China Harbour Engineering Company Limited

Contract No. HY/2010/02

Hong Kong – Zhuhai – Macao Bridge Hong Kong Boundary Crossing Facilities – Reclamation Works

Annual Review Report for March 2015 to February 2016

[01/2017]

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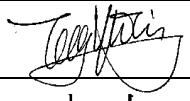
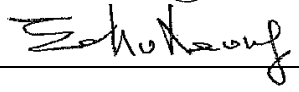
Prepared & Checked:	Y T Tang	
Reviewed, Approved and Certified:	Echo Leong (ETL)	

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RAMBOLL ENVIRON

Ref.: HYDHZMBEEM00_0_4978L.17

19 January 2017

By Fax (3698 5999) and By Post

Ove Arup & Partners
Chief Resident Engineer's Office
5 Ying Hei Road, Tung Chung, Lantau
Hong Kong

Attention: Mr. Paul Appleton

Dear Sir,

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/2010/02 – HZMB HKBCF – Reclamation Works
Annual EM&A Review Report for March 2015 to February 2016

Reference is made to the Environmental Team's submission of the Annual EM&A Review Report for March 2015 to February 2016 certified by the ET Leader (ET's ref.: "60249820/C/RMKY17011901" dated 19 January 2017) and provided to us via e-mail on 19 January 2017.

Please be informed that the Annual EM&A Review Report for March 2015 to February 2016 shall be submitted to EPD as per the EM&A Manual. As such, ET Leader is reminded that it is the ET's responsibility to ensure their duties under the EPs and EM&A programmes are fully discharged.

The ET Leader and the dolphin specialist of the ET are reminded that the EM&A report should never be regarded as a platform to express their own opinions towards a government topic, or to advocate his/her personal ideas, and also our verification to your report does not release any of your obligation in the EM&A Manual under the applicable Environmental Permit(s) for this project.

Thank you very much for your attention and please feel free to contact the undersigned should you require further information.

Yours faithfully,
For and on behalf of
Ramboll Environ Hong Kong Limited

Raymond Dai
Independent Environmental Checker

c.c.	HyD	Mr. Vico Cheung	(By Fax: 3188 6614)
	HyD	Mr. Wai-Ping Lee	(By Fax: 3188 6614)
	AECOM	Ms. Echo Leong	(By Fax: 2317 7609)
	CHEC	Mr. Lim Kim Chuan	(By Fax: 2578 0413)

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EXECUTIVE SUMMARY

Contract No. HY/2010/02 – Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities – Reclamation Works (here below, known as "the Contract") mainly comprises reclamation at the northeast of the Hong Kong International Airport of an area of about 130-hectare for the construction of an artificial island for the development of the Hong Kong Boundary Crossing Facilities (HKBCF), and about 19-hectare for the southern landfall of the Tuen Mun - Chek Lap Kok Link (TMCLKL). It is a designated Project and is governed by the current permits for the Project, i.e. the amended Environmental Permits (EPs) issued on 11 April 2016 (EP-353/2009/K) and 13 March 2015 (EP-354/2009/D) (for TMCLKL Southern Landfall Reclamation only).

Ove Arup & Partners Hong Kong Limited (Arup) was appointed by Highways Department (HyD) as the consultants for the design and construction assignment for the Project's reclamation works (i.e. the Engineer for the Contract).

China Harbour Engineering Company Limited (CHEC) was awarded by HyD as the Contractor to undertake the construction work of the Contract.

Ramboll Environ Hong Kong Ltd. was employed by HyD as the Independent Environmental Checker (IEC) and Environmental Project Office (ENPO) for the Contract.

AECOM Asia Co. Ltd. (AECOM) was appointed by CHEC to undertake the role of Environmental Team for the Contract for carrying out the environmental monitoring and audit (EM&A) works.

The construction phase of the Contract under the EPs was commenced on 12 March 2012 and will be tentatively completed by early Year 2017. The EM&A programme, including air quality, noise, water quality and dolphin monitoring and environmental site inspections, was commenced on 12 March 2012.

This report documents the findings of EM&A works conducted in the period between 1 March 2015 and 29 February 2016. As informed by the Contractor, major activities in the reporting period were:-

Marine-base works

- Cellular structure installation and backfilling
- Capping Beams structures
- Conforming sloping seawalls
- Surcharge remove & laying
- Earthwork fill
- Deep Cement Mixing
- Jet grout columns works
- Geotechnical Instrumentation works
- Removal of Temporary Seawall
- Installations of Precast Culverts except sloping outfalls
- Maintenance of silt curtain & silt screen at sea water intake of HKIA
- Cellular structure – Connecting Arcs
- Cellular structure – Capping Beams
- Cellular structure – Backfill
- Rubble Mound Seawall
- Rock fill

Land-base works

- Maintenance works of Site Office at Works Area WA2
- Maintenance works of Public Works Regional Laboratory at Works Area WA3
- Maintenance of Temporary Marine Access at Works Area WA2
- Earthwork fill
- Jet grout columns works
- Surcharge removal & laying
- Deep Cement Mixing
- Removal of Temporary Seawall
- Vertical Band Drains

- Installations of Precast Culverts except sloping outfalls
- Geotechnical Instrumentation Works

A summary of monitoring and audit activities conducted in the reporting period is listed below:

24-hour Total Suspended Particulates (TSP) monitoring	65 sessions
1-hour TSP monitoring	65 sessions
Noise monitoring	53 sessions
Impact water quality monitoring	156 sessions
Impact dolphin monitoring	24 surveys
Joint Environmental site inspection	52 sessions

Breaches of Action and Limit Levels for Air Quality

One (1) Limit Level Exceedance of 24hr-TSP was recorded at AMS2 on 10 August 2015. After investigation, there is no adequate information to conclude the recorded exceedances are related to this Contract. No 1hr-TSP was recorded in the reporting year.

Breaches of Action and Limit Levels for Noise

For construction noise, no exceedance was recorded at all monitoring stations in the reporting year.

Breaches of Action and Limit Levels for Water Quality

Two (2) Action Level Exceedances of SS at IS10 and SR5 during Flood tide were recorded on 23 March 2015. No Action and Limit Level exceedance was recorded on other monitoring date in March 2015. After investigation, there is no adequate information to conclude the recorded exceedances are related to this Contract.

Two (2) Action Level Exceedances of suspend solids were recorded at IS5 and IS(Mf)6 during flood tide on 17 July 2015, the exceedances were confirmed after checking against relevant control station(s) during flood tide i.e. CS6, CSA and CS(Mf)5 following the Action and Limit Levels for Water Quality. After investigation, there is no adequate information to conclude the recorded exceedances are related to this Contract.

One (1) Action Level Exceedance of SS at SR7 during flood tide was recorded on 30 September 2015. After investigation, there is no adequate information to conclude the recorded exceedance is related to this Contract. No Action and Limit Level exceedance was recorded on other monitoring date in September 2015; one (1) Action Level Exceedance of SS at SR6 during flood tide was recorded on 2 October 2015. After investigation, there is no adequate information to conclude the recorded exceedance is related to this Contract. No Action and Limit Level exceedance was recorded on other monitoring date in October 2015; one (1) Action Level Exceedance of SS at IS(Mf)9 during flood tide was recorded on 6 Nov 2015. After investigation, there is no adequate information to conclude the recorded exceedance is related to this Contract. No Action and Limit Level exceedance was recorded on other monitoring date in November 2015.

One (1) action level impact water quality monitoring exceedance at monitoring station IS(Mf)11 has been recorded on 28 December 2015 during flood tide. After investigation, there is no adequate information to conclude the recorded exceedance is related to this Contract; 2 limit level exceedances of turbidity level were recorded at monitoring station SR4(N) and IS8 respectively on 5 February 2016; 2 action level exceedances of suspended solids were recorded at monitoring station SR4(N) and IS8 respectively on 5 February 2016. No exceedance at other monitoring stations in the between December 2015 and February 2016. After investigation, there is no adequate information to conclude the recorded exceedances are related to this Contract.

Triggering of Event and Action Plan for Impact Dolphin Monitoring

Four (4) Limit level exceedances were recorded in the reporting year for impact dolphin monitoring. The investigation results showed that although no unacceptable changes in environmental parameters of this Contract have been measured. Event and Action Plan for Impact Dolphin Monitoring was triggered. After investigation, there was no evidence that indicated that the reduced number of dolphins in NWL and NEL was

related solely to Contract works. It was also concluded the contribution of impacts due to the HZMB works as a whole (or individual contracts) cannot be quantified nor separate from the other stress factors. For investigation results please refer to Appendix L of the corresponding quarterly reports.

Implementation Status and Review of Environmental Mitigation Measures

Most of the recommended mitigation measures, as included in the EM&A programme, were implemented properly in the reporting year. Reference is made to ET's proposal of the omission of air monitoring station (AMS 6) dated on 1 November 2012 and EPD's letter dated on 19 November 2012 regarding the conditional approval of the proposed omission of air monitoring station (AMS 6) for Contract No. HY/2010/02. The aforesaid omission of Monitoring Station AMS6 was effective since 19 November 2012.

As informed by the premises owner of (AMS7A) - Chu Kong Air-Sea Union Transportation Co. LTD would not grant us the permission to install air quality monitoring equipment (High volume sampler) and conduct 1-hour TSP/24 hour TSP monitoring at the premises of Chu Kong Air-Sea Union Transportation Co. LTD after December 2015. In order to fulfil the EM&A requirement of this Contract, as permission to conduct impact air quality monitoring at the premise of Hong Kong SkyCity Marriott Hotel has been granted in December 2015, ET proposed relocation of air quality monitoring station (AMS7A) on 15 December 2015, with no further comment received from IEC on 15 December 2015 and no particular comment received from EPD on 21 December 2015, the impact air quality monitoring station AMS7A (Chu Kong Air-Sea Union Transportation Company Limited) has been relocated to AMS7 (Hong Kong SkyCity Marriott Hotel) on 30 December 2015. The impact air quality monitoring for December 2015 was conducted before the relocation of AQM Station from AMS7A to AMS7. The impact air quality monitoring for January and February 2016 were conducted at AMS7 (Hong Kong SkyCity Marriott Hotel), Action Level for air quality, as derived from the baseline monitoring data recorded at Hong Kong SkyCity Marriott Hotel will be adopted for this air quality monitoring location.

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

Moreover, regular review and checking on the construction methodologies, working processes and plants were carried out to ensure the environmental impacts were kept minimal and recommended environmental mitigation measures were implemented effectively.

Complaint, Notification of Summons and Successful Prosecution

Eight (8) environmental complaints were received in the reporting year.

No summons or successful prosecution was received in the reporting year.

1. INTRODUCTION

1.1 Background

1.1.1 Contract No. HY/2010/02 – Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities – Reclamation Work (here below, known as "the Contract") mainly comprises reclamation at the northeast of the Hong Kong International Airport of an area of about 130-hectare for the construction of an artificial island for the development of the Hong Kong Boundary Crossing Facilities (HKBCF), and about 19-hectare for the southern landfall of the Tuen Mun - Chek Lap Kok Link (TMCLKL).

1.1.2 The environmental impact assessment (EIA) reports (Hong Kong – Zhuhai – Macao Bridge Hong Kong Boundary Crossing Facilities – EIA Report (Register No. AEIAR-145/2009) (HKBCFEIA) and Tuen Mun – Chek Lap Kok Link – EIA Report (Register No. AEIAR-146/2009) (TMCLKLEIA), and their environmental monitoring and audit (EM&A) Manuals (original EM&A Manuals), for the Project were approved by Environmental Protection Department (EPD) in October 2009.

1.1.3 EPD subsequently issued the Environmental Permit (EP) for HKBCF in November 2009 (EP-353/2009) and the Variation of Environmental Permit (VEP) in June 2010 (EP-353/2009/A), November 2010 (EP-353/2009/B), November 2011 (EP-353/2009/C), March 2012 (EP-353/2009/D), October 2012 (EP-353/2009/E), April 2013 (EP-353/2009/F), August 2013 (EP-353/2009/G), January 2015 (EP-353/2009/H), July 2015 (EP-353/2009/I), February 2016 (EP-353/2009/J) and April 2016 (EP-353/2009/K). Similarly, EPD issued the Environmental Permit (EP) for TMCLKL in November 2009 (EP-354/2009) and the Variation of Environmental Permit (VEP) in December 2010 (EP-354/2009/A), January 2014 (EP-354/2009/B), December 2014 (EP-354/2009/C) and March 2015 (EP-354/2009/D).

1.1.4 The Project is a designated Project and is governed by the current permits for the Project, i.e. the amended EPs issued on 11 April 2016 (EP-353/2009/K) and 13 March 2015 (EP-354/2009/D) (for TMCLKL Southern Landfall Reclamation only).

1.1.5 A Contract Specific EM&A Manual, which included all Contract-relation contents from the original EM&A Manuals for the Contract, was issued in May 2012.

1.1.6 Ove Arup & Partners Hong Kong Limited (Arup) was appointed by Highways Department (HyD) as the consultants for the design and construction assignment for the Project's reclamation works (i.e. the Engineer for the Contract).

1.1.7 China Harbour Engineering Company Limited (CHEC) was awarded by HyD as the Contractor to undertake the construction work of the Contract.

1.1.8 Ramboll Environ Hong Kong Ltd. was employed by HyD as the Independent Environmental Checker (IEC) and Environmental Project Office (ENPO) for the Project.

1.1.9 AECOM Asia Co. Ltd. (AECOM) was appointed by CHEC to undertake the role of Environmental Team for the Contract for carrying out the EM&A works.

1.1.10 The construction phase of the Contract under the EPs was commenced on 12 March 2012 and will be tentatively completed by early Year 2017.

1.1.11 According to the Contract Specific EM&A Manual, there is a need of an EM&A programme including air quality, noise, water quality and dolphin monitoring and environmental site inspections. The EM&A programme of the Project commenced on 12 March 2012.

1.2 Scope of Report

1.2.1 This is the fourth Annual EM&A Review Report under the Contract No. HY/2010/02 Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities – Reclamation Works. This report presents a summary of the environmental monitoring and audit works, list of activities and mitigation measures proposed by the ET for the Contract from 1 March 2015 and 29 February 2016.

1.3 Contract Organization

1.3.1 The Contract organization structure is shown in Appendix A. The key personnel contact names and numbers are summarized in Table 1.1.

Table 1.1 Contact Information of Key Personnel

Party	Position	Name	Telephone	Fax
Engineer's Representative (ER) (Ove Arup & Partners Hong Kong Limited)	Chief Resident Engineer	Roger Marechal (Effective between 1 March 2015 – 15 September 2015 during the reporting year)	2528 3031	2668 3970
Engineer's Representative (ER) (Ove Arup & Partners Hong Kong Limited)	Chief Resident Engineer	Paul Appleton (Effective 16 September 2015 onward)	2528 3031	2668 3970
IEC / ENPO (Ramboll Environ Hong Kong Limited)	Independent Environmental Checker	Raymond Dai	5181 8401	3548 6988
	Environmental Project Office Leader	Y.H. Hui	3547 2133	3548 6988
Contractor (China Harbour Engineering Company Limited)	General Manager (S&E)	Daniel Leung	3157 1086	2578 0413
	Environmental Officer	Richard Ng (Left this project on 15 June 2015)	36932253	2578 0413
		Louie Chan (Effective on 15 June 2015)	36932254	2578 0413
	24-hour Hotline	Alan C.C. Yeung	9448 0325	--
ET (AECOM Asia Company Limited)	ET Leader	Echo Leong	3922 9280	2317 7609

1.4 Summary of Construction Works

1.4.1 The construction phase of the Contract under the EP commenced on 12 March 2012.

1.4.2 As informed by the Contractor, details of the major works carried out in the reporting year are listed below:-

Marine-base works

- Cellular structure installation and backfilling

- Capping Beams structures
- Conforming sloping seawalls
- Surcharge remove & laying
- Earthwork fill
- Deep Cement Mixing
- Jet grout columns works
- Geotechnical Instrumentation works
- Removal of Temporary Seawall
- Installations of Precast Culverts except sloping outfalls
- Maintenance of silt curtain & silt screen at sea water intake of HKIA
- Cellular structure – Connecting Arcs
- Cellular structure – Capping Beams
- Cellular structure – Backfill
- Rubble Mound Seawall
- Rock fill

Land-base works

- Maintenance works of Site Office at Works Area WA2
- Maintenance works of Public Works Regional Laboratory at Works Area WA3
- Maintenance of Temporary Marine Access at Works Area WA2
- Earthwork fill
- Jet grout columns works
- Surcharge removal & laying
- Deep Cement Mixing
- Removal of Temporary Seawall
- Vertical Band Drains
- Installations of Precast Culverts except sloping outfalls
- Geotechnical Instrumentation Works

1.4.3 The construction programme of the Contract is shown in Appendix B.

1.4.4 The general layout plan of the Contract site showing the detailed works areas is shown in Figure 1.

1.4.5 The environmental mitigation measures implementation schedule are presented in Appendix C.

2. SUMMARY OF EM&A PROGRAMME REQUIREMENTS

2.1 Monitoring Parameters

2.1.1 The Contract Specific EM&A Manual designated 4 air quality monitoring stations, 2 noise monitoring stations, 21 water monitoring stations (9 Impact Stations, 7 Sensitive Receiver Stations and 5 Control/Far Field Stations) to monitor environmental impacts on air quality, noise and water quality respectively. Pre-set and fixed transect line vessel based dolphin survey was required in two AFCD designated areas (Northeast and Northwest Lantau survey areas). The impact dolphin monitoring at each survey area should be conducted twice per month.

2.1.2 For impact air quality monitoring, monitoring locations AMS2 (Tung Chung Development Pier) and AMS7 (Hong Kong SkyCity Marriott Hotel) were set up at the proposed locations in accordance with Contract Specific EM&A Manual. The conditional omission of Monitoring Station AMS6 was effective since 19 November 2012. For monitoring location AMS3 (Ho Yu College), as proposed in the Contract Specific EM&A Manual, approval for carrying out impact monitoring could not be obtained from the principal of the school. Permission on setting up and carrying out impact monitoring works at nearby sensitive receivers, like Caribbean Coast and Coastal Skyline, was also sought. However, approvals for carrying out impact monitoring works within their premises were not obtained. Impact air quality monitoring was conducted at site boundary of the site office area in Works Area WA2 (AMS3A) respectively. Same baseline and Action Level for air quality, as derived from the baseline monitoring data recorded at Ho Yu College, was adopted for this alternative air quality location. Due to hand over of work site where the AMS3A and NMS3A was located, it was proposed to EPD on 27 December 2014 to relocate both monitoring station to alternative location AMS3B and NMS3B and approval of such relocation was given by the EPD on 2 January 2014. The monitoring stations AMS3A and NMS3A were renamed to monitoring station AMS3B and NMS3B respectively after relocation on 29 January 2014. The monitoring at AMS3B and NMS3B commenced at February 2014.

2.1.3 Reference is made to ET's proposal of relocation of air quality monitoring station (AMS7) dated on 2 February 2015, with no further comment received from IEC on 2 February 2015 and no objection received from EPD on 5 February 2015, the impact air quality monitoring station AMS7 (Hong Kong SkyCity Marriott Hotel) has been relocated to AMS7A (Chu Kong Air-Sea Union Transportation Company Limited) on 3 February 2015. Action Level for air quality, as derived from the baseline monitoring data recorded at Hong Kong SkyCity Marriott Hotel, was adopted for this alternative air quality location.

2.1.4 As informed by the premises owner of (AMS7A) - Chu Kong Air-Sea Union Transportation Co. LTD would not grant us the permission to install air quality monitoring equipment (High volume sampler) and conduct 1-hour TSP/24 hour TSP monitoring at the premises of Chu Kong Air-Sea Union Transportation Co. LTD after December 2015. In order to fulfil the EM&A requirement of this Contract, as permission to conduct impact air quality monitoring at the premise of Hong Kong SkyCity Marriott Hotel has been granted in December 2015, ET proposed relocation of air quality monitoring station (AMS7A) on 15 December 2015, with no further comment received from IEC on 15 December 2015 and no particular comment received from EPD on 21 December 2015, the impact air quality monitoring station AMS7A (Chu Kong Air-Sea Union Transportation Company Limited) has been relocated to AMS7 (Hong Kong SkyCity Marriott Hotel) on 30 December 2015. The impact air quality monitoring for December 2015 was conducted before the relocation of AQM Station from AMS7A to AMS7. The impact air quality monitoring for January and February 2016 were conducted at AMS7 (Hong Kong SkyCity Marriott Hotel), Action Level for air quality, as derived from the baseline monitoring data recorded at Hong Kong SkyCity Marriott Hotel will be adopted for this air quality monitoring location.

2.1.5 For impact noise monitoring, monitoring locations NMS2 (Seaview Crescent Tower 1) was set up at the proposed locations in accordance with Contract Specific EM&A Manual. However, for monitoring location NMS3 (Ho Yu College), as proposed in the Contract Specific EM&A Manual, approval for carrying out impact monitoring could not be obtained from the principal of the school. Permission on setting up and carrying out impact monitoring works at nearby sensitive receivers, like Caribbean Coast and Coastal Skyline, was also sought. However, approvals for carrying out impact monitoring works within their premises were not obtained. Impact noise monitoring was conducted at site

boundary of the site office area in Works Area WA2 (NMS3A) respectively. Same baseline noise level, as derived from the baseline monitoring data recorded at Ho Yu College was adopted for this alternative noise monitoring location.

2.1.6 In accordance with the Contract Specific EM&A Manual, twenty-one stations were designated for impact water quality monitoring. The nine Impact Stations (IS) were chosen on the basis of their proximity to the reclamation and thus the greatest potential for water quality impacts, the seven Sensitive Receiver Stations (SR) were chosen as they are close to the key sensitive receives and the five Control/ Far Field Stations (CS) were chosen to facilitate comparison of the water quality of the IS stations with less influence by the Contract/ ambient water quality conditions.

2.1.7 Due to safety concern and topographical condition of the original locations of SR4 and SR10B, alternative impact water quality monitoring stations, naming as SR4(N) and SR10B(N), were adopted, which are situated in vicinity of the original impact water quality monitoring stations (SR4 and SR10B) and could be reachable. Same baseline and Action Level for water quality, as derived from the baseline monitoring data recorded, were adopted for these alternative impact water quality monitoring stations.

2.1.8 The monitoring locations used during the reporting year are depicted in Figures 2, 3 and 4 respectively.

2.1.9 The Contract Specific EM&A Manual also required environmental site inspections for air quality, noise, water quality, chemical, waste management, marine ecology and landscape and visual impact.

2.2 Environmental Quality Performance (Action/Limit Levels)

2.2.1 The environmental quality performance limits (i.e. Action and/or Limit Levels) of air, water quality and Chinese White Dolphin monitoring were derived from the baseline air, baseline water quality monitoring results at the respective monitoring stations and baseline Chinese White Dolphin monitoring respectively, while the environmental quality performance limits of noise monitoring were defined in the EM&A Manual.

2.2.2 The environmental quality performance limits of air quality, noise, water and Chinese White Dolphin monitoring are given in Appendix D.

2.3 Environmental Mitigation Measures

2.3.1 Relevant environmental mitigation measures were stipulated in the Particular Specification and EPs (EP-353/2009/K and EP-354/2009/D) (for TMCLKL Southern Landfall Reclamation only) for the Contractor to adopt. A list of environmental mitigation measures and their implementation statuses are given in Appendix C.

3. MONITORING RESULTS

3.1 Air Quality Monitoring

3.1.1 Introduction

3.1.1.1. In accordance with the Contract Specific EM&A Manual, impact 1-hour Total Suspended Particulates (TSP) monitoring was conducted for at least three times every 6 days, while impact 24-hour TSP monitoring was carried out for at least once every 6 days at the 4 monitoring stations (AMS2, AMS3B, AMS6 and AMS7/7A[1]).

3.1.1.2. The monitoring locations for impact air quality monitoring are depicted in Figure 2. However, for AMS6 (Dragonair/CNAC (Group) Building), permission on setting up and carrying out impact monitoring works was sought, however, access to the premise has not been granted yet on this report issuing date.

3.1.1.3. Reference is made to ET's proposal of relocation of air quality monitoring station (AMS7) dated on 2 February 2015, with no further comment received from IEC on 2 February 2015 and no objection received from EPD on 5 February 2015, the impact air quality monitoring station AMS7 (Hong Kong SkyCity Marriott Hotel) has been relocated to AMS7A (Chu Kong Air-Sea Union Transportation Company Limited) on 3 February 2015 and monitoring work at AMS7A commenced on 5 February 2015. Action Level for air quality, as derived from the baseline monitoring data recorded at Hong Kong SkyCity Marriott Hotel, was adopted for this alternative air quality location.

3.1.1.4. ET proposed relocation of air quality monitoring station (AMS7A) on 15 December 2015, with no further comment received from IEC on 15 December 2015 and no particular comment received from EPD on 21 December 2015, the impact air quality monitoring station AMS7A (Chu Kong Air-Sea Union Transportation Company Limited) has been relocated to AMS7 (Hong Kong SkyCity Marriott Hotel) on 30 December 2015. The impact air quality monitoring for December 2015 was conducted before the relocation of AQM Station from AMS7A to AMS7. The impact air quality monitoring for January and February 2016 were conducted at AMS7 (Hong Kong SkyCity Marriott Hotel), Action Level for air quality, as derived from the baseline monitoring data recorded at Hong Kong SkyCity Marriott Hotel will be adopted for this air quality monitoring location.

3.1.1.5. The weather was mostly sunny and fine, with occasional cloudy and occasional rainy in the reporting period. The major dust source in the reporting period included construction activities from the Contract, as well as nearby traffic emissions.

3.1.1.6. The number of monitoring events and exceedances recorded in each month of the reporting period are presented in Table 3.1 and Table 3.2 respectively.

3.1.1.7. The baseline and impact air quality monitoring data are provided in the baseline monitoring report and monthly EM&A reports respectively. The graphical plots of the impact air quality monitoring results are provided in Appendix E. No specific trend of the monitoring results or existence of persistent pollution source was noted.

Table 3.1 Summary of Number of Monitoring Events for 1-hr & 24-hr TSP Concentration

Monitoring Parameter	Location	No. of monitoring events
		Mar 15 – Feb 16
1-hr TSP	AMS2	195
	AMS3B	195
	AMS7/7A	195
24-hr TSP	AMS2	65

[1] The monitoring stations AMS7 was renamed to monitoring station AMS7A after relocation on 3 February 2014. Monitoring work was resumed from AMS7A to AMS7 since January 2016.

	AMS3B	65
	AMS7/7A	65

Table 3.2 Summary of Number of Exceedances for 1-hr & 24-hr TSP Monitoring

Monitoring Parameter	Location	Level of Exceedance	Level of Exceedance
			Mar 15 – Feb 16
1-hr TSP	AMS2	Action	0
		Limit	0
	AMS3B	Action	0
		Limit	0
	AMS7/7A	Action	0
		Limit	0
	Total		***0***
24-hr TSP	AMS2	Action	0
		Limit	**1**
	AMS3B	Action	0
		Limit	0
	AMS7/7A	Action	0
		Limit	0
	Total		***1***

3.1.2 Environmental Mitigation Measures

3.1.2.1 Relevant Air mitigation measures, as recommended in the EIA Report were stipulated in the EM&A Manual for the Contractor to adopt. The implementation status of air quality mitigation measures is depicted in Appendix C.

3.1.3 Summary of Actions Taken in the event of Non-Compliance

3.1.3.1 Other than the mitigation measures implemented as mentioned in Appendix C, in the event of non-compliance, actions were taken in accordance with the Event-Action Plan in the EM&A Manual. The Contractor was notified immediately. Investigation was carried out within three working days of identification of non-compliance such as identifying the air pollution sources, checking the implementation status of the mitigation measures, etc., and measurement was repeated to confirm the investigation findings. Further investigation was carried out to identify the source of pollution when deemed necessary. In summary, no direct evidence between the exceedance at AMS2 and the Hong Kong Boundary Crossing Facilities - reclamation works could be established for all non-compliances and therefore no action was required to be taken.

3.1.4 Review of Reasons for and the implications of Non-Compliance

3.1.4.1 A total of 1 Limit Level exceedance was recorded during the 24-hr TSP impact monitoring period. No exceedance of 1-hour TSP exceedance level was recorded at all monitoring station during the 1-hr TSP impact monitoring period. Investigation into the possible causes of each exceedance was undertaken and reported in the respective monthly EM&A reports.

3.1.5 Environmental Acceptability of the Contract

3.1.5.1 Trend of 1-hour and 24-hour TSP

3.1.5.1.1 The 24-hour TSP monitoring results were well below the Action and Limit levels, despite the exceedance caused by non Contract activities at AMS2. The trend of TSP at AMS2, AMS3B and AMS7/7A were comparable to the baseline range and showed no noticeable deterioration of air quality during the impact monitoring period.

3.1.5.2 Correlation between exceedances with possible dust generating activities

3.1.5.2.1 Possible dust generating activities of the Contract did not cause any noticeable deterioration in air quality at Hong Kong Boundary Crossing Facilities – Reclamation Works. With proper implementation of air quality mitigation measures, the monitoring results showed no adverse air quality impact.

3.1.5.3 Comparison of EM&A results with EIA predictions

Table 3.3 Maximum Predicted TSP concentrations under the "Mitigated" scenario

ASR	Location	Predicted Daily Concentrations*		Average Impact 1-hour TSP Levels, μg/m^3	Average Impact 24-hour TSP Levels, μg/m^3
		1-hour	24-hour		
AMS7	Hong Kong SkyCity Marriott Hotel	344	92	80	72

*Extracted from Table 5-8 of the EIA report

3.1.5.3.1 At 1-hour and 24-hour TSP monitoring station at AMS7/7A, the average 24-hour TSP levels recorded in the EM&A programme were in similar magnitude as the Daily dust level predicted in the EIA.

3.1.6 Practicality and Effectiveness of the EIA process and the EM&A programme

3.1.6.1 Monitoring and auditing of air quality was recommended for the construction phase of the Project in the EIA to ensure no exceedance of the TSP standard at the sensitive receiver.

3.1.6.2 The air quality monitoring methodology was effective in monitoring the air quality impacts of the Contract. Baseline monitoring of 1-hour and 24-hour TSP helped to determine the ambient TSP levels at the sensitive receiver prior to commencement of construction works. During periods when there were possible dust generating construction activities, impact monitoring of 24-hour TSP helped to determine whether the Contract caused unacceptable air quality impacts on the sensitive receiver. As the scope of the Contract mainly includes reclamation works during the reporting period and dust generation from the construction activities such as wind erosion and sand filling is the key concern during the construction phase. The monitoring of TSP was therefore considered to be cost effective for the Contract.

3.1.6.3 All recommended mitigation measures were applicable to the Contract. As discussed above, the Contract did not cause unacceptable air quality impacts. However, as the nature of the Contract is reclamation works of approximately 130 hectares of land in size, some mitigation measures in practice were generally focused on dust generating activities only. Nevertheless, the mitigation measures implemented were effective and efficient in controlling air quality impacts.

3.1.6.4 Monitoring and audit of 24-hour TSP levels had ensured that any deterioration in air quality was readily detected and timely actions taken to rectify any non-compliance. Assessment and analysis of 24-hour TSP results collected throughout the baseline and impact monitoring periods also demonstrated the environmental acceptability of the Contract. Weekly site inspections had ensured that the EIA recommended air quality mitigation measures were effectively implemented. The EM&A program is considered to be cost effective.

3.1.7 Conclusion

3.1.7.1 Air quality monitoring for the Contract was conducted during the baseline and impact monitoring periods. Key construction activities including geotextile laying, stone column installation, stone blanket laying, construction of cellular structure and backfill cellular structure. The trend of 1-Hour TSP and 24-hour TSP was comparable to the baseline range and showed no noticeable deterioration of air quality during the monitoring period. Although exceedances were recorded, they were isolated and short-term events. There is no evidence of long-term deteriorating trend.

3.1.7.2 The average 24-hour TSP levels recorded at AMS7/7A in EM&A programme were in similar magnitude with the Daily dust level predicted in the EIA. No TSP level was predicted by the Project EIA at AMS2 and AMS3B and therefore, no comparison of EM&A data with EIA predictions could be made. Air quality mitigation measures implemented were effective in controlling air quality impacts.

3.2 Noise Monitoring

3.2.1 Introduction

3.2.1.1 Impact noise monitoring was conducted at the 2 monitoring stations (NMS2 and NMS3B) for at least once per week during 07:00 – 19:00 in the reporting period.

3.2.1.2 The monitoring locations used during the reporting period are depicted in Figure 2.

3.2.1.3 Major noise sources during the noise monitoring included construction activities of the Contract and nearby traffic noise.

3.2.1.4 The number of impact noise monitoring events and exceedances are summarized in Table 3.4 and Table 3.5 respectively.

Table 3.4 Summary of Number of Monitoring Events for Impact Noise

Monitoring Parameter	Location	No. of monitoring events
		Mar 15- Feb 16
Noise	NMS2	53
	NMS3B	53

Table 3.5 Summary of Number of Monitoring Exceedances for Impact Noise

Monitoring Parameter	Location	Level of Exceedance	No. of Exceedance(s)
Noise	NMS2	Action	0
		Limit	0
	NMS3B	Action	0
		Limit	0
	Total		**0**

3.2.1.5 The graphical plots of the trends of the monitoring results are provided in Appendix F. No specific trend of the monitoring results or existence of persistent pollution source was noted.

3.2.2 Environmental Mitigation Measures

3.2.2.1. Relevant noise mitigation measures, as recommended in the EIA Report were stipulated in the EM&A Manual for the Contractor to adopt. The implementation status of noise mitigation measures is depicted in Appendix C. Construction Noise Permits were applied and complied with when construction works were carried out during restricted hours.

3.2.3 Non-compliance (exceedances) of the Environmental Quality Performance Limits (Action and Limit Levels)

3.2.3.1 Summary of Non-compliance (Exceedances)

3.2.3.1.1 Table 3.5 summarised the number exceedance recorded at each monitoring station throughout the impact monitoring period. There was no exceedance recorded at both NMS2 and NMS3B.

3.2.3.2 Summary of Actions Taken in the event of Non-Compliance

3.2.3.2.1 No event of non-compliance of construction noise was recorded in the reporting period.

3.2.3.3 Review of Reasons for and the implications of Non-Compliance

3.2.3.3.1 No event of non-compliance of construction noise was recorded in the reporting period.

3.2.3.3.2 In summary, the average impact noise levels recorded in the reporting period were generally within the range of the predicted construction noise levels in the Project EIA.

3.2.4 Environmental Acceptability of the Contract

3.2.4.1 Trend of Measured Noise Level (Leq)

3.2.4.1.1 All the noise monitoring results for all monitoring stations were below the Action and Limit levels. The trend showed no noticeable noise impact from the Contract during the impact monitoring period.

3.2.4.2 Correlation between exceedances with possible noise generating activities

3.2.4.2.1 No Exceedance was recorded for all monitoring stations. The impact noise levels recorded were generally similar to the predicted construction noise levels in the Project EIA.

3.2.5 Comparison of EM&A results with EIA predictions

3.2.5.1 The EIA predicted that noise emitted by the use of Powered Mechanical Equipment (PME) on site would be the major source of noise impact during construction. The Construction Noise Impact at Noise Sensitive Receivers are summarised in Table 3.6 (extracted from Table 6-9 of the EIA Report).

Table 3.6 Construction Noise Impact at Noise Sensitive Receivers

NSR	Location	Predicted Noise Levels, dB(A)	
		Total Noise Impacts, dB(A)	Criterion, dB(A)
NMS2	Seaview Crescent Tower 1	74	75

3.2.5.2 During the construction period of the Contract, no exceedances were received in the impact monitoring period. The measured impact noise levels of the Contract for each monitoring station are summarised in Table 3.7 for comparison with EIA.

Table 3.7 Summary of Construction Noise Monitoring Results in the Reporting Period

NSR	Location	Average, dB(A), $L_{eq,30\ mins}$	Range, dB(A), $L_{eq,30\ mins}$	Limit Level, dB(A), $L_{eq,30\ mins}$
NMS2	Seaview Crescent Tower 1	66.9	62.8 – 70.7*	75
NMS3B	Site Boundary of Site Office Area at Works Area WA2	65.9	55 – 68.5*	70

* +3dB(A) Façade correction included

3.2.5.3 The average impact noise levels recorded in EM&A during impact monitoring were all within the range of the predicted construction noise levels in the EIA Report.

3.2.6 Practicality and Effectiveness of the EIA process and the EM&A programme

3.2.6.1 Monitoring and auditing of noise was recommended for the construction phase of the Project in the EIA process to ensure compliance with the appropriate criterion at the receivers.

3.2.6.2 The noise monitoring methodology was effective in monitoring the noise impacts of the Contract. Baseline noise monitoring determined the ambient noise levels at the sensitive receivers prior to commencement of construction works. During periods when possible noise generating construction activities were on-going, impact noise monitoring would determine whether the Contract caused adverse noise impacts on the sensitive receivers. The monitoring methodology which focus on $L_{eq30\ minute}$ therefore considered to be cost effective for the Contract.

3.2.6.3 Noise mitigation measures recommended in the EIA Report were stipulated in the EM&A Manual for the Contractor to implement during the construction phase of the Project. The list of noise mitigation measures is depicted in Appendix C. All recommended mitigation measures were applicable to the Contract. As discussed above, the Contract did not cause adverse noise impacts to the receivers. Therefore, the mitigation measures implemented were effective and efficient in controlling noise impacts.

3.2.6.4 Monitoring and audit of noise levels ensured that any noise impact to the receivers would readily be detected and timely actions could be taken to rectify any non-compliance. Assessment and analysis of noise results collected throughout the baseline and impact monitoring periods also demonstrated the environmental acceptability of the Contract. Weekly site inspections ensured that the EIA recommended noise mitigation measures were effectively implemented. The EM&A program is considered to be cost effective.

3.2.7 Conclusion

3.2.7.1 The trend of L_{eq} was comparable to the baseline range and showed no noticeable noise impact during the impact monitoring period. Although exceedance was recorded, there was no evidence of long-term increasing trend. The average impact noise levels recorded in EM&A programme were all lower than the construction noise levels predicted in the EIA.

3.3 Water Quality Monitoring

3.3.1 Introduction

3.3.1.1 Impact water quality monitoring was conducted 3 times per week during mid-ebb and mid-flood tides at 21 water monitoring stations (9 Impact Stations, 7 Sensitive Receiver Stations and 5 Control/Far Field Stations).

3.3.1.2 The monitoring locations used during the reporting period are depicted in Figure 3.

3.3.1.3 Number of impact water quality monitoring events and exceedances recorded in the reporting period at each impact station are summarized in Table 3.8 and Table 3.9 respectively.

Table 3.8 Summary of Number of Monitoring Events for Impact Water Quality

Monitoring Parameter	Tide	No. of monitoring events
		Mar 15 - Feb 16
Water Quality	Mid-Ebb	156
	Mid-Flood	156

Table 3.9 Summary of Water Quality Exceedances in Mar 15-Feb 16

Station	Exceedance Level	DO (S&M)		DO (Bottom)		Turbidity		SS		Total	
		Ebb	Flood	Ebb	Flood	Ebb	Flood	Ebb	Flood	Ebb	Flood
IS5	Action	0	0	0	0	0	0	0	**(1) 17 July 2015**	0	**(1) 17 July 2015**
	Limit	0	0	0	0	0	0	0	0	0	0
IS(Mf)6	Action	0	0	0	0	0	0	0	**(1) 17 July 2015**	0	**(1) 17 July 2015**
	Limit	0	0	0	0	0	0	0	0	0	0
IS7	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0
IS8	Action	0	0	0	0	0	0	0	**(1) 5 Feb 16**	0	**(1) 5 Feb 16**
	Limit	0	0	0	0	0	**(1) 5 Feb 16**	0	0	0	**(1) 5 Feb 16**
IS(Mf)9	Action	0	0	0	0	0	0	0	**(1) 6 Nov 15**	0	**(1) 6 Nov 15**
	Limit	0	0	0	0	0	0	0	0	0	0
IS10	Action	0	0	0	0	0	0	0	**(1) 23 Mar 15**	0	**(1) 23 Mar 15**
	Limit	0	0	0	0	0	0	0	0	0	0
IS(Mf)11	Action	0	0	0	0	0	0	0	**(1) 28 Dec 15**	0	**(1) 28 Dec 15**
	Limit	0	0	0	0	0	0	0	0	0	0
IS(Mf)16	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0
IS17	Action	0	0	0	0	0	0	0	0	0	0

Station	Exceedance Level	DO (S&M)		DO (Bottom)		Turbidity		SS		Total	
		Ebb	Flood	Ebb	Flood	Ebb	Flood	Ebb	Flood	Ebb	Flood
	Limit	0	0	0	0	0	0	0	0	0	0
SR3	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0
SR4(N)	Action	0	0	0	0	0	0	0	**(1) 5 Feb 16**	0	**(1) 5 Feb 16**
	Limit	0	0	0	0	0	**(1) 5 Feb 16**	0	0	0	**(1) 5 Feb 16**
SR5	Action	0	0	0	0	0	0	0	**(1) 23 Mar 15**	0	**(1) 23 Mar 15**
	Limit	0	0	0	0	0	0	0	0	0	0
SR6	Action	0	0	0	0	0	0	0	**(1) 2 Oct 2015**	0	**(1) 2 Oct 2015**
	Limit	0	0	0	0	0	0	0	0	0	0
SR7	Action	0	0	0	0	0	0	0	**(1) 30 Sept 2015**	0	**(1) 30 Sept 2015**
	Limit	0	0	0	0	0	0	0	0	0	0
SR10A	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0
SR10B (N)	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0
Total	**Action**	0	0	0	0	0	0	0	**10**	**10**	
	Limit	0	0	0	0	0	**2**	0	0	2	

Note: S: Surface;
M: Mid-depth;

3.3.1.4 Please refer to the monthly EM&A report (March 2015 to February 2016) accordingly for the details of the captioned exceedances.

3.3.1.5 The graphical plots of the trends of the monitoring results are provided in Appendix G. No specific trend of the monitoring results or existence of persistent pollution source was noted.

3.3.2 Environmental Mitigation Measures

3.3.2.1 Relevant water quality mitigation measures, as recommended in the EIA Report were stipulated in the EM&A Manual for the Contractor to adopt. The implementation status of water quality mitigation measure is depicted in Appendix C.

3.3.3 Non-compliance (exceedances) of the Environmental Quality Performance Limits (Action and Limit Levels)

3.3.3.1 Summary of Non-compliance (Exceedances)

3.3.3.1.1 Table 3.9 summarised the number of dissolved oxygen, turbidity and suspended solids exceedances recorded at each sensitive receiver station throughout the impact monitoring period. A total of twelve exceedances were recorded during the entire construction period with 10 Action level exceedances and 2 Limit level exceedances.

3.3.4 Review of Reasons for and the implications of Non-Compliance

3.3.4.1 Ten (10) Action Level exceedances of measured suspended solids (SS) values (in mg/L) and two (2) Limit Level exceedances of Turbidity (in NTU) were recorded during the reporting period. After investigation, all impact water quality exceedances were considered not related to this Contract. For details of investigation please refer to monthly EM&A Report of this Contract.

3.3.4.2 After review of the investigation results of the water quality exceedances (for detail of investigations please refer to section 4 of monthly EM&A report (Mar 15 to Feb 16), ambient conditions were considered to have effects on the water quality monitoring results. Exceedances were considered to be due local effects in the vicinity of the monitoring station where exceedance was recorded and after investigation, there is no adequate information to conclude the recorded exceedances are related to this Contract.

3.3.5 Environmental Acceptability of the Contract

3.3.5.1 Trend of water quality

Dissolved Oxygen

3.3.5.1.1 The dissolved oxygen levels recorded in the impact monitoring period showed a seasonal trend in which lower DO levels were recorded during the wet season and higher DO levels were recorded during the dry season. One reason for this seasonal trend may have been the increase in water temperature during the wet season leading to decreases in the solubility of oxygen in water and vice versa during the dry season. The trend of dissolved oxygen levels was presented in Appendix G. Other than an isolated action level exceedance, the trend of dissolved oxygen levels at each monitoring stations in Appendix G did not show any noticeable deterioration of dissolved oxygen levels.

Turbidity

3.3.5.1.2 The turbidity levels were fairly distributed at most monitoring station during the reporting period. While trend of turbidity levels at impact station IS5, IS17, IS7, IS8 and IS10 were more fluctuated and a higher turbidity level were recorded March 2015 and but no apparent trend was observed. The trend of turbidity levels of each monitoring station was shown in Appendix G. Despite two isolated events, turbidity levels of all monitoring stations were still lower than the Action Level during the monitoring period.

Suspended Solids

3.3.5.1.3 The trend of suspended solid levels of each impact monitoring station was shown similar with the control stations of each tide, i.e , slightly fluctuated between the period from September 2015 to February 2016. The trend of suspended solid levels of each monitoring station was shown in Appendix G. Despite few isolated events, suspended solids levels of all monitoring stations were still lower than the Action Level during the monitoring period.

3.3.6 Correlation between exceedances with possible marine construction activities

3.3.6.1 With proper implementation of water quality mitigation measures, marine construction activities of the Contract were not observed to cause any unacceptable water quality impacts to the sensitive receiver stations.

Table 3.10 Summary of number of water quality exceedances per monitoring month

Month	Imported Fill* m^3/month	Depth averaged DO	Depth averaged Turbidity	Depth averaged SS	Total
Mar-15	376,294	0	0	**2**	**2**
Apr-15	240,642	0	0	0	0
May-15	743,731	0	0	0	0
Jun-15	368,595	0	0	0	0
Jul-15	35,549	0	0	**2**	**2**
Aug-15	23,625	0	0	0	0
Sep-15	34,520	0	0	**1**	**1**
Oct-15	9,246	0	0	**1**	**1**
Nov-15	0	0	0	**1**	**1**
Dec-15	0	0	0	**1**	**1**
Jan-16	0	0	0	0	0
Feb-16	0	0	**2**	**2**	**4**

*Only marine filling is counted

3.3.6.2 As shown in Table 3.10, there was no apparent correlation between the filling rates and the number of water quality exceedances recorded per monitoring day.

3.3.6.3 For dissolved oxygen, the numbers of dissolved oxygen exceedances show no noticeable deterioration of dissolved oxygen or correlation between filling rate and dissolve oxygen exceedance.

3.3.6.4 For turbidity, the numbers of turbidity exceedances show no noticeable deterioration of turbidity or correlation between filling rate and turbidity exceedance.

3.3.6.5 For suspended solids, the numbers of suspended solids exceedances show no noticeable deterioration of suspended solid or correlation between filling rate and suspended exceedance.

3.3.6.6 The trend did not show any correlation between water quality impact and the filling rates during the impact monitoring period.

3.3.6.7 With proper implementation of water quality mitigation measures and additional mitigation measures, marine construction activities of the Contract were not observed to cause any unacceptable water quality impacts to the sensitive receiver stations.

3.3.7 Comparison of EM&A results with EIA predictions

3.3.7.1 Results from the sensitive receiver stations were compared with the EIA predictions for the sensitive receivers in the following manner:

- WSR 27 - San Tau Beach SSSI with SR3
- WSR 22c- Tai Ho Wan Inlet (outside) with SR4(N)

- WSR 25 - Cooling water intake at HK International Airport with SR5

Dissolved oxygen (DO)

3.3.7.2 According to Section 9.10.7.4 of the EIA Report, the dissolved oxygen depletion from the loss of sediment to suspension during the construction of the reclamation for HKBCF was calculated to be 0.4 mg/L at WSR25. Since, as stated in the Table 9.6a of the EIA report the DO of the NW Western water is generally high with average ranges between 5.7 – 6.8 mg/L and depletion will not be detrimental to the ecological systems of the area. The average Depth averaged DO record at SR5 is 6.2 mg/L in May 2015 when the filling rate/month is the highest during the reporting period and therefore no significant dissolved oxygen depletion from was noted during impact monitoring.

3.3.7.3 The baseline dissolved oxygen levels and the level of depletion during impact monitoring at each sensitive receiver are summarised in Tables 3.11.

Table 3.11 Comparison of depth averaged dissolved oxygen levels (Surface & Mid-depth, Bottom depth) during baseline and impact monitoring period (mgL^{-1})

Sensitive Receiver in Baseline	Associated Location during Impact Monitoring	Monitoring Depth	Baseline mean		Impact mean (May 2015)		Depletion during Impact Monitoring	
			Mid-ebb	Mid-flood	Mid-ebb	Mid-flood	Mid-ebb	Mid-flood
SR3	SR3*	Surface & mid	6.8	6.7	6.4	6.5	-0.4	-0.2
		Bottom	-	6.2	-	-	-	-
SR4^	SR4(N)**	Surface & mid	6.1	6.3	6.6	6.4	0.5	0.1
		Bottom	6.0	6.2	6.4	6.4	0.4	0.2
SR5	SR5**	Surface & mid	6.4	6.3	6.3	6.2	-0.1	-0.1
		Bottom	6.1	6.1	6.2	6.1	0.1	0
SR6	SR6**	Surface & mid	6.6	6.5	6.4	6.3	-0.2	-0.2
		Bottom	6.2	6.1	6.3	6.2	0.1	0.1
SR7	SR7**	Surface & mid	6.3	6.0	6.2	6.5	-0.1	0.5
		Bottom	6.1	5.9	6.2	6.4	0.1	0.5
SR10A	SR10A	Surface & mid	6.0	6.0	6.0	5.9	0	-0.1
		Bottom	5.7	5.8	5.9	5.7	0.2	-0.1
SR10B^	SR10B(N)**	Surface & mid	6.1	6.0	6.1	6.0	0	0
		Bottom	6.2	5.8	6.0	5.8	-0.2	0

^Due to safety issue, the water quality monitoring location of SR4 has been changed to SR4(N) and water quality monitoring location of SR10B has been changed as SR10B(N) during impact monitoring.
*Only mid-depth station of DO were monitored at SR3 in mid-ebb during baseline monitoring, in both mid-ebb and mid-flood during impact monitoring as the water depth less than 3m.
** The mid-depth station of DO was omitted at SR4(N) during impact monitoring as the water depth is less than 6m.

3.3.7.4 Comparing baseline averaged dissolved oxygen levels with EM&A results; no significant depletion was found at all sensitive receiver locations. There was no adverse effect on dissolved oxygen concentrations as a result of the filling works of the Contract as the depleted dissolved oxygen concentrations did not breach the Water Quality Objectives nor did they exceed the AL levels adopted for the Contract.

Suspended solids (SS)

3.3.7.5 The EIA determined the acceptability of elevations in suspended sediment concentrations based on the Water Quality Objectives. The Water Quality Objectives for suspended sediments for the North Western Water Control Zones were defined as being an allowable elevation of 30% above the background. The ambient and tolerance values for suspended sediment concentrations in the vicinity of sensitive receivers adopted in Table 9.11 of the EIA Report are presented in Table 3.12.

Table 3.12 Ambient and Tolerance Values for Suspended Sediment Concentrations (mgL^{-1}) in the Vicinity of Sensitive Receivers adopted in the EIA

Sensitive Receiver in EIA Report	Associated EPD Station	Ambient value (90th Percentile)		Tolerance value (30% Tolerance)	
		Dry Season	Wet Season	Dry Season	Wet Season
WSR 27	NM5,6,8	8.3	5.6	2.5	1.7
WSR 22c	NM1,2,3	5.5	3.7	1.7	1.1
WSR 25	NM1,2,3	5.5	3.7	1.7	1.1

3.3.7.6 The use of single layer silt curtain system has been modelled in the 2012 mitigated scenario. The predicted suspended sediment concentrations under the 2012 mitigated scenario of the Contract as shown in Table 9.21 in the EIA Report are summarised in Table 3.13.

Table 3.13 Calculated Elevations in Suspended Sediment Concentrations at Sensitive Receivers (mgL^{-1}) under the 2012 mitigated scenario from the EIA

Sensitive Receiver in EIA Report	Associated Location during Impact Monitoring	Calculated Elevations	
		Dry Season	Wet Season
WSR 27	SR3	0.0	0.0
WSR 22c	SR4(N)	0.1	0.0
WSR 25	SR5	3.0	2.7

3.3.7.7 For suspended solids, as the baseline monitoring was conducted in October 2011 which is the transitional season or just the start of dry season while no data were recorded in the wet season, direct comparison with the EIA predictions could not be made. The comparison of EM&A results with baseline results in the following paragraphs was based on the criteria of acceptability of 30 percent elevations above the background as defined in the Water Quality Objectives which was also used in scenario predictions in the EIA.

3.3.7.8 Baseline water quality monitoring for the Contract was conducted during the transitional season. The mean baseline suspended solids level at each sensitive receiver and 30 percent of the baseline mean are presented in Table 3.14.

Table 3.14 Baseline suspended solids levels and 30% of baseline mean (mgL^{-1})

Associated Location in Baseline Report	Baseline mean		30% of baseline mean	
	Mid-ebb	Mid-flood	Mid-ebb	Mid-flood
SR3	14.0	16.3	4.2	4.9
SR4	11.3	12.2	3.4	3.7
SR5	10.6	11.9	3.2	3.6
SR6	11.9	11.9	3.6	3.6
SR7	11.4	10.4	3.4	3.1
SR10A	10.2	10.2	3.1	3.1
SR10B	11.5	11.1	3.5	3.3

3.3.7.9 The average elevations in suspended solids concentrations of May 2015 were compared with the baseline levels are provided in Table 3.15.

Table 3.15 Average suspended solids levels at sensitive receivers (mgL^{-1}) in May 2015

Sensitive Receiver in Baseline	Associated Location during Impact Monitoring	Impact SS Mean (in May 2015)			
		Mid-ebb	Elevation	Mid-flood	Elevation
SR3	SR3	7.12	-6.88	7.51	-8.79
SR4	SR4(N)*	5.30	-6.00	7.67	-4.53
SR5	SR5	5.92	-4.68	6.02	-5.88
SR6	SR6	6.09	-5.81	4.98	-6.92
SR7	SR7	5.49	-5.91	4.55	-5.85
SR10A	SR10A	5.40	-4.80	4.25	-5.95
SR10B	SR10B(N)*	4.49	-7.01	6.81	-4.29

*Due to safety issue, the water quality monitoring location of SR4 & SR10B have been changed to SR4(N) & SR10B(N) respectively during impact monitoring.

3.3.7.10 With the highest filling rate in May 2015, the elevations in suspended solids levels were below 30 percent of the baseline suspended solids levels at all stations. Regional influences would have effects on the deterioration in water quality than activities at the work site. Exceedances were considered to be due local effects in the vicinity of the monitoring station where exceedance was recorded and after investigation, there is no adequate information to conclude the recorded exceedances are related to this Contract.

3.3.8 Practicality and Effectiveness of the EIA process and the EM&A programme

3.3.8.1 Monitoring and audit of water quality was recommended for the construction phase of the Contract in the EIA process to ensure any deterioration in water quality would be readily detected and timely action could be taken to rectify the situation.

3.3.8.2 Baseline water quality monitoring determined the ambient water quality in the region prior to commencement of construction works. Impact water quality monitoring helped to determine whether the Contract would cause unacceptable water quality impacts on the sensitive receivers.

3.3.8.3 Water quality mitigation measures were recommended in the EIA and a list of water quality mitigation measures were stipulated in the EM&A Manual for the Contractor to implement during the construction phase of the Project. The list of water quality mitigation measures is depicted in Appendix C. All recommended mitigation measures were applicable to the Contract. Precautionary measures including installation of silt curtains were also implemented to prevent migration of suspended solids towards the sensitive receivers. Monitoring results showed that water quality at sensitive receivers was affected by regional water quality influenced by tidal and climatic conditions, local impacts from the vicinity of the receivers. As discussed above, the Contract was not observed to cause unacceptable water quality impacts to the sensitive receivers. Therefore, the mitigation measures implemented were effective and efficient in controlling water quality impacts.

3.3.8.4 Monitoring and audit of water quality ensured that any water quality impacts to the receivers would be readily detected and timely actions could be taken to rectify any non-compliance. Assessment and analysis of water quality results collected throughout the baseline, impact and post-Contract monitoring periods also demonstrated the environmental acceptability of the Contract. Weekly site inspections ensured that the EIA recommended and additional water quality mitigation measures were effectively implemented.

3.3.9 Conclusion

3.3.9.1 Water quality monitoring for the Contract was conducted during the baseline and impact monitoring periods. For turbidity and suspended solids levels, a total of 12 exceedances were recorded. Assessment indicated that there was no correlation between the filling rates and the number of water quality exceedances recorded. Exceedances were considered to be due local effects in the vicinity of

the monitoring station where exceedance was recorded and after investigation, there is no adequate information to conclude the recorded exceedances are related to this Contract.

3.3.9.2 The DO and SS levels recorded at SR3, SR4 (N) and SR5 were in similar magnitude as predicted in the Project EIA. No comparison could be made from SR6 to SR10B(N) as predictions were not made in the Project EIA. For turbidity, as no prediction was made in the Project EIA, no comparison could be made. With the implementation of water quality mitigation measures recommended in the EIA and additional water quality mitigation measures implemented during the EM&A programme, marine construction activities of the Contract did not cause any unacceptable water quality impacts to the sensitive receivers.

3.4 Dolphin Monitoring

3.4.1 Introduction

3.4.1.1 In accordance with the requirements specified in Section 9.3 of the EM&A Manuel, monthly vessel-based surveys were conducted to monitor impacts on the Indo-Pacific humpback or Chinese white dolphin (*Sousa chinensis*). The surveys were conducted in the areas known as NEL and NWL and travelled the transect lines depicted in Figure 4.

3.4.1.2 The total transect length for NEL and NWL combined is approximately 111km although some Contract and other works at times have caused temporary truncation of some lines, particularly lines 1,2,9 and 10. Due to the presence of deployed silt curtain systems at the site boundaries of the Contract, some of the transect lines shown in Figure 5 could not be fully surveyed during the regular survey. Transect 10 is reduced from 6.4km to approximately 3.6km in length due to the HKBCF construction site.

3.4.1.3 Coordinates for transect lines 1, 2, 7, 8, 9 and 11 have been updated inrespect to the Proposal for Alteration of Transect Line for Dolphin Monitoring approved by EPD on 19 August 2015.Therefore the total transect length for both NEL and NWL combined is reduced to approximately 108km.

3.4.1.4 Surveys were conducted twice per month, using combined line transect and photo-identification techniques. The research team comprised qualified and experienced researchers and Marine Mammal Observers (MMO).

3.4.2 Environmental Mitigation Measures

3.4.2.1 Relevant mitigation measures for dolphins, as recommended in the EIA Report were stipulated in the EM&A Manual for the Contractor to adopt. The implementation status of mitigation measures for dolphins is depicted in Appendix C.

3.4.3 Summary of Actions Taken in the event of Non-Compliance

3.4.3.1 The enhanced EAP for CWD monitoring with numerical AL/LL were implemented in the reporting period.

3.4.3.2 Four (4) Limit level exceedance**s** were recorded in the reporting period for impact dolphin monitoring. (Table 3.16). The investigation results showed that although no unacceptable changes in environmental parameters of this Contract have been measured. The Event and Action Plan for Impact Dolphin Monitoring was triggered. For investigation results please refer to Appendix L of the corresponding quarterly reports. For information on environmental acceptability of the Contract see Section 3.4.13

Table 3.16 Summary of the STG/ANI Quarterly Values

Quarterly period		STG*	ANI**	Level Exceeded
March 2015- May 2015	**NEL**	0	0	Limit Level
	NWL	1.6	5.2	
June 2015- August 2015	**NEL**	0	0	Limit Level
	NWL	1.7	4.7	
September 2015- November 2015	**NEL**	0	0	Limit Level
	NWL	1.9	3.8	
December 2015- February 2016	**NEL**	0	0	Limit Level
	NWL	1.2	4.5	

* STG represents groups of dolphins (recorded on effort)
** ANI represents number of individual dolphins (recorded on effort)

3.4.4 Summary of Survey Effort and Dolphin Sightings

3.4.4.1 Vessel-based surveys were conducted monthly from March 2015 to February 2016, i.e., during the fourth year of the construction phase. A total of 48 survey days were completed between March 2015-February 2016 (Appendix H: Table 1). A total of 2615.7km were completed of which 2572 km were conducted under favourable conditions (defined as Beaufort Sea State 3 or better and with visibility of >1km) (Appendix H: Table 2). In the first year of impact monitoring (2012-13), 49 survey days were completed (total travelled 2627.5km; under favourable conditions 2601.4km). In the second year of impact monitoring (2013-14), 50 survey days were completed (total travelled 2667.1km; 2595.4km under favourable conditions). In the third year of impact monitoring (2014-15), 48 survey days were completed (total travelled 2641.7km; 2637.1km conducted under favourable conditions). In all four years, >98% of the track length covered was completed under favourable conditions. Between March 2015-February 2016, a total of 43 dolphin sightings were recorded, 26 as on effort and 17 as opportunistic[2] (Appendix H: Figure 1). In the first year of impact monitoring, a total of 203 dolphin sightings were recorded, 145 as on effort and 58 as opportunistic. In the second year, a total of 135 dolphin sightings were recorded, 91 on effort and 44 opportunistic. In the third year, a total of 72 dolphin sightings were recorded, 46 on effort and 26 opportunistic. The total number of sightings has decreased between each year of impact monitoring.

3.4.5 Distribution

3.4.5.1. Sightings of dolphins were divided into quarterly periods. The highest number of sightings were made between June 2015 – November 2015. The lowest number of sightings were recorded in December 2015–February 2016. No sightings were made in the NEL section of the survey area (Appendix H: Figure 2). In NWL and adjacent waters, dolphins were consistently distributed in areas of rocky, reefy shoreline or where there was a marked depth contour. These areas are the Sha Chau and Lung Kwu Chau Marine Protected Area (SCLKCMPA), the adjacent maritime border of Hong Kong SAR and the Peoples Republic of China (PRC) and the Tai O area. Since long term monitoring has been initiated by AFCD, there has been a regular and year round occurrence of dolphins in these areas of northern Lantau.

3.4.6 Encounter Rate

3.4.6.1. Encounter rates of “on effort” sightings (i.e. groups) per area per quarter for the year March 2015 to February 2016 were calculated[3]. For NWL, quarterly dolphin encounter rates were similar between March-November with a slight peak during the period September–November (Appendix H: Figure 3). Within NWL, quarterly encounter rates ranged from 3 to 6 groups (Year 1); 5 to 9 groups (Year 2); 2 to 4 groups (Year 3) and one group (Year 4) per 100km on effort (figures rounded). Years 3 and 4 of construction works showed the lowest encounter rates.

3.4.7. Group Size

3.4.7.1. The majority of all sightings recorded were of less than 5 individuals (79%). Larger groups were seen in southern NWL and in, or adjacent to, SCLKCMPA. There was no seasonal pattern although with so few sightings patterns may be difficult to discern. The two mother and calf groups sighted were both in groups of five or more individuals. Two of the large groups sighted were noted as exhibiting multiple behavior which incorporated feeding and two groups were recorded as feeding. Four groups were recorded as travelling and one group was milling near an anchored fishing vessel. Groups of five or more were sighted throughout the year (Appendix H: Figure 4).

3.4.8. Habitat Use

[2] “On effort” sightings are classified as those sightings which are made when the vessel is on the designated trackline and observers are actively searching. “Opportunistic sightings” are those sightings which occur while travelling between tracklines, additional sightings made when travelling back to a transect line after photographing a dolphin group and/or any dolphins noted when transiting between areas or on passage to transect lines.

[3] The same calculation as implemented in the AFCD Annual Monitoring Reports was used; [(total ‘on effort” sightings/total track conducted in Beaufort Sea State 3 or better)*100] for both NEL and NWL separately and for the two areas combined.

3.4.8.1 The EM&A Manuel stipulated that surveys be conducted in such a way as to be comparable to the baseline survey for this Contract (September -November 2011) and to the long term annual monitoring conducted by AFCD. As such, analyses of density per survey effort (DPSE) and sightings per survey effort (SPSE) were calculated in accordance with the methodology detailed in AFCD reports (e.g., AFCD 2012[4]). The survey areas are divided into 1km x 1km squares and the relative number of sightings and densities are calculated for each block. NEL has 55 blocks and NWL has 90 blocks (only blocks of more than 0.75km^2 are included). For the period March 2015-February 2016, DPSE was calculated in six categories, ranging from low use to high use. Neither NEL nor NWL have any areas of high use (> 60 DPSE); 0% (NEL) and 10% (NWL) as moderate use (20.1-60 DPSE); and 100% (NEL) and 90% (NWL) as low use (< 20 DPSE). (Appendix H: Figure 5).

3.4.8.2 For the period March 2015-February 2016, SPSE was calculated in six categories, ranging from low use to high use. NEL and NWL have 0% and 2% of each respective area classified as high use (> 15 SPSE); 0% of NEL and 10% NWL and; as moderate use (5.1-15 SPSE); and 100% (NEL) and 88% (NWL) as low use (< 5 SPSE) (Appendix H: Figure 6).

3.4.8.3 For the period February 2011 – January 2012, DPSE was calculated in six categories, ranging from low use to high use. NEL and NWL have 4% and 17% of each respective area classified as high use (> 60 DPSE); 20% (NEL) and 16% (NWL) as moderate use (20.1-60 DPSE); and 76% (NEL) and 68% (NWL) as low use (< 20 DPSE) (Appendix H: Figure 7). These figures were compared to impact monitoring data for March 2013-February 2014, March 2014-February 2015 and March 2015-February 2016 (Table 3.17). For DPSE in NWL, there was an increase in low use grid cells, a decrease in moderate use cells and a decrease in high use cells. Noting the geographical location of the cells between advanced and impact monitoring, there are less high use cells in the centre of the NWL area indicating that habitat utilisation of this area has decreased. In NEL, all cell use was low during impact monitoring and there were no on effort sightings in NEL during March 2015-February 2016.

3.4.8.4 For the period February 2011 – January 2012, SPSE was calculated in six categories, ranging from low use to high use. NEL and NWL have 9% and 22% of each respective area classified as high use (> 15 SPSE); 31% (NEL) and 27% (NWL) as moderate use (5.1-15 SPSE); and 60% (NEL) and 51% (NWL) as low use (< 5 SPSE) (Appendix H: Figure 7). These figures were compared to impact monitoring data for March 2013-February 2014 and March 2014-February 2015 (Table 3.17). For SPSE in NWL, there has been an increase in low use grid cells and a reduction in both moderate and high use area. This correlates with that observed for DPSE, unsurprisingly as they are derived from interrelated data. For SPSE in NEL, this is also true, with an observed increase in low use areas and a concomitant decrease in high and moderate use cells, when compared to impact monitoring. No on effort sightings were made in NEL during March 2015-February 2016 and only one sighting in the previous year (2014-15).

Table 3.17 Comparison of low, moderate and high habitat utilisation in NEL and NWL between years 2011-12; 2013-14, 2014-15 and 2015-16 (in %)

	Advanced*	2013-14	2014-15	2015-16	Advanced*	2013-14	2014-15	2015-16
Frequency of Use	NWL				NEL			
	DPSE							
<20	68	76	85	90	76	100	100	100
20-60	16	14	13	10	20	0	0	0
> 60	17	10	2	0	4	0	0	0
	SPSE							
<5	51	72	86	88	60	91	98	100
5-15	27	20	11	10	31	9	2	0
>15	22	8	3	2	9	0	0	0

[4] Agriculture, Fisheries and Conservation Department (AFCD) 2012. *Annual Marine Mammal Monitoring Programme April 2011-March 2012.)* The Agriculture, Fisheries and Conservation Department, Government of the Hong Kong SAR.

*Advance = advance baseline monitoring conducted between 2011 and 2012.

3.4.9 Mother and Calf Pairs

3.4.9.1 Two mothers and the offspring of individuals identified from the first year of impact monitoring (2012) were sighted during the year 2015-16. Two mother and calves born in year 2015-16 were also sighted, both of which were previously identified (Appendix H: Figure 8). Although it is often difficult to identify calves, using high resolution images and the identity of mothers, it is sometimes possible to track poorly marked individual calves, while they still stay in close proximity to their mother. Mother-offspring bonds are known to last years, sometimes decades, in delphinid species. During 2015-18, HZMB 023 and her offspring HZMB 022 were sighted on two occasions each, once together and once each without the other. This juvenile is well marked and was born prior to the impact monitoring period and estimated to be five to six years old. HZMB 044 is a well-known individual and is recorded in AFCD records as NL98. She was first sighted with a new born calf in 2012 and the calf was individually identified in 2014-15 as HZMB 125. Both were seen together on a single occasion in January 2016. A female identified as HZMB 047 was initially recorded in September 2012 and was sighted with a new born calf in March 2015. A female identified as HZMB 114 was initially recorded in October 2013 and was sighted with a new calf in November 2015 (Appendix H: Figure 9). There were no sightings of the three known females, HZMB 026, HZMB 098 and HZMB 116, who were identified with calves previously during impact monitoring.

3.4.10 Activities Associated with Fishing Boats

3.4.10.1 Four distinctive behavioural categories were defined; “boat association”, “feeding”, “travelling” and “surface active”. Three other categories were also defined; “multiple” (more than one behaviour was observed at one time), “other” and “unknown” (Appendix H: Figure 10). From spring (March – May 2014) onwards throughout the year, the frequency of feeding decreased and travelling and multiple activities increased. Multiple activities included both travelling and feeding behavior. When compared to the previous three years of impact monitoring, feeding is an important activity although its frequency appears to have decreased and travelling times have increased in 2015-16 (Appendix H: Figure 11). Again, it is noted that as sightings numbers become less, patterns can be difficult to interpret with confidence.

3.4.10.2 In 2012-13, the area of Lung Kwu Chau in NWL was highlighted as an important feeding area as it was again in 2013-14, 2014-15 and 2015-16. The area to the south of NWL is also important for feeding/surface active behaviours. As the impact monitoring progresses, a decreasing trend in the overall number of dolphin sightings in NEL and mid NWL has become apparent (Appendix H: Figure 12).

3.4.11 Photo-Identification Catalogue

3.4.11.1 A total of 119 dolphins comprise the photo identification catalogue established specifically for the HZMB Contract (Appendix H: Table 3). Not all dolphins photographed are identifiable as only individuals with unambiguous marks, cuts, wounds, injuries and/or pigmentation or with uniquely shaped fins can be included in the photo-identification catalogue. There are 15 dolphins which have been sighted on six days or more during impact monitoring, nine (9) of which are known from the AFCD catalogue (HZMB 001 [WL46]; HZMB 002 [WL111]; HZMB 011 [EL01]; HZMB 041 [NL24]; HZMB 044 [NL98]; HZMB 51 [NL213]; HZMB 054 [CH34]; HZMB 083 [NL136]; HZMB 098 [NL104]). The highest number of re-sightings recorded during impact monitoring surveys is 12 (HZMB 002 and HZMB 054), excluding multiple sightings made on the same day.

3.4.12 Dolphin Abundance

3.4.12.1 No sightings were recorded in NEL. For NWL, the overall abundance estimate is 15 [95% CI 4.3, 32.0])

3.4.13 **Environmental Acceptability of the Contract**

3.4.13.1 It was recognised in the EIA that the HZMB is adjacent to several areas of importance to the dolphin population of Hong Kong. As such, it was stipulated in the EM&A Manuel for the HKBCF that a suitable analytical technique be proposed and implemented so that significant changes could be detected. A multi-parameter spatial (sometimes known as predictive) model was proposed and reviewed by management authorities and analyses developed as and when data has been made available. The purpose of the model was to make predictions of future habitat use, derived from baseline information, and compare these predictions to actual observations. Environmental covariates, such as salinity, temperature, depth, etc., which may also be drivers of dolphin habitat use, were also tested within spatial models so as to either eliminate or incorporate any influence these may have. The model thus incorporated environmental variables salinity, temperature, turbidity, depth, tidal state, time of day, as well as information associated with the sighting, e.g., group size, behavior, boat association. Following a meeting in October 2015, ENPO suggested that the information regarding density surface modelling presented in Quarterly EM&A Reports and Annual EM&A Review Reports be provided as a separate report with details for review before incorporating it into the EM&A reports. This ET agreed all such data and results be removed and provided separately.

3.4.14 **Summary**

3.4.14.1. The variable nature of habitat use, group size, behavior, mother and calf occurrence and encounter rates by small delphinids and the ability to detect significant change in small populations is a challenge faced by many research studies. Historical data from AFCD also shows such variability (in AFCD annual monitoring reports). A view of individual distribution and behavioural activities for the reporting year do show that areas of importance, such as Lung Kwu Chau, are still being frequented, behavioural activities appear similar to that known from pre construction information, although travelling frequency appears to be on the increase, and that at least two calves identified in 2012-13 have survived to 2015-16. In 2013-14, an emerging trend for decreased use of NEL was noted and no sightings were seen in NEL in 2015-16. In addition, a decrease in sightings in the mid-section of NWL is also noted.

3.4.15 **Verification of Impact Statements Stated in EIA and Supporting Documentation**

3.4.15.1 The statements made in the EIA and supporting documents are descriptive and do not provide a quantitative framework against which to compare data gathered during impact monitoring for the purposes of verifying impact on CWD. Further, some statements made pertain only to the operational phase of HZMB (that is, when all in water construction works are completed) and not the explicit impacts of the many different construction activities which are required to construct HZMB. In the interests of thoroughness, any impact statements made in key documents relevant to HKBCF are extracted here and commented on with regards to the data gathered from this the reporting year of construction activities at HKBCF.

3.4.15.2 The EIA report for HZMB[5] makes several statements with regards to impact on cetaceans during the construction phase in sections pertaining to water quality and bioaccumulation:

3.4.15.3 Construction Phase: In section 10.6.4.25 of the EIA report, it is stated that, "Project has low potential to cause increased sewage discharge, therefore this potential impact is insignificant. The potential water quality impacts due to site runoff, sewage from workforce and wastewater from various construction activities, and accidental spillage would be controlled through the implementation of suitable mitigation measures, including temporary drainage system, chemical toilets, etc"

3.4.15.4 This Contract has largely maintained water quality objectives as described in the EM&A Manual except where noted in Section 7.1.5 (see here for full details). The exceedances noted were short in duration and localised to the Project site. These incidents were short in duration and when the Contractor was notified, actions were promptly taken and no further exceedances were noted.

3.4.15.5 In Section 10.6.4.37 of the EIA report, it is stated that, "Thus insignificant bioaccumulation impacts from the construction of HKBCF and HKLR are predicted for CWD (except perhaps with the exception of silver – as per 10.6.4.32)"

3.4.15.6 It is noted that for both of the above impact predictions to be investigated more thoroughly, long term trends in pathogens and toxin loads in CWD should be analysed. This has recently been completed for the Pearl River Delta (PRD) population of CWD and it is noted that both bioaccumulation and biomagnification are significantly higher than populations elsewhere (Gui *et al* 2014[6]). There has been no updated toxin analyses of Chinese white dolphin in the reporting year.

3.4.15.7 In Section 10.7.2.8 of the EIA report, it is stated that, "164 ha of sea area (138 ha reclamation and 26 ha works area) will be lost during construction due to HKBCF reclamation near the northeast Airport Island. Although the sea area is only utilised by limited number of individual CWD, it is of moderate ecological value due to the close proximity of the dolphin hotspot at the Brothers Islands. Moderate impact is anticipated and mitigation measures are required. As the habitat loss due to construction would largely be carried forward to the operational phase and become permanent habitat loss, mitigation measures for operational phase (see Section 10.7.4) will mitigate this impact as well."

3.4.15.8 At HKBCF, moderate impact is anticipated but the degree or type of impact is not quantified in any numerical, spatial or temporal scale. In the second year of construction activities at HKBCF there was an emerging pattern of decreased habitat use as indicated by encounter rate and number and type of "high" density cells in NEL. As anticipated in the second year (2013-14) report, this became more apparent in the third year (2014-2015) and NEL recorded no sightings in year four (2015-16) although a single sighting adjacent to HKBCF was made by MMO and site staff in November 2015. AFCD data indicate that higher than usual dolphin mortality has continued from 2014-15 to 2015-16. Again it is suggested that appropriate review of these data should be conducted to investigate any possible relationship with both anthropogenic activities and natural processes in the dolphins habitat. The impact of "permanent habitat loss" as a result of the HKBCF reclamation (Section 10.7.4. of the EIA), is stated to be fully mitigated by the establishment of a Marine Protected Area after the construction phase of the Project is completed. This predication cannot be assessed until the HZMB operational phase starts and the Marine Park Area is established.

[5] Ove Arup & Partners Hong Kong Ltd 2009 HZMB – HKBCF & HKLR EIA Report. 24037-REP-125-01 Pages 83-5, 97, 115
[6] Gui, D., Yu, R., He, X., Tu, Q., Chen, L. and Wu, Y. Bioaccumulation and biomagnification of persistent organic pollutants in Indo-Pacific humpback dolphins (*Sousa chinensis*) from the Pearl River Estuary, China. *Chemosphere* 114:106-113

3.4.15.9 The Ecological Baseline Survey[7] defines an Impact Index which is used to predict impact for each area through which the HZMB structure passes. HKBCF is located in the area defined as the "Northeast Lantau Section (NELS) – from the eastern edge of the airport platform to its connection to the North Lantau Highway".

3.4.15.10 It is noted that this report states (Section 5.7.10) that "it is imperative that cumulative impacts along the whole alignment [of HZMB] are thoroughly assessed".

3.4.15.11 A reference to cumulative impacts is made in Section 10.7.6 of the EIA. Section 10.7.6.3 is relevant to HKBCF. This refers only to the cumulative impact of the permanent loss of CWD habitat and no other impacts of either the construction or operational phase of the HZMB Contract. Nonetheless, the conclusion of this section states that the setting up of a marine park "effectively mitigates" CWD habitat loss. As such, this prediction cannot be verified until such a time as a marine park is established.

3.4.15.12 A cumulative assessment has been published using data gathered prior to the initiation of HKBCF construction activities (Marcotte *et al*, 2015[8]). This assessment notes that the increase in high speed ferry traffic has been concomitant to a significant decrease in dolphins sighted in NEL and adjacent NWL waters. Several other threats were considered in this study, however, high speed ferries were the most significant impact. Therefore, this study showed a significant decline in dolphins in NEL and adjacent areas was ongoing for a decade prior to commencement of HKBCF activities. The high speed ferry traffic has continued to increase in the area as HKBCF and other Projects have commenced[9].

3.4.16 Practicality and Effectiveness of the EM&A Programme

3.4.16.1 Monitoring and auditing of marine mammals was recommended for the construction phase of HKBCF to evaluate impact on marine mammals.

3.4.16.2 Combined line transect and photo-identification methodologies have been used as part of the AFCD long term monitoring programme for over 15 years. As such, a long term data set can be used to establish trends in population distribution and abundance over the long term.

3.4.16.3 The AFCD annual monitoring reports for the period 2011-2012, 2012-13, 2013-14 and 2014-15 have all stated that a significant decline had been detected in population abundance in the NEL area over the last decade. Only long term inter annual abundance estimates can be used to detect such changes. This decline was noted prior to construction had begun at HKBCF and has now been attributed to high speed ferries by an independent study (see Section 3.4.6.4.2).

3.4.17 Conclusion

3.4.17.1 Between March 2015 and February 2016, dolphins have been almost entirely absent from NEL and parts of NWL are no longer frequently used.

3.4.17.2 Marine mammal monitoring was conducted between March 2015 and February 2016 in accordance with EM&A Manuel methodologies. These methodologies have been invaluable in the past in determining both broad scale and long term patterns of distribution, abundance, association, habitat use and behavioral activities. There is historically much variation in these parameters and most observations to date have concurred with observations documented previously with the now emerging trend of decreased habitat use within NEL. As AFCD Monitoring has reported a significant decline in this area prior to HKBCF construction activities, it is difficult to distinguish how much HKBCF activities may have influenced this existing decline.

[7] Agreement No. MW 01/2003. Hong Kong- Zhuhai- Macao Bridge: Hong Kong Section and the North Lantau Highway Connection: Ecological Baseline Survey. Final 9 Month Ecological Baseline Survey Report the (p 42 – 43)
[8] Marcotte, D., Hung, S. K., & Caquard, S. 2015. Mapping cumulative impacts on Hong Kong's pink dolphin population. *Ocean & Coastal Management*, *109*, 51-63
[9] http://www.mardep.gov.hk/en/publication/pdf/portstat_1_y_d2.pdf

3.4.17.3 Four (4) Limit level exceedances were recorded in the reporting period for impact dolphin monitoring. The investigation results showed that although no unacceptable changes in environmental parameters of this Contract have been measured. Event and Action Plan for Impact Dolphin Monitoring was triggered. After investigation, there was no evidence that indicated that the reduced number of dolphins in NWL and NEL was related solely to Contract works. It was also concluded the contribution of impacts due to the HZMB works as a whole (or individual contracts) cannot be quantified nor separate from the other stress factors. Please also refer to the attachment for full investigation result. For investigation results please refer to Appendix L of the corresponding quarterly reports.

4. ENVIRONMENTAL SITE INSPECTION AND AUDIT

4.1.1 Site Inspection

4.1.1.1 Site Inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures for the Contract. In the reporting period, 52 site inspections were carried out. Recommendations on remedial actions were given to the Contractors for the deficiencies identified during the site audits.

4.1.1.2 Particular observations during the site inspections are described below:

Air Quality

4.1.1.3 Dust was observed when vehicle passes through access roads at portion C2c and E2 and when vehicle passed through road at Portion C1a and Portion D; fugitive dust was observed when vehicle was drove pass portion C2c and road at Portion B, E2 and during rock filling; fugitive dust was observed at northeastern part of the site and at northeastern part of the site. the Contractor was reminded to provide sufficient dust control measures to prevent generation of fugitive dust. The Contractor provided watering or other preventative measures to prevent generation of fugitive dust. (Closed)

4.1.1.4 Fugitive dust was observed generated when spoil was excavated at east side of the reclamation works, unloading of rocks and at Portion E1. The Contractor was reminded to sprayed dusty materials with water or a dust suppression chemical immediately prior to loading or unloading or transfer operation and the Contractor was advised to provide dust control measures when material during excavated of the spoil. The Contractor applied water on exposed soil during excavation of spoil. (Closed)

4.1.1.5 Fugitive dust was observed at Portion E1. The Contractor was reminded to provide effective dust control measures such as sufficient watering on road. Photo record shows that watering was provided on site to prevent generation of fugitive dust. The Contractor was reminded to provide sufficient measures to prevent generation of fugitive dust. (Reminder)

4.1.1.6 Exposed soil was observed at Portion D, the Contractor was reminded to provide sufficient measures to prevent site runoff of turbid water to the sea or to area which is outside the site boundary. (Reminder)

4.1.1.7 Dark smoke emission from plant/equipment was observed at Portion D and C1a; from pelican barge was observed at Portion C2b and emitted from excavator was observed at Portion D, the Contractor was reminded to ensure dark smoke emission from plant/equipment should be avoided. The Contractor prevented dark smoke emission of plant/equipment. (Closed)

4.1.1.8 Dark smoke was observed from an excavator at Portion C2c. The Contractor was reminded to maintain to equipment in good condition. Photo record shows that dark smoke was no longer observed from the excavator and barge near Portion C2c. The Contractor was reminded to check the dark smoke of machineries and ensure proper implementation of air quality mitigation measures. (Reminder)

4.1.1.9 Dark smoke emission was observed from plant/equipment of derrick barge and pelican barge and on at Portion E1, the Contractor was advised to provide measures to avoid emission of dark smoke. The Contractor subsequently provided measures to avoid emission of dark smoke. (Closed)

4.1.1.10 Dark smoke was observed at portion C2a when a vessel was in operation. The Contractor was reminded to prevent. (Reminder)

4.1.1.11 Watering was observed during site walk, the Contractor was reminded to continue to provide sufficient dust control measures and ensure generation of fugitive dust is prevented. (Reminder)

4.1.1.12 Rock material was observed dry; the Contractor was reminded to moisten to prevent generation of fugitive dust during operation. The Contractor provided dust control measure on barge. (Closed)

4.1.1.13 Cement was observed on surface of grout production facility; the Contractor was reminded that to ensure generation of fugitive dust is prevented and the entire grouting process and materials unloading, loading and transfer shall be performed within an enclosed system. (Reminder)

4.1.1.14 Road was observed moistened. The Contractor was reminded to continue to provide control measures to prevent generation of fugitive dust. (Reminder)

4.1.1.15 The Contractor was reminded to continue to provide sufficient dust control to prevent generation of fugitive dust. (Reminder)

4.1.1.16 Fugitive dust was observed when vehicle was drove pass the road, during grout production process and during rock filling process. The Contractor was reminded to provide sufficient dust control to prevent generation of fugitive dust. The Contractor subsequently provided dust control measures to the area. (Closed)

4.1.1.17 Two idling generators were found at Portion B without proper NRMM labels.The Contractor was reminded to label the generator properly. Subsequently, the Contractor properly labelled one of the generator and the Contractor was reminded to label the another generator properly. As informed by the Contractor, another idle generator was provided with NRMM label and removed from site. (Closed)

Noise

4.1.1.18 The panel of the air compressor at Portion C2c was observed open during operation. The Contractor was reminded to keep all flaps and/or panels closed during operation. The Contractor subsequently closed the panels. (Closed)

4.1.1.19 The Contractor was reminded to provide the facilities with acoustic decoupling measures in accordance with the proposed mitigation measures for noise stated in the EP-353/2009/H. (Reminder)

Water Quality

4.1.1.20 Defect on part of the pipe for transferring DCM material was observed on barge (天駿 3). The Contractor was reminded to ensure all pipes in a good condition and provide sandbags along the edge of the barge in order to prevent such materials from entering nearby water (Closed)

4.1.1.21 Tipping of rock material to the sea was observed at Portion D, the Contractor was reminded to keep the tipping point as low as possible. (Reminder)

4.1.1.22 Insufficient sand bags was observed on idle grout production facilities, the Contractor was reminded to provide enough sand bags before operation of the grout production facilities to prevent potential runoff. (Reminder)

4.1.1.23 Insufficient sand bund was observed at Portion C2b when DCM was conducted. The Contractor was reminded to provide sufficient bunding to prevent potential runoff. The Contractor subsequently enhanced sand bund at the works area. (Closed)

4.1.1.24 Defects were observed on the secondary enclosure of grout delivery pipes. The Contractor was reminded to provide effective measure to contain any potential leakage of wastewater/grout and prevent them from releasing to the sea. The Contractor enhanced the measures to contain any potential leakage of wastewater/grout and prevent them from releasing to the sea. (Closed)

4.1.1.25 Grout mixture was observed on land at the connection point of pipes. The Contractor was reminded to ensure no grout material is released to the sea. (Reminder)

4.1.1.26 Pipes were observed at Portion E1, the Contractor was reminded to provide preventive measures and avoid potential release of turbid water. (Reminder)

4.1.1.27 Disconnection of secondary protective pipe was observed, the Contractor was reminded provide effective measures to avoid any wastewater discharged from the grouting production process or domestic sewage to the sea. The Contractor subsequently provided maintenance to the disconnected pipes. (Closed)

4.1.1.28 Delivery pipe of floating grout production facilities was observed not fully enclosed. The Contractor was reminded to ensure full enclosure and prevent any potential runoff. The Contractor subsequently provided full enclosure to delivery pipes of the grout production facilities. (Closed)

4.1.1.29 Soil was observed accumulated one side of the vessel, the Contractor was reminded to clear them regularly prevent runoff and keep the site clean and tidy. (Reminder)

4.1.1.30 Soil was observed at area near water outlet. The Contractor was reminded to provide measures such as sand bags to prevent silty water at water outlet. (Reminder)

4.1.1.31 Silt plume was observed at the northern part of the Portion C2b inside area enclosed by perimeter silt curtain. The Contractor was reminded to properly implement water quality mitigation measures. The Contractor provided measures such as rock bund the edge of Portion C2b. The contractor was reminded to ensure silt plume is prevented (Reminder)

4.1.1.32 Oil was observed in water adjacent to Portion C2c. The Contractor was reminded to clear the oil and take actions in accordance with the Spill Response Plan. The oil was cleared by the Contractor using oil spill kit and the used spill kit was disposed of by the Contractor as chemical waste. (Closed)

4.1.1.33 Turbid water was observed to flow from land area to seawall. The Contractor was advised to provide measures to prevent turbid water from going to the sea area. The Contractor provided measure to prevent the turbid water from going into the sea area from the land area. (Closed)

4.1.1.34 A deformed drip tray was observed on site. The Contractor was reminded to provide drip tray which can effectively contain potential leakage of oil. The Contractor subsequently provided drip tray without defect. (Closed)

4.1.1.35 Gaps between vehicle accesses were observed on the landing barge near Portion E1. The Contractor was reminded to provide measure to prevent potential runoff on the landing barge. (Reminder)

4.1.1.36 Material was observed stockpiled on cells at Portion E1 and near Portion C2a. The Contractor was reminded to provide preventative measures to the works process to prevent runoff. The Contractor subsequently removed the material from Portion E1. (Closed)

4.1.1.37 The Contractor was reminded to provide preventive measures, such as liner and bunding, for the stockpile of excavated materials at Portion C2a and C2b. (Reminder)

4.1.1.38 Runoff was observed onsite and silt plume was observed by at the sea area by the seawall near Portion C2a. The Contractor was advised to provide control measures to prevent runoff. The Contractor subsequently provided measures to prevent runoff. (Closed)

4.1.1.39 Turbid water was observed at Portion E1, the Contractor was reminded to prevent runoff of turbid water. The Contractor subsequently provided measures to prevent runoff of turbid water. (Closed)

4.1.1.40 Silt curtain was observed temporarily disconnected during maintenance. The Contractor was reminded the silt curtain should be reinstated after maintenance is completed. The Contractor subsequently collected the silt curtain. (Reminder)

4.1.1.41 The Contractor was reminded to continue to carry out maintenance as necessary and ensure integrity of the perimeter silt curtain at all time. (Reminder)

Chemical and Waste Management

4.1.1.42 A generator was placed on ground without provision of drip tray on barge (天駿 3), chemical containers were placed on bare ground without provision of drip tray at Portion C2C. The Contractor was reminded to provide the generator with drip tray to retain oil leakage, if any. The Contractor removed the generator on barge on barge (天駿 3). (Closed)

4.1.1.43 Generator was observed without drip tray. The Contractor was reminded to provide mitigation measures such as drip tray to all generators. Contractor removed the generator from the area. (Closed)

4.1.1.44 Generator was observed without drip tray on barge San Han Bo 210, the Contractor was reminded to provide mitigation measure such as drip tray or bunding to generator. The Contractor subsequently provided bunding to the generator. (Closed)

4.1.1.45 Oil drum was observed outside drip tray at Portion C1 and on barge Wing Hop Lee, were observed without drip tray at workshop area; oil drums were observed without drip tray on barge. The Contractor was reminded to provide mitigation measure such as drip tray to oil drum. The Contractor provided drip tray to oil drums. (Closed)

4.1.1.46 Oil drums was observed without drip tray at Portion C2b, on barge 振明 93 and on barge 港龍, the Contractor was reminded to provided drip tray to oil drums. The Contractor subsequently removed the oil drums from the concerned area. (Closed)

4.1.1.47 Oil drums without drip trays were observed barge 利航 8, on deck surface of barge Evershine18 and barge 振明 and material supplying vessel and on deck surface of barge DL4; generator was observed without drip tray. The Contractor was reminded to provide mitigation measures such as drip tray to oil drums. The Contractor removed the oil drums on deck surface of barge Evershine18 and barge 振明. The contractor removed the generator or provided drip tray to the oil drum on ground. The material supplying vessel where the oil drums were observed left the site. (Closed)

4.1.1.48 Oil drums without drip trays were observed on deck surface of barge DL4. The Contractor was reminded to provide mitigation measures such as drip tray to oil drums. The Contractor removed the oil drum. (Closed)

4.1.1.49 Oil drums without drip trays were observed at portion C2a. The Contractor was reminded to provide mitigation measures such as drip tray to oil drums. The oil drums were removed by the Contractor. (Closed)

4.1.1.50 Idle air compressors were observed without drip tray, the Contractor was reminded to provide trip tray to air compressor before use of air compressor. (Reminder)

4.1.1.51 A moveable lighting was observed without drip tray, the Contractor was reminded to provide preventive measures such as trip tray to the machine. The Contractor subsequently removed the machine from the area. (Closed)

4.1.1.52 Oil water mixture was observed accumulated inside bunding. The Contractor was reminded to regularly clear the oil water mixture accumulated inside drip tray. Subsequently, the Contractor removed the oil water mixture accumulated inside drip tray. (Closed)

4.1.1.53 It was observed that sand was loaded inside drip trays. The Contractor was reminded to clear the sand inside drip tray. The Contractor subsequently cleared the sand inside drip tray. (Closed)

4.1.1.54 It was observed that water and oil mixture accumulated inside drip tray at Portion E2. The Contractor was reminded to clear the sand inside drip tray. The Contractor subsequently cleared the water and oil mixture accumulated inside drip tray. (Closed)

4.1.1.55 Bags of inert waste were observed on site, the Contractor was reminded to collect and dispose them of properly and regularly. (Reminder)

4.1.1.56 General refuses were observed at Portion D and Portion E. The Contractor was reminded to regular collect and dispose of the general refuses on site to keep the site clean and tidy. The Contractor subsequently collected and removed the general refuses at Portion D. (Closed)

4.1.1.57 Oil drum were observed without drip tray on barge GD852, the Contractor was reminded to provide drip tray to oil drums. The oil drums were subsequently removed by the Contractor. (Closed)

4.1.1.58 A generator was observed without drip tray, the Contractor was reminded to provide drip tray to generator. The Contractor subsequently provided drip tray to generator. (Closed)

4.1.1.59 Chemical container was observed placing on bare ground at Portion C2b.The Contractor should provide drip trays as proper chemical container storage measure. Subsequently, the Contractor provided drip tray to oil drums. (Closed)

4.1.1.60 The Contractor was reminded to remove the water mixture which accumulated inside the drip trays at Portion C2a and dispose of as chemical waste properly. The Contractor subsequently removed the water mixture inside drip tray. (Closed)

4.1.1.61 Stagnant water was observed accumulated inside a drip tray on Barge Luen Hing 368; Oil and water mixture was observed on barge 振明 18, s informed by the Contractor, the barge 振明 18 had left construction site of HKBCF reclamation works. The Contractor was reminded to clear the water/oil water mixture regularly to prevent potential runoff. (Reminder)

4.1.1.62 It was observed that liquid was accumulated inside drip tray, the Contractor was reminded to regularly clear the water accumulated inside drip tray to prevent potential runoff. The Contractor subsequently rectified the situation and cleared the water accumulated inside drip tray. (Closed)

4.1.1.63 It was observed that sand was loaded inside drip tray. The Contractor was reminded to clear the sand inside drip tray. (Pending for Contractor's rectification)

4.1.1.64 A deformed drip tray was observed on site. The Contractor was reminded to provide drip tray which can effectively contain potential leakage of oil. (Pending for Contractor's rectification)

4.1.1.65 Defective drip tray was observed on barge, the Contractor was advised to provide drip tray without defects on barges. The Contractor rectified the defect of the drip tray. (Closed)

4.1.1.66 Water was observed inside drip tray at workshop area, the Contractor was reminded to clear the water accumulated inside drip tray to prevent runoff. The Contractor subsequently cleared the water accumulated in the drip tray. (Closed)

4.1.1.67 General refuse and bags of general refuse were observed on land area of Portion D and C1a; was observed at entrance area of workshop at portion C1a and C2c.. The Contractor was reminded to regularly clear the general refuse and provide rubbish bin with cover/lid. The Contractor cleared the general refuse on land area of Portion D and C1a. (Closed)

4.1.1.68 Oil stain was observed on ground at workshop area; the Contractor was reminded to clean the oil stain and disposed them of as chemical waste, subsequently, the Contractor cleared the oil stain and disposed them of as chemical waste. (Closed)

4.1.1.69 Floating debris on water surface at Portion D was observed. The Contractor was reminded to remove the debris on sea regularly. The Contractor removed the debris on sea. (Closed)

4.1.1.70 Temporary waste storage or rubbish bin was not provided on land area of Portion B beside Portion E2. To keep the site clean and tidy, the Contractor was reminded to provide rubbish bin with cover/lid to works area. (Reminder)

4.1.1.71 Waste water generated from the grout mixing process was stored within soil bund; the Contractor was advised to provide sufficient enclosure and ensure the wastewater from the work process is not released to the sea. The Contractor provided sufficient enclosure to the waste water observed. (Closed)

4.1.1.72 General refuse was observed stored on site without proper covers and at portion at portion C2c and on site. The Contractor was reminded to provide rubbish bin with over to general refuse. General refuse was cleared by the Contractor. (Closed)

4.1.1.73 General refuse was observed on site and at area near the pier of southern part and south eastern part of the site; the Contractor was reminded to provide sufficient rubbish bin on site and regular properly collect and dispose of general refuse. General refuse was removed by the Contractor. (Closed)

4.1.1.74 It was observed that the pipes used for transferring grout between barge DL4 and 天駿 3 were not fully enclosed, the Contractor was advised to provide measures to ensure potential leakage of grout from the grouting production process to the sea can be effective prevented. The Contractor provided measures to prevent potential leakage of grout from the grouting production process to the sea. (Closed)

4.1.1.75 Solidified grout was observed on deck of barge DL4. The Contractor was reminded to keep the deck surface clean and tidy. The solidified grouts were cleared by the Contractor. (Closed)

4.1.1.76 Hole was observed within bunding placed on Barge SHB 209, the Contractor was advised to provide effective mitigation measures by sealing the hole to prevent leakage and potential runoff. The Contractor rectified the deficiency by sealing the hole within the bunding on barge SHB 209. (Closed)

4.1.1.77 It was observed that waste water was generated from the jet grout process; the Contractor was advised to provide sufficient enclosure and ensure the wastewater from the work process is not released to the sea. Contractor enhanced the soil bund and ensures the wastewater from the work process is not released to the sea. (Closed)

4.1.1.78 Solidified grout was observed stored on deck of barge 天駿 3. The Contractor was reminded to sort and dispose them of properly (Reminder).

4.1.1.79 General refuse was observed on site, on ground at Portion D and on ground at portion C2a, the Contractor was reminded to clear the general refuse and keep the site clean and tidy. Subsequently, the Contractor collected and cleared the general refuse and kept the site clean and tidy. (Closed)

4.1.1.80 Bags of waste was observed, the Contractor was reminded to regularly clear bags of waste to keep the site clean and tidy.(Reminder)

4.1.1.81 Chemical container was observed without bunding. The Contractor was reminded to store chemical in bunded area. The Contractor subsequently removed the chemical container from the area. (Closed)

4.1.1.82 Wood materials were observed scattered at Portion C2a. The Contractor was reminded to regualrly clear the materials and keep the site tidy. The Contractor subsequently assigned area for temporary storage of wood materials. (Closed)

Landscape and Visual Impact

4.1.1.83 No adverse observation was identified in the reporting period.

Others

4.1.1.84 The Contractor has rectified most of the observations as identified during environmental site inspection in the reporting period. Rectifications of remaining identified items are undergoing by the

Contractor. Follow-up inspections on the status on provision of mitigation measures will be conducted to ensure all identified items are mitigated properly.

5. ADVICE ON THE SOLID AND LIQUID WASTE MANAGEMENT STATUS

5.1 Summary of Solid and Liquid Waste Management

5.1.1 The Contractor registered as a chemical waste producer for this Contract. Sufficient numbers of receptacles were available for general refuse collection and sorting.

5.1.2 As advised by the Contractor, 2167739.6 m^3 of imported fill were imported for the Contract use in the reporting period. 19kg of metals, 2,573kg of paper/cardboard packaging, 11,000.2kg of plastics, 800kg of chemical waste and 682.5m^3 of others, e.g. general refuse were generated and disposed of in the reporting period. Summary of waste flow table is detailed in Appendix I.

5.1.3 The Contractor is advised to properly maintain on site C&D materials and wastes collection, sorting and recording system, dispose of C&D materials and wastes at designated ground and maximize reuse / recycle of C&D materials and wastes. The Contractor is reminded to properly maintain the site tidiness and dispose of the wastes accumulated on site regularly and properly.

5.1.4 The Contractor is reminded that chemical waste containers should be properly treated and stored temporarily in designated chemical waste storage area on site in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes.

5.1.5 The treated marine sediment and/or treated excavated filling material specified by Contract no. HY/2013/01 has been received as public fill for Contract no. HY/2010/02's reclamation filling works since January 2015. As informed by the Contractor in the reporting year, such site arrangement has been discontinued since 24 February 2016.

6. IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES

6.1 Implementation Status of Environmental Mitigation Measures

6.1.1 A summary of the Implementation Schedule of Environmental Mitigation Measures (EMIS) is presented in Appendix C. Moreover, regular review and checking on the construction methodologies, working processes and plants were carried out to ensure the environmental impacts were kept minimal and recommended environmental mitigation measures were implemented effectively.

6.1.2 Training of marine travel route for marine vessels operator was given to relevant staff and relevant records were kept properly.

6.1.3 Regarding the implementation of dolphin monitoring and protection measures (i.e. implementation of Dolphin Watching Plan, Dolphin Exclusion Zone and Silt Curtain integrity Check), regular checks were conducted by experienced MMOs within the works area to ensure that no dolphins were trapped by the silt curtain area. There were no dolphins spotted within the silt curtain during this reporting year. The relevant procedures were followed and all measures were well implemented. The silt curtains were also inspected in accordance to the submitted plan. As informed by the Contractor, a precast box culvert segment was delivered to Portion D on 10 Aug 2015, 22 Aug 2015 and 25 Aug 2015, the northwestern part of the perimeter silt curtain was temporarily opened for the delivery. Dolphin Exclusion Zone was implemented accordingly.

6.1.4 Acoustic decoupling measures on noisy plants on construction vessels were checked regularly and these measures were implemented.

6.1.5 The Contractor was reminded to carry out necessary actions to rectify the above deficiencies and the Contractor was reminded not to operate those PME during restricted hours without compliance with the CNP conditions.

6.1.6 The Contractor was reminded to strictly comply with the condition of the CNP.

6.1.7 The Contractor was reminded that all water quality mitigation measures with respect to the recommendations in the EIA Report and EM&A Manual in particular on EIA Ref. Section 9.11.1.1 should be fully and properly implemented.

6.1.8 As informed by the Contractor, an area of Portion B has been handed over to other Contract and the perimeter silt curtain near this area of Portion B has been rearranged on 31 July 2015 for berthing another Contractor's vessels (which do not belong to this Contract). IEC/ENPO was informed on 5 Aug 2015 immediately after ET's review. IEC/ENPO provided further comments on 1 September 2015, ET responded 2 September 2015 with notification letter ref.:60249820/rmky15090201.IEC/ENPO expressed no further comment via letter ref.: HYDHZMBEEM00_0_03351L.15 on 8 September 2015 for the removal of section of perimeter silt curtain near Portion B of HKBCF. EPD replied on 24 September 2015 via memo (39) in Ax(1) to EP2/G/A/146 pt.8 and reminded HyD that if grouting trial is undertaken, to adhere to the VEP requirement and undertake the necessary mitigation measures after the phase removal of the perimeter silt curtain.

7. SUMMARY OF EXCEEDANCES OF THE ENVIRONMENTAL QUALITY PERFORMANCE LIMIT

7.1 Summary of Exceedances of the Environmental Quality Performance Limit

7.1.1 One (1) Limit Level Exceedance of 24hr-TSP was recorded at AMS2 on 10 August 2015. After investigation, there is no adequate information to conclude the recorded exceedances are related to this Contract. No 1hr-TSP was recorded in the reporting period.

7.1.2 For construction noise, no exceedance was recorded at all monitoring stations in the reporting period.

7.1.3 Ten (10) Action Level exceedances were recorded at measured suspended solids (SS) values (in mg/L) and two (2) Limit Level exceedances were recorded at measured turbidity (in NTU). After investigation, all impact water quality exceedances were considered not related to this Contract.

7.1.4 Four (4) Limit level exceedances were recorded in the reporting period for impact dolphin monitoring. The investigation results showed that although no unacceptable changes in environmental parameters of this Contract have been measured. Event and Action Plan for Impact Dolphin Monitoring was triggered. After investigation, there was no evidence that indicated that the reduced number of dolphins in NWL and NEL was related solely to Contract works. It was also concluded the contribution of impacts due to the HZMB works as a whole (or individual contracts) cannot be quantified nor separate from the other stress factors. Please also refer to the attachment for full investigation result. For investigation results please refer to Appendix L of the corresponding quarterly reports.

7.1.5 Cumulative statistics on exceedances is provided in Appendix J.

8. SUMMARY OF COMPLAINTS, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

8.1 Summary of Environmental Complaints, Notification of Summons and Successful Prosecutions

8.1.1 Total of eight (8) environmental complaints were received in the reporting period. The Environmental Complaint Handling Procedure is annexed in Figure 5.

8.1.2 As informed by the Contractor on 09 March 2015, there is an air quality complaint received on 06 March 2015. The complainant Mr. Fung requested for follow-up actions to be taken by relevant departments in response to his Complaint about sand and dust emission from 4-5 uncovered sand barges parking near the coastline of Tuen Mun, the complainant concerns about the health problems to residents as the sand is blown to their apartments. After investigation, there is no adequate information to conclude the observed impact is related to this Contract.

8.1.3 Environmental Protection Department (EPD) referred a noise complaint to this project on 10 April 2015 and ENPO forwarded the noise complaint to Environmental Team on 15 April 2015. The complaint involves a complainant, who is resident of Caribbean Coast, Tung Chung and he was disturbed by noise from construction activities of the HZMB Project during weekends and holidays. After investigation, there is no adequate information to conclude the observed noise nuisance is related to this Contract.

8.1.4 A complainant contacted EPD through EPD's hotline on 21 May 2015 and complained that noise was generated from construction works when construction of artificial island at Lantau Island area was carried out overnight and dark smoke was emitted by construction plant. EPD's staff has contacted complainant and came to know that the dark smoke referring to could also be construction dust emitting from the filling work at the HKBCF. This complaint was subsequently referred by EPD to HZMB project team on 22 May 2015 to follow-up. Investigation was conducted and with referred to the available information; it is unable to determine whether the night time noise and dark smoke complaint is related to this Contract.

8.1.5 As informed by the Contractor, 3 July 2015, an air quality complaint has been received on 11 June 2015 by HyD via complaint hotline 1823. The complainant complained that sand and dust pollution near Richland Garden, 138 Wu Chui Road, Tuen Mun, caused by sand delivery barges. After investigation, there is no adequate information to conclude the observed impact is related to this Contract

8.1.6 As informed by Engineer Representative of this Contract on 13 July 2015, EPD referred a noise related complaint to this Contract on 13 July 2015. The complainant complained noise came from BCF site near HK Skycity Marriott Hotel during nighttime period of the past 10 days which involves excavation with a grab dredger, transfer of excavated material using a derrick barge and a tug boat, and backfilling with a pelican barge. Based on EPD's record, the above activities are covered by CNP no. GW-RS0503-15. After investigation, the construction activities carried out during restricted hour between 1- 13 July 2015 were considered complied with CNP conditions (no. GW-RS0503-15).

8.1.7 As informed by the Contractor on 30 July, Home Affairs Department referred a complaint to project team of this Contract on 29 July 2015. The complaint involved Mr. Chan and Mr. Tang, Resident Representatives of Tong Fuk Village who complained significant sand loss of Tong Fuk Beach, particularly after typhoon when the beach was hit by strong waves; this exposed the rocks at the beach. The complainant enquired whether the sand loss is related to sand extraction for construction of airport and reclamation works of HZMB artificial island. After investigation, the complaint is considered as non-project related.

8.1.8 A complainant who lives at 1 Sky City Road East, Hong Kong SkyCity Marriott Hotel, Hong Kong International Airport, Lantau, Hong Kong complained to EPD's hotline on 23 October 2015 that loud noise were generated by HZMB artificial island construction site of China Harbour Engineering Company Ltd adjacent to the premises approximately between 10pm to 12am, during recent weekdays and Saturday. In addition, loud noise and dark smoke were noted on the construction site of HZMB artificial island during Sunday and public holiday. The complainant questioned whether the

Contractor was allowed to conduct construction work during Sunday and public holiday. The complaint was referred by EPD to the project team of Contract No. HY/2010/02 to follow up on 23 October 2015. After investigation, with referred to the available information, it is unable to determine whether the night time noise complaint and the concerned dark smoke are related to this Contract.

8.1.9 A water quality complaint was referred to the ENPO at 10:22 am on the 4 December 2015 by EPD; ENPO referred this complaint to this Contract on the same day. With referred to the information provided by ENPO, EPD has contacted the complainant, and obtained the additional information from the complainant and it is suspected that the incident happened in the afternoon on 28 November 2015. A video was provided by the complainant who shows that turbid water behind a barge, the incident is suspected to be happened in the afternoon on 28 November 2015. After investigation, it is considered not related to this Contract.

8.1.10 No notification of summons and successful prosecutions is noted during the reporting period.

8.1.11 Statistics on complaints, notifications of summons and successful prosecutions are summarized in Appendix J.

9. REVIEW OF THE VALIDITY OF THE EIA PREDICTION

9.1 One (1) Limit Level Exceedance of 24hr-TSP was recorded at AMS2 on 10 August 2015. After investigation, there is no adequate information to conclude the recorded exceedances are related to this Contract. No 1hr-TSP was recorded in the reporting period. All the rest of air quality monitoring results in the reporting period were below the Action Levels established in the baseline air quality monitoring carried out in November 2011. The result was in line with the Environmental Impact Assessment (EIA) prediction that dust generation would be controlled and would not exceed the acceptable criteria, with proper implementation of the recommended dust mitigation measures.

9.2 No noise monitoring exceedance was recorded in the reporting period. This is generally in line with the EIA and ERR prediction that with the implementation of noise mitigation measures, the construction noise from the Contract works will meet the stipulated criterion at the residential NSRs and at a majority of the education institutions as predicted by the EIA.

9.3 Twelve (12) water quality monitoring exceedances were recorded in the reporting period and it was considered not related to the Contract works, considering all the rest of water quality monitoring results in the reporting period were below the Action Levels established in the baseline water quality monitoring carried out in November 2011. The result was in line with the Environmental Impact Assessment (EIA) prediction that water quality impact would be controlled and would not exceed the acceptable criteria, with proper implementation of the recommended water quality mitigation measures.

10. REVIEW OF ENVIRONMENTAL IMPLEMENTATION STATUS

10.1 The impact air quality, noise and water quality monitoring programme ensured that any environmental impact to the receivers would be readily detected and timely actions could be taken to rectify any non-compliance. The environmental monitoring results indicated that the construction activities in general were in compliance with the relevant environmental requirements and were environmentally acceptable. The weekly site inspection ensured that all the environmental mitigation measures recommended in the EIA were effectively implemented. Despite the minor deficiencies found during site audits, the Contractor had taken appropriate actions to rectify deficiencies within reasonable timeframe. Therefore, the effectiveness and efficiency of the mitigation measures were considered high in most of the time.

10.2 For all the parameters under monitoring as mentioned in Section 3, the measured levels were in line with the EIA predictions generally. This indicates that the mitigation measures were effectively implemented.

10.3 Four (4) oil spillages were observed on 14 May 2015 on sea area near Northeastern of Portion C2c, near Cell No. 78 on 23 June 2015, near Cell No. 28 on 23 December 2015 and 17 February 2016 at Sea surface near cell no.109. These oil spillage incidents including size, location, time of the spillage and Contractor's actions taken in response to the spill incident have been reviewed during the reporting period and closed out during the reporting period. The Contractor was reminded to continue to follow the spill response plan when oil is observed on sea.

10.4 As informed by the Contractor, an area of Portion B has been handed over to other Contract and the perimeter silt curtain near this area of Portion B has been rearranged on 31 July 2015 for berthing another Contractor's vessels (which do not belong to this Contract). IEC/ENPO was informed on 5 Aug 2015 immediately after ET's review. IEC/ENPO provided further comments on 1 September 2015, ET responded 2 September 2015 with notification letter ref.:60249820/rmky15090201. IEC/ENPO expressed no further comment via letter ref.: HYDHZMBEEM00_0_03351L.15 on 8 September 2015 for the removal of section of perimeter silt curtain near Portion B of HKBCF. EPD replied on 24 September 2015 via memo (39) in Ax(1) to EP2/G/A/146 pt.8 and reminded HyD that if grouting trial is undertaken, to adhere to the VEP requirement and undertake the necessary.

10.5 There is a report of silt plume observed near the silt curtain for HZMB HKBCF Project maintained by Contract No. HY/2010/02 during a site visit conducted by HyD on 15 April 2015. The location was near the eastern part of HKBCF reclamation works (portion B and E), near the silt curtain for HZMB HKBCF Project maintained by Contract No. HY/2010/02. After investigation, there was no adequate information to indicate that the observed silt plume was caused by active works.

10.6 IEC/ENPO notified ET via email on 22 June 2015 that silt plume was observed being dispersed from Portion E1 to the open waters outside the silt curtain for the HZMB HKBCF Contract maintained by Contract No. HY/2010/02 at about 3:00 pm on 20 June 2015. After investigation, there was no adequate information to indicate that the observed silt plume was generated by active works or due to inadequate clearance maintained between vessels of this Contract and the sea bed during navigation. However, the Contractor was reminded to regularly check the performance of the silt curtain and ensure swift provision of maintenance to the perimeter silt curtains once defects of the perimeter silt curtain were observed.

10.7 Frequency of watering per day on exposed soil was checked; with reference to the record provided by the Contract, watering was conducted at least 8 times per day on reclaimed land. The frequency of watering is the mainly refer to water truck. Sprinklers are only served to strengthen dust control measure for busy traffic at the entrance of Portion D. As informed by the Contractor, during the mal-function period of sprinkler, water truck will enhance watering at such area. The Contractor was reminded to ensure provision of watering of at least 8 times per day on all exposed soil

11. REVIEW OF EM&A PROGRAMME

11.1 The environmental monitoring methodology was considered well established as the monitoring results were found in line with the EIA predictions.

11.2 As effective follow up actions were promptly taken once exceedances were recorded, no further exceedance occurred for each case. The EM&A programme was considered successfully and adequately conducted during the course of the reporting period.

12. COMMENTS, RECOMMENDATIONS AND CONCLUSIONS

12.1 Comments on mitigation measures

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

12.2 Air Quality Impact

- All working plants and vessels on site should be regularly inspected and properly maintained to avoid dark smoke emission.
- All vehicles should be washed to remove any dusty materials before leaving the site.
- Haul roads should be sufficiently dampened to minimize fugitive dust generation.
- Wheel washing facilities should be properly maintained and reviewed to ensure properly functioning.
- Temporary exposed slopes and open stockpiles should be properly covered.
- Enclosure should be erected for cement debagging, batching and mixing operations.
- Water spraying should be provided to suppress fugitive dust for any dusty construction activity.

12.3 Construction Noise Impact

- Quieter powered mechanical equipment should be used as far as possible.
- Noisy operations should be oriented to a direction away from sensitive receivers as far as possible.
- Proper and effective noise control measures for operating equipment and machinery on-site should be provided, such as erection of movable noise barriers or enclosure for noisy plants. Closely check and replace the sound insulation materials regularly
- Vessels and equipment operating should be checked regularly and properly maintained.
- Noise Emission Label (NEL) shall be affixed to the air compressor and hand-held breaker operating within works area.
- Better scheduling of construction works to minimize noise nuisance.

12.4 Water Quality Impact

- Regular review and maintenance of silt curtain systems, drainage systems and desilting facilities in order to make sure they are functioning effectively.
- Construction of seawall should be completed as early as possible.
- Regular inspect and review the loading process from barges to avoid splashing of material.
- Silt, debris and leaves accumulated at public drains, wheel washing bays and perimeter u-channels and desilting facilities should be cleaned up regularly.
- Silty effluent should be treated/ desilted before discharged. Untreated effluent should be prevented from entering public drain channel.
- Proper drainage channels/bunds should be provided at the site boundaries to collect/intercept the surface run-off from works areas.
- Exposed slopes and stockpiles should be covered up properly during rainstorm.

12.5 Chemical and Waste Management

- All types of wastes, both on land and floating in the sea, should be collected and sorted properly and disposed of timely and properly. They should be properly stored in designated areas within works areas temporarily.
- All chemical containers and oil drums should be properly stored and labelled.
- All plants and vehicles on site should be properly maintained to prevent oil leakage.
- All kinds of maintenance works should be carried out within roofed, paved and confined areas.
- All drain holes of the drip trays utilized within works areas should be properly plugged to avoid any oil and chemical waste leakage.
- Oil stains on soil surface and empty chemical containers should be cleared and disposed of as chemical waste.
- Regular review should be conducted for working barges and patrol boats to ensure sufficient measures and spill control kits were provided on working barges and patrol boats to avoid any spreading of leaked oil/chemicals.

12.6 Landscape and Visual Impact

- All existing, retained/transplanted trees at the works areas should be properly fenced off and regularly inspected.

12.7 Recommendations on EM&A Programme

12.7.1. The impact monitoring programme for air quality, noise, water quality and dolphin ensured that any deterioration in environmental condition was readily detected and timely actions taken to rectify any non-compliance. Assessment and analysis of monitoring results collected demonstrated the environmental impacts of the Contract. With implementation of recommended effective environmental mitigation measures, the Contract's environmental impacts were considered as environmentally acceptable. The weekly environmental site inspections ensured that all the environmental mitigation measures recommended were effectively implemented.

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

12.8 Conclusions

12.8.1 The construction phase and EM&A programme of the Contract commenced on 12 March 2012.

12.8.2 One (1) Limit Level Exceedance of 24hr-TSP was recorded at AMS2 on 10 August 2015. No 1hr-TSP was recorded in the reporting period.No exceedance of 1-hour TSP exceedance level was recorded at all monitoring station during the 1-hr TSP impact monitoring period. Investigation into the possible causes of each exceedance was undertaken and reported in the respective monthly EM&A reports, the investigations results confirmed that the air quality exceedances were not related to Contract.

12.8.3 Construction noise, no exceedance was recorded at all monitoring stations in the reporting period.. Noise generating activities of the Contract did not cause any noticeable noise impact at the sensitive receivers. The impact noise levels recorded were generally similar to the predicted construction noise levels in the Project EIA.

12.8.4 10 action level exceedances were recorded at measured suspended solids (SS) values (in mg/L), two (2) Limit Level exceedance was recorded at measured turbidity (in NTU). Exceedances were considered to be due to local effects in the vicinity of the monitoring station where exceedance was recorded and after investigation, there is no adequate information to conclude the recorded exceedances are related to this Contract.

12.8.5 Four (4) Limit level exceedances were recorded in the reporting period for impact dolphin monitoring. The investigation results showed that although no unacceptable changes in environmental parameters of this Contract have been measured. Event and Action Plan for Impact Dolphin Monitoring was triggered. After investigation, there was no evidence that indicated that the reduced number of dolphins in NWL and NEL was related solely to Contract works. It was also concluded the contribution of impacts due to the HZMB works as a whole (or individual contracts) cannot be quantified nor separate from the other stress factors. Please also refer to the attachment for full investigation result. For investigation results please refer to Appendix L of the corresponding quarterly reports.

12.8.6 Environmental site inspection was carried out 52 times in the reporting period. Recommendations on remedial actions were given to the Contractors for the deficiencies identified during the site audits.

12.8.7 Eight (8) environmental complaints were received in the reporting period.

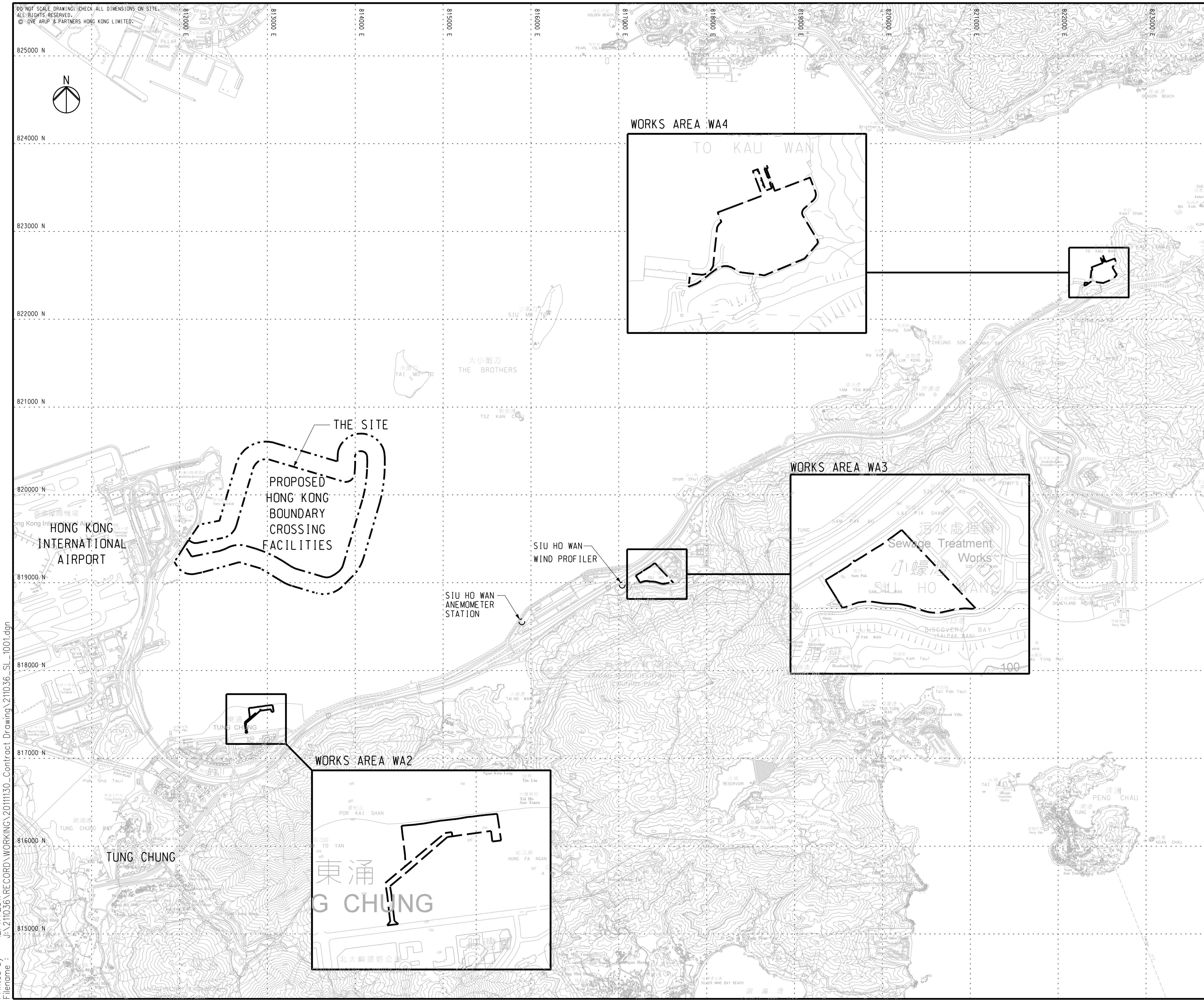
12.8.8 No summons or successful prosecution was received in the reporting period.

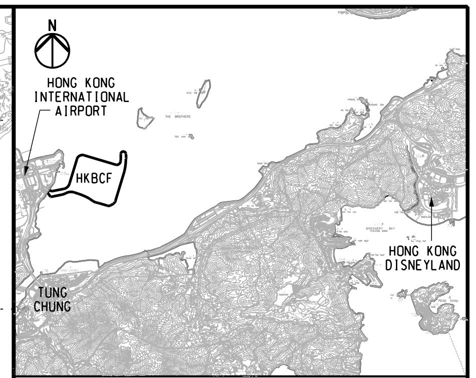
12.8.9 As discussed in the above sections, the Contract did not cause unacceptable environmental impacts or disturbance to air quality, noise, water quality in the vicinity near the reclamation works.

12.8.10 Apart from the above mentioned monitoring, most of the recommended mitigation measures, as included in the EM&A programme, were implemented properly in the reporting period.

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

12.8.12 Moreover, regular review and checking on the construction methodologies, working processes and plants were carried out to ensure the environmental impacts were kept minimal and recommended environmental mitigation measures were implemented effectively.





KEY PLAN

NOTES

1. ALL COORDINATES ARE RELATED TO HONG KONG 1980 GRID.
2. ALL LEVELS ARE IN METRES ABOVE HONG KONG PRINCIPAL DATUM (mPD).
3. REFER TO DRG NO. 211036/SL/1002 FOR THE DEFINITION OF SETTING OUT LINE (SOL) FOR THE HONG KONG BOUNDARY CROSSING FACILITIES (HKBCF) RECLAMATION SITE.
4. REFER TO DRG NO. 211036/SL/1004 FOR DETAILS OF SITE BOUNDARY.
5. FOR EXTENT OF SORTING FACILITIES AT FILL BANK AT TSEUNG KWAN O AREA 137 REFER TO DRG NO. 211036/SL/1015.

LEGEND

— · · — SITE BOUNDARY
— · — SETTING OUT LINE (SOL)
— — WORKS AREA BOUNDARY

Rev	Description	By	Date
-	FOR CONSTRUCTION	HYJL	11/11

Consultant

ARUP 奧雅納工程顧問 Ove Arup & Partners Hong Kong Limited

Supported By : Ecosystems Ltd.
EDA Marine Ltd.
Geotechnical Consulting Group (Asia) Ltd.
Hong Kong Cetacean Research Project
InteliBuild Technyx Asia Limited
Tony Gee and Partners LLP

Contract No. and Title:
Contract No. HY/2010/02
Hong Kong-Zhuhai-Macao Bridge
Hong Kong Boundary Crossing Facilities
- Reclamation Works

Drawing title
KEY PLAN

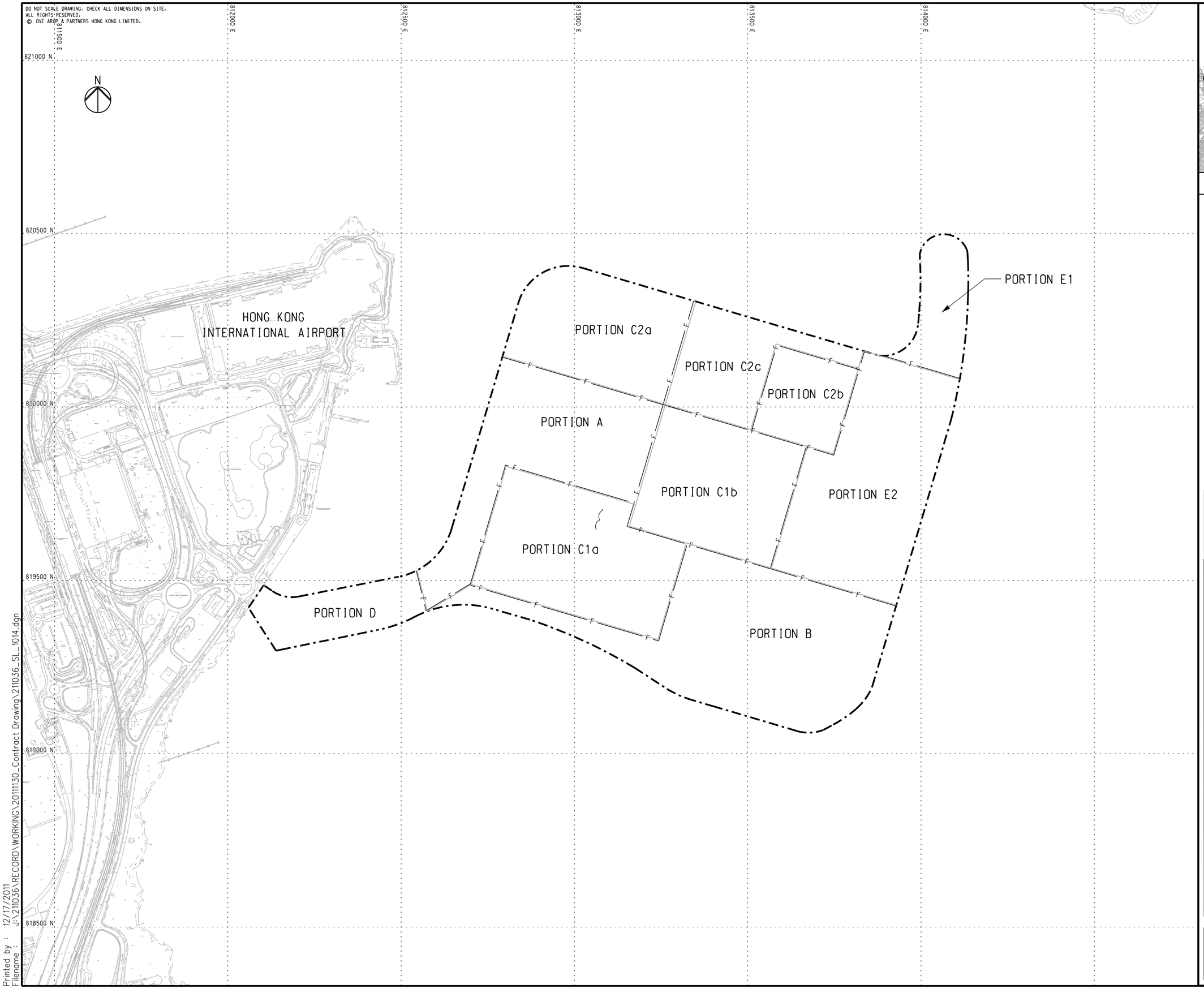
Drawing no.	Rev.
211036/SL/1001	-

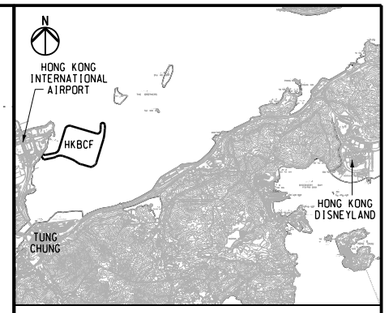
Drawn	Date	Checked	Approved
RL	11/09	KKY	DML

Scale 1:20000 @A1 1:40000 @A3
Status WORKING

路政署
HIGHWAYS DEPARTMENT
港珠澳大橋香港工程管理處
Hong Kong - Zhuhai - Macao Bridge
Hong Kong Project Management Office

Printed by : 12/17/2011
Filename : J:\211036\RECORD\WORKING\20111130_Contract Drawing\211036_SL_1001.dgn





KEY PLAN

NOTES

1. FOR LEGENDS AND NOTES FOR CHAIN LINK FENCE AND GATE REFER TO DRG NO. 211036/SL/1013.
2. THE ERECTION OF CHAIN LINK FENCE AND GATES SHALL BE COMPLETED BY THE HANDOVER DATE OF EACH PORTION OF SITE, OR AS INSTRUCTED BY THE ENGINEER.
3. FOR SETTING OUT COORDINATES OF DIFFERENT PORTIONS OF SITE REFER TO DRG NO. 211036/SL/1003.
4. ACCESS POINTS BETWEEN PORTIONS SHALL BE PROVIDED BY THE CONTRACTOR. AND THE LOCATIONS SHALL BE AGREED WITH THE ENGINEER ON SITE.
5. FOR HOARDING AND FENCE AT FILL BANK AT TSEUNG KWAN O AREA 137 REFER TO DRG NO. 211036/SL/1015.

LEGEND

- SETTING OUT LINE (SOL)
- WORKS AREA BOUNDARY
- PORTIONS BOUNDARY LINE

Rev	Description	By	Date
-	FOR CONSTRUCTION	HYJL	11/11

Consultant

ARUP 奧雅納工程顧問 Ove Arup & Partners Hong Kong Limited

Supported By :
- Ecosystems Ltd.
- EDA Marine Ltd.
- Geotechnical Consulting Group (Asia) Ltd.
- Hong Kong Cetacean Research Project
- InteliBuild Technyx Asia Limited
- Tony Gee and Partners LLP

Contract No. and Title:
Contract No. HY/2010/02
Hong Kong-Zhuhai-Macao Bridge
Hong Kong Boundary Crossing Facilities
- Reclamation Works

Drawing title
WORKS AREA LAYOUT
AND HORADING PLAN
(SHEET 2 OF 3)

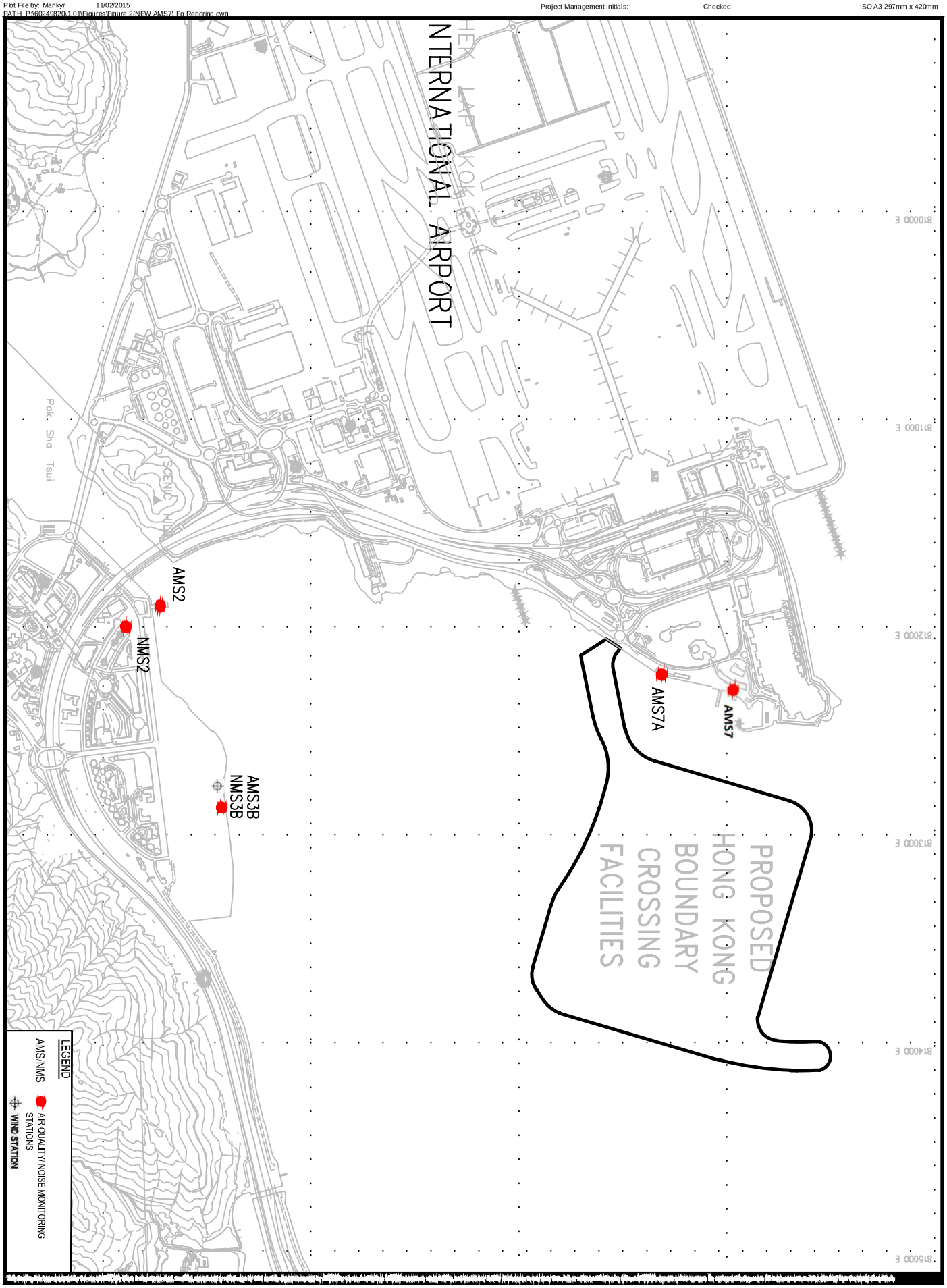
Drawing no.	Rev.
211036/SL/1014	-

Drawn	Date	Checked	Approved
RL	06/10	KKY	DML

Scale 1:5000 @A1 1:10000 @A3
Status WORKING

路政署 HIGHWAYS DEPARTMENT
港珠澳大橋香港工程管理處
Hong Kong - Zhuhai - Macao Bridge
Hong Kong Project Management Office

Printed by : 12/17/2011
Filename : J:\211036\RECORD\WORKING\20111130_Contract Drawing\211036_SL_1014.dgn



HONG KONG - ZHUHAI - MACAO BRIDGE
HONG KONG BOUNDARY CROSSING FACILITIES
- RECLAMATION WORKS
Project No.: - Date: JANUARY 2015

AIR QUALITY AND NOISE MONITORING STATIONS FOR HKBCF

AECOM

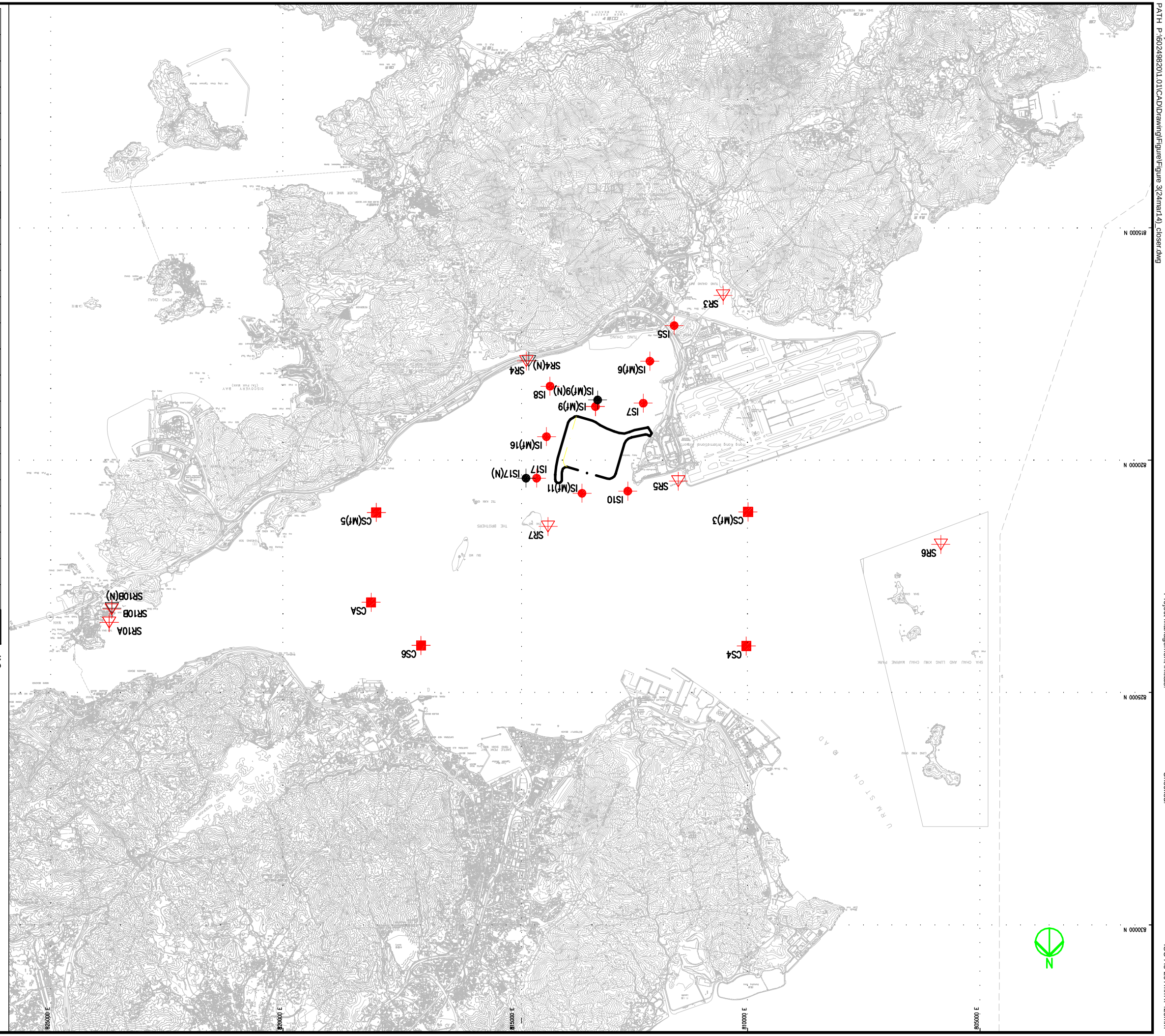
Figure 2

Plot File by: Kwokhc
PATH P:\60249820\1.01CAD\Drawing\Figure\Figure 3(24mar14)_closer.dwg
25/03/2014

Project Management Initials:

Checked:

ISO A3 297mm x 420mm



MONITORING STATIONS	CO-ORDINATES	
	EASTING	NORTHING
IS5	811579	817106
IS(M)6	812101	817873
IS7	812244	818777
IS8	814251	818412
IS(M)9	813273	818850
IS(M)9(N)	813226	818708
IS10	812577	820670
IS(M)11	813562	820716
IS(M)16	814328	819497
IS17	814539	820391
IS17(N)	814767	820391
SR3	810525	816456
SR4(N)	814705	817859
SR5	811489	820455
SR6	805837	821818
SR7	814293	821431
SR10A	823741	823495
SR10B(N)	823683	823187
CS(M)3	809989	821117
CS(M)5	817990	821129
CS4	810025	824004
CS6	817028	823992
CSA	818103	823064

SETTING OUT SCHEDULE

LEGEND

- IS — IMPACT STATIONS
- CS — CONTROL / FAR FIELD STATIONS
- SR — SENSITIVE RECEIVERS STATIONS
- SR — SENSITIVE RECEIVERS STATIONS (RELOCATED)
- IS — IMPACT STATIONS (RELOCATED)

HONG KONG - ZHUHAI - MACAO BRIDGE
HONG KONG BOUNDARY CROSSING FACILITIES
- RECLAMATION WORKS

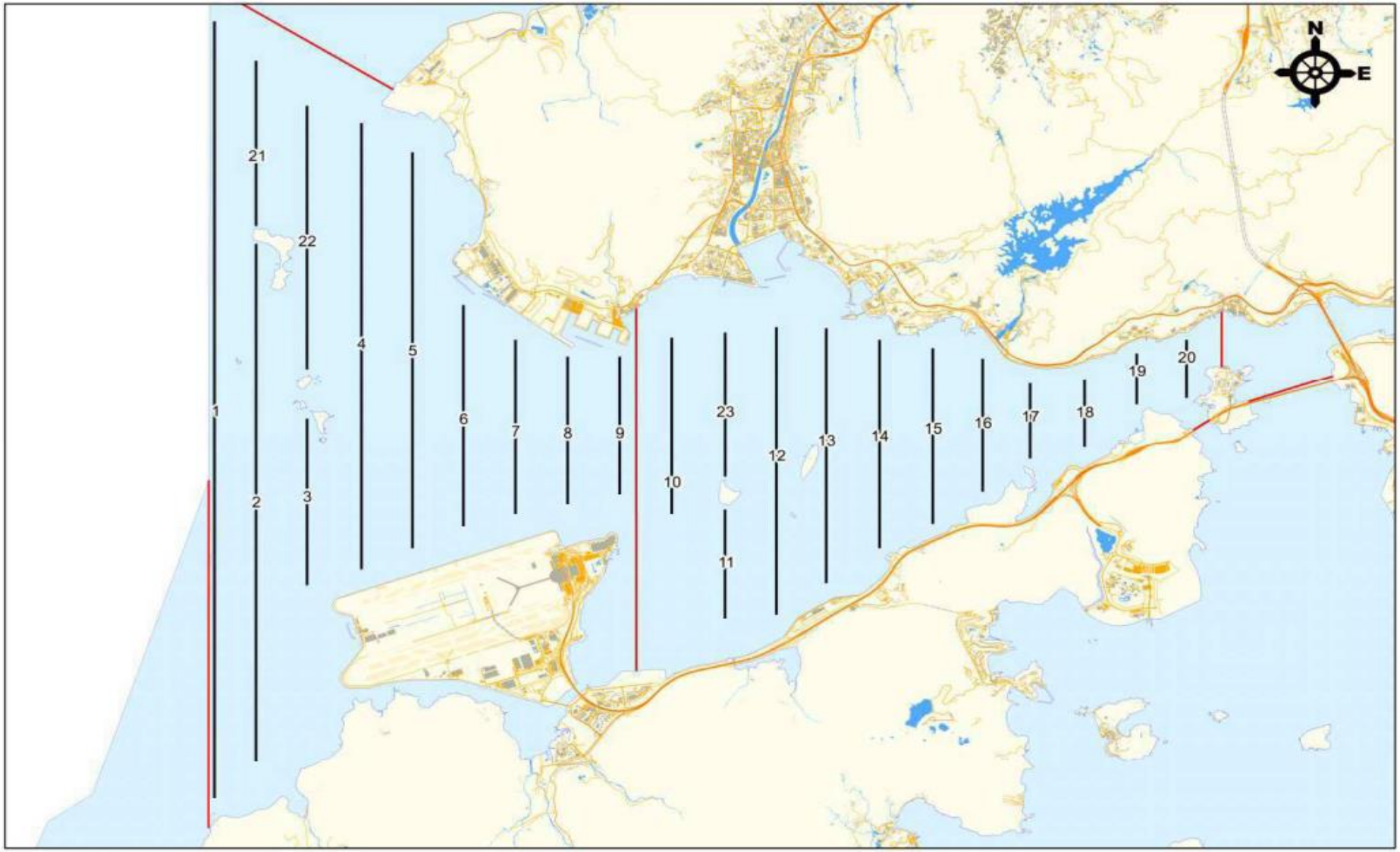
Project No.: -

Date: MAR 2014

WATER QUALITY MONITORING STATION

AECOM

Figure 3



Remarks:

***Transect 10 is now 3.6km in length due to the HKBCF construction site.**

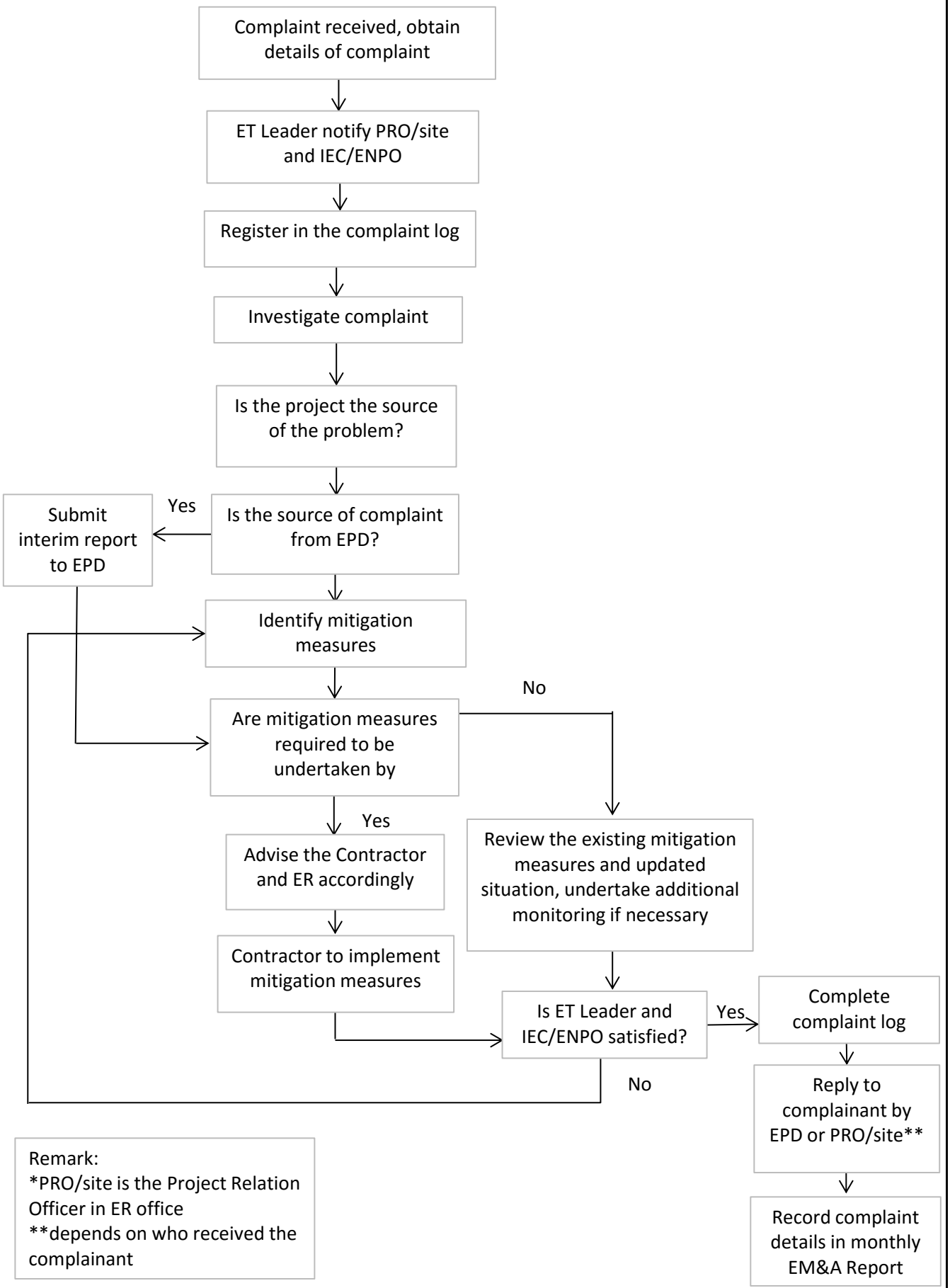
^Coordinates for transect lines 1, 2, 7, 8, 9 and 11 have been updated in respect to the Proposal for Alteration of Transect Line for Dolphin Monitoring approved by EPD on 19 August 2015. The total transect length for both NEL and NWL combined is 108km.

HONG KONG - ZHUHAI - MACAO BRIDGE
HONG KONG BOUNDARY CROSSING FACILITIES
- RECLAMATION WORKS
Project No.: 60249820 Date: November 2015

Impact Dolphin Monitoring
Line Transect Layout Map

AECOM

Figure 4



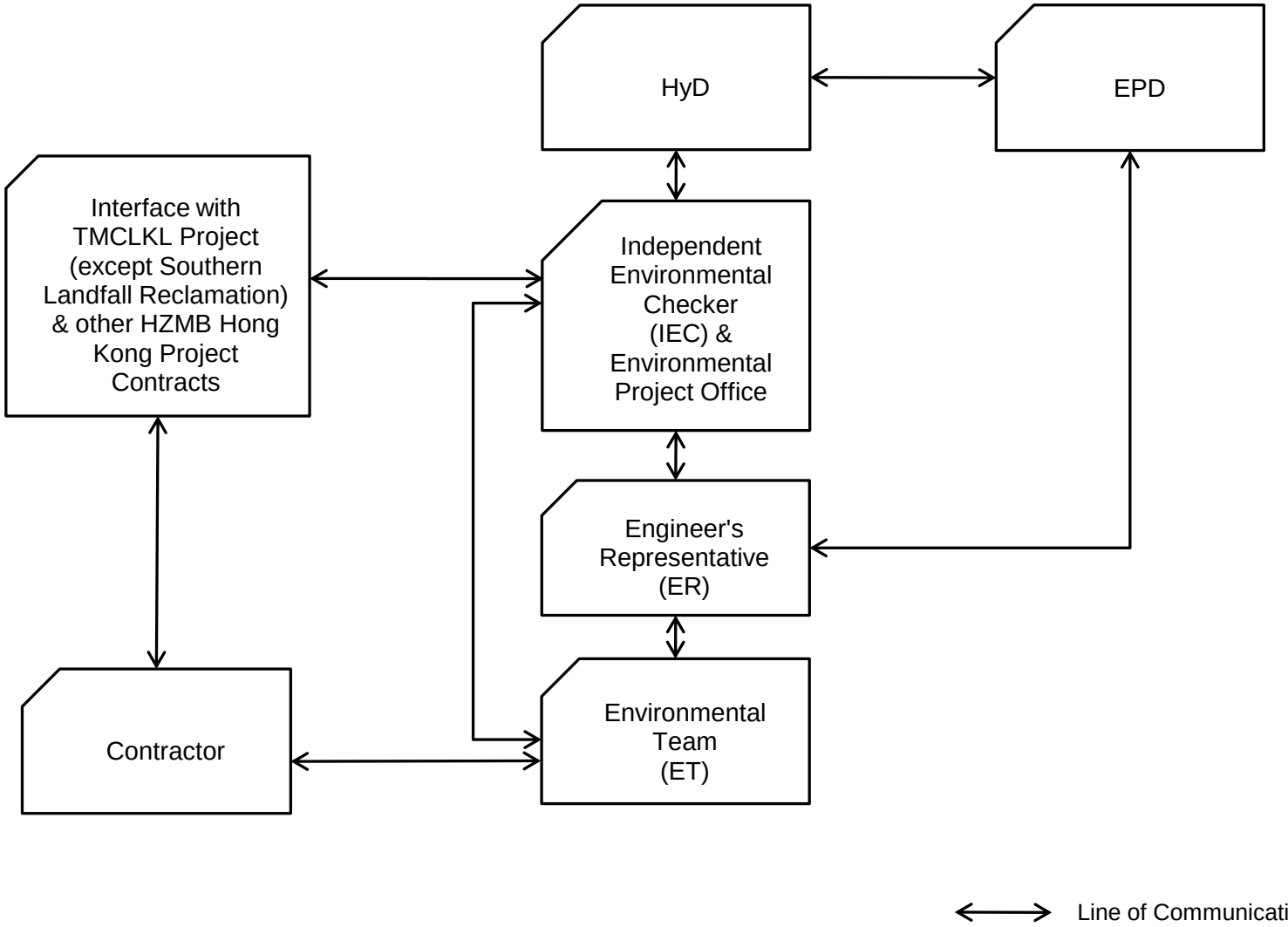
HONG KONG - ZHUHAI - MACAO BRIDGE
HONG KONG BOUNDARY CROSSING FACILITIES
- RECLAMATION WORKS

AECOM

Environmental Complaint Handling Procedure

Project No.: 60249820 **Date: July 2012**

Figure 5



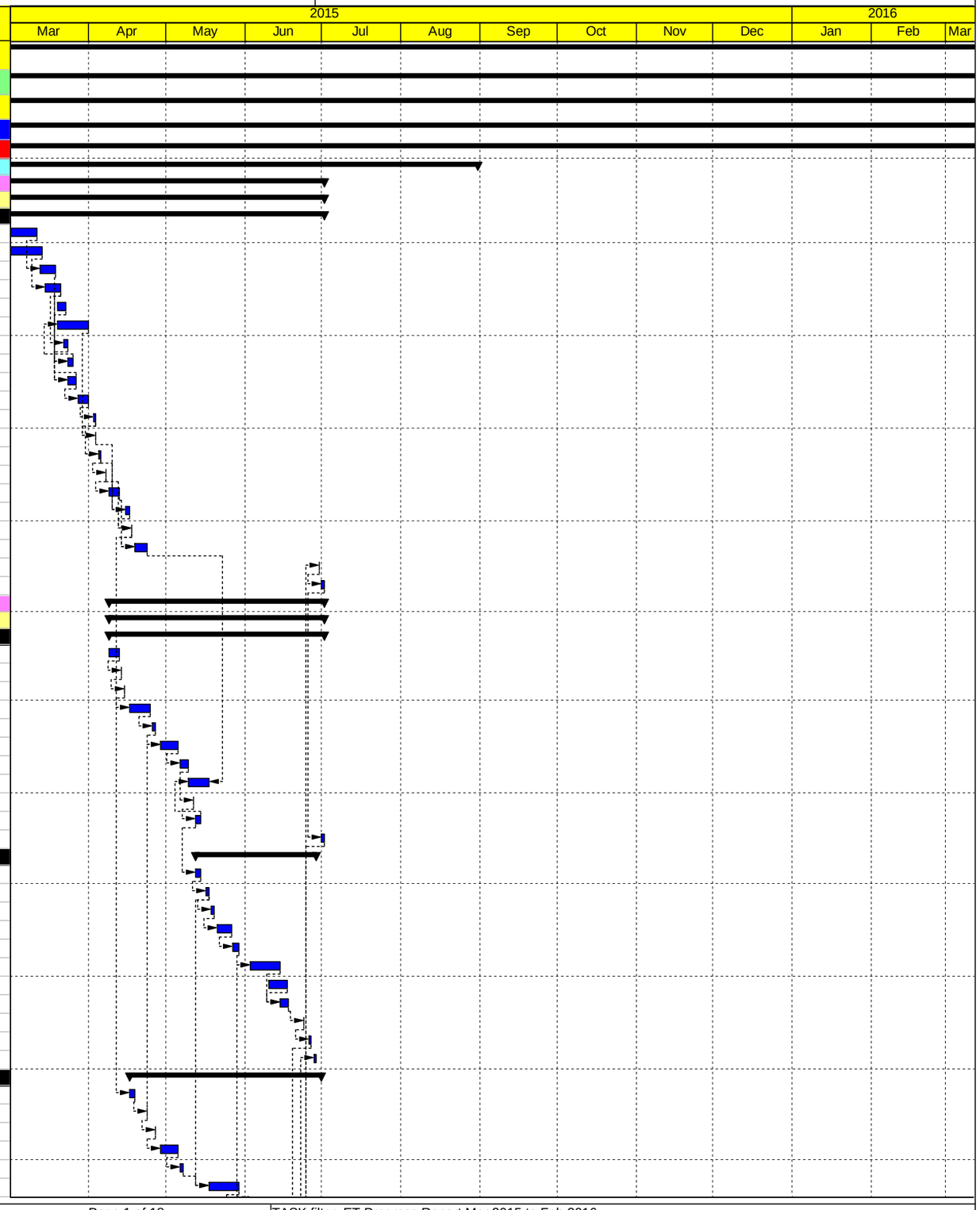
HONG KONG - ZHUHAI - MACAO BRIDGE
HONG KONG BOUNDARY CROSSING FACILITIES
--RECLAMATION WORKS
Project No.: 60249820 Date: April 2013

Contract Organisation for Environmental Works

AECOM

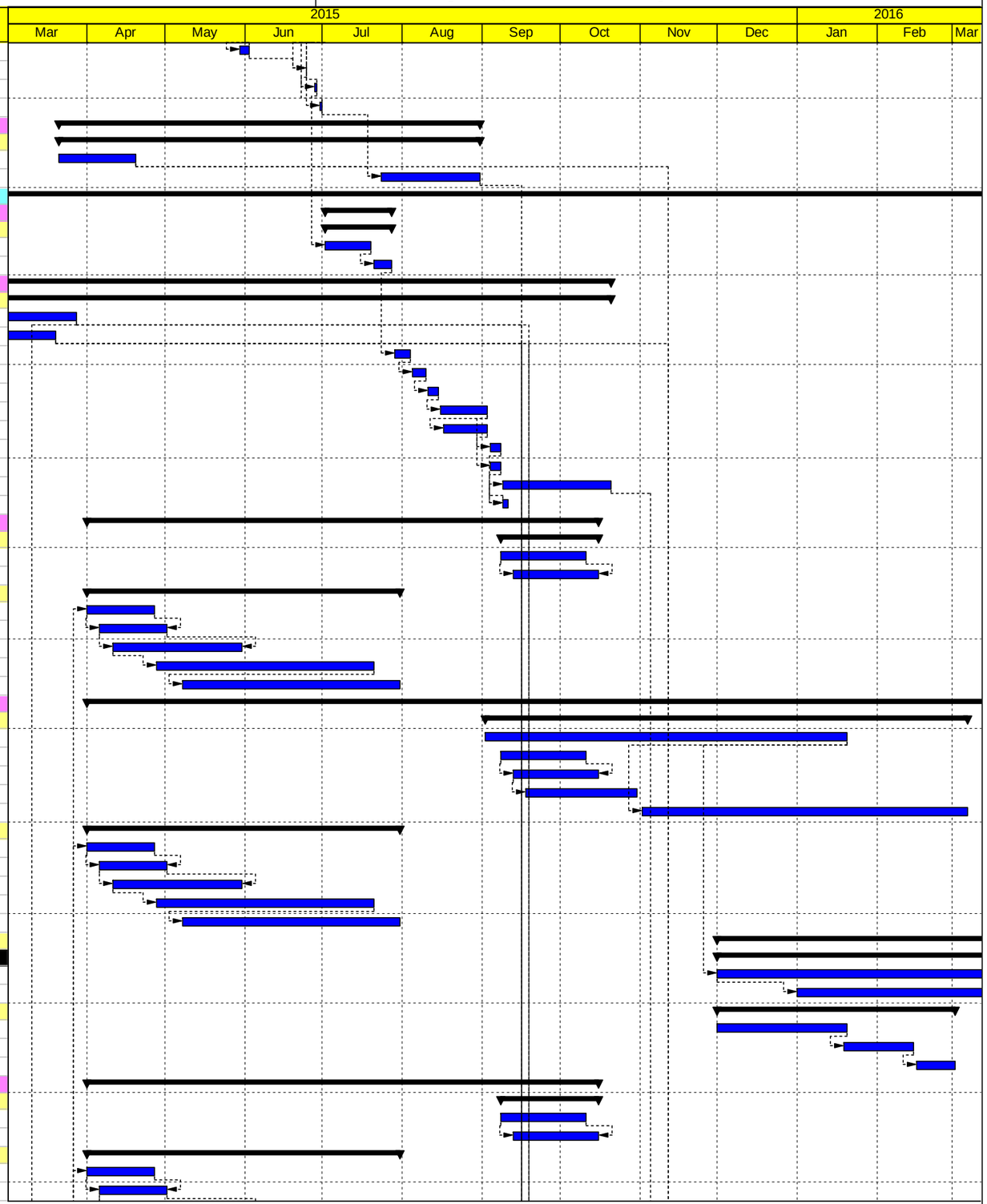
Appendix A

Activity ID	Activity Name	Actual Duration	Start	Finish
53rd_8 Monthly Progress Report Status as on 21Apr2016		593	05-Sep-14 A	20-Apr-16 A
Work Zone, as defined in PS Clause 1.03(6)		593	05-Sep-14 A	20-Apr-16 A
Portion A, B, C & E		593	05-Sep-14 A	20-Apr-16 A
Portion A, B, C & E		593	05-Sep-14 A	20-Apr-16 A
Seawall		506	01-Nov-14 A	21-Mar-16 A
Cellular Structures		217	26-Jan-15 A	31-Aug-15 A
Cellular Main Cells 85cells		157	26-Jan-15 A	02-Jul-15 A
Full Guide Frames Method 85cells		157	26-Jan-15 A	02-Jul-15 A
Portion E1 C078 & C079 & Portion E2 C065 & C066 4cells		157	26-Jan-15 A	02-Jul-15 A
CSE1-040-0C	PE1 C078 Sheetpiles Collection	40	26-Jan-15 A	12-Mar-15 A
CSE1-040-1C	PE1 C079 Sheetpiles Collection	35	02-Feb-15 A	14-Mar-15 A
CSE1-040-0C	PE1 C078 Sheetpiles Driving	6	13-Mar-15 A	19-Mar-15 A
CSE1-040-1C	PE1 C079 Sheetpiles Driving	6	15-Mar-15 A	21-Mar-15 A
CSE1-040-0C	PE1 C078 Crane Plant removal	3	20-Mar-15 A	23-Mar-15 A
CSE1-040-1C	PE1 C079 Extension Sheetpiles 2m removal	12	20-Mar-15 A	01-Apr-15 A
CSE1-040-1C	PE1 C079 Crane Plant removal	2	22-Mar-15 A	23-Mar-15 A
CSE1-040-1C	PE1 C079 Backfill inside cell stg1 3,200m3	2	24-Mar-15 A	26-Mar-15 A
CSE1-040-0C	PE1 C078 Backfill inside cell stg1 3,200m3	3	24-Mar-15 A	27-Mar-15 A
CSE1-040-0C	PE1 C078 Extension Sheetpiles 2m removal	4	28-Mar-15 A	01-Apr-15 A
CSE1-040-0C	PE1 C078 Removal of Crane and Temp Guide Frame	1	03-Apr-15 A	04-Apr-15 A
CSE1-040-1C	PE1 C079 Removal of Crane & Temp Guide Frame	0	04-Apr-15 A	04-Apr-15 A
CSE1-040-0C	PE1 C078 Removal of underwater guard ring	1	05-Apr-15 A	06-Apr-15 A
CSE1-040-01	PE1 C078 Removal of Temp Piles	0	08-Apr-15 A	08-Apr-15 A
CSE1-040-01	PE1 C078 Backfill inside cell stg2 5,752m3	4	09-Apr-15 A	13-Apr-15 A
CSE1-040-1C	PE1 C079 Removal of underwater guard ring	2	15-Apr-15 A	17-Apr-15 A
CSE1-040-11	PE1 C079 Removal of Temp Piles	0	18-Apr-15 A	18-Apr-15 A
CSE1-040-11	PE1 C079 Backfill inside cell stg2 6,134m3	5	19-Apr-15 A	24-Apr-15 A
CSE1-040-11	PE1 C079 Sand Fill to Top	0	30-Jun-15 A	30-Jun-15 A
CSE1-040-01	PE1 C078 Sand Fill to Top	1	01-Jul-15 A	02-Jul-15 A
Connecting Arcs		84	09-Apr-15 A	02-Jul-15 A
Portion E1 between C077/078 to C079/080 3nrs		84	09-Apr-15 A	02-Jul-15 A
C077/078		84	09-Apr-15 A	02-Jul-15 A
CAE1-2010	PE1 C077/078 - Temp Piles Drivening	4	09-Apr-15 A	13-Apr-15 A
CAE1-2020	PE1 C077/078 - Temp Guide Frame Installation	0	14-Apr-15 A	14-Apr-15 A
CAE1-2030	PE1 C077/078 - ICE Certificate & Form 5	0	15-Apr-15 A	15-Apr-15 A
CAE1-2040	PE1 C077/078 - Sea Side Arc Sheetpile Assemby	8	17-Apr-15 A	25-Apr-15 A
CAE1-2050	PE1 C077/078 - Sea Side Arc Sheetpile Drivening	1	26-Apr-15 A	27-Apr-15 A
CAE1-2060	PE1 C077/078 - Land Side Arc Sheetpile Assemby	7	29-Apr-15 A	06-May-15 A
CAE1-2070	PE1 C077/078 - Land Side Arc Sheetpile Drivening	3	07-May-15 A	10-May-15 A
CAE1-2100	PE1 C077/078 - Backfill	8	10-May-15 A	18-May-15 A
CAE1-2080	PE1 C077/078 - Removal of Guide Frame	0	12-May-15 A	12-May-15 A
CAE1-2090	PE1 C077/078 - Removal of Temp Piles	2	13-May-15 A	15-May-15 A
CAE1-2110	PE1 C077/078 Sand Fill to Top	1	01-Jul-15 A	02-Jul-15 A
C078/079		47	13-May-15 A	29-Jun-15 A
CAE1-4010	PE1 C078/079 - Temp Piles Drivening	2	13-May-15 A	15-May-15 A
CAE1-4020	PE1 C078/079 - Temp Guide Frame Installation	1	17-May-15 A	18-May-15 A
CAE1-4030	PE1 C078/079 - ICE Certificate & Form 5	1	19-May-15 A	20-May-15 A
CAE1-4040	PE1 C078/079 - Sea Side Arc Sheetpile Assemby	6	21-May-15 A	26-May-15 A
CAE1-4050	PE1 C078/079 - Sea Side Arc Sheetpile Drivening	3	27-May-15 A	29-May-15 A
CAE1-4060	PE1 C078/079 - Land Side Arc Sheetpile Assemby	12	03-Jun-15 A	14-Jun-15 A
CAE1-4065	PE1 C078/079 - Machine Repair	8	10-Jun-15 A	17-Jun-15 A
CAE1-4070	PE1 C078/079 - Land Side Arc Sheetpile Drivening	3	15-Jun-15 A	18-Jun-15 A
CAE1-4080	PE1 C078/079 - Removal of Guide Frame	0	24-Jun-15 A	24-Jun-15 A
CAE1-4090	PE1 C078/079 - Removal of Temp Piles	1	26-Jun-15 A	27-Jun-15 A
CAE1-4100	PE1 C078/079 - Backfill	1	28-Jun-15 A	29-Jun-15 A
C079/080		75	17-Apr-15 A	01-Jul-15 A
CAE1-3010	PE1 C079/080 - Temp Piles Drivening	2	17-Apr-15 A	19-Apr-15 A
CAE1-3020	PE1 C079/080 - Temp Guide Frame Installation	0	24-Apr-15 A	24-Apr-15 A
CAE1-3030	PE1 C079/080 - ICE Certificate & Form 5	0	27-Apr-15 A	27-Apr-15 A
CAE1-3040	PE1 C079/080 - Sea Side Arc Sheetpile Assemby	7	29-Apr-15 A	06-May-15 A
CAE1-3050	PE1 C079/080 - Sea Side Arc Sheetpile Drivening	1	07-May-15 A	08-May-15 A
CAE1-3060	PE1 C079/080 - Land Side Arc Sheetpile Assemby	12	18-May-15 A	29-May-15 A

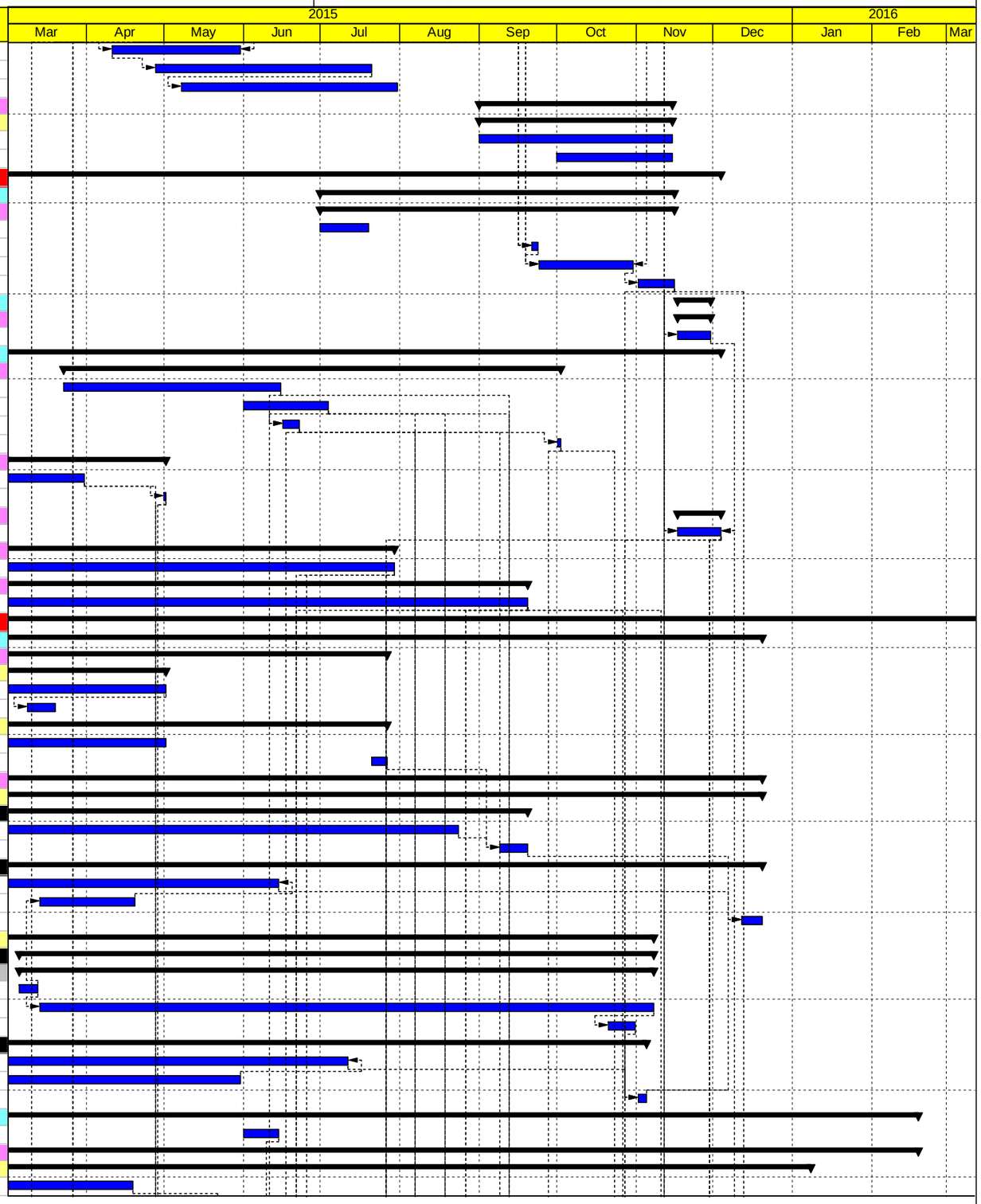


Remaining Level of Effort ◆ ◆ Milestone
Actual Level of Effort ▼ Summary
Actual Work
Remaining Work
Critical Remaining Work

Activity ID	Activity Name	Actual Duration	Start	Finish
CAE1-3070	PE1 C079/080 - Land Side Arc Sheetpile Drivening	4	30-May-15 A	02-Jun-15 A
CAE1-3080	PE1 C079/080 - Removal of Guide Frame	0	25-Jun-15 A	25-Jun-15 A
CAE1-3090	PE1 C079/080 - Removal of Temp Piles	1	28-Jun-15 A	29-Jun-15 A
CAE1-3100	PE1 C079/080 - Backfill	1	30-Jun-15 A	01-Jul-15 A
Capping Beams		151	21-Mar-15 A	31-Aug-15 A
Portion E1 between C090 to C074 Capping Beams		151	21-Mar-15 A	31-Aug-15 A
CBE1-030	PE1 Capping Beams structure C068 to C076 9cells 4days/cell	27	21-Mar-15 A	20-Apr-15 A
CBE1-020	PE1 Capping Beams structure C080 to C077 4cells 10days/cell	35	24-Jul-15 A	31-Aug-15 A
Conforming Sloping Seawalls		506	01-Nov-14 A	21-Mar-16 A
Geotextile		26	02-Jul-15 A	28-Jul-15 A
Seawall Portion E1 at C068 - C090 23cells		26	02-Jul-15 A	28-Jul-15 A
SGE1-014	PE1 Formation Level at C079 - C078 2cells 20,000m3	18	02-Jul-15 A	20-Jul-15 A
SGE1-020	PE1 Geotextile at C079 - C078 2cells	6	21-Jul-15 A	28-Jul-15 A
Rockfill		354	01-Nov-14 A	20-Oct-15 A
Seawall Portion E1 at C068 - C090 23cells		354	01-Nov-14 A	20-Oct-15 A
RFE1-030	PE1 Rockfill at C076 - C068 9cells	132	01-Nov-14 A	28-Mar-15 A
RFE1-010	PE1 Rockfill at C090 - C081 10cells	125	01-Nov-14 A	20-Mar-15 A
RFE1-040	PE1 10-60kg Underlayer 5,650m3	5	29-Jul-15 A	04-Aug-15 A
RFE1-050	PE1 10-60kg Echo	4	05-Aug-15 A	10-Aug-15 A
RFE1-060	PE1 10-60kg Trimming and Acceptance	4	11-Aug-15 A	15-Aug-15 A
RFE1-070	PE1 Type2 Rockfill upto -6mPD 8,849m3	15	16-Aug-15 A	03-Sep-15 A
RFE1-080	PE1 Type1 Rockfill upto -6mPD 6,632m3	15	17-Aug-15 A	03-Sep-15 A
RFE1-090	PE1 Type2 Rockfill upto -1.35mPD 3,366m3	3	04-Sep-15 A	08-Sep-15 A
RFE1-100	PE1 Type1 Rockfill upto -1.35mPD 3,740m3	3	04-Sep-15 A	08-Sep-15 A
RFE1-120	PE1 60-300ton Underlayer	42	09-Sep-15 A	20-Oct-15 A
RFE1-110	PE1 Type1 & Type2 Rockfill Trimming and Acceptance	2	09-Sep-15 A	11-Sep-15 A
Rock Armour - DWP07		198	01-Apr-15 A	16-Oct-15 A
Portion B At K028 - K039 (Ch1+100 - Ch1+600)		38	08-Sep-15 A	16-Oct-15 A
RFB1-010	PB at K028 - K039 on cells Removal of temporary rockfill	33	08-Sep-15 A	11-Oct-15 A
RFB1-020	PB at K028 - K039 on cells Geotextile & Underlayer 10-60kg 6,506m3 200m3/day	33	13-Sep-15 A	16-Oct-15 A
Portion B At K040 - K048 (Ch1+600 - Ch1+990)		121	01-Apr-15 A	31-Jul-15 A
RFB2-010	PB at K040 - K048 on cells Removal of temporary rockfill 15m/day	24	01-Apr-15 A	27-Apr-15 A
RFB2-020	PB at K040 - K048 on cells Geotextile & Underlayer 10-60kg 15m/day	26	06-Apr-15 A	02-May-15 A
RFB2-030	PB at K040 - K048 on cells Rock Armour 1-3ton 11,802m3, 237m3/day	50	11-Apr-15 A	31-May-15 A
RFB2-040	PB at K040 - K048 in front of cells Removal of temporary rockfill 3.5m/day	84	28-Apr-15 A	21-Jul-15 A
RFB2-060	PB at K040 - K048 in front of cells Rock Armour 1-3ton 11,802m3 141m3/day	84	08-May-15 A	31-Jul-15 A
Rock Armour - Before Surcharge Period		355	01-Apr-15 A	21-Mar-16 A
Portion B At K028 - K039 (Ch1+102 - Ch1+600)		187	02-Sep-15 A	07-Mar-16 A
BF-RFB1-040	PB at K028 - K039 in front of cells Removal of temporary rockfill 10205m3 190m3/day	140	02-Sep-15 A	20-Jan-16 A
BF-RFB1-010	PB at K028 - K039 on cells Removal of temporary rockfill	33	08-Sep-15 A	11-Oct-15 A
BF-RFB1-020	PB at K028 - K039 on cells Geotextile & Underlayer 10-60kg 6,506m3 200m3/day	33	13-Sep-15 A	16-Oct-15 A
BF-RFB1-030	PB at K028 - K039 on cells Rock Armour 0.3-1ton 13,505m3 237m3/day	43	18-Sep-15 A	31-Oct-15 A
BF-RFB1-050	PB at K028 - K039 in front of cells Geotextile & Underlayer 10-60kg 15m/day	122	02-Nov-15 A	07-Mar-16 A
Portion B At K040 - K048 (Ch1+600 - Ch1+990)		121	01-Apr-15 A	31-Jul-15 A
BF-RFB2-010	PB at K040 - K048 on cells Removal of temporary rockfill 15m/day	24	01-Apr-15 A	27-Apr-15 A
BF-RFB2-020	PB at K040 - K048 on cells Geotextile & Underlayer 10-60kg 15m/day	26	06-Apr-15 A	02-May-15 A
BF-RFB2-030	PB at K040 - K048 on cells Rock Armour 1-3ton 11,802m3, 237m3/day	50	11-Apr-15 A	31-May-15 A
BF-RFB2-040	PB at K040 - K048 in front of cells Removal of temporary rockfill 3.5m/day	84	28-Apr-15 A	21-Jul-15 A
BF-RFB2-060	PB at K040 - K048 in front of cells Rock Armour 1-3ton 11,802m3 141m3/day	84	08-May-15 A	31-Jul-15 A
Portion E1 & E2 In Front of Cells Ch1+990 - 3+810		107	01-Dec-15 A	21-Mar-16 A
Portion E2 Ch1+990 - Ch2+260		107	01-Dec-15 A	21-Mar-16 A
BF-RFE2-040	PE2 Ch1+990 - Ch2+260 in front of cells Removal of temporary rockfill 25,648m3	100	01-Dec-15 A	14-Mar-16 A
BF-RFE2-050	PE2 Ch1+990 - Ch2+260 in front of cells Geotextile & Underlayer 10-60kg 15m/day	76	01-Jan-16 A	21-Mar-16 A
Portion C2c & C2b At C090 - C101 (Ch3+810 - Ch4+262)		88	01-Dec-15 A	02-Mar-16 A
BF-RFC2c-040	PC2c at C091 - C101 in front of cells Removal of temporary rockfill 41,188m3	50	01-Dec-15 A	20-Jan-16 A
BF-RFC2c-052	PC2c at C091 - C101 Accropode Installation Trial stg1 180nrs 10nrs/day	23	19-Jan-16 A	15-Feb-16 A
BF-RFC2c-054	PC2c at C091 - C101 Accropode Installation Stg2 900nrs 30nrs/day	15	16-Feb-16 A	02-Mar-16 A
Rock Armour - After Surcharge Period		198	01-Apr-15 A	16-Oct-15 A
Portion B At K028 - K039 (Ch1102 - Ch1600)		38	08-Sep-15 A	16-Oct-15 A
AF-RFB1-010	PB at K028 - K039 on cells Removal of temporary rockfill	33	08-Sep-15 A	11-Oct-15 A
AF-RFB1-020	PB at K028 - K039 on cells Geotextile & Underlayer 10-60kg 6,506m3 200m3/day	33	13-Sep-15 A	16-Oct-15 A
Portion B At K040 - K048 (Ch1600 - Ch1990)		121	01-Apr-15 A	31-Jul-15 A
AF-RFB2-010	PB at K040 - K048 on cells Removal of temporary rockfill 15m/day	24	01-Apr-15 A	27-Apr-15 A
AF-RFB2-020	PB at K040 - K048 on cells Geotextile & Underlayer 10-60kg 15m/day	26	06-Apr-15 A	02-May-15 A

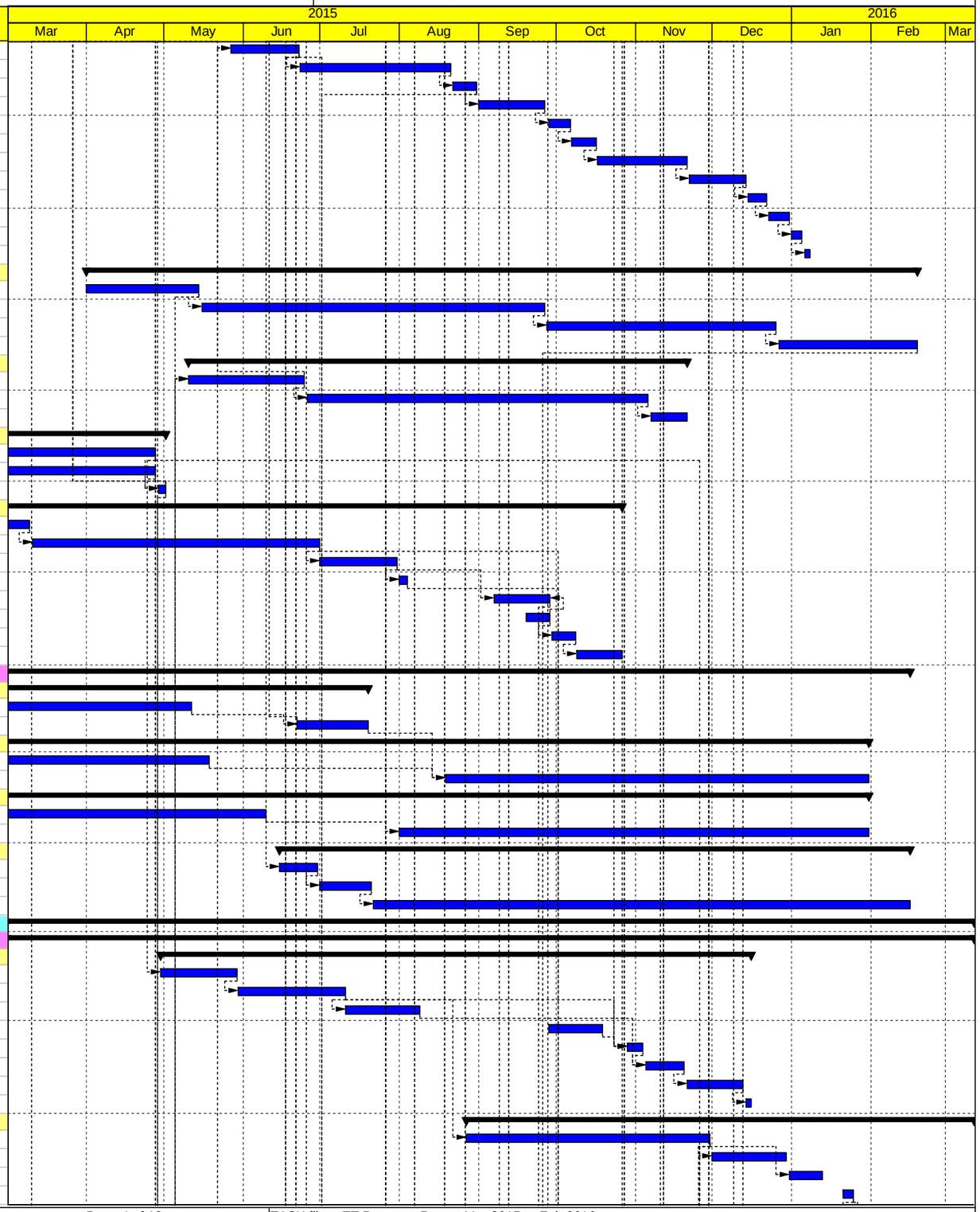


Activity ID	Activity Name	Actual Duration	Start	Finish
AF-RFB2-030	PB at K040 - K048 on cells Rock Armour 1-3ton 11,802m3, 237m3/day	50	11-Apr-15 A	31-May-15 A
AF-RFB2-040	PB at K040 - K048 in front of cells Removal of temporary rockfill 3.5m/day	84	28-Apr-15 A	21-Jul-15 A
AF-RFB2-060	PB at K040 - K048 in front of cells Rock Armour 1-3ton 11,802m3 141m3/day	84	08-May-15 A	31-Jul-15 A
Accropode		75	01-Sep-15 A	15-Nov-15 A
Accropode Production about 18,000nrs		75	01-Sep-15 A	15-Nov-15 A
OP1-00010	Trial Mix and Casting Yard Establish	75	01-Sep-15 A	15-Nov-15 A
OP1-00020	Mould Fabrication	45	01-Oct-15 A	15-Nov-15 A
Reclamation		338	31-Dec-14 A	04-Dec-15 A
Marine Fill		118	01-Jul-15 A	16-Nov-15 A
Land Portion E1		118	01-Jul-15 A	16-Nov-15 A
MFE1-005	PE1 Marine Sand Fill upto -8.0mPD 51,373m3	16	01-Jul-15 A	20-Jul-15 A
MFE1-010	PE1 Marine Sand Fill upto -6.0mPD 13,725m3 5,000m3/day Layer by Layer	3	21-Sep-15 A	23-Sep-15 A
MFE1-020	PE1 Marine Sand Fill -6.0mPD to +0.0mPD 165,257m3 5,000m3/day Layer by Layer	32	24-Sep-15 A	31-Oct-15 A
MFE1-030	PE1 Marine Sand Fill 0.0mPD to +2.5mPD 125,000m3 10,000m3/day	12	02-Nov-15 A	16-Nov-15 A
Vertical Band Drains by Land Plant		11	17-Nov-15 A	30-Nov-15 A
Land Portion E1 12,243nrs by Land		11	17-Nov-15 A	30-Nov-15 A
VBDE1-10	PE1 Vertical Band Drains 3,478nrs by land plant (400nrs/day) (2HP)	11	17-Nov-15 A	30-Nov-15 A
Earthwork Fill		338	31-Dec-14 A	04-Dec-15 A
Land Portion C2a		194	23-Mar-15 A	02-Oct-15 A
EFC2a-051	PC2a Edge Area C108-C112 Remedial works by additional band drains (outstanding 1,659	85	23-Mar-15 A	15-Jun-15 A
EFC2a-052	PC2a Edge Area C108-C112 Install Instrumentation 2points	29	01-Jun-15 A	04-Jul-15 A
EFC2a-055	PC2a Edge Area NorthWest Earthwork Fill Type D Sand 100% stg2 50,077m3 10,000m/d	6	16-Jun-15 A	22-Jun-15 A
EFC2a-065	PC2a Edge Area NorthWest Earthwork Fill Type D Sand 100% stg3 9,668m3 5,000m/day	2	01-Oct-15 A	02-Oct-15 A
Land Portion E2		53	01-Mar-15 A	02-May-15 A
EFE2-024	PE2 North(N) -Edge 100m Type D Earthwork Sand Fill upto +5.5mPD 43,745m3 10,000m	25	01-Mar-15 A	31-Mar-15 A
EFE2-026	PE2 North(N) -Edge 100m Type D Earthwork Sand Fill upto +5.5mPD 11,255m3 14,000m	1	01-May-15 A	02-May-15 A
Land Portion E1		15	17-Nov-15 A	04-Dec-15 A
EFE1-010	PE1 Type D Earthwork Sand Fill upto +5.5mPD 118,263m3 5,000m3/day	15	17-Nov-15 A	04-Dec-15 A
Land Portion C2b		192	31-Dec-14 A	30-Jul-15 A
EFC2b-010	PC2b Earthwork Fill Type B public w compaction upto +5.5mPD 168,546m3 5,000m3/day	192	31-Dec-14 A	30-Jul-15 A
Land Portion C2c		241	31-Dec-14 A	20-Sep-15 A
EFC2c-010	PC2c Earthwork Fill Type B public w compaction upto +5.5mPD 276,853m3 5,000m3/day	241	31-Dec-14 A	20-Sep-15 A
Surcharge		593	05-Sep-14 A	20-Apr-16 A
Portion A Surcharge		471	05-Sep-14 A	20-Dec-15 A
Main Reclamation Areas		325	05-Sep-14 A	27-Jul-15 A
A2 East		239	05-Sep-14 A	02-May-15 A
SURA0-420	PA A2 East Surcharge Period as +11.5mPD 8mths (2 May 2015)	239	05-Sep-14 A	02-May-15 A
SURA0-430	PA A2 East Surcharge Removal 75,757m3 10,000m3/day	11	09-Mar-15 A	20-Mar-15 A
Area of CLP substation		325	05-Sep-14 A	27-Jul-15 A
SUEA2-0070	PA CLP Substation Sand Surcharge Period as +11.5mPD 8mths (2 May2015)	239	05-Sep-14 A	02-May-15 A
SUEA2-0080	PA CLP Substation Sand Surcharge Removal on Main Area 60,410m3 10,000m3/day	5	21-Jul-15 A	27-Jul-15 A
Edge Area From SOL offset within 180m to 50m		427	19-Oct-14 A	20-Dec-15 A
CH5+110 to 5+440 Portion A North		427	19-Oct-14 A	20-Dec-15 A
Area of 50m to 120 from Offset		266	28-Dec-14 A	20-Sep-15 A
SUEA1-2090	PA North 120m-50m from Offset Surcharge Period +11.5mPD 8mths (24Aug2015)	239	28-Dec-14 A	24-Aug-15 A
SUEA1-2100	PA North 120m-73m from Offset Surcharge Removal 64,941m3 10,000m3/day	11	09-Sep-15 A	20-Sep-15 A
Area of 0 to 50m from Offset		427	19-Oct-14 A	20-Dec-15 A
SUEA1-2180	PA North 50m-10m Surcharge Period +7.0mPD 8mths (15Jun2015)	239	19-Oct-14 A	15-Jun-15 A
SUEA1-2150	PA North 50m-40m Surcharge Sand Laying upto +11.5mPD 87520m3 8,000m3/day	31	14-Mar-15 A	20-Apr-15 A
SUEA1-2190	PA North 73m-10m Surcharge Sand Removal 80,000m3 10,000m3/day	7	12-Dec-15 A	20-Dec-15 A
CH5+440 to 5+650 Portion A South		358	15-Nov-14 A	08-Nov-15 A
Area of 40m - 120m from Offset (other CLP area)		247	06-Mar-15 A	08-Nov-15 A
Upto +11.5mPD Area		247	06-Mar-15 A	08-Nov-15 A
SUEA3-0060	PA South 120m-40m from SOL Surcharge Sand Laying upto +11.5mPD 60,480m3 8,000r	6	06-Mar-15 A	13-Mar-15 A
SUEA3-0070	PA South Surcharge Period +11.5mPD 8mths (8 Nov2015)	239	14-Mar-15 A	08-Nov-15 A
SUEA3-0080	PA South Surcharge Removal 111,581m3 10,000m3/day	11	21-Oct-15 A	31-Oct-15 A
Area of 10m - 40m from Offset (other CLP area)		355	15-Nov-14 A	05-Nov-15 A
SUEA4-0070	PA South 40m-10m Surcharge Period 8mths (12Jul2015)	239	15-Nov-14 A	12-Jul-15 A
SUEA4-0040	PA South 40m-10m from SOL Surcharge Sand Laying upto +9.5mPD 34,020m3 1,000m3	166	15-Nov-14 A	30-May-15 A
SUEA4-0080	PA South 40m-10m Surcharge Sand Removal 40,000m3 10,000m3/day	3	02-Nov-15 A	05-Nov-15 A
Land Portion B		494	13-Oct-14 A	19-Feb-16 A
SURB3-005	PB Main Area East-N Removal DCM material	14	01-Jun-15 A	14-Jun-15 A
Edge Areas		394	21-Jan-15 A	19-Feb-16 A
at K013 - K027		347	26-Jan-15 A	08-Jan-16 A
SUEB0-007	PB Edge Area K013-K027 Additional Works by Additional Band Drains 8,480nrs	68	26-Jan-15 A	19-Apr-15 A



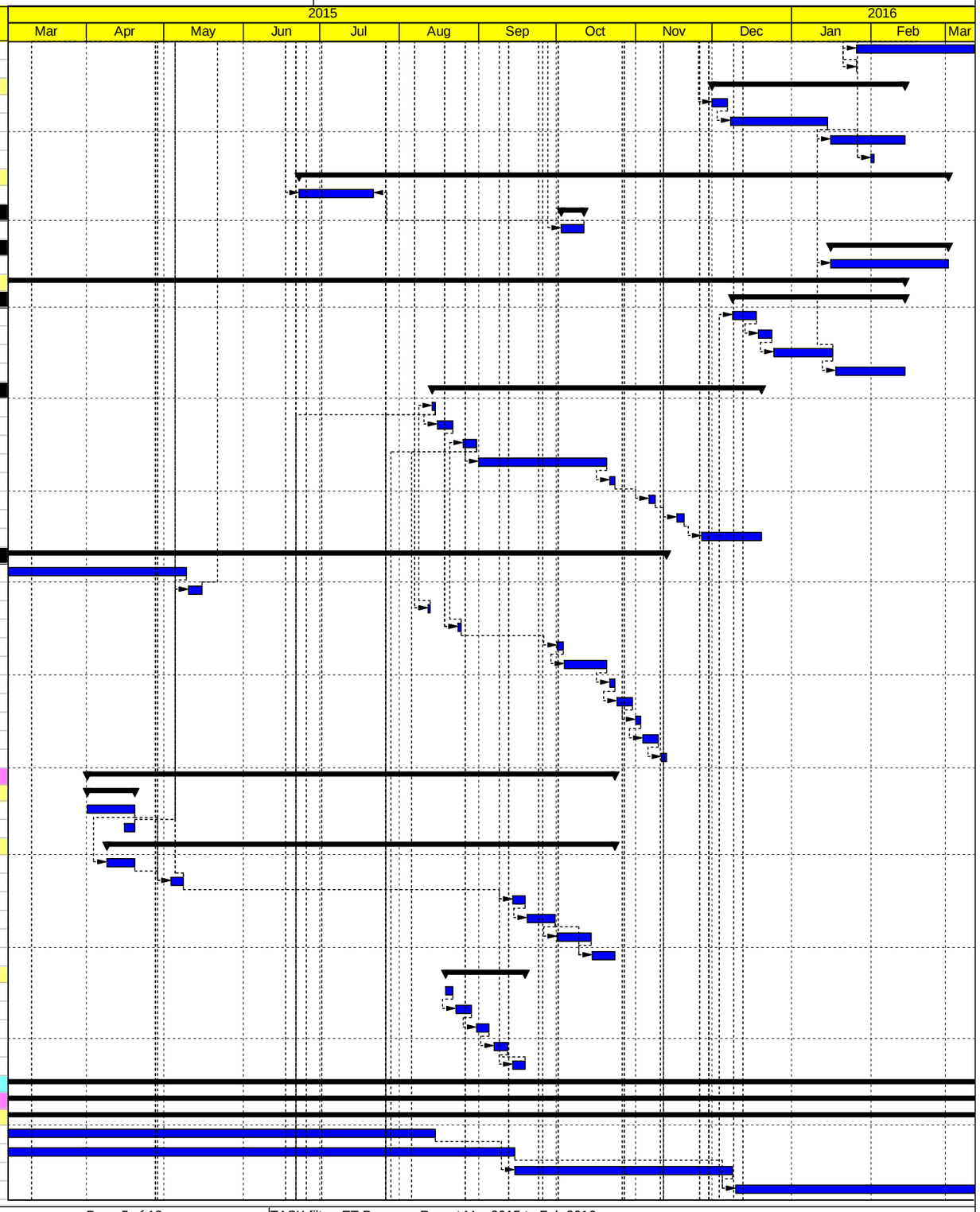
Remaining Level of Effort ◆ ◆ Milestone
Actual Level of Effort ▼ Summary
Actual Work
Remaining Work
Critical Remaining Work

Activity ID	Activity Name	Actual Duration	Start	Finish
SUEB0-010	PB Edge Area K013-K027 Sand Surcharge upto 6.5mPD 41,766m3 10,000m3/day	23	27-May-15 A	22-Jun-15 A
SUEB0-012	PB Edge Area K013-K027 Sand Surcharge Checking at +6.5mPD	59	23-Jun-15 A	21-Aug-15 A
SUEB0-014	PB Edge Area K013-K027 Sand Surcharge upto 7.5mPD 41,766m3 5,000m3/day	7	22-Aug-15 A	31-Aug-15 A
SUEB0-016	PB Edge Area K013-K027 Sand Surcharge Checking at +7.5mPD	26	01-Sep-15 A	26-Sep-15 A
SUEB0-018	PB Edge Area K013-K027 Sand Surcharge upto 8.5mPD 41,766m3 5,000m3/day by Dum	8	28-Sep-15 A	06-Oct-15 A
SUEB0-020	PB Edge Area K013-K027 Sand Surcharge Checking at +8.5mPD	10	07-Oct-15 A	16-Oct-15 A
SUEB0-030	PB Edge Area K013-K027 Sand Surcharge upto 9.5mPD 38,102m3 5,000m3/day by Dum	30	17-Oct-15 A	21-Nov-15 A
SUEB0-032	PB Edge Area K013-K027 Sand Surcharge Checking at +9.5mPD	22	22-Nov-15 A	14-Dec-15 A
SUEB0-034	PB Edge Area K013-K027 Sand Surcharge upto 10.5mPD 38,102m3 5,000m3/day by Dur	6	15-Dec-15 A	22-Dec-15 A
SUEB0-036	PB Edge Area K013-K027 Sand Surcharge Checking at +10.5mPD	8	23-Dec-15 A	31-Dec-15 A
SUEB0-038	PB Edge Area K013-K027 Sand Surcharge up to 11.5mPD 38,103m3 5,000m3/day by Du	3	01-Jan-16 A	05-Jan-16 A
SUEB0-039	PB Edge Area K013-K027 Sand Surcharge Survey Inspection	2	06-Jan-16 A	08-Jan-16 A
at K028 - K035		324	01-Apr-15 A	19-Feb-16 A
SUEB0-060	PB Edge Area K028-K035 Sand Surcharge upto 8.5mPD 45,272m3 5,000m3/day upto 20	38	01-Apr-15 A	15-May-15 A
SUEB0-070	PB Edge Area K028-K035 Surcharge Period +8.5mPD 4.5mths	134	16-May-15 A	26-Sep-15 A
SUEB0-072	PB Edge Area K028-K035 Surcharge Strength Test Achievement (Await compliance for fil	90	27-Sep-15 A	26-Dec-15 A
SUEB0-080	PB Edge Area K028-K035 Sand Surcharge Laying up to 11.5mPD 45,440m3 5,000m3/da	46	27-Dec-15 A	19-Feb-16 A
at K036 - K039		194	11-May-15 A	21-Nov-15 A
SUEB0-062	PB Edge Area K036-K039 Sand Surcharge upto 8.5mPD 45,448m3 10,000m3/day	39	11-May-15 A	25-Jun-15 A
SUEB0-125	PB Edge Area K036-K039 Surcharge Period +8.5mPD 4.5mths	133	26-Jun-15 A	06-Nov-15 A
SUEB0-130	PB Edge Area K036-K039 Surcharge Strength Test Achievement	14	07-Nov-15 A	21-Nov-15 A
at K040 - K046 (w Deep Cement Mixing)		101	21-Jan-15 A	02-May-15 A
DCM-1050	PB Edge Area K040-K046 Deep Cement Mixing 73m width - 1st 3plants Installation 98,00	97	21-Jan-15 A	28-Apr-15 A
DCM-1060	PB Edge Area K040-K046 Deep Cement Mixing 73m width - 2nd 3plants Installation 83,5(	83	04-Feb-15 A	28-Apr-15 A
DCM-1080	PB Edge Area K040-K046 Filling up to +5.5mPD 41,000m3 10,000m3/day at DCM by TS	3	29-Apr-15 A	02-May-15 A
at K047 - K052 (w Deep Cement Mixing)		243	26-Feb-15 A	27-Oct-15 A
DCM-2010	PB Edge Area K047-K052 Mobilization (5 Plants)	12	26-Feb-15 A	10-Mar-15 A
DCM-2020	PB Edge Area K047-K052 Deep Cement Mixing 30m width - Installation 123,470m3	112	11-Mar-15 A	30-Jun-15 A
DCM-2030	PB Edge Area K047-K052 Deep Cement Mixing 30m width - Hardening	30	01-Jul-15 A	31-Jul-15 A
DCM-2040	PB Edge Area K047-K052 Filling up to +5.5mPD 35,000m3 10,000m3/day at DCM by Du	2	01-Aug-15 A	04-Aug-15 A
DCM-2060	PB Edge Area K047-K052 36-73m Filling up to +8.5mPD 34,864m3 5,000m3/day at DCM	19	07-Sep-15 A	28-Sep-15 A
DCM-2050	PB Edge Area K047-K052 Filling up to +5.5mPD 60,000m3 5,000m3/day	10	19-Sep-15 A	28-Sep-15 A
DCM-2061	PB Edge Area K047-K052 36-73m CPT Test	10	29-Sep-15 A	08-Oct-15 A
DCM-2062	PB Edge Area K047-K052 36-73m Filling up to +11.5mPD 33,470m3 5,000m3/day at DCI	15	09-Oct-15 A	27-Oct-15 A
Reclamation Areas		491	13-Oct-14 A	16-Feb-16 A
at East of Main Area		280	13-Oct-14 A	20-Jul-15 A
SURB0-040	PB Main Area East Sand Surcharge Period +11.5mPD 7mths (12May2015)	211	13-Oct-14 A	12-May-15 A
SURB0-050	PB Main Area East Sand Surcharge Removal 211,956m3 10,000m3/day	26	22-Jun-15 A	20-Jul-15 A
at West of Main Area stg1		468	20-Oct-14 A	31-Jan-16 A
SURB1-030	PB Main Area West-S Sand Surcharge Period +11.5mPD (19May2015 after 7mths surcha	211	20-Oct-14 A	19-May-15 A
SURB1-040	PB Main Area West-S Sand Surcharge Removal 291,223m3 10,000m3/day	153	19-Aug-15 A	31-Jan-16 A
at West of Main Area stg2		446	11-Nov-14 A	31-Jan-16 A
SURB2-030	PB Main Area West-N Sand Surcharge Period +11.5mPD (10Jun2015 after 7mths)	211	11-Nov-14 A	10-Jun-15 A
SURB2-040	PB Main Area West-N Sand Surcharge Removal 335,714m3 10,000m3/day	170	01-Aug-15 A	31-Jan-16 A
at North- East of Main Area		246	15-Jun-15 A	16-Feb-16 A
SURB3-010	PB Main Area East-N Sand Surcharge upto +8.5mPD 29,149m3 14,000m3/day	13	15-Jun-15 A	30-Jun-15 A
SURB3-020	PB Main Area East-N Sand Surcharge upto +11.5mPD 75,499m3 14,000m3/day	17	01-Jul-15 A	21-Jul-15 A
SURB3-030	PB Main Area North Sand Surcharge Period +11.5mPD 7mths (16Feb2016)	209	22-Jul-15 A	16-Feb-16 A
Land Portion C2a		377	01-Mar-15 A	12-Mar-16 A
Edge Areas		377	01-Mar-15 A	12-Mar-16 A
Deep Cement Mixing Works at C101 - C103		230	30-Apr-15 A	16-Dec-15 A
DCM-3010	PC2a Edge Area C101-C103 Mobilization from K040-K046 3plants	30	30-Apr-15 A	29-May-15 A
DCM-3020	PC2a Edge Area C101-C103 43m width x 128.5m Length Installation 753nrs 18nrs/day	42	30-May-15 A	11-Jul-15 A
DCM-3030	PC2a Edge Area C101-C103 Hardening & Pause Period	29	11-Jul-15 A	09-Aug-15 A
DCM-3035	PC2a Edge Area C101-C103 Instrumentation Installation	21	28-Sep-15 A	19-Oct-15 A
DCM-3040	PC2a Edge Area C101-C103 Filling up to +5.5mPD Type D (73m width, 28,200m3) 5,000	5	29-Oct-15 A	04-Nov-15 A
DCM-3050	PC2a Edge Area C101-C103 Filling up to +8.5mPD Surcharge (30m width, 14,607m3 5,0(	13	05-Nov-15 A	20-Nov-15 A
DCM-3052	PC2a Edge Area C101-C103 CPT Test	22	21-Nov-15 A	13-Dec-15 A
DCM-3060	PC2a Edge Area C101-C103 Filling up to +11.5mPD Surcharge (30m width, 14,607m3 5,(	2	14-Dec-15 A	16-Dec-15 A
VO - Deep Cement Mixing Works at C104 - C107		198	27-Aug-15 A	12-Mar-16 A
DCM-4130	PC2a Edge Area C104-C107 43m width Installation 1,764nrs (Outstanding 1,175nrs, 20nrs	95	27-Aug-15 A	30-Nov-15 A
DCM-4140	PC2a Edge Area C104-C107 Hardening & Pause Period	29	01-Dec-15 A	30-Dec-15 A
DCM-4150	PC2a Edge Area C104-C107 Filling up to +5.5mPD Type D (73m width, 17094m3) 5,000n	11	31-Dec-15 A	13-Jan-16 A
DCM-4160	PC2a Edge Area C104-C107 Filling up to +8.5mPD Surcharge (30m width, 16889m3 5,00	3	21-Jan-16 A	25-Jan-16 A



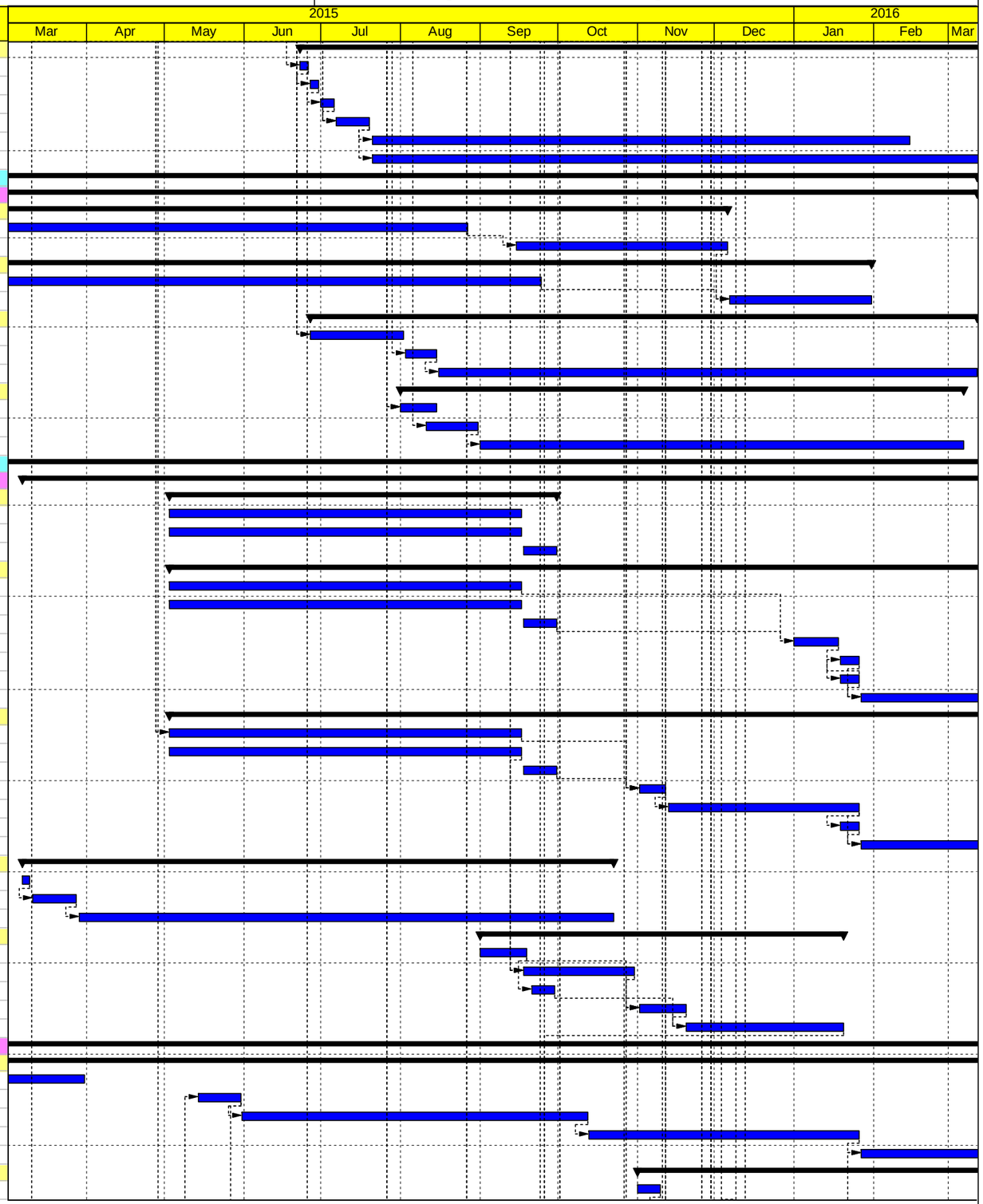
Remaining Level of Effort
Actual Level of Effort
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

Activity ID	Activity Name	Actual Duration	Start	Finish
DCM-4170	PC2a Edge Area C104-C107 Filling up to +11.5mPD Surcharge (30m width, 16889m3 5,0	40	26-Jan-16 A	12-Mar-16 A
DCM-4162	PC2a Edge Area C104-C107 Surcharge CPT Test	0	26-Jan-16 A	26-Jan-16 A
VO - Deep Cement Mixing Works at C108 - C109		75	01-Dec-15 A	14-Feb-16 A
DCM-5100	PC2a Edge Area C108-C109 Relocation of Cement Plant	6	01-Dec-15 A	07-Dec-15 A
DCM-5110	PC2a Edge Area C108-C109 43m width Installation 471nrs 11nrs/day	38	08-Dec-15 A	15-Jan-16 A
DCM-5120	PC2a Edge Area C108-C109 Hardening & Pause Period	29	16-Jan-16 A	14-Feb-16 A
DCM-5130	PC2a Edge Area C108-C109 Filling up to +5.5mPD Type D (73m width, 8547m3) 5,000m3	1	01-Feb-16 A	02-Feb-16 A
at C110 - C112 Cellular Seawall		253	23-Jun-15 A	02-Mar-16 A
SUEC2a-005	PC2a Edge Area C110-C112 Sand Surcharge Period +5.5mPD 1mth	29	23-Jun-15 A	22-Jul-15 A
Conforming Works at C110-C112		9	03-Oct-15 A	12-Oct-15 A
SUEC2a-002	PC2a Edge Area C110-C112 Strength Test Result (CPT)	9	03-Oct-15 A	12-Oct-15 A
VO - Deep Cement Mixing Works at C110 - C112		46	16-Jan-16 A	02-Mar-16 A
DCM-4210	PC2a Edge Area C110-C112 23m width Installation 597nrs 15nrs/day (w CNY)	46	16-Jan-16 A	02-Mar-16 A
CH4+710 - CH5+110 Rubble Mound Seawall		350	01-Mar-15 A	14-Feb-16 A
Deep Cement Mixing at CH4+710 - CH4+880		67	09-Dec-15 A	14-Feb-16 A
DCM-5010	PC2a Ch4+710 - Ch4+880 DCM Mobilization from E2 K067	9	09-Dec-15 A	18-Dec-15 A
DCM-5012	PC2a Ch4+710 - Ch4+880 DCM Formation Level	5	19-Dec-15 A	24-Dec-15 A
DCM-5020	PC2a Ch4+710 - Ch4+880 DCM Installation 111nrs 6nrs/day	23	25-Dec-15 A	17-Jan-16 A
DCM-5030	PC2a Ch4+710 - Ch4+880 Hardening & Pause Period	27	18-Jan-16 A	14-Feb-16 A
10-73m Ch4+880 - Ch5+010		128	14-Aug-15 A	20-Dec-15 A
SUEC2a-1030	PC2a Ch4+880 - Ch5+010 10m-73m Surcharge Sand upto 6.5mPD 8,914m3 5,000m3/da	1	14-Aug-15 A	15-Aug-15 A
SUEC2a-1034	PC2a Ch4+880 - Ch5+010 10m-73m Checking Strength at +6.5mPD	6	16-Aug-15 A	22-Aug-15 A
SUEC2a-1036	PC2a Ch4+880 - Ch5+010 10m-73m Surcharge Sand upto 7.5mPD 8,914m3 5,000m3/da	4	26-Aug-15 A	31-Aug-15 A
SUEC2a-1038	PC2a Ch4+880 - Ch5+010 10m-73m Checking Strength at +7.5mPD	50	01-Sep-15 A	21-Oct-15 A
SUEC2a-1050	PC2a Ch4+880 - Ch5+010 10m-73m Surcharge Sand to 8.5mPD 7,210m3 5,000m3/day	2	22-Oct-15 A	24-Oct-15 A
SUEC2a-1070	PC2a Ch4+880 - Ch5+010 Surcharge Sand to 9.5mPD 7,210m3 5000m3/day	3	06-Nov-15 A	08-Nov-15 A
SUEC2a-1090	PC2a Ch4+880 - Ch5+010 Surcharge Sand to 10.5mPD 7,210m3 5000m3/day	3	17-Nov-15 A	19-Nov-15 A
SUEC2a-1110	PC2a Ch4+880 - Ch5+010 Surcharge Sand to +11.5mPD 7,210m3 5,000m3/day	20	27-Nov-15 A	20-Dec-15 A
73-120m		257	01-Mar-15 A	13-Nov-15 A
SUEC2a-1010	PC2a C113-C117 70m from SOL Check Point for Undrained shear strength Area at +5.5m	70	01-Mar-15 A	10-May-15 A
SUEC2a-1020	PC2a C113-C117 73m-120m from SOL Surcharge Sand upto 7.5mPD stg1 11,347m3 4,0(	5	11-May-15 A	16-May-15 A
SUEC2a-2022	PC2a C113-C117 73m-120m Surcharge Sand upto 6.5mPD 5,672m3 5,000m3/day by Dur	1	12-Aug-15 A	13-Aug-15 A
SUEC2a-2026	PC2a C113-C117 73m-120m Surcharge Sand upto 7.5mPD 5,672m3 5,000m3/day by Dur	1	24-Aug-15 A	25-Aug-15 A
SUEC2a-2032	PC2a C113-C117 73m-120m Surcharge Sand upto 8.5mPD 11,347m3 5,000m3/day	3	01-Oct-15 A	03-Oct-15 A
SUEC2a-2036	PC2a C113-C117 73m-120m Strength Test Result at 8.5mPD	17	04-Oct-15 A	21-Oct-15 A
SUEC2a-2040	PC2a C113-C117 73m-120m Surcharge Sand upto 9.5mPD 11,347m3 5,000m3/day	2	22-Oct-15 A	24-Oct-15 A
SUEC2a-2045	PC2a C113-C117 73m-120m Strength Test Result at 9.5mPD	6	25-Oct-15 A	31-Oct-15 A
SUEC2a-2050	PC2a C113-C117 73m-120m Surcharge Sand upto 10.5mPD 11,347m3 5000m3/day	2	01-Nov-15 A	03-Nov-15 A
SUEC2a-2055	PC2a C113-C117 73m-120m Strength Test Result at 10.5mPD	6	04-Nov-15 A	10-Nov-15 A
SUEC2a-2080	PC2a C113-C117 73m-120m Surcharge Sand upto 11.5mPD 11,347m3 5,000m3/day	2	11-Nov-15 A	13-Nov-15 A
Reclamation Areas		206	01-Apr-15 A	24-Oct-15 A
C2aC1 South		16	01-Apr-15 A	20-Apr-15 A
SURC2a-010	PC2a Main East Sand Surcharge Laying upto 8.5mPD 184,068m3 7,500m3/day by TSHD	16	01-Apr-15 A	20-Apr-15 A
SURC2a-014	PC2a Main South Sand Surcharge Laying upto 11.5mPD 138,901m3 by TSHD upto 20Ap	3	16-Apr-15 A	20-Apr-15 A
C2aC1		198	09-Apr-15 A	24-Oct-15 A
SURC2a-060	PC2a Main North Sand Surcharge Laying upto 8.5mPD 100,961m3 by TSHD upto 20Apr2	9	09-Apr-15 A	20-Apr-15 A
SURC2a-062	PC2a Main North Sand Surcharge Laying upto 8.5mPD 83,107m3 14,000m3/day by TSHI	5	04-May-15 A	09-May-15 A
SURC2aC1-0	PC2a C2aC1 Sand Surcharge Laying 8.5mPD to 9.5mPD 46,412m3 5,000m3/day	5	14-Sep-15 A	19-Sep-15 A
SURC2aC1-0	PC2a C2aC1 Sand Surcharge Laying 9.5mPD to 10.5mPD 46,412m3 5,000m3/day	9	20-Sep-15 A	30-Sep-15 A
SURC2aC1-0	PC2a C2aC1 Strength Test Result	14	01-Oct-15 A	14-Oct-15 A
SURC2aC1-0	PC2a C2aC1 Sand Surcharge Laying 10.5mPD to 11.5mPD 46,412m3 5,000m3/day	8	15-Oct-15 A	24-Oct-15 A
C2aC2		31	19-Aug-15 A	19-Sep-15 A
SURC2aC2-0	PC2a C2aC2 Sand Surcharge Laying 8.5mPD to 9.5mPD 30000m3 5,000m3/day	3	19-Aug-15 A	22-Aug-15 A
SURC2aC2-0	PC2a C2aC2 Stability Checking at 9.5mPD	6	23-Aug-15 A	29-Aug-15 A
SURC2aC2-0	PC2a C2aC2 Sand Surcharge Laying 9.5mPD to 10.5mPD 30000m3 5,000m3/day	5	31-Aug-15 A	05-Sep-15 A
SURC2aC2-0	PC2a C2aC2 Stability Checking at 10.5mPD	5	07-Sep-15 A	12-Sep-15 A
SURC2aC2-0	PC2a C2aC2 Sand Surcharge Laying 10.5mPD to 11.5mPD 30000m3 5,000m3/day	5	14-Sep-15 A	19-Sep-15 A
Land Portion C1a		441	15-Jan-15 A	31-Mar-16 A
Reclamation Areas		441	15-Jan-15 A	31-Mar-16 A
C3		441	15-Jan-15 A	31-Mar-16 A
SURC1a-020	PC1a Main Area East Sand Surcharge Period as +11.5mPD 7mths	212	15-Jan-15 A	15-Aug-15 A
SURC1a-022	PC1a Main Area West Sand Surcharge Period as +11.5mPD 8mths	243	15-Jan-15 A	15-Sep-15 A
SURC1a-030	PC1a North East Land Area Sand Surcharge Removal 280,000m3 10,000m3/day	79	15-Sep-15 A	09-Dec-15 A
SURC1a-040	PC1a North West Land Area Sand Surcharge Removal 297,616m3 10,000m3/day	100	10-Dec-15 A	31-Mar-16 A



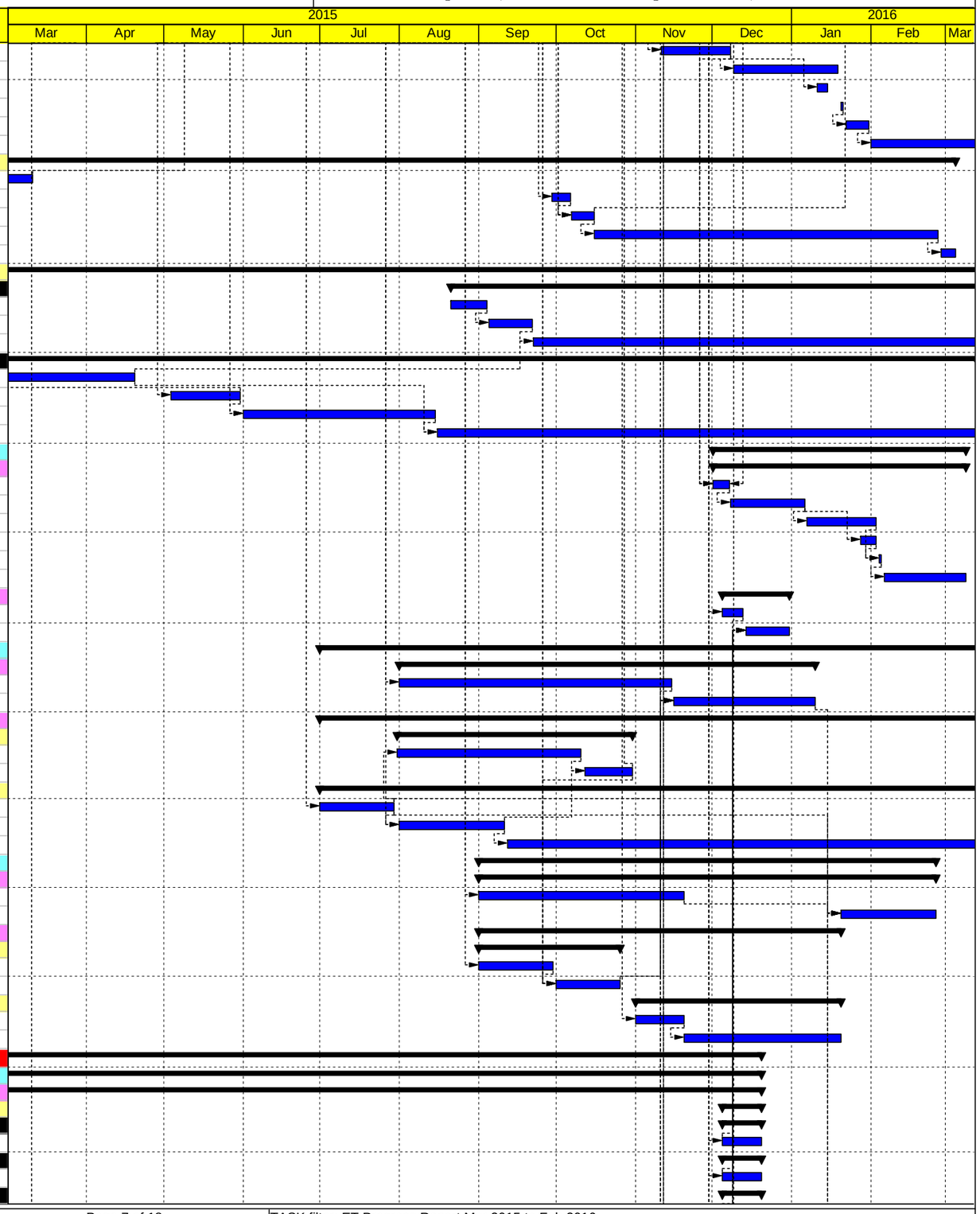
Remaining Level of Effort ◆ ◆ Milestone
Actual Level of Effort ▼ ▼ Summary
Actual Work
Remaining Work
Critical Remaining Work

Activity ID	Activity Name	Actual Duration	Start	Finish
C4		267	23-Jun-15 A	16-Mar-16 A
SURC1a-100	PC1a South Land Area Sand Surcharge up to 6.5mPD 7,000m3 5,000m3/day by Dump T	3	23-Jun-15 A	26-Jun-15 A
SURC1a-110	PC1a South Land Area Sand Surcharge up to 7.5mPD 7,000m3 5,000m3/day by Dump T	2	27-Jun-15 A	30-Jun-15 A
SURC1a-120	PC1a South Land Area Sand Surcharge up to 8.5mPD 6,000m3 5,000m3/day by Dump T	4	01-Jul-15 A	06-Jul-15 A
SURC1a-130	PC1a South Land Area Sand Surcharge up to 11.5mPD 20,000m3 5,000m3/day by Dump	11	07-Jul-15 A	20-Jul-15 A
SURC1a-140	PC1a South East Land Area Sand Surcharge Period at +11.5mPD 7mths (15Feb2016)	209	21-Jul-15 A	15-Feb-16 A
SURC1a-150	PC1a South West Land Area Sand Surcharge Period at +11.5mPD 8mths (16Mar2016)	239	21-Jul-15 A	16-Mar-16 A
Land Portion C1b		415	22-Jan-15 A	12-Mar-16 A
Reclamation Areas		415	22-Jan-15 A	12-Mar-16 A
West (1/4 Areas)		318	22-Jan-15 A	06-Dec-15 A
SURC1b-020	PC1b West Sand Surcharge Period +11.5mPD 7mths	217	22-Jan-15 A	27-Aug-15 A
SURC1b-030	PC1b West Sand Surcharge Removal 336,434m310,000m3/day	76	15-Sep-15 A	06-Dec-15 A
East (3/4 Areas)		364	01-Feb-15 A	31-Jan-16 A
SURC1b-050	PC1b East Sand Surcharge Period +11.5mPD 7mths	236	01-Feb-15 A	24-Sep-15 A
SURC1b-060	PC1b East Sand Surcharge Removal 336,435m3 10,000m3/day	51	07-Dec-15 A	31-Jan-16 A
North Side close to Portion C2b		259	27-Jun-15 A	12-Mar-16 A
SURC1b-1010	PC1b Main Area Sand Surcharge Laying upto 8.5mPD 30,000m3 5,000m3/day by Dump T	31	27-Jun-15 A	02-Aug-15 A
SURC1b-1020	PC1b Main Area Sand Surcharge Laying upto 11.5mPD 30,000m3 5,000m3/day by Dump	11	03-Aug-15 A	15-Aug-15 A
SURC1b-1030	PC1b Main Area Sand Surcharge Period as +11.5mPD 7mths (12Mar2016)	209	16-Aug-15 A	12-Mar-16 A
North Side close to Portion C2c		219	01-Aug-15 A	07-Mar-16 A
SURC1b-1060	PC1b Main Area Sand Surcharge Laying upto 8.5mPD 42,351m3 5,000m3/day by Dump T	12	01-Aug-15 A	15-Aug-15 A
SURC1b-1070	PC1b Main Area Sand Surcharge Laying upto 11.5mPD 42,351m3 5,000m3/day by Dump	17	11-Aug-15 A	31-Aug-15 A
SURC1b-1080	PC1b Main Area Sand Surcharge Period as +11.5mPD 7mths (28Mar2016)	188	01-Sep-15 A	07-Mar-16 A
Land Portion E2		436	09-Feb-15 A	20-Apr-16 A
North Part		410	07-Mar-15 A	20-Apr-16 A
Edge Areas - North (C3)		151	03-May-15 A	30-Sep-15 A
SUEE2-310	PE2 North Edge C3 Sand Surcharge Period at +5.5mPD Testing	137	03-May-15 A	17-Sep-15 A
SUEE2-320	PE2 North Edge C3 Remedial Works by Additional Band Drains	137	03-May-15 A	17-Sep-15 A
SUEE2-330	PE2 North Edge C3 Sand Surcharge Laying up to 5.5mPD	11	18-Sep-15 A	30-Sep-15 A
Edge Areas - North (TM)		353	03-May-15 A	20-Apr-16 A
SUEE2-410	PE2 North Edge TM Sand Surcharge Period at +5.5mPD Testing	137	03-May-15 A	17-Sep-15 A
SUEE2-420	PE2 North Edge TM Remedial Works by Additional Band Drains	137	03-May-15 A	17-Sep-15 A
SUEE2-430	PE2 North Edge TM Sand Surcharge Laying up to 5.5mPD	11	18-Sep-15 A	30-Sep-15 A
SUEE2-440	PE2 North Edge TM Sand Surcharge Laying up to 8.5mPD 18248m3 5,000m3/day	14	01-Jan-16 A	18-Jan-16 A
SUEE2-460	PE2 North Edge TM Surcharge CPT Test	7	19-Jan-16 A	26-Jan-16 A
SUEE2-450	PE2 North Edge TM Sand Surcharge Period as +8.5mPD 4.5mths	7	19-Jan-16 A	26-Jan-16 A
SUEE2-470	PE2 North Edge TM Sand Surcharge Laying up to +11.5mPD 18,248m3 5,000m3/day	72	27-Jan-16 A	20-Apr-16 A
Edge Areas - East (TM) C064-C067		353	03-May-15 A	20-Apr-16 A
SUEE2-110	PE2 North & East Edge C064-C067 Sand Surcharge Period at +5.5mPD Testing	137	03-May-15 A	17-Sep-15 A
SUEE2-115	PE2 North & East Edge C064-C067 Remedial Works by Additional Band Drains	137	03-May-15 A	17-Sep-15 A
SUEE2-117	PE2 North & East Edge C064-C067 Sand Surcharge Laying up to 5.5mPD	11	18-Sep-15 A	30-Sep-15 A
SUEE2-120	PE2 East Edge C064-C067 Sand Surcharge Laying up to 8.5mPD 18,250m3 5,000m3/day	9	02-Nov-15 A	12-Nov-15 A
SUEE2-130	PE2 East Edge C064-C067 Sand Surcharge Period as +8.5mPD 4.5mths	74	13-Nov-15 A	26-Jan-16 A
SUEE2-135	PE2 East Edge C064-C067 Surcharge CPT Test	7	19-Jan-16 A	26-Jan-16 A
SUEE2-140	PE2 East Edge C064-C067 Sand Surcharge Laying up to +11.5mPD 18,249m3 5,000m3/	72	27-Jan-16 A	20-Apr-16 A
Land Areas - East (TM) C057 - C063 Ch2+300 to Ch2+600		230	07-Mar-15 A	23-Oct-15 A
SURE2-040-1	PE2 North Main Sand Surcharge tunnel area Laying upto 8.5mPD 64,632m3 20,000m3/d	2	07-Mar-15 A	10-Mar-15 A
SURE2-042-1	PE2 North Main Sand Surcharge tunnel area Laying upto 11.5mPD at tunnel area 64,631	15	11-Mar-15 A	28-Mar-15 A
SURE2-050	PE2 Land C057-C063 Tunnel Sand Surcharge Period as +11.5mPD at tunnel area 7mths	208	29-Mar-15 A	23-Oct-15 A
Land Areas - West (C3)		141	01-Sep-15 A	20-Jan-16 A
SURE2-170-20	PE2 Land C061-C064 Non-Tunnel Sand Surcharge non tunnel area Laying upto 8.5mPD s	16	01-Sep-15 A	19-Sep-15 A
SURE2-170-10	PE2 Land C061-C064 Non-Tunnel Remedial Works by Additional Band Drains	43	18-Sep-15 A	31-Oct-15 A
SURE2-170-30	PE2 Land C061-C064 Non-Tunnel Sand Surcharge non tunnel area Laying upto 11.5mPD	8	21-Sep-15 A	30-Sep-15 A
SURE2-170-40	PE2 Land C061-C064 Non-Tunnel Sand Surcharge non tunnel area Laying upto 8.5mPD s	16	02-Nov-15 A	20-Nov-15 A
SURE2-170-50	PE2 Land C061-C064 Non-Tunnel Sand Surcharge non tunnel area Laying upto 11.5mPD	52	20-Nov-15 A	20-Jan-16 A
South Part		436	09-Feb-15 A	20-Apr-16 A
Edge Areas East C058 to C063		416	01-Mar-15 A	20-Apr-16 A
SUEE2-009	PE2 North-E Edge Sand Period as +5.5mPD 1mths	30	01-Mar-15 A	31-Mar-15 A
SUEE2-010	PE2 Edge C057-C063 Sand Surcharge Laying up to 8.5mPD 73,756m3 7,000m3/day by T	15	14-May-15 A	30-May-15 A
SUEE2-020	PE2 Edge C058-C063 Sand Surcharge Period as +8.5mPD 4.5mths	135	31-May-15 A	12-Oct-15 A
SUEE2-025	PE2 Edge C058-C063 Sand Surcharge Strength Test	105	13-Oct-15 A	26-Jan-16 A
SUEE2-030	PE2 Edge C058-C063 Sand Surcharge Laying up to +11.5mPD 62259m3 5,000m3/day	72	27-Jan-16 A	20-Apr-16 A
VO DCM Edge Areas East C056 to C057		171	01-Nov-15 A	20-Apr-16 A
DCM-4305	PE2 Edge C056-C057 Mobilization and Lower Down Surcharge	9	01-Nov-15 A	10-Nov-15 A

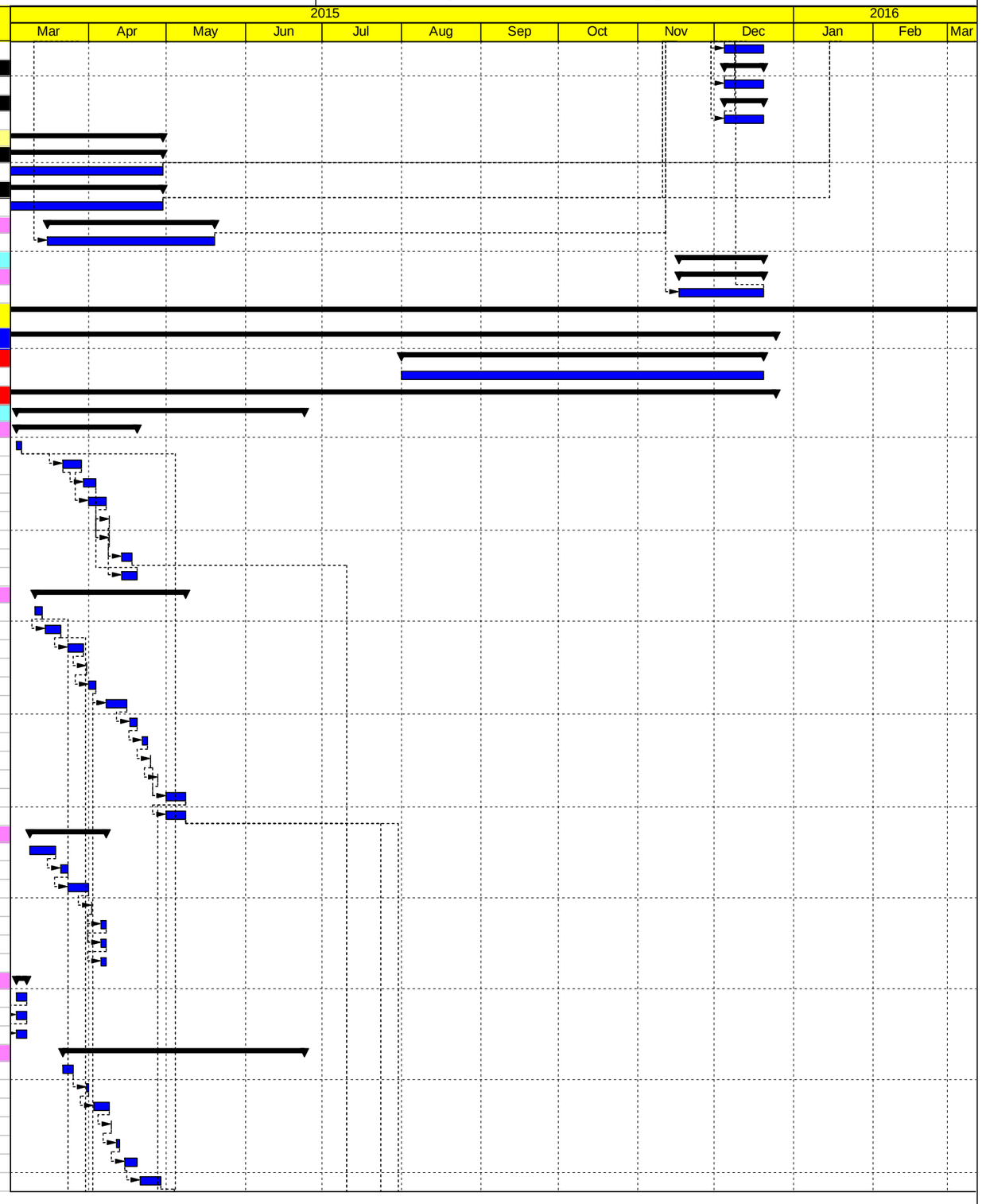


Remaining Level of Effort ◆ ◆ Milestone
Actual Level of Effort ▼ ▼ Summary
Actual Work
Remaining Work
Critical Remaining Work

Activity ID	Activity Name	Actual Duration	Start	Finish
DCM-4310	PE2 Edge C056-C057 43m width Installation 229nrs 10nrs/day	27	11-Nov-15 A	08-Dec-15 A
DCM-4320	PE2 Edge C056-C057 Hardening & Pause Period	41	09-Dec-15 A	19-Jan-16 A
DCM-4330	PE2 Edge C056-C057 Filling up to +5.5mPD Type D (73m width, 8,547m3) 5,000m3/day	4	11-Jan-16 A	15-Jan-16 A
DCM-4350	PE2 Edge C056-C057 Filling up to +8.5mPD Surcharge (30m width, 8,547m3 5,000m3/da	1	20-Jan-16 A	21-Jan-16 A
DCM-4360	PE2 Edge C056-C057 Surcharge CPT Test	9	22-Jan-16 A	31-Jan-16 A
DCM-4370	PE2 Edge C056-C057 Filling up to +11.5mPD Surcharge (30m width, 8,547m3 5,000m3/c	68	01-Feb-16 A	20-Apr-16 A
Edge Areas East C052 to C055		387	12-Feb-15 A	05-Mar-16 A
SUEE2-005	PE2 East Edge Sand Period as +5.5mPD 1mth	27	12-Feb-15 A	11-Mar-15 A
SURE2-402	PE2 Edge C052-C055 300m Zone Sand Surcharge CPT Test	8	29-Sep-15 A	06-Oct-15 A
SURE2-410	PE2 Edge C052-C055 300m Zone Sand Surcharge Laying upto 8.5mPD 52,773m3 10,00(	8	07-Oct-15 A	15-Oct-15 A
SURE2-420	PE2 Edge C052-C055 300m Zone Sand Surcharge Pause Period at 8.5mPD 4.5mths (27	134	16-Oct-15 A	27-Feb-16 A
SURE2-425	PE2 Edge C052-C055 300m Zone Sand Surcharge CPT Test at 8.5mPD	6	28-Feb-16 A	05-Mar-16 A
Land Areas		434	09-Feb-15 A	18-Apr-16 A
300m to 100m Zone		241	21-Aug-15 A	18-Apr-16 A
SURE2-510	PE2 Land C052-C056 300m Zone Sand Surcharge Laying upto 8.5mPD stg2 122,640m3	12	21-Aug-15 A	04-Sep-15 A
SURE2-520	PE2 Land C052-C056 300m Zone Sand Surcharge Laying upto 11.5mPD 116,695m3 5,00	14	05-Sep-15 A	21-Sep-15 A
SURE2-530	PE2 Land C052-C056 300m Zone Sand Surcharge Period as +11.5mPD 7mths 18Apr201	209	22-Sep-15 A	18-Apr-16 A
Out of K052 300m		398	09-Feb-15 A	13-Mar-16 A
SURE2-015	PE2 South Main Sand Surcharge Laying upto 11.5mPD 56,012m3 10,000m3/day by TSHD	57	09-Feb-15 A	20-Apr-15 A
SURE2-012	PE2 Land C052-C060 Non-Tunnel Sand Surcharge Laying upto 8.5mPD 117,620m3 7,00(	24	04-May-15 A	30-May-15 A
SURE2-018	PE2 Land C052-C060 Non-Tunnel Sand Surcharge Laying upto 11.5mPD 120,758m3 14,(	65	01-Jun-15 A	15-Aug-15 A
SURE2-020	PE2 Land C052-C060 Non-Tunnel Sand Surcharge Period as +11.5mPD 7mths 13Mar201	210	16-Aug-15 A	13-Mar-16 A
Land Portion E1		99	01-Dec-15 A	09-Mar-16 A
Deep Cement Mixing C077 - C080 150m (Exclude VB & RS)		99	01-Dec-15 A	09-Mar-16 A
DCM-4010	PE1 Edge Area DCM Mobilization from PC2a DCM plant and PE2 cement barge	7	01-Dec-15 A	07-Dec-15 A
DCM-4020	PE1 Edge Area DCM Installation 415nrs 10nrs/day	29	08-Dec-15 A	06-Jan-16 A
DCM-4050	PE1 Edge Area DCM Hardening	27	07-Jan-16 A	03-Feb-16 A
DCM-4060	PE1 Edge Area DCM Flling upto +5.5mPD 25,000m3 5,000m3/day	5	28-Jan-16 A	03-Feb-16 A
DCM-4080	PE1 Edge Area Surcharge Filling up to +8.5mPD (10,000m3) 10,000m3/day at interface c	1	04-Feb-16 A	05-Feb-16 A
DCM-4083	PE1 Edge Area Surcharge Pause Period 4.5mths at interface of non DCM area 19Jun2016	32	06-Feb-16 A	09-Mar-16 A
Edge Areas Excluded 150m of DCM Area		26	05-Dec-15 A	31-Dec-15 A
SUEE1-005	PE1 Edge +5.5mPD Strength Test	8	05-Dec-15 A	13-Dec-15 A
SUEE1-010	PE1 Edge Sand Surcharge Laying up to 8.5mPD 126,529m3 10,000m3/day	15	14-Dec-15 A	31-Dec-15 A
Land Portion C2b		283	01-Jul-15 A	09-Apr-16 A
Edge Areas		162	01-Aug-15 A	10-Jan-16 A
SUEC2b-040	PC2b Edge Area CPT Test & Instrumentation Installation at +5.5mPD	106	01-Aug-15 A	15-Nov-15 A
SUEC2b-050	PC2b Edge Area PBF Surcharge w compaction upto 8.5mPD 12,054m3 5,000m3/day	52	16-Nov-15 A	10-Jan-16 A
Reclamation Areas		283	01-Jul-15 A	09-Apr-16 A
North		92	31-Jul-15 A	31-Oct-15 A
SURC2b-011	PC2b Main Area North PBF Surcharge w compaction upto 8.5mPD 62,964m3 5,000m3/da	67	31-Jul-15 A	10-Oct-15 A
SURC2b-014	PC2b Main Area North Sand Surcharge Laying upto 11.5mPD 40,000m3 5,000m3/day by	17	12-Oct-15 A	31-Oct-15 A
South		283	01-Jul-15 A	09-Apr-16 A
SURC2b-010	PC2b Main Area South PBF Surcharge w compaction upto 8.5mPD 188,893m3 5,000m3/	27	01-Jul-15 A	30-Jul-15 A
SURC2b-012	PC2b Main Area South PBF Surcharge Laying upto 11.5mPD 128,842m3 10,000m3/day b	35	01-Aug-15 A	11-Sep-15 A
SURC2b-034	PC2b Main Area South PBF Surcharge Period as +11.5mPD 7mths (9Apr2016)	210	12-Sep-15 A	09-Apr-16 A
Land Portion C2c		178	01-Sep-15 A	26-Feb-16 A
Edge Areas		178	01-Sep-15 A	26-Feb-16 A
SUEC2c-005	PC2c Edge Area PBF CPT Test & Instrumentation Installation at +5.5mPD	80	01-Sep-15 A	20-Nov-15 A
SUEC2c-010	PC2c Edge Area PBF Surcharge w compaction upto 8.5mPD 43,395m3 5,000m3/day	31	20-Jan-16 A	26-Feb-16 A
Reclamation Areas		141	01-Sep-15 A	20-Jan-16 A
West		55	01-Sep-15 A	26-Oct-15 A
SURC2c-W010	PC2c Main Area Public Surcharge w compaction upto 8.5mPD 79,119m3 5,000m3/day	27	01-Sep-15 A	30-Sep-15 A
SURC2c-W020	PC2c Main Area Sand Surcharge Laying upto 11.5mPD stg1 80,000m3 10,000m3/day by	21	01-Oct-15 A	26-Oct-15 A
East		80	01-Nov-15 A	20-Jan-16 A
SURC2c-E010	PC2c Main Area Public Surcharge w compaction upto 8.5mPD 79,119m3 5,000m3/day	17	01-Nov-15 A	20-Nov-15 A
SURC2c-E020	PC2c Main Area Sand Surcharge Laying upto 11.5mPD stg2 109,120m3 5,000m3/day by	52	20-Nov-15 A	20-Jan-16 A
Geotechnical Instrumentation Works		302	16-Dec-14 A	20-Dec-15 A
Geotechnical Instrumentation Works for Seawalls		302	16-Dec-14 A	20-Dec-15 A
Cluster Type SD 26nrs Instrumentation and CPT Cluster behind cells		302	16-Dec-14 A	20-Dec-15 A
Portion E1		13	05-Dec-15 A	20-Dec-15 A
SD-13 C071		13	05-Dec-15 A	20-Dec-15 A
CTSD-130	Installation of SD-13 (C071) PE1	13	05-Dec-15 A	20-Dec-15 A
SD-14 C074		13	05-Dec-15 A	20-Dec-15 A
CTSD-140	Installation of SD-14 (C074) PE1	13	05-Dec-15 A	20-Dec-15 A
SD-15 C078		13	05-Dec-15 A	20-Dec-15 A



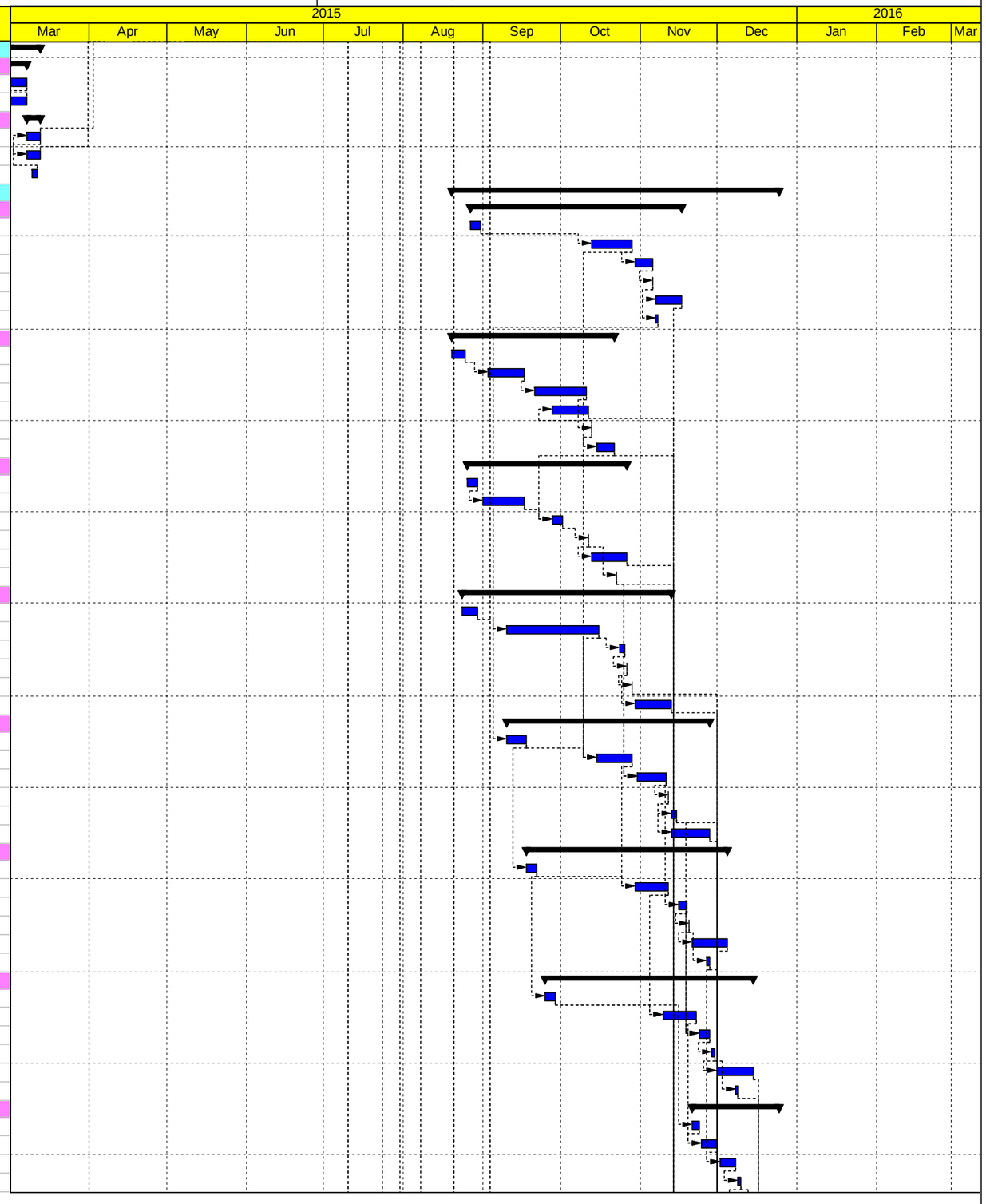
Activity ID	Activity Name	Actual Duration	Start	Finish
CTSD-150	Installation of SD-15 (C078) PE1	13	05-Dec-15 A	20-Dec-15 A
SD-16 C084		13	05-Dec-15 A	20-Dec-15 A
CTSD-160	Installation of SD-16 (C084) PE1	13	05-Dec-15 A	20-Dec-15 A
SD-17 C089		13	05-Dec-15 A	20-Dec-15 A
CTSD-170	Installation of SD-17 (C089) PE1	13	05-Dec-15 A	20-Dec-15 A
Portion C2b & C2c		109	16-Dec-14 A	30-Apr-15 A
SD-18 C094		109	16-Dec-14 A	30-Apr-15 A
CTSD-180	Installation of SD-18 (C094) PC2c	109	16-Dec-14 A	30-Apr-15 A
SD-19 C099		109	16-Dec-14 A	30-Apr-15 A
CTSD-190	Installation of SD-19 (C099) PC2c	109	16-Dec-14 A	30-Apr-15 A
Cluster Type SE 26nrs Surface movement marker cluster at top of cell and sloping seawall		53	16-Mar-15 A	20-May-15 A
CTSE-120	Installation of SE-12 (C069) PE2	53	16-Mar-15 A	20-May-15 A
Geotechnical Instrumentation Works for Reclamation RA & RB		29	17-Nov-15 A	20-Dec-15 A
Settlement Marker Type 2		29	17-Nov-15 A	20-Dec-15 A
SMT2-100	M2 - Installation of Settlement Marker Type2 at PE1	29	17-Nov-15 A	20-Dec-15 A
Portion D		534	28-Oct-14 A	14-Apr-16 A
Precast Yard for Seawall Blocks & Culverts		339	20-Jan-15 A	25-Dec-15 A
Concrete Blocks		141	01-Aug-15 A	20-Dec-15 A
PD-PY1-0200	Precast Seawall Blocks for Permanent construction 1,990nrs (3,180 - 1190)	141	01-Aug-15 A	20-Dec-15 A
Culverts		339	20-Jan-15 A	25-Dec-15 A
Culverts C1		112	04-Mar-15 A	24-Jun-15 A
C1-2		47	04-Mar-15 A	20-Apr-15 A
PY-C1-2050	PD C01-2 - Foundation Formwork Removal	2	04-Mar-15 A	06-Mar-15 A
PY-C1-2060	PD C01-2 - Wall internal Formwork	7	22-Mar-15 A	29-Mar-15 A
PY-C1-2070	PD C01-2 - Wall Rebar Fixing	5	30-Mar-15 A	04-Apr-15 A
PY-C1-2080	PD C01-2 - Wall External Formwork	7	01-Apr-15 A	08-Apr-15 A
PY-C1-2110	PD C01-2 - Wall Internal Formwork Removal	0	09-Apr-15 A	09-Apr-15 A
PY-C1-2090	PD C01-2 - Wall Concrete	0	09-Apr-15 A	09-Apr-15 A
PY-C1-2120	PD C01-2 - Top Slab Formwork Removal	4	14-Apr-15 A	18-Apr-15 A
PY-C1-2100	PD C01-2 - Wall External Formwork Removal	6	14-Apr-15 A	20-Apr-15 A
C1-3		59	11-Mar-15 A	09-May-15 A
PY-C1-3010	PD C01-3 - Foundation Platform	3	11-Mar-15 A	14-Mar-15 A
PY-C1-3020	PD C01-3 - Foundation Rebar Fixing	6	15-Mar-15 A	21-Mar-15 A
PY-C1-3030	PD C01-3 - Foundation Formwork	6	24-Mar-15 A	30-Mar-15 A
PY-C1-3040	PD C01-3 - Foundation Concrete	0	31-Mar-15 A	31-Mar-15 A
PY-C1-3050	PD C01-3 - Foundation Formwork Removal	3	01-Apr-15 A	04-Apr-15 A
PY-C1-3060	PD C01-3 - Wall internal Formwork	8	08-Apr-15 A	16-Apr-15 A
PY-C1-3070	PD C01-3 - Wall Rebar Fixing	3	17-Apr-15 A	20-Apr-15 A
PY-C1-3080	PD C01-3 - Wall External Formwork	2	22-Apr-15 A	24-Apr-15 A
PY-C1-3090	PD C01-3 - Wall Concrete	0	25-Apr-15 A	25-Apr-15 A
PY-C1-3100	PD C01-3 - Wall External Formwork Removal	0	28-Apr-15 A	28-Apr-15 A
PY-C1-3110	PD C01-3 - Wall Internal Formwork Removal	8	01-May-15 A	09-May-15 A
PY-C1-3120	PD C01-3 - Top Slab Formwork Removal	8	01-May-15 A	09-May-15 A
C1-4		30	09-Mar-15 A	08-Apr-15 A
PY-C1-4060	PD C01-4 - Wall internal Formwork	10	09-Mar-15 A	19-Mar-15 A
PY-C1-4070	PD C01-4 - Wall Rebar Fixing	3	21-Mar-15 A	24-Mar-15 A
PY-C1-4080	PD C01-4 - Wall External Formwork	8	24-Mar-15 A	01-Apr-15 A
PY-C1-4090	PD C01-4 - Wall Concrete	0	02-Apr-15 A	02-Apr-15 A
PY-C1-4100	PD C01-4 - Wall External Formwork Removal	2	06-Apr-15 A	08-Apr-15 A
PY-C1-4110	PD C01-4 - Wall Internal Formwork Removal	2	06-Apr-15 A	08-Apr-15 A
PY-C1-4120	PD C01-4 - Top Slab Formwork Removal	2	06-Apr-15 A	08-Apr-15 A
C1-5		4	04-Mar-15 A	08-Mar-15 A
PY-C1-5100	PD C01-5 - Wall External Formwork Removal	4	04-Mar-15 A	08-Mar-15 A
PY-C1-5110	PD C01-5 - Wall Internal Formwork Removal	4	04-Mar-15 A	08-Mar-15 A
PY-C1-5120	PD C01-5 - Top Slab Formwork Removal	4	04-Mar-15 A	08-Mar-15 A
C1-6		94	22-Mar-15 A	24-Jun-15 A
PY-C1-6010	PD C01-6 - Foundation Platform	4	22-Mar-15 A	26-Mar-15 A
PY-C1-6020	PD C01-6 - Foundation Rebar Fixing	1	31-Mar-15 A	01-Apr-15 A
PY-C1-6030	PD C01-6 - Foundation Formwork	6	03-Apr-15 A	09-Apr-15 A
PY-C1-6040	PD C01-6 - Foundation Concrete	0	10-Apr-15 A	10-Apr-15 A
PY-C1-6050	PD C01-6 - Foundation Formwork Removal	1	12-Apr-15 A	13-Apr-15 A
PY-C1-6060	PD C01-6 - Wall internal Formwork	5	15-Apr-15 A	20-Apr-15 A
PY-C1-6070	PD C01-6 - Wall Rebar Fixing	8	21-Apr-15 A	29-Apr-15 A



Activity ID	Activity Name	Actual Duration	Start	Finish
PY-C1-6080	PD C01-6 - Wall External Formwork	5	24-Apr-15 A	29-Apr-15 A
PY-C1-6090	PD C01-6 - Wall Concrete	0	30-Apr-15 A	30-Apr-15 A
PY-C1-6100	PD C01-6 - Wall External Formwork Removal	0	08-May-15 A	08-May-15 A
PY-C1-6110	PD C01-6 - Wall Internal Formwork Removal	3	20-May-15 A	22-May-15 A
PY-C1-6120	PD C01-6 - Top Slab Formwork Removal	2	22-Jun-15 A	24-Jun-15 A
Culverts C2		198	20-Jan-15 A	06-Aug-15 A
C2-2		88	29-Mar-15 A	25-Jun-15 A
PY-C2-2010	PD C02-2 - Foundation Platform	7	29-Mar-15 A	05-Apr-15 A
PY-C2-2020	PD C02-2 - Foundation Rebar Fixing	2	05-Apr-15 A	07-Apr-15 A
PY-C2-2030	PD C02-2 - Foundation Formwork	3	11-Apr-15 A	14-Apr-15 A
PY-C2-2040	PD C02-2 - Foundation Concrete	0	15-Apr-15 A	15-Apr-15 A
PY-C2-2050	PD C02-2 - Foundation Formwork Removal	1	17-Apr-15 A	18-Apr-15 A
PY-C2-2060	PD C02-2 - Wall internal Formwork	8	21-Apr-15 A	29-Apr-15 A
PY-C2-2070	PD C02-2 - Wall Rebar Fixing	4	30-Apr-15 A	04-May-15 A
PY-C2-2080	PD C02-2 - Wall External Formwork	3	01-May-15 A	04-May-15 A
PY-C2-2090	PD C02-2 - Wall Concrete	0	05-May-15 A	05-May-15 A
PY-C2-2100	PD C02-2 - Wall External Formwork Removal	0	11-May-15 A	11-May-15 A
PY-C2-2110	PD C02-2 - Wall Internal Formwork Removal	3	21-Jun-15 A	23-Jun-15 A
PY-C2-2120	PD C02-2 - Top Slab Formwork Removal	1	24-Jun-15 A	25-Jun-15 A
C2-3		172	20-Jan-15 A	10-Jul-15 A
PY-C2-3010	PD C02-3 - Foundation Platform	43	20-Jan-15 A	04-Mar-15 A
PY-C2-3020	PD C02-3 - Foundation Rebar Fixing	6	07-Mar-15 A	13-Mar-15 A
PY-C2-3030	PD C02-3 - Foundation Formwork	4	14-Mar-15 A	18-Mar-15 A
PY-C2-3040	PD C02-3 - Foundation Concrete	0	19-Mar-15 A	19-Mar-15 A
PY-C2-3050	PD C02-3 - Foundation Formwork Removal	4	20-Mar-15 A	24-Mar-15 A
PY-C2-3060	PD C02-3 - Wall internal Formwork	6	03-May-15 A	09-May-15 A
PY-C2-3070	PD C02-3 - Wall Rebar Fixing	17	10-May-15 A	26-May-15 A
PY-C2-3080	PD C02-3 - Wall External Formwork	13	14-May-15 A	26-May-15 A
PY-C2-3090	PD C02-3 - Wall Concrete	2	27-Jun-15 A	28-Jun-15 A
PY-C2-3100	PD C02-3 - Wall External Formwork Removal	2	29-Jun-15 A	30-Jun-15 A
PY-C2-3110	PD C02-3 - Wall Internal Formwork Removal	3	06-Jul-15 A	08-Jul-15 A
PY-C2-3120	PD C02-3 - Top Slab Formwork Removal	2	09-Jul-15 A	10-Jul-15 A
C2-4		99	06-Apr-15 A	13-Jul-15 A
PY-C2-4010	PD C02-4 - Foundation Platform	4	06-Apr-15 A	10-Apr-15 A
PY-C2-4020	PD C02-4 - Foundation Rebar Fixing	4	12-Apr-15 A	16-Apr-15 A
PY-C2-4030	PD C02-4 - Foundation Formwork	4	17-Apr-15 A	21-Apr-15 A
PY-C2-4040	PD C02-4 - Foundation Concrete	0	22-Apr-15 A	22-Apr-15 A
PY-C2-4050	PD C02-4 - Foundation Formwork Removal	17	23-Apr-15 A	10-May-15 A
PY-C2-4060	PD C02-4 - Wall internal Formwork	8	11-May-15 A	19-May-15 A
PY-C2-4070	PD C02-4 - Wall Rebar Fixing	6	21-Jun-15 A	26-Jun-15 A
PY-C2-4080	PD C02-4 - Wall External Formwork	3	27-Jun-15 A	29-Jun-15 A
PY-C2-4090	PD C02-4 - Wall Concrete	2	30-Jun-15 A	01-Jul-15 A
PY-C2-4100	PD C02-4 - Wall External Formwork Removal	2	02-Jul-15 A	03-Jul-15 A
PY-C2-4110	PD C02-4 - Wall Internal Formwork Removal	3	09-Jul-15 A	11-Jul-15 A
PY-C2-4120	PD C02-4 - Top Slab Formwork Removal	2	12-Jul-15 A	13-Jul-15 A
C2-5		102	26-Apr-15 A	06-Aug-15 A
PY-C2-5010	PD C02-5 - Foundation Platform	4	26-Apr-15 A	30-Apr-15 A
PY-C2-5020	PD C02-5 - Foundation Rebar Fixing	8	01-May-15 A	09-May-15 A
PY-C2-5030	PD C02-5 - Foundation Formwork	3	10-May-15 A	13-May-15 A
PY-C2-5040	PD C02-5 - Foundation Concrete	0	14-May-15 A	14-May-15 A
PY-C2-5050	PD C02-5 - Foundation Formwork Removal	2	14-May-15 A	16-May-15 A
PY-C2-5060	PD C02-5 - Wall internal Formwork	6	12-Jul-15 A	17-Jul-15 A
PY-C2-5070	PD C02-5 - Wall Rebar Fixing	6	15-Jul-15 A	20-Jul-15 A
PY-C2-5080	PD C02-5 - Wall External Formwork	2	21-Jul-15 A	23-Jul-15 A
PY-C2-5090	PD C02-5 - Wall Concrete	1	24-Jul-15 A	25-Jul-15 A
PY-C2-5100	PD C02-5 - Wall External Formwork Removal	1	26-Jul-15 A	27-Jul-15 A
PY-C2-5110	PD C02-5 - Wall Internal Formwork Removal	2	02-Aug-15 A	04-Aug-15 A
PY-C2-5120	PD C02-5 - Top Slab Formwork Removal	1	05-Aug-15 A	06-Aug-15 A
Culverts C3		8	14-Mar-15 A	22-Mar-15 A
C3-2		8	14-Mar-15 A	22-Mar-15 A
PY-C3-2100	PD C03-2 - Wall External Formwork Removal	4	14-Mar-15 A	18-Mar-15 A
PY-C3-2110	PD C03-2 - Wall Internal Formwork Removal	4	14-Mar-15 A	18-Mar-15 A
PY-C3-2120	PD C03-2 - Top Slab Formwork Removal	8	14-Mar-15 A	22-Mar-15 A

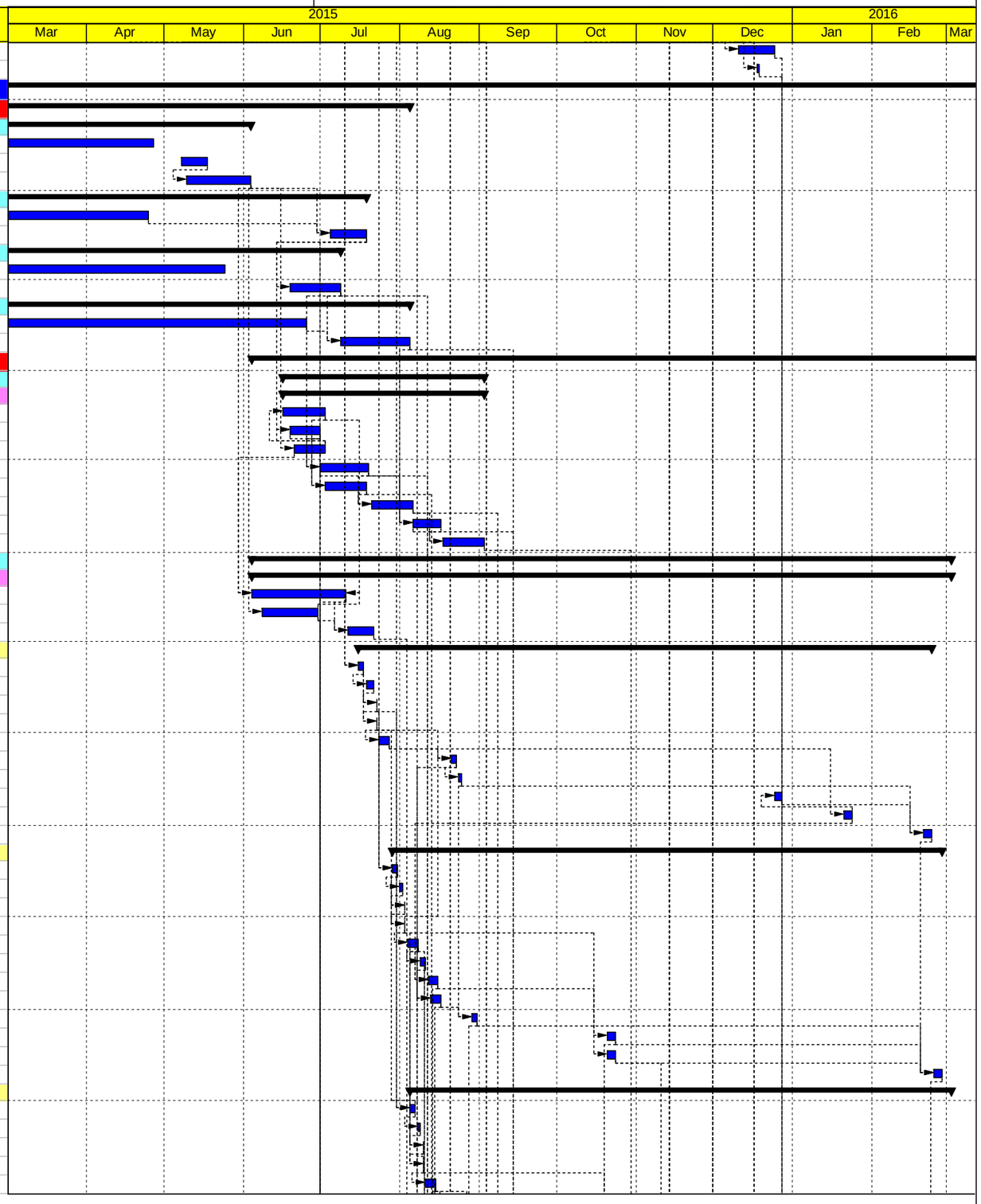
Remaining Level of Effort ◆ ◆ Milestone
Actual Level of Effort ▼ Summary
Actual Work
Remaining Work
Critical Remaining Work

Activity ID	Activity Name	Actual Duration	Start	Finish
Culverts C4		12	01-Mar-15 A	13-Mar-15 A
C4-2		7	01-Mar-15 A	08-Mar-15 A
PY-C4-2110	PD C04-2 - Wall Internal Formwork Removal	7	01-Mar-15 A	08-Mar-15 A
PY-C4-2120	PD C04-2 - Top Slab Formwork Removal	7	01-Mar-15 A	08-Mar-15 A
C4-5		5	08-Mar-15 A	13-Mar-15 A
PY-C4-5110	PD C04-5 - Wall Internal Formwork Removal	5	08-Mar-15 A	13-Mar-15 A
PY-C4-5120	PD C04-5 - Top Slab Formwork Removal	5	08-Mar-15 A	13-Mar-15 A
PY-C4-5100	PD C04-5 - Wall External Formwork Removal	2	10-Mar-15 A	12-Mar-15 A
Culverts EC1		127	20-Aug-15 A	25-Dec-15 A
EC1-1		82	27-Aug-15 A	17-Nov-15 A
PY-EC1-01010	PD EC1-01 Casting Bed	4	27-Aug-15 A	31-Aug-15 A
PY-EC1-01020	PD EC1-01 Base Reinforcement	16	13-Oct-15 A	29-Oct-15 A
PY-EC1-01030	PD EC1-01 Base Formwork	7	30-Oct-15 A	06-Nov-15 A
PY-EC1-01040	PD EC1-01 Base Concrete	0	06-Nov-15 A	06-Nov-15 A
PY-EC1-01060	PD EC1-01 Base Curing	10	07-Nov-15 A	17-Nov-15 A
PY-EC1-01050	PD EC1-01 Base Removal of Formwork	1	07-Nov-15 A	08-Nov-15 A
EC1-2		63	20-Aug-15 A	22-Oct-15 A
PY-EC1-02010	PD EC1-02 Casting Bed	5	20-Aug-15 A	25-Aug-15 A
PY-EC1-02020	PD EC1-02 Base Reinforcement	14	03-Sep-15 A	17-Sep-15 A
PY-EC1-02030	PD EC1-02 Base Formwork	20	21-Sep-15 A	11-Oct-15 A
PY-EC1-02060	PD EC1-02 Base Curing	14	28-Sep-15 A	12-Oct-15 A
PY-EC1-02040	PD EC1-02 Base Concrete	0	13-Oct-15 A	13-Oct-15 A
PY-EC1-02050	PD EC1-02 Base Removal of Formwork	7	15-Oct-15 A	22-Oct-15 A
EC1-3		62	26-Aug-15 A	27-Oct-15 A
PY-EC1-03010	PD EC1-03 Casting Bed	4	26-Aug-15 A	30-Aug-15 A
PY-EC1-03020	PD EC1-03 Base Reinforcement	16	01-Sep-15 A	17-Sep-15 A
PY-EC1-03030	PD EC1-03 Base Formwork	4	28-Sep-15 A	02-Oct-15 A
PY-EC1-03040	PD EC1-03 Base Concrete	0	12-Oct-15 A	12-Oct-15 A
PY-EC1-03060	PD EC1-03 Base Curing	14	13-Oct-15 A	27-Oct-15 A
PY-EC1-03050	PD EC1-03 Base Removal of Formwork	0	23-Oct-15 A	23-Oct-15 A
EC1-4		81	24-Aug-15 A	13-Nov-15 A
PY-EC1-04010	PD EC1-04 Casting Bed	6	24-Aug-15 A	30-Aug-15 A
PY-EC1-04020	PD EC1-04 Base Reinforcement	36	10-Sep-15 A	16-Oct-15 A
PY-EC1-04030	PD EC1-04 Base Formwork	2	24-Oct-15 A	26-Oct-15 A
PY-EC1-04040	PD EC1-04 Base Concrete	0	27-Oct-15 A	27-Oct-15 A
PY-EC1-04050	PD EC1-04 Base Removal of Formwork	0	29-Oct-15 A	29-Oct-15 A
PY-EC1-04060	PD EC1-04 Base Curing	14	30-Oct-15 A	13-Nov-15 A
EC1-5		79	10-Sep-15 A	28-Nov-15 A
PY-EC1-05010	PD EC1-05 Casting Bed	8	10-Sep-15 A	18-Sep-15 A
PY-EC1-05020	PD EC1-05 Base Reinforcement	14	15-Oct-15 A	29-Oct-15 A
PY-EC1-05030	PD EC1-05 Base Formwork	11	31-Oct-15 A	11-Nov-15 A
PY-EC1-05040	PD EC1-05 Base Concrete	0	12-Nov-15 A	12-Nov-15 A
PY-EC1-05050	PD EC1-05 Base Removal of Formwork	2	13-Nov-15 A	15-Nov-15 A
PY-EC1-05060	PD EC1-05 Base Curing	15	13-Nov-15 A	28-Nov-15 A
EC1-6		78	18-Sep-15 A	05-Dec-15 A
PY-EC1-06010	PD EC1-06 Casting Bed	4	18-Sep-15 A	22-Sep-15 A
PY-EC1-06020	PD EC1-06 Base Reinforcement	13	30-Oct-15 A	12-Nov-15 A
PY-EC1-06030	PD EC1-06 Base Formwork	3	16-Nov-15 A	19-Nov-15 A
PY-EC1-06040	PD EC1-06 Base Concrete	0	20-Nov-15 A	20-Nov-15 A
PY-EC1-06060	PD EC1-06 Base Curing	14	21-Nov-15 A	05-Dec-15 A
PY-EC1-06050	PD EC1-06 Base Removal of Formwork	1	27-Nov-15 A	28-Nov-15 A
EC1-7		81	25-Sep-15 A	15-Dec-15 A
PY-EC1-07010	PD EC1-07 Casting Bed	4	25-Sep-15 A	29-Sep-15 A
PY-EC1-07020	PD EC1-07 Base Reinforcement	13	10-Nov-15 A	23-Nov-15 A
PY-EC1-07030	PD EC1-07 Base Formwork	4	24-Nov-15 A	28-Nov-15 A
PY-EC1-07040	PD EC1-07 Base Concrete	1	29-Nov-15 A	30-Nov-15 A
PY-EC1-07060	PD EC1-07 Base Curing	14	01-Dec-15 A	15-Dec-15 A
PY-EC1-07050	PD EC1-07 Base Removal of Formwork	1	08-Dec-15 A	09-Dec-15 A
EC1-8		34	21-Nov-15 A	25-Dec-15 A
PY-EC1-08010	PD EC1-08 Casting Bed	3	21-Nov-15 A	24-Nov-15 A
PY-EC1-08020	PD EC1-08 Base Reinforcement	6	25-Nov-15 A	01-Dec-15 A
PY-EC1-08030	PD EC1-08 Base Formwork	6	02-Dec-15 A	08-Dec-15 A
PY-EC1-08040	PD EC1-08 Base Concrete	1	09-Dec-15 A	10-Dec-15 A



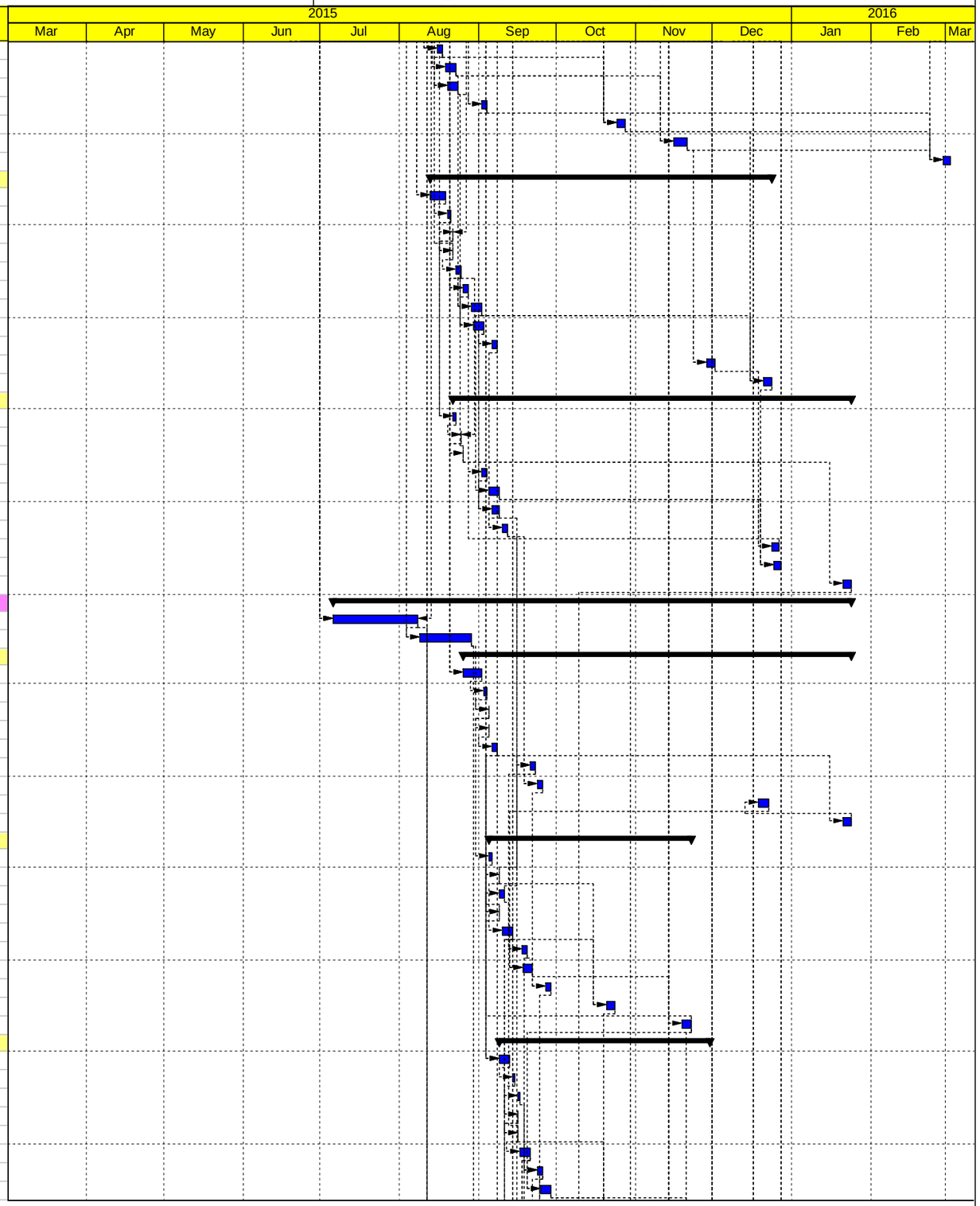
Remaining Level of Effort ◆ ◆ Milestone
Actual Level of Effort ▼ Summary
Actual Work
Remaining Work
Critical Remaining Work

Activity ID	Activity Name	Actual Duration	Start	Finish
PY-EC1-08060	PD EC1-08 Base Curing	14	11-Dec-15 A	25-Dec-15 A
PY-EC1-08050	PD EC1-08 Base Removal of Formwork	1	18-Dec-15 A	19-Dec-15 A
Site Construction		534	28-Oct-14 A	14-Apr-16 A
Surcharge		281	28-Oct-14 A	05-Aug-15 A
West1 Portion		217	30-Oct-14 A	03-Jun-15 A
A1660	PD West1 - Surcharge Period +11.5mPD 6mths	179	30-Oct-14 A	27-Apr-15 A
A1700	PD West1 - Preparation Works & Mobilization of plant	10	08-May-15 A	18-May-15 A
A1930	PD West1 - Surcharge Removal 60,000m3 5,000m3/day	25	10-May-15 A	03-Jun-15 A
West2 Portion		264	28-Oct-14 A	19-Jul-15 A
A2220	PD West2 - Surcharge Period +11.5mPD 6mths	179	28-Oct-14 A	25-Apr-15 A
A2230	PD West2 - Surcharge Removal 60,000m3 5,000m3/day	14	05-Jul-15 A	19-Jul-15 A
East1 Portion		225	26-Nov-14 A	08-Jul-15 A
A1690	PD East1 - Surcharge Period +11.5mPD 6mths	180	26-Nov-14 A	24-May-15 A
A1705	PD East1 - Surcharge Removal 60,000m3 5,000m3/day	20	19-Jun-15 A	08-Jul-15 A
East2 Portion		220	28-Dec-14 A	05-Aug-15 A
A2260	PD East2 - Surcharge Period +11.5mPD 6mths	180	28-Dec-14 A	25-Jun-15 A
A2270	PD East2 - Surcharge Removal 60,000m3 5,000m3/day	27	09-Jul-15 A	05-Aug-15 A
C1 to C4		315	04-Jun-15 A	14-Apr-16 A
Removal of Temporary Seawall		79	16-Jun-15 A	03-Sep-15 A
Removal of North Temporary Seawall		79	16-Jun-15 A	03-Sep-15 A
PD-V2-0030	PD C1 - Removal of North Temporary Seawall West1 Ch6+136 to CH6+000	17	16-Jun-15 A	02-Jul-15 A
PD-V2-0015	PD C2 - Removal of Temporary Seawall blocks West2 CH6+000 to 5+893 400nrs	12	19-Jun-15 A	30-Jun-15 A
PD-V2-0010	PD C1 - Removal of Temporary Seawall blocks West1 CH6+136 to 6+000 400nrs	12	21-Jun-15 A	02-Jul-15 A
PD-V2-0020	PD C3 - Removal of Temporary Seawall blocks East1 CH5+893 to 5+800 400nrs	19	01-Jul-15 A	20-Jul-15 A
PD-V2-0035	PD C2 - Removal of North Temporary Seawall West2 Ch6+000 to CH5+900	16	03-Jul-15 A	19-Jul-15 A
PD-V2-0040	PD C3 - Removal of North Temporary Seawall East1 CH5+900 to CH5+800	16	21-Jul-15 A	06-Aug-15 A
PD-V2-0025	PD C4 - Removal of North Temporary Seawall blocks East2 CH5+800 to 5+650 400nrs	11	06-Aug-15 A	17-Aug-15 A
PD-V2-0045	PD C4 - Removal of North Temporary Seawall East2 CH5+800 to CH5+650	16	18-Aug-15 A	03-Sep-15 A
Installations of Precast Culverts except sloping outfalls		273	04-Jun-15 A	03-Mar-16 A
Culvert C1		273	04-Jun-15 A	03-Mar-16 A
PD-C1-0010	PD C1 Excavation 83,000m3 2,500m3/day	37	04-Jun-15 A	11-Jul-15 A
PD-C1-0005	PD C1 Pipe Piling Installation	22	08-Jun-15 A	30-Jun-15 A
PD-C1-0020	PD C1 Leveling of Foundation 4,200m2 200m2/day	10	12-Jul-15 A	22-Jul-15 A
C1-2		223	16-Jul-15 A	24-Feb-16 A
PD-C1-2-010	PD C1-2 Back & Delivery to site stg1	2	16-Jul-15 A	18-Jul-15 A
PD-C1-2-015	PD C1-2 Install the buoyancy Tank	3	19-Jul-15 A	22-Jul-15 A
PD-C1-2-020	PD C1-2 floating to the location	0	23-Jul-15 A	23-Jul-15 A
PD-C1-2-040	PD C1-2 Installation	0	23-Jul-15 A	23-Jul-15 A
PD-C1-2-050	PD C1-2 Removal of North Steel Bulkhead	4	24-Jul-15 A	28-Jul-15 A
PD-C1-2-100	PD C1-2 Backfill Beside of Culvert	2	21-Aug-15 A	23-Aug-15 A
PD-C1-2-110	PD C1-2 Backfill upto +3.5mPD except Manholes	1	24-Aug-15 A	25-Aug-15 A
PD-C1-2-070	PD C1-2 Manhole Insitu concrete	3	25-Dec-15 A	28-Dec-15 A
PD-C1-2-060	PD C1-2 Removal of South Steel Bulkhead	3	21-Jan-16 A	24-Jan-16 A
PD-C1-2-120	PD C1-2 Backfill Manhole upto +5.5mPD	3	21-Feb-16 A	24-Feb-16 A
C1-3		214	29-Jul-15 A	28-Feb-16 A
PD-C1-3-010	PD C1-3 Back & Delivery to Site stg2	2	29-Jul-15 A	31-Jul-15 A
PD-C1-3-015	PD C1-3 Install the buoyancy Tank	1	01-Aug-15 A	02-Aug-15 A
PD-C1-3-020	PD C1-3 floating to the location	0	03-Aug-15 A	03-Aug-15 A
PD-C1-3-040	PD C1-3 Installation	0	03-Aug-15 A	03-Aug-15 A
PD-C1-3-050	PD C1-3 Removal of North Steel Bulkhead	4	04-Aug-15 A	08-Aug-15 A
PD-C1-3-080	PD C1-2/3 Movement Joint Installation	2	09-Aug-15 A	11-Aug-15 A
PD-C1-3-060	PD C1-3 Removal of South Steel Bulkhead	4	12-Aug-15 A	16-Aug-15 A
PD-C1-3-100	PD C1-3 Backfill Beside of Culvert	4	13-Aug-15 A	17-Aug-15 A
PD-C1-3-110	PD C1-3 Backfill upto +3.5mPD except Manholes	2	29-Aug-15 A	31-Aug-15 A
PD-C1-3-090	PD C1-2/3 Movement Joint Insitu	3	21-Oct-15 A	24-Oct-15 A
PD-C1-3-070	PD C1-3 Manhole Insitu concrete	3	21-Oct-15 A	24-Oct-15 A
PD-C1-3-120	PD C1-3 Backfill Manhole upto +5.5mPD	3	25-Feb-16 A	28-Feb-16 A
C1-4		211	05-Aug-15 A	03-Mar-16 A
PD-C1-4-010	PD C1-4 Back & Delivery to Site stg3	2	05-Aug-15 A	07-Aug-15 A
PD-C1-4-015	PD C1-4 Install the buoyancy Tank	1	08-Aug-15 A	09-Aug-15 A
PD-C1-4-020	PD C1-4 floating to the location	0	10-Aug-15 A	10-Aug-15 A
PD-C1-4-040	PD C1-4 Installation	0	10-Aug-15 A	10-Aug-15 A
PD-C1-4-050	PD C1-4 Removal of North Steel Bulkhead	4	11-Aug-15 A	15-Aug-15 A



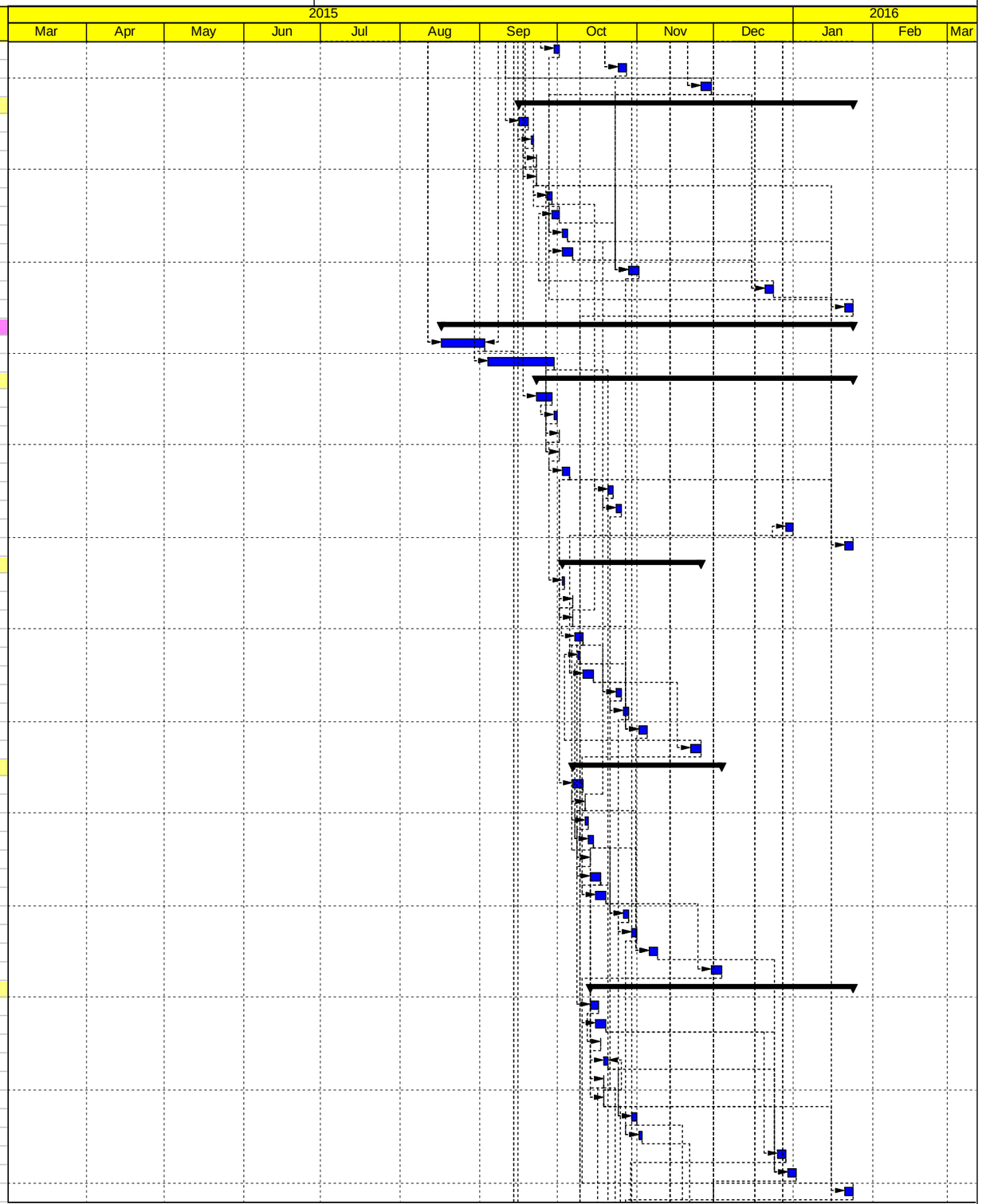
Remaining Level of Effort
Actual Level of Effort
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

Activity ID	Activity Name	Actual Duration	Start	Finish
PD-C1-4-080	PD C1-3/4 Movement Joint Installation	2	16-Aug-15 A	18-Aug-15 A
PD-C1-4-060	PD C1-4 Removal of South Steel Bulkhead	4	19-Aug-15 A	23-Aug-15 A
PD-C1-4-100	PD C1-4 Backfill Beside of Culvert	4	20-Aug-15 A	24-Aug-15 A
PD-C1-4-110	PD C1-4 Backfill upto +3.5mPD except Manholes	2	02-Sep-15 A	04-Sep-15 A
PD-C1-4-090	PD C1-3/4 Movement Joint Insitu	3	25-Oct-15 A	28-Oct-15 A
PD-C1-4-070	PD C1-4 Manhole Insitu concrete	5	16-Nov-15 A	21-Nov-15 A
PD-C1-4-120	PD C1-4 Backfill Manhole upto +5.5mPD	3	29-Feb-16 A	03-Mar-16 A
C1-5		133	13-Aug-15 A	24-Dec-15 A
PD-C1-5-010	PD C1-5 & C1-6 Back & Delivery to Site stg4	6	13-Aug-15 A	19-Aug-15 A
PD-C1-5-015	PD C1-5 Install the buoyancy Tank	1	20-Aug-15 A	21-Aug-15 A
PD-C1-5-020	PD C1-5 floating to the location	0	22-Aug-15 A	22-Aug-15 A
PD-C1-5-040	PD C1-5 Installation	0	22-Aug-15 A	22-Aug-15 A
PD-C1-5-050	PD C1-5 Removal of North Steel Bulkhead	2	23-Aug-15 A	25-Aug-15 A
PD-C1-5-080	PD C1-4/5 Movement Joint Installation	2	26-Aug-15 A	28-Aug-15 A
PD-C1-5-060	PD C1-5 Removal of South Steel Bulkhead	4	29-Aug-15 A	02-Sep-15 A
PD-C1-5-100	PD C1-5 Backfill Beside of Culvert	4	30-Aug-15 A	03-Sep-15 A
PD-C1-5-110	PD C1-5 Backfill upto +3.5mPD except Manholes	2	06-Sep-15 A	08-Sep-15 A
PD-C1-5-070	PD C1-5 Manhole Insitu concrete	3	29-Nov-15 A	02-Dec-15 A
PD-C1-5-090	PD C1-4/5 Movement Joint Insitu	3	21-Dec-15 A	24-Dec-15 A
C1-6		155	22-Aug-15 A	24-Jan-16 A
PD-C1-6-015	PD C1-6 Install the buoyancy Tank	1	22-Aug-15 A	23-Aug-15 A
PD-C1-6-020	PD C1-6 floating to the location	0	25-Aug-15 A	25-Aug-15 A
PD-C1-6-040	PD C1-6 Installation	0	26-Aug-15 A	26-Aug-15 A
PD-C1-6-080	PD C1-5/6 Movement Joint Installation	2	02-Sep-15 A	04-Sep-15 A
PD-C1-6-060	PD C1-6 Removal of South Steel Bulkhead	4	05-Sep-15 A	09-Sep-15 A
PD-C1-6-100	PD C1-6 Backfill Beside of Culvert	3	06-Sep-15 A	09-Sep-15 A
PD-C1-6-110	PD C1-6 Backfill upto +3.5mPD except Manholes	2	10-Sep-15 A	12-Sep-15 A
PD-C1-6-070	PD C1-6 Manhole Insitu concrete	3	24-Dec-15 A	27-Dec-15 A
PD-C1-6-090	PD C1-5/6 Movement Joint Insitu	3	25-Dec-15 A	28-Dec-15 A
PD-C1-6-050	PD C1-6 Removal of North Steel Bulkhead	3	21-Jan-16 A	24-Jan-16 A
Culvert C2		202	06-Jul-15 A	24-Jan-16 A
PD-C2-0010	PD C2 Excavation 73,000m3 2,500m3/day	33	06-Jul-15 A	08-Aug-15 A
PD-C2-0020	PD C2 Leveling of Foundation	20	09-Aug-15 A	29-Aug-15 A
C2-2		151	26-Aug-15 A	24-Jan-16 A
PD-C2-2-010	PD C2-2 & C2-3 Back & Delivery to site stg5	7	26-Aug-15 A	02-Sep-15 A
PD-C2-2-015	PD C2-2 Install the buoyancy Tank	1	03-Sep-15 A	04-Sep-15 A
PD-C2-2-020	PD C2-2 floating to the location	0	05-Sep-15 A	05-Sep-15 A
PD-C2-2-040	PD C2-2 Installation	0	05-Sep-15 A	05-Sep-15 A
PD-C2-2-050	PD C2-2 Removal of North Steel Bulkhead	2	06-Sep-15 A	08-Sep-15 A
PD-C2-2-100	PD C2-2 Backfill Beside of Culvert	2	21-Sep-15 A	23-Sep-15 A
PD-C2-2-110	PD C2-2 Backfill upto +3.5mPD except Manholes	2	24-Sep-15 A	26-Sep-15 A
PD-C2-2-070	PD C2-2 Manhole Insitu concrete	4	19-Dec-15 A	23-Dec-15 A
PD-C2-2-060	PD C2-2 Removal of South Steel Bulkhead	3	21-Jan-16 A	24-Jan-16 A
C2-3		79	05-Sep-15 A	23-Nov-15 A
PD-C2-3-015	PD C2-3 Install the buoyancy Tank	1	05-Sep-15 A	06-Sep-15 A
PD-C2-3-040	PD C2-3 Installation	0	09-Sep-15 A	09-Sep-15 A
PD-C2-3-080	PD C2-2/3 Movement Joint Installation	2	09-Sep-15 A	11-Sep-15 A
PD-C2-3-020	PD C2-3 floating to the location	0	09-Sep-15 A	09-Sep-15 A
PD-C2-3-050	PD C2-3 Removal of North Steel Bulkhead	4	10-Sep-15 A	14-Sep-15 A
PD-C2-3-100	PD C2-3 Backfill Beside of Culvert	2	18-Sep-15 A	20-Sep-15 A
PD-C2-3-060	PD C2-3 Removal of South Steel Bulkhead	4	18-Sep-15 A	22-Sep-15 A
PD-C2-3-110	PD C2-3 Backfill upto +3.5mPD except Manholes	2	27-Sep-15 A	29-Sep-15 A
PD-C2-3-090	PD C2-2/3 Movement Joint Insitu	3	21-Oct-15 A	24-Oct-15 A
PD-C2-3-070	PD C2-3 Manhole Insitu concrete	4	19-Nov-15 A	23-Nov-15 A
C2-4		82	09-Sep-15 A	30-Nov-15 A
PD-C2-4-010	PD C2-4 Back & Delivery to site stg6	4	09-Sep-15 A	13-Sep-15 A
PD-C2-4-015	PD C2-4 Install the buoyancy Tank	1	14-Sep-15 A	15-Sep-15 A
PD-C2-4-080	PD C2-3/4 Movement Joint Installation	1	16-Sep-15 A	17-Sep-15 A
PD-C2-4-020	PD C2-4 floating to the location	0	16-Sep-15 A	16-Sep-15 A
PD-C2-4-040	PD C2-4 Installation	0	16-Sep-15 A	16-Sep-15 A
PD-C2-4-050	PD C2-4 Removal of North Steel Bulkhead	4	17-Sep-15 A	21-Sep-15 A
PD-C2-4-100	PD C2-4 Backfill Beside of Culvert	2	24-Sep-15 A	26-Sep-15 A
PD-C2-4-060	PD C2-4 Removal of South Steel Bulkhead	4	25-Sep-15 A	29-Sep-15 A



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

Activity ID	Activity Name	Actual Duration	Start	Finish
PD-C2-4-110	PD C2-4 Backfill upto +3.5mPD except Manholes	2	30-Sep-15 A	02-Oct-15 A
PD-C2-4-090	PD C2-3/4 Movement Joint Insitu	3	25-Oct-15 A	28-Oct-15 A
PD-C2-4-070	PD C2-4 Manhole Insitu concrete	4	26-Nov-15 A	30-Nov-15 A
C2-5		130	16-Sep-15 A	24-Jan-16 A
PD-C2-5-010	PD C2-5 Back & Delivery to site stg7	4	16-Sep-15 A	20-Sep-15 A
PD-C2-5-015	PD C2-5 Install the buoyancy Tank	1	21-Sep-15 A	22-Sep-15 A
PD-C2-5-020	PD C2-5 floating to the location	0	23-Sep-15 A	23-Sep-15 A
PD-C2-5-040	PD C2-5 Installation	0	23-Sep-15 A	23-Sep-15 A
PD-C2-5-100	PD C2-5 Backfill Beside of Culvert	2	27-Sep-15 A	29-Sep-15 A
PD-C2-5-080	PD C2-4/5 Movement Joint Installation	3	29-Sep-15 A	02-Oct-15 A
PD-C2-5-110	PD C2-5 Backfill upto +3.5mPD except Manholes	2	03-Oct-15 A	05-Oct-15 A
PD-C2-5-060	PD C2-5 Removal of South Steel Bulkhead	4	03-Oct-15 A	07-Oct-15 A
PD-C2-5-090	PD C2-4/5 Movement Joint Insitu	4	29-Oct-15 A	02-Nov-15 A
PD-C2-5-070	PD C2-5 Manhole Insitu concrete	3	21-Dec-15 A	24-Dec-15 A
PD-C2-5-050	PD C2-5 Removal of North Steel Bulkhead	3	21-Jan-16 A	24-Jan-16 A
Culvert C3		160	17-Aug-15 A	24-Jan-16 A
PD-C3-0010	PD C3 Excavation 68,000m3 2,500m3/day	17	17-Aug-15 A	03-Sep-15 A
PD-C3-0020	PD C3 Leveling of Foundation	26	04-Sep-15 A	30-Sep-15 A
C3-2		123	23-Sep-15 A	24-Jan-16 A
PD-C3-2-010	PD C3-2 & C3-3 Back & Delivery to site stg8	6	23-Sep-15 A	29-Sep-15 A
PD-C3-2-015	PD C3-2 Install the buoyancy Tank	1	30-Sep-15 A	01-Oct-15 A
PD-C3-2-020	PD C3-2 floating to the location	0	02-Oct-15 A	02-Oct-15 A
PD-C3-2-040	PD C3-2 Installation	0	02-Oct-15 A	02-Oct-15 A
PD-C3-2-050	PD C3-2 Removal of North Steel Bulkhead	3	03-Oct-15 A	06-Oct-15 A
PD-C3-2-100	PD C3-2 Backfill Beside of Culvert	2	21-Oct-15 A	23-Oct-15 A
PD-C3-2-110	PD C3-2 Backfill upto +3.5mPD except Manholes	2	24-Oct-15 A	26-Oct-15 A
PD-C3-2-070	PD C3-2 Manhole Insitu concrete	3	29-Dec-15 A	01-Jan-16 A
PD-C3-2-060	PD C3-2 Removal of South Steel Bulkhead	3	21-Jan-16 A	24-Jan-16 A
C3-3		54	03-Oct-15 A	26-Nov-15 A
PD-C3-3-015	PD C3-3 Install the buoyancy Tank	1	03-Oct-15 A	04-Oct-15 A
PD-C3-3-020	PD C3-3 floating to the location	0	07-Oct-15 A	07-Oct-15 A
PD-C3-3-040	PD C3-3 Installation	0	07-Oct-15 A	07-Oct-15 A
PD-C3-3-050	PD C3-3 Removal of North Steel Bulkhead	3	08-Oct-15 A	11-Oct-15 A
PD-C3-3-080	PD C3-2/3 Movement Joint Installation	1	09-Oct-15 A	10-Oct-15 A
PD-C3-3-060	PD C3-3 Removal of South Steel Bulkhead	4	11-Oct-15 A	15-Oct-15 A
PD-C3-3-100	PD C3-3 Backfill Beside of Culvert	2	24-Oct-15 A	26-Oct-15 A
PD-C3-3-110	PD C3-3 Backfill upto +3.5mPD except Manholes	2	27-Oct-15 A	29-Oct-15 A
PD-C3-3-090	PD C3-2/3 Movement Joint Insitu	3	02-Nov-15 A	05-Nov-15 A
PD-C3-3-070	PD C3-3 Manhole Insitu concrete	4	22-Nov-15 A	26-Nov-15 A
C3-4		58	07-Oct-15 A	04-Dec-15 A
PD-C3-4-010	PD C3-4 Back & Delivery to site stg9	4	07-Oct-15 A	11-Oct-15 A
PD-C3-4-040	PD C3-4 Installation	0	12-Oct-15 A	12-Oct-15 A
PD-C3-4-015	PD C3-4 Install the buoyancy Tank	1	12-Oct-15 A	13-Oct-15 A
PD-C3-4-080	PD C3-3/4 Movement Joint Installation	2	13-Oct-15 A	15-Oct-15 A
PD-C3-4-020	PD C3-4 floating to the location	0	14-Oct-15 A	14-Oct-15 A
PD-C3-4-050	PD C3-4 Removal of North Steel Bulkhead	4	14-Oct-15 A	18-Oct-15 A
PD-C3-4-060	PD C3-4 Removal of South Steel Bulkhead	4	16-Oct-15 A	20-Oct-15 A
PD-C3-4-100	PD C3-4 Backfill Beside of Culvert	2	27-Oct-15 A	29-Oct-15 A
PD-C3-4-110	PD C3-4 Backfill upto +3.5mPD except Manholes	2	30-Oct-15 A	01-Nov-15 A
PD-C3-4-090	PD C3-3/4 Movement Joint Insitu	3	06-Nov-15 A	09-Nov-15 A
PD-C3-4-070	PD C3-4 Manhole Insitu concrete	4	30-Nov-15 A	04-Dec-15 A
C3-5		102	14-Oct-15 A	24-Jan-16 A
PD-C3-5-010	PD C3-5 Back & Delivery to site stg10	3	14-Oct-15 A	17-Oct-15 A
PD-C3-5-060	PD C3-5 Removal of South Steel Bulkhead	4	16-Oct-15 A	20-Oct-15 A
PD-C3-5-015	PD C3-5 Install the buoyancy Tank	0	18-Oct-15 A	18-Oct-15 A
PD-C3-5-080	PD C3-4/5 Movement Joint Installation	2	19-Oct-15 A	21-Oct-15 A
PD-C3-5-020	PD C3-5 floating to the location	0	19-Oct-15 A	19-Oct-15 A
PD-C3-5-040	PD C3-5 Installation	0	19-Oct-15 A	19-Oct-15 A
PD-C3-5-100	PD C3-5 Backfill Beside of Culvert	2	30-Oct-15 A	01-Nov-15 A
PD-C3-5-110	PD C3-5 Backfill upto +3.5mPD except Manholes	1	02-Nov-15 A	03-Nov-15 A
PD-C3-5-070	PD C3-5 Manhole Insitu concrete	3	26-Dec-15 A	29-Dec-15 A
PD-C3-5-090	PD C3-4/5 Movement Joint Insitu	3	30-Dec-15 A	02-Jan-16 A
PD-C3-5-050	PD C3-5 Removal of North Steel Bulkhead	3	21-Jan-16 A	24-Jan-16 A



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

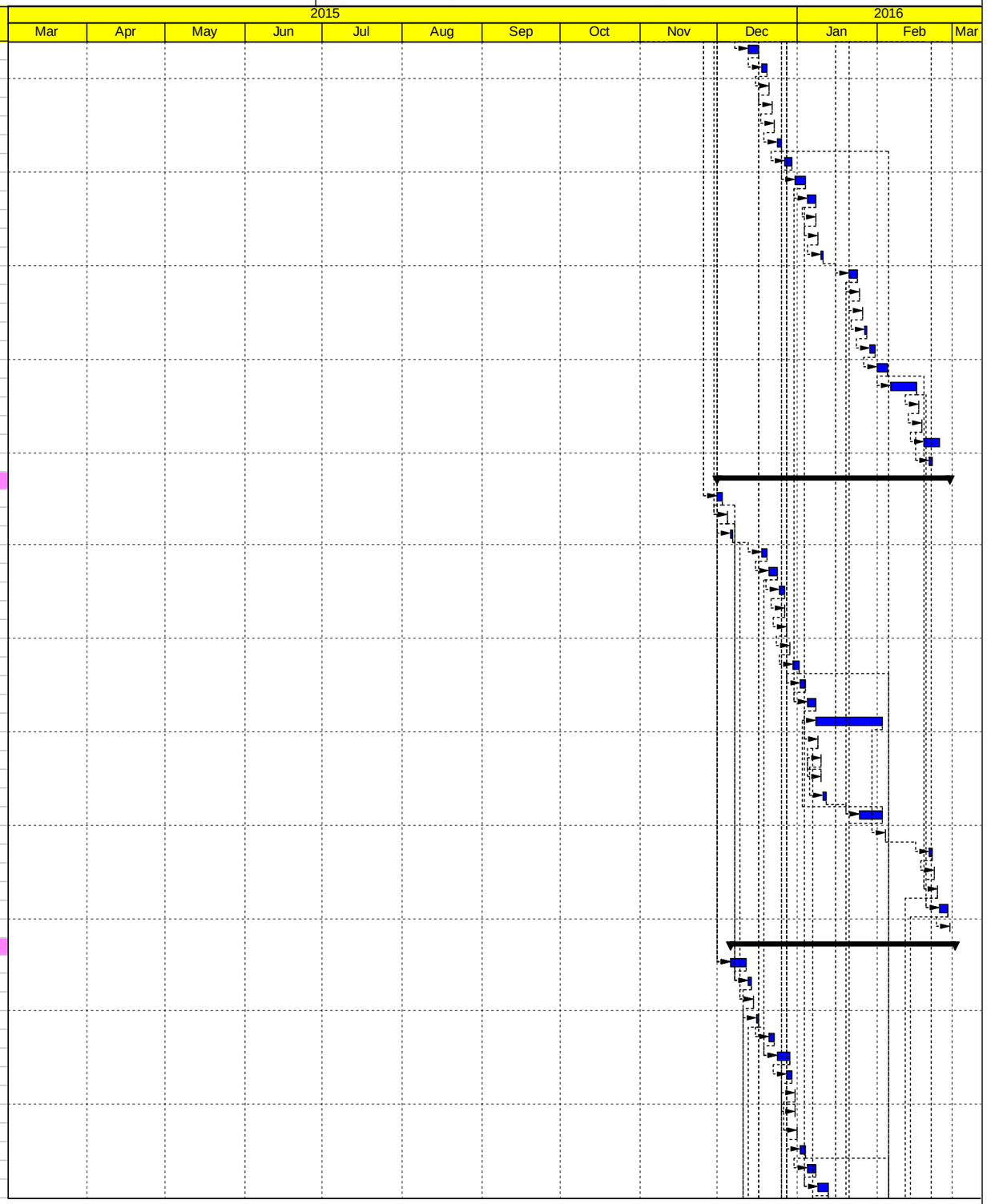
Activity ID	Activity Name	Actual Duration	Start	Finish
Culvert C4		127	19-Sep-15 A	24-Jan-16 A
PD-C4-0010	PD C4 Excavation 68,000m3 2,500m3/day	36	19-Sep-15 A	25-Oct-15 A
PD-C4-0020	PD C4 Leveling of Foundation 3,450m2 200m2/day	4	26-Oct-15 A	30-Oct-15 A
C4-2		94	22-Oct-15 A	24-Jan-16 A
PD-C4-2-010	PD C4-2 & C4-3 Back & Delivery to site stg11	6	22-Oct-15 A	28-Oct-15 A
PD-C4-2-015	PD C4-2 Install the buoyancy Tank	1	29-Oct-15 A	30-Oct-15 A
PD-C4-2-020	PD C4-2 floating to the location	0	31-Oct-15 A	31-Oct-15 A
PD-C4-2-040	PD C4-2 Installation	0	31-Oct-15 A	31-Oct-15 A
PD-C4-2-060	PD C4-2 Removal of South Steel Bulkhead	3	04-Nov-15 A	07-Nov-15 A
PD-C4-2-100	PD C4-2 Backfill Beside of Culvert	2	24-Nov-15 A	26-Nov-15 A
PD-C4-2-110	PD C4-2 Backfill upto +3.5mPD except Manholes	2	27-Nov-15 A	29-Nov-15 A
PD-C4-2-070	PD C4-2 Manhole Insitu concrete	4	15-Dec-15 A	19-Dec-15 A
PD-C4-2-050	PD C4-2 Removal of North Steel Bulkhead	3	21-Jan-16 A	24-Jan-16 A
C4-3		41	01-Nov-15 A	12-Dec-15 A
PD-C4-3-015	PD C4-3 Install the buoyancy Tank	1	01-Nov-15 A	02-Nov-15 A
PD-C4-3-020	PD C4-3 floating to the location	0	04-Nov-15 A	04-Nov-15 A
PD-C4-3-040	PD C4-3 Installation	0	04-Nov-15 A	04-Nov-15 A
PD-C4-3-050	PD C4-3 Removal of North Steel Bulkhead	2	05-Nov-15 A	07-Nov-15 A
PD-C4-3-060	PD C4-3 Removal of South Steel Bulkhead	3	12-Nov-15 A	15-Nov-15 A
PD-C4-3-100	PD C4-3 Backfill Beside of Culvert	2	27-Nov-15 A	29-Nov-15 A
PD-C4-3-110	PD C4-3 Backfill upto +3.5mPD except Manholes	2	30-Nov-15 A	02-Dec-15 A
PD-C4-3-090	PD C4-2/3 Movement Joint Insitu	3	06-Dec-15 A	09-Dec-15 A
PD-C4-3-070	PD C4-3 Manhole Insitu concrete	4	08-Dec-15 A	12-Dec-15 A
PD-C4-3-080	PD C4-2/3 Movement Joint Installation	4	08-Dec-15 A	12-Dec-15 A
C4-4		49	04-Nov-15 A	23-Dec-15 A
PD-C4-4-010	PD C4-4 Back & Delivery to site stg12	4	04-Nov-15 A	08-Nov-15 A
PD-C4-4-015	PD C4-4 Install the buoyancy Tank	1	09-Nov-15 A	10-Nov-15 A
PD-C4-4-020	PD C4-4 floating to the location	0	11-Nov-15 A	11-Nov-15 A
PD-C4-4-040	PD C4-4 Installation	0	11-Nov-15 A	11-Nov-15 A
PD-C4-4-050	PD C4-4 Removal of North Steel Bulkhead	2	12-Nov-15 A	14-Nov-15 A
PD-C4-4-060	PD C4-4 Removal of South Steel Bulkhead	3	25-Nov-15 A	28-Nov-15 A
PD-C4-4-100	PD C4-4 Backfill Beside of Culvert	2	30-Nov-15 A	02-Dec-15 A
PD-C4-4-110	PD C4-4 Backfill upto +3.5mPD except Manholes	2	03-Dec-15 A	05-Dec-15 A
PD-C4-4-070	PD C4-4 Manhole Insitu concrete	4	13-Dec-15 A	17-Dec-15 A
PD-C4-4-080	PD C4-3/4 Movement Joint Installation	1	18-Dec-15 A	19-Dec-15 A
PD-C4-4-090	PD C4-3/4 Movement Joint Insitu	3	20-Dec-15 A	23-Dec-15 A
C4-5		73	11-Nov-15 A	23-Jan-16 A
PD-C4-5-010	PD C4-5 Back & Delivery to site stg13	4	11-Nov-15 A	15-Nov-15 A
PD-C4-5-015	PD C4-5 Install the buoyancy Tank	1	16-Nov-15 A	17-Nov-15 A
PD-C4-5-020	PD C4-5 floating to the location	0	18-Nov-15 A	18-Nov-15 A
PD-C4-5-040	PD C4-5 Installation	0	18-Nov-15 A	18-Nov-15 A
PD-C4-5-060	PD C4-5 Removal of South Steel Bulkhead	4	29-Nov-15 A	03-Dec-15 A
PD-C4-5-100	PD C4-5 Backfill Beside of Culvert	2	03-Dec-15 A	05-Dec-15 A
PD-C4-5-110	PD C4-5 Backfill upto +3.5mPD except Manholes	1	06-Dec-15 A	07-Dec-15 A
PD-C4-5-070	PD C4-5 Manhole Insitu concrete	3	21-Dec-15 A	24-Dec-15 A
PD-C4-5-080	PD C4-4/5 Movement Joint Installation	1	21-Dec-15 A	22-Dec-15 A
PD-C4-5-090	PD C4-4/5 Movement Joint Insitu	3	23-Dec-15 A	26-Dec-15 A
PD-C4-5-050	PD C4-5 Removal of North Steel Bulkhead	2	21-Jan-16 A	23-Jan-16 A
Permanent Access to Portion A		128	21-Sep-15 A	27-Jan-16 A
PD-A2080	PD - C1 Divert Access	21	21-Sep-15 A	12-Oct-15 A
PD-A2110	PD - C4 Divert Access	6	04-Jan-16 A	10-Jan-16 A
PD-A2090	PD - C2 Divert Access	6	21-Jan-16 A	27-Jan-16 A
Removal of Temporary Access to Portion A		113	13-Oct-15 A	03-Feb-16 A
PD-A1100	PD C1 - Removal of Temporary Access	7	13-Oct-15 A	20-Oct-15 A
PD-A1110	PD C2 - Removal of Temporary Access	6	28-Jan-16 A	03-Feb-16 A
Construction of Sloping Outfalls		107	19-Nov-15 A	05-Mar-16 A
Culvert C1 Sloping Outfall		107	19-Nov-15 A	05-Mar-16 A
PD-C1-0110	PD C1-1 Outfall Excavation	23	19-Nov-15 A	12-Dec-15 A
PD-C1-0120	PD C1-1 Outfall Formation	6	13-Dec-15 A	19-Dec-15 A
PD-C1-0125	PD C1-1 Buoyancy	1	31-Dec-15 A	01-Jan-16 A
PD-C1-0130	PD C1-1 Outfall Installation	0	02-Jan-16 A	02-Jan-16 A
PD-C1-0140	PD C1-1 Outfall Removal of Buoyancy & Bulkhead	3	03-Jan-16 A	06-Jan-16 A
PD-C1-0150	PD C1-1 Outfall Insitu Concrete	13	21-Feb-16 A	05-Mar-16 A

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

Activity ID	Activity Name	Actual Duration	Start	Finish
Culvert C2 Sloping Outfall		31	25-Jan-16 A	25-Feb-16 A
PD-C2-0110	PD C2-1 Outfall Excavation	16	25-Jan-16 A	10-Feb-16 A
PD-C2-0122	PD C2-1 & C3-1 Back & Delivery Stg18	6	29-Jan-16 A	04-Feb-16 A
PD-C2-0125	PD C2-1 Buoyancy	1	05-Feb-16 A	06-Feb-16 A
PD-C2-0120	PD C2-1 Outfall Formation	2	11-Feb-16 A	13-Feb-16 A
PD-C2-0130	PD C2-1 Outfall Installation (20Feb2016)	0	20-Feb-16 A	20-Feb-16 A
PD-C2-0140	PD C2-1 Outfall Removal of Buoyancy & Bulkhead	3	21-Feb-16 A	24-Feb-16 A
PD-C2-0150	PD C2-1 Outfall Insitu Concrete	0	25-Feb-16 A	25-Feb-16 A
Culvert C4 Sloping Outfall		41	11-Jan-16 A	21-Feb-16 A
PD-C4-0110	PD C4-1 Outfall Excavation	12	11-Jan-16 A	23-Jan-16 A
PD-C4-0125	PD C4-1 Buoyancy	1	21-Jan-16 A	22-Jan-16 A
PD-C4-0120	PD C4-1 Outfall Formation	2	24-Jan-16 A	26-Jan-16 A
PD-C4-0130	PD C4-1 Outfall Installation	0	28-Jan-16 A	28-Jan-16 A
PD-C4-0140	PD C4-1 Outfall Removal of Buoyancy & Bulkhead	3	29-Jan-16 A	01-Feb-16 A
PD-C4-0150	PD C4-1 Outfall Insitu Concrete	0	21-Feb-16 A	21-Feb-16 A
Construction of Permanent Seawall		165	15-Oct-15 A	14-Apr-16 A
Vertical Seawall Type V2 6+136 to 5+650		165	15-Oct-15 A	14-Apr-16 A
Foundation Leveling		92	15-Oct-15 A	22-Jan-16 A
PD-V2-0055	PD C1/C2 - Vertical Seawall V2 VSOP19-16 Foundation Leveling 3,000m2 and Geotextile	15	15-Oct-15 A	31-Oct-15 A
PD-V2-0060	PD C2/C3 - Vertical Seawall V2 VSOP15-11 Foundation Leveling 3,000m2 and Geotextile	20	02-Nov-15 A	23-Nov-15 A
PD-V2-0065	PD C3/C4 - Vertical Seawall V2 VSOP10-05 Foundation Leveling 3,000m2 and Geotextile	55	24-Nov-15 A	22-Jan-16 A
Seawall Blocks Installation		132	20-Nov-15 A	14-Apr-16 A
PD-V2-0090	PD C1/C2 - Vertical Seawall Blocks V2 VSOP19-16 Type 2A5, 2A4 & 2A3 606nrs (30nrs/(	56	20-Nov-15 A	19-Jan-16 A
PD-V2-0110	PD C2/C3 - Vertical Seawall Blocks V2 VSOP15-11 Type 2A x3 & 2D 772nrs (30nrs/day)	51	17-Dec-15 A	13-Feb-16 A
PD-V2-0130	PD C3/C4 - Vertical Seawall Blocks V2 VSOP10-05 Type 2A x4, 2AC 905nrs (30nrs/day)	71	24-Jan-16 A	14-Apr-16 A
Rockfill Type 2 behind seawall		26	28-Jan-16 A	29-Feb-16 A
PD-V2-0190	PD C1/C2 - Vertical Seawall V2 Rockf ill Type 2 VSOP19-16 2,100m3	3	28-Jan-16 A	31-Jan-16 A
PD-V2-0200	PD C2/C3 - Vertical Seawall V2 Rockf ill Type 2 VSOP15-11 3,400m3	13	15-Feb-16 A	29-Feb-16 A
Geotextile Type 1		27	01-Feb-16 A	05-Mar-16 A
PD-V2-0240	PD C1/C2 - Vertical Seawall V2 Geotextile Type 1 VSOP19-16 1,500m2	2	01-Feb-16 A	03-Feb-16 A
PD-V2-0250	PD C2/C3 - Vertical Seawall V2 Geotextile Type 1 VSOP15-11 2,400m2	11	22-Feb-16 A	05-Mar-16 A
Reclamation upto +3.25mPD		7	21-Feb-16 A	29-Feb-16 A
PD-V2-0290	PD C1/C2 - Vertical Seawall V2 backfill with compaction upto +3.25mPD VSOP20-16	7	21-Feb-16 A	29-Feb-16 A
Extension Culvert EC1		218	02-Aug-15 A	07-Mar-16 A
Excavation & Supporting		121	02-Aug-15 A	01-Dec-15 A
PD-EC1-0-010	PD EC1 Sheetpiles at EC1-6	73	02-Aug-15 A	20-Oct-15 A
PD-EC1-0-020	PD EC1 Excavation 31,000m3	20	20-Oct-15 A	10-Nov-15 A
PD-EC1-0-030	PD EC1 Formation of Foundation EC1-1, EC1-2 & EC1-3	6	11-Nov-15 A	18-Nov-15 A
PD-EC1-0-040	PD EC1 Formation of Foundation EC1-4, EC1-5 & EC1-6	6	19-Nov-15 A	25-Nov-15 A
PD-EC1-0-050	PD EC1 Formation of Foundation EC1-7 & EC1-8	5	26-Nov-15 A	01-Dec-15 A
Insitu Concrete		109	19-Nov-15 A	07-Mar-16 A
EC1-1		102	19-Nov-15 A	29-Feb-16 A
PD-EC1-1-010	PD EC1-1, EC1-2 & EC1-3 Back & Delivery stg14	6	19-Nov-15 A	25-Nov-15 A
PD-EC1-1-020	PD EC1-1 Buoyancy	1	26-Nov-15 A	27-Nov-15 A
PD-EC1-1-030	PD EC1-1 Installation of Precast Culvert Base	2	28-Nov-15 A	30-Nov-15 A
PD-EC1-1-040	PD EC1-1 Removal of Buoyancy	1	01-Dec-15 A	02-Dec-15 A
PD-EC1-1-045	PD EC1-1 External Wall Frameworks	2	16-Jan-16 A	18-Jan-16 A
PD-EC1-1-050	PD EC1-1 External Wall Rebar Fixing	26	19-Jan-16 A	18-Feb-16 A
PD-EC1-1-060	PD EC1-1 External Wall Formwork Installation	24	22-Jan-16 A	19-Feb-16 A
PD-EC1-1-070	PD EC1-1 External Wall Rebar & Formwork Checking	0	20-Feb-16 A	20-Feb-16 A
PD-EC1-1-080	PD EC1-1 External Wall Insitu Concrete	0	22-Feb-16 A	22-Feb-16 A
PD-EC1-1-090	PD EC1-1 External Wall Formwork Removal	0	23-Feb-16 A	23-Feb-16 A
PD-EC1-1-100	PD EC1-1 External Wall Support Framework Removal	2	24-Feb-16 A	26-Feb-16 A
PD-EC1-1-110	PD EC1-1 Internal Wall Cleaning	2	24-Feb-16 A	26-Feb-16 A
PD-EC1-1-120	PD EC1-1 Internal Wall Rebar Fixing	0	27-Feb-16 A	27-Feb-16 A
PD-EC1-1-130	PD EC1-1 Internal Chamfer Formwork Installation	0	27-Feb-16 A	27-Feb-16 A
PD-EC1-1-150	PD EC1-1 Internal Wall Chamfer & Baseslab Concrete	0	28-Feb-16 A	28-Feb-16 A
PD-EC1-1-140	PD EC1-1 Internal Chamfer Rebar & Formwork Checking	0	28-Feb-16 A	28-Feb-16 A
PD-EC1-1-160	PD EC1-1 Internal Wall Chamfer Formwork Removal	0	29-Feb-16 A	29-Feb-16 A
EC1-2		89	28-Nov-15 A	25-Feb-16 A
PD-EC1-2-020	PD EC1-2 Buoyancy	2	28-Nov-15 A	30-Nov-15 A
PD-EC1-2-030	PD EC1-2 Installation of Precast Culvert Base	1	03-Dec-15 A	04-Dec-15 A
PD-EC1-2-040	PD EC1-2 Removal of Buoyancy	1	05-Dec-15 A	06-Dec-15 A
PD-EC1-2-045	PD EC1-2 External Wall Frameworks	5	07-Dec-15 A	12-Dec-15 A

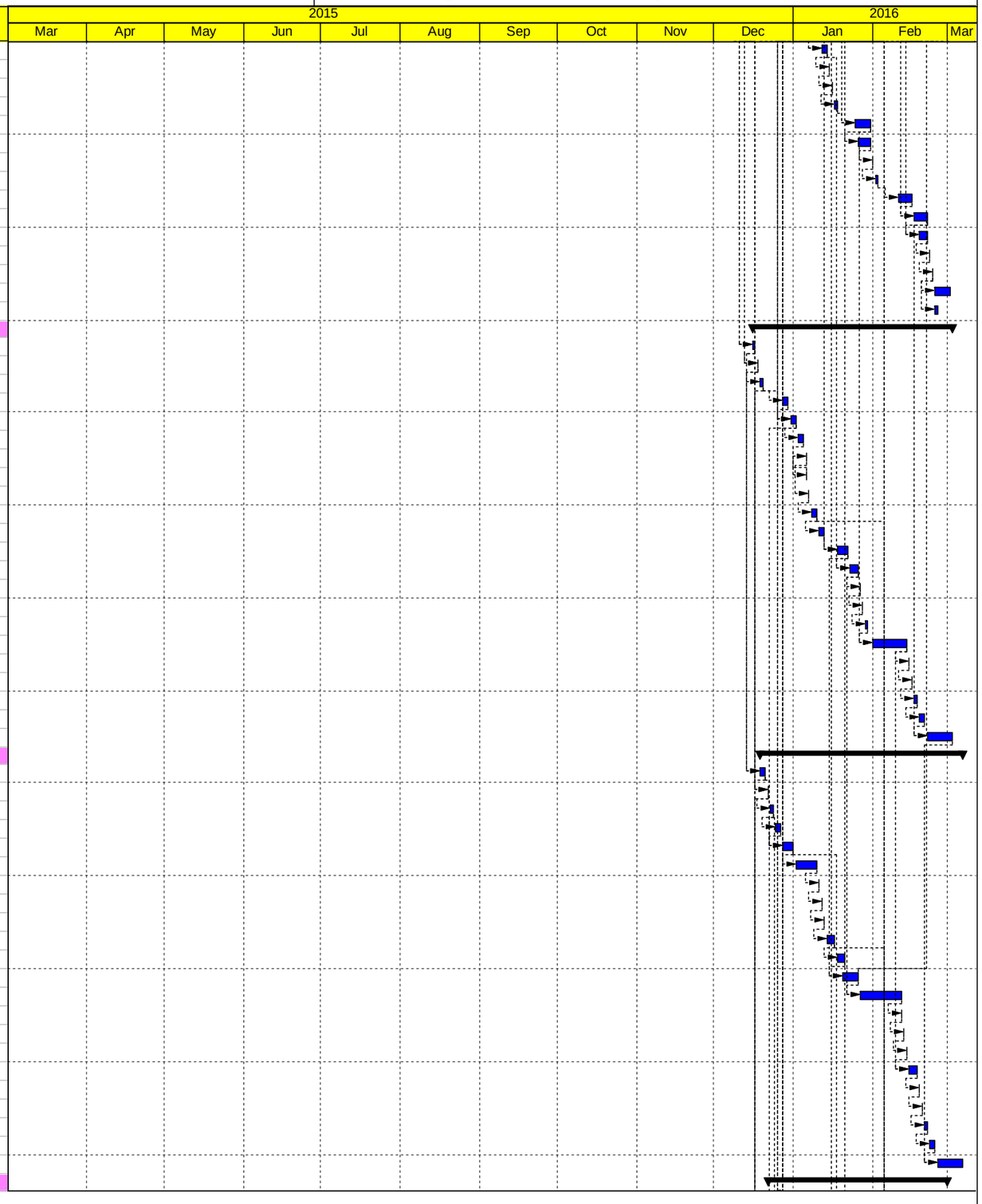
Remaining Level of Effort ◆ ◆ Milestone
Actual Level of Effort Summary
Actual Work
Remaining Work
Critical Remaining Work

Activity ID	Activity Name	Actual Duration	Start	Finish
PD-EC1-2-050	PD EC1-2 External Wall Rebar Fixing	3	13-Dec-15 A	17-Dec-15 A
PD-EC1-2-060	PD EC1-2 External Wall Formwork Installation	2	18-Dec-15 A	20-Dec-15 A
PD-EC1-2-070	PD EC1-2 External Wall Rebar & Formwork Checking	0	21-Dec-15 A	21-Dec-15 A
PD-EC1-2-080	PD EC1-2 External Wall Insitu Concrete	0	22-Dec-15 A	22-Dec-15 A
PD-EC1-2-090	PD EC1-2 External Wall Formwork Removal	0	23-Dec-15 A	23-Dec-15 A
PD-EC1-2-100	PD EC1-2 External Wall Support Framework Removal	2	24-Dec-15 A	26-Dec-15 A
PD-EC1-2-110	PD EC1-2 Internal Wall Cleaning	3	27-Dec-15 A	30-Dec-15 A
PD-EC1-2-120	PD EC1-2 Internal Wall Rebar Fixing	4	31-Dec-15 A	04-Jan-16 A
PD-EC1-2-130	PD EC1-2 Internal Chamfer Formwork Installation	3	05-Jan-16 A	08-Jan-16 A
PD-EC1-2-140	PD EC1-2 Internal Chamfer Rebar & Formwork Checking	0	08-Jan-16 A	08-Jan-16 A
PD-EC1-2-150	PD EC1-2 Internal Wall Chamfer & Baseslab Concrete	0	09-Jan-16 A	09-Jan-16 A
PD-EC1-2-160	PD EC1-2 Internal Wall Chamfer Formwork Removal	1	10-Jan-16 A	11-Jan-16 A
PD-EC1-2-170	PD EC1-2 Internal Wall Formwork Installation	3	21-Jan-16 A	24-Jan-16 A
PD-EC1-2-180	PD EC1-2 Internal Wall Rebar & Formwork Checking	0	25-Jan-16 A	25-Jan-16 A
PD-EC1-2-190	PD EC1-2 Internal Wall Concrete	0	26-Jan-16 A	26-Jan-16 A
PD-EC1-2-200	PD EC1-2 Internal Wall Formwork Removal	1	27-Jan-16 A	28-Jan-16 A
PD-EC1-2-210	PD EC1-2 Top Slab Support	2	29-Jan-16 A	31-Jan-16 A
PD-EC1-2-220	PD EC1-2 Top Slab Formwork	4	01-Feb-16 A	05-Feb-16 A
PD-EC1-2-230	PD EC1-2 Top Slab Rebar Fixing	6	06-Feb-16 A	16-Feb-16 A
PD-EC1-2-240	PD EC1-2 Top Slab Rebar & Formwork Checking	0	17-Feb-16 A	17-Feb-16 A
PD-EC1-2-250	PD EC1-2 Top Slab Insitu Concrete	0	18-Feb-16 A	18-Feb-16 A
PD-EC1-2-270	PD EC1-2 Top Slab Curing	6	19-Feb-16 A	25-Feb-16 A
PD-EC1-2-260	PD EC1-2 Top Slab Side Formwork Removal	1	21-Feb-16 A	22-Feb-16 A
EC1-3		90	01-Dec-15 A	29-Feb-16 A
PD-EC1-3-020	PD EC1-3 Buoyancy	2	01-Dec-15 A	03-Dec-15 A
PD-EC1-3-030	PD EC1-3 Installation of Precast Culvert Base	0	05-Dec-15 A	05-Dec-15 A
PD-EC1-3-040	PD EC1-3 Removal of Buoyancy	1	06-Dec-15 A	07-Dec-15 A
PD-EC1-3-045	PD EC1-3 External Wall Frameworks	2	18-Dec-15 A	20-Dec-15 A
PD-EC1-3-050	PD EC1-3 External Wall Rebar Fixing	3	21-Dec-15 A	24-Dec-15 A
PD-EC1-3-060	PD EC1-3 External Wall Formwork Installation	2	25-Dec-15 A	27-Dec-15 A
PD-EC1-3-070	PD EC1-3 External Wall Rebar & Formwork Checking	0	27-Dec-15 A	27-Dec-15 A
PD-EC1-3-080	PD EC1-3 External Wall Insitu Concrete	0	28-Dec-15 A	28-Dec-15 A
PD-EC1-3-090	PD EC1-3 External Wall Formwork Removal	0	29-Dec-15 A	29-Dec-15 A
PD-EC1-3-100	PD EC1-3 External Wall Support Framework Removal	3	30-Dec-15 A	01-Jan-16 A
PD-EC1-3-110	PD EC1-3 Internal Wall Cleaning	2	02-Jan-16 A	04-Jan-16 A
PD-EC1-3-120	PD EC1-3 Internal Wall Rebar Fixing	3	05-Jan-16 A	08-Jan-16 A
PD-EC1-3-180	PD EC1-3 Internal Wall Rebar & Formwork Checking	26	08-Jan-16 A	03-Feb-16 A
PD-EC1-3-130	PD EC1-3 Internal Chamfer Formwork Installation	0	09-Jan-16 A	09-Jan-16 A
PD-EC1-3-150	PD EC1-3 Internal Wall Chamfer & Baseslab Concrete	0	10-Jan-16 A	10-Jan-16 A
PD-EC1-3-140	PD EC1-3 Internal Chamfer Rebar & Formwork Checking	0	10-Jan-16 A	10-Jan-16 A
PD-EC1-3-160	PD EC1-3 Internal Wall Chamfer Formwork Removal	1	11-Jan-16 A	12-Jan-16 A
PD-EC1-3-170	PD EC1-3 Internal Wall Formwork Installation	9	25-Jan-16 A	03-Feb-16 A
PD-EC1-3-190	PD EC1-3 Internal Wall Concrete	0	04-Feb-16 A	04-Feb-16 A
PD-EC1-3-200	PD EC1-3 Internal Wall Formwork Removal	1	21-Feb-16 A	22-Feb-16 A
PD-EC1-3-210	PD EC1-3 Top Slab Support	0	23-Feb-16 A	23-Feb-16 A
PD-EC1-3-220	PD EC1-3 Top Slab Formwork	0	24-Feb-16 A	24-Feb-16 A
PD-EC1-3-230	PD EC1-3 Top Slab Rebar Fixing	3	25-Feb-16 A	28-Feb-16 A
PD-EC1-3-240	PD EC1-3 Top Slab Rebar & Formwork Checking	0	29-Feb-16 A	29-Feb-16 A
EC1-4		87	06-Dec-15 A	02-Mar-16 A
PD-EC1-4-010	PD EC1-4, EC1-5 & EC1-6 Back & Delivery stg15	6	06-Dec-15 A	12-Dec-15 A
PD-EC1-4-020	PD EC1-4 Buoyancy	1	13-Dec-15 A	14-Dec-15 A
PD-EC1-4-030	PD EC1-4 Installation of Precast Culvert Base	0	15-Dec-15 A	15-Dec-15 A
PD-EC1-4-040	PD EC1-4 Removal of Buoyancy	1	16-Dec-15 A	17-Dec-15 A
PD-EC1-4-045	PD EC1-4 External Wall Frameworks	2	21-Dec-15 A	23-Dec-15 A
PD-EC1-4-050	PD EC1-4 External Wall Rebar Fixing	5	24-Dec-15 A	29-Dec-15 A
PD-EC1-4-060	PD EC1-4 External Wall Formwork Installation	2	28-Dec-15 A	30-Dec-15 A
PD-EC1-4-080	PD EC1-4 External Wall Insitu Concrete	0	31-Dec-15 A	31-Dec-15 A
PD-EC1-4-070	PD EC1-4 External Wall Rebar & Formwork Checking	0	31-Dec-15 A	31-Dec-15 A
PD-EC1-4-090	PD EC1-4 External Wall Formwork Removal	0	01-Jan-16 A	01-Jan-16 A
PD-EC1-4-100	PD EC1-4 External Wall Support Framework Removal	2	02-Jan-16 A	04-Jan-16 A
PD-EC1-4-110	PD EC1-4 Internal Wall Cleaning	3	05-Jan-16 A	08-Jan-16 A
PD-EC1-4-120	PD EC1-4 Internal Wall Rebar Fixing	4	09-Jan-16 A	13-Jan-16 A



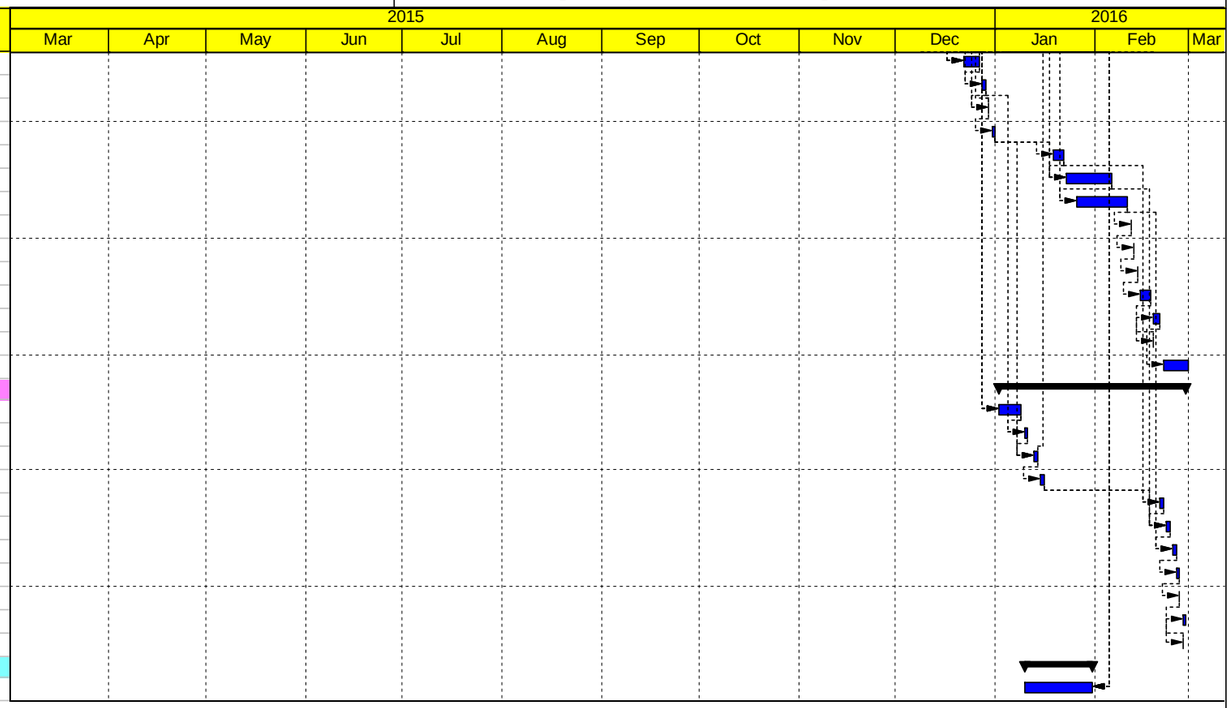
Remaining Level of Effort
Actual Level of Effort
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

Activity ID	Activity Name	Actual Duration	Start	Finish
PD-EC1-4-130	PD EC1-4 Internal Chamfer Formwork Installation	2	12-Jan-16 A	14-Jan-16 A
PD-EC1-4-140	PD EC1-4 Internal Chamfer Rebar & Formwork Checking	0	15-Jan-16 A	15-Jan-16 A
PD-EC1-4-150	PD EC1-4 Internal Wall Chamfer & Baseslab Concrete	0	16-Jan-16 A	16-Jan-16 A
PD-EC1-4-160	PD EC1-4 Internal Wall Chamfer Formwork Removal	1	17-Jan-16 A	18-Jan-16 A
PD-EC1-4-170	PD EC1-4 Internal Wall Formwork Installation	6	25-Jan-16 A	31-Jan-16 A
PD-EC1-4-180	PD EC1-4 Internal Wall Rebar & Formwork Checking	5	26-Jan-16 A	31-Jan-16 A
PD-EC1-4-190	PD EC1-4 Internal Wall Concrete	0	01-Feb-16 A	01-Feb-16 A
PD-EC1-4-200	PD EC1-4 Internal Wall Formwork Removal	1	02-Feb-16 A	03-Feb-16 A
PD-EC1-4-210	PD EC1-4 Top Slab Support	5	11-Feb-16 A	16-Feb-16 A
PD-EC1-4-220	PD EC1-4 Top Slab Formwork	5	17-Feb-16 A	22-Feb-16 A
PD-EC1-4-230	PD EC1-4 Top Slab Rebar Fixing	3	19-Feb-16 A	22-Feb-16 A
PD-EC1-4-240	PD EC1-4 Top Slab Rebar & Formwork Checking	0	23-Feb-16 A	23-Feb-16 A
PD-EC1-4-250	PD EC1-4 Top Slab Insitu Concrete	0	24-Feb-16 A	24-Feb-16 A
PD-EC1-4-270	PD EC1-4 Top Slab Curing	6	25-Feb-16 A	02-Mar-16 A
PD-EC1-4-260	PD EC1-4 Top Slab Side Formwork Removal	1	25-Feb-16 A	26-Feb-16 A
EC1-5		78	16-Dec-15 A	03-Mar-16 A
PD-EC1-5-020	PD EC1-5 Buoyancy	1	16-Dec-15 A	17-Dec-15 A
PD-EC1-5-030	PD EC1-5 Installation of Precast Culvert Base	0	18-Dec-15 A	18-Dec-15 A
PD-EC1-5-040	PD EC1-5 Removal of Buoyancy	1	19-Dec-15 A	20-Dec-15 A
PD-EC1-5-045	PD EC1-5 External Wall Frameworks	2	28-Dec-15 A	30-Dec-15 A
PD-EC1-5-050	PD EC1-5 External Wall Rebar Fixing	2	31-Dec-15 A	02-Jan-16 A
PD-EC1-5-060	PD EC1-5 External Wall Formwork Installation	2	03-Jan-16 A	05-Jan-16 A
PD-EC1-5-080	PD EC1-5 External Wall Insitu Concrete	0	06-Jan-16 A	06-Jan-16 A
PD-EC1-5-070	PD EC1-5 External Wall Rebar & Formwork Checking	0	06-Jan-16 A	06-Jan-16 A
PD-EC1-5-090	PD EC1-5 External Wall Formwork Removal	0	07-Jan-16 A	07-Jan-16 A
PD-EC1-5-100	PD EC1-5 External Wall Support Framework Removal	2	08-Jan-16 A	10-Jan-16 A
PD-EC1-5-110	PD EC1-5 Internal Wall Cleaning	2	11-Jan-16 A	13-Jan-16 A
PD-EC1-5-120	PD EC1-5 Internal Wall Rebar Fixing	4	18-Jan-16 A	22-Jan-16 A
PD-EC1-5-130	PD EC1-5 Internal Chamfer Formwork Installation	3	23-Jan-16 A	26-Jan-16 A
PD-EC1-5-140	PD EC1-5 Internal Chamfer Rebar & Formwork Checking	0	27-Jan-16 A	27-Jan-16 A
PD-EC1-5-150	PD EC1-5 Internal Wall Chamfer & Baseslab Concrete	0	28-Jan-16 A	28-Jan-16 A
PD-EC1-5-160	PD EC1-5 Internal Wall Chamfer Formwork Removal	1	29-Jan-16 A	30-Jan-16 A
PD-EC1-5-170	PD EC1-5 Internal Wall Formwork Installation	9	01-Feb-16 A	14-Feb-16 A
PD-EC1-5-180	PD EC1-5 Internal Wall Rebar & Formwork Checking	0	15-Feb-16 A	15-Feb-16 A
PD-EC1-5-190	PD EC1-5 Internal Wall Concrete	0	16-Feb-16 A	16-Feb-16 A
PD-EC1-5-200	PD EC1-5 Internal Wall Formwork Removal	1	17-Feb-16 A	18-Feb-16 A
PD-EC1-5-210	PD EC1-5 Top Slab Support	2	19-Feb-16 A	21-Feb-16 A
PD-EC1-5-220	PD EC1-5 Top Slab Formwork	10	22-Feb-16 A	03-Mar-16 A
EC1-6		75	19-Dec-15 A	07-Mar-16 A
PD-EC1-6-020	PD EC1-6 Buoyancy	2	19-Dec-15 A	21-Dec-15 A
PD-EC1-6-030	PD EC1-6 Installation of Precast Culvert Base	0	22-Dec-15 A	22-Dec-15 A
PD-EC1-6-040	PD EC1-6 Removal of Buoyancy	1	23-Dec-15 A	24-Dec-15 A
PD-EC1-6-045	PD EC1-6 External Wall Frameworks	2	25-Dec-15 A	27-Dec-15 A
PD-EC1-6-050	PD EC1-6 External Wall Rebar Fixing	4	28-Dec-15 A	01-Jan-16 A
PD-EC1-6-060	PD EC1-6 External Wall Formwork Installation	8	02-Jan-16 A	10-Jan-16 A
PD-EC1-6-070	PD EC1-6 External Wall Rebar & Formwork Checking	0	11-Jan-16 A	11-Jan-16 A
PD-EC1-6-080	PD EC1-6 External Wall Insitu Concrete	0	12-Jan-16 A	12-Jan-16 A
PD-EC1-6-090	PD EC1-6 External Wall Formwork Removal	0	13-Jan-16 A	13-Jan-16 A
PD-EC1-6-100	PD EC1-6 External Wall Support Framework Removal	3	14-Jan-16 A	17-Jan-16 A
PD-EC1-6-110	PD EC1-6 Internal Wall Cleaning	3	18-Jan-16 A	21-Jan-16 A
PD-EC1-6-120	PD EC1-6 Internal Wall Rebar Fixing	6	20-Jan-16 A	26-Jan-16 A
PD-EC1-6-130	PD EC1-6 Internal Chamfer Formwork Installation	12	27-Jan-16 A	12-Feb-16 A
PD-EC1-6-140	PD EC1-6 Internal Chamfer Rebar & Formwork Checking	0	12-Feb-16 A	12-Feb-16 A
PD-EC1-6-150	PD EC1-6 Internal Wall Chamfer & Baseslab Concrete	0	13-Feb-16 A	13-Feb-16 A
PD-EC1-6-160	PD EC1-6 Internal Wall Chamfer Formwork Removal	0	14-Feb-16 A	14-Feb-16 A
PD-EC1-6-170	PD EC1-6 Internal Wall Formwork Installation	3	15-Feb-16 A	18-Feb-16 A
PD-EC1-6-180	PD EC1-6 Internal Wall Rebar & Formwork Checking	0	19-Feb-16 A	19-Feb-16 A
PD-EC1-6-190	PD EC1-6 Internal Wall Concrete	0	20-Feb-16 A	20-Feb-16 A
PD-EC1-6-200	PD EC1-6 Internal Wall Formwork Removal	1	21-Feb-16 A	22-Feb-16 A
PD-EC1-6-210	PD EC1-6 Top Slab Support	2	23-Feb-16 A	25-Feb-16 A
PD-EC1-6-220	PD EC1-6 Top Slab Formwork	10	26-Feb-16 A	07-Mar-16 A
EC1-7		66	22-Dec-15 A	01-Mar-16 A



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

Activity ID	Activity Name	Actual Duration	Start	Finish
PD-EC1-7-010	PD EC1-7 & C1-1 Back & Delivery stg16	5	22-Dec-15 A	27-Dec-15 A
PD-EC1-7-020	PD EC1-7 Buoyancy	1	28-Dec-15 A	29-Dec-15 A
PD-EC1-7-030	PD EC1-7 Installation of Precast Culvert Base	0	30-Dec-15 A	30-Dec-15 A
PD-EC1-7-040	PD EC1-7 Removal of Buoyancy	1	31-Dec-15 A	01-Jan-16 A
PD-EC1-7-045	PD EC1-7 External Wall Frameworks	3	19-Jan-16 A	22-Jan-16 A
PD-EC1-7-050	PD EC1-7 External Wall Rebar Fixing	14	23-Jan-16 A	06-Feb-16 A
PD-EC1-7-060	PD EC1-7 External Wall Formwork Installation	12	26-Jan-16 A	11-Feb-16 A
PD-EC1-7-070	PD EC1-7 External Wall Rebar & Formwork Checking	0	12-Feb-16 A	12-Feb-16 A
PD-EC1-7-080	PD EC1-7 External Wall Insitu Concrete	0	13-Feb-16 A	13-Feb-16 A
PD-EC1-7-090	PD EC1-7 External Wall Formwork Removal	0	14-Feb-16 A	14-Feb-16 A
PD-EC1-7-100	PD EC1-7 External Wall Support Framework Removal	3	15-Feb-16 A	18-Feb-16 A
PD-EC1-7-120	PD EC1-7 Internal Wall Rebar Fixing	2	19-Feb-16 A	21-Feb-16 A
PD-EC1-7-110	PD EC1-7 Internal Wall Cleaning	0	19-Feb-16 A	19-Feb-16 A
PD-EC1-7-130	PD EC1-7 Internal Chamfer Formwork Installation	8	22-Feb-16 A	01-Mar-16 A
EC1-8		54	02-Jan-16 A	29-Feb-16 A
PD-EC1-8-010	PD EC1-8 & C4-1 Back & Delivery stg17	7	02-Jan-16 A	09-Jan-16 A
PD-EC1-8-020	PD EC1-8 Buoyancy	1	10-Jan-16 A	11-Jan-16 A
PD-EC1-8-030	PD EC1-8 Outfall Installation of Precast Culvert Base	1	13-Jan-16 A	14-Jan-16 A
PD-EC1-8-040	PD EC1-8 Removal of Buoyancy	1	15-Jan-16 A	16-Jan-16 A
PD-EC1-8-045	PD EC1-8 External Wall Frameworks	1	21-Feb-16 A	22-Feb-16 A
PD-EC1-8-050	PD EC1-8 External Wall Rebar Fixing	1	23-Feb-16 A	24-Feb-16 A
PD-EC1-8-060	PD EC1-8 External Wall Formwork Installation	1	25-Feb-16 A	26-Feb-16 A
PD-EC1-8-070	PD EC1-8 External Wall Rebar & Formwork Checking	1	26-Feb-16 A	27-Feb-16 A
PD-EC1-8-080	PD EC1-8 External Wall Insitu Concrete	0	27-Feb-16 A	27-Feb-16 A
PD-EC1-8-100	PD EC1-8 External Wall Support Framework Removal	1	28-Feb-16 A	29-Feb-16 A
PD-EC1-8-090	PD EC1-8 External Wall Formwork Removal	0	28-Feb-16 A	28-Feb-16 A
Backfilling & Reclamation		21	10-Jan-16 A	31-Jan-16 A
PD-EC1-0100-0	Backfill west side of EC1-2 to EC1-6 for Handover to Other Contractors	21	10-Jan-16 A	31-Jan-16 A



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

Appendix C - Implementation Schedule of Environmental Mitigation Measures

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
Air Quality				
S5.5.6.1 of HKBCFEIA	A1	The contractor shall follow the procedures and requirements given in the Air Pollution Control (Construction Dust) Regulation	All construction sites	V
S5.5.6.2 of HKBCFEIA and S4.8.1 of TKCLKLEIA	A2	Proper watering of exposed spoil should be undertaken throughout the construction phase: • Any excavated or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet and then removed or backfilled or reinstated where practicable within 24 hours of the excavation or unloading; • Any dusty materials remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads; • A stockpile of dusty material should not be extend beyond the pedestrian barriers, fencing or traffic cones. • Where practicable, vehicle washing facilities with high pressure water jet should be provided at every discernible or designated vehicle exit point. The area where vehicle washing takes place and the road section between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores; • When there are open excavation and reinstatement works, hoarding of not less	All construction sites	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		than 2.4m high should be provided as far as practicable along the site boundary with provision for public crossing. Good site practice shall also be adopted by the Contractor to ensure the conditions of the hoardings are properly maintained throughout the construction period; • The portion of any road leading only to construction site that is within 30m of a vehicle entrance or exit should be kept clear of dusty materials; • Surfaces where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation takes place should be sprayed with water or a dust suppression chemical continuously; • Any area that involves demolition activities should be sprayed with water or a dust suppression chemical immediately prior to, during and immediately after the activities so as to maintain the entire surface wet; • Where a scaffolding is erected around the perimeter of a building under construction, effective dust screens, sheeting or netting should be provided to enclose the scaffolding from the ground floor level of the building, or a canopy should be provided from the first floor level up to the highest level of the scaffolding; • Any skip hoist for material transport should be totally enclosed by impervious sheeting; • Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered		

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		on the top and the 3 sides; • Cement or dry PFA delivered in bulk should be stored in a closed silo fitted with an audible high level alarm which is interlocked with the material filling line and no overfilling is allowed; • All unpaved roads/exposed area shall be watered which results in dust suppression by forming moist cohesive films among the discrete grains of road surface material. • No burning of debris or other materials on the works areas is allowed; • 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; • Open dropping heights for excavated materials shall be controlled to a maximum height of 2m to minimise the fugitive dust arising from unloading; • 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. 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; • Loading, unloading, transfer, handling or storage of bulk cement or dry PFA should be carried out in a totally enclosed system or facility, and any vent or exhaust should be fitted with an effective fabric filter or equivalent air pollution control		

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		system; and • Exposed earth should be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shotcrete or other suitable surface stabiliser within six months after the last construction activity on the construction site or part of the construction site where the exposed earth lies.		
S5.5.6.3 of HKBCFEIA and S4.8.1 of TKCLKLEIA	A3	The Contractor should undertake proper watering on all exposed spoil and associated work areas (with at least 8 times per day) throughout the construction phase.	All construction sites	V
S5.5.6.4 of HKBCFEIA and S4.11 of TKCLKLEIA	A4	Implement regular dust monitoring under EM&A programme during the construction stage.	Selected representative dust monitoring station	V
S5.5.7.1 of HKBCFEIA	A5	The following mitigation measures should be adopted to prevent fugitive dust emissions for concrete batching plant: • Loading, unloading, handling, transfer or storage of any dusty materials should be carried out in totally enclosed system; • All dust-laden air or waste gas generated by the process operations should be properly extracted and vented to fabric filtering system to meet the emission limits for TSP;	All construction sites	N/A

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		• Vents for all silos and cement/ pulverised fuel ash (PFA) weighing scale should be fitted with fabric filtering system; • The materials which may generate airborne dusty emissions should be wetted by water spray system; • All receiving hoppers should be enclosed on three sides up to 3m above unloading point; • All conveyor transfer points should be totally enclosed; • All access and route roads within the premises should be paved and wetted; and • Vehicle cleaning facilities should be provided and used by all concrete trucks before leaving the premises to wash off any dust on the wheels and/or body.		
S5.5.2.7 of HKBCFEIA	A6	The following mitigation measures should be adopted to prevent fugitive dust emissions at barging point: • All road surface within the barging facilities will be paved; • Dust enclosures will be provided for the loading ramp; • Vehicles will be required to pass through designated wheels wash facilities; and • Continuous water spray at the loading points.	All construction sites	N/A (Construction in process)
Construction Noise (Air borne)				
S6.4.10 of HKBCFEIA	N1	Use of good site practices to limit noise emissions by considering the following: • only well-maintained plant should be operated on-site and plant should be	All construction sites	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		serviced regularly during the construction programme; • machines and plant (such as trucks, cranes) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • plant known to emit noise strongly in one direction, where possible, be orientated so that the noise is directed away from nearby NSRs; • silencers or mufflers on construction equipment should be properly fitted and maintained during the construction works; • mobile plant should be sited as far away from NSRs as possible and practicable; • material stockpiles, mobile container site officer and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities.		
S6.4.11 of HKBCFEIA	N2	Install temporary hoarding located on the site boundaries between noisy construction activities and NSRs. The conditions of the hoardings shall be properly maintained throughout the construction period.	All construction sites	V
S6.4.12 of HKBCFEIA	N3	Install movable noise barriers (typically density @14kg/m^2), acoustic mat or full enclosure close to noisy plants including air compressor, generators, saw.	For plant items listed in Appendix 6D of the EIA report at all construction sites	N/A
S6.4.13 of HKBCFEIA	N4	Select “Quiet plants” which comply with the BS 5228 Part 1 or TM standards.	For plant items listed in Appendix 6D of the	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
			EIA report at all construction sites	
S6.4.14 of HKBCFEIA	N5	Sequencing operation of construction plants where practicable.	All construction sites where practicable	V
S5.1 of TMCLKLEIA	N6	Implement a noise monitoring under EM&A programme.	Selected representative noise monitoring station	V
Waste Management (Construction Waste)				
S12.6 of TMCLKLEIA	WM1	The Contractor shall identify a coordinator for the management of waste.	All construction sites	V
S12.6 of TMCLKLEIA	WM2	The Contractor shall apply for and obtain the appropriate licenses for the disposal of public fill, chemical waste and effluent discharges.	All construction sites	V
S12.6 of TMCLKLEIA	WM3	EM&A of waste handling, storage, transportation, disposal procedures and documentation through the site audit programme shall be undertaken.	All construction sites	V
S8.3.8 of HKBCFEIA and S12.6 of TMCLKLEIA	WM4	*Construction and Demolition Material* The following mitigation measures should be implemented in handling the waste: • Maintain temporary stockpiles and reuse excavated fill material for backfilling and reinstatement; • Carry out on-site sorting;	All construction sites	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		• Make provisions in the Contract documents to allow and promote the use of recycled aggregates where appropriate; • Adopt 'Selective Demolition' technique to demolish the existing structures and facilities with a view to recovering broken concrete effectively for recycling purpose, where possible; • Implement a trip-ticket system for each works contract to ensure that the disposal of C&D materials are properly documented and verified; • Implement an enhanced Waste Management Plan similar to ETWBTC (Works) No. 19/2005 – "Environmental Management on Construction Sites" to encourage on-site sorting of C&D materials and to minimize their generation during the course of construction; • In addition, disposal of the C&D materials onto any sensitive locations such as agricultural lands, etc. should be avoided. The Contractor shall propose the final disposal sites to the Project Proponent and get its approval before implementation; and • The surplus surcharge should be transferred to a fill bank.		
S8.3.9-S8.3.11 of HKBCFEIA and S12.6 of	WM5	*C&D Waste* • Standard formwork or pre-fabrication should be used as far as practicable in order to minimise the arising of C&D materials. The use of more durable formwork or plastic facing for the construction works should be considered. Use of wooden	All construction sites	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
TMCLKLEIA		hoardings should not be used, as in other projects. Metal hoarding and falsework should be used to enhance the possibility of recycling. The purchasing of construction materials will be carefully planned in order to avoid over ordering and wastage. • The Contractor should recycle as much of the C&D materials as possible on-site. Public fill and C&D waste should be segregated and stored in different containers or skips to enhance reuse or recycling of materials and their proper disposal. Where practicable, concrete and masonry can be crushed and used as fill. Steel reinforcement bar can be used by scrap steel mills. Different areas of the sites should be considered for such segregation and storage.		
S8.2.12-S8.3.15 of HKBCFEIA and S12.6 of TMCLKLEIA	WM6	*Chemical Waste* • Chemical waste that is produced, as defined by Schedule 1 of the Waste Disposal (Chemical Waste) (General) Regulation, should be handled in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. • Containers used for the storage of chemical wastes should be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition, and securely closed; have a capacity of less than 450 liters unless the specification has been approved by the EPD; and display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the regulation. • The storage area for chemical wastes should be clearly labelled and used solely for	All construction sites	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		the storage of chemical waste; enclosed on at least 3 sides; have an impermeable floor and bunding of sufficient capacity to accommodate 110% of the volume of the largest container or 20 % of the total volume of waste stored in that area, whichever is the greatest; have adequate ventilation; covered to prevent rainfall entering; and arranged so that incompatible materials are adequately separated. • Disposal of chemical waste should be via a licensed waste collector; be to a facility licensed to receive chemical waste, such as the Chemical Waste Treatment Centre which also offers a chemical waste collection service and can supply the necessary storage containers; or be to a reuser of the waste, under approval from the EPD.		
S8.3.16 of HKBCFEIA and S12.6 of TMCLKLEIA	WM7	*Sewage* • Adequate numbers of portable toilets should be provided for the workers. The portable toilets should be maintained in a state, which will not deter the workers from utilizing these portable toilets. Night soil should be collected by licensed collectors regularly.	All construction sites	V
S8.3.17 of HKBCFEIA and S12.6 of TMCLKLEIA	WM8	*General Refuse* • The site and surroundings shall be kept tidy and litter free. General refuse generated on-site should be stored in enclosed bins or compaction units separately from construction and chemical wastes. • A reputable waste collector should be employed by the Contractor to remove general refuse from the site, separately from construction and chemical wastes, on	All construction sites	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		a daily basis to minimize odour, pest and litter impacts. Burning of refuse on construction sites is prohibited by law. • Aluminium cans are often recovered from the waste stream by individual collectors if they are segregated and made easily accessible. Separate labelled bins for their deposit should be provided if feasible. • Office wastes can be reduced through the recycling of paper if volumes are large enough to warrant collection. Participation in a local collection scheme should be considered by the Contractor. In addition, waste separation facilities for paper, aluminum cans, plastic bottles etc., should be provided. • Training should be provided to workers about the concepts of site cleanliness and appropriate waste management procedure, including reduction, reuse and recycling of 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. • All waste containers shall be in a secure area on hardstanding.		

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
Water Quality (Construction Phase)				
	W1	Mitigation during the marine works to reduce impacts to within acceptable levels have been recommended and will comprise a series of measures that restrict the method and sequencing of backfilling, as well as protection measures. Details of the measures are provided below: • Reclamation filling for the Project shall not proceed until at least 200m of leading seawall at the reclamation area formed above +2.2mPD, unless otherwise agreement was obtained from EPD, except for the 300m gaps for marine access. All underwater filling works shall be carried out behind seawalls to avoid dispersion of suspended solids outside the Project limit; • Except for the filling of the cellular structures, not more than 15% public fill shall be used for reclamation filling below +2.5mPD during construction of the seawall; • After the seawall is completed except for the 300m marine access as indicated in the EPs, not more than 30% public fill shall be used for reclamation filling below +2.5mPD, unless otherwise agreement from EPD was obtained; • Upon completion of 200m leading seawall, no more than a total of 60 filling barge trips per day shall be made with a cumulative maximum daily filling rate of 60,000	During filling	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		m3 for HKBCF and TMCLKL southern landfall reclamation during the filling operation; and • Upon completion of the whole section of seawall except for the 300m marine access as indicated in the EPs, no more than a total of 190 filling barge trips per day shall be made with a cumulative maximum daily filling rate of 190,000 m3 for the remaining filling operations for HKBCF and TMCLKL southern landfall reclamation. • Floating type perimeter silt curtains shall be around the HKBCF site before the commencement of marine works. Staggered layers of silt curtain shall be provided to prevent sediment loss at navigation accesses. The length of each staggered layers shall be at least 200m; • Single layer silt curtain to be applied around the North-east airport water intake; • The silt-curtains should be maintained in good condition to ensure the sediment plume generated from filling be confined effectively within the site boundary; • The filling works shall be scheduled to spread the works evenly over a working day; • Cellular structure shall be used for seawall construction; • A layer of geotextile shall be placed on top of the seabed before any filling activities take place inside the cellular structures to form the seawall; • The conveyor belts shall be fitted with windboards and conveyor release points shall be covered with curtain to prevent any spillage of filling materials onto the		

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		surrounding waters; and • An additional layer of silt curtain shall be installed near the active stone column installation points. A layer of geotextile with stone blanket on top shall be placed on the seabed prior to stone column installation works. • 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		
S9.11.1.3 of HKBCFEIA and S6.10 of TMCLKLEIA	W2	<u>Land Works</u> General construction activities on land should also be governed by standard good working practice. Specific measures to be written into the works contracts should include: • wastewater from temporary site facilities should be controlled to prevent direct discharge to surface or marine waters; • 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; • 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	All land-based construction sites	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		direct stormwater to such silt removal facilities. Catchpits and perimeter channels should be constructed in advance of site formation works and earthworks; • 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; • temporary access roads should be surfaced with crushed stone or gravel; • rainwater pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities; • measures should be taken to prevent the washout of construction materials, soil, silt or debris into any drainage system; • open stockpiles of construction materials (e.g. aggregates and sand) on site should be covered with tarpaulin or similar fabric during rainstorms; • 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; • discharges of surface run-off into foul sewers must always be prevented in order not to unduly overload the foul sewerage system; • all vehicles and plant should be cleaned before they leave the construction site to		

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		ensure that no earth, mud or debris is deposited by them on roads. A wheel washing bay should be provided at every site exit; • wheel wash overflow shall be directed to silt removal facilities before being discharged to the storm drain; • the section of construction road between the wheel washing bay and the public road should be surfaced with crushed stone or coarse gravel; • wastewater generated from concreting, plastering, internal decoration, cleaning work and other similar activities, shall be screened to remove large objects; • 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 offsite disposal; • the contractors shall prepare an oil / chemical cleanup plan and ensure that leakages or spillages are contained and cleaned up immediately; • waste oil should be collected and stored for recycling or disposal, in accordance with the Waste Disposal Ordinance; • 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; and • surface run-off from bunded areas should pass through oil/grease traps prior to		

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		discharge to the storm water system..		
S9.14 of HKBCFEIA and S6.10 of TMCLKLEIA	W3	Implement a water quality monitoring programme	At identified monitoring location	V
S6.10 of TMCLKLEIA	W4	All construction works shall be subject to routine audit to ensure implementation of all EIA recommendations and good working practice.	All construction site areas	V
Ecology (Construction Phase)				
S10.7 of HKBCFEIA and S8.14 of TMCLKLEIA	E1	• Install silt curtain during the construction • Limit works fronts • Construct seawall prior to reclamation filling where practicable • Good site practices • Strict enforcement of no marine dumping • Site runoff control • Spill response plan	Seawall, reclamation area	V
S10.7 of HKBCFEIA	E2	• Watering to reduce dust generation; prevention of siltation of freshwater habitats; Site runoff should be desilted, to reduce the potential for suspended sediments, organics and other contaminants to enter streams and standing freshwater.	Land-based works areas	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
S10.7 of HKBCFEIA and S8.14 of TMCLKLEIA	E3	• Good site practices, including strictly following the permitted works hours, using quieter machines where practicable, and avoiding excessive lightings during night time.	Land-based works areas	V
S10.7 of HKBCFEIA and S8.14 of TMCLKLEIA	E4	• Dolphin Exclusion Zone • Dolphin watching plan	Marine works	V
S10.7 of HKBCFEIA and S8.14 of TMCLKLEIA	E5	• Decouple compressors and other equipment on working vessels • Proposal on design and implementation of acoustic decoupling measures applied during reclamation works • Avoidance of percussive piling	Marine works	V
S10.7 of HKBCFEIA and S8.14 of TMCLKLEIA	E6	• Control vessel speed • Skipper training • Predefined and regular routes for working vessels; avoid Brothers Islands	Marine traffic	V
S10.10 of HKBCFEIA and S8.14 of TMCLKLEIA	E7	• Vessel based dolphin monitoring	Northeast and Northwest Lantau	V
Fisheries				

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
S11.7 of HKBCFEIA	F1	• Reduce re-suspension of sediments • Limit works fronts • Good site practices • Strict enforcement of no marine dumping • Spill response plan	Seawall, reclamation area	V
S11.7 of HKBCFEIA	F2	• Install silt-grease trap in the drainage system collecting surface runoff	Reclamation area	V
Landscape & Visual (Construction Phase)				
S14.3.3. 3 of HKBCFEIA and S10.9 of TMCLKLEIA	LV1	*Mitigate Landscape Impacts* G1/CM4 Grass-hydroseed or sheeting bare soil surface and stock pile areas. G9 Reserve of loose natural granite rocks for re-use. Provide new coastline to adopt "natural-look" by means of using armour rocks in the form of natural rock materials and planting strip area accommodating screen buffer to enhance "natural-look" of new coastline.	All construction site areas	N/A
S10.9 of TMCLKLEIA	LV2	*Mitigate Landscape Impacts* CM7 Ensure no run-off into water body adjacent to the Project Area.	All construction site areas	V
S14.3.3. 3 of HKBCFEIA	LV4	*Mitigate Visual Impacts* V1 Minimize time for construction activities during construction period.	All construction site areas	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
S10.9 of TMCLKLEIA	LV5	*Mitigate Visual Impacts* CM6 Control night-time lighting and glare by hooding all lights.	All construction site areas	V
EM&A				
S15.2.2 of HKBCFEIA	EM1	An Independent Environmental Checker needs to be employed as per the EM&A Manual.	All construction site areas	V
S15.5 - S15.6 of HKBCFEIA	EM2	• An Environmental Team needs to be employed as per the EM&A Manual. • Prepare a systematic Environmental Management Plan to ensure effective implementation of the mitigation measures. • An environmental impact monitoring needs to be implementing by the Environmental Team to ensure all the requirements given in the EM&A Manual are fully complied with.	All construction site areas	V

Legend: V = implemented; x = not implemented; N/A = not applicable

Appendix D - Summary of Action and Limit Levels

Table 1 – Action and Limit Levels for 1-hour TSP

Location	Action Level	Limit Level
AMS2	374 μg/m^3	500 μg/m^3
AMS3B*	368 μg/m^3	500 μg/m^3
AMS6	360 μg/m^3	500 μg/m^3
AMS7/7A^	370 μg/m^3	500 μg/m^3

Remarks: * Action Level set out at AMS3 Ho Yu College is adopted.

^ Action Level set out at AMS7 Hong Kong SkyCity Marriot Hotel is adopted.

Table 2 – Action and Limit Levels for 24-hour TSP

Location	Action Level	Limit Level
AMS2	176 μg/m^3	260 μg/m^3
AMS3B*	167 μg/m^3	260 μg/m^3
AMS6	173 μg/m^3	260 μg/m^3
AMS7/7A^	183 μg/m^3	260 μg/m^3

Remarks: * Action Level set out at AMS3 Ho Yu College is adopted.

^ Action Level set out at AMS7 Hong Kong SkyCity Marriot Hotel is adopted.

Table 3 – Action and Limit Levels for Construction Noise (0700-1900 hrs of normal weekdays)

Location	Action Level	Limit Level
NMS2	When one documented complaint, related to 0700 – 1900 hours on normal weekdays, is received from any one of the sensitive receivers	75 dB(A)
NMS3B		*65 / 70 dB(A)

*Daytime noise Limit Level of 70 dB(A) applies to education institutions, while 65dB(A) applies during school examination period.

Table 4 – Action and Limit Levels for Water Quality

Parameters	**Action**	**Limit**
DO in mg L^{-1} (Surface, Middle & Bottom)	Surface and Middle 5.0 Bottom 4.7	Surface and Middle 4 .2 (except 5 mg/L for FCZ) Bottom 3.6
SS in mg L^{-1} (depth-averaged)	23.5 and 120% of upstream control station's SS at the same tide of the same day	34.4 and 130% of upstream control station's SS at the same tide of the same day and 10mg/L for WSD Seawater intakes
Turbidity in NTU (depth-averaged)	27.5 and 120% of upstream control station's turbidity at the same tide of the same day	47.0 and130% of upstream control station's turbidity at the same tide of the same day

Notes:

1. "depth-averaged" is calculated by taking the arithmetic means of reading of all three depths.
2. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
3. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.

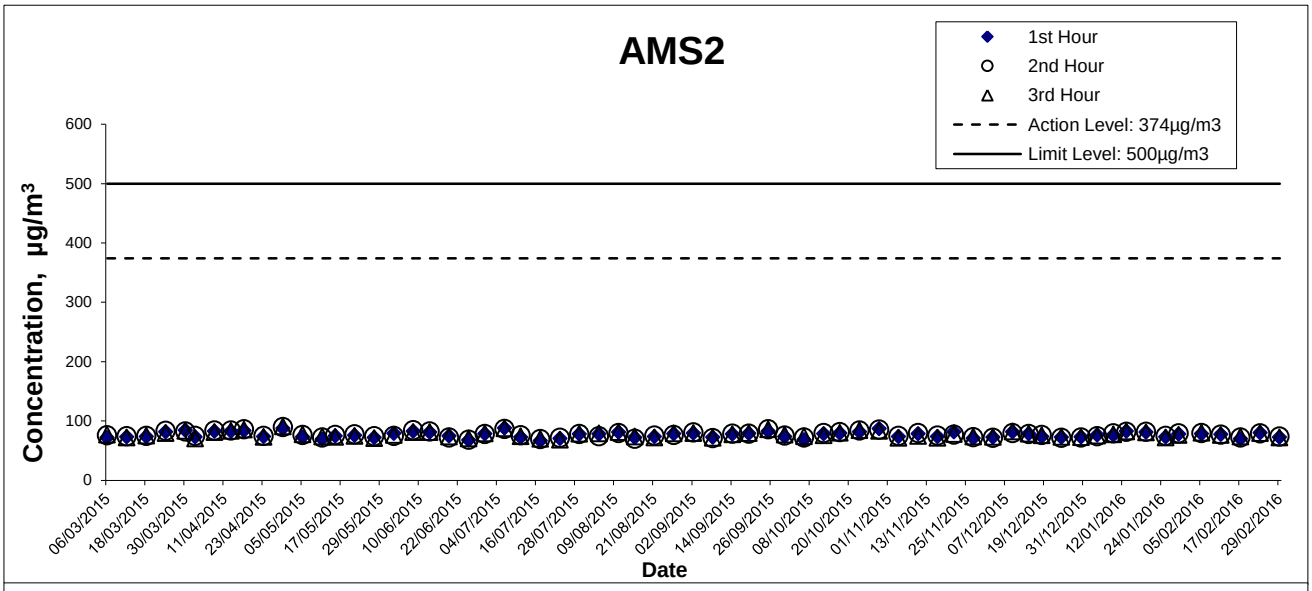
Table 5(a) Action and Limit Levels for Chinese White Dolphin Monitoring - Approach to Define Action Level (AL) and Limit Level (LL):

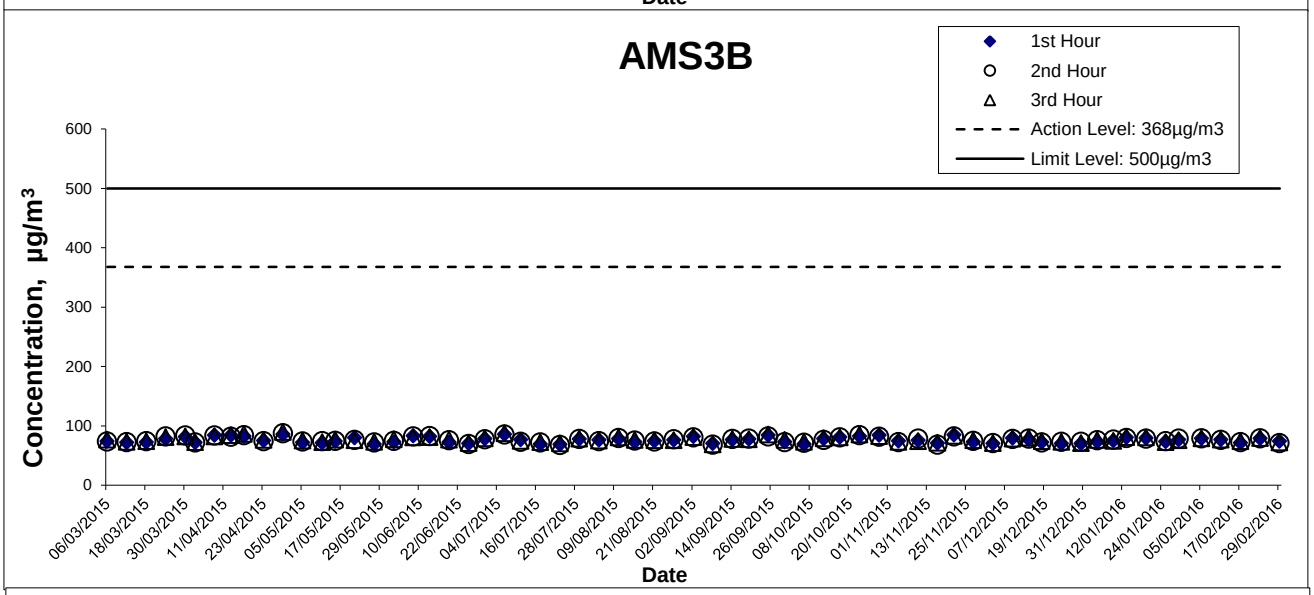
	North Lantau Social Cluster	
	NEL	**NWL**
Action Level	(STG < 70% of baseline) & (ANI < 70% of baseline)	(STG < 70% of baseline) & (ANI < 70% of baseline)
Limit Level	[(STG < 40% of baseline) & (ANI < 40% of baseline)] AND [(STG < 40% of baseline) & (ANI < 40% of baseline)]	

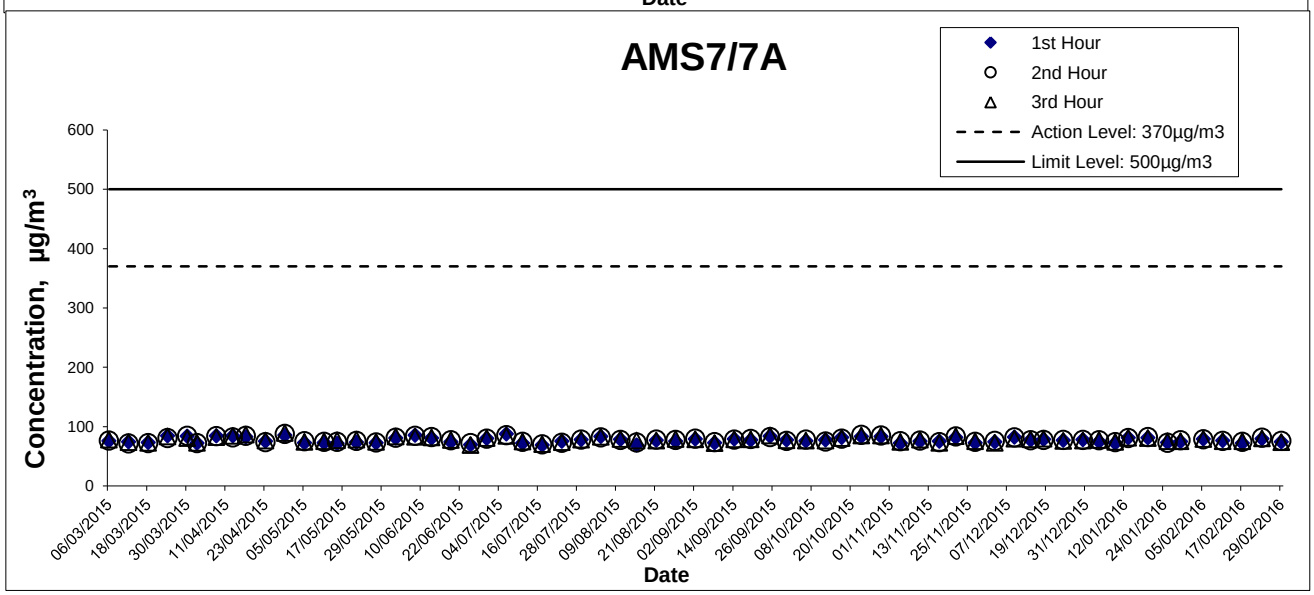
For North Lantau Social Cluster, action level will be trigger if either NEL **or** NWL fall below the criteria; limit level will be triggered if both NEL **and** NWL fall below the criteria.

Table 5(b) Derived Value of Action Level (AL) and Limit Level (LL) for Chinese White Dolphin Monitoring

	North Lantau Social Cluster	
	NEL	**NWL**
Action Level	(STG < 4.2) & (ANI < 15.5)	(STG < 6.9) & (ANI < 31.3)
Limit Level	[(STG < 2.4) & (ANI <8.9)] AND [(STG < 3.9)& (ANI < 17.9)]	







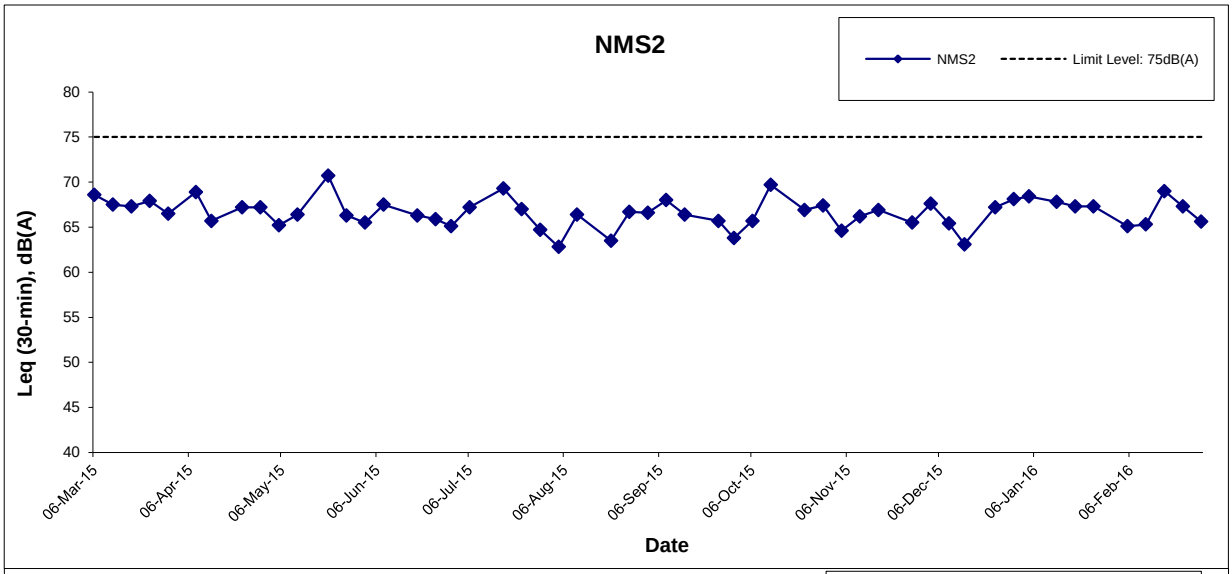
HONG KONG - ZHUHAI - MACAO BRIDGE
HONG KONG BOUNDARY CROSSING FACILITIES
- RECLAMATION WORKS

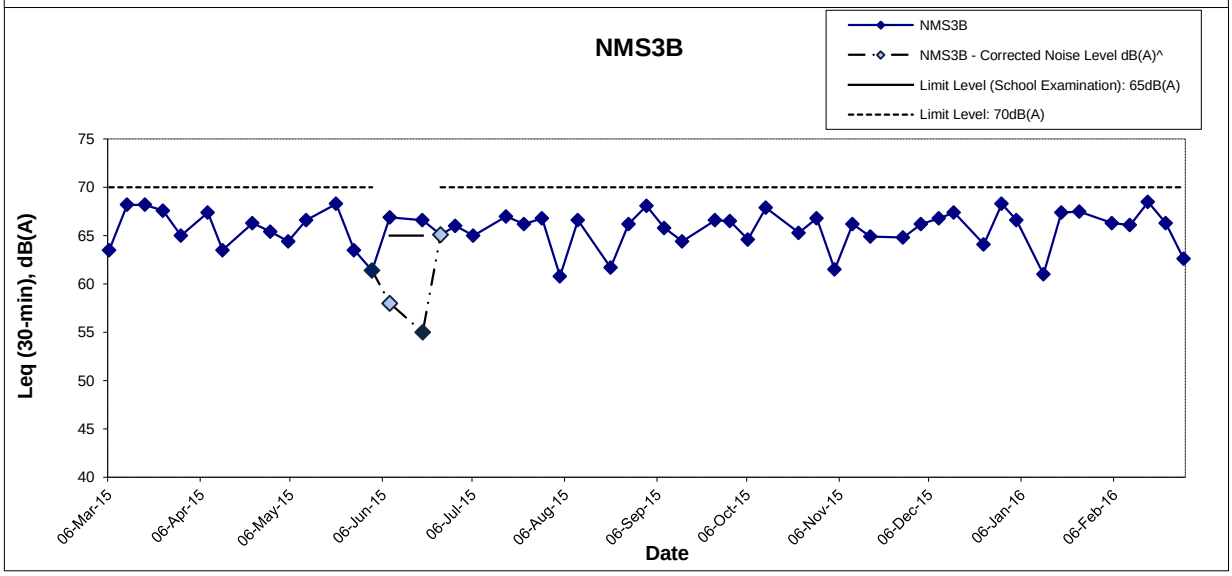
AECOM

Graphical Presentation of Impact 1-hour TSP Monitoring Results

Project No.: 60249820 **Date: March 2016**

Appendix E





Remarks: Effective from July 2012, the Limit Level at NMS3A was revised to 70dB(A). Daytime noise Limit Level of 70 dB(A) applies to education institutions, while 65dB(A) applies during school examination period.

> The measured noise level on 8 and 19 June 2015 at NMS3B exceeded the noise level of 65dB(A) during examination period but it is higher than the baseline level. Therefore, baseline correction was carried out and the corrected noise level which solely represent the noise level of Construction works are 58.0 dB(A) and 54.8 dB(A) respectively which are lower than the exceedance level of 65dB(A) . As such the EAP was not triggered.

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HONG KONG BOUNDARY CROSSING FACILITIES
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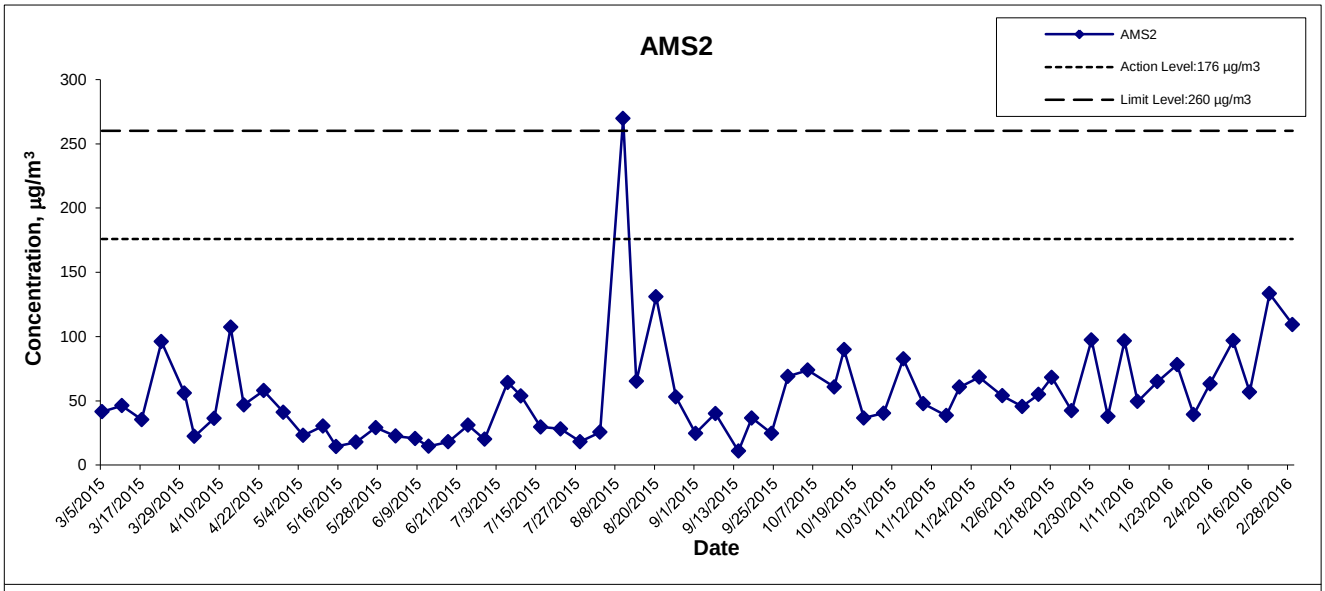
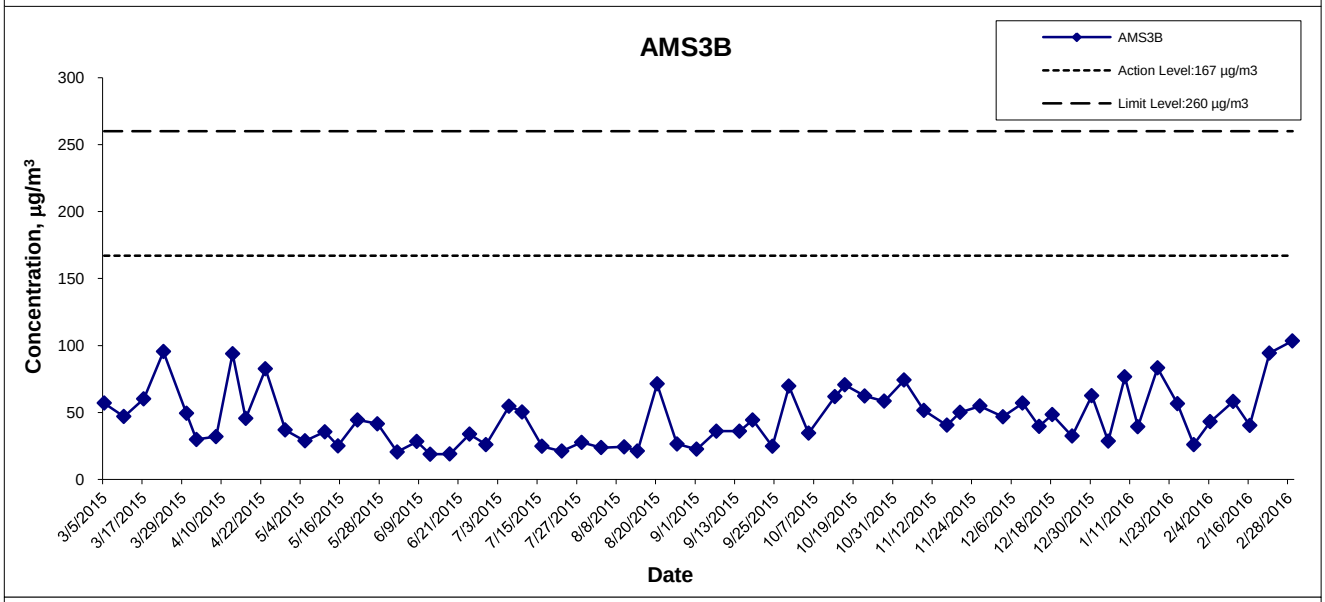
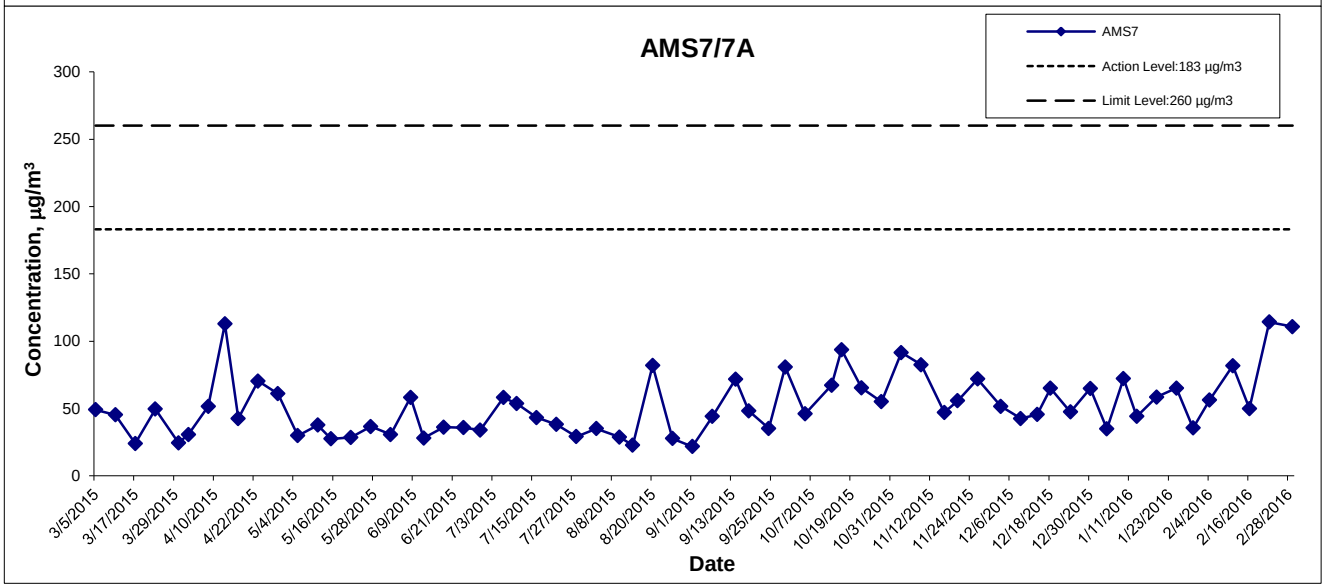
Graphical Presentation of Impact Daytime Construction Noise Monitoring Results

Project No.: 60249820 **Date: March 2016** **Appendix F**







HONG KONG - ZHUHAI - MACAO BRIDGE
HONG KONG BOUNDARY CROSSING FACILITIES
- RECLAMATION WORKS

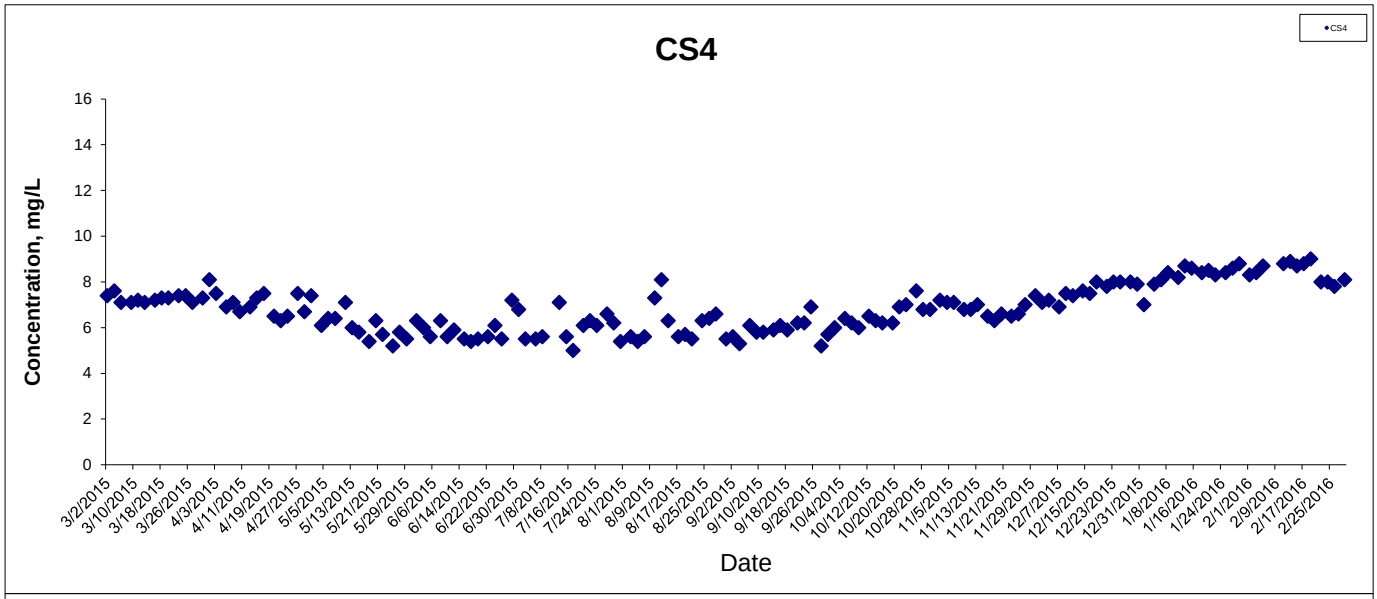
AECOM

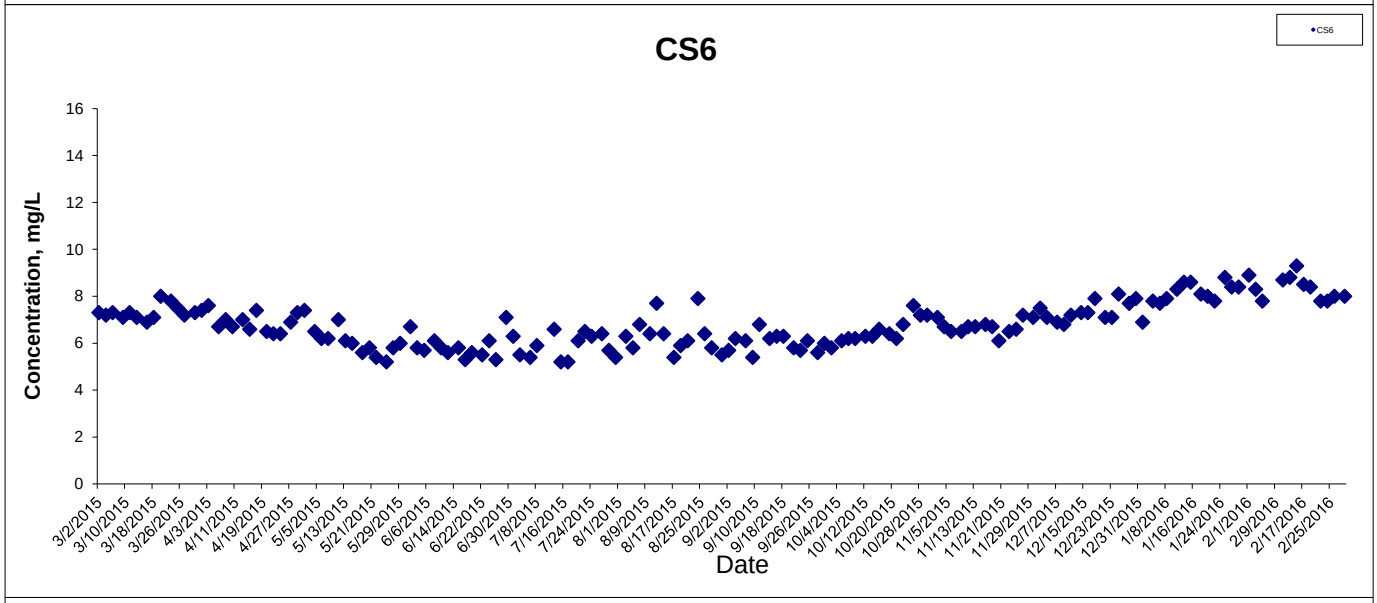
Graphical Presentation of Impact 24-hour TSP Monitoring Results

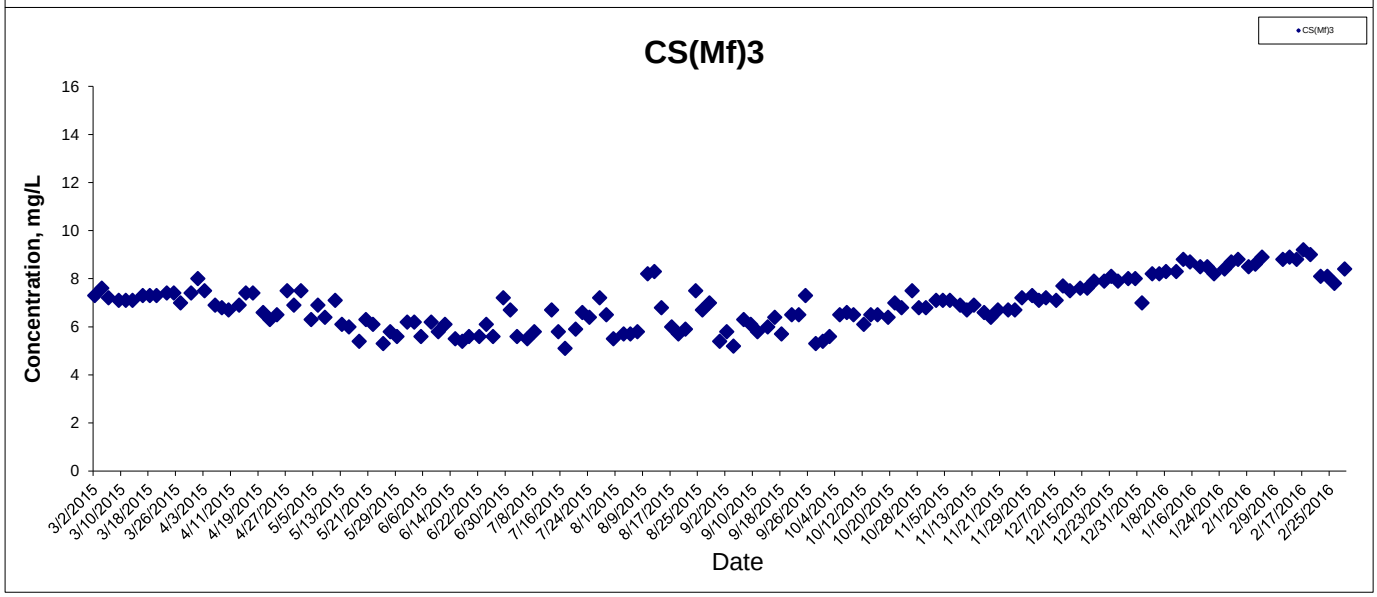
Project No.: 60249820 **Date: March 2016**

Appendix G

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







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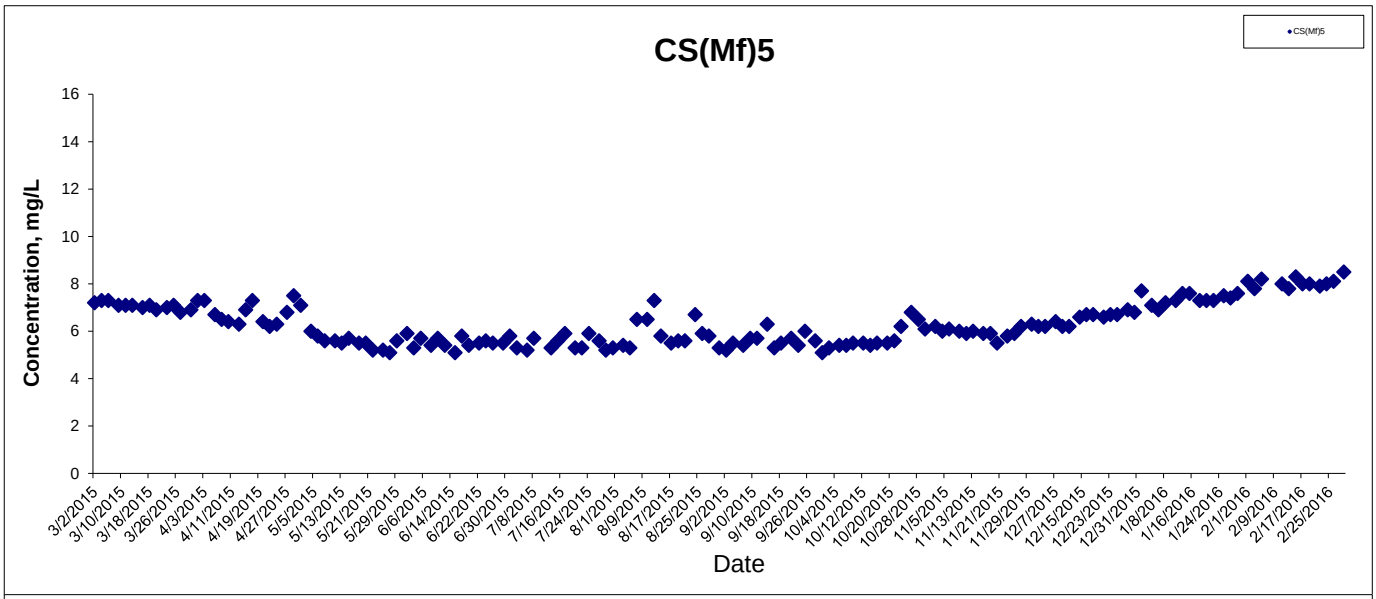
HONG KONG BOUNDARY CROSSING FACILITIES
- RECLAMATION WORKS

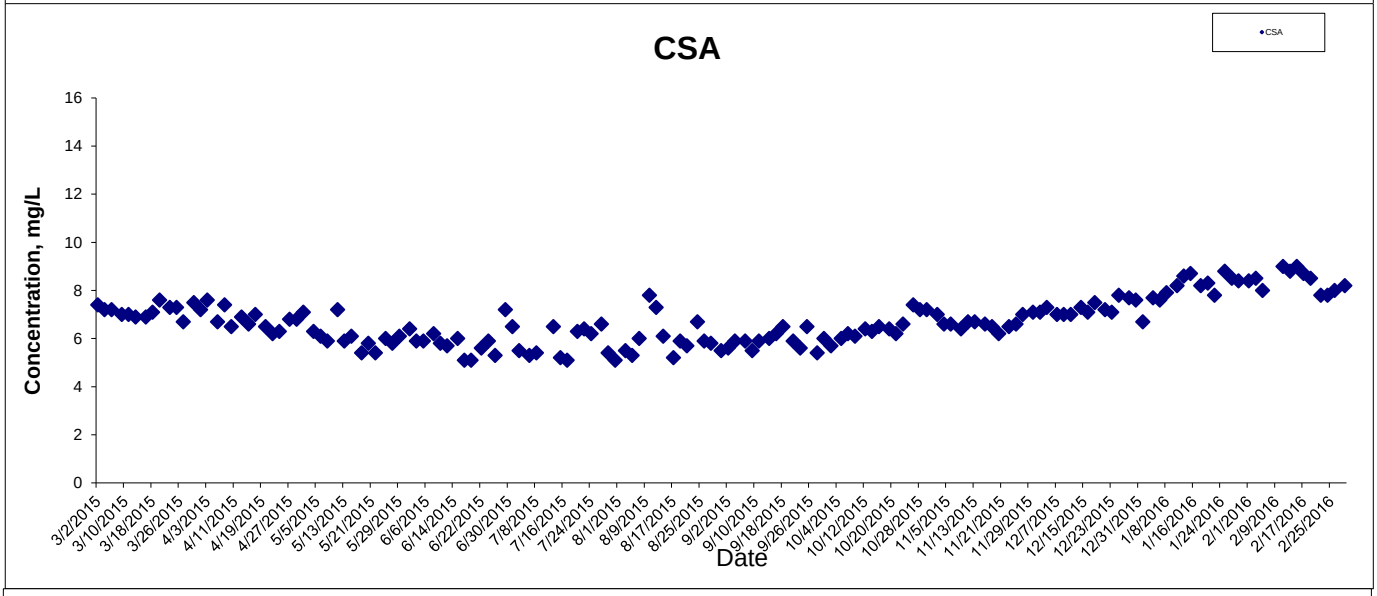
Graphical Presentation of Impact Water Quality Monitoring Results

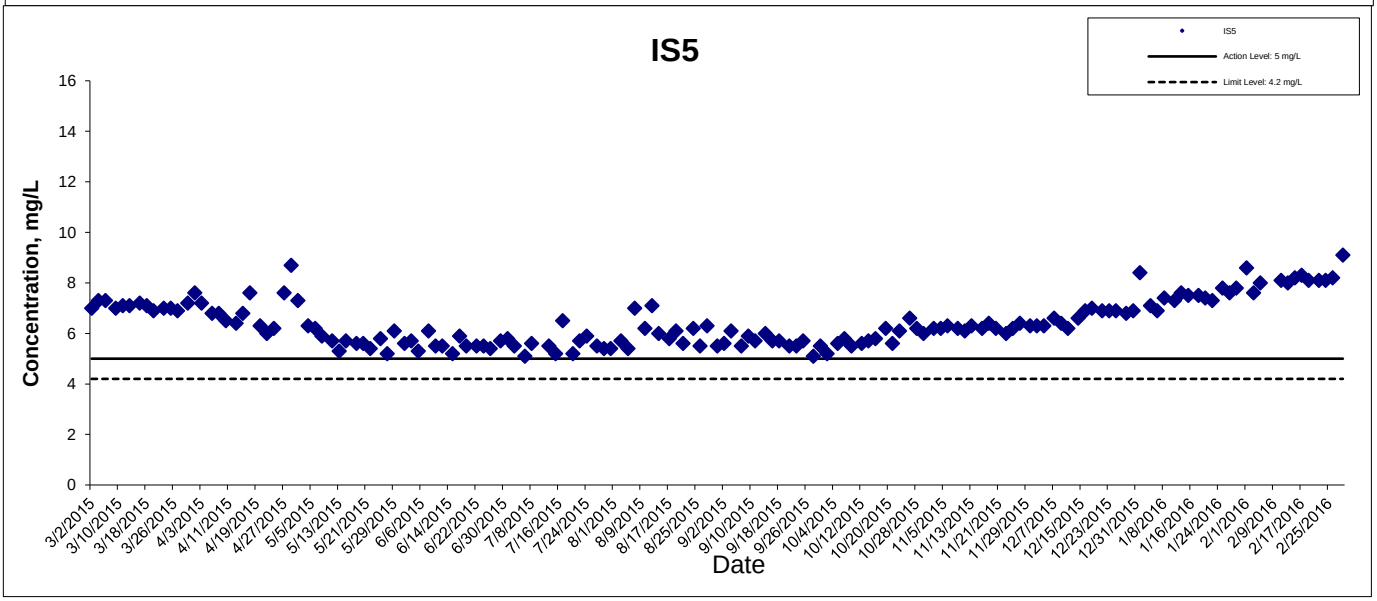
Project No.: 60249820 Date: May 2016

Appendix G

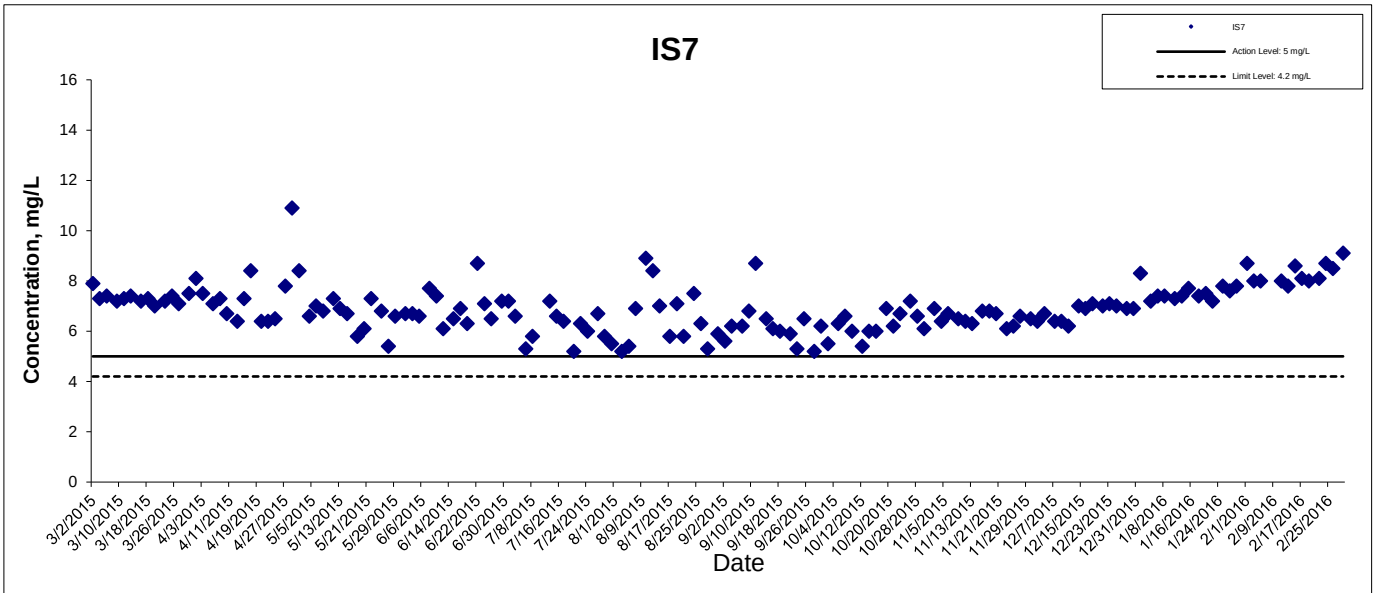
Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide

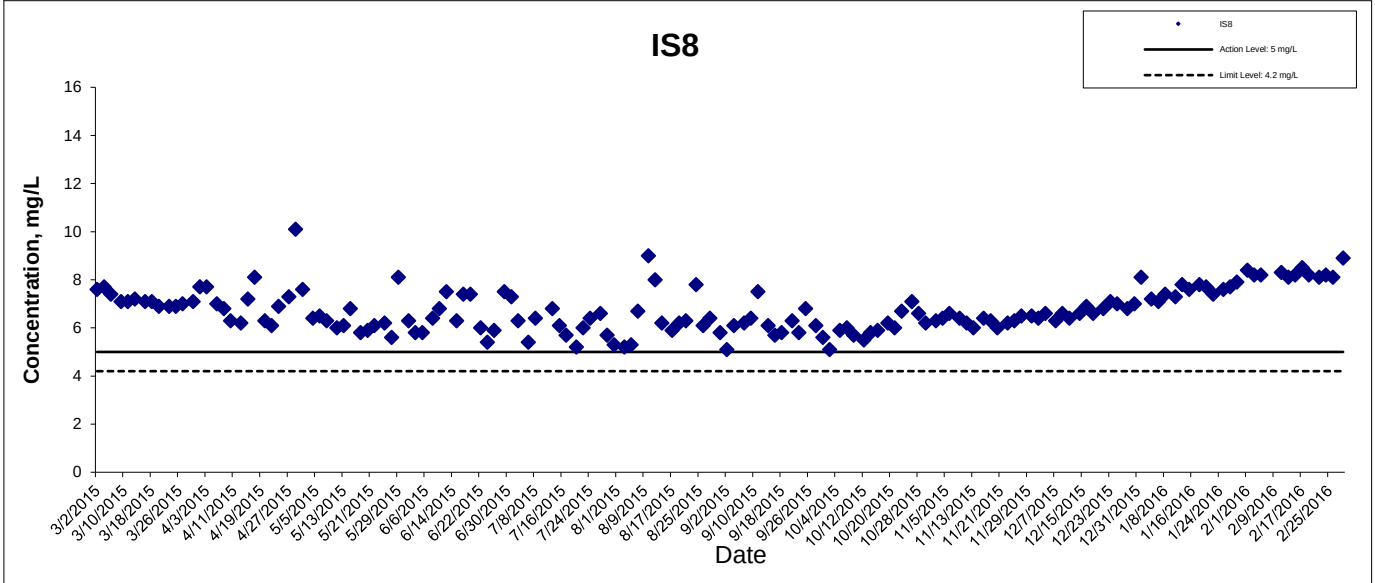


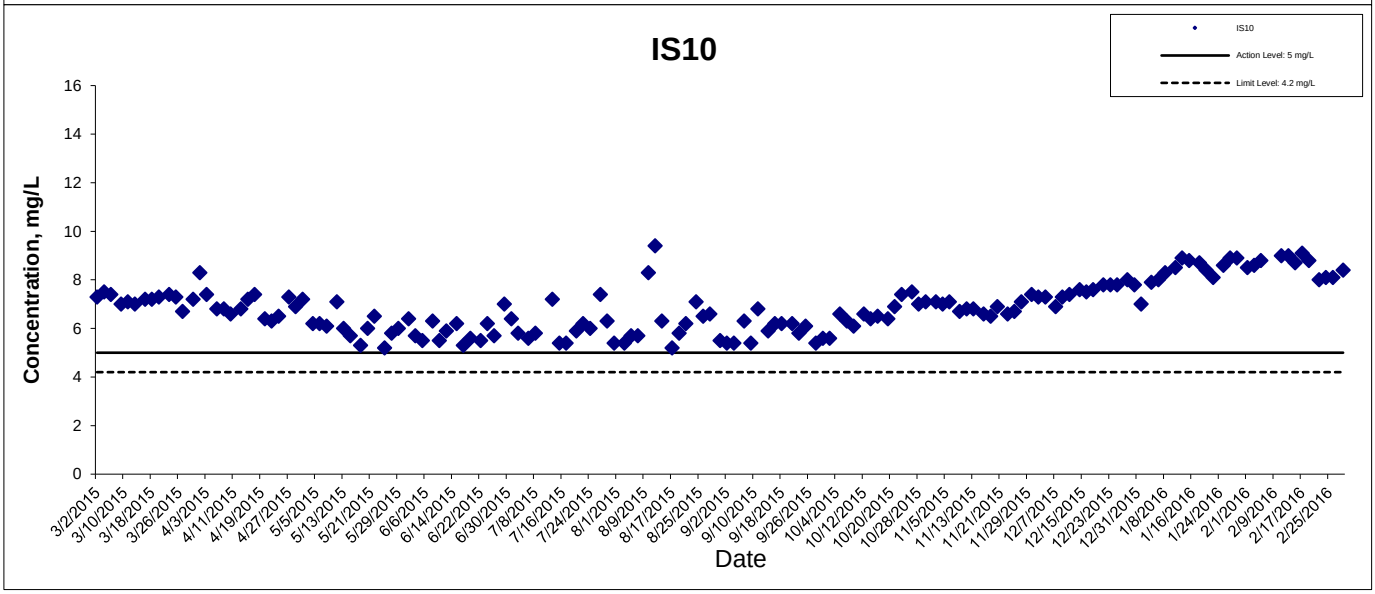




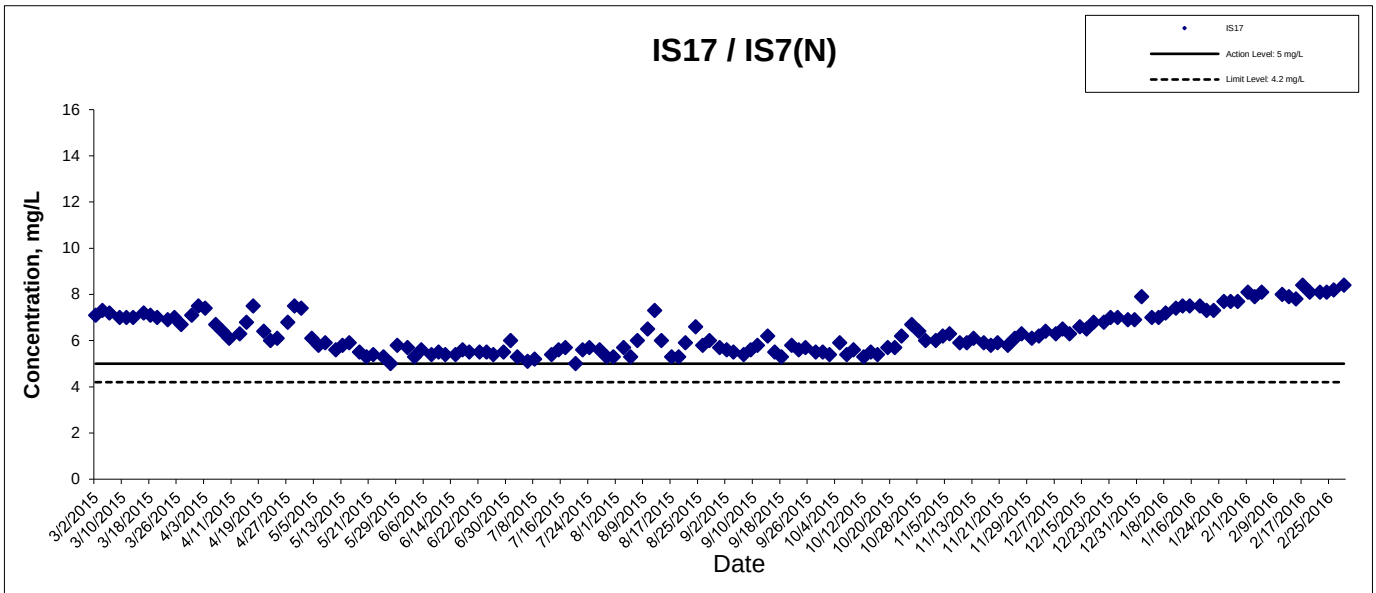
Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide

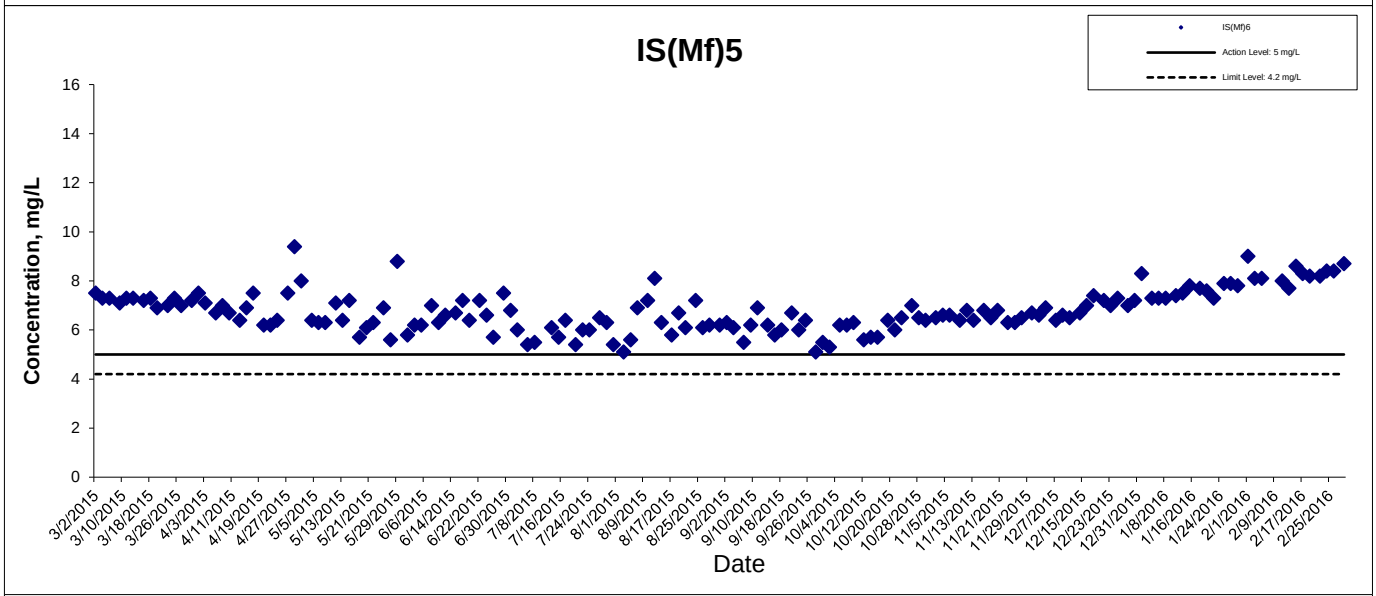


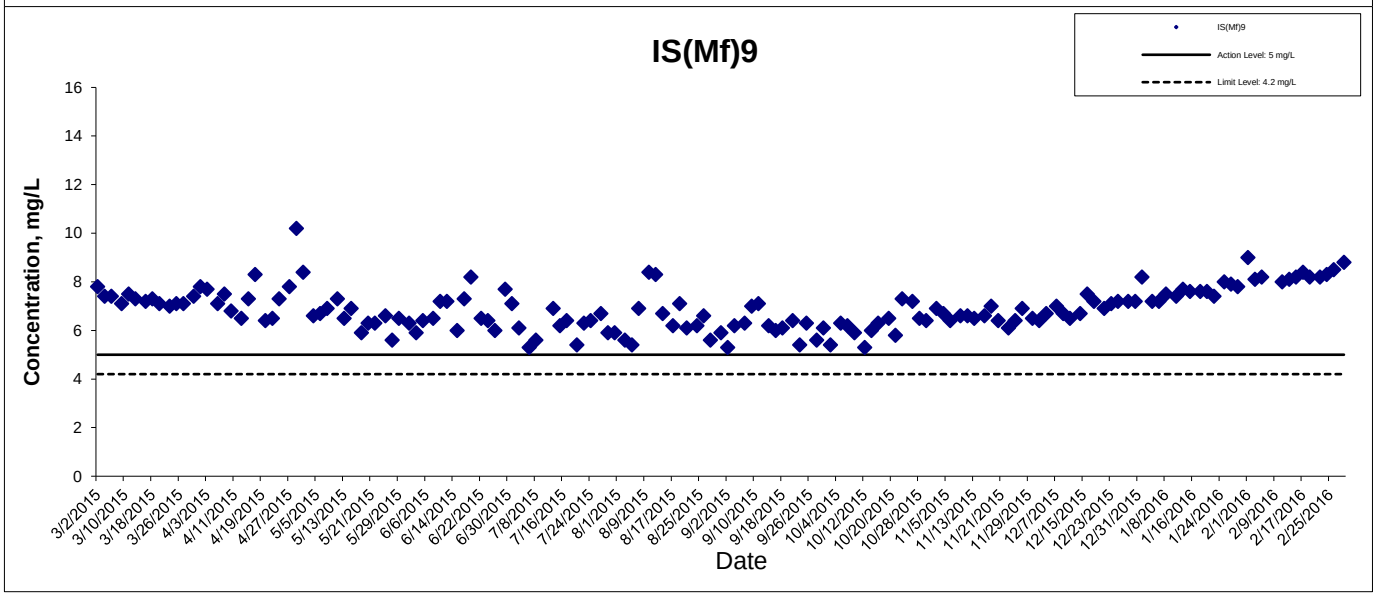




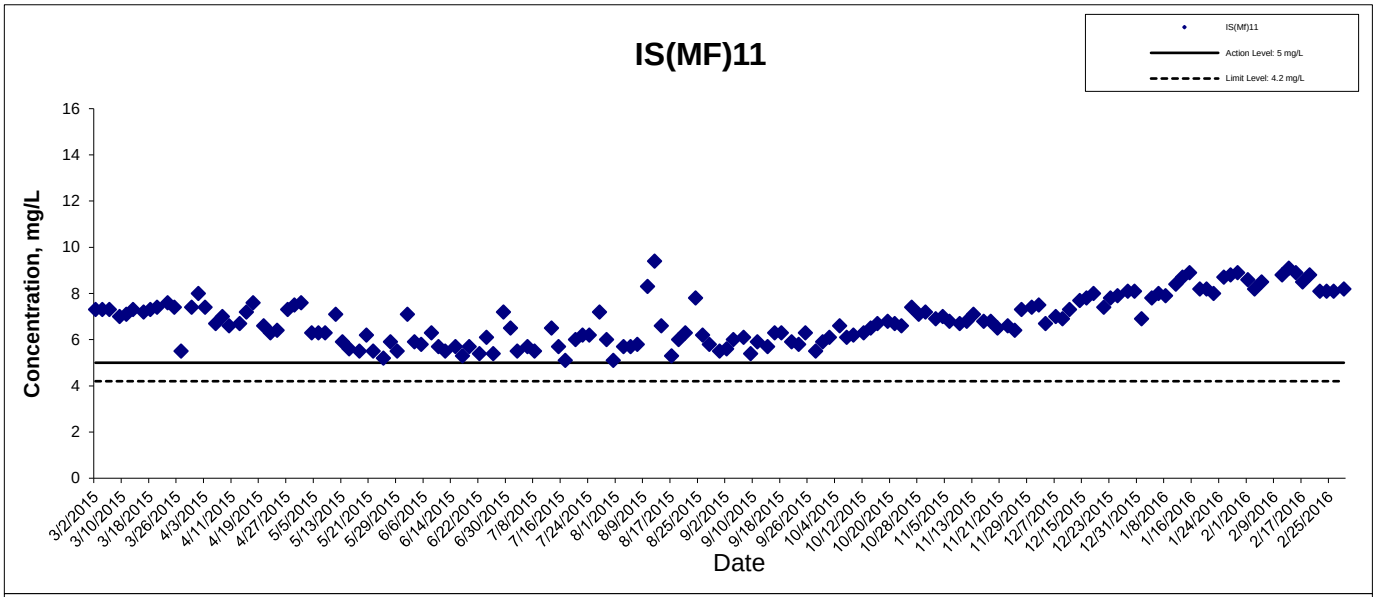
Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide

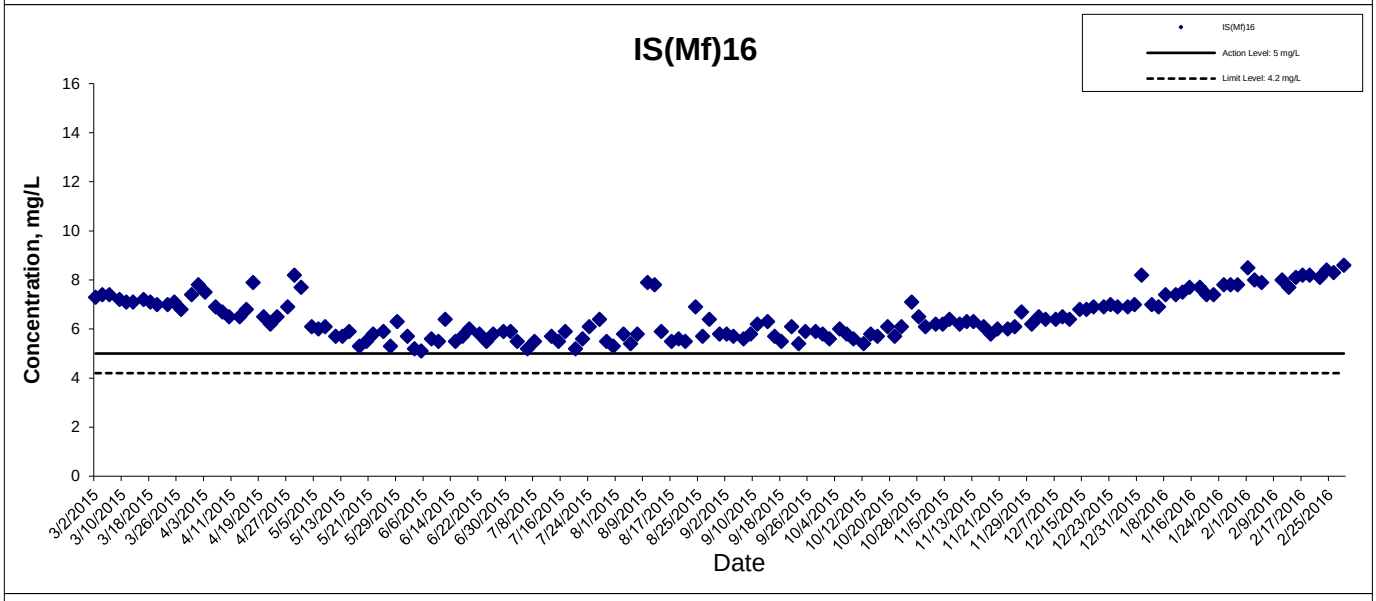


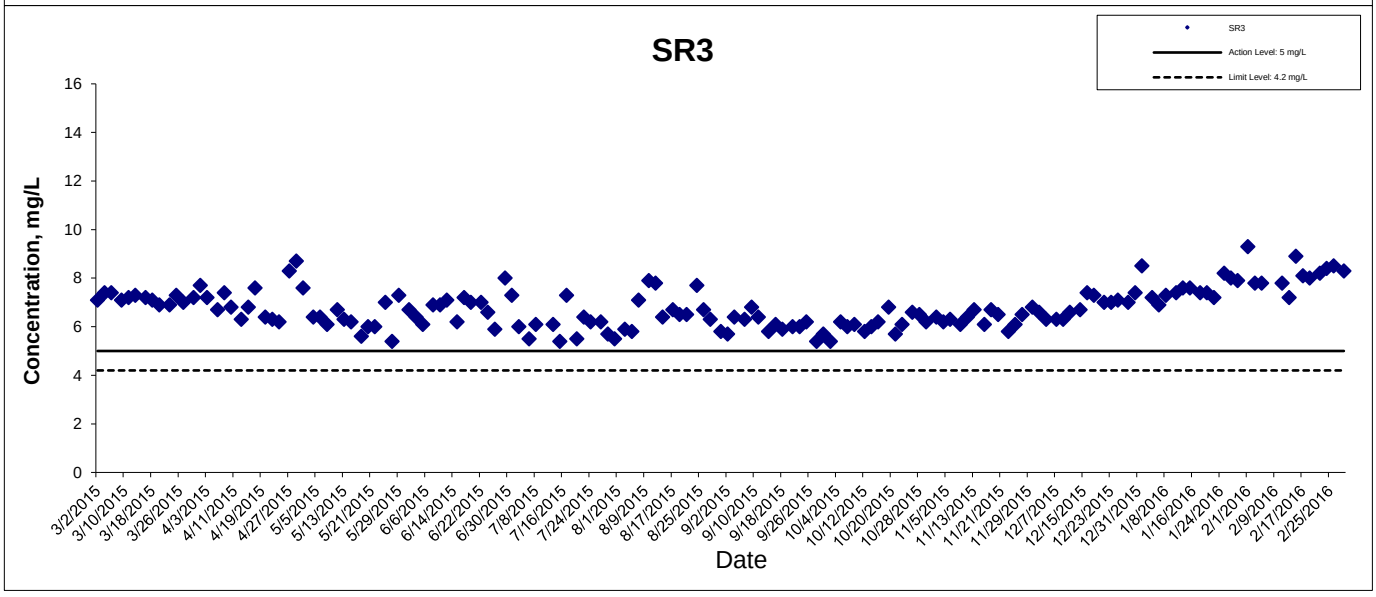




Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide







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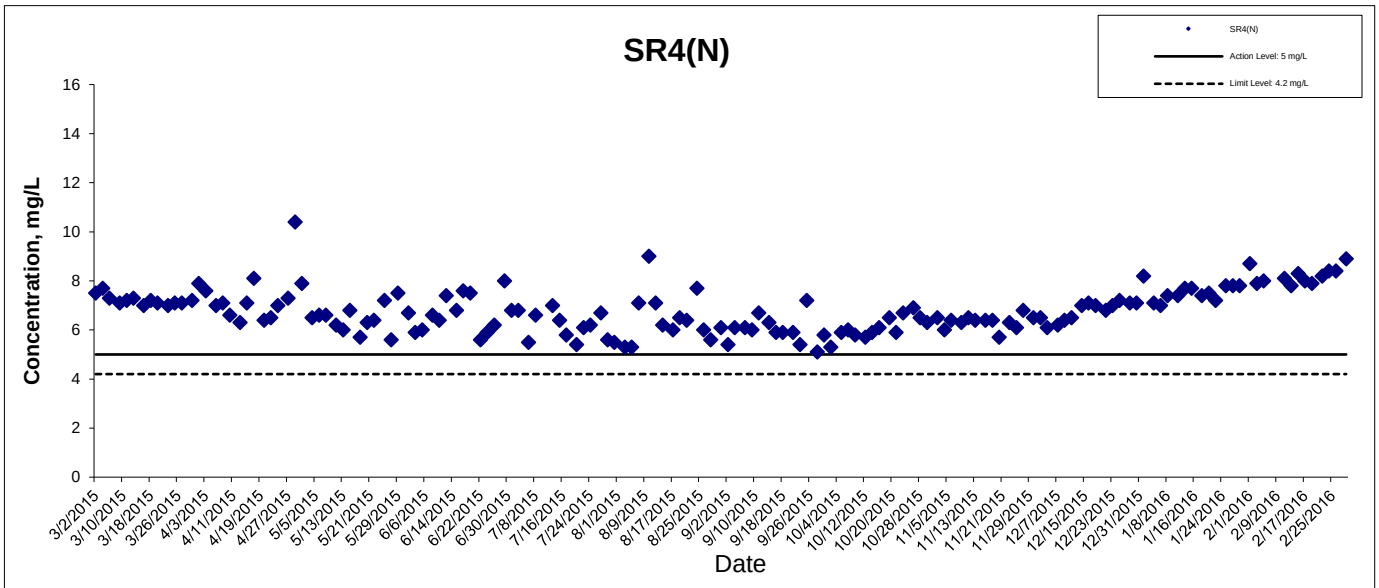
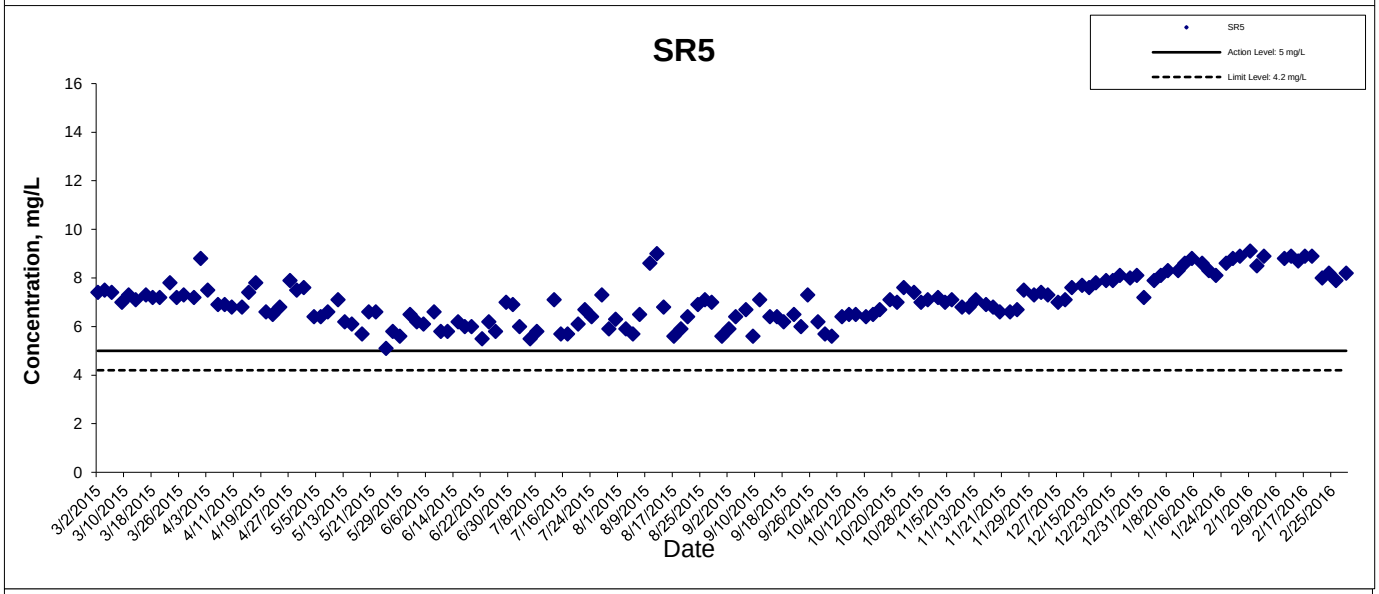
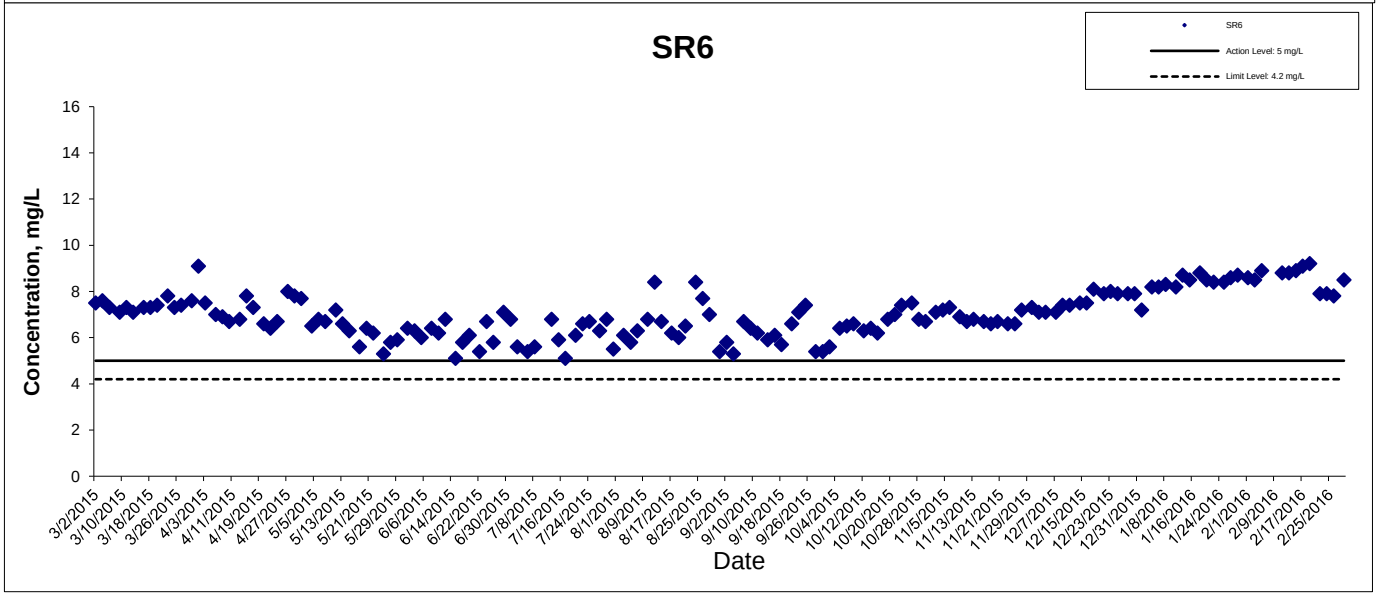
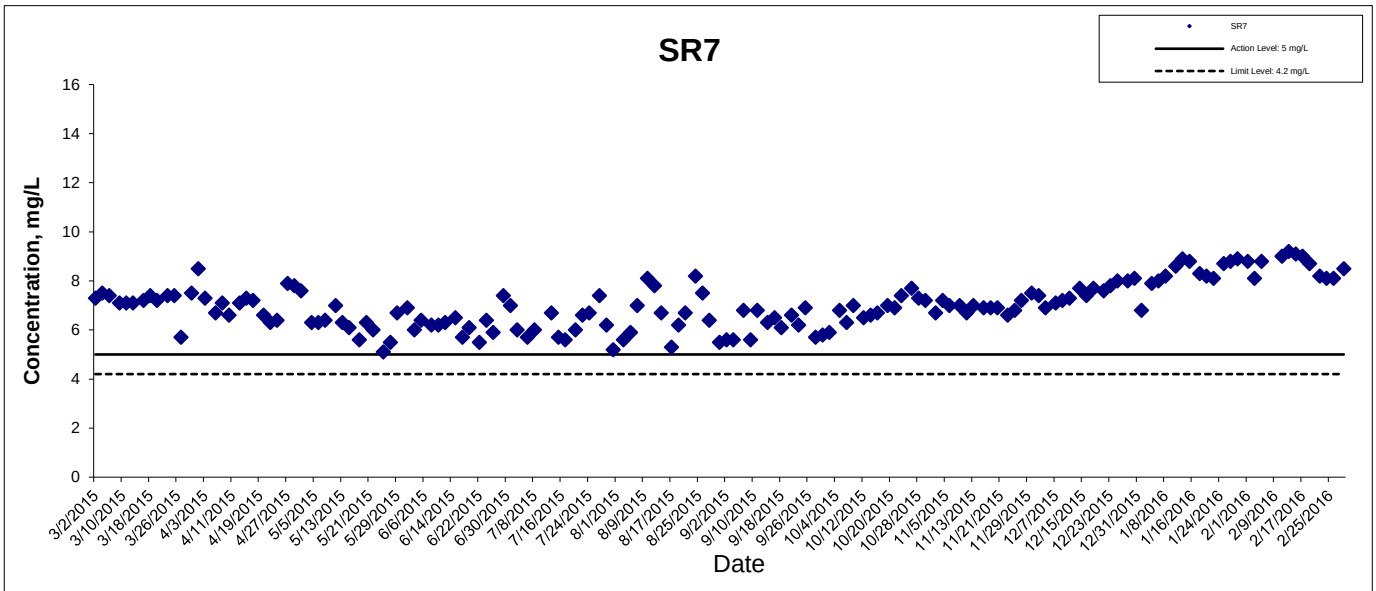
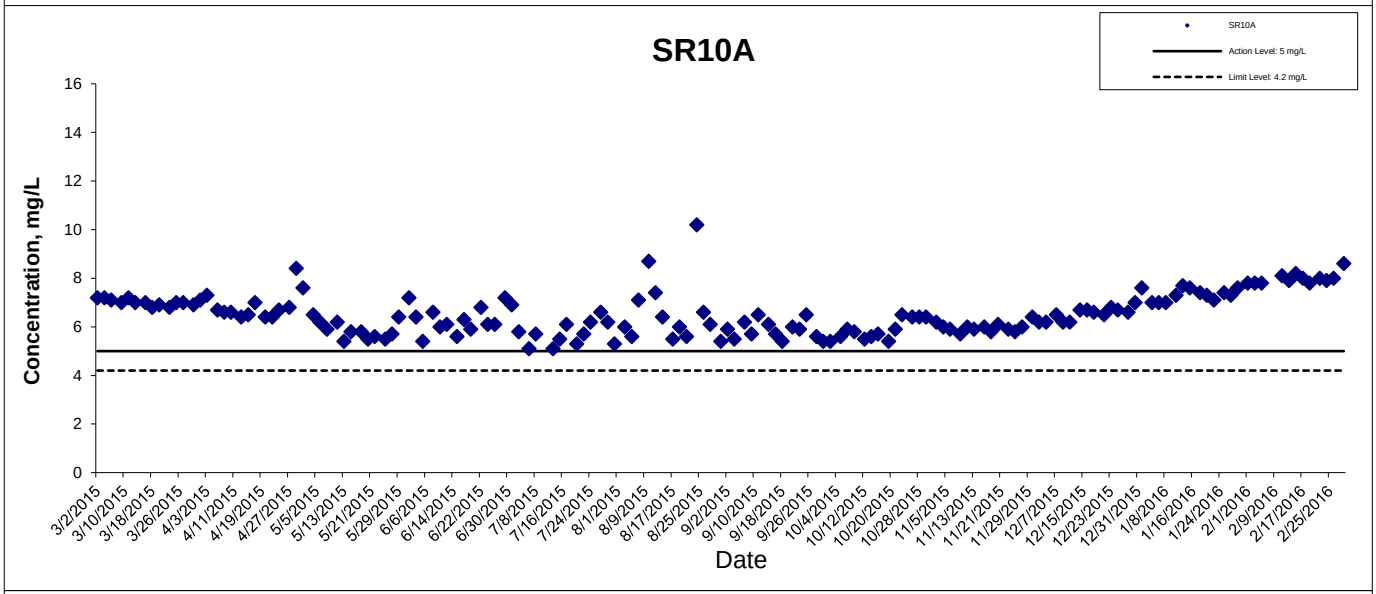


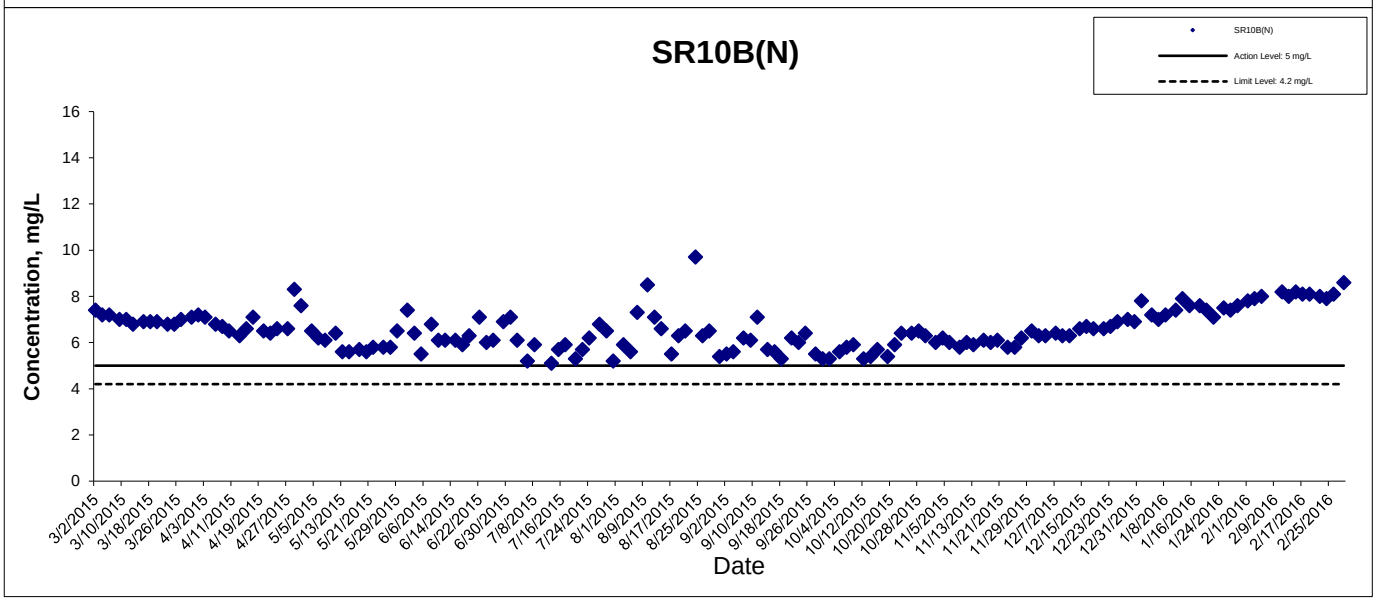




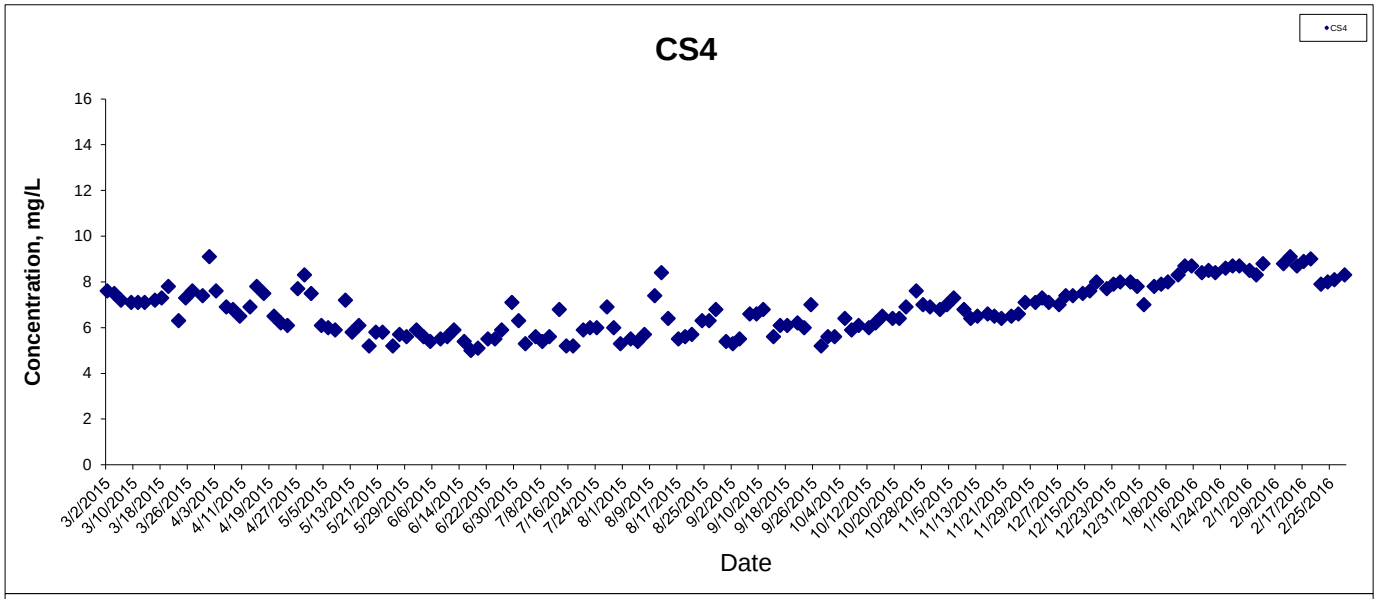
Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide

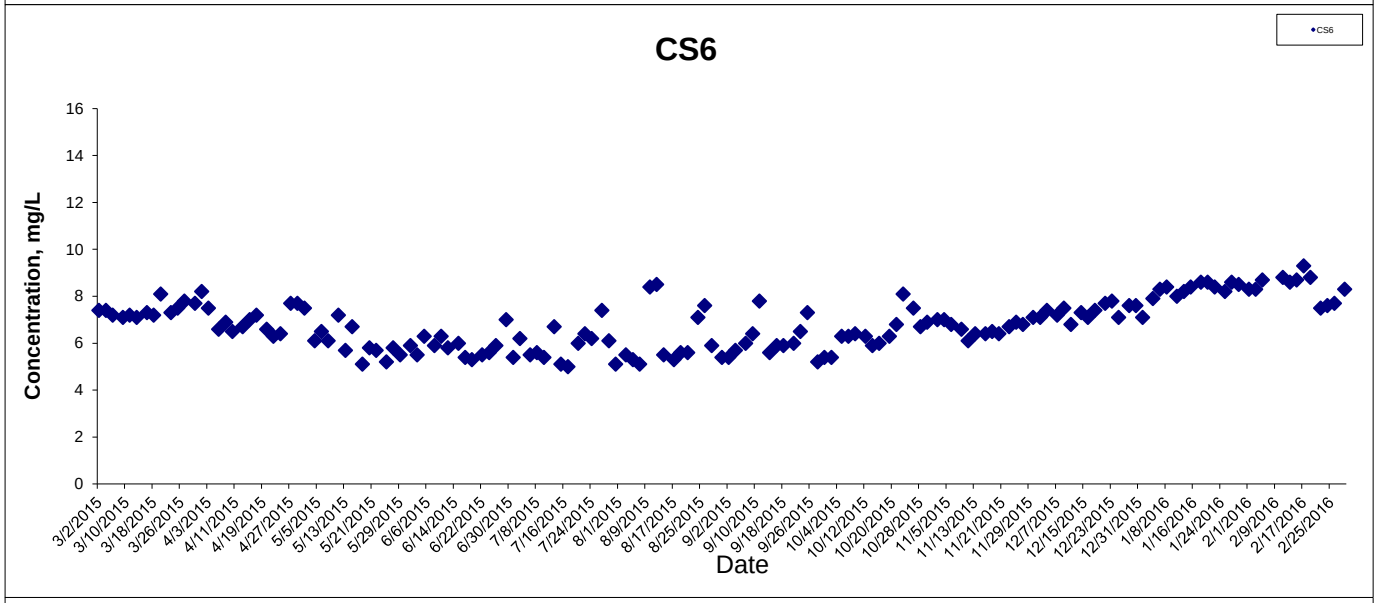


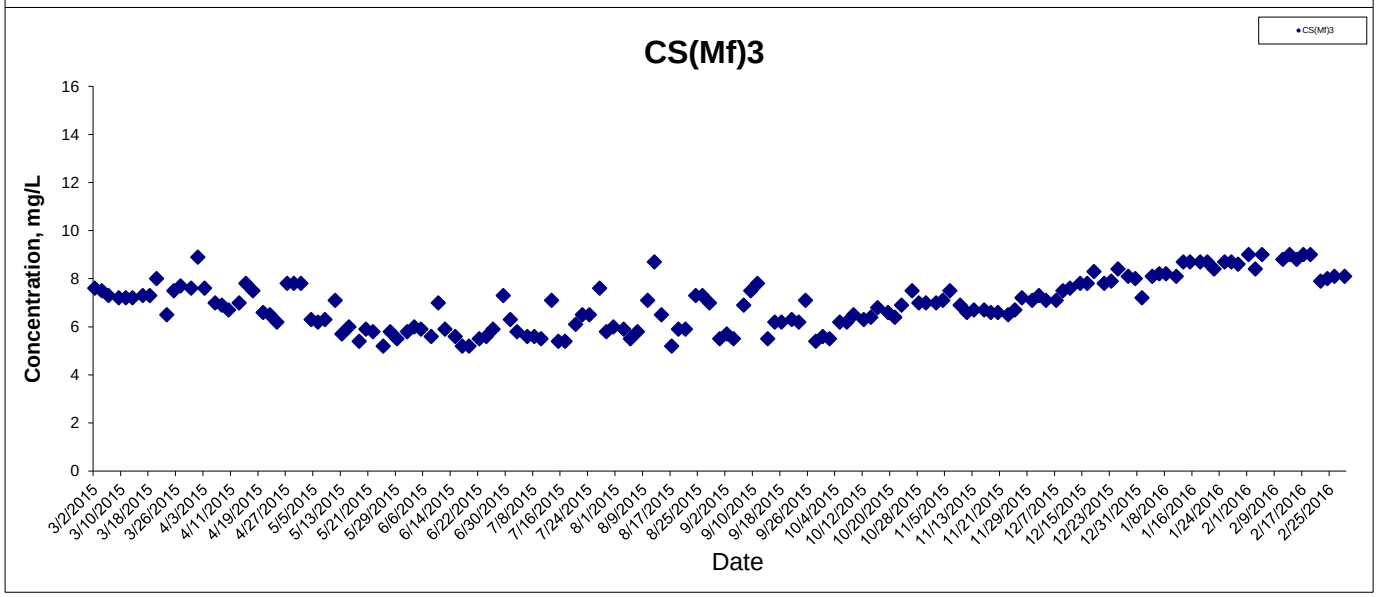




Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide







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HONG KONG BOUNDARY CROSSING FACILITIES
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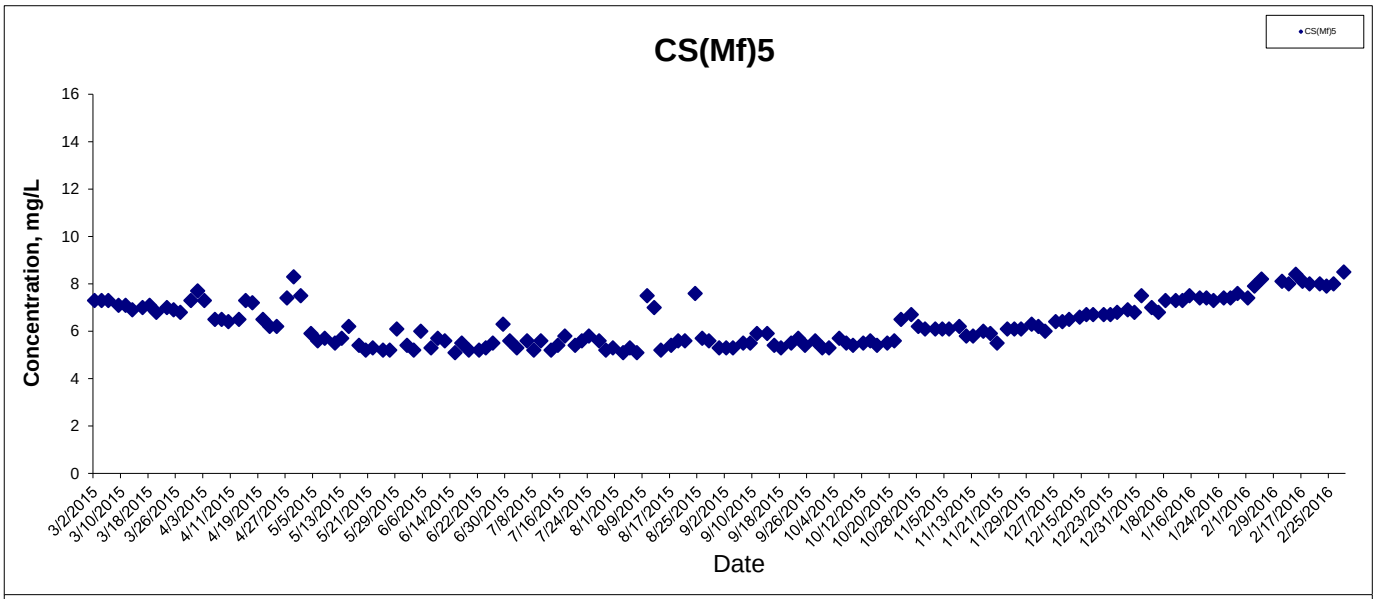
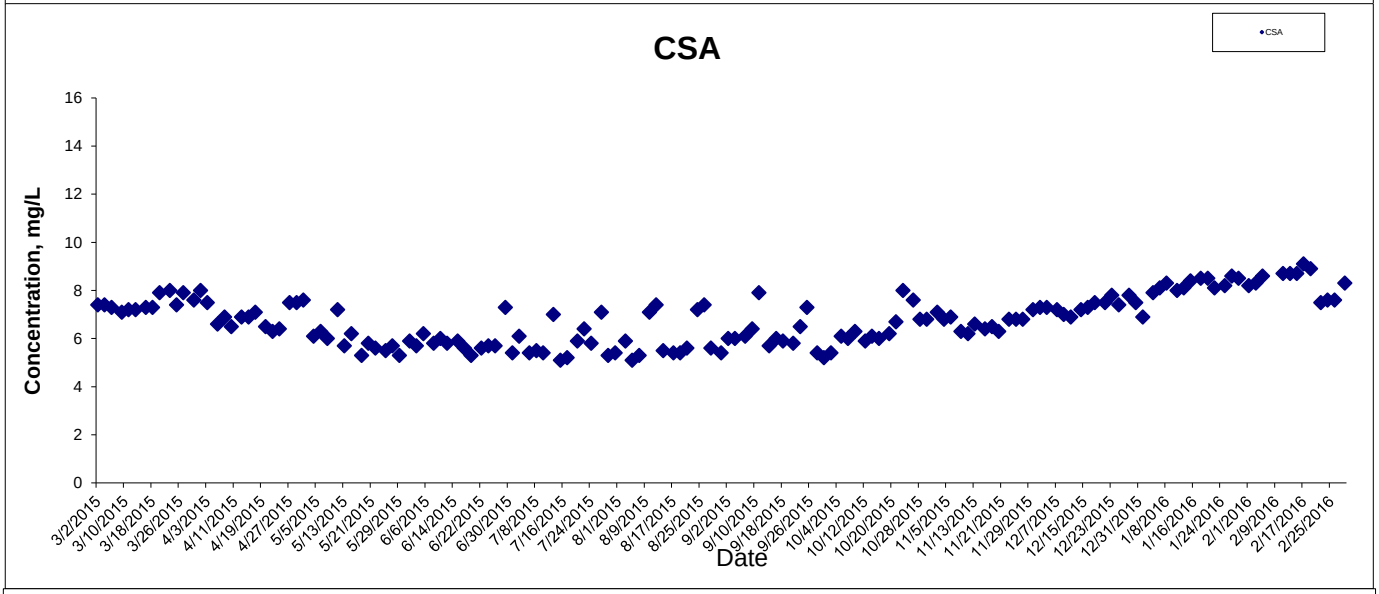
Graphical Presentation of Impact Water Quality Monitoring Results

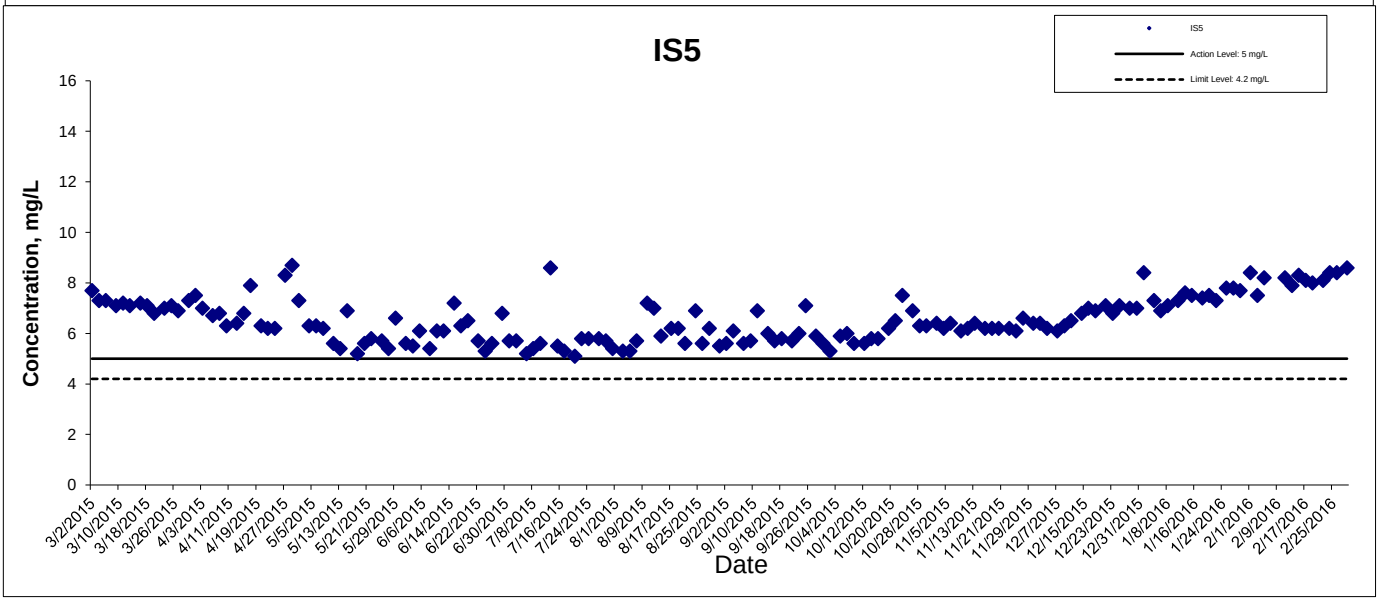
Project No.: 60249820 Date: May 2016

Appendix G

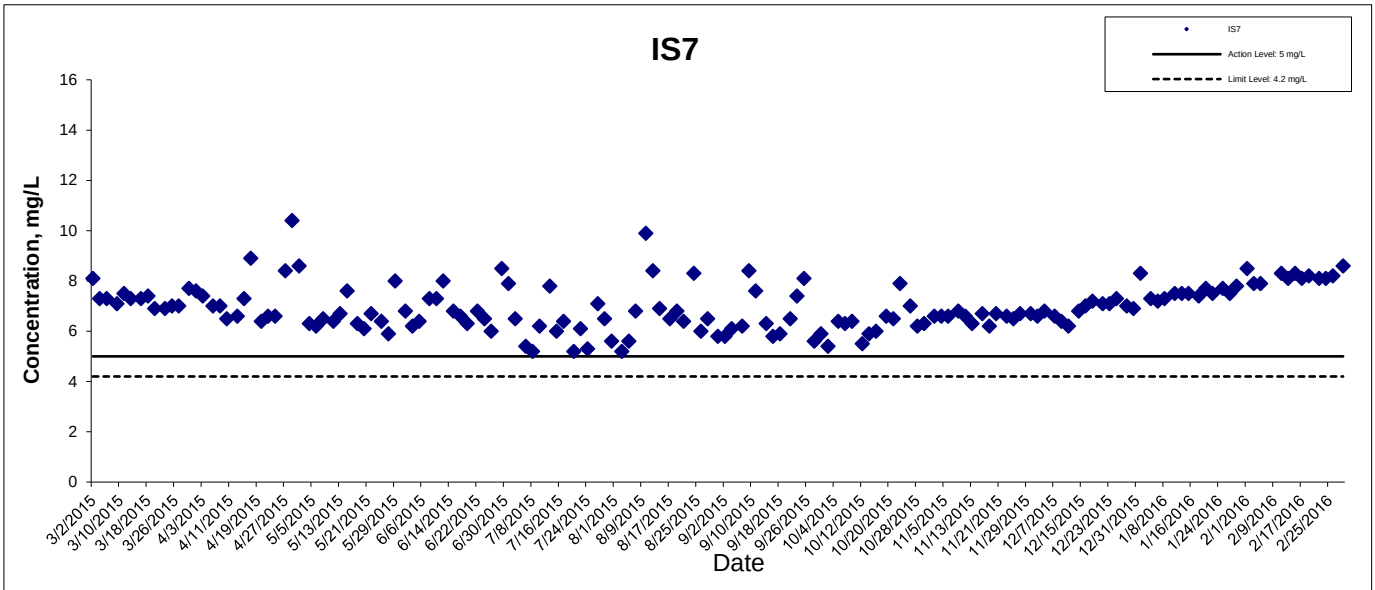
Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide

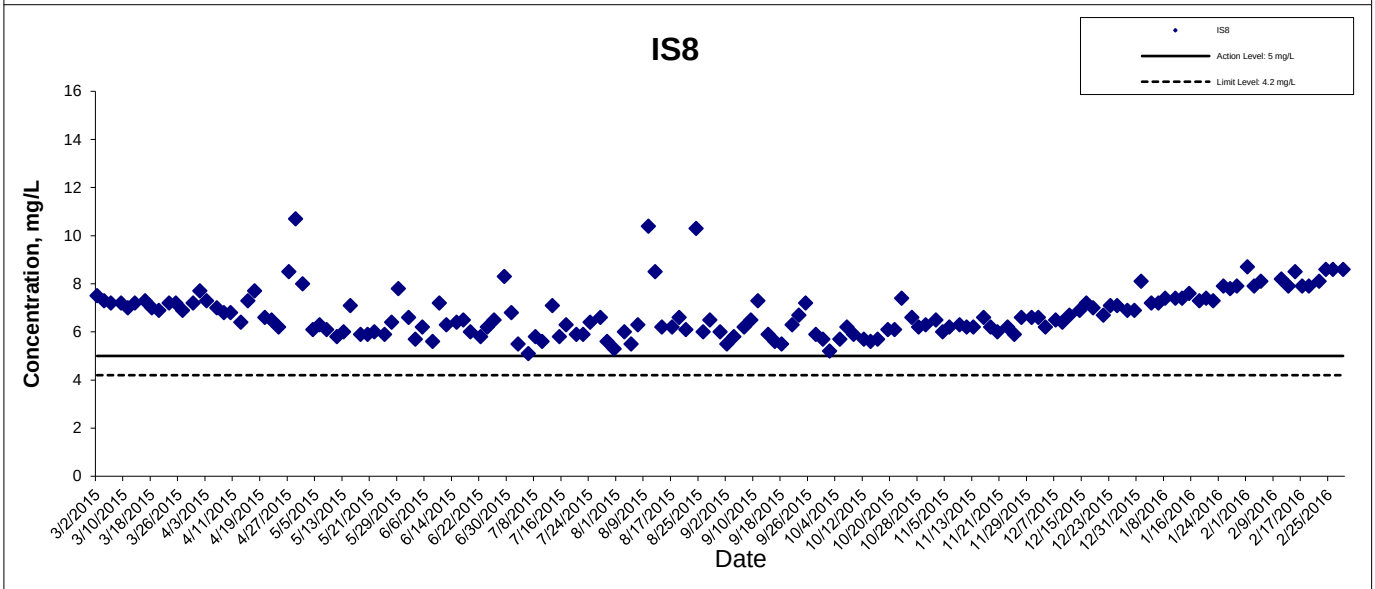


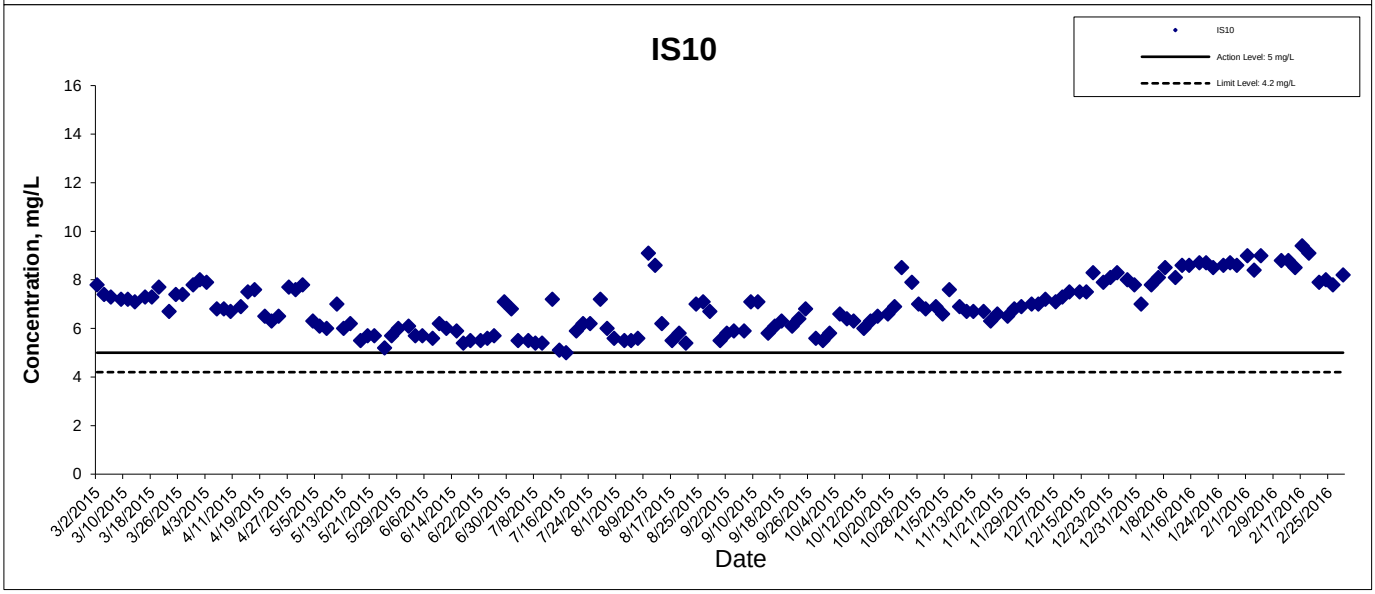




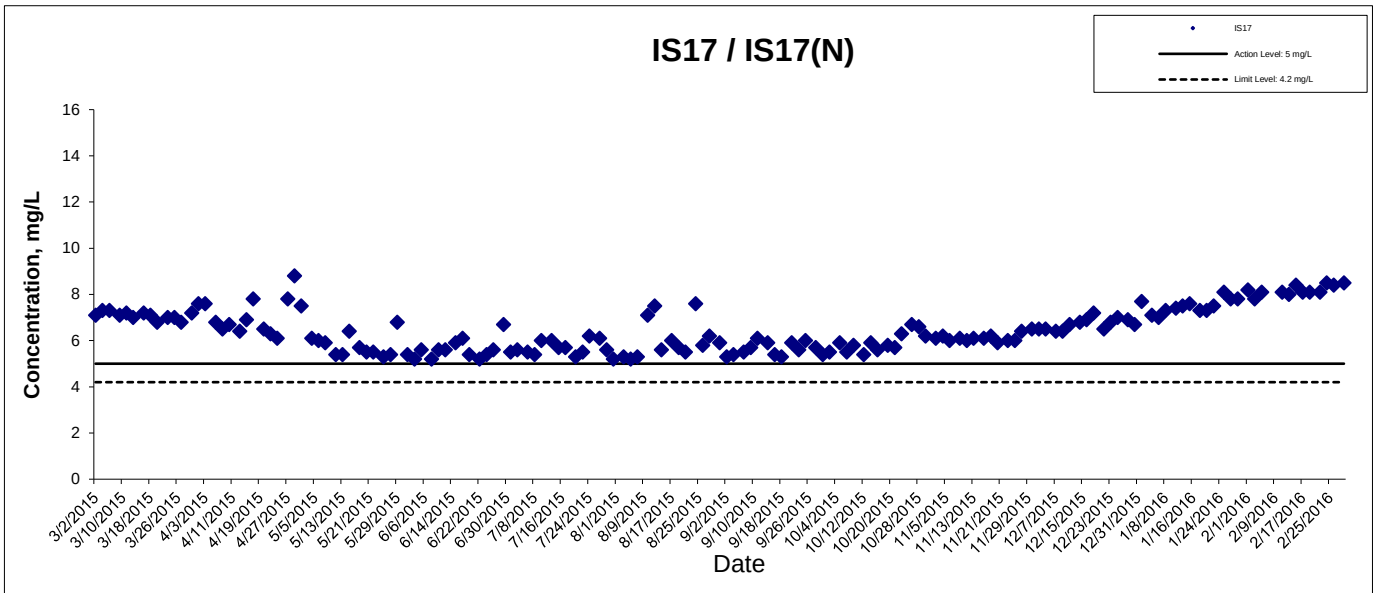
Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide

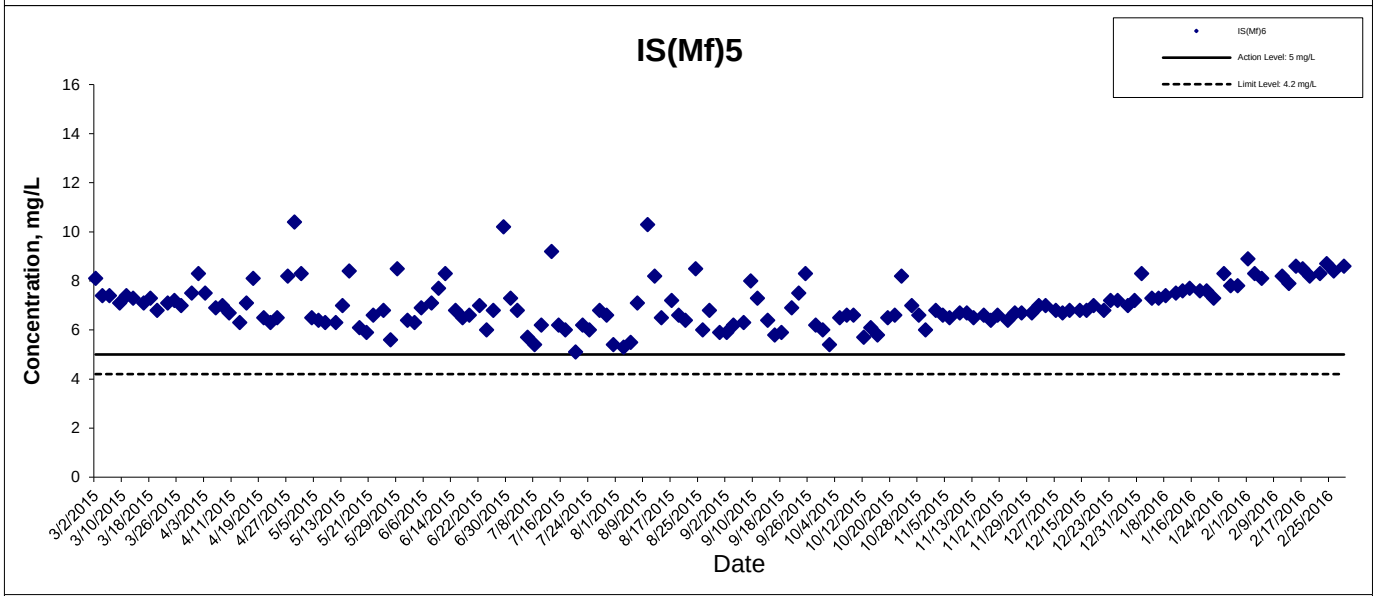


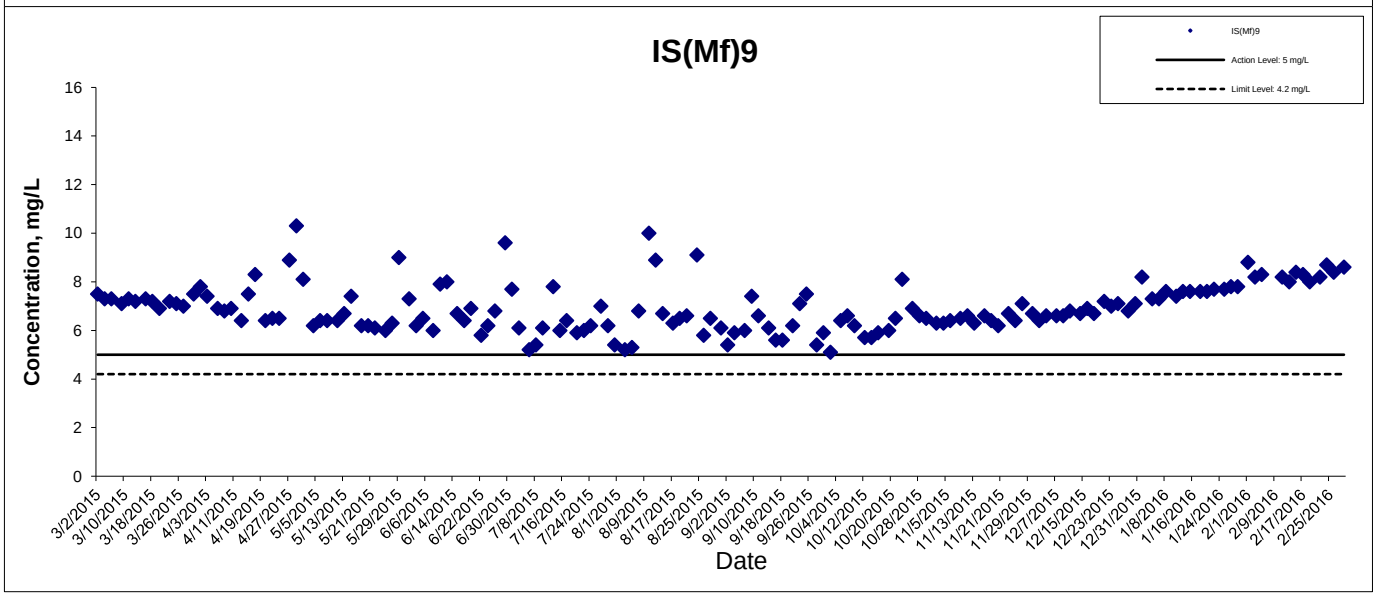




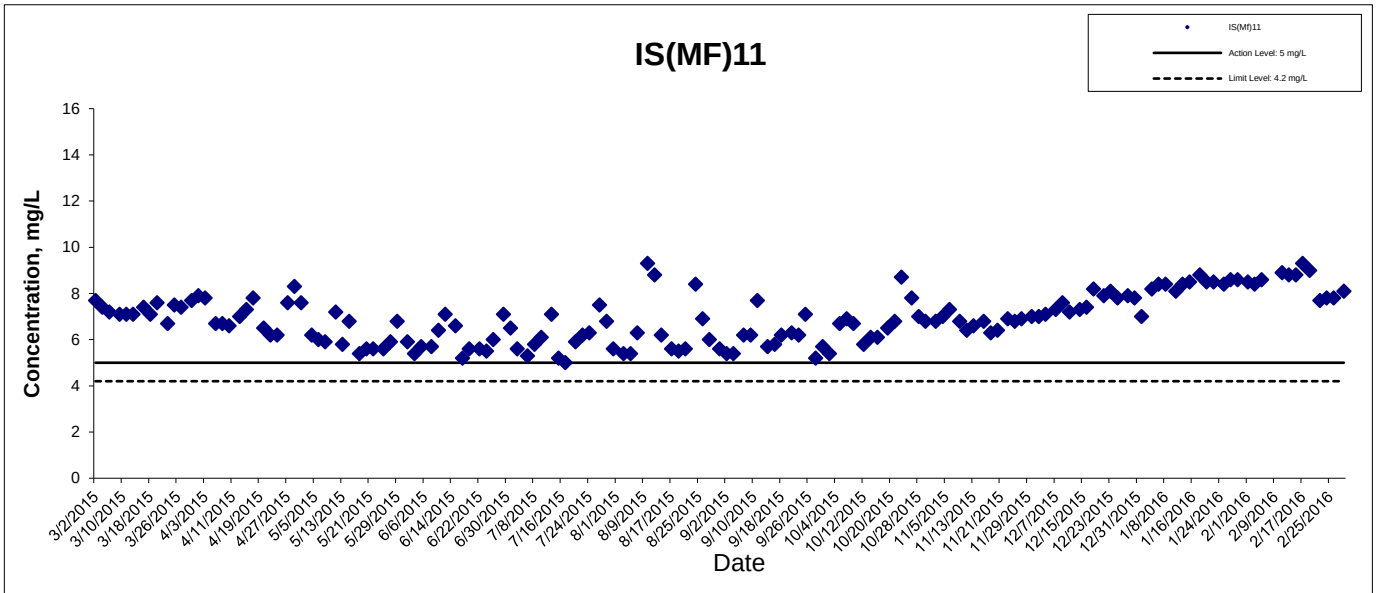
Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide

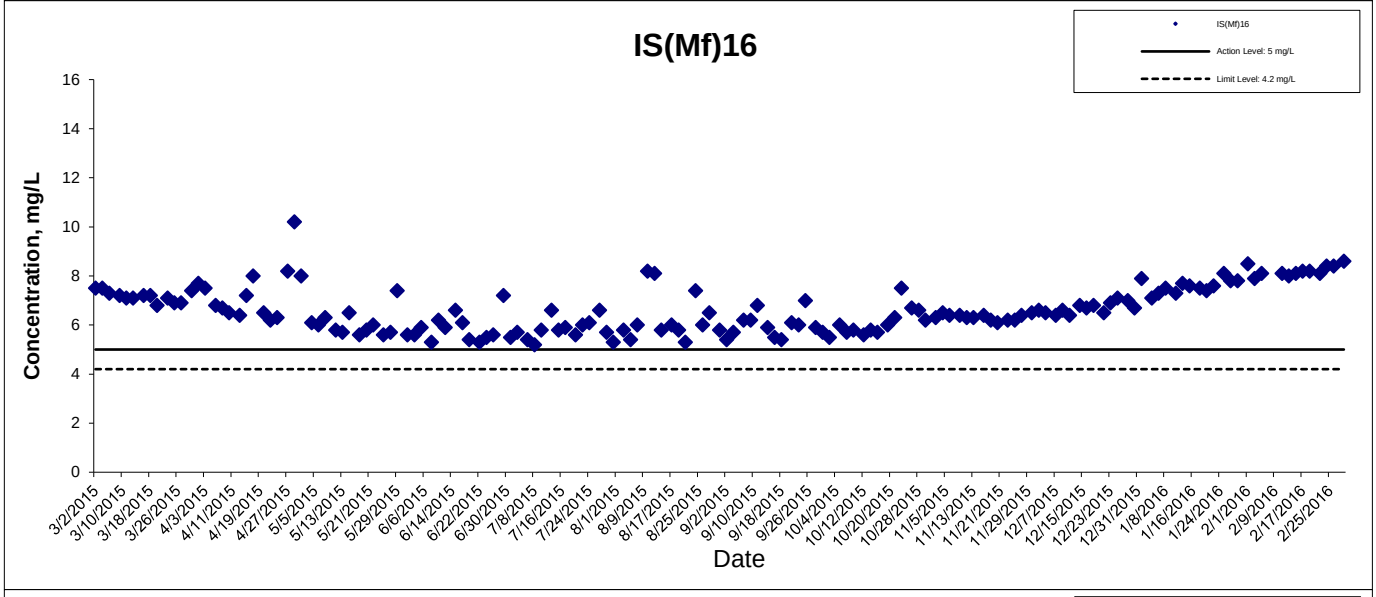


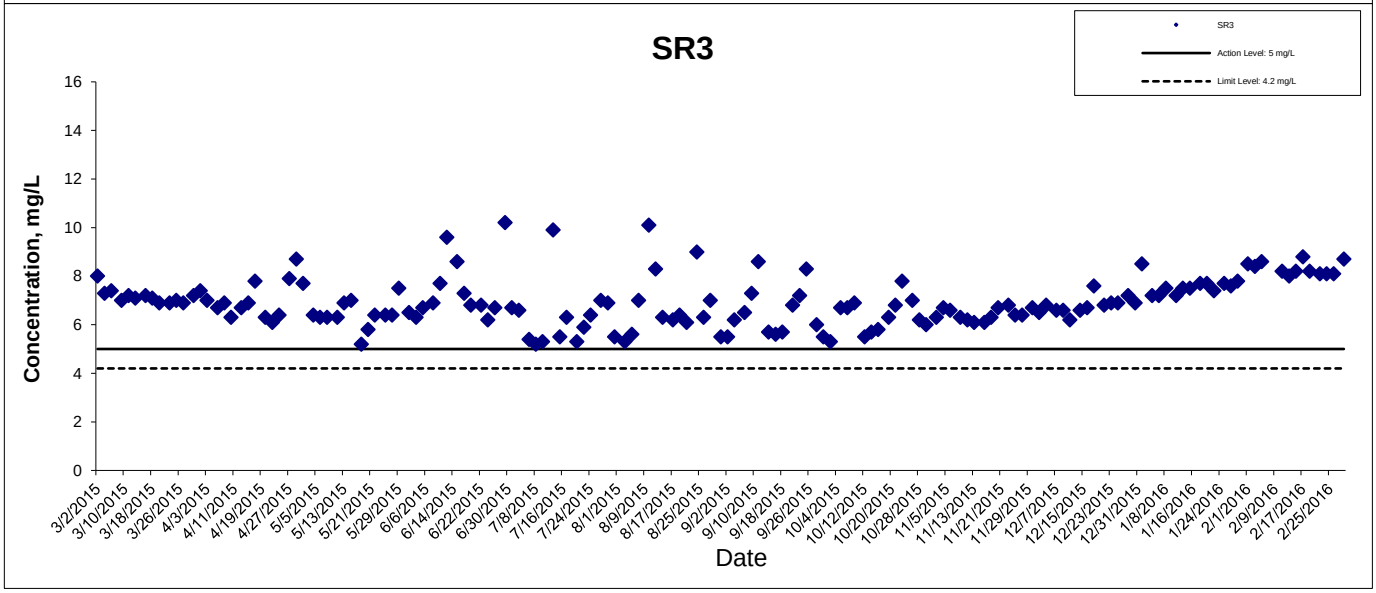




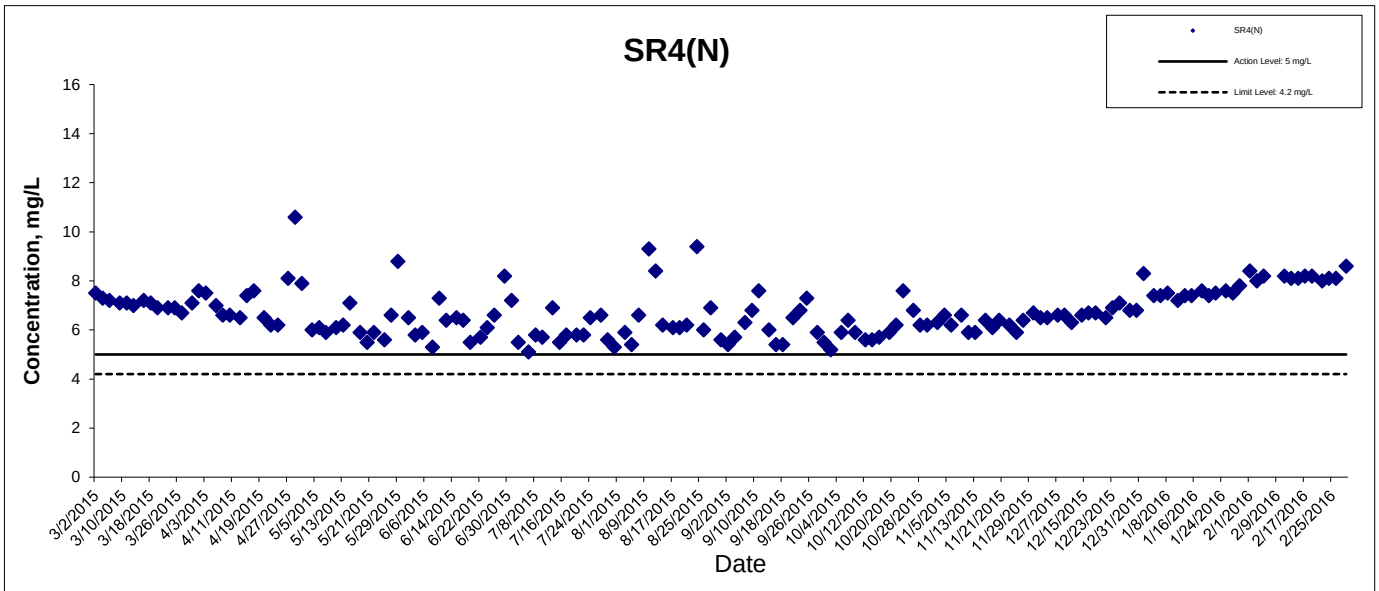
Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide

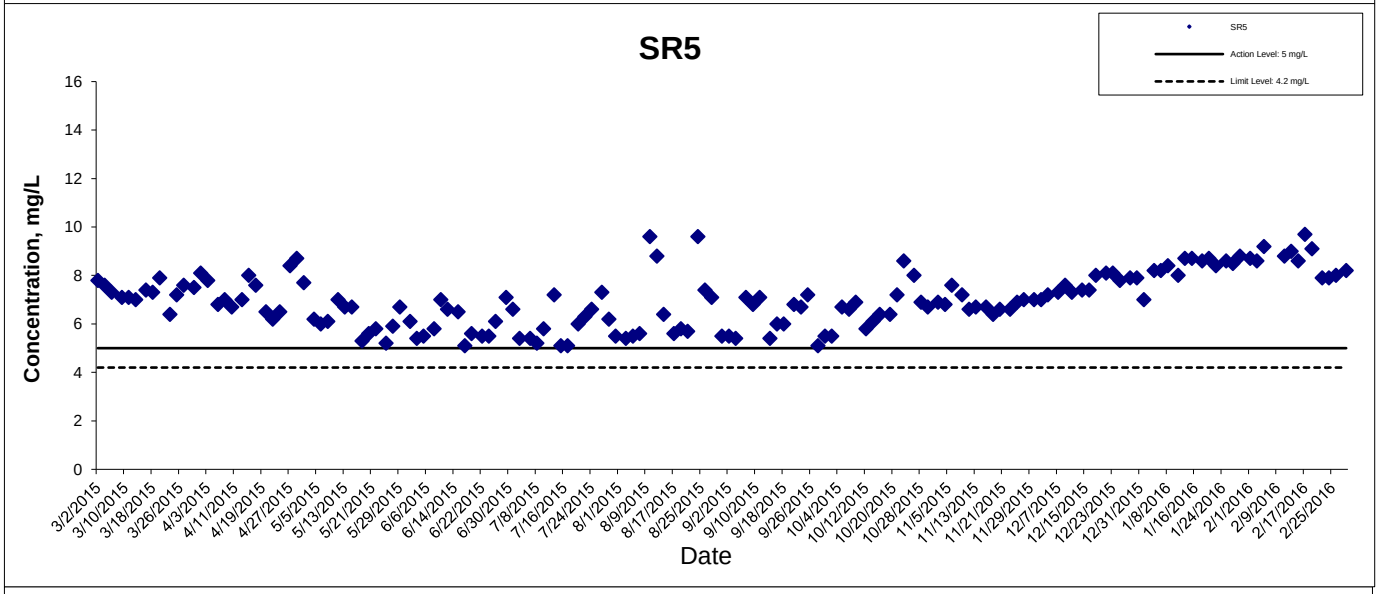


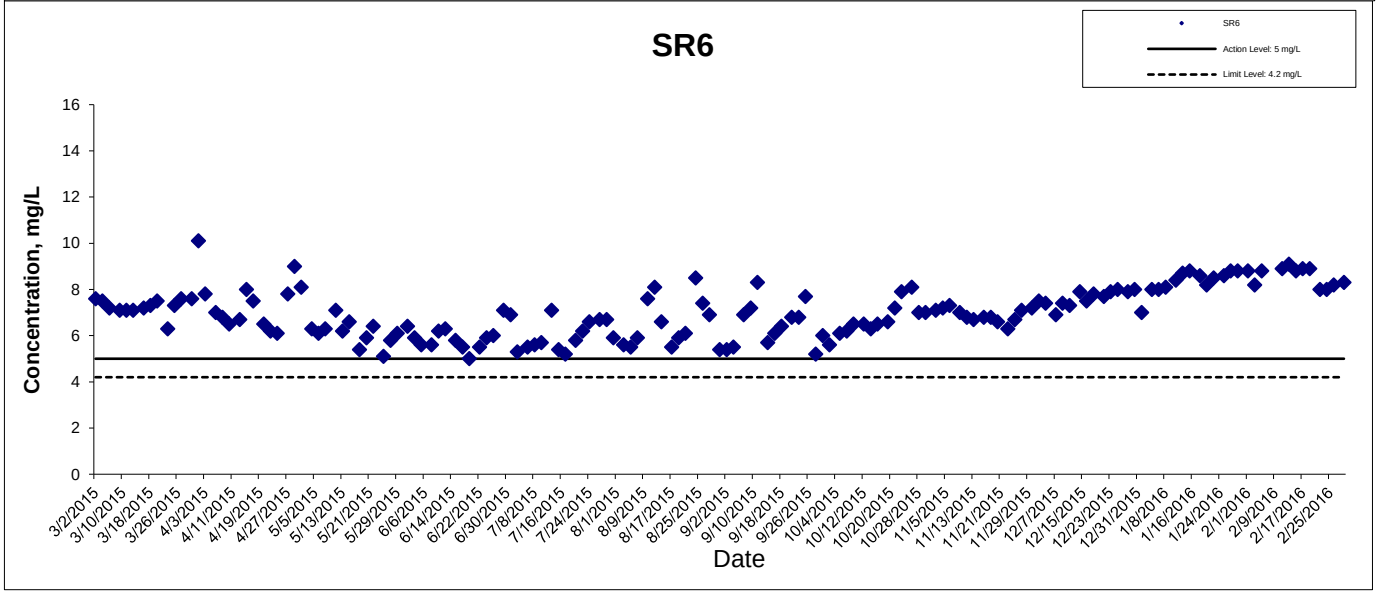




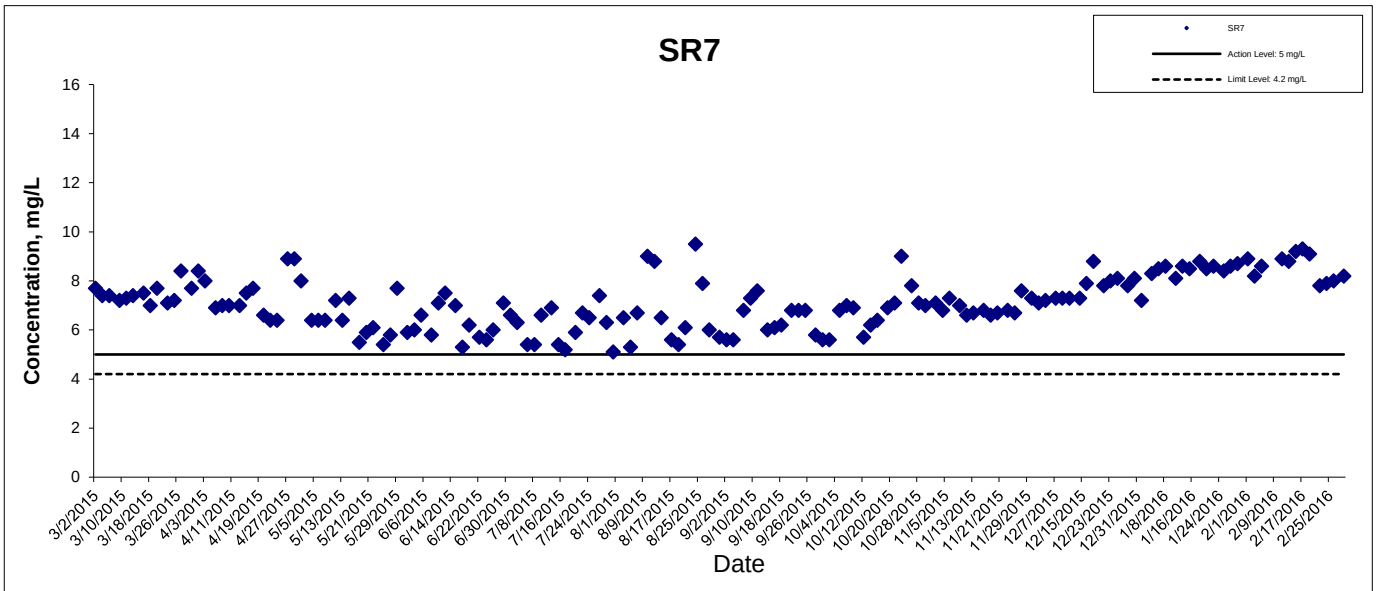
Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide

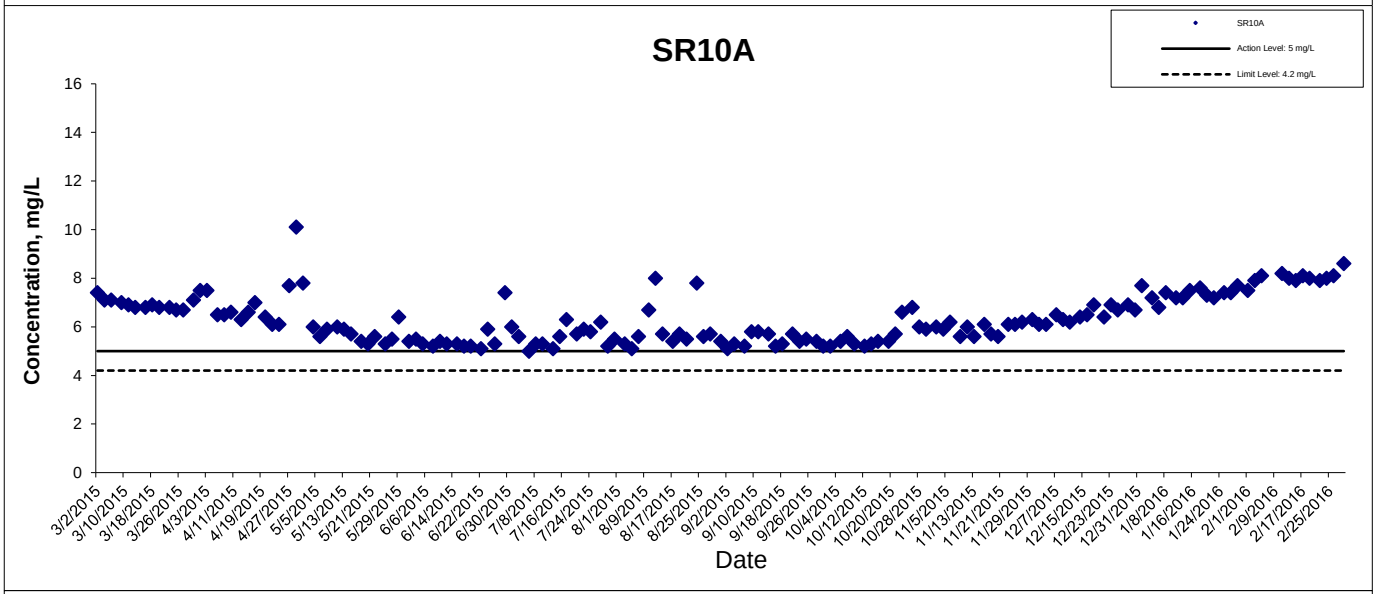


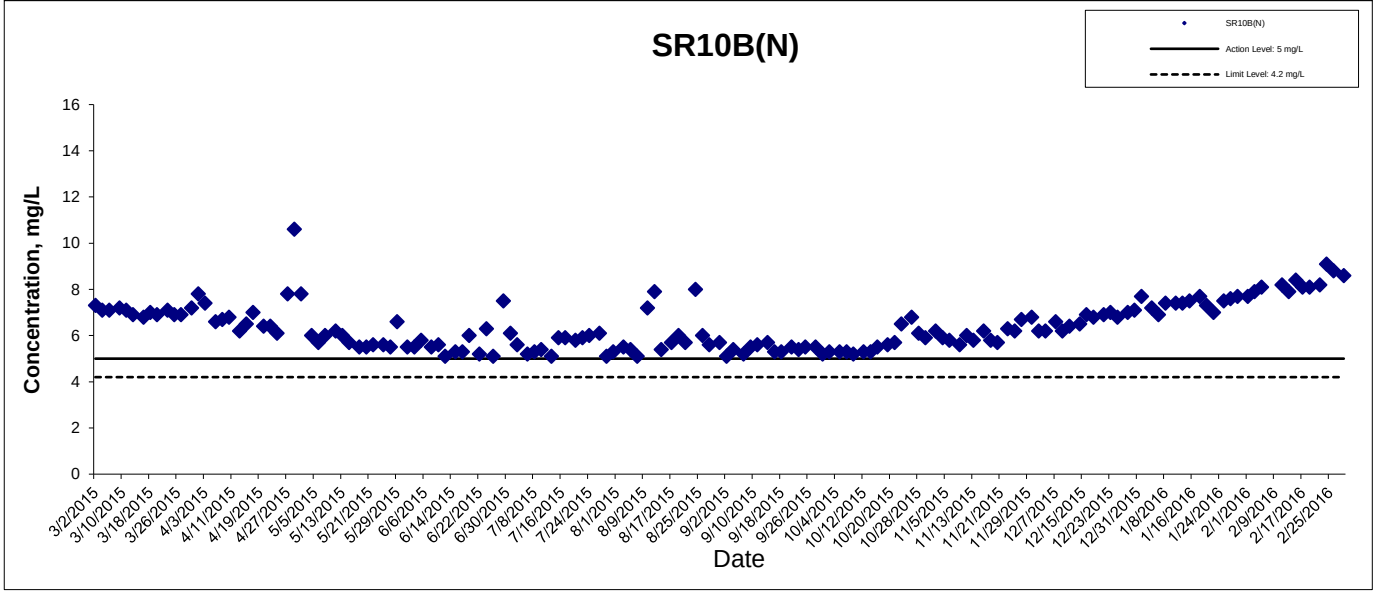




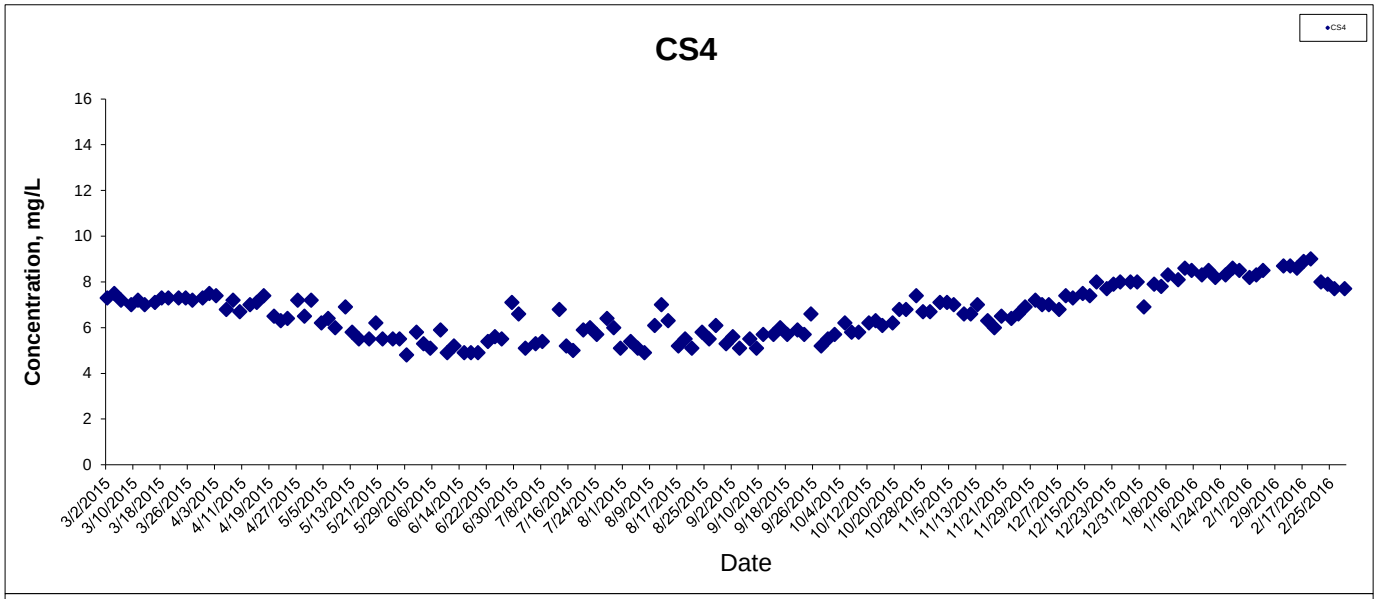
Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide

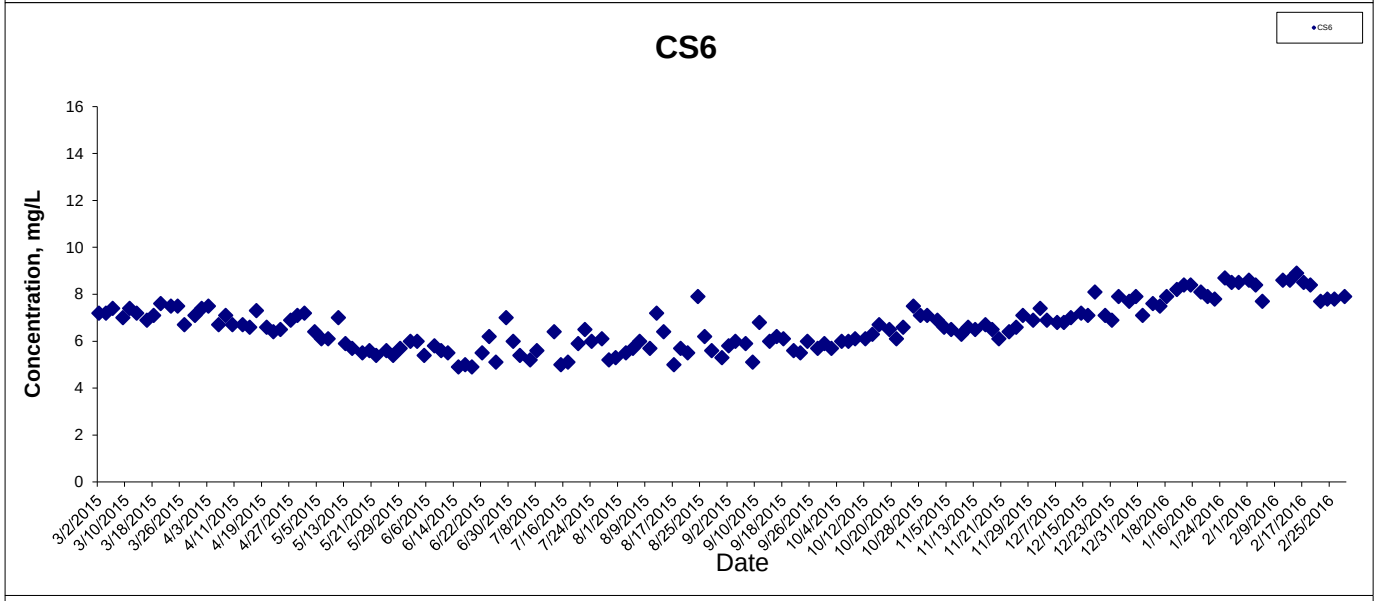


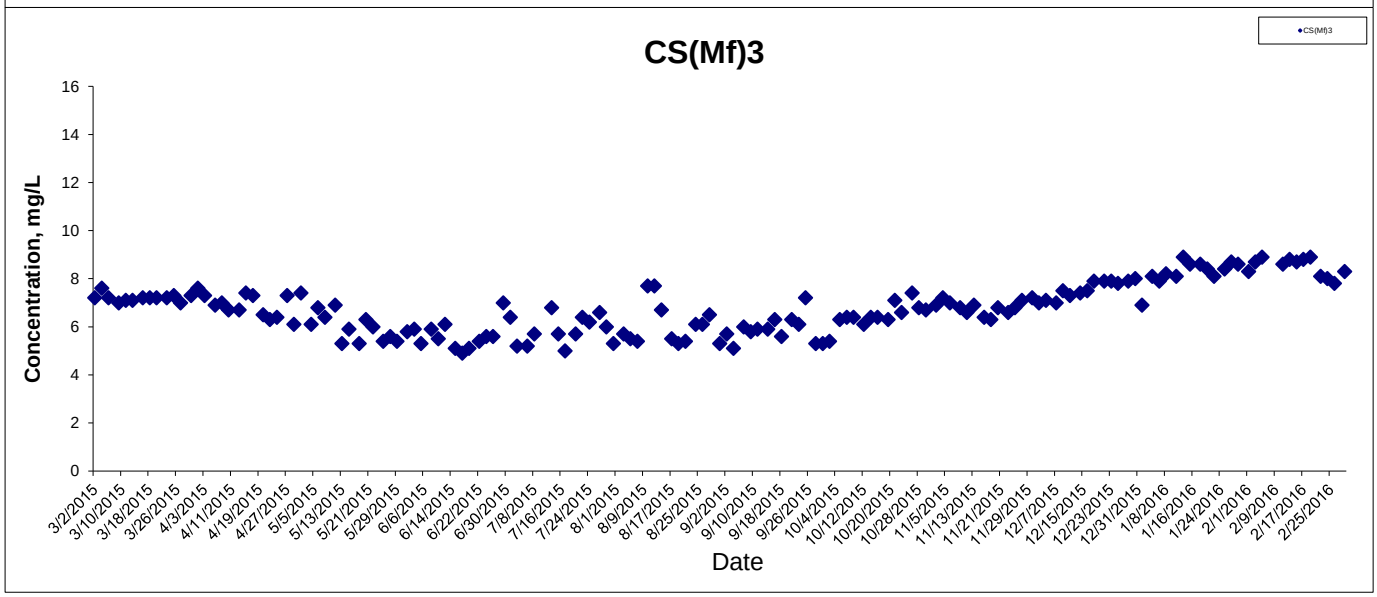




Dissolved Oxygen (Bottom) at Mid-Ebb Tide







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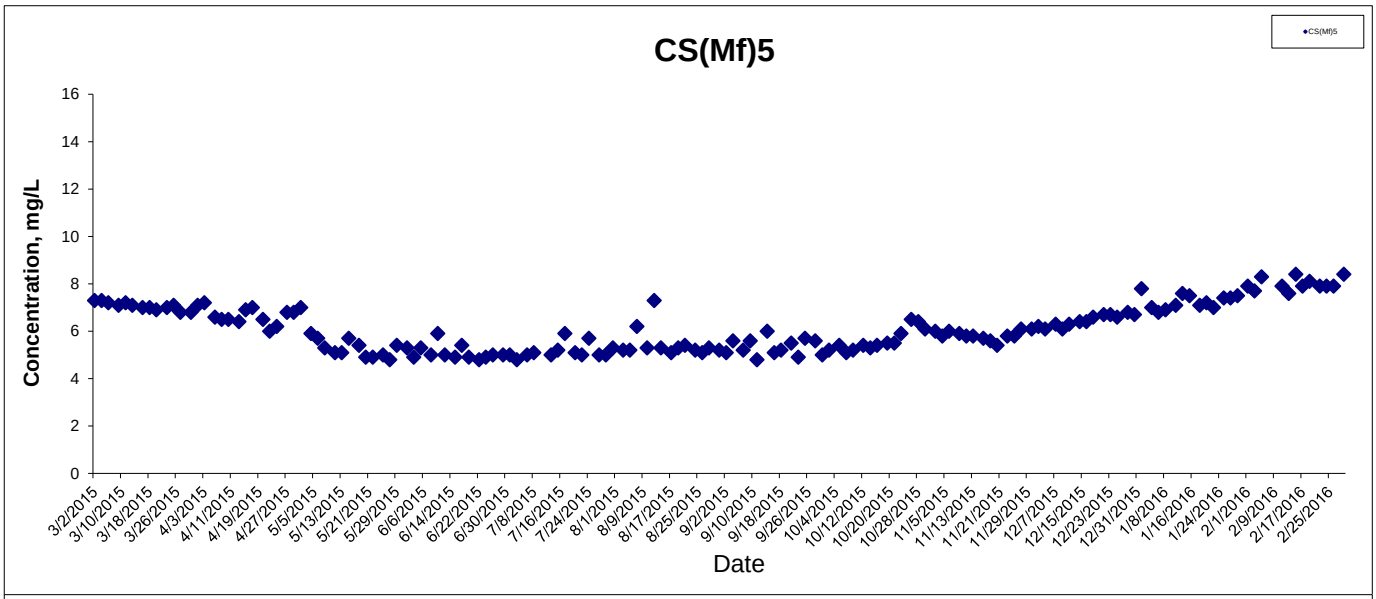
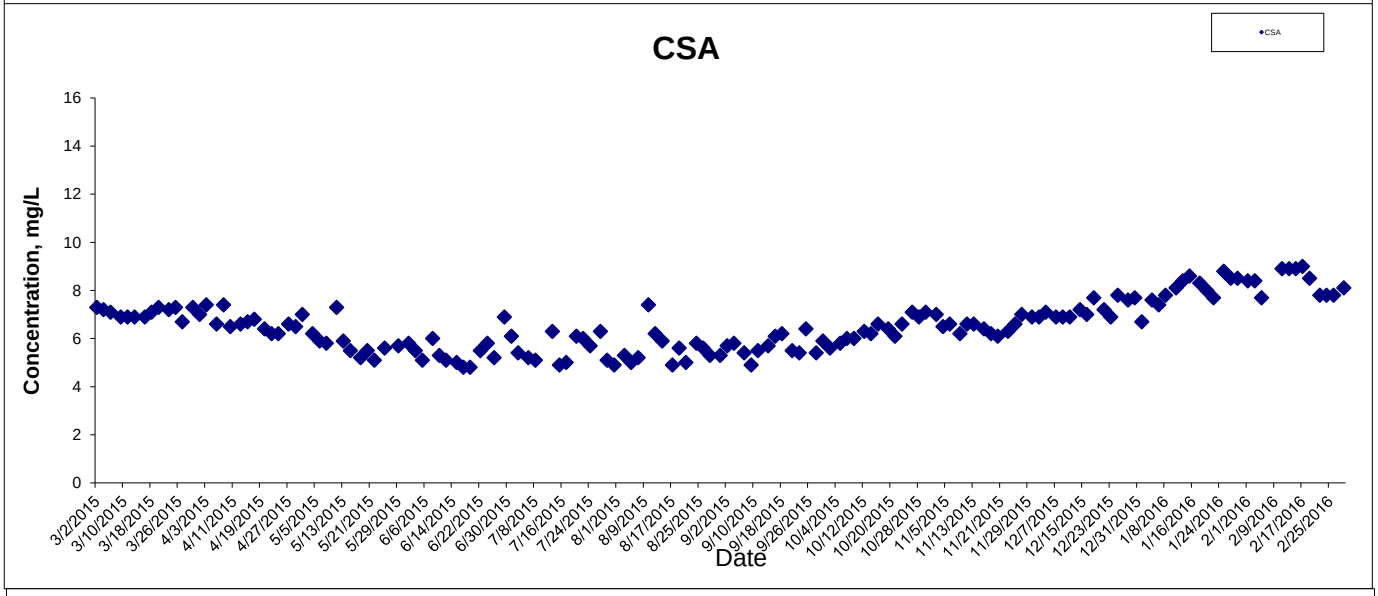
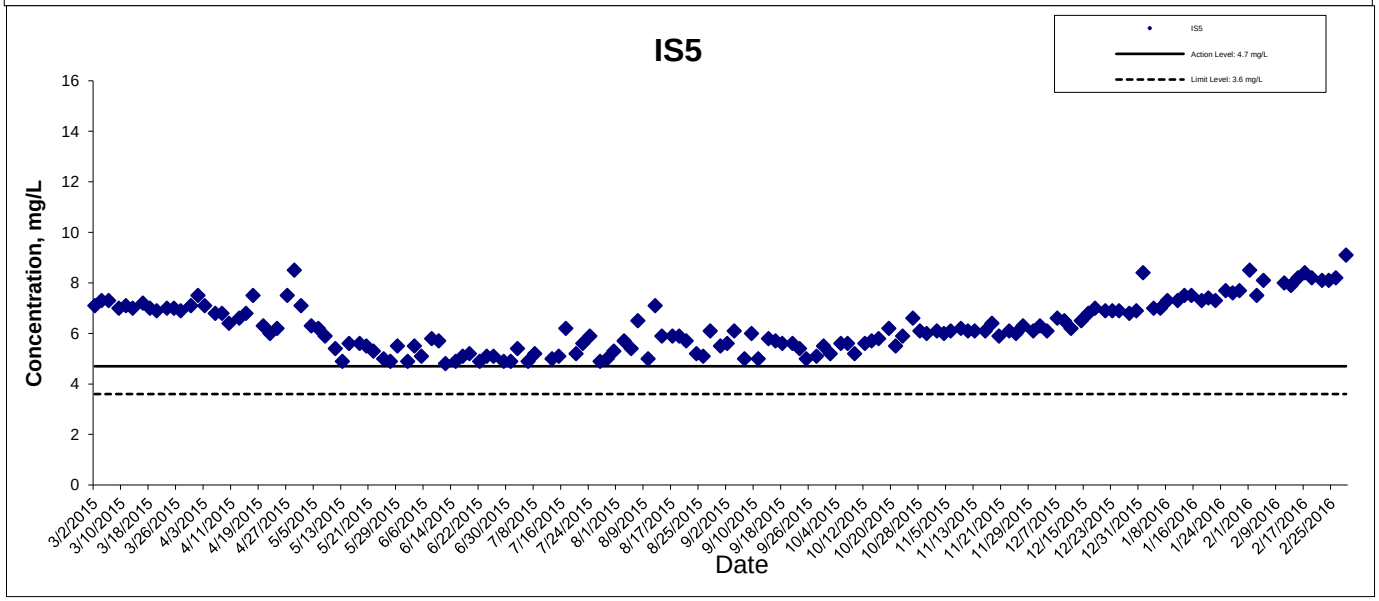
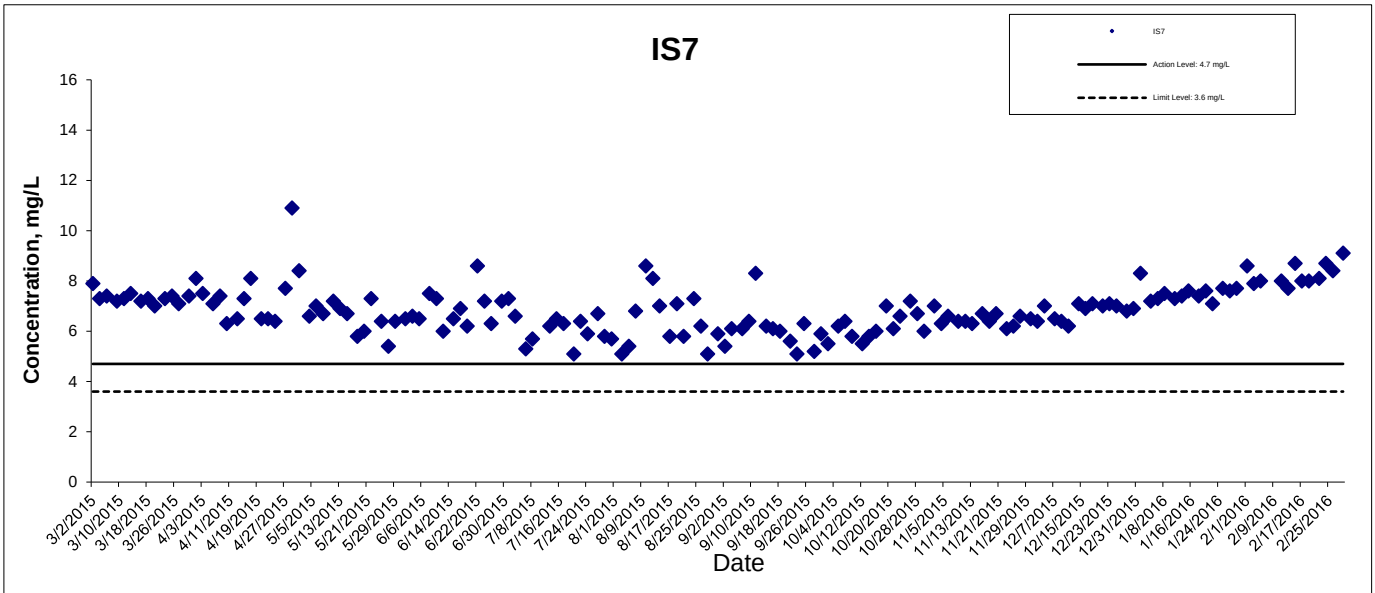
Dissolved Oxygen (Bottom) at Mid-Ebb Tide

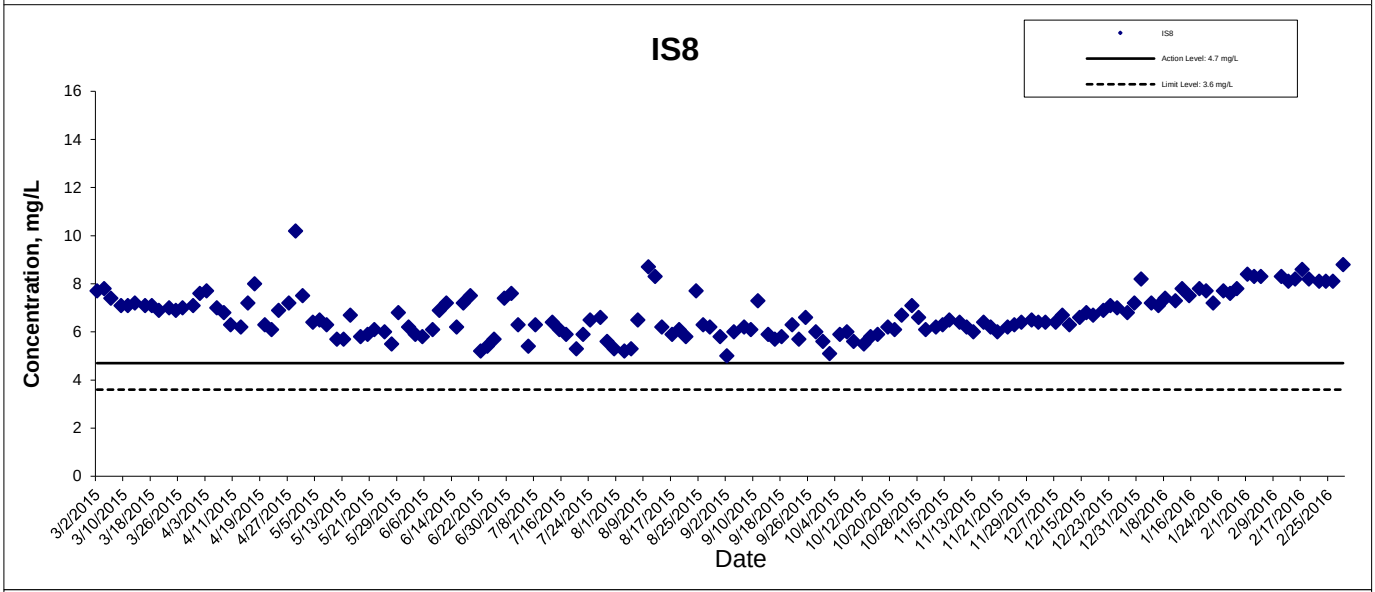


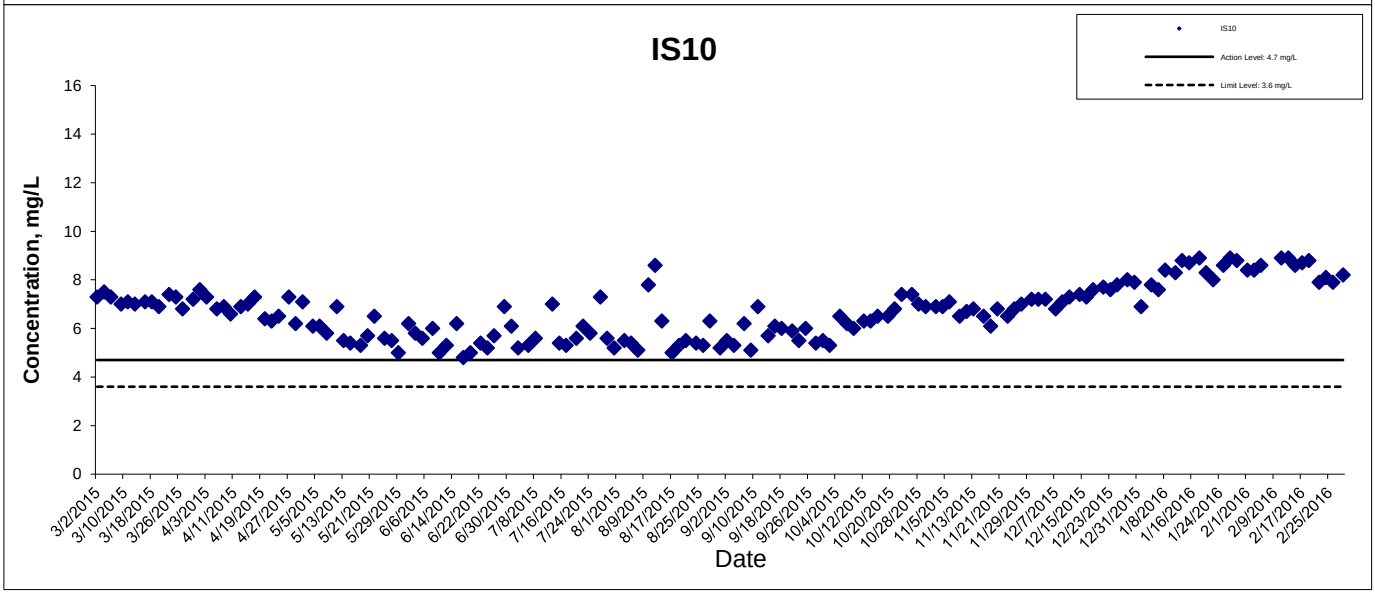




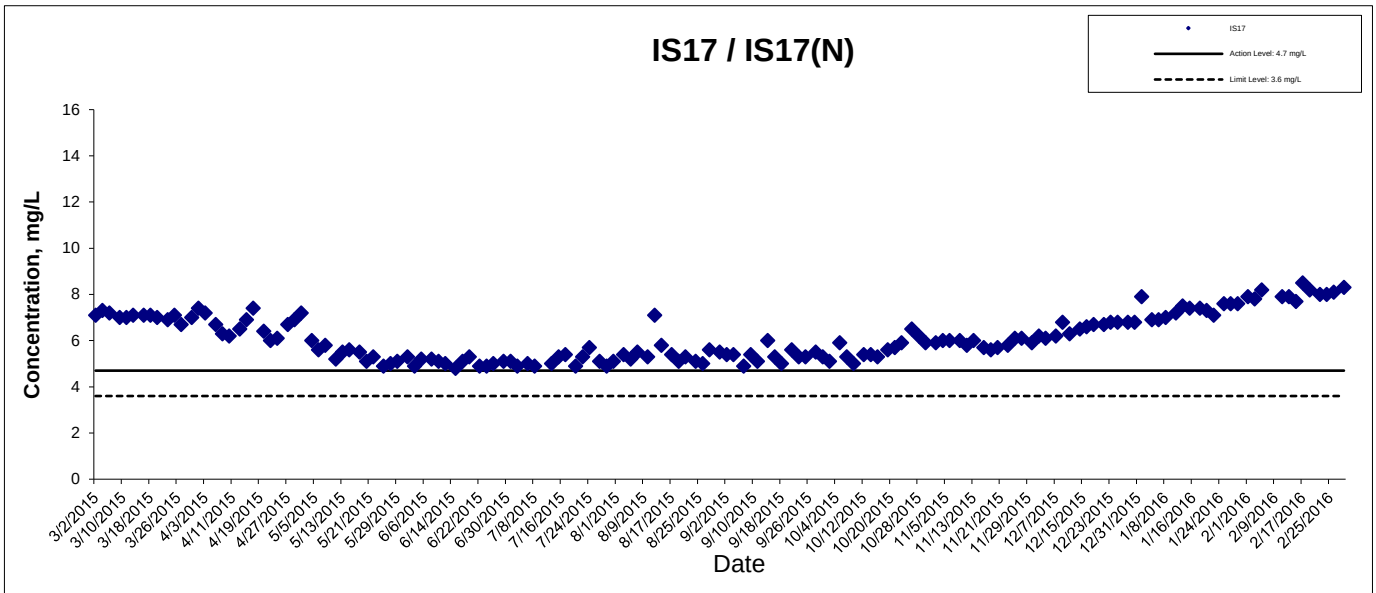
Dissolved Oxygen (Bottom) at Mid-Ebb Tide

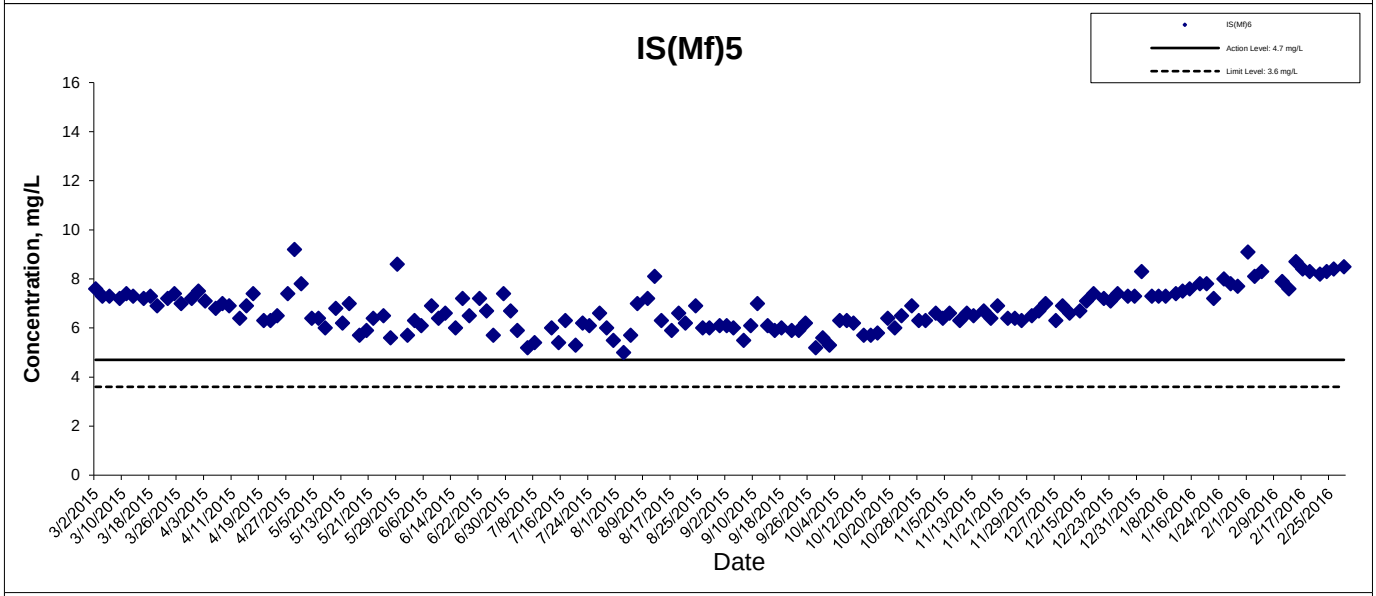


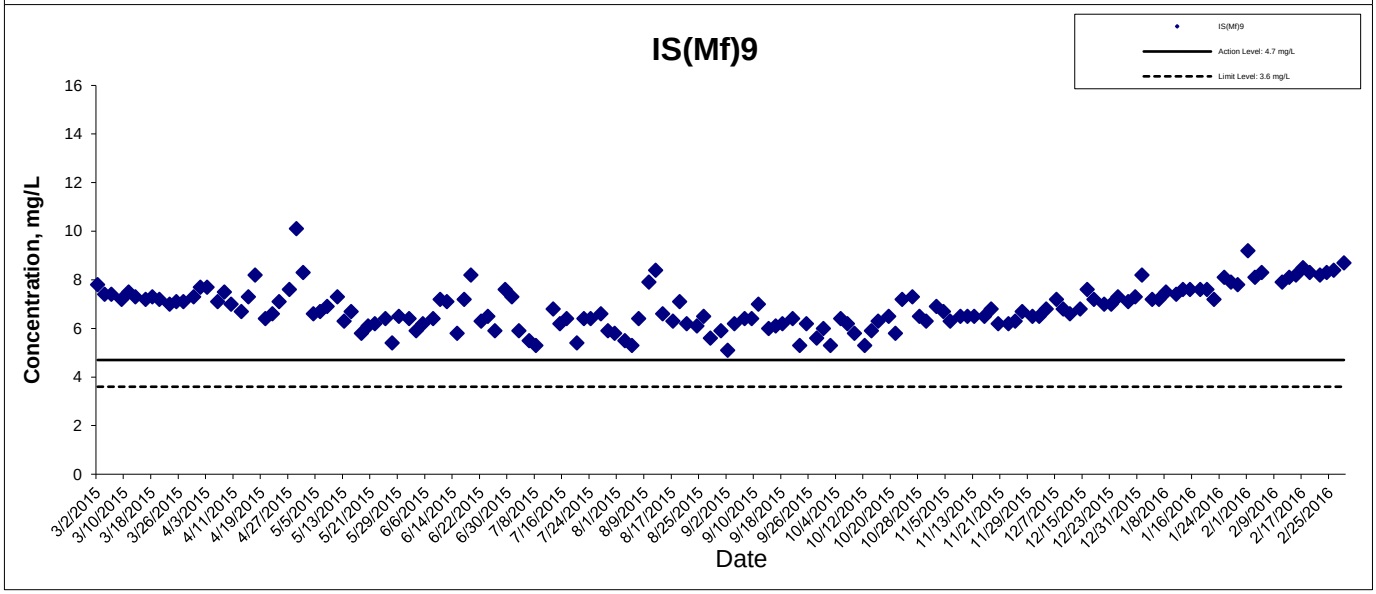




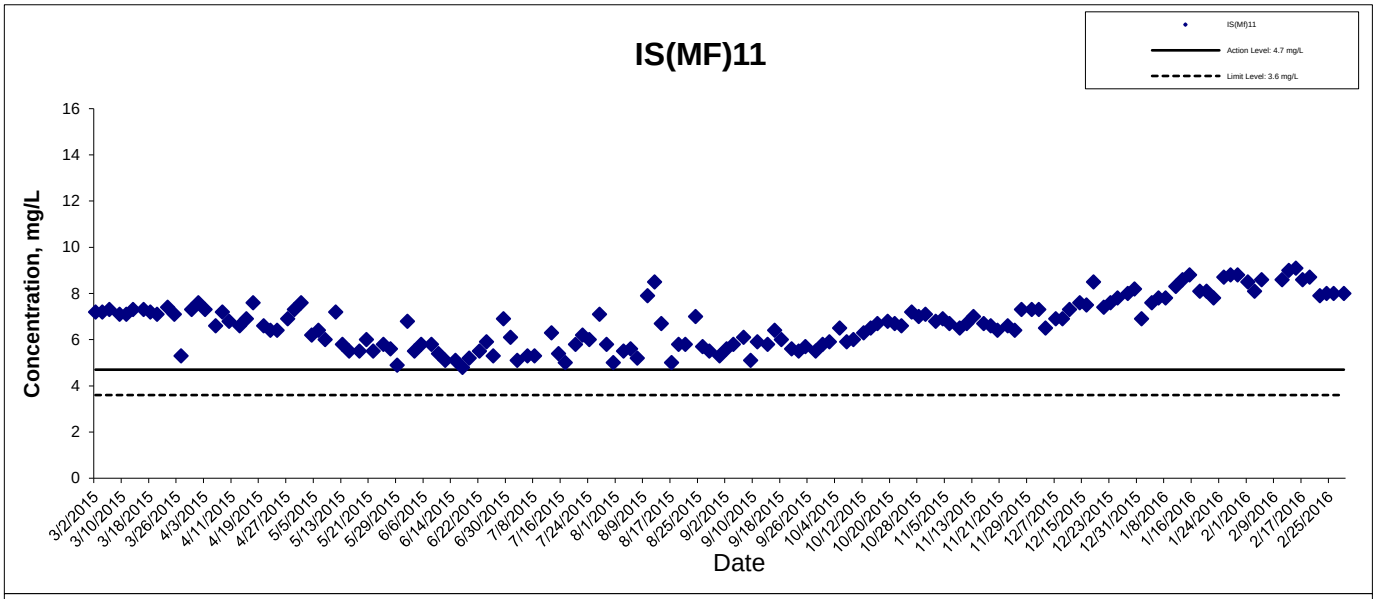
Dissolved Oxygen (Bottom) at Mid-Ebb Tide

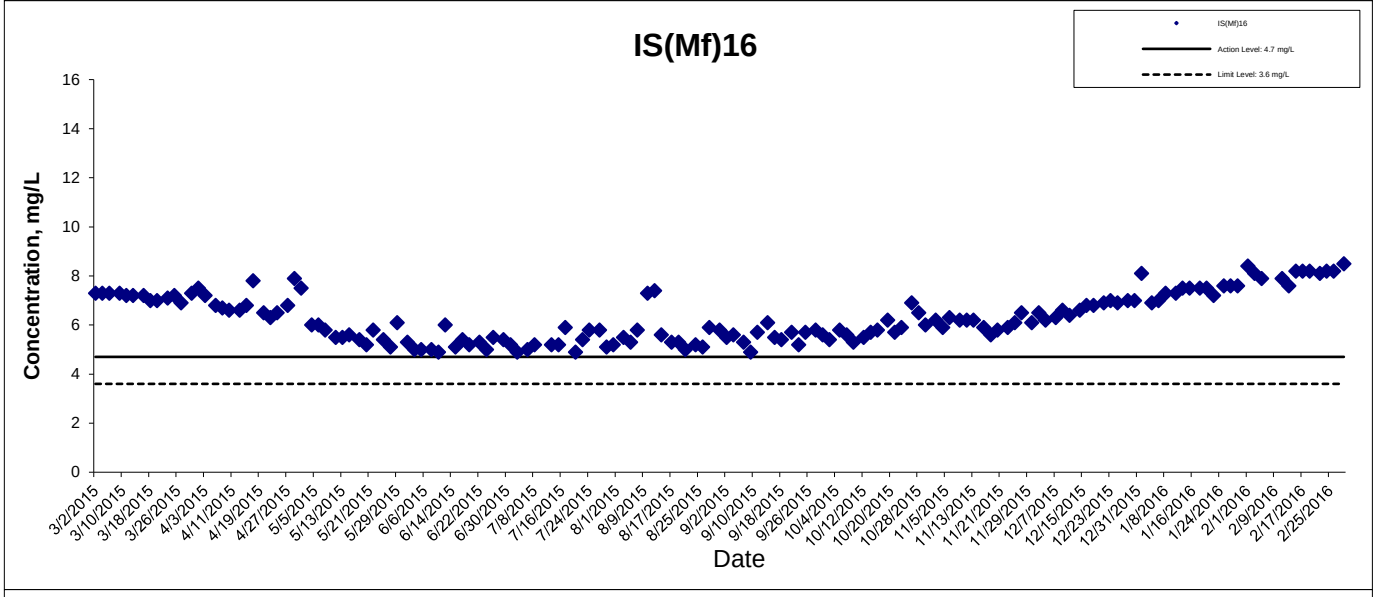


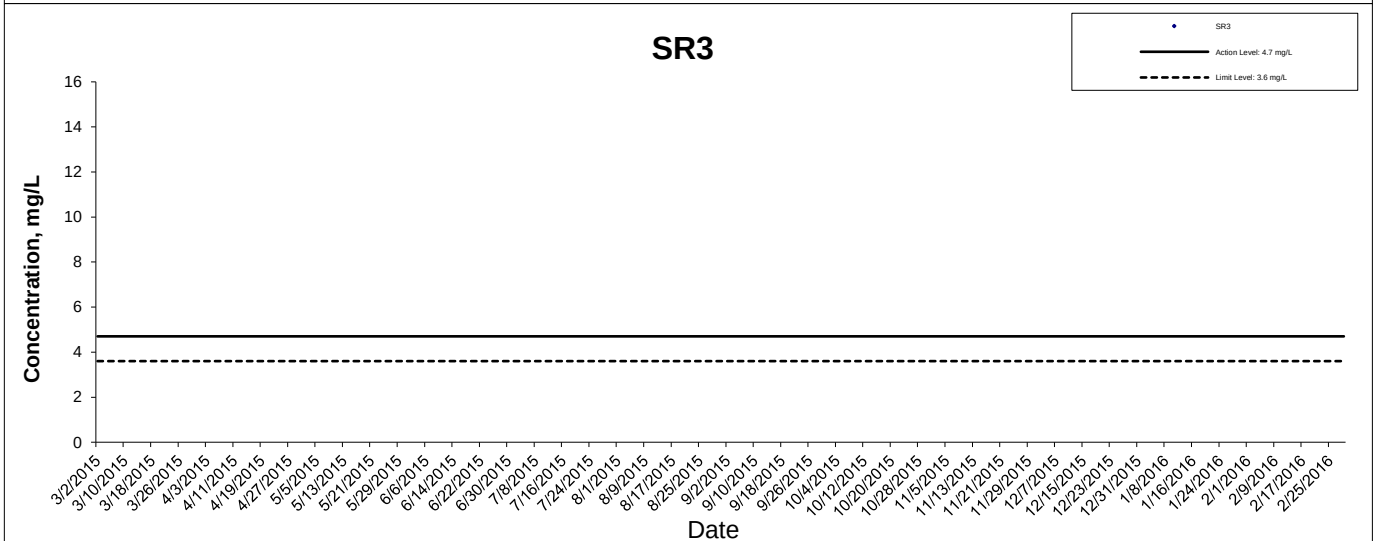




Dissolved Oxygen (Bottom) at Mid-Ebb Tide

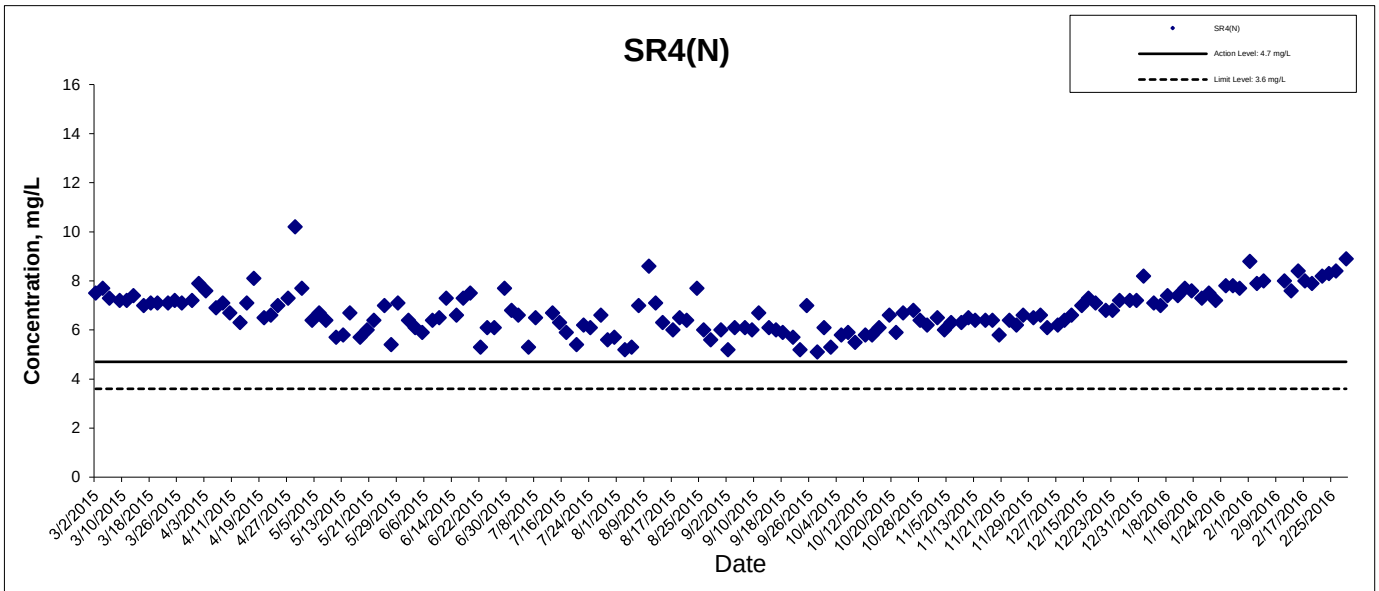


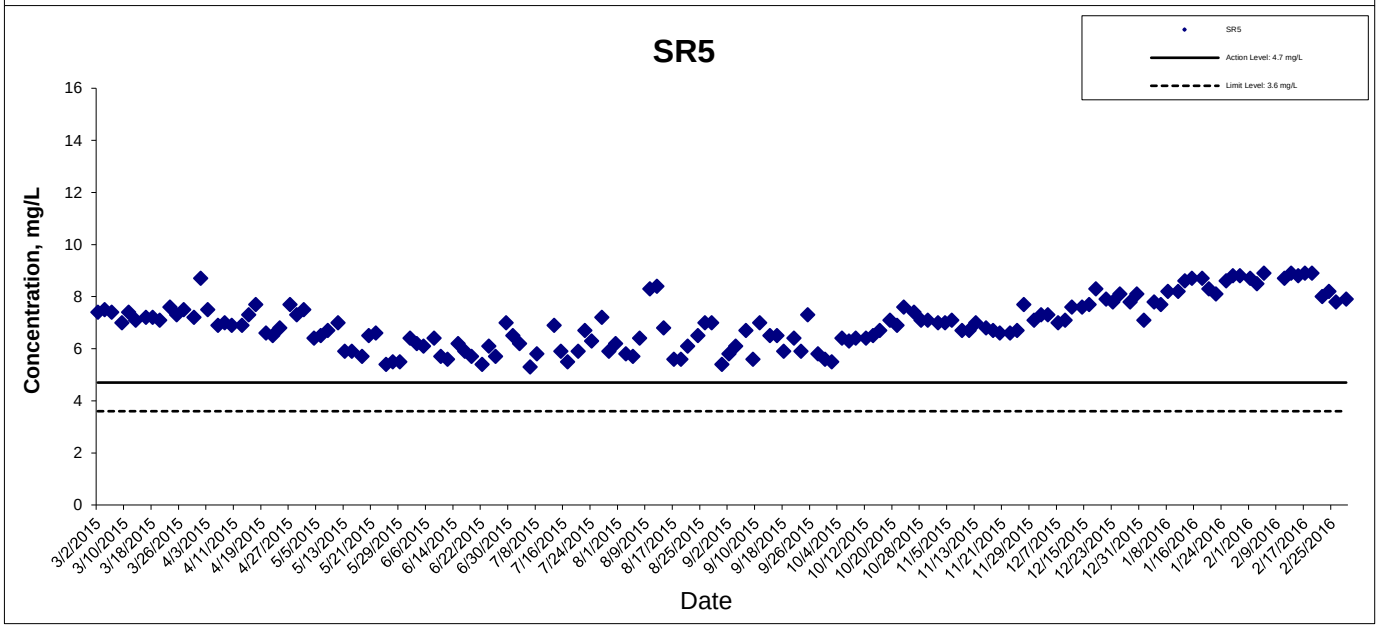


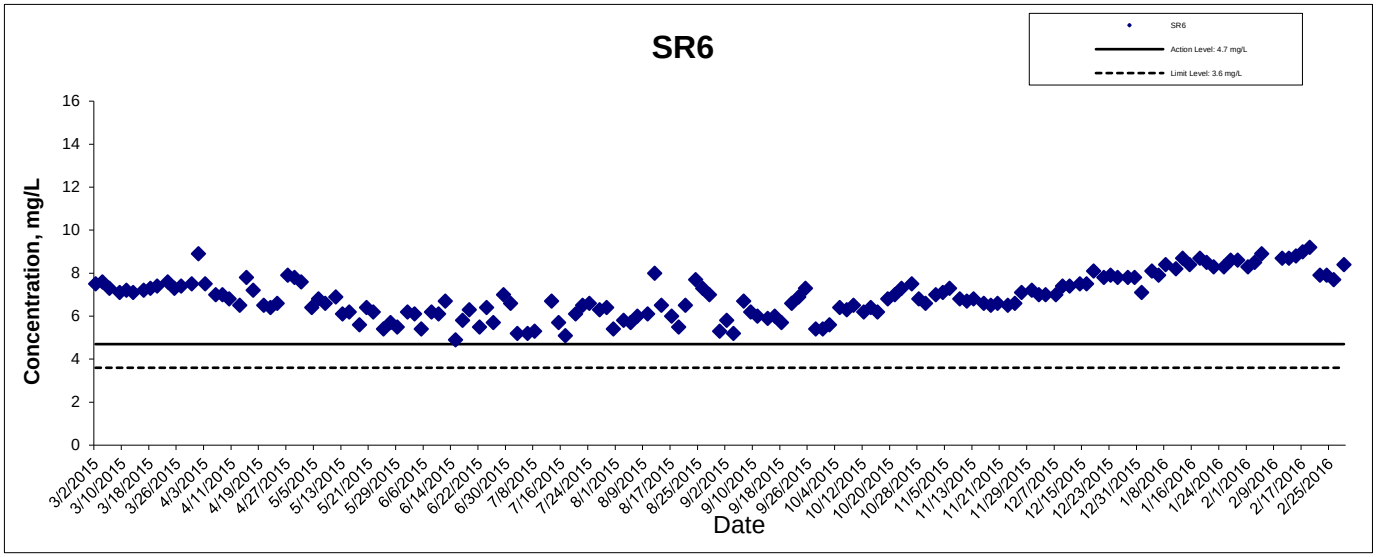


As the measured water depths were less than 3 m during all monitoring days, water samples are collected at mid-depth only .

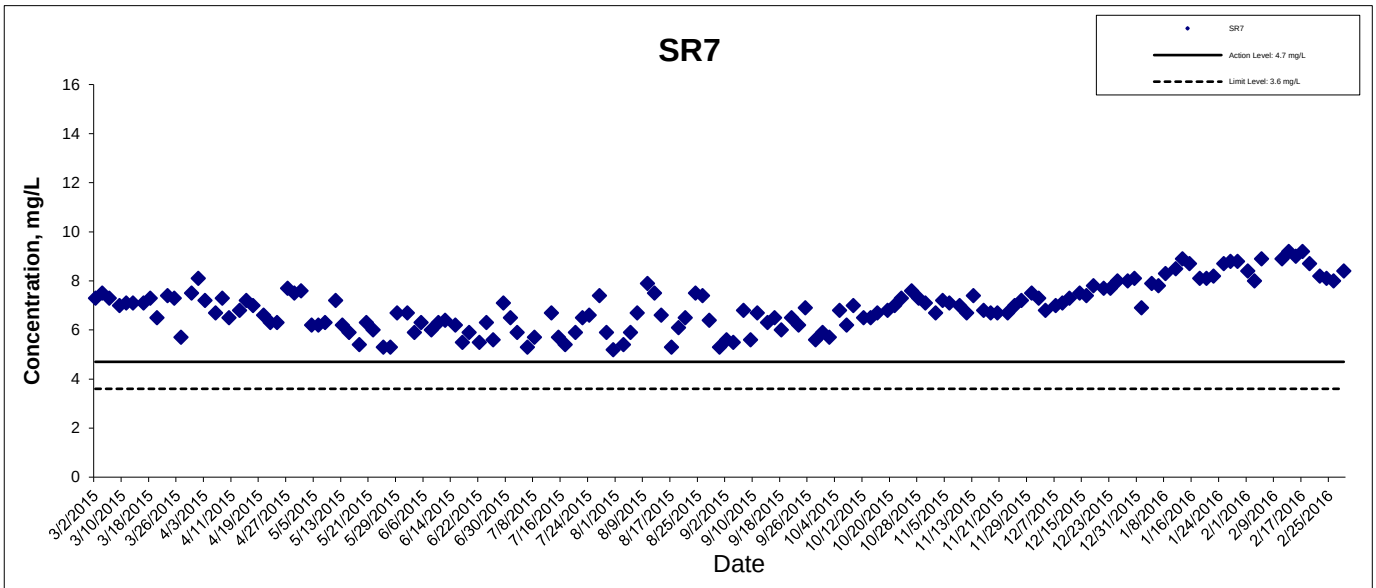
Dissolved Oxygen (Bottom) at Mid-Ebb Tide

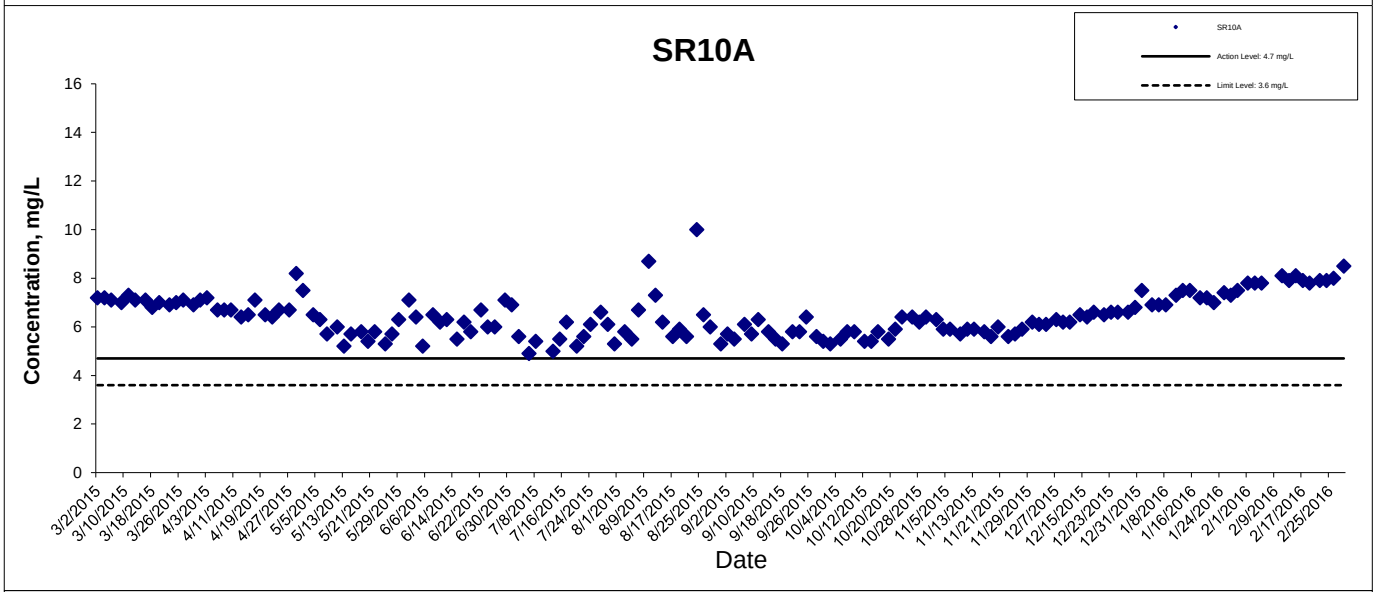


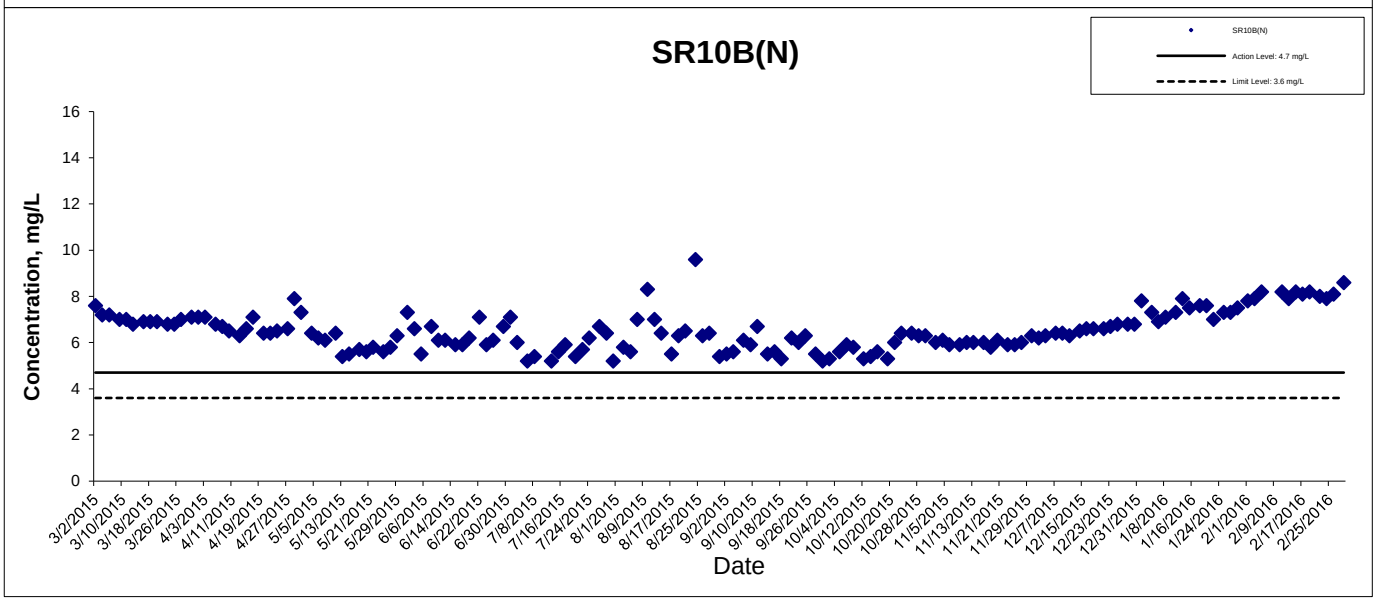




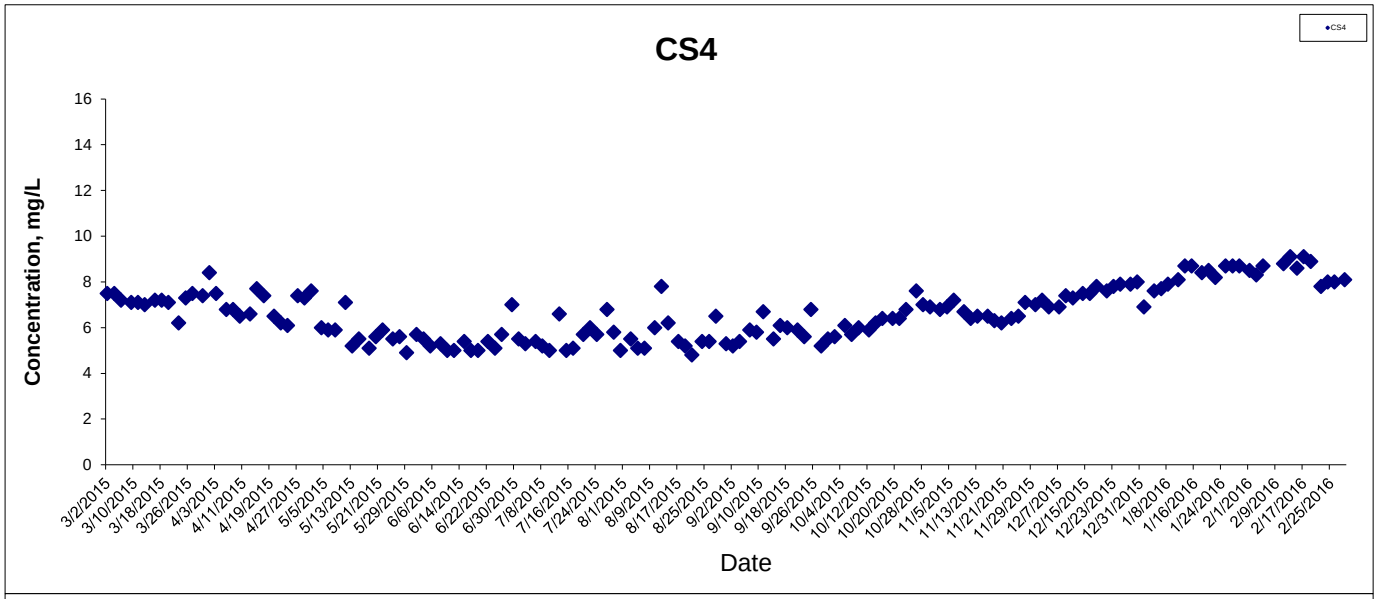
Dissolved Oxygen (Bottom) at Mid-Ebb Tide

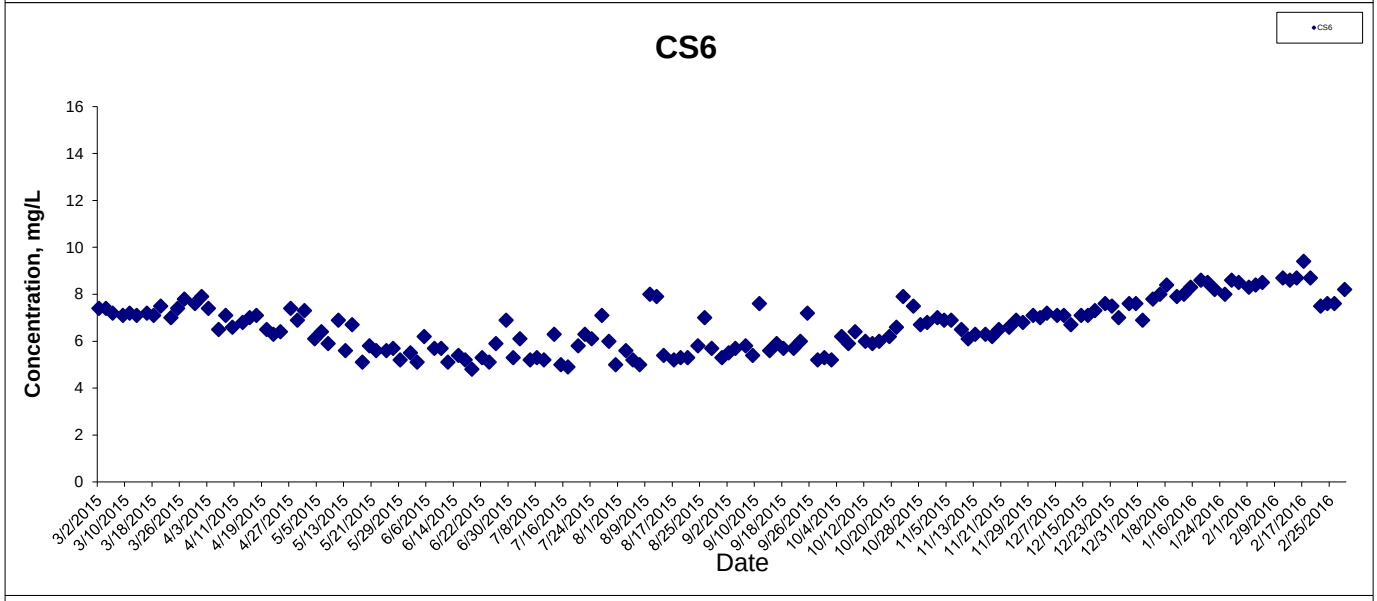


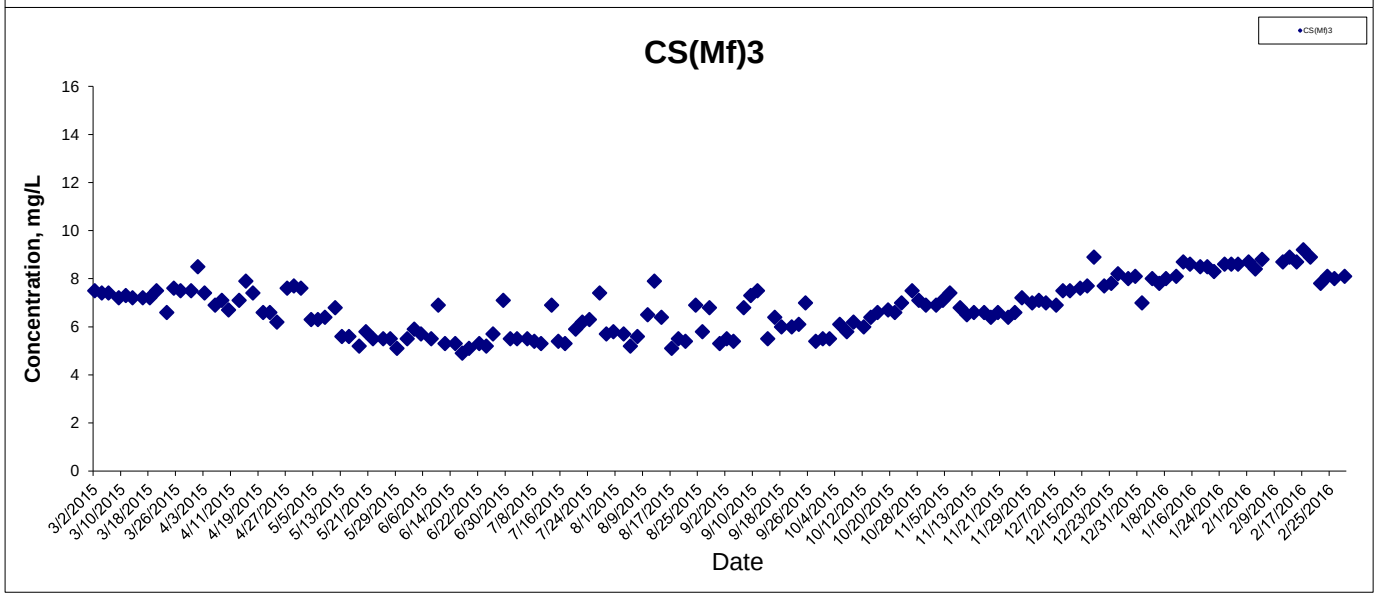




Dissolved Oxygen (Bottom) at Mid-Flood Tide







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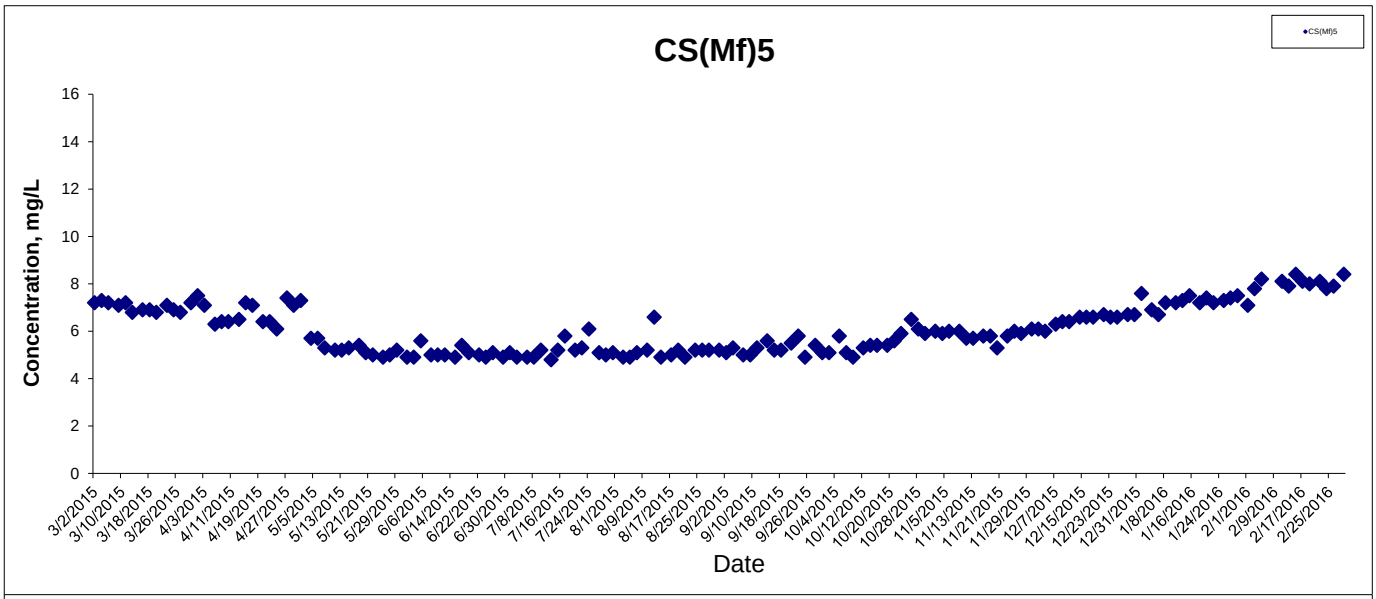
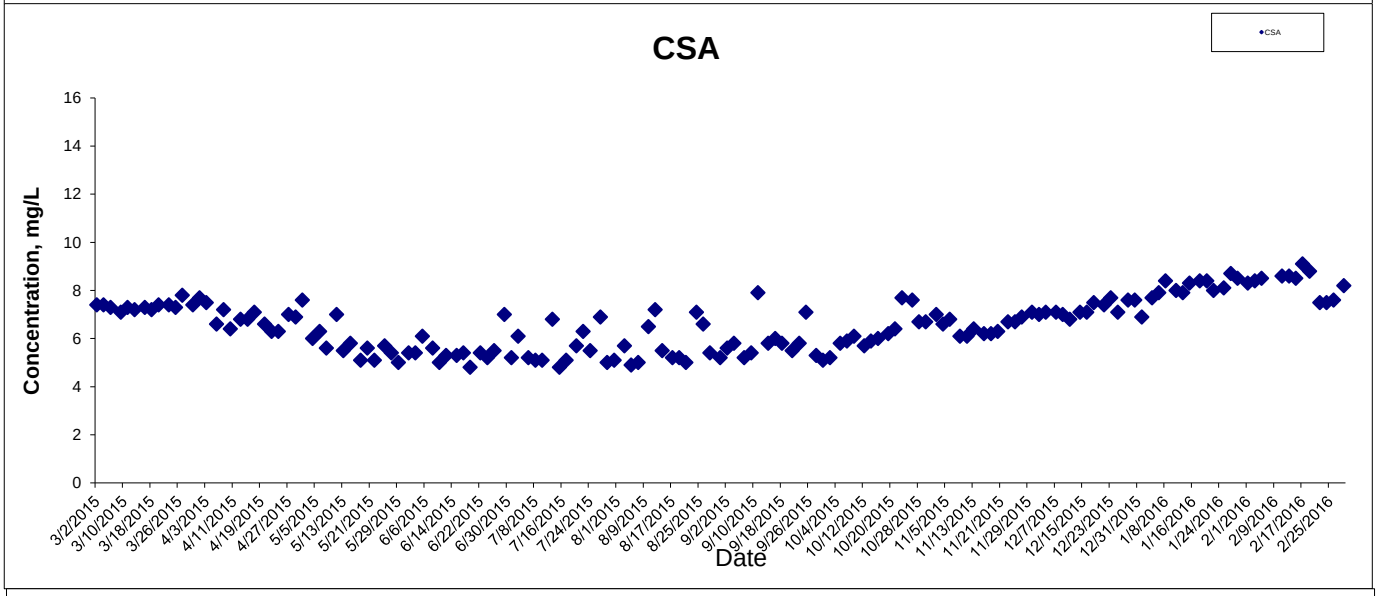
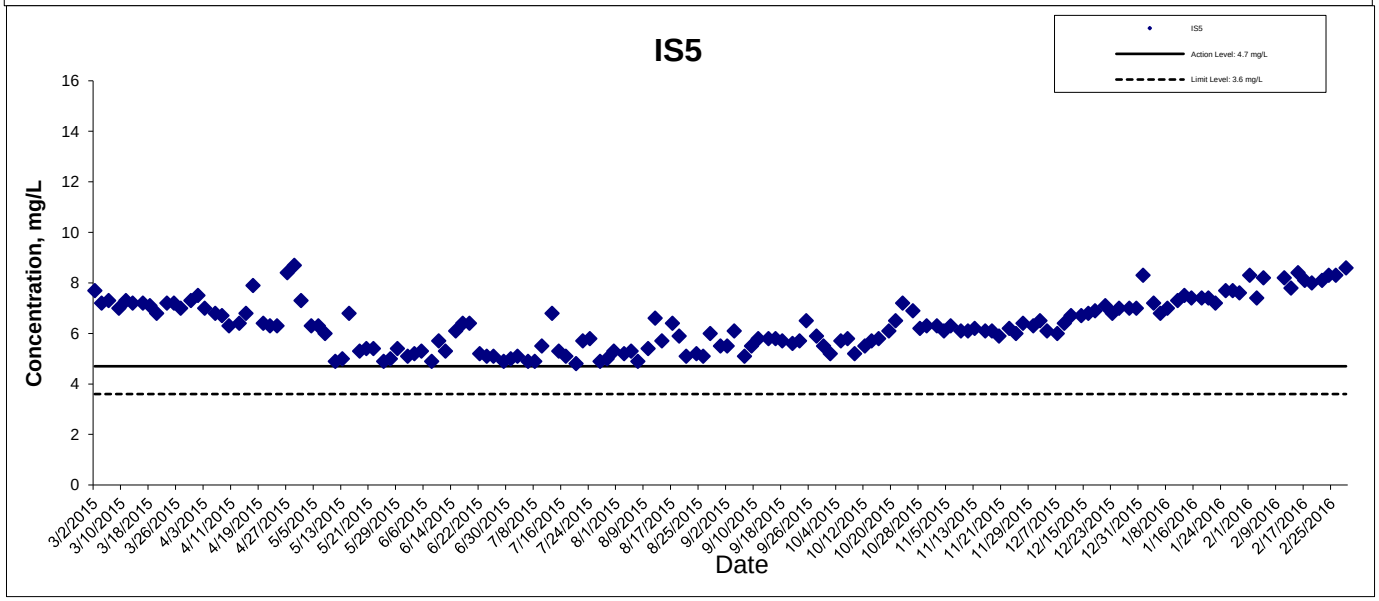
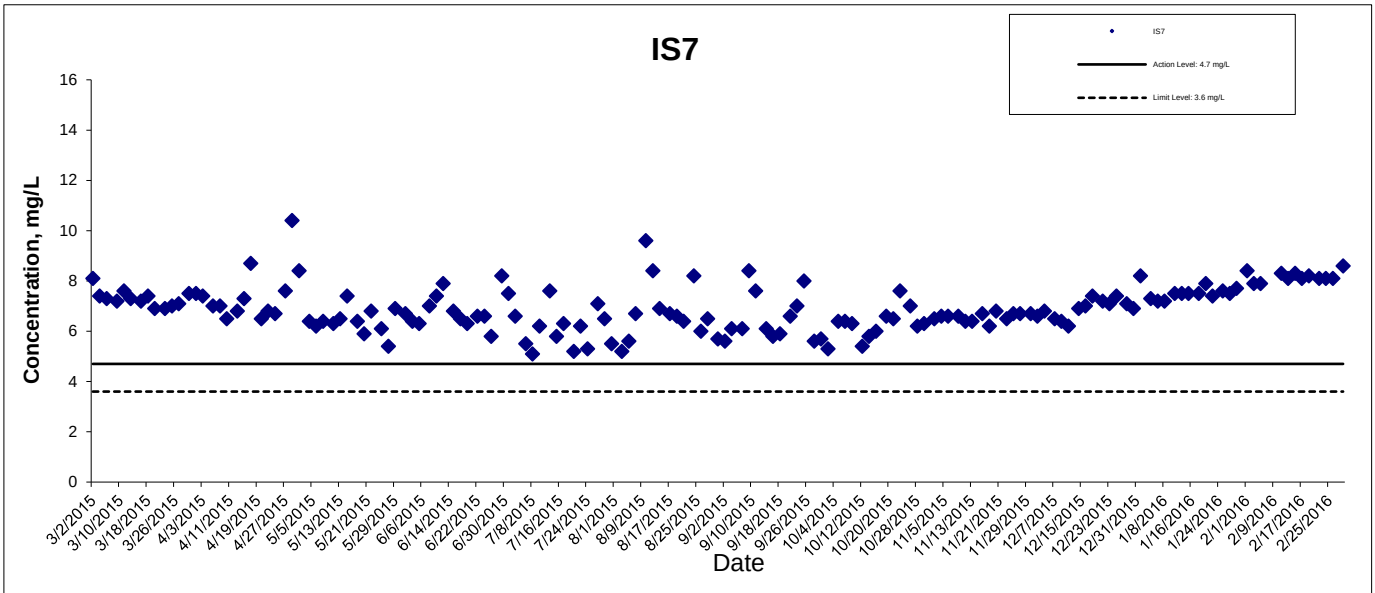
Dissolved Oxygen (Bottom) at Mid-Flood Tide

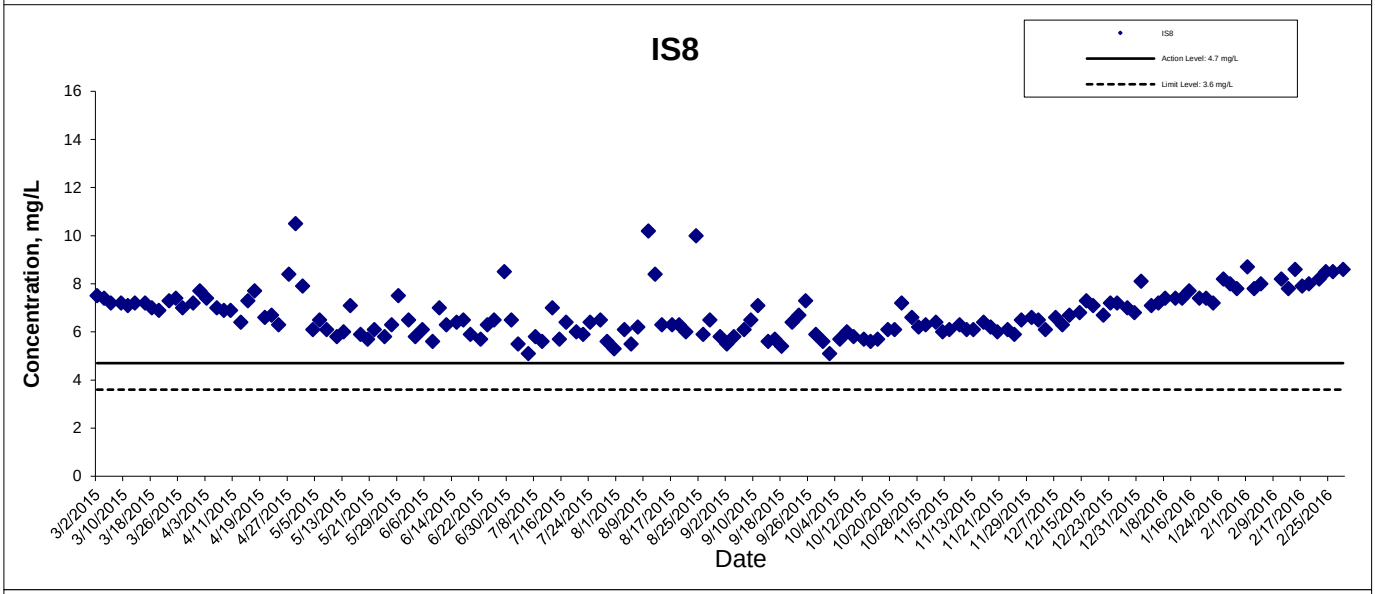


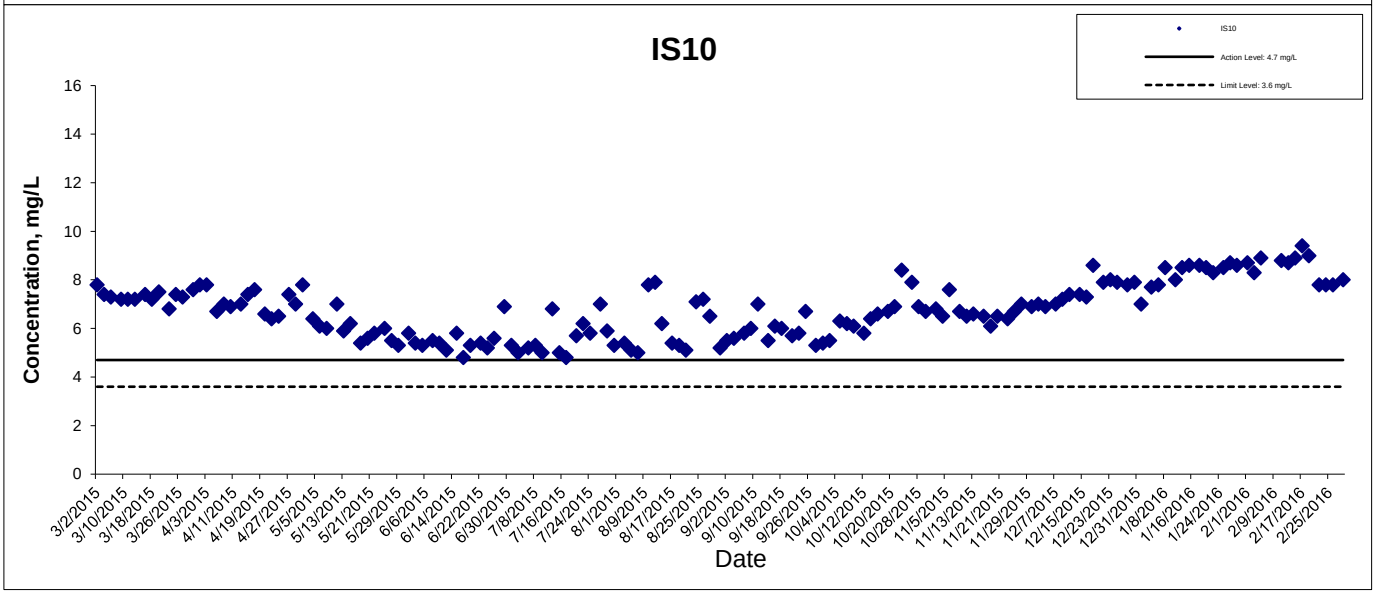




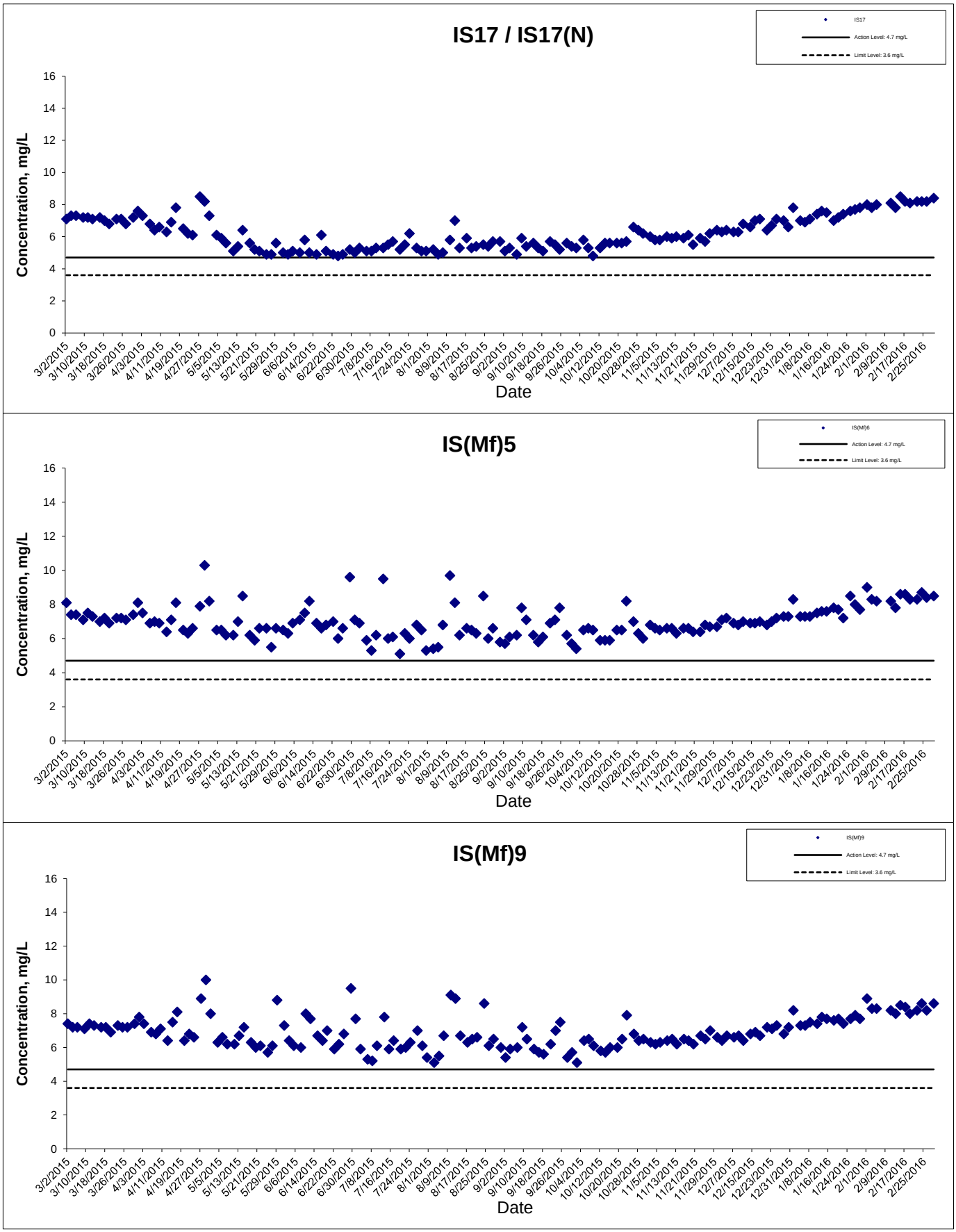
Dissolved Oxygen (Bottom) at Mid-Flood Tide



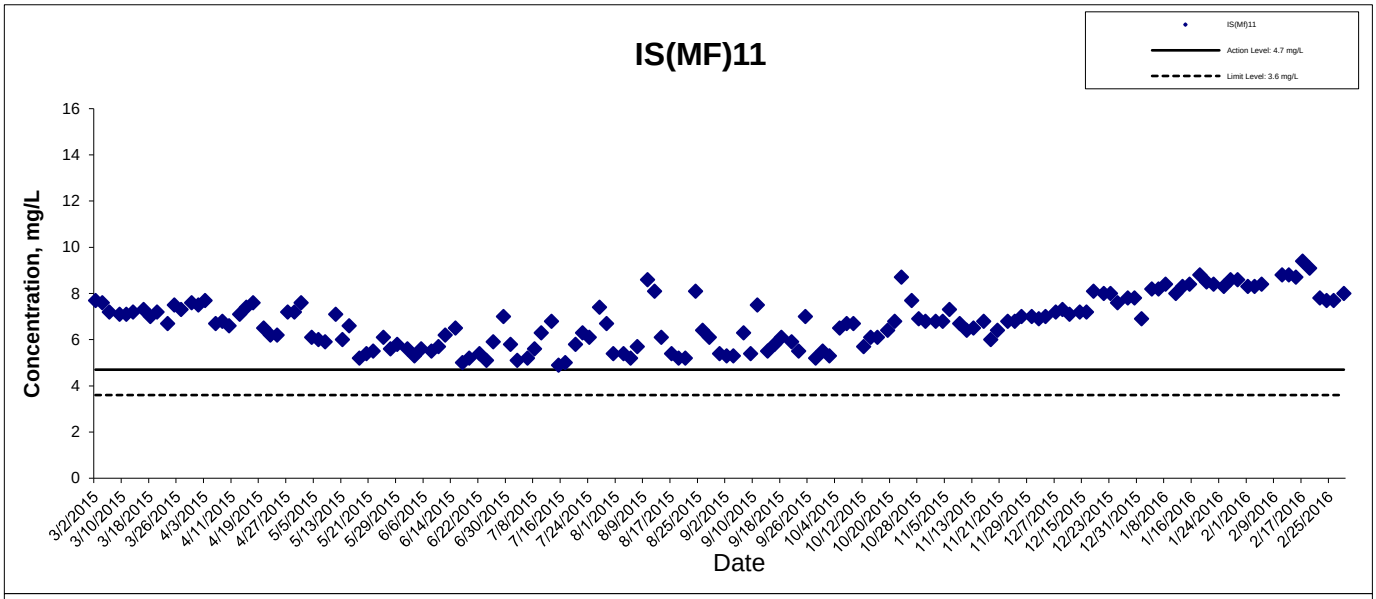


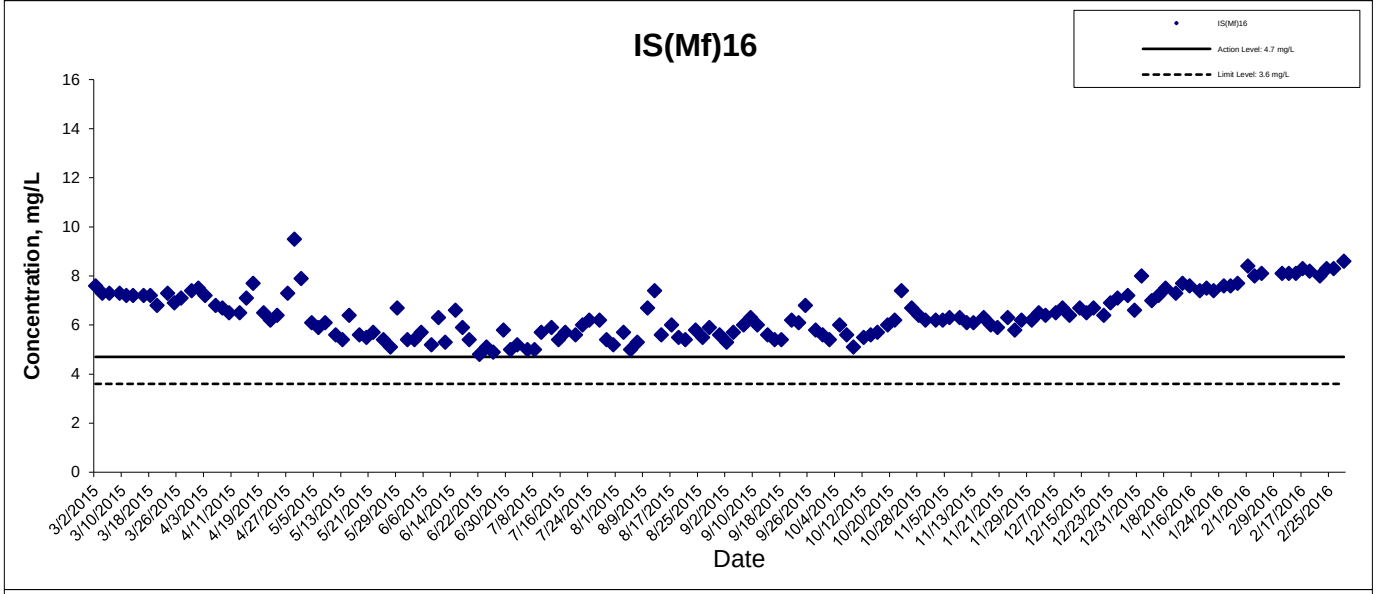


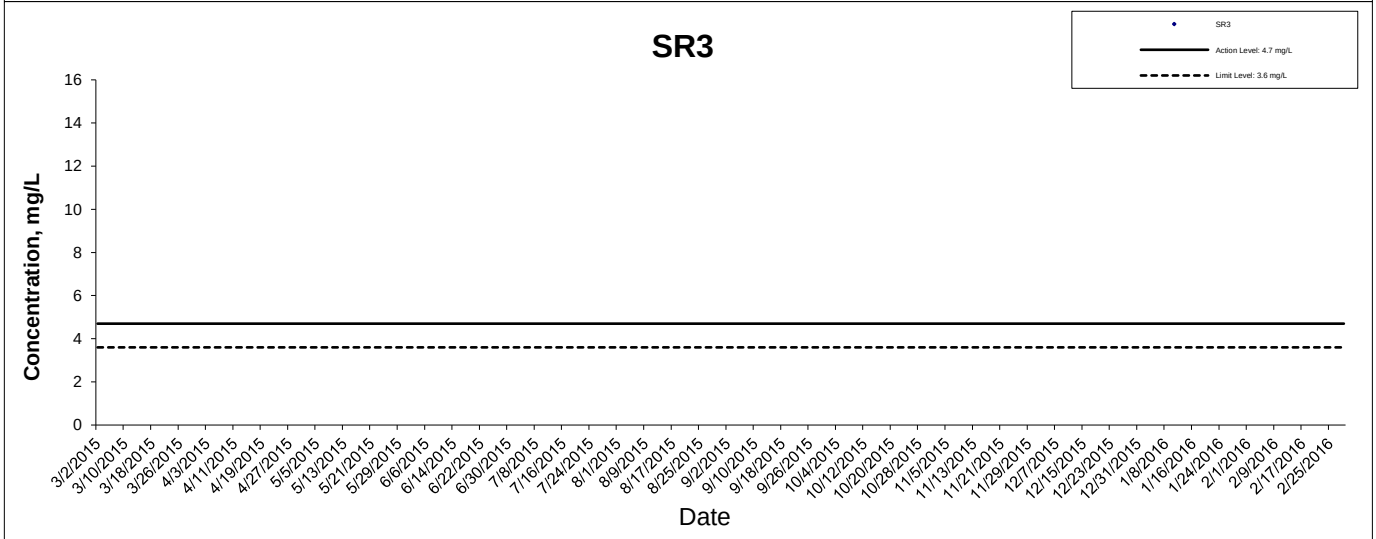
Dissolved Oxygen (Bottom) at Mid-Flood Tide



Dissolved Oxygen (Bottom) at Mid-Flood Tide

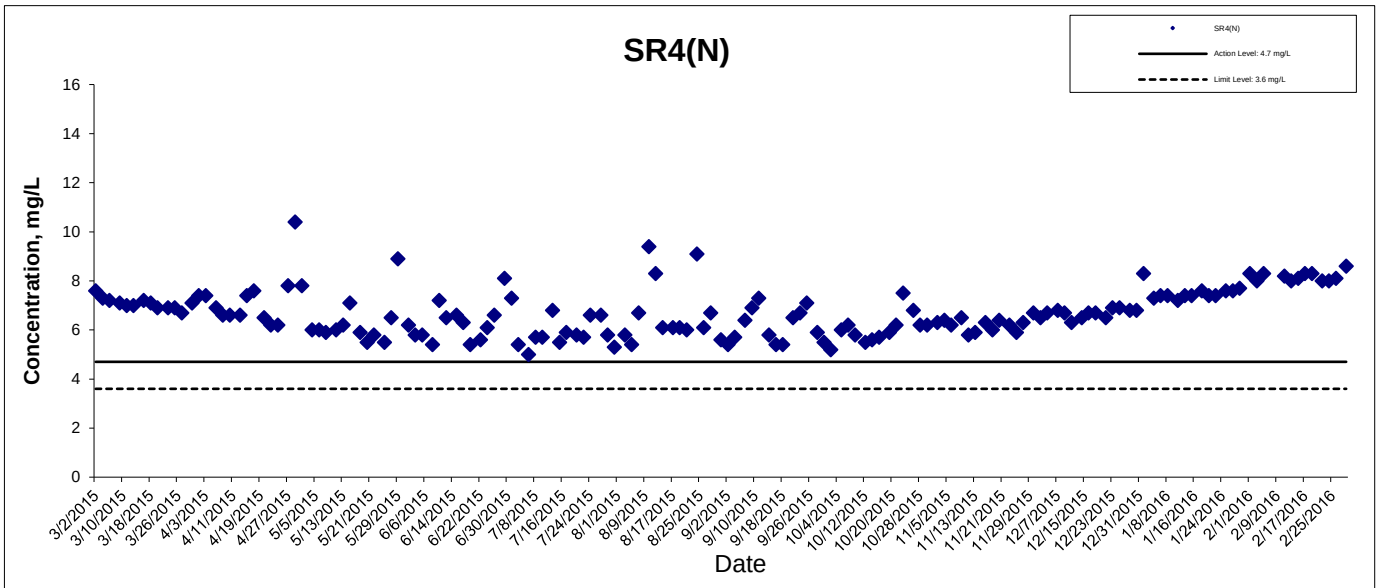


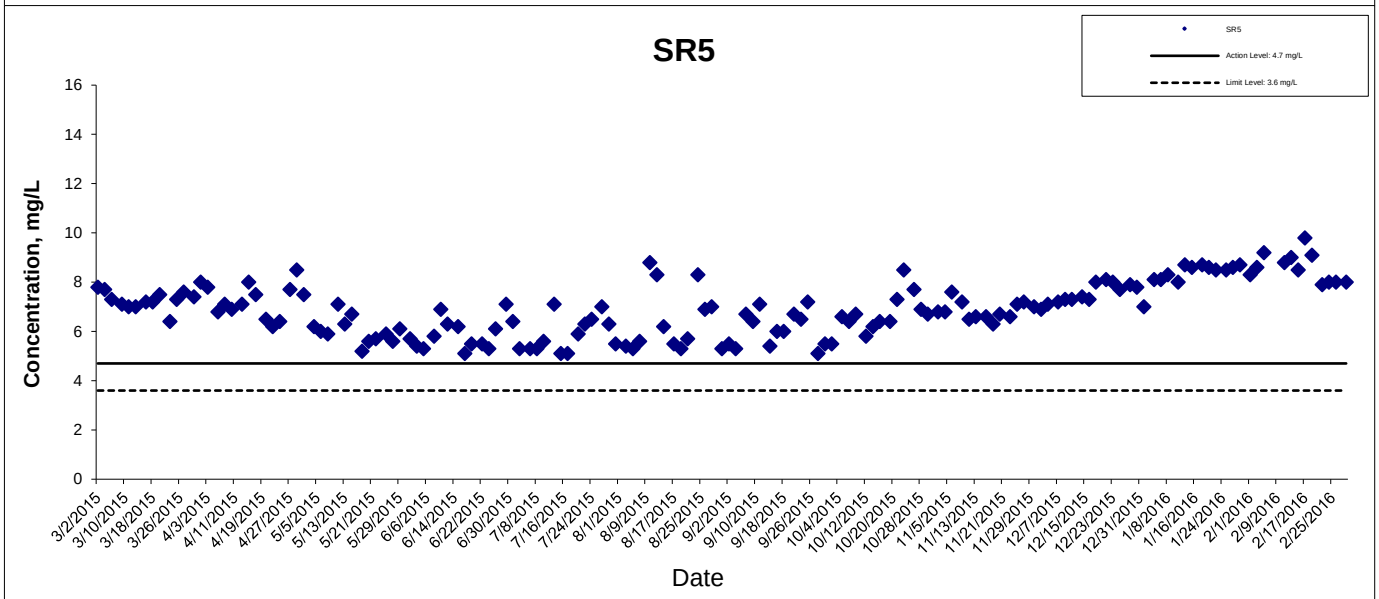


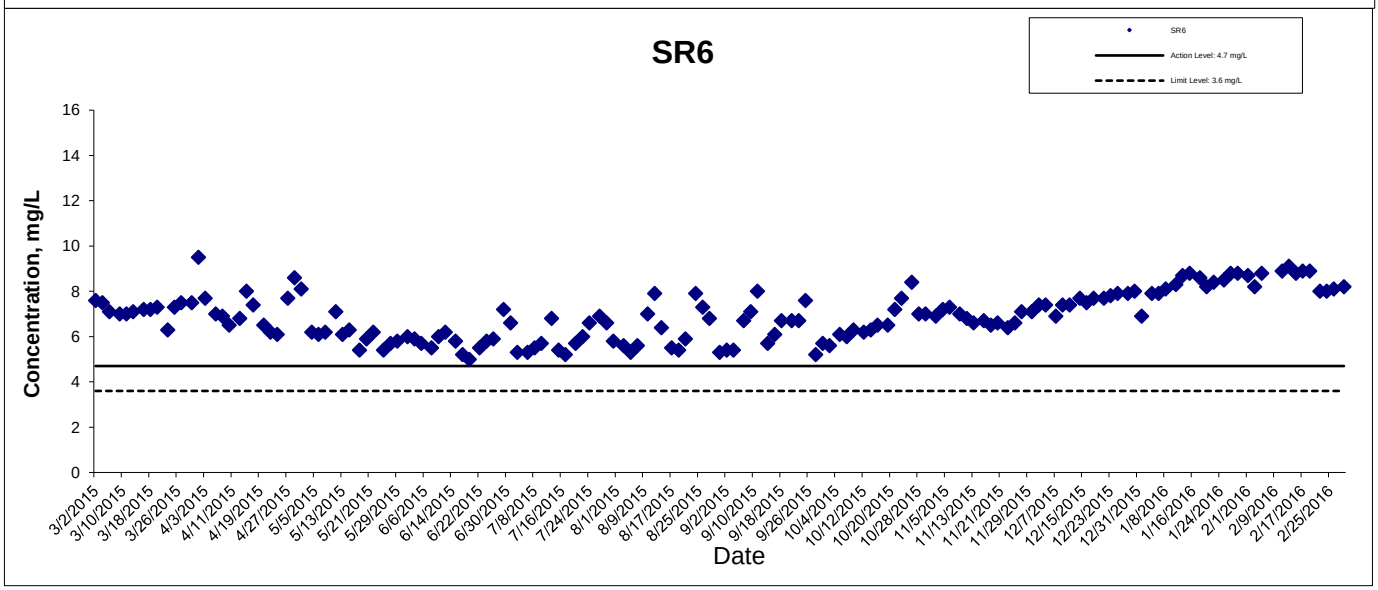


As the measured water depths were less than 3 m during all monitoring days, water samples are collected at mid-depth only .

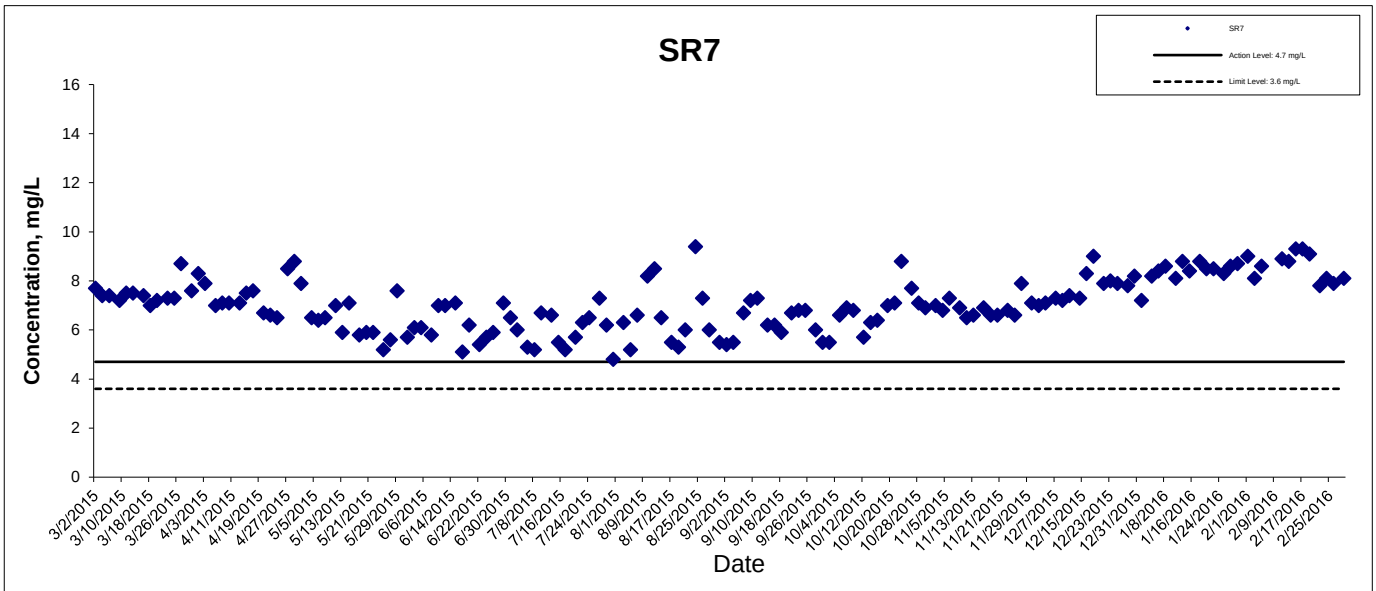
Dissolved Oxygen (Bottom) at Mid-Flood Tide

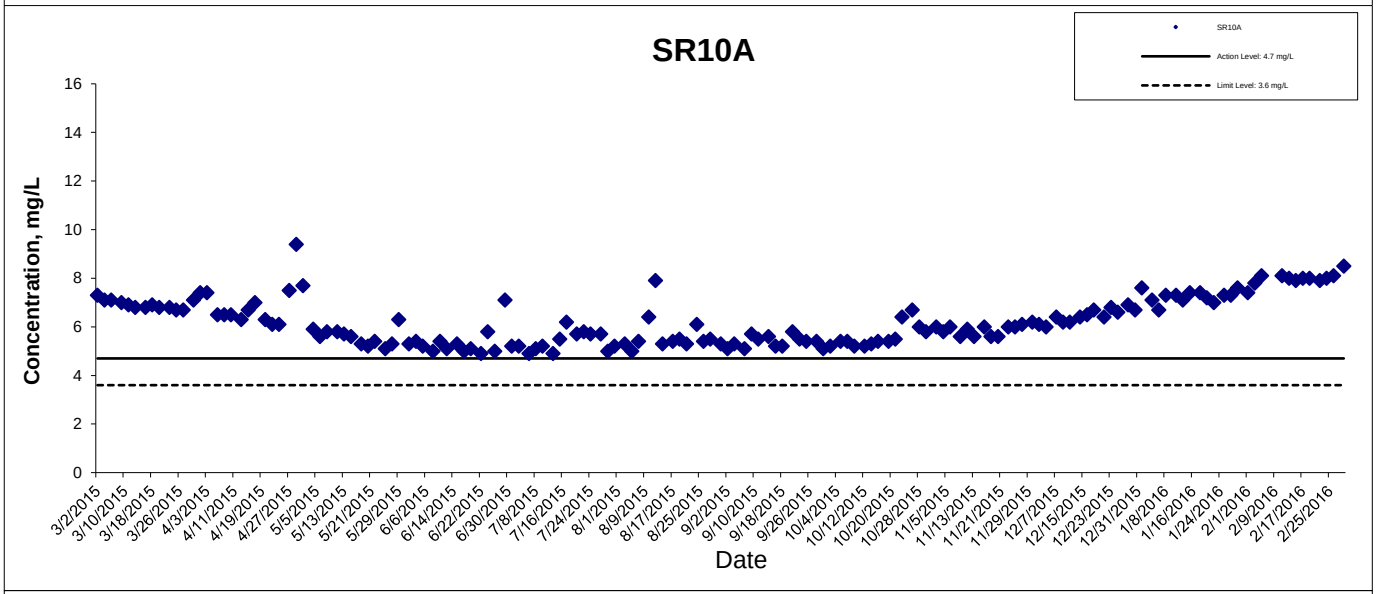


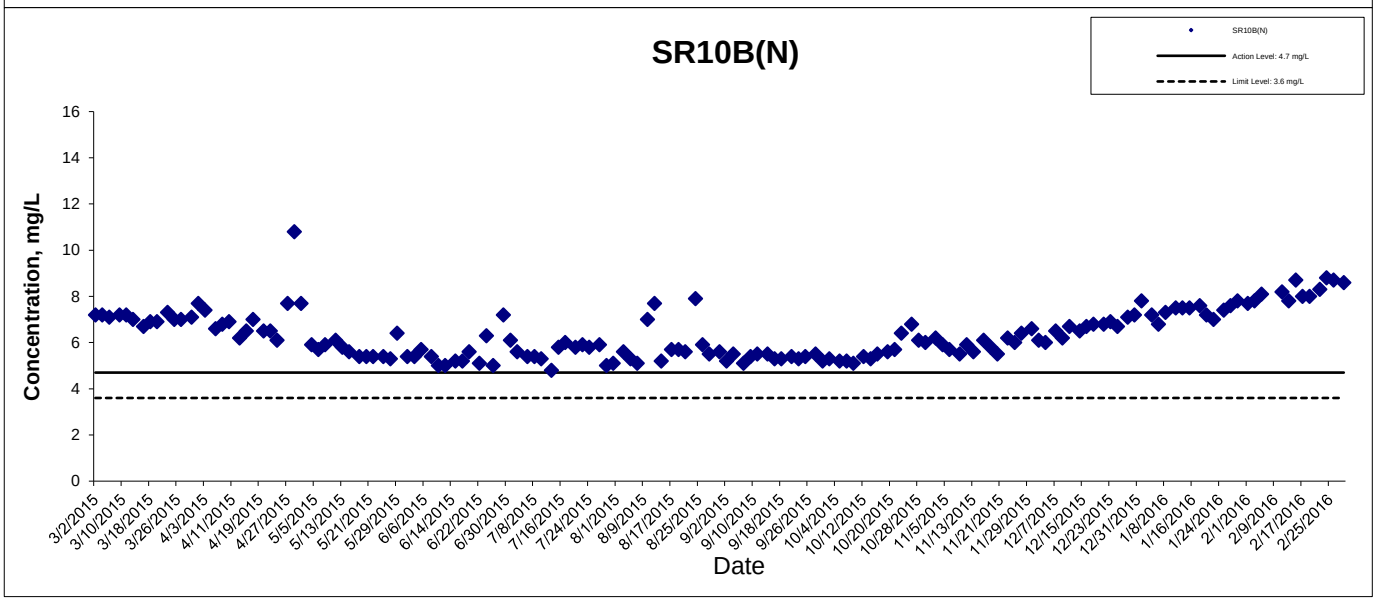




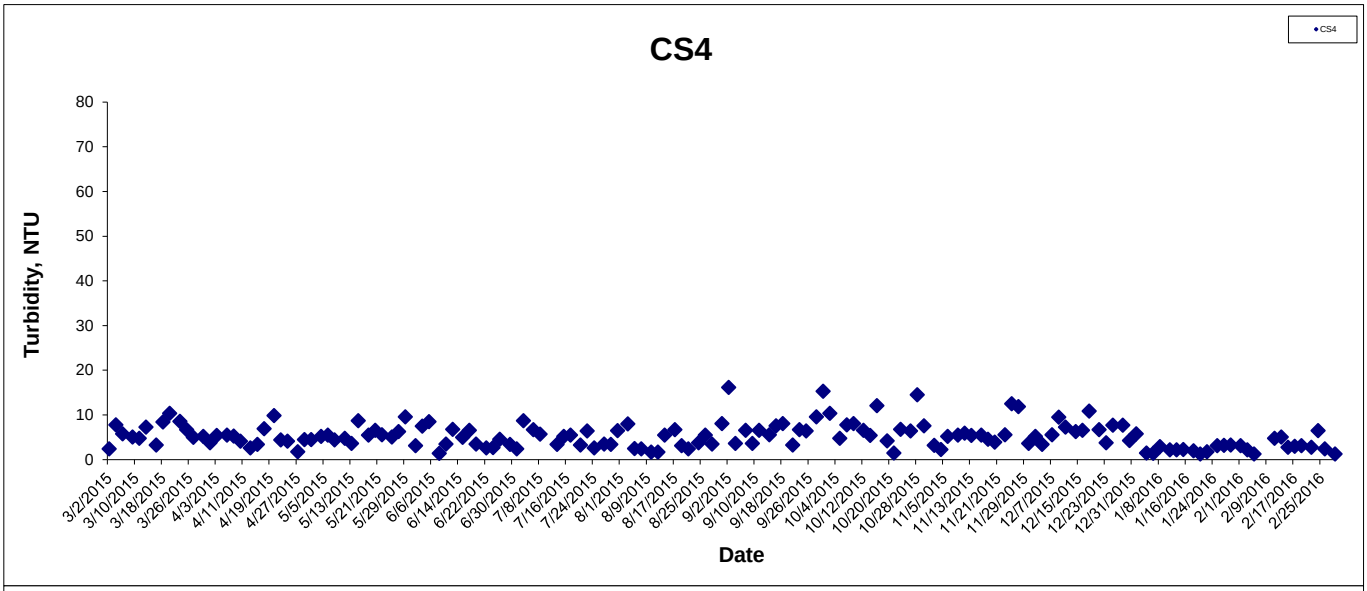
Dissolved Oxygen (Bottom) at Mid-Flood Tide

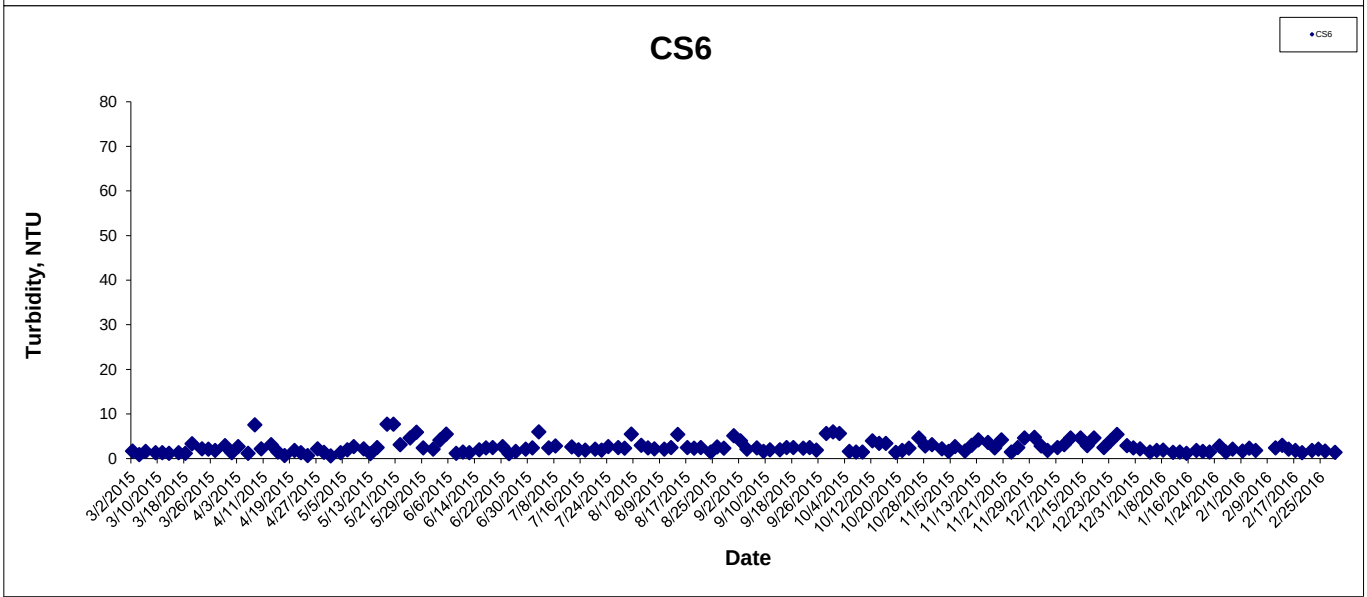


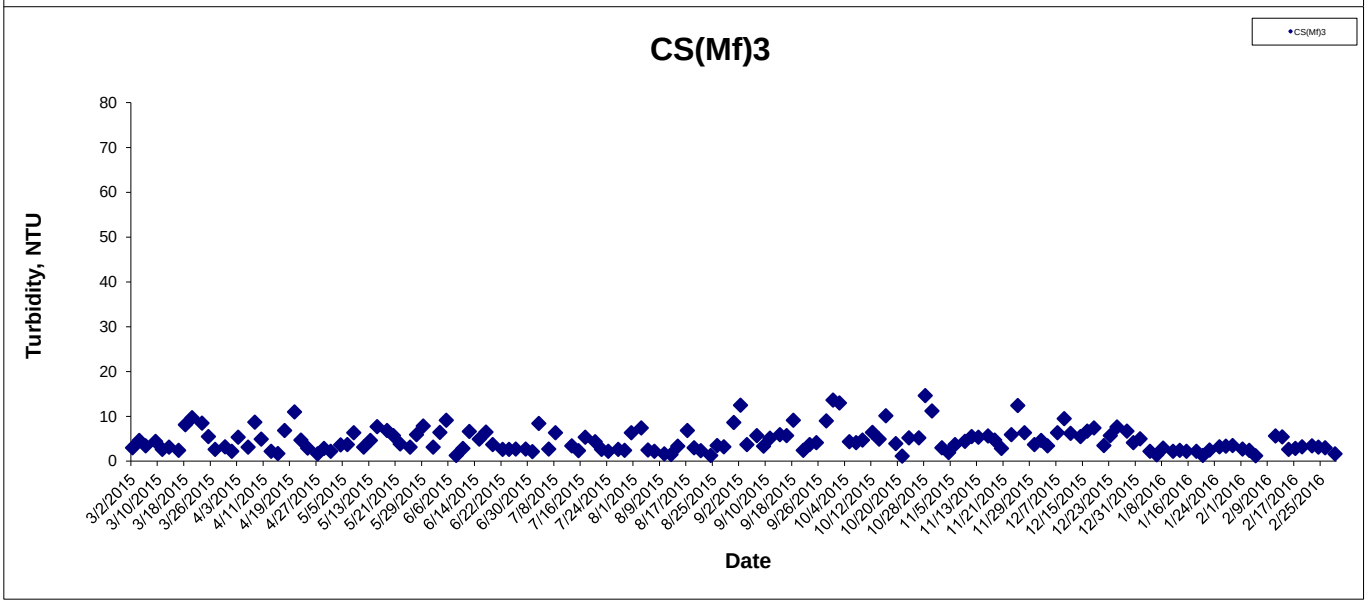




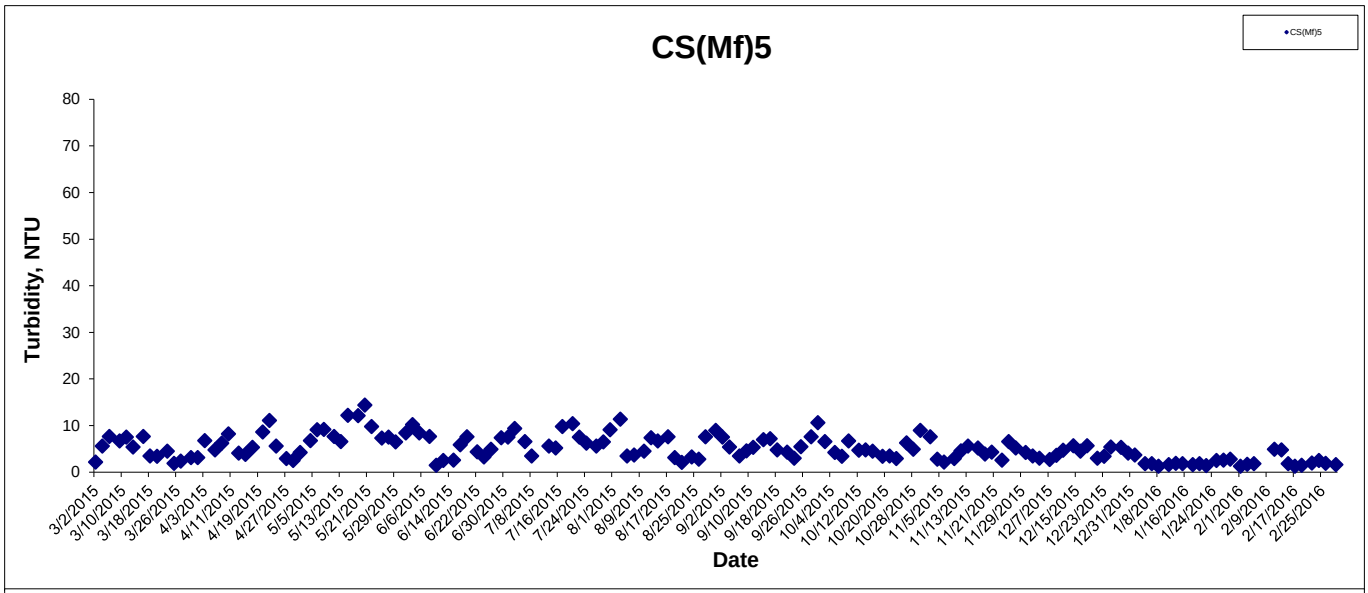
Turbidity at Mid-Ebb Tide

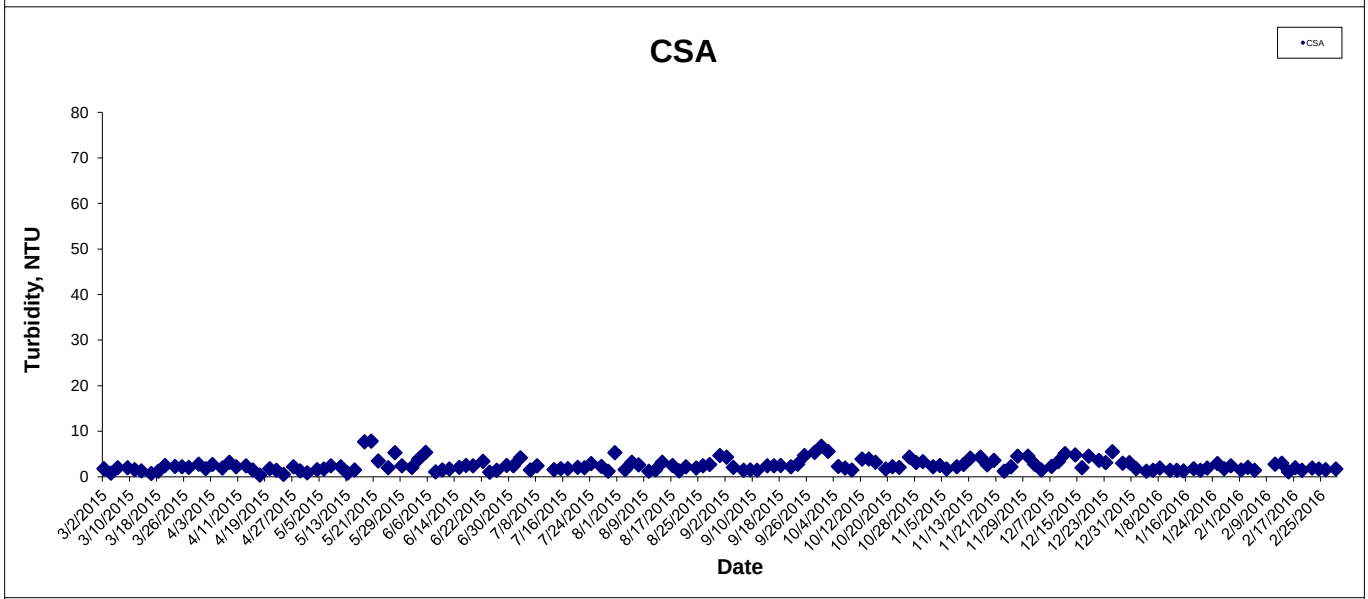


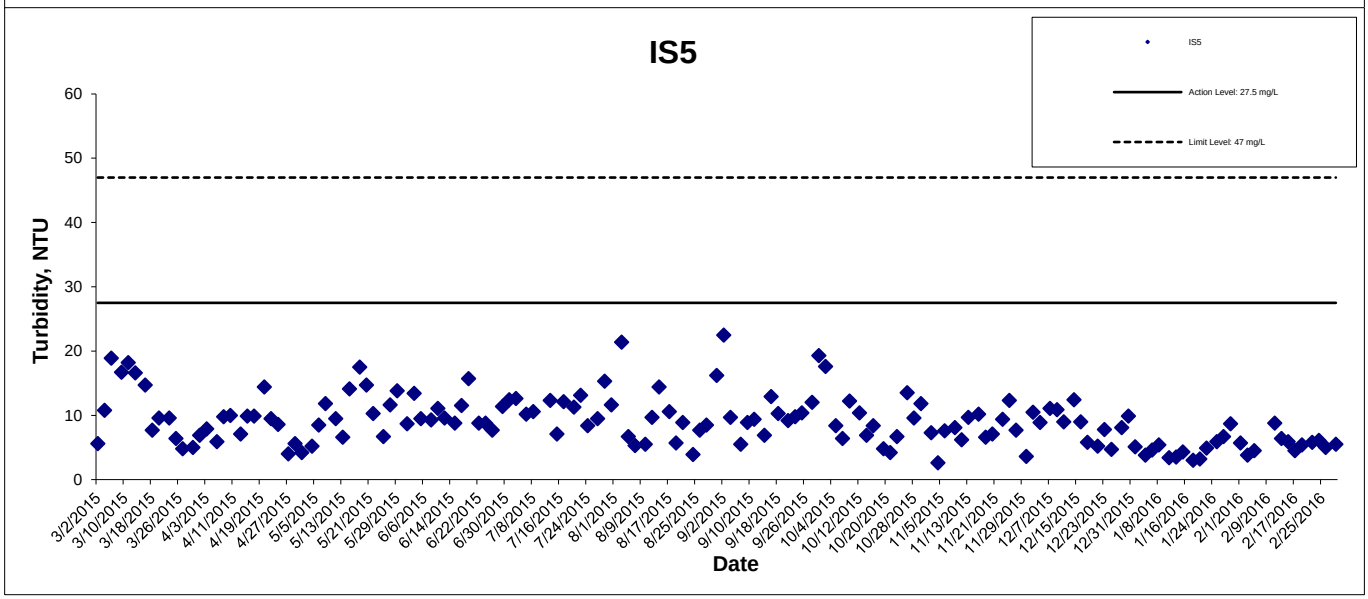




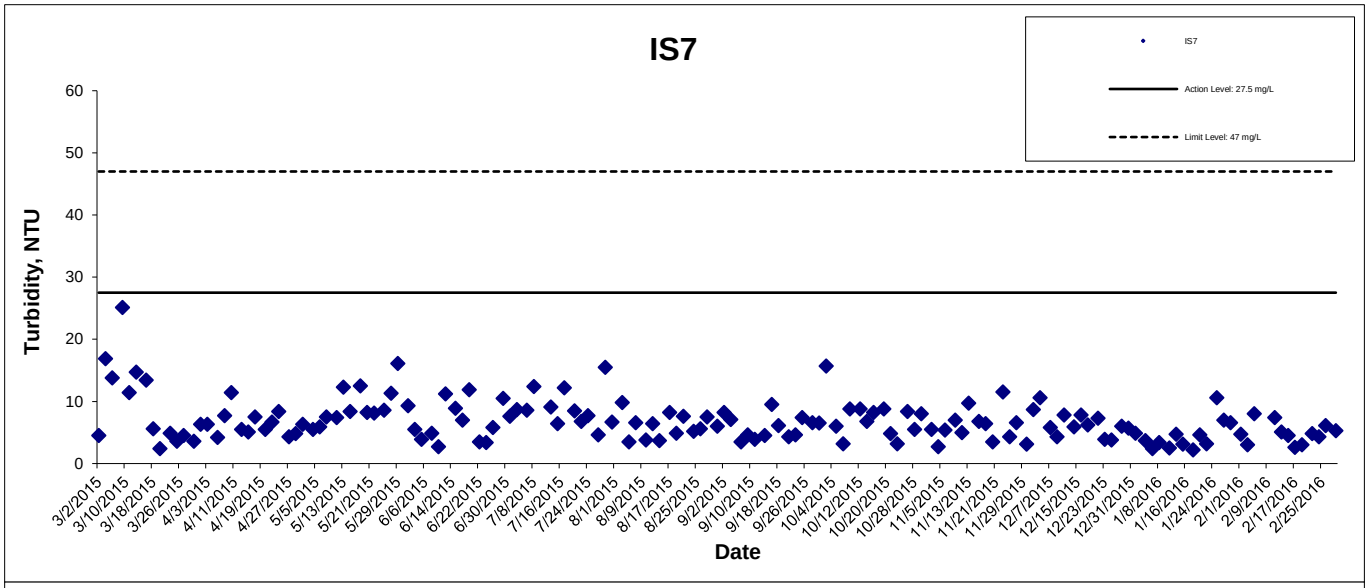
Turbidity at Mid-Ebb Tide

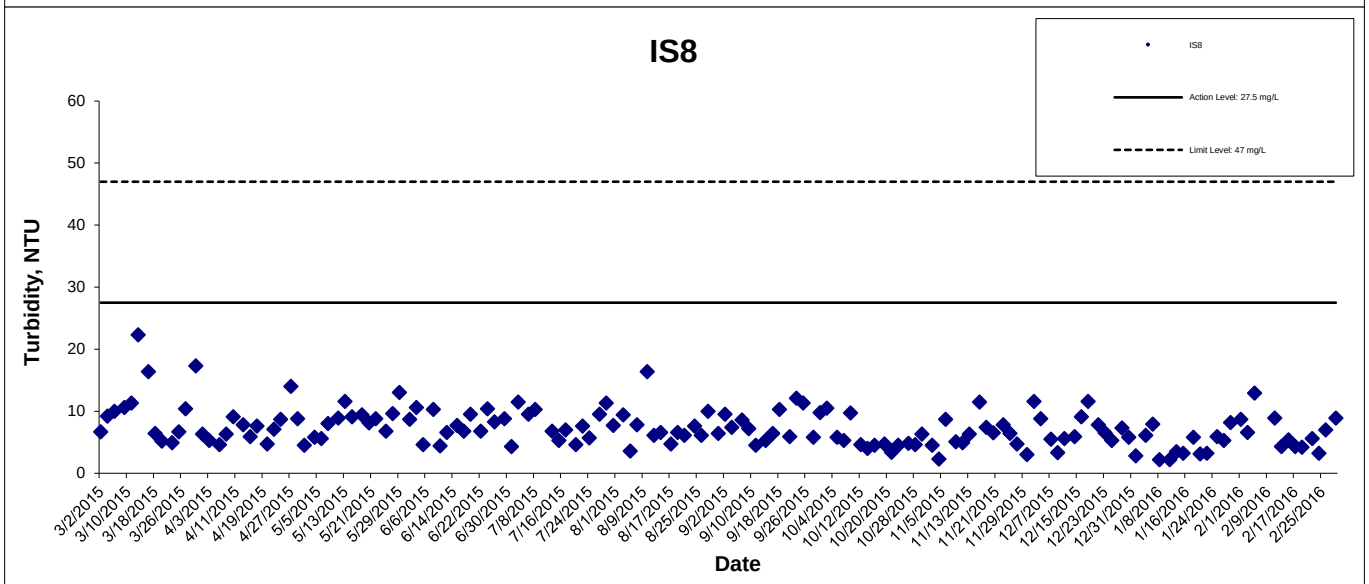


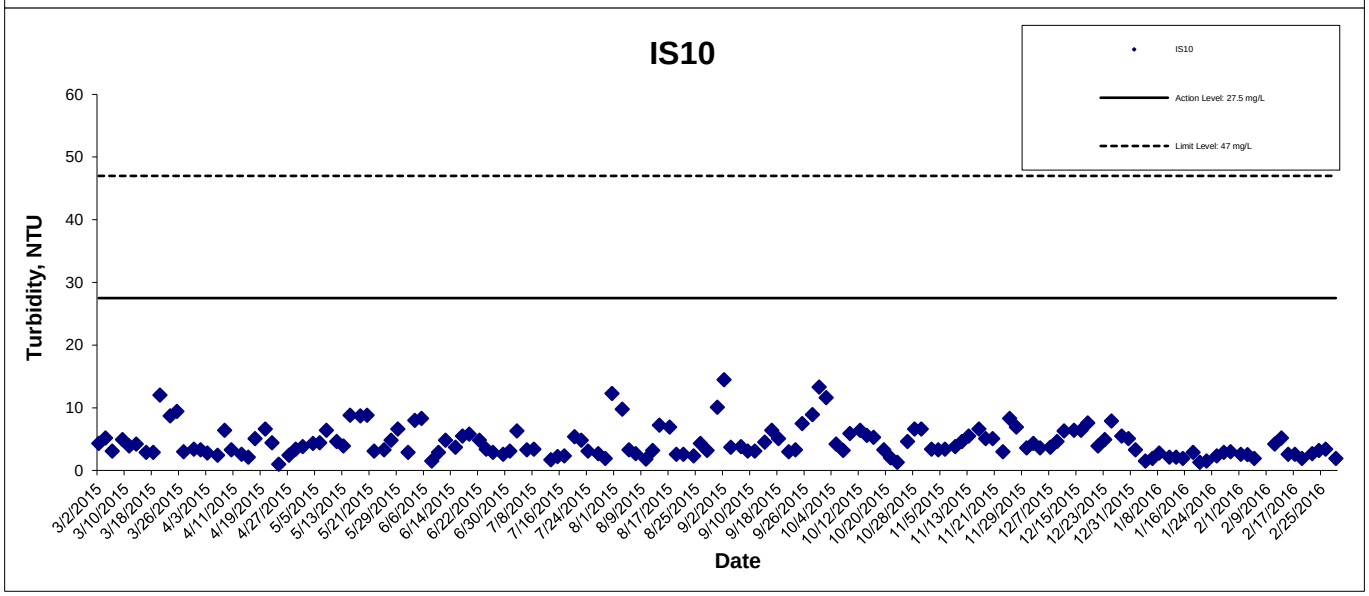




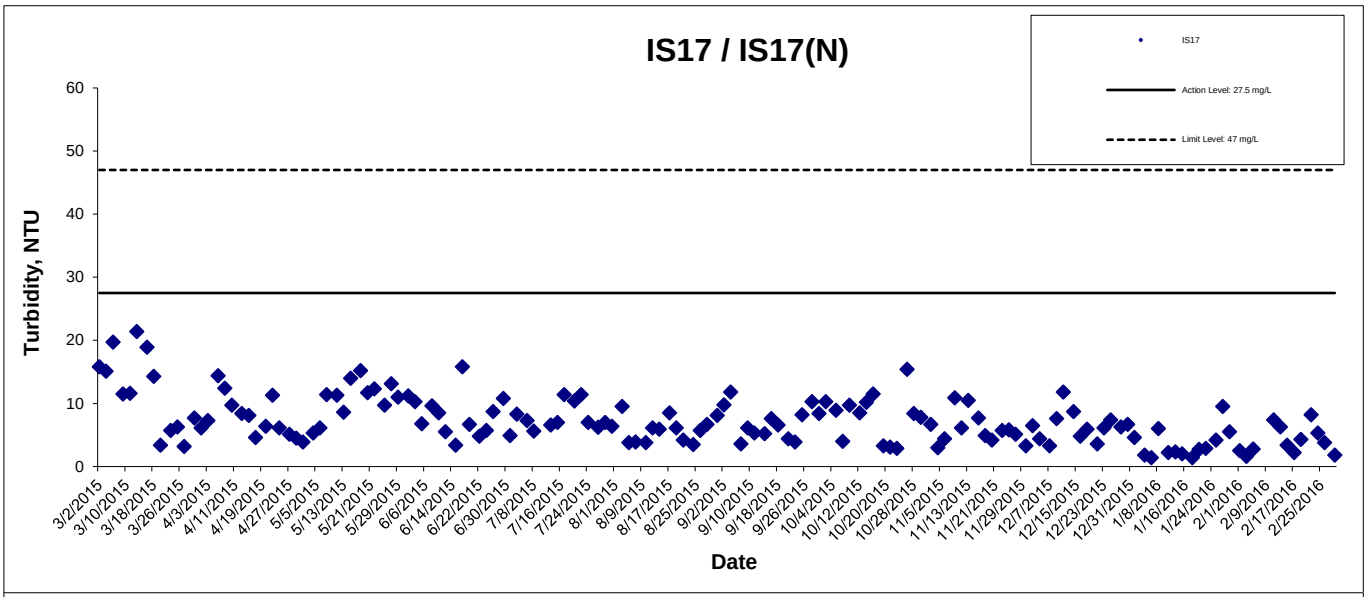
Turbidity at Mid-Ebb Tide

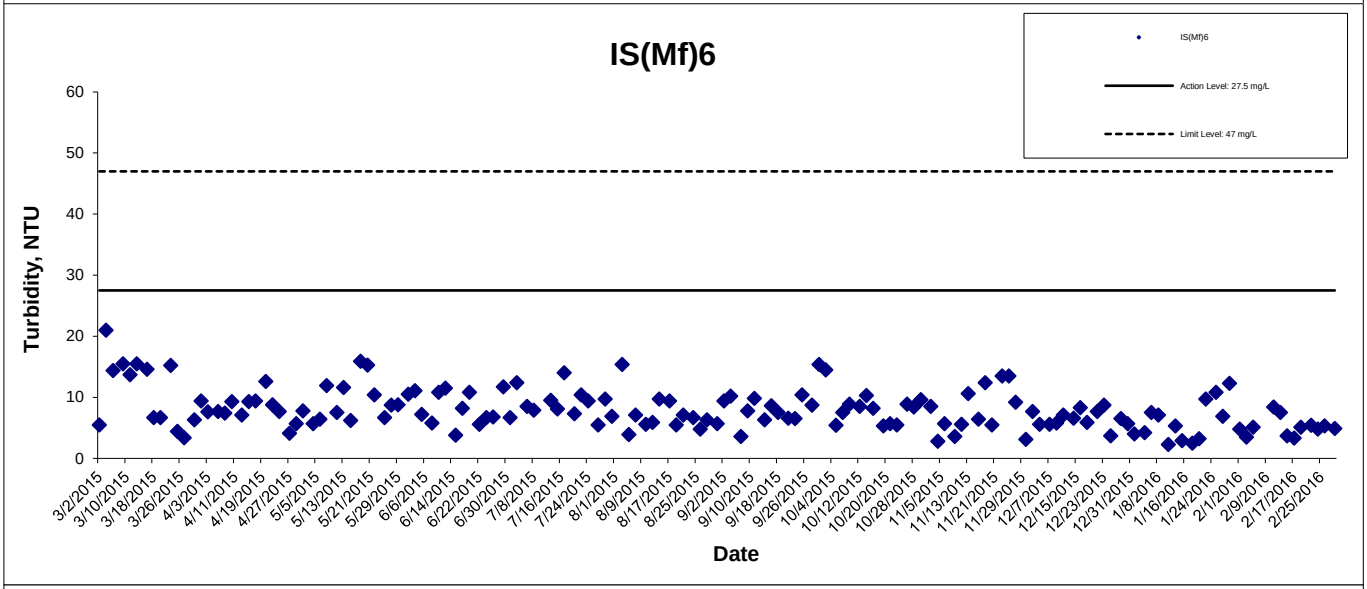


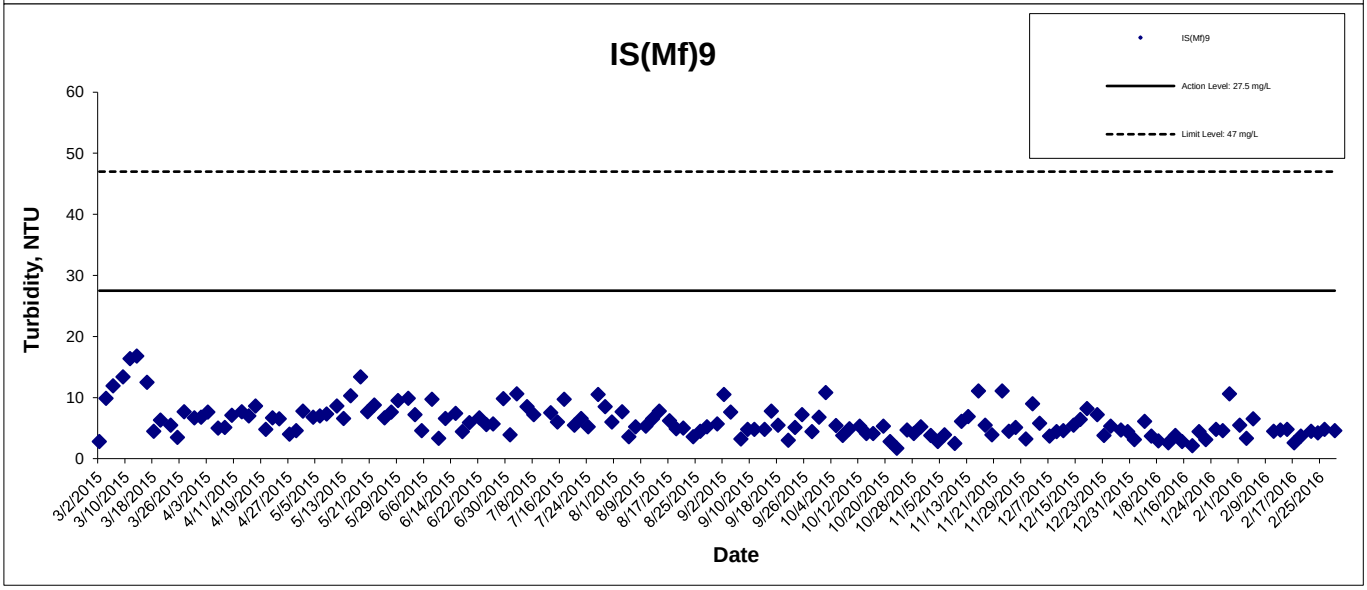




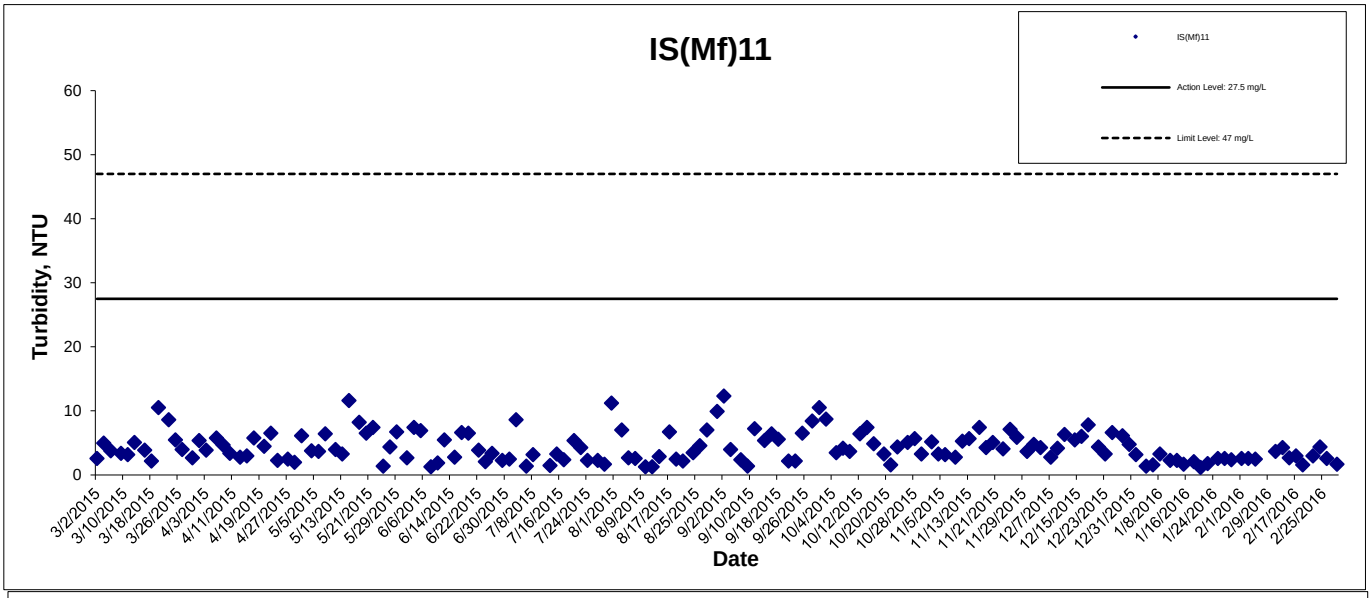
Turbidity at Mid-Ebb Tide

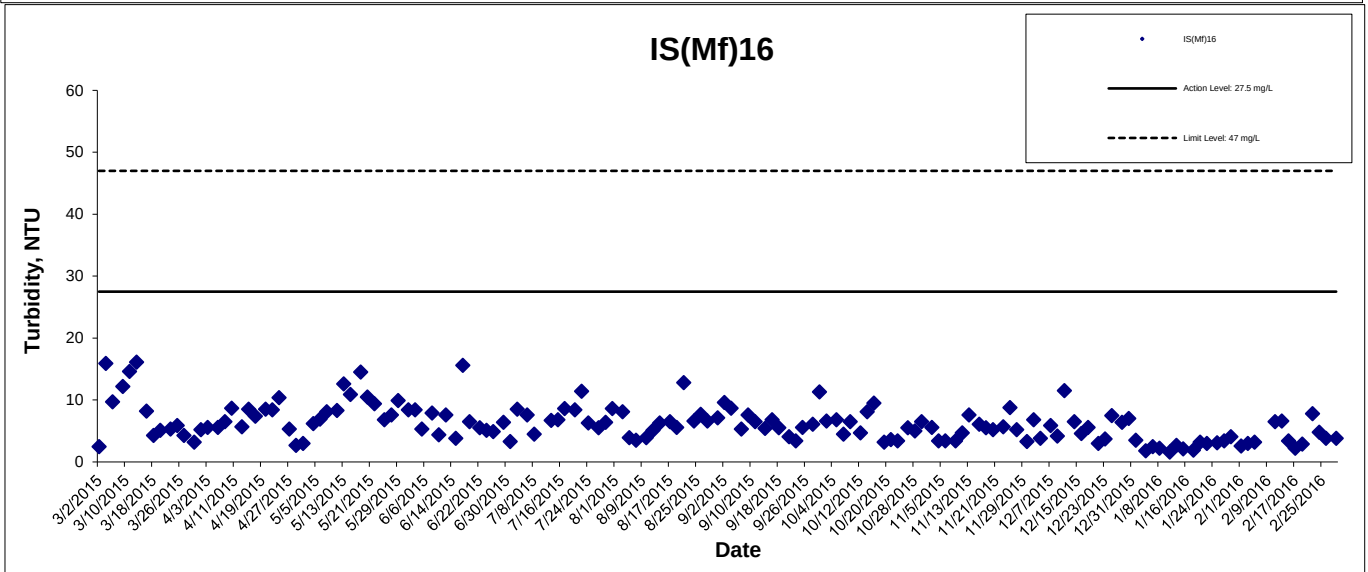


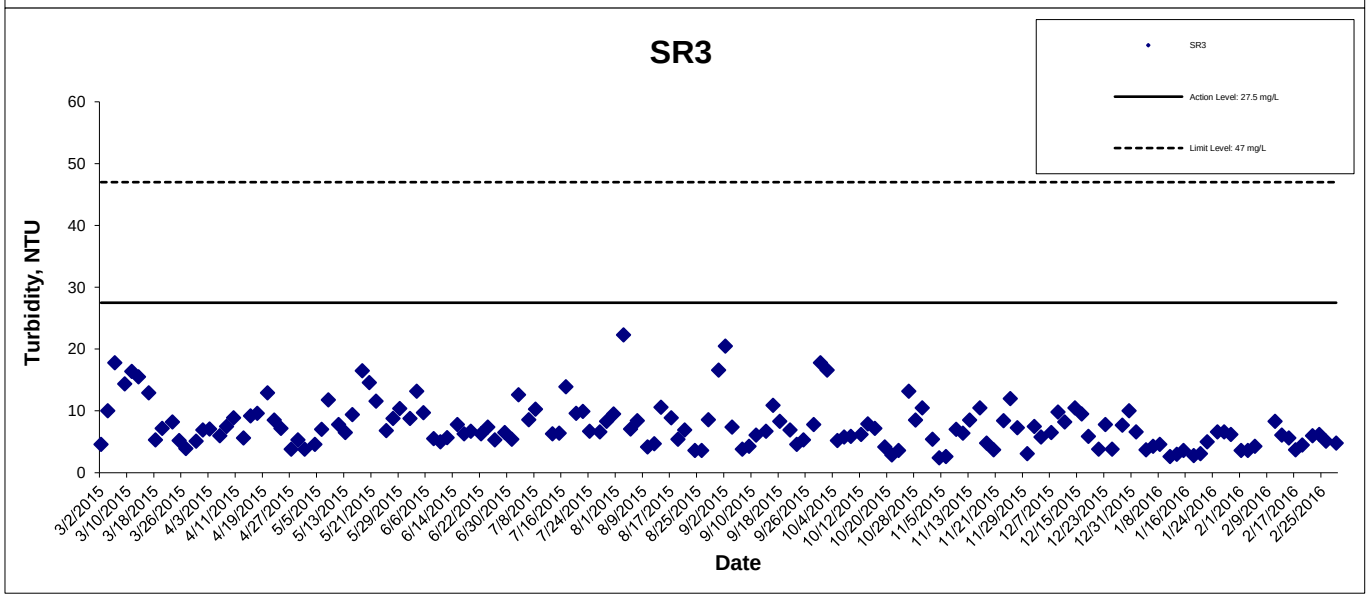




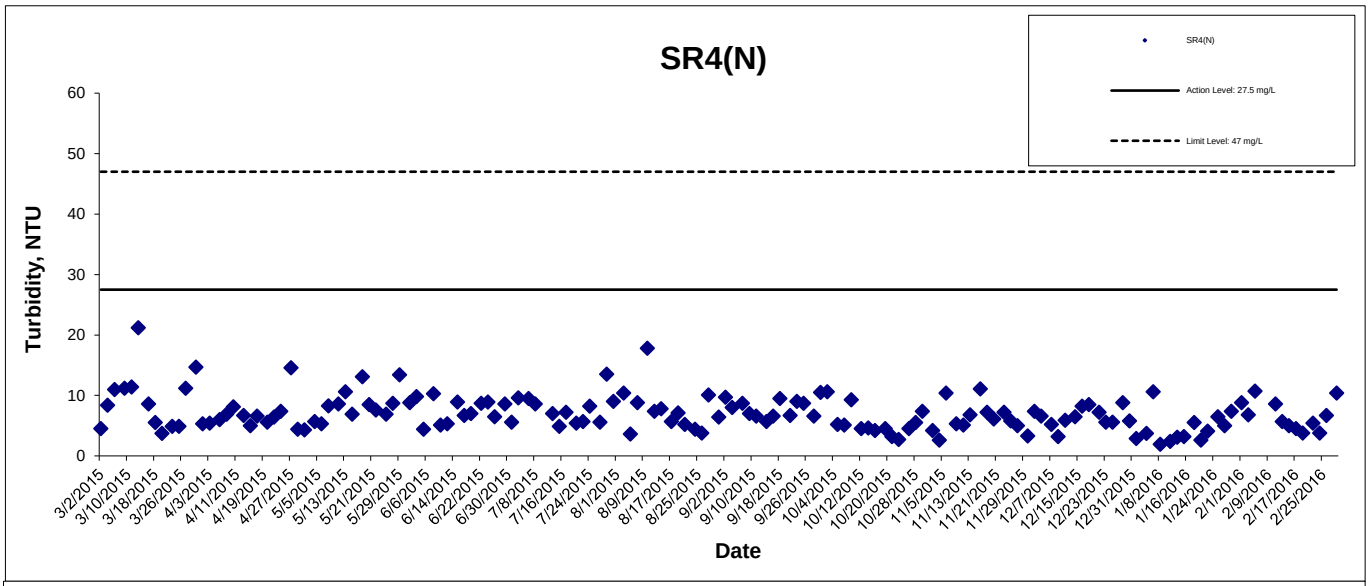
Turbidity at Mid-Ebb Tide

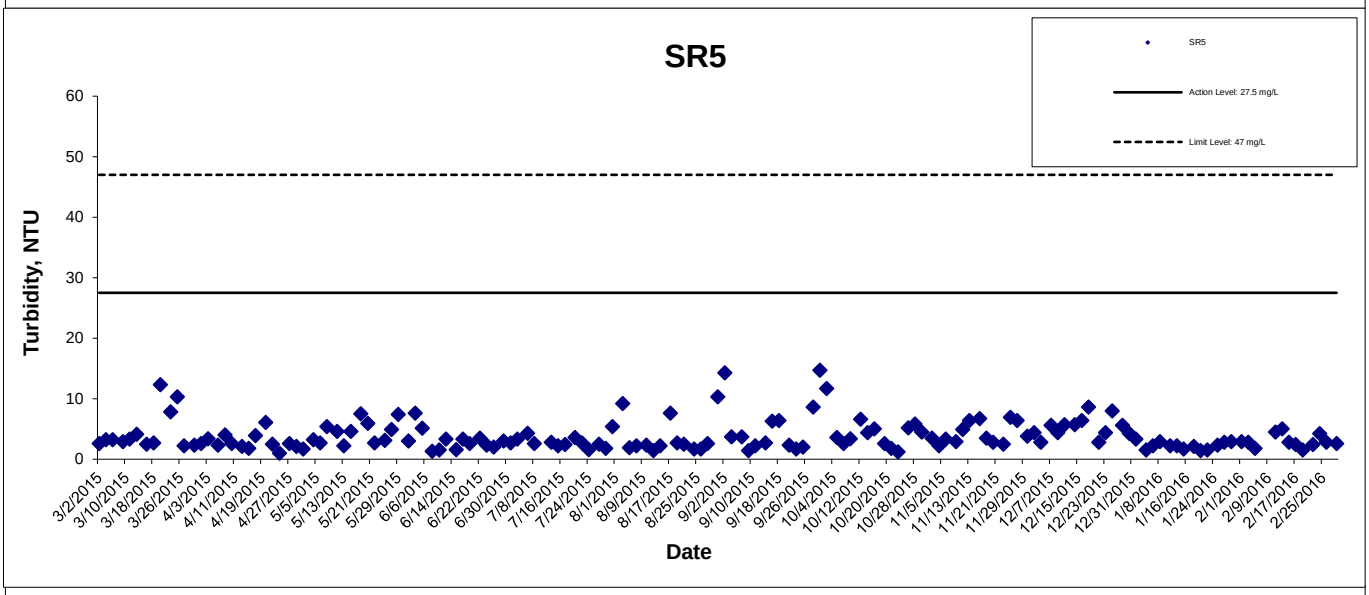


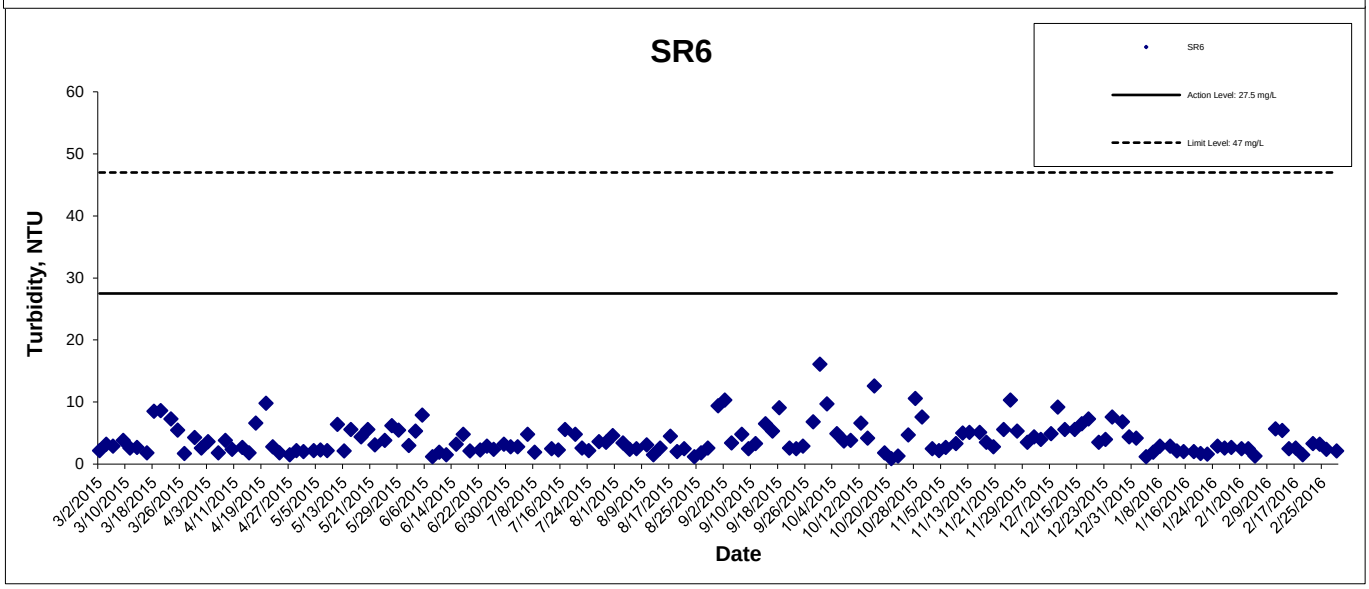




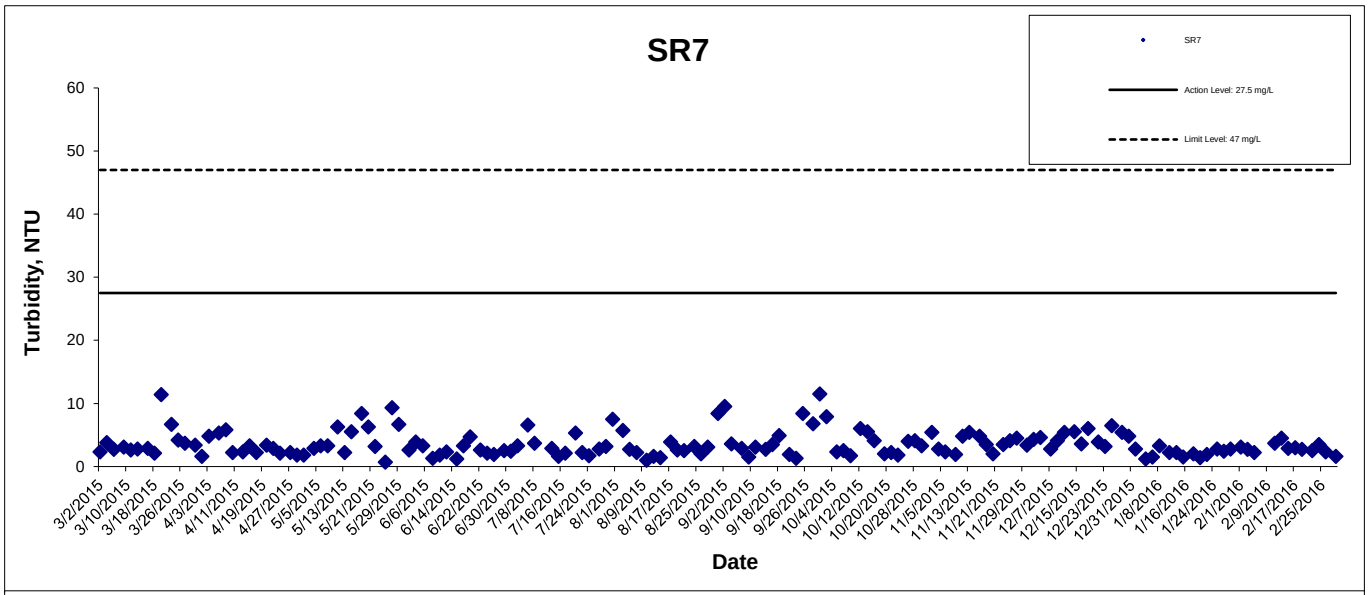
Turbidity at Mid-Ebb Tide

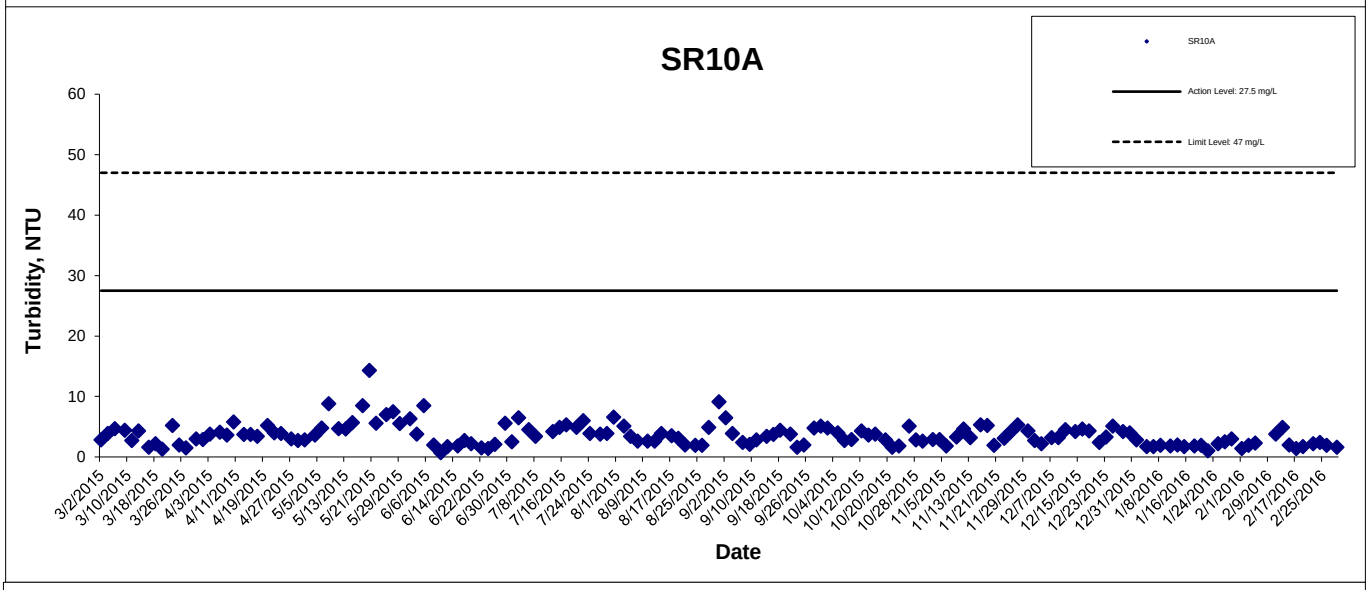


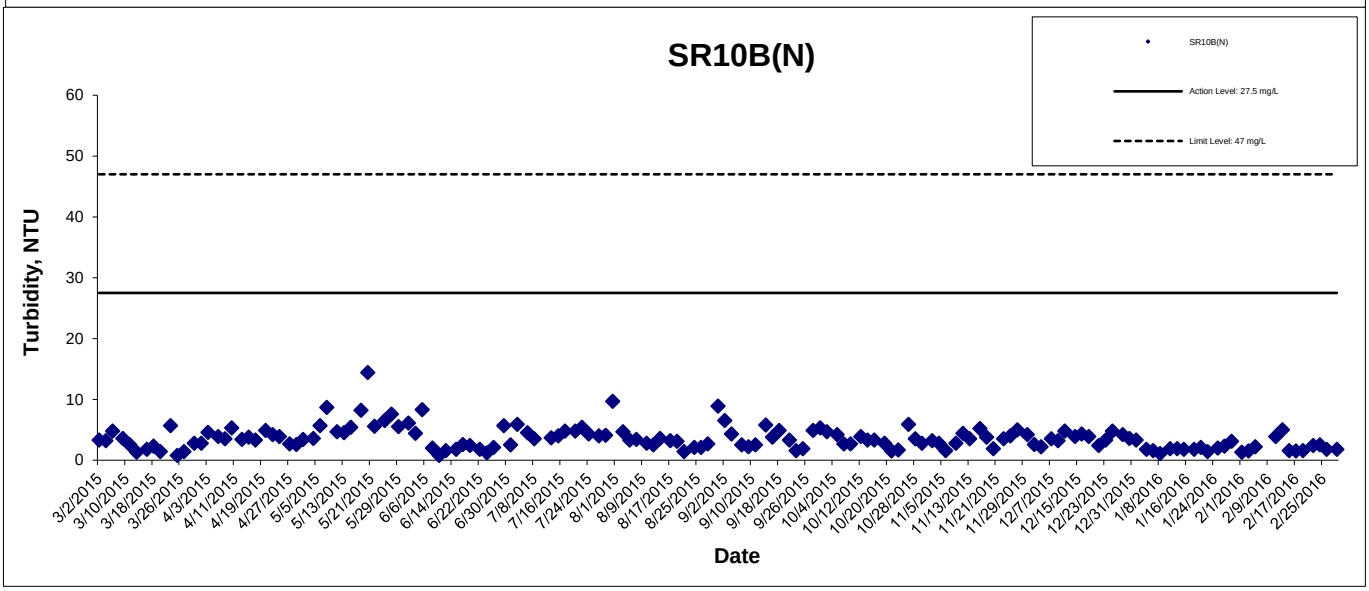




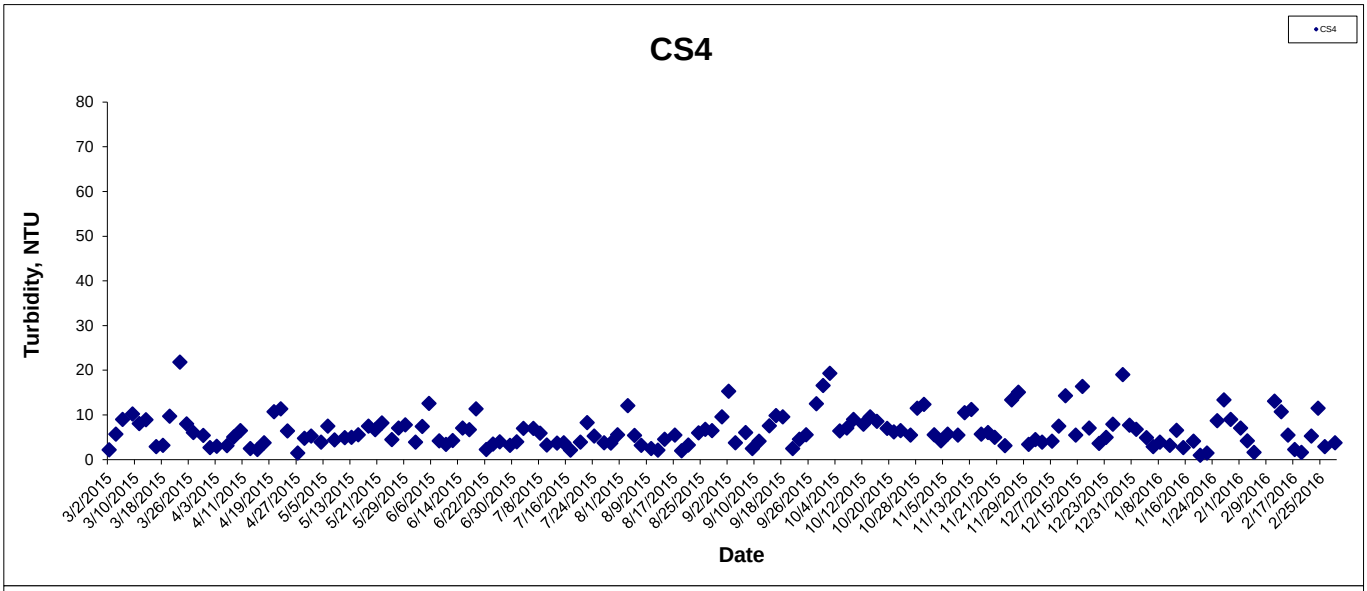
Turbidity at Mid-Ebb Tide

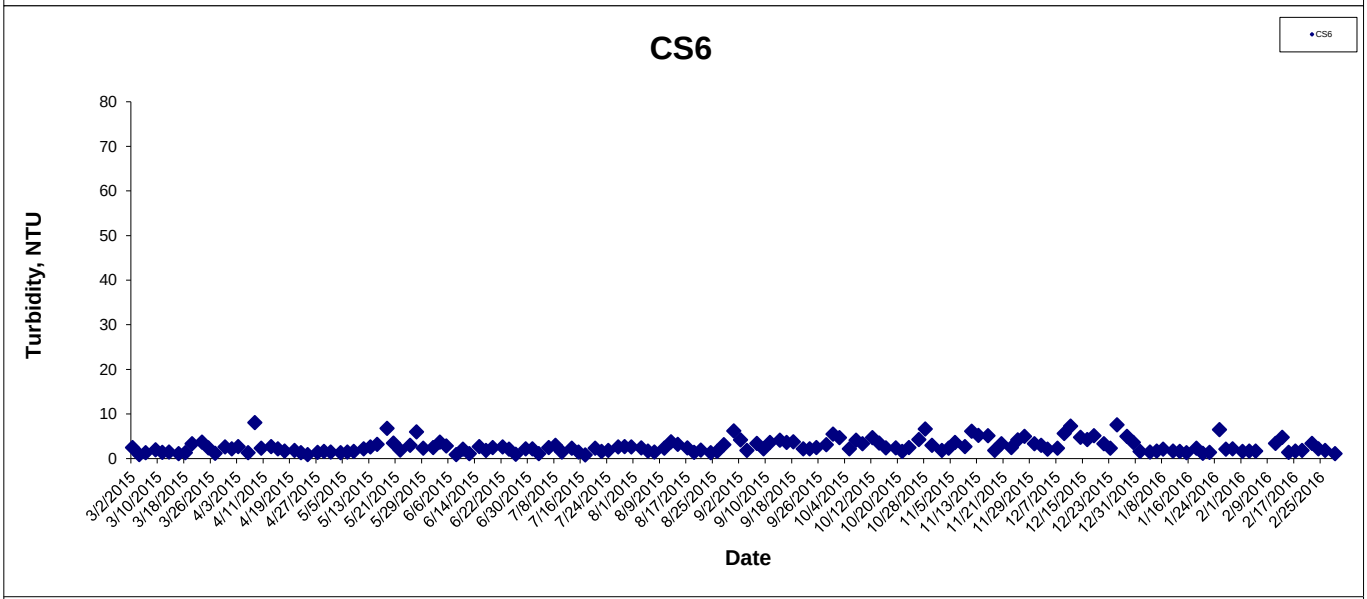


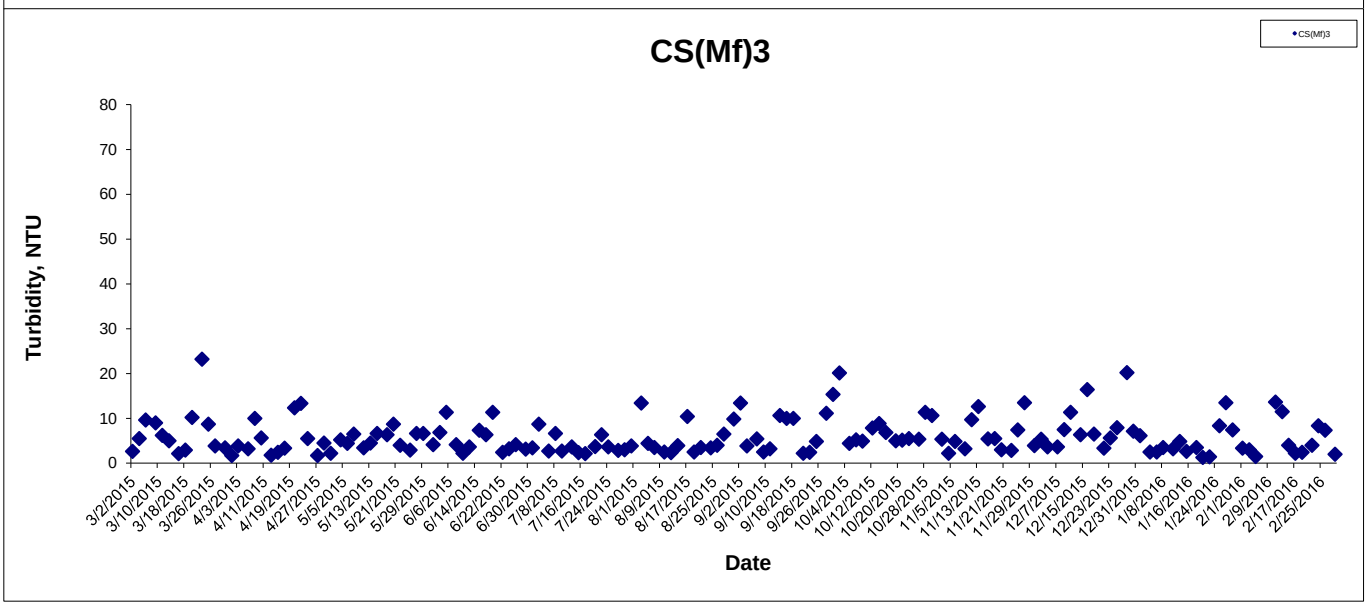




Turbidity at Mid-Flood Tide







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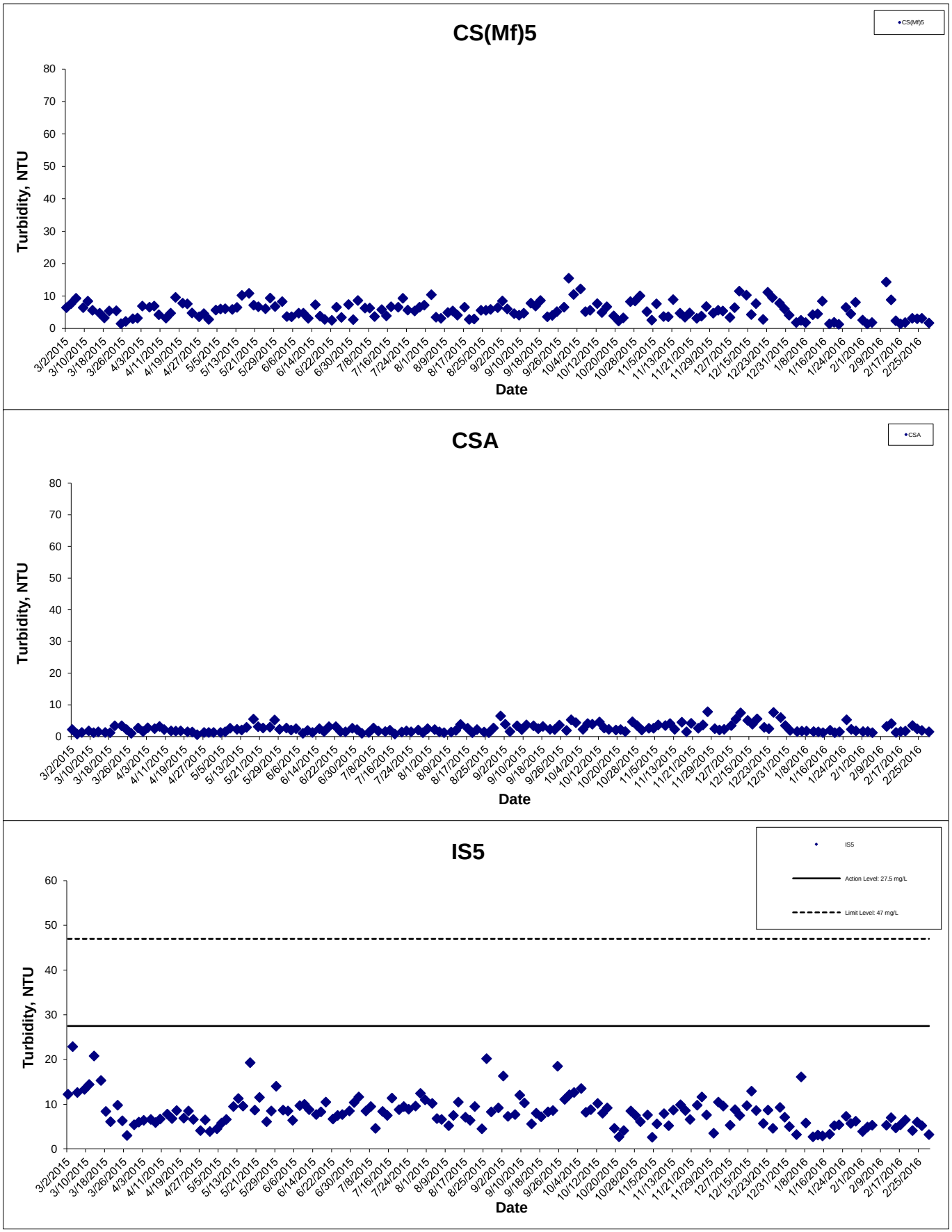

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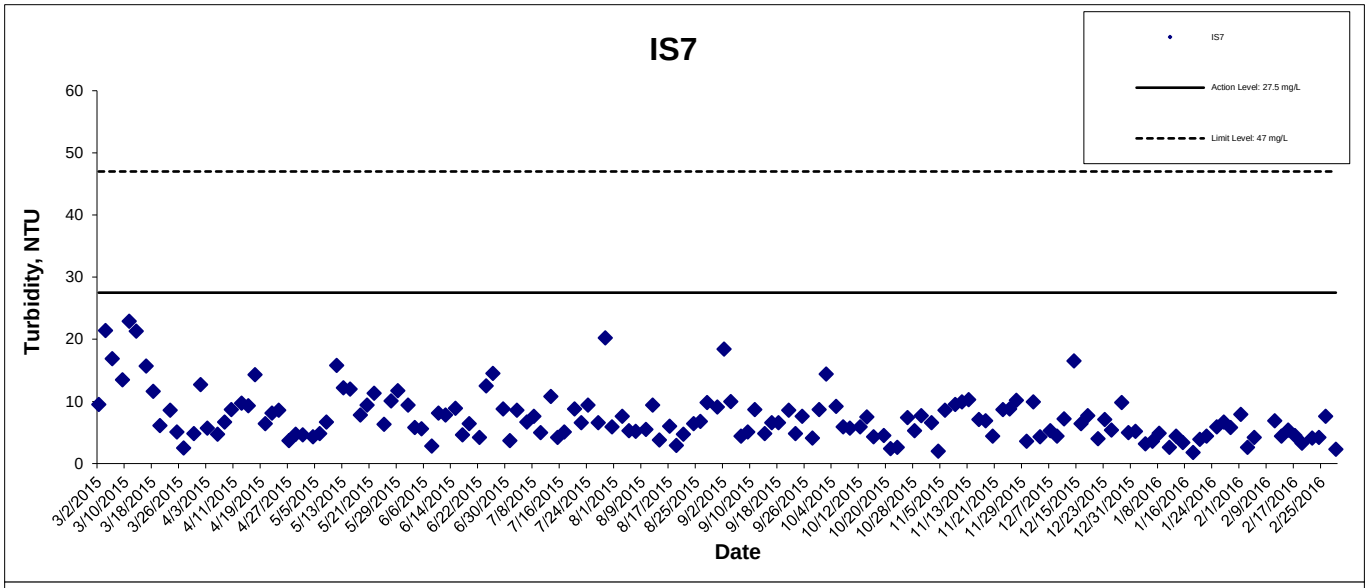

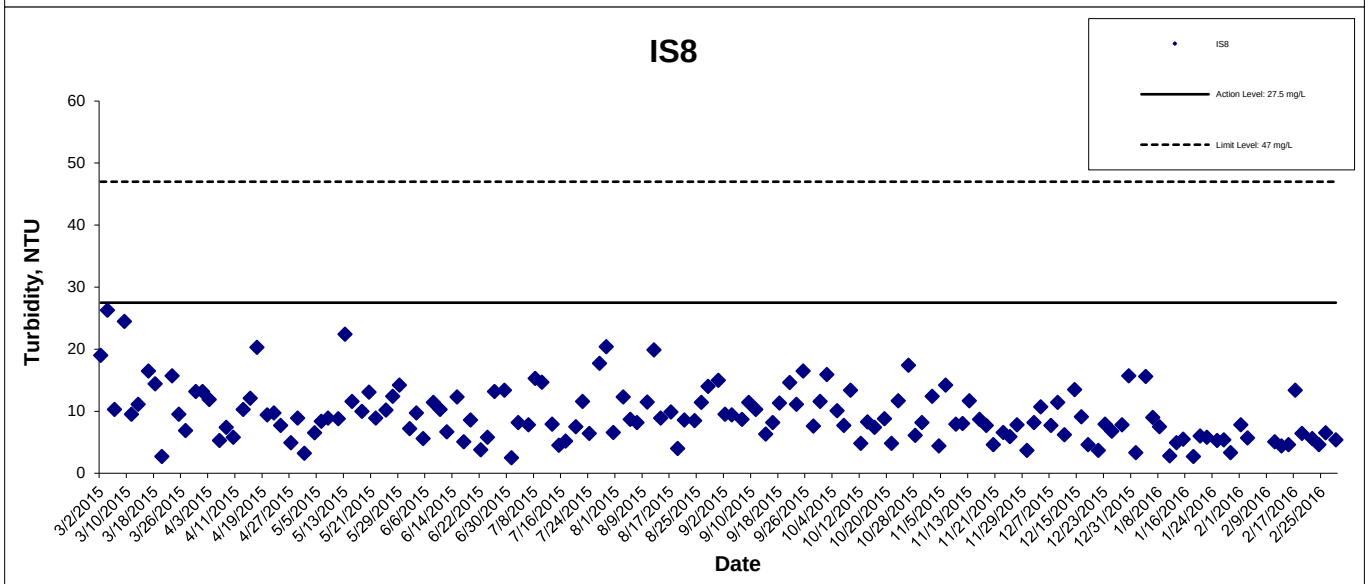

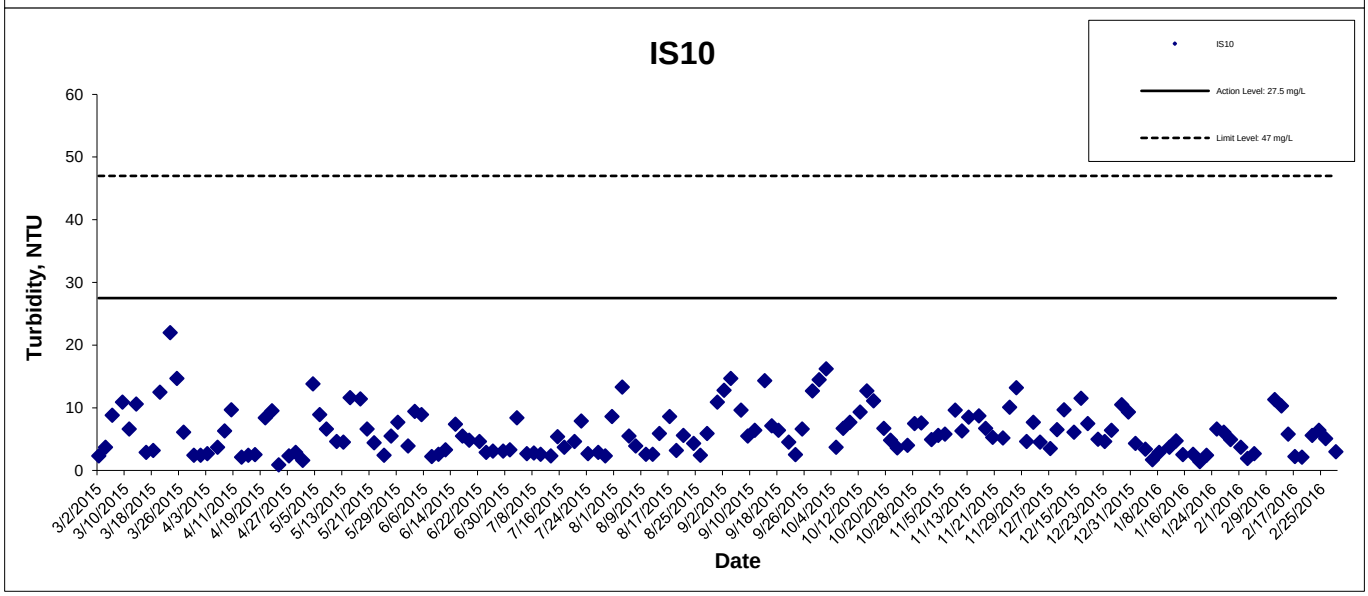

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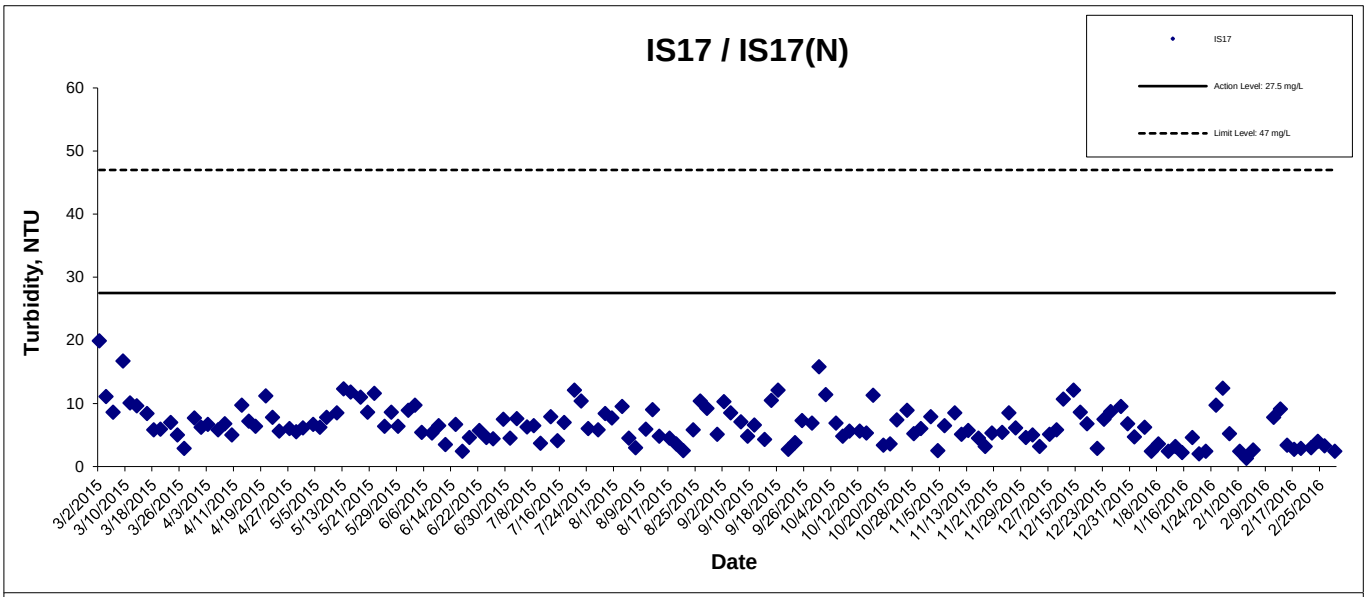
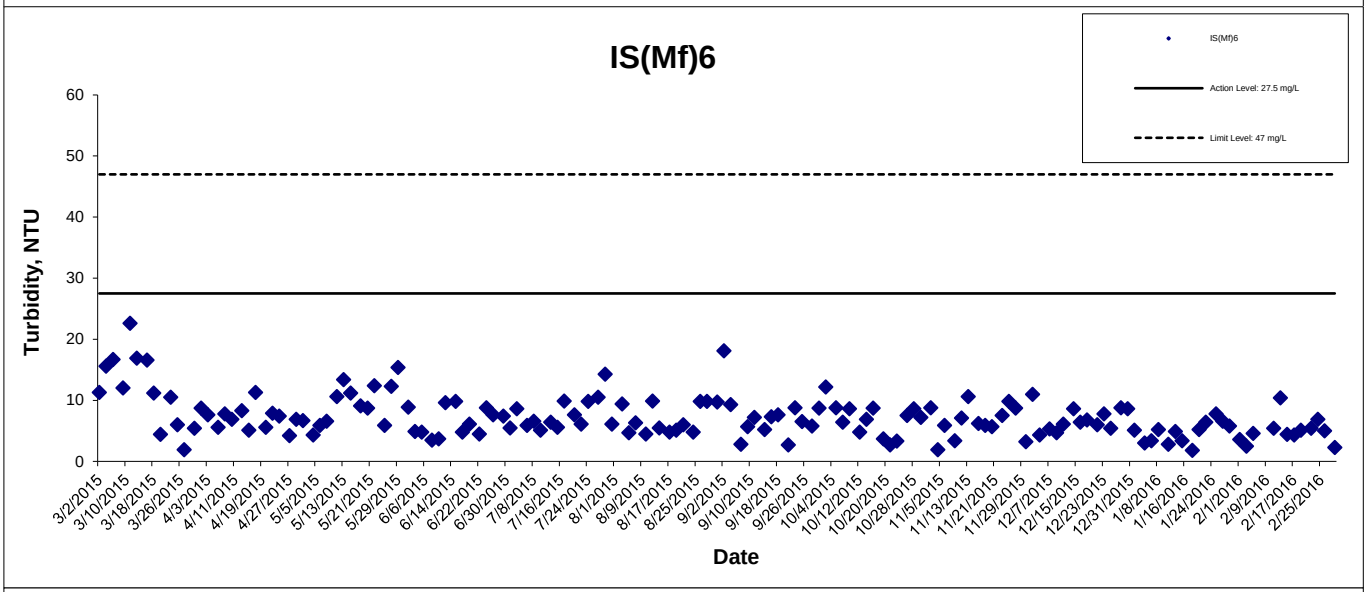
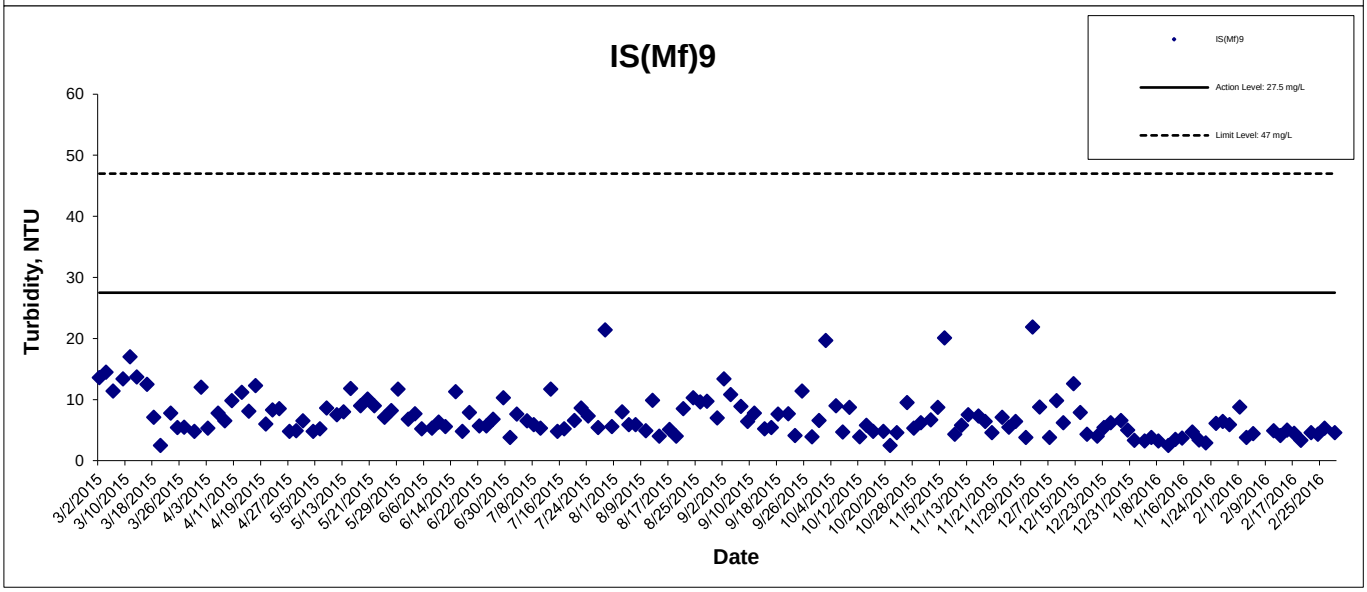
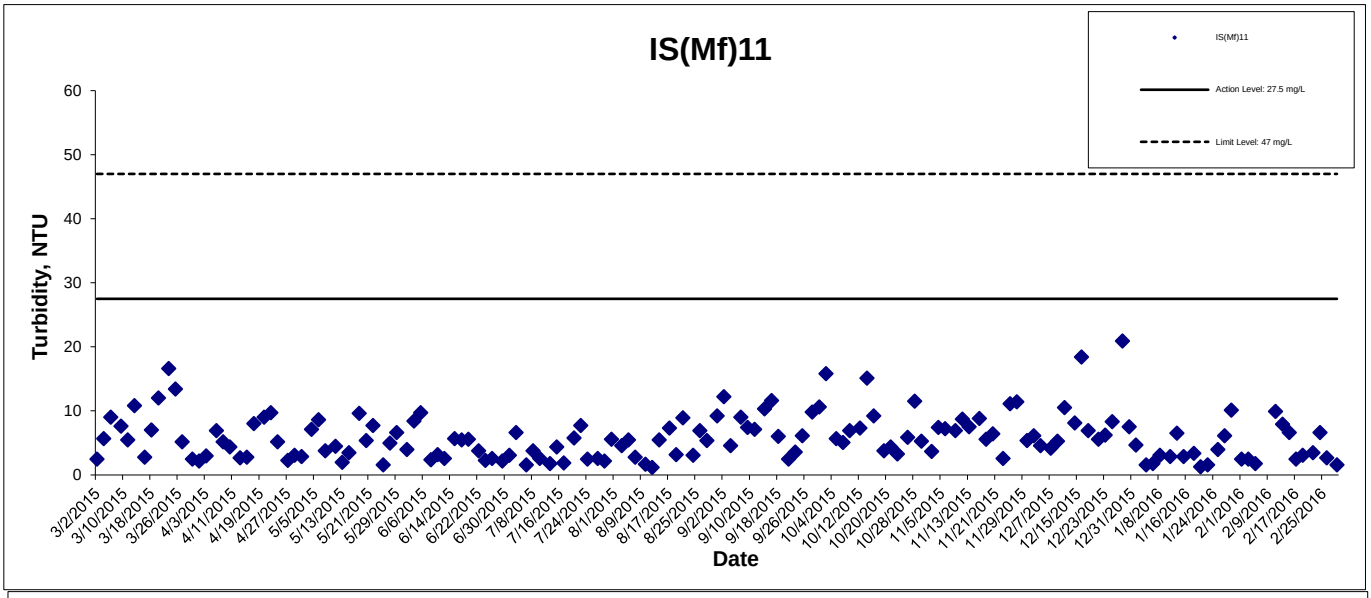
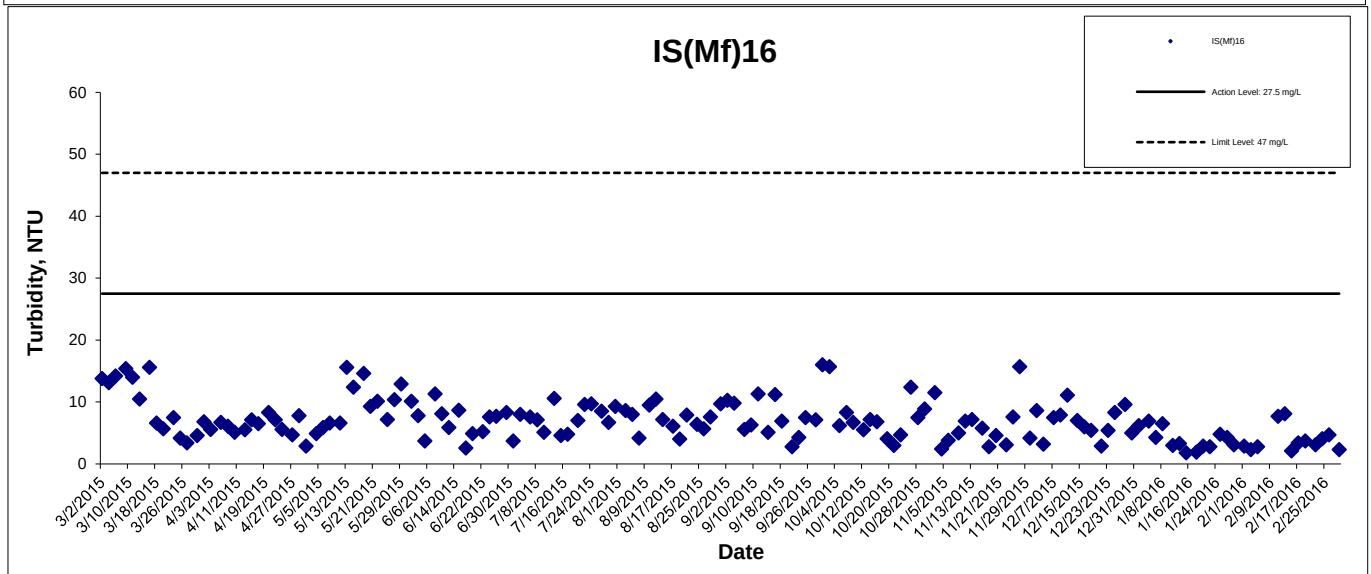


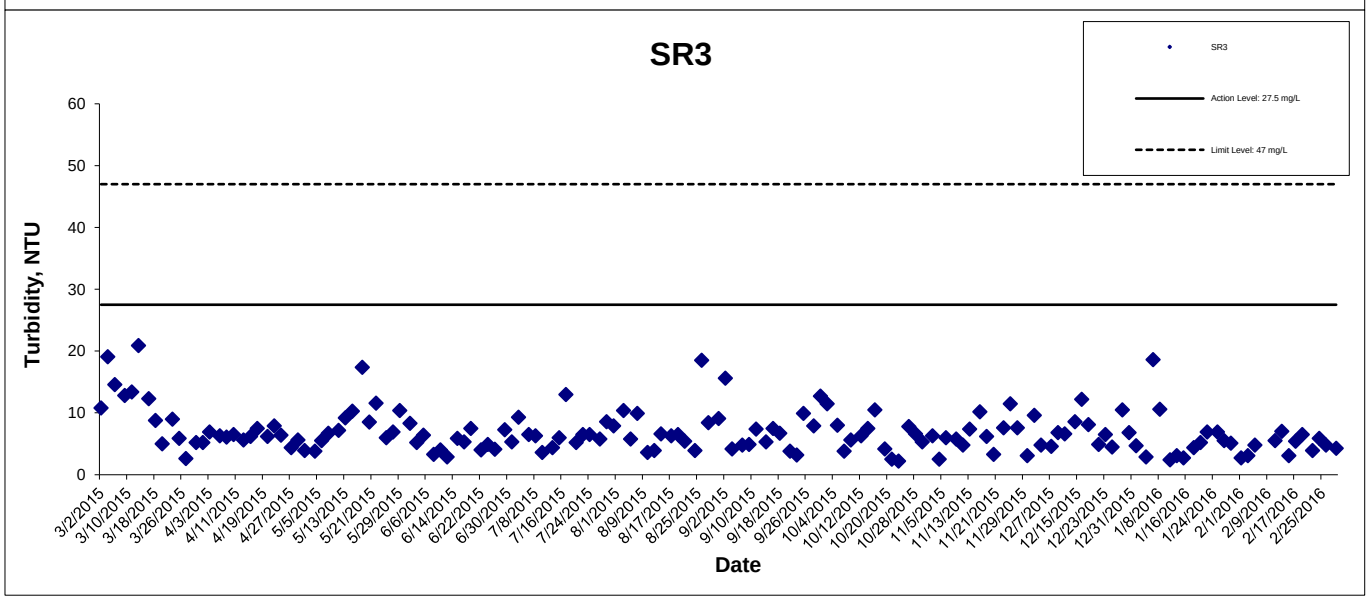




Turbidity at Mid-Flood Tide







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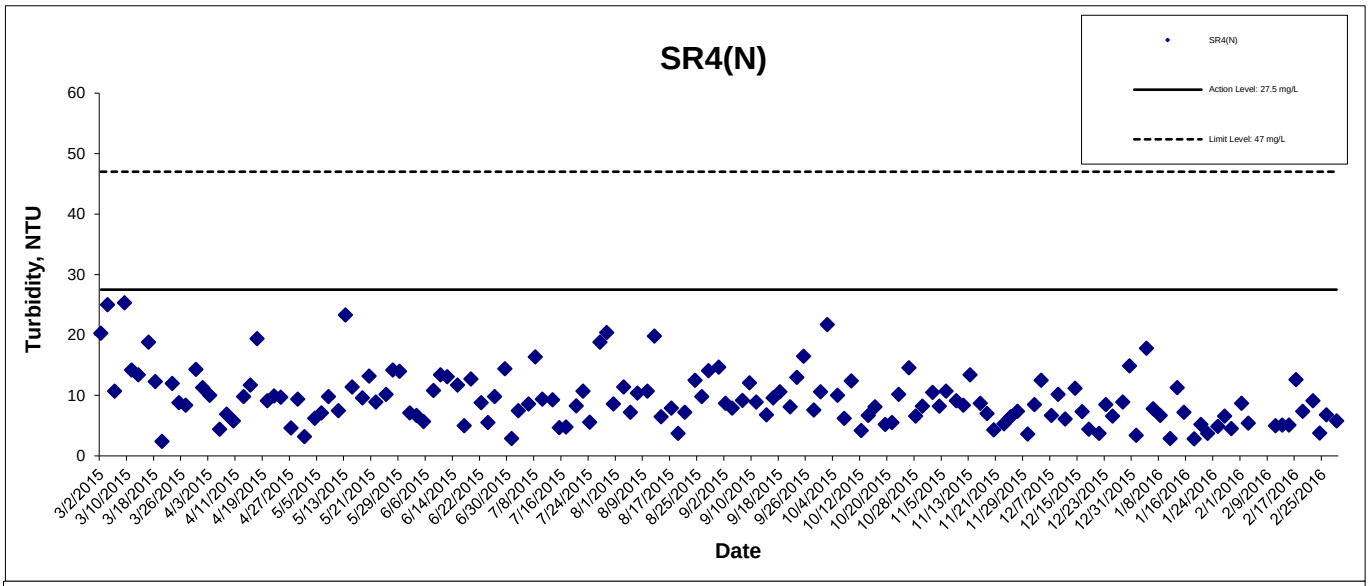

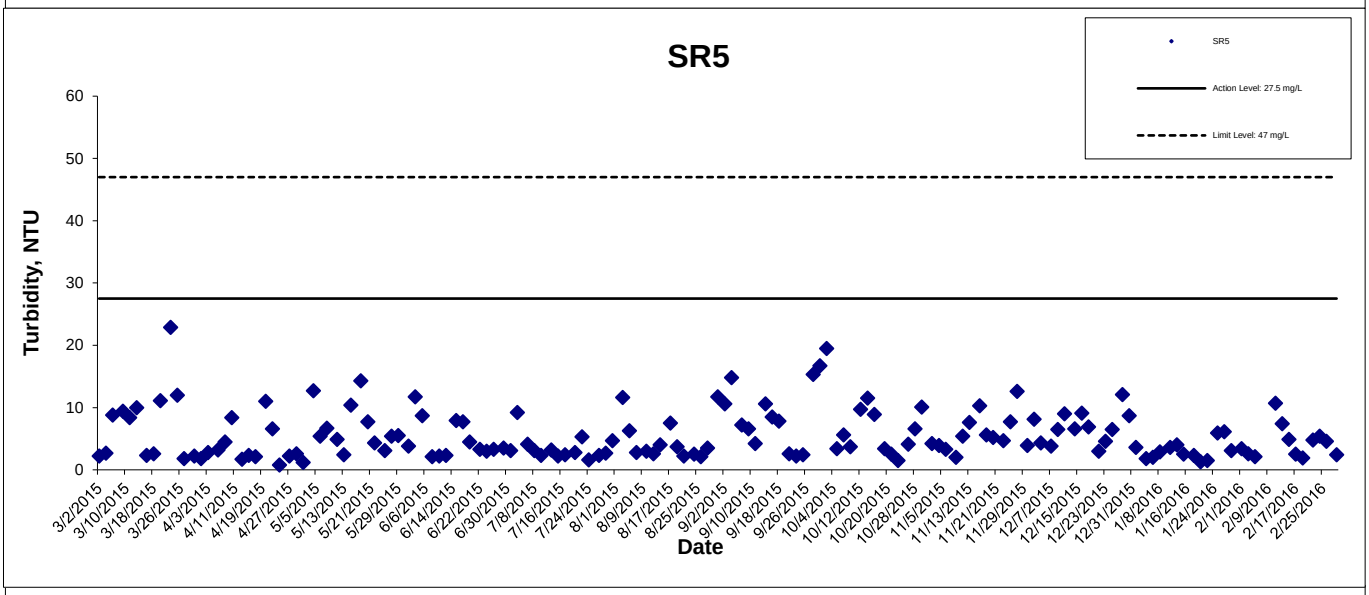

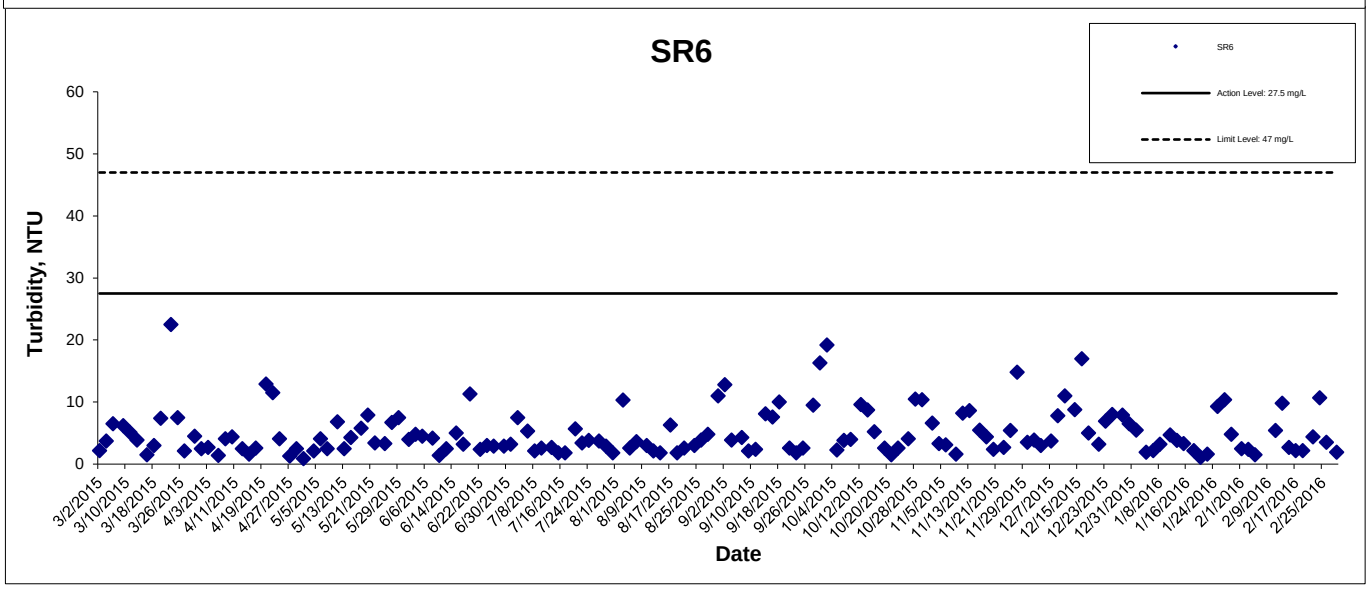

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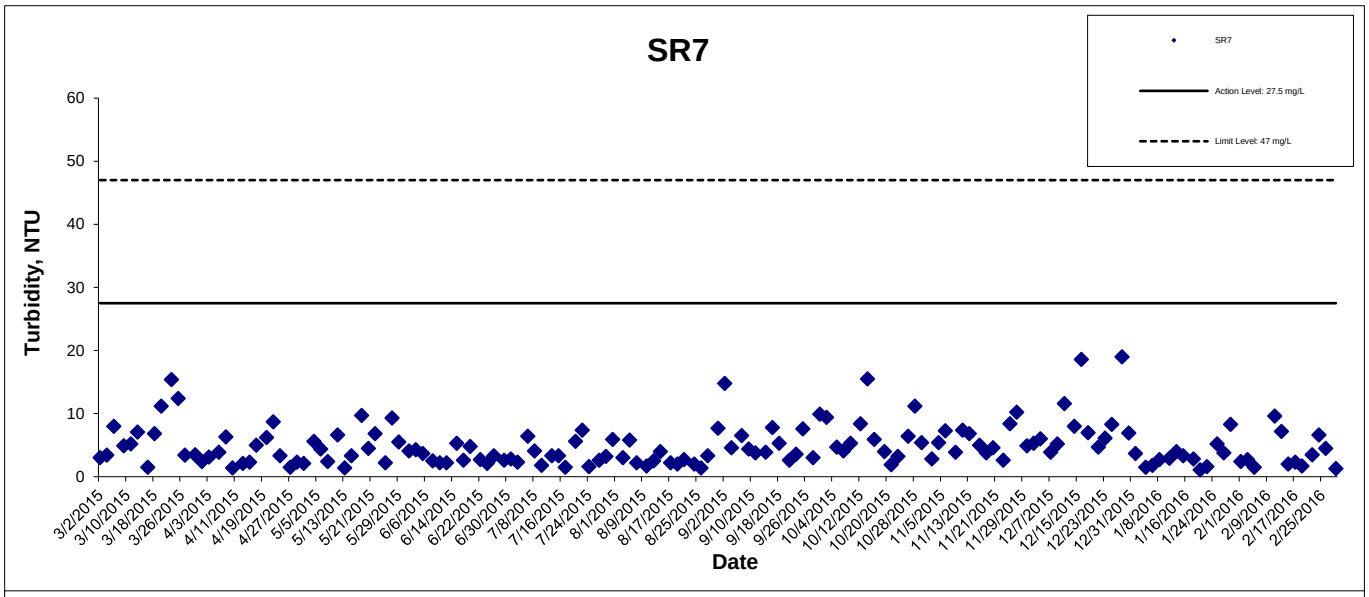
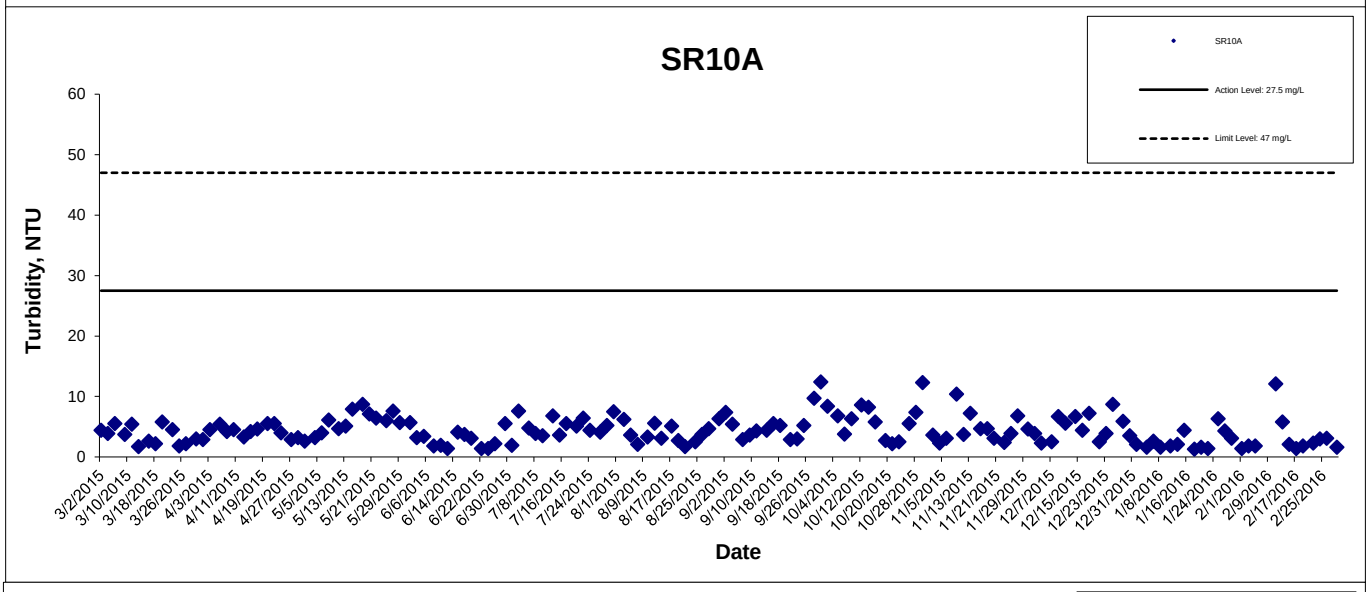
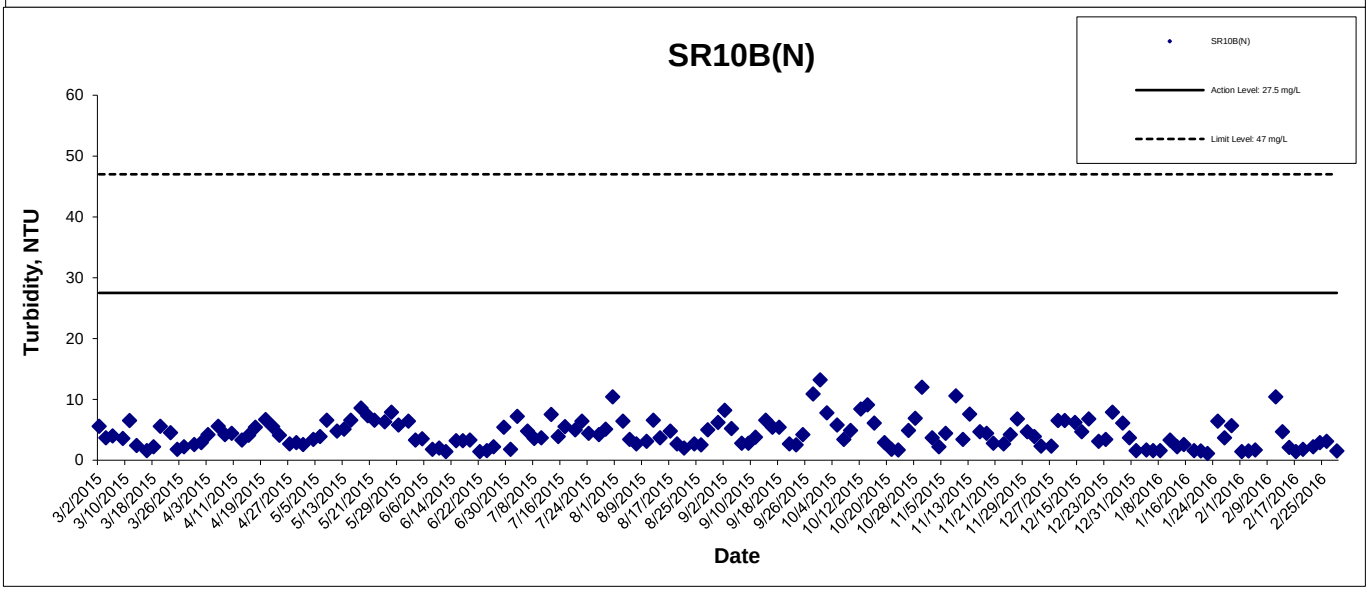
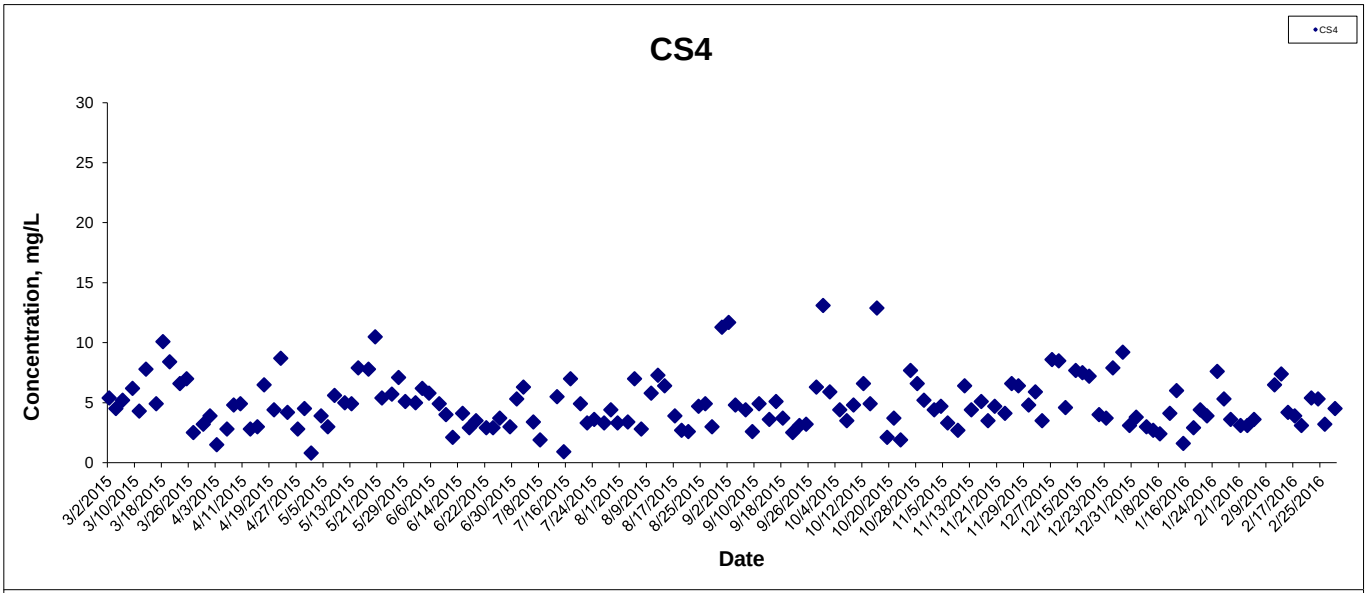
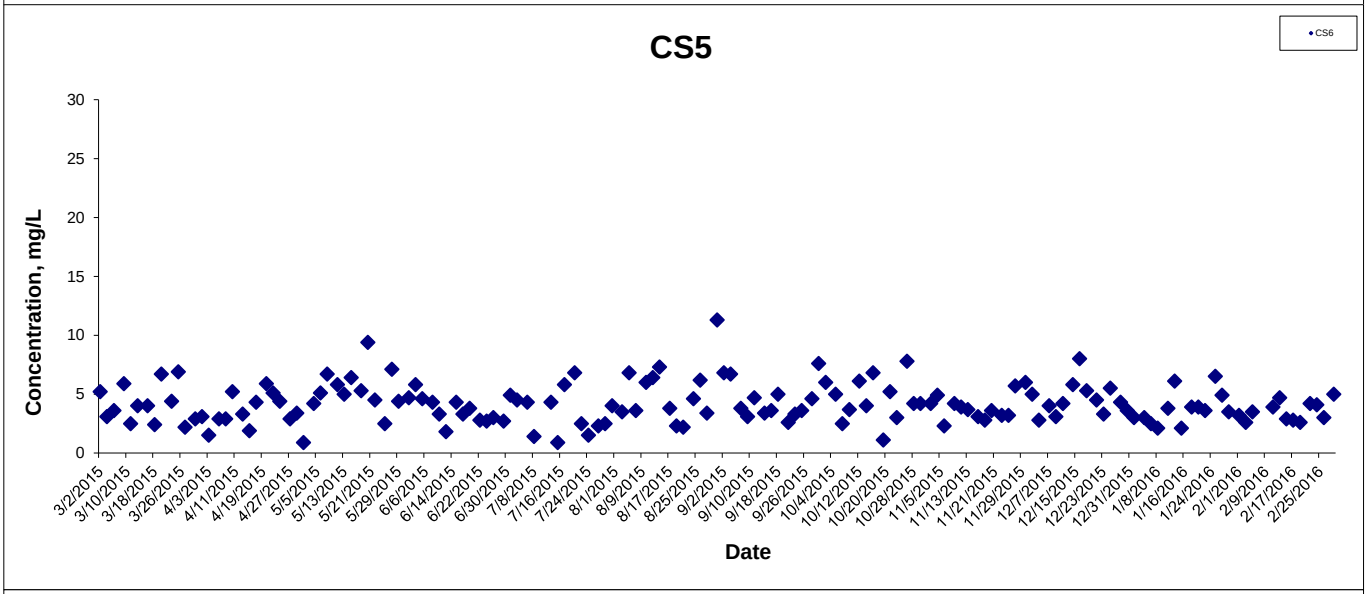


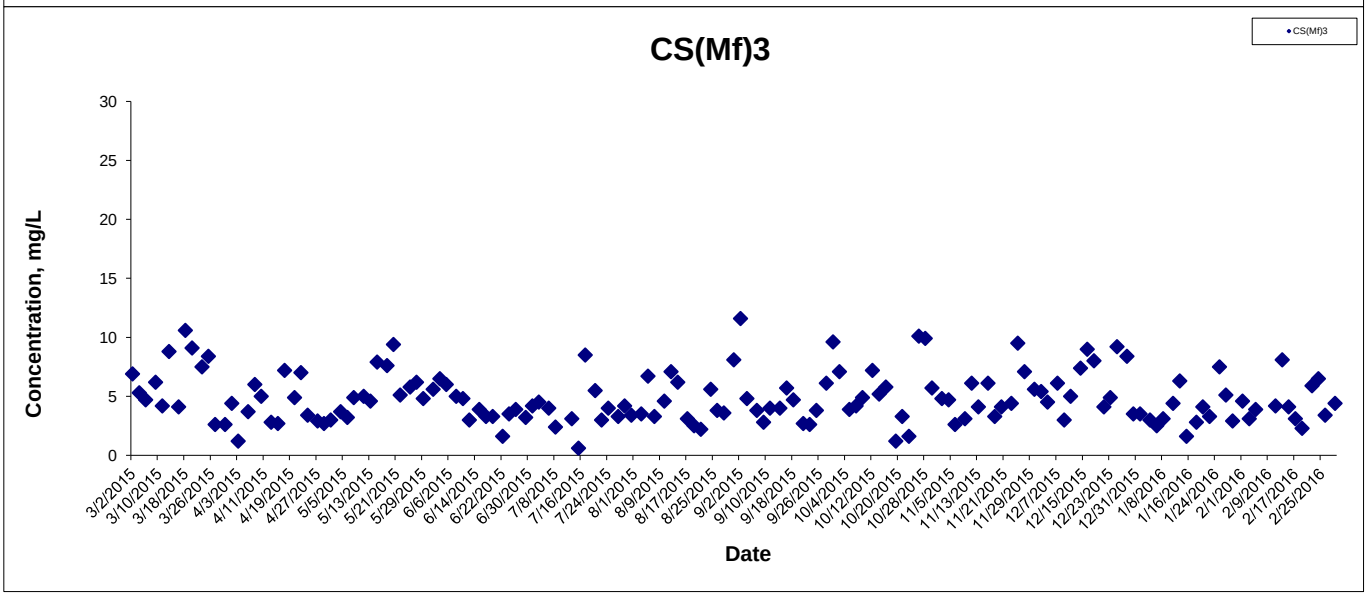




Suspended Solids at Mid-Ebb Tide







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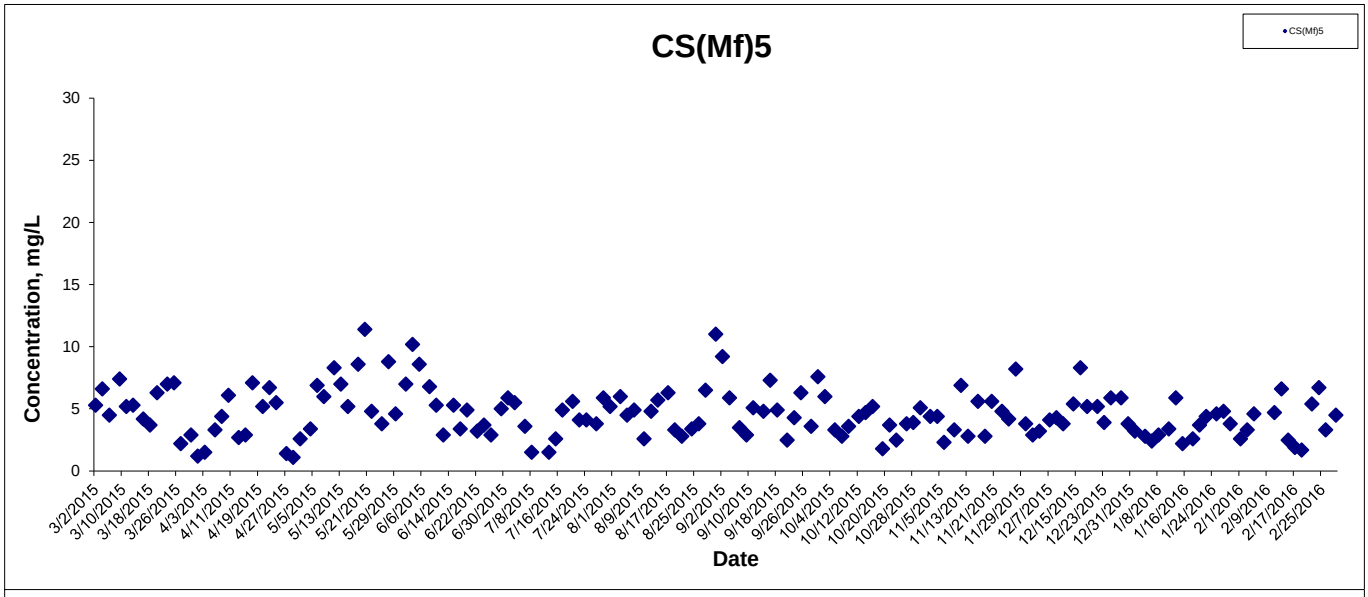

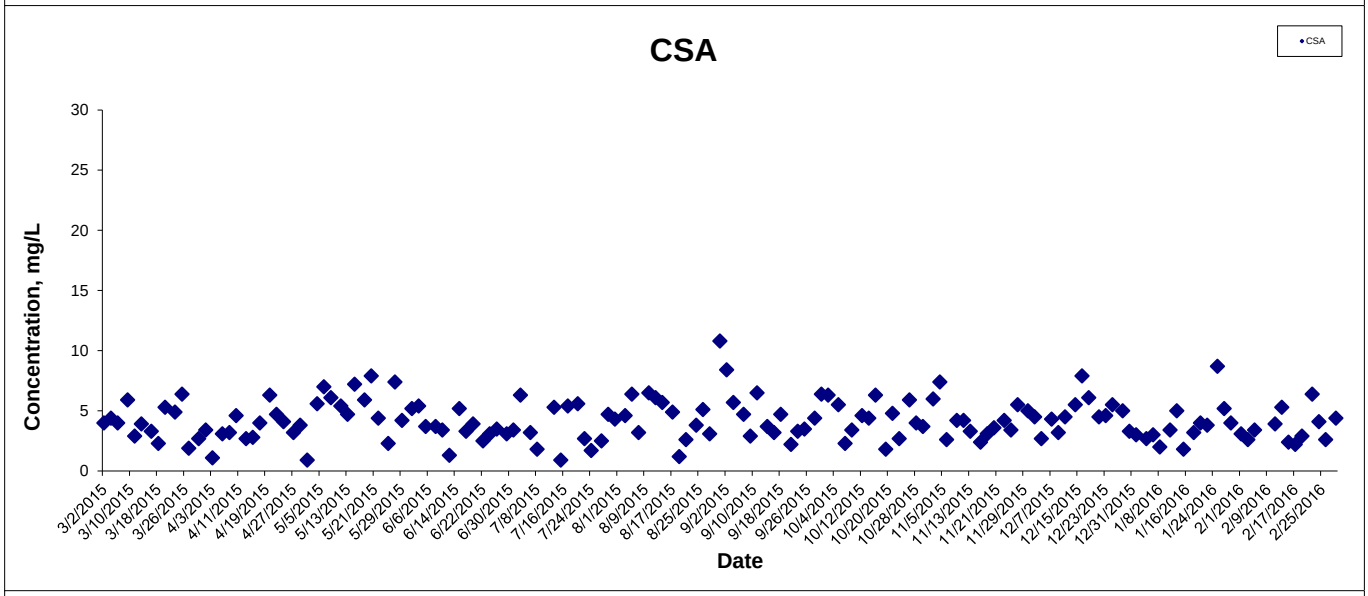

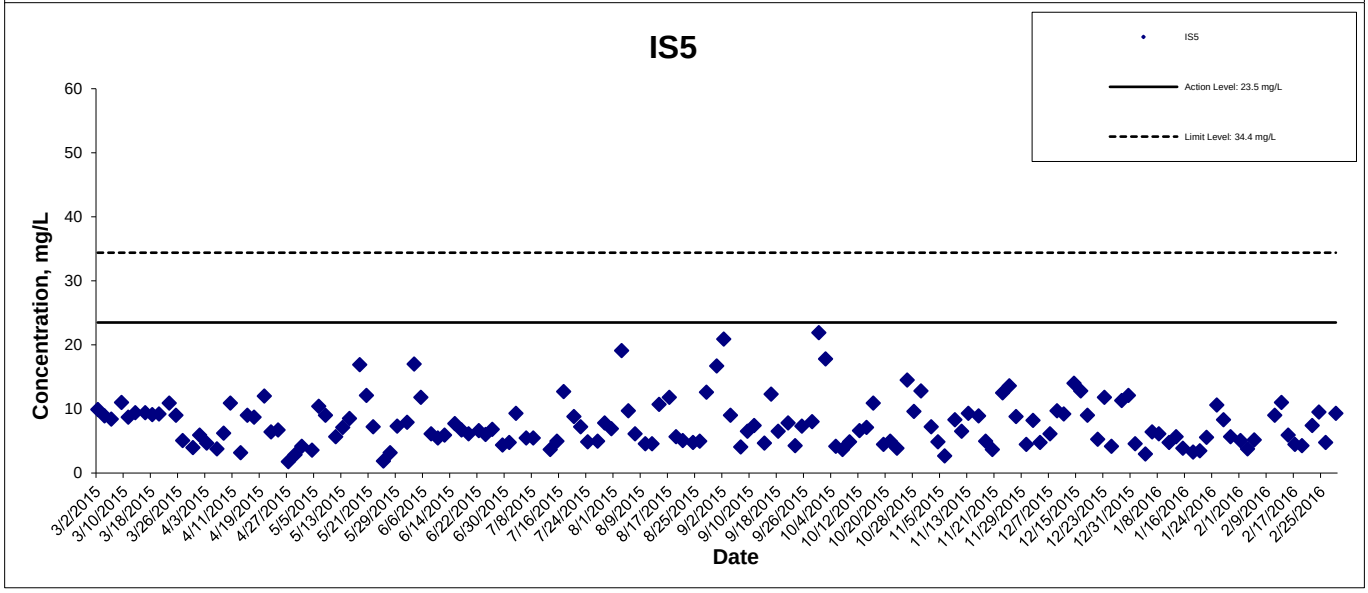

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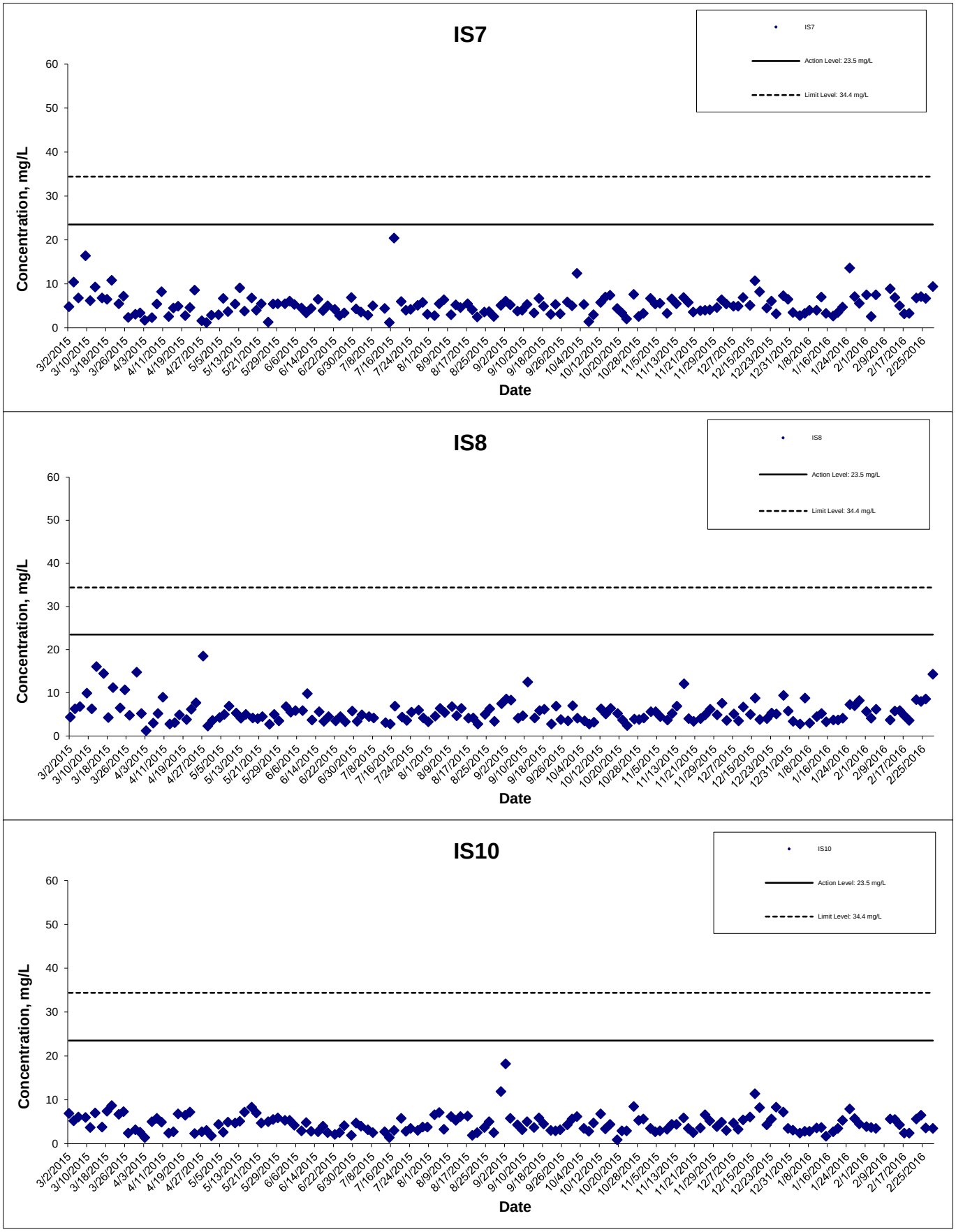
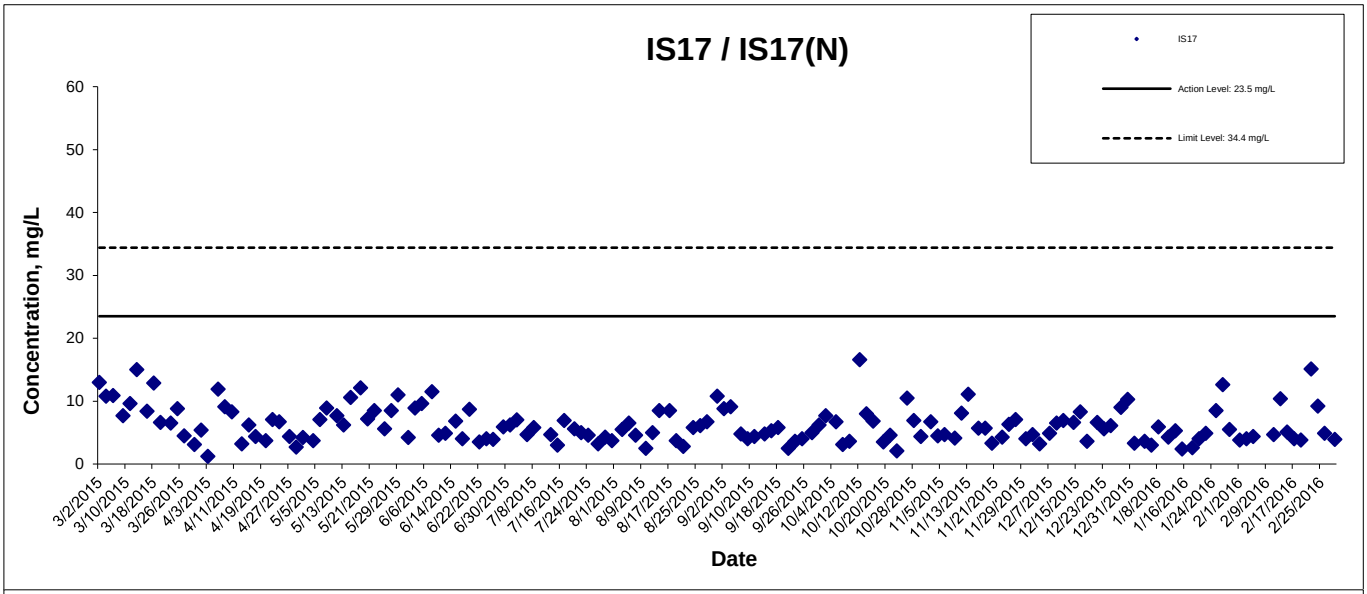
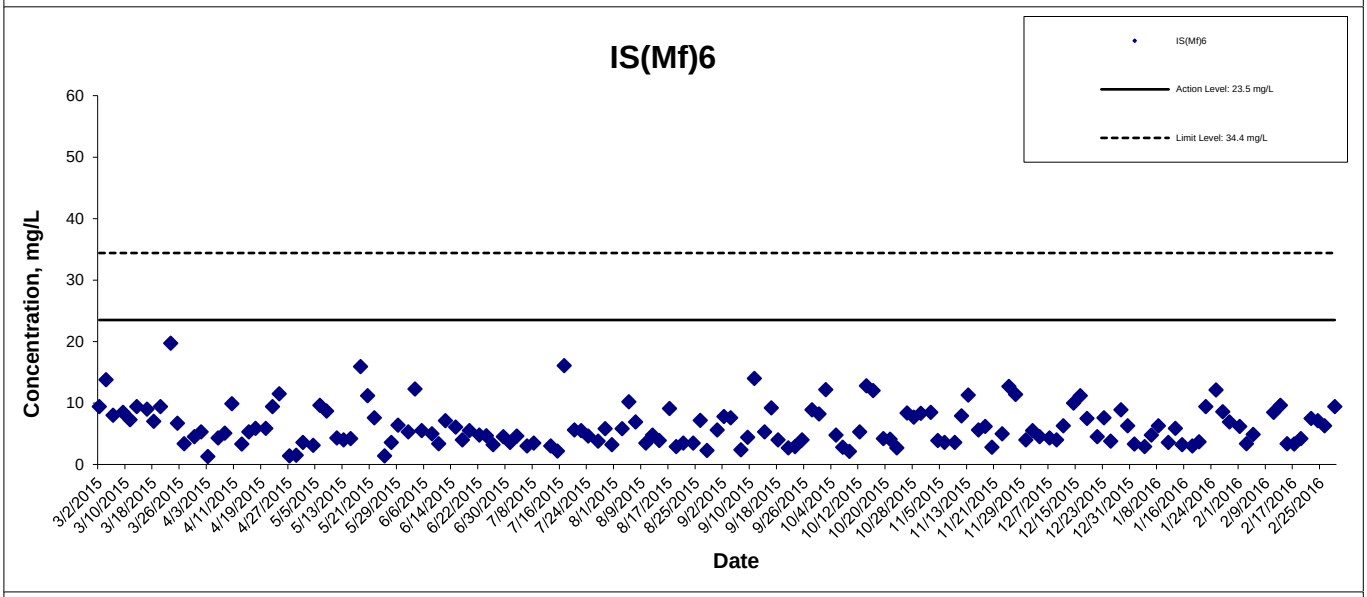
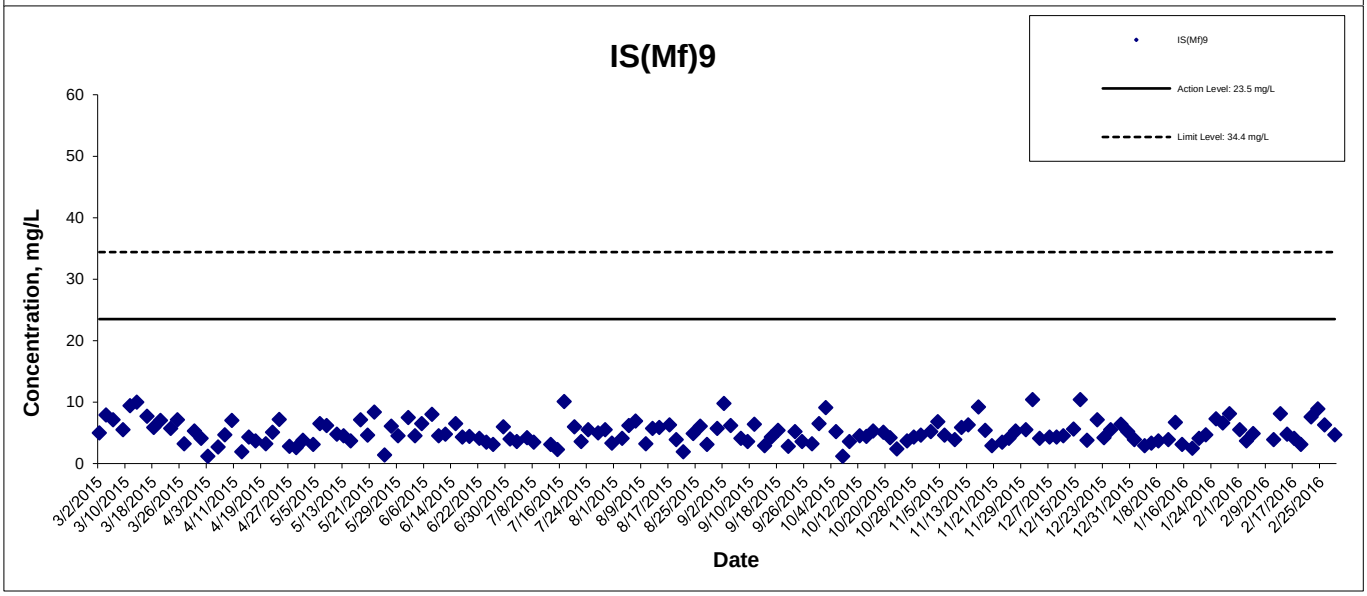


Suspended Solids at Mid-Ebb Tide







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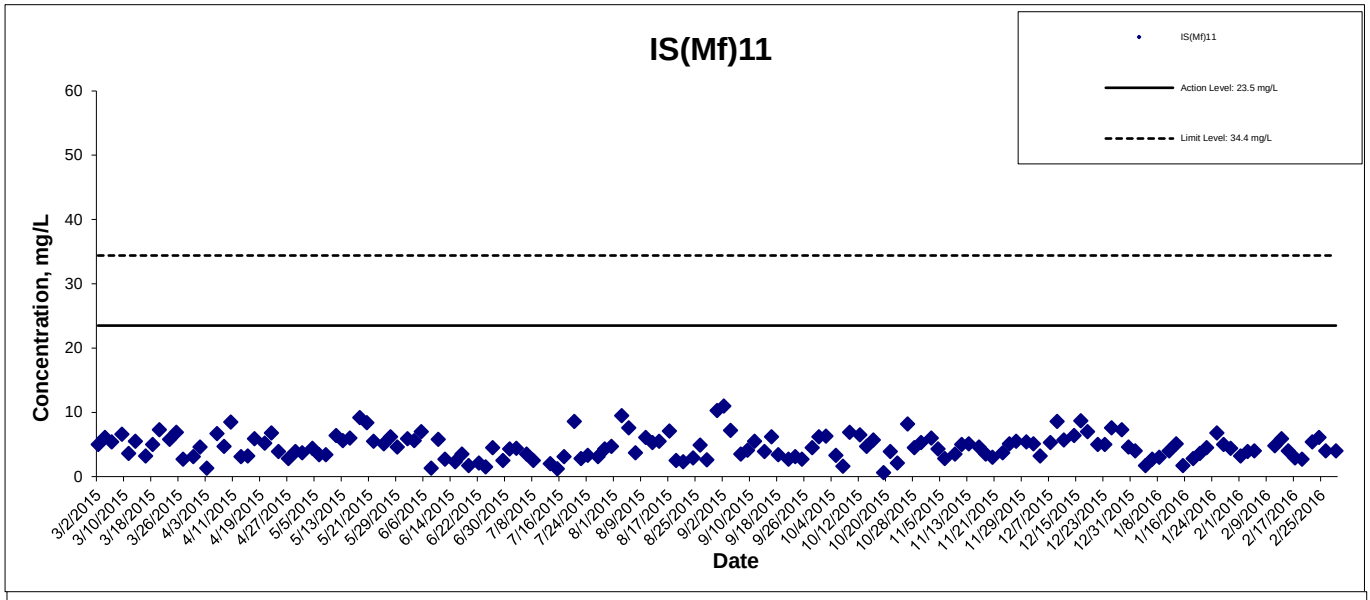

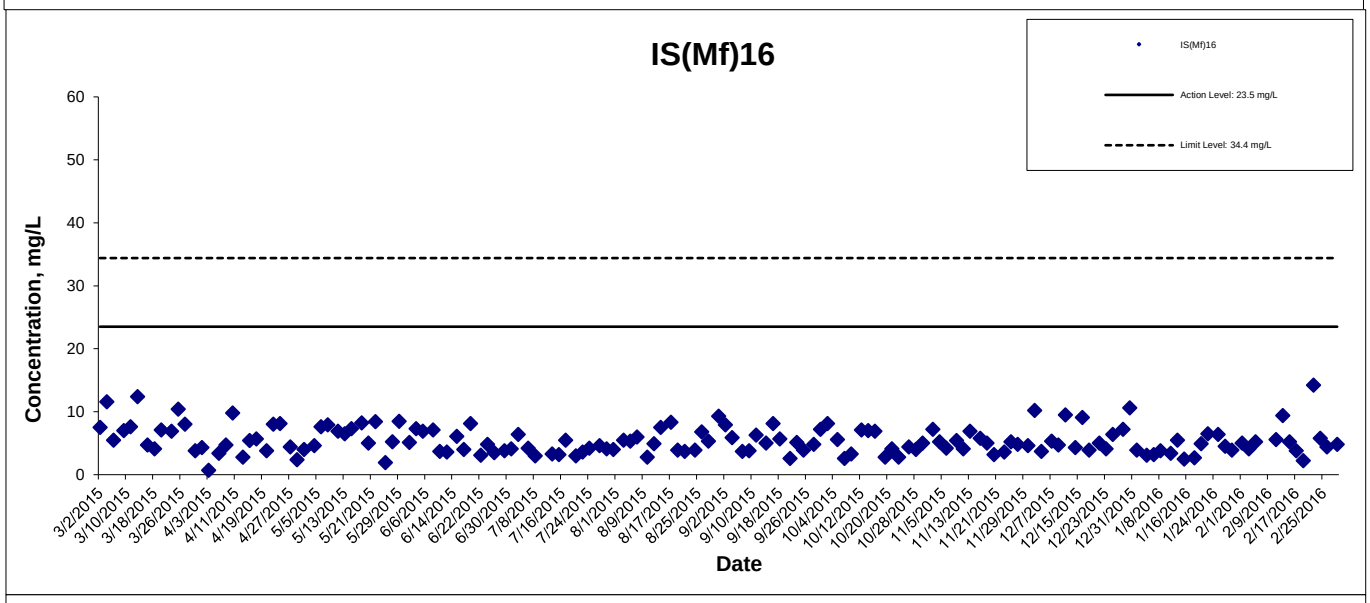

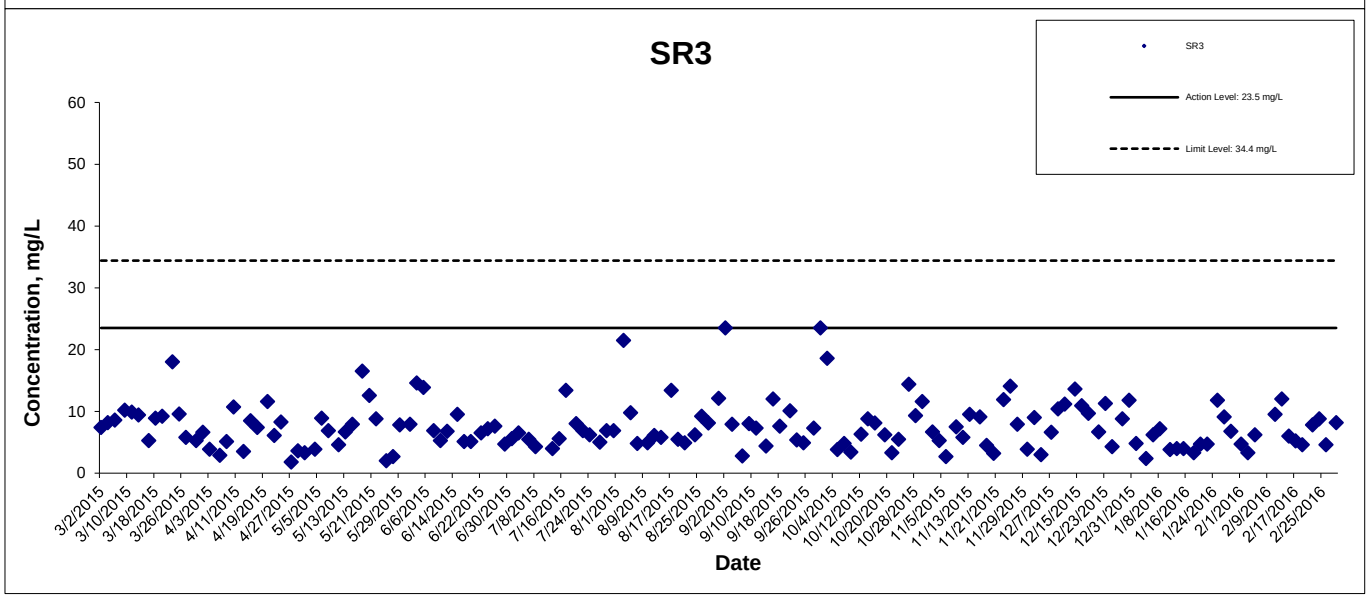

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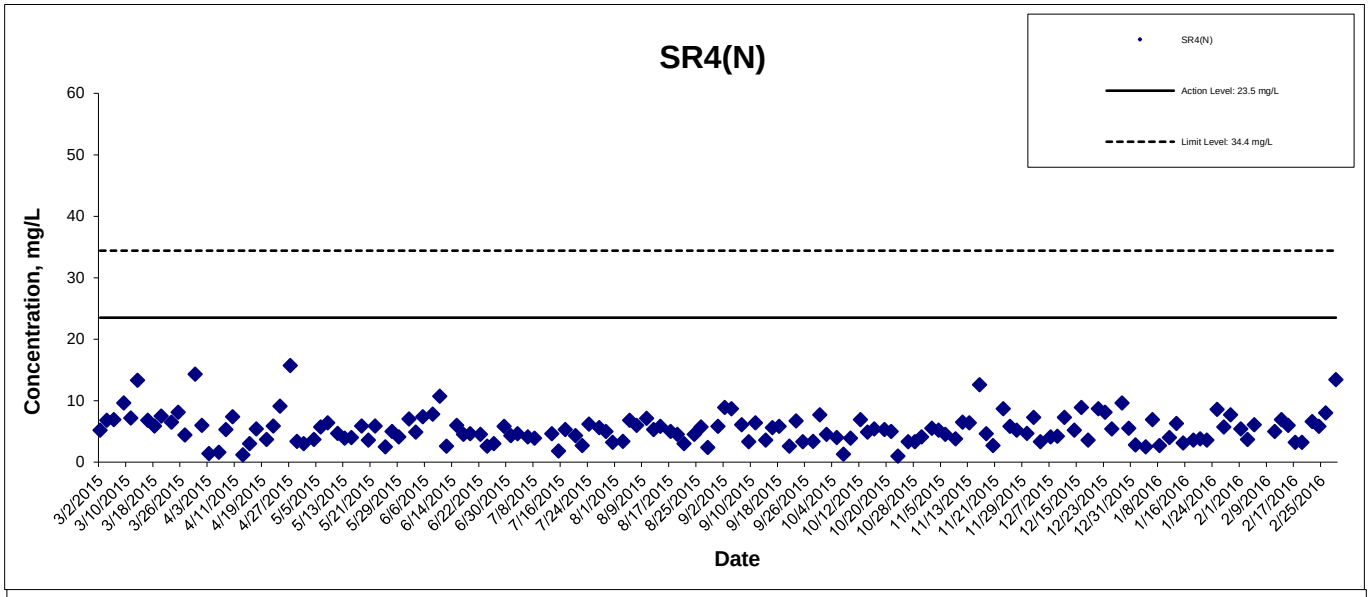

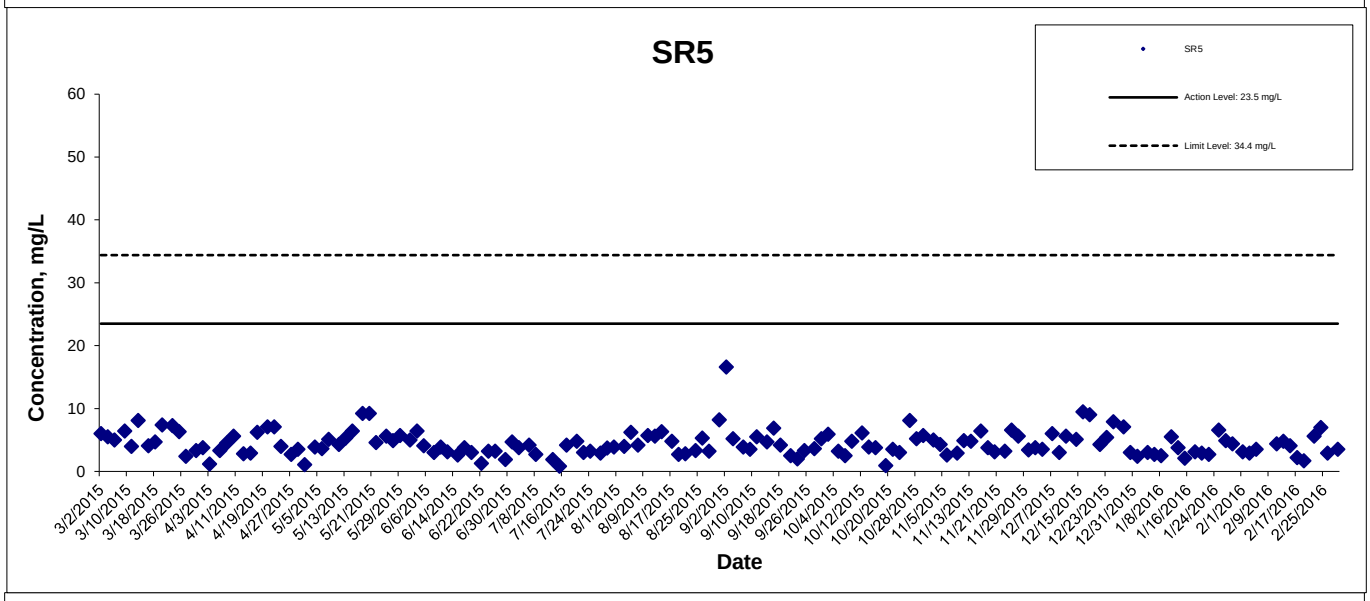

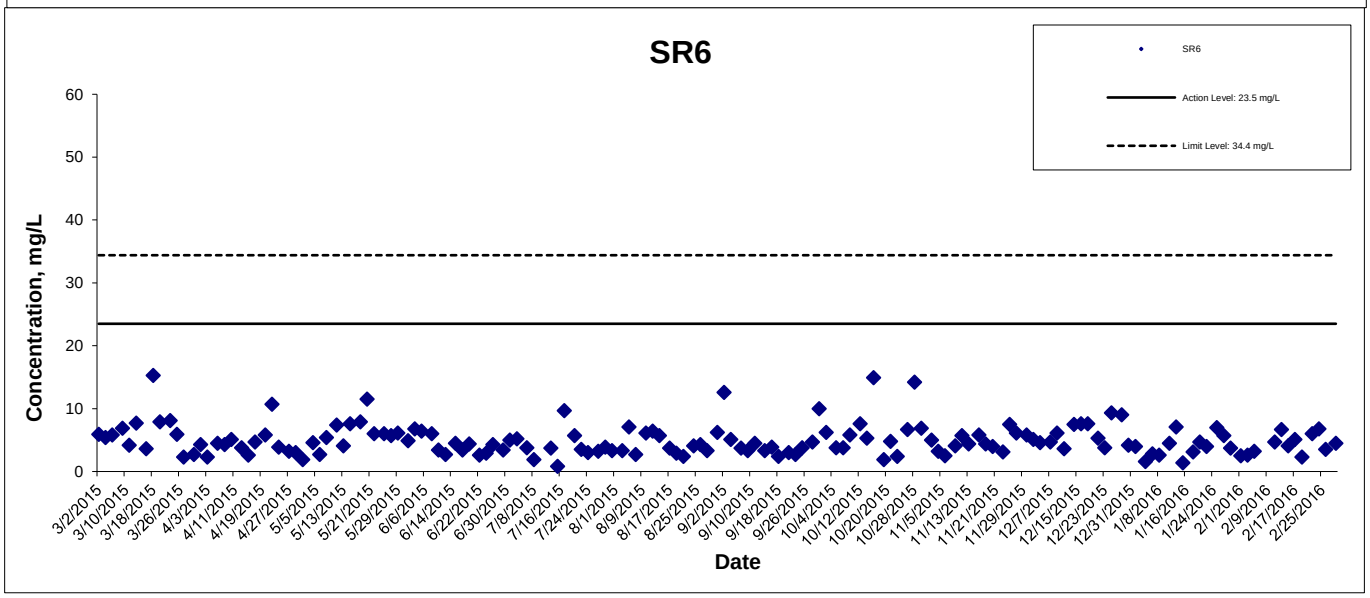

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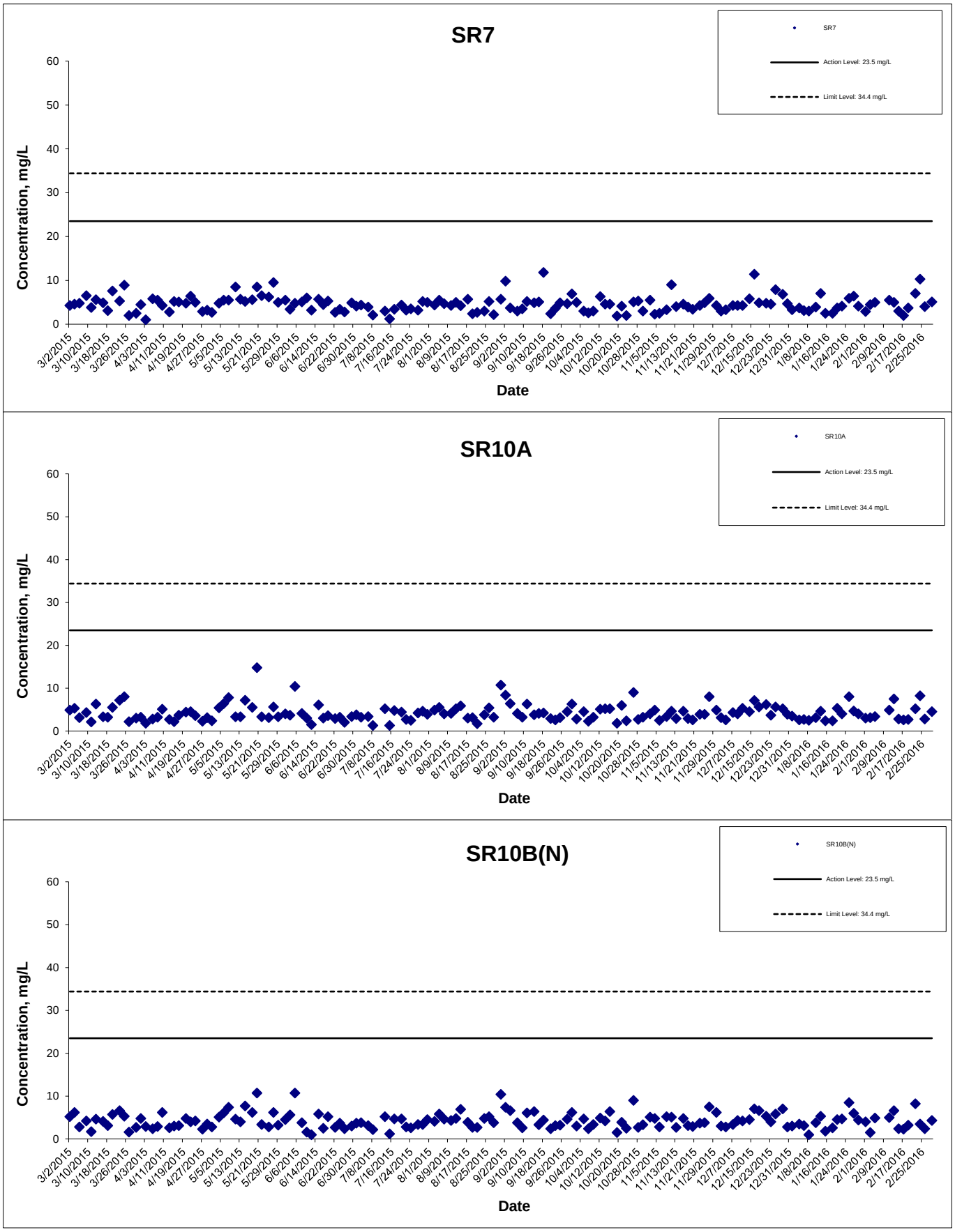
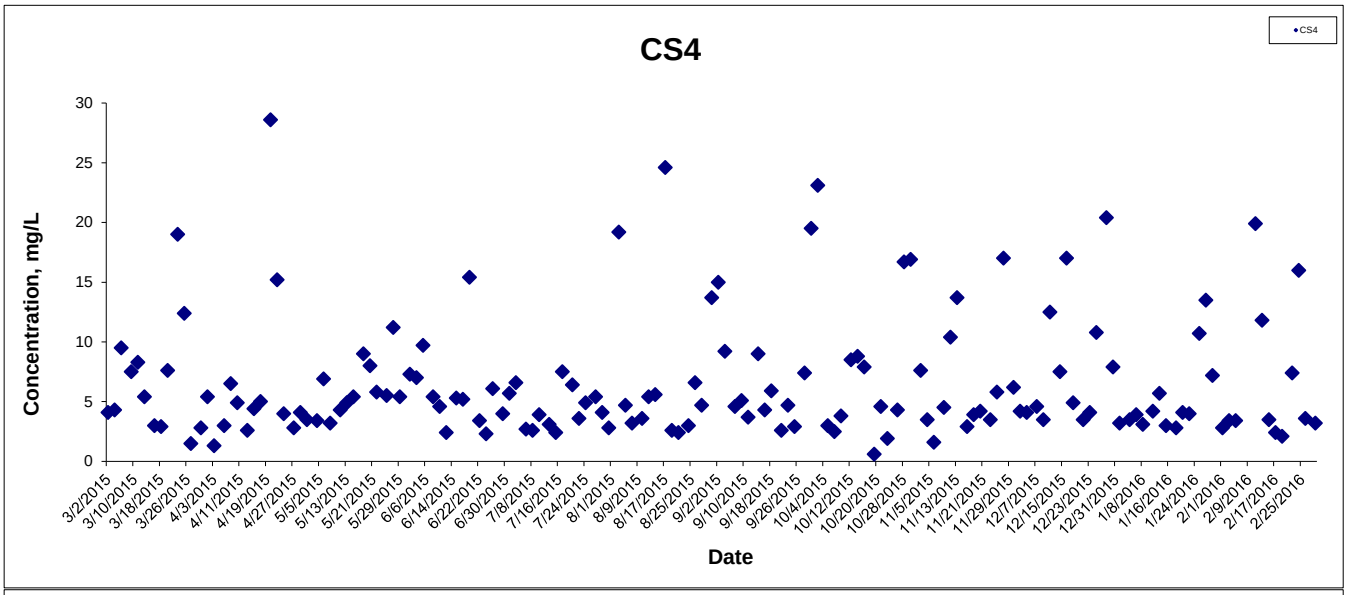
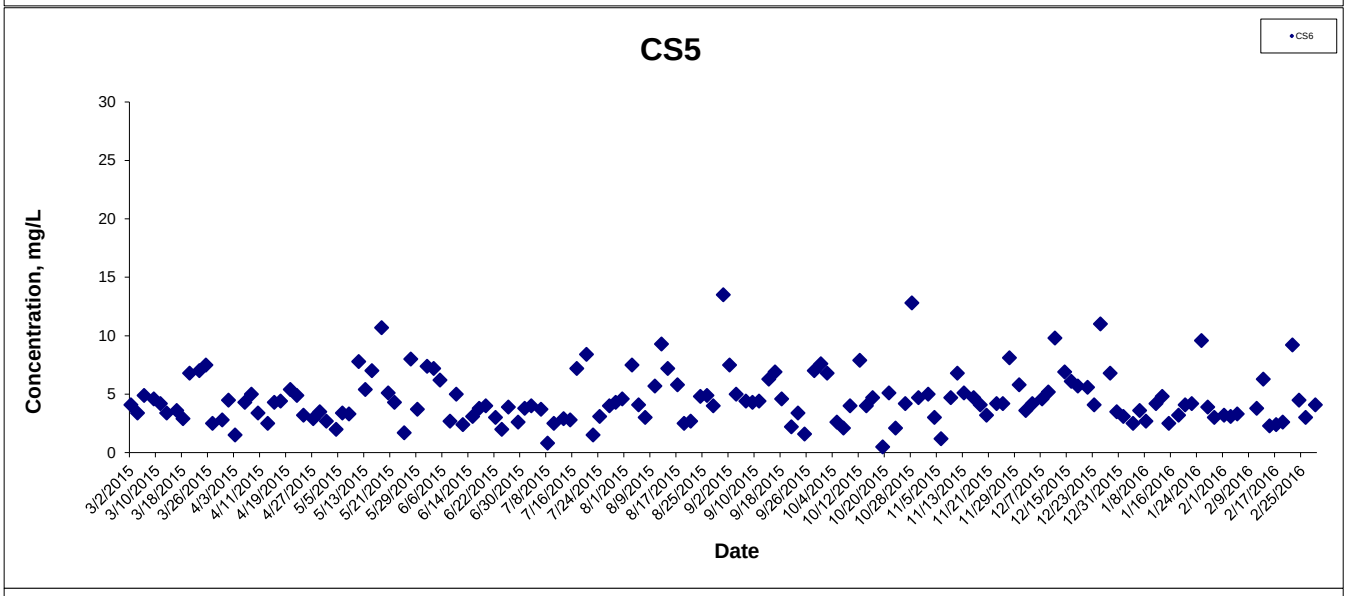
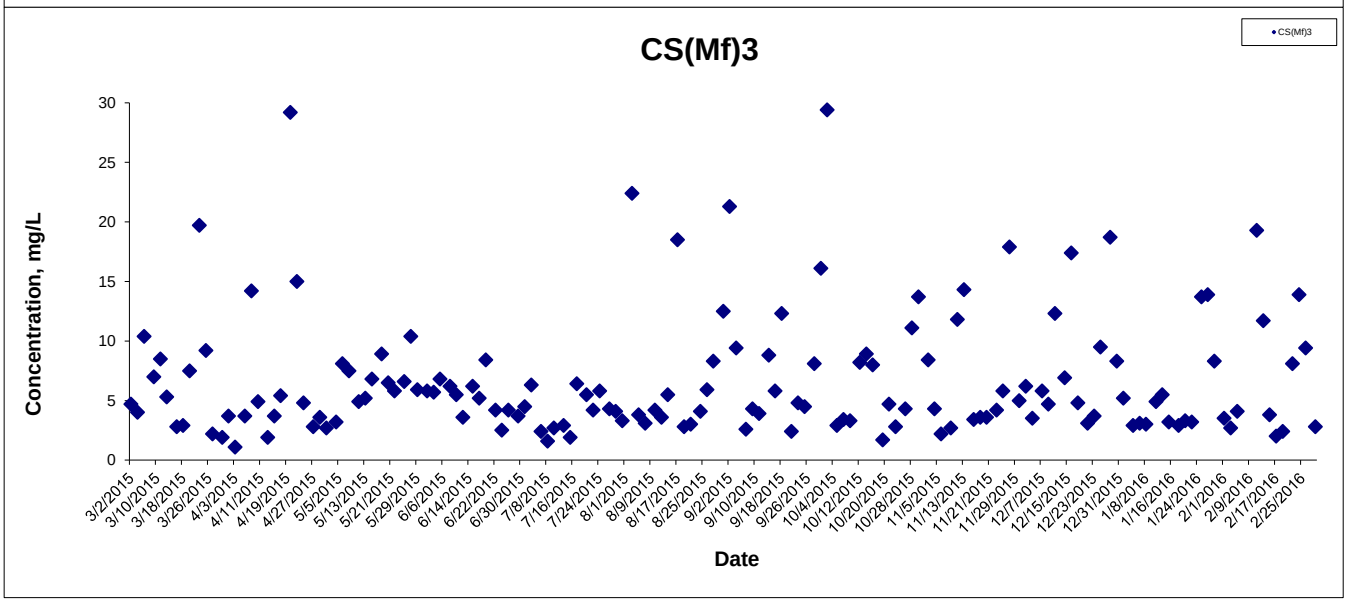


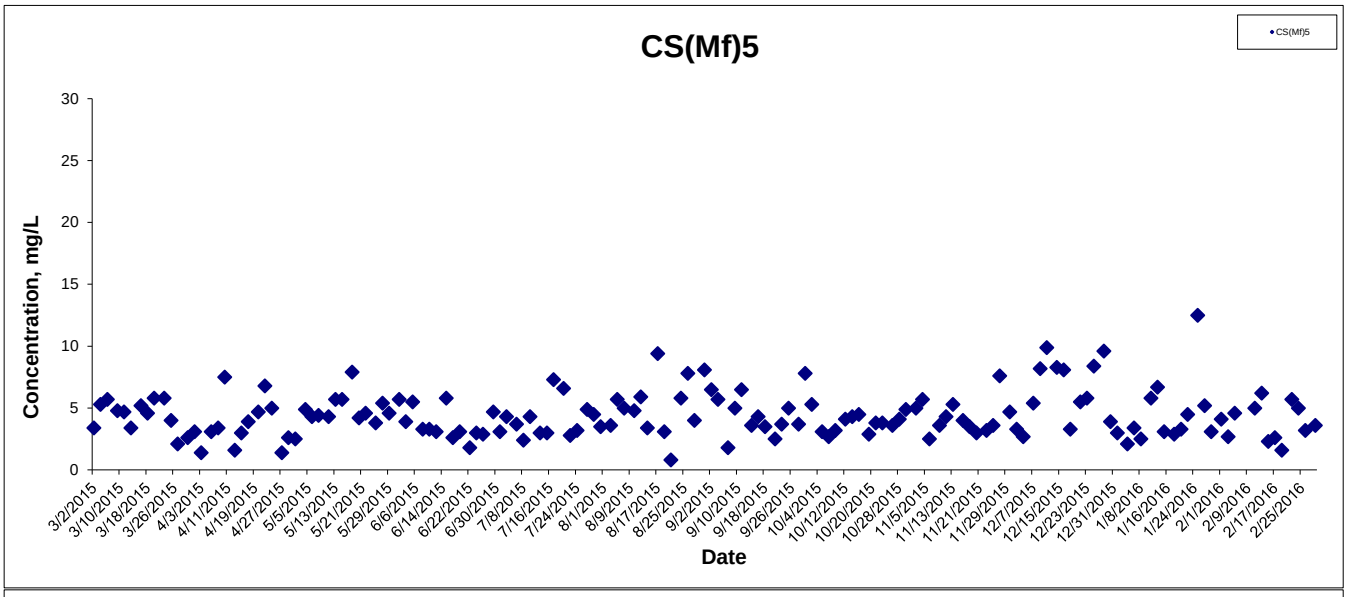
Suspended Solids at Mid-Flood Tide

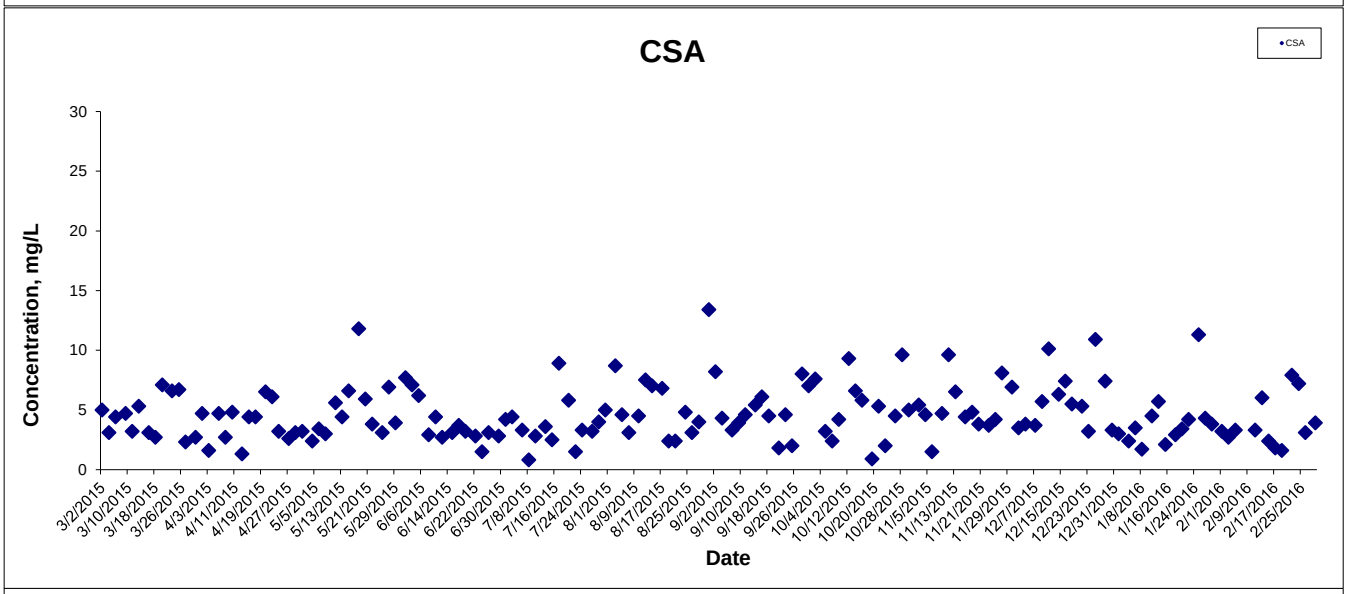


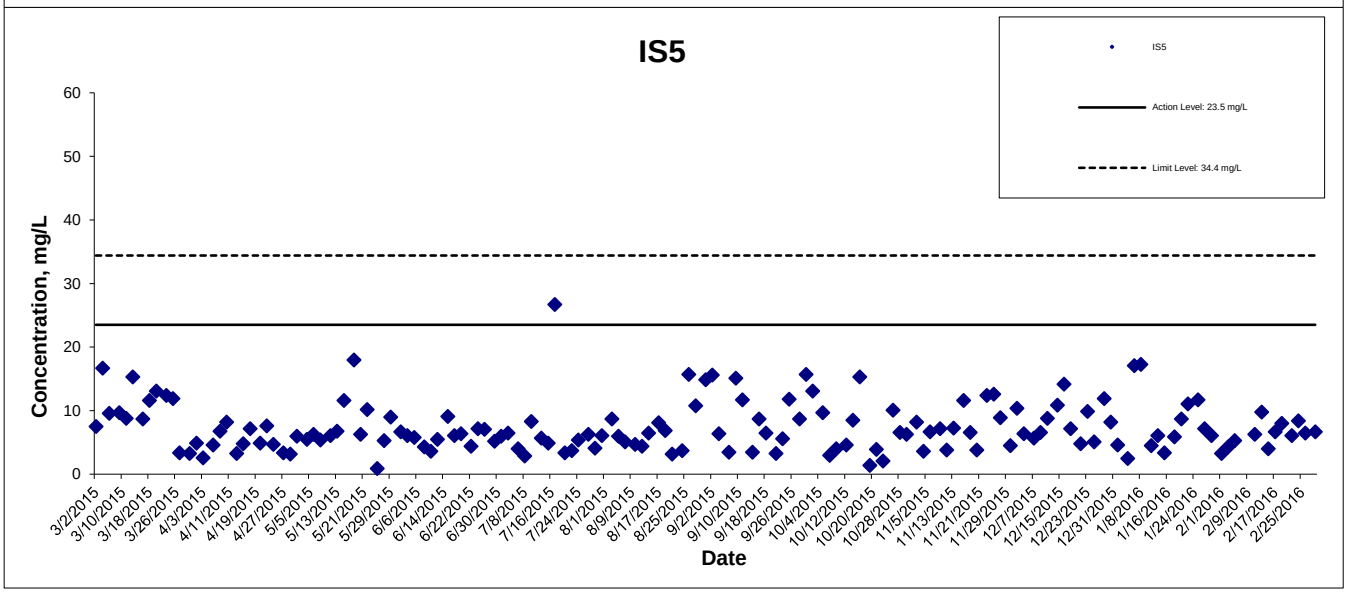




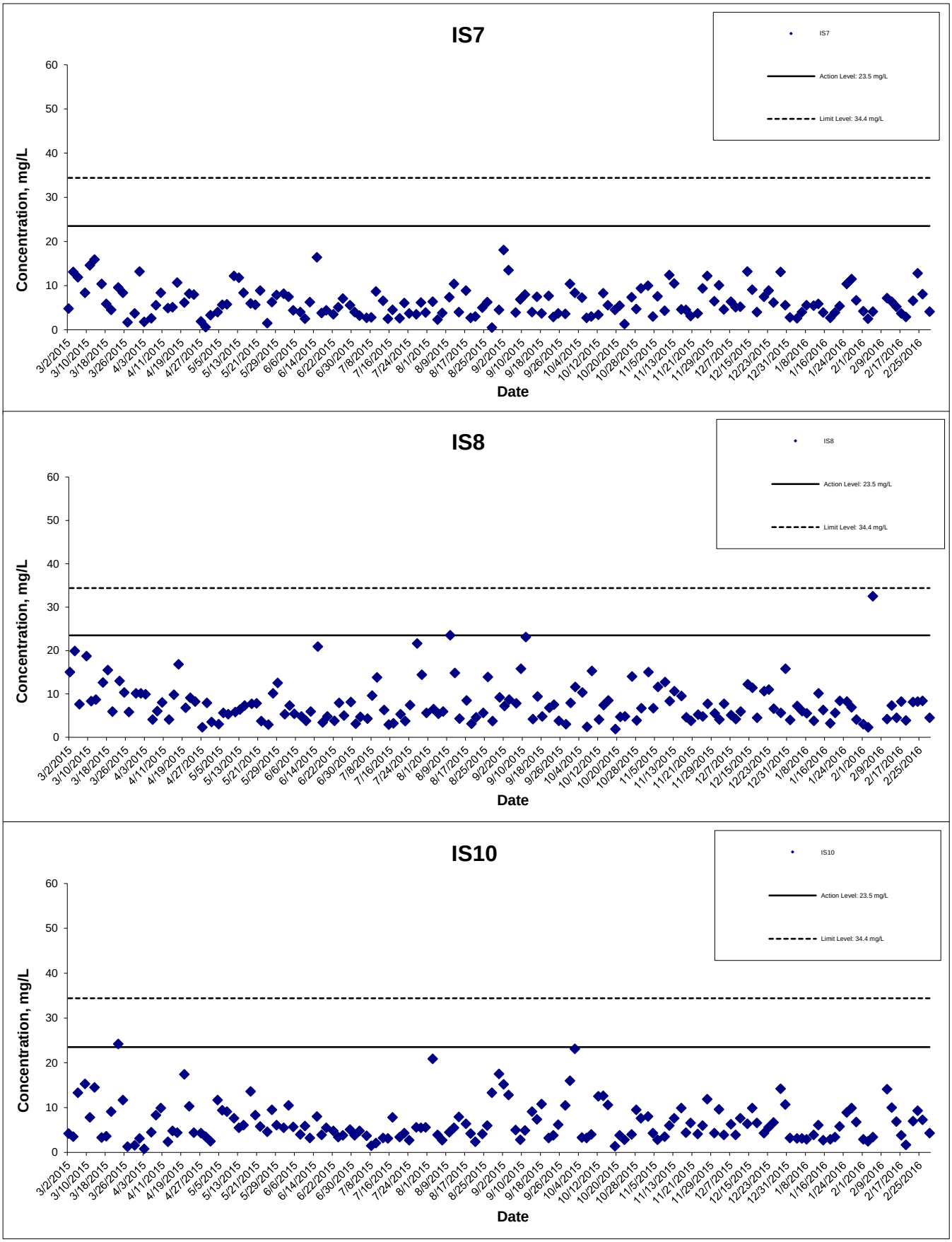
Suspended Solids at Mid-Flood Tide







Suspended Solids at Mid-Flood Tide



HONG KONG - ZHUHAI - MACAO BRIDGE
HONG KONG BOUNDARY CROSSING FACILITIES
- RECLAMATION WORKS

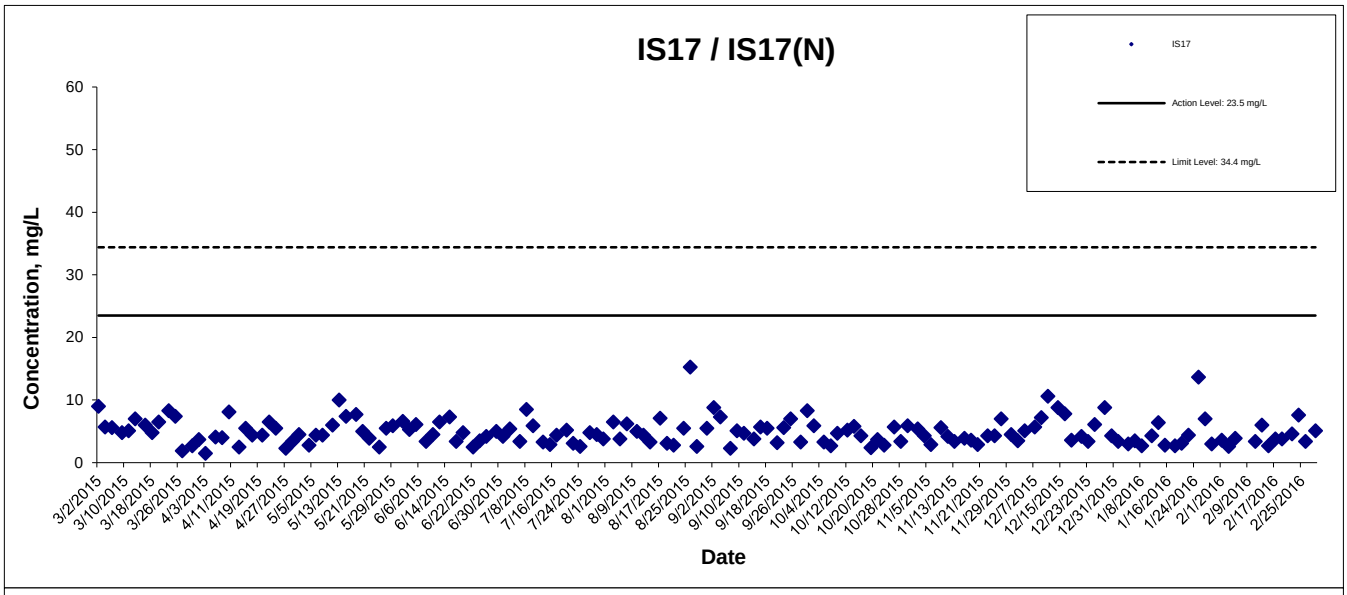
AECOM

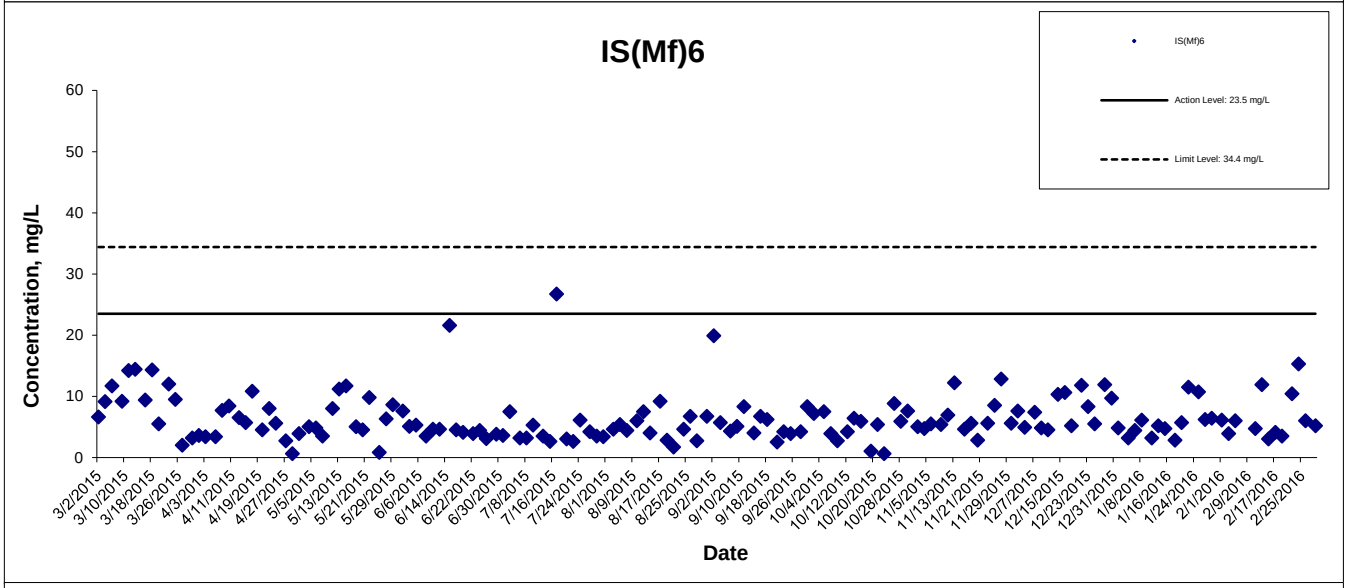
Graphical Presentation of Impact Water Quality Monitoring Results

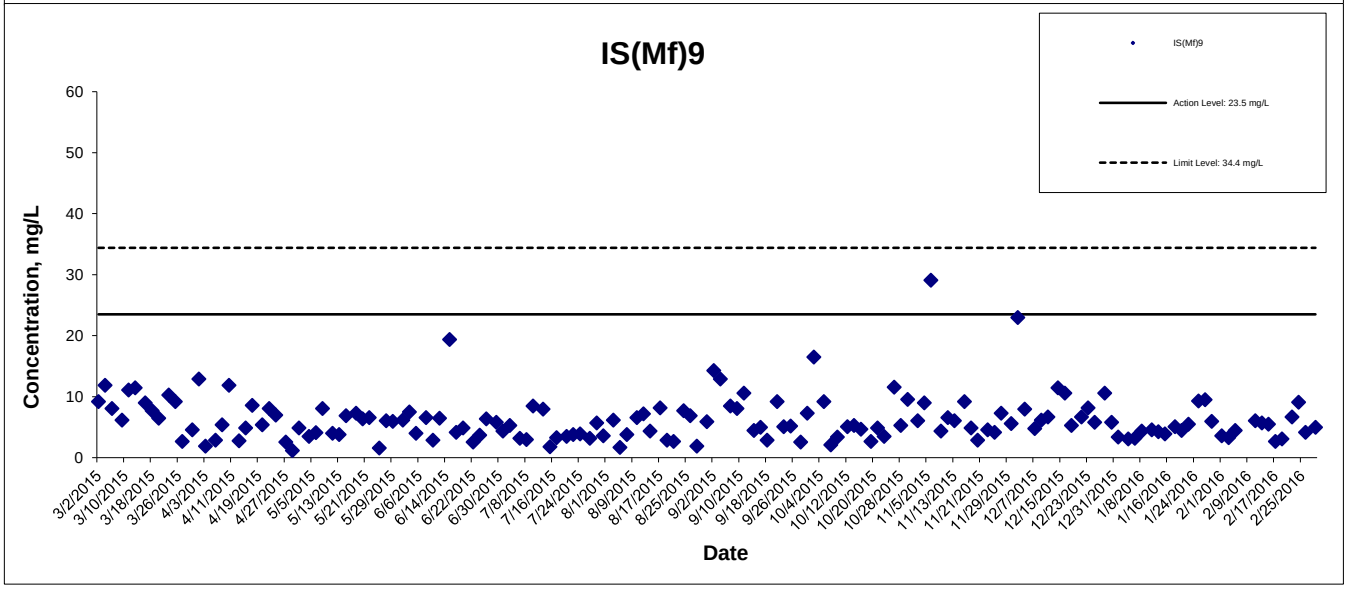
Project No.: 60249820 **Date: May 2016**

Appendix G

Suspended Solids at Mid-Flood Tide







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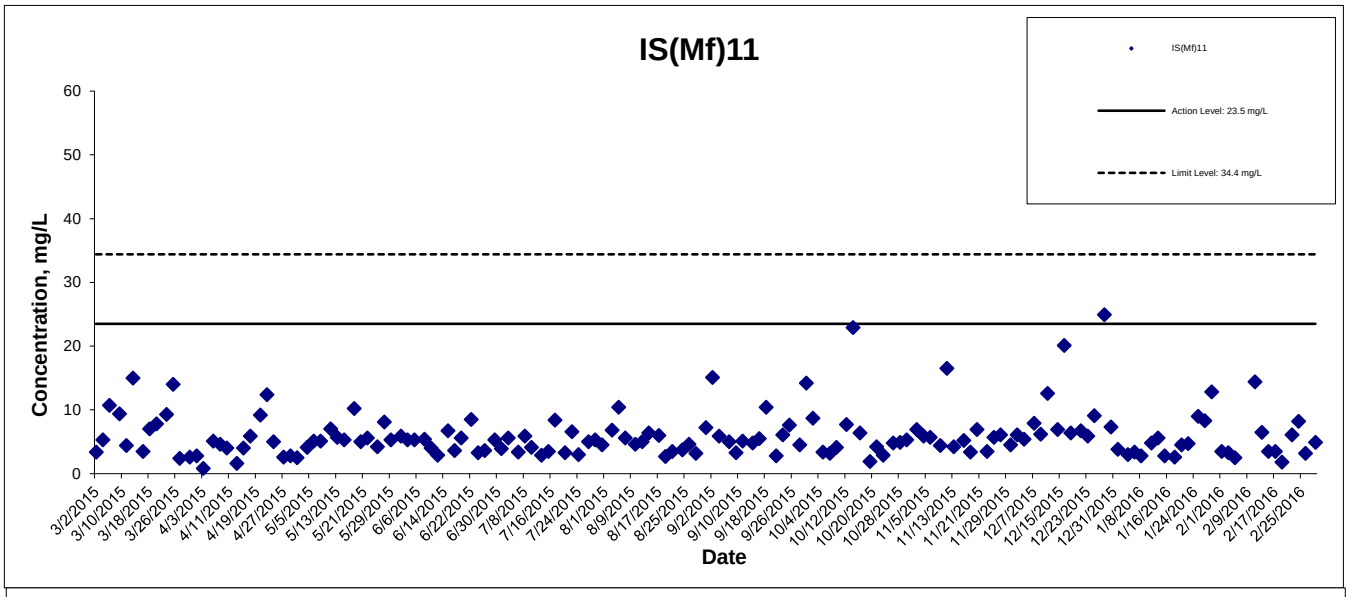
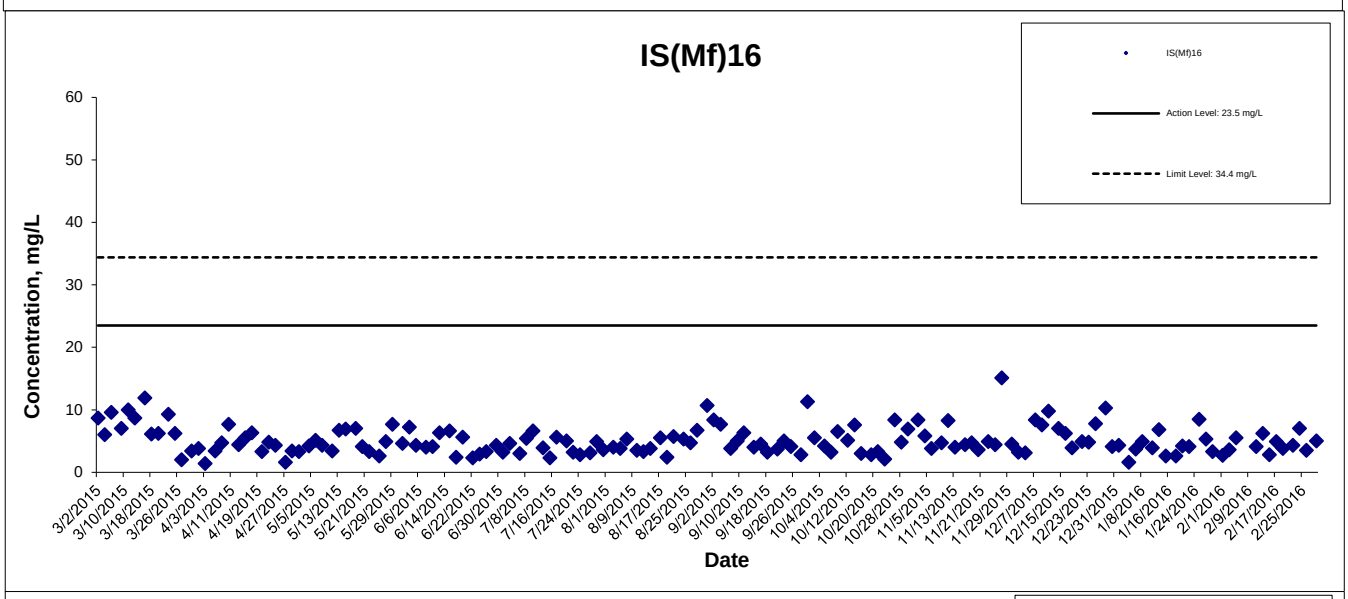
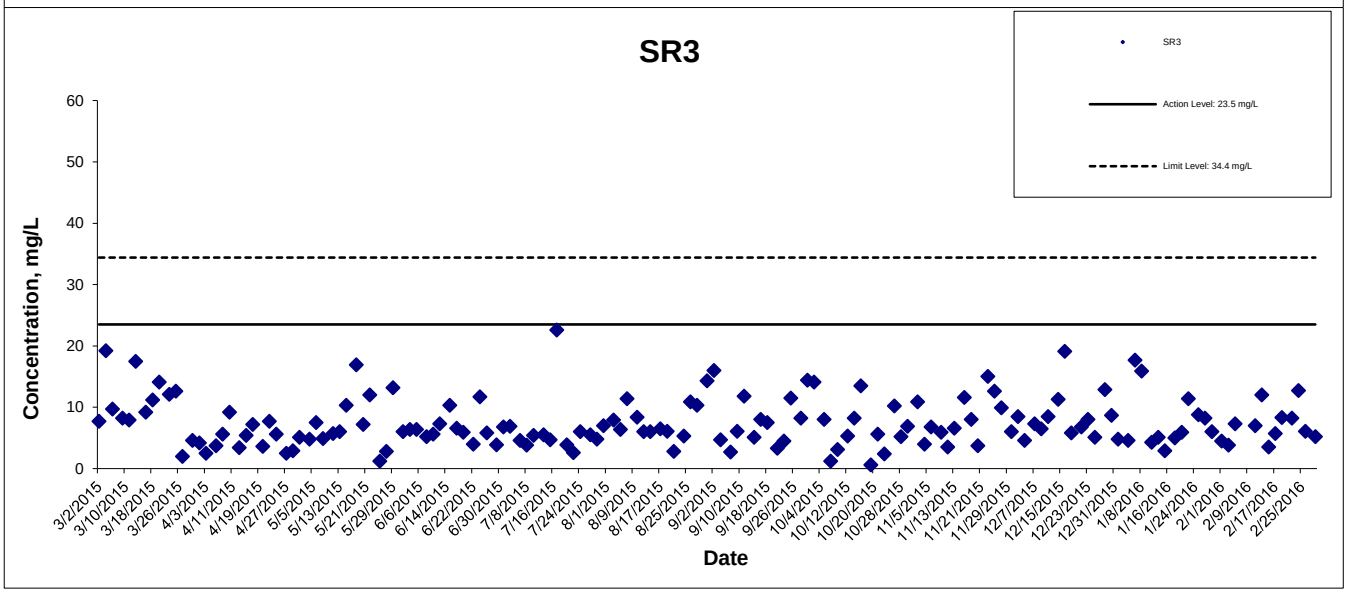
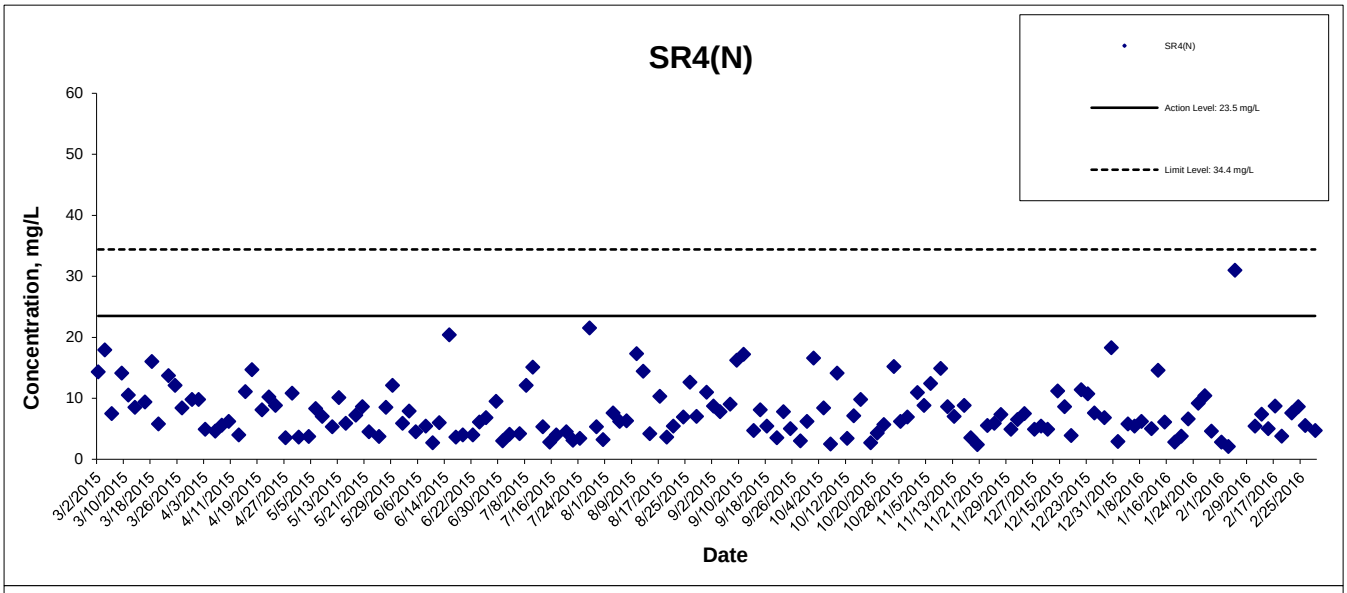
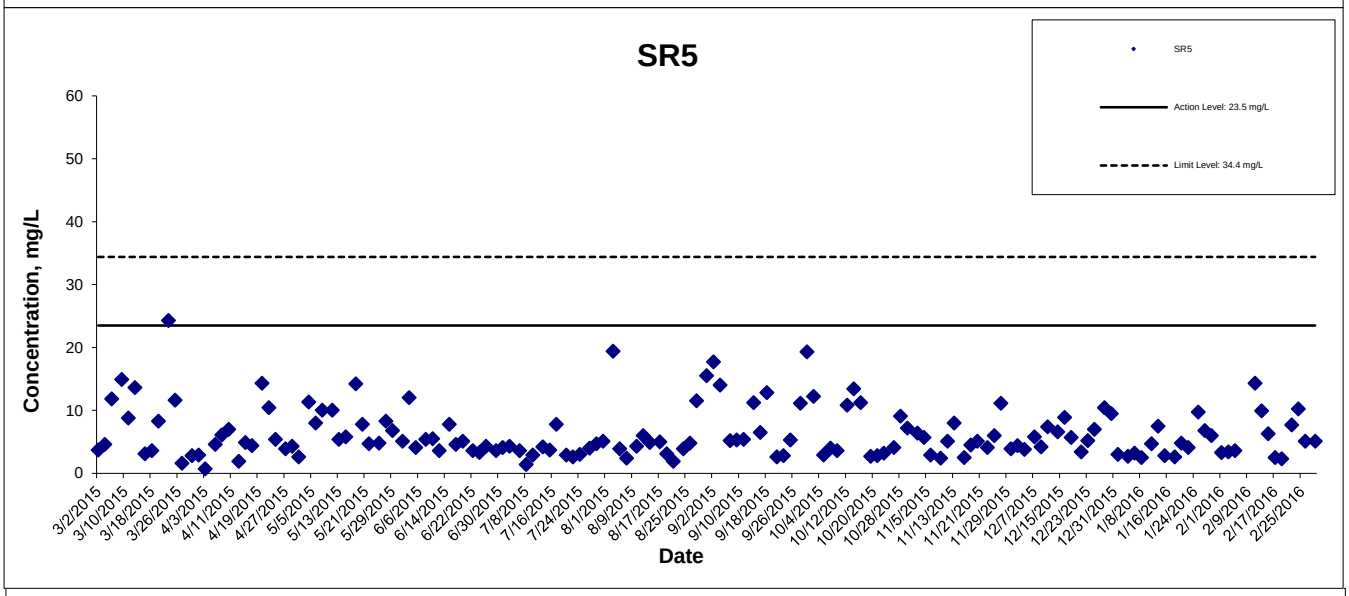


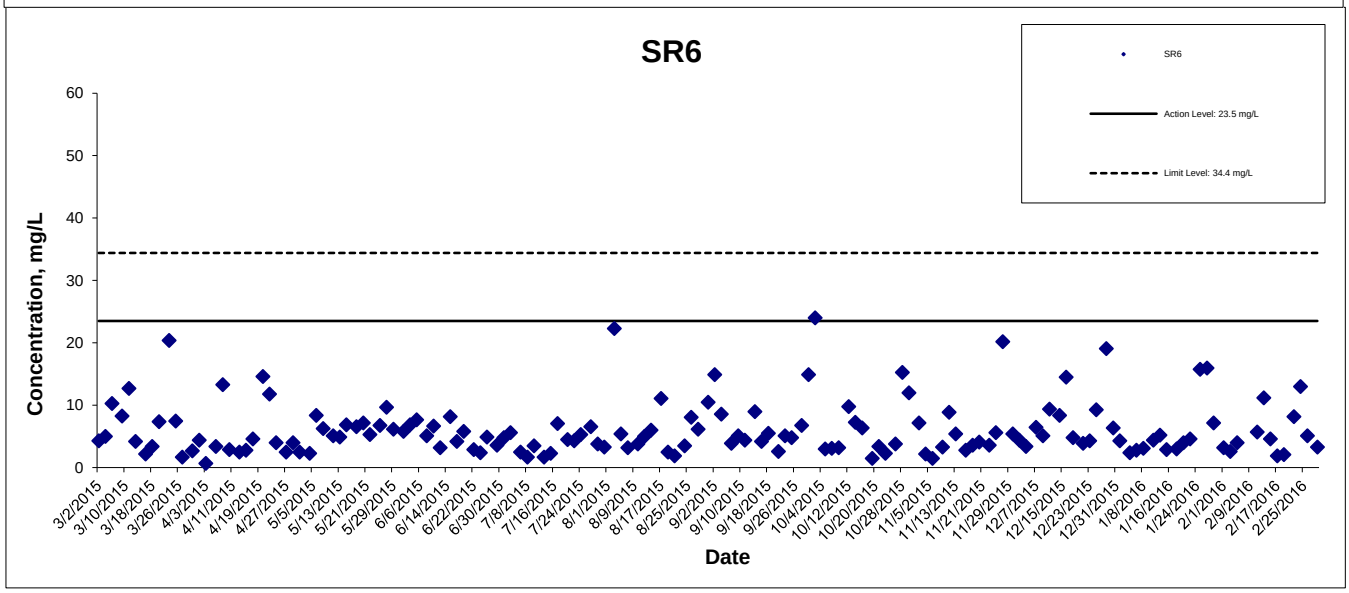




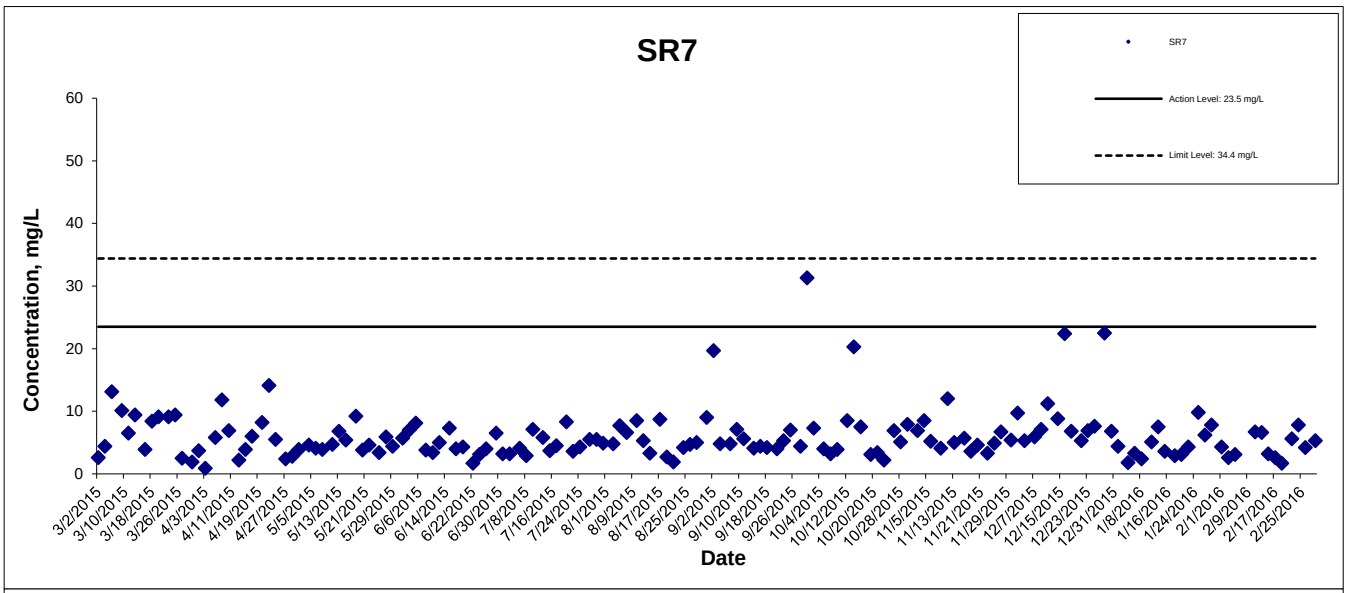
Suspended Solids at Mid-Flood Tide

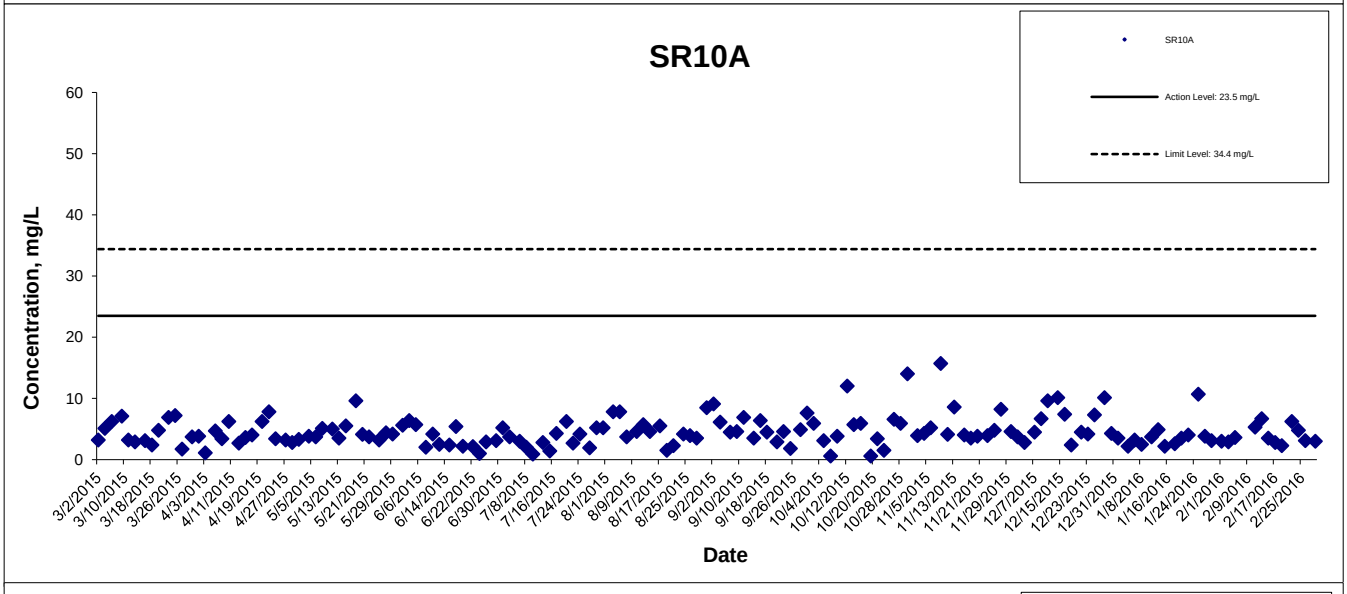


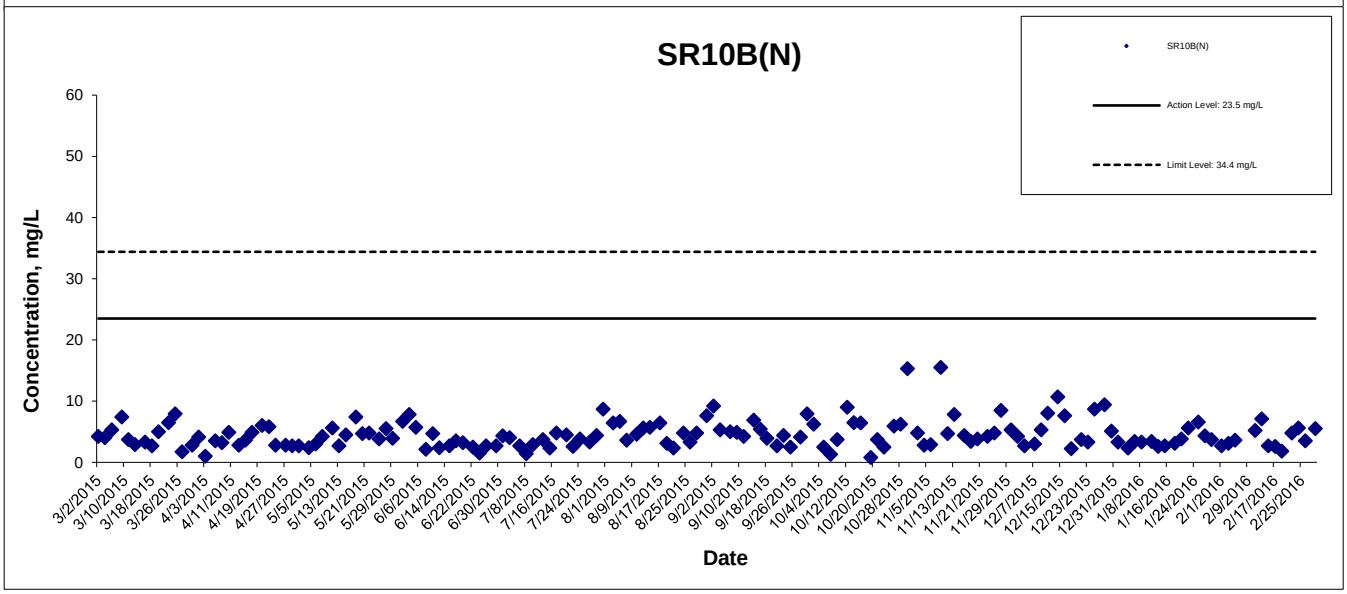




Suspended Solids at Mid-Flood Tide







Appendix H Impact Dolphin Monitoring Survey Findings and Analysis

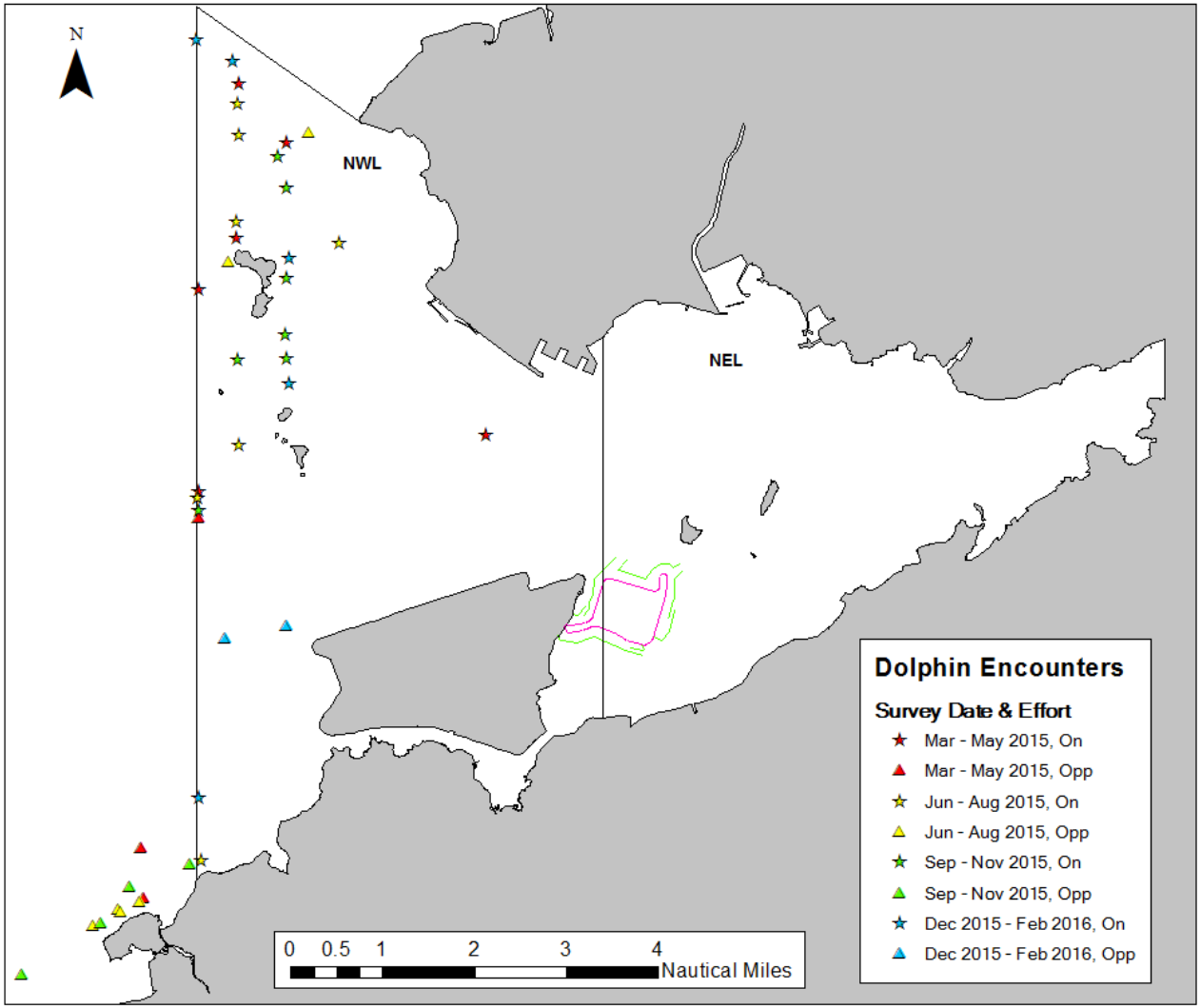


Figure 1 Dolphin Sightings Recorded During Monitoring Surveys, March 2015 -February 2016

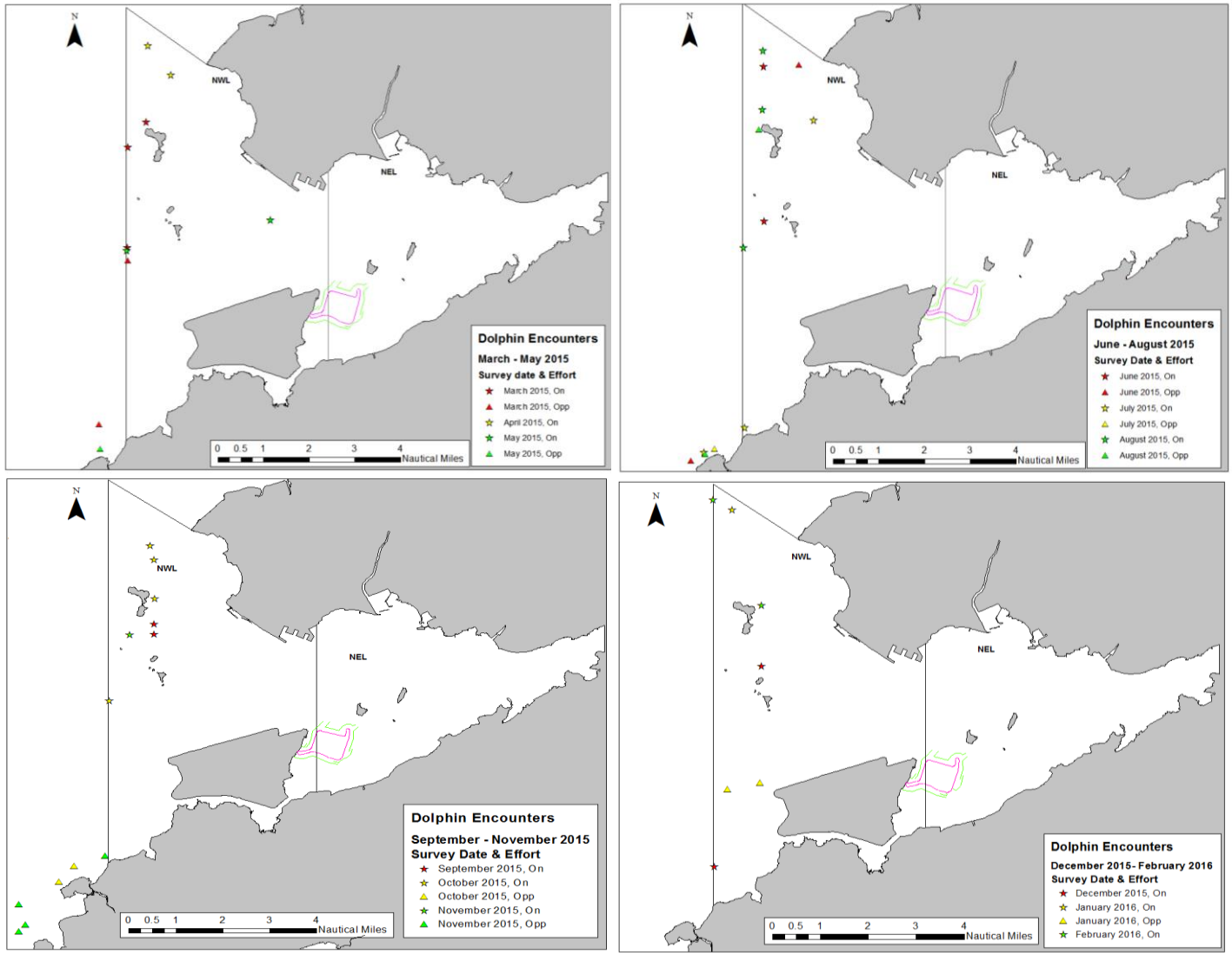


Figure 2 Dolphin Sightings Recorded per Quarter During Monitoring Surveys, March 2015 - February 2016

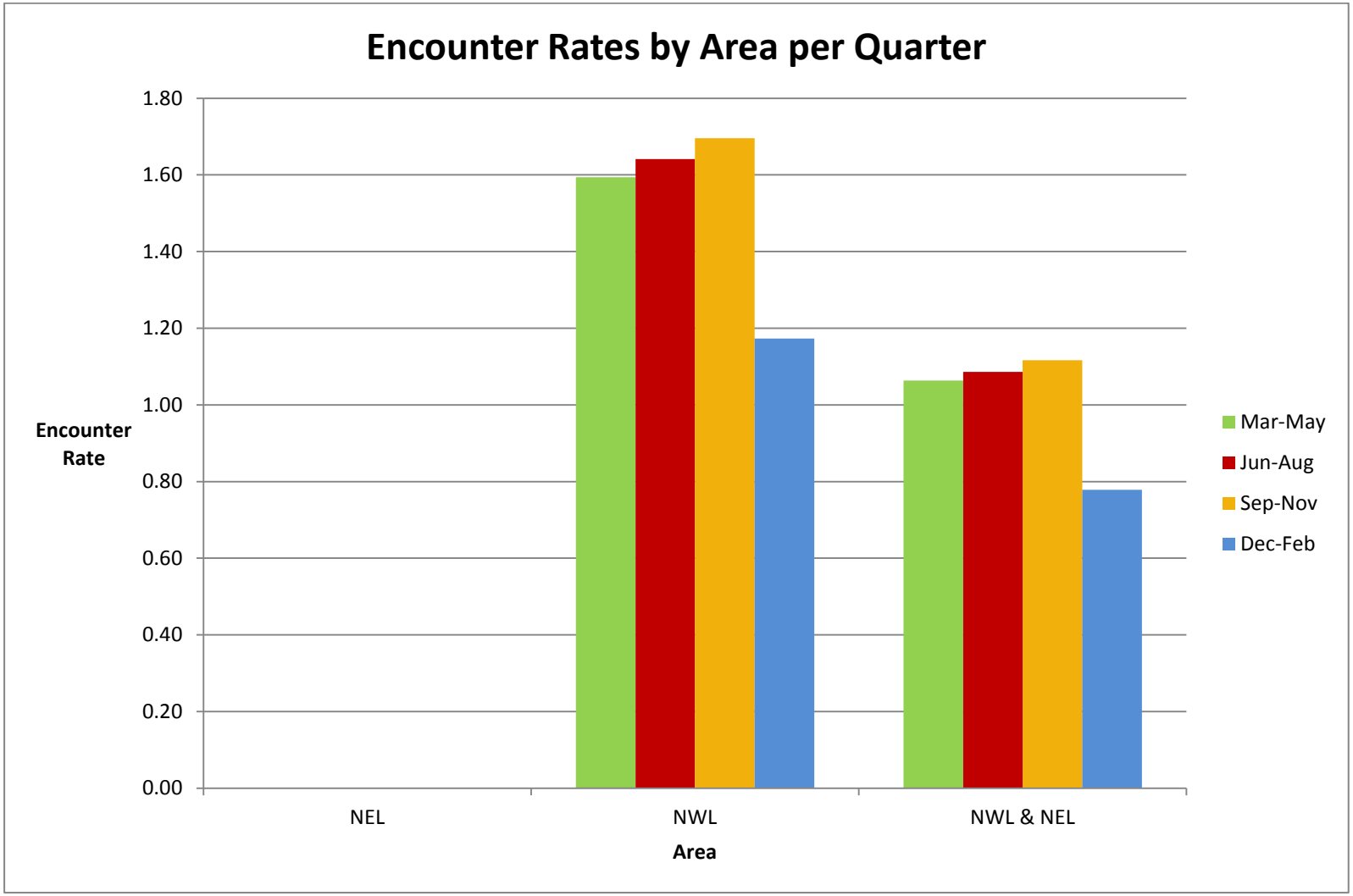


Figure 3 Encounter Rates of "On-Effort" Sightings (i.e., groups) for NWL and NEl and NWL Combined per Quarter for the Year March 2015 - February 2016

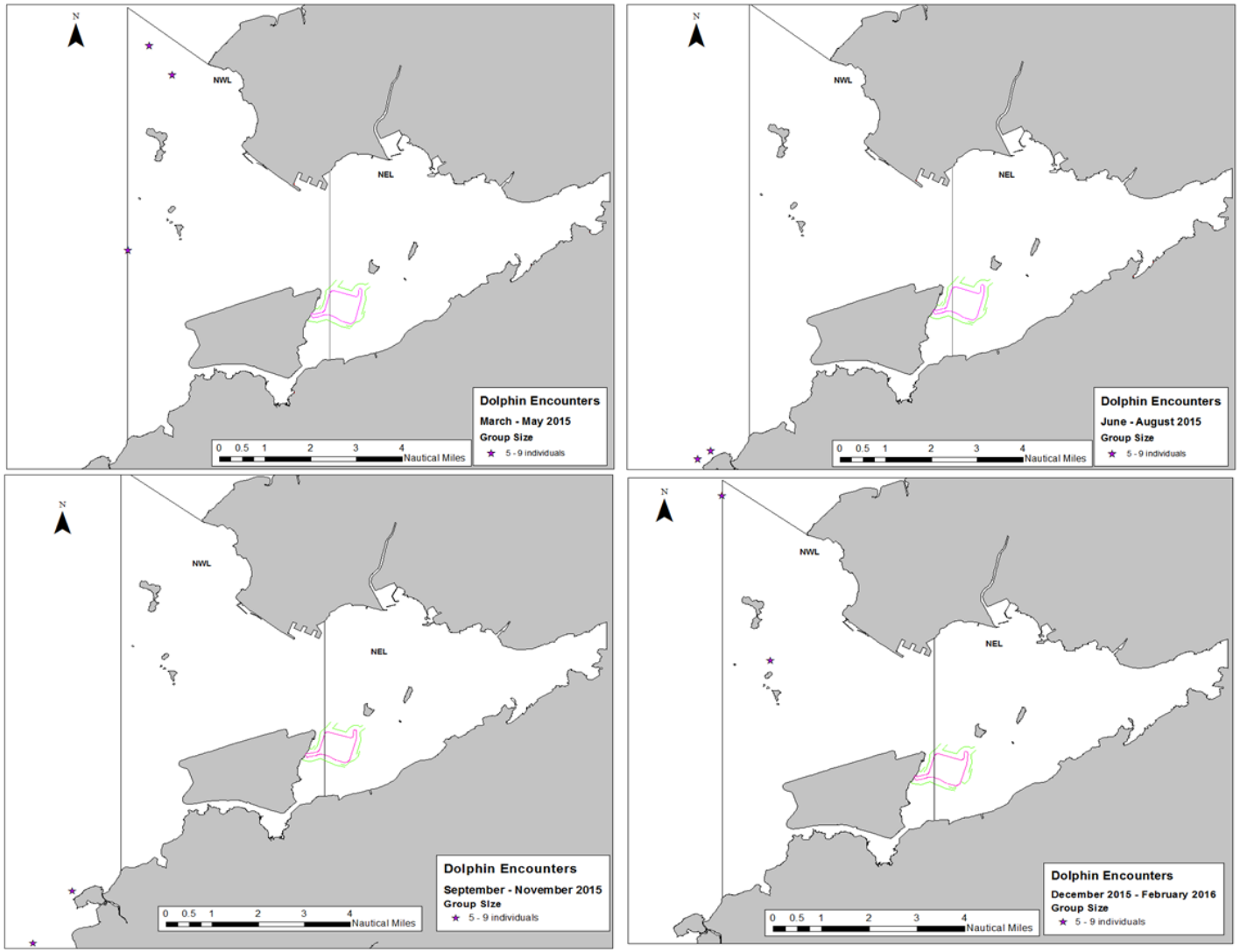


Figure 4 Dolphin Groups Sizes of More than Five Individuals per Quarter recorded between March 2015 and February 2016

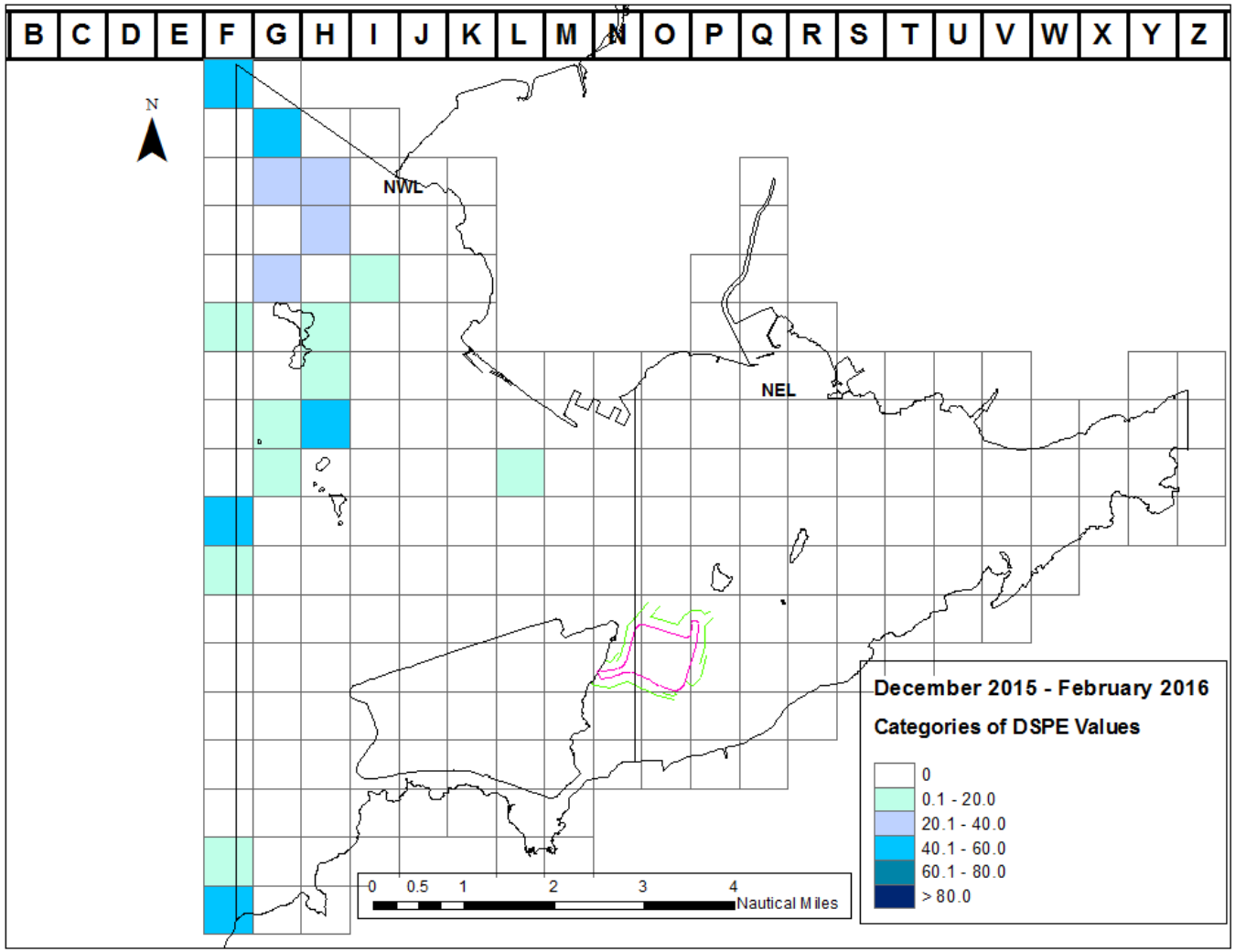


Figure 5 Dolphin density DPSE (number of dolphins per 100 units of survey effort) for March 2015 - February 2016

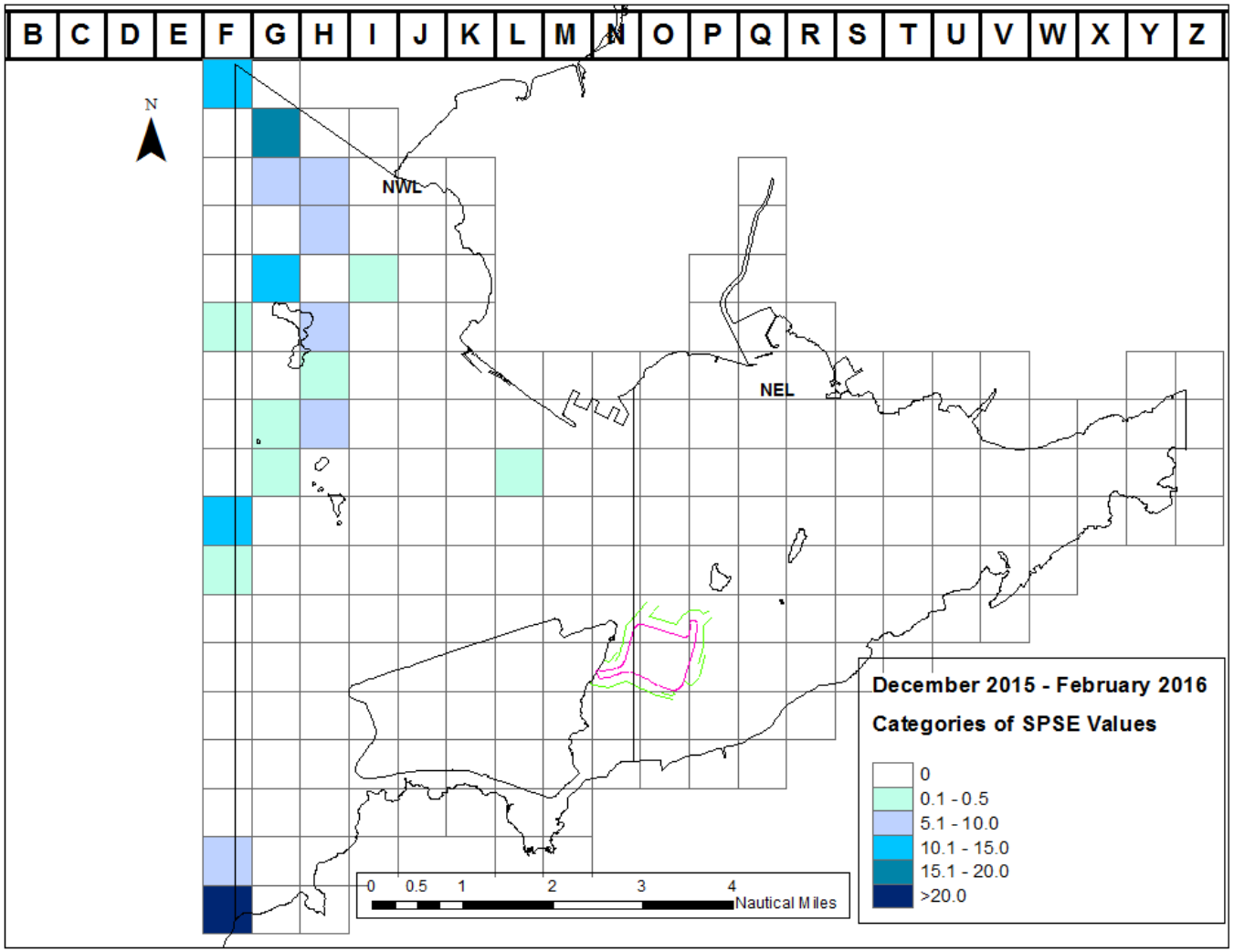


Figure 6 Sighting density SPSE (number of sightings per 100 units of survey effort) for March 2015 - February 2016

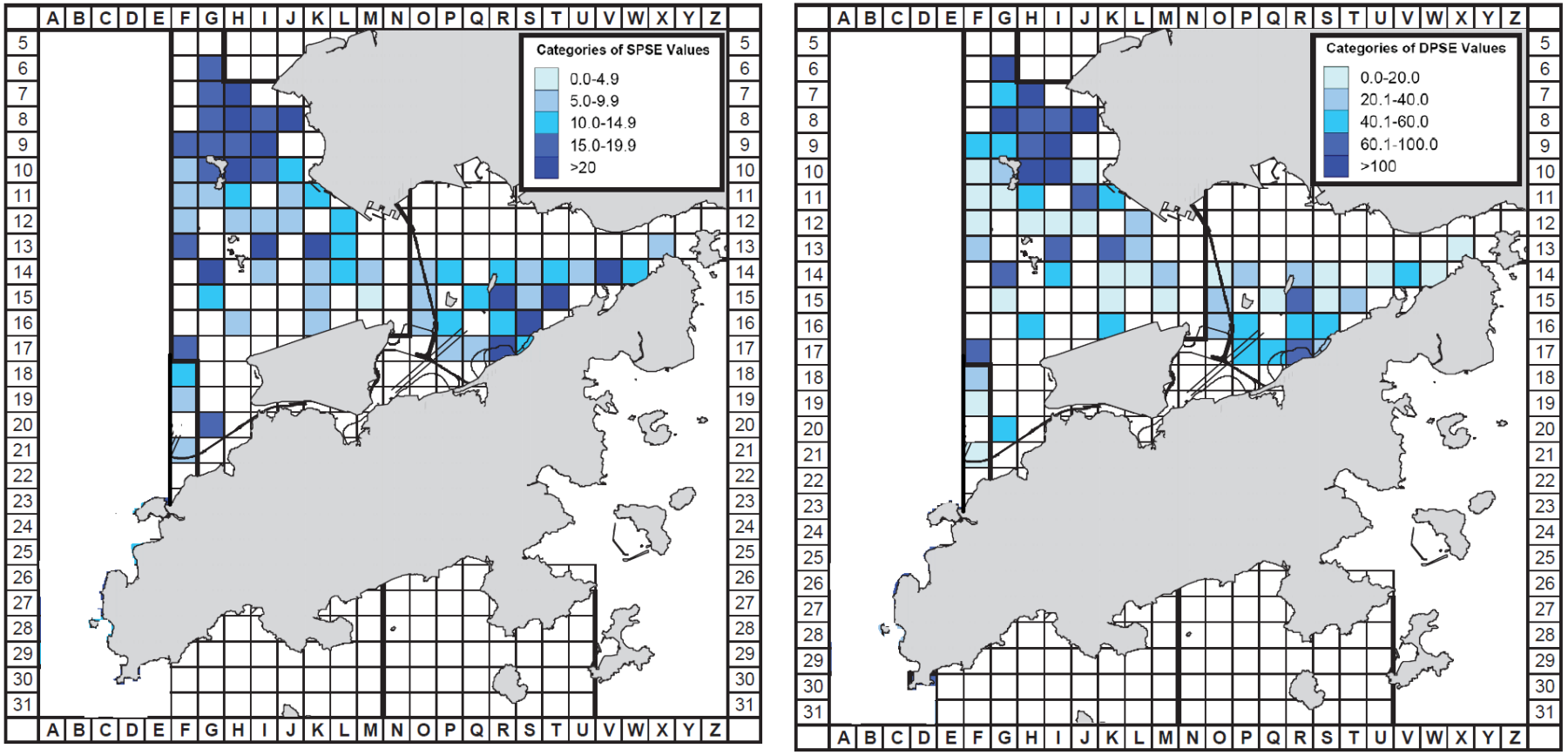


Figure 7. Yearly Dolphin Density Maps (number of dolphins/dolphin groups per 100 units of survey effort). Derived from Baseline and Advanced Chinese White Dolphin Monitoring for the period between February 2011 - January

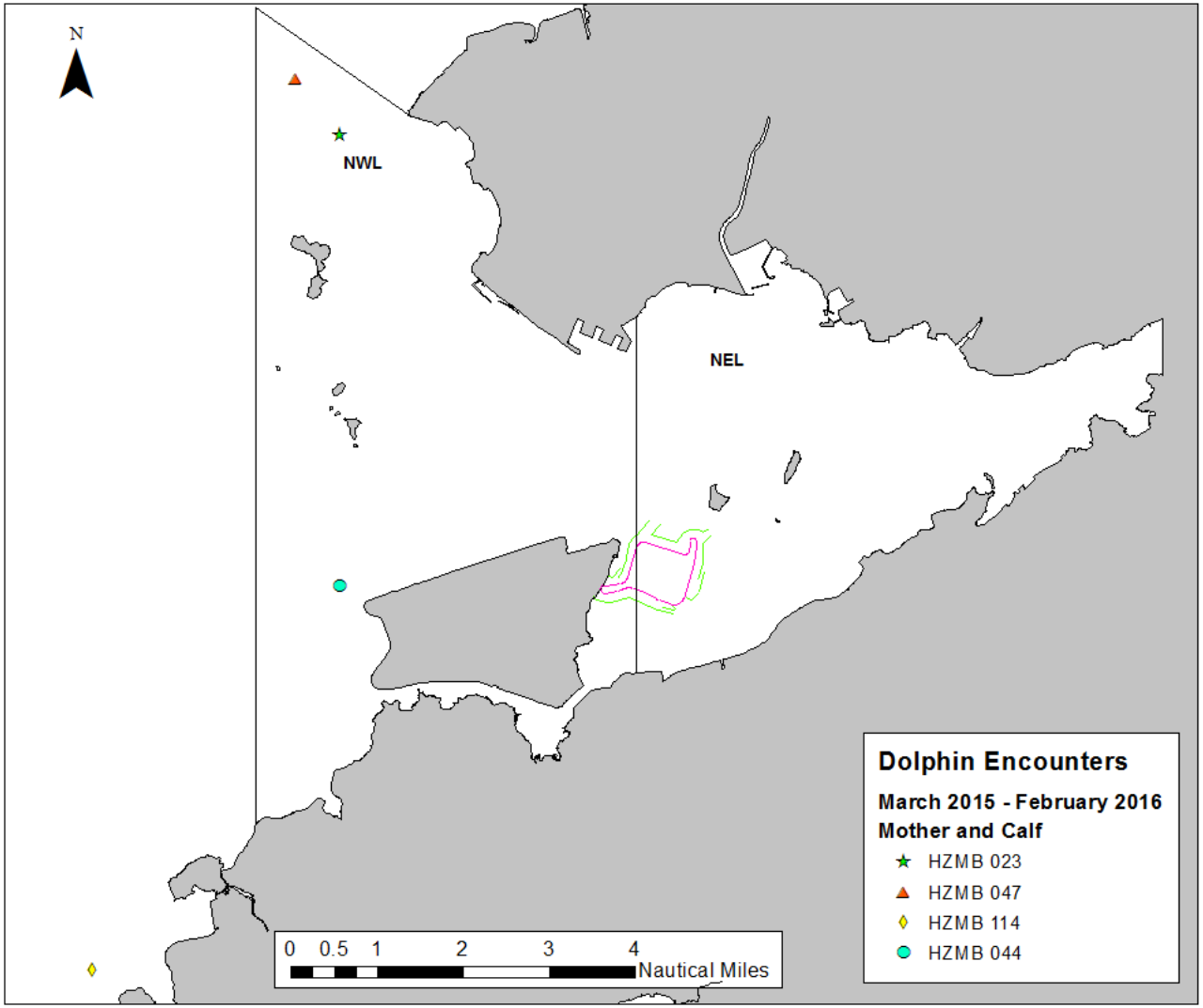


Figure 8 Mother and Offspring/Calf Pairs Sighted During Monitoring Surveys, March 2015 -February 2016

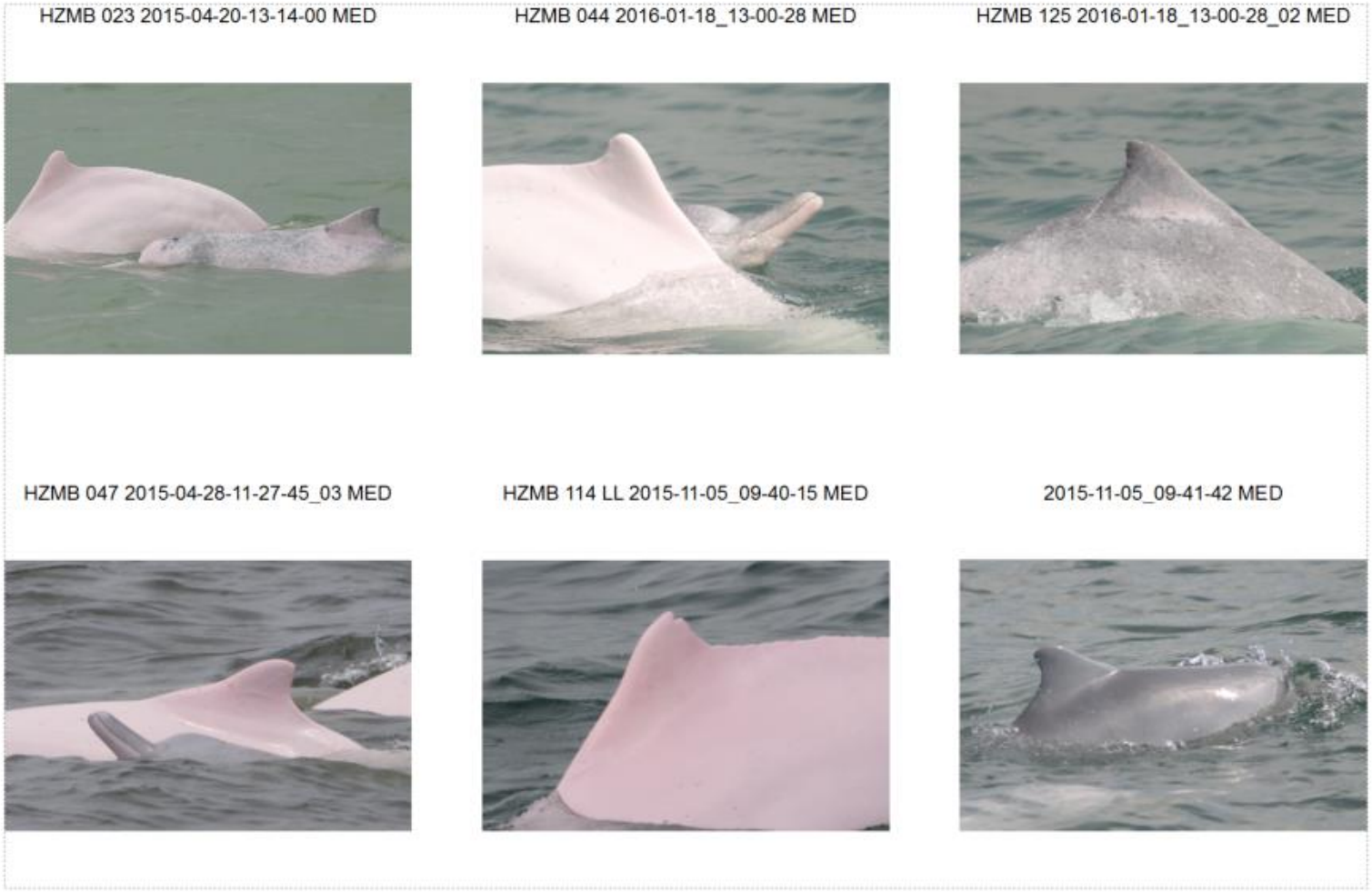


Figure 9. Calves and Juveniles of Females Identified in the HZMB Catalogue seen during the year March 2015 - February 2015. HZMB 023 and HZMB 044 were sighted with offspring in 2012 and HZMB 047 and HZMB 114 were first sighted with calves in 2015-16.

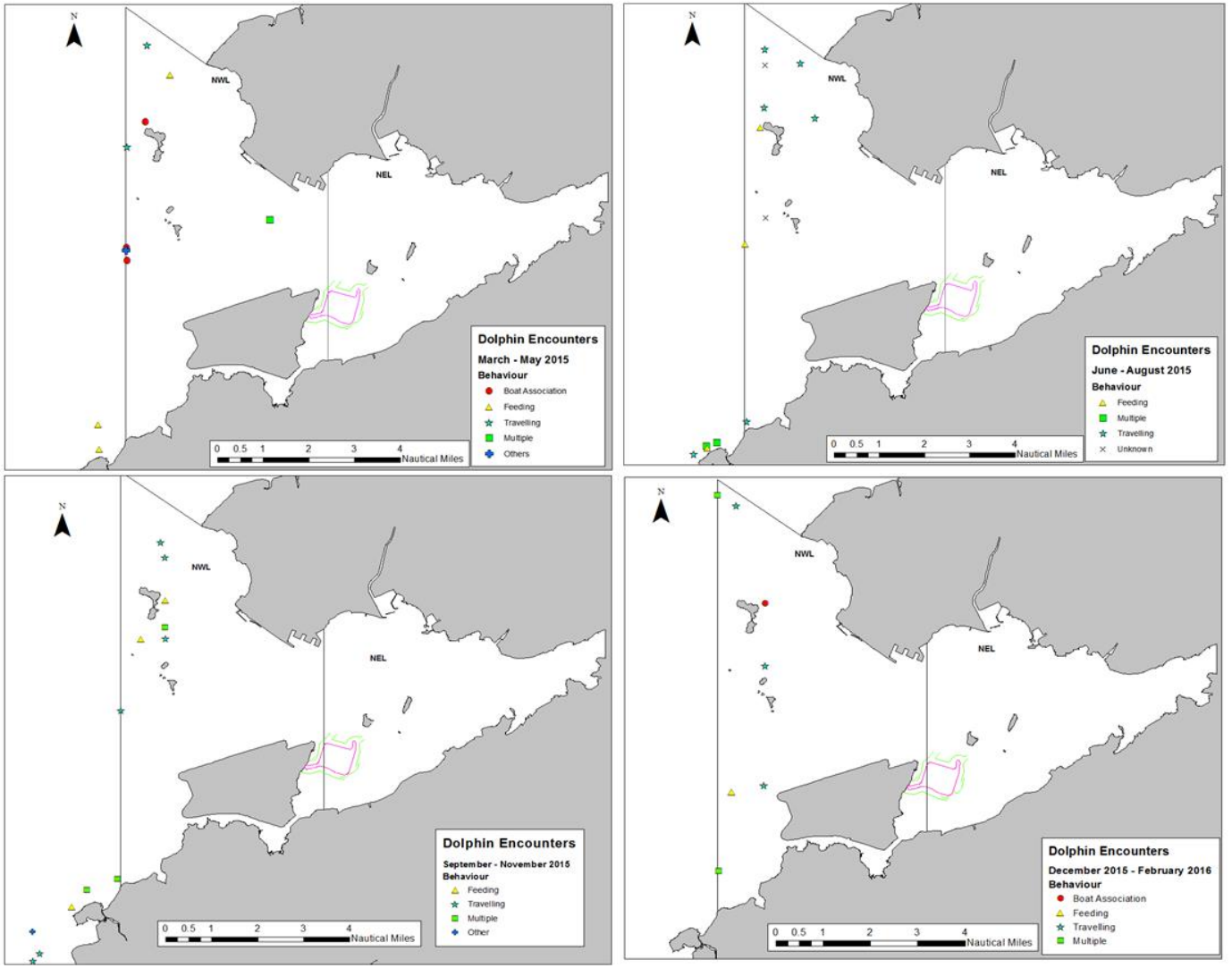
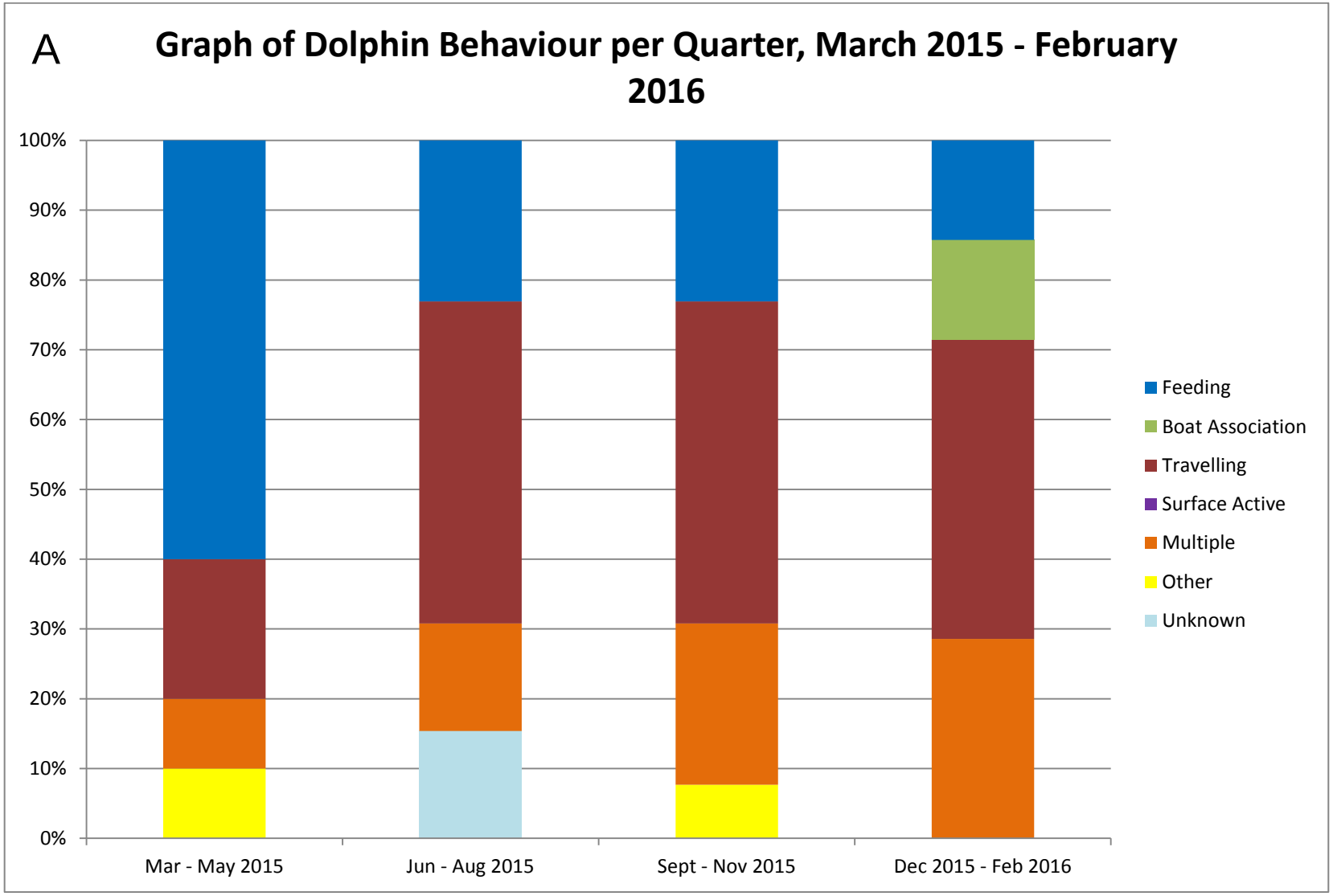
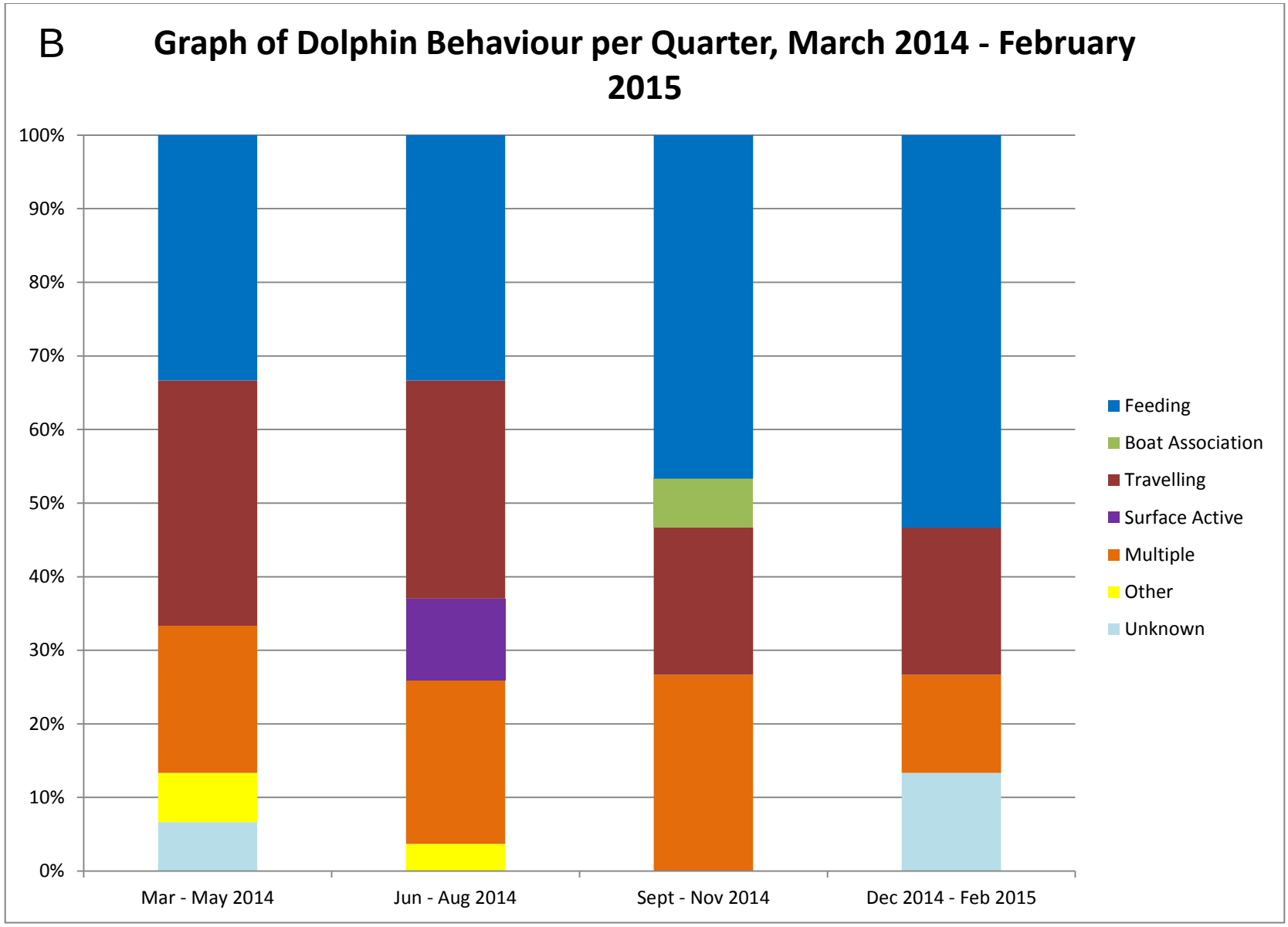


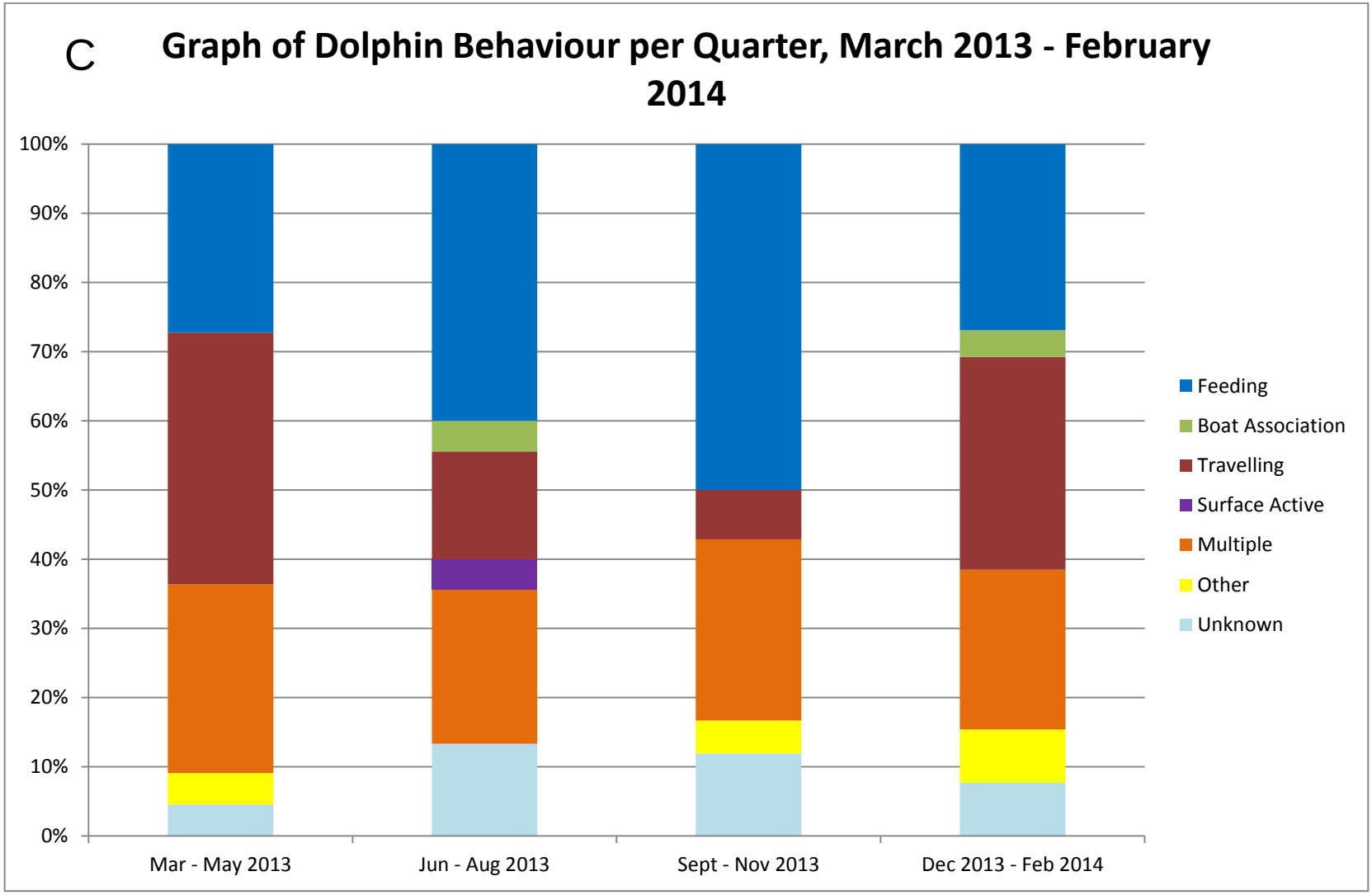
Figure 10 Dolphin Behavioural Activities per Quarter recorded between March 2015 and February 2016


A
Graph of Dolphin Behaviour per Quarter, March 2015 - February 2016
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Mar - May 2015
Jun - Aug 2015
Sept - Nov 2015
Dec 2015 - Feb 2016
Feeding
Boat Association
Travelling
Surface Active
Multiple
Other
Unknown

B


Graph of Dolphin Behaviour per Quarter, March 2014 - February 2015
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Mar - May 2014
Jun - Aug 2014
Sept - Nov 2014
Dec 2014 - Feb 2015
Feeding
Boat Association
Travelling
Surface Active
Multiple
Other
Unknown

C


Graph of Dolphin Behaviour per Quarter, March 2013 - February 2014
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Mar - May 2013
Jun - Aug 2013
Sept - Nov 2013
Dec 2013 - Feb 2014
Feeding
Boat Association
Travelling
Surface Active
Multiple
Other
Unknown

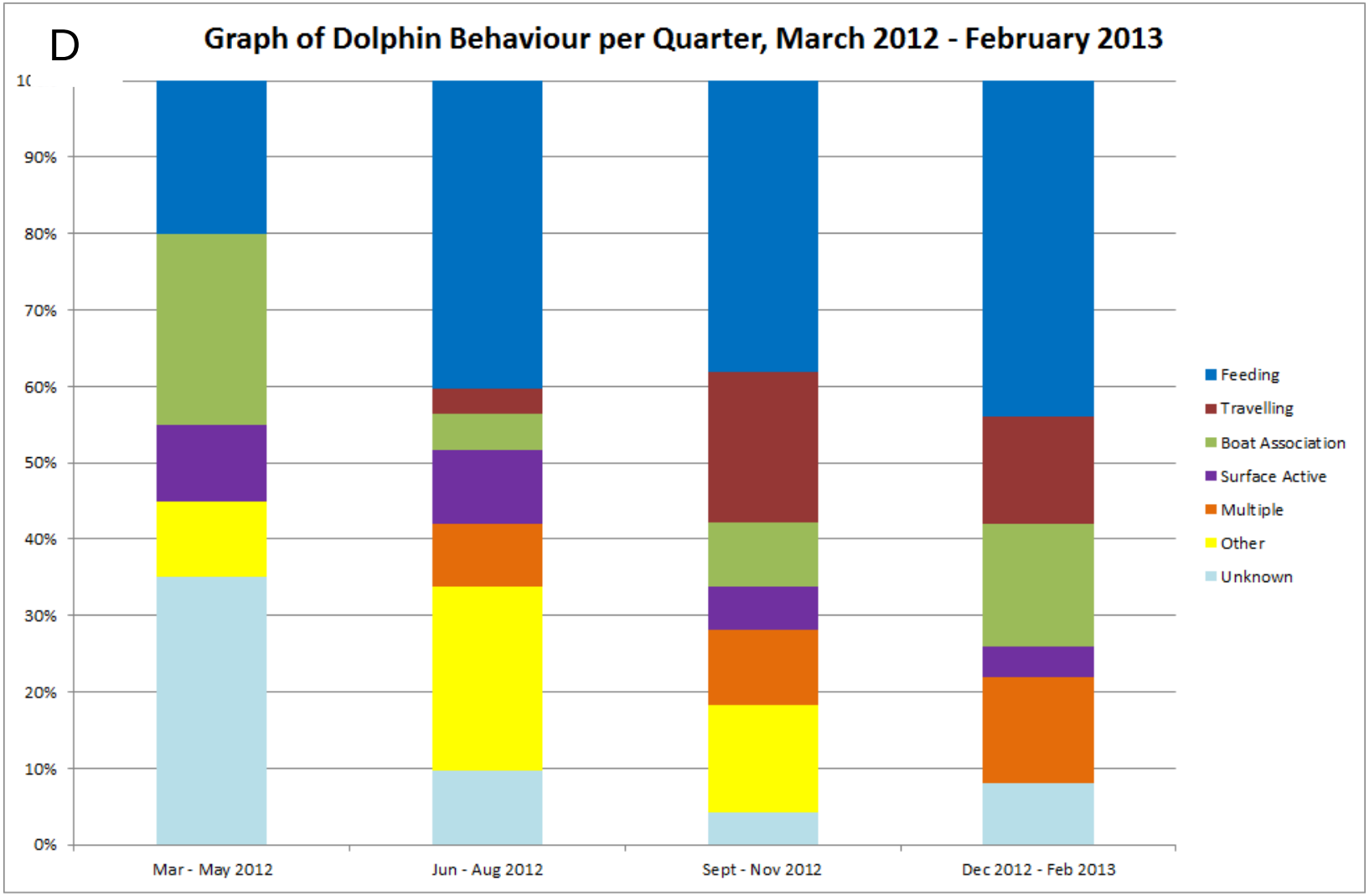


Figure 11. A) Dolphin Behavioural Activity per Quarter recorded between March 2015-February 2016 and; B) between March 2014-February 2015 and; C) between March 2013-February 2014 and; D) between March 2012-February 2013.

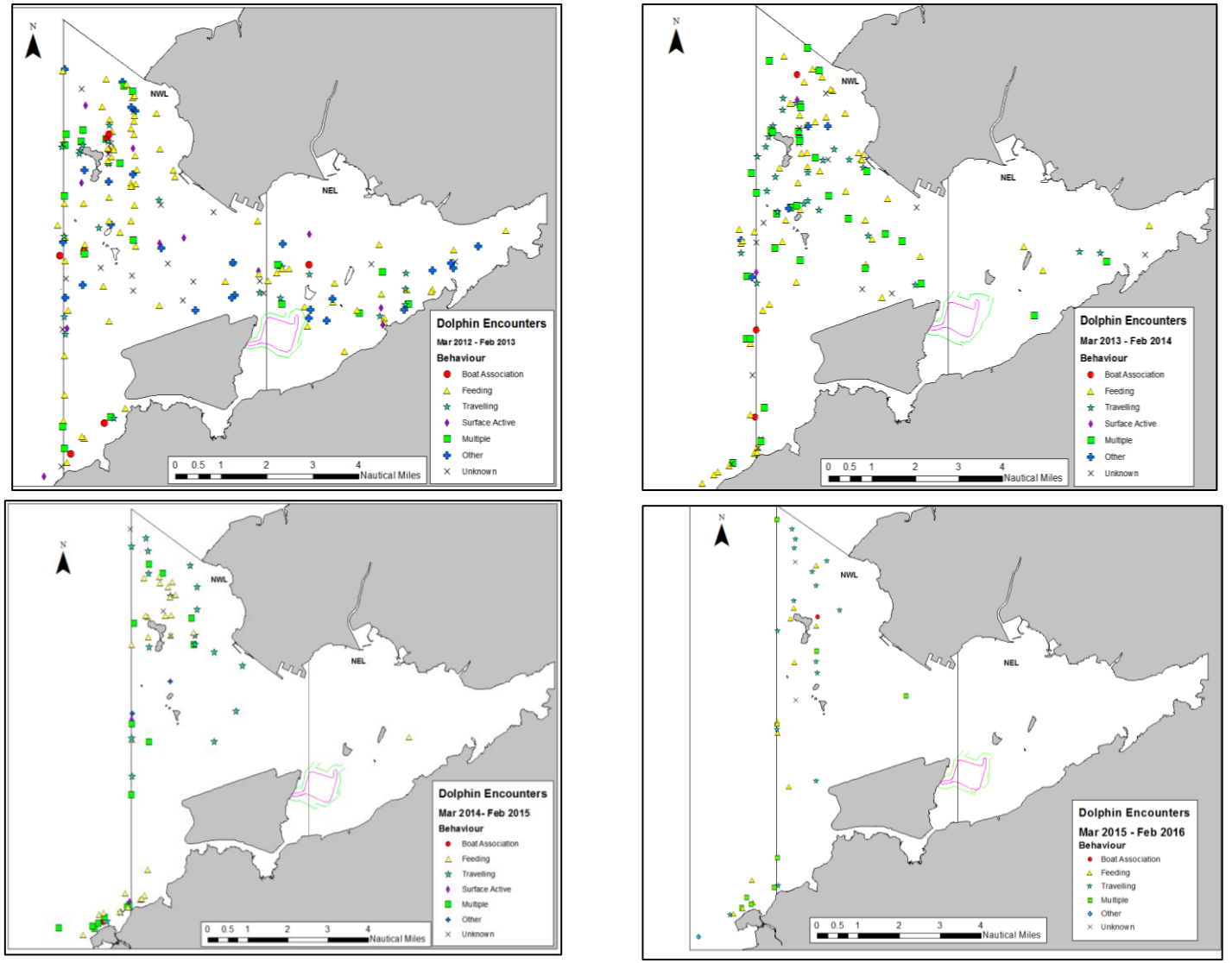


Figure 12. A Comparison of the location of behaviours from 2012-13 to 2015-16. The island of Lung Kwu Chau, in the northern part of NWL, and the Tai O area, to the southern sector of NWL, have become increasingly important feeding areas.

Table 1 Impact Monitoring Survey Schedule and Details (March 2015 – February 2016)

Date	Location of Survey	No. Sightings ON	No. Sightings Opp	Total km ON EFFORT (favourable conditions)
03/19/2015	NWL (1-6, 21, 22)	2	1	67.0
03/20/2015	NE and NW Lantau (7-20,23)	0	0	42.6
03/30/2015	NWL (1-6, 21, 22)	1	1	63.3
03/31/2015	NE and NW Lantau (7-20,23)	0	0	46.0
04/20/2015	NWL (1-6, 21, 22)	1	0	63.3
04/21/2015	NE and NW Lantau (7-20,23)	0	0	47.5
04/28/2015	NWL (1-6, 21, 22)	1	0	63.6
04/29/2015	NE and NW Lantau (7-20,23)	0	0	46.5
05/11/2015	NWL (1-6, 21, 22)	1	0	62.9
05/12/2015	NE and NW Lantau (7-20,23)	0	0	46.1
05/18/2015	NE and NW Lantau (1-7)	1	1	67.0
05/20/2015	NWL (8-20,23)	0	0	42.4
06/03/2015	NE and NW Lantau (4-20,23)	0	0	69.5
06/04/2015	NWL (1-3,21,22)	2	0	39.5
06/11/2015	NWL (1-6,21,22)	0	2	63.0
06/12/2015	NE and NW Lantau (7-20,23)	0	0	46.0
07/06/2015	NE and NW Lantau (1-6,21,22)	1	1	63.2
07/07/2015	NWL (7-20,23)	0	0	46.6
07/28/2015	NE and NW Lantau (1-6,21,22)	1	1	62.6
07/29/2015	NWL (7-20,23)	0	0	46.9
08/10/2015	NWL (1-7, 21, 22)	1	1	66.9
08/11/2015	NE and NW Lantau (8-20,23)	0	0	42.5
08/24/2015	NE and NW Lantau (5-20, 23)	0	0	59.8
08/25/2015	NWL (1-4, 21, 22)	2	1	48.6
09/07/2015	NWL (1-5, 21, 22)	2	0	57.1
09/08/2015	NE and NW Lantau (6-20,23)	0	0	50.9
09/29/2015	NE and NW Lantau (1-7, 21, 22)	0	0	66.2
09/30/2015	NWL (8-20,23)	0	0	42.1
10/07/2015	NE and NW Lantau (7-20,23)	0	0	47.3
10/09/2015	NWL (1-6, 21, 22)	2	1	61.1
10/22/2015	NWL (1-7, 21, 22)	2	1	65.7
10/23/2015	NE and NW Lantau (8-20,23)	0	0	42.7
11/05/2015	NWL (1-5, 21, 22)	0	3	56.6
11/06/2015	NE and NW Lantau (6-20,23)	0	0	52.3
11/17/2015	NWL (1-4, 21, 22)	1	1	48.3
11/19/2015	NE and NW Lantau (5-20,23)	0	0	60.4
12/01/2015	NWL (1-7, 21, 22)	2	0	66.3
12/02/2015	NE and NW Lantau (7-20,23)	0	0	42.7

Table 1 Impact Monitoring Survey Schedule and Details (March 2015 – February 2016) (con)

Date	Location of Survey	No. Sightings ON	No. Sightings Opp	Total km ON EFFORT (favourable conditions)
12/08/2015	NWL (1-4, 21, 22)	0	0	48.9
01/07/2016	NWL (1-6, 21, 22)	1	0	62.1
01/08/2016	NE and NW Lantau (7-20,23)	0	0	46.5
01/18/2016	NWL (1-5, 21, 22)	0	2	57.2
01/19/2016	NE and NW Lantau (6-20,23)	0	0	51.8
02/04/2016	NWL (1-6, 21, 22)	2	0	62.1
02/05/2016	NE and NW Lantau (7-20,23)	0	0	46.2
02/18/2016	NWL (1-6, 21, 22)	0	0	62.5
02/19/2016	NE and NW Lantau (7-20,23)	0	0	45.8

Table 2 Impact Monitoring Survey Effort Summary (March 2015 – February 2016)

Date	Area	Sea State (on effort)	Effort (km)	Season	Vessel	Type
03/19/2015	NWL	1	67	SPRING	HKDW	IMPACT
03/20/2015	NWL	1	6.1	SPRING	HKDW	IMPACT
03/20/2015	NEL	1	30.3	SPRING	HKDW	IMPACT
03/20/2015	NEL	2	6.2	SPRING	HKDW	IMPACT
03/30/2015	NWL	0	1.8	SPRING	HKDW	IMPACT
03/30/2015	NWL	1	53	SPRING	HKDW	IMPACT
03/30/2015	NWL	2	8.5	SPRING	HKDW	IMPACT
03/31/2015	NWL	1	4.9	SPRING	HKDW	IMPACT
03/31/2015	NWL	2	5	SPRING	HKDW	IMPACT
03/31/2015	NEL	1	30.3	SPRING	HKDW	IMPACT
03/31/2015	NEL	2	5.8	SPRING	HKDW	IMPACT
04/20/2015	NWL	1	11.1	SPRING	HKDW	IMPACT
04/20/2015	NWL	2	52.2	SPRING	HKDW	IMPACT
04/21/2015	NWL	1	6.2	SPRING	HKDW	IMPACT
04/21/2015	NWL	2	4	SPRING	HKDW	IMPACT
04/21/2015	NEL	1	33.1	SPRING	HKDW	IMPACT
04/21/2015	NEL	2	4.2	SPRING	HKDW	IMPACT
04/28/2015	NWL	1	11.7	SPRING	HKDW	IMPACT
04/28/2015	NWL	2	40.8	SPRING	HKDW	IMPACT
04/28/2015	NWL	3	11.1	SPRING	HKDW	IMPACT
04/29/2015	NWL	1	6.2	SPRING	HKDW	IMPACT
04/29/2015	NWL	2	3.9	SPRING	HKDW	IMPACT
04/29/2015	NEL	1	36.4	SPRING	HKDW	IMPACT
05/11/2015	NWL	1	8	SPRING	HKDW	IMPACT
05/11/2015	NWL	2	52.3	SPRING	HKDW	IMPACT
05/11/2015	NWL	3	2.6	SPRING	HKDW	IMPACT
05/12/2015	NWL	1	9.8	SPRING	HKDW	IMPACT
05/12/2015	NEL	1	36.3	SPRING	HKDW	IMPACT
05/18/2015	NWL	1	17.2	SPRING	HKDW	IMPACT
05/18/2015	NWL	2	34.4	SPRING	HKDW	IMPACT
05/18/2015	NWL	3	15.4	SPRING	HKDW	IMPACT
05/20/2015	NWL	1	6	SPRING	HKDW	IMPACT
05/20/2015	NEL	1	26	SPRING	HKDW	IMPACT
05/20/2015	NEL	2	10.4	SPRING	HKDW	IMPACT
06/03/2015	NWL	1	7.6	SUMMER	HKDW	IMPACT
06/03/2015	NWL	2	21.2	SUMMER	HKDW	IMPACT
06/03/2015	NWL	3	4	SUMMER	HKDW	IMPACT
06/03/2015	NEL	1	35.4	SUMMER	HKDW	IMPACT
06/03/2015	NEL	2	1.3	SUMMER	HKDW	IMPACT
06/04/2015	NWL	2	18.7	SUMMER	HKDW	IMPACT

Table 2 Impact Monitoring Survey Effort Summary (March 2015 – February 2016) (con)

Date	Area	Sea State (on effort)	Effort (km)	Season	Vessel	Type
06/04/2015	NWL	3	13.4	SUMMER	HKDW	IMPACT
06/04/2015	NWL	4	7.4	SUMMER	HKDW	IMPACT
06/11/2015	NWL	2	13.7	SUMMER	HKDW	IMPACT
06/11/2015	NWL	3	46.2	SUMMER	HKDW	IMPACT
06/11/2015	NWL	4	3.1	SUMMER	HKDW	IMPACT
06/12/2015	NWL	2	4.2	SUMMER	HKDW	IMPACT
06/12/2015	NWL	3	5.7	SUMMER	HKDW	IMPACT
06/12/2015	NEL	1	21.3	SUMMER	HKDW	IMPACT
06/12/2015	NEL	2	13.7	SUMMER	HKDW	IMPACT
06/12/2015	NEL	3	1.1	SUMMER	HKDW	IMPACT
07/06/2015	NWL	1	4.6	SUMMER	HKDW	IMPACT
07/06/2015	NWL	2	46.7	SUMMER	HKDW	IMPACT
07/06/2015	NWL	3	11.9	SUMMER	HKDW	IMPACT
07/07/2015	NWL	1	0.3	SUMMER	HKDW	IMPACT
07/07/2015	NWL	2	5.8	SUMMER	HKDW	IMPACT
07/07/2015	NWL	3	4	SUMMER	HKDW	IMPACT
07/07/2015	NEL	1	30.1	SUMMER	HKDW	IMPACT
07/07/2015	NEL	2	6.4	SUMMER	HKDW	IMPACT
07/28/2015	NWL	1	29	SUMMER	HKDW	IMPACT
07/28/2015	NWL	2	19.4	SUMMER	HKDW	IMPACT
07/28/2015	NWL	3	14.2	SUMMER	HKDW	IMPACT
07/29/2015	NWL	2	7.2	SUMMER	HKDW	IMPACT
07/29/2015	NWL	3	3.4	SUMMER	HKDW	IMPACT
07/29/2015	NEL	1	15	SUMMER	HKDW	IMPACT
07/29/2015	NEL	2	21.3	SUMMER	HKDW	IMPACT
08/10/2015	NWL	1	28.7	SUMMER	HKDW	IMPACT
08/10/2015	NWL	2	28.8	SUMMER	HKDW	IMPACT
08/10/2015	NWL	3	9.4	SUMMER	HKDW	IMPACT
08/11/2015	NWL	1	6.3	SUMMER	HKDW	IMPACT
08/11/2015	NEL	1	28.8	SUMMER	HKDW	IMPACT
08/11/2015	NEL	2	7.4	SUMMER	HKDW	IMPACT
08/24/2015	NWL	1	23.5	SUMMER	HKDW	IMPACT
08/24/2015	NEL	1	33.8	SUMMER	HKDW	IMPACT
08/24/2015	NEL	2	2.5	SUMMER	HKDW	IMPACT
08/25/2015	NWL	1	48.6	SUMMER	HKDW	IMPACT
09/07/2015	NWL	1	53.9	AUTUMN	HKDW	IMPACT
09/07/2015	NWL	2	3.2	AUTUMN	HKDW	IMPACT
09/08/2015	NWL	1	14.9	AUTUMN	HKDW	IMPACT
09/08/2015	NEL	1	13.7	AUTUMN	HKDW	IMPACT
09/08/2015	NEL	2	22.3	AUTUMN	HKDW	IMPACT

Table 2 Impact Monitoring Survey Effort Summary (March 2015 – February 2016) (con)

Date	Area	Sea State (on effort)	Effort (km)	Season	Vessel	Type
09/29/2015	NWL	1	4	AUTUMN	HKDW	IMPACT
09/29/2015	NWL	2	30.6	AUTUMN	HKDW	IMPACT
09/29/2015	NWL	3	27.8	AUTUMN	HKDW	IMPACT
09/29/2015	NWL	4	3.8	AUTUMN	HKDW	IMPACT
09/30/2015	NWL	1	3	AUTUMN	HKDW	IMPACT
09/30/2015	NWL	2	3.1	AUTUMN	HKDW	IMPACT
09/30/2015	NEL	1	12.4	AUTUMN	HKDW	IMPACT
09/30/2015	NEL	2	15.5	AUTUMN	HKDW	IMPACT
09/30/2015	NEL	3	8.1	AUTUMN	HKDW	IMPACT
10/07/2015	NWL	1	9.9	AUTUMN	HKDW	IMPACT
10/07/2015	NEL	1	37.4	AUTUMN	HKDW	IMPACT
10/09/2015	NWL	1	21.7	AUTUMN	HKDW	IMPACT
10/09/2015	NWL	2	28.9	AUTUMN	HKDW	IMPACT
10/09/2015	NWL	3	7.2	AUTUMN	HKDW	IMPACT
10/09/2015	NWL	4	3.3	AUTUMN	HKDW	IMPACT
10/22/2015	NWL	1	22.3	AUTUMN	HKDW	IMPACT
10/22/2015	NWL	2	40.1	AUTUMN	HKDW	IMPACT
10/22/2015	NWL	3	3.3	AUTUMN	HKDW	IMPACT
10/23/2015	NWL	2	6.3	AUTUMN	HKDW	IMPACT
10/23/2015	NEL	1	26.4	AUTUMN	HKDW	IMPACT
10/23/2015	NEL	2	10	AUTUMN	HKDW	IMPACT
11/05/2015	NWL	0	0.7	AUTUMN	HKDW	IMPACT
11/05/2015	NWL	1	37.2	AUTUMN	HKDW	IMPACT
11/05/2015	NWL	2	16.4	AUTUMN	HKDW	IMPACT
11/05/2015	NWL	3	2.3	AUTUMN	HKDW	IMPACT
11/06/2015	NWL	3	4.3	AUTUMN	HKDW	IMPACT
11/06/2015	NWL	4	10.9	AUTUMN	HKDW	IMPACT
11/06/2015	NEL	1	1.3	AUTUMN	HKDW	IMPACT
11/06/2015	NEL	2	7	AUTUMN	HKDW	IMPACT
11/06/2015	NEL	3	22.9	AUTUMN	HKDW	IMPACT
11/06/2015	NEL	4	5.9	AUTUMN	HKDW	IMPACT
11/17/2015	NWL	1	38.9	AUTUMN	HKDW	IMPACT
11/17/2015	NWL	2	9.4	AUTUMN	HKDW	IMPACT
11/19/2015	NWL	1	18.6	AUTUMN	HKDW	IMPACT
11/19/2015	NWL	2	4.8	AUTUMN	HKDW	IMPACT
11/19/2015	NEL	1	31.3	AUTUMN	HKDW	IMPACT
11/19/2015	NEL	2	5.7	AUTUMN	HKDW	IMPACT
12/01/2015	NWL	1	27.6	WINTER	HKDW	IMPACT
12/01/2015	NWL	2	27.8	WINTER	HKDW	IMPACT
12/01/2015	NWL	3	10.9	WINTER	HKDW	IMPACT

Table 2 Impact Monitoring Survey Effort Summary (March 2015 – February 2016) (con)

Date	Area	Sea State (on effort)	Effort (km)	Season	Vessel	Type
12/02/2015	NEL	1	31.6	WINTER	HKDW	IMPACT
12/02/2015	NEL	2	4.9	WINTER	HKDW	IMPACT
12/07/2015	NWL	1	3.1	WINTER	HKDW	IMPACT
12/07/2015	NWL	2	9.2	WINTER	HKDW	IMPACT
12/07/2015	NWL	3	10.7	WINTER	HKDW	IMPACT
12/07/2015	NEL	1	26.8	WINTER	HKDW	IMPACT
12/07/2015	NEL	2	9.8	WINTER	HKDW	IMPACT
12/08/2015	NWL	1	0.3	WINTER	HKDW	IMPACT
12/08/2015	NWL	2	40.3	WINTER	HKDW	IMPACT
12/08/2015	NWL	3	8.3	WINTER	HKDW	IMPACT
01/07/2016	NWL	1	24	WINTER	HKDW	IMPACT
01/07/2016	NWL	2	38.1	WINTER	HKDW	IMPACT
01/08/2016	NWL	1	10	WINTER	HKDW	IMPACT
01/08/2016	NEL	1	36.5	WINTER	HKDW	IMPACT
01/18/2016	NWL	1	13.2	WINTER	HKDW	IMPACT
01/18/2016	NWL	2	32.7	WINTER	HKDW	IMPACT
01/18/2016	NWL	3	11.3	WINTER	HKDW	IMPACT
01/19/2016	NWL	1	14.9	WINTER	HKDW	IMPACT
01/19/2016	NEL	1	36.9	WINTER	HKDW	IMPACT
02/04/2016	NWL	1	23.6	WINTER	HKDW	IMPACT
02/04/2016	NWL	2	28.4	WINTER	HKDW	IMPACT
02/04/2016	NWL	3	10.1	WINTER	HKDW	IMPACT
02/05/2016	NWL	3	3	WINTER	HKDW	IMPACT
02/05/2016	NWL	4	6.9	WINTER	HKDW	IMPACT
02/05/2016	NEL	1	4	WINTER	HKDW	IMPACT
02/05/2016	NEL	2	19.9	WINTER	HKDW	IMPACT
02/05/2016	NEL	3	10	WINTER	HKDW	IMPACT
02/05/2016	NEL	4	2.4	WINTER	HKDW	IMPACT
02/18/2016	NWL	1	62.5	WINTER	HKDW	IMPACT
02/19/2016	NWL	1	10	WINTER	HKDW	IMPACT
02/19/2016	NEL	1	35.8	WINTER	HKDW	IMPACT

Table 3 Sightings of Individually Identified Chinese White Dolphin (*Sousa chinensis*) between March 2012 – February 2016 and baseline sightings

Identification Number	Baseline Identification Number	Date (YYYY-MM-DD)	Sighting Number	Area Sighted
HZMB 130		2016/02/04	1199	NWL
HZMB 129		2016/01/07	1189	NWL
		2015/10/22	1156	NWL
		2015/09/07	1143	NWL
		2015/08/25	1138	NWL
HZMB 128		2015/01/03	1056	NWL
HZMB 127		2015/01/03	1056	NWL
HZMB 126		2015/02/23	1068	NWL
		2015/01/03	1054	NWL
HZMB 125		2014/10/13	1019	NWL
HZMB 124		2014/09/22	1005	NWL
HZMB 123		2014/08/25	998	NWL
HZMB 122		2015/10/22	1156	NWL
		2014/08/04	989	NWL
HZMB 121		2014/07/14	968	NWL
HZMB 120		2014/05/31	951	NWL
HZMB 119		2014/04/19	940	NWL
HZMB 118		2014/01/06	890	NWL
HZMB 117		2014/06/17	964	NWL
		2014/01/06	888	NWL
HZMB 116		2014/08/25	999	NWL
HZMB 115		2014/07/14	972	NWL
		2014/07/14	971	NWL
		2013/12/26	879	NWL
		2013/12/26	879	NWL
HZMB 114		2015/11/05	1162	NWL
		2013/10/24	827	NWL
HZMB 113		2013/10/24	827	NWL
HZMB 112		2013/10/15	815	NWL
HZMB 111		2013/10/15	815	NWL
HZMB 110		2016/01/18	1193	NWL
		2013/10/15	812	NWL
HZMB 108		2015/06/11	1118	NWL
		2013/08/30	780	NEL
HZMB 107		2015/07/28	1126	NWL
		2014/10/13	1019	NWL
		2014/05/31	951	NWL
		2013/08/21	770	NWL
HZMB 106		2013/08/21	769	NWL
HZMB 105		2014/05/31	951	NWL
		2013/07/08	711	NWL

Identification Number	Baseline Identification Number	Date (YYYY-MM-DD)	Sighting Number	Area Sighted
HZMB 104		2013/07/08	711	NWL
HZMB 103		2013/07/08	711	NWL
HZMB 102		2013/07/08	706	NWL
HZMB 101		2013/07/08	706	NWL
HZMB 100		2013/07/08	706	NWL
HZMB 099		2013/06/13	681	NWL
		2013/06/13	680	NWL
HZMB 098	NL104	2015/02/23	1077	NWL
		2014/12/18	1044	NWL
		2014/08/04	992	NWL
		2014/01/06	888	NWL
		2013/11/02	849	NWL
		2013/11/02	845	NWL
		2013/10/24	831	NWL
		2013/07/08	711	NWL
		2013/05/24	659	NWL
		2011/11/07	Baseline	NWL
		2011/11/05	Baseline	NWL
		2011/11/05	Baseline	NWL
		2011/11/02	Baseline	NWL
		2011/10/28	Baseline	NWL
		2011/09/23	Baseline	NWL
		2011/09/16	Baseline	NWL
HZMB 097		2013/05/09	647	NWL
HZMB 096		2013/04/01	621	NWL
HZMB 095		2013/08/30	780	NEL
		2013/06/25	697	NWL
		2013/06/13	682	NWL
		2013/04/01	621	NWL
HZMB 094		2014/10/13	1019	NWL
		2014/05/31	954	NWL
		2014/02/17	910	NWL
		2013/06/26	703	NWL
		2013/06/25	698	NWL
		2013/03/18	601	NWL
HZMB 093		2013/05/24	657	NWL
		2013/02/21	587	NWL
HZMB 092		2015/04/20	1097	NWL
		2013/02/21	589	NWL
		2013/02/15	581	NWL

Identification Number	Baseline Identification Number	Date (YYYY-MM-DD)	Sighting Number	Area Sighted
HZMB 091		2013/02/15	579	NWL
HZMB 090		2013/06/25	697	NWL
		2013/06/13	682	NWL
		2013/02/15	579	NWL
HZMB 089		2013/02/15	579	NWL
HZMB 088		2013/02/15	579	NWL
HZMB 087		2013/02/15	579	NWL
HZMB 086	NL242	2015/03/19	1086	NWL
		2013/05/09	642	NWL
		2013/02/15	579	NWL
		2011/10/10	Baseline	NWL
HZMB 085		2014/10/13	1019	NWL
		2014/05/31	954	NWL
HZMB 084		2013/06/26	703	NWL
		2013/02/15	579	NWL
		2013/02/14	575	NWL
HZMB 083	NL136	2015/12/01	1180	NWL
		2015/05/11	1104	NWL
		2013/12/19	863	NWL
		2013/03/28	607	NWL
		2013/02/15	579	NWL
		2013/01/28	568	NWL
		2013/01/28	564	NWL
		2012/04/19	267	NWL
		2011/10/28	Baseline	NWL
		2011/10/28	Baseline	NWL
		2011/10/10	Baseline	NEL
		2011/09/06	Baseline	NWL
HZMB 082		2014/10/20	1024	NWL
		2013/02/21	587	NWL
		2013/02/15	579	NWL
		2013/01/28	563	NWL
HZMB 081		2013/01/28	559	NWL
		2013/01/28	557	NWL
HZMB 080		2013/01/28	556	NWL
HZMB 079		2013/01/28	556	NWL
HZMB 078		2013/02/15	579	NWL
		2013/01/08	552	NWL
HZMB 077		2013/12/26	878	NWL
		2013/07/08	706	NWL
		2012/12/11	541	NWL

Identification Number	Baseline Identification Number	Date (YYYY-MM-DD)	Sighting Number	Area Sighted
HZMB 076		2013/07/08	706	NWL
		2012/12/11	541	NWL
HZMB 075		2012/12/06	525	NEL
HZMB 074		2013/05/09	647	NWL
		2013/04/01	623	NWL
		2013/04/01	621	NWL
		2013/02/21	594	NEL
		2012/12/10	529	NEL
		2012/12/06	525	NEL
HZMB 073		2013/05/09	647	NWL
		2013/04/01	623	NWL
		2013/04/01	621	NWL
		2013/02/21	594	NEL
		2012/12/10	529	NEL
		2012/12/06	525	NEL
HZMB 072		2012/10/24	476	NWL
HZMB 071		2012/10/24	475	NWL
		2012/10/12	466	NWL
HZMB 070		2012/10/24	476	NWL
HZMB 069		2015/06/04	1116	NWL
		2013/08/21	774	NWL
		2013/07/08	711	NWL
		2012/10/24	476	NWL
HZMB 068		2014/10/20	1025	NWL
		2013/11/01	839	NWL
		2012/10/24	476	NWL
HZMB 067		2012/10/24	475	NWL
HZMB 066	NL93	2013/01/28	559	NWL
		2012/12/11	537	NWL
		2012/10/24	475	NWL
		2012/10/12	466	NWL
		2011/11/07	Baseline	NWL
		2011/11/05	Baseline	NWL
HZMB 064		2015/03/19	1086	NWL
		2014/06/17	964	NWL
		2013/05/09	647	NWL
		2013/01/28	561	NWL
		2012/10/24	475	NWL
		2012/10/12	466	NWL

Identification Number	Baseline Identification Number	Date (YYYY-MM-DD)	Sighting Number	Area Sighted
HZMB 063		2013/05/09	647	NWL
		2012/10/12	466	NWL
HZMB 062		2012/12/06	525	NEL
		2012/10/11	457	NWL
HZMB 060		2012/09/18	447	NWL
HZMB 059		2013/02/21	591	NWL
		2012/09/18	445	NWL
HZMB 057		2012/09/18	440	NWL
HZMB 056		2012/09/18	442	NWL
		2012/09/05	433	NEL
HZMB 055		2012/09/04	425	NWL
HZMB 054	CH34	2015/12/01	1180	NWL
		2015/04/20	1097	NWL
		2015/01/15	1062	NWL
		2014/05/31	953	NWL
		2014/01/06	888	NWL
		2013/11/07	854	NWL
		2013/11/02	845	NWL
		2013/10/24	831	NWL
		2013/08/30	780	NEL
		2013/07/08	711	NWL
		2013/09/18	448	NWL
		2012/09/05	432	NEL
		2011/11/07	Baseline	NWL
		2011/11/05	Baseline	NWL
		2011/11/02	Baseline	NWL
		2011/11/01	Baseline	NEL
		2011/11/01	Baseline	NEL
		2011/10/28	Baseline	NWL
		2011/10/06	Baseline	NWL
HZMB 053		2012/09/04	425	NWL
HZMB 052		2012/09/04	423	NWL

Identification Number	Baseline Identification Number	Date (YYYY-MM-DD)	Sighting Number	Area Sighted
HZMB 051	NL213	2015/05/11	1104	NWL
		2014/08/04	989	NWL
		2013/05/09	644	NWL
		2013/04/01	622	NWL
		2013/02/15	582	NWL
		2013/02/15	581	NWL
		2013/01/28	559	NWL
		2013/01/28	556	NWL
		2012/09/04	422	NWL
HZMB 050		2014/07/14	971	NWL
		2014/01/10	900	NWL
		2014/01/06	888	NWL
		2013/02/15	579	NWL
		2012/09/04	421	NWL
HZMB 049		2015/10/09	1151	NWL
		2014/07/29	982	NWL
		2012/09/03	419	NWL
HZMB 048		2012/09/03	419	NWL
HZMB 047		2015/04/28	1100	NWL
		2012/09/03	412	NWL
HZMB 046		2012/09/03	412	NWL
HZMB 045		2014/02/17	910	NWL
		2013/06/13	682	NWL
		2013/02/15	579	NWL
		2012/11/01	495	NWL

Identification Number	Baseline Identification Number	Date (YYYY-MM-DD)	Sighting Number	Area Sighted
HZMB 044	NL98	2016/01/18	1194	NWL
		2014/10/13	1019	NWL
		2014/02/17	910	NWL
		2013/12/19	864	NWL
		2013/11/02	845	NWL
		2013/11/01	842	NWL
		2013/10/15	819	NWL
		2013/05/09	648	NWL
		2013/05/09	647	NWL
		2013/04/01	623	NWL
		2013/04/01	621	NWL
		2013/02/15	579	NWL
		2012/11/01	495	NWL
		2011/11/07	Baseline	NWL
		2011/11/06	Baseline	NEL
		2011/11/01	Baseline	NEL
		2011/10/06	Baseline	NEL
HZMB 043		2012/09/03	407	NWL
HZMB 042	NL260	2015/10/22	1156	NWL
		2013/12/19	863	NWL
		2012/11/01	495	NWL
		2011/11/07	Baseline	NWL
HZMB 041	NL24	2014/06/05	960	NEL
		2014/02/17	910	NWL
		2013/11/02	845	NWL
		2013/05/09	648	NWL
		2013/05/09	647	NWL
		2013/04/01	623	NWL
		2013/04/01	621	NWL
		2013/02/15	579	NWL
		2012/11/01	495	NWL
		2011/11/06	Baseline	NEL
		2011/11/05	Baseline	NWL
		2011/11/05	Baseline	NWL
		2011/10/10	Baseline	NWL

Identification Number	Baseline Identification Number	Date (YYYY-MM-DD)	Sighting Number	Area Sighted
HZMB 040		2014/02/17	910	NWL
		2014/01/06	893	NWL
		2013/10/15	821	NWL
		2013/07/08	714	NWL
		2013/07/08	711	NWL
		2013/02/21	589	NWL
		2012/11/01	493	NWL
HZMB 038		2012/11/01	490	NWL
HZMB 037		2012/11/01	490	NWL
HZMB 036		2012/09/03	407	NWL
		2012/11/01	490	NWL
HZMB 035		2013/02/15	579	NWL
		2012/11/01	490	NWL
HZMB 034		2012/11/01	493	NWL
HZMB 028		2014/11/17	1035	NWL
		2013/04/01	625	NWL
		2012/08/06	373	NWL
HZMB 027		2013/12/19	863	NWL
		2013/02/15	579	NWL
		2013/01/28	568	NWL
		2013/01/28	564	NWL
		2012/06/14	299	NWL
HZMB 026		2014/10/13	1018	NWL
		2013/06/25	697	NWL
		2013/05/09	642	NWL
		2013/01/28	561	NWL
		2012/06/13	295	NEL
HZMB 025		2013/02/22	596	NEL
		2013/02/21	591	NWL
		2012/12/06	525	NEL
		2012/10/11	457	NWL
		2012/06/13	295	NEL
HZMB 024		2013/03/18	601	NWL
		2012/06/13	295	NEL

Identification Number	Baseline Identification Number	Date (YYYY-MM-DD)	Sighting Number	Area Sighted
HZMB 023		2015/10/09	1153	NWL
		2015/10/09	1152	NWL
		2015/04/20	1097	NWL
		2014/12/18	1044	NWL
		2014/11/17	1035	NWL
		2014/01/06	888	NWL
		2013/07/08	715	NWL
		2013/07/08	711	NWL
		2013/04/01	619	NWL
		2013/02/21	589	NWL
		2013/02/15	579	NWL
		2012/07/10	330	NWL
HZMB 022		2015/07/09	1143	NWL
		2015/04/20	1097	NWL
		2014/12/18	1044	NWL
		2014/11/17	1035	NWL
		2014/08/04	991	NWL
		2014/01/06	888	NWL
		2013/10/24	827	NWL
		2013/07/08	715	NWL
		2013/07/08	711	NWL
		2013/04/01	619	NWL
		2013/02/21	589	NWL
		2013/02/15	579	NWL
		2012/07/10	330	NWL
HZMB 021	NL37	2012/07/10	330	NWL
		2011/09/16	Baseline	NWL
HZMB 020		2012/07/10	330	NWL
HZMB 019		2012/07/10	330	NWL
HZMB 018		2014/02/17	910	NWL
		2013/05/09	647	NWL
		2013/02/21	594	NEL
		2012/12/10	529	NEL
		2012/07/10	330	NWL
HZMB 017		2012/07/10	330	NWL

Identification Number	Baseline Identification Number	Date (YYYY-MM-DD)	Sighting Number	Area Sighted
HZMB 016		2013/07/08	706	NWL
		2012/12/11	539	NWL
		2012/09/18	446	NWL
		2012/09/04	421	NWL
		2012/07/10	330	NWL
HZMB 015		2012/07/10	330	NEL
HZMB 014	NL176	2015/08/25	1139	NWL
		2013/12/26	880	NWL
		2012/08/06	373	NWL
		2012/06/13	295	NEL
		2011/11/06	Baseline	NEL
		2011/11/01	Baseline	NEL
		2011/11/01	Baseline	NEL
HZMB 013		2012/05/28	281	NWL
HZMB 012		2012/05/28	281	NWL
HZMB 011	EL01	2013/02/22	597	NEL
		2013/02/21	592	NEL
		2013/02/14	572	NEL
		2012/11/06	517	NEL
		2012/09/19	452	NWL
		2012/03/31	261	NEL
		2011/11/02	Baseline	NWL
		2011/11/01	Baseline	NEL
HZMB 009		2015/03/19	1084	NWL
		2012/05/28	281	NWL
HZMB 008		2015/07/06	1122	NWL
		2012/05/28	281	NWL
HZMB 007	NL246	2012/12/10	529	NEL
		2011/11/06	Baseline	NEL
		2011/09/16	Baseline	NWL
HZMB 006		2015/10/22	1158	NWL
		2013/02/21	594	NEL
		2012/12/11	539	NWL
		2012/11/01	495	NWL
		2012/03/29	250	NWL

Identification Number	Baseline Identification Number	Date (YYYY-MM-DD)	Sighting Number	Area Sighted
HZMB 005		2015/02/09	1070	NWL
		2015/02/09	1069	NWL
		2013/11/09	860	NWL
		2013/11/07	858	NWL
		2013/10/15	813	NWL
		2012/12/10	532	NWL
		2012/08/06	374	NWL
		2012/05/28	287	NWL
HZMB 004		2015/07/28	1126	NWL
		2012/09/04	421	NWL
		2012/03/31	262	NWL
HZMB 003	NL179	2013/10/15	812	NWL
		2013/06/25	697	NWL
		2012/12/10	529	NEL
		2012/03/31	261	NWL
		2011/11/06	Baseline	NEL
		2011/09/16	Baseline	NWL
HZMB 002	WL111	2014/05/31	951	NWL
		2013/12/26	878	NWL
		2013/12/19	863	NWL
		2013/11/01	839	NWL
		2013/10/15	819	NWL
		2013/09/24	798	NWL
		2013/02/14	573	NWL
		2012/12/11	536	NWL
		2012/12/11	535	NWL
		2012/10/12	466	NWL
		2012/10/24	475	NWL
		2012/05/28	281	NWL
		2012/03/29	250	NWL
		2011/11/02	Baseline	NWL
HZMB 001	WL46	2014/08/25	997	NWL
		2013/08/21	771	NWL
		2013/06/13	681	NWL
		2013/04/01	617	NWL
		2013/02/14	573	NWL
		2012/03/29	250	NWL
	CH98	2011/11/02	Baseline	NWL

Identification Number	Baseline Identification Number	Date (YYYY-MM-DD)	Sighting Number	Area Sighted
	NL11	2011/11/02	Baseline	NWL
		2011/11/07	Baseline	NWL
	NL12	2011/11/02	Baseline	NWL
	NL33	2011/09/23	Baseline	NWL
		2011/11/01	Baseline	NEL
		2011/11/05	Baseline	NWL
		2011/11/07	Baseline	NWL
	NL46	2011/10/28	Baseline	NWL
	CH153	2011/10/11	Baseline	NWL
	NL48	2001/11/07	Baseline	NWL
		2011/11/02	Baseline	NWL
		2011/09/16	Baseline	NWL
	NL75	2011/09/16	Baseline	NWL
		2011/09/16	Baseline	NWL
		2011/11/01	Baseline	NEL
	NL80	2011/11/02	Baseline	NWL
	NL118	2011/09/06	Baseline	NWL
	NL120	2011/11/06	Baseline	NEL
		2011/10/10	Baseline	NWL
	NL123	2011/11/06	Baseline	NEL
		2011/10/10	Baseline	NWL
		2011/10/06	Baseline	NWL
	NL139	2011/11/01	Baseline	NEL
		2011/10/10	Baseline	NEL
		2011/09/16	Baseline	NWL
	NL165	2011/11/05	Baseline	NWL
		2011/11/02	Baseline	NWL
	NL170	2011/10/06	Baseline	NEL
	NL188	2011/11/07	Baseline	NWL
		2011/11/01	Baseline	NWL
		2011/10/28	Baseline	NWL
	NL191	2011/09/07	Baseline	NWL
	NL202	2011/11/07	Baseline	NWL
		2011/10/28	Baseline	NWL
	NL210	2011/11/07	Baseline	NWL
		2011/11/05	Baseline	NWL
		2011/11/02	Baseline	NWL
		2011/09/07	Baseline	NWL
	NL214	2011/11/05	Baseline	NWL
		2011/11/02	Baseline	NWL
		2011/10/28	Baseline	NWL

Identification Number	Baseline Identification Number	Date (YYYY-MM-DD)	Sighting Number	Area Sighted
	NL220	2011/10/10	Baseline	NEL
	NL224	2011/10/28	Baseline	NWL
	NL226	2011/11/05	Baseline	NWL
		2011/10/17	Baseline	WL
	NL230	2011/11/02	Baseline	NWL
		2011/10/17	Baseline	WL
	NL233	2011/10/28	Baseline	NWL
		2011/10/06	Baseline	NWL
		2011/09/16	Baseline	NWL
	NL241	2011/11/07	Baseline	NWL
		2011/11/02	Baseline	NWL
		2011/09/16	Baseline	NWL
	NL244	2011/11/01	Baseline	NEL
		2011/11/01	Baseline	NWL
		2011/09/05	Baseline	WL
	NL256	2011/11/02	Baseline	NWL
	NL258	2011/09/16	Baseline	NWL
		2011/09/05	Baseline	WL
	NL259	2011/11/07	Baseline	NWL
	NL261	2011/11/01	Baseline	NEL
	NL264	2011/11/06	Baseline	NEL
		2011/10/06	Baseline	NEL
		2011/09/23	Baseline	NWL
	NL269	2011/11/02	Baseline	NWL
	NL272	2011/11/05	Baseline	NWL
		2011/11/02	Baseline	NWL
		2011/10/28	Baseline	NWL
		2011/09/16	Baseline	NWL
	NL278	2011/11/02	Baseline	NWL
	NL279	2011/11/02	Baseline	NWL
	SL42	2011/11/02	Baseline	NWL
	SL43	2011/10/28	Baseline	NWL
	WL04	2011/11/05	Baseline	NWL
		2011/11/02	Baseline	NWL
		2011/10/17	Baseline	WL
		2011/10/10	Baseline	NWL
		2011/09/16	Baseline	NWL

Identification Number	Baseline Identification Number	Date (YYYY-MM-DD)	Sighting Number	Area Sighted
	WL05	2011/11/01	Baseline	NEL
		2011/11/01	Baseline	NEL
	WL11	2011/11/07	Baseline	NWL
	WL25	2011/10/17	Baseline	WL
		2011/09/23	Baseline	WL
		2011/09/16	Baseline	NWL
	WL88	2011/11/02	Baseline	WL
		2011/09/16	Baseline	NWL
	WL116	2011/09/16	Baseline	NWL
	WL124	2011/11/02	Baseline	NWL
	WL156	2011/10/28	Baseline	NWL
		2011/09/23	Baseline	WL
	WL162	2011/09/16	Baseline	NWL
	NL275	*2011/09/23*	*Baseline*	*WL*
	SL48	*2011/11/02*	*Baseline*	*WL*
		2011/10/17	*Baseline*	*WL*
		2011/09/23	*Baseline*	*WL*
	CH108	*2011/11/02*	*Baseline*	*WL*
		2011/11/02	*Baseline*	*WL*
	CH157	*2011/11/02*	*Baseline*	*WL*
	NL206	*2011/10/07*	*Baseline*	*WL*
	WL28	*2011/09/23*	*Baseline*	*WL*
	WL42	*2011/11/02*	*Baseline*	*WL*
		2011/09/05	*Baseline*	*WL*
	WL47	*2011/10/17*	*Baseline*	*WL*
	WL61	*2011/10/17*	*Baseline*	*WL*
		2011/09/23	*Baseline*	*WL*
	WL66	*2011/11/07*	*Baseline*	*WL*
	WL68	*2011/09/05*	*Baseline*	*WL*
		2011/09/05	*Baseline*	*WL*
	WL72	*2011/11/02*	*Baseline*	*WL*
		2011/11/02	*Baseline*	*WL*
		2011/09/23	*Baseline*	*WL*
	WL87	*2011/09/23*	*Baseline*	*WL*
	WL88	*2011/11/02*	*Baseline*	*WL*
		2011/09/16	*Baseline*	*WL*
	WL116	*2011/09/16*	*Baseline*	*WL*
	WL118	*2011/11/02*	*Baseline*	*WL*
		2011/11/02	*Baseline*	*WL*
	WL123	*2011/11/02*	*Baseline*	*WL*

Identification Number	Baseline Identification Number	Date (YYYY-MM-DD)	Sighting Number	Area Sighted
	WL124	*2011/11/02*	*Baseline*	*WL*
	WL128	*2011/11/07*	*Baseline*	*WL*
		2011/11/02	*Baseline*	*WL*
	WL131	*2011/11/02*	*Baseline*	*WL*
		2011/11/02	*Baseline*	*WL*
		2011/09/23	*Baseline*	*WL*
	WL132	*2011/09/23*	*Baseline*	*WL*
	WL137	*2011/11/02*	*Baseline*	*WL*
	WL138	*2011/11/02*	*Baseline*	*WL*
	WL144	*2011/11/02*	*Baseline*	*WL*
	WL145	*2011/09/05*	*Baseline*	*WL*
	WL146	*2011/10/17*	*Baseline*	*WL*
	WL153	*2011/11/07*	*Baseline*	*WL*
	WL157	*2011/09/23*	*Baseline*	*WL*
	WL158	*2011/09/23*	*Baseline*	*WL*
	WL163	*2011/11/07*	*Baseline*	*WL*
		2011/11/02	*Baseline*	*WL*
	WL165	*2011/10/17*	*Baseline*	*WL*
	WL167	*2011/10/17*	*Baseline*	*WL*
	WL170	*2011/11/07*	*Baseline*	*WL*
	WL171	*2011/10/28*	*Baseline*	*WL*

China Harbour Engineering Company Limited

Monthly Summary Waste Flow Table for December / 2015 (year)

Project : Hong Kong – Zhuhai – Macao Bridge, Hong Kong Boundary Crossing Facilities – Reclamation Works Contract No.: HY/2010/02

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete (see Note 1)	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 2)	Chemical Waste (see Note 4)	Others, e.g. general refuse (see Note 3)
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000 m^3)
Jan-15	0.0000	0.0000	0.0000	0.0000	0.0000	1774.7845	0.0000	0.4200	4.0000	2.4000	0.0455
Feb-15	0.0000	0.0000	0.0000	0.0000	0.0000	1120.6675	0.0000	0.1400	0.0000	0.0000	0.0390
Mar-15	0.0000	0.0000	0.0000	0.0000	0.0000	390.8735	0.0040	0.3340	0.0020	0.0000	0.0390
Apr-15	0.0000	0.0000	0.0000	0.0000	0.0000	251.3183	0.0000	0.1400	0.0000	0.0000	0.0390
May-15	0.0000	0.0000	0.0000	0.0000	0.0000	778.9842	0.0000	0.1960	0.0000	0.0000	0.0260
Jun-15	0.0000	0.0000	0.0000	0.0000	0.0000	400.6428	0.0000	0.1680	0.0000	0.0000	0.0520
Sub-total	0.0000	0.0000	0.0000	0.0000	0.0000	4717.2709	0.0040	1.3980	4.0020	2.4000	0.2405
Jul-15	0.0000	0.0000	0.0000	0.0000	0.0000	60.7108	0.0150	0.4750	0.0020	0.0000	0.0585
Aug-15	0.0000	0.0000	0.0000	0.0000	0.0000	60.6718	0.0000	0.3360	5.1200	0.0000	0.0585
Sep-15	0.0000	0.0000	0.0000	0.0000	0.0000	69.8487	0.0000	0.0000	0.0000	0.0000	0.0780
Oct-15	0.0000	0.0000	0.0000	0.0000	0.0000	32.4733	0.0000	0.2800	0.0000	0.0000	0.0715
Nov-15	0.0000	0.0000	0.0000	0.0000	0.0000	40.5700	0.0000	0.3920	0.0000	0.0000	0.0715
Dec-15	0.0000	0.0000	0.0000	0.0000	0.0000	23.0400	0.0000	0.0000	0.0000	0.0000	0.0845
Total	0.0000	0.0000	0.0000	0.0000	0.0000	5004.5856	0.0190	2.8810	9.1240	2.4000	0.6630

Notes: (1) Broken concrete for recycling into aggregates.

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

(3) Use the conversion factor : 1 full load of dumping truck being equivalent to 6.5m^3 by volume.

(4) Chemical waste refer to spent “battery” and “oil with water”.

China Harbour Engineering Company Limited

Monthly Summary Waste Flow Table for February / 2016 (year)

Project : Hong Kong – Zhuhai – Macao Bridge, Hong Kong Boundary Crossing Facilities – Reclamation Works Contract No.: HY/2010/02

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete (see Note 1)	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 2,5)	Chemical Waste (see Note 4)	Others, e.g. general refuse (see Note 3)
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000 m^3)
Jan-15	0.0000	0.0000	0.0000	0.0000	0.0000	52.4729	0.0000	0.2520	0.0000	0.8000	0.0520
Feb-15	0.0000	0.0000	0.0000	0.0000	0.0000	6.1333	0.0000	0.0000	6.0800	0.0000	0.0520
Mar-15											
Apr-15											
May-15											
Jun-15											
Sub-total	0.0000	0.0000	0.0000	0.0000	0.0000	58.6062	0.0000	0.2520	6.0800	0.8000	0.1040
Jul-15											
Aug-15											
Sep-15											
Oct-15											
Nov-15											
Dec-15											
Total	0.0000	0.0000	0.0000	0.0000	0.0000	58.6062	0.0000	0.2520	6.0800	0.8000	0.1040

Notes: (1) Broken concrete for recycling into aggregates.

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

(3) Use the conversion factor : 1 full load of dumping truck being equivalent to 6.5m^3 by volume.

(4) Chemical waste refer to spent “battery” and “oil with water”.

(5) About 152 Water-barriers were recycled (~40kg each, Total: ~4000kg or ~4.0 '000kg).

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

Cumulative statistics on Exceedances

		Total no. recorded in this month	Total no. recorded since project commencement
1-Hour TSP	Action	-	-
	Limit	-	-
24-Hour TSP	Action	-	-
	Limit	-	-
Noise	Action	-	-
	Limit	-	-
Water Quality	Action	-	2
	Limit	-	3
Dolphin Monitoring	Action	-	-
	Limit	-	-

Remarks: Exceedances which are not project-related are not presented in this table.

Cumulative statistics on Complaints, Notifications of Summons and Successful Prosecutions

	Date Received	Subject	Status	Total no. received in this quarter	Total no. received since project commencement
Environmental complaints	9 March 2015	As informed by the Contractor on 09 March 2015, there is an air quality complaint received on 06 March 2015. The complainant Mr. Fung requested for follow-up actions to be taken by relevant departments in response to his Complaint about sand and dust emission from 4-5 uncovered sand barges parking near the coastline of Tuen Mun, the complainant concerns about the	Closed	1	28

		health problems to residents as the sand is blown to their apartments. After investigation, there is no adequate information to conclude the observed impact is related to this Contract.			
	15 April 2015	Environmental Protection Department (EPD) referred a noise complaint to this project on 10 April 2015 and ENPO forwarded the noise complaint to Environmental Team on 15 April 2015. The complaint involves a complainant, who is resident of Caribbean Coast, Tung Chung and he was disturbed by noise from construction activities of the HZMB Project during weekends and holidays. Afte r investigation, there is no adequate information to conclude the observed noise nuisance is related to this Contract.	Closed	2	29
	22 May 2015	A complainant contacted EPD through EPD's hotline on 21 May 2015 and complained that noise was generated from construction works when construction of artificial island at Lantau Island area was carried out overnight and dark smoke was emitted by construction plant. EPD's staff has contacted complainant and came to know that the dark smoke referring to could also be construction dust emitting from the filling work at the HKBCF. This complaint was subsequently referred by EPD to HZMB project team on 22	Closed	3	30

		May 2015 to follow-up. Investigation was conducted and with referred to the available information; it is unable to determine whether the night time noise and dark smoke complaint is related to this Contract.			
	3 July 2015	As informed by the Contractor, 3 July 2015, an air quality complaint has been received on 11 June 2015 by HyD via complaint hotline 1823. The complainant complained that sand and dust pollution near Richland Garden, 138 Wu Chui Road, Tuen Mun, caused by sand delivery barges. After investigation, there is no adequate information to conclude the observed impact is related to this Contract.	Closed	4	31
	13 July 2015	As informed by Engineer Representative of this Contract on 13 July 2015, EPD referred a noise related complaint to this Contract on 13 July 2015. The complainant complained noise came from BCF site near HK Skycity Marriott Hotel during nighttime period of the past 10 days which involves excavation with a grab dredger, transfer of excavated material using a derrick barge and a tug boat, and backfilling with a pelican barge. Based on EPD's record, the above activities are covered by CNP no. GW-RS0503-15. After	Closed	5	32

		investigation, the construction activities carried out during restricted hour between 1- 13 July 2015 were considered complied with CNP conditions (no. GW-RS0503-15).			
	30 July 2015	As informed by the Contractor on 30 July 2015, Home Affairs Department referred a complaint to project team of this Contract on 29 July 2015. The complaint involved Mr. Chan and Mr. Tang, Resident Representatives of Tong Fuk Village who complained significant sand loss of Tong Fuk Beach, particularly after typhoon when the beach was hit by strong waves; this exposed the rocks at the beach. The complainant enquired whether the sand loss is related to sand extraction for construction of airport and reclamation works of HZMB artificial island. After investigation, the complaint is considered as non-project related.	Closed	6	33
	23 October 2015	A complainant who lives at 1 Sky City Road East, Hong Kong SkyCity Marriott Hotel, Hong Kong International Airport, Lantau, Hong Kong complained to EPD's hotline on 23 October 2015 that loud noise were generated by HZMB artificial island construction site of China Harbour Engineering Company Ltd adjacent to the premises approximately between	Closed	7	34

		10pm to 12am, during recent weekdays and Saturday. In addition, loud noise and dark smoke were noted on the construction site of HZMB artificial island during Sunday and public holiday. The complainant questioned whether the Contractor was allowed to conduct construction work during Sunday and public holiday. The complaint was referred by EPD to the project team of Contract No. HY/2010/02 to follow up on 23 October 2015. After investigation, with referred to the available information, it is unable to determine whether the night time noise complaint and the concerned dark smoke are related to this Contract.			
	4 December 2015	A water quality complaint was referred to the ENPO at 10:22 am on the 4 December 2015 by EPD; ENPO referred this complaint to this Contract on the same day. With referred to the information provided by ENPO, EPD has contacted the complainant, and obtained the additional information from the complainant and it is suspected that the incident happened in the afternoon on 28 November 2015. A video was provided by the complainant who shows that turbid water behind a barge, the incident is	Closed	8	35

		suspected to be happened in the afternoon on 28 November 2015. After investigation, it is considered not related to this Contract.			
Notification of summons	-	-	-	-	2
Successful Prosecutions	-	-	-	-	2

Appendix K – Event Action Plan

Event / Action Plan for Air Quality

Event	Action			
	ET Leader	IEC	ER	Contractor
Action Level				
Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform IEC and ER; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method.	1. Notify Contractor.	1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
Exceedance for two or more consecutive samples	1. Identify source; 2. Inform IEC and ER; 3. Advise the ER on the effectiveness of the proposed remedial measures; 4. Repeat measurements to confirm findings; 5. Increase monitoring frequency to daily; 6. Discuss with IEC and Contractor on remedial actions required; 7. If exceedance continues, arrange meeting with IEC and ER; 8. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ER on the effectiveness of the proposed remedial measures; 5. Supervise Implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Submit proposals for remedial to ER within 3 working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
Limit Level				
Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform ER, Contractor and EPD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ER on the effectiveness of the proposed remedial measures; 5. Supervise implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate.

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
Exceedance for two or more consecutive samples	1. Notify IEC, ER, Contractor and EPD; 2. Identify source; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Arrange meeting with IEC and ER to discuss the remedial actions to be taken; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring.	1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

Event / Action Plan for Construction Noise

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
Action Level	1. Notify IEC and Contractor; 2. Identify source, investigate the causes of exceedance and propose remedial measures; 3. Report the results of investigation to the IEC, ER and Contractor; 4. Discuss with the Contractor and formulate remedial measures; 5. Increase monitoring frequency to check mitigation effectiveness.	1. Review the analysed results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures are properly implemented.	1. Submit noise mitigation proposals to IEC; 2. Implement noise mitigation proposals.
Limit Level	1. Inform IEC, ER, EPD and Contractor; 2. Identify source; 3. Repeat measurements to confirm findings; 4. Increase monitoring frequency; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Inform IEC, ER and EPD the causes and actions taken for the exceedances; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring.	1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractors remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

Event / Action Plan for Water Quality

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
Action level being exceeded by one sampling day	1. Repeat *in situ* measurement to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, contractor and ER; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, ER and Contractor; 6. Ensure mitigation measures are implemented; 7. Repeat measurement on next day of exceedance to confirm findings.	1. Check monitoring data submitted by ET and Contractor's working methods; 2. Discuss with ET and Contractor on possible remedial actions; 3. Review the proposed mitigation measures submitted by Contractor and advise the ER accordingly; 4. Assess the effectiveness of the implemented mitigation measures.	1. Confirm receipt of notification of non-compliance in writing; 2. Discuss with IEC on the proposed mitigation measures; 3. Make agreement on mitigation measures to be implemented; 4. Ensure mitigation measures are properly implemented.	1. Inform the ER 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. Discuss with ET and IEC on possible remedial actions and propose mitigation measures to IEC and ER; 5. Implement the agreed mitigation measures. 6. Amend working methods if appropriate.

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
Action level being exceeded by two or more consecutive sampling days	1. Repeat *in situ* measurement to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, Contractor and ER; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, ER and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Action level; 8. Repeat measurement on next day of exceedance to confirm findings.	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 ER accordingly; 4. Assess the effectiveness of the implemented mitigation measures.	1. Confirm receipt of notification of non-compliance in writing; 2. Discuss with IEC on the proposed mitigation measures; 3. Make agreement on mitigation measures to be implemented; 4. Ensure mitigation measures are properly implemented; 5. Assess the effectiveness of the implemented mitigation measures.	1. Inform the Engineer 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. Discuss with ET and IEC on possible remedial actions and propose mitigation measures to IEC and ER within 3 working days of notification; 5. Implement the agreed mitigation measures; 6. Amend working methods if appropriate.

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
Limit level being exceeded by one sampling day	1. Repeat *in-situ* measurement to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, Contractor, ER and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, ER and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Limit level.	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 ER accordingly; 4. Assess the effectiveness of the implemented mitigation measures.	1. Confirm receipt of notification of failure in writing; 2. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 3. Request Contractor to critically review the working methods; 4. Ensure mitigation measures are properly implemented; 5. Assess the effectiveness of the implemented mitigation measures.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment and consider changes of working methods; 4. Submit proposal of mitigation measures to ER within 3 working days of notification and discuss with ET, IEC and ER; 5. Implement the agreed mitigation measures; 6. Amend working methods if appropriate.

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
Limit level being exceeded by two or more consecutive sampling days	1. Repeat *in-situ* measurement to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, contractor, ER and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, ER and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days.	1. 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 ER accordingly.	1. Confirm receipt of notification of failure in writing; 2. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 3. Request Contractor to critically review the working methods; 4. Make agreement on the mitigation measures to be implemented; 5. Ensure mitigation measures are properly implemented; 6. Assess the effectiveness of the implemented mitigation measures; 7. 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.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Take immediate action to avoid further exceedance; 3. Rectify unacceptable practice; 4. Check all plant and equipment and consider changes of working methods; 5. Submit proposal of mitigation measures to ER within 3 working days of notification and discuss with ET, IEC and ER; 6. Implement the agreed mitigation measures; 7. Resubmit proposals of mitigation measures if problem still not under control; 8. As directed by the Engineer, to slow down or to stop all or part of the construction activities until no exceedance of Limit level.

Event / Action Plan for Dolphin Monitoring

Event	ET Leader	IEC	ER / SOR	Contractor
Action Level	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, ER/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.	1. Check monitoring data submitted by ET and Contractor; 2. Discuss monitoring results and finding with the ET and the Contractor.	1. Discuss monitoring with the IEC and any other measures proposed by the ET; 2. If ER/SOR is satisfied with the proposal of any other measures, ER/SOR to signify the agreement in writing on the measures to be implemented.	1. Inform the ER/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 ER/SOR; 3. Implement the agreed measures.
Limit Level	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, ER/SOR and Contractor of findings; 5. Check monitoring data;	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, ER/SOR and 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	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 ER/SOR is satisfied with the proposals for additional dolphin monitoring and/or any other mitigation measures submitted by ET and Contractor and verified by IEC, ER/SOR to signify the agreement in writing on such proposals and any other mitigation measures.	1. Inform the ER/SOR and confirm notification of the non-compliance in writing; 2. Attend the meeting to discuss with ET, IEC and ER/SOR the necessity of additional dolphin monitoring and any other 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

	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, ER/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.	by ET and Contractor and advise ER/SOR of the results and findings accordingly. 5. Supervise / Audit the implementation of additional monitoring and/or any other mitigation measures and advise ER/SOR the results and findings accordingly.	3. Supervise the implementation of additional monitoring and/or any other mitigation measures.	and/or any other mitigation measures.