	DBJV	For Portion N6
Construction Noise Permit	GW-RW0512-15	20-Oct-15	19-Jan-16	DBJV	For Dredging and Reclamation Works
Construction Noise Permit	GW-RW0018-16	20-Jan-16	19-Jul-16	DBJV	For Urmston Road in front of Pillar Point
Construction Noise Permit	GW-RW0638-15	14-Dec-15	13-Jun-16	DBJV	For site WA23
Construction Noise Permit	GW-RW0533-16	29-Sep-16	28-Mar-17	DBJV	For Portion N6
Construction Noise Permit	GW-RW0180-16	09-Apr-16	30-Sep-16	DBJV	For Urmston Road in front of Pillar Point
Construction Noise Permit	GW-RW0450-16	27-Jul-16	19-Jan-17	DBJV	For Urmston Road in front of Pillar Point
Construction Noise Permit	GW-RW0334-16	14-Jun-16	13-Dec-16	DBJV	For site WA23A+B
Construction Noise Permit	GW-RW0143-16	29-Mar-16	28-Sep-16	DBJV	For Portion N6
Construction Noise Permit	GW-RS0324-16	18-Apr-16	17-Oct-16	DBJV	For excavation works at Southern Landfall
Construction Noise Permit	GW-RS0860-16	25-Aug-16	24-Feb-17	DBJV	For Southern Landfall
Construction Noise Permit	GW-RS1447-15	05-Jan-16	04-Jun-16	DBJV	For excavation works at Southern Landfall
Construction Noise Permit	GW-RW0538-17	16-Oct-17	15-Apr-18	DBJV	For Urmston Road in front of Pillar Point

License/ Permit	License or Permit No.	Date of Issue	Date of Expiry	License/ Permit Holder	Remarks
Construction Noise Permit	GW-RW0644-16	30-Nov-16	29-May-17	DBJV	For Urmston Road in front of Pillar Point
Construction Noise Permit	GW-RW0279-17	13-Jun-17	12-Dec-17	DBJV	WA23 @ Tsing Yi
Construction Noise Permit	PP-RS0012-17	13-Jun-17	30-Aug-17	DBJV	Southern Landfall
Construction Noise Permit	GW-RW0247-17	19-May-17	09-Nov-17	DBJV	For Urmston Road in front of Pillar Point
Construction Noise Permit	GW-RW0666-16	13-Dec-16	12-Jun-17	DBJV	For site WA23A+B
Construction Noise Permit	GW-RW0143-17	29-Mar-17	28-Sep-17	DBJV	For Portion N6
Construction Noise Permit	GW-RS0121-17	25-Feb-17	24-Aug-17	DBJV	For Southern Landfall
Construction Noise Permit	GW-RS0165-17	01-Mar-17	02-Sep-17	DBJV	For Southern Landfall
Construction Noise Permit	PP-RS0019-17	31-Aug-17	30-Nov-17	DBJV	Southern Landfall (Percussive Piling)
Construction Noise Permit	GW-RS0713-17	01-Sep-17	28-Feb-18	DBJV	Southern Landfall
Construction Noise Permit	GW-RS0878-17	11-Oct-17	02-Apr-18	DBJV	Southern Landfall
Construction Noise Permit	PP-RS0026-17	03-Apr-17	31-Jul-18	DBJV	Southern Landfall (Percussive Piling)
Construction Noise Permit	GW-RW0641-17	16-Dec-17	06-Dec-18	DBJV	WA23 @ Tsing Yi
Construction Noise Permit	GW-RW0344-18	20-Aug-18	19-Feb-19	DBJV	WA23 @ Tsing Yi
Construction Noise Permit	GW-RW0060-18	20-Feb-18	19-Aug-18	DBJV	WA23 @ Tsing Yi
Construction Noise Permit	GW-RS0027-18	22-Jan-18	14-Jul-18	DBJV	Southern Landfall
Construction Noise Permit	GW-RS0598-18	15-Jul-18	14-Jan-19	DBJV	Southern Landfall
Construction Noise Permit	GW-RW0406-18	16-Oct-18	15-Apr-19	DBJV	Urmston Road in front of Pillar Point
Construction Noise Permit	GW-RS0966-18	26-Oct-18	14-Apr-19	DBJV	Southern Landfall
Construction Noise Permit	GW-RS0224-19	25-Mar-19	24-Sep-19	DBJV	Southern Landfall
Construction Noise Permit	GW-RS0766-19	02-Sep-19	25-Feb-20	DBJV	Southern Landfall
Construction Noise Permit	GW-RW0179-19	27-Apr-19	15-Oct-19	DBJV	Urmston Road in front of Pillar Point
Construction Noise Permit	GW-RW0063-19	20-Feb-19	19-Aug-19	DBJV	WA23 @ Tsing Yi
Construction Noise Permit	GW-RW0374-19	20-Aug-19	19-Feb-20	DBJV	WA23 @ Tsing Yi

License/ Permit	License or Permit No.	Date of Issue	Date of Expiry	License/ Permit Holder	Remarks
Construction Noise Permit	GW-RW0181-20	29-Apr-20	14-Oct-20	DBJV	Urmston Road in front of Pillar Point
Construction Noise Permit	GW-RW0144-20	14-Apr-20	31-Aug-20	DBJV	WA23 Tsing Yi Storage Area
Construction Noise Permit	GW-RS1137-19	26-Dec-19	05-Jun-20	DBJV	Southern Landfall
Construction Noise Permit	GW-RS0418-20	22-Jun-20	21-Dec-20	DBJV	Southern Landfall
Construction Noise Permit	GW-RW0497-19	17-Oct-19	15-Apr-20	DBJV	Northern Landfall

2.8 *IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES*

A summary of the Environmental Mitigation and Enhancement Measure Implementation Schedules (EMIS) is presented in *Appendix B*. The necessary mitigation measures were implemented properly for this Contract.

2.9 *SUMMARY OF EXCEEDANCES OF THE ENVIRONMENTAL QUALITY PERFORMANCE LIMIT*

Impact air quality monitoring, impact water quality and post-construction water quality monitoring, operational water quality monitoring, impact dolphin monitoring, operational dolphin monitoring and post-translocation coral monitoring were conducted for this Contract in accordance with the updated EM&A Manual.

One hundred and twenty two (122) Action Level and fifteen (15) Limit Level exceedances of 1-hour TSP, twelve (12) Action Level and four (4) Limit Level exceedances of 24-hour TSP were recorded for air quality monitoring during the impact monitoring period.

Fifty-eight (58) Action Level of Dissolved Oxygen (Surface and Middle), eighty-three (83) Action Level and eighteen (18) Limit Level exceedances of Dissolved Oxygen (Bottom), twenty-seven (27) Action Level and one (1) Limit Level exceedances of Suspended Solids (SS) were recorded for water quality monitoring during the impact monitoring period.

Eleven (11) Action Level and twenty (20) Limit Level exceedances were recorded for impact dolphin monitoring during the impact monitoring period.

Three (3) Limit Level exceedances were recorded for quarterly post-construction (operational) dolphin monitoring data between June 2020 and March 2021.

No exceedance of Action and Limit Levels was recorded for post-translocation coral monitoring.

Actions were taken in accordance with the Event Action Plan as presented in *Appendix F*.

2.10 SUMMARY OF COMPLAINTS, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

The Environmental Complaint Handling Procedure is provided in *Figure 2.4*.

There was no prosecution recorded in the impact monitoring period. A notification of summons regarding the complaint case received on 17 November 2016 has been received in the monitoring period.

A total of 17 environmental complaints were received in the impact monitoring period. Investigations were conducted for the environmental complaints in accordance with the complaint handling process as stated in the Complaint Management Plan. Environmental complaints in the impact monitoring period are summarized in *Table 2.21* below.

Table 2.21 Summary of Environmental Complaints

	Complaint(s)	Investigation/Follow up action(s)
1	Compliant/ enquiry case regarding dust emission was notified by the Contractor on 25 April 2014.	The investigation findings showed that the case was not related to the works under this Contract and was thus invalid.
2	Environmental complaint case regarding to the noise generated by derrick light nearby Melody Garden was referred by EPD on 29 October 2014.	The case was considered not related to the works under this Contract and was thus invalid.
3	Two potential environmental complaint cases regarding to the dust emission by works area nearby the River Trade Terminal was referred by EPD on 12 November 2014.	The cases were considered not related to the works under this Contract and were thus invalid.

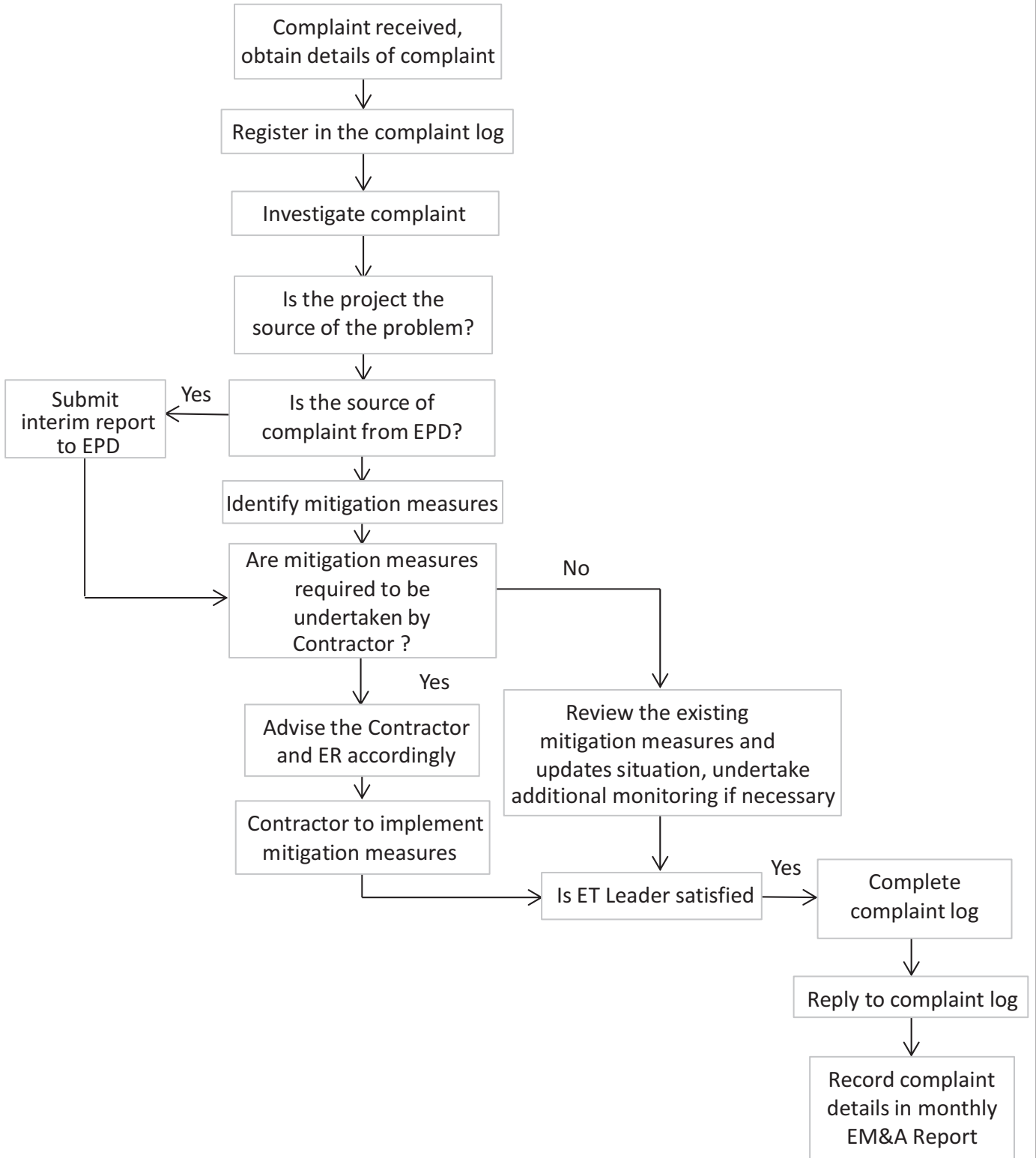


Figure 2.4

Environmental Complaint Handling Procedure

4	Environmental complaint case regarding dust emission from the barge area at Southern Landfall was referred by EPD on 20 May 2016.	A joint site inspection was carried out with the Contractor, SOR and EPD on 23 May 2016 to verify the remedial measures. The complaint was handled in accordance with the Environmental Complaint Handling Procedure and the interim report was submitted to EPD on 24 May 2016.
5	Environmental complaint case regarding muddy water discharge near the Pier at 33 Ho Yeung Street, Tuen Mun at Northern Landfall was referred by EPD on 28 June 2016.	The complaint case was considered to be not related to this Contract's work and was thus invalid.
6	Complaint case regarding marine litter disposal was received on 16 July 2016.	Upon investigation, the case was considered to be not related to this Contract.
7	Environmental complaint case regarding whitish effluent discharge at the sea near cell 54-55 of the artificial island of HKBCF was referred by EPD on 22 September 2016.	Starting from 29 September 2016, the Contractor had discontinued the practice of transportation of preliminarily treated and recycled water from the Northern Landfall to Southern Landfall in order to prevent reoccurrence of similar incident. No other additional action was required.
8	Environmental complaint case regarding effluent discharge at the sea was referred by EPD on 28 November 2016.	The Contractor has been reminded to adhere strictly to implement all relevant mitigation measures of water quality impact recommended or specified in the EP (EP-354/2009/D), the water discharge license, the approved EIA and the Updated EM&A Manual of this Project to avoid causing water pollution. A series of remedial actions were implemented by the Contractor, which are detailed in DBJV's investigation report (refer to <i>Twelfth Quarterly EM&A Report</i>).
9	Environmental complaint case regarding hammering Noise from	After investigation, the complaint case was considered to be not related to this Contract.

	unidentified Sources was referred by EPD on 14 December 2016.	
10	Environmental complaint case regarding sewage discharge at the east of the artificial island of the Hong Kong - Zhuhai-Macao Bridge was referred by IEC on 16 January 2017.	After investigation, the environmental complaint case was considered to be not related to this Contract.
11	Environmental complaint case regarding trespassing of construction vessels in Brothers Marine Park was referred by IEC on 17 January 2017.	After investigation, the environmental complaint case was considered to be not related to this Contract.
12	Environmental complaint case regarding muddy water discharge at the site area near Ho Yeung Street was referred by EPD on 14 February 2017.	Upon investigation, there were no adequate evidences to conclude that the complaint case was related to this Contract.
13	Environmental complaint case regarding noise nuisance and water pollution at the site near HKBCF of HZMB was referred by IEC on 28 March 2017.	Upon investigation, there were no adequate evidences to conclude that the complaint cases were related to this Contract.
14	Environmental complaint case regarding light pollution at Tuen Mun Pier was referred by IEC on 25 October 2017.	The Contractor has been reminded to implement mitigation measures of light impact to avoid causing visual impact.
15	Environmental complaint case regarding air, noise and light pollution at River Trade Terminal was referred by IEC on 30 January 2018.	Upon investigation, there were no adequate evidences to conclude that the complaint cases were related to this Contract.
16	One environmental complaint concerning dust nuisance was received on 22 May 2019.	Upon investigation, there were no adequate evidences to conclude that the complaint cases were related to this Contract.

Statistics on complaints, notifications of summons, successful prosecutions are summarised in *Annex H*.

CONCLUSION AND RECOMMENDATIONS

The construction phase EM&A programme for the Contract commenced on 1 November 2013 and was terminated since 19 March 2021.

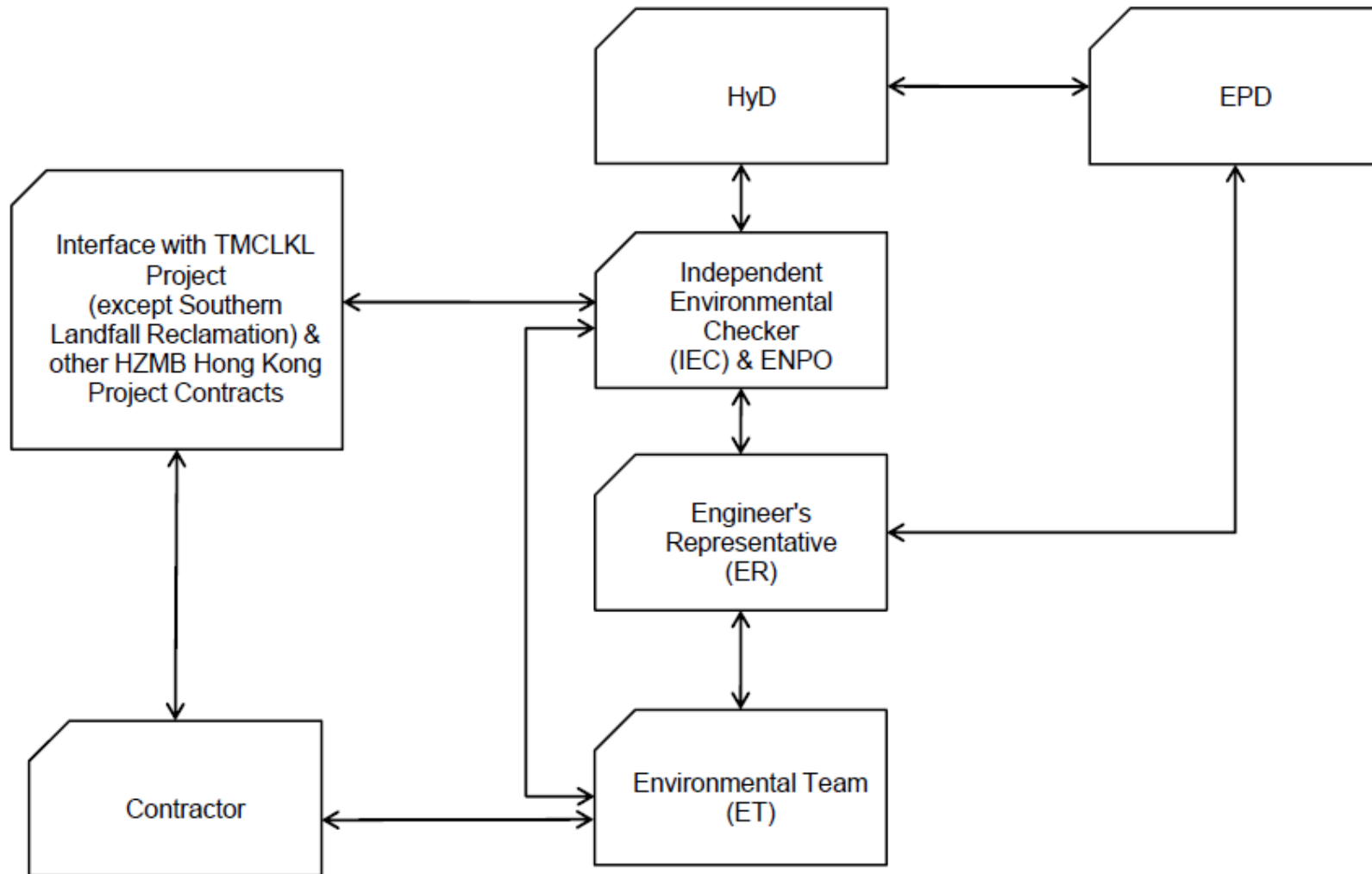
This is the Final EM&A Report under the Contract No. *HY/2012/08* presents a summary of the environmental monitoring and audit works from 1 November 2013 to 19 March 2021, in accordance with the Updated EM&A Manual and the requirements of the Environmental Permits.

The review of monitoring data suggested that the construction works under this Contract have proceeded in an environmentally acceptable manner in the impact monitoring period. In general, the monitoring results were in line with EIA predictions.

The EM&A programme was considered as adequate and effective in monitoring impacts arising from the Contract.

Appendix A

Project Organization for Environmental Works



↔ Line of Communication

Appendix B

Environmental Mitigation and Enhancement Measure Implementation Schedules

(Adopted from: CINOTECH (2011) Agreement No. CE35/2011 EP Baseline Environmental Monitoring for Hong Kong-Zhuhai-Macao Bridge Tuen Mun-Chek Lap Kok Link - Investigation. Updated EM&A Manual for Tuen Mun-Chek Lap Kok Link)

Contract No. HY/2012/08
Tuen Mun – Chek Lap Kok Link
Northern Connection Sub-sea Tunnel Section
Environmental Mitigation and Enhancement Measure Implementation Schedule

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
Air Quality									
4.8.1	3.8	An effective watering programme of twice daily watering with complete coverage, is estimated to reduce by 50%. This is recommended for all areas in order to reduce dust levels to a minimum.	All areas / throughout construction period	Contractor	TMEIA Avoid smoke impacts and disturbance		Y		✓
4.8.1	3.8	Watering of the construction sites in Lantau for 8 times/day and in Tuen Mun for 12 times/day to reduce dust emissions by 87.5% and 91.7% respectively and shall be undertaken.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓
4.8.1	3.8	The Contractor shall, to the satisfaction of the Engineer, install effective dust suppression measures and take such other measures as may be necessary to ensure that at the Site boundary and any nearby sensitive receiver, dust levels are kept to acceptable levels.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓
4.8.1	3.8	The Contractor shall not burn debris or other materials on the works areas.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓
4.8.1	3.8	In hot, dry or windy weather, the watering programme shall maintain all exposed road surfaces and dust sources wet.	All unpaved haul roads / throughout construction period in hot, dry or windy weather	Contractor	TMEIA Avoid smoke impacts and disturbance		Y		✓
4.8.1	3.8	Where breaking of oversize rock/concrete is required, watering shall be implemented to control dust. Water spray shall be used during the handling of fill material at the site and at active cuts, excavation and fill sites where dust is likely to be created.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓
4.8.1	3.8	Open dropping heights for excavated materials shall be controlled to a maximum height of 2m to minimise the fugitive dust arising from unloading.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓
4.8.1	3.8	During transportation by truck, materials shall not be loaded to a level higher than the side and tail boards, and shall be dampened or covered before transport.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓
4.8.1	3.8	Materials 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. The tarpaulin shall be properly secured and shall extend at least 300mm over the edges of the side and tail boards.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓
4.8.1	3.8	No earth, mud, debris, dust and the like shall be deposited on public roads. Wheel washing facility shall be usable prior to any earthworks excavation activity on the site.	All site exits / throughout construction period	Contractor	TMEIA Avoid dust		Y		✓
4.8.1	3.8	Areas of exposed soil shall be minimised to areas in which works have been completed shall be restored as soon as is practicable.	All exposed surfaces / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓
4.8.1	3.8	All stockpiles of aggregate or spoil shall be enclosed or covered and water applied in dry or windy condition.	All areas / throughout construction period	Contractor	TMEIA Avoid dust generation		Y		✓

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Contract No. HY/2012/08
Tuen Mun – Chek Lap Kok Link
Northern Connection Sub-sea Tunnel Section
Environmental Mitigation and Enhancement Measure Implementation Schedule

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
4.11	Section 3	EM&A in the form of 1 hour and 24 hour dust monitoring and site audit.	All representative existing ASRs / throughout construction period	Contractor	EM&A Manual		Y		✓
WATER QUALITY									
<i>Marine Works (Sequence A)</i>									
6.1	Annex A	Construction of seawalls to be advanced by at least 200m before the main reclamation dredging and filling can commence. The protection by advanced seawall is a dynamic process depending on the progress of the construction activities and the stage when such protection could be realised is illustrated in Figure 6.2a and detailed in Appendix D6a. The part of the works where such measures can be undertaken for the majority of the time includes the following locations: - TM-CLKL northern reclamation;	All areas/ prior to dredging and backfilling works	Contractor	TM-EIAO		Y		✓
6.1	-	a maximum of 50% public fill to be used for all seawall filling below +2.5mPD for TM-CLKL southern and northern landfalls.	TM-CLKL seawall filling	Contractor	TM-EIAO		Y		✓
6.1	-	a maximum of 30% public fill to be used for reclamation filling below +2.5mPD for TM-CLKL southern landfall	TM-CLKL southern landfall reclamation filling	Contractor	TM-EIAO		Y		✓
6.1	-	a maximum of 100% public fill to be used for reclamation filling below +2.5mPD for TM-CLKL northern landfall	TM-CLKL northern landfall reclamation filling	Contractor	TM-EIAO		Y		✓
6.1	-	Use of cage type silt curtains round all grab dredgers during the HKBCF, HKLR and TM-CLKL southern reclamation works.	All areas dredging works	Contractor	TM-EIAO		Y		✓
	Figure 1.1 of Annex C	A layer of floating type silt curtain will be applied when dredging and reclamation works are being undertaken at Portion N-a as shown in Figure 1.1 of Annex C of the EM&A Manual.	All areas/ through out marine works	Contractor	TM-EIAO		Y		✓
6.1	-	Trailer suction hopper dredgers shall not allow mud to overflow.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines, DASO permit conditions.		Y		✓
6.1	-	The use of Lean Material Overboard (LMOB) systems shall be prohibited.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines, DASO permit conditions.		Y		✓

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*Contract No. HY/2012/08
Tuen Mun – Chek Lap Kok Link
Northern Connection Sub-sea Tunnel Section
Environmental Mitigation and Enhancement Measure Implementation Schedule*

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
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6.1 Figure 6.2b Appendix D6b	Annex A	For other parts of the reclamation works construction of seawalls to be advanced by at least 200m before the main reclamation dredging and filling can commence. It should be noted that the protection by advanced seawall is a dynamic process depending on the progress of the construction activities and the stage when such protection could be realised is illustrated in Figure 6.2b and detailed in Appendices D6b. The part of the works where such measures can be undertaken for the majority of the time includes the following locations: - TM-CLKL northern reclamation; - Reclamation filling for Portion D of HKBCF; Reclamation filling for FSD berth of HKBCF; and - Reclamation dredging and filling for Portion 1 of HKLR;	TM-CLKL northern landfall, Portion D of HKBCF and HKLR	Contractor	TM-EIAO		Y		✓
6.1	-	The filling material for the other parts of the works are the same as Sequence A;	All other areas/backfilling works	Contractor	TM-EIAO		Y		✓
6.1	5.7	Cage type silt curtain (with steel enclosure) shall be used for grab dredgers working in the site of HKBCF and TM- CLKL southern reclamation. Cage type silt curtains will be applied round all grab dredgers at other works area.	HKBCF, HKLR and TM-CLKL grab dredging	Contractor	TM-EIAO		Y		✓

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*Contract No. HY/2012/08
Tuen Mun – Chek Lap Kok Link
Northern Connection Sub-sea Tunnel Section
Environmental Mitigation and Enhancement Measure Implementation Schedule*

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
6.1	Annex A	A layer of floating type silt curtain will be applied around all works as defined in Appendix D6b.	All areas/ through out marine works	Contractor	TM-EIAO		Y		✓
6.1	-	TM-CLKL northern landfall: - Reclamation filling shall not proceed until at least 200m section of leading seawall at both the east and west sides of the reclamation are formed above +2.5 mPD, except for 100m gaps for marine access;	All areas/ through out marine works	Contractor	TM-EIAO		Y		✓
<i>General Marine Works</i>									
6.1	-	Use of TMB for the construction of the submarine tunnel.	Tunnel works / Construction phase	Contractor	TM-EIAO		Y		✓
6.1	-	Export dredged spoils from NWWCZ.	All areas as much as possible / dredging activities	Contractor	DASO Permit conditions		Y		✓
6.1	-	Where public fill is proposed for filling below +2.5mPD, the fine content in the public fill will be controlled to 25%	All areas/ backfilling works	Contractor	TM-EIAO		Y		✓
6.1	-	Where sand fill is proposed for filling below +2.5mPD, the fine content in the sand fill will be controlled to 5%.	All areas/ backfilling works	Contractor	TM-EIAO		Y		✓
6.1	-	Mechanical grabs shall be designed and maintained to avoid spillage and should seal tightly while being lifted.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		✓
6.1	-	Barges and hopper dredgers shall have tight fitting seals to their bottom openings to prevent leakage of material.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		✓
6.1	-	Any pipe leakages shall be repaired quickly. Plant should not be operated with leaking pipes.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		✓
6.1	-	Loading of barges and hoppers shall be controlled to prevent splashing of dredged material to the surrounding water. Barges or hoppers shall not be filled to a level which will cause overflow of materials or pollution of water during loading or transportation.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		✓

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*Contract No. HY/2012/08
Tuen Mun – Chek Lap Kok Link
Northern Connection Sub-sea Tunnel Section
Environmental Mitigation and Enhancement Measure Implementation Schedule*

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
6.1	-	Excess material shall be cleaned from the decks and exposed fittings of barges and hopper dredgers before the vessel is moved.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		✓
6.1	-	Adequate freeboard shall be maintained on barges to reduce the likelihood of decks being washed by wave action;	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		✓
6.1	-	All vessels shall be sized such that adequate clearance is maintained between vessels and the sea bed at all states of the tide to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		✓
6.1	-	The works shall not cause foam, oil, grease, litter or other objectionable matter to be present in the water within and adjacent to the works site.	All areas/ throughout construction period	Contractor	Marine Fill Committee Guidelines. DASO permit conditions.		Y		✓
6.1	5.2	Silt curtain shall have proved effectiveness from the producer and shall be fully maintained throughout the works by the contractor.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	The daily maximum production rates shall not exceed those assumed in the water quality assessment.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	The dredging and filling works shall be scheduled to spread the works evenly over a working day.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
<i>Land Works</i>									
6.1	-	Wastewater from temporary site facilities should be controlled to prevent direct discharge to surface or marine waters.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Sewage effluent and discharges from on- site kitchen facilities shall be directed to Government sewer in accordance with the requirements of the WPCO or collected for disposal offsite. The use of soakaways shall be avoided.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Storm drainage shall be directed to storm drains via adequately designed sand/silt removal facilities such as sand traps, silt traps and sediment basins. Channels, earth bunds or sand bag barriers should be provided on site to properly direct stormwater to such silt removal facilities. Catchpits and perimeter channels should be constructed in advance of site formation works and earthworks.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓

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*Contract No. HY/2012/08
Tuen Mun – Chek Lap Kok Link
Northern Connection Sub-sea Tunnel Section
Environmental Mitigation and Enhancement Measure Implementation Schedule*

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
6.1	-	Silt removal facilities, channels and manholes shall be maintained and any deposited silt and grit shall be removed regularly, including specifically at the onset of and after each rainstorm.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Temporary access roads should be surfaced with crushed stone or gravel.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Rainwater pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Measures should be taken to prevent the washout of construction materials, soil, silt or debris into any drainage system.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Open stockpiles of construction materials (e.g. aggregates and sand) on site should be covered with tarpaulin or similar fabric during rainstorms.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	5.8	Manholes (including any newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system, and to prevent storm run-off from getting into foul sewers.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Discharges of surface run-off into foul sewers must always be prevented in order not to unduly overload the foul sewerage system.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	All vehicles and plant should be cleaned before they leave the construction site to ensure that no earth, mud or debris is deposited by them on roads. A wheel washing bay should be provided at every site exit.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Wheel wash overflow shall be directed to silt removal facilities before being discharged to the storm drain.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Section of construction road between the wheel washing bay and the public road should be surfaced with crushed stone or coarse gravel.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Wastewater generated from concreting, plastering, internal decoration, cleaning work and other similar activities, shall be screened to remove large objects.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Vehicle and plant servicing areas, vehicle wash bays and lubrication facilities shall be located under roofed areas. The drainage in these covered areas shall be connected to foul sewers via a petrol interceptor in accordance with the requirements of the WPCO or collected for off site disposal.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	The Contractor shall prepare an oil / chemical cleanup plan and ensure that leakages or spillages are contained and cleaned up immediately.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓

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*Contract No. HY/2012/08
Tuen Mun – Chek Lap Kok Link
Northern Connection Sub-sea Tunnel Section
Environmental Mitigation and Enhancement Measure Implementation Schedule*

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
6.1	-	Waste oil should be collected and stored for recycling or disposal, in accordance with the Waste Disposal Ordinance.	All areas/ throughout construction period	Contractor	TM-EIAO Waste Disposal Ordinance		Y		✓
6.1	-	All fuel tanks and chemical storage areas should be provided with locks and be sited on sealed areas. The storage areas should be surrounded by bunds with a capacity equal to 110% of the storage capacity of the largest tank.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Surface run-off from bunded areas should pass through oil/grease traps prior to discharge to the stormwater system.	All areas/ throughout construction period	Contractor	TM-EIAO		Y		✓
6.1	-	Roadside gullies to trap silt and grit shall be provided prior to discharging the stormwater into the marine environment. The sumps will be maintained and cleaned at regular intervals.	Roadside/design and operation	Design Consultant/ Contractor	TM-EIAO	Y		Y	✓
6.1	Section 5	All construction works shall be subject to routine audit to ensure implementation of all EIA recommendations and good working practice.	All areas/ throughout construction period	Contractor	EM&A Manual		Y		✓

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*Contract No. HY/2012/08
Tuen Mun – Chek Lap Kok Link
Northern Connection Sub-sea Tunnel Section
Environmental Mitigation and Enhancement Measure Implementation Schedule*

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
<i>Water Quality Monitoring</i>									
6.1	Section 5	Water quality monitoring shall be undertaken for suspended solids, turbidity, and dissolved oxygen. Nutrients and metal parameters shall also be measured for Mf sediment operations (only HKBCF and HKLR required handling of Mf sediment) during baseline, backfilling and post construction period. One year operation phase water quality monitoring at designated stations.	Designated monitoring stations as defined in EM&A Manual, Section 5/ Before, through-out marine construction period, post construction and monthly operational phase water quality monitoring for a year.	Contractor	EM&A Manual		Y	Y	Operational phase water quality monitoring commenced in June 2020 and completed in May
ECOLOGY									
8.14	6.3	Specification for and implement pre, during and post construction dolphin abundance monitoring.	All Areas/Detailed Design/ during construction works/post construction	Design Consultant/ Contractor	TMEIA	Y	Y	Y	✓
8.14	6.3,6.5	Specification and implementation of 250m dolphin exclusion zone.	All dredging and reclamation areas/Detailed Design/ during all reclamation and dredging works	Design Consultant/ Contractor	TMEIA	Y	Y		✓
8.15	6.3, 6.5	Specification and deployment of an artificial reef of an area of 3,600m2 in an area where fishing activities are prohibited.	Area of prohibited fishing activities/Detailed Design/towards end of construction period	TM-CLKL/ HKBCF Design Consultant/TM-CLKL/ HKBCF Contractor	TMEIA	Y		Y	N/A. To be implemented by AFCD.
8.14	6.3, 6.5	Specification and implementation of marine vessel control specifications	All areas/Detailed Design/ during construction works	Design Consultant/ Contractor	TMEIA	Y	Y		✓
8.14	6.3, 6.5	Design and implementation of acoustic decoupling methods for dredging and reclamation works	All areas/ Detailed Design/ during dredging and reclamation works	Design Consultant/ Contractor	TMEIA	Y	Y		✓
8.15	6.3, 6.4	Pre-construction phase survey and coral translocation	Detailed Design/Prior to construction	Design Consultant/ Contractor	TMEIA	Y	Y		✓
8.15	6.5	Audit coral translocation success	Post translocation	Contractor	TMEIA		Y		✓

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Contract No. HY/2012/08
Tuen Mun – Chek Lap Kok Link
Northern Connection Sub-sea Tunnel Section
Environmental Mitigation and Enhancement Measure Implementation Schedule

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
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7.13	6.5	The loss of habitat shall be supplemented by enhancement planting in accordance with the landscape mitigation schedule.	All areas / As soon as accessible	Contractor	TMEIA		Y		√
7.13	6.5	Spoil heaps shall be covered at all times.	All areas / Throughout construction period	Contractor	TMEIA		Y		√
7.13	6.5	Avoid damage and disturbance to the remaining and surrounding natural habitat	All areas / Throughout construction period	Contractor	TMEIA		Y		√
7.13	6.5	Placement of equipment in designated areas within the existing disturbed land	All areas / Throughout construction period	Contractor	TMEIA		Y		√
7.13	6.5	Disturbed areas to be reinstated immediately after completion of the works.	All areas / Throughout construction period	Contractor	TMEIA		Y		√
7.13	6.5	Construction activities should be restricted to the proposed works boundary.	All areas / Throughout construction period	Contractor	TMEIA		Y		√
LANDSCAPE AND VISUAL									
10.9	7.6	The colour and shape of the toll control buildings, ventilation building and administration building shall adopt a design which could blend it into the vicinity elements, and the details will be developed in detailed design stage (DM2)	All areas/detailed design	Design Consultant	TMEIA	Y			√
10.9	7.6	Aesthetic design of the viaduct, retaining wall and other structures will be developed under ACABAS submission (DM5)	All areas/detailed design	Design Consultant	TMEIA	Y			√
10.9	7.6	Screening of construction works by hoardings around works area in visually unobtrusive colours, to screen works (CM5)	All areas/detailed design/ during construction/post construction	Design Consultant/ Contractor	TMEIA	Y	Y		√
10.9	7.6	Control night-time lighting and glare by hooding all lights (CM6)	All areas/detailed design/ during construction	Design Consultant/ Contractor	TMEIA	Y	Y		√
10.9	7.6	Ensure no run-off into water body adjacent to the Project Area (CM7)	All areas/detailed design/ during construction	Design Consultant/ Contractor	TMEIA	Y	Y		√
10.9	7.6	Avoidance of excessive height and bulk of buildings and structures (CM8)	All areas/detailed design/ during construction	Design Consultant/ Contractor	TMEIA	Y	Y		√
10.9	7.6	Aesthetically pleasing design (visually unobtrusive and non-reflective) as regard to the form, material and finishes shall be incorporated to all buildings, engineering structures and associated infrastructure facilities (OM5)	All areas/detailed design/ during construction / during operation	Design Consultant/ Contractor	TMEIA	Y	Y	Y	√
10.9	7.6	Avoidance of excessive height and bulk of buildings and structures (OM6)	All areas/detailed design/ during construction / during operation	Design Consultant/ Contractor	TMEIA	Y	Y	Y	√
WASTE									
12.6		The Contractor shall identify a coordinator for the management of waste.	Contract mobilisation	Contractor	TMEIA		Y		√

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*Contract No. HY/2012/08
Tuen Mun – Chek Lap Kok Link
Northern Connection Sub-sea Tunnel Section
Environmental Mitigation and Enhancement Measure Implementation Schedule*

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
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12.6		The Contractor shall prepare and implement a Waste Management Plan which specifies procedures such as a ticketing system, to facilitate tracking of loads and to ensure that illegal disposal of wastes does not occur, and protocols for the maintenance of records of the quantities of wastes generated, recycled and disposed. A recording system for the amount of waste generated, recycled and disposed (locations) should be established.	Contract mobilisation	Contractor	TMEIA, Works Branch Technical Circular No. 5/99 for the Trip-ticket System for Disposal of Construction and Demolition Material		Y		✓
12.6		The Contractor shall apply for and obtain the appropriate licenses for the disposal of public fill, chemical waste and effluent discharges.	Contract mobilisation	Contractor	TMEIA, Land (Miscellaneous Provisions) Ordinance (Cap 28); Waste Disposal Ordinance (Cap 354); Dumping at Sea Ordinance (Cap 466); Water Pollution Control Ordinance.		Y		✓
12.6	8.1	Training shall be provided to workers about the concepts of site cleanliness and appropriate waste management procedures including waste reduction, reuse and recycling.	Contract Mobilisation	Contractor	TMEIA		Y		✓
12.6	8.1	The extent of cutting operation should be optimised where possible. Earth retaining structures and bored pile walls should be proposed to minimise the extent of cutting.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	The surplus surcharge should be transferred to a fill bank	Reclamation areas / after surcharge works	Contractor	TMEIA		Y		✓
12.6	8.1	Rock armour from the existing seawall should be reused on the new sloping seawall as far as possible	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	The site and surroundings shall be kept tidy and litter free.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	No waste shall be burnt on site.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Provisions to be made in contract documents to allow and promote the use of recycled aggregates where appropriate.	Detailed Design	Design Consultant	TMEIA	Y			✓
12.6	8.1	The Contractor shall be prohibited from disposing of C&D materials at any sensitive locations. The Contractor should propose the final disposal sites in the EMP and WMP for approval before implementation.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Stockpiled material shall be covered by tarpaulin and /or watered as appropriate to prevent windblown dust/ surface run off.	All areas / throughout construction period	Contractor	TMEIA		Y		✓

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*Contract No. HY/2012/08
Tuen Mun – Chek Lap Kok Link
Northern Connection Sub-sea Tunnel Section
Environmental Mitigation and Enhancement Measure Implementation Schedule*

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
12.6	8.1	Excavated material in trucks shall be covered by tarpaulins to reduce the potential for spillage and dust generation.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Wheel washing facilities shall be used by all trucks leaving the site to prevent transfer of mud onto public roads.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Dredged marine mud shall be disposed of in a gazetted marine disposal ground under the requirements of the Dumping at Seas Ordinance.	Reclamation areas / throughout dredging works	Contractor	TMEIA		Y		✓
12.6	8.1	Standard formwork or pre-fabrication should be used as far as practicable so as to minimise the C&D materials arising. The use of more durable formwork/plastic facing for construction works should be considered. The use of wooden hoardings should be avoided and metal hoarding should be used to facilitate recycling. Purchasing of construction materials should avoid over-ordering and wastage.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	The Contractor should recycle as many C&D materials (this is a waste section) as possible on-site. The public fill and C&D waste should be segregated and stored in separate containers or skips to facilitate the reuse or recycling of materials and proper disposal. Where practicable, the concrete and masonry should be crushed and used as fill materials. Steel reinforcement bar should be collected for use by scrap steel mills. Different areas of the sites should be considered for segregation and storage activities.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	All falsework will be steel instead of wood.	All areas / throughout construction period	Contractor	TMEIA		Y		✓

Legend: D=Design, C=Construction, O=Operation

Note: Funding Agent for all mitigation measures will be the Highways Department of the Hong Kong SAR Government

*Contract No. HY/2012/08
Tuen Mun – Chek Lap Kok Link
Northern Connection Sub-sea Tunnel Section
Environmental Mitigation and Enhancement Measure Implementation Schedule*

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
12.6	8.1	Chemical waste producers should register with the EPD. Chemical waste should be handled in accordance with the Code of Practice on the Packaging, Handling and Storage of Chemical Wastes as follows: - suitable for the substance to be held, - resistant to corrosion, maintained in good conditions and securely closed; - Having a capacity of <450L unless the specifications have been approved by the EPD; and - Displaying a label in English and Chinese according to the instructions prescribed in Schedule 2 of the Regulations. - Clearly labelled and used solely for the storage of chemical wastes; - Enclosed with at least 3 sides; - Impermeable floor and bund with capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in the area, whichever is greatest; - Adequate ventilation; - Sufficiently covered to prevent rainfall entering (water collected within the bund must be tested and disposed of as chemical waste, if necessary); and - Incompatible materials are adequately separated.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Waste oils, chemicals or solvents shall not be disposed of to drain,	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Adequate numbers of portable toilets should be provided for on-site workers. Portable toilets should be maintained in reasonable states, which will not deter the workers from utilising them.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Night soil should be regularly collected by licensed collectors.	All areas / throughout construction period	Contractor	TMEIA		Y		✓

Legend: D=Design, C=Construction, O=Operation

Note: Funding Agent for all mitigation measures will be the Highways Department of the Hong Kong SAR Government

*Contract No. HY/2012/08
Tuen Mun – Chek Lap Kok Link
Northern Connection Sub-sea Tunnel Section
Environmental Mitigation and Enhancement Measure Implementation Schedule*

EIA Reference	EM&A Manual Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Stages			Status *
						D	C	O	
12.6	8.1	General refuse arising on-site should be stored in enclosed bins or compaction units separately from C&D and chemical wastes. Sufficient dustbins shall be provided for storage of waste as required under the Public Cleansing and Prevention of Nuisances By-laws. In addition, general refuse shall be cleared daily and shall be disposed of to the nearest licensed landfill or refuse transfer station. Burning of refuse on construction sites is prohibited.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	All waste containers shall be in a secure area on hardstanding;	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Training shall be provided to workers about the concepts of site cleanliness and appropriate waste management procedure, including waste reduction, reuse and recycling.	All areas / throughout construction period	Contractor	TMEIA		Y		✓
12.6	8.1	Office wastes can be reduced by recycling of paper if such volume is sufficiently large to warrant collection. Participation in a local collection scheme by the Contractor should be advocated. Waste separation facilities for paper, aluminium cans, plastic bottles, etc should be provided on-site.	Site Offices/ throughout construction period	Contractor	TMEIA		Y		✓
12.6	Section 8	EM&A of waste handling, storage, transportation, disposal procedures and documentation through the site audit programme shall be undertaken.	All areas / throughout construction period	Contractor	EM&A Manual		Y		✓
CULTURAL HERITAGE									
11.8	Section 9	EM&A in the form of audit of the mitigation measures	All areas / throughout construction period	Highways Department	EIAO-TM		Y		v

*** Remarks:**

- ✓ Compliance of Mitigation Measures
- <> Compliance of Mitigation but need improvement
- x Non-compliance of Mitigation Measures
- ▲ Non-compliance of Mitigation Measures but rectified by Contractor
- Δ Deficiency of Mitigation Measures but rectified by Contractor
- N/A Not Applicable in Reporting Period

Legend: D=Design, C=Construction, O=Operation

Note: Funding Agent for all mitigation measures will be the Highways Department of the Hong Kong SAR Government

Appendix C

Summary of Action and Limit Levels

Table C1 *Action and Limit Levels for 1-hour and 24-hour TSP*

Parameters	Action	Limit
24 Hour TSP Level in $\mu\text{g}/\text{m}^3$	ASR1 = 213 ASR5 = 238 AQMS1 = 213 ASR6 = 238 ASR10 = 214	260
1 Hour TSP Level in $\mu\text{g}/\text{m}^3$	ASR1 = 331 ASR5 = 340 AQMS1 = 335 ASR6 = 338 ASR10 = 337	500

Table C2 *Action and Limit Levels for Water Quality*

Parameter	Action Level#	Limit Level#
DO in mg/L ^(a)	<u>Surface and Middle</u> 5.0 mg/L	<u>Surface and Middle</u> 4.2 mg/L
	<u>Bottom</u> 4.7 mg/L	<u>Bottom</u> 3.6 mg/L
Turbidity in NTU (Depth-averaged ^{(b), (c)})	120% of upstream control station at the same tide of the same day and 95%-ile of baseline data, i.e., 27.5 NTU	130% of upstream control station at the same tide of the same day and 99%-ile of baseline data, i.e., 47.0 NTU
SS in mg/L (Depth-averaged ^{(b), (c)})	120% of upstream control station at the same tide of the same day and 95%-ile of baseline data, i.e., 23.5 mg/L	130% of upstream control station at the same tide of the same day and 10mg/L for WSD Seawater Intakes at Tuen Mun and 99%-ile of baseline data, i.e., 34.4 mg/L

Notes:

Baseline data: data from HKZMB Baseline Water Quality Monitoring between 6 and 31 October 2011.

- (a) For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
- (b) "Depth-averaged" is calculated by taking the arithmetic means of reading of all three depths
- (c) For turbidity and SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
- (d) All figures given in the table are used for reference only, and EPD may amend the figures whenever it is considered as necessary
- (e) The 1%-ile of baseline data for surface and middle DO is 4.2 mg/L, whilst for bottom DO is 3.6 mg/L.

Table C3 *Action and Limit Levels for Impact and Post-Construction (Operational) Dolphin Monitoring*

	North Lantau Social Cluster	
	NEL	NWL
Action Level	STG < 70% of baseline & ANI < 70% of baseline	STG < 70% of baseline & ANI < 70% of baseline
Limit Level	[STG < 40% of baseline & ANI < 40% of baseline] and STG < 40% of baseline & ANI < 40% of baseline	

Notes:

1. STG means quarterly encounter rate of number of dolphin sightings, which is **6.00 in NEL** and **9.85 in NWL** during the baseline monitoring period
2. ANI means quarterly encounter rate of total number of dolphins, which is **22.19 in NEL** and **44.66 in NWL** during the baseline monitoring period
3. For North Lantau Social Cluster, AL will be trigger if NEL or NWL fall below the criteria; LL will be triggered if both NEL and NWL fall below the criteria.

Table C4 *Derived Value of Action Level (AL) and Limit Level (LL)*

	North Lantau Social Cluster	
	NEL	NWL
Action Level	STG < 4.2 & ANI < 15.5	STG < 6.9 & ANI < 31.3
Limit Level	NEL = [STG < 2.4 & ANI < 8.9] and NWL = [STG < 3.9 & ANI < 17.9]	

Appendix D

Impact Air Quality Monitoring Results

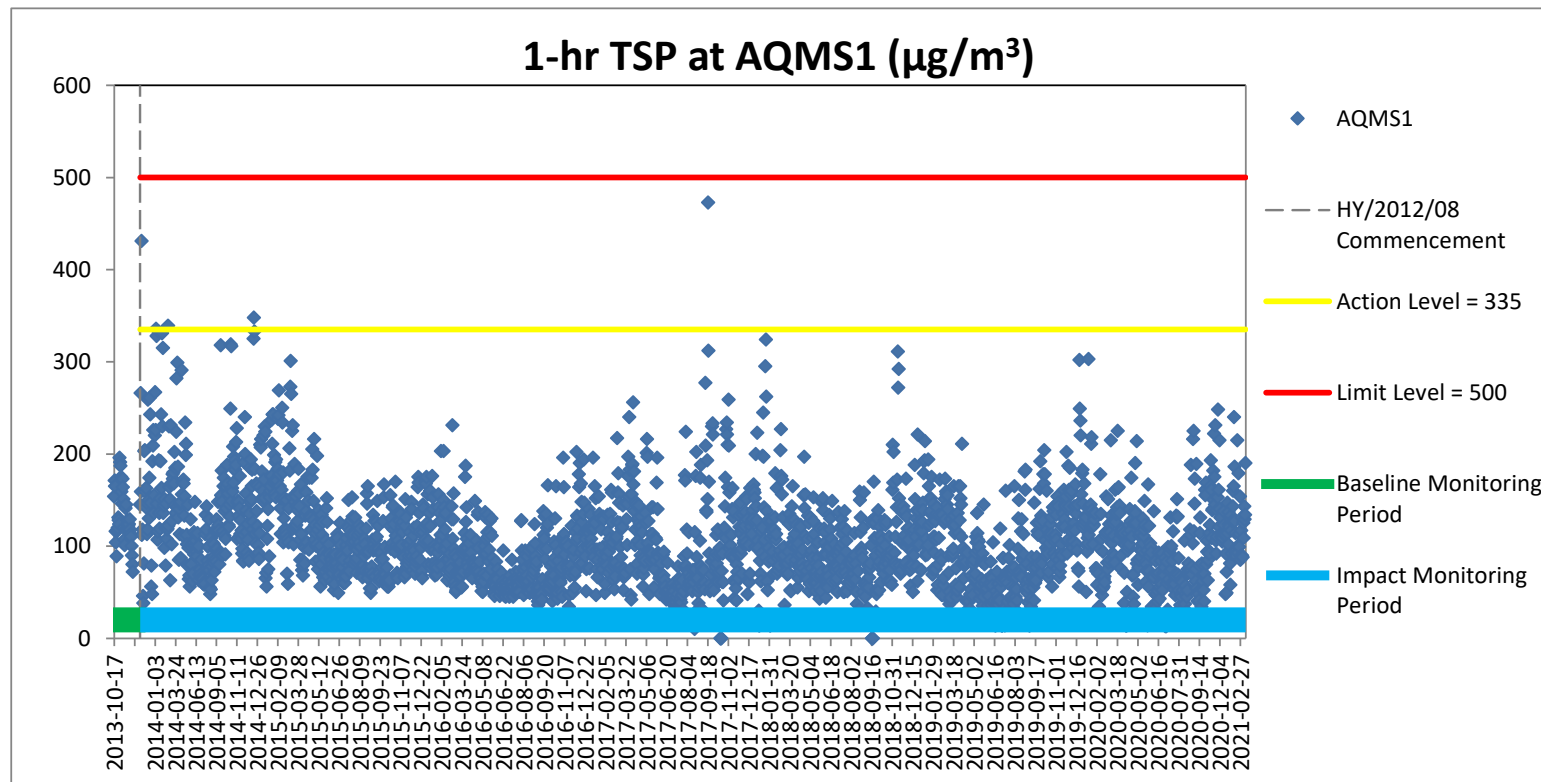


Figure D.1 Baseline & Impact Monitoring - 1-hour Total Suspended Particulates ($\mu\text{g}/\text{m}^3$) at AQMS1 between 17 October 2013 and 19 March 2021 during Baseline & Impact Monitoring period. Weather condition within the reporting period varied between sunny to rainy. The overall monitoring results were not affected by weather conditions. Major land-based construction activities were included in Section 1.4.

Ref: 0212330_Impact AQM graphs_Final.xlsx



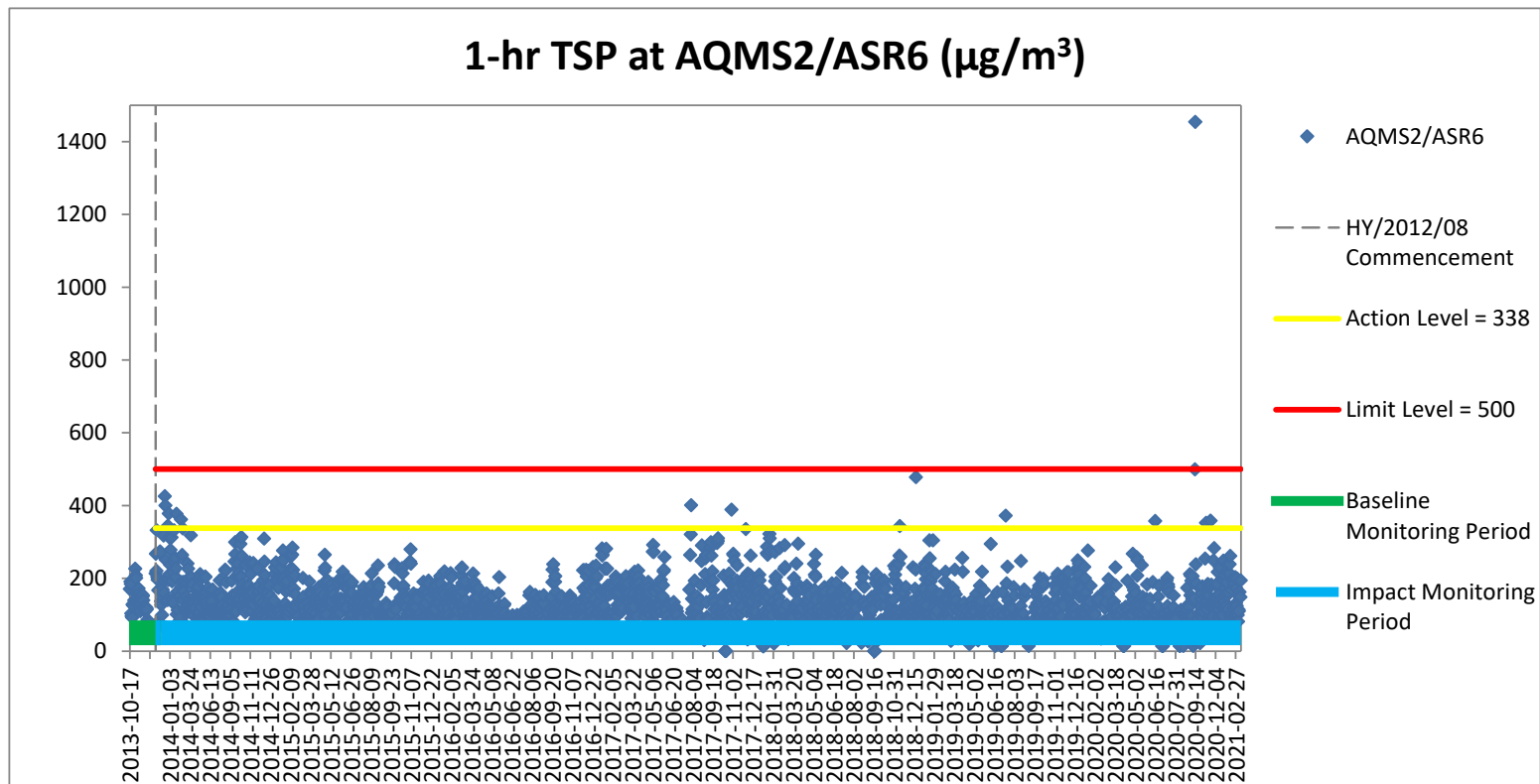


Figure D.2 Baseline & Impact Monitoring - 1-hour Total Suspended Particulates ($\mu\text{g}/\text{m}^3$) at AQMS2/ASR6 between 17 October 2013 and 19 March 2021 during Baseline & Impact Monitoring period. Weather condition within the reporting period varied between sunny to rainy. The overall monitoring results were not affected by weather conditions. Major land-based construction activities were included in Section 1.4.

Ref: 0212330_Impact AQM graphs_Final.xlsx



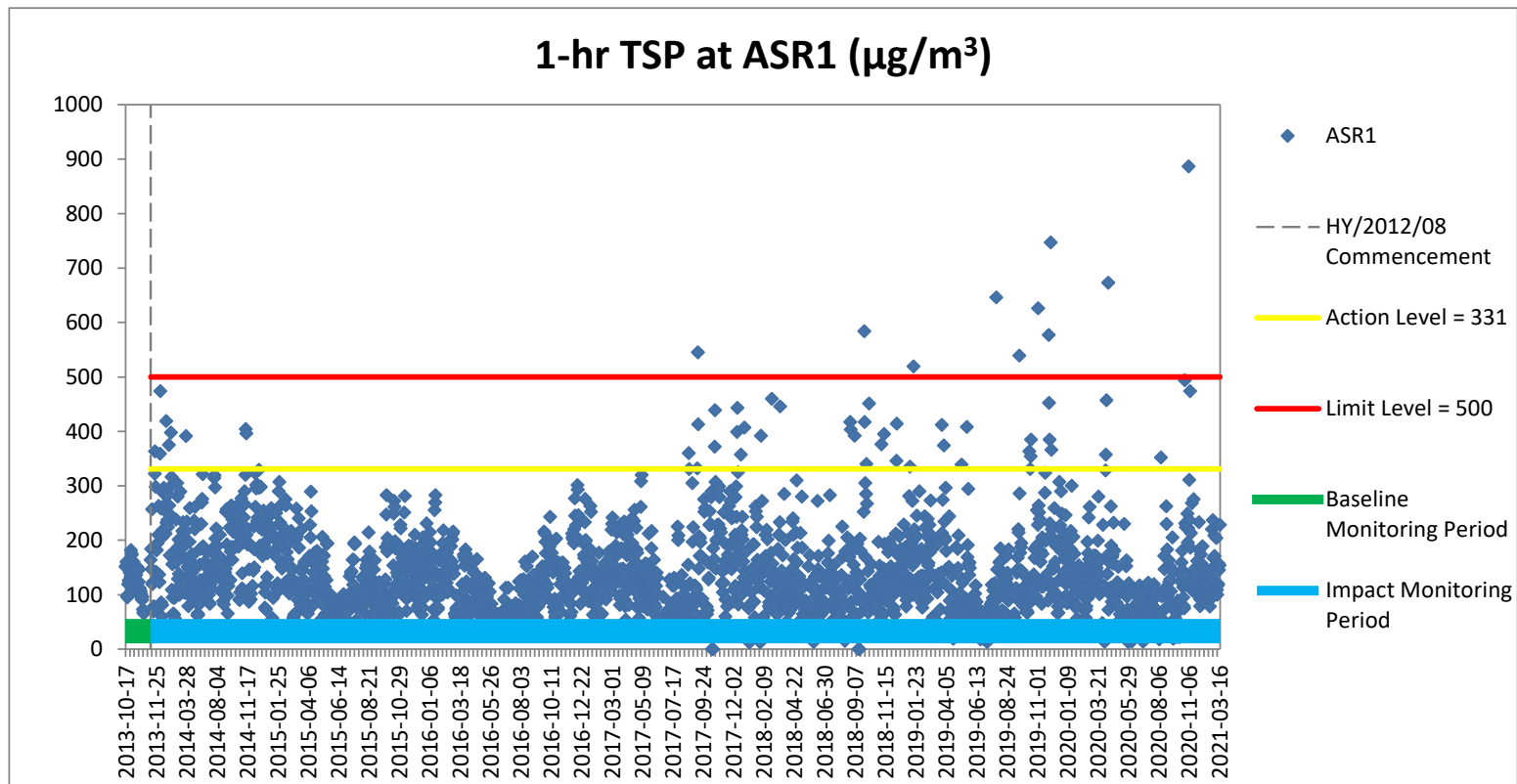


Figure D.3 Baseline & Impact Monitoring - 1-hour Total Suspended Particulates ($\mu\text{g}/\text{m}^3$) at ASR1 between 17 October 2013 and 19 March 2021 during Baseline & Impact Monitoring period. Weather condition within the reporting period varied between sunny to rainy. The overall monitoring results were not affected by weather conditions. Major land-based construction activities were included in Section 1.4.

Ref: 0212330_Impact AQM graphs_Final.xlsx



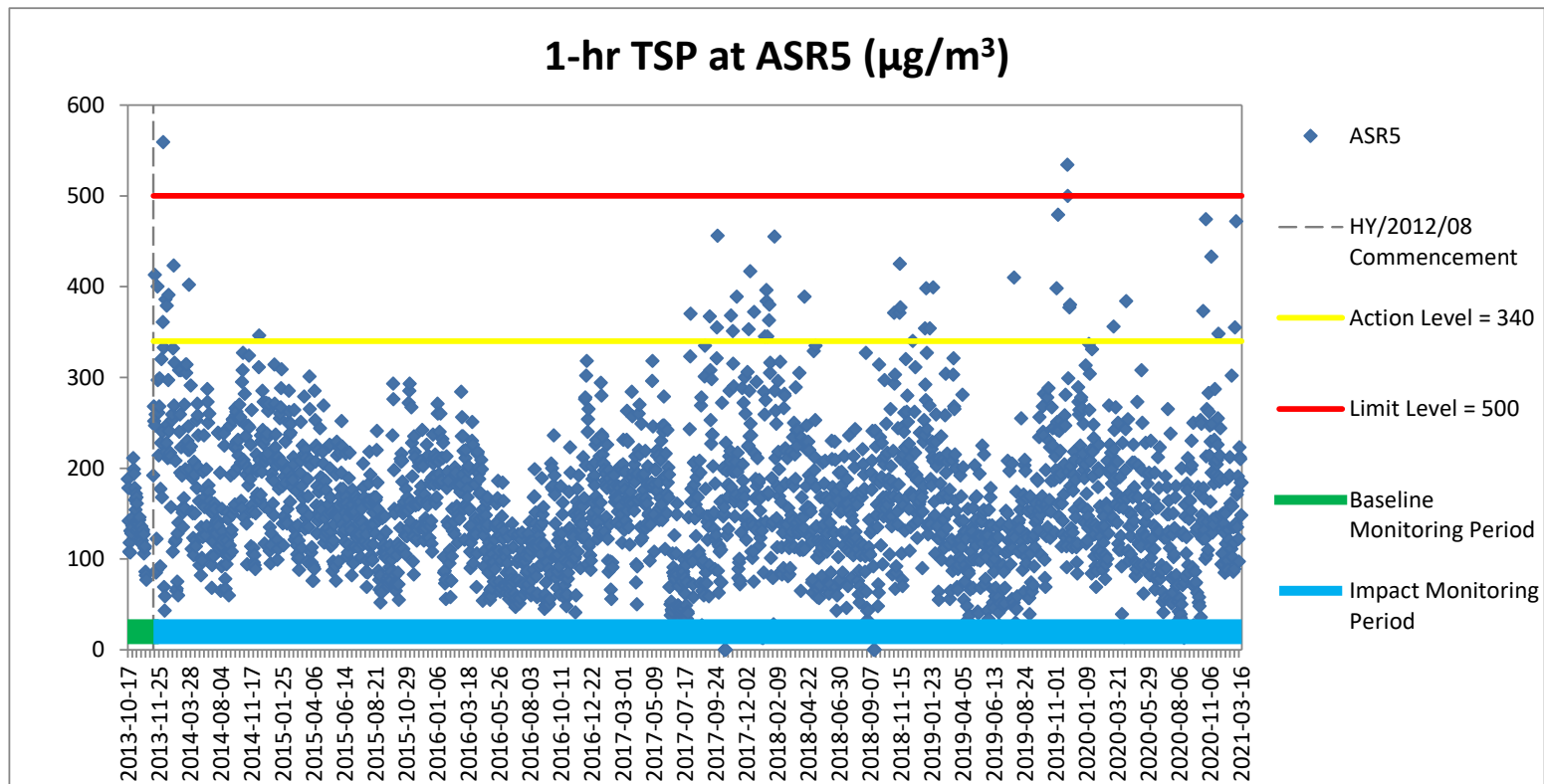


Figure D.4 Baseline & Impact Monitoring - 1-hour Total Suspended Particulates ($\mu\text{g}/\text{m}^3$) at ASR5 between 17 October 2013 and 19 March 2021 during Baseline & Impact Monitoring period. Weather condition within the reporting period varied between sunny to rainy. The overall monitoring results were not affected by weather conditions. Major land-based construction activities were included in Section 1.4.

Ref: 0212330_Impact AQM graphs_Final.xlsx



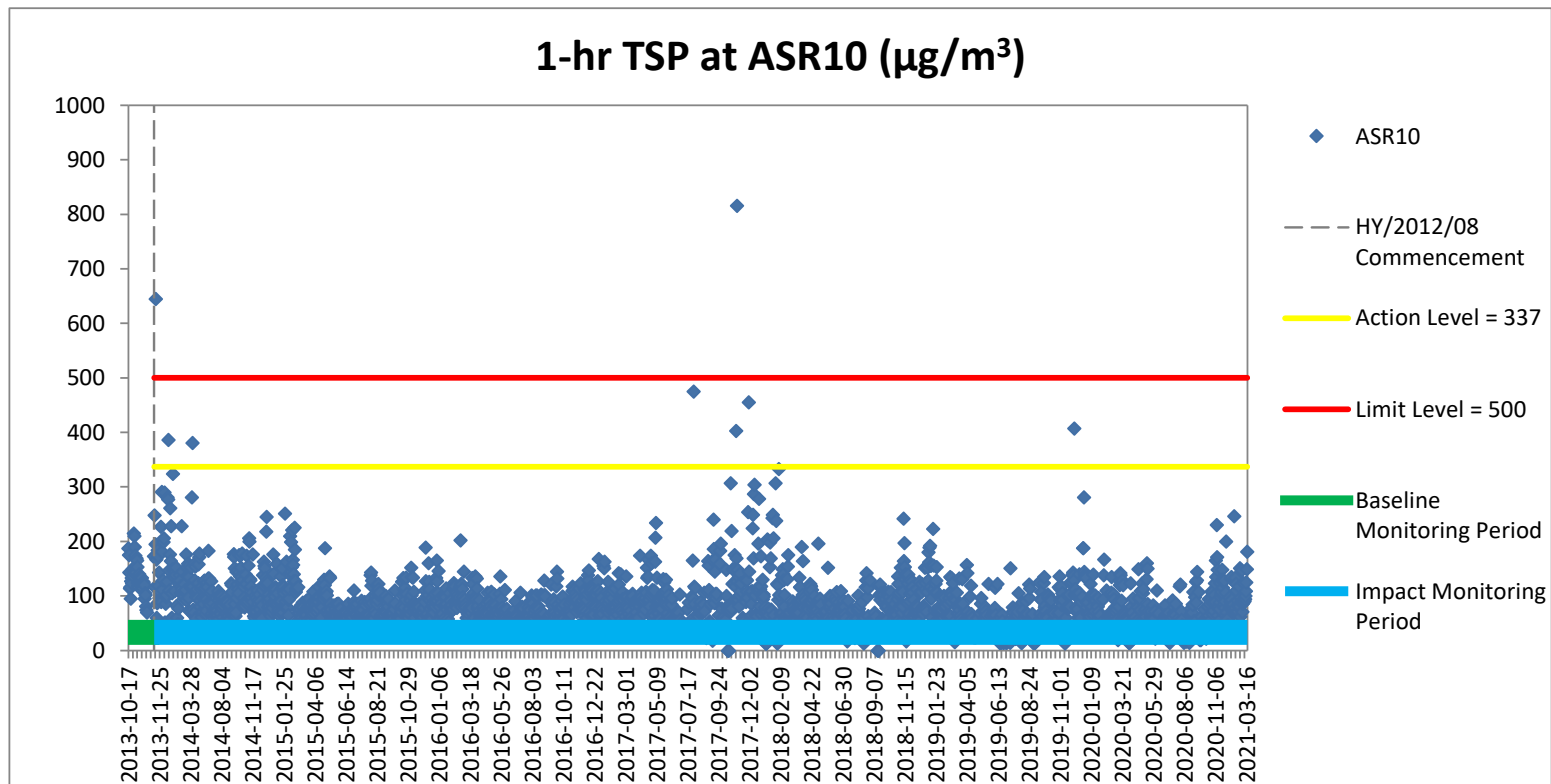


Figure D.5 Baseline & Impact Monitoring - 1-hour Total Suspended Particulates ($\mu\text{g}/\text{m}^3$) at ASR10 between 17 October 2013 and 19 March 2021 during Baseline & Impact Monitoring period. Weather condition within the reporting period varied between sunny to rainy. The overall monitoring results were not affected by weather conditions. Major land-based construction activities were included in Section 1.4.

Ref: 0212330_Impact AQM graphs_Final.xlsx



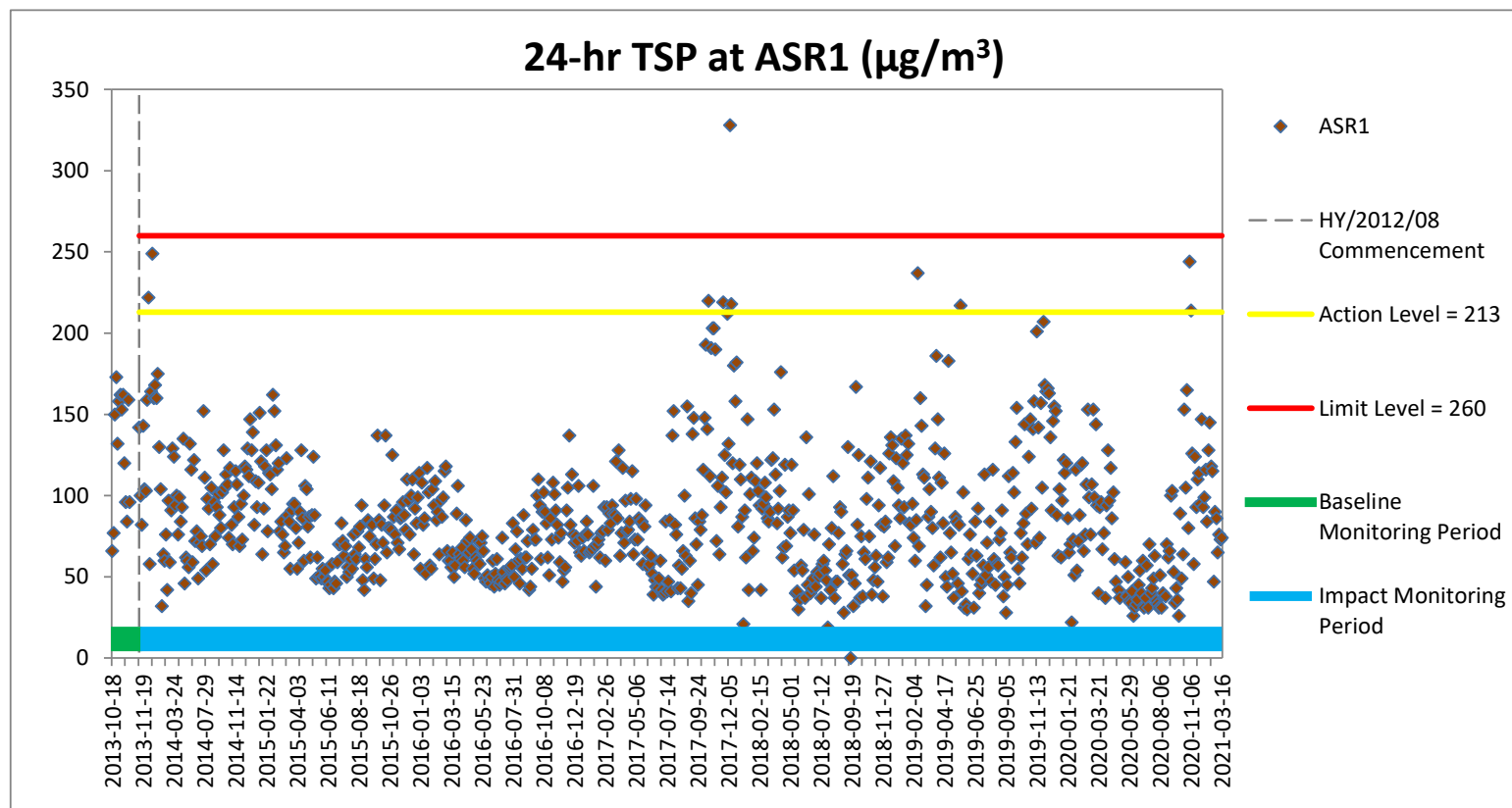


Figure D.6 Baseline & Impact Monitoring - 24-hour Total Suspended Particulates ($\mu\text{g}/\text{m}^3$) at ASR1 between 17 October 2013 and 19 March 2021 during Baseline & Impact Monitoring period. Weather condition within the reporting period varied between sunny to rainy. The overall monitoring results were not affected by weather conditions. Major land-based construction activities were included in Section 1.4.

Ref: 0212330_Impact AQM graphs_Final.xlsx



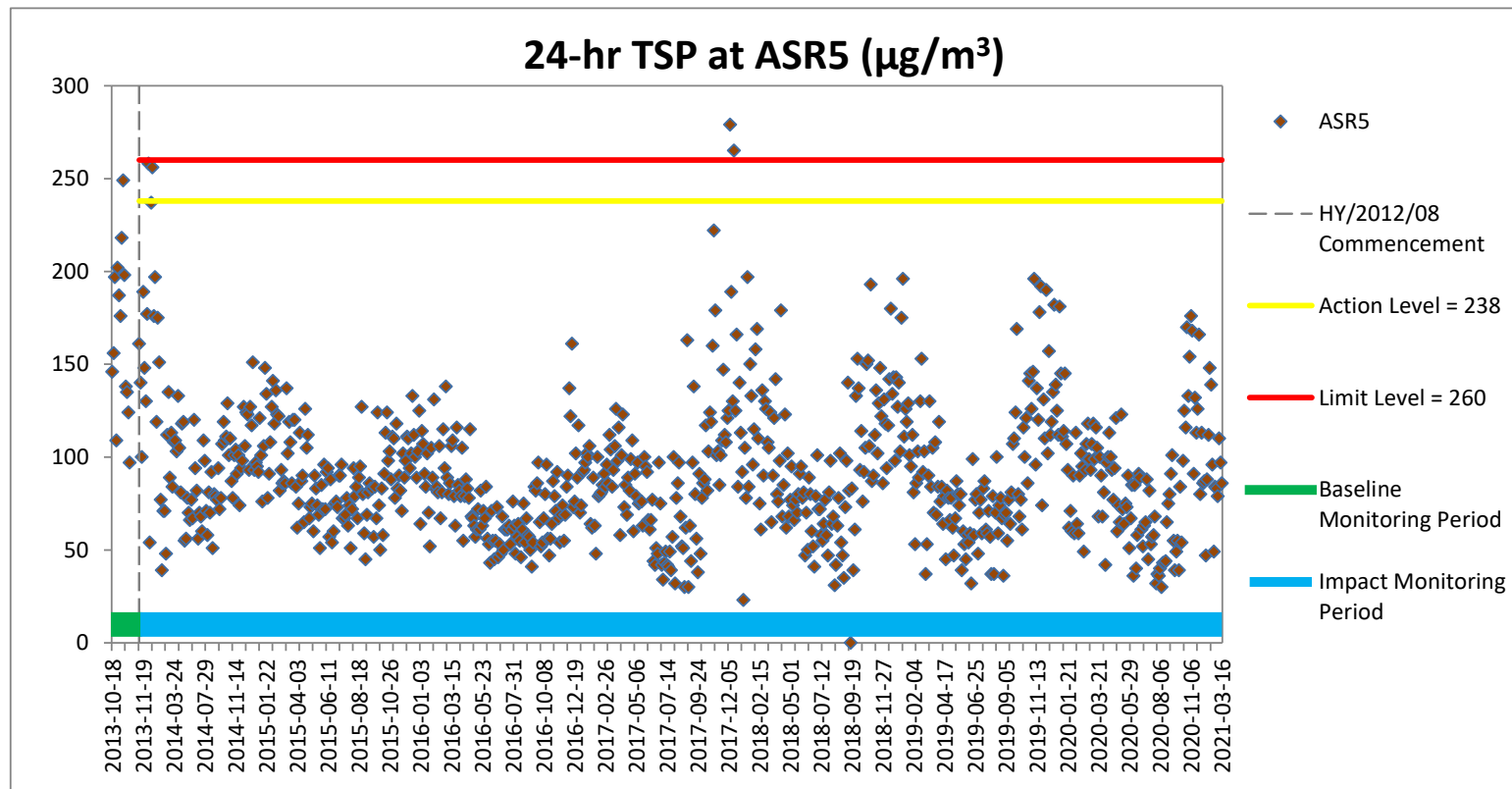


Figure D.7 Baseline & Impact Monitoring - 24-hour Total Suspended Particulates ($\mu\text{g}/\text{m}^3$) at ASR5 between 17 October 2013 and 19 March 2021 during Baseline & Impact Monitoring period. Weather condition within the reporting period varied between sunny to rainy. The overall monitoring results were not affected by weather conditions. Major land-based construction activities were included in Section 1.4.

Ref: 0212330_Impact AQM graphs_Final.xlsx



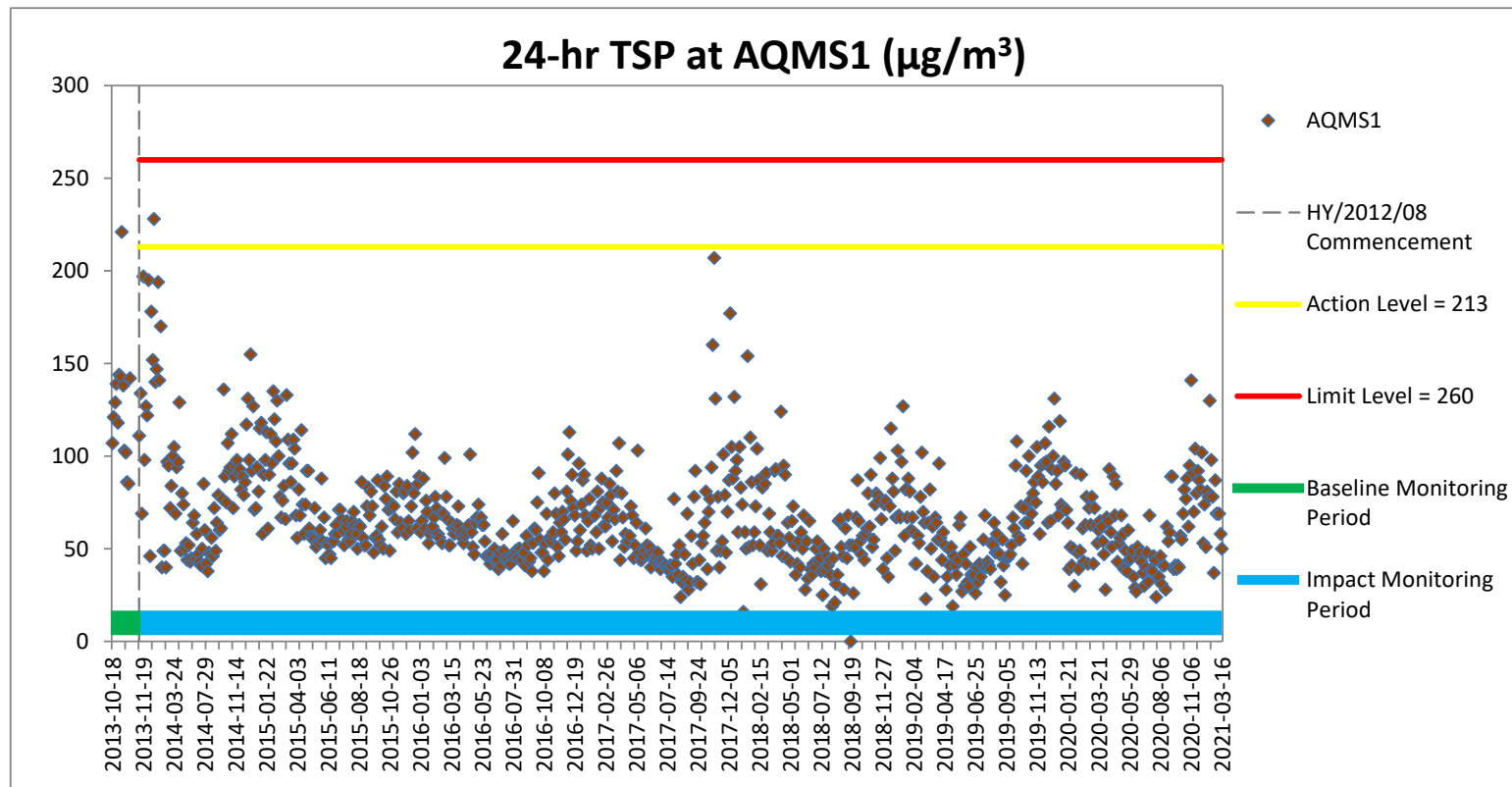


Figure D.8 Baseline & Impact Monitoring - 24-hour Total Suspended Particulates ($\mu\text{g}/\text{m}^3$) at AQMS1 between 17 October 2013 and 19 March 2021 during Baseline & Impact Monitoring period. Weather condition within the reporting period varied between sunny to rainy. The overall monitoring results were not affected by weather conditions. Major land-based construction activities were included in Section 1.4.

Ref: 0212330_Impact AQM graphs_Final.xlsx



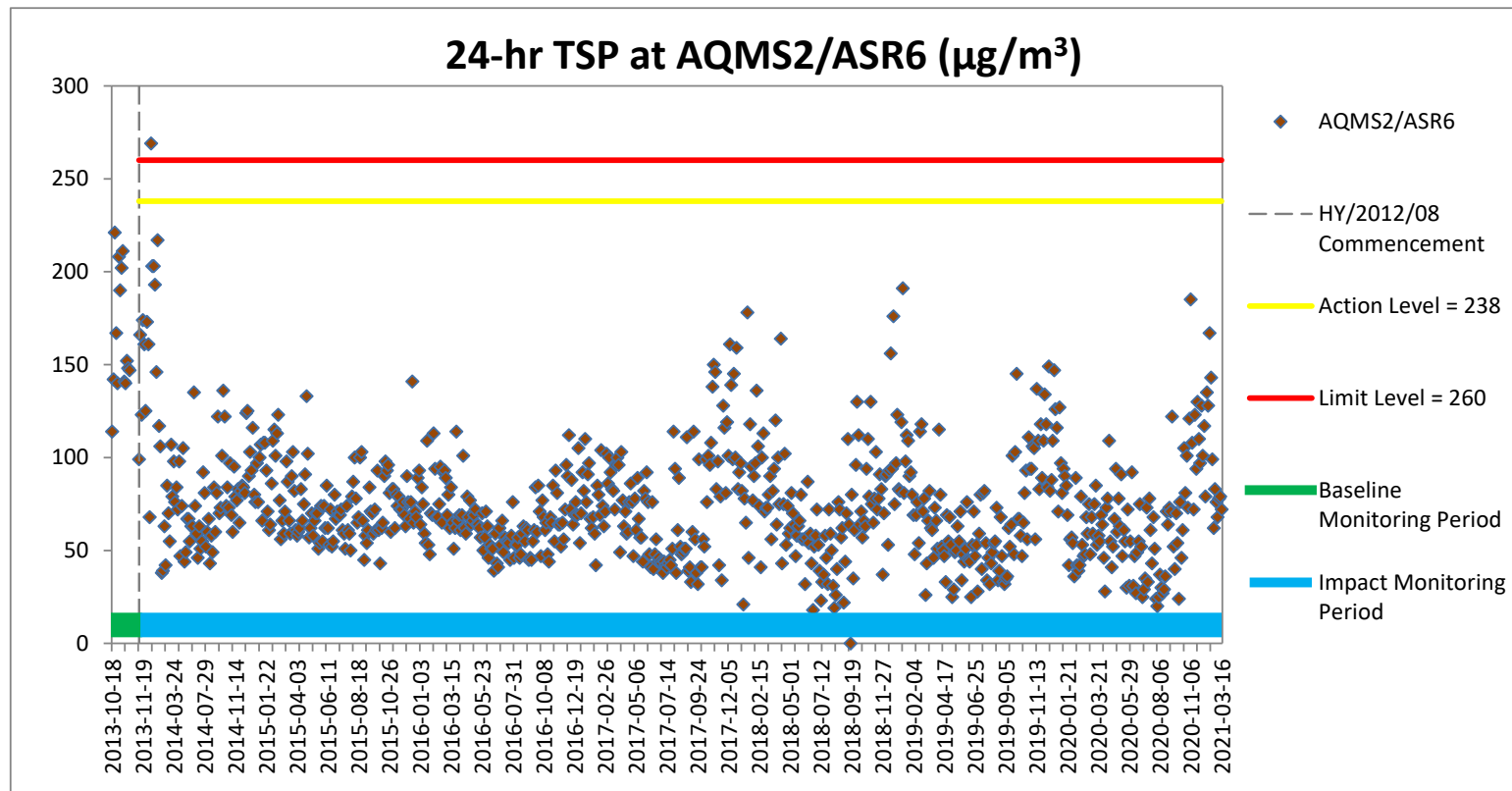


Figure D.9 Baseline & Impact Monitoring - 24-hour Total Suspended Particulates ($\mu\text{g}/\text{m}^3$) at AQMS2/ASR6 between 17 October 2013 and 19 March 2021 during Baseline & Impact Monitoring period. Weather condition within the reporting period varied between sunny to rainy. The overall monitoring results were not affected by weather conditions. Major land-based construction activities were included in Section 1.4.

Ref: 0212330_Impact AQM graphs_Final.xlsx



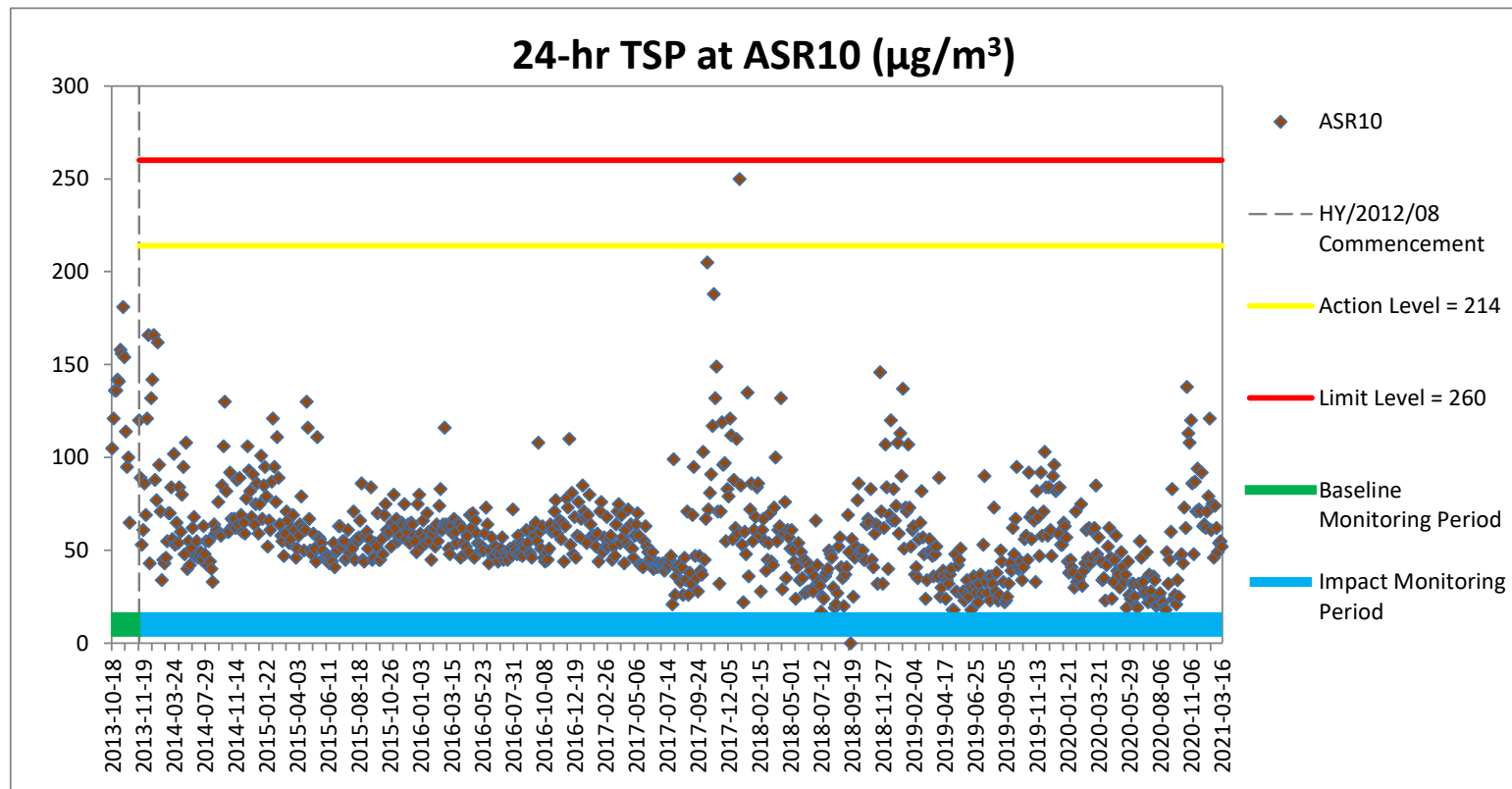


Figure D.10 Baseline & Impact Monitoring – 24-hour Total Suspended Particulates ($\mu\text{g}/\text{m}^3$) at ASR10 between 17 October 2013 and 19 March 2021 during Baseline & Impact Monitoring period. Weather condition within the reporting period varied between sunny to rainy. The overall monitoring results were not affected by weather conditions. Major land-based construction activities were included in Section 1.4.

Ref: 0212330_Impact AQM graphs_Final.xlsx



Appendix E

Impact Water Quality
Monitoring Results, Post-
Construction Water Quality
Monitoring Results and
Operational Phase Water
Quality Monitoring Results

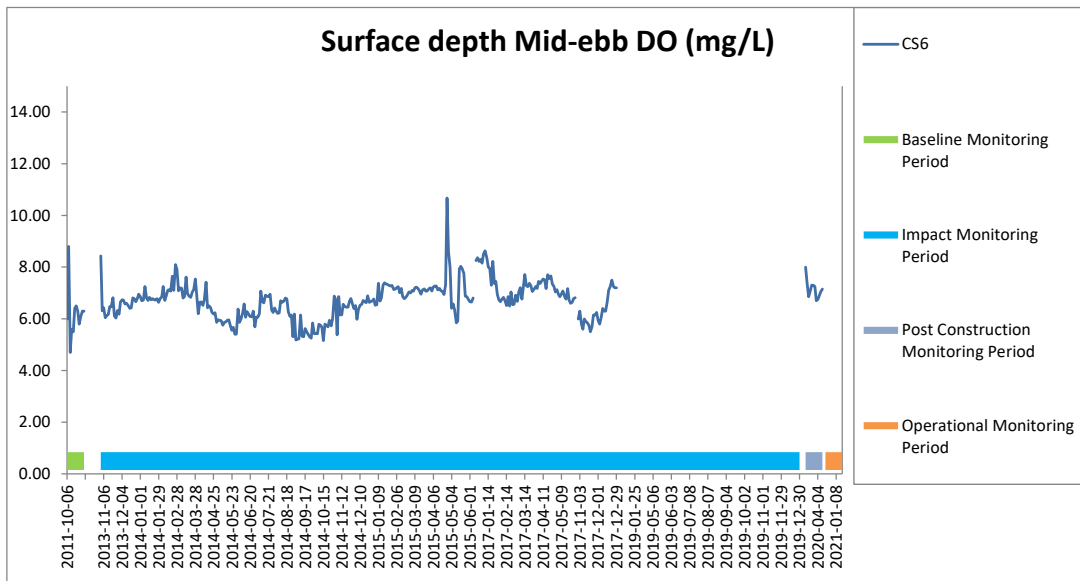
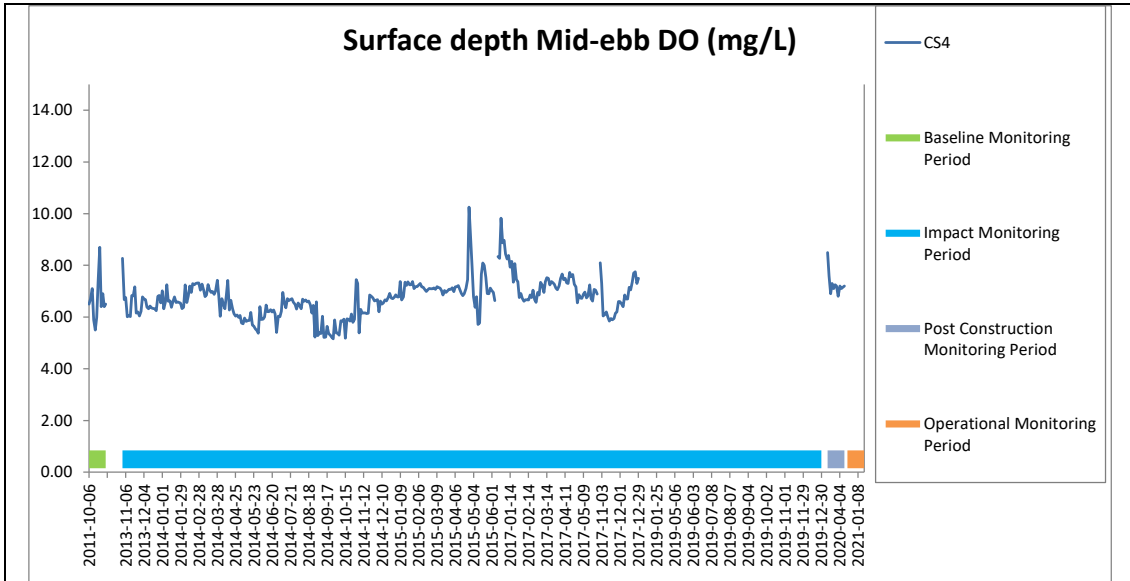


Figure E1 Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-ebb tide during the course of the Contract at CS4 and CS6.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

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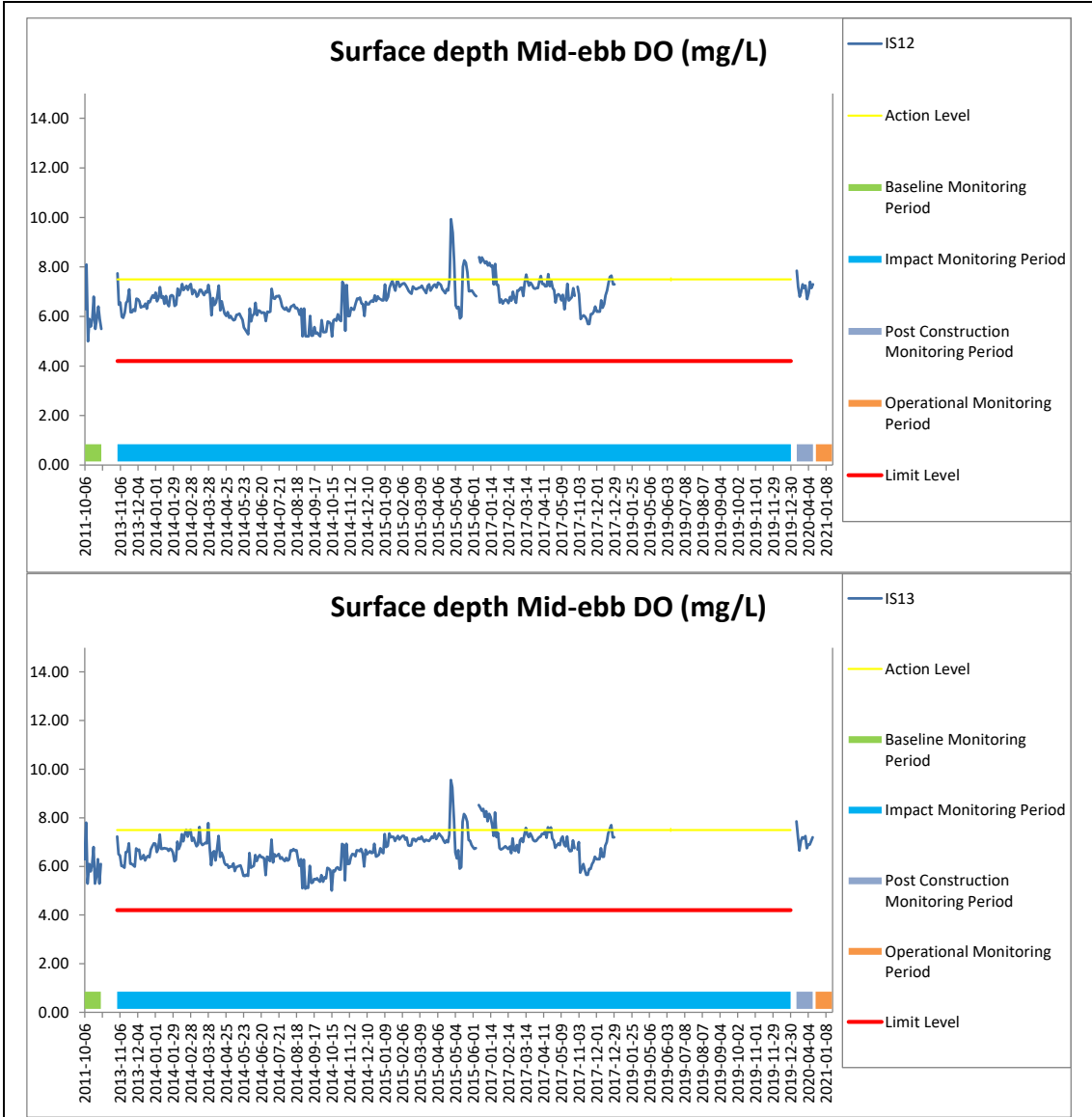


Figure E2 Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-ebb tide during the course of the Contract at IS12 and IS13.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

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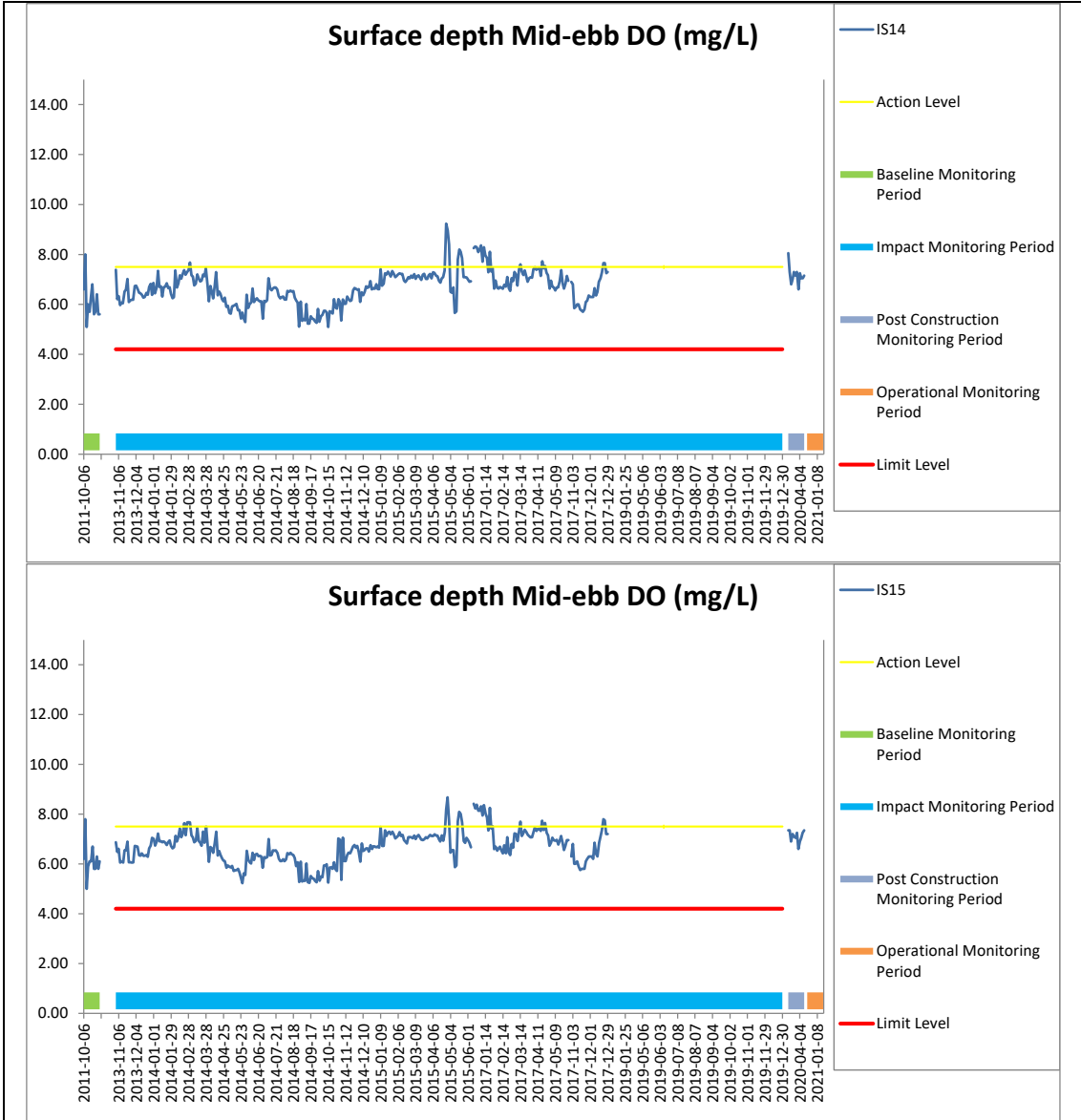


Figure E3 Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-ebb tide during the course of the Contract at IS14 and IS15.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

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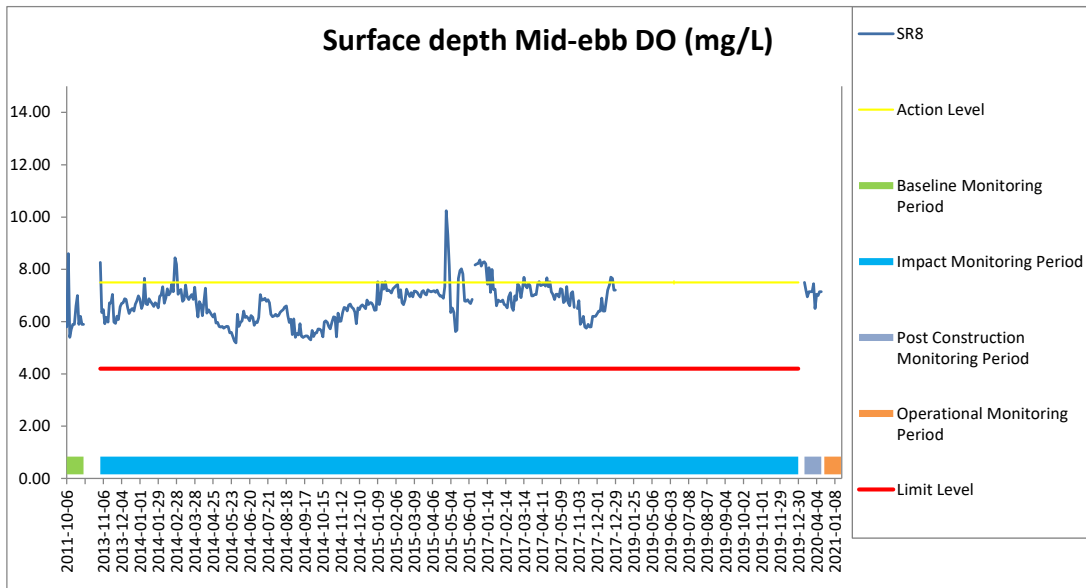
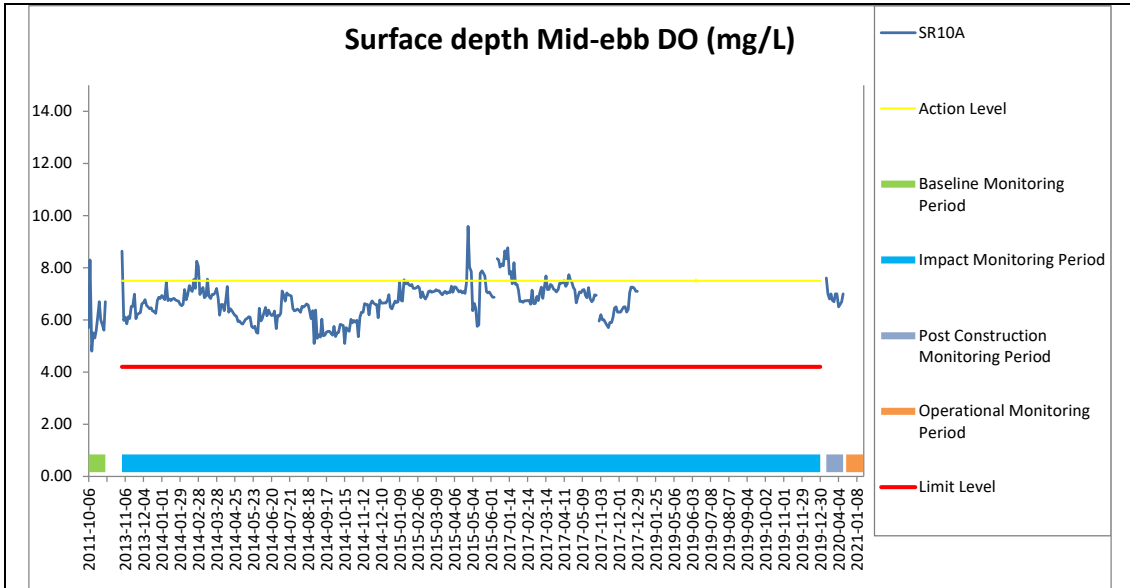


Figure E4 Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-ebb tide during the course of the Contract at SR10A and SR8.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

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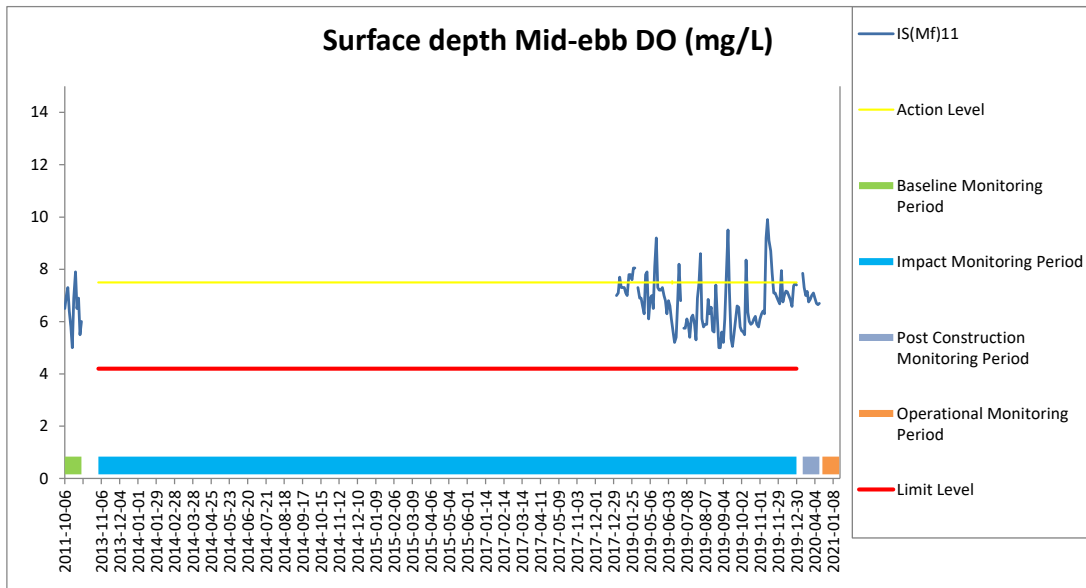
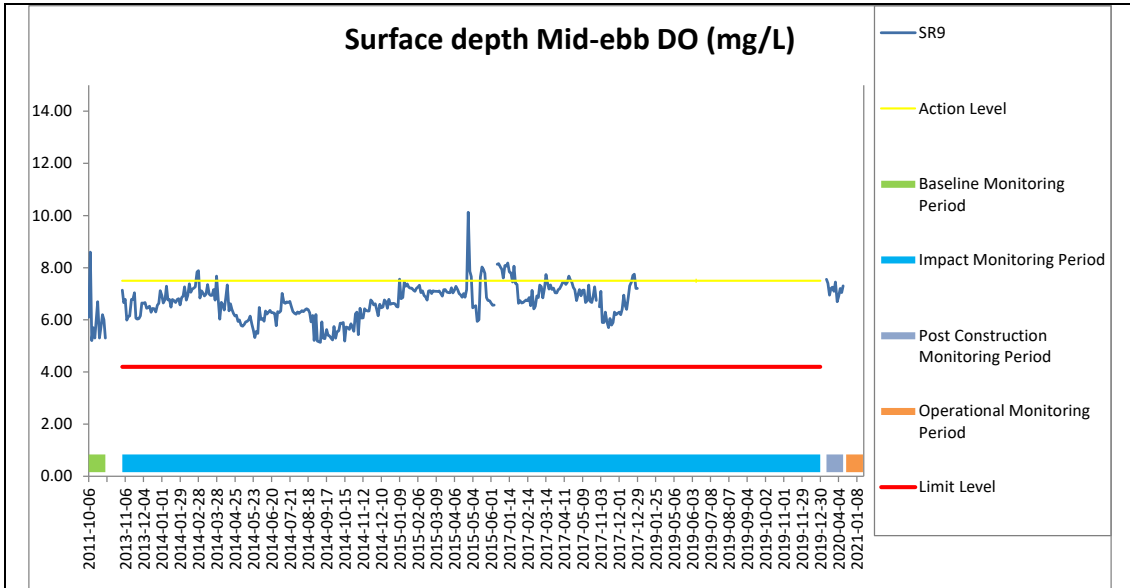


Figure E5 Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-ebb tide during the course of the Contract at SR9 and IS(Mf)11.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

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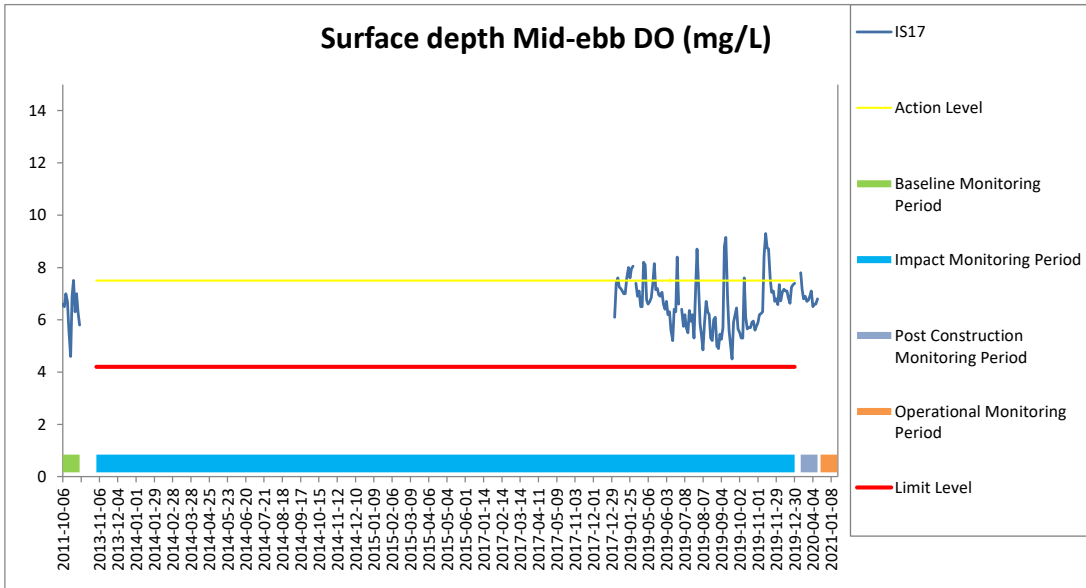
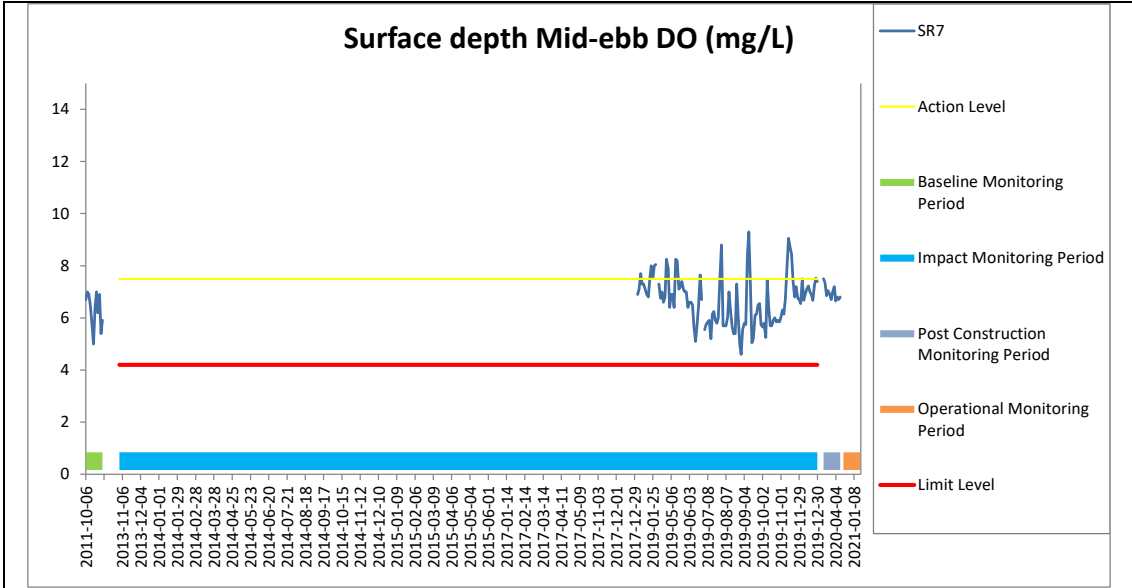


Figure E6 Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-ebb tide during the course of the Contract at SR7 and IS17.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



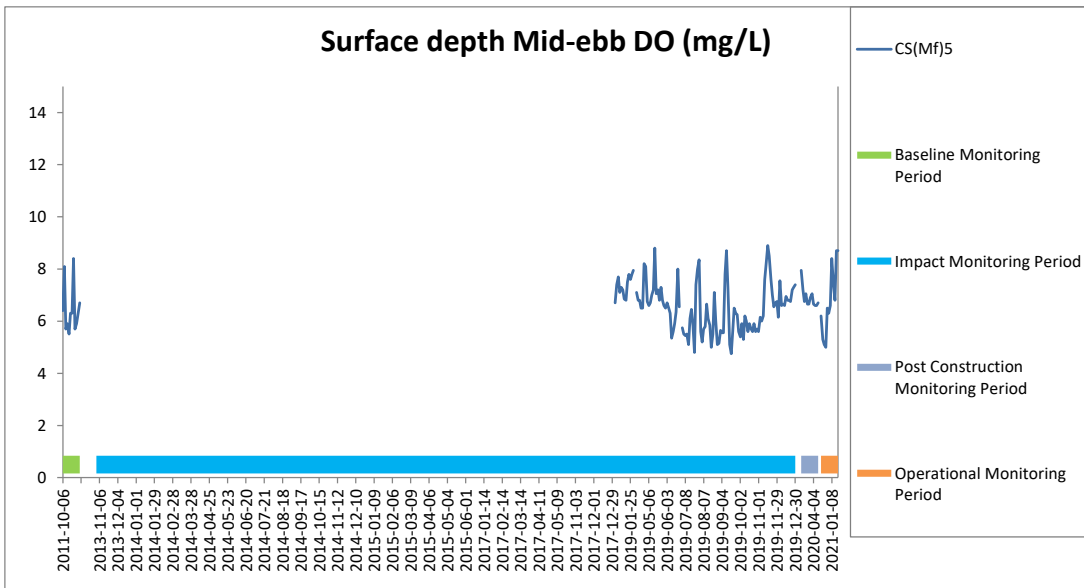
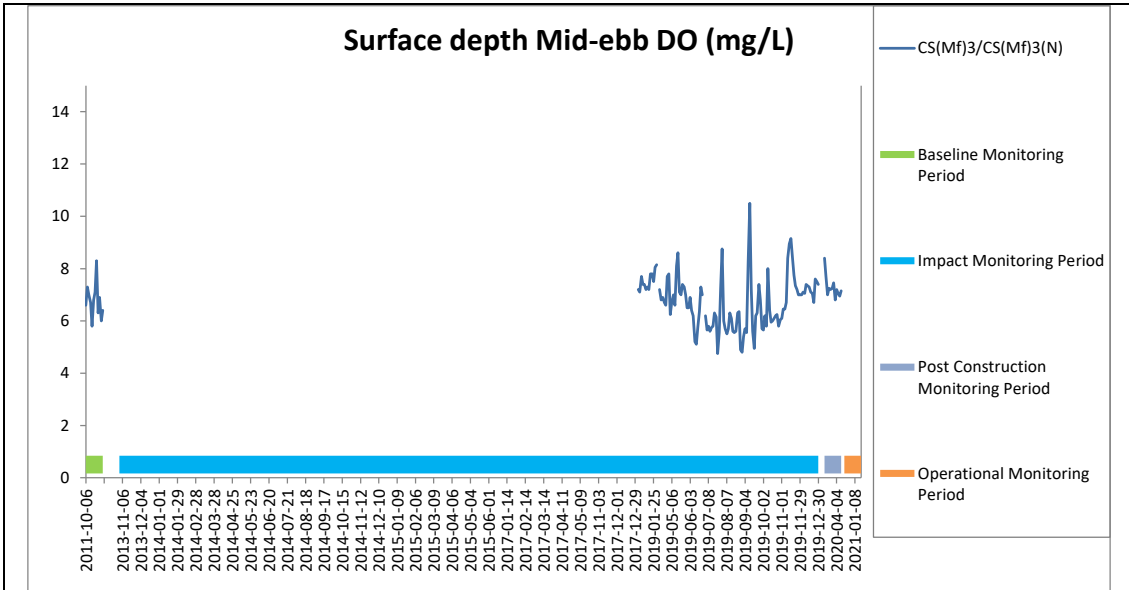


Figure E7 Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-ebb tide during the course of the Contract at CS(Mf)3/CS(Mf)3(N) and CS(Mf)5.
(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

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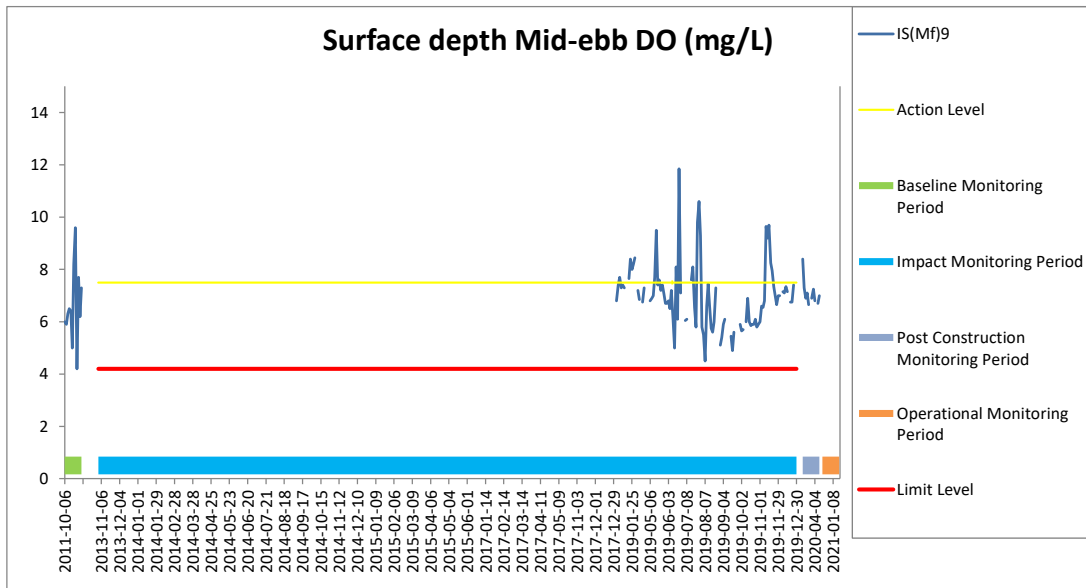
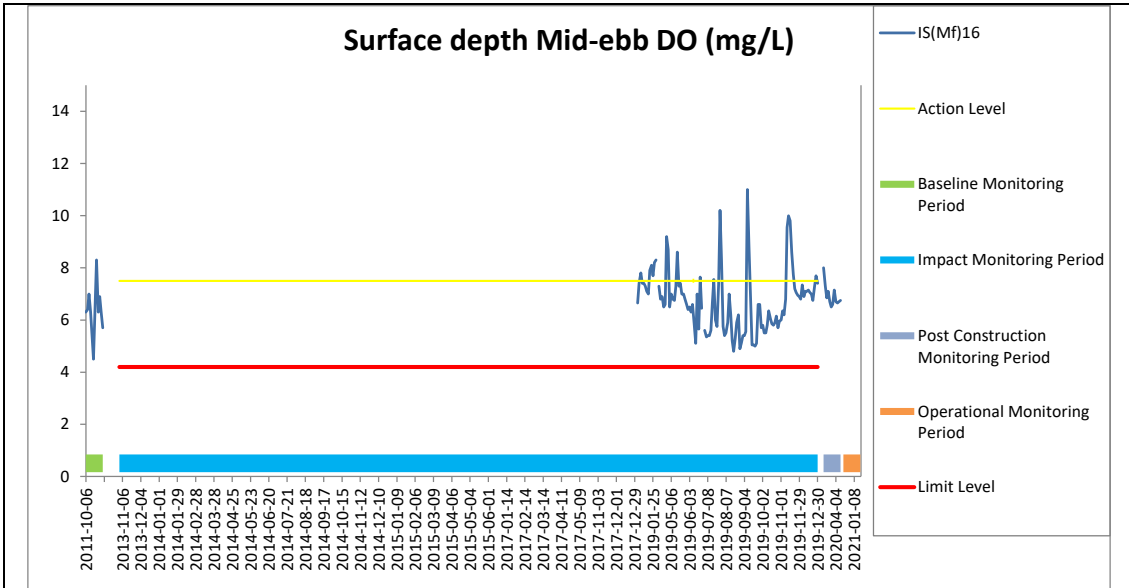


Figure E8 Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-ebb tide during the course of the Contract at IS(Mf)16 and IS(Mf)9.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

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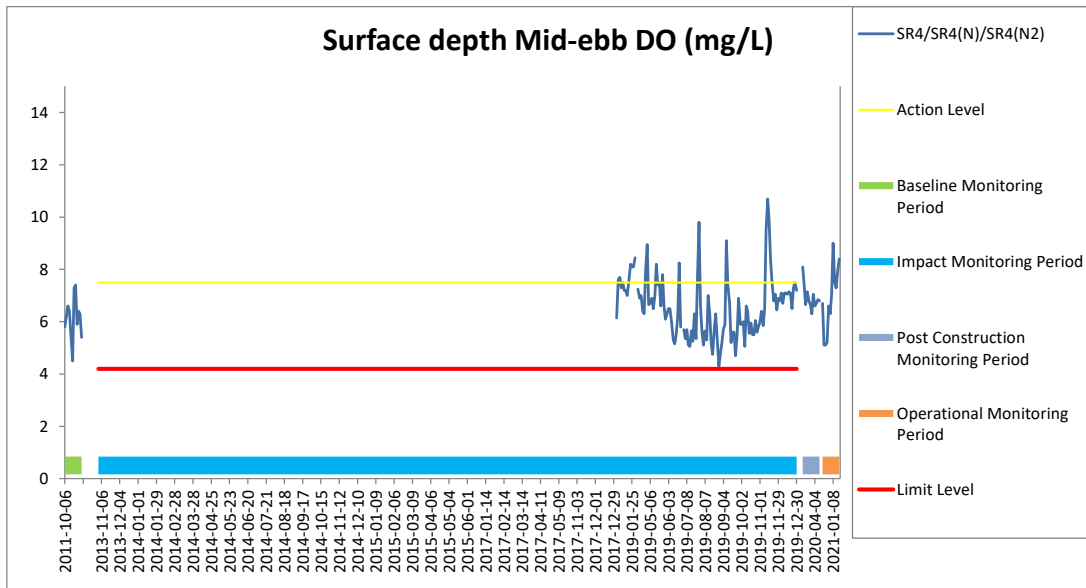
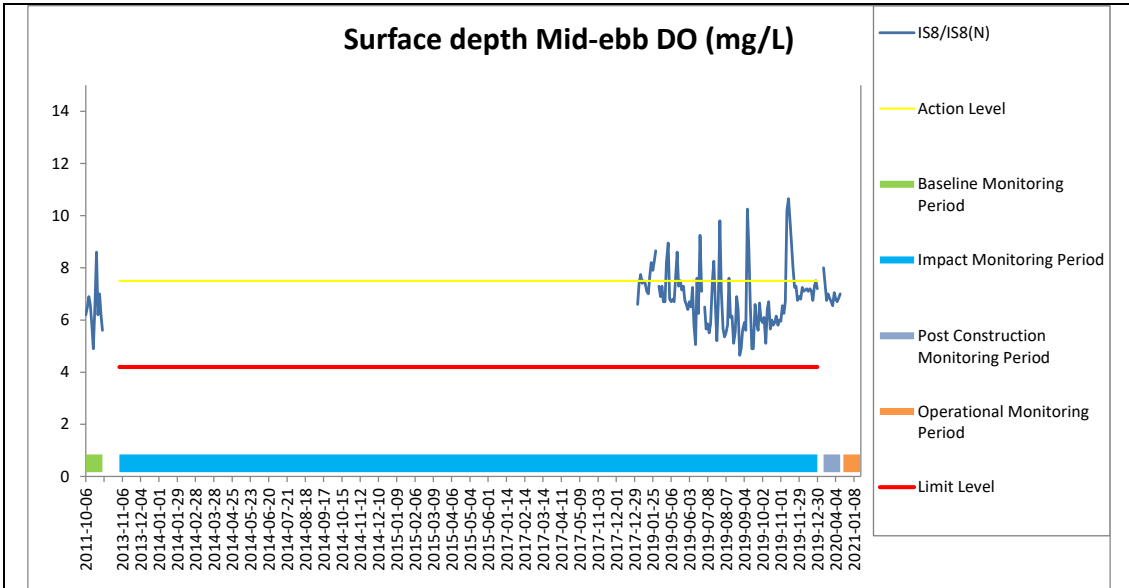


Figure E9 Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-ebb tide during the course of the Contract at IS8/IS8(N) and SR4/SR4(N)/SR4(N2).

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

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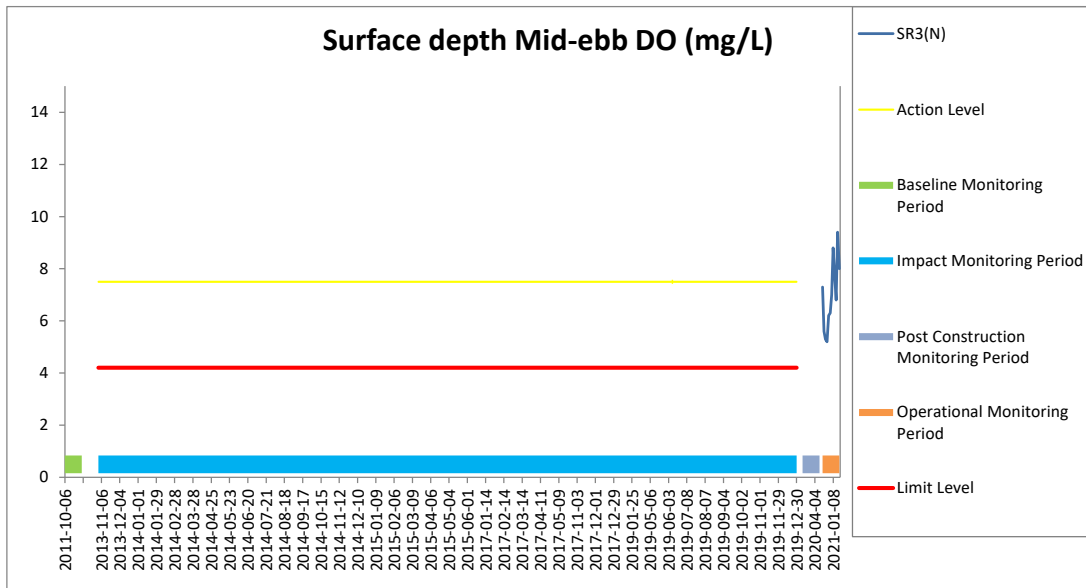
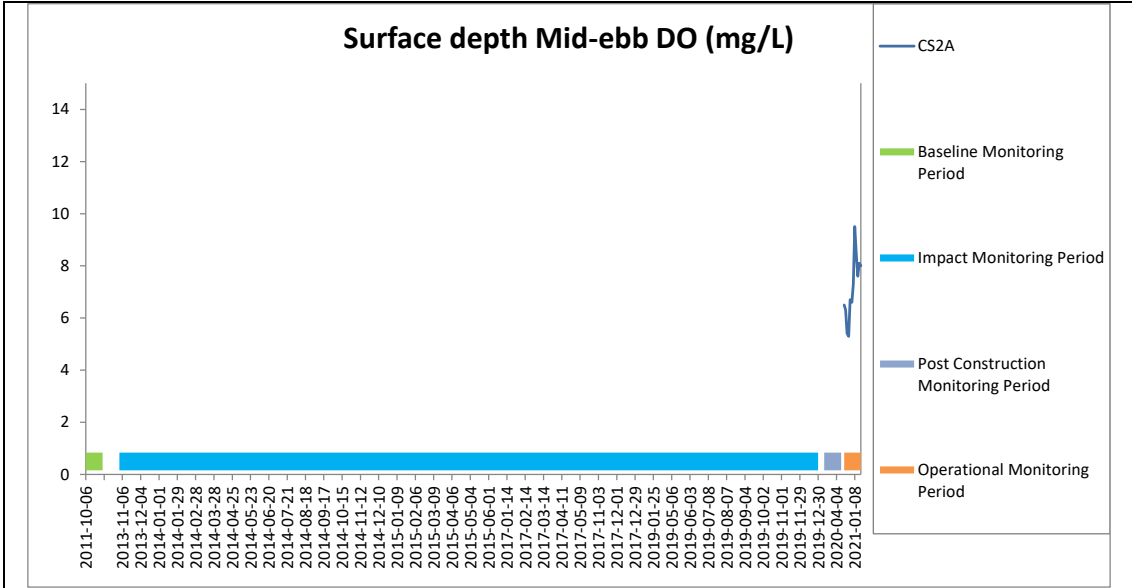


Figure E10 Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-ebb tide during the course of the Contract at CS2A and SR3(N).

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

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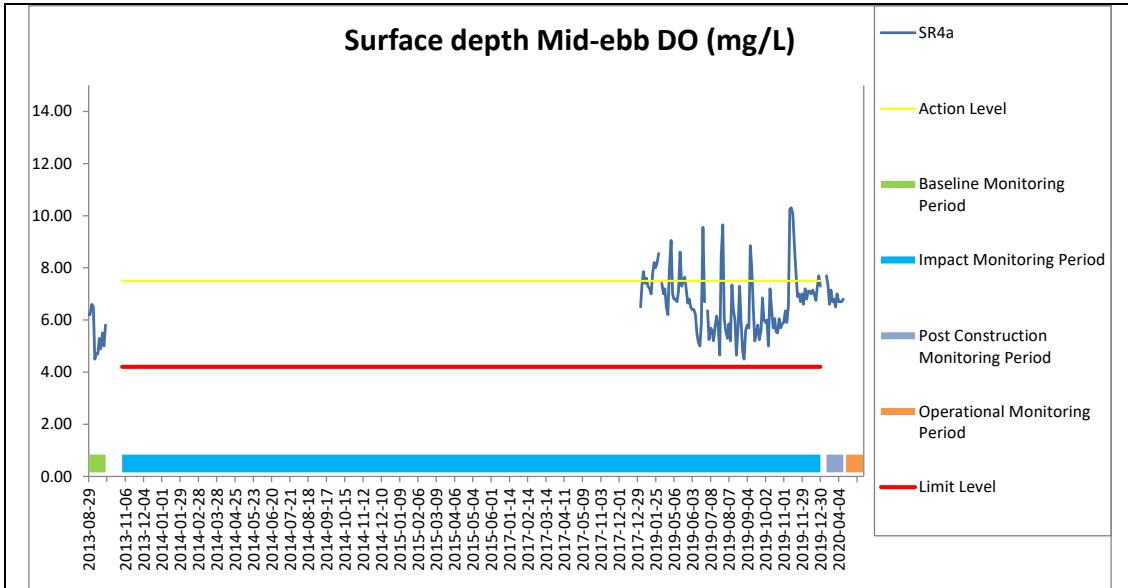


Figure E11 Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-ebb tide during the course of the Contract at SR4a.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



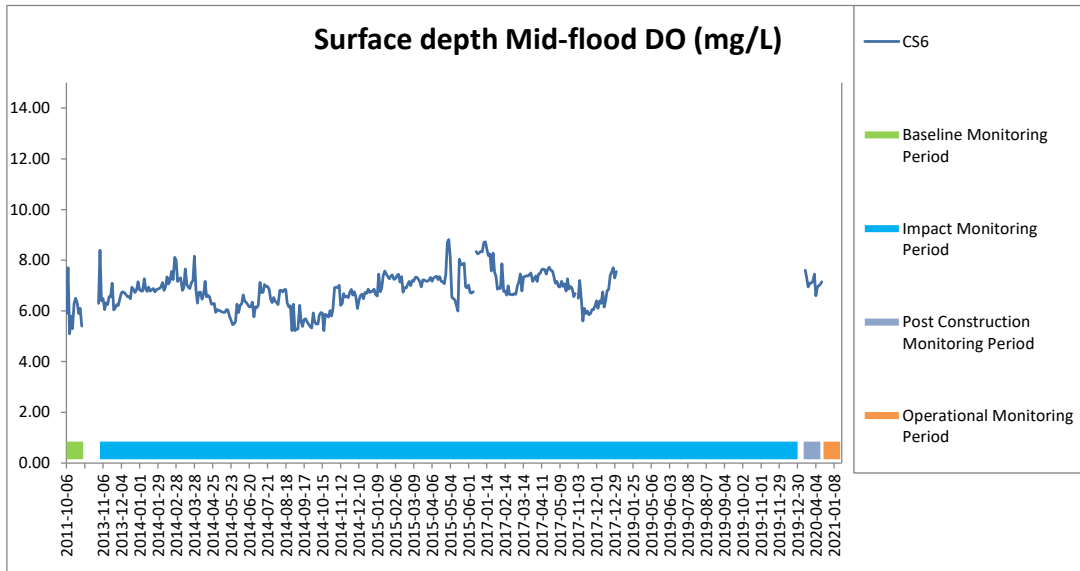
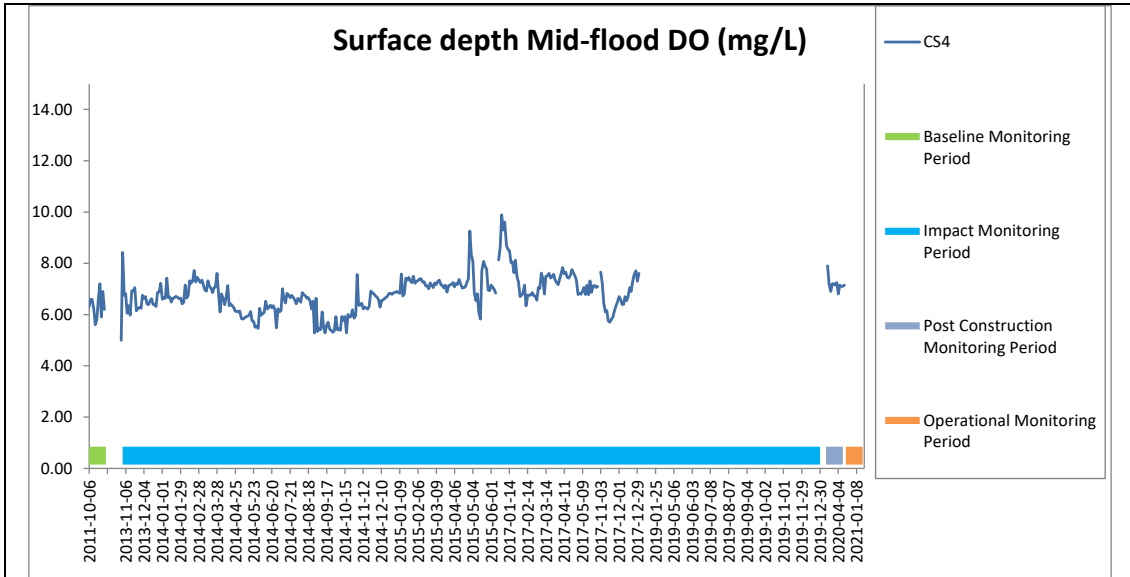


Figure E12 Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-flood tide during the course of the Contract at CS4 and CS6.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

**Environmental
Resources
Management**



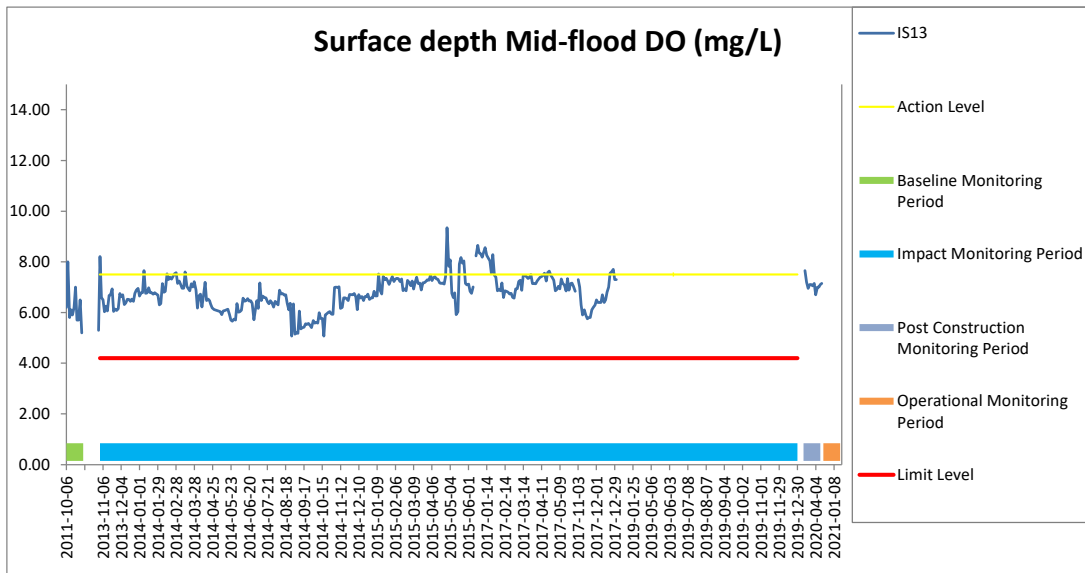
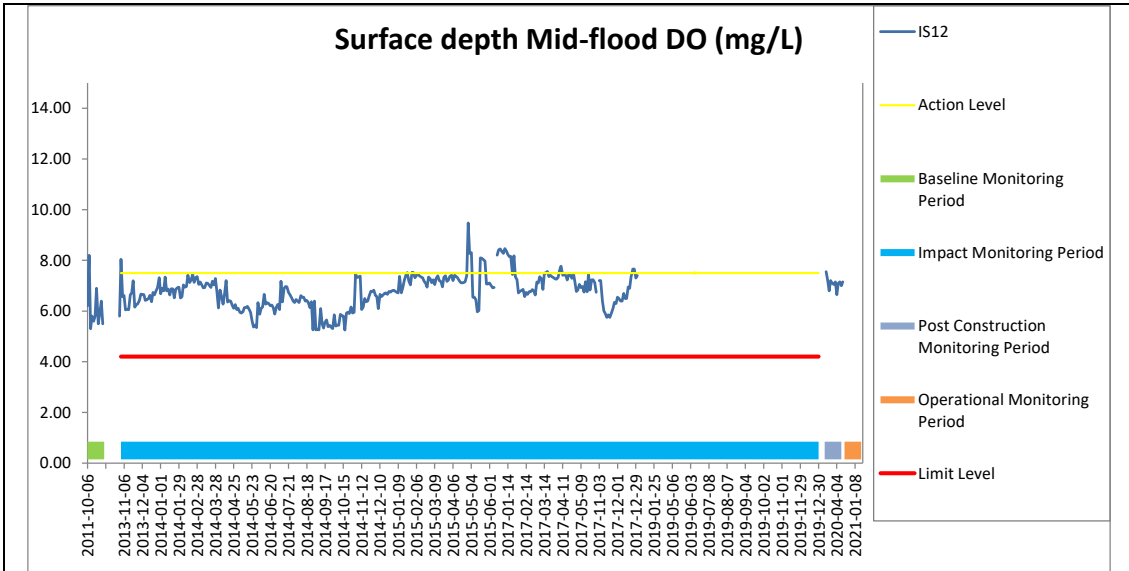


Figure E13 Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-flood tide during the course of the Contract at IS12 and IS13.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

**Environmental
Resources
Management**



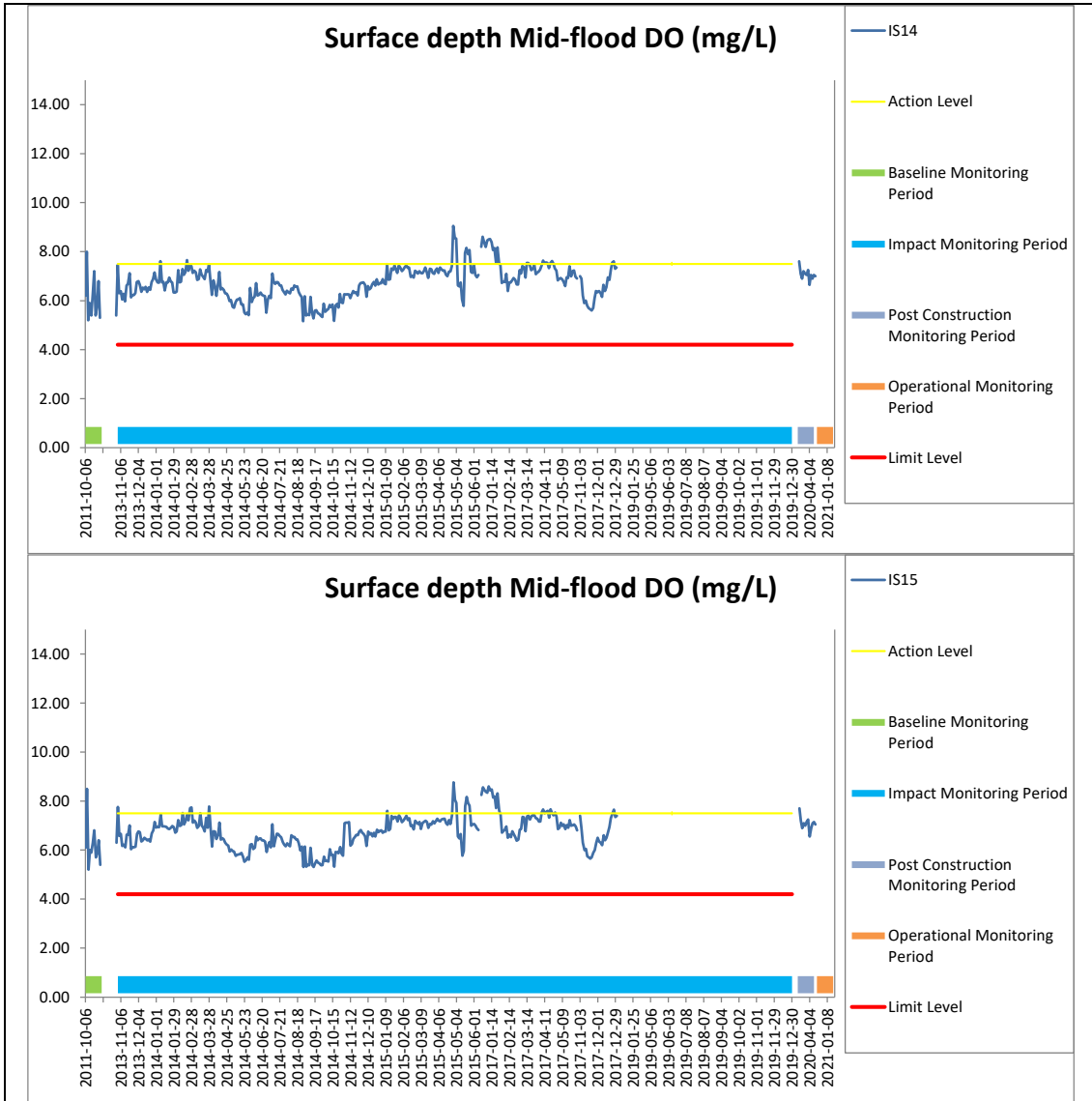


Figure E14 Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-flood tide during the course of the Contract at IS14 and IS15.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

**Environmental
Resources
Management**



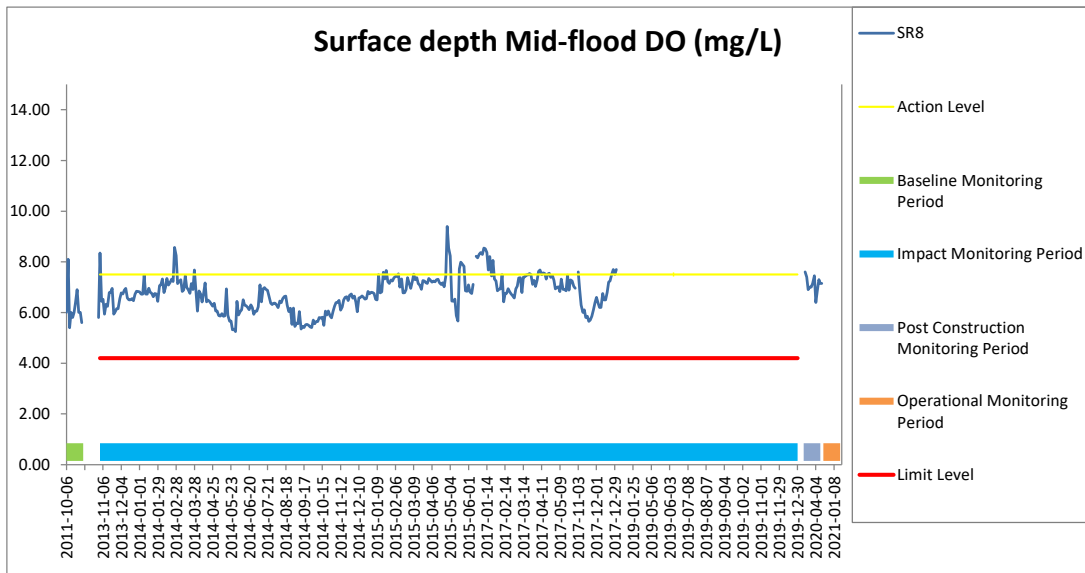
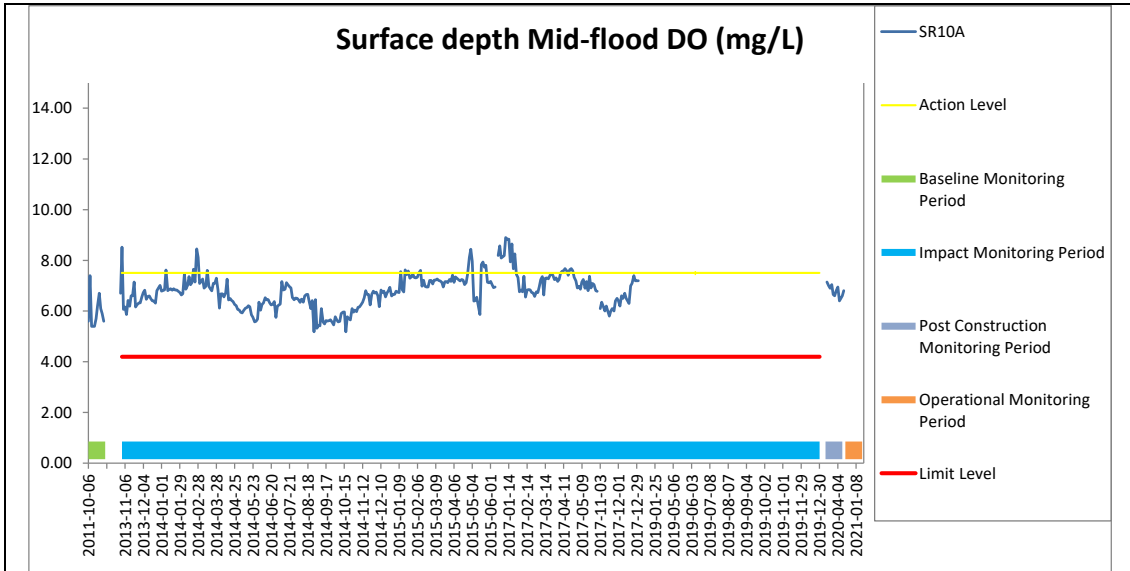


Figure E15 Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-flood tide during the course of the Contract at SR10A and SR8.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

**Environmental
Resources
Management**



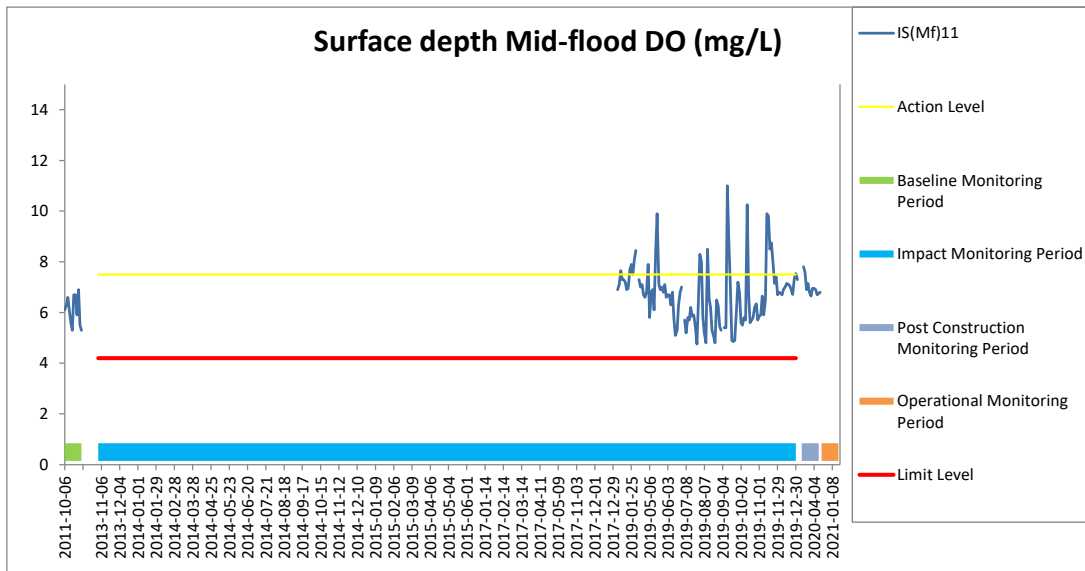
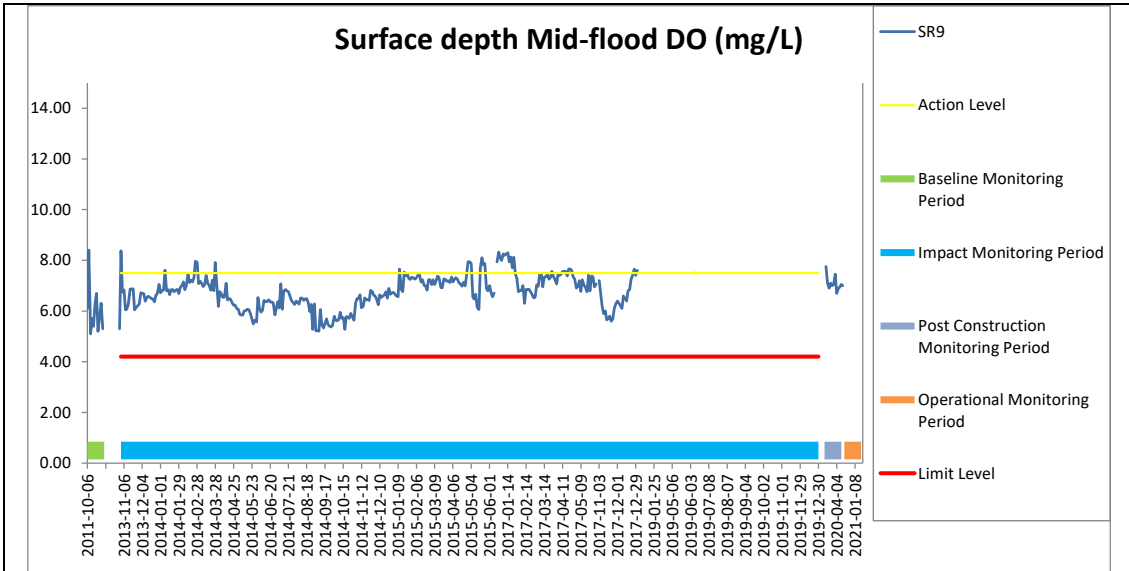


Figure E16 Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-flood tide during the course of the Contract at SR9 and IS(Mf)11.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

**Environmental
Resources
Management**



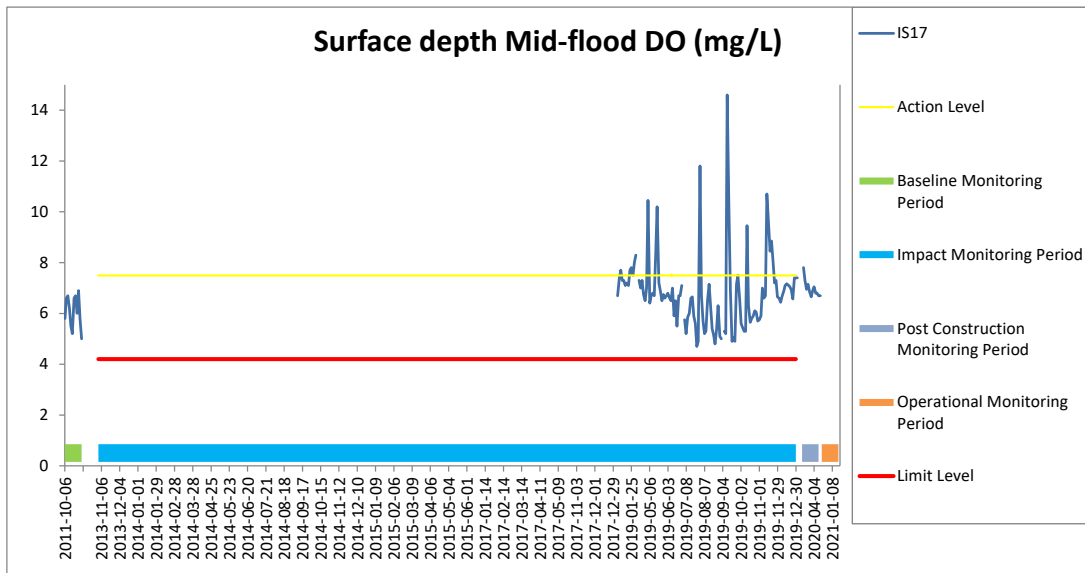
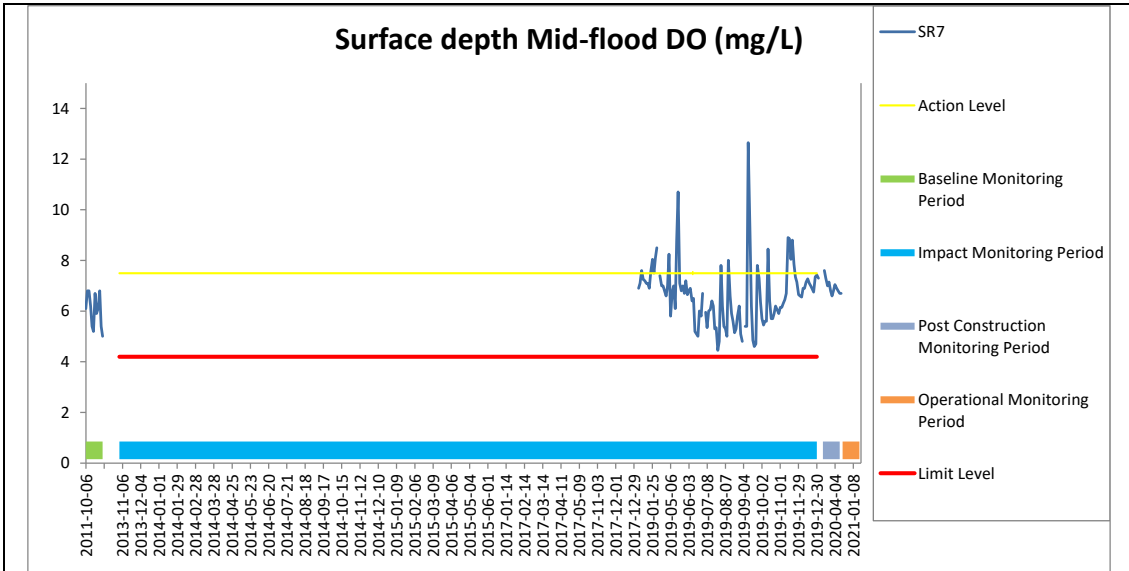


Figure E17 Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-flood tide during the course of the Contract at SR7 and IS17.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



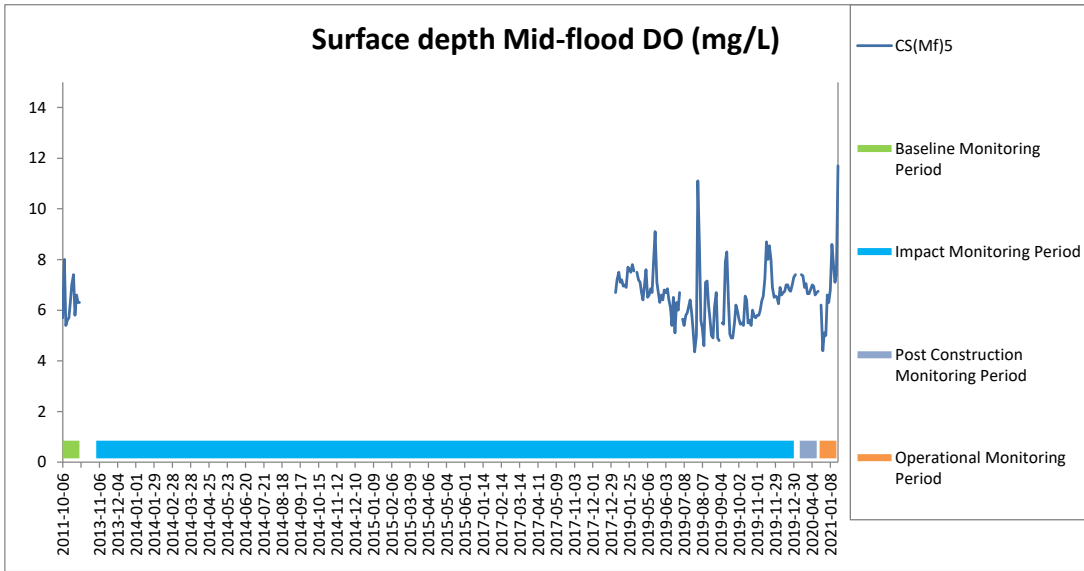
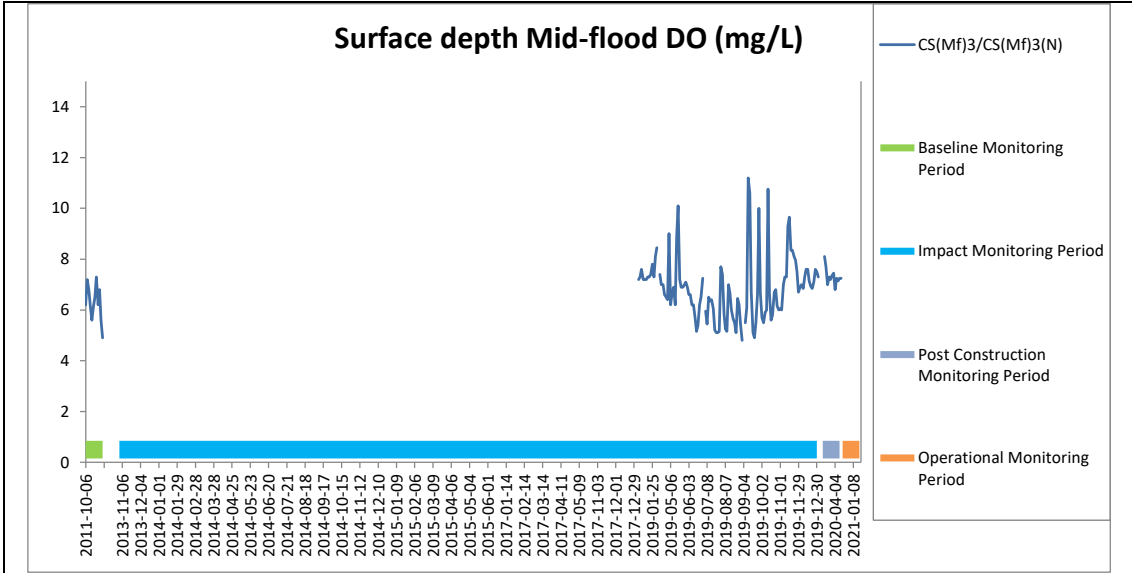


Figure E18 Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-flood tide during the course of the Contract at CS(Mf)3/CS(Mf)3(N) and CS(Mf)5.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



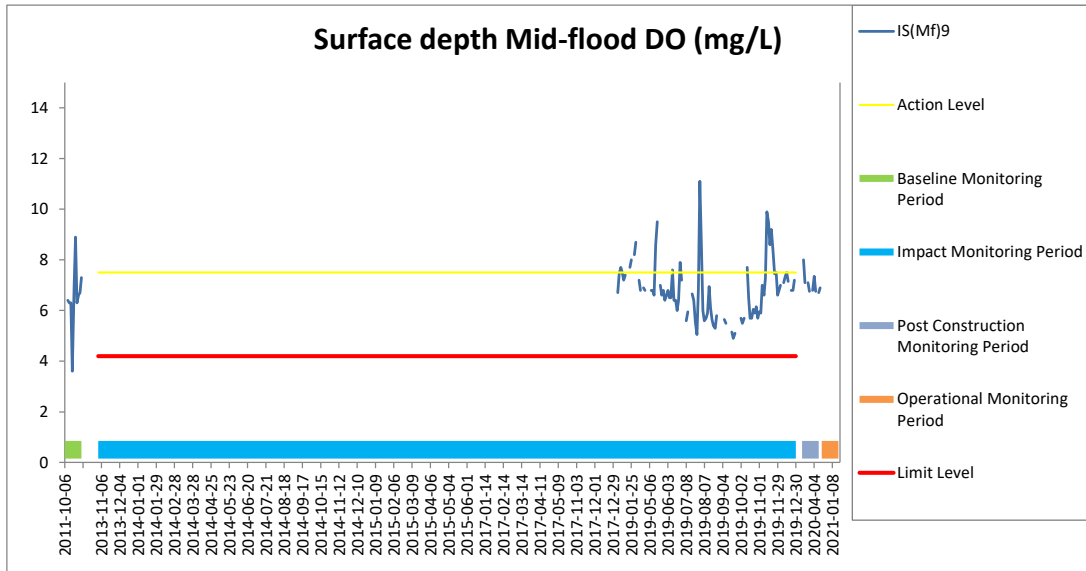
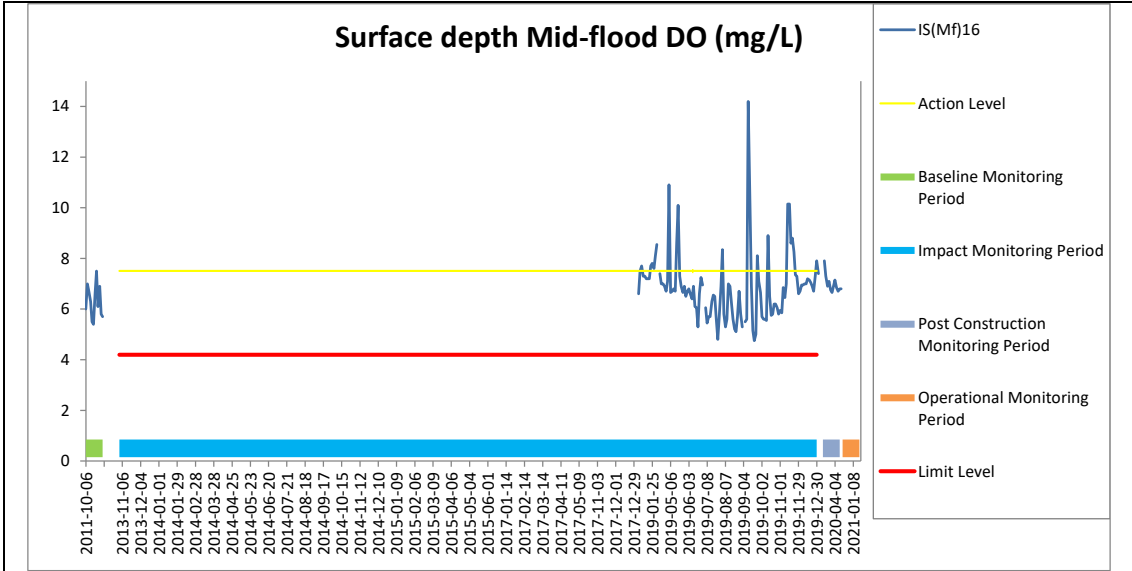


Figure E19 Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-flood tide during the course of the Contract at IS(Mf)16 and IS(Mf)9.
(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



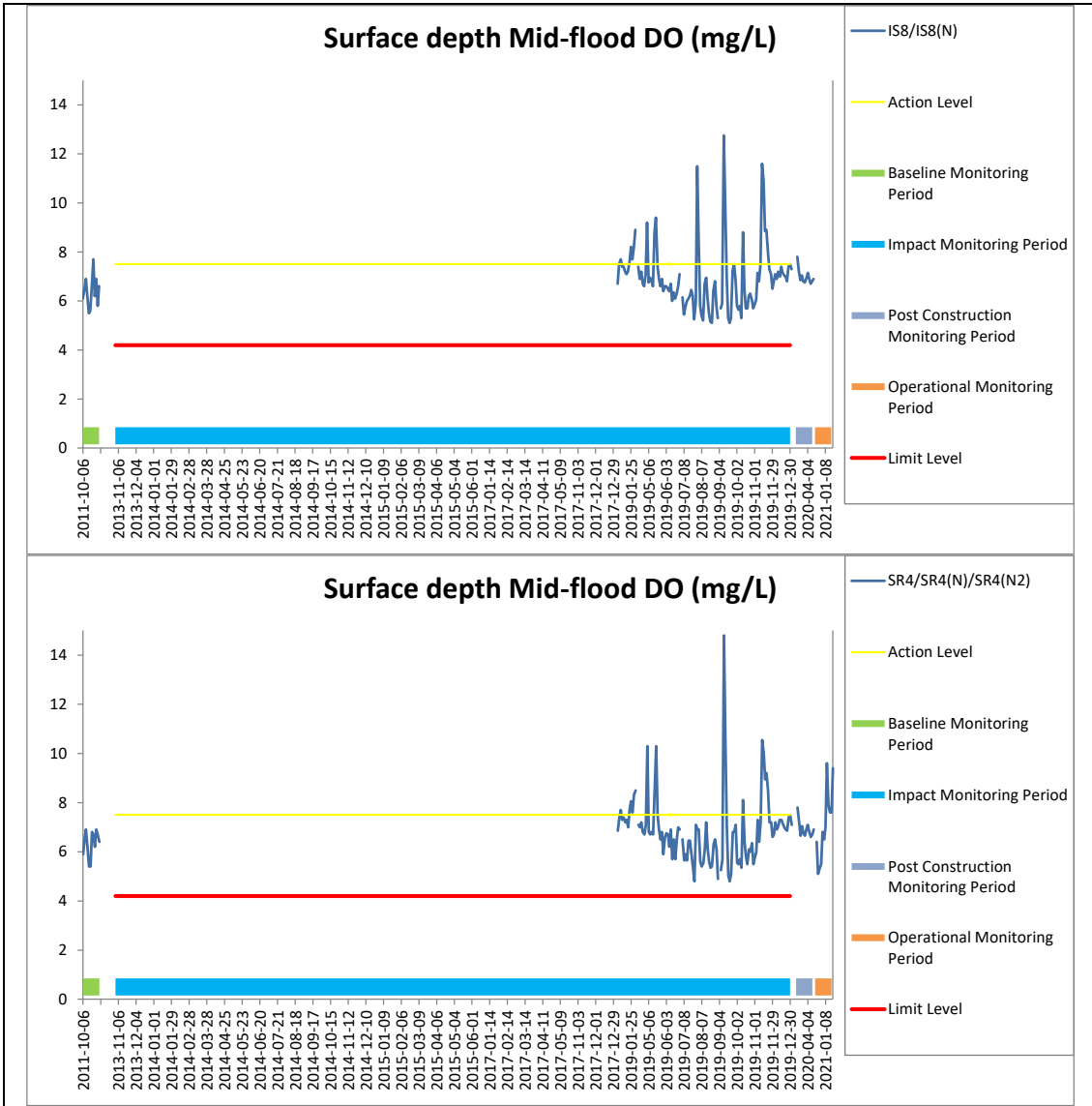


Figure E20 Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-flood tide during the course of the Contract at IS8/IS8(N) and SR4/SR4(N)/SR4(N2).

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

**Environmental
Resources
Management**



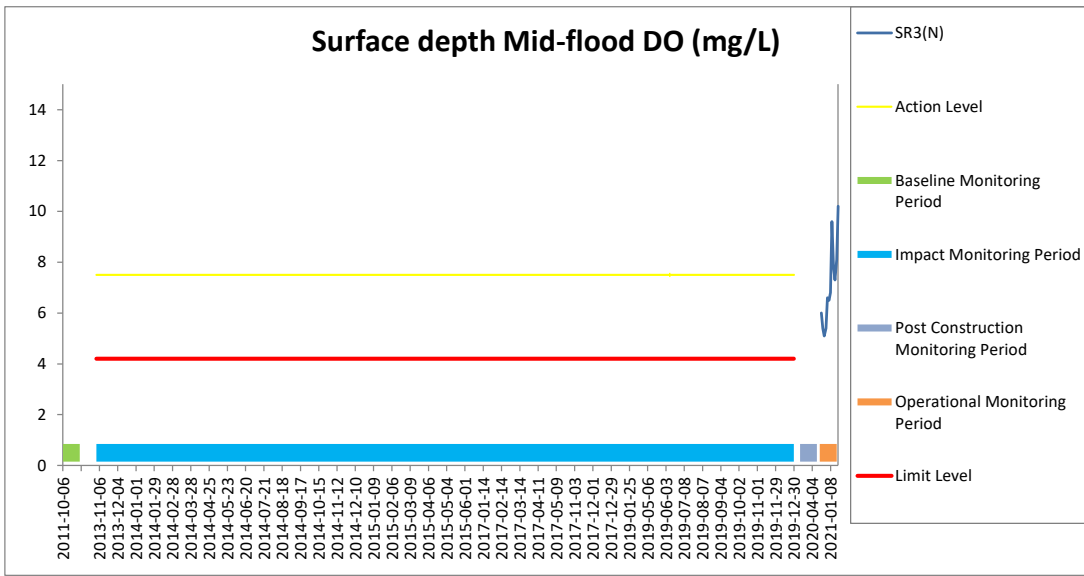
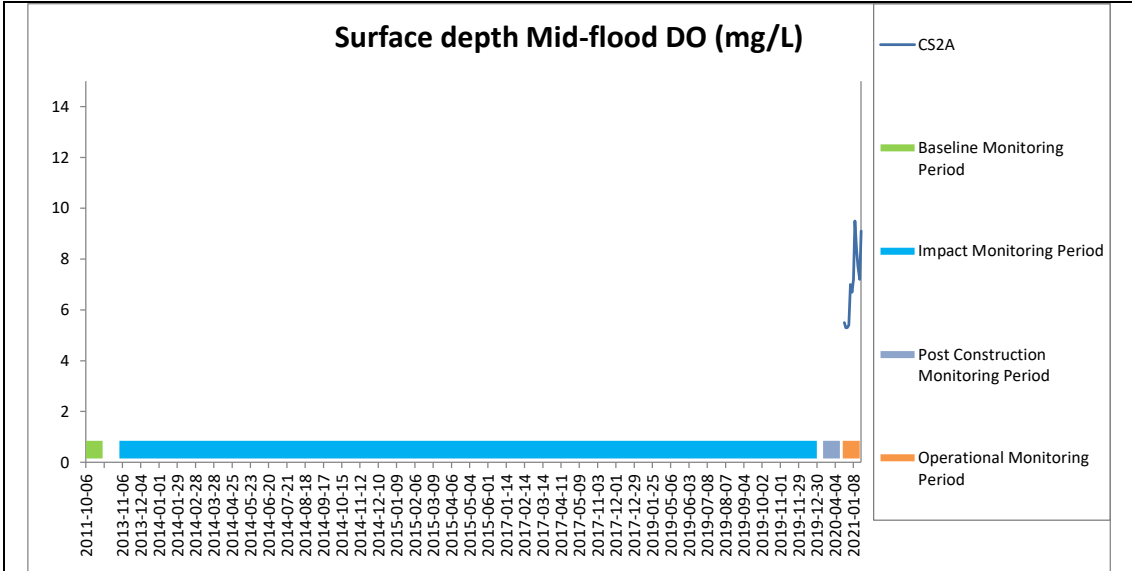


Figure E21 Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-flood tide during the course of the Contract at CS2A and SR3(N).

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



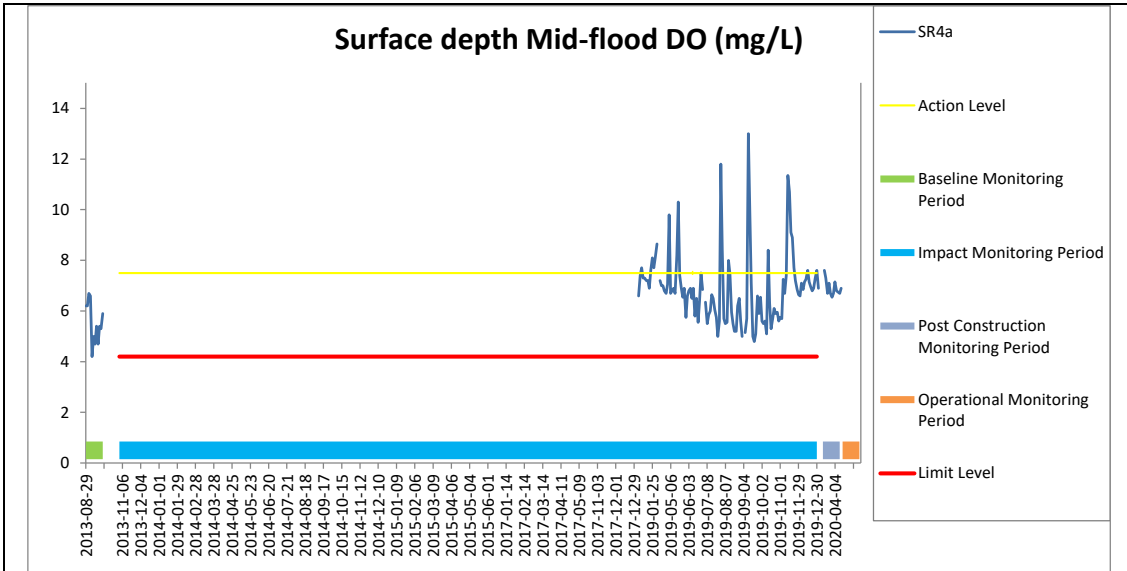


Figure E22 Mean Level of Dissolved Oxygen (mg/L) in surface waters during mid-flood tide during the course of the Contract at SR4a.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



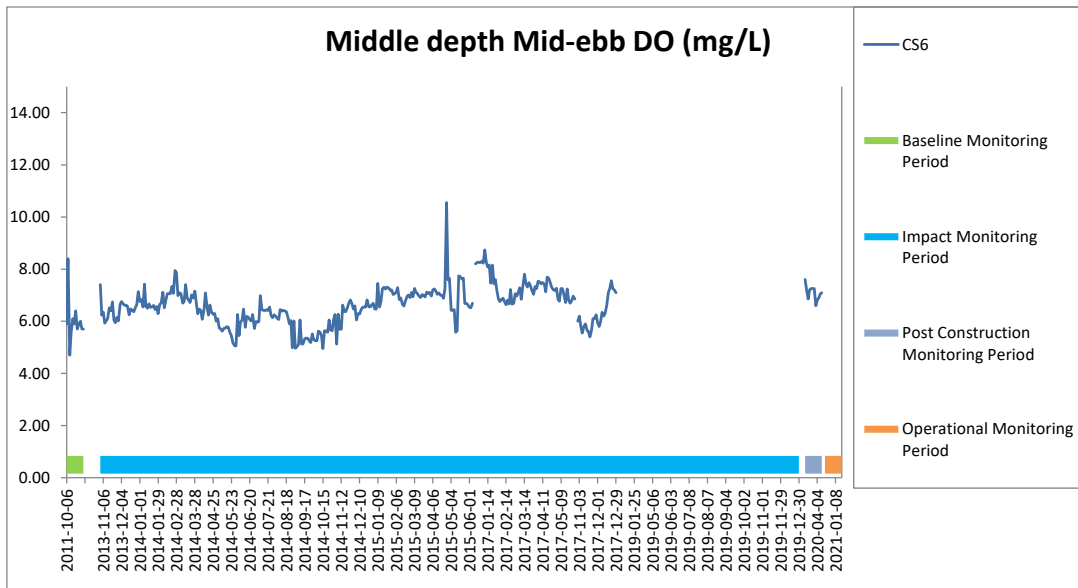
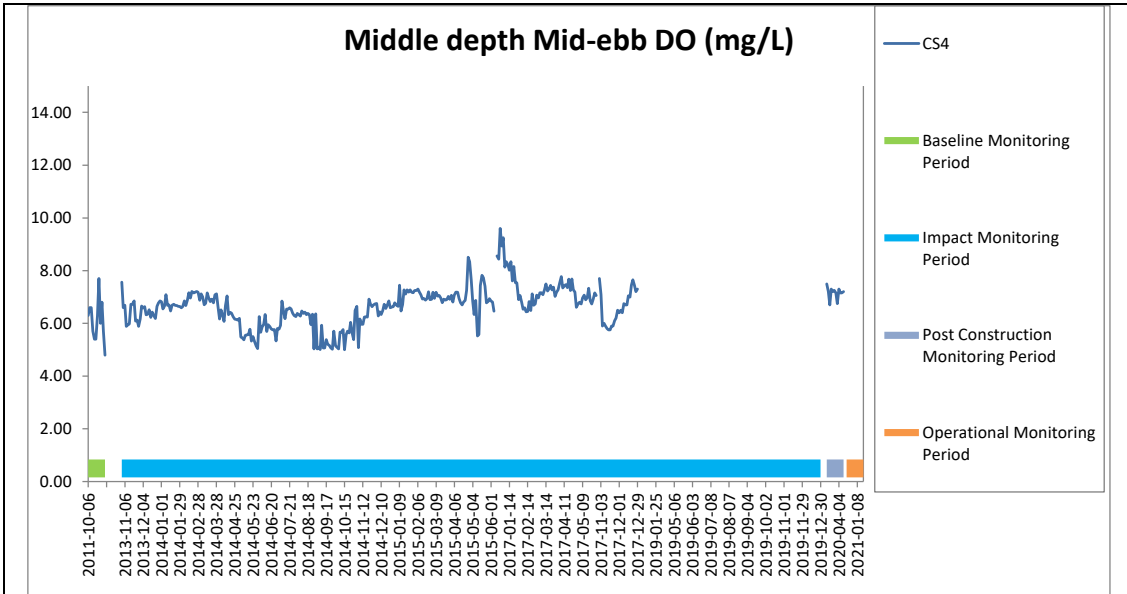


Figure E23 Mean Level of Dissolved Oxygen (mg/L) in mid-depth waters during mid-ebb tide during the course of the Contract at CS4 and CS6.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

**Environmental
Resources
Management**



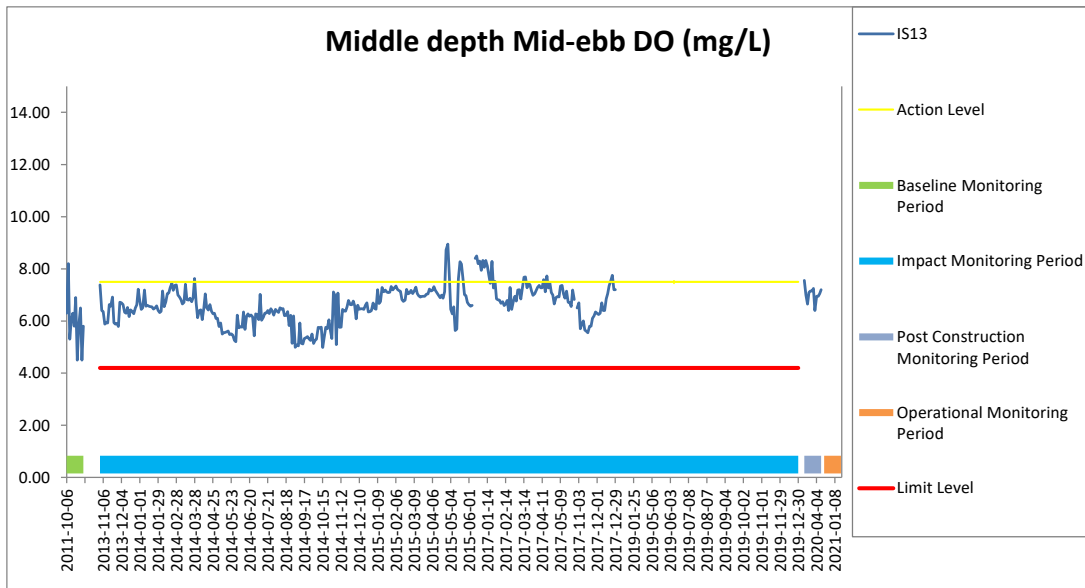
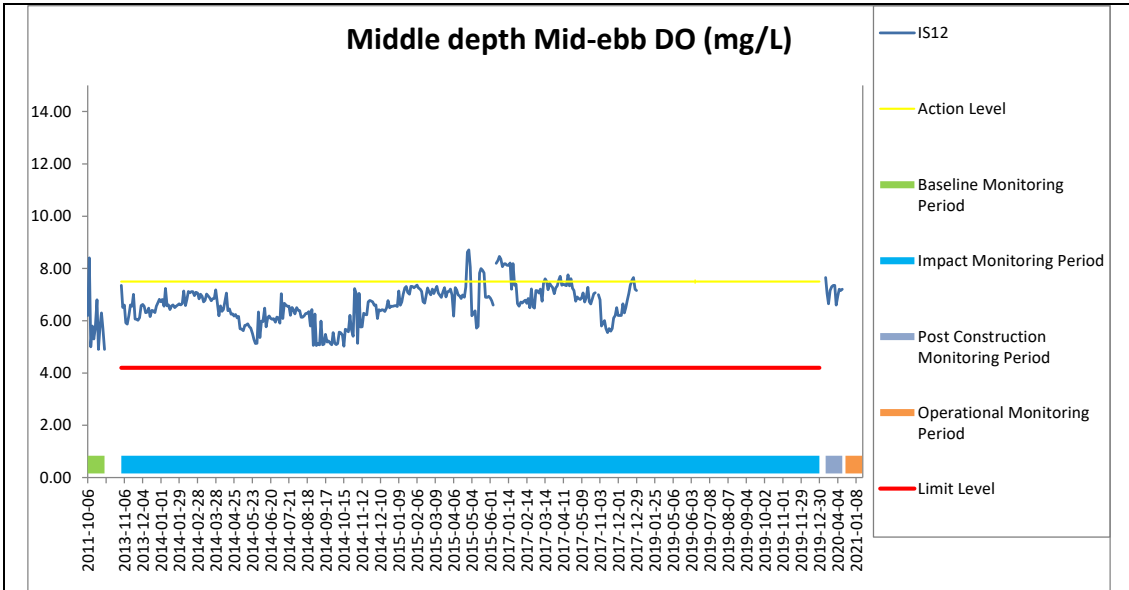


Figure E24 Mean Level of Dissolved Oxygen (mg/L) in mid-depth waters during mid-ebb tide during the course of the Contract at IS12 and IS13.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



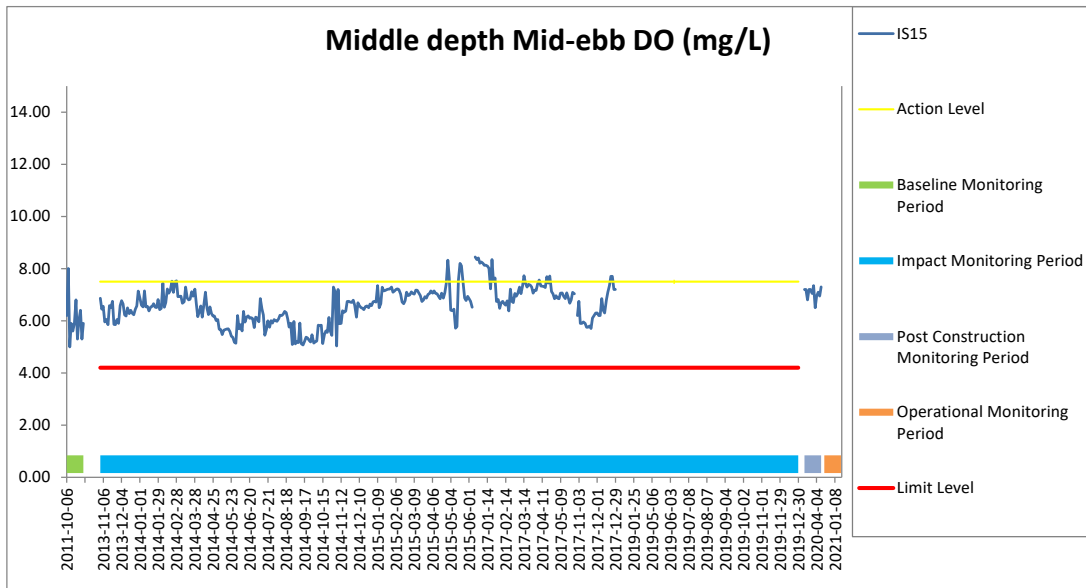
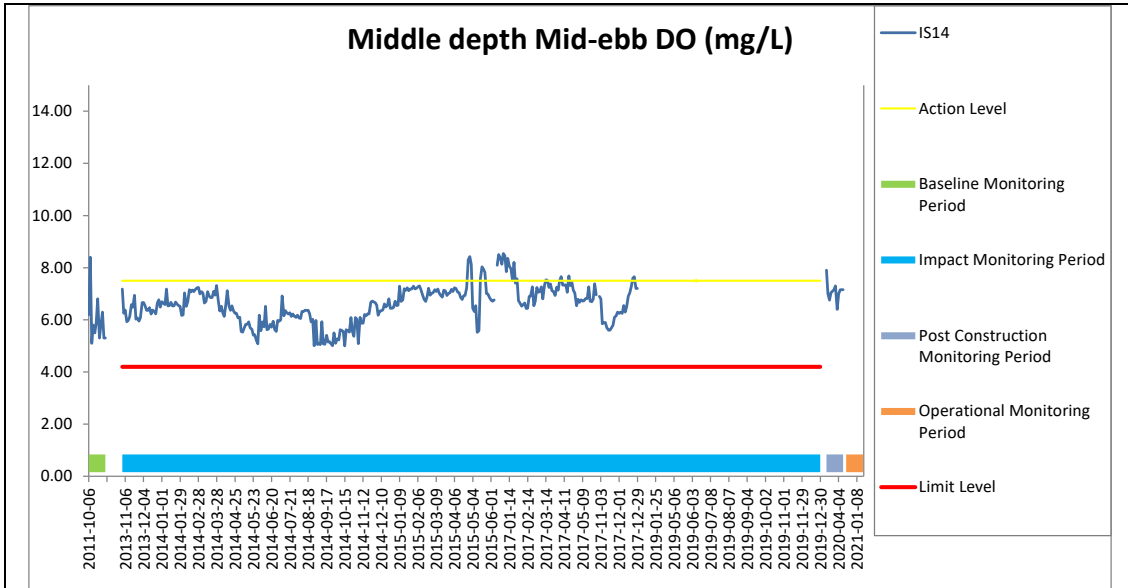


Figure E25 Mean Level of Dissolved Oxygen (mg/L) in mid-depth waters during mid-ebb tide during the course of the Contract at IS14 and IS15.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



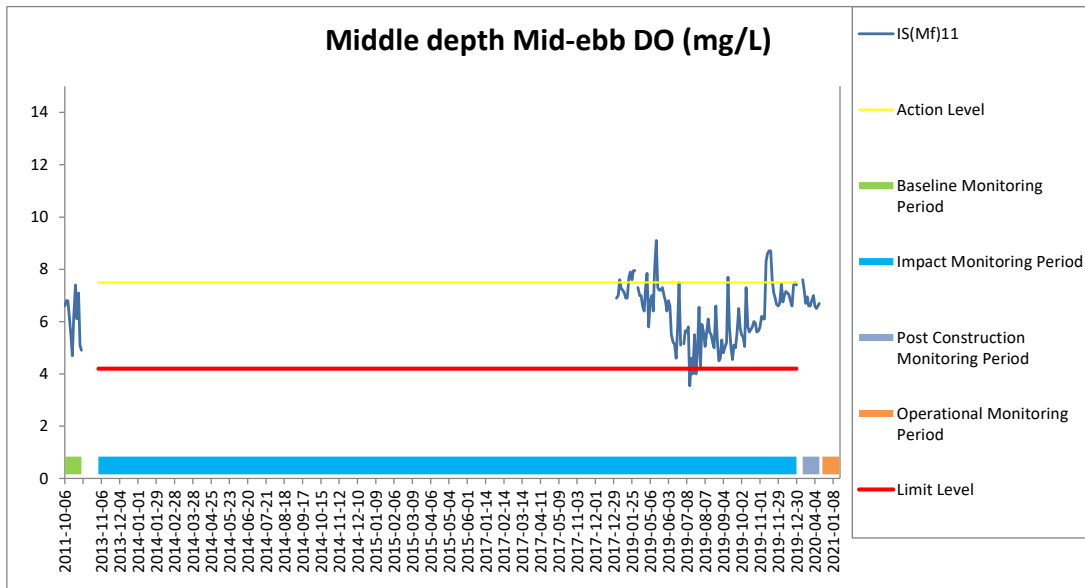
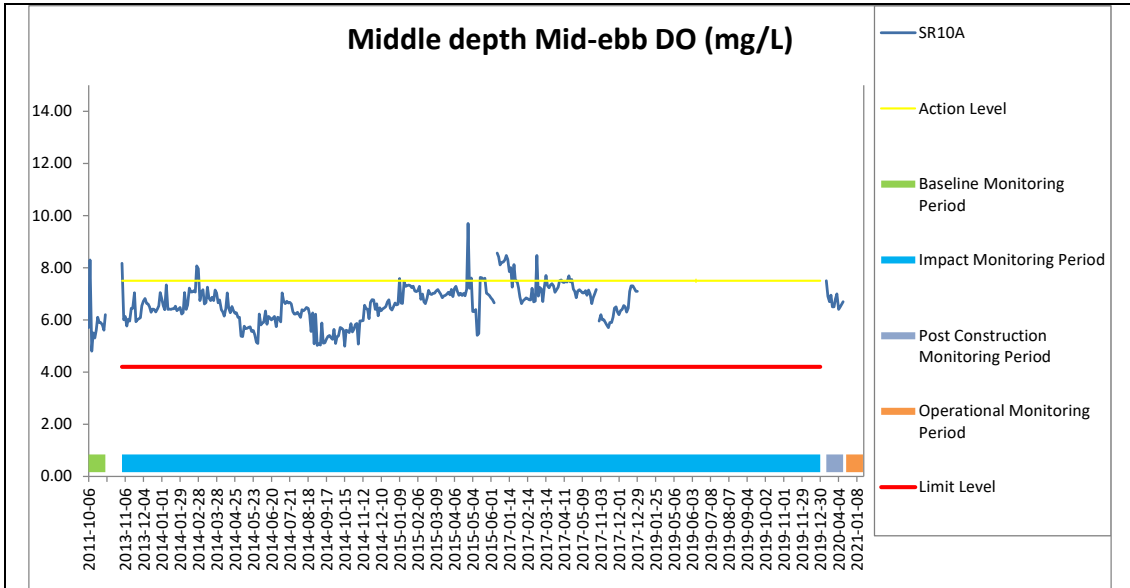


Figure E26 Mean Level of Dissolved Oxygen (mg/L) in mid-depth waters during mid-ebb tide during the course of the Contract at SR10A and IS(Mf)11.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



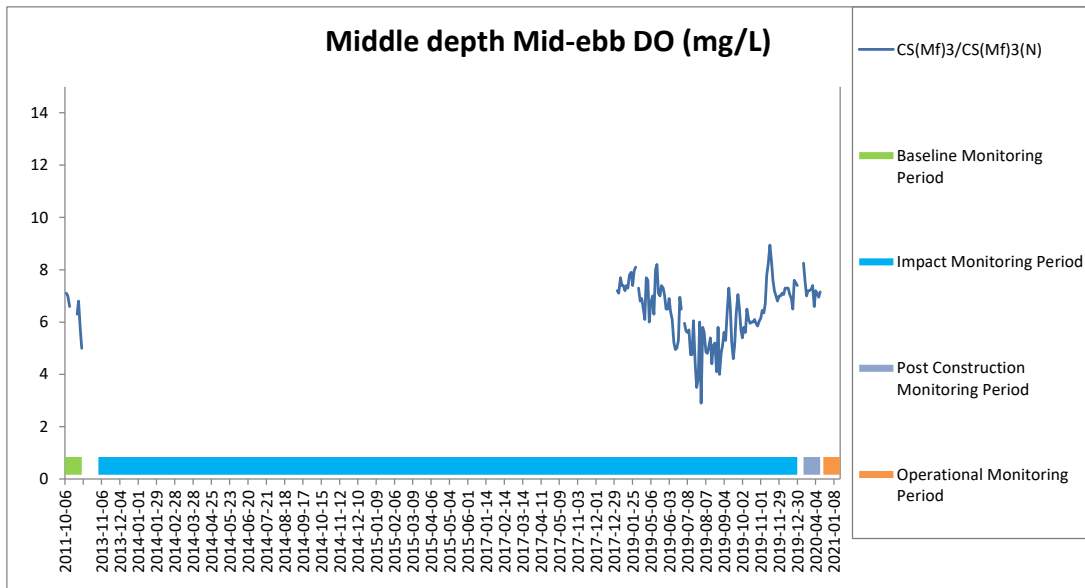
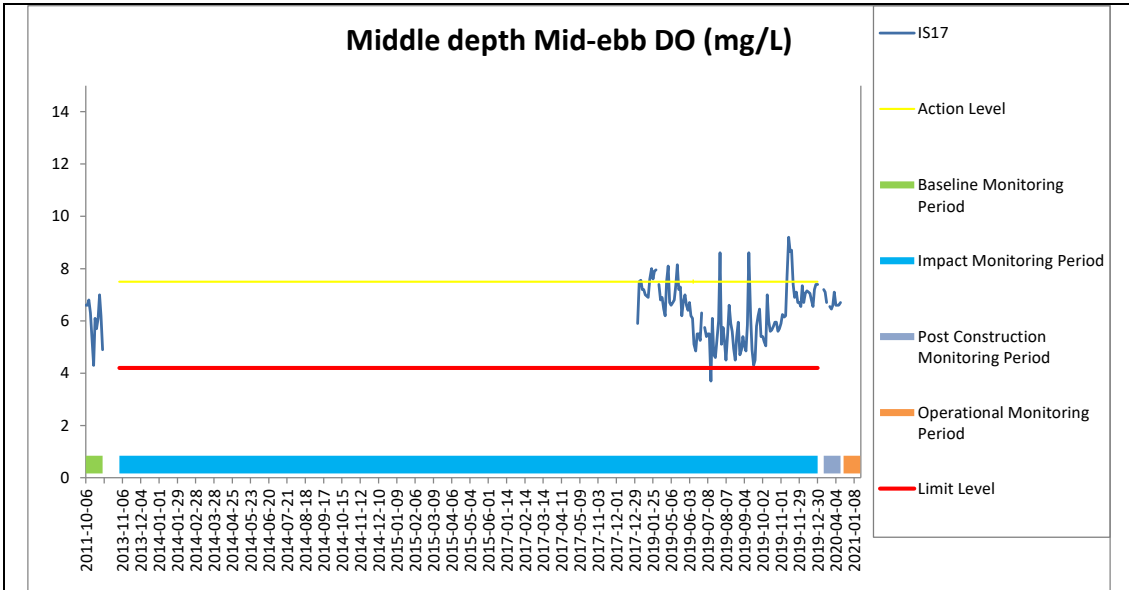


Figure E27 Mean Level of Dissolved Oxygen (mg/L) in mid-depth waters during mid-ebb tide during the course of the Contract at IS17 and CS(Mf)3/CS(Mf)3(N).

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



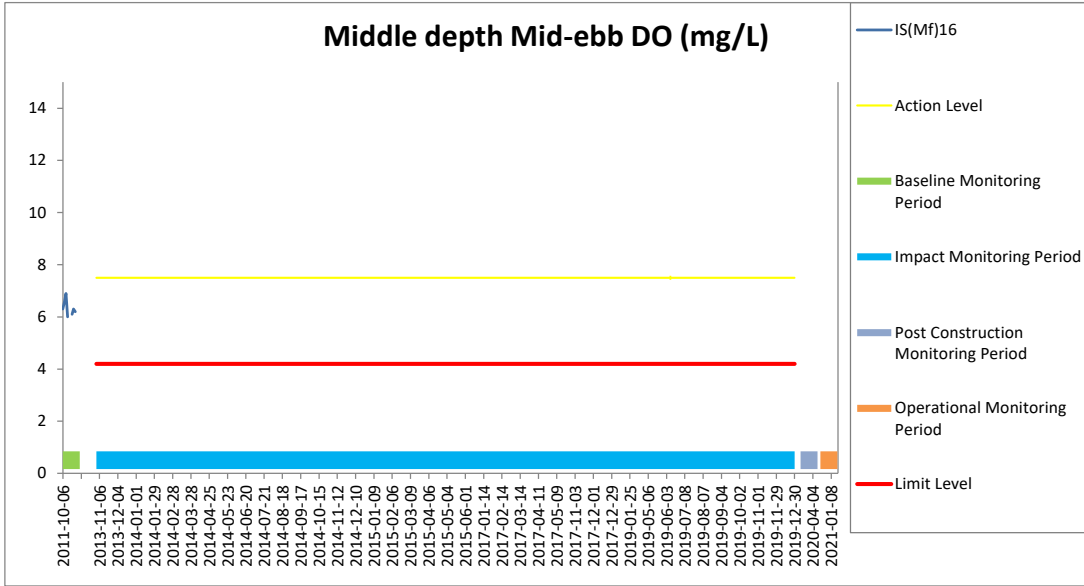
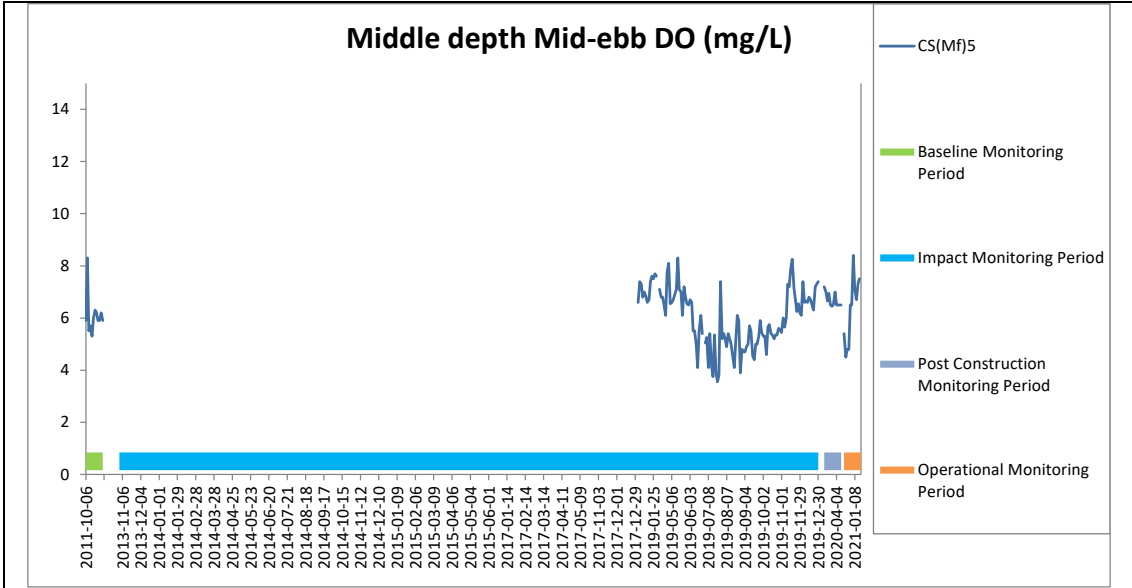


Figure E28 Mean Level of Dissolved Oxygen (mg/L) in mid-depth waters during mid-ebb tide during the course of the Contract at CS(Mf)5 and IS(Mf)16.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



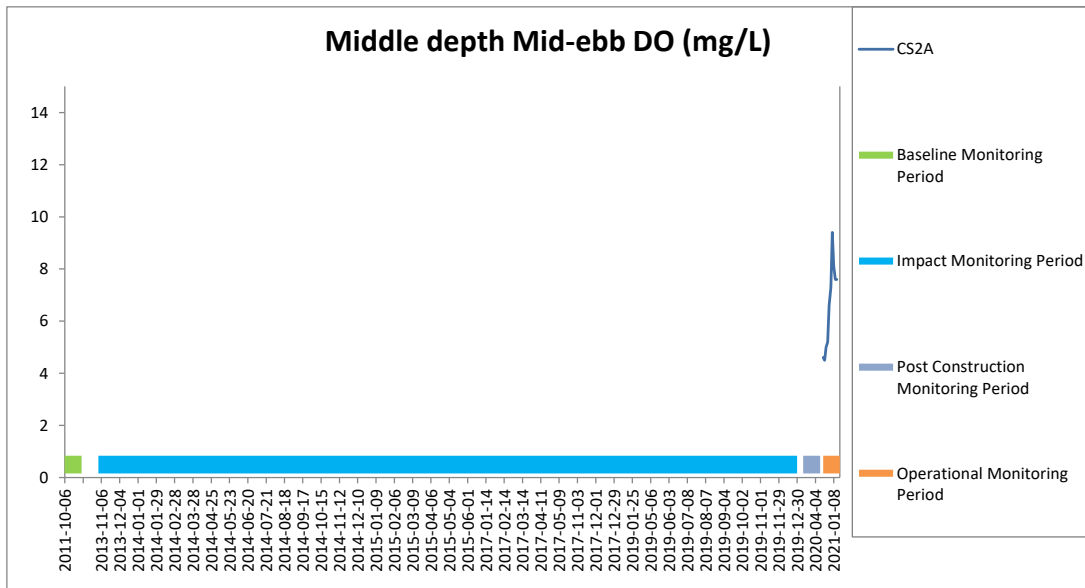
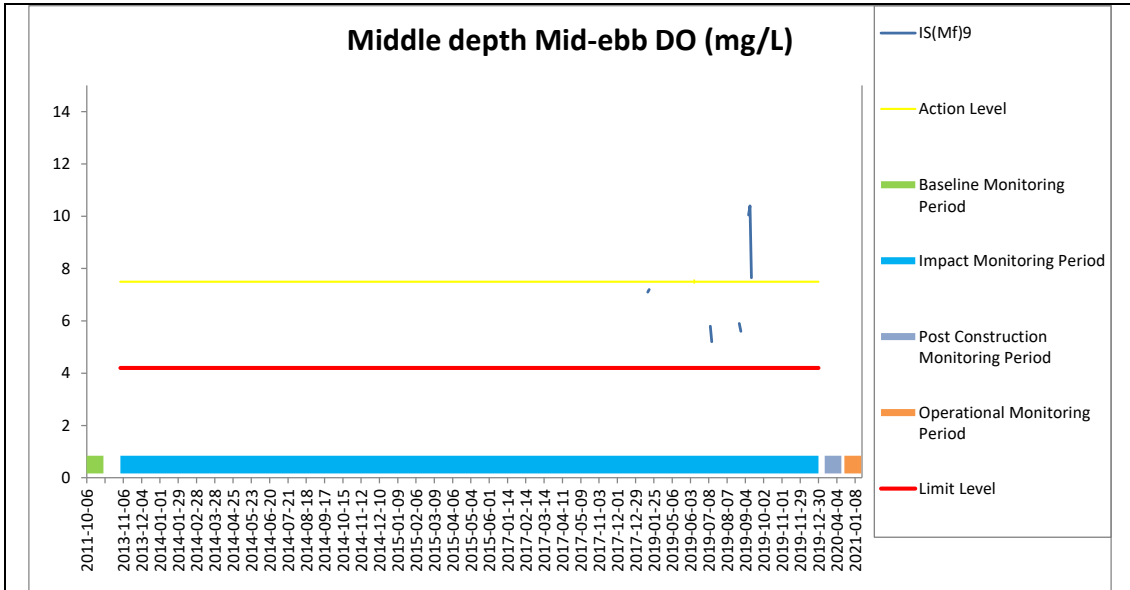


Figure E29 Mean Level of Dissolved Oxygen (mg/L) in mid-depth waters during mid-ebb tide during the course of the Contract at IS(Mf)9 and CS2A.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



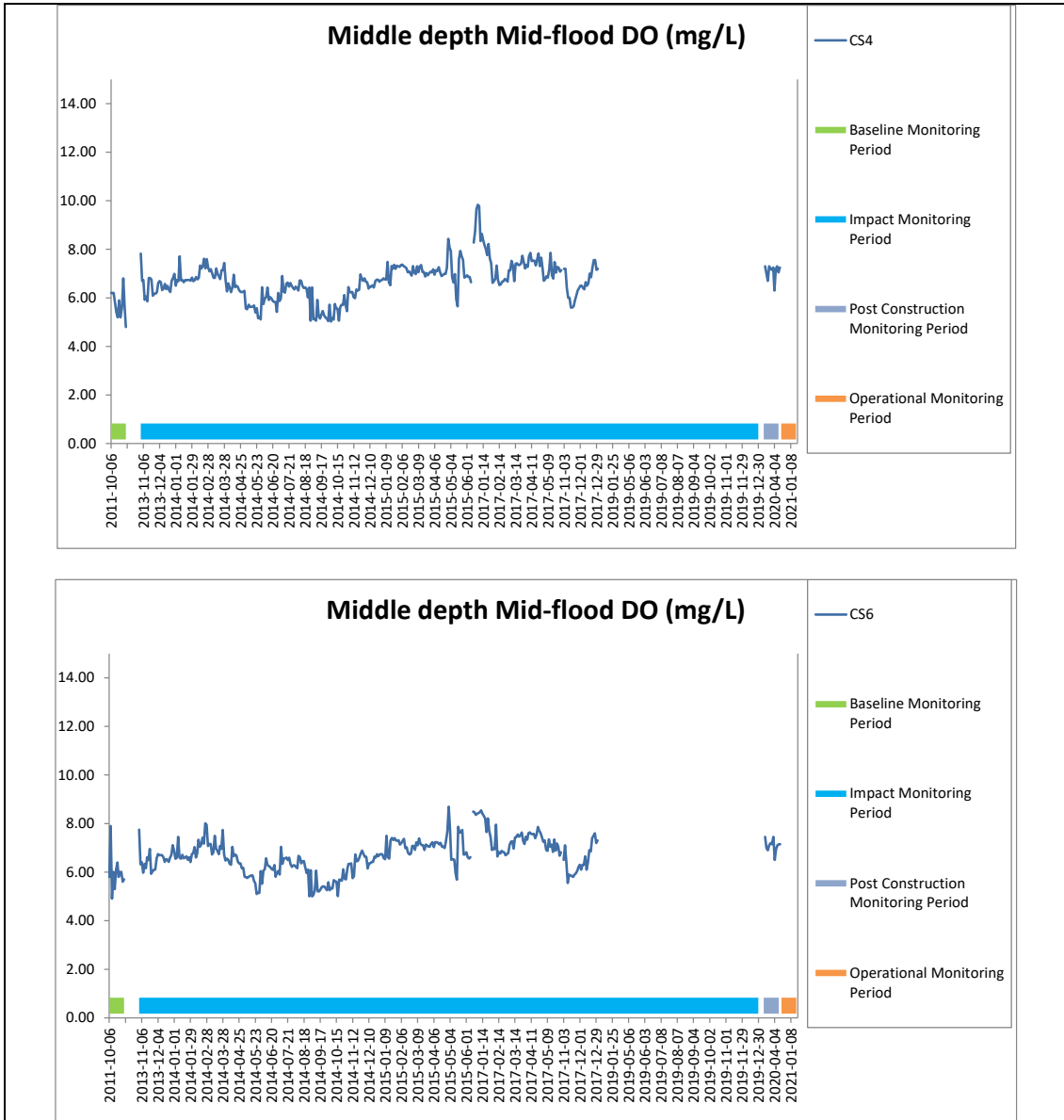


Figure E30 Mean Level of Dissolved Oxygen (mg/L) in mid-depth waters during mid-flood tide during the course of the Contract at CS4 and CS6.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



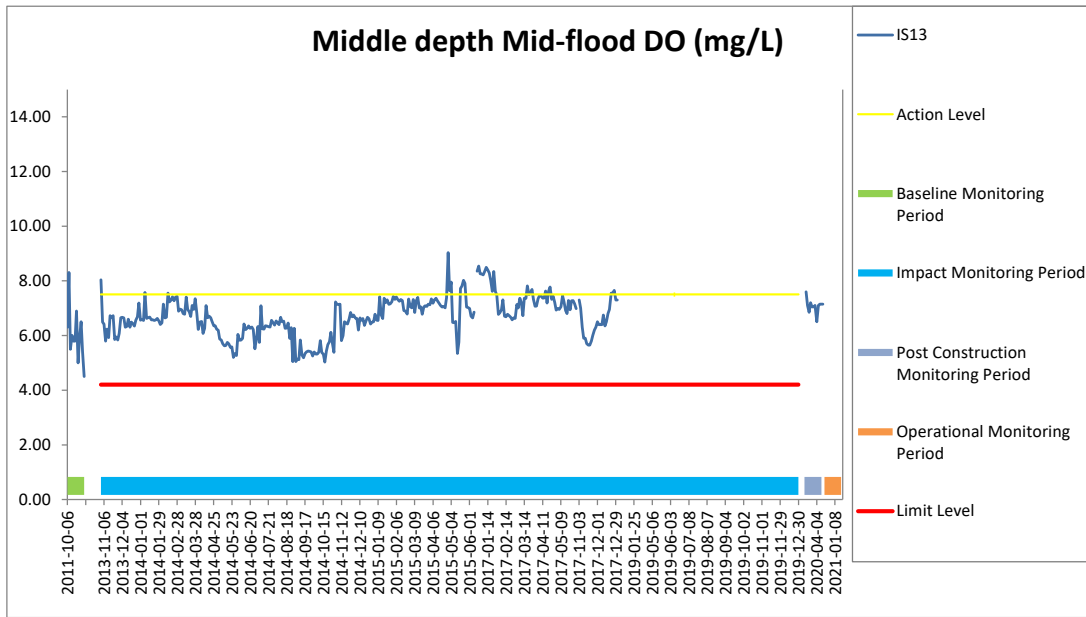
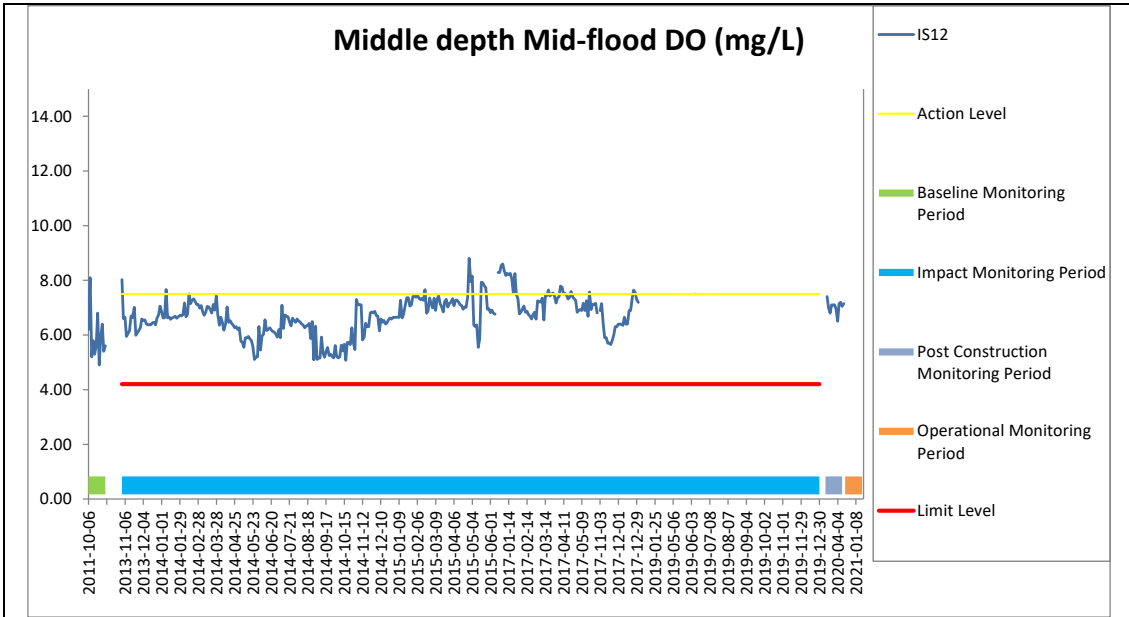


Figure E31 Mean Level of Dissolved Oxygen (mg/L) in mid-depth waters during mid-flood tide during the course of the Contract at IS12 and IS13.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



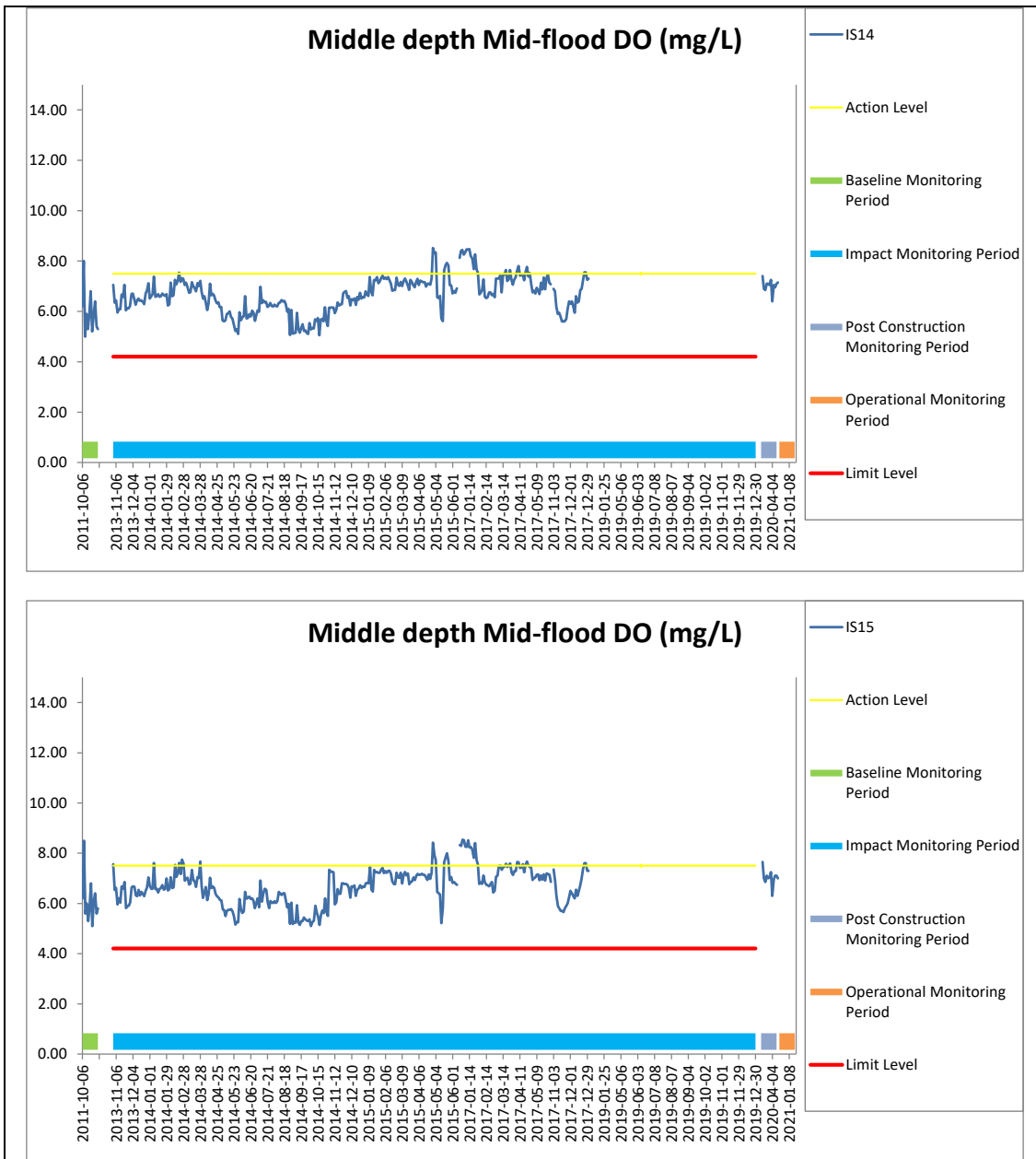


Figure E32 Mean Level of Dissolved Oxygen (mg/L) in mid-depth waters during mid-flood tide during the course of the Contract at IS14 and IS15.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



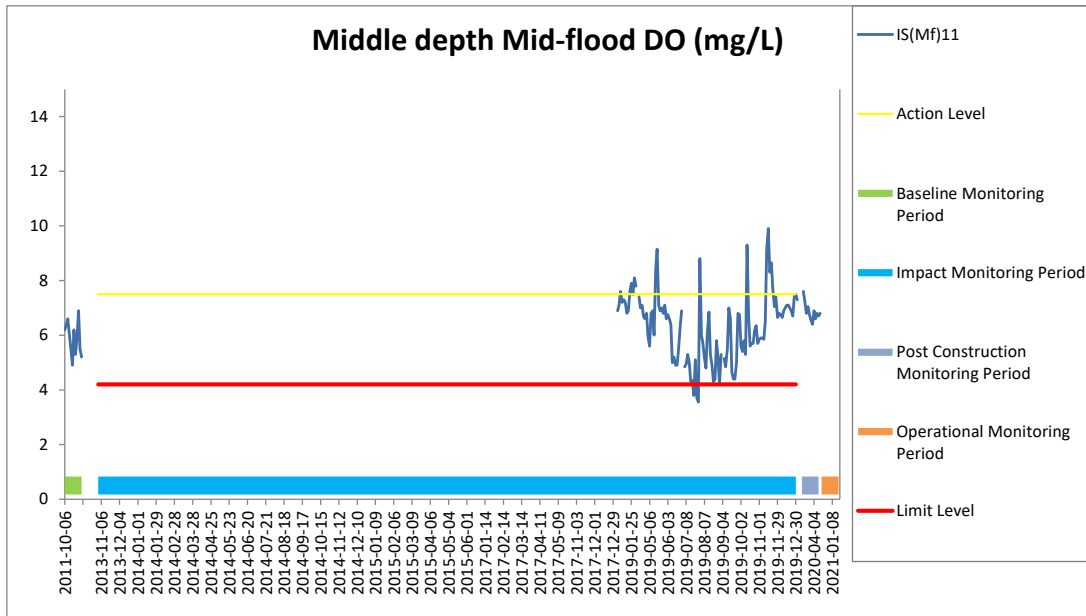
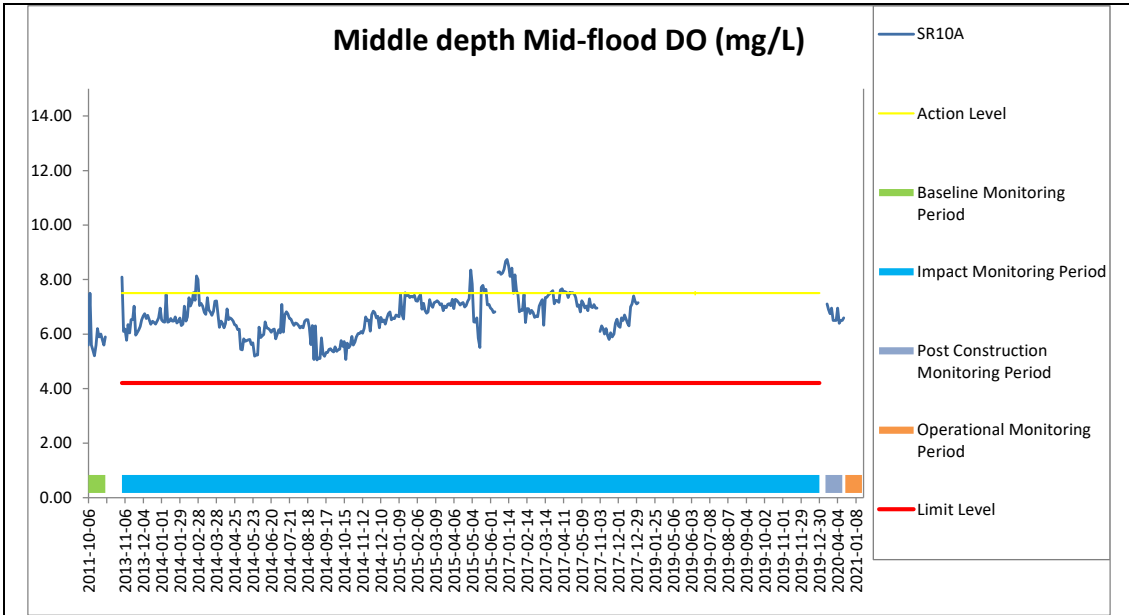


Figure E33 Mean Level of Dissolved Oxygen (mg/L) in mid-depth waters during mid-flood tide during the course of the Contract at SR10A and IS(Mf)11.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

**Environmental
Resources
Management**



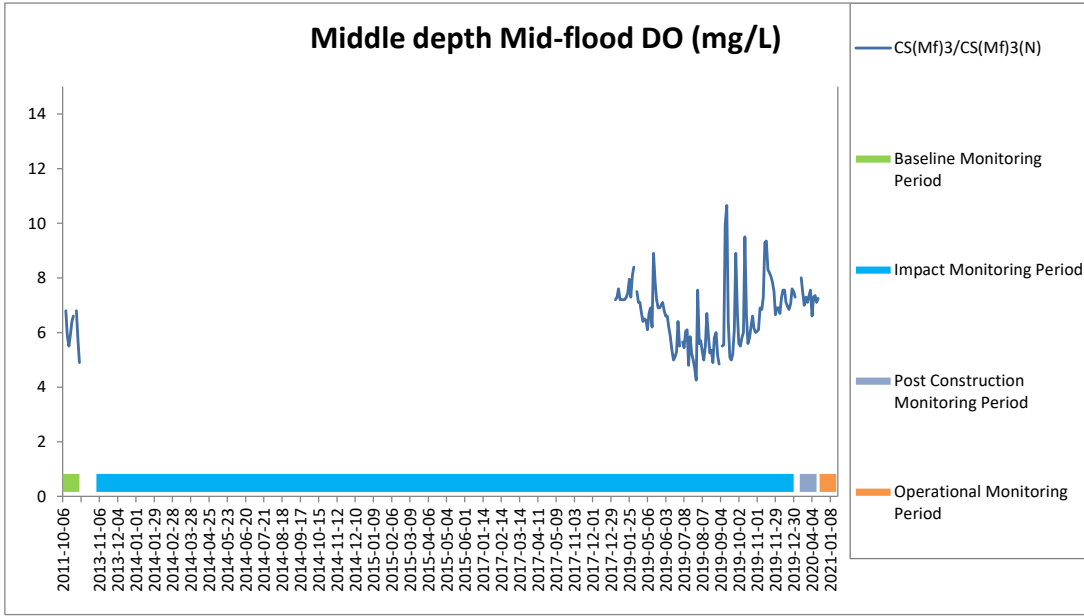
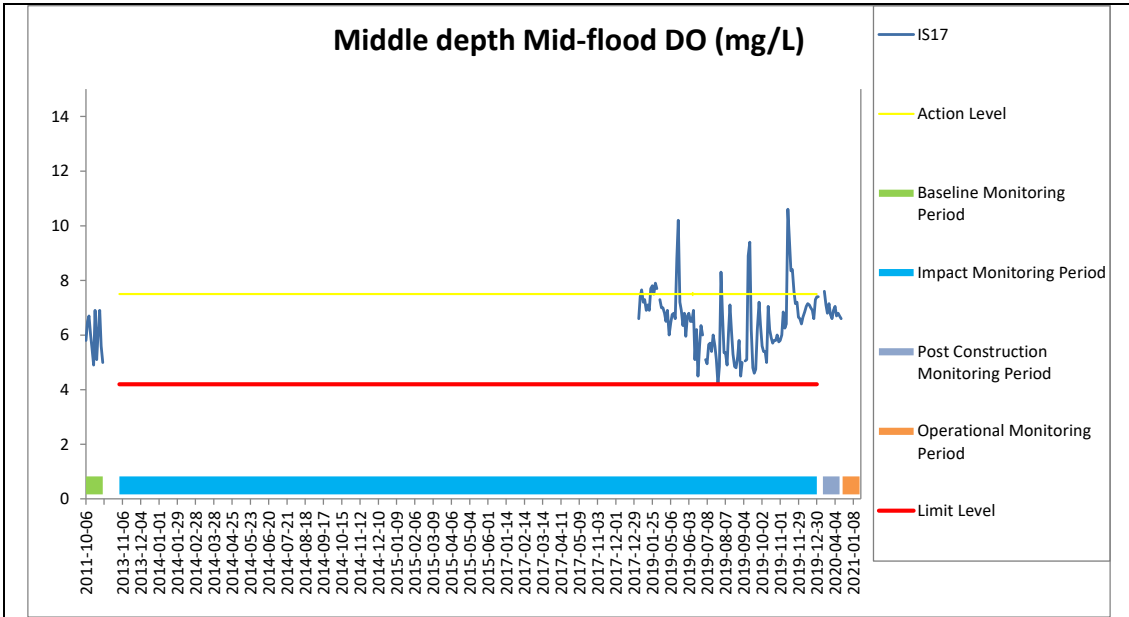


Figure E34 Mean Level of Dissolved Oxygen (mg/L) in mid-depth waters during mid-flood tide during the course of the Contract at IS17 and CS(Mf)3/CS(Mf)3(N).

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



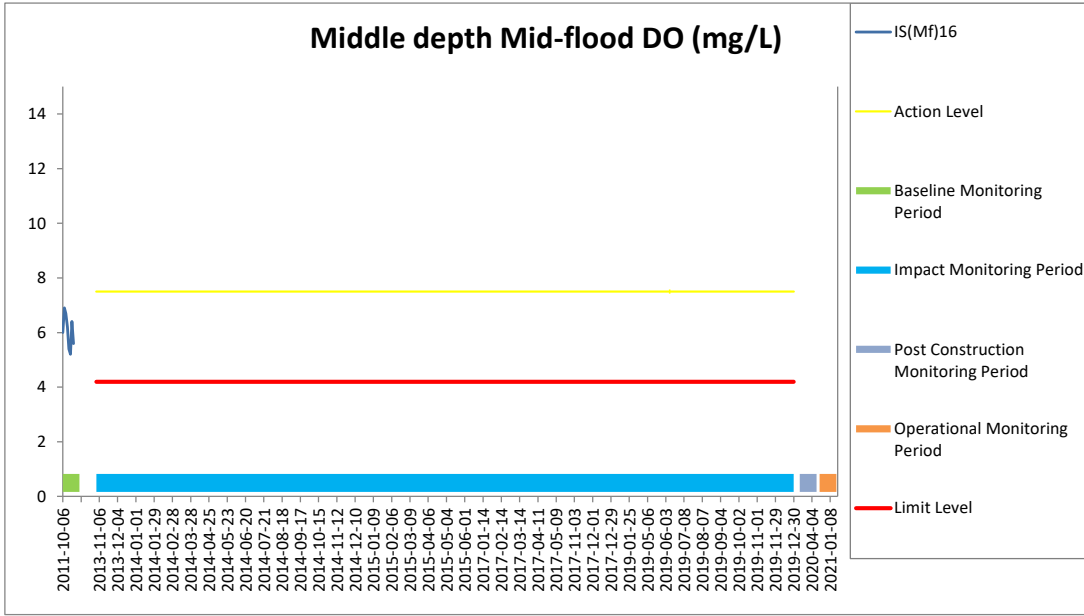
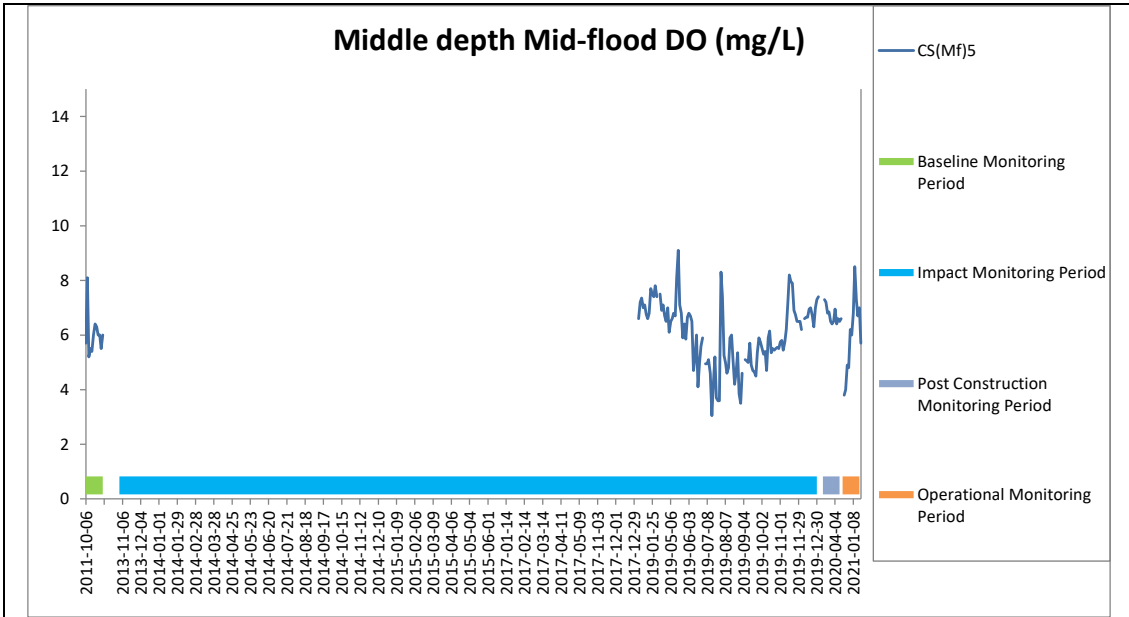


Figure E35 Mean Level of Dissolved Oxygen (mg/L) in mid-depth waters during mid-flood tide during the course of the Contract at CS(Mf)5 and IS(Mf)16.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

**Environmental
Resources
Management**



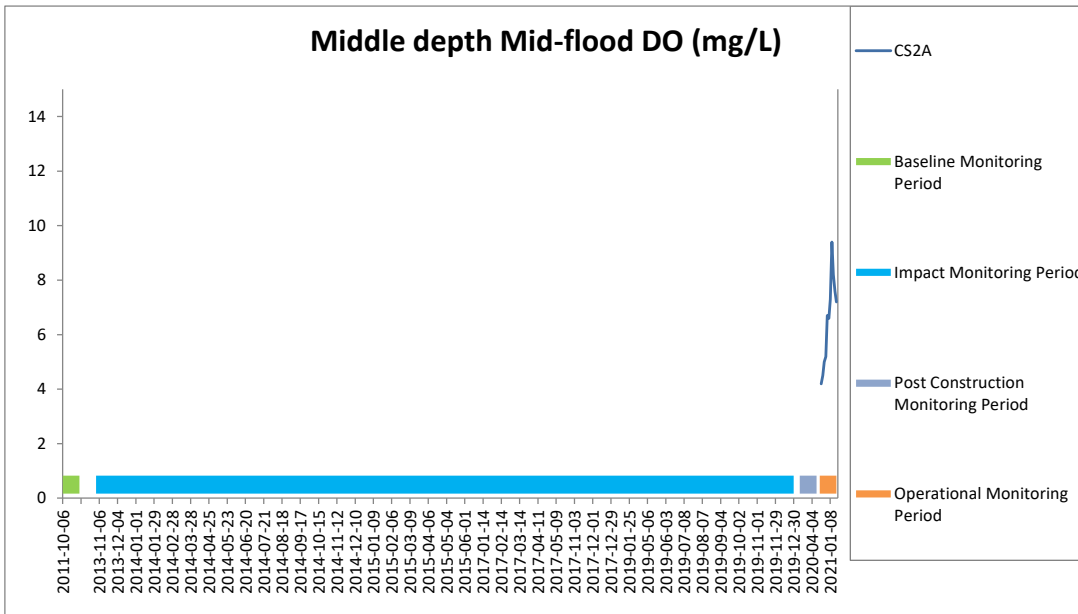
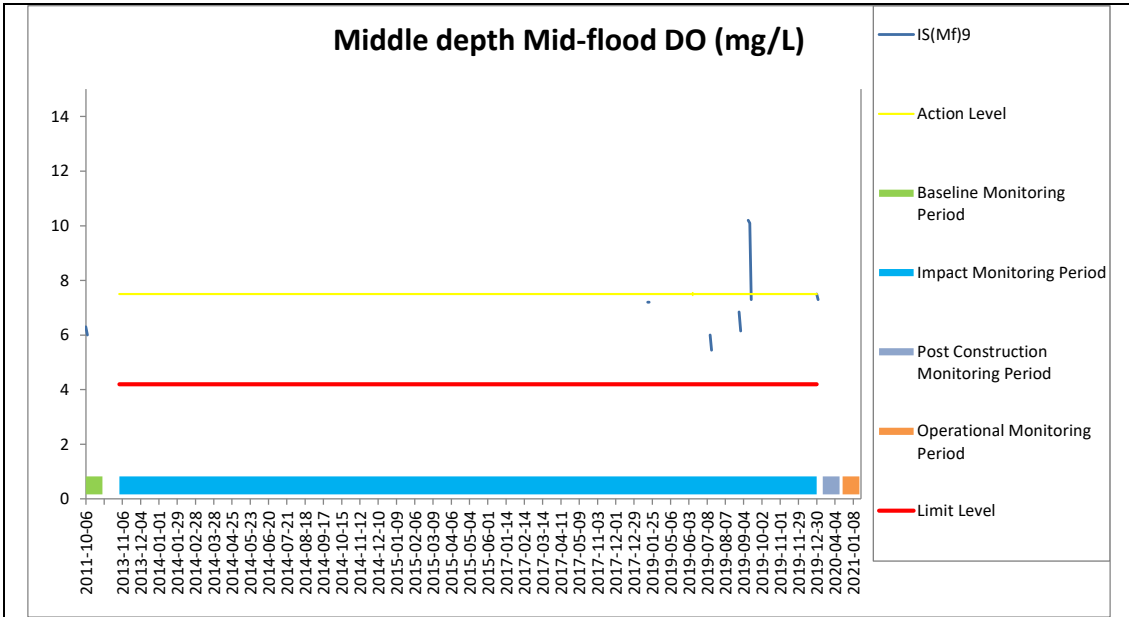


Figure E36 Mean Level of Dissolved Oxygen (mg/L) in mid-depth waters during mid-flood tide during the course of the Contract at IS(Mf)9 and CS2A.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



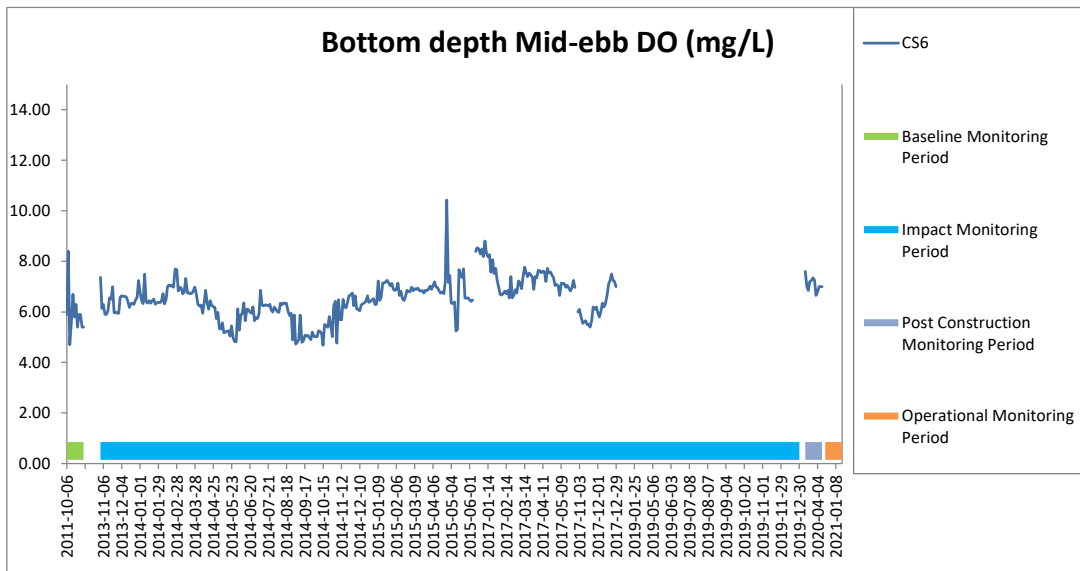
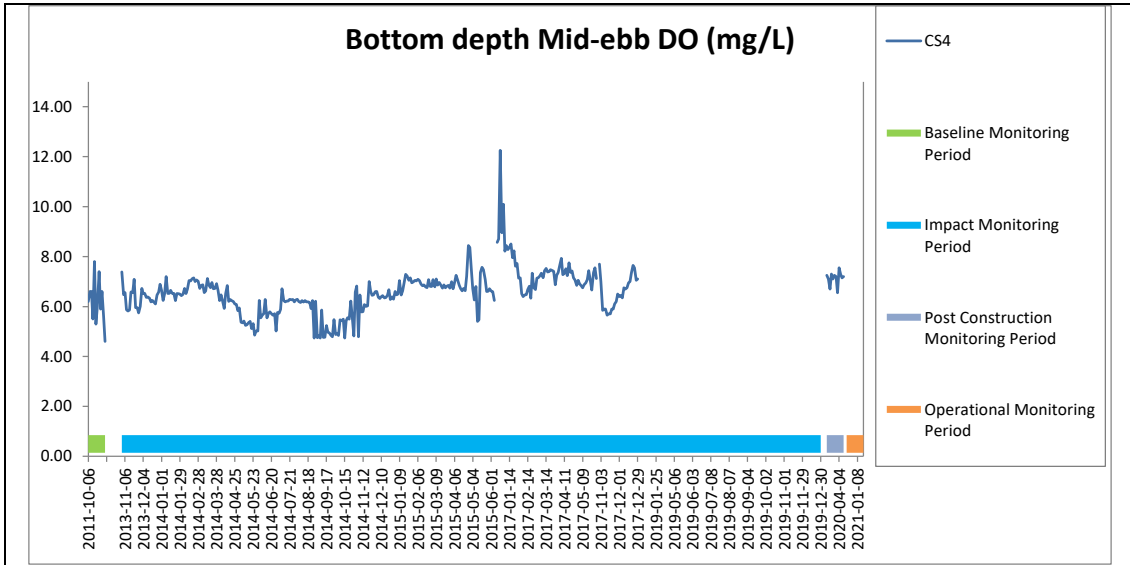


Figure E37 Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-ebb tide during the course of the Contract at CS4 and CS6.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

**Environmental
Resources
Management**



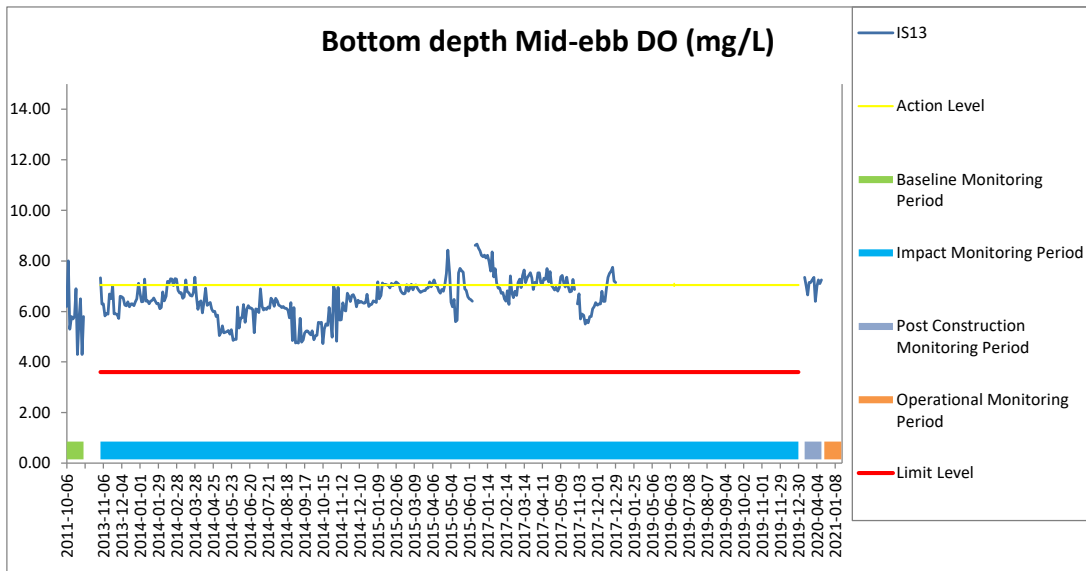
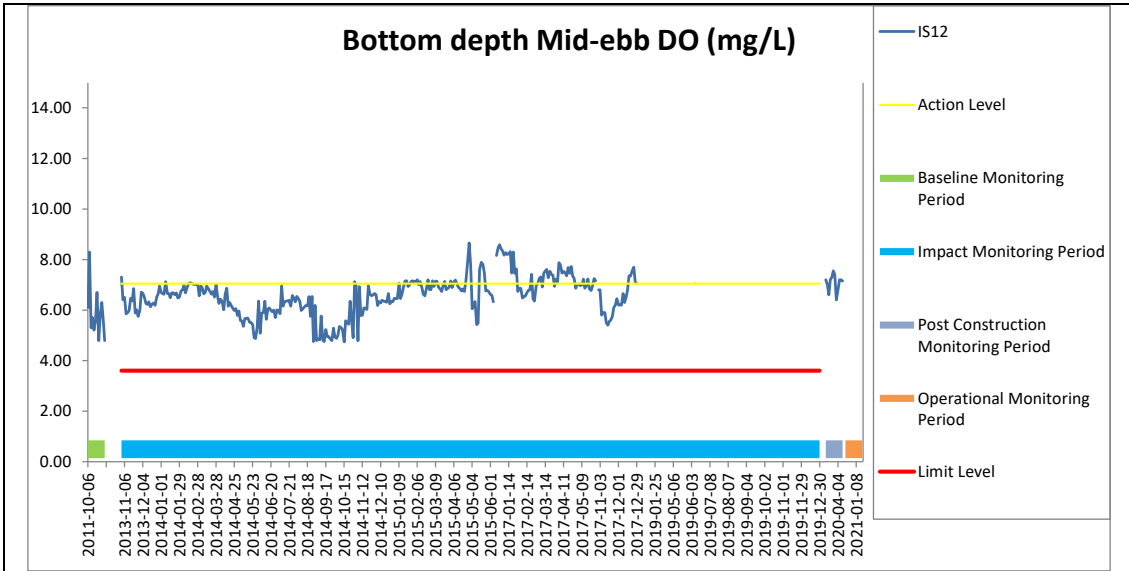


Figure E38 Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-ebb tide during the course of the Contract at IS12 and IS13.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



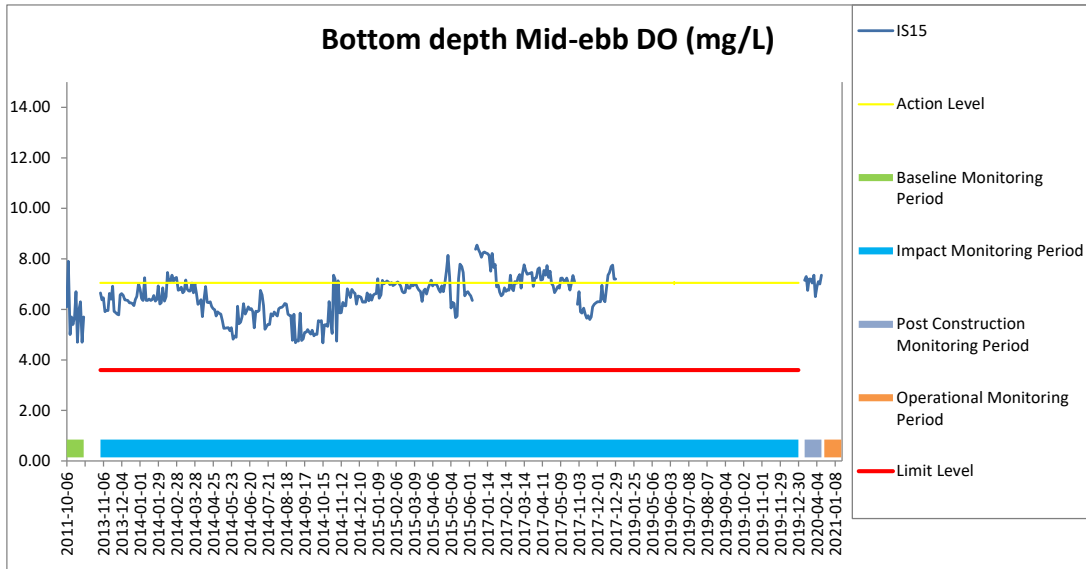
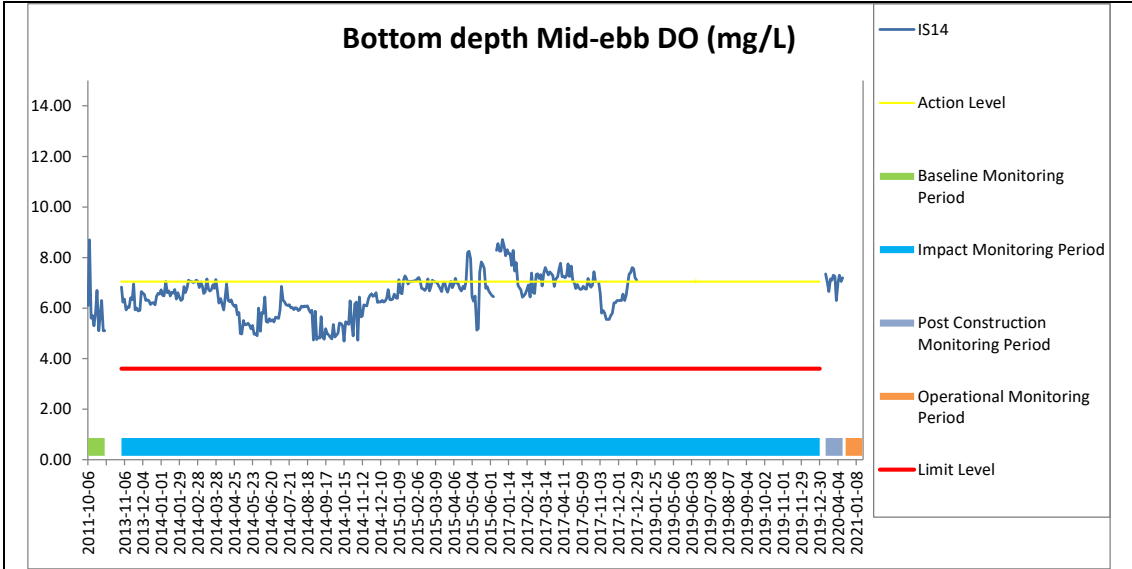


Figure E39 Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-ebb tide during the course of the Contract at IS14 and IS15.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



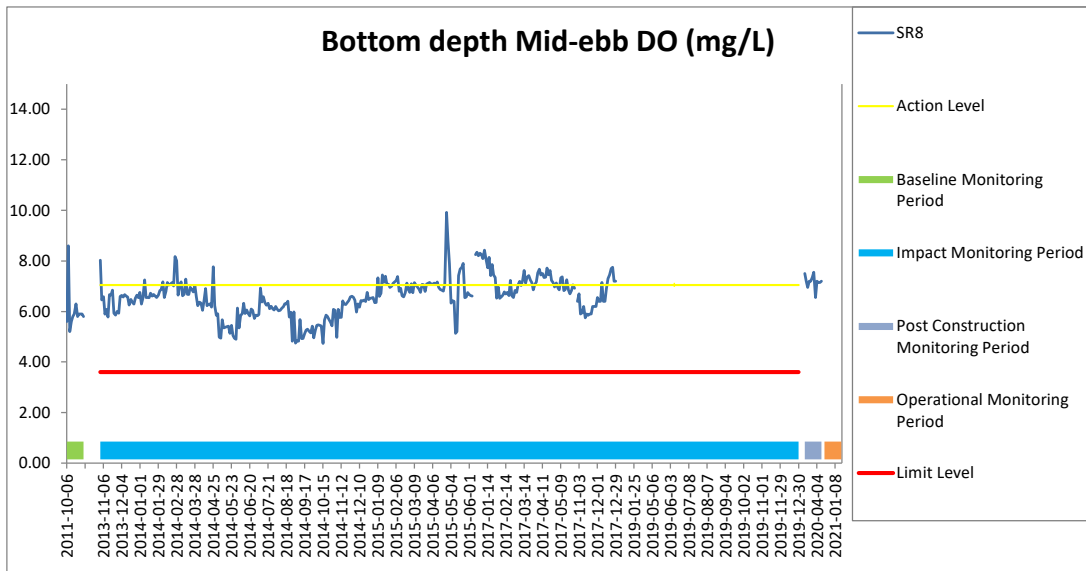
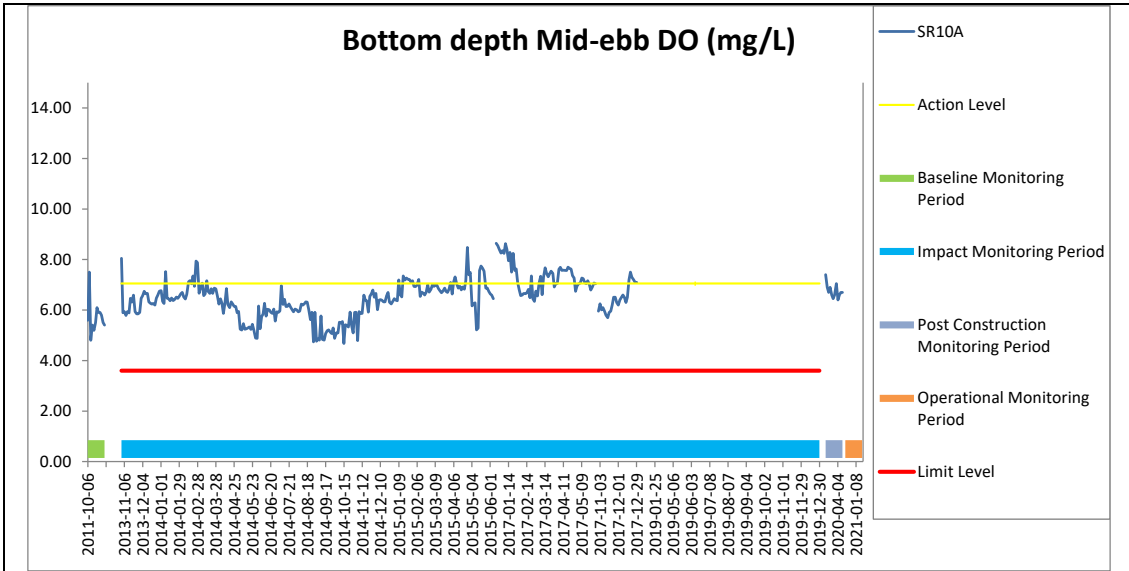


Figure E40 Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-ebb tide during the course of the Contract at SR10A and SR8.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



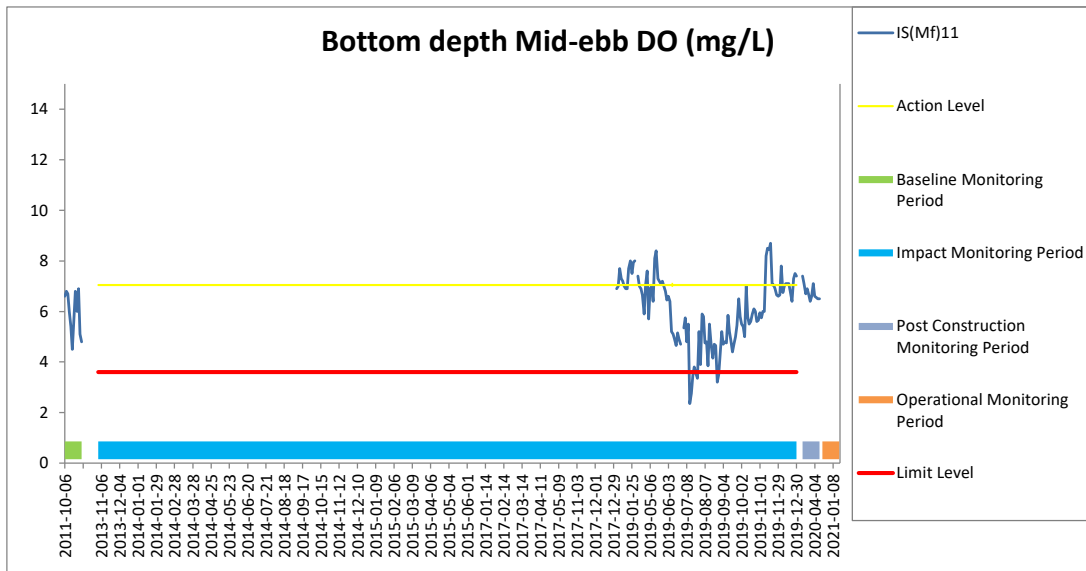
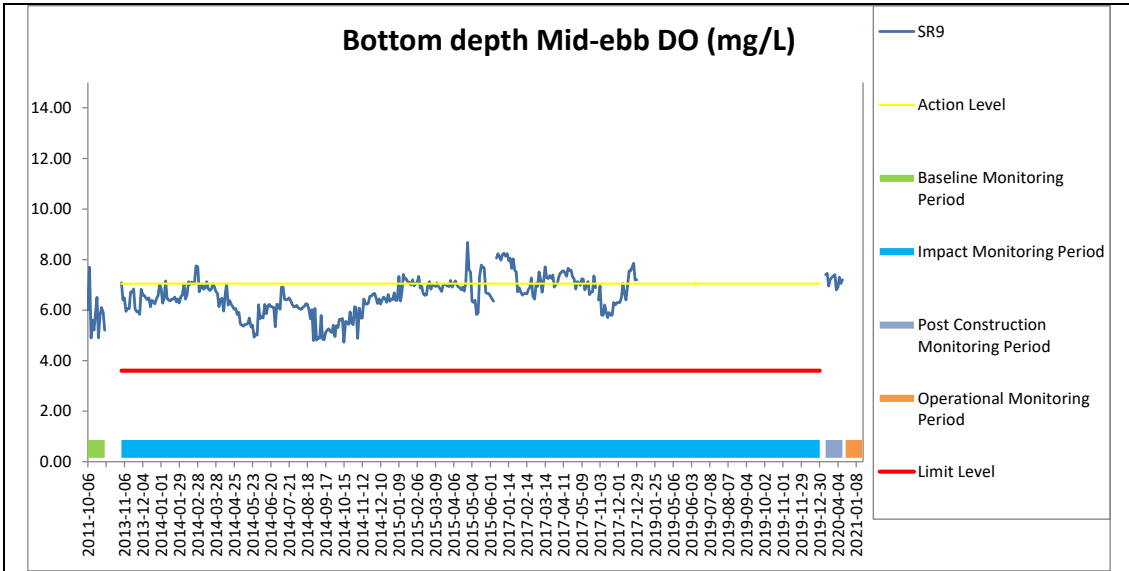


Figure E41 Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-ebb tide during the course of the Contract at SR9 and IS(Mf)11.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



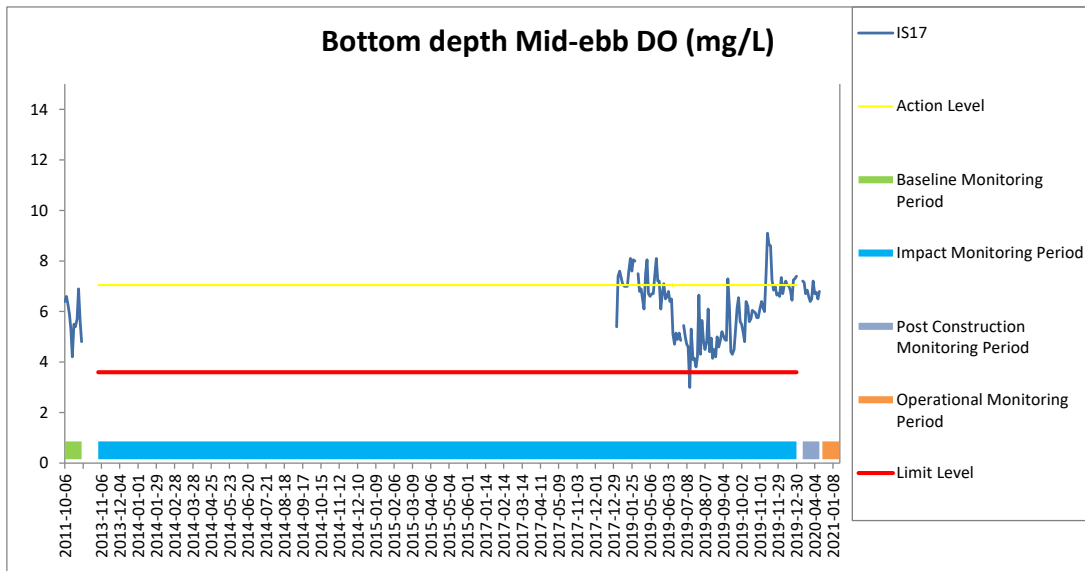
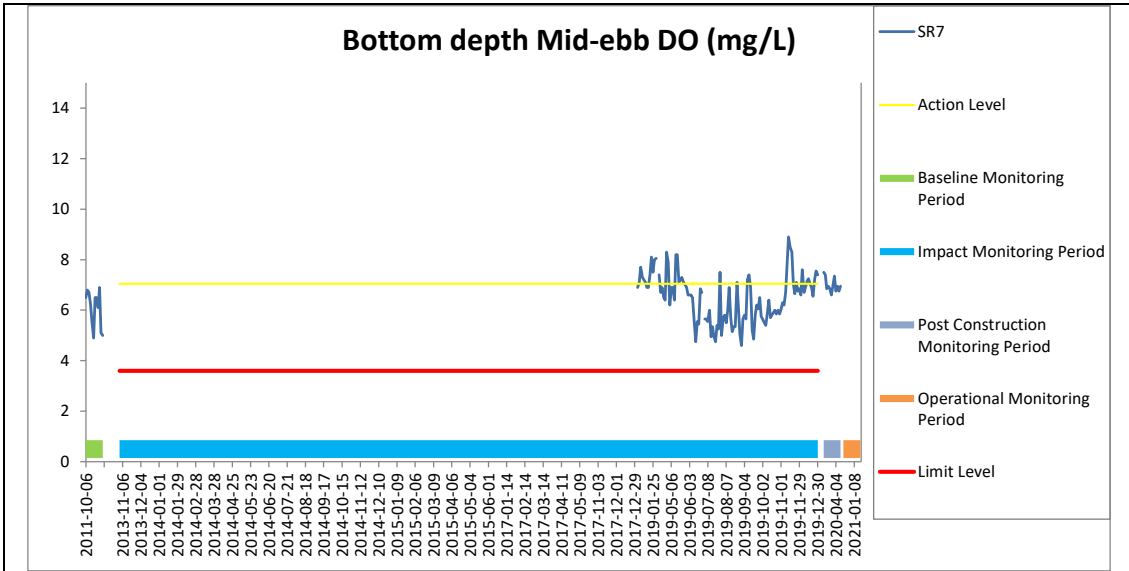


Figure E42 Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-ebb tide during the course of the Contract at SR7 and IS17.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



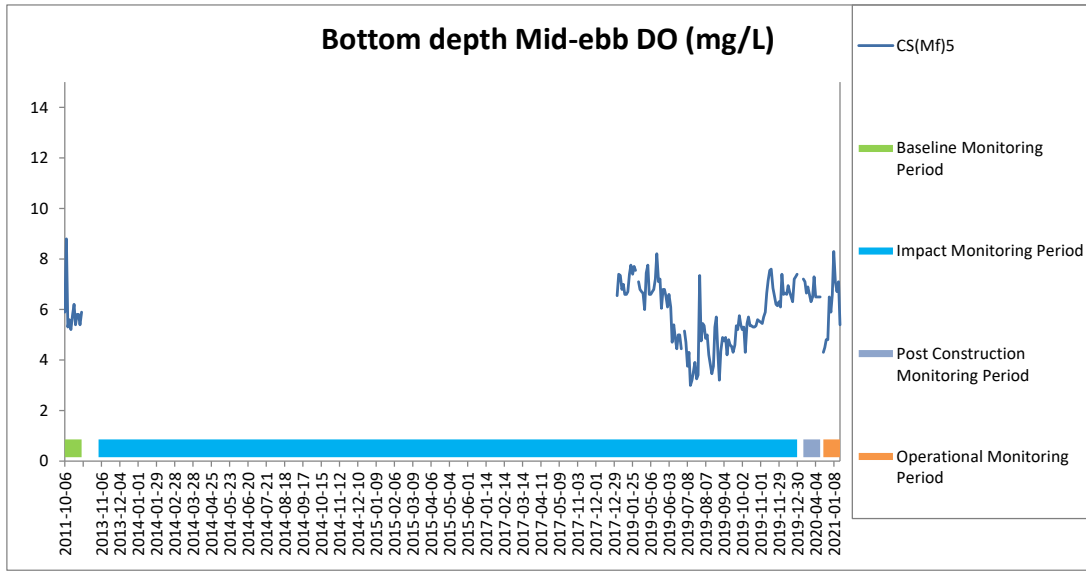
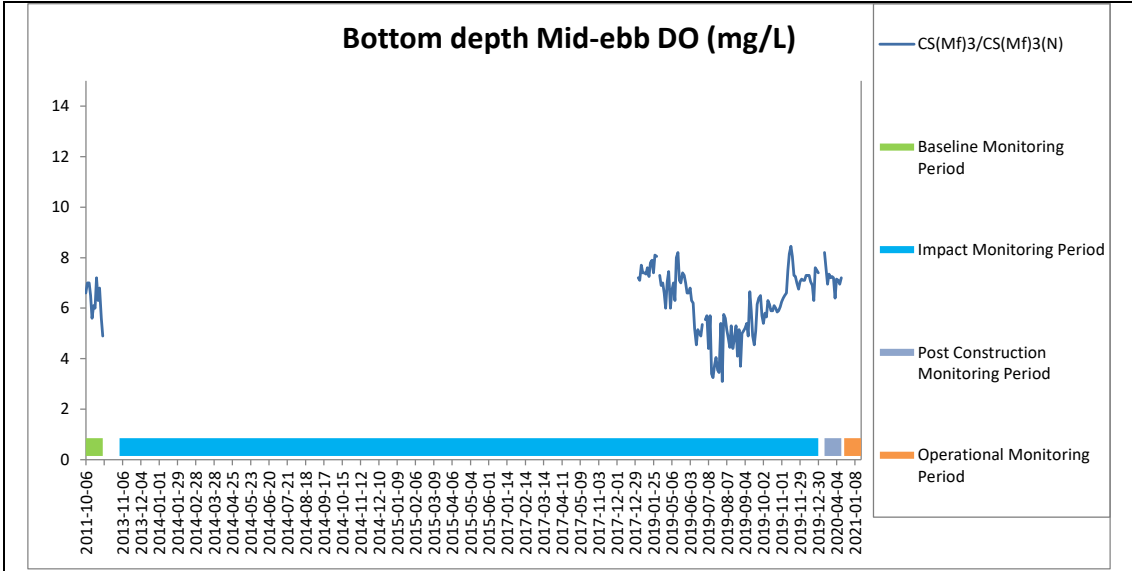


Figure E43 Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-ebb tide during the course of the Contract at CS(Mf)3/CS(Mf)3(N) and CS(Mf)5.
(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



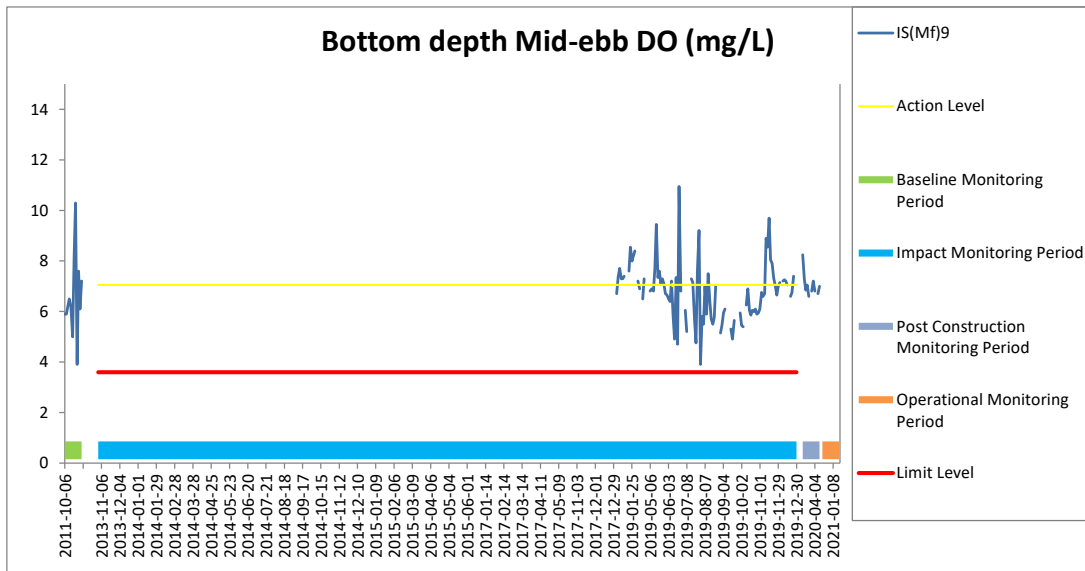
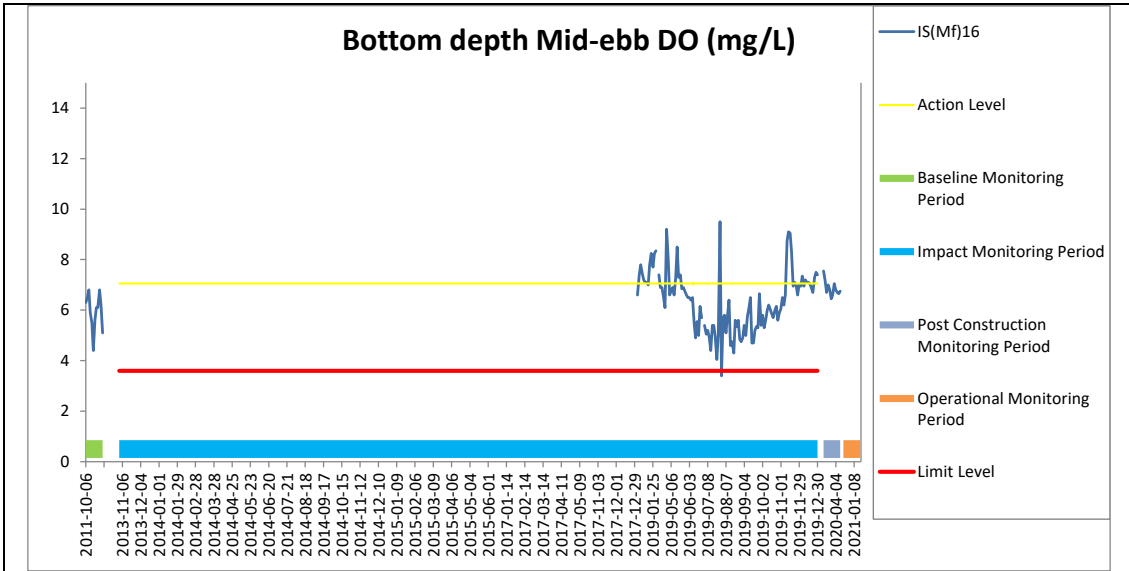


Figure E44 Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-ebb tide during the course of the Contract at IS(Mf)16 and IS(Mf)9.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



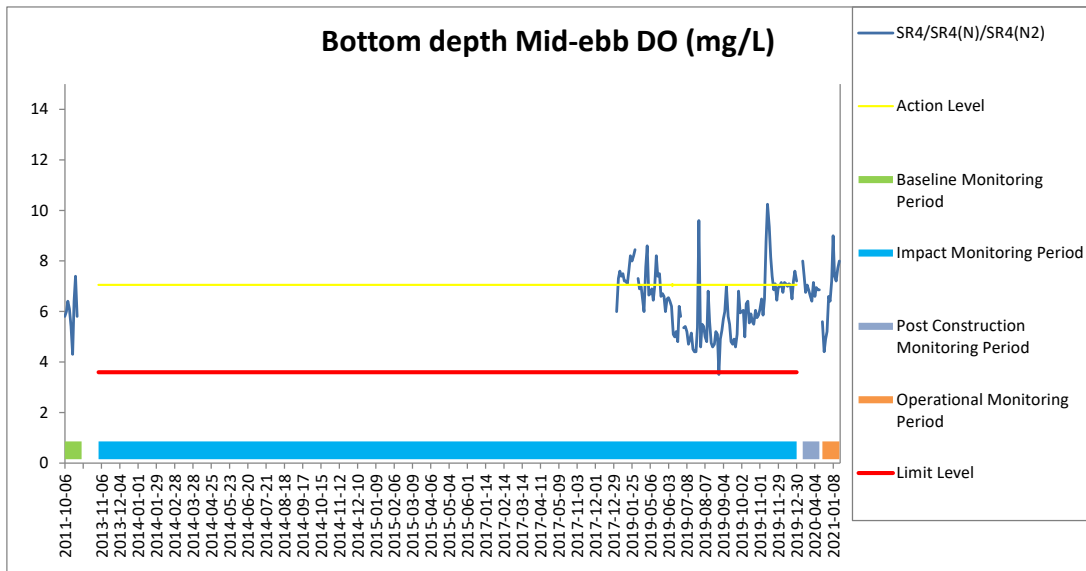
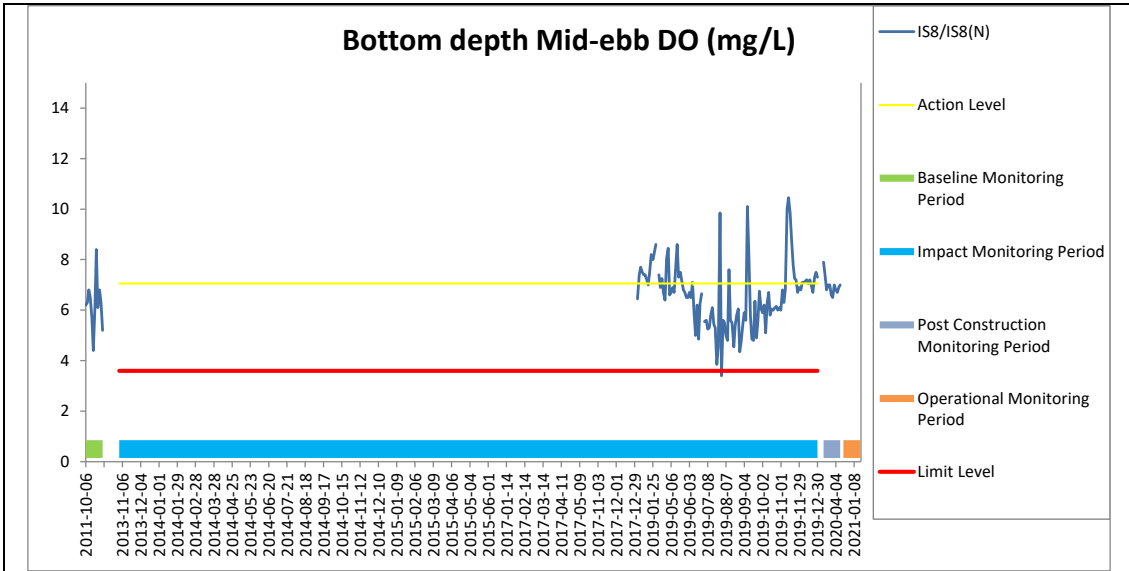


Figure E45 Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-ebb tide during the course of the Contract at IS8/IS8(N) and SR4/SR4(N)/SR4(N2).

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



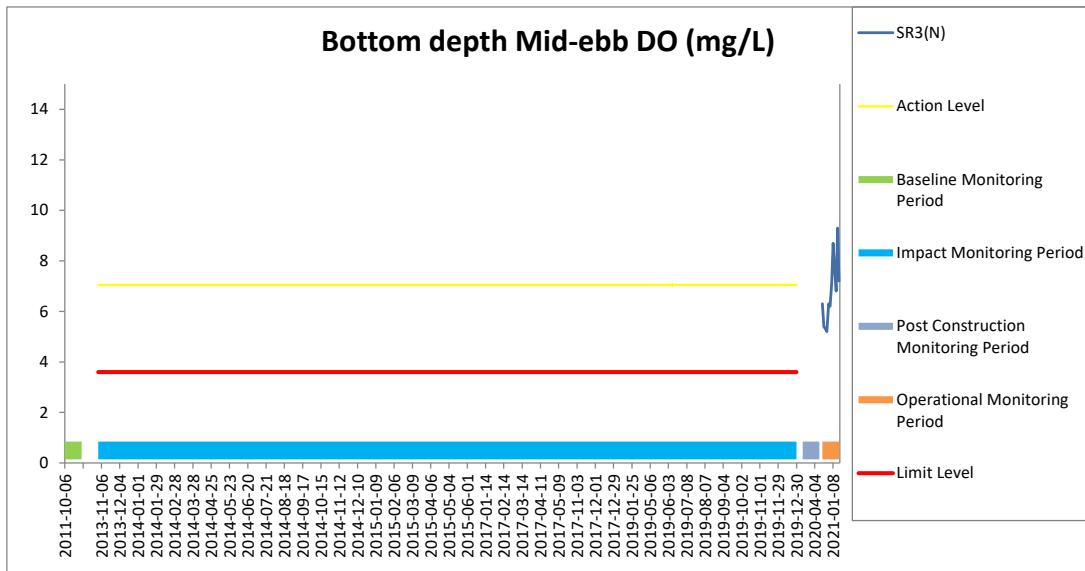
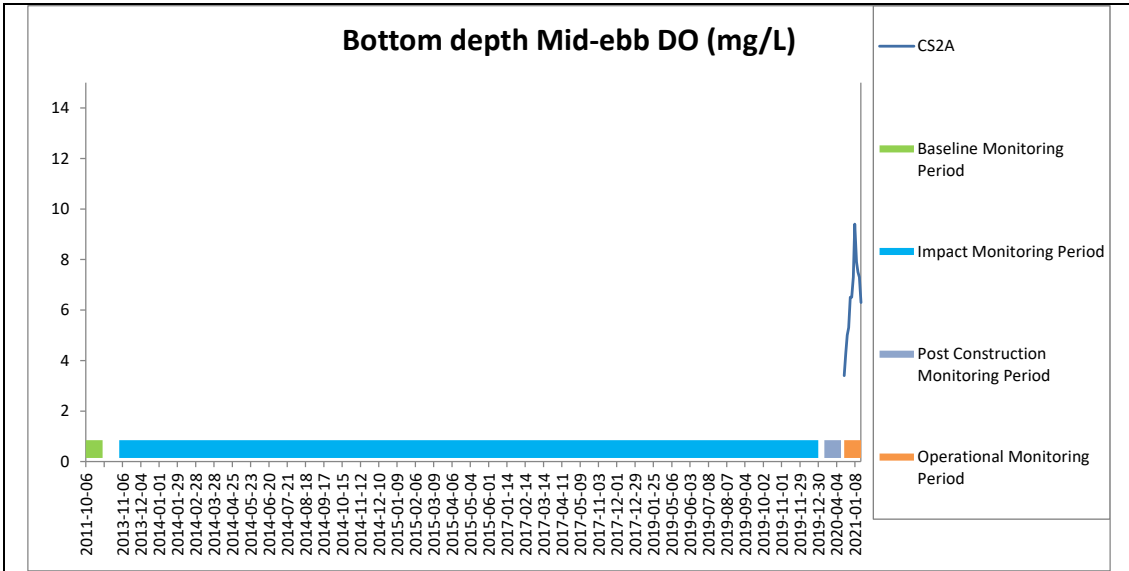


Figure E46 Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-ebb tide during the course of the Contract at CS2A and SR3(N).

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



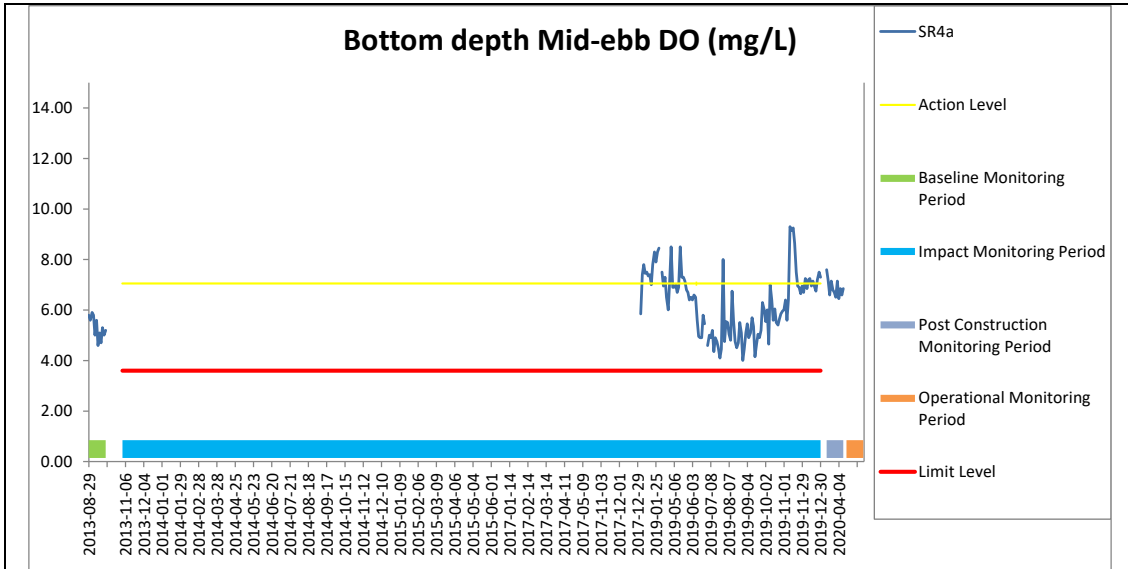


Figure E47 Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-ebb tide during the course of the Contract at SR4a.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



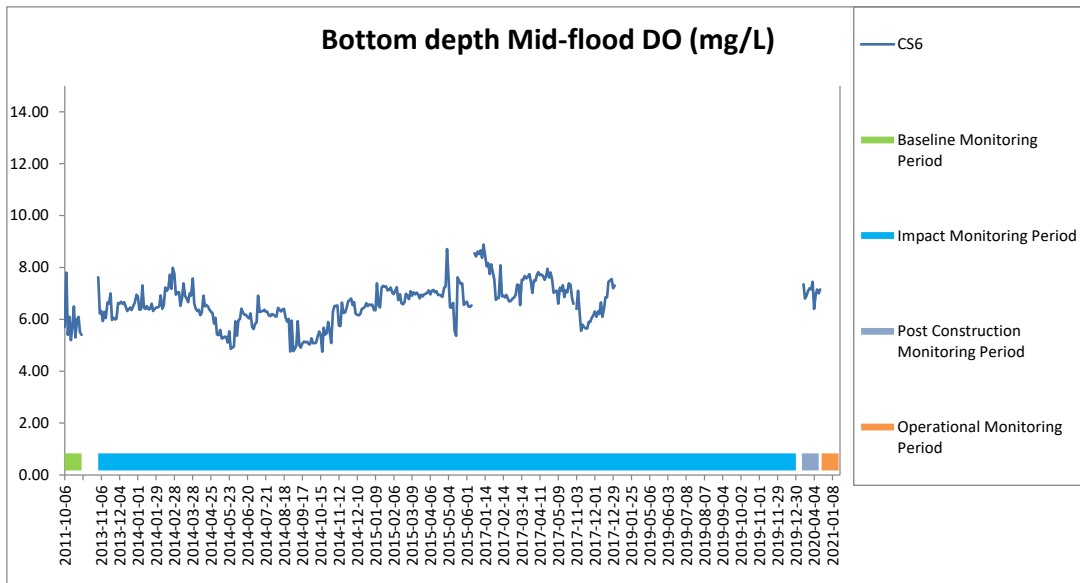
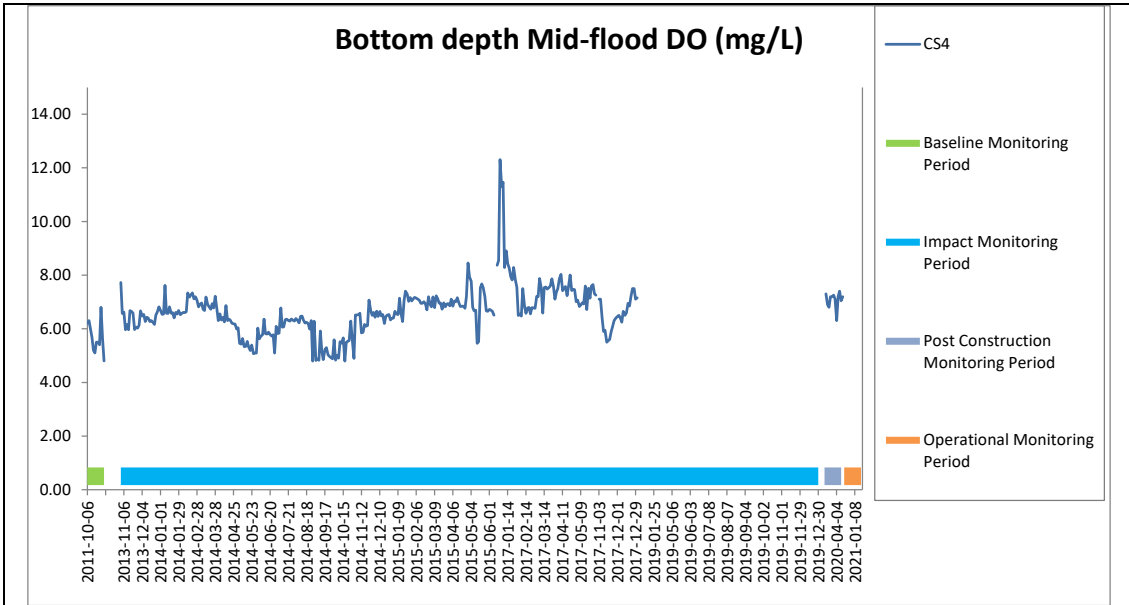


Figure E48 Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-flood tide during the course of the Contract at CS4 and CS6.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



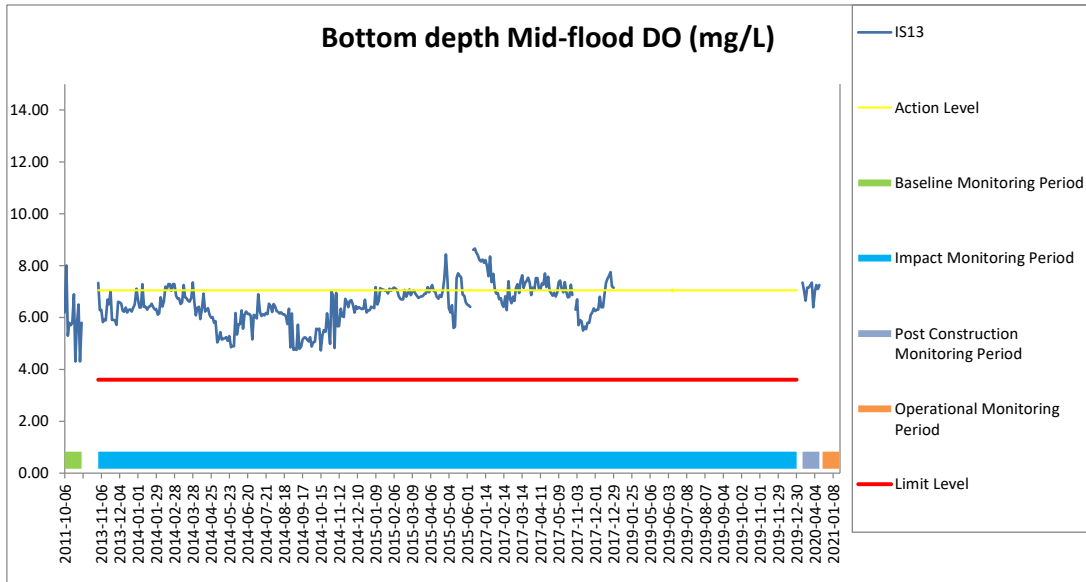
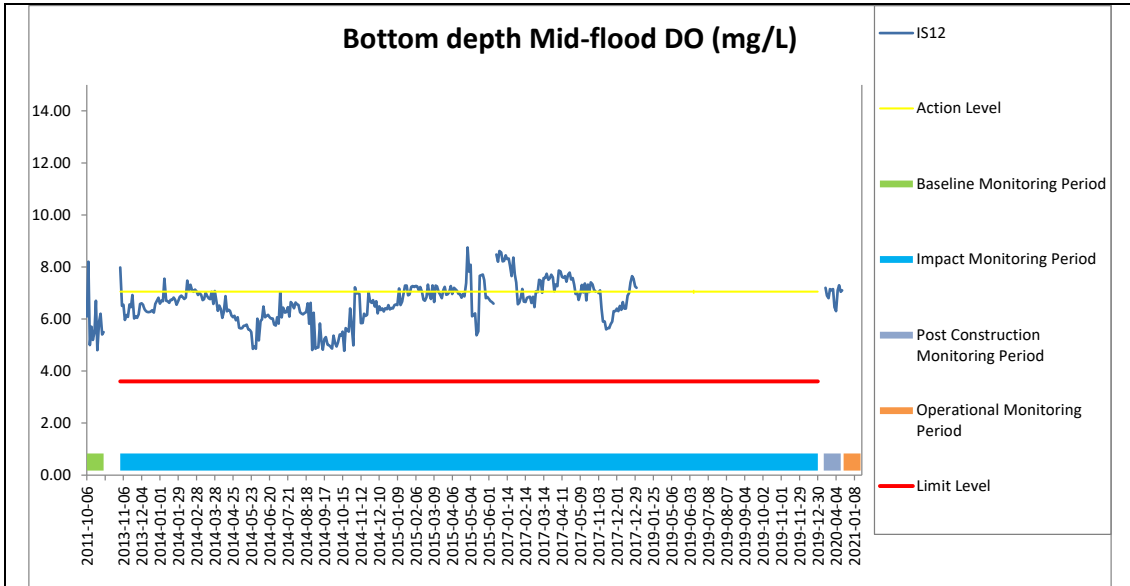


Figure E49 Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-flood tide during the course of the Contract at IS12 and IS13.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



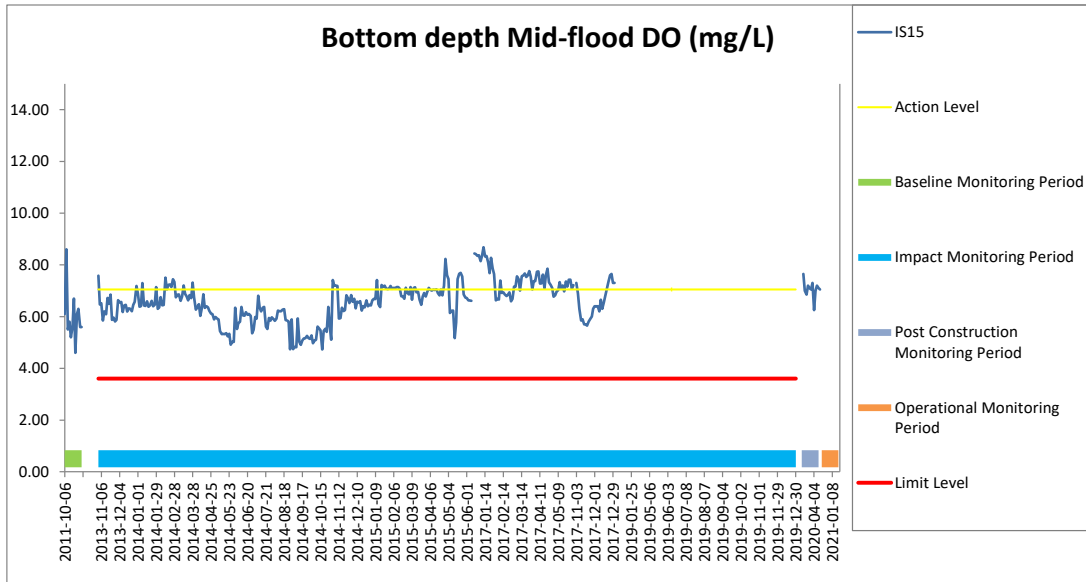
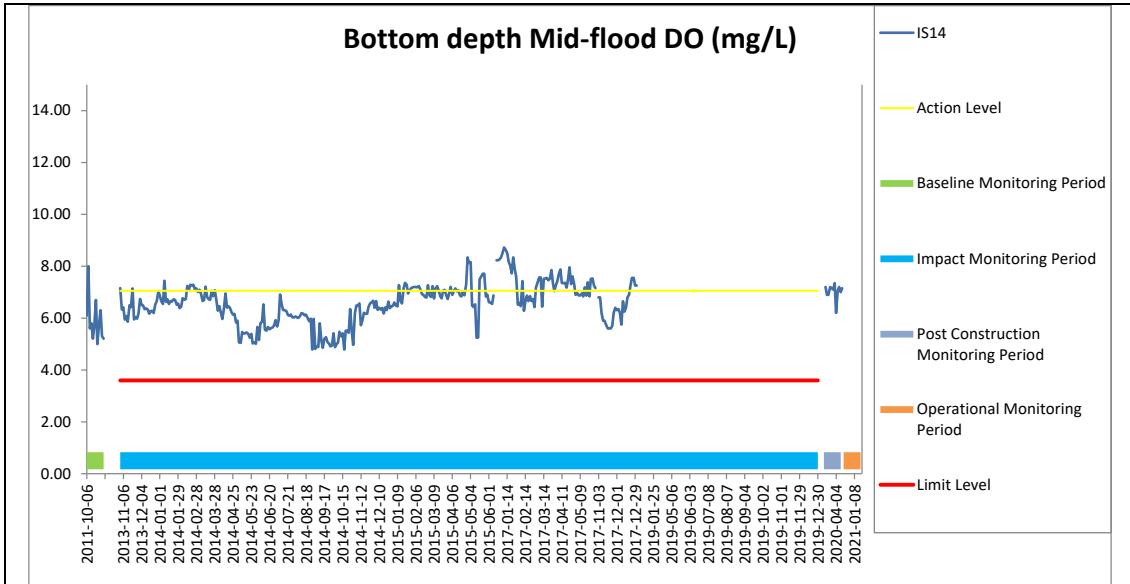


Figure E50 Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-flood tide during the course of the Contract at IS14 and IS15.
(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



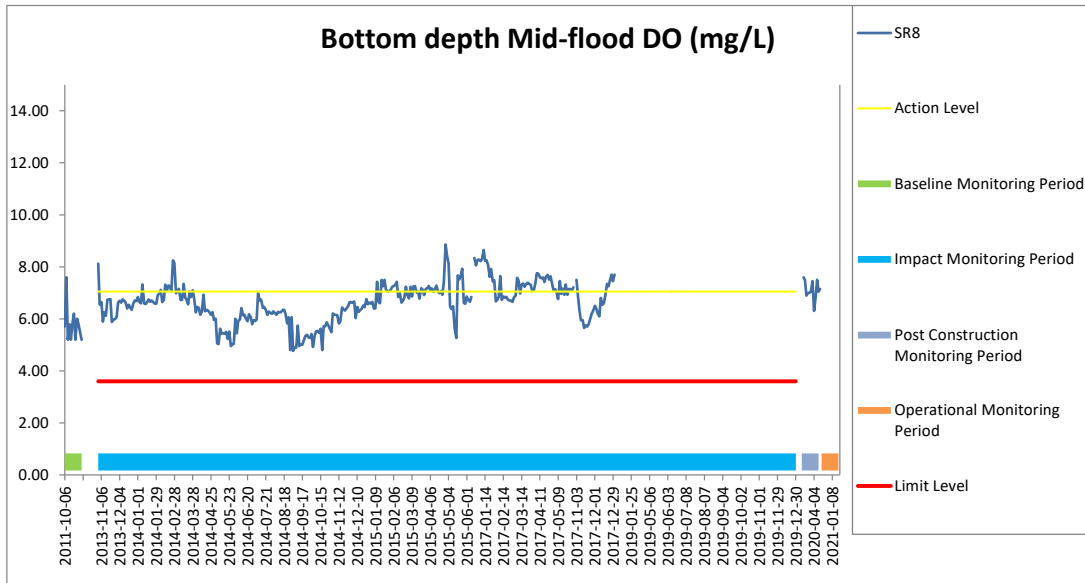
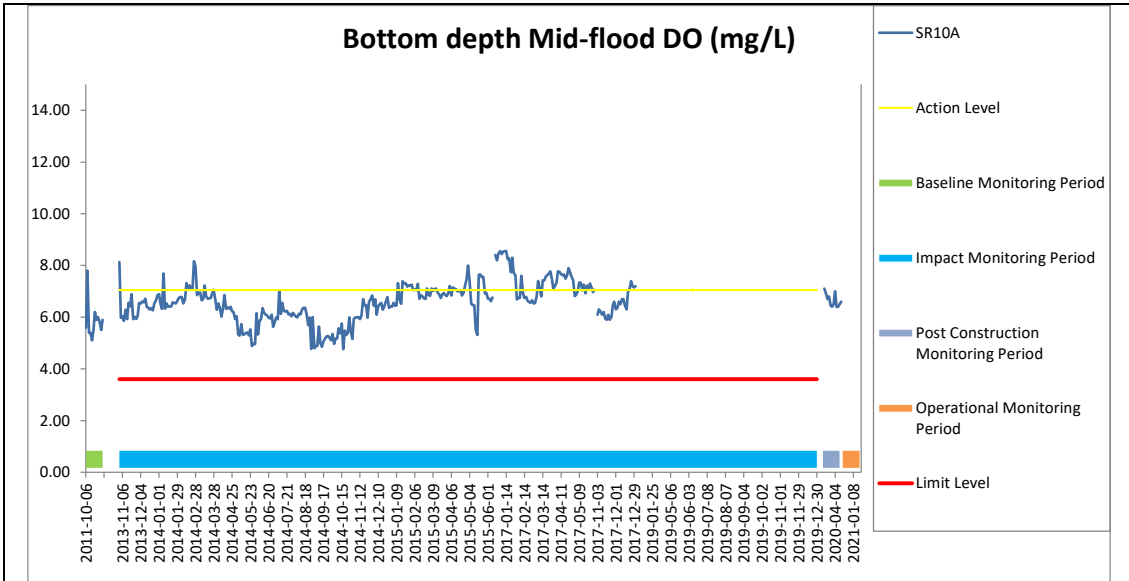


Figure E51 Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-flood tide during the course of the Contract at SR10A and SR8.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

**Environmental
Resources
Management**



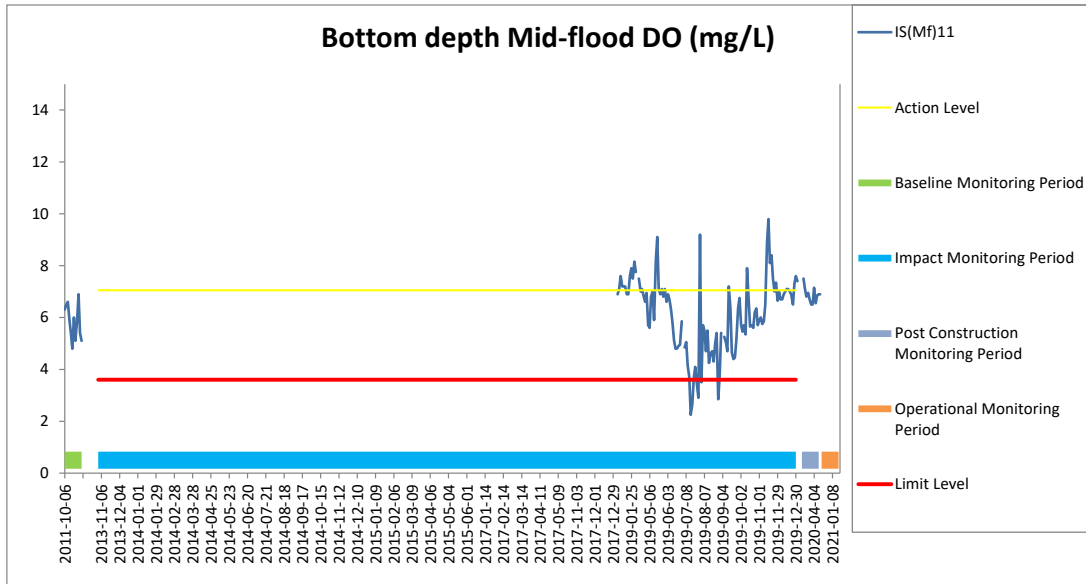
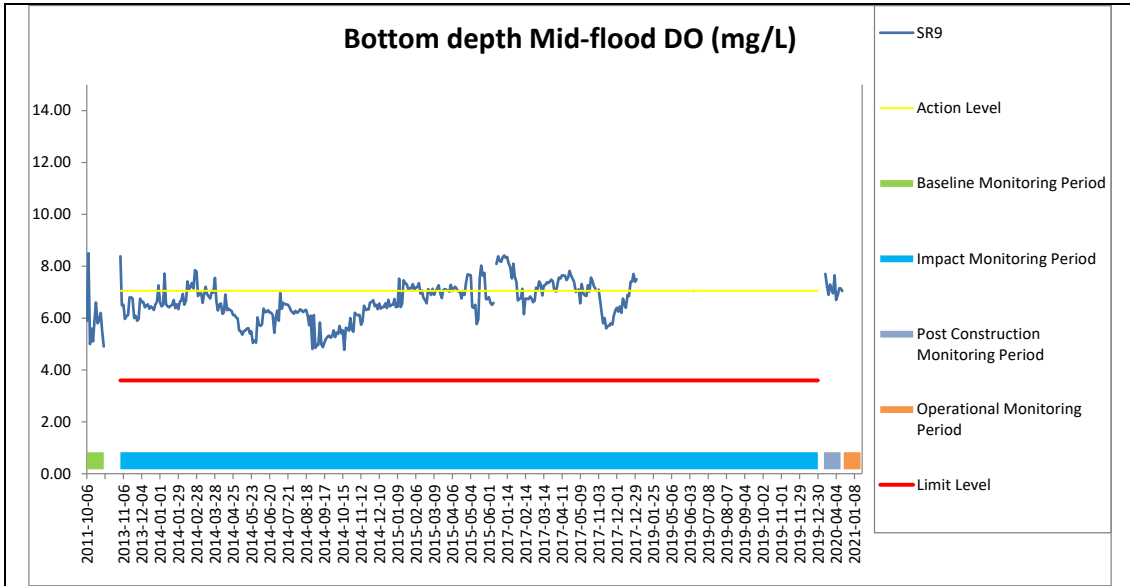


Figure E52 Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-flood tide during the course of the Contract at SR9 and IS(Mf)11.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



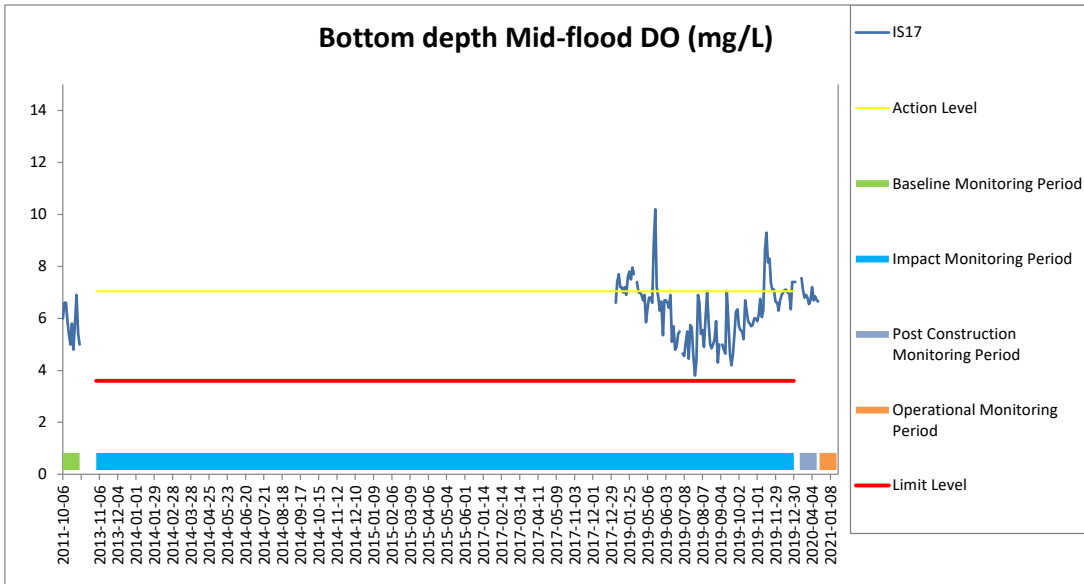
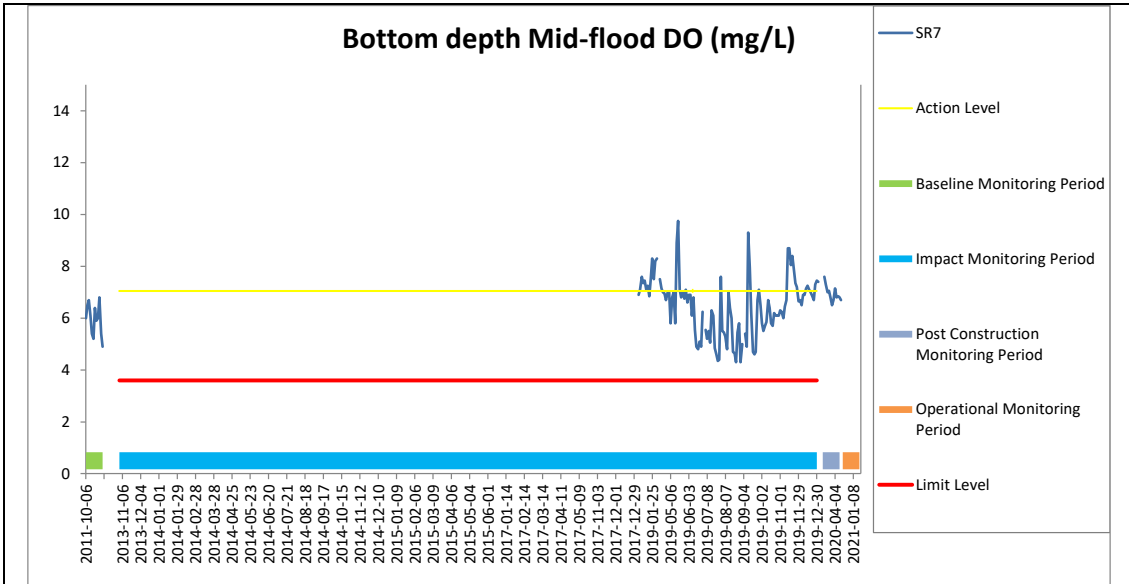


Figure E53 Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-flood tide during the course of the Contract at SR7 and IS17.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

**Environmental
Resources
Management**



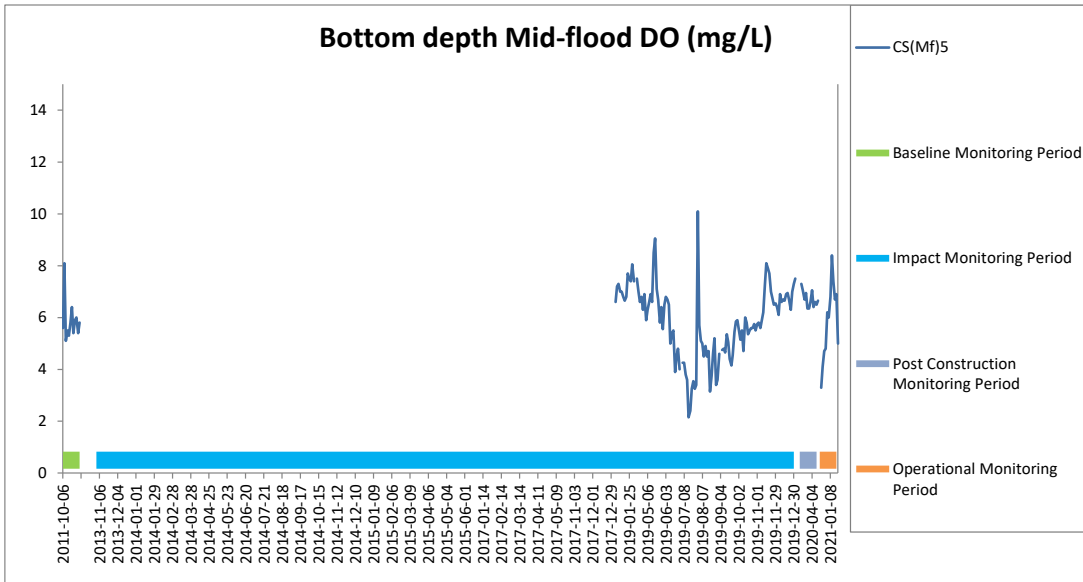
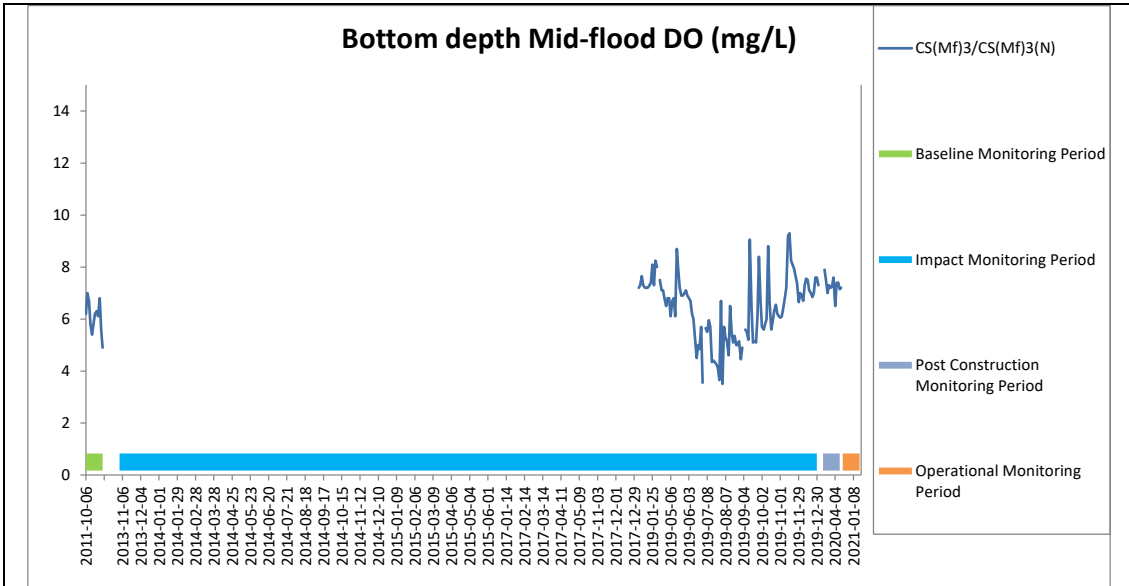


Figure E54 Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-flood tide during the course of the Contract at CS(Mf)3/CS(Mf)3(N) and CS(Mf)5.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



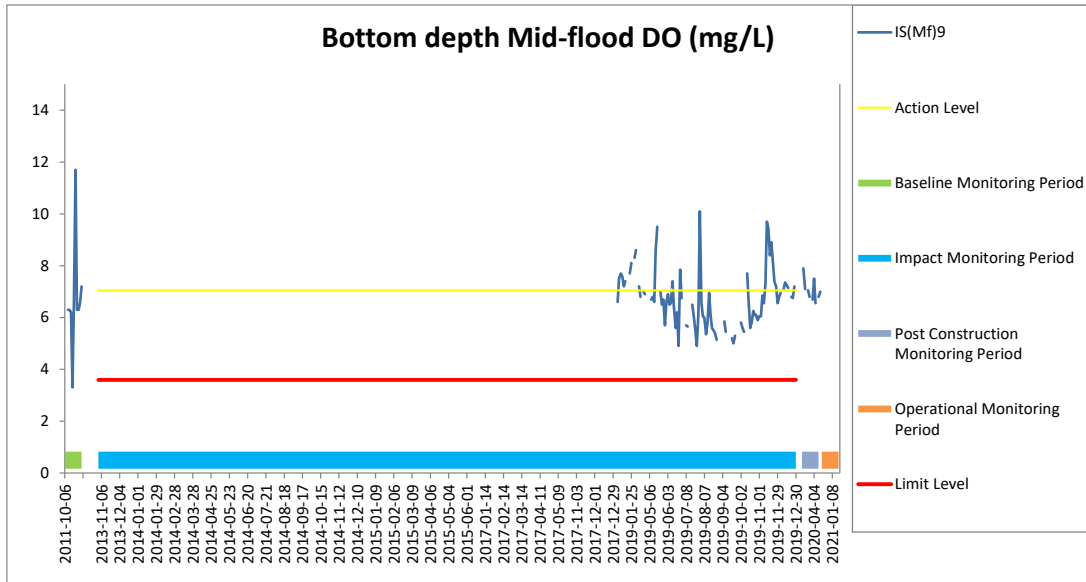
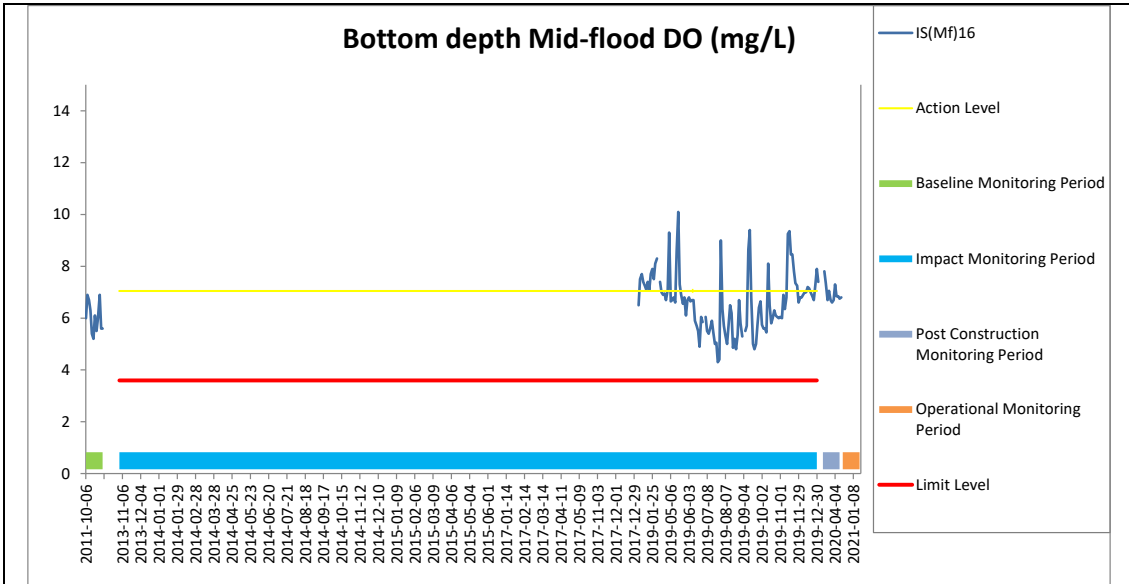


Figure E55 Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-flood tide during the course of the Contract at IS(Mf)16 and IS(Mf)9.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



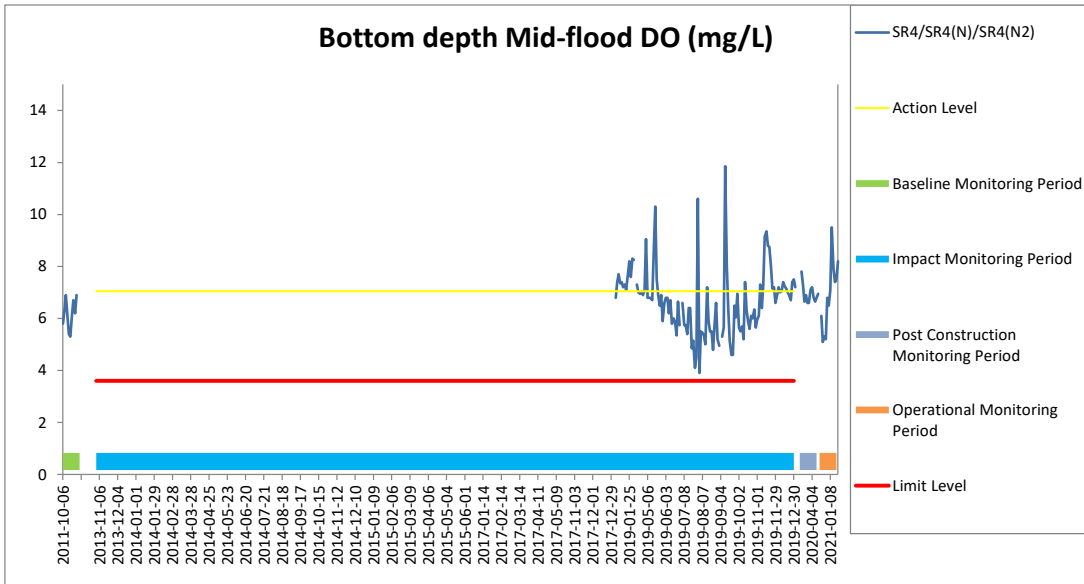
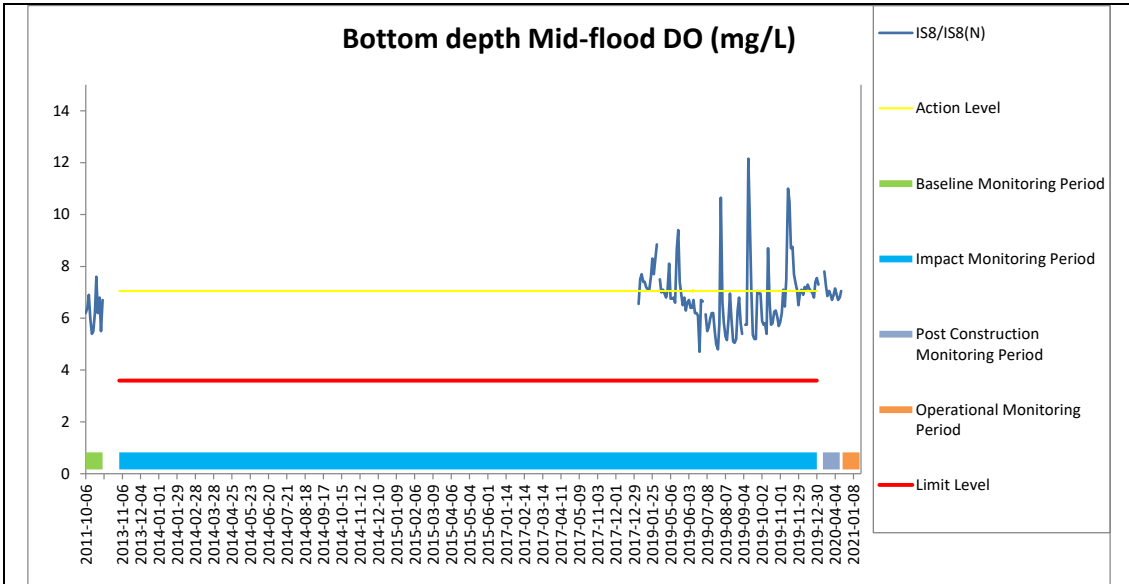


Figure E56 Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-flood tide during the course of the Contract at IS8/IS8(N) and SR4/SR4(N)/SR4(N2).

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

**Environmental
Resources
Management**



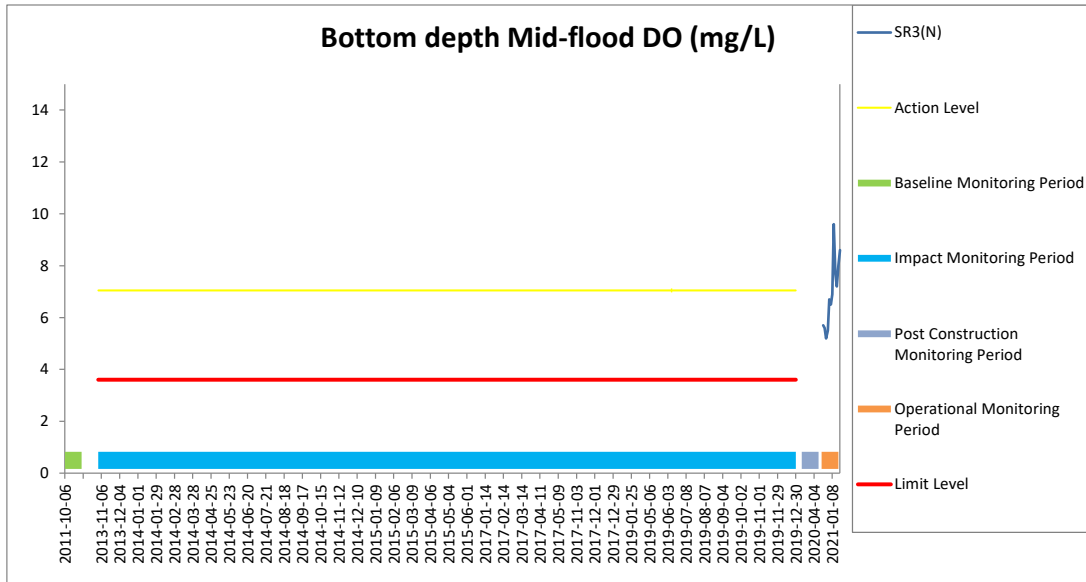
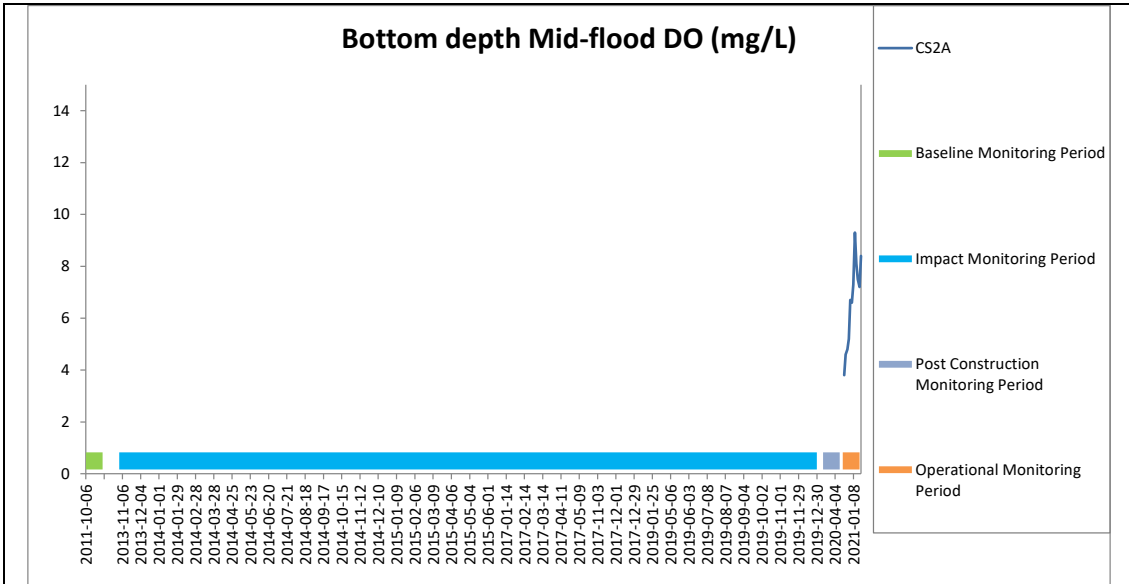


Figure E57 Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-flood tide during the course of the Contract at CS2A and SR3(N).

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



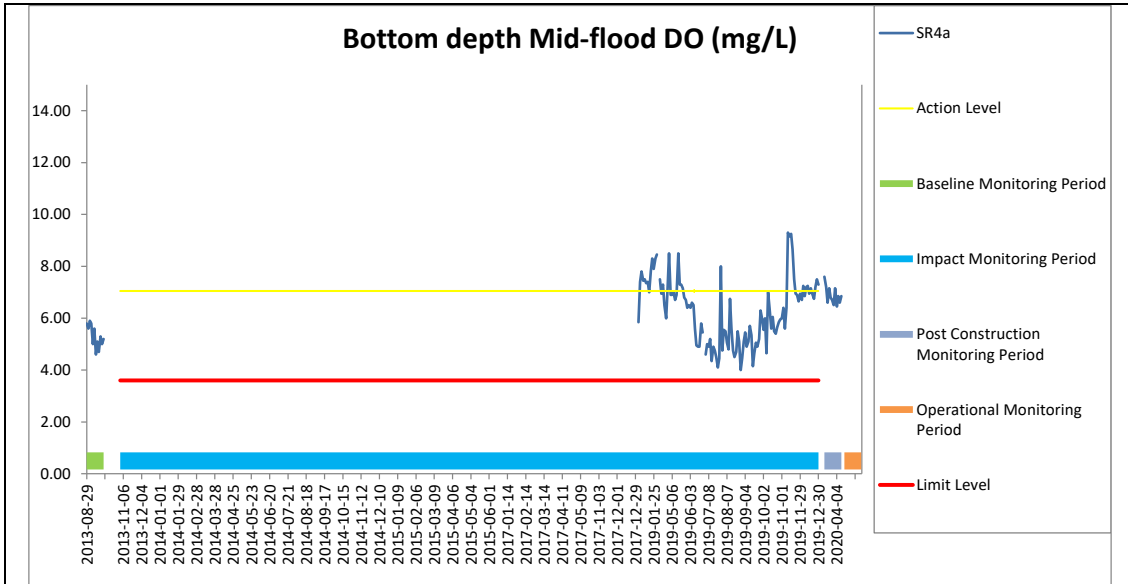


Figure E58 Mean Level of Dissolved Oxygen (mg/L) in bottom waters during mid-flood tide during the course of the Contract at SR4a.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



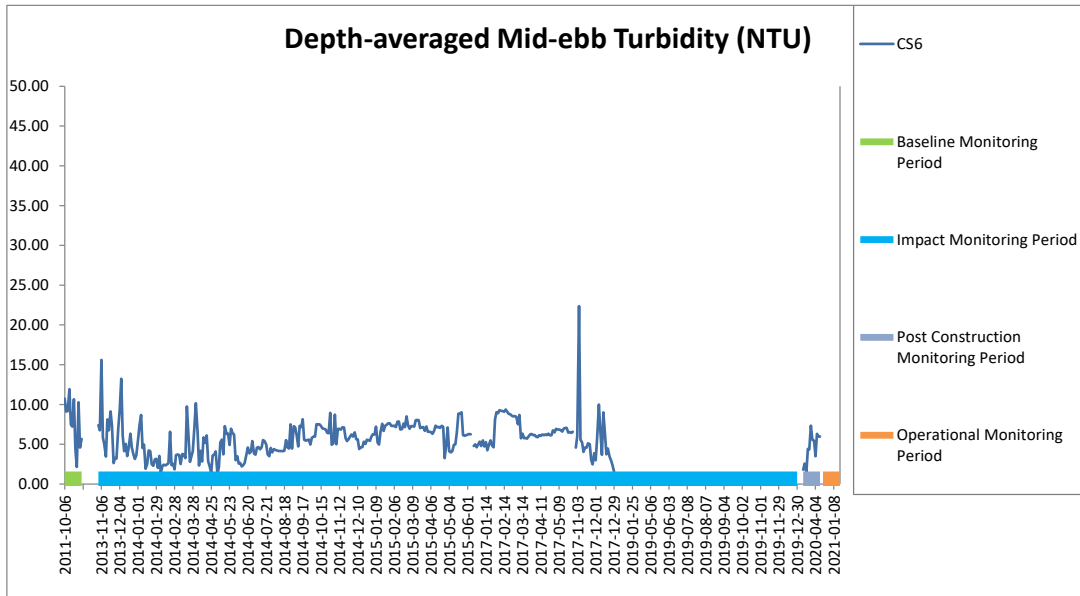
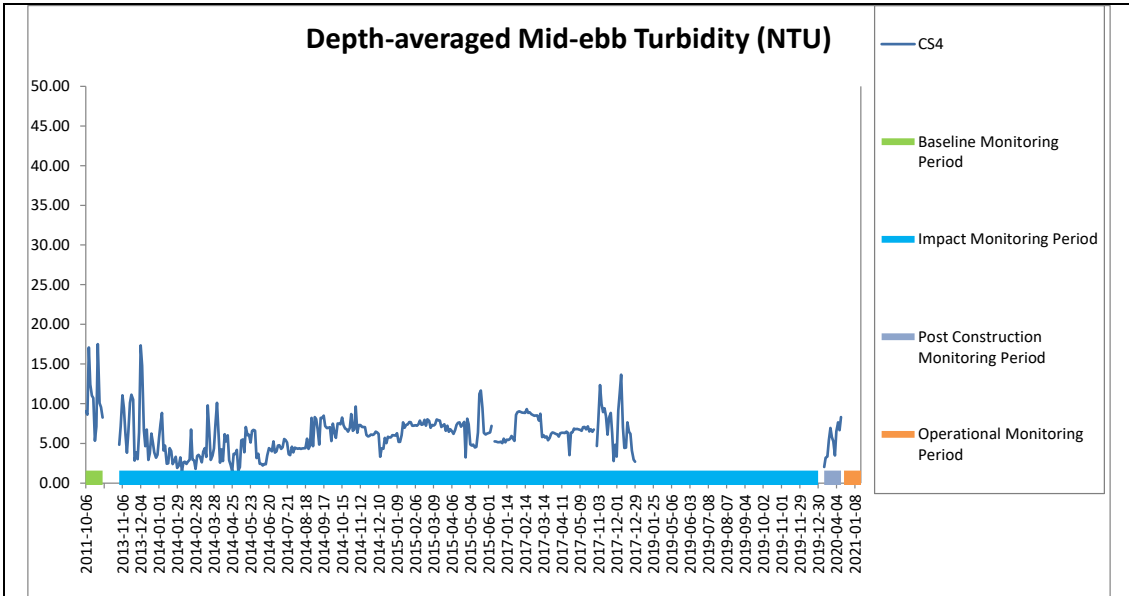


Figure E59 Mean Level of depth-averaged Turbidity (NTU) during mid-ebb tide during the course of the Contract at CS4 and CS6.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



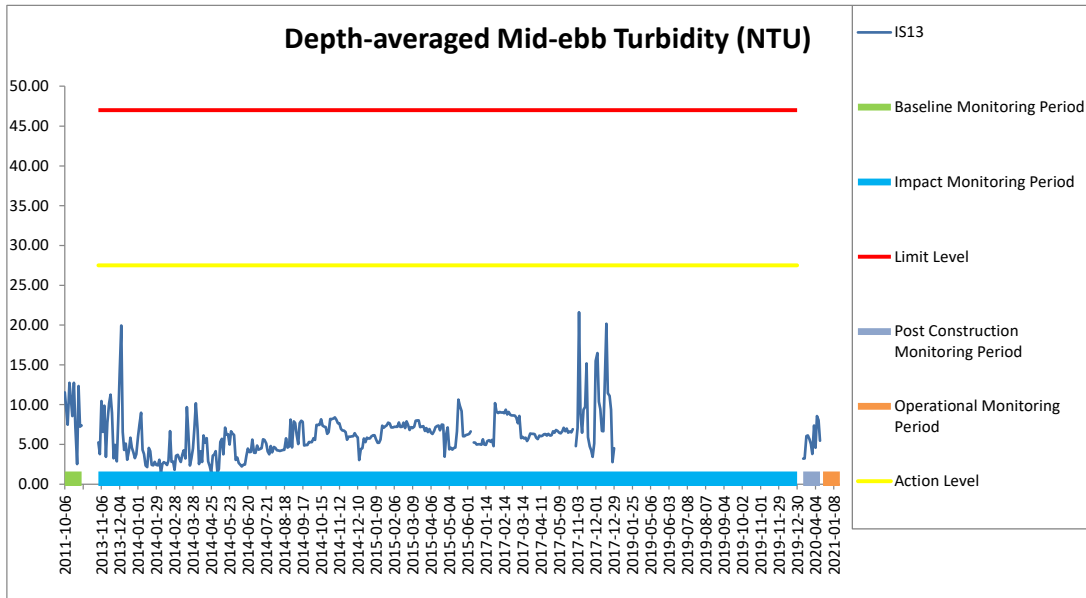
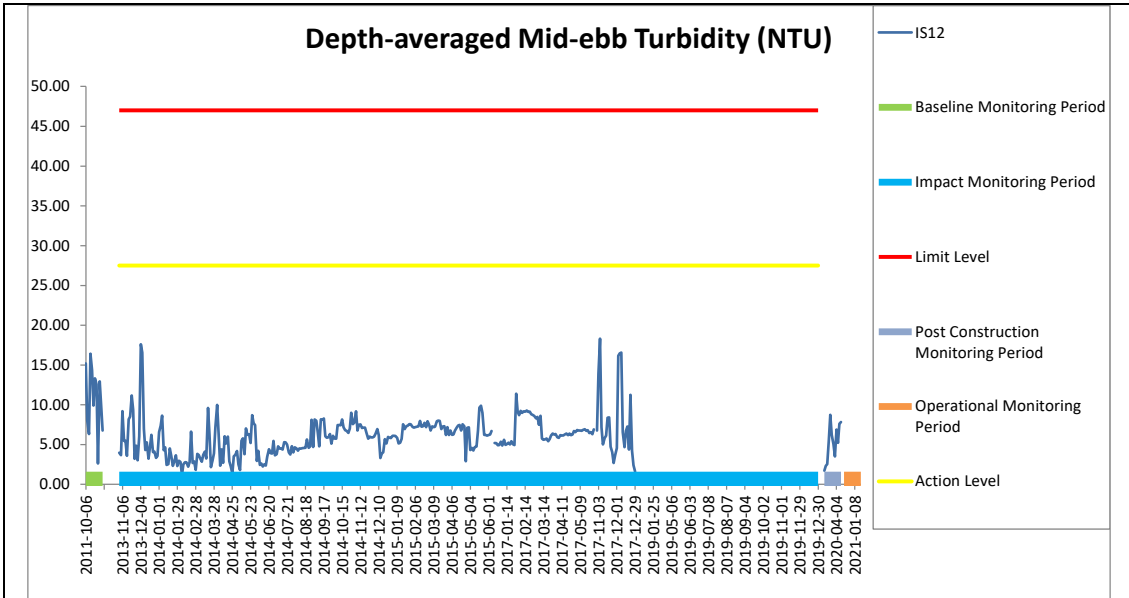


Figure E60 Mean Level of depth-averaged Turbidity (NTU) during mid-ebb tide during the course of the Contract at IS12 and IS13.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



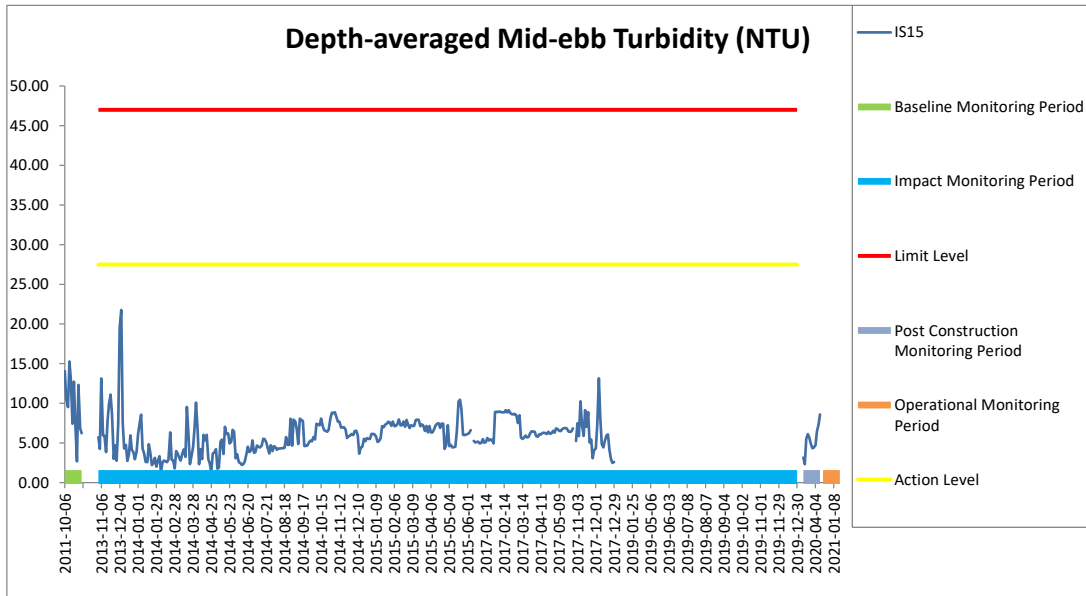
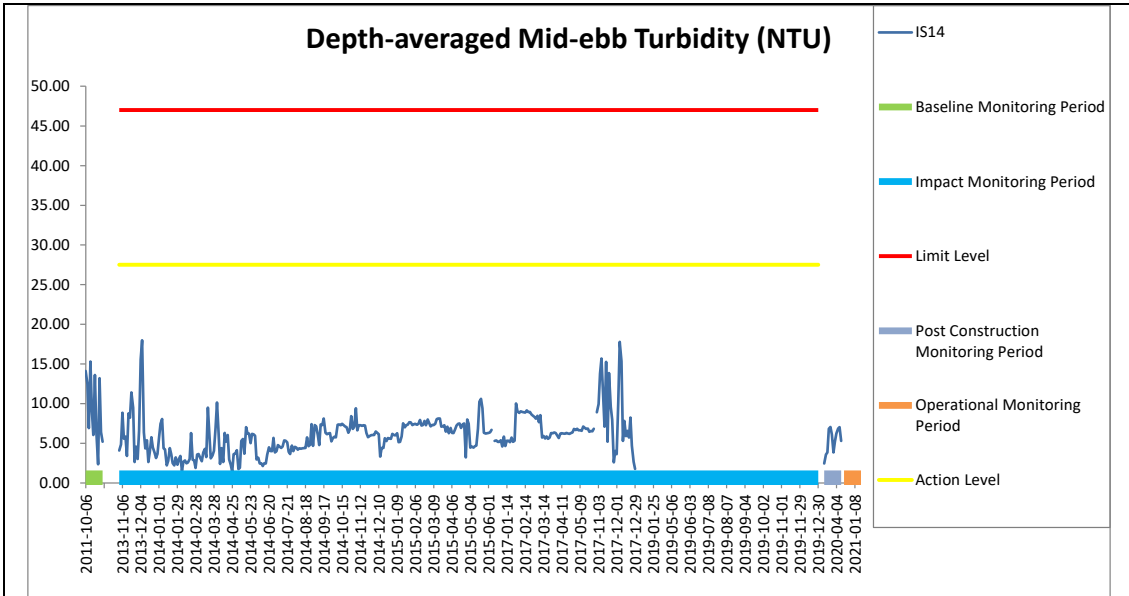


Figure E61 Mean Level of depth-averaged Turbidity (NTU) during mid-ebb tide during the course of the Contract at IS14 and IS15.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



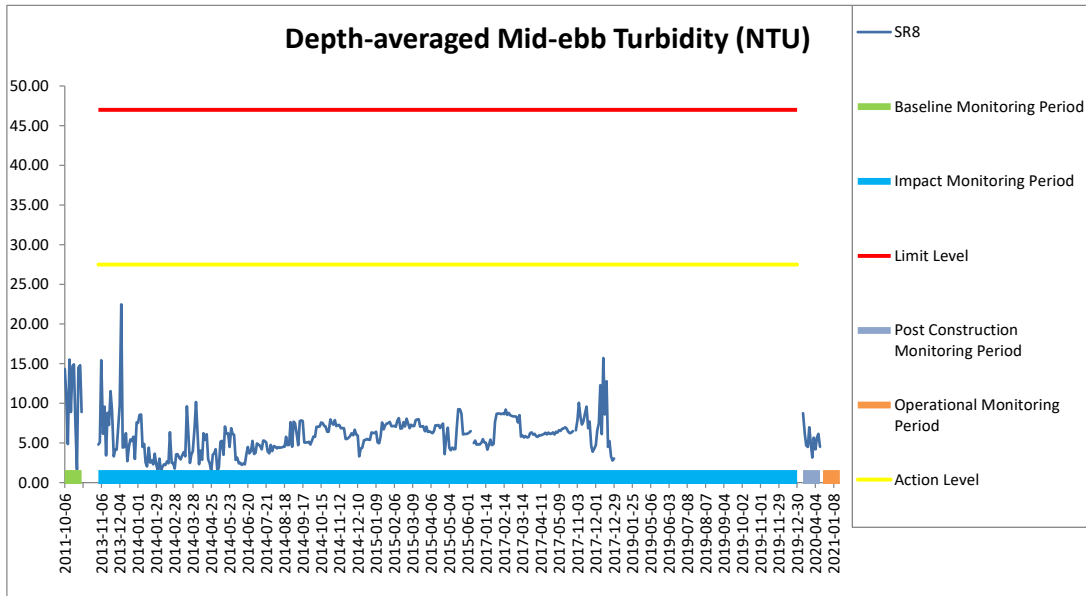
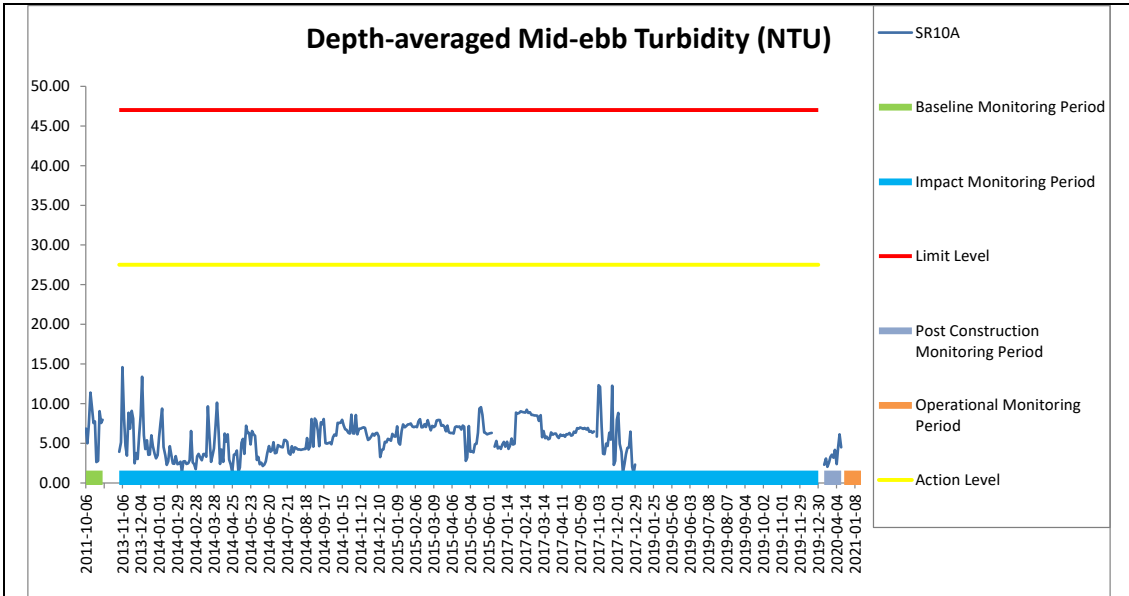


Figure E62 Mean Level of depth-averaged Turbidity (NTU) during mid-ebb tide during the course of the Contract at SR10A and SR8.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



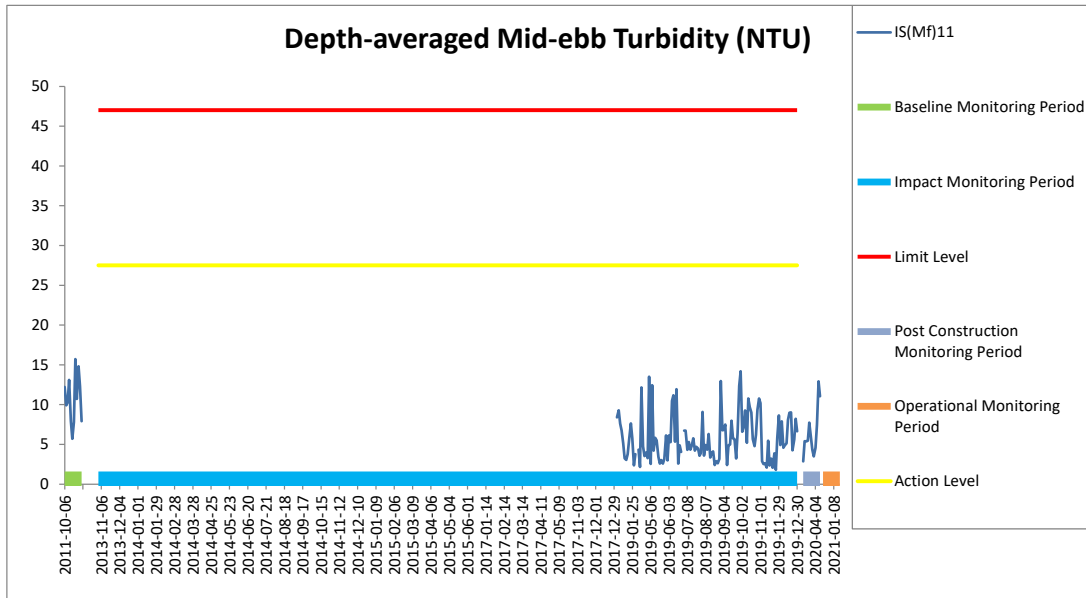
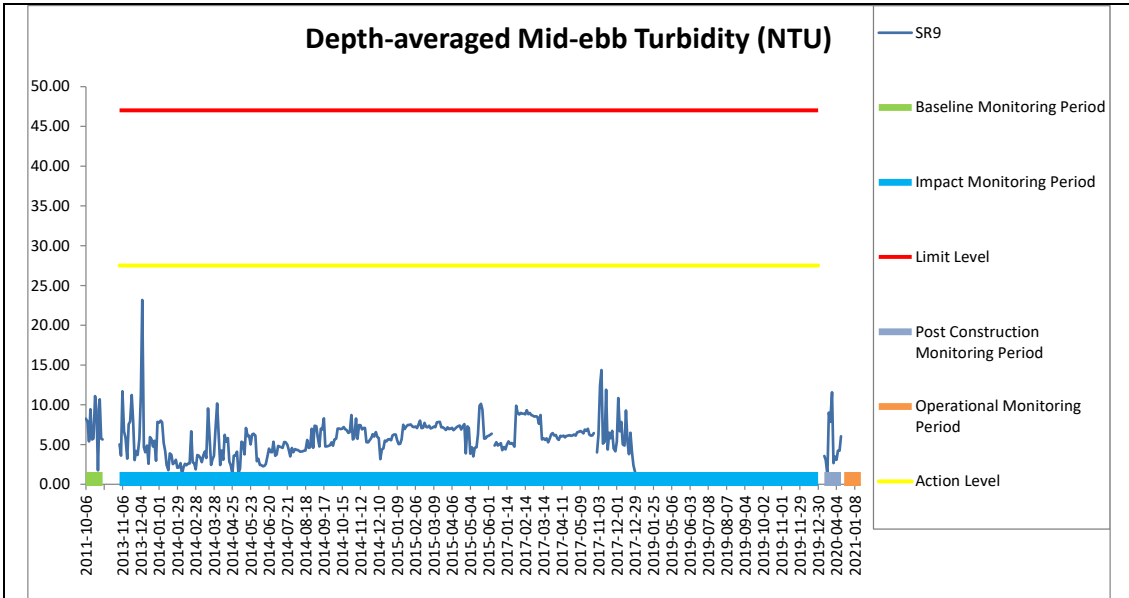


Figure E63 Mean Level of depth-averaged Turbidity (NTU) during mid-ebb tide during the course of the Contract at SR9 and IS(Mf)11.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



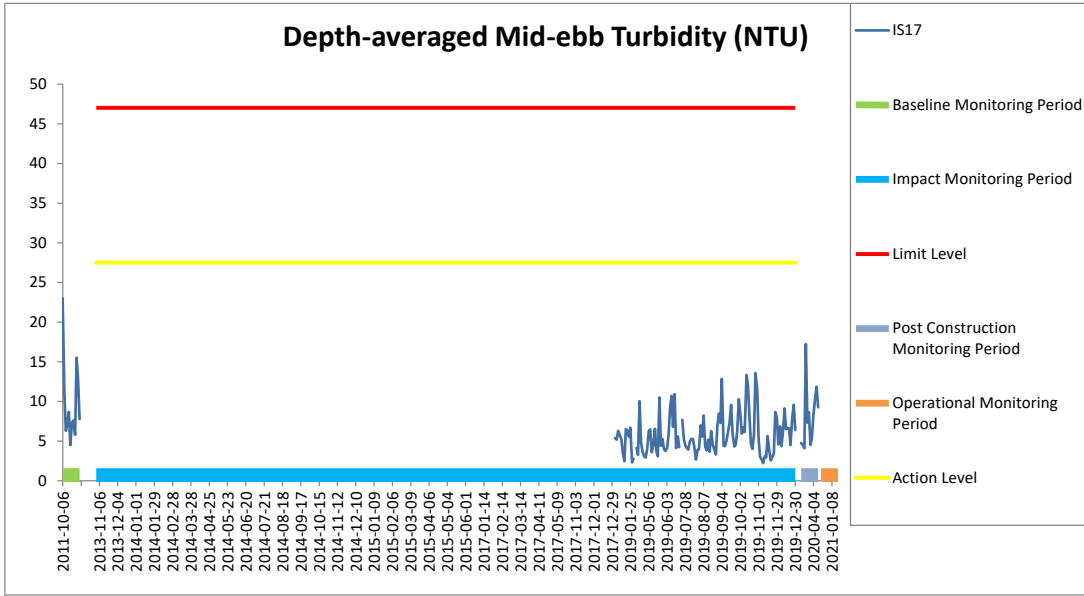
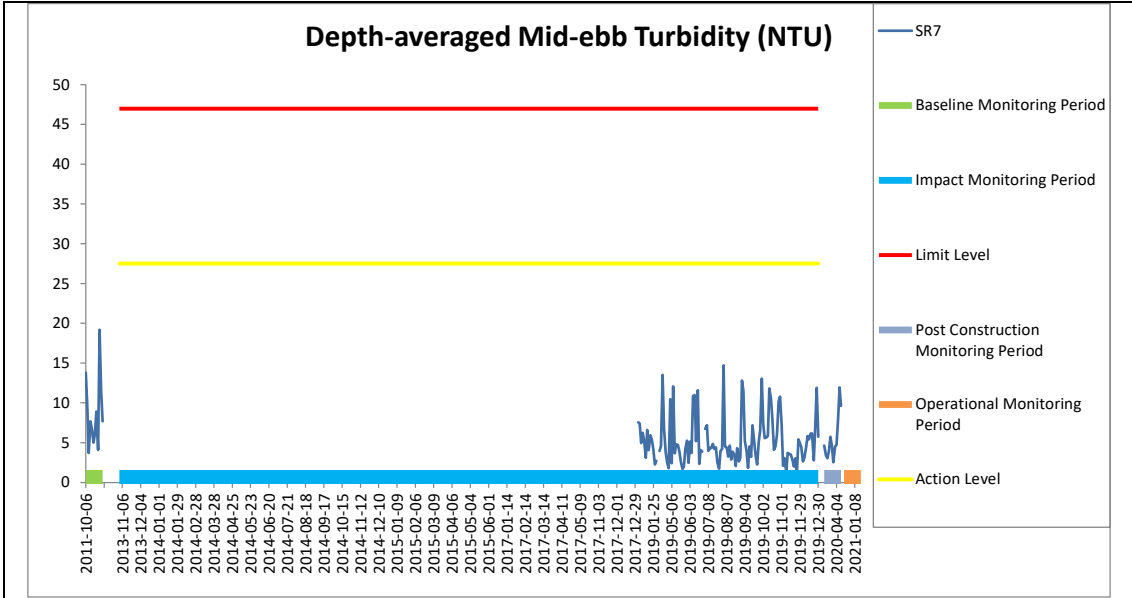


Figure E64 Mean Level of depth-averaged Turbidity (NTU) during mid-ebb tide during the course of the Contract at SR7 and IS17.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



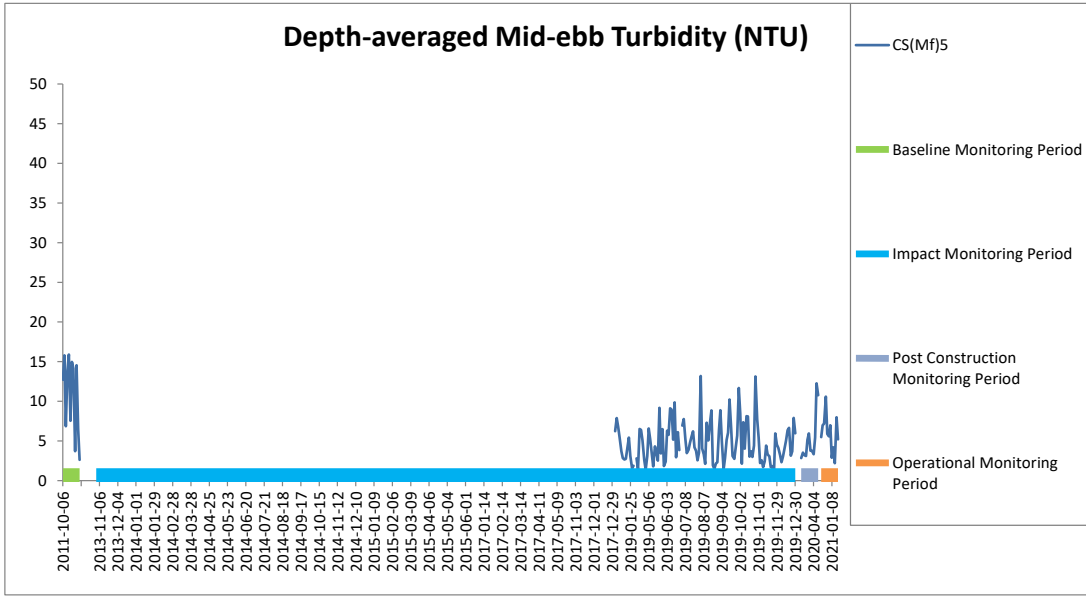
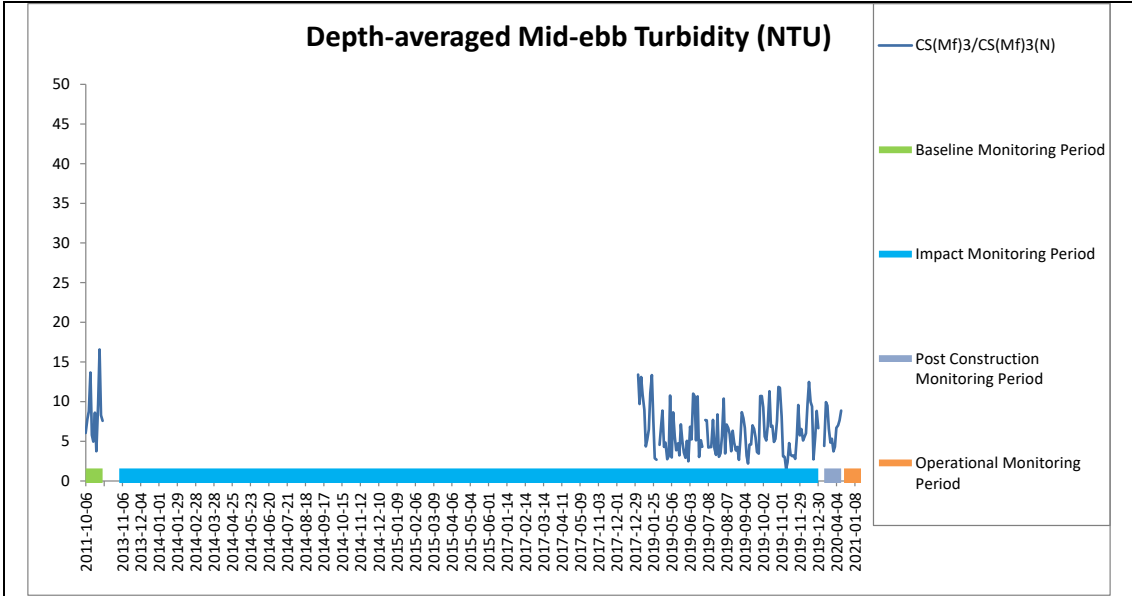


Figure E65 Mean Level of depth-averaged Turbidity (NTU) during mid-ebb tide during the course of the Contract at CS(Mf)3/CS(Mf)3(N) and CS(Mf)5.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



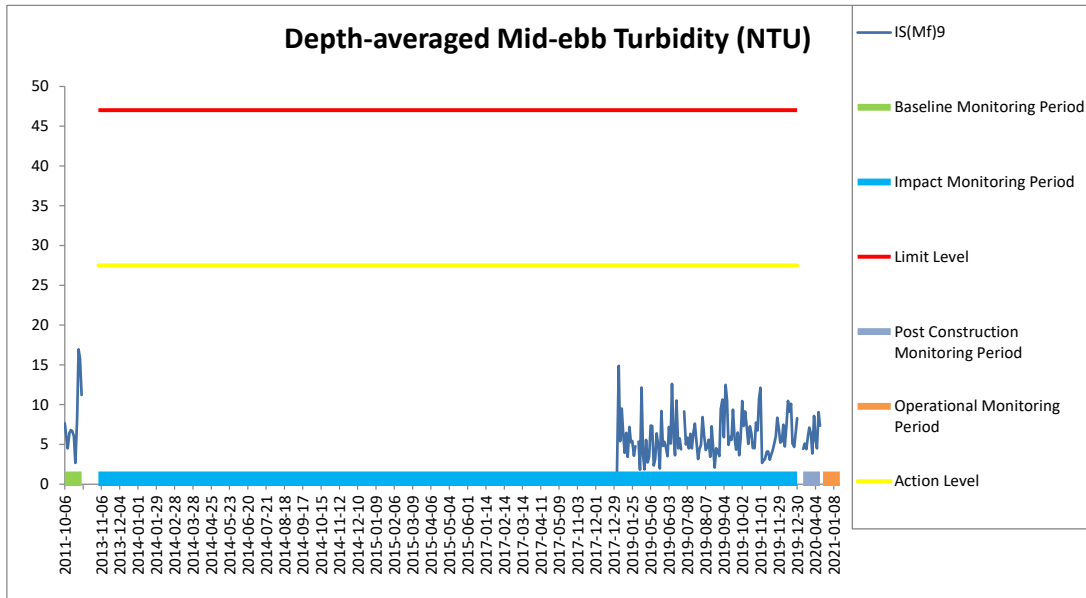
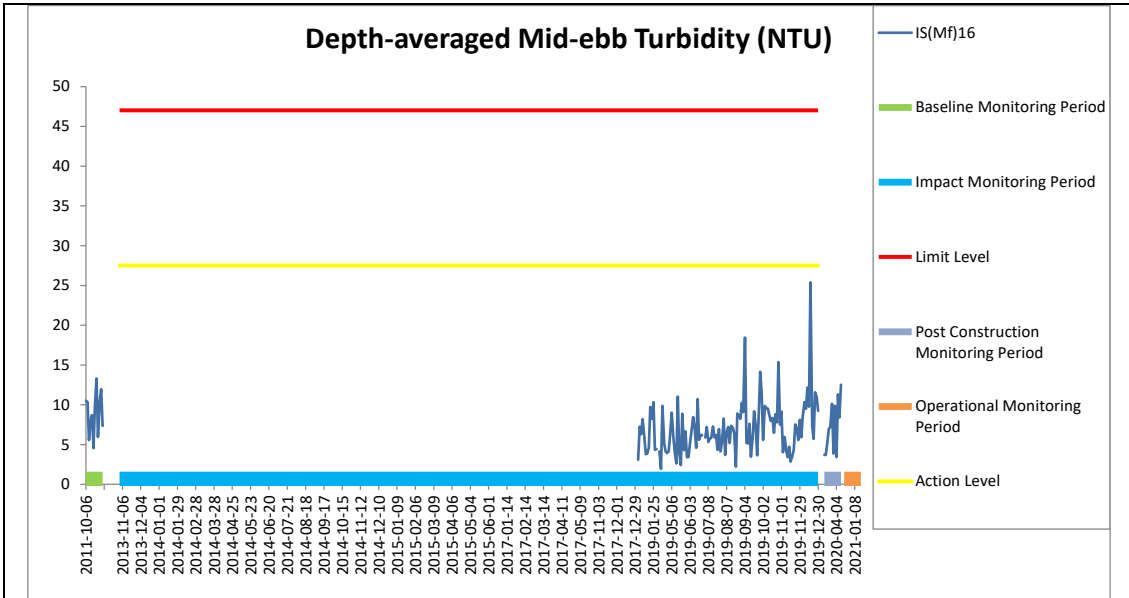


Figure E66 Mean Level of depth-averaged Turbidity (NTU) during mid-ebb tide during the course of the Contract at IS(Mf)16 and IS(Mf)9.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



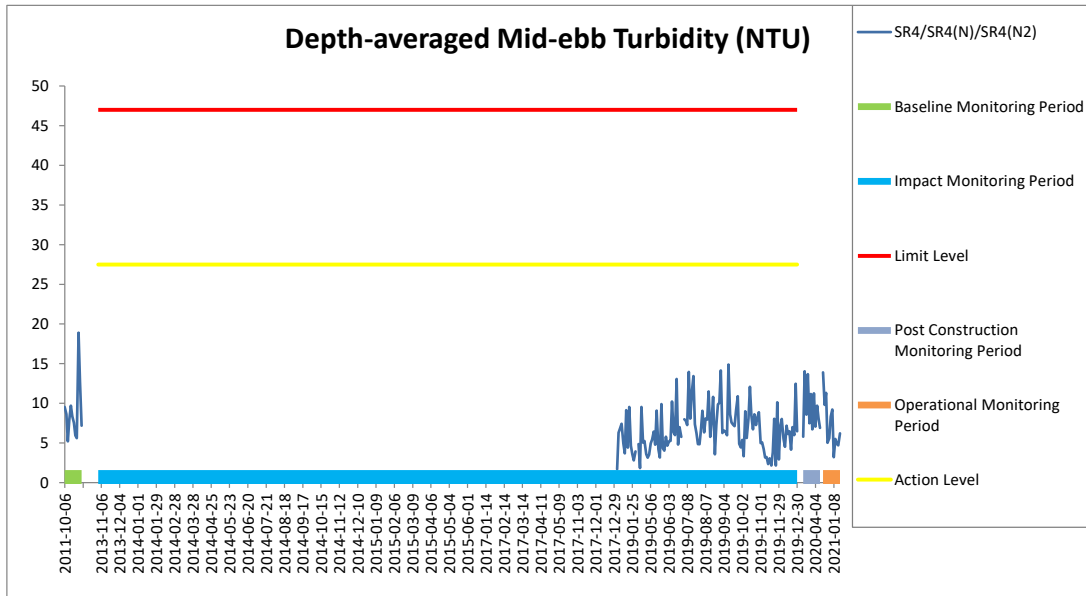
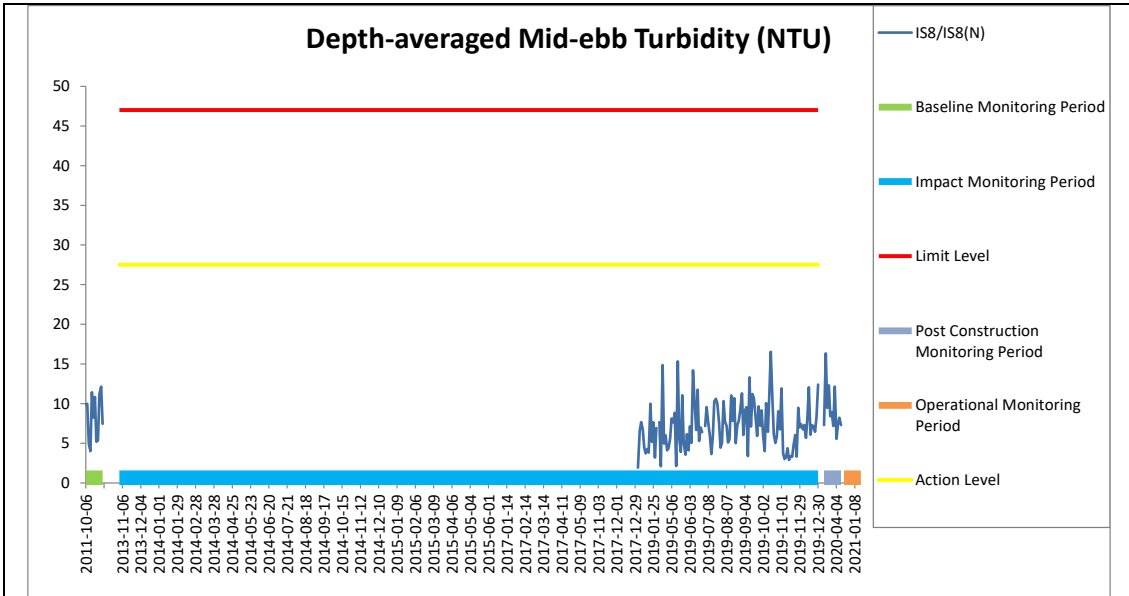


Figure E67 Mean Level of depth-averaged Turbidity (NTU) during mid-ebb tide during the course of the Contract at IS8/IS8(N) and SR4/SR4(N)/SR4(N2).
(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

**Environmental
Resources
Management**



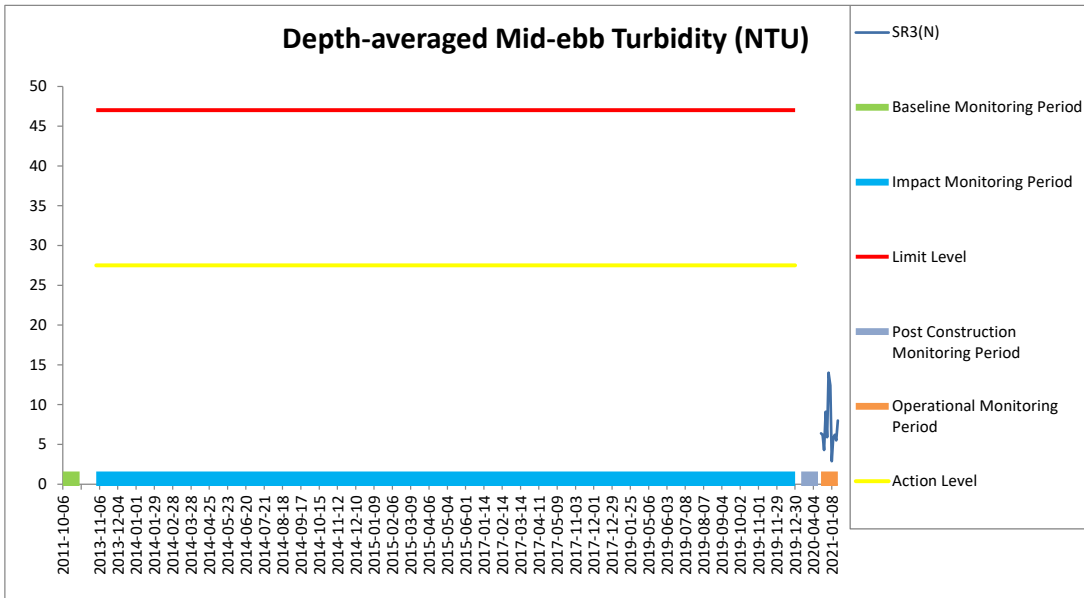
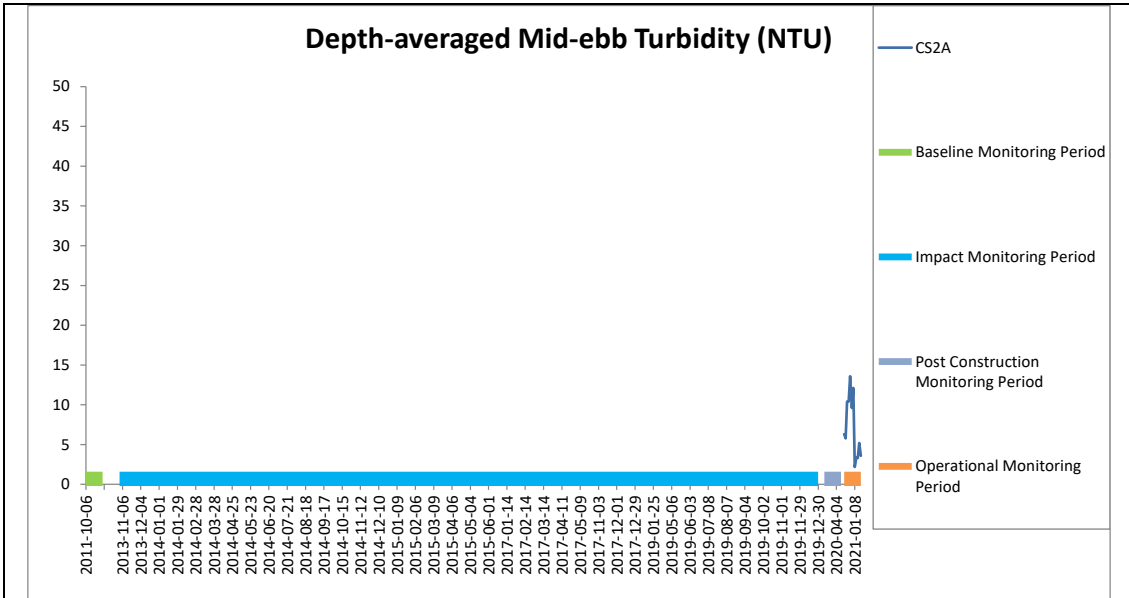


Figure E68 Mean Level of depth-averaged Turbidity (NTU) during mid-ebb tide during the course of the Contract at CS2A and SR3(N).

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



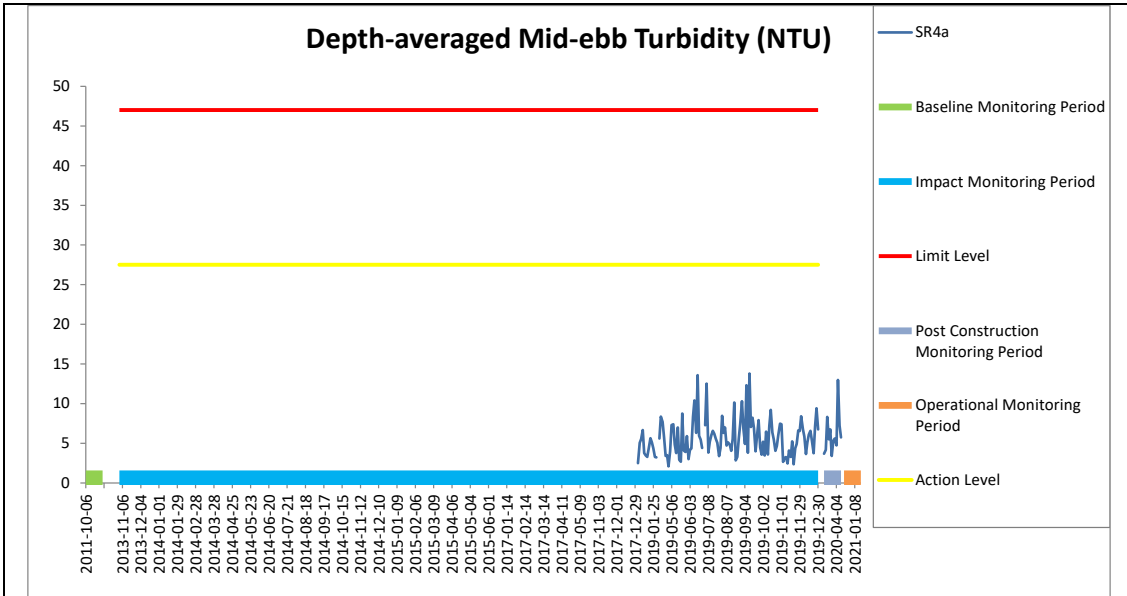


Figure E69 Mean Level of depth-averaged Turbidity (NTU) during mid-ebb tide during the course of the Contract at SR4a.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

**Environmental
Resources
Management**



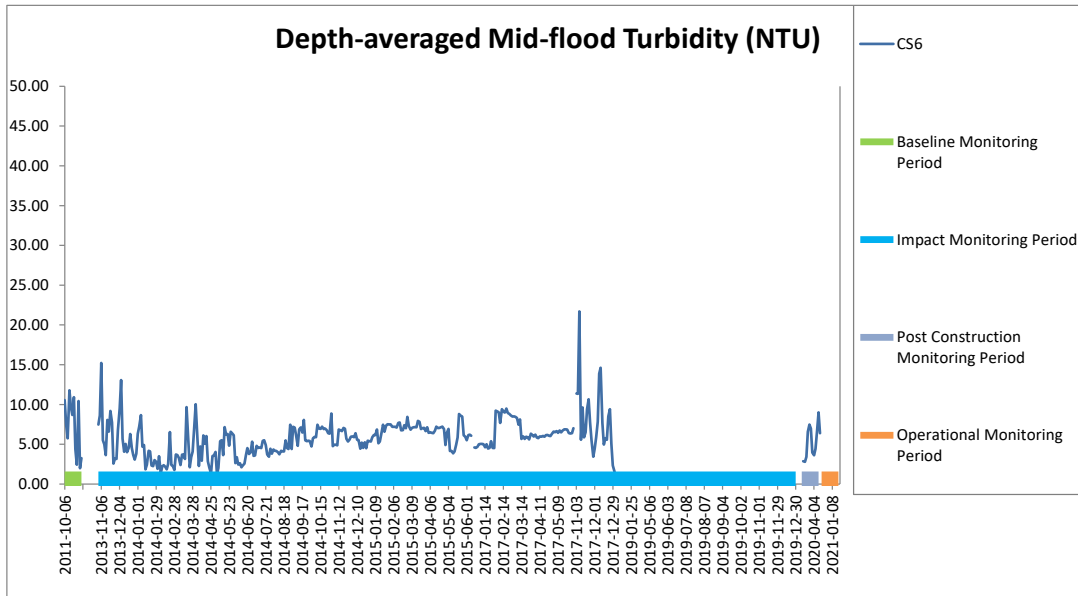
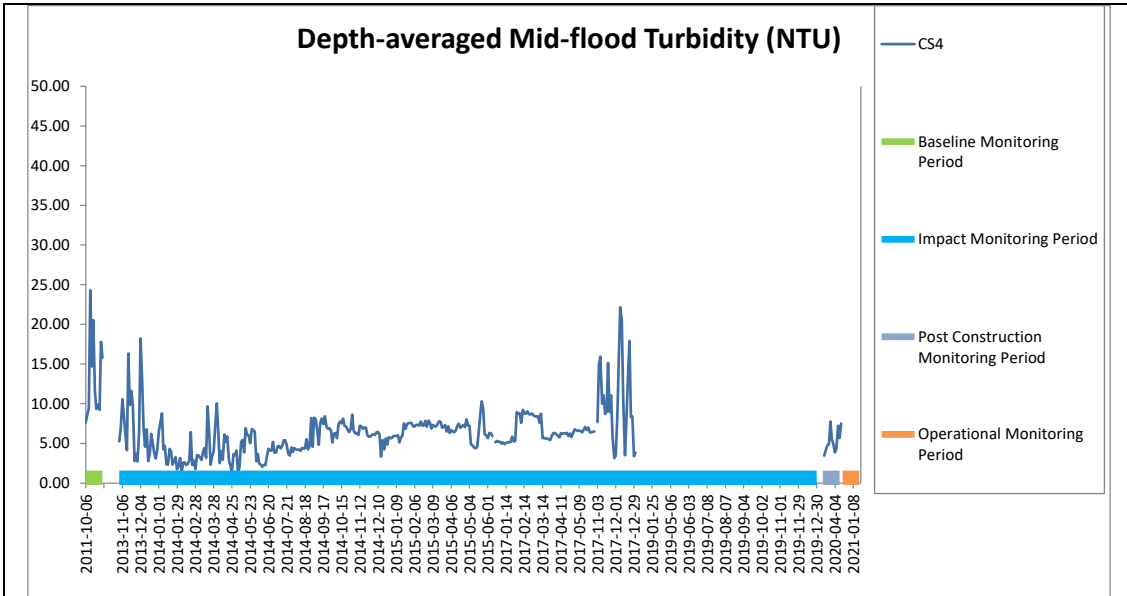


Figure E70 Mean Level of depth-averaged Turbidity (NTU) during mid-flood tide during the course of the Contract at CS4 and CS6.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



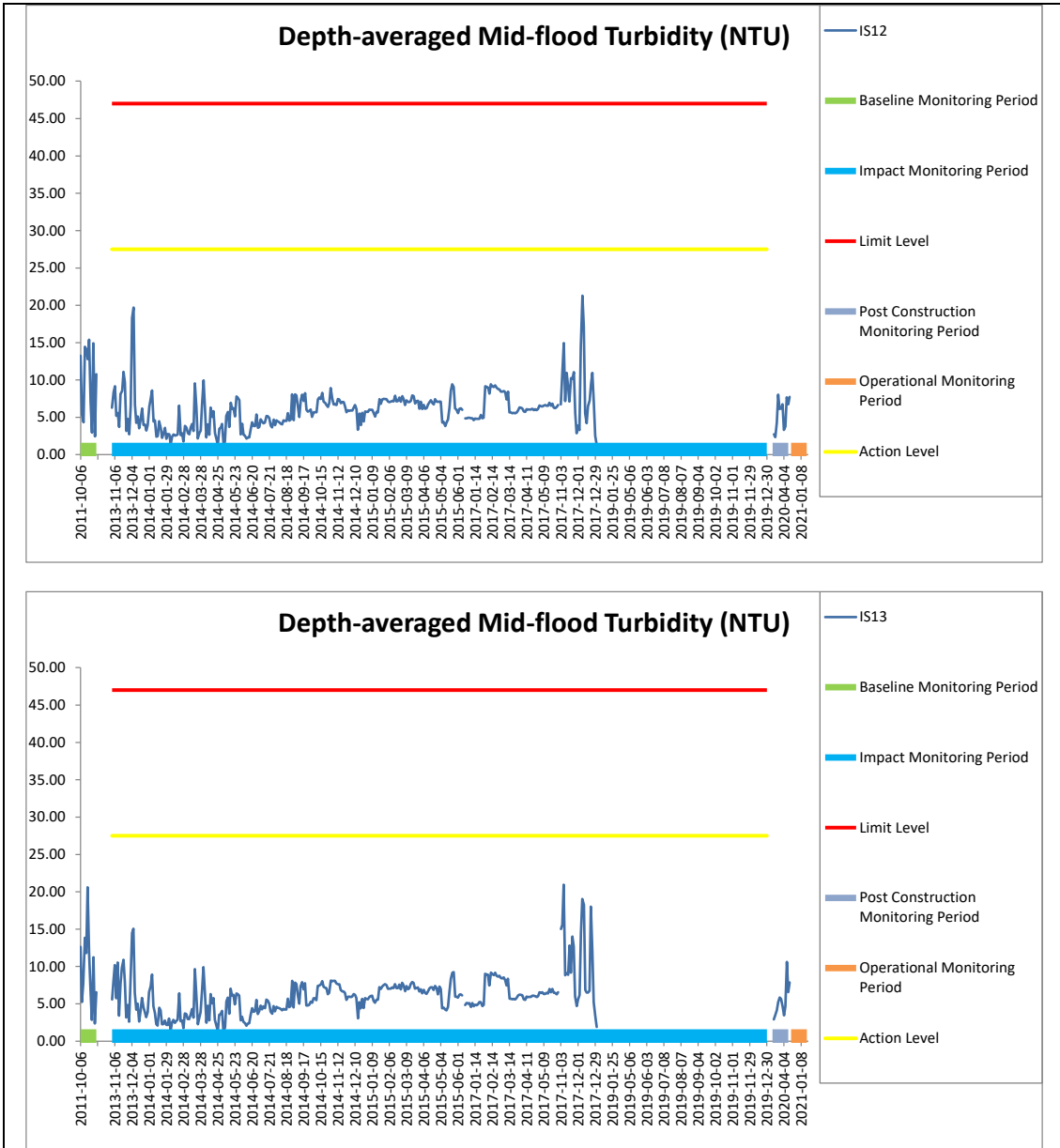


Figure E71 Mean Level of depth-averaged Turbidity (NTU) during mid-flood tide during the course of the Contract at IS12 and IS13.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



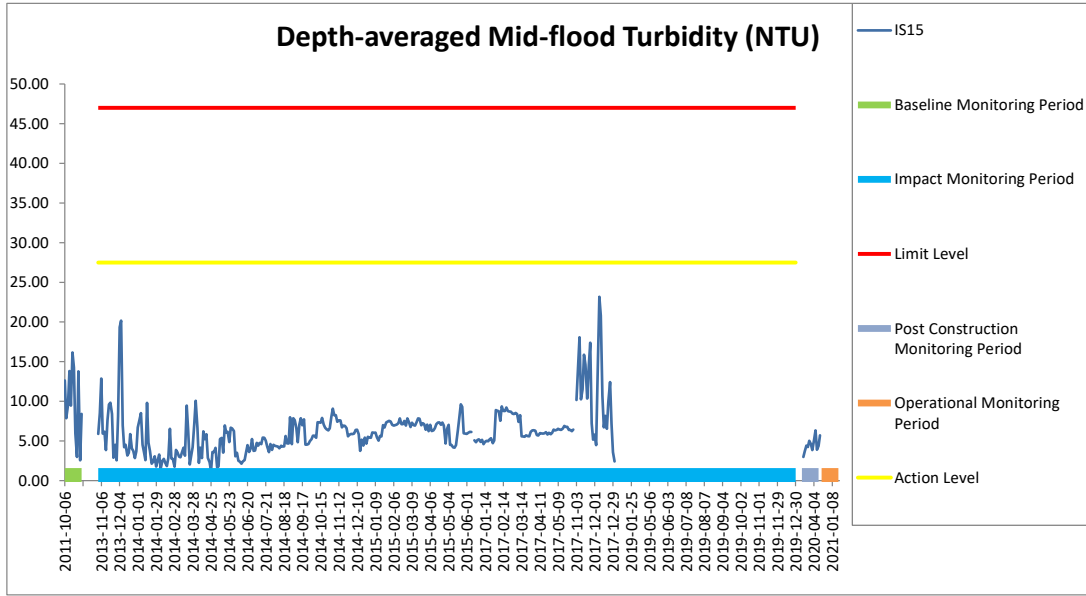
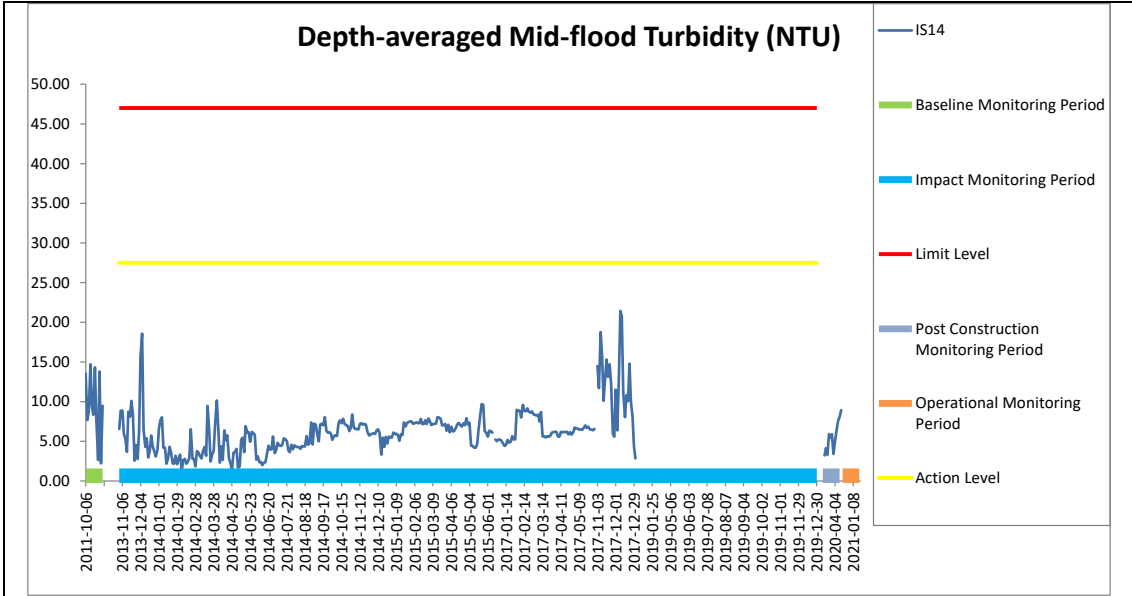


Figure E72 Mean Level of depth-averaged Turbidity (NTU) during mid-flood tide during the course of the Contract at IS14 and IS15.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



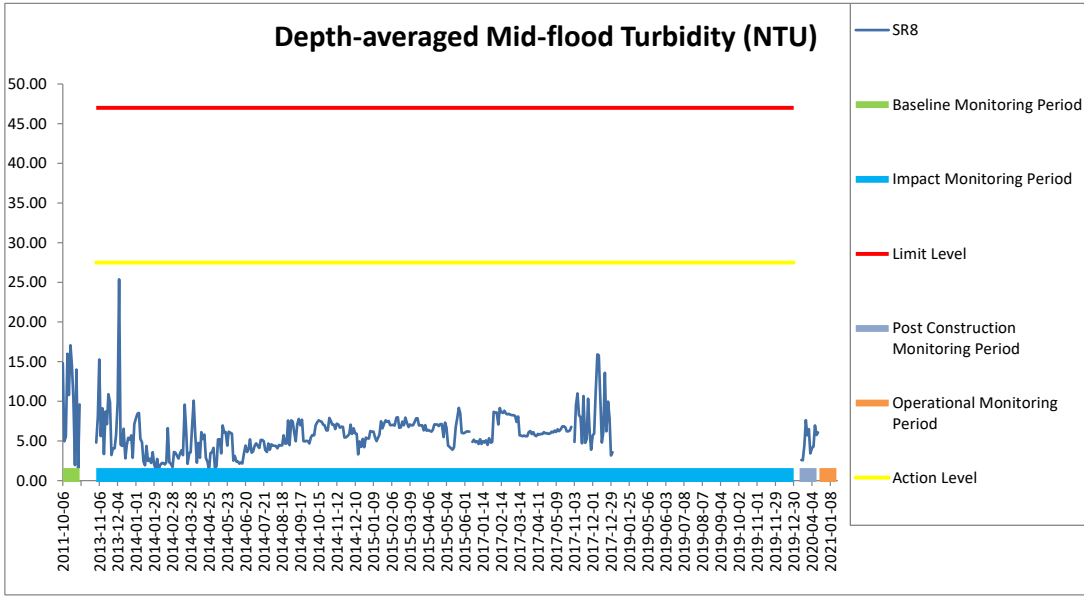
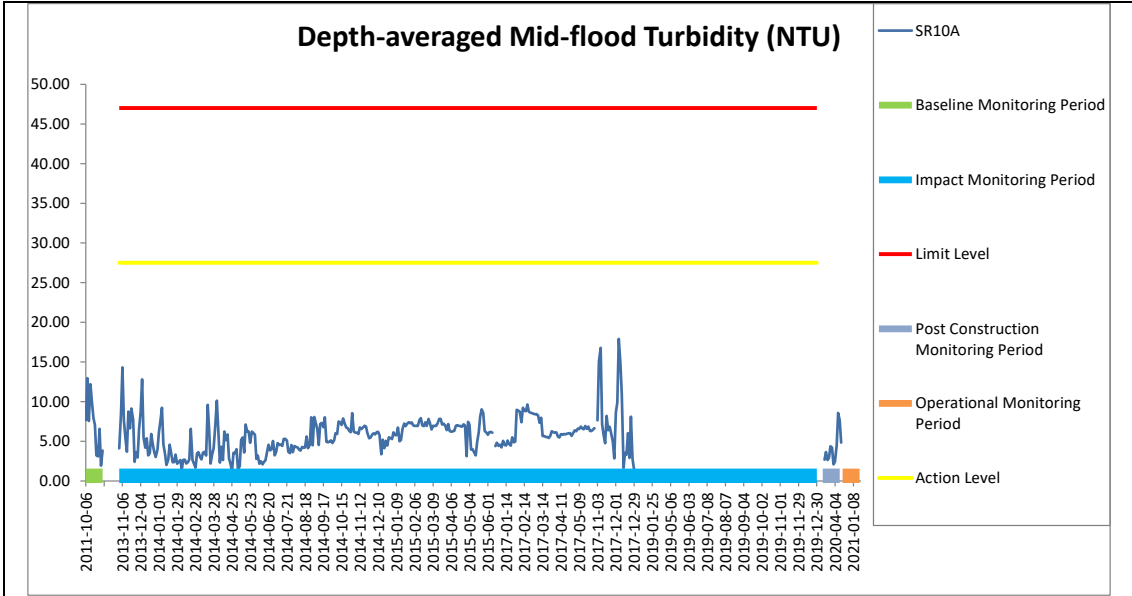


Figure E73 Mean Level of depth-averaged Turbidity (NTU) during mid-flood tide during the course of the Contract at SR10A and SR8.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



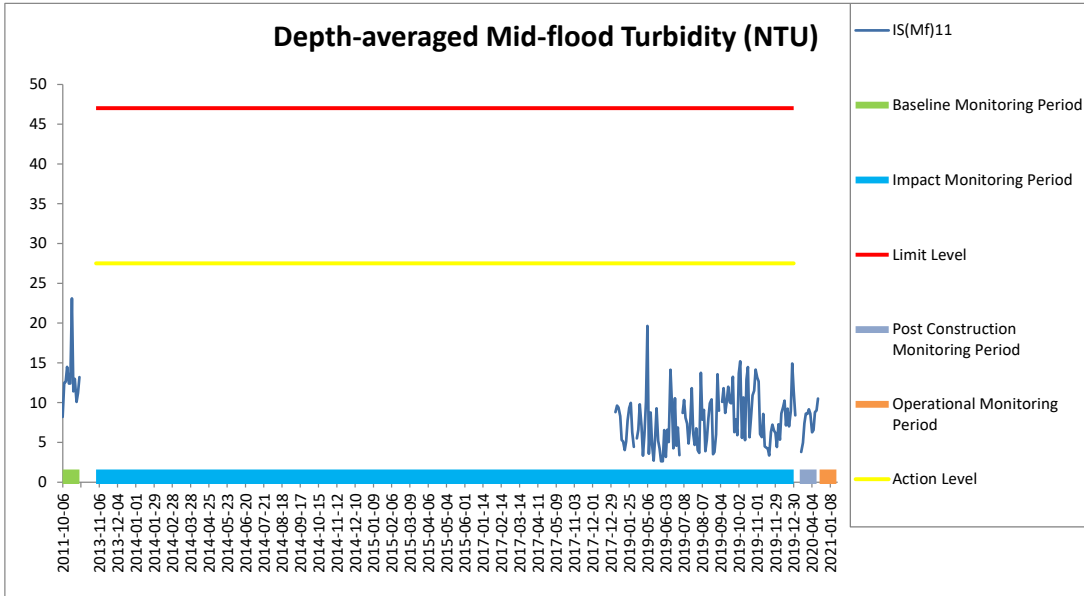
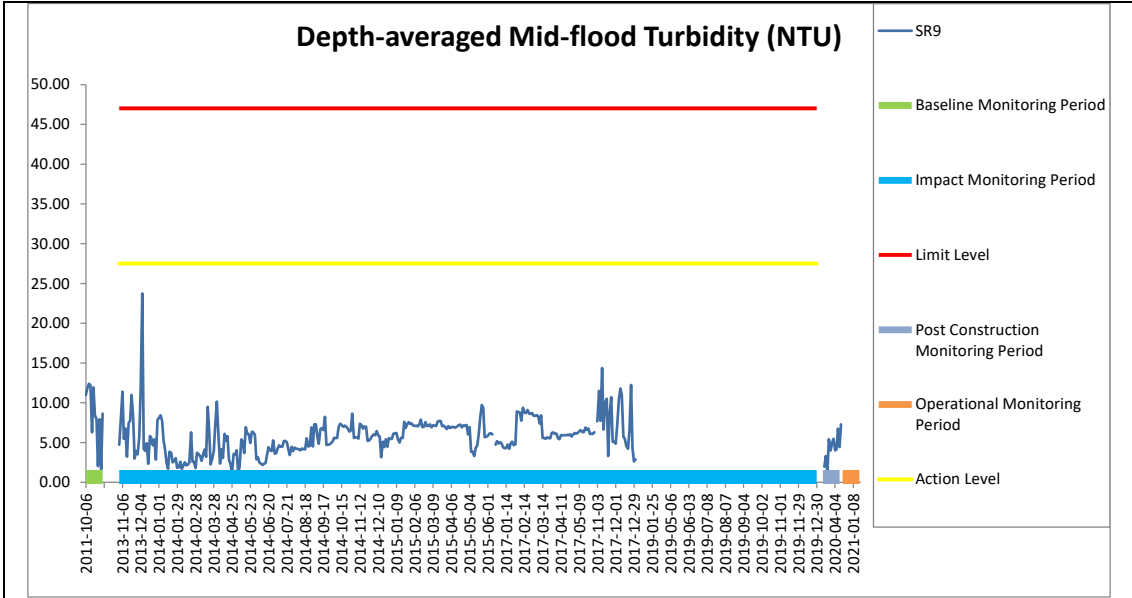


Figure E74 Mean Level of depth-averaged Turbidity (NTU) during mid-flood tide during the course of the Contract at SR9 and IS(Mf)11.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



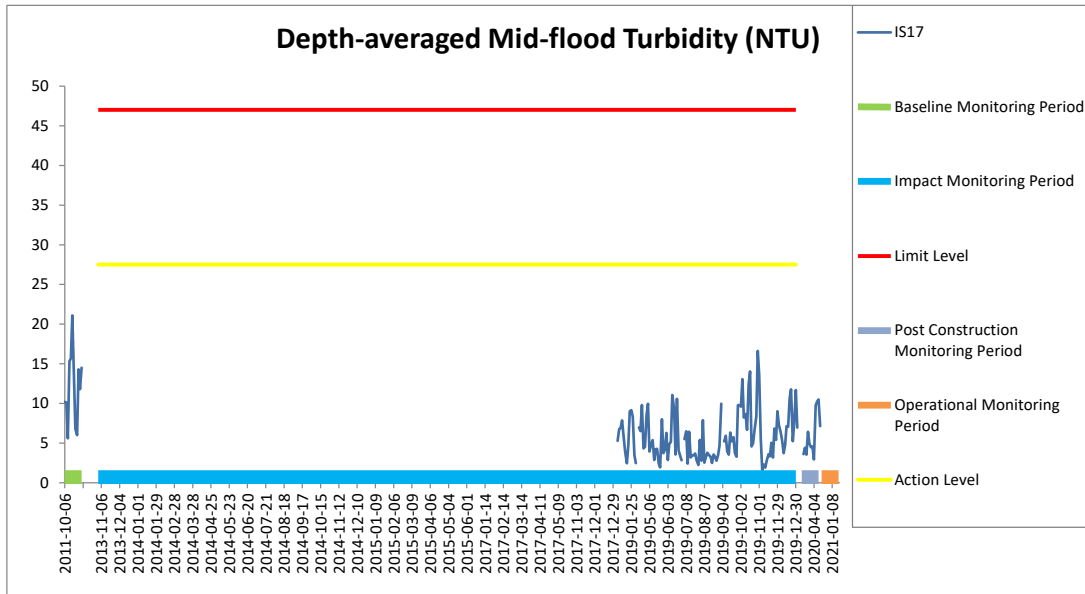
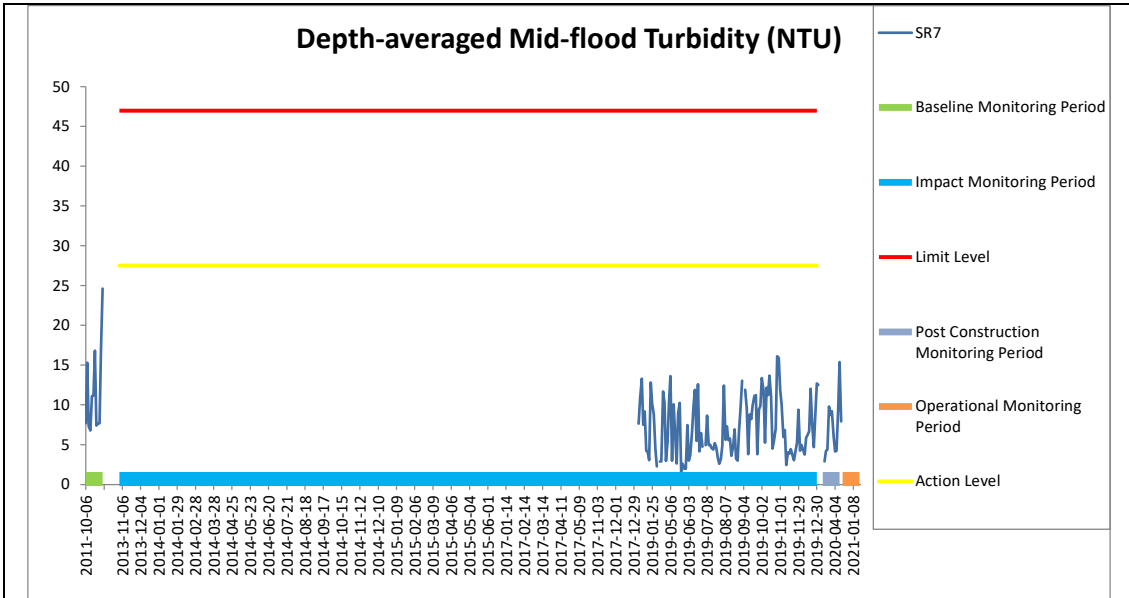


Figure E75 Mean Level of depth-averaged Turbidity (NTU) during mid-flood tide during the course of the Contract at SR7 and IS17.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

**Environmental
Resources
Management**



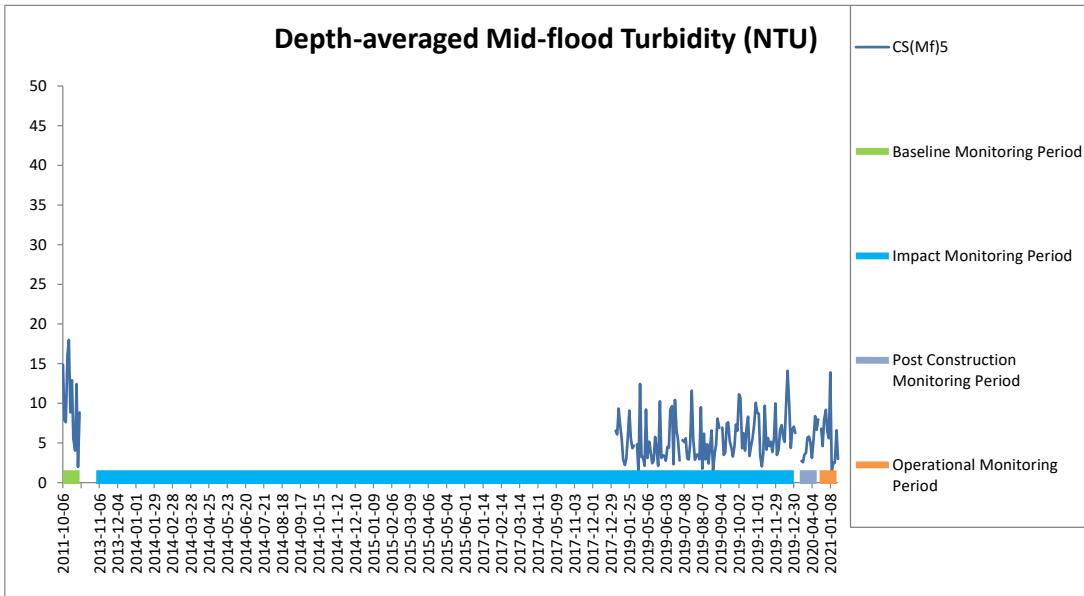
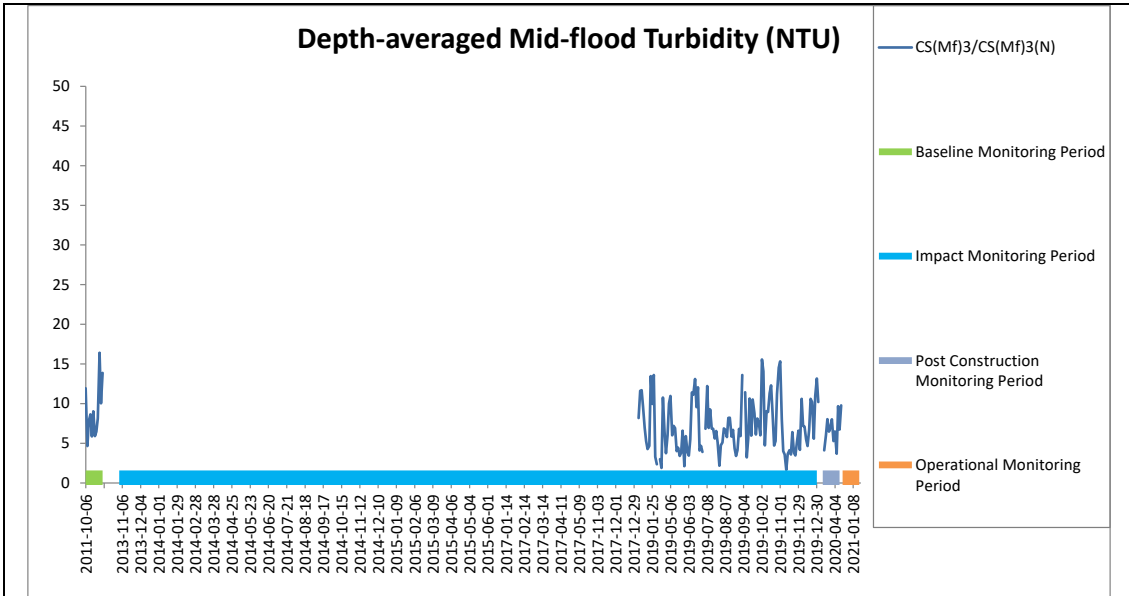


Figure E76 Mean Level of depth-averaged Turbidity (NTU) during mid-flood tide during the course of the Contract at CS(Mf)3/CS(Mf)3(N) and CS(Mf)5.
(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



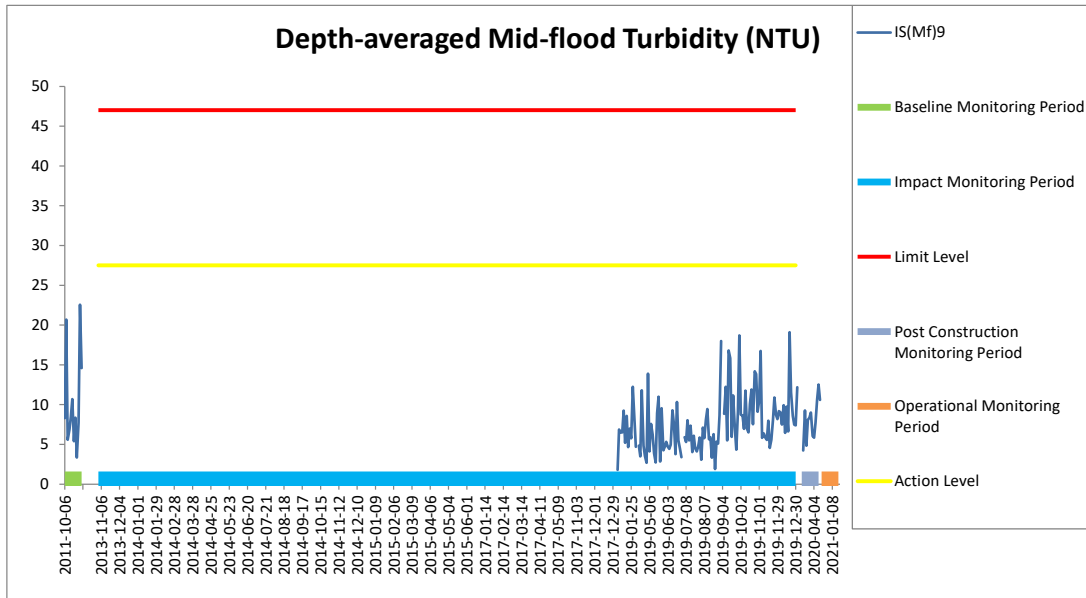
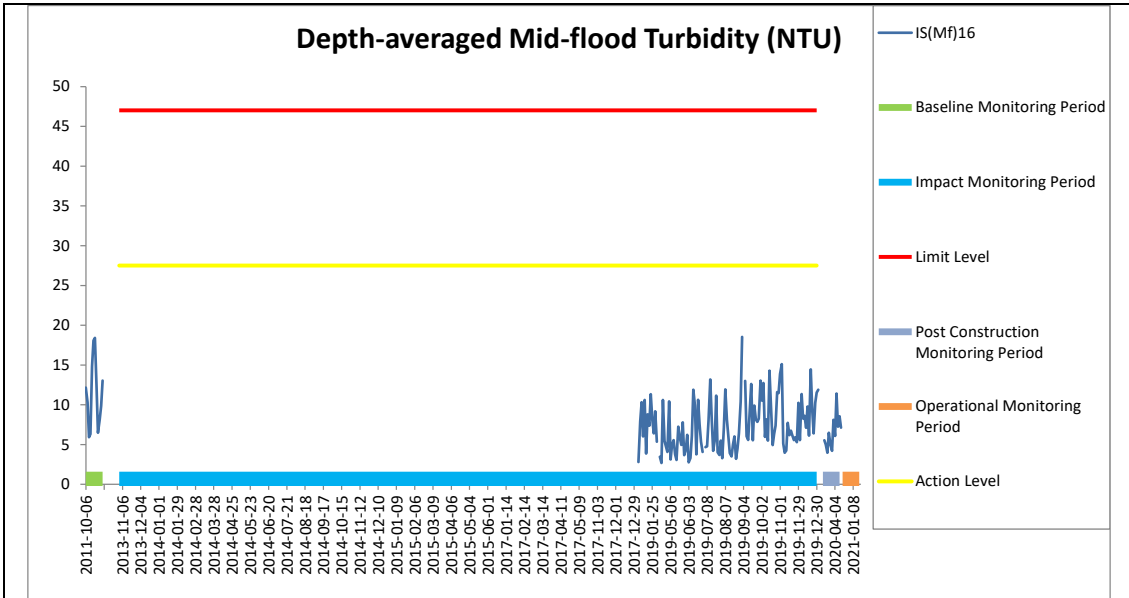


Figure E77 Mean Level of depth-averaged Turbidity (NTU) during mid-flood tide during the course of the Contract at IS(Mf)16 and IS(Mf)9.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



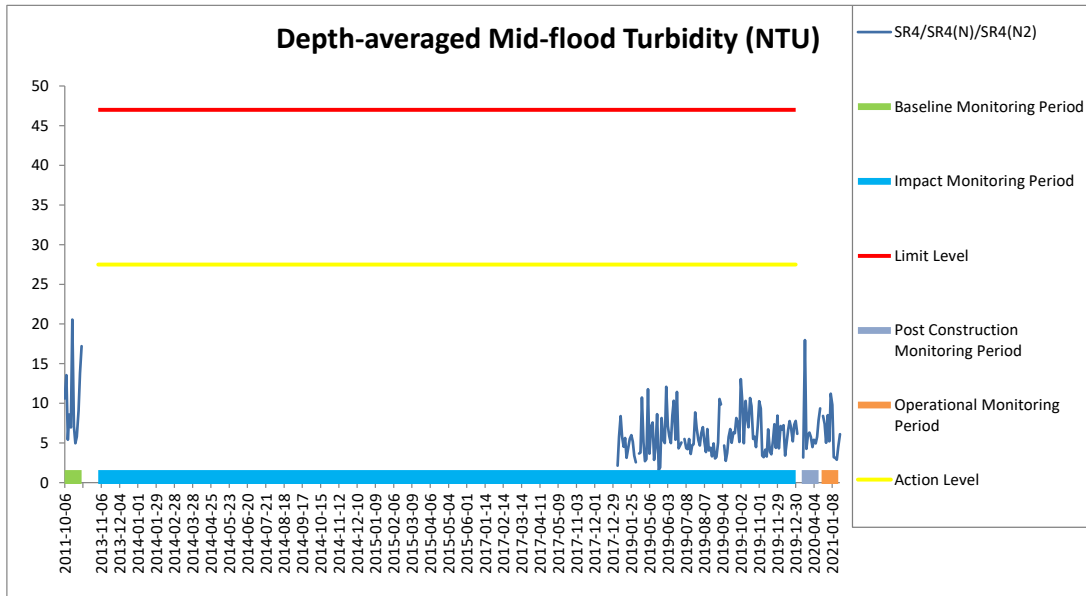
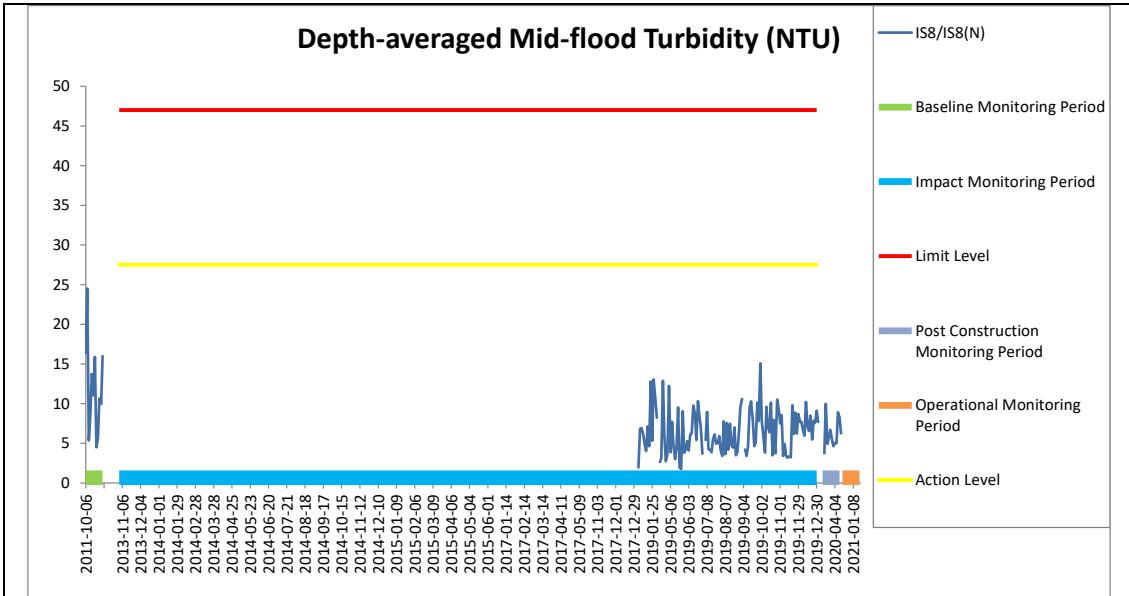


Figure E78 Mean Level of depth-averaged Turbidity (NTU) during mid-flood tide during the course of the Contract at IS8/IS8(N) and SR4/SR4(N)/SR4(N2).
(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



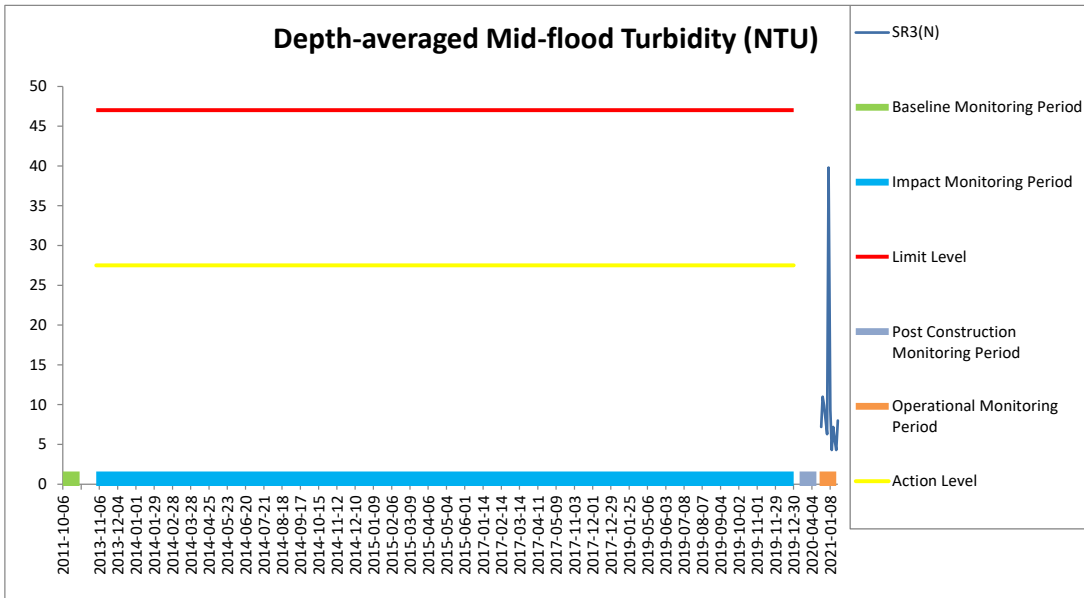
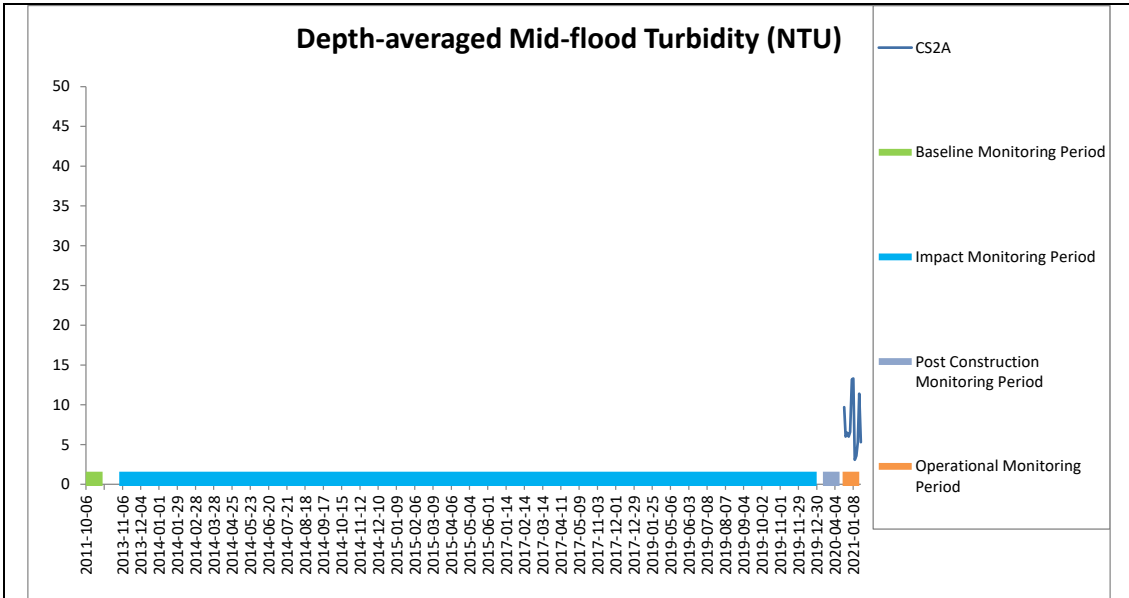


Figure E79 Mean Level of depth-averaged Turbidity (NTU) during mid-flood tide during the course of the Contract at CS2A and SR3(N).

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



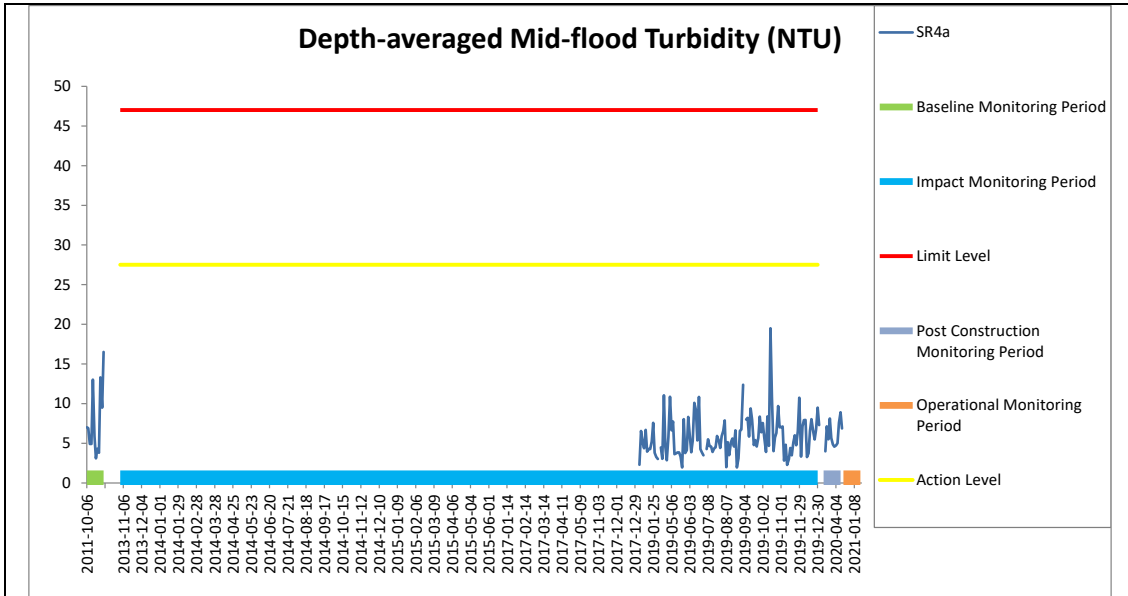


Figure E80 Mean Level of depth-averaged Turbidity (NTU) during mid-flood tide during the course of the Contract at SR4a.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

**Environmental
Resources
Management**



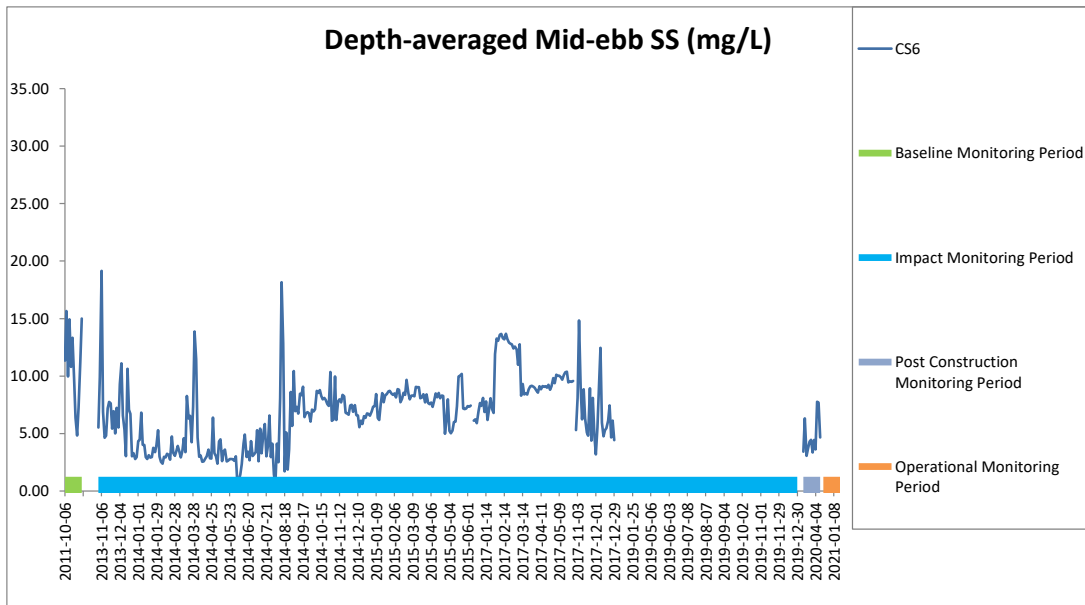
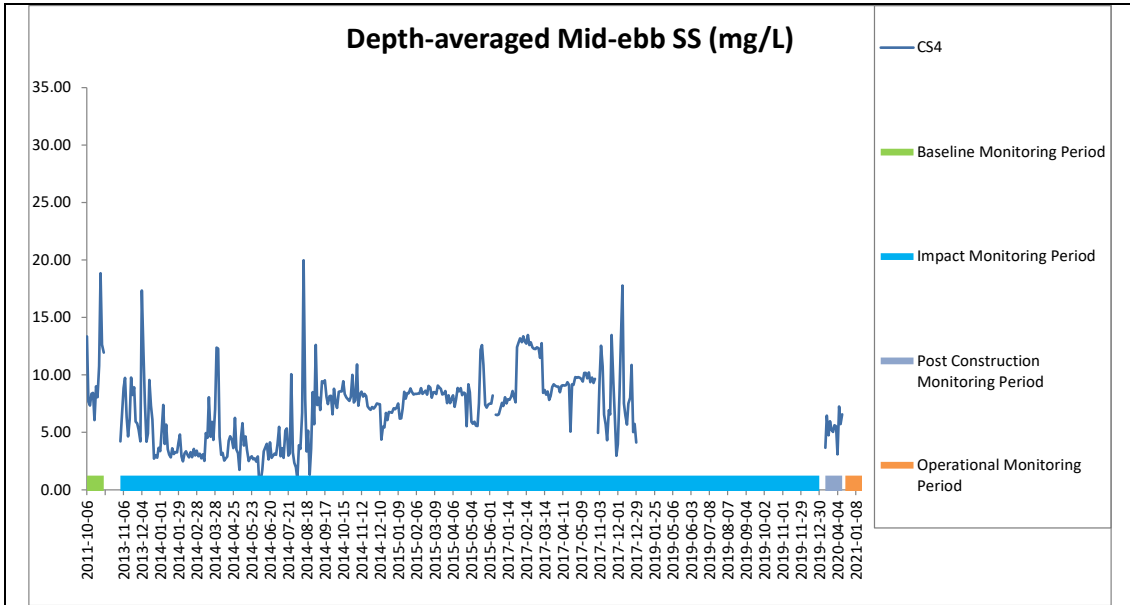


Figure E81 Mean Level of depth-averaged Suspended Solids (mg/L) during mid-ebb tide during the course of the Contract at CS4 and CS6.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

**Environmental
Resources
Management**



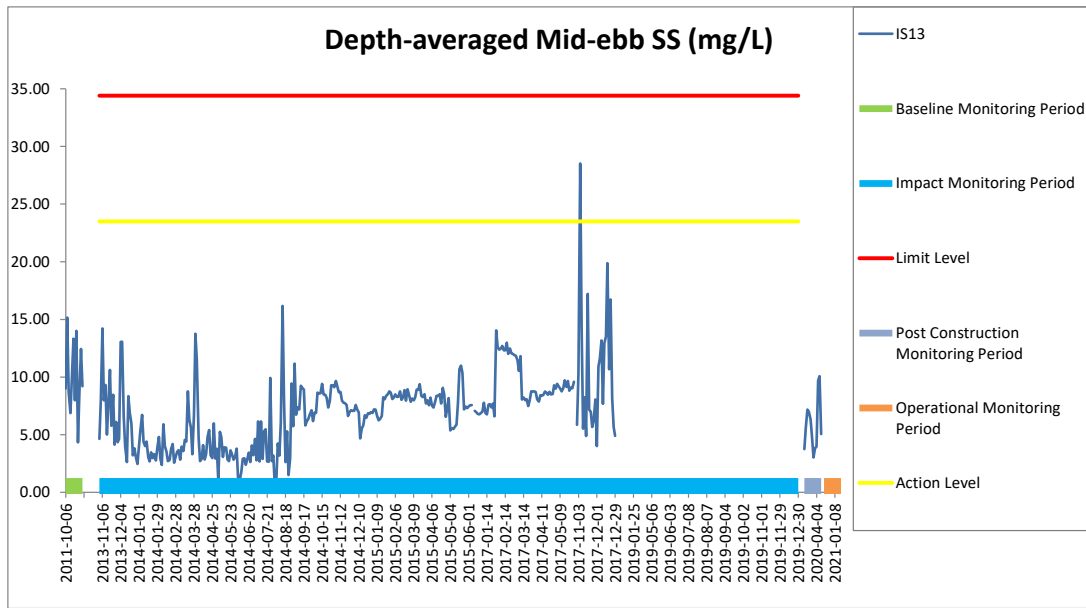
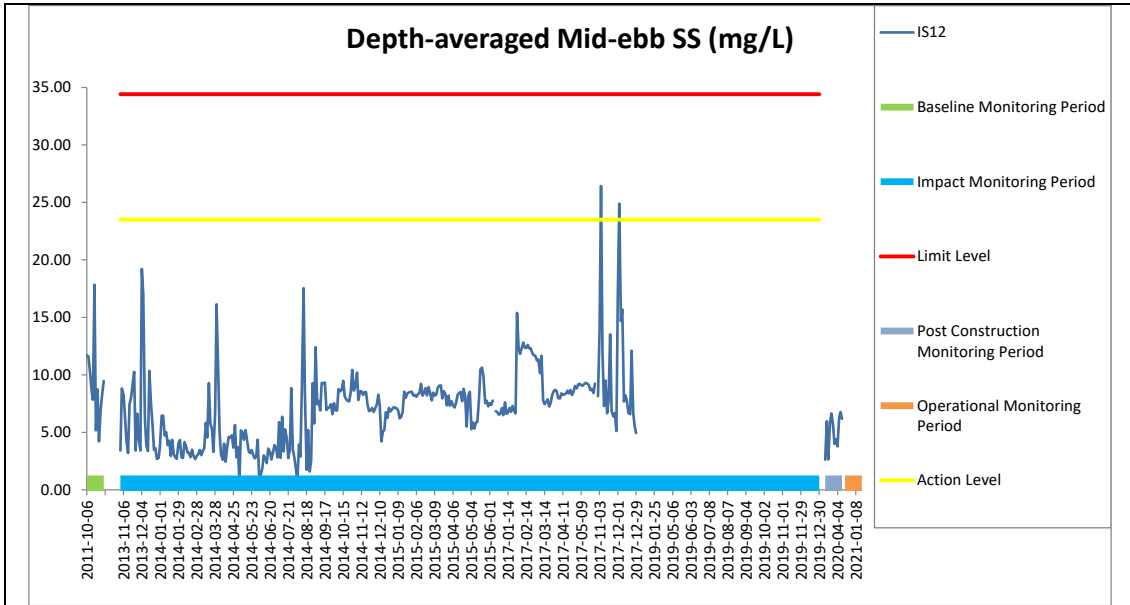


Figure E82 Mean Level of depth-averaged Suspended Solids (mg/L) during mid-ebb tide during the course of the Contract at IS12 and IS13.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



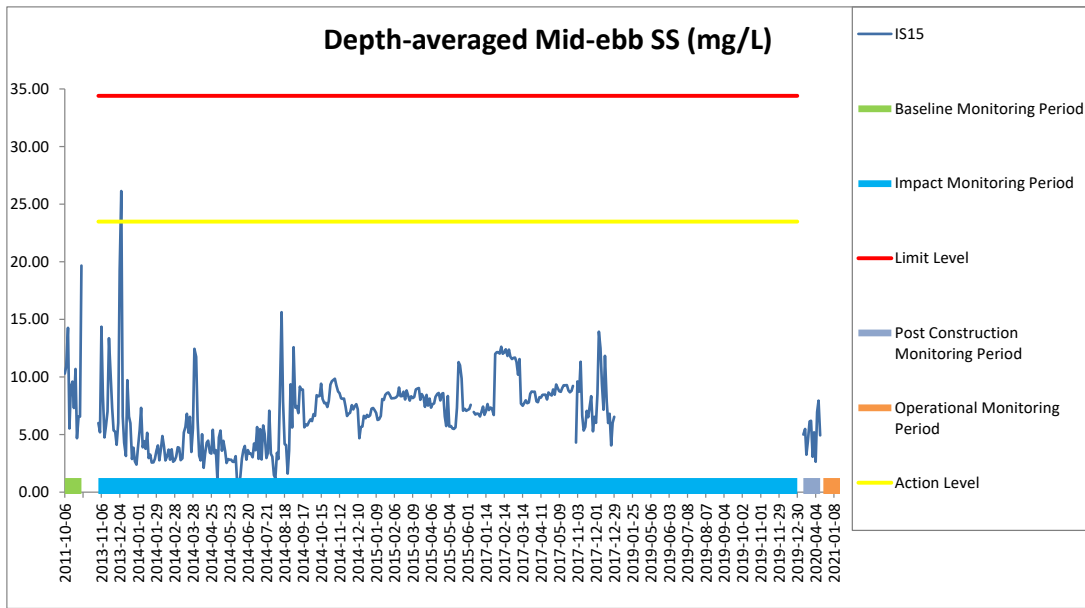
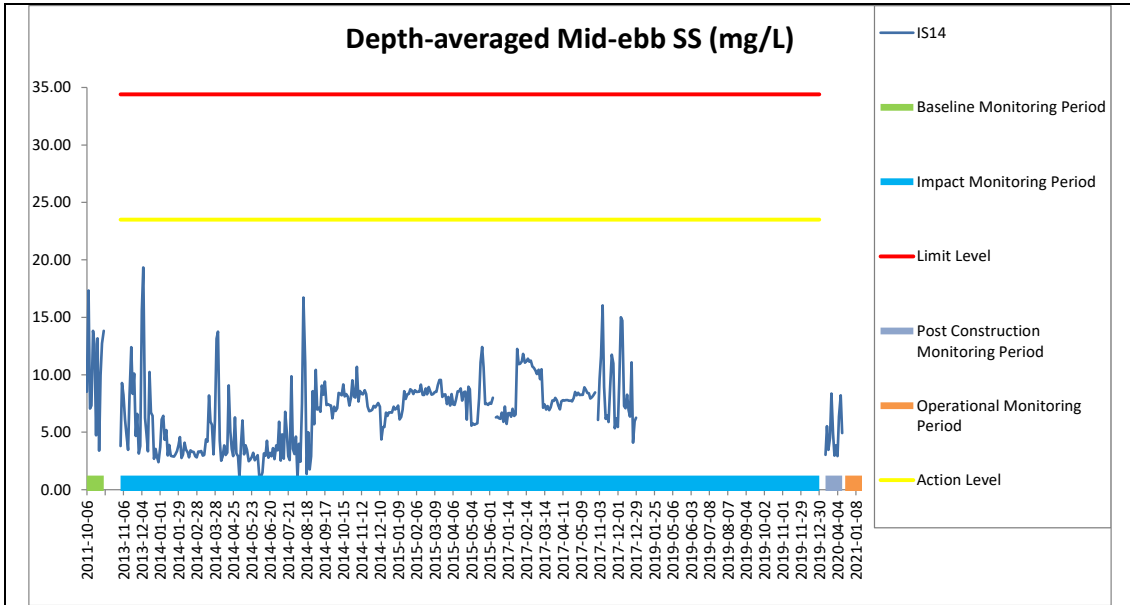


Figure E83 Mean Level of depth-averaged Suspended Solids (mg/L) during mid-ebb tide during the course of the Contract at IS14 and IS15.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



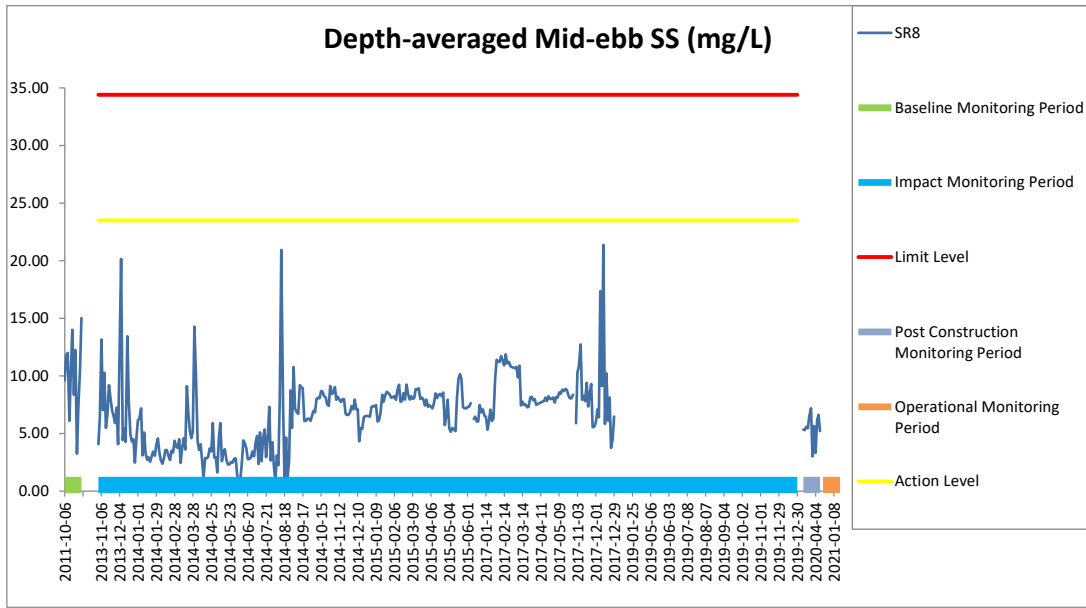
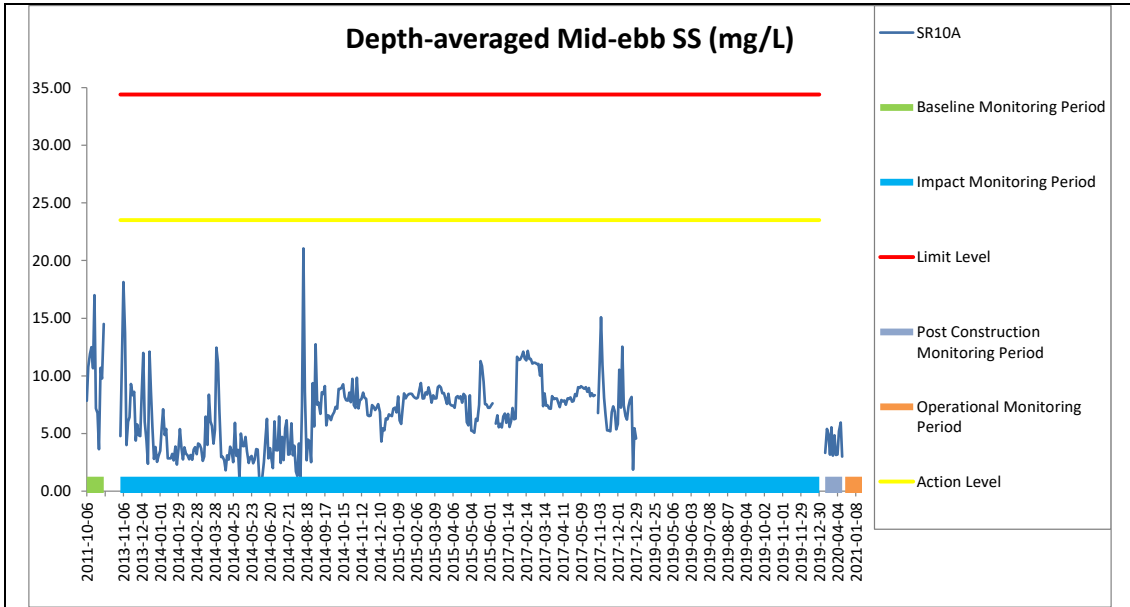


Figure E84 Mean Level of depth-averaged Suspended Solids (mg/L) during mid-ebb tide during the course of the Contract at SR10A and SR8.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



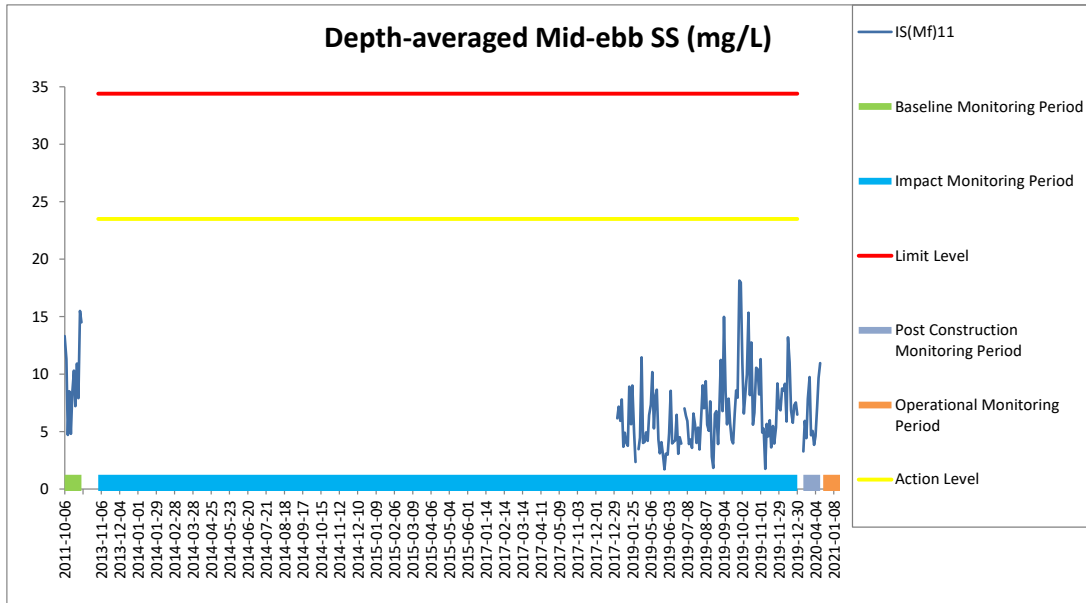
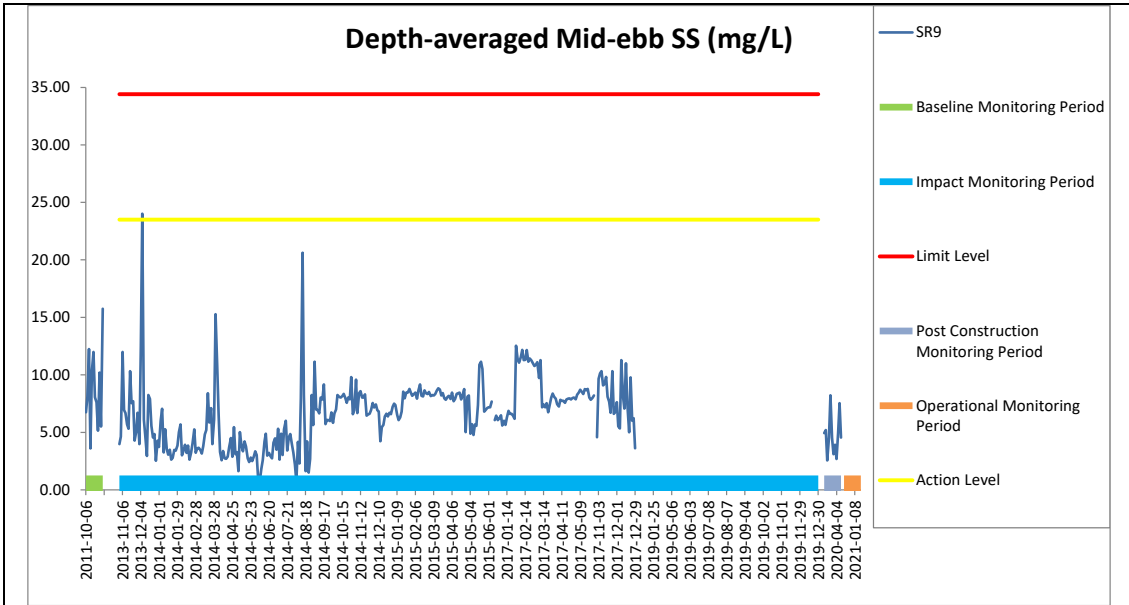


Figure E85 Mean Level of depth-averaged Suspended Solids (mg/L) during mid-ebb tide during the course of the Contract at SR9 and IS(Mf)11.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



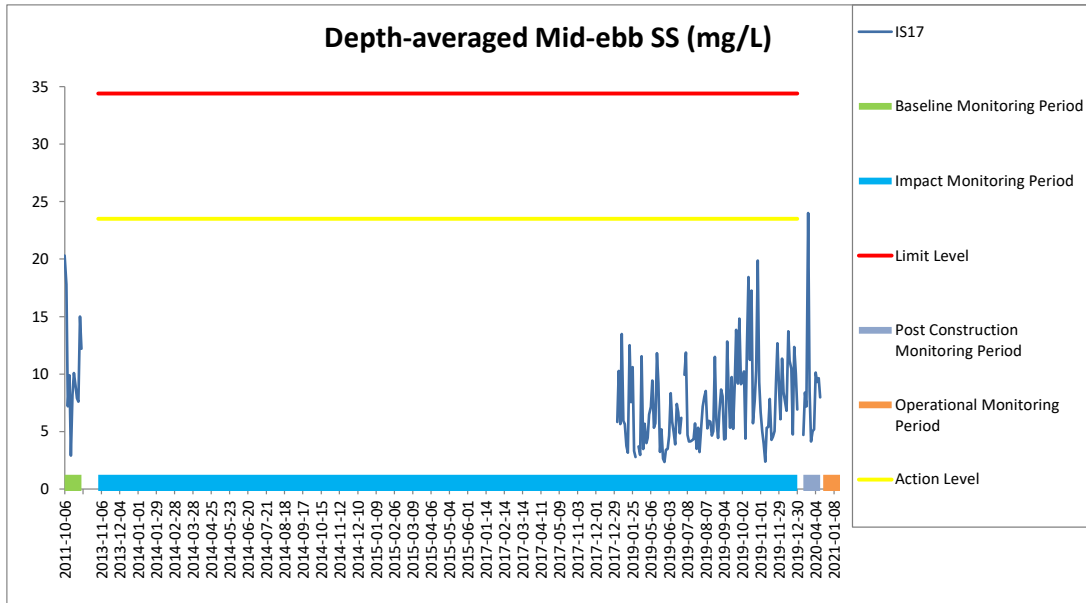
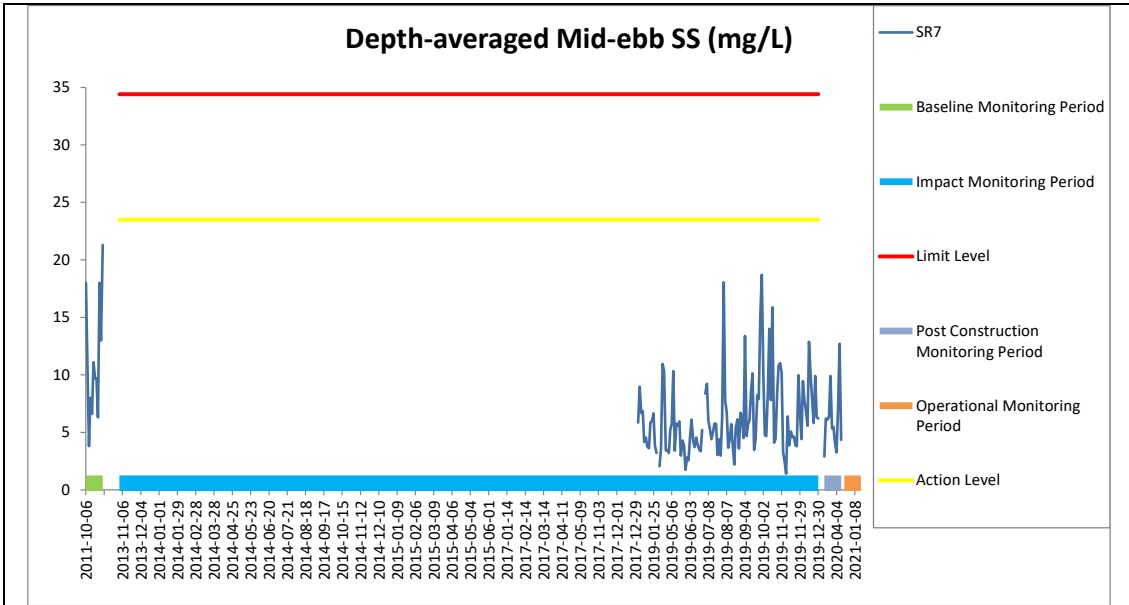


Figure E86 Mean Level of depth-averaged Suspended Solids (mg/L) during mid-ebb tide during the course of the Contract at SR7 and IS17.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



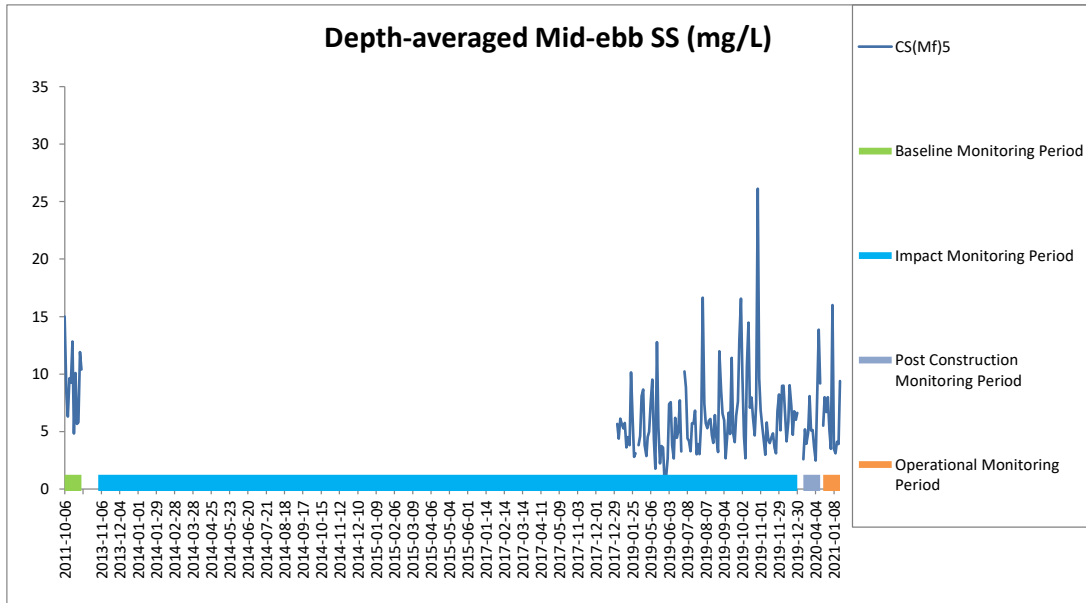
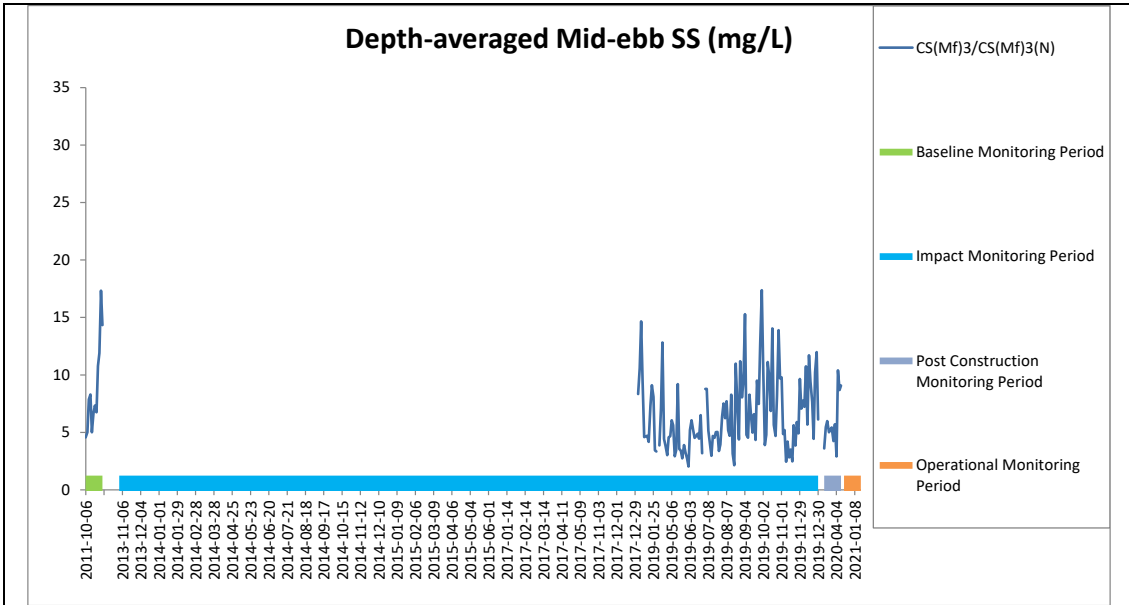


Figure E87 Mean Level of depth-averaged Suspended Solids (mg/L) during mid-ebb tide during the course of the Contract at CS(Mf)3/CS(Mf)3(N) and CS(Mf)5.
(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



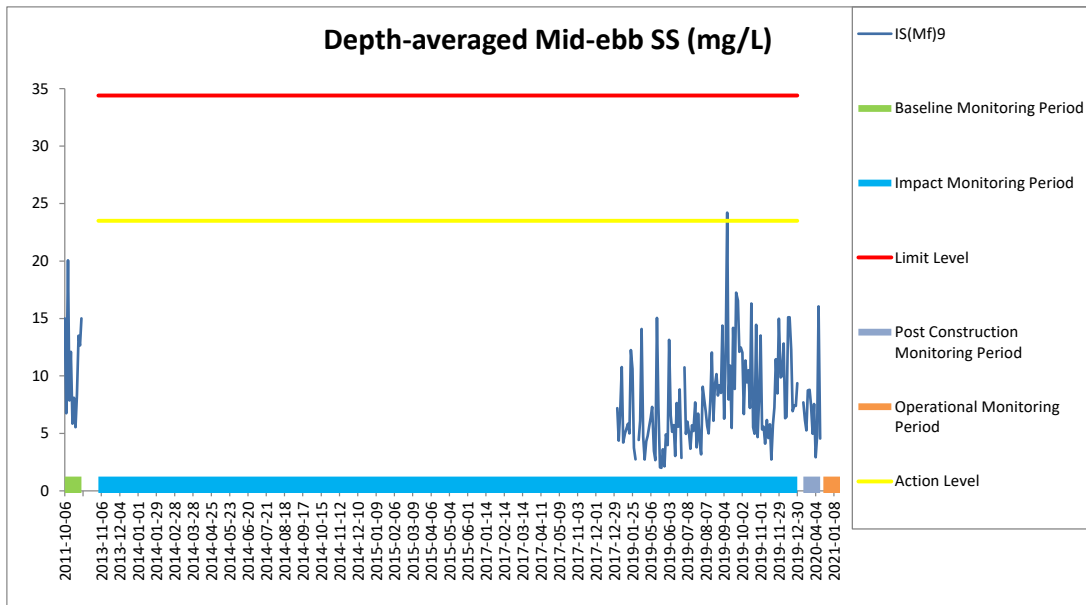
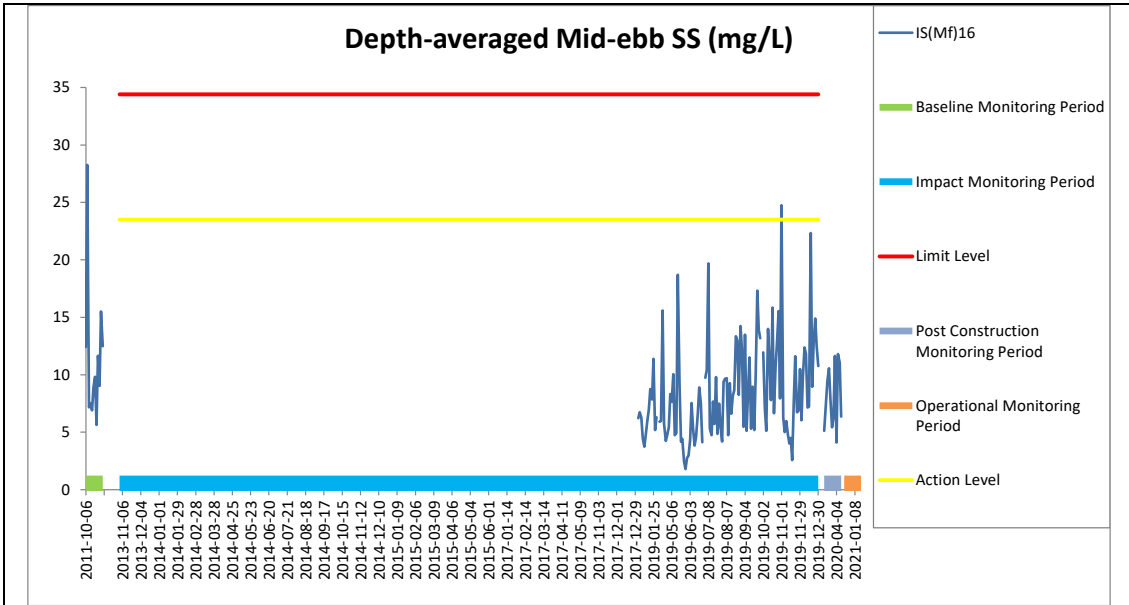


Figure E88 Mean Level of depth-averaged Suspended Solids (mg/L) during mid-ebb tide during the course of the Contract at IS(Mf)16 and IS(Mf)9.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



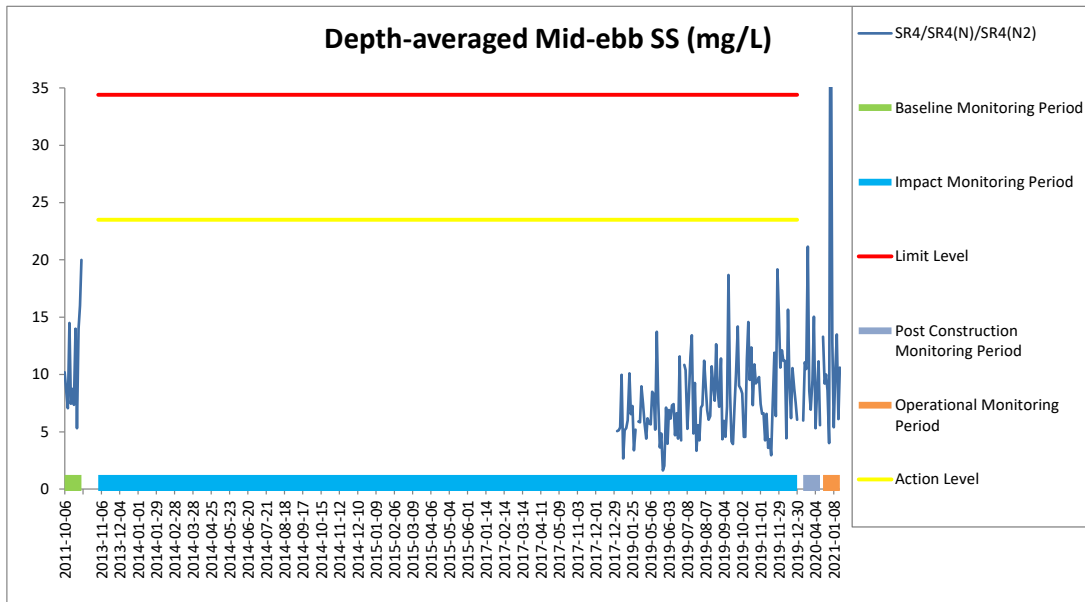
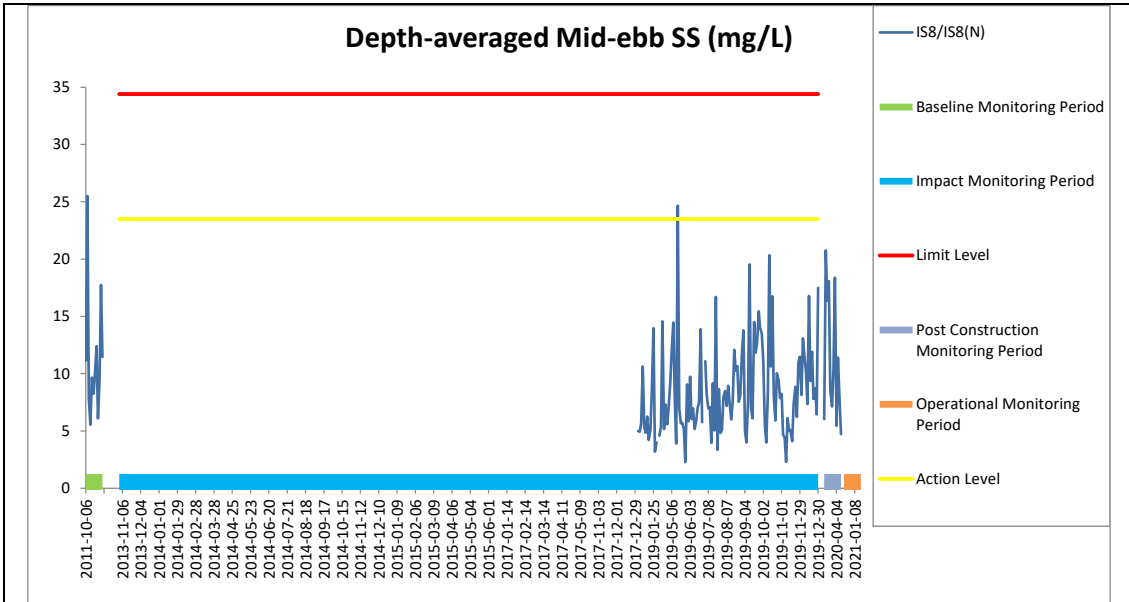


Figure E89 Mean Level of depth-averaged Suspended Solids (mg/L) during mid-ebb tide during the course of the Contract at IS8/IS8(N) and SR4/SR4(N)/SR4(N2).

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



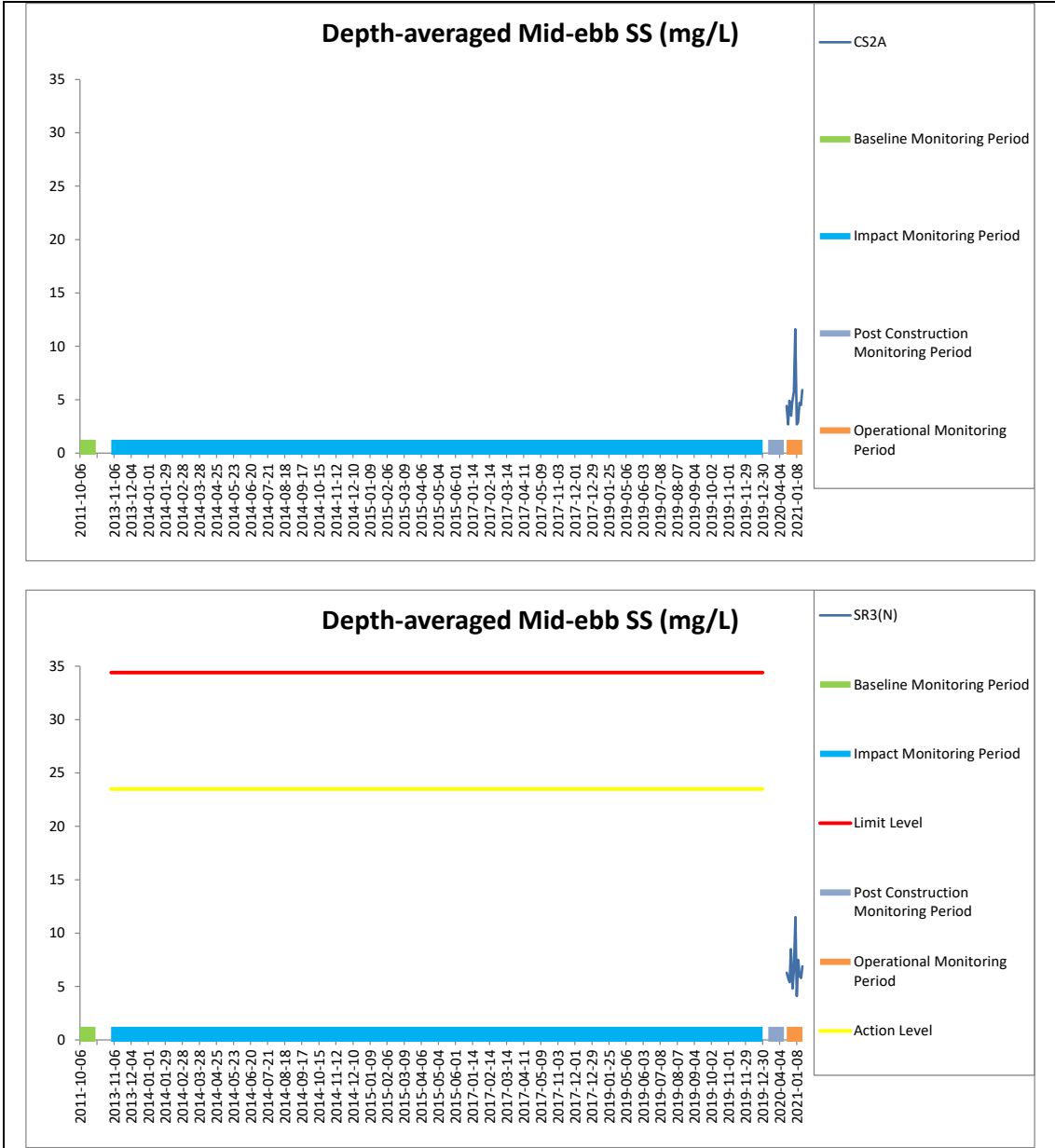


Figure E90 Mean Level of depth-averaged Suspended Solids (mg/L) during mid-ebb tide during the course of the Contract at CS2A and SR3(N).

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



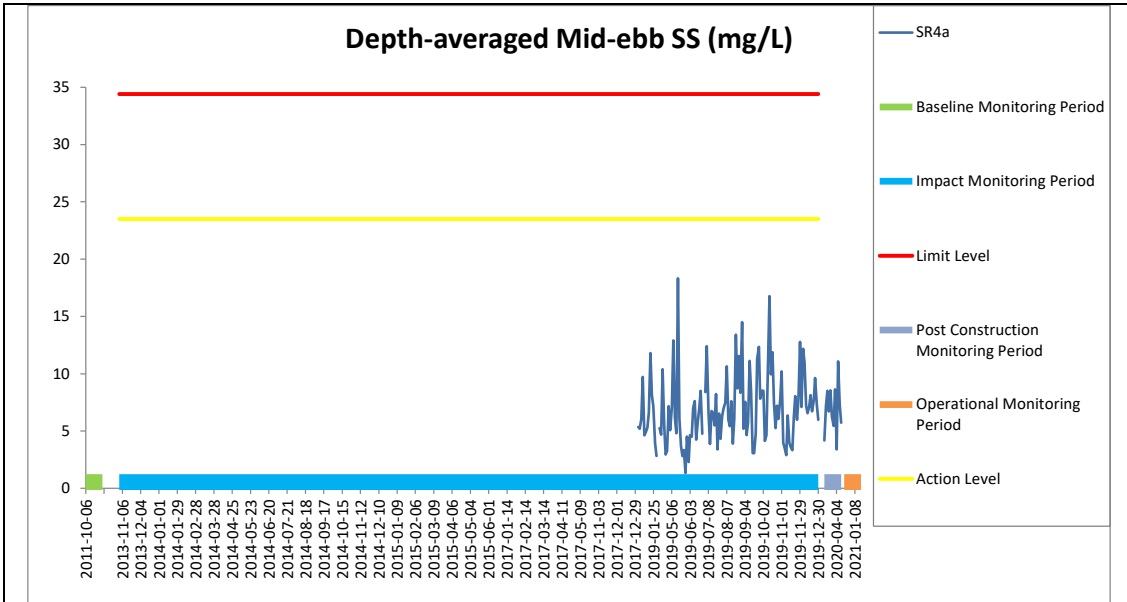


Figure E91 Mean Level of depth-averaged Suspended Solids (mg/L) during mid-ebb tide during the course of the Contract at SR4a.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

**Environmental
Resources
Management**



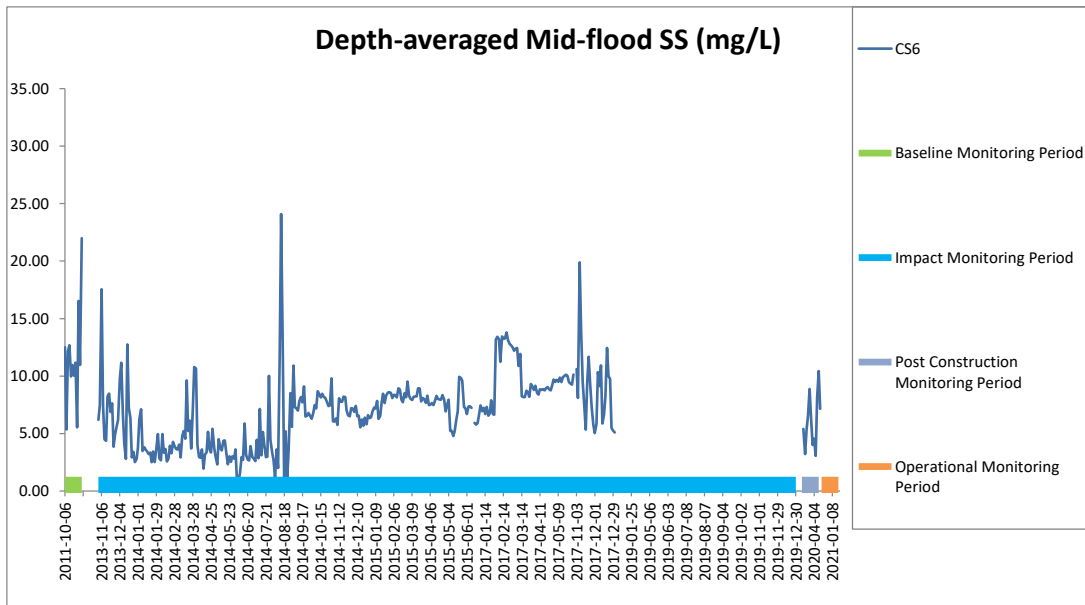
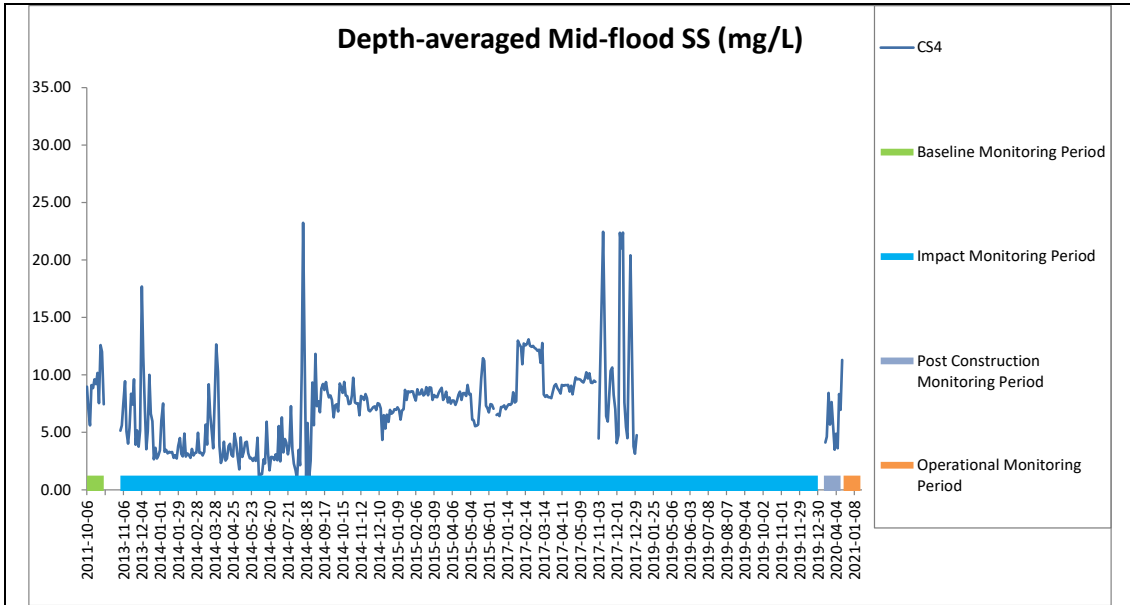


Figure E92 Mean Level of depth-averaged Suspended Solids (mg/L) during mid-flood tide during the course of the Contract at CS4 and CS6.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

**Environmental
Resources
Management**



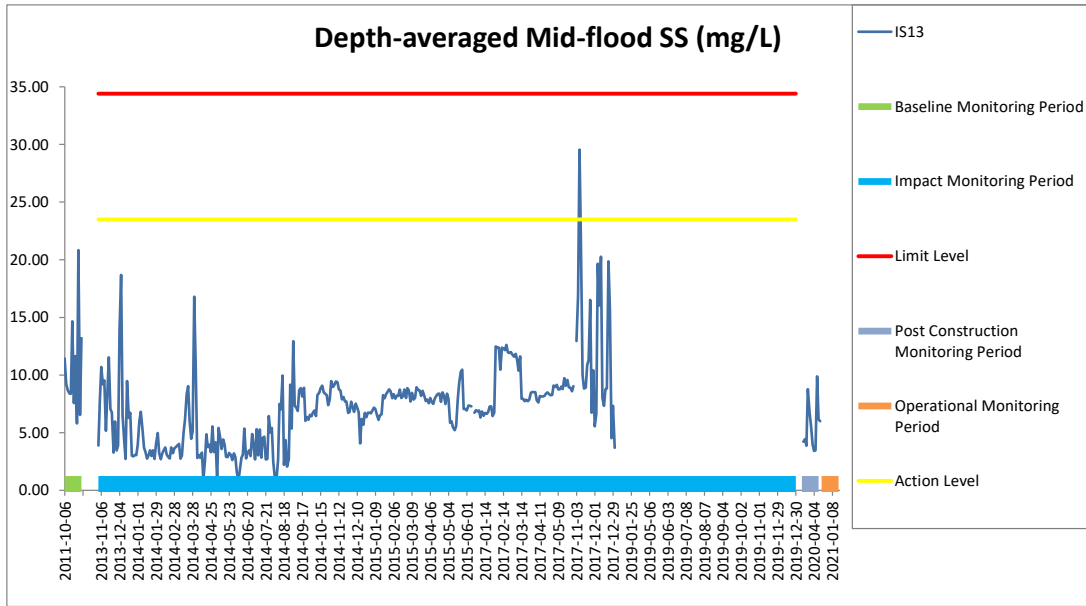
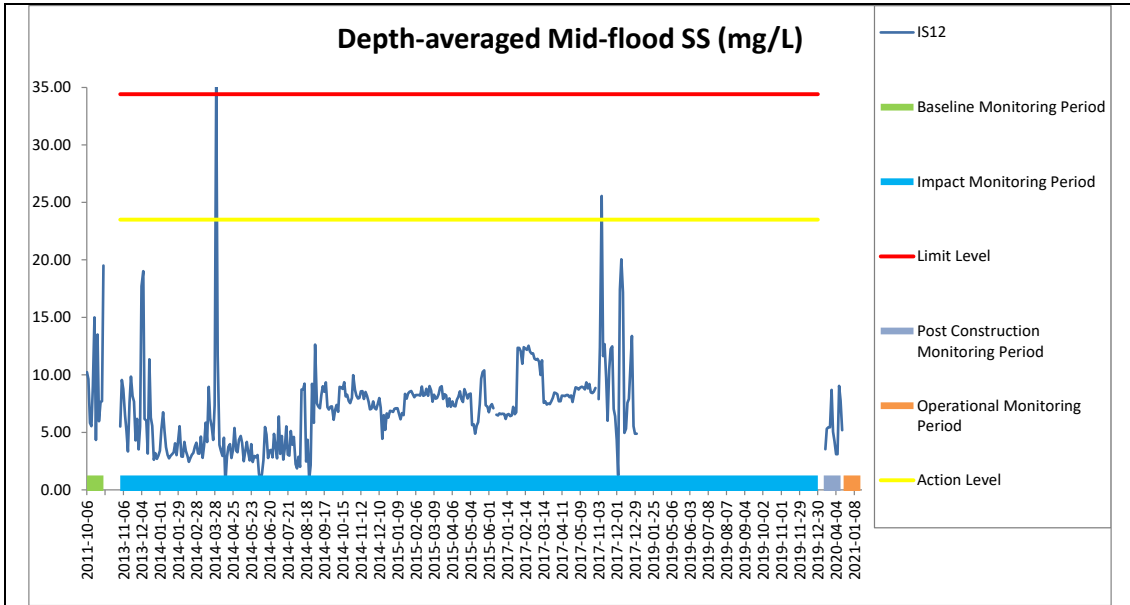


Figure E93 Mean Level of depth-averaged Suspended Solids (mg/L) during mid-flood tide during the course of the Contract at IS12 and IS13.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



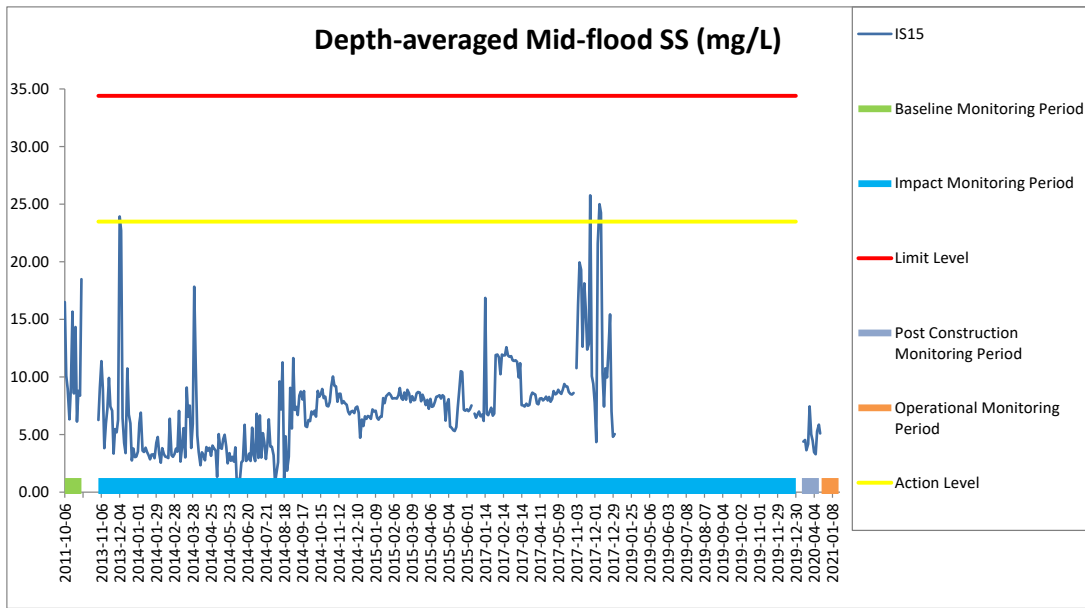
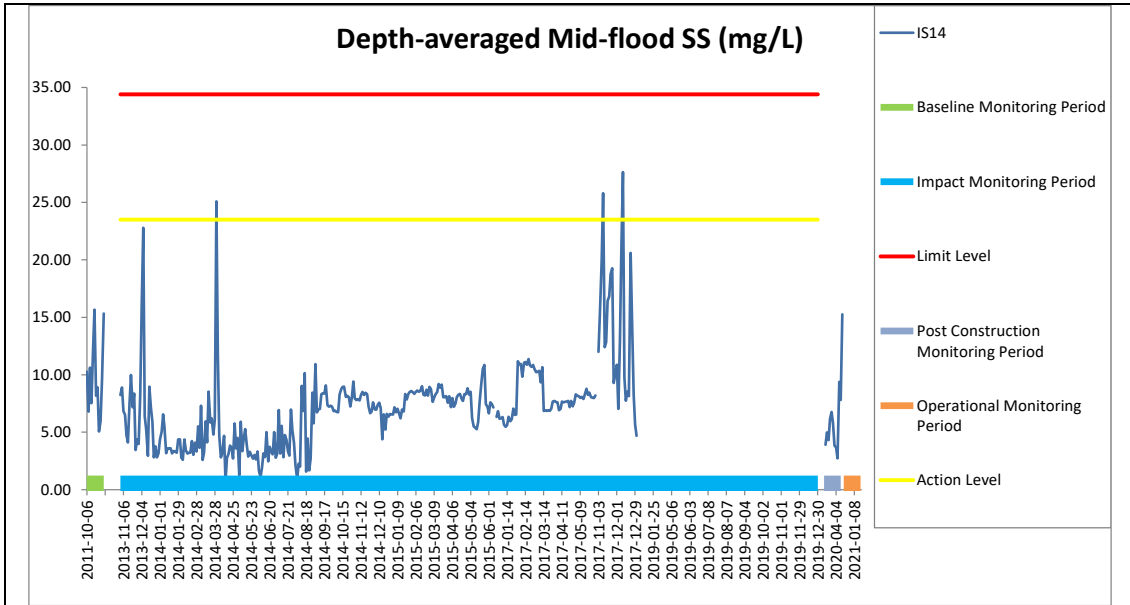


Figure E94 Mean Level of depth-averaged Suspended Solids (mg/L) during mid-flood tide during the course of the Contract at IS14 and IS15.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



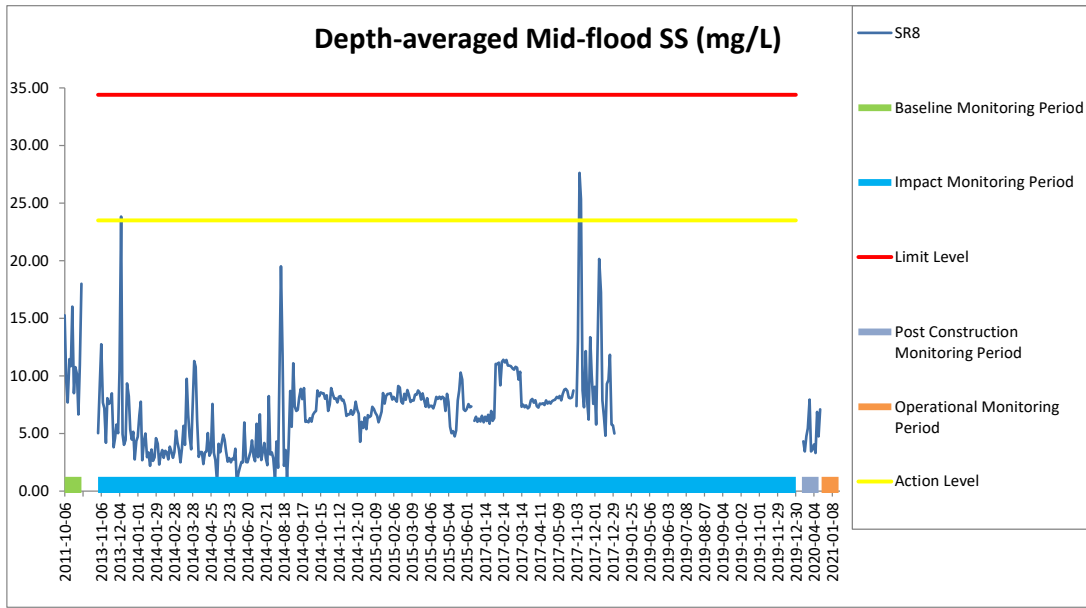
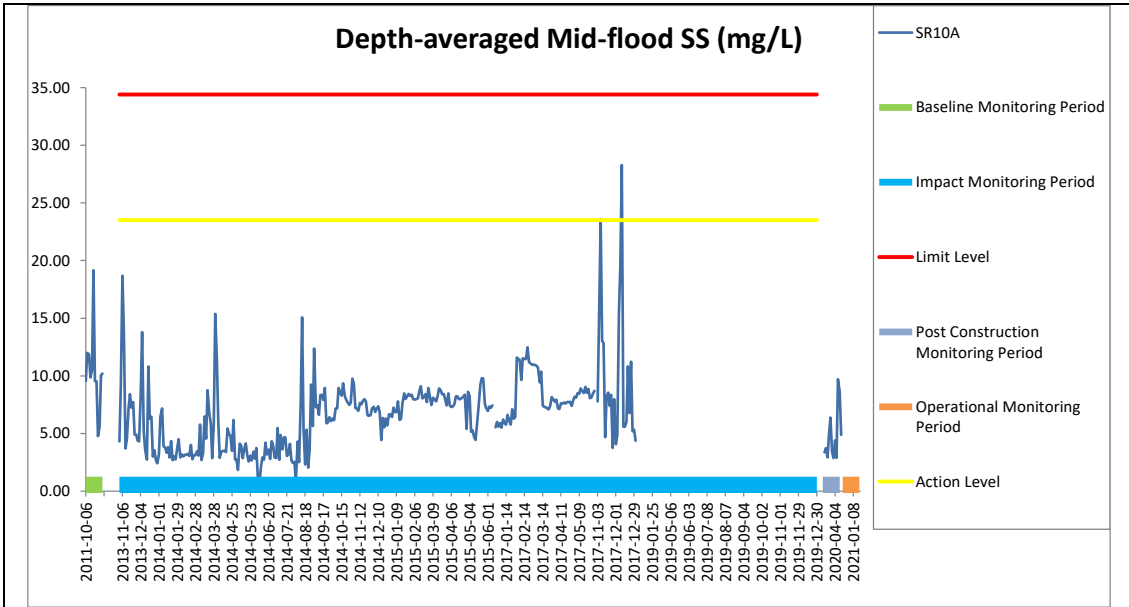


Figure E95 Mean Level of depth-averaged Suspended Solids (mg/L) during mid-flood tide during the course of the Contract at SR10A and SR8.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



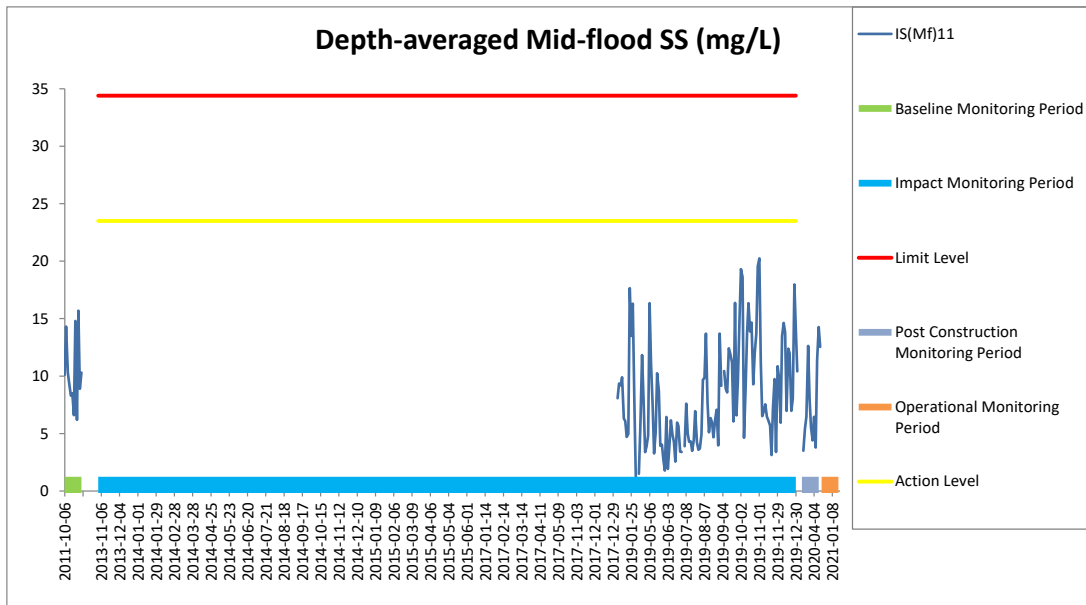
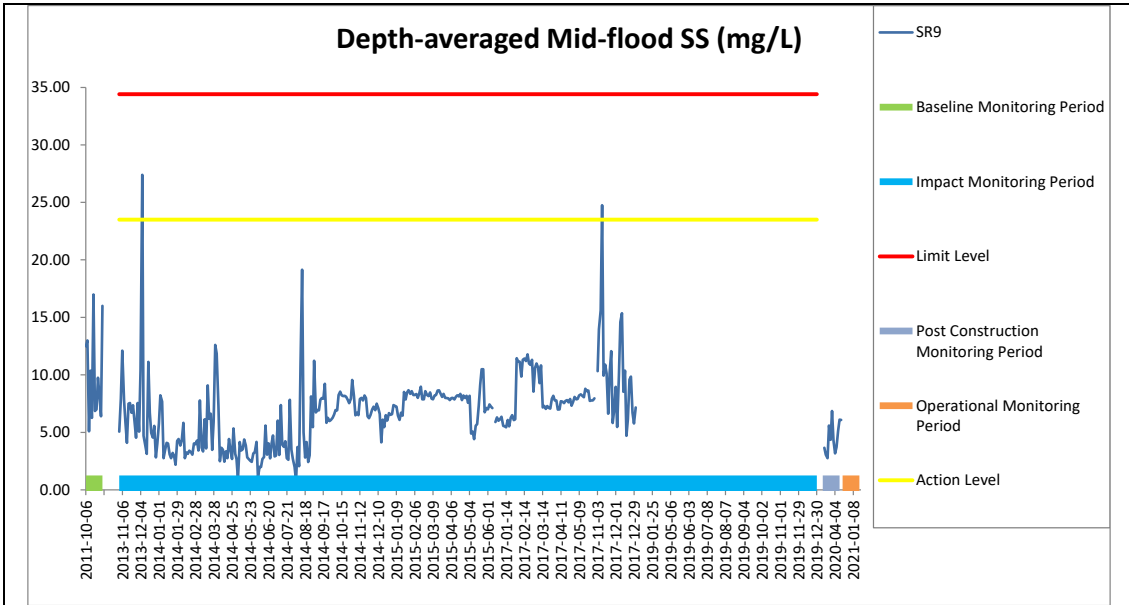


Figure E96 Mean Level of depth-averaged Suspended Solids (mg/L) during mid-flood tide during the course of the Contract at SR9 and IS(Mf)11.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



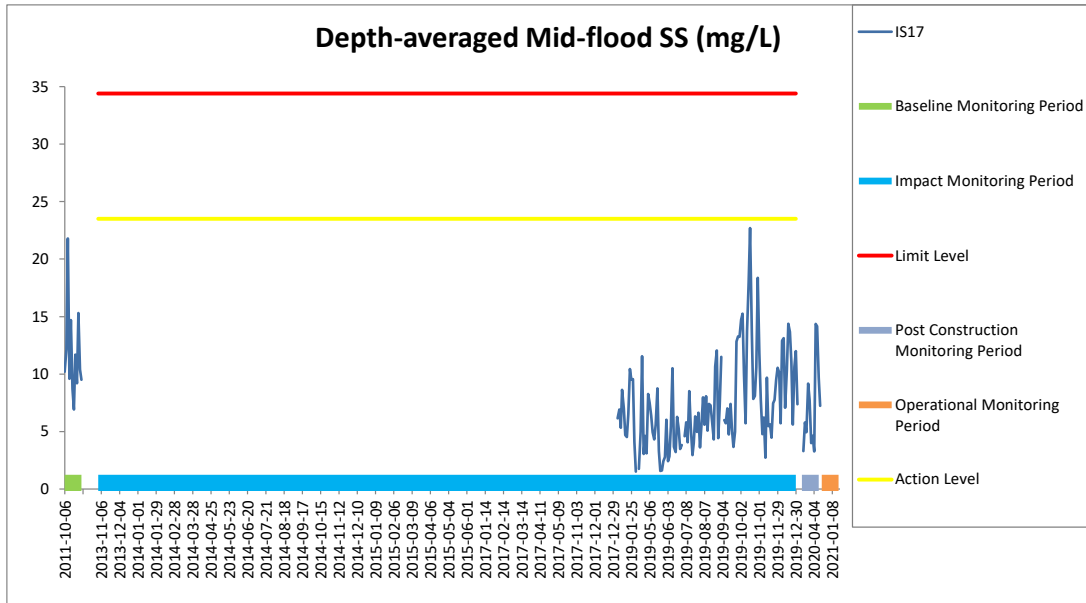
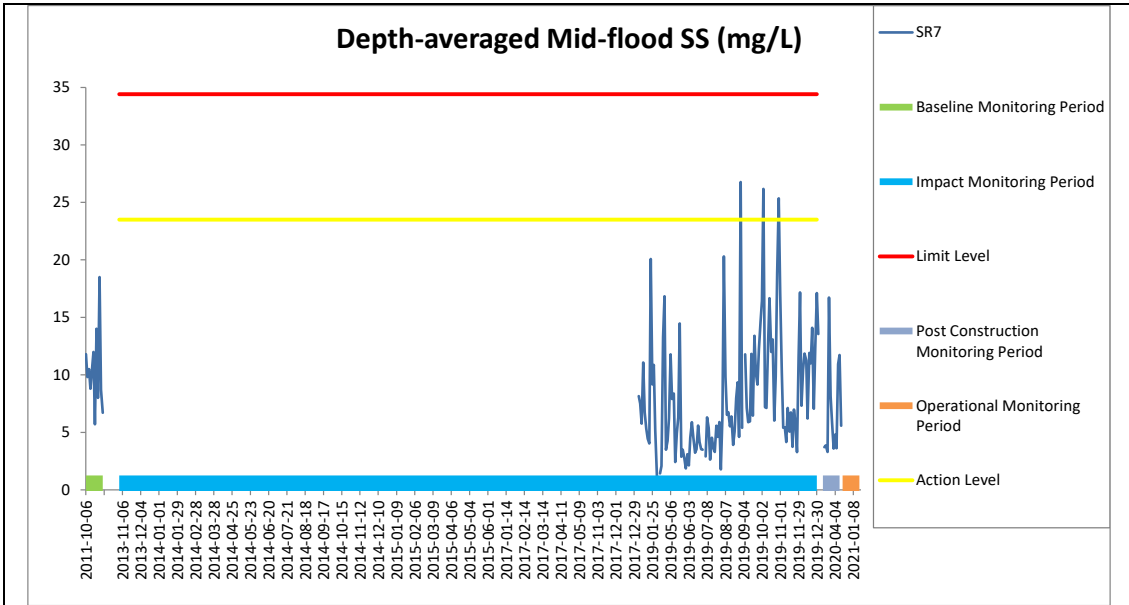


Figure E97 Mean Level of depth-averaged Suspended Solids (mg/L) during mid-flood tide during the course of the Contract at SR7 and IS17.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



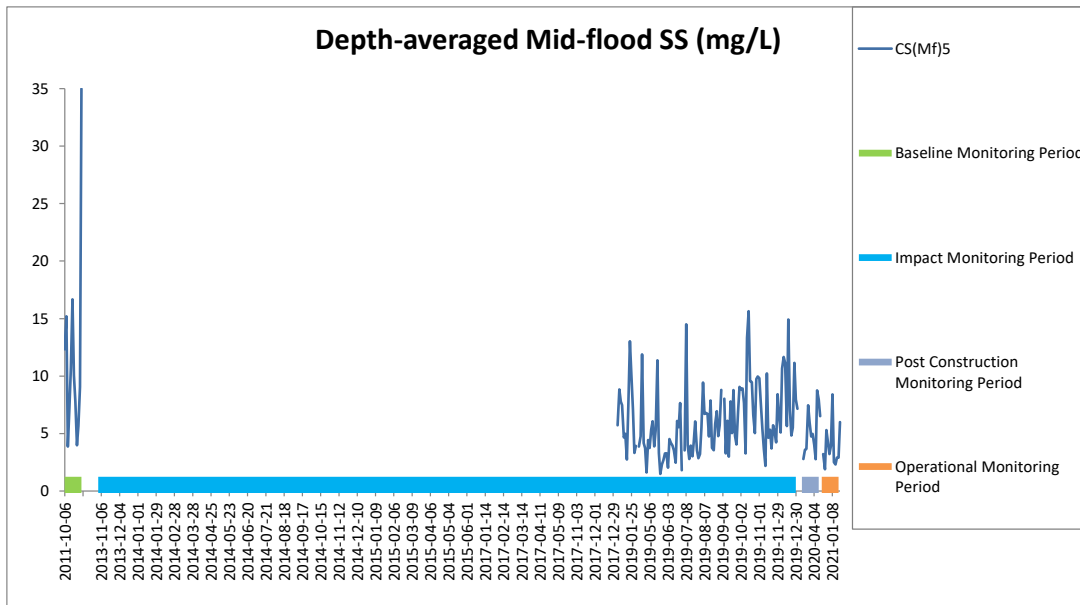
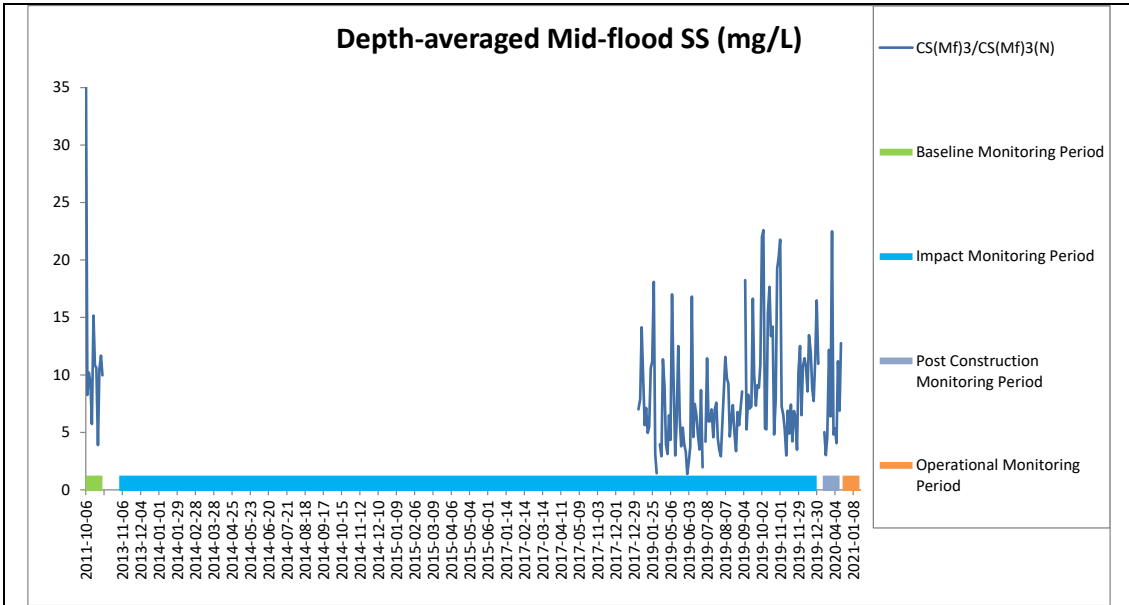


Figure E98 Mean Level of depth-averaged Suspended Solids (mg/L) during mid-flood tide during the course of the Contract at CS(Mf)3/CS(Mf)3(N) and CS(Mf)5.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



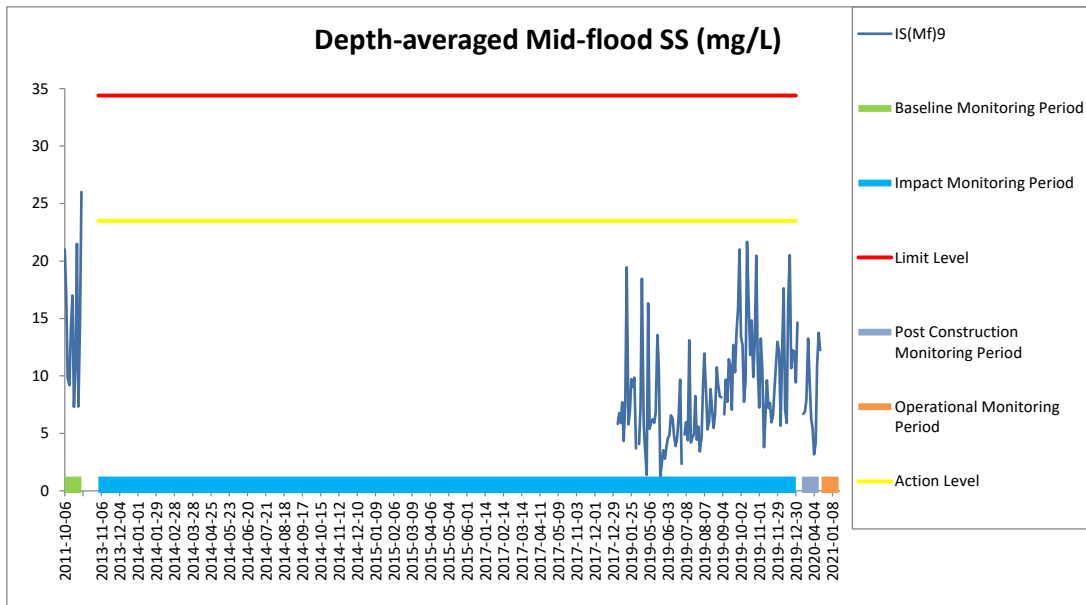
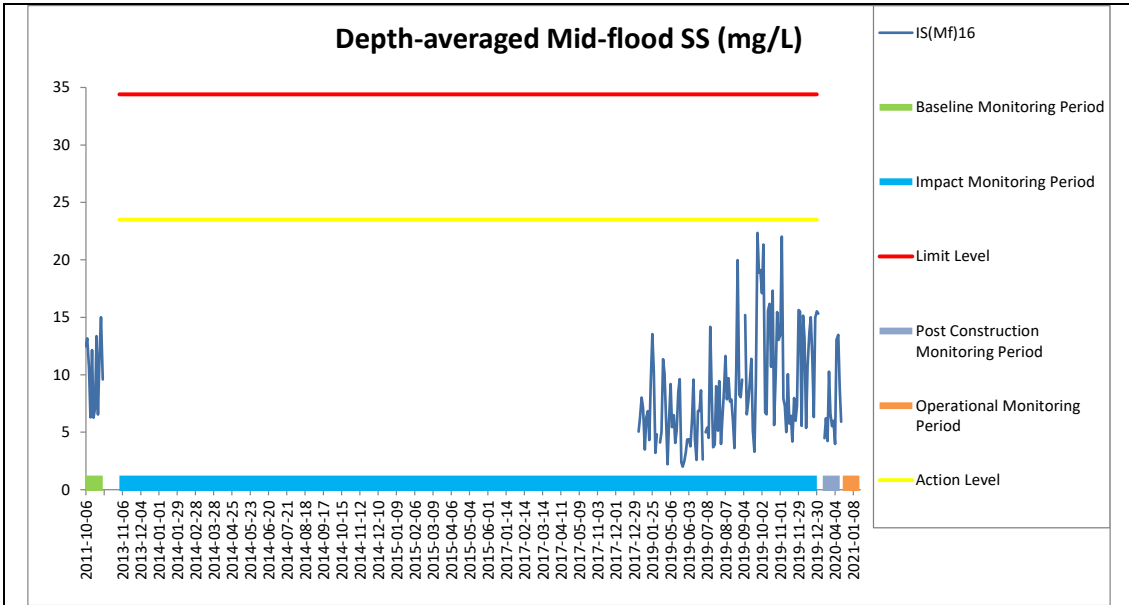


Figure E99 Mean Level of depth-averaged Suspended Solids (mg/L) during mid-flood tide during the course of the Contract at IS(Mf)16 and IS(Mf)9.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



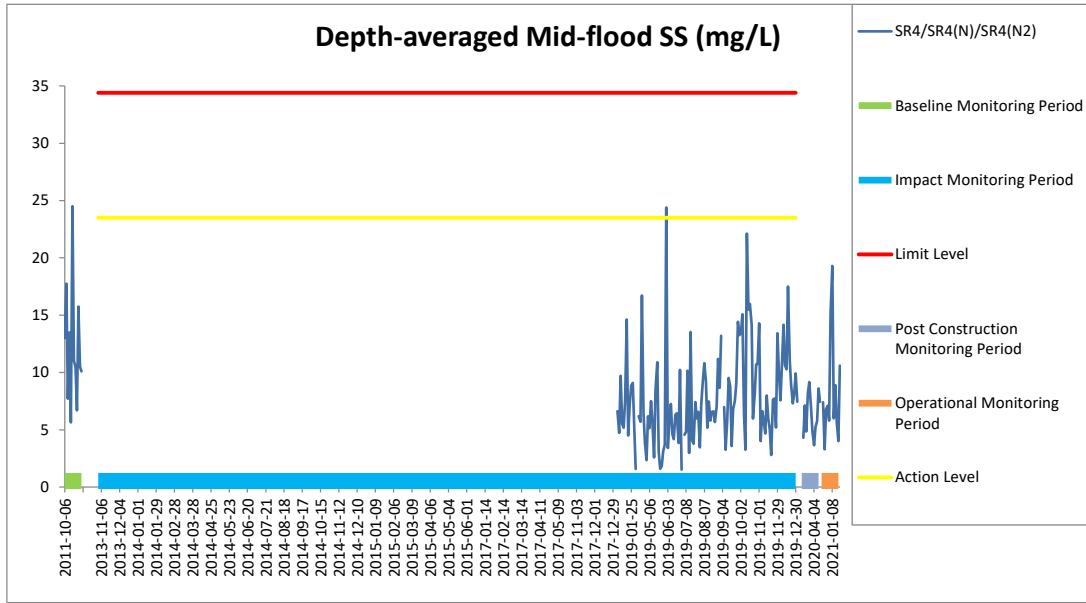
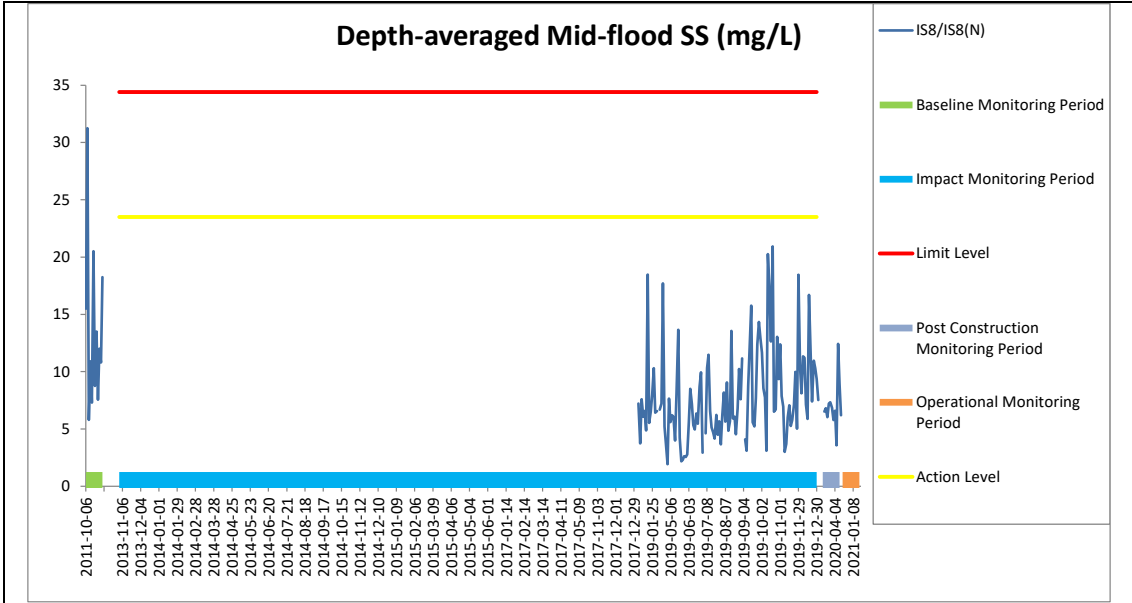


Figure E100 Mean Level of depth-averaged Suspended Solids (mg/L) during mid-flood tide during the course of the Contract at IS8/IS8(N) and SR4/SR4(N)/SR4(N2).

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



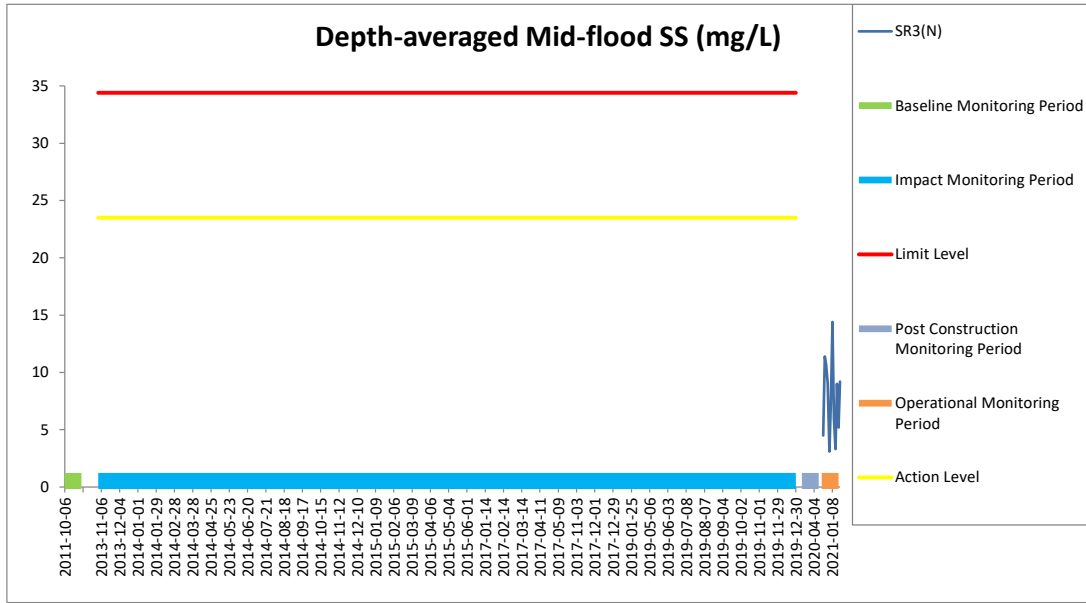
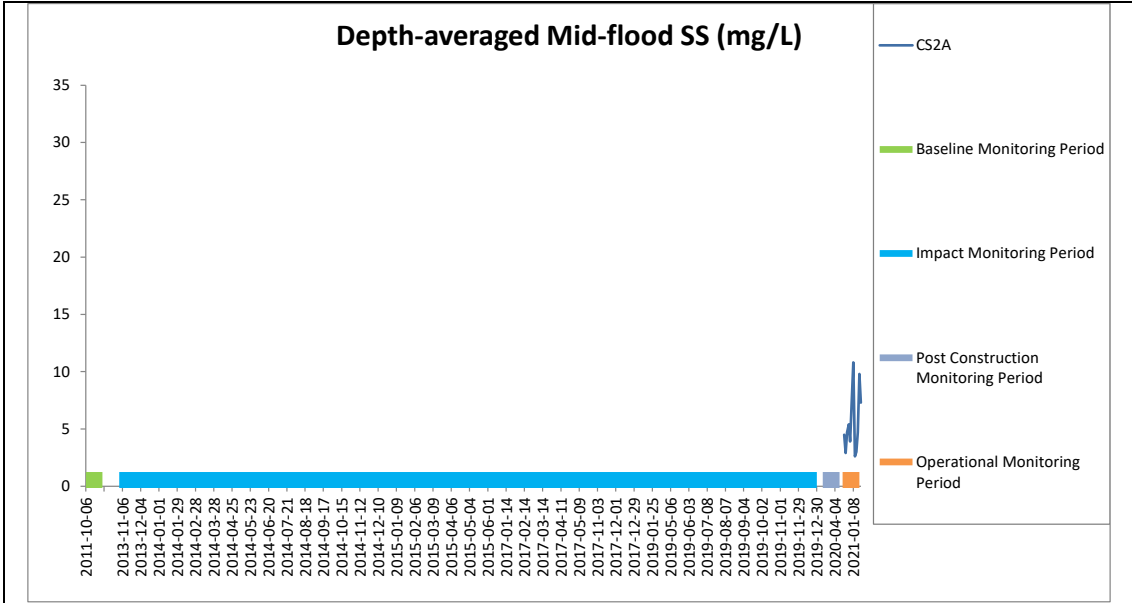


Figure E101 Mean Level of depth-averaged Suspended Solids (mg/L) during mid-flood tide during the course of the Contract at CS2A and SR3(N).
(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



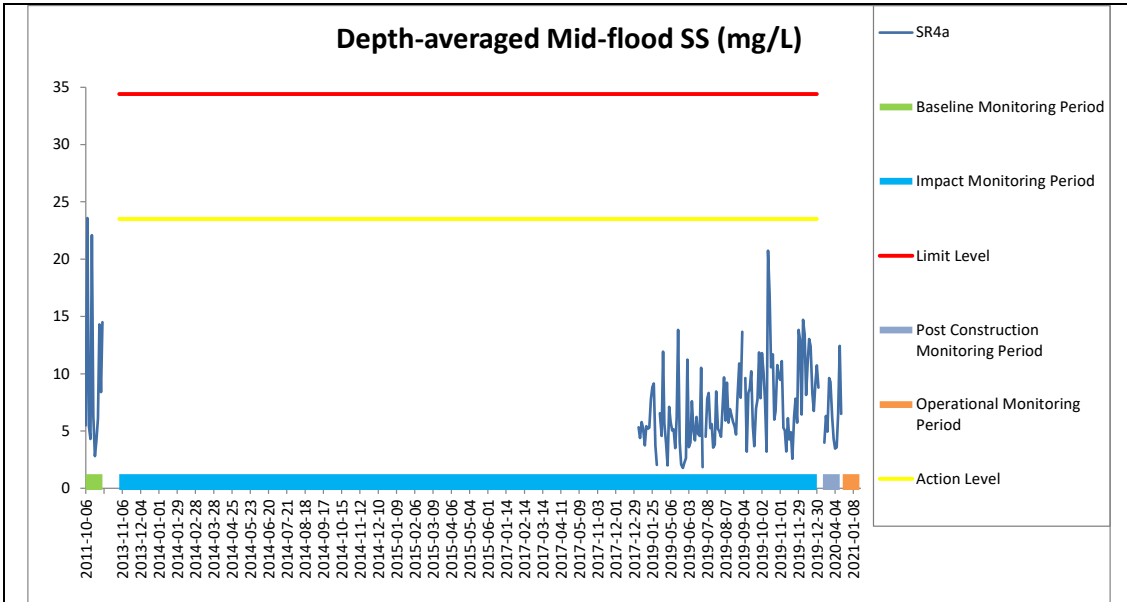


Figure E102 Mean Level of depth-averaged Suspended Solids (mg/L) during mid-flood tide during the course of the Contract at SR4a.

(Weather condition varied between sunny to rainy during the course of the Project.) Overall monitoring results were not affected by weather conditions. In-situ monitoring is taken according to the requirement specified in the EM&A Manual, i.e. 3 water depth namely 1m below sea surface, mid-depth and 1m above sea bed. If the water depth is less than 3m, mid-depth sampling only. If water depth less than 6m, mid-depth may be omitted.

Environmental Resources Management



Appendix F

Event and Action Plan

Event and Action Plan for Impact Air Monitoring

	Action			
	ET (a)	IEC (a)	SOR (a)	Contractor(s)
Action Level Exceedance				
1. Identify the source.		1. Check monitoring data submitted by the ET.	1. Confirm receipt of notification of failure in writing.	1. Rectify any unacceptable practice
2. Repeat measurement to confirm finding. If two consecutive measurements exceed Action Level, the exceedance is then confirmed.		2. Check the Contractor's working method.	2. Notify the Contractor.	2. Amend working methods if appropriate
3. Inform the IEC and the SOR.		3. If the exceedance is confirmed to be Project related after investigation, discuss with the ET and the Contractor on possible remedial measures.	3. Ensure remedial measures properly implemented.	3. If the exceedance is confirmed to be Project related, submit proposals for remedial actions to IEC within 3 working days of notification
4. Investigate the cause of exceedance and check Contractor's working procedures to determine possible mitigation to be implemented.		4. Advise the SOR on the effectiveness of the proposed remedial measures.		4. Implement the agreed proposals
5. If the exceedance is confirmed to be Project related after investigation, increase monitoring frequency to daily.		5. Supervise implementation of remedial measures.		5. Amend proposal if appropriate
6. Discuss with the IEC and the Contractor on remedial actions required.				
7. If exceedance continues, arrange meeting with the IEC and the SOR.				
8. If exceedance stops, cease additional monitoring.				

	Action			
	ET (a)	IEC (a)	SOR (a)	Contractor(s)
Limit Level Exceedance	<ol style="list-style-type: none"> 1. Identify the source. 2. Repeat measurement to confirm finding. If two consecutive measurements exceed Limit Level, the exceedance is then confirmed. 3. Inform the IEC, the SOR, the DEP and the Contractor. 4. Investigate the cause of exceedance and check Contractor's working procedures to determine possible mitigation to be implemented. 5. If the exceedance is confirmed to be Project related after investigation, increase monitoring frequency to daily. 6. Carry out analysis of the Contractor's working procedures to determine possible mitigation to be implemented. 7. Arrange meeting with the IEC and the SOR to discuss the remedial actions to be taken. 8. Assess effectiveness of the Contractor's remedial actions and keep the IEC, the DEP and the SOR informed of the results. 9. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by the ET. 2. Check Contractor's working method. 3. If the exceedance is confirmed to be Project related after investigation, discuss with the ET and the Contractor on possible remedial measures. 4. Advise the SOR 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. If the exceedance is confirmed to be Project related after investigation, in consultation with the IEC, agree with the Contractor on the remedial measures to be implemented. 4. Ensure remedial measures are properly implemented. 5. If exceedance continues, consider what activity of the work is responsible and instruct the Contractor to stop that activity of work until the exceedance is abated. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance. 2. If the exceedance is confirmed to be Project related after investigation, submit proposals for remedial actions to IEC within 3 working days of notification. 3. Implement the agreed proposals. 4. Amend proposal if appropriate. 5. Stop the relevant activity of works as determined by the SOR until the exceedance is abated.

Note: (a) ET – Environmental Team; IEC – Independent Environmental Checker; SOR – Supervising Officer's Representative

Event & Action Plan for Impact Water Quality Monitoring

Event	ET Leader	IEC	SOR	Contractor
Action level being exceeded by one sampling day	<ol style="list-style-type: none"> 1. Repeat <i>in situ</i> measurement on next day of exceedance to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, contractor and SOR; 4. Check monitoring data, all plant, equipment and Contractor's working methods. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET and Contractor's working methods. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of non-compliance in writing; 2. Notify Contractor. 	<ol style="list-style-type: none"> 1. Inform the SOR and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Amend working methods if appropriate.
Action level being exceeded by two or more consecutive sampling days	<ol style="list-style-type: none"> 1. Repeat measurement on next day of exceedance to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, Contractor, SOR and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, SOR and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Action level; 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET and Contractor's working method; 2. Discuss with ET and Contractor on possible remedial actions; 3. Review the proposed mitigation measures submitted by Contractor and advise the SOR accordingly; 4. Supervise the implementation of mitigation measures. 	<ol style="list-style-type: none"> 1. Discuss with IEC on the proposed mitigation measures; 2. Ensure mitigation measures are properly implemented; 3. Assess the effectiveness of the implemented mitigation measures. 	<ol style="list-style-type: none"> 1. Inform the Supervising Officer and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment and consider changes of working methods; 4. Submit proposal of additional mitigation measures to SOR within 3 working days of notification and discuss with ET, IEC and SOR; 5. Implement the agreed mitigation measures.
Limit level being exceeded by one sampling day	<ol style="list-style-type: none"> 1. Repeat measurement on next day of exceedance to confirm findings; 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET and 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in 	<ol style="list-style-type: none"> 1. Inform the SOR and confirm notification of the

Event	ET Leader	IEC	SOR	Contractor
	<ol style="list-style-type: none"> 2. Identify source(s) of impact; 3. Inform IEC, Contractor, SOR and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, SOR and Contractor; 	<ol style="list-style-type: none"> Contractor's working method; 2. Discuss with ET and Contractor on possible remedial actions; 3. Review the proposed mitigation measures submitted by Contractor and advise the SOR accordingly. 	<ol style="list-style-type: none"> writing; 2. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 3. Request Contractor to review the working methods. 	<ol style="list-style-type: none"> non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment and consider changes of working methods; 4. Submit proposal of mitigation measures to SOR within 3 working days of notification and discuss with ET, IEC and SOR.
Limit level being exceeded by two or more consecutive sampling days	<ol style="list-style-type: none"> 1. Repeat measurement on next day of exceedance to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, contractor, SOR and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, SOR 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; 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET and Contractor's working method; 2. Discuss with ET and Contractor on possible remedial actions; 3. Review the Contractor's mitigation measures whenever necessary to assure their effectiveness and advise the SOR accordingly; 4. Supervise the implementation of mitigation measures. 	<ol style="list-style-type: none"> 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. Ensure mitigation measures are properly implemented; 5. Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the construction activities until no exceedance of Limit level. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposal of mitigation measures to SOR within 3 working days of notification and discuss with ET, IEC and SOR; 3. Implement the agreed mitigation measures; 4. Resubmit proposals of mitigation measures if problem still not under control; 5. As directed by the Supervising Officer, to slow down or to stop all or part of the construction activities until no exceedance of Limit level.

Note: ET – Environmental Team, IEC – Independent Environmental Checker, SOR – Supervising Officer's Representative

Event/ Action Plan for Impact and Post-construction (Operational) Dolphin Monitoring

EVENT	ACTION			
	ET	IEC	SOR	Contractor
Action Level	<ol style="list-style-type: none"> 1. Repeat statistical data analysis to confirm findings; 2. Review all available and relevant data, including raw data and statistical analysis results of other parameters covered in the EM&A, to ascertain if differences are as a result of natural variation or previously observed seasonal differences; 3. Identify source(s) of impact; 4. Inform the IEC, SOR and Contractor; 5. Check monitoring data. 6. Review to ensure all the dolphin protective measures are fully and properly implemented and advise on additional measures if necessary. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET and Contractor; 2. Discuss monitoring results and finding with the ET and the Contractor. 	<ol style="list-style-type: none"> 1. Discuss monitoring with the IEC and any other measures proposed by the ET; 2. If SOR is satisfied with the proposal of any other measures, SOR to signify the agreement in writing on the measures to be implemented. 	<ol style="list-style-type: none"> 1. Inform the SOR and confirm notification of the non-compliance in writing; 2. Discuss with the ET and the IEC and propose measures to the IEC and the SOR; 3. Implement the agreed measures.
Limit Level	<ol style="list-style-type: none"> 1. Repeat statistical data analysis to confirm findings; 2. Review all available and relevant data, including raw data and statistical analysis results of other parameters covered in the EM&A, to ascertain if differences are as a result of natural variation or previously observed seasonal differences; 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET and Contractor; 2. Discuss monitoring results and findings with the ET and the Contractor; 3. Attend the meeting to discuss with ET, SOR and 	<ol style="list-style-type: none"> 1. Attend the meeting to discuss with ET, IEC and Contractor the necessity of additional dolphin monitoring and any other potential mitigation measures. 2. If SOR is satisfied with the 	<ol style="list-style-type: none"> 1. Inform the SOR and confirm notification of the non-compliance in writing; 2. Attend the meeting to discuss with ET, IEC and SOR the necessity of additional dolphin monitoring and any other

EVENT	ACTION			
	ET	IEC	SOR	Contractor
	3. Identify source(s) of impact; 4. Inform the IEC, SOR and Contractor of findings; 5. Check monitoring data; 6. Repeat review to ensure all the dolphin protective measures are fully and properly implemented and advise on additional measures if necessary. 7. If ET proves that the source of impact is caused by any of the construction activity by the works contract, ET to arrange a meeting to discuss with IEC, SOR and Contractor the necessity of additional dolphin monitoring and/or any other potential mitigation measures (e.g., consider to modify the perimeter silt curtain or consider to control/temporarily stop relevant construction activity etc.) and submit to IEC a proposal of additional dolphin monitoring and/or mitigation measures where necessary.	Contractor the necessity of additional dolphin monitoring and any other potential mitigation measures. 4. Review proposals for additional monitoring and any other mitigation measures submitted by ET and Contractor and advise SOR of the results and findings accordingly. 5. Supervise / Audit the implementation of additional monitoring and/or any other mitigation measures and advise SOR the results and findings accordingly.	proposals for additional dolphin monitoring and/or any other mitigation measures submitted by ET and Contractor and verified by IEC, SOR to signify the agreement in writing on such proposals and any other mitigation measures. 3. Supervise the implementation of additional monitoring and/or any other mitigation measures.	potential mitigation measures. 3. Jointly submit with ET to IEC a proposal of additional dolphin monitoring and/or any other mitigation measures when necessary. 4. Implement the agreed additional dolphin monitoring and/or any other mitigation measures.

Note: ET – Environmental Team, IEC – Independent Environmental Checker, SOR – Supervising Officer’s Representative

Appendix G

Summary of Waste Flow Table

Name of Department: HyD

Contract No. / Works Order No.: HY/2012/08

Monthly Summary Waste Flow Table for December 2013 [to be submitted not later than the 15th day of each month following reporting month]

(All quantities shall be rounded off to 3 decimal places.)

Month	Actual Quantities of <u>Inert</u> Construction Waste Generated Monthly									
	(a)=(b)+(c)+(d)+(e) Total Quantity Generated	(b) Hard Rock and Large Broken Concrete	(c) Reused in the Contract	(d) Reused in other Projects	(e) Disposed of as Public Fill	Imported Fill to WA 23 & Reclamation Area (Rockfill 400)	Imported Fill to WA 23 & Reclamation Area (Rockfill Type A)	Imported Fill to RTT Barging Point	Marine Disposal (Cat. L)	Marine Disposal (Cat. M)
	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 m ³)	(in '000 m ³)
Jan										
Feb										
Mar										
Apr										
May										
Jun										
Sub-total										
Jul										
Aug										
Sep	0.000	0.000	0.000	0.000	0.000	1.820	0.788	0.000	0.000	0.000
Oct	0.000	0.000	0.000	0.000	0.000	18.667	3.328	0.000	0.000	0.000
Nov	2.835	0.000	0.000	0.000	2.835	45.929	1.520	0.000	21.100	13.200
Dec	0.883	0.000	0.000	0.000	0.883	145.125	13.824	45.472	40.500	5.000
Total	3.718	0.000	0.000	0.000	3.718	211.541	19.460	45.472	61.600	18.200

Month	Actual Quantities of <u>Non-inert</u> Construction Waste Generated Monthly								
	Metals		Paper/ cardboard packaging		Plastics (see Note 3)		Chemical Waste		Others, e.g. General Refuse disposed at Landfill
	(in '000kg)		(in '000kg)		(in '000kg)		(in '000kg)		(in '000ton)
	generated	recycled	generated	recycled	generated	recycled	generated	recycled	generated
Jan									
Feb									
Mar									
Apr									
May									
Jun									
Sub-total									
Jul									
Aug									
Sep	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008
Oct	0.000	0.000	0.120	0.120	0.000	0.000	0.000	0.000	0.000
Nov	0.000	0.000	0.130	0.130	0.000	0.000	0.000	0.000	0.152
Dec	0.000	0.000	0.130	0.130	0.000	0.000	0.000	0.000	0.012
Total	0.000	0.000	0.380	0.380	0.000	0.000	0.000	0.000	0.172

Forecast of Total Quantities of Construction and Demolition Materials to be Generated from the Contract*							
Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed of as Public Fill	Imported Fill	Marine Disposal (Cat. L)	Marine Disposal (Cat. M)
(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 m ³)	(in '000 m ³)
10.000	0.000	0.000	0.000	10.000	180.000	5.000	40.000

Forecast of Total Quantities of Construction and Demolition Materials to be Generated from the Contract*				
Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	General Refuse disposed of at Landfill
(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m ³)
0.000	0.050	0.000	0.000	0.100

- Notes:
- (1) The performance targets are given in the **ER Appendix 8J Clause 14** and the EM & A Manual(s).
 - (2) The waste flow table shall also include C&D materials to be imported for use at the Site.
 - (3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.
 - (4) The Contractor shall also submit the latest forecast of the total amount of C&D materials expected to be generated from the Works, together with a breakdown of the nature where the amount of C&D materials expected to be generated from the Works is equal to or exceeding 50,000 m³. (**ER Part 8 Clause 8.8.5 (d) (ii)** refers).

Appendix D – Monthly Summary Waste Flow Table

Name of Department: HyD

Contract No. / Works Order No.: HY/2012/08

Monthly Summary Waste Flow Table for December 2014 [to be submitted not later than the 15th day of each month following reporting month] (All quantities shall be rounded off to 3 decimal places.)

Month	Monthly Break-down of <u>Inert</u> Construction & Demolition Materials (i.e. Public Fill Materials)				
	(a)=(b)+(c)+(d)+(e) Total Quantity Generated	(b) Hard Rock and Large Broken Concrete	(c) Reused in the Contract	(d) Reused in other Projects	(e) Disposed of as Public Fill
	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)
2013 Sub-total	3.718	0.000	0.000	0.000	3.718
Jan-2014	9.012	0.000	0.000	0.000	9.012
Feb-2014	0.000	0.000	0.000	0.000	0.000
Mar-2014	0.105	0.000	0.000	0.000	0.105
Apr-2014	0.022	0.000	0.000	0.000	0.022
May-2014	1.016	0.000	0.000	0.000	1.016
Jun-2014	4.393	0.000	0.000	0.000	4.393
Half Year Sub-total	14.548	0.000	0.000	0.000	14.548
Jul-2014	14.405	0.000	0.000	0.000	14.405
Aug-2014	12.728	0.000	0.000	0.000	12.728
Sep-2014	6.843	0.000	0.000	0.000	6.843
Oct-2014	1.228	0.000	0.000	0.000	1.228
Nov-2014	0.595	0.000	0.000	0.000	0.595
Dec-2014	10.151	0.000	0.000	0.000	10.151
Project Total Quantities	64.216	0.000	0.000	0.000	64.216

Month	Monthly Construction & Demolition Material Movements (Import Fill Materials & Marine Mud Disposal)							
	Imported Fill to WA 23 & Reclamation Area (Rockfill 400)	Imported Fill to WA 23 & Reclamation Area (Rockfill 200)	Imported Fill to WA 23 & Reclamation Area (Rockfill Type A)	Imported Fill to Reclamation Area (Public Fill) (by Barge)	* Imported Fill to Reclamation Area (Public Fill)(From Rambler Channel) (by Truck)	* Imported Fill to Reclamation Area (From RTT Barging Point) (by Truck)	Marine Disposal (Cat. L)	Marine Disposal (Cat. M _P & M _F)
	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 m ³)	(in '000 m ³)
2013 Sub-total	211.541	2.508	19.460	0.000	0.000	45.472	61.600	18.200
Jan-2014	177.300	4.050	8.544	0.000	0.000	124.412	34.000	12.500
Feb-2014	143.891	27.825	5.371	0.000	0.000	81.296	18.500	24.500
Mar-2014	257.304	53.388	27.958	113.789	0.000	63.961	37.300	40.450
Apr-2014	198.245	10.186	41.702	191.094	0.000	26.640	28.600	15.400
May-2014	236.816	4.612	65.308	150.749	43.718	15.165	18.700	29.150
Jun-2014	233.430	2.856	37.103	108.667	25.433	0.000	40.700	7.700
Half Year Sub-total	1246.986	102.917	185.986	564.299	69.151	311.474	177.800	129.700
Jul-2014	177.859	0.000	65.758	161.817	22.958	0.000	37.950	7.150
Aug-2014	174.710	23.110	33.127	351.703	40.379	0.000	12.100	0.000
Sep-2014	124.251	28.994	23.424	476.618	22.932	0.000	0.000	0.000
Oct-2014	22.217	22.729	17.547	481.962	0.000	0.000	0.000	0.000
Nov-2014	25.889	22.640	16.268	175.370	0.000	0.000	2.320	0.000
Dec-2014	23.498	2.830	1.431	80.520	0.000	0.000	0.000	0.000
Project Total Quantities	2006.951	205.728	363.001	2292.289	155.420	356.946	291.770	155.050

• Fields under review. These are good imported purchased material, not wastes generated from the site.

Month	Actual Quantities of <u>Non-inert</u> Construction Waste Generated Monthly								
	Metals		Paper/ cardboard packaging		Plastics (see Note 3)		Chemical Waste		Others, e.g. General Refuse disposed at Landfill
	(in '000kg)		(in '000kg)		(in '000kg)		(in '000kg)		(in '000ton)
	generated	recycled	generated	recycled	generated	recycled	generated	Disposed	generated
2013 Sub-total	0.000	0.000	0.380	0.380	0.000	0.000	0.000	0.000	0.172
Jan-2014	0.000	0.000	0.130	0.130	0.000	0.000	0.000	0.000	0.045
Feb-2014	0.000	0.000	0.000	0.000	0.000	0.000	0.020	0.020	0.028
Mar-2014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.036
Apr-2014	0.000	0.000	0.160	0.160	0.000	0.000	0.000	0.000	0.026
May-2014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.042
Jun-2014	0.000	0.000	0.000	0.000	0.000	0.000	0.030	0.030	0.030
Half Year Sub-total	0.000	0.000	0.290	0.290	0.000	0.000	0.050	0.050	0.207
Jul-2014	0.000	0.000	0.300	0.300	0.000	0.000	0.000	0.000	0.033
Aug-2014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.022
Sep-2014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.039
Oct-2014	0.000	0.000	0.080	0.080	0.000	0.000	0.060	0.060	0.033
Nov-2014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.050
Dec-2014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.049
Project Total Quantities	0.000	0.000	1.050	1.050	0.000	0.000	0.110	0.110	0.605

Forecast of Total Quantities of Construction and Demolition Materials to be Generated from the Contract*							
Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed of as Public Fill	Imported Fill	Marine Disposal (Cat. L)	Marine Disposal (Cat. M)
(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 m ³)	(in '000 m ³)
5.000	0.000	0.000	0.000	5.000	180.000	5.000	40.000

Forecast of Total Quantities of Construction and Demolition Materials to be Generated from the Contract*				
Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	General Refuse disposed of at Landfill
(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m ³)
0.000	0.050	0.000	0.000	0.100

- Notes:
- (1) The performance targets are given in the **ER Appendix 8J Clause 14** and the EM & A Manual(s).
 - (2) The waste flow table shall also include C&D materials to be imported for use at the Site.
 - (3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.
 - (4) The Contractor shall also submit the latest forecast of the total amount of C&D materials expected to be generated from the Works, together with a breakdown of the nature where the amount of C&D materials expected to be generated from the Works is equal to or exceeding 50,000 m³. (**ER Part 8 Clause 8.8.5 (d) (ii)** refers).

Monthly Summary Waste Flow Table

Name of Department: HyD

Contract No. / Works Order No.: HY/2012/08

Monthly Summary Waste Flow Table for **December 2015** [to be submitted not later than the 15th day of each month following reporting month] (All quantities shall be rounded off to 3 decimal places.)

Month	Monthly Break-down of <u>Inert</u> Construction & Demolition Materials (i.e. Public Fill Materials)				
	(a)=(b)+(c)+(d)+(e) Total Quantity Generated	(b) Hard Rock and Large Broken Concrete	(c) Reused in the Contract	(d) Reused in other Projects	(e) Disposed of as Public Fill
	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)
Sub-total	64.216	0.000	0.000	0.000	64.216
Jan-2015	30.877	0.000	0.000	0.000	30.877
Feb-2015	4.152	0.000	0.000	0.000	4.152
Mar-2015	36.718	0.000	0.000	0.000	36.718
Apr-2015	62.847	0.000	0.000	0.000	62.847
May-2015	121.436	0.000	0.000	0.000	121.436
Jun-2015	247.282	0.000	0.000	0.000	247.282
Half Year Sub-total	503.312	0.000	0.000	0.000	503.312
Jul-2015	233.422	0.000	0.000	0.000	233.422
Aug-2015	62.367	0.000	0.000	0.000	62.367
Sep-2015	9.555	0.000	0.000	0.000	9.555
Oct-2015	7.218	0.000	0.000	0.000	7.218
Nov-2015	11.578	0.000	0.000	0.000	11.578
Dec-2015	38.600	0.000	0.000	0.000	38.600
Project Total Quantities	930.268	0.000	0.000	0.000	930.268

Month	Actual Quantities of <u>Non-inert</u> Construction Waste Generated Monthly								
	Metals		Paper/ cardboard packaging		Plastics (see Note 3)		Chemical Waste		Others, e.g. General Refuse disposed at Landfill
	(in '000kg)		(in '000kg)		(in '000kg)		(in '000kg)		(in '000ton)
	generated	recycled	generated	recycled	generated	recycled	generated	Disposed	generated
Sub-total	0.000	0.000	1.050	1.050	0.000	0.000	0.110	0.110	0.605
Jan-2015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.080
Feb-2015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.074
Mar-2015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.115
Apr-2015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.091
May-2015	0.000	0.000	0.000	0.000	0.000	0.000	1.600	1.600	0.108
Jun-2015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.120
Half Year Sub-total	0.000	0.000	0.000	0.000	0.000	0.000	1.600	1.600	0.588
Jul-2015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.172
Aug-2015	0.000	0.000	0.300	0.300	0.000	0.000	0.000	0.000	0.246
Sep-2015	0.000	0.000	0.300	0.300	0.220	0.220	0.000	0.000	0.195
Oct-2015	0.000	0.000	0.300	0.300	0.000	0.000	0.000	0.000	0.177
Nov-2015	0.000	0.000	0.200	0.200	5.950	5.950	0.000	0.000	0.093
Dec-2015	0.000	0.000	0.000	0.000	0.700	0.700	0.000	0.000	0.141
Project Total Quantities	0.000	0.000	2.150	2.150	6.870	6.870	1.710	1.710	2.217

Forecast of Total Quantities of Construction and Demolition Materials to be Generated from the Contract*				
Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed of as Public Fill
(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)
50.000	0.000	0.000	0.000	50.000

Forecast of Total Quantities of Construction and Demolition Materials to be Generated from the Contract*				
Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	General Refuse disposed of at Landfill
(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m ³)
0.000	0.000	0.000	0.000	0.200

- Notes:
- (1) The performance targets are given in the **ER Appendix 8J Clause 14** and the EM & A Manual(s).
 - (2) The waste flow table shall also include C&D materials to be imported for use at the Site.
 - (3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.
 - (4) The Contractor shall also submit the latest forecast of the total amount of C&D materials expected to be generated from the Works, together with a breakdown of the nature where the amount of C&D materials expected to be generated from the Works is equal to or exceeding 50,000 m³. (**ER Part 8 Clause 8.8.5 (d) (ii)** refers).

Monthly Summary Waste Flow Table

Name of Department: HyD

Contract No. / Works Order No.: HY/2012/08

Monthly Summary Waste Flow Table for December 2016 [to be submitted not later than the 15th day of each month following reporting month] (All quantities shall be rounded off to 3 decimal places.)

Month	Monthly Break-down of <u>Inert</u> Construction & Demolition Materials (i.e. Public Fill Materials)				
	(a)=(b)+(c)+(d)+(e) Total Quantity Generated	(b) Hard Rock and Large Broken Concrete	(c) Reused in the Contract	(d) Reused in other Projects	(e) Disposed of as Public Fill
	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)
Sub-total	930.268	0.000	0.000	0.000	930.268
Jan-2016	24.068	0.000	0.000	0.000	24.068
Feb-2016	9.229	0.000	0.000	0.000	9.229
Mar-2016	3.501	0.000	0.000	0.000	3.501
Apr-2016	9.175	0.000	0.000	0.000	9.175
May-2016	2.392	0.000	0.000	0.000	2.392
Jun-2016	5.597	0.000	0.000	0.000	5.597
Half Year Sub-total	53.962	0.000	0.000	0.000	53.962
Jul-2016	10.063	0.000	0.000	0.000	10.063
Aug-2016	31.621	0.000	0.000	0.000	31.621
Sep-2016	9.450	0.000	0.000	0.000	9.450
Oct-2016	23.118	0.000	0.000	0.000	23.118
Nov-2016	13.293	0.000	0.000	0.000	13.293
Dec-2016	25.662	0.000	0.000	0.000	25.662
Project Total Quantities	1097.437	0.000	0.000	0.000	1097.437

Month	Actual Quantities of <u>Non-inert</u> Construction Waste Generated Monthly								
	Metals		Paper/ cardboard packaging		Plastics (see Note 3)		Chemical Waste		Others, e.g. General Refuse disposed at Landfill
	(in '000kg)		(in '000kg)		(in '000kg)		(in '000kg)		(in '000ton)
	generated	recycled	generated	recycled	generated	recycled	generated	Disposed	generated
Sub-total	0.000	0.000	2.150	2.150	6.870	6.870	1.710	1.710	2.217
Jan-2016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.113
Feb-2016	1.850	1.850	0.000	0.000	0.000	0.000	4.740	4.740	0.102
Mar-2016	0.000	0.000	0.200	0.200	0.000	0.000	3.000	3.000	0.111
Apr-2016	0.000	0.000	0.200	0.200	0.000	0.000	0.000	0.000	0.198
May-2016	0.000	0.000	0.200	0.200	0.000	0.000	0.000	0.000	0.202
Jun-2016	0.000	0.000	0.200	0.200	0.000	0.000	0.000	0.000	0.214
Half Year Sub-total	1.850	1.850	0.800	0.800	0.000	0.000	7.740	7.740	0.940
Jul-2016	0.000	0.000	0.200	0.200	0.000	0.000	0.000	0.000	0.292
Aug-2016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.323
Sep-2016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.335
Oct-2016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.235
Nov-2016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.305
Dec-2016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.288
Project Total Quantities	1.850	1.850	3.150	3.150	6.870	6.870	9.450	9.450	4.935

Forecast of Total Quantities of Construction and Demolition Materials to be Generated from the Contract*				
Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed of as Public Fill
(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)
20.000	0.000	0.000	0.000	20.000

Forecast of Total Quantities of Construction and Demolition Materials to be Generated from the Contract*				
Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	General Refuse disposed of at Landfill
(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000 ton)
0.000	0.000	0.000	0.000	0.100

- Notes:
- (1) The performance targets are given in the **ER Appendix 8J Clause 14** and the EM & A Manual(s).
 - (2) The waste flow table shall also include C&D materials to be imported for use at the Site.
 - (3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.
 - (4) The Contractor shall also submit the latest forecast of the total amount of C&D materials expected to be generated from the Works, together with a breakdown of the nature where the amount of C&D materials expected to be generated from the Works is equal to or exceeding 50,000 m³. (**ER Part 8 Clause 8.8.5 (d) (ii)** refers).

Monthly Summary Waste Flow Table

Name of Department: HyD

Contract No. / Works Order No.: HY/2012/08

Monthly Summary Waste Flow Table for December 2017 [to be submitted not later than the 15th day of each month following reporting month] (All quantities shall be rounded off to 3 decimal places.)

Month	Monthly Break-down of <u>Inert</u> Construction & Demolition Materials (i.e. Public Fill Materials)				
	(a)=(b)+(c)+(d)+(e) Total Quantity Generated	(b) Hard Rock and Large Broken Concrete	(c) Reused in the Contract	(d) Reused in other Projects	(e) Disposed of as Public Fill
	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)
Sub-total	1097.465	0.000	0.000	0.000	1097.465
Jan-2017	60.781	0.000	0.000	0.000	60.781
Feb-2017	17.367	0.000	0.000	0.000	17.367
Mar-2017	7.508	0.000	0.000	0.000	7.508
Apr-2017	15.603	0.000	0.000	0.000	15.603
May-2017	12.358	0.000	0.000	0.000	12.358
Jun-2017	0.194	0.000	0.000	0.000	0.194
Half Year Sub-total	113.811	0.000	0.000	0.000	113.811
Jul-2017	0.652	0.000	0.000	0.000	0.652
Aug-2017	1.624	0.000	0.000	0.000	1.624
Sep-2017	0.886	0.000	0.000	0.000	0.886
Oct-2017	0.706	0.000	0.000	0.000	0.706
Nov-2017	3.259	0.000	0.000	0.000	3.259
Dec-2017	3.574	0.000	0.000	0.000	3.574
Project Total Quantities	1221.977	0.000	0.000	0.000	1221.977

Month	Actual Quantities of <u>Non-inert</u> Construction Waste Generated Monthly								
	Metals		Paper/ cardboard packaging		Plastics (see Note 3)		Chemical Waste		Others, e.g. General Refuse disposed at Landfill
	(in '000kg)		(in '000kg)		(in '000kg)		(in '000kg)		(in '000ton)
	generated	recycled	generated	recycled	generated	recycled	generated	Disposed	generated
Sub-total	1.850	1.850	3.150	3.150	6.870	6.870	9.450	9.450	4.935
Jan-2017	0.000	0.000	0.000	0.000	0.000	0.000	3.400	3.400	0.257
Feb-2017	0.000	0.000	0.200	0.200	0.000	0.000	0.000	0.000	0.340
Mar-2017	0.000	0.000	0.000	0.000	0.000	0.000	6.100	6.100	0.286
Apr-2017	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.237
May-2017	0.000	0.000	0.000	0.000	0.000	0.000	10.400	10.400	0.300
Jun-2017	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.317
Half Year Sub-total	0.000	0.000	0.200	0.200	0.000	0.000	19.900	19.900	1.737
Jul-2017	0.000	0.000	0.200	0.200	0.000	0.000	0.000	0.000	0.272
Aug-2017	141.990	141.990	0.200	0.200	0.000	0.000	0.000	0.000	0.305
Sep-2017	0.000	0.000	0.200	0.200	0.000	0.000	0.000	0.000	0.300
Oct-2017	132.270	132.270	0.000	0.000	0.000	0.000	0.000	0.000	0.244
Nov-2017	343.270	343.270	0.200	0.200	0.000	0.000	3.800	3.800	0.345
Dec-2017	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.121
Project Total Quantities	619.380	619.380	4.150	4.150	6.870	6.870	33.150	33.150	7.914

Forecast of Total Quantities of Construction and Demolition Materials to be Generated from the Contract*				
Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed of as Public Fill
(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)
3.000	0.000	0.000	0.000	3.000

Forecast of Total Quantities of Construction and Demolition Materials to be Generated from the Contract*				
Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	General Refuse disposed of at Landfill
(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000 ton)
50.000	0.000	0.000	0.000	0.200

- Notes:
- (1) The performance targets are given in the **ER Appendix 8J Clause 14** and the EM & A Manual(s).
 - (2) The waste flow table shall also include C&D materials to be imported for use at the Site.
 - (3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.
 - (4) The Contractor shall also submit the latest forecast of the total amount of C&D materials expected to be generated from the Works, together with a breakdown of the nature where the amount of C&D materials expected to be generated from the Works is equal to or exceeding 50,000 m³. (**ER Part 8 Clause 8.8.5 (d) (ii)** refers).

Appendix D – Monthly Summary Waste Flow Table

Name of Department: HyD

Contract No. / Works Order No.: HY/2012/08

Monthly Summary Waste Flow Table for December 2018 [to be submitted not later than the 15th day of each month following reporting month]

(All quantities shall be rounded off to 3 decimal places.)

Month	Monthly Break-down of <u>Inert</u> Construction & Demolition Materials (i.e. Public Fill Materials)				
	(a)=(b)+(c)+(d)+(e) Total Quantity Generated	(b) Hard Rock and Large Broken Concrete	(c) Reused in the Contract	(d) Reused in other Projects	(e) Disposed of as Public Fill
	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)
Sub-total, 2013-2017	1221.977	0.000	0.000	0.000	1221.977
Jan-2018	7.165	0.000	0.000	0.000	7.165
Feb-2018	1.762	0.000	0.000	0.000	1.762
Mar-2018	66.457	0.000	0.000	62.274	4.183
Apr-2018	123.942	0.000	0.000	50.648	73.294
May-2018	127.964	0.000	0.000	62.822	65.142
Jun-2018	102.987	0.000	0.000	55.385	47.602
Half Year Sub-total	430.277	0.000	0.000	231.129	199.148
Jul-2018	43.768	0.000	0.000	0.000	43.768
Aug-2018	57.809	0.000	0.000	40.722	17.087
Sep-2018	39.763	0.000	0.000	11.276	28.487
Oct-2018	108.689	0.000	20.471	79.694	28.342
Nov-2018	155.310	0.000	25.702	116.028	13.580
Dec-2018	146.997	0.000	30.581	106.520	9.896
Project Total Quantities	2224.407	0.000	76.754	585.369	1562.284

Actual Quantities of Non-inert Construction Waste Generated Monthly

Month	Metals		Paper/ cardboard packaging		Plastics (see Note 3)		Chemical Waste		Others, e.g. General Refuse disposed at Landfill
	(in '000kg)		(in '000kg)		(in '000kg)		(in '000kg)		(in '000ton)
	generated	recycled	generated	recycled	generated	recycled	generated	Disposed	generated
Sub-total, 2013-2017	619.38	619.38	4.15	4.15	6.87	6.87	33.15	33.15	8.259
Jan-2018	241.50	241.50	0.20	0.20	0.00	0.00	2.80	2.80	0.272
Feb-2018	256.94	256.94	0.20	0.20	0.00	0.00	0.00	0.00	0.258
Mar-2018	229.36	229.36	0.00	0.00	0.00	0.00	2.00	2.00	0.459
Apr-2018	195.55	195.55	0.00	0.00	0.00	0.00	8.60	8.60	0.281
May-2018	93.01	93.01	0.30	0.30	0.00	0.00	10.40	10.40	0.686
Jun-2018	0.00	0.00	0.00	0.00	1.06	1.06	0.00	0.00	0.408
Half Year Sub-total	1016.36	1016.36	0.70	0.70	1.06	1.06	23.80	23.80	2.364
Jul-2018	0.00	0.00	0.86	0.86	0.77	0.77	0.00	0.00	0.768
Aug-2018	980.56	980.56	0.00	0.00	0.00	0.00	2.00	2.00	0.749
Sep-2018	838.04	838.04	0.00	0.00	0.00	0.00	0.00	0.00	0.445
Oct-2018	2702.35	2702.35	1.02	1.02	0.00	0.00	0.00	0.00	0.437
Nov-2018	394.69	394.69	0.00	0.00	0.00	0.00	1.40	1.40	0.448
Dec-2018	212.44	212.44	1.01	1.01	0.00	0.00	0.00	0.00	0.519
Project Total Quantities	6763.82	6763.82	7.74	7.74	8.70	8.70	60.35	60.35	13.989

Forecast of Total Quantities of Construction and Demolition Materials to be Generated from the Contract*

Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed of as Public Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	General Refuse disposed of at Landfill
(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000 ton)
2850.000	0.000	50.000	800.000	2000.000	7000.00	10.00	9.50	65.00	15.000

- Notes:
- (1) The performance targets are given in the **ER Appendix 8J Clause 14** and the EM & A Manual(s).
 - (2) The waste flow table shall also include C&D materials to be imported for use at the Site.
 - (3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.
 - (4) The Contractor shall also submit the latest forecast of the total amount of C&D materials expected to be generated from the Works, together with a breakdown of the nature where the amount of C&D materials expected to be generated from the Works is equal to or exceeding 50,000 m³. (**ER Part 8 Clause 8.8.5 (d) (ii)** refers).

Monthly Summary Waste Flow Table

Name of Department: HyD

Contract No. / Works Order No.: HY/2012/08

Monthly Summary Waste Flow Table for December 2019 [to be submitted not later than the 15th day of each month following reporting month] (All quantities shall be rounded off to 3 decimal places.)

Month	Monthly Break-down of <u>Inert</u> Construction & Demolition Materials (i.e. Public Fill Materials)				
	(a)=(b)+(c)+(d)+(e) Total Quantity Generated	(b) Hard Rock and Large Broken Concrete	(c) Reused in the Contract	(d) Reused in other Projects	(e) Disposed of as Public Fill
	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)
Sub-total	2224.407	0.000	76.754	585.369	1562.284
Jan-2019	299.831	0.000	53.419	215.427	30.985
Feb-2019	133.335	0.000	46.021	67.707	19.607
Mar-2019	120.224	0.000	50.455	20.964	48.805
Apr-2019	130.329	0.000	58.956	0.000	71.373
May-2019	67.355	0.000	51.297	0.000	16.058
Jun-2019	4.134	0.000	0.000	0.000	4.134
Half Year Sub-total	755.208	0.000	260.148	304.098	190.962
Jul-2019	3.821	0.000	0.000	0.000	3.821
Aug-2019	2.388	0.000	0.000	0.000	2.388
Sep-2019	4.191	0.000	0.000	0.000	4.191
Oct-2019	8.366	0.000	0.000	0.000	8.366
Nov-2019	6.215	0.000	0.000	0.000	6.215
Dec-2019	4.216	0.000	0.000	0.000	4.216
Project Total Quantities	3008.822	0.000	336.902	889.467	1782.443

Month	Actual Quantities of <u>Non-inert</u> Construction Waste Generated Monthly								
	Metals		Paper/ cardboard packaging		Plastics (see Note 3)		Chemical Waste		Others, e.g. General Refuse disposed at Landfill
	(in '000kg)		(in '000kg)		(in '000kg)		(in '000kg)		(in '000ton)
	generated	recycled	generated	recycled	generated	recycled	generated	Disposed	generated
Sub-total	6763.82	6763.82	7.74	7.74	8.70	8.70	60.35	60.35	13.989
Jan-2019	394.55	394.55	0.00	0.00	0.00	0.00	0.00	0.00	0.538
Feb-2019	103.72	103.72	0.62	0.62	0.00	0.00	1.672	1.672	0.578
Mar-2019	88.20	88.20	0.46	0.46	0.00	0.00	0.00	0.00	0.692
Apr-2019	260.89	260.89	0.00	0.00	3.90	3.90	1.045	1.045	0.707
May-2019	0.66	0.66	1.46	1.46	0.00	0.00	0.00	0.00	0.798
Jun-2019	136.75	136.75	0.66	0.66	0.00	0.00	4.14	4.14	0.751
Half Year Sub-total	984.77	984.77	3.20	3.20	3.90	3.90	6.857	6.857	4.064
Jul-2019	444.37	444.37	1.20	1.20	0.00	0.00	0.00	0.00	0.730
Aug-2019	505.93	505.93	0.00	0.00	1.58	1.58	3.80	3.80	0.703
Sep-2019	397.10	397.10	0.60	0.60	1.62	1.62	8.00	8.00	0.737
Oct-2019	523.05	523.05	0.00	0.00	1.04	1.04	5.80	5.80	0.754
Nov-2019	271.73	271.73	1.90	1.90	0.00	0.00	1.00	1.00	0.525
Dec-2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.441
Project Total Quantities	9890.77	9890.77	14.64	14.64	16.84	16.84	85.807	85.807	21.943

Forecast of Total Quantities of Construction and Demolition Materials to be Generated from the Contract*				
Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed of as Public Fill
(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)
3200.000	0.000	350.000	1000.000	2000.000

Forecast of Total Quantities of Construction and Demolition Materials to be Generated from the Contract*				
Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	General Refuse disposed of at Landfill
(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000 ton)
10500.00	20.00	20.00	100.00	30.000

- Notes:
- (1) The performance targets are given in the **ER Appendix 8J Clause 14** and the EM & A Manual(s).
 - (2) The waste flow table shall also include C&D materials to be imported for use at the Site.
 - (3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.
 - (4) The Contractor shall also submit the latest forecast of the total amount of C&D materials expected to be generated from the Works, together with a breakdown of the nature where the amount of C&D materials expected to be generated from the Works is equal to or exceeding 50,000 m³. (**ER Part 8 Clause 8.8.5 (d) (ii)** refers).

Monthly Summary Waste Flow Table

Name of Department: HyD

Contract No. / Works Order No.: HY/2012/08

Monthly Summary Waste Flow Table for December 2020 [to be submitted not later than the 15th day of each month following reporting month] (All quantities shall be rounded off to 3 decimal places.)

Month	Monthly Break-down of <u>Inert</u> Construction & Demolition Materials (i.e. Public Fill Materials)				
	(a)=(b)+(c)+(d)+(e) Total Quantity Generated	(b) Hard Rock and Large Broken Concrete	(c) Reused in the Contract	(d) Reused in other Projects	(e) Disposed of as Public Fill
	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)
Sub-total	3008.812	0.000	336.902	889.467	1782.443
Jan-2020	174.69	0.000	0.000	0.000	174.69
Feb-2020	1.455	0.000	0.000	0.000	1.455
Mar-2020	3.252	0.000	0.000	0.000	3.252
Apr-2020	4.200	0.000	0.000	0.000	4.200
May-2020	7.015	0.000	0.000	0.000	7.015
Jun-2020	2.670	0.000	0.000	0.000	2.693
Half Year Sub-total	193.282	0.000	0.000	0.000	193.305
Jul-2020	1.440	0.000	0.000	0.000	1.440
Aug-2020	1.159	0.000	0.000	0.000	1.159
Sep-2020	0.074	0.000	0.000	0.000	0.074
Oct-2020	0.253	0.000	0.000	0.000	0.253
Nov-2020	0.251	0.000	0.000	0.000	0.251
Dec-2020	0.554	0.000	0.000	0.000	0.554
Project Total Quantities	3205.825	0.000	336.902	889.467	1979.479

Month	Actual Quantities of <u>Non-inert</u> Construction Waste Generated Monthly								
	Metals		Paper/ cardboard packaging		Plastics (see Note 3)		Chemical Waste		Others, e.g. General Refuse disposed at Landfill
	(in '000kg)		(in '000kg)		(in '000kg)		(in '000kg)		(in '000ton)
	generated	recycled	generated	recycled	generated	recycled	generated	Disposed	generated
Sub-total	9890.77	9890.77	14.64	14.64	16.84	16.84	85.807	85.807	21.943
Jan-2020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.54
Feb-2020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.349
Mar-2020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.226
Apr-2020	22.14	22.14	1.30	1.30	0.00	0.00	6.40	6.40	0.521
May-2020	6.2	6.2	0.54	0.54	0.00	0.00	0.60	0.60	0.536
Jun-2020	0.00	0.00	0.74	0.74	0.00	0.00	1.00	1.00	0.303
Half Year Sub-total	28.34	28.34	2.58	2.58	0.00	0.00	8.00	8.00	5.475
Jul-2020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.140
Aug-2020	0.00	0.00	1.06	1.06	0.00	0.00	0.00	0.00	0.110
Sep-2020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.100
Oct-2020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.145
Nov-2020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.167
Dec-2020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.173
Project Total Quantities	9919.11	9919.11	18.28	18.28	16.84	16.84	93.807	93.807	28.243

Forecast of Total Quantities of Construction and Demolition Materials to be Generated from the Contract*				
Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed of as Public Fill
(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)
3200.000	0.000	350.000	1000.000	2000.000

Forecast of Total Quantities of Construction and Demolition Materials to be Generated from the Contract*				
Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	General Refuse disposed of at Landfill
(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000 ton)
10000.00	20.00	18.00	120.00	30.000

- Notes:
- (1) The performance targets are given in the **ER Appendix 8J Clause 14** and the EM & A Manual(s).
 - (2) The waste flow table shall also include C&D materials to be imported for use at the Site.
 - (3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.
 - (4) The Contractor shall also submit the latest forecast of the total amount of C&D materials expected to be generated from the Works, together with a breakdown of the nature where the amount of C&D materials expected to be generated from the Works is equal to or exceeding 50,000 m³. (**ER Part 8 Clause 8.8.5 (d) (ii)** refers).

Monthly Summary Waste Flow Table

Name of Department: HyD

Contract No. / Works Order No.: HY/2012/08

Monthly Summary Waste Flow Table for **March 2021** [to be submitted not later than the 15th day of each month following reporting month] (All quantities shall be rounded off to 3 decimal places.)

Month	Monthly Break-down of <u>Inert</u> Construction & Demolition Materials (i.e. Public Fill Materials)				
	(a)=(b)+(c)+(d)+(e) Total Quantity Generated	(b) Hard Rock and Large Broken Concrete	(c) Reused in the Contract	(d) Reused in other Projects	(e) Disposed of as Public Fill
	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)
Sub-total	3205.825	0.000	336.902	889.467	1979.479
Jan-2021	1.031	0.000	0.000	0.000	1.031
Feb-2021	0.210	0.000	0.000	0.000	0.210
Mar-2021	0.409	0.000	0.000	0.000	0.409
Apr-2021					
May-2021					
Jun-2021					
Half Year Sub-total					
Jul-2021					
Aug-2021					
Sep-2021					
Oct-2021					
Nov-2021					
Dec-2021					
Project Total Quantities	3207.475	0.000	336.902	889.467	1981.129

Month	Actual Quantities of <u>Non-inert</u> Construction Waste Generated Monthly								
	Metals		Paper/ cardboard packaging		Plastics (see Note 3)		Chemical Waste		Others, e.g. General Refuse disposed at Landfill
	(in '000kg)		(in '000kg)		(in '000kg)		(in '000kg)		(in '000ton)
	generated	recycled	generated	recycled	generated	recycled	generated	Disposed	generated
Sub-total	9919.11	9919.11	18.28	18.28	16.84	16.84	93.807	93.807	28.243
Jan-2021	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.071
Feb-2021	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.011
Mar-2021	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.034
Apr-2021									
May-2021									
Jun-2021									
Half Year Sub-total									
Jul-2021									
Aug-2021									
Sep-2021									
Oct-2021									
Nov-2021									
Dec-2021									
Project Total Quantities	9919.11	9919.11	18.28	18.28	16.84	16.84	93.807	93.807	28.359

Forecast of Total Quantities of Construction and Demolition Materials to be Generated from the Contract*				
Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed of as Public Fill
(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)	(in '000 ton)
3200.000	0.000	350.000	1000.000	2000.000

Forecast of Total Quantities of Construction and Demolition Materials to be Generated from the Contract*				
Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	General Refuse disposed of at Landfill
(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000 ton)
10000.00	20.00	18.00	120.00	30.000

- Notes:
- (1) The performance targets are given in the **ER Appendix 8J Clause 14** and the EM & A Manual(s).
 - (2) The waste flow table shall also include C&D materials to be imported for use at the Site.
 - (3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.
 - (4) The Contractor shall also submit the latest forecast of the total amount of C&D materials expected to be generated from the Works, together with a breakdown of the nature where the amount of C&D materials expected to be generated from the Works is equal to or exceeding 50,000 m³. (**ER Part 8 Clause 8.8.5 (d) (ii)** refers).

Appendix H

Cumulative Statistics on
Exceedances, Complaints,
Notifications of Summons
and Successful Prosecutions

Table H1 *Cumulative Statistics on Exceedances*

Monitoring Parameters	Action/Limit Level	Total No. recorded since Contract commencement
1-Hr TSP	Action	122
	Limit	15
24-Hr TSP	Action	12
	Limit	4
Water Quality	Action	168
	Limit	19
Impact Dolphin Monitoring	Action	11
	Limit	20
Post Construction (Operational)	Action	0
Dolphin Monitoring	Limit	3

Table H2 *Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions*

Reporting Period	Cumulative Statistics		
	Complaints	Notifications of Summons	Successful Prosecutions
Total No. received since Contract commencement	17	1	0