FUGRO TECHNICAL SERVICES LIMITED
Fugro Development Centre,
5 Lok Yi Street, Tai Lam,
Tuen Mun, N.T.,
Hong Kong.
Tel : +852 2450 8233
Fax : +852 2450 6138
E-mail : matlab@fugro.com
Website : www.fugro.com

Report No.: 0394/13/ED/0399C

Final EM&A Report

Client : China International Water & Electric Corporation
Project: Providing Sufficient Water Depth for Kwai Tsing Container Basin and its Approach Channel
Contract No.: CV/2013/04
Report No.: 0394/13/ED/0399C

Project Proponent:

Civil Engineering & Development Department
101 Princess Margaret Road,
Homantin,
Kowloon, Hong Kong.

Prepared by: Jimmy Lui

Reviewed by: Cyrus Lai

Certified by:

Colin Yung
Environmental Team Leader for
Fugro Technical Services Limited

RAMBOLL

Ref.: CEDDWKTBEM00_0_0405L.20.docx

17 November 2020
By Post

Mott MacDonald Hong Kong Ltd.
3/F Mapletree Bay Point,
348 Kwun Tong Road
Kwun Tong, Kowloon

Attention: Mr. C M Howley

Dear Mr. Howley,

Re: Agreement No. CE 63/2008 (CE)
Dredging Works in Kwai Tsing Container Basin and its Approach Channel – Investigation, Design and Construction)

Contract No. CV/2013/04
Dredging Works in Kwai Tsing Container Basin and its Approach Channel
Verification of Final EM&A Report

Reference is made to the Environmental Team's submission of the Final Environmental Monitoring & Audit Report (ET's Report No. 0394/13/ED/0399C) received by e-mail on 28 October 2020.

We write to verify the captioned report in accordance with Section 12.4 of the EM&A Manual.

Thank you very much for your kind attention and please do not hesitate to contact our Mr. Theo Chan or the undersigned should you have any queries.

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

Y H Hui
Independent Environmental Checker

Cc:	MMHK	Mr. Jason Chan	(by post and email)
	Fugro	Mr. Colin Yung	(by email)
	CIWE	Mr. K.O. Leung	(by email)

Ramboll Hong Kong Limited 英環香港有限公司
21/F, BEA Harbour View Centre, 56 Gloucester Road, Wan Chai, Hong Kong Tel: 852.3465 2888 Fax: 852.3465 2899
www.ramboll.com

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Fugro Development Centre,
5 Lok Yi Street, Tai Lam,
Tuen Mun, N.T.,
Hong Kong.
Tel : +852 2450 8233
Fax : +852 2450 6138
E-mail : matlab@fugro.com
Website : www.fugro.com

EXECUTIVE SUMMARY

i. This is the Final Environmental Monitoring Audit (EM&A) Review Report for Contract No. CV/2013/04 – Dredging Works in Kwai Tsing and its Approach Channel (Agreement No. CE63/2008 – Providing Sufficient Water Depth for Kwai Tsing Container Basin and its Approach Channel). The dredging works commenced on 23 April 2014 and were substantially completed on 21 November 2017. The dredging works were resumed on 23 November 2018 to remove the high spots at Z2B1, Z2B2 and Z2C1. All dredging works under this Contract of the construction phase, including the dredging works in Hotspot area in sub-zones Z1A, Z1B, Z2A, Z2B and Z2C were completed on 31 July 2020. This report presents the environmental monitoring and audit works conducted from 23 April 2014 to 29 August 2020, including the construction work period (i.e. 23 April 2014 – 21 November 2017, 23 November 2018 – 31 July 2020) and the post-construction monitoring period (4 August 2020 – 29 August 2020).

ii. Construction Activities for the Reporting Period
During the reporting period, the principal work activities included:
- Preparation works of dredging for hard materials at Portion A (Zone Z1A, Z2B1, Z2B2 and Z2C1 in EP)
- Site Trial on Dredging works without Silt Curtain Deployment at Portion A (Zone Z2C2 and Z4A in EP) and Portion E (Zone Z13B in EP)
- Dredging at Portion A (Zone Z1A, Z1B, Z2A1, Z2A2, Z2A3, Z2B1, Z2B2, Z2C1, Z2C2, Z2C3, Z2C4, Z3A, Z3B, Z4A and Z4B in EP)
- Dredging at Portion B (Zone Z5A, Z5B, Z5C, Zone Z6A, Z6B, Z6C, Z6D, Zone Z7 and Zone Z8 in EP)
- Dredging at Portion C (Zone Z9, Z10, Z11 and Z12 in EP)
- Dredging at Portion D (Zone Z13A in EP)
- Dredging at Portion E (Zone Z13B in EP)
- Dredging at the Hotspot area in Portion A (Zone Z1A, Z1B, Z2A, Z2B and Z2C in EP)

iii. Water Quality Monitoring
Routine impact water quality monitoring at 22 designated monitoring stations namely C1, C2, C3, G1, G2, G3, G4, G5, G6, SR1, SR2, SR3, SR4, SR5, SR6, SR7, SR8, SR9, SR10, SR11, SR12, SR13 were conducted.

Referring to the Proposal for Temporary Suspension of Impact Water Quality Monitoring (0394_13_ED_0326F) which was submitted to EPD in August 2016 with no objection was received from EPD; removal of routine water quality monitoring stations at SR1 was effective on 24 December 2016.

Referring to the *Proposal on Removal of Some Water Quality Monitoring Stations After Resumption of Marine Construction Works (Dredging Works and Marine Works of the Northern Part of Kwai Tsing Container Basin Only)* (0394_13_ED_0332I) which has been submitted to EPD and relevant parties in December 2016 with no objection, removal of routine water quality monitoring stations at SR6, SR7, SR8, SR9, SR10 and SR11 was effective from 23 January 2017. Due to removal of some sensitive receivers in routine water quality monitoring, gradient stations G3, G5 and G6 were also be removed and gradient stations G1 and G4 replaced the previous control stations C1, C2 and C3 as C1A and C2A with reference to the approved proposal (0394_13_ED_0332I) which was effective from 23 January 2017.

FUGRO TECHNICAL SERVICES LIMITED
Fugro Development Centre,
5 Lok Yi Street, Tai Lam,
Tuen Mun, N.T.,
Hong Kong.
Tel : +852 2450 8233
Fax : +852 2450 6138
E-mail : matlab@fugro.com
Website : www.fugro.com

Referring to the *Proposal of Scale down for the Water Quality Monitoring Stations during High Spots Removal at Sub-zone Z2B1, Z2B2 and Z2C1* (Ref.: 0394/13/ED/0370G), routine water quality monitoring stations at SR2 (Casam, Gazetted Beach) and SR3 (Approach, Gazetted Beach) were removed. The proposal was justified by ET and verified by IEC, also no objection was received from other parties. The proposal was approved by EPD as per EPD's memo (Ref. (6) in Ax(1) to EP2/N3/C/57 Pt.10) dated 20 August 2019. The removal of the water quality monitoring at SR2 and SR3 was effective from 23 August 2019.

The EM&A works were suspended from 23 November 2017 to 22 November 2018 and were resumed on 23 November 2018 due to the resumption of dredging works to remove the high spots at Z2B1, Z2B2 and Z2C1. The water quality monitoring and construction works were temporarily suspended from 21 February 2020 to 29 March 2020 and were resumed on 30 March 2020.

Exceedances of DO (S&M), DO (B), Turbidity, NH_3-N (in-situ & lab), UIA (in-situ & lab), TIN (in-situ & lab), Suspended Solids and *E.coli* were recorded at various monitoring stations, detail of exceedance are summarized in **Table I and II**. All exceedance were investigated, however investigation indicated these exceedances were not related to the Project works.

Table I Summary of Water Quality Exceedances – Routine Impact Monitoring (In-situ)

Station	Exceedance Level	DO (S&M)		DO (B)		Turbidity		NH_3-N		UIA		TIN		Total	
		E	F	E	F	E	F	E	F	E	F	E	F	E	F
SR1	Action	0	0	0	0	0	0	0	0	0	0	-	-	0	0
	Limit	0	0	0	0	2	1	0	0	0	0	-	-	2	1
SR2	Action	2	4	4	3	3	2	8	15	0	0	-	-	17	24
	Limit	49	45	56	62	3	3	21	16	4	4	-	-	133	130
SR3	Action	3	3	4	3	5	6	15	13	0	0	-	-	27	25
	Limit	46	43	55	59	2	2	17	18	9	7	-	-	129	129
SR4	Action	0	0	0	0	0	0	0	0	0	0	-	-	0	0
	Limit	0	0	0	0	4	3	0	0	28	29	-	-	32	32
SR5	Action	2	0	2	1	9	8	-	-	-	-	40	36	53	45
	Limit	48	49	54	55	3	4	-	-	-	-	485	494	590	602
SR6	Action	6	5	4	5	30	31	-	-	-	-	-	-	40	41
	Limit	67	70	79	79	13	14	-	-	-	-	-	-	159	163
SR7	Action	1	1	0	0	16	19	-	-	-	-	-	-	17	20
	Limit	68	76	94	92	1	0	-	-	-	-	-	-	163	168
SR8	Action	2	2	3	1	16	23	-	-	-	-	-	-	21	26
	Limit	50	52	72	77	8	8	-	-	-	-	-	-	130	137
SR9	Action	7	3	3	6	18	24	-	-	-	-	82	82	110	115
	Limit	33	35	75	73	20	13	-	-	-	-	138	142	266	263
SR10	Action	7	9	2	4	20	22	-	-	-	-	88	77	117	112
	Limit	39	35	69	68	3	4	-	-	-	-	81	88	192	195
SR11	Action	1	4	2	1	15	15	-	-	-	-	88	83	106	103
	Limit	44	38	70	70	1	3	-	-	-	-	58	61	173	172
SR12	Action	0	0	0	0	0	0	0	0	0	0	-	-	0	0
	Limit	0	0	0	0	2	2	2	2	30	28	-	-	34	32
SR13	Action	6	2	4	5	0	0	-	-	-	-	-	-	10	7
	Limit	54	62	66	67	0	0	-	-	-	-	-	-	120	129
Total	Action	37	33	28	29	132	150	23	28	0	0	298	278	1036	
	Limit	498	505	690	702	62	57	40	36	71	68	762	785	4276	

FUGRO TECHNICAL SERVICES LIMITED
Fugro Development Centre, 5 Lok Yi Street, Tai Lam, Tuen Mun, N.T., Hong Kong.
Tel : +852 2450 8233
Fax : +852 2450 6138
E-mail : matlab@fugro.com
Website : www.fugro.com

Table II Summary of Water Quality Exceedances – Routine Impact Monitoring (Laboratory Analysis)

Station	Exceedance Level	Suspended Solids		BOD_5		*E. coli*		NH_3-N		UIA		Synthetic Detergent		TIN		Total	
		E	F	E	F	E	F	E	F	E	F	E	F	E	F	E	F
SR1	Action	0	0	0	0	0	0	0	0	0	0	0	0	-	-	0	0
	Limit	27	23	0	0	0	0	0	0	0	0	0	0	-	-	27	23
SR2	Action	3	8	-	-	-	-	12	18	0	0	-	-	-	-	15	26
	Limit	2	0	-	-	-	-	21	18	4	4	-	-	-	-	27	22
SR3	Action	5	3	-	-	-	-	20	17	0	0	-	-	-	-	25	20
	Limit	0	0	-	-	-	-	19	23	9	6	-	-	-	-	28	29
SR4	Action	0	0	0	0	0	0	0	0	0	0	0	0	-	-	0	0
	Limit	27	46	0	0	3	2	0	0	28	27	0	0	-	-	58	75
SR5	Action	6	8	-	-	-	-	-	-	-	-	-	-	52	45	58	53
	Limit	0	1	-	-	-	-	-	-	-	-	-	-	465	481	465	482
SR6	Action	27	22	-	-	-	-	-	-	-	-	-	-	-	-	27	22
	Limit	0	0	-	-	-	-	-	-	-	-	-	-	-	-	0	0
SR7	Action	4	4	-	-	-	-	-	-	-	-	-	-	-	-	4	4
	Limit	0	0	-	-	-	-	-	-	-	-	-	-	-	-	0	0
SR8	Action	6	3	-	-	-	-	-	-	-	-	-	-	-	-	6	3
	Limit	0	0	-	-	-	-	-	-	-	-	-	-	-	-	0	0
SR9	Action	18	19	-	-	-	-	-	-	-	-	-	-	83	77	101	96
	Limit	0	0	-	-	-	-	-	-	-	-	-	-	113	116	113	116
SR10	Action	1	3	-	-	-	-	-	-	-	-	-	-	76	74	77	77
	Limit	0	0	-	-	-	-	-	-	-	-	-	-	55	58	55	58
SR11	Action	2	2	-	-	-	-	-	-	-	-	-	-	68	68	70	70
	Limit	0	0	-	-	-	-	-	-	-	-	-	-	38	36	38	36
SR12	Action	0	0	0	0	0	0	0	0	0	0	0	0	-	-	0	0
	Limit	40	52	0	0	1	0	2	2	30	28	0	0	-	-	73	82
SR13	Action	2	2	-	-	-	-	-	-	-	-	-	-	-	-	2	2
	Limit	0	0	-	-	-	-	-	-	-	-	-	-	-	-	0	0
Total	Action	74	74	0	0	0	0	32	35	0	0	0	0	279	264	758	
	Limit	96	122	0	0	4	2	42	43	71	65	0	0	671	691	1807	

Table III Summary of the Exceedances Recorded – 24-hr Monitoring

Station	Exceedance Level	Turbidity	DO	NH_3-N	Total
SR4	Action	0	0	0	0
	Limit	37	45	0	82
SR5	Action	416	174	-	590
	Limit	706	3963	-	4669
SR9	Action	2308	603	-	2911
	Limit	1259	1289	-	2548
SR10	Action	1336	283	-	1619
	Limit	466	3810	-	4276
SR11	Action	1025	673	-	1698
	Limit	1035	4203	-	5238
SR12	Action	1	0	0	1
	Limit	267	14	0	281
SR13	Action	8	157	-	165
	Limit	212	7012	-	7224
Total	Action	5094	1890	0	6984
	Limit	3982	20336	0	24318

iv. Supplementary 24-hr water quality monitoring was also conducted at 7 of the stations, which were SR4, SR5, SR9, SR10, SR11, SR12 and SR13. Referring to the Proposal on Removal of Some Water Quality Monitoring Stations After Resumption of Marine Construction Works (Dredging Works and Marine Works of the Northern Part of Kwai Tsing Container Basin Only) (0394/13/ED/0332I) which has been submitted to EPD and relevant parties in December 2016 with no objection, removal of 24 hour monitoring stations at SR9, SR10 and SR11 was effective from 23 January 2017. The setups of 24 hour monitoring stations at SR9, SR10 and SR11 were removed on 7 February 2017. Number of exceedances recorded in the reporting period at each 24 hour monitoring station is summarized in Table III. However, investigation indicated the exceedance was not related to the Project works.

v. Non-Compliance, Complaints, Notifications of Summons and Successful Prosecutions
No successful complaint, notification of prosecutions or summons was received in the reporting period.

Two leakage incidents were reported on 14 October 2014 and 2 October 2015 respectively. Base on the finding of two comprehensive incident reports on leakage on 14 October 2014 and 2 October 2015, which was submitted to EPD on 3 December 2014 and 17 December 2015 respectively, it was considered the Project or the incidents did not cause significant negative impact to the water quality in terms of the analyzed data.

A non-compliance case was recorded by EPD during the site inspection on 8 December 2014 regarding the failure to comply with Environmental Permit Condition No. 3.1 (c). According to the letter submitted to EPD by the Contractor (Ref: CV201304/H4a/132/KO/pl), the Contractor had

taken immediate actions to avoid recurrence of the noncompliance. No further action was required by EPD regarding the non-compliance case on 8 December 2014.

vi. According to Contractor, no archaeological deposit was found during reporting period.

vii. Compliance with Specific EP conditions
Implementation of Contractor's mitigation measures for dredging work and the associated dredging records were checked. It was concluded that the dredging is conducted orderly in compliance with the EP requirements on site mitigation measures in general.

1. INTRODUCTION

1.1 Background

1.1.1 The Project objective is to dredge approximately 4.0 million cubic metres of sediment from the seabed of Kwai Tsing Container Basin, as well as portions of Northern Fairway and Western Fairway, to provide sufficient depth of container basin and approach channel to Kwai Tsing Container Terminal (KTCT) for the safe navigation of Ultra Large Container Ships (ULCS).

1.1.2 The environmental monitoring and audit works of this Project is governed by Environmental Permit (EP) No. EP-426/2011/A, EM&A Manual (AEIAR-156/2010) and EM&A TIN (EPD Letter Ref: (34) in Ax(1) to EP2/N3/C/57Pt.7)).

1.1.3 The project proponent was the Civil Engineering & Development Department, HKSAR (CEDD). The Project General Layout is shown in **Figure 1**.

1.1.4 Mott MacDonald Hong Kong Ltd. (MMHK) was commissioned by CEDD as the Engineer for the Project. Ramboll Hong Kong Limited (RHK) was employed as the Independent Environmental Checker (IEC) in the Project.

1.1.5 China International Water & Electric Corporation Limited (CIWE) was appointed as the main Contractor for the aforesaid dredging works under CEDD Contract No. CV/2013/04.

1.1.6 Fugro Technical Services Limited (FTS) was appointed as the Environmental Team (ET) to implement the Environmental Monitoring and Audit (EM&A) programme for the Project.

1.1.7 The construction phase of the Project under the EP was commenced on 23 April 2014. The EM&A programme of the Project commenced on 23 April 2014. The dredging work under CEDD Contract No.CV/2013/04 was completed on 31 July 2020.

1.1.8 In accordance with Section 2.1.7 of the EM&A Manual, a post-construction water quality monitoring was conducted from 4 August 2020 to 29 August 2020. The results of the post-construction water quality monitoring are also presented in this Final EM&A Report.

1.2 Purpose of the Report

1.2.1 This Final EM&A Review Report is prepared by FTS. This report presents a summary of the environmental monitoring and audit works, list of activities and mitigation measures conducted by the ET for the Project during reporting period from 23 April 2014 to 29 August 2020 under the Contract No.CV/2013/04, also the review of the validity of EIA report of the mitigation measures, cost effectiveness of EM&A Programme and recommendation.

1.3 Structure of the Report

1.3.1 The structure of this report is as follows:

Section 1: Introduction, including background, purpose and structure of the report

Section 2: Basic Project Information – summaries background and scope of the Contract, site description, project organization and contract details, construction programme, the construction works undertaken during the project period.

Section 3: Routine Impact Water Quality Monitoring – summaries the monitoring parameters, monitoring programmes, monitoring methodologies, monitoring frequency, monitoring locations, Action and Limit Levels, monitoring results and Event / Action Plans.

Section 4: 24-hr Water Quality Monitoring – summaries the monitoring parameters, monitoring programmes, monitoring methodologies, monitoring frequency, monitoring locations, Action and Limit Levels, monitoring results and Event / Action Plans.

Section 5: Environmental Site Inspection – summaries the audit findings of the weekly site inspections undertaken within the reporting period and the implementation status of environmental mitigation measures in the construction period.

Section 6: Non-Compliance, Complaints, Notifications of Summons and Prosecution – summaries any environmental complaints, environmental summons and successful prosecutions within the project period.

Section 7: Review of the validity of EIA Report prediction and Hypotheses Test - comparison of the Water Quality Monitoring Results with the EIA Predictions, validity of EIA prediction and shortcoming in EIA report

Section 8: Review of the Effectiveness and Efficiency of the Mitigation Measures - effectiveness of the mitigation measures and cost effectiveness and efficiency of mitigation programme

Section 9: Conclusion

2. BASIC PROJECT INFORMATION

2.1 Project Organizations

2.1.1 The Project Organization structure is shown in **Appendix A**. The key personnel contact names and numbers are summarized in **Table 2.1**.

Table 2.1 Key Personnel Contact of the Contract

Party	Position	Name	Telephone	Fax
Project Proponent (CEDD)	Engineer	Mr. Ng Chi Ho	2762 5605	2714 0113
Engineer's Representative (MMHK)	Resident Engineer	Mr. Jason Chan	2585 8595	2827 1823
		Ms. Sunny Zhao	2828 5908	2827 1823
Independent Environmental Checker (RHK)	Independent Environmental Checker	Mr. YH Hui	3465 2888	3465 2899
Contractor (CIWE)	Site Agent	Mr. KO Leung	2508 0983	2508 0987
Environmental Team (FTS)	Environmental Team Leader	Mr. Colin Yung	3565 4114	3565 4160

2.2 Construction Programme

2.2.1 The construction phase of the Project under the EP commenced on 23 April 2014 and were substantially completed on 21 November 2017. The dredging works were resumed on 23 November 2018 to remove the high spots at Z2B1, Z2B2 and Z2C1. All dredging works under this Contract of the construction phase, including the dredging works in Hotspot area in sub-zones Z1A, Z1B, Z2A, Z2B and Z2C were completed on 31 July 2020.

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

2.3 Summary of EM&A Programme Requirements

2.3.1 The EM&A programme requires environmental monitoring for water quality and environmental site inspections for air quality, noise, water quality, waste management, landscape and visual impact. The EM&A requirements for each parameter described in the following sections include:

- Environmental mitigation measures, as recommended in the Project EIA reports;
- Environmental impact hypotheses tested;
- Action and Limit levels;
- All monitoring parameters; and
- Event / Action Plan;

Fugro Development Centre,
5 Lok Yi Street, Tai Lam,
Tuen Mun, N.T.,
Hong Kong.

Tel : +852 2450 8233
Fax : +852 2450 6138
E-mail : matlab@fugro.com
Website : www.fugro.com

2.4 Construction Activities during the reporting period:

During the reporting period, the principal work activities included:

- Preparation works of dredging for hard materials at Portion A (Zone Z1A, Z2B1, Z2B2 and Z2C1 in EP)
- Site Trial on Dredging works without Silt Curtain Deployment at Portion A (Zone Z2C2 and Z4A in EP) and Portion E (Zone Z13B in EP)
- Dredging at Portion A (Zone Z1A, Z1B, Z2A1, Z2A2, Z2A3, Z2B1, Z2B2, Z2C1, Z2C2, Z2C3, Z2C4, Z3A, Z3B, Z4A and Z4B in EP)
- Dredging at Portion B (Zone Z5A, Z5B, Z5C, Zone Z6A, Z6B, Z6C, Z6D, Zone Z7 and Zone Z8 in EP)
- Dredging at Portion C (Zone Z9, Z10, Z11 and Z12 in EP)
- Dredging at Portion D (Zone Z13A in EP)
- Dredging at Portion E (Zone Z13B in EP)
- Dredging at the Hotspot area in Portion A (Zone Z1A, Z1B, Z2A, Z2B and Z2C in EP)

3. ROUTINE IMPACT WATER QUALITY MONITORING

3.1 Monitoring Methodology

3.1.1 In-situ measurements and water samples were taken at 3 depths of the water column for each monitoring location, i.e. 1m below the surface, mid-depth, and 1m above the seabed, except where the water depth was less than 6m in which case the mid-depth was omitted and for locations where the water depth was less than 3m only the mid-depth level was monitored.

In-Situ Measurement

3.1.2 Prior to each monitoring day, wet bulb calibration was performed for the DO probes. Zero check in distilled water and calibration with a solution of known NTU were carried out for the turbidity probes. Three-point calibration of pH probes was completed each monitoring day.

3.1.3 At each sampling depth, two consecutive measurements were taken for turbidity, pH, DO, temperature, salinity, and ammonia. Separate deployment of the monitoring instruments was conducted for the consecutive measurements. When the difference between the two measurements for DO or turbidity was higher than 25% of the value of the first reading, the reading would be discarded and further readings would be taken. Three replicates of TIN measurement were performed for each depth at each monitoring location.

Laboratory Analysis

3.1.4 Duplicate water samples were collected at each sampling depth for laboratory measurement of SS, BOD_5 & synthetic detergent, ammonia, and *E.coli* at the required monitoring stations shown in **Table 3.4**. Three replicates were taken for TIN measurements at the specified locations. Samples were stored in high density polythene bottles, packed in ice (cooled to 4°C without being frozen), and delivered to the laboratory on the same day of collection for analysis.

3.1.5 ALS Technichem (HK) Pty Ltd (HOKLAS Reg. No. 066) and Fugro Technical Services Limited (HOKLAS Reg. No. 015), were appointed to be the laboratory for analysis of water samples in the impact monitoring project. The methods adopted by the laboratories and the reporting limits are detailed in **Table 3.1**.

Table 3.1 Laboratory Measurement/Analysis Methods and Reporting Limits

Analysis Description	Method	Reporting limits
Suspended Solid	APHA 2540D	1 mg/L
Ammonia	APHA 4500NH3:B&C	0.01 mg/L
Nitrite	APHA 4500NO2:B&H	0.01 mg/L
Nitrate	APHA 4500NO3:I	0.01 mg/L
Total Inorganic Nitrogen	By Calculation	0.02 mg/L
5-day Biochemical Oxygen Demand	APHA 5210B	1 mg/L
Synthetic Detergent	As Methylene Blue Active Substance	0.5 mg/L
E. coli	DoE Section 7.8 & 7.9 plus in situ urease test	1 cfu/100mL

3.2 Monitoring Equipment

3.2.1 Equipment used for in-situ measurement and water sampling during impact water quality monitoring is summarised in **Table 3.2**. The equipment is in compliance with the requirements set out in the EM&A Manual. All in-situ monitoring instruments were calibrated by a HOKLAS-accredited laboratory or by standard solutions. Calibration of temperature, DO, salinity, pH and turbidity is conducted in three month interval, while QA/QC for in-situ ammonia measurement is carried out at 1-month interval.

Table 3.2 Water Quality Monitoring and Sampling Equipment

Parameter	Equipment	Model	Range	Equipment Accuracy
Nitrate	Photometer	• HACH DR900, and • Nitrate Reagent Set (Cadmium Reduction Method)	NO_3: 0.01 to 0.50 mg/L	±0.5%
Ammonia, Nitrite	Photometer	• Lovibond MD600 Maxi Direct, and • Ammonia Reagent Set (Indophenol blue / Salicylate); • Nitrite Reagent Set (N-(1-Naphthyl)-ethylendiamine)	NH_3-N: 0.02 to 1mg/L; 1 to 50mg/L NO_2: 0.01 to 0.5mg/L	±2%
Temperature, Dissolved Oxygen, salinity, pH, Turbidity	Water Quality Monitoring Device	YSI 6920V2-2-M Sonde	Temp: -5 to 50°C DO: 0-50mg/L DO%: 0-500% Sal: 0 to 70 ppt pH: 0 to 14 pH units Turb: 0-1000NTU	Temp: ±0.15°C DO: ±0.1mg/L or 1% (whichever greater) for 0-20mg/L; ±15% for 20-50mg/L Sal: ±1% or 0.1ppt (whichever greater) pH: ±0.2 units Turb: ±2% or 0.3NTU (whichever greater)
		Xylem EXO 3 Sonde	Temp: -5 to 50°C DO: 0-50mg/L DO%: 0-500% Sal: 0 to 175 ppt (By conversion of conductivity) pH: 0 to 14 pH units Turb: 0-4000NTU (FNU)	Temp: ±0.01°C (for -5-35°C) DO: ±0.1mg/L or 1% (whichever greater) for 0-20mg/L; ±15% for 20-50mg/L Sal: ±0.5% or 0.012ppt (for 0-72.7 ppt) (By conversion of conductivity) (whichever greater) pH: ±0.2 units Turb: ±2% or 0.3NTU (FNU) (whichever greater)
Water Sampling	Water Sampler	Aquatic Research Transparent PC Horizontal Water Sampler 2.2L / 3L / 5L	NA	NA
Positioning	Global Positioning System (GPS)	Garmin eTrex	NA	±3m
		Garmin GPS72	NA	±3m
Water Depth	Echo Sounder	Garmin ECHO 100	0.6 to 91 m	0.1 m

3.3 Monitoring Parameters

3.3.1 The monitoring parameters and frequency for both in-situ measurement and laboratory analysis are summarised in **Table 3.3**. Parameters for each monitoring station are specified in **Table 3.4**.

Table 3.3 Monitoring Parameters and Frequency

Parameters	Monitoring Frequency
In-situ Measurement Turbidity (in NTU), pH, Dissolved Oxygen (in mg/L and %), Temperature (in °C), Salinity (in ppt), [1]Ammonia-N (in mg/L-N and UIA); [2]TIN: Ammonia-N (in mg/L), Nitrite (in mg/L), Nitrate (in mg/L) Laboratory Analysis [1]Ammonia-N (in mg/L-N and UIA), Suspended Solids (SS), [3]BOD_5, [3]*E.coli*, [3]Synthetic Detergent; [2]TIN: Ammonia-N (in mg/L), Nitrite (in mg/L), Nitrate (in mg/L)	3 days per week, at mid-flood and mid-ebb tides (except [3]detergent which shall be taken one day per month, at mid-flood and mid-ebb) 36 hours interval was allowed between subsequent sets of measurement.

Notes:

1. Ammonia measurements and samples were taken at SR1, SR2, SR3, SR4, SR12, C1, C2, C3 only. (Ammonia measurements and samples were taken at SR2, SR3, SR4, SR12, C1A, C2A only during the period from 23 January 2017 to 22 August 2018 and have been further scale down at SR4, SR12 and C1A and C2A only since 23 August 2018);
   UIA: In-situ unionized ammonia was calculated from in-situ measurement of NH_3-N, temperature, pH and salinity; Laboratory determined unionized ammonia was calculated from analysed NH_3-N from water samples and in-situ measurement of temperature, pH and salinity;
2. Total Inorganic Nitrogen (TIN) measurements and samples were taken at SR5, SR9, SR10, SR11, G1, G2, G3, G4, G5, G6 only; (TIN measurements and samples were taken at SR5, G2, C1A and C2A only since 23 January 2017);
3. BOD_5, *E.coli* and Synthetic Detergent samples were taken at SR1, SR4, SR12, C1, C2, C3 only. (BOD_5, *E.coli* and Synthetic Detergent samples were taken at SR4, SR12, C1A and C2A only since 23 January 2017)

.

Table 3.4 Water Quality Monitoring Parameters

ID	In-situ Measurement							Laboratory Analysis					
	pH	Temperature	Salinity	Turbidity	Dissolved Oxygen / Dissolved Oxygen%	NH_3-N / UIA[1]	TIN (NH_3-N, NO_2 & NO_3)	Suspended Solids	BOD_5	*E. coli*	NH_3-N / UIA[1]	Synthetic Detergent	TIN (NH_3-N, NO_2 & NO_3)
[2]SR1	O	O	O	O	O	O		O	O	O	O	O	
[5]SR2	O	O	O	O	O	O		O			O		
[5]SR3	O	O	O	O	O	O		O			O		
SR4	O	O	O	O	O	O		O	O	O	O	O	
SR5	O	O	O	O	O		O	O					O
[3]SR6	O	O	O	O	O			O					
[3]SR7	O	O	O	O	O			O					
[3]SR8	O	O	O	O	O			O					

ID	In-situ Measurement							Laboratory Analysis					
	pH	Temperature	Salinity	Turbidity	Dissolved Oxygen / Dissolved Oxygen%	NH_3-N / UIA[1]	TIN (NH_3-N, NO_2 & NO_3)	Suspended Solids	BOD_5	*E. coli*	NH_3-N / UIA[1]	Synthetic Detergent	TIN (NH_3-N, NO_2 & NO_3)
[3]SR9	O	O	O	O	O		O	O					O
[3]SR10	O	O	O	O	O		O	O					O
[3]SR11	O	O	O	O	O		O	O					O
SR12	O	O	O	O	O	O		O	O	O	O	O	
SR13	O	O	O	O	O			O					
[4]G1	O	O	O	O	O		O	O					O
G2	O	O	O	O	O		O	O					O
[4]G3	O	O	O	O	O		O	O					O
[4]G4	O	O	O	O	O		O	O					O
[4]G5	O	O	O	O	O		O	O					O
[4]G6	O	O	O	O	O		O	O					O
[4]C1	O	O	O	O	O	O		O	O	O	O	O	
[4]C1A	O	O	O	O	O	O	O	O	O	O	O	O	O
[4]C2	O	O	O	O	O	O		O	O	O	O	O	
[4]C2A	O	O	O	O	O	O	O	O	O	O	O	O	O
[4]C3	O	O	O	O	O	O		O	O	O	O	O	

Note:

1. UIA: In-situ unionized ammonia was calculated from in-situ measurement of NH_3-N, temperature, pH and salinity; laboratory determined unionized ammonia was calculated from analysed NH_3-N from water samples taken and in-situ measurement of temperature, pH and salinity;
2. Referring to the Proposal for Temporary Suspension of Impact Water Quality Monitoring (0394_13_ED_0326F) which was submitted to EPD in August 2016 with no objection was received from EPD; removal of routine water quality monitoring stations at SR1 was effective on 24 December 2016;
3. Referring to the Proposal on Removal of Some Water Quality Monitoring Stations After Resumption of Marine Construction Works (Dredging Works and Marine Works of the Northern Part of Kwai Tsing Container Basin Only) (0394_13_ED_0332I) which has been submitted to EPD and relevant parties in December 2016 with no objection, removal of routine water quality monitoring stations at SR6, SR7, SR8, SR9, SR10 and SR11 was effective from 23 January 2017;
4. Due to removal of some sensitive receivers in routine water quality monitoring, gradient stations G3, G5 and G6 were also be removed and gradient stations G1 and G4 replaced the previous control stations C1, C2 and C3 as C1A and C2A with reference to the approved proposal (0394_13_ED_0332I) which was effective from 23 January 2017;
5. Referring to the Proposal of Scale down for the Water Quality Monitoring Stations during High Spots Removal at Sub-zone Z2B1, Z2B2 and Z2C1 (Ref.: 0394/13/ED/0370G), routine water quality monitoring stations at SR2 (Casam, Gazetted Beach) and SR3 (Approach, Gazetted Beach) were removed. The proposal was justified by ET and verified by IEC, also no objection was received from other parties. The proposal was approved by EPD as per EPD's memo (Ref. (6) in Ax(1) to EP2/N3/C/57 Pt.10) dated 20 August 2019. The removal of the water quality monitoring at SR2 and SR3 was effective from 23 August 2019.

3.4 Monitoring Locations

3.4.1 Routine impact water quality monitoring at 22 designated monitoring stations namely C1, C2, C3, G1, G2, G3, G4, G5, G6, SR1, SR2, SR3, SR4, SR5, SR6, SR7, SR8, SR9, SR10, SR11, SR12, SR13 were conducted.

3.4.2 Referring to the Proposal for Temporary Suspension of Impact Water Quality Monitoring (0394_13_ED_0326F) which was submitted to EPD in August 2016 with no objection was received from EPD; removal of routine water quality monitoring stations at SR1 was effective on 24 December 2016.

3.4.3 Referring to the *Proposal on Removal of Some Water Quality Monitoring Stations After Resumption of Marine Construction Works (Dredging Works and Marine Works of the Northern Part of Kwai Tsing Container Basin Only)* (0394_13_ED_0332I) which has been submitted to EPD and relevant parties in December 2016 with no objection, removal of routine water quality monitoring stations at SR6, SR7, SR8, SR9, SR10 and SR11 was effective from 23 January 2017. Due to removal of some sensitive receivers in routine water quality monitoring, gradient stations G3, G5 and G6 were also be removed and gradient stations G1 and G4 replaced the previous control stations C1, C2 and C3 as C1A and C2A with reference to the approved proposal (0394_13_ED_0332I) which was effective from 23 January 2017.

3.4.4 Referring to the *Proposal of Scale down for the Water Quality Monitoring Stations during High Spots Removal at Sub-zone Z2B1, Z2B2 and Z2C1* (Ref.: 0394/13/ED/0370G), routine water quality monitoring stations at SR2 (Casam, Gazetted Beach) and SR3 (Approach, Gazetted Beach) were removed. The proposal was justified by ET and verified by IEC, also no objection was received from other parties. The proposal was approved by EPD as per EPD's memo (Ref. (6) in Ax(1) to EP2/N3/C/57 Pt.10) dated 20 August 2019. The removal of the water quality monitoring at SR2 and SR3 was effective from 23 August 2019.

3.4.5 Detailed information of the monitoring locations is summarised in **Table 3.5**. The locations of the stations are also shown in **Figure 2**.

Table 3.5 Locations of Water Quality Monitoring Stations

Water Monitoring Station		Easting	Northing
[1]SR1	Near Hong Kong Garden, WSD Flushing Water Intake	822690.971	824644.361
[4]SR2	Casam, Gazetted Beach	825723.225	825334.784
[4]SR3	Approach, Gazetted Beach	826960.152	825260.726
SR4	Tsuen Wan, WSD Flushing Water Intake	829270.482	825382.994
SR5	Ma Wan, Fish Culture Zone	823758.839	823575.934
[2]SR6	Kau Yi Chau, Corals	825655.637	816444.509
[2]SR7	Green Island, Corals	829830.065	815996.449
[2]SR8	Shek Kok Tsui, Corals	828562.803	811100.522
[2]SR9	Cheung Sha Wan, Fish Culture Zone	818700.675	810910.924
[2]SR10	Lo Tik Wan, Fish Culture Zone	831528.007	809237.067
[2]SR11	Sok Kwu Wan, Fish Culture Zone	831721.774	807839.924
SR12	Tsing Yi, WSD Flushing Water Intake	829599.152	823262.269
SR13	EMSD Cooling Water Intake for Kwai Chung Hospital	831397.450	822002.433
[3]G1/ C1A	Gradient Station/ Control Station A	820626.195	822834.323
G2	Gradient Station	825979.792	824683.158
[3]G3	Gradient Station	826431.159	820617.725
[3]G4/ C2A	Gradient Station/ Control Station B	830423.070	819431.722
[3]G5	Gradient Station	821388.238	815001.087
[3]G6	Gradient Station	831293.103	811408.482

Water Monitoring Station		Easting	Northing
^{3}C1	Control Station	817511.733	822492.021
^{3}C2	Control Station	825062.857	808648.094
^{3}C3	Control Station	835061.918	807452.449

Remark:
1. Referring to the Proposal for Temporary Suspension of Impact Water Quality Monitoring (0394_13_ED_0326F) which was submitted to EPD in August 2016 with no objection was received from EPD; removal of routine water quality monitoring stations at SR1 was effective on 24 December 2016;
2. Referring to the Proposal on Removal of Some Water Quality Monitoring Stations After Resumption of Marine Construction Works (Dredging Works and Marine Works of the Northern Part of Kwai Tsing Container Basin Only) (0394_13_ED_0332I) which has been submitted to EPD and relevant parties in December 2016 with no objection, removal of routine water quality monitoring stations at SR6, SR7, SR8, SR9, SR10 and SR11 was effective from 23 January 2017;
3. Due to removal of some sensitive receivers in routine water quality monitoring, gradient stations G3, G5 and G6 were also be removed and gradient stations G1 and G4 replaced the previous control stations C1, C2 and C3 as C1A and C2A with reference to the approved proposal (0394_13_ED_0332I) which was effective from 23 January 2017;
4. Referring to the Proposal of Scale down for the Water Quality Monitoring Stations during High Spots Removal at Sub-zone Z2B1, Z2B2 and Z2C1 (Ref.: 0394/13/ED/0370G), routine water quality monitoring stations at SR2 (Casam, Gazetted Beach) and SR3 (Approach, Gazetted Beach) were removed. The proposal was justified by ET and verified by IEC, also no objection was received from other parties. The proposal was approved by EPD as per EPD's memo (Ref. (6) in Ax(1) to EP2/N3/C/57 Pt.10) dated 20 August 2019. The removal of the water quality monitoring at SR2 and SR3 was effective from 23 August 2019.

3.5 Monitoring Date, Time Frequency and Duration

3.5.1 In the reporting period, impact water quality monitoring was carried out 3 days per week, at mid-flood and mid-ebb tides, from 23 April 2014 to 21 November 2017 and 23 November 2018 to 31 July 2020. The post construction monitoring for all designated monitoring stations (i.e. SR1, SR2, SR3 SR4, SR5, SR6, SR7, SR8. SR9, SR10, SR11, SR12, SR13, G1, G2, G3, G4, G5, G6, C1, C2 and C3) were conducted between 28 November 2017 and 23 December 2017 after the substantial completion of the Project except for sub-zone Z2B1, Z2B2 and Z2C1. The post construction monitoring for the remaining monitoring stations (i.e. SR4, SR5, SR12, SR13, G2, C1A and C2A) were conducted between 4 August 2020 and 29 August 2020 after the completion of removal of high spots at Z2B1, Z2B2 and Z2C1.. The methodology of water quality monitoring was enclosed in baseline water quality monitoring report (report no. 0394/13/ED/0132E) and TIN monitoring proposal (report no. 0394/13/ED/0104C).

3.5.2 The EM&A works were suspended from 23 November 2017 to 22 November 2018 and were resumed on 23 November 2018 due to the resumption of dredging works to remove the high spots at Z2B1, Z2B2 and Z2C1. The water quality monitoring and construction works were temporarily suspended from 21 February 2020 to 29 March 2020 and were resumed on 30 March 2020.

3.6 Action and Limit Levels

3.6.1 Referring to the ER Letter ref. (CV/2013/04)/M45/400/1247 dated 19 March 2015, a report on Revised Baseline Water Quality Monitoring Test Methodology – Review of Action and Limit Levels (0394/13/ED/0175C) has been submitted to EPD by ER in March 2015. A set of updated Action and Limit Level for the wet season (April – October) was proposed and applied

to the water quality monitoring data since 1 April 2015. The Action and Limit Level is given in **Appendix C**.

3.7 Results and Observations

3.7.1 Impact water quality monitoring and post construction water quality monitoring were conducted at the designated monitoring stations (i.e. SR1, SR2, SR3 SR4, SR5, SR6, SR7, SR8. SR9, SR10, SR11, SR12, SR13, G1, G2, G3, G4, G5, G6, C1, C2 and C3) between 23 April 2014 and 23 December 2017 and at the remaining monitoring stations (i.e. SR4, SR5, SR12, SR13, G2, C1A and C2A) between 23 November 2018 and 29 August 2020. Impact water quality monitoring and post construction water quality monitoring results as graphical presentations are provided in **Appendix D**.

3.7.2 During the reporting period, red tide occurrences were reported in Hong Kong waters. In addition, some adverse weather conditions including Rainstorm Warning signal, Thunderstorm Warning signals, Strong Monsoon Signal and Tropical Cyclone Warning Signals were reported. Heavy marine traffic (not associated with the Project) was commonly observed nearby the Project site and its vicinity, that the propeller wash from vessels could lead to potential disturbance of seabed sediment and affect the water quality.

3.7.3 Number of AL and LL exceedances recorded in water quality monitoring in the construction period (23 April 2014 – 31 July 2020) at each impact station is summarized in **Table 3.6** and **3.7**.

FUGRO TECHNICAL SERVICES LIMITED
Fugro Development Centre,
5 Lok Yi Street, Tai Lam,
Tuen Mun, N.T.,
Hong Kong.
Tel : +852 2450 8233
Fax : +852 2450 6138
E-mail : matlab@fugro.com
Website : www.fugro.com

Table 3.6 Summary of Water Quality Exceedance (In-situ Measurement)

Station	Exceedance Level	DO (S&M)		DO (B)		Turbidity		NH_3-N		UIA		TIN		Total	
		E	F	E	F	E	F	E	F	E	F	E	F	E	F
SR1	Action	0	0	0	0	0	0	0	0	0	0	-	-	0	0
	Limit	0	0	0	0	2	1	0	0	0	0	-	-	2	1
SR2	Action	2	4	4	3	3	2	8	15	0	0	-	-	17	24
	Limit	49	45	56	62	3	3	21	16	4	4	-	-	133	130
SR3	Action	3	3	4	3	5	6	15	13	0	0	-	-	27	25
	Limit	46	43	55	59	2	2	17	18	9	7	-	-	129	129
SR4	Action	0	0	0	0	0	0	0	0	0	0	-	-	0	0
	Limit	0	0	0	0	4	3	0	0	28	29	-	-	32	32
SR5	Action	2	0	2	1	9	8	-	-	-	-	40	36	53	45
	Limit	48	49	54	55	3	4	-	-	-	-	485	494	590	602
SR6	Action	6	5	4	5	30	31	-	-	-	-	-	-	40	41
	Limit	67	70	79	79	13	14	-	-	-	-	-	-	159	163
SR7	Action	1	1	0	0	16	19	-	-	-	-	-	-	17	20
	Limit	68	76	94	92	1	0	-	-	-	-	-	-	163	168
SR8	Action	2	2	3	1	16	23	-	-	-	-	-	-	21	26
	Limit	50	52	72	77	8	8	-	-	-	-	-	-	130	137
SR9	Action	7	3	3	6	18	24	-	-	-	-	82	82	110	115
	Limit	33	35	75	73	20	13	-	-	-	-	138	142	266	263
SR10	Action	7	9	2	4	20	22	-	-	-	-	88	77	117	112
	Limit	39	35	69	68	3	4	-	-	-	-	81	88	192	195
SR11	Action	1	4	2	1	15	15	-	-	-	-	88	83	106	103
	Limit	44	38	70	70	1	3	-	-	-	-	58	61	173	172
SR12	Action	0	0	0	0	0	0	0	0	0	0	-	-	0	0
	Limit	0	0	0	0	2	2	2	2	30	28	-	-	34	32
SR13	Action	6	2	4	5	0	0	-	-	-	-	-	-	10	7
	Limit	54	62	66	67	0	0	-	-	-	-	-	-	120	129
Total	Action	37	33	28	29	132	150	23	28	0	0	298	278	1036	
	Limit	498	505	690	702	62	57	40	36	71	68	762	785	4276	

FUGRO TECHNICAL SERVICES LIMITED
Fugro Development Centre,
5 Lok Yi Street, Tai Lam,
Tuen Mun, N.T.,
Hong Kong.
Tel : +852 2450 8233
Fax : +852 2450 6138
E-mail : matlab@fugro.com
Website : www.fugro.com

Table 3.7 Summary of Water Quality Exceedance (Laboratory Analysis)

Station	Exceedance Level	Suspended Solids		BOD_5		*E. coli*		NH_3-N		UIA		Synthetic Detergent		TIN		Total	
		E	F	E	F	E	F	E	F	E	F	E	F	E	F	E	F
SR1	Action	0	0	0	0	0	0	0	0	0	0	0	0	-	-	0	0
	Limit	27	23	0	0	0	0	0	0	0	0	0	0	-	-	27	23
SR2	Action	3	8	-	-	-	-	12	18	0	0	-	-	-	-	15	26
	Limit	2	0	-	-	-	-	21	18	4	4	-	-	-	-	27	22
SR3	Action	5	3	-	-	-	-	20	17	0	0	-	-	-	-	25	20
	Limit	0	0	-	-	-	-	19	23	9	6	-	-	-	-	28	29
SR4	Action	0	0	0	0	0	0	0	0	0	0	0	0	-	-	0	0
	Limit	27	46	0	0	3	2	0	0	28	27	0	0	-	-	58	75
SR5	Action	6	8	-	-	-	-	-	-	-	-	-	-	52	45	58	53
	Limit	0	1	-	-	-	-	-	-	-	-	-	-	465	481	465	482
SR6	Action	27	22	-	-	-	-	-	-	-	-	-	-	-	-	27	22
	Limit	0	0	-	-	-	-	-	-	-	-	-	-	-	-	0	0
SR7	Action	4	4	-	-	-	-	-	-	-	-	-	-	-	-	4	4
	Limit	0	0	-	-	-	-	-	-	-	-	-	-	-	-	0	0
SR8	Action	6	3	-	-	-	-	-	-	-	-	-	-	-	-	6	3
	Limit	0	0	-	-	-	-	-	-	-	-	-	-	-	-	0	0
SR9	Action	18	19	-	-	-	-	-	-	-	-	-	-	83	77	101	96
	Limit	0	0	-	-	-	-	-	-	-	-	-	-	113	116	113	116
SR10	Action	1	3	-	-	-	-	-	-	-	-	-	-	76	74	77	77
	Limit	0	0	-	-	-	-	-	-	-	-	-	-	55	58	55	58
SR11	Action	2	2	-	-	-	-	-	-	-	-	-	-	68	68	70	70
	Limit	0	0	-	-	-	-	-	-	-	-	-	-	38	36	38	36
SR12	Action	0	0	0	0	0	0	0	0	0	0	0	0	-	-	0	0
	Limit	40	52	0	0	1	0	2	2	30	28	0	0	-	-	73	82
SR13	Action	2	2	-	-	-	-	-	-	-	-	-	-	-	-	2	2
	Limit	0	0	-	-	-	-	-	-	-	-	-	-	-	-	0	0
Total	Action	74	74	0	0	0	0	32	35	0	0	0	0	279	264	758	
	Limit	96	122	0	0	4	2	42	43	71	65	0	0	671	691	1807	

3.7.4 During the construction period (23 April 2014 – 31 July 2020), 70 AL and 1003 LL exceedances for DO (S&M); 57 AL and 1392 LL exceedances for DO (B); 282 AL and 119 LL exceedances for Turbidity; 51 AL and 76 LL exceedances for NH_3-N (in-situ); 139 LL exceedances for UIA (in-situ); 576 AL and 1547 LL exceedances for TIN (in-situ); 148 AL and 218 LL exceedances for Suspended solid; 6 LL exceedances for *E.coli*; 67 AL and 85 LL exceedances for NH_3-N (lab); 136 LL exceedances for UIA (in-situ) and 543 AL and 1362 LL exceedances for TIN (lab) were recorded.

3.7.5 A number of exceedances were recorded in the construction period (23 April 2014 – 31 July 2020), however, based on the finding from the investigation on the recorded cases of exceedances, the cause was found not related to the project. The exceedances may be caused by influences in the vicinity of the station or changes of the ambient conditions.

3.8 Event and Action Plan

3.8.1 The Event and Action Plan is given in **Appendix F**.

3.9 Exemption of Silt Curtain in Operation phase

3.9.1 A site trial for reviewing the exemption of silt curtain in operation phase was conducted on 11 March 2016, 8 April 2016, 15 June 2016, 16 June 2016, 21 June 2016, 22 June 2016, 23 June 2016 and 29 June 2016. A report on the review of operation phase silt curtain and water quality monitoring – site trial summarizing the findings was enclosed in Appendix K of the Monthly EM&A Report November 2016 (0394/13ED/0336A). As per the finding of the trail, silt curtain will be exempted for maintenance dredging work during Operation Phase. No objection was received from EPD regarding the review of operation phase silt curtain and water quality monitoring – site trial report. The record of the email circulation from stakeholders showing no objection regarding the review of operation phase silt curtain and water quality monitoring – site trial report is shown in **Appendix I**.

4. 24-HR WATER QUALITY MONITORING

4.1 Monitoring Methodology

4.1.1 In accordance with the requirement from Section 2.1.3.10 of the EM&A Manual, a Testing Methodology and Specification of 24 Hours Water Quality Monitoring (0394/13/ED/0111C) was submitted to EPD on 14 April 2014 with no objection was received from EPD, and was applied on site.

4.1.2 The monitoring probes are set up around the fish rack at the Fish Culture Zone and seawater intake point. Small buoys are placed on the sea surface to indicate the locations of the monitoring probes. Data loggers and wireless modems are placed on a framework or covered places, such as storage house on the fish rack.

4.1.3 The 24 hours water quality monitoring is performed at a depth of 1 to 2m below the water surface. The dissolved oxygen, temperature and turbidity data are logged at 5 minutes interval by the multi-probe, while ammonia data are logged at 20 minutes interval and data are transmitted via the wireless transmission system to the designated computers with the installation of automatic checking programme to detect exceedances at the offices of ET. In case where an action/limit level exceedance is evidenced (a continuous exceedance for any 30 minutes i.e. 6 consecutive monitoring data exceedances for DO, temperature and turbidity; and 3 consecutive exceedances of ammonia data), an email notification will be sent automatically to ET, Contractor, ER, EPD, AFCD and WSD to alert the event for further investigation.

4.2 Monitoring Equipment

4.2.1 The following equipment and facilities were used for the monitoring of water quality impacts:

Dissolved Oxygen, Turbidity and Temperature Measuring Equipment

A multi probe meter measuring dissolved oxygen, temperature and turbidity is set up at the 24 hours monitoring stations

- A DO level in the range of 0-20 mg/L and 0-200% saturation;
- A temperature of between 0 and 45 degree Celsius;
- A turbidity of between 0-1000NTU

The DO equipment is equipped with built-in salinity compensation.

Ammonia Measuring Equipment

The ammonia measuring equipment is used to monitor seawater ammonia level at WSD flushing water intake on a 24 hours a days 7 days a week during works basis.

Data Acquisition System

The data acquisition system is used to log water quality data at 5 minutes interval by the multi-probe and at 20 min interval by the ammonia sensor. Data will be transmitted via the wireless transmission system to the designated computers at ET office.

Table 4.1 lists out the detail of monitoring equipment.

Table 4.1 24 Hours Water Quality Monitoring Equipment

Parameter	Equipment	Model	Range	Equipment Accuracy
Temperature, Dissolved Oxygen, Turbidity	Water Quality Monitoring Device	• YSI 6920V2-2-M Sonde	Temp: -5 to 50°C DO: 0-50mg/L DO%: 0-500% Turb: 0-1000NTU	▪ Temp: ±0.15°C ▪ DO: ±0.1mg/L or 1% (whichever greater) for 0-20mg/L; ±15% for 20-50mg/L ▪ Turb: ±2% or 0.3NTU (whichever greater)
Data Acquisition System	Data Logger	Campbell CR200	NA	NA
	Data Logger	Campbell CR800	NA	NA
	Data Transmitter	NXN GT-511	NA	NA
Ammonia	Photometric Analyzer	Systea S.p.A. Micromac 1000 Ammonia Reagent Set: OPA	N-NH_3: 0-2mg/L	N-NH_3: <0.01mg/L

4.2.2 Equipment Calibration

In-situ monitoring instruments are checked, calibrated and certified by a laboratory accredited under HOKLAS or any other international accreditation scheme before use, and subsequently re-calibrated at 3 months intervals throughout the water quality monitoring programme.

The monitoring equipment, monitoring probes are cleaned and checked twice a week.

4.3 Monitoring Parameters

4.3.1 Dissolved oxygen, temperature and turbidity are recorded every 5 minutes, 24 hours a day 7 days a week during dredging works.

4.3.2 In-situ NH_3-N at WSD Flushing Water Intake are measured every 20 minutes, 24 hours a day 7 days a week during works.

4.3.3 The water quality parameters measured at particular locations are shown in **Table 4.2**.

Table 4.2 24-hr Water Quality Monitoring Parameters

ID	Description	Parameters				
		Temperature	Turbidity	DO (mg/L)	DO%	NH_3-N
SR4	Tsuen Wan, WSD Flushing Water Intake	O	O	O	O	O
SR5	Ma Wan, Fish Culture Zone	O	O	O	O	
SR9*	Cheung Sha Wan, Fish Culture Zone	O	O	O	O	
SR10*	Lo Tik Wan, Fish Culture Zone	O	O	O	O	
SR11*	Sok Kwu Wan, Fish Culture Zone	O	O	O	O	
SR12	Tsing Yi, WSD Flushing Water Intake	O	O	O	O	O
SR13	EMSD Cooling Water Intake for Kwai Chung Hospital	O	O	O	O	

Remark:

1. Referring to the Proposal on Removal of Some Water Quality Monitoring Stations After Resumption of Marine Construction Works (Dredging Works and Marine Works of the Northern Part of Kwai Tsing Container Basin Only) (0394/13/ED/0332I) which has been submitted to EPD and relevant parties in December 2016 with no objection, removal of 24 hour monitoring stations at SR9, SR10 and SR11 was effective from 23 January 2017. The setups of 24 hour monitoring stations at SR9, SR10 and SR11 were removed on 7 February 2017.

4.4 Monitoring Locations

The 24 hours water quality monitoring works are performed at the following locations (**Table 4.3**).

Table 4.3 Location of Water Quality Monitoring Station

Water Monitoring Station		Easting	Northing
SR4	Tsuen Wan, WSD Flushing Water Intake	829270.482	825382.994
SR5	Ma Wan, Fish Culture Zone	823758.839	823575.934
SR9*	Cheung Sha Wan, Fish Culture Zone	818700.675	810910.924
SR10*	Lo Tik Wan, Fish Culture Zone	831528.007	809237.067
SR11*	Sok Kwu Wan, Fish Culture Zone	831721.774	807839.924
SR12	Tsing Yi, WSD Flushing Water Intake	829599.152	823262.269
SR13	EMSD Cooling Water Intake for Kwai Chung Hospital	831397.450	822002.433

Remark:

1. Revisions on monitoring locations were proposed in previous submission (ET Ref: 0394/13/ED/0103 – WATER QUALITY MONITORING LOCATION) and were agreed among AFCD, EMSD, WSD and EPD;
2. Referring to the Proposal on Removal of Some Water Quality Monitoring Stations After Resumption of Marine Construction Works (Dredging Works and Marine Works of the Northern Part of Kwai Tsing Container Basin Only) (0394/13/ED/0332I) which has been submitted to EPD and relevant parties in December 2016 with no objection,

removal of 24 hour monitoring stations at SR9, SR10 and SR11 was effective from 23 January 2017. The setups of 24 hour monitoring stations at SR9, SR10 and SR11 were removed on 7 February 2017.

4.5 Action and Limit Levels

4.5.1 Referring to the ER Letter ref. (CV/2013/04)/M45/400/1247 dated 19 March 2015, a Revised Baseline Water Quality Monitoring Test Methodology – Review of Action and Limit Levels (0394/13/ED/0175C) has been submitted to EPD by ER in March 2015. The Action and Limit Level for the wet season (April – October) was effected and applied to the water quality monitoring data from 1 April 2015. The Action and Limit Level is given in **Appendix C**.

4.6 Results and Observations

4.6.1 24-hr water quality monitoring was conducted at all designated 24 hours water quality monitoring stations (i.e. SR4, SR5, SR9, SR10, SR11, SR12 and SR13) between 23 April 2014 and 22 January 2017 and at the remaining stations (i.e. SR4, SR5, SR12 and SR13) between 23 January 2017 and 22 November 2017, 23 November 2018 and 31 July 2020. Results are provided in **Appendix E**.

4.6.2 The EM&A works were suspended from 23 November 2017 to 22 November 2018 and were resumed on 23 November 2018 due to the resumption of dredging works to remove the high spots at Z2B1, Z2B2 and Z2C1. The water quality monitoring and construction works were temporarily suspended from 21 February 2020 to 29 March 2020 and were resumed on 30 March 2020.

4.6.3 During the reporting period, red tide occurrences were reported in Hong Kong waters. In addition, some adverse weather conditions including Rainstorm Warning signal, Thunderstorm Warning signals, Strong Monsoon Signal and Tropical Cyclone Warning Signals were reported. Heavy marine traffic (not associated with the Project) was commonly observed nearby the Project site and its vicinity, that the propeller wash from vessels could lead to potential disturbance of seabed sediment and affect the water quality. The above conditions may affect monitoring results. Furthermore, the fish culturing or other activities occurring on the fish rack may cause adverse impact on the receiving water. Number of AL and LL exceedances recorded in the water quality monitoring in the construction period (23 April 2014 – 31 July 2020) at each impact station is summarized in **Table 4.4**.

Table 4.4 Summary of Water Quality Exceedance (24-hr Monitoring)

Station	Exceedance Level	Turbidity	DO	NH_3-N	Total
SR4	Action	0	0	0	0
	Limit	37	45	0	82
SR5	Action	416	174	-	590
	Limit	706	3963	-	4669
SR9	Action	2308	603	-	2911
	Limit	1259	1289	-	2548
SR10	Action	1336	283	-	1619
	Limit	466	3810	-	4276
SR11	Action	1025	673	-	1698
	Limit	1035	4203	-	5238
SR12	Action	1	0	0	1
	Limit	267	14	0	281
SR13	Action	8	157	-	165
	Limit	212	7012	-	7224
Total	Action	5094	1890	0	6984
	Limit	3982	20336	0	24318

4.6.4 5094 AL and 3982 LL exceedances for Turbidity and 1890 AL and 20336 LL exceedance for Dissolved Oxygen were recorded in the construction period (23 April 2014 – 31 July 2020). Based on the finding from the investigation on the recorded cases of exceedances, the cause was found not related to the project. The exceedances may be caused by influences in the vicinity of the station or changes of the ambient conditions.

4.7 Event and Action Plan

4.7.1 The Event and Action Plan is given in **Appendix F**.

5. ENVIRONMENTAL SITE INSPECTION AND AUDIT

5.1 Site Inspections

5.1.1 The Environmental Team conducted 265 site inspections in the reporting period.

5.1.2 During the site inspections in the reporting period, the reminders and observations were summarized in **Table 5.1**

Table 5.1 Summary of Site Observation and Reminders

Environmental Aspect	Observations and Reminders
A. Water Quality	Dredging operation practice: - Contractor was reminded to employ better dredging operation practice like steady transfer of grab bucket, extension of retention time above silt curtain, lowering of grab bucket into the hopper barge and close the grab bucket while transferring to the silt curtain cage.
	Maintenance of silt curtain: - Contractor was reminded to keep maintenance on the silt curtain and to clean up the dredged material at the edge of the silt curtain.
B. Waste Management	Storage of chemical/ fuel: - Contractor was reminded to store the mechanical fuel properly in good containers with appropriate labels and drip tray.
	Stagnant water: - Contractor was reminded to remove the stagnant water in the drip tray and the surface of the chemical container.
	Sediment residue: - Contractor was reminded to clean up the sediment residue properly at the deck of the barge.
C. Marine Ecology	Nil
D. Fisheries	Nil
E. Hazard to life	Nil
F. Landscape Visual and Glare	Nil
G. Cultural Heritage	Nil
H. Noise	Coverage of the engine: - Contractor was reminded to close all the covers of the panel so the engine part during operation
I. Construction Dust	Nil
J. Other Environmental Issue	House-keeping: - Contractor was reminded to weed the drainage area regularly, to prevent dripping from water tap, to handle the oil strain on the floor properly and to keep the site area clean.
	Dark smoke emission - Contractor was reminded to implement regular maintenance programme for the engine

Environmental Aspect	Observations and Reminders
	Non-road mobile machinery (NRMM) label: - Contractor was reminded to place a corrected NRMM label for the air compressors

5.1.3 According to Contractor, no archaeological deposit was found during reporting period.

5.2 Implementation Status of Environmental Mitigation Measures

5.2.1 Implementation of mitigation measures for dredging works and the associated dredging records were checked and the findings. A summary of the Implementation Schedule of Environmental Mitigation Measures (EMIS) is presented in **Appendix G**. Mitigation measures were implemented properly in general during project period. Status of required submission under the EP during or prior to the construction period (23 April 2014 – 21 November 2017) is summarized in **Table 5.2.**

Table 5.2 Compliance with EP Conditions in the Reporting Period

EP Condition	Compliance Status and/or Recommendations
2.3 Community Liaison Group	A Community Liaison Group (CLG) was set up comprising representatives from the relevant concerned and affected parties, including the fishery sector to facilitate communication, enquiries and complaints handlings on all environmental issues for the construction stage of the project.
EP Condition 2.5 Submission	1 closed grab dredger operated in the Zone 9, 10, 11, 12, 13A and 13B and 2 closed grab dredger operated in Zone Z1A and Z1B, 2A1, 2A2, 2A3, 2B1, 2B2, 2C1, 2C2, 2C3, 2C4, 3A, 3B, 4A, 4B, 5A, 5B, 5C, 6A, 6B, 6C, 6D, 7 and 8.
2.6 Submission of Detailed Dredging Methodology for Hotspot (Zone Z2B)	A detailed dredging plan for Hotspot and Trial Results (0394/13/ED/0213C) was submitted to EPD for approval on 23 July 2015. Dredging works at Hotspot were complied with the detailed dredging methodology for Hotspot and EP requirements.
2.7 Submission of Environmental Monitoring and Audit of Total Inorganic Nitrogen	A proposal for environmental monitoring and audit of total inorganic nitrogen (0394/13/ED/0104C) was submitted to EPD for approval on 2 January 2014.
3.1 (a), 3.1 (d) and 4.1 (a) Measures to Mitigate Water Quality Impact	Complied with EP requirement to maintain daily dredging rate below 4000m^3 for each dredger. No more than three grab dredgers operating within the Project Area at any one time for the Project. No more than one grab dredger operating within each of the five main zones. Maximum dredging rate maintained within 900 m^3 per day during both wet season and dry season in Zone 1A; 2050 m^3 and 1100 m^3 per day during wet season and dry season respectively in Zone 1B; 2000 m^3 and 750 m^3 per day during wet season and dry season respectively in Zone 2A1; 1450 m^3 and 650 m^3 per day during wet season and dry season respectively in Zone 2A2; 2900 m^3 and 1500 m^3 per day during wet season and dry season respectively in Zone 2A3; 800 m^3 and 400 m^3 per day during wet season and dry season respectively in Zone 2B1; 1450 m^3 and 950 m^3 per day during wet season and dry season respectively in Zone 2B2; 1550 m^3 and 850 m^3 per day during wet season and

EP Condition	Compliance Status and/or Recommendations
	dry season respectively in Zone 2C1; 2050 m^3 and 1100 m^3 per day during wet season and dry season respectively in Zone 2C2; 4000 m^3 and 2750 m^3 per day during wet season and dry season respectively in Zone 2C3; 2900 m^3 and 1500 m^3 per day during wet season and dry season respectively in Zone 2C4; 3440 m^3 and 1600 m^3 per day during wet season and dry season respectively in Zone 3A, 3B, 4A and 4B; 4000 m^3 per day during both dry and wet seasons in Zone 5A, 5B, 5C, 6A, 6B, 6C, 6D, 7, 8, 9, 10,11, 12, 13A and 13B.
2.9, 3.1 (e) and 4.1 (c) Silt Curtain Deployment	Silt curtain deployment complied with Silt Curtain Deployment Plan (Version 3), which was submitted to EPD on 7 March 2014.
2.10 and 3.1 (f) Silt Screen Deployment Plan	Silt screens deployment at WSD1, WSD8 and EMSD1 complied with Silt Screen Deployment Plan (Version 3.0), which was submitted to EPD on 28 February 2014.
3.1 (g) 24-hr environmental monitoring and audit	24-hr enhanced environmental monitoring and audit of water quality parameters implemented in accordance with the Testing Methodology and Specification of 24 Hours Water Quality Monitoring (0394/13/ED/0111C), which submitted on 14 April 2014.
5.3 Submission of Baseline Monitoring Report	Baseline Monitoring Report (0394/13/ED/0132E) was submitted to EPD on14 April 2014.
5.4 Submission of Monthly EM&A Report	Monthly EM&A Reports were submitted to EPD within 10 working days after the end of each reporting month.
6.2 and 6.3 Electronic Report of EM&A Information	A dedicated project website (http://www.ktd-monitoring.com) was set up where the environmental monitoring and project data was placed.

5.2.2 The mitigation measures recommended in the EIA report and required by the EP are considered effective in minimizing environmental impacts. The Contractor has implemented the recommended mitigation measures in general.

5.3 Summary of Action taken

5.3.1 The exceedances recorded were considered not related to the Project, follow-up actions are not required.

5.4 Advice on the Solid and Liquid Waste Management Status

5.4.1 According to the Contractor, total 510 m^3 general refuse were generated and disposed of in the reporting period. Summary of waste flow table is detailed in **Appendix H**.

5.5 Dredging and Disposal

5.5.1 The daily dredging rates, silt curtain deployment and silt screen deployment within the Project area were checked and confirmed to be complied with EP conditions.

6. NON-COMPLIANCE, COMPLAINTS, NOTIFICATION OF SUMMONS AND PROSECUTION

6.1.1 No successful complaint, notification of summons or prosecution was received in the reporting period. Cumulative complaint log, summaries of complaints, notification of summons and successful prosecutions are presented in **Tables 6.1**, **6.2** and **6.3**.

Table 6.1 Environmental Complaints Log

Complaint Log No.	Date of Receipt	Received From and Received By	Nature of Complaint	Date Investigated	Outcome	Date of Reply
Nil	-	-	-	-	-	-

Table 6.2 Cumulative Statistics on Complaints

Environmental Parameters	Cumulative No. Brought Forward	No. of Complaints This Month	Cumulative Project-to-Date
Air	0	0	0
Noise	0	0	0
Water	0	0	0
Waste	0	0	0
Total	0	0	0

Table 6.3 Cumulative Statistics on Successful Prosecutions

Environmental Parameters	Cumulative No. Brought Forward	No. of Prosecutions This Month	Cumulative Project-to-Date
Air	0	0	0
Noise	0	0	0
Water	0	0	0
Waste	0	0	0
Total	0	0	0

6.1.2 Two leakage incidents were reported on 14 October 2014 and 2 October 2015 respectively. Base on the finding of two comprehensive incident reports on leakage on 14 October 2014 and 2 October 2015, which was submitted to EPD on 3 December 2014 and 17 December 2015 respectively, it was considered the Project or the incidents did not cause significant negative impact to the quality in terms of the analyzed data.

6.1.3 A non-compliance case was recorded by EPD during the site inspection on 8 December 2014 regarding the failure to comply with Environmental Permit Condition No. 3.1 (c). According to the letter submitted to EPD by the Contractor (Ref: CV201304/H4a/132/KO/pl), the Contractor had taken immediate actions to avoid recurrence of the noncompliance. No further action was required by EPD regarding the non-compliance case on 8 December 2014.

7. REVIEW OF THE VALIDITY OF EIA REPORT PREDICTIONS AND HYPOTHESESE TEST

7.1 Comparison of the Water Quality Monitoring Results with the EIA Predictions

7.1.1 Referring to the predictions in Table 3.12 to Table 3.23, Appendix 3.8, Appendix 3.9 and Appendix 3.12 of the EIA Report (AEIAR-156/2010), the comparison of the water quality monitoring results with EIA prediction was summaried in **Table 7.1**, **Table 7.2**, **Table 7.3**, **Table 7.4** and **Table 7.5**.

Table 7.1 Comparison of the Results of Suspended Solid with the EIA Prediction

Water Monitoring Station	Dry Season[3]		Wet Season[3]	
	EIA Prediction[1] (mg/L)	Monitoring Results[2] (mg/L)	EIA Prediction[1] (mg/L)	Monitoring Results[2] (mg/L)
WSD Flushing Water Intake				
SR1	11.3-12.5	4.7	8.5-9.6	5.3
SR4	12.4-13.3	5.5	16.0-16.9	4.6
SR12	12.7-15.2	5.7	15.8-20.4	5.0
Gazetted Beaches				
SR2	5.6-6.7	4.3	5.5-6.3	4.4
SR3	5.8-6.0	4.6	5.4-5.9	4.3
Fish Culture Zones				
SR5	5.7-8.0	5.1	5.7-7.4	4.7
SR9	4.9	4.8	4.9	4.6
SR10	4.5-4.7	3.7	4.5-4.6	3.9
SR11	3.5	3.5	3.5	3.6
Corals				
SR6	4.5-5.3	5.1	6.1-8.2	4.9
SR7	6.5-7.2	4.3	6.4-6.6	3.9
SR8	4.2-4.9	4.1	4.1-4.3	4.0
EMSD Cooling Water Intake				
SR13	12.2-12.7	6.4	15.6-16.3	5.2

Remark:
1. A range of EIA prediction is obtained base on the modelling scenarios predicted in Section 3.5 in the approved EIA report, which is taken in depth average. The predicted values of SR2, SR3, SR5, SR6, SR7, SR8, SR9, SR10 and SR11 are calculated by the sum of the predicted SS elevation in the EIA report with the Baseline values.
2. The monitoring results in the table are obtained by taken the depth average of the mid-flood and mid-ebb results.
3. Dry season referred to November to March; Wet season referred to April to October.

Table 7.2 Comparison of the Results of Dissolved Oxygen with the EIA Prediction

Water Monitoring Station	Dry Season[4]				Wet Season[4]			
	DO (S&M)		DO (B)		DO (S&M)		DO (B)	
	EIA Prediction[12] (mg/L)	Monitoring Results[3] (mg/L)	EIA Prediction[12] (mg/L)	Monitoring Results[3] (mg/L)	EIA Prediction[12] (mg/L)	Monitoring Results[3] (mg/L)	EIA Prediction[12] (mg/L)	Monitoring Results[3] (mg/L)
WSD Flushing Water Intake								
SR1	5.39-5.41	7.28	5.69	7.19	4.05-4.06	6.00	2.69-2.70	5.77
SR4	5.25-5.26	6.80	5.39-5.40	6.69	4.19-4.21	5.86	3.29-3.30	5.61
SR12	5.24-5.25	6.65	5.39-5.40	6.49	4.18-4.20	5.53	3.27-3.30	5.05
Gazetted Beaches								
SR2	5.39-5.41	7.11	5.69-5.70	6.99	4.05-4.06	5.91	2.69-2.70	5.53
SR3	5.40	7.06	5.70	6.92	4.05-4.06	5.92	2.69-2.70	5.54
Fish Culture Zones								
SR5	5.39-5.40	7.01	5.69-5.70	6.88	4.04-4.05	6.06	2.69-2.70	5.59
SR9	5.95	7.79	6.20	7.64	4.55	6.97	4.10	5.54
SR10	6.20	7.66	6.20	7.59	4.20	6.59	2.70	5.80
SR11	6.20	7.63	6.20	7.55	4.20	6.79	2.70	5.75
Corals								
SR6	5.95	7.42	5.95-6.10	7.35	4.54-4.55	5.93	4.08-4.09	5.37
SR7	5.85	7.31	5.85-6.00	7.26	4.60	5.95	2.50	5.18
SR8	5.85	7.70	5.85-6.00	7.65	4.60	6.42	2.50	5.65
EMSD Cooling Water Intake								
SR13	5.25	6.65	5.25-5.40	6.49	4.20	5.45	3.30	5.00

Remark:
1. A range of EIA prediction is obtained base on the modelling scenarios predicted in Section 3.5 in the approved EIA report.
2. The predicted DO (S&M) is taken by the calculation from the depth average of DO and the DO (B).
3. The monitoring results in the table are obtained by taken the average of the mid-flood and mid-ebb results.
4. Dry season referred to November to March; Wet season referred to April to October.

Table 7.3 Comparison of the Results of TIN with the EIA Prediction

Water Monitoring Station	Dry Season[3]		Wet Season[3]	
	EIA Prediction[1] (mg/L)	Monitoring Results[2] (mg/L)	EIA Prediction[1] (mg/L)	Monitoring Results[2] (mg/L)
Fish Culture Zones				
SR5	0.29	0.38	0.37	0.78
SR9	0.25	0.25	0.50	0.40
SR10	0.14	0.18	0.21	0.35
SR11	0.14	0.18	0.21	0.31

Remark:
1. The prediction is obtained base on the modelling scenarios predicted in Section 3.5 in the approved EIA report, which is taken in depth average.
2. The monitoring results in the table are obtained by taken the depth average of the laboratory results in the mid-flood and mid-ebb tide.
3. Dry season referred to November to March; Wet season referred to April to October.

Table 7.4 Comparison of the Results of NH_3-N with the EIA Prediction

Water Monitoring Station	Dry Season[3]		Wet Season[3]	
	EIA Prediction[1] (mg/L)	Monitoring Results[2] (mg/L)	EIA Prediction[1] (mg/L)	Monitoring Results[2] (mg/L)
WSD Flushing Water Intake				
SR1	0.10-0.22	0.11	0.08-0.12	0.07
SR4	0.10-1.13	0.18	0.08-0.41	0.14
SR12	0.09-1.52	0.18	0.10-1.32	0.14
Gazetted Beaches				
SR2	0.11-0.29	0.12	0.10-0.15	0.09
SR3	0.11-1.05	0.13	0.08-0.19	0.09

Remark:
1. The prediction is obtained base on the modelling scenarios predicted in Section 3.5 in the approved EIA report, which is taken in depth average.
2. The monitoring results in the table are obtained by taken the depth average of the laboratory results in the mid-flood and mid-ebb tide.
3. Dry season referred to November to March; Wet season referred to April to October.

Table 7.5 Comparison of the Results of UIA with the EIA Prediction

Water Monitoring Station	Dry Season[3]		Wet Season[3]	
	EIA Prediction[1] (mg/L)	Monitoring Results[2] (mg/L)	EIA Prediction[1] (mg/L)	Monitoring Results[2] (mg/L)
WSD Flushing Water Intake				
SR1	0.006-0.014	0.004	0.005-0.008	0.003
SR4	0.006-0.077	0.006	0.005-0.027	0.008
SR12	0.006-0.104	0.007	0.006-0.091	0.008
Gazetted Beaches				
SR2	0.007-0.019	0.004	0.006-0.010	0.005
SR3	0.007-0.073	0.004	0.005-0.012	0.005

Remark:
1. The prediction is obtained base on the modelling scenarios predicted in Section 3.5 in the approved EIA report, which is taken in depth average.
2. The monitoring results in the table are obtained by taken the depth average of the laboratory results in the mid-flood and mid-ebb tide.
3. Dry season referred to November to March; Wet season referred to April to October.

7.2 Validity of the EIA Report Predictions

7.2.1 Base on the comparison of the results of the SS, DO, TIN, NH_3-N and UIA with the prediction in the EIA report, most of the water quality monitoring results were lower than or within the range of the EIA prediction (higher than the EIA prediction for DO), except for the SS in SR11 in wet season which is slightly higher than the EIA prediction and also for results of TIN in SR5, SR10 and SR11, which was relatively higher than the EIA prediction. The exceptional cases may be due to the influences in the vicinity of the station or changes of the ambient conditions.

7.2.2 Refer to the predictions of EIA report, no adverse environmental impact related to waste manage management, marine ecology, hazard to life, fisheries, cultural heritage, landscape and visual impact, construction dust, noise and odour, given that the mitigation measures suggested in the EP and EIA report were fully implemented. No quantitative comparison other than water quality monitoring results are available for hypotheses test. Therefore the EIA prediction was valid and in a conservative side in general.

7.3 Shortcoming of the EIA Report

7.3.1 The predictions of the cumulative impact of the concurrent projects were based on the predicted time frame (i.e. 2011 to 2013) for forecasting. However the actual construction period was from 23 April 2014 to 31 July 2020, which was out of the predicted timeframe. Any unpredicted concurrent projects beyond the EIA prediction would cause unpredictable cumulative impact from the concurrent projects to the ambient conditions of the Project during the construction period, while the water quality was closely monitored throughout the construction period and no project related adverse water quality impact was found.

8. REVIEW OF THE EFFECTIVENESS AND EFFICIENCY OF THE MITIGATION MEASURES

8.1 Effectiveness of the Mitigation Measures

8.1.1 Base on the weekly site inspection, mitigation measures recommended in the EIA report and required by the EP were considered effective in minimizing environmental impacts. The Contractor has implemented the recommended mitigation measures in general.

8.1.2 No successful complaint, notification of summons or prosecution was received in the project period.

8.1.3 Although AL and LL exceedances were recorded for DO (S&M), DO (B), Turbidity, NH_3-N (in-situ & lab), UIA (in-situ & lab), TIN (in-situ & lab) and *E.coli* during the reporting period. However, based on the finding from the investigation on the recorded cases of exceedances, the cause was found not related to the project. The exceedances were considered caused by influences in the vicinity of the station or changes in ambient conditions and not related to the Project. Besides, most impact monitoring results of SS, DO, NH_3-N and UIA were lower than or within the range of the EIA prediction (higher than the EIA prediction for DO). Therefore the mitigation measures suggested in the EP (EP No. EP-426/2011/A) and EM&A Manual (AEIAR-156/2010) in the construction phase were considered to be effective and conservative.

8.1.4 Due to the small scale (approximately 30,000 m^3/yr), ad hoc basis, short durations of the maintenance dredging and only one close grab dredger will be operated at any time during operation phase, the potential water quality impact during operation phase will be significantly less than that assumed for construction phase dredging. The site trail simulating the maintenance dredging operation conducted on 11 March 2016, 8 April 2016, 15 June 2016, 16 June 2016, 21 June 2016, 22 June 2016, 23 June 2016 and 29 June 2016 without the deployment of silt curtain also showed that there was no adverse water quality impact to the SRs (refer to the report in Appendix K of the Monthly EM&A Report November 2016 (0394/13ED/0336A) for details). The necessity of mitigation measures suggested in EIA report and EM&A Manual A2 during operation phase such as deployment of silt screen at three WSD seawater intakes, the implementation of 24 hours water quality monitoring at SR12 (Tsing Yi, WSD Flushing Water Intake (WSD1)), the scale of operation water quality monitoring programme at three control stations and six sensitive receivers, are worth being further investigated during operation phase.

8.1.5 An EM&A designated web-site was set up in accordance with EP condition 6.2 and 6.3 apart from uploading all EM&A data to EPD EIAO web-site to allow the public inspection. The necessity of a duplicated website (apart from EPD EIAO web-site) for the small scale, ad hoc basis, infrequent and a periodical maintenance dredging is worth to be reviewed during operation phase.

8.2 Cost Effectiveness and Efficiency of the Mitigation Measures and EM&A Programme

8.2.1 Some cost effective mitigation measures for examples, deployment and maintenance programme of silt curtains and site screens, shut down of machines and plant that were in intermittent use, which recommended in the EM&A that were implemented promptly. Therefore the mitigation measures were considered to be cost effective and efficiency.

9. CONCLUSION

9.1.1 The dredging works was commenced on 23 April 2014. All dredging works under this Contract of the construction phase, included removal of hard materials in sub-zones Z1A, Z2B1, Z2B2 and Z2C1 and the dredging works in Hotspot area in sub-zones Z1A, Z1B, Z2A, Z2B and Z2C was completed on 31 July 2020. The EM&A programme was carried out in accordance with the EM&A Manual requirements. As per the EM&A Manual, water quality impact monitoring was conducted during the dredging works.

9.1.2 During the reporting period, exceedances were recorded for DO (S&M), DO (B), Turbidity, NH_3-N (in-situ & lab), UIA (in-situ & lab), TIN (in-situ & lab), Suspended Solids and *E.coli* in the routine impact monitoring. DO and Turbidity exceedance was recorded in 24-hr monitoring. Investigation found that the exceedances were not project related and were considered caused by influences in the vicinity of the stations or change in ambient conditions.

9.1.3 Environmental site inspections were carried out weekly in the reporting period.

9.1.4 No successful complaint, notification of summons or prosecution was received in the reporting period.

9.1.5 In accordance with Section 2.1.7 of the EM&A Manual, a post-construction water quality monitoring was conducted from 4 August 2020 to 29 August 2020.

9.1.6 Refer to the review of operation phase silt curtain and water quality monitoring – site trial report in Appendix K of the Monthly EM&A Report November 2016 (0394/13ED/0336A), silt curtain will be exempted for carrying out maintenance dredging work during Operation Phase. No objection was received from EPD regarding the review of operation phase silt curtain and water quality monitoring – site trial report.

9.1.7 Due to the small scale (approximately 30,000 m^3/yr), ad hoc basis, short durations of the maintenance dredging and only one close grab dredger will be operated at any time during operation phase, the potential water quality impact during operation phase will be significantly less than that assumed for construction phase dredging. The site trail simulating the maintenance dredging operation conducted on 11 March 2016, 8 April 2016, 15 June 2016, 16 June 2016, 21 June 2016, 22 June 2016, 23 June 2016 and 29 June 2016 without the deployment of silt curtain also showed that there was no adverse water quality impact to the SRs (refer to the report in Appendix K of the Monthly EM&A Report November 2016 (0394/13ED/0336A) for details). The necessity of mitigation measures suggested in EIA report and EM&A Manual A2 during operation phase such as deployment of silt screen at three WSD seawater intakes, the implementation of 24 hours water quality monitoring at SR12 (Tsing Yi, WSD Flushing Water Intake (WSD1)), the scale of operation water quality monitoring programme at three control stations and six sensitive receivers, are worth being further investigated during operation phase.

Fugro Development Centre,
5 Lok Yi Street, Tai Lam,
Tuen Mun, N.T.,
Hong Kong.
Tel : +852 2450 8233
Fax : +852 2450 6138
E-mail : matlab@fugro.com
Website : www.fugro.com

9.1.8 An EM&A designated web-site was set up in accordance with EP condition 6.2 and 6.3 apart from uploading all EM&A data to EPD EIAO web-site to allow the public inspection. The necessity of a duplicated website (apart from EPD EIAO web-site) for the small scale, ad hoc basis, infrequent and a periodical maintenance dredging is worth to be reviewed during operation phase.

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Fugro Development Centre,
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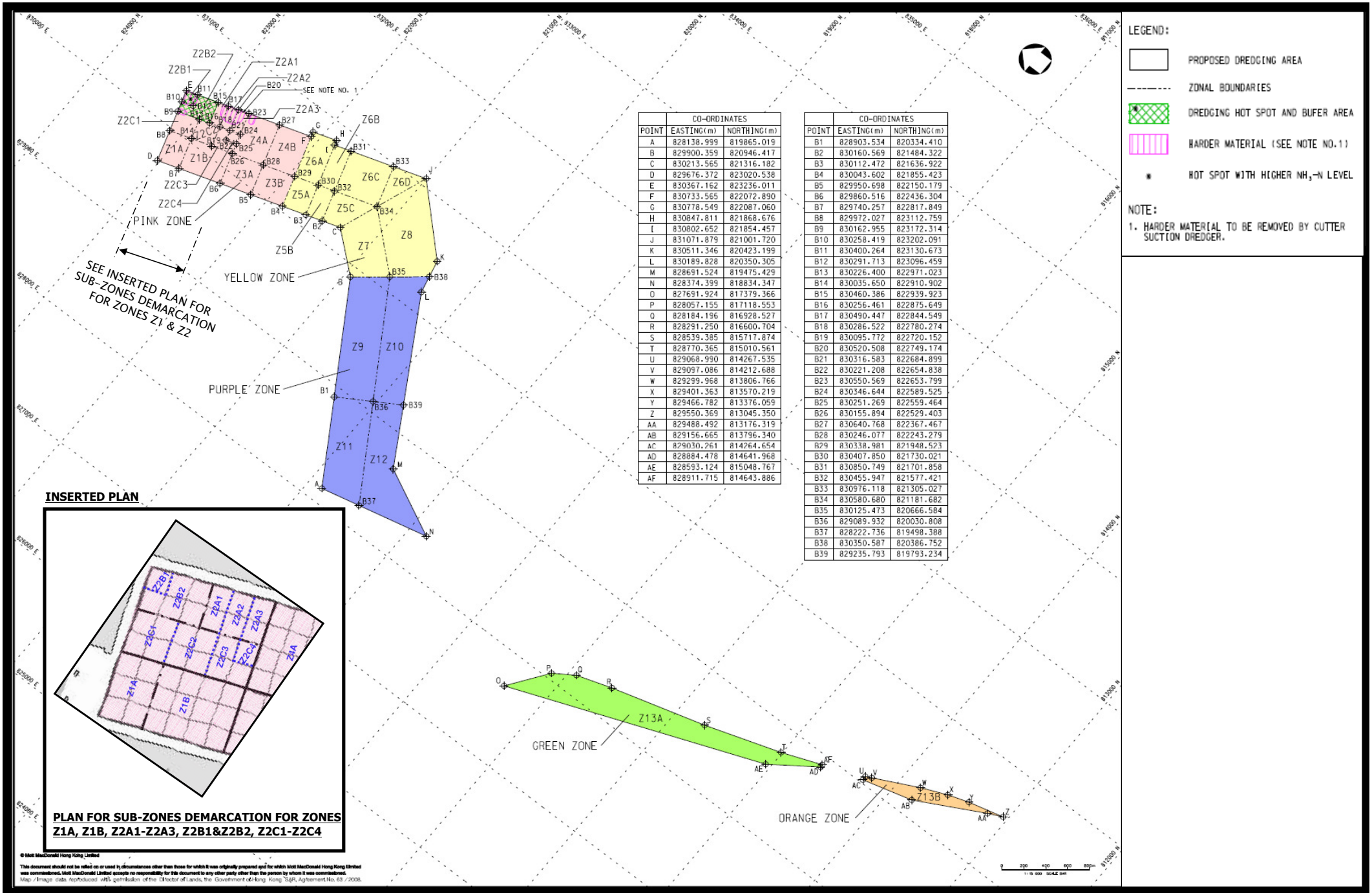
Tel : +852 2450 8233
Fax : +852 2450 6138
E-mail : matlab@fugro.com
Website : www.fugro.com

Figure 1

Project General Layout



	CO-ORDINATES	
POINT	EASTING(m)	NORTHING(m)
A	828138.999	819865.019
B	829900.359	820946.417
C	830213.565	821316.182
D	829676.372	823020.538
E	830367.162	823236.011
F	830733.565	822072.890
G	830778.549	822087.060
H	830847.811	821868.676
I	830802.652	821854.457
J	831071.879	821001.720
K	830511.346	820423.199
L	830189.828	820350.305
M	828691.524	819475.429
N	828374.399	818834.347
O	827691.924	817379.366
P	828057.155	817118.553
Q	828184.196	816928.527
R	828291.250	816600.704
S	828539.385	815717.874
T	828770.365	815010.561
U	829068.990	814267.535
V	829097.086	814212.688
W	829299.968	813806.766
X	829401.363	813570.219
Y	829466.782	813376.059
Z	829550.369	813045.350
AA	829488.492	813176.319
AB	829156.665	813796.340
AC	829030.261	814264.654
AD	828884.478	814641.968
AE	828593.124	815048.767
AF	828911.715	814643.886

	CO-ORDINATES	
POINT	EASTING(m)	NORTHING(m)
B1	828903.534	820334.410
B2	830160.569	821484.322
B3	830112.472	821636.922
B4	830043.602	821855.423
B5	829950.698	822150.179
B6	829860.516	822436.304
B7	829740.257	822817.849
B8	829972.027	823112.759
B9	830162.955	823172.314
B10	830258.419	823202.091
B11	830400.264	823130.673
B12	830291.713	823096.459
B13	830226.400	822971.023
B14	830035.650	822910.902
B15	830460.386	822939.923
B16	830256.461	822875.649
B17	830490.447	822844.549
B18	830286.522	822780.274
B19	830095.772	822720.152
B20	830520.508	822749.174
B21	830316.583	822684.899
B22	830221.208	822654.838
B23	830550.569	822653.799
B24	830346.644	822589.525
B25	830251.269	822559.464
B26	830155.894	822529.403
B27	830640.768	822367.467
B28	830246.077	822243.279
B29	830338.981	821948.523
B30	830407.850	821730.021
B31	830850.749	821701.858
B32	830455.947	821577.421
B33	830976.118	821305.027
B34	830580.680	821181.682
B35	830125.473	820666.584
B36	829089.932	820030.808
B37	828222.736	819498.388
B38	830350.587	820386.752
B39	829235.793	819793.234

INSERTED PLAN

PLAN FOR SUB-ZONES DEMARCATION FOR ZONES Z1A, Z1B, Z2A1-Z2A3, Z2B1&Z2B2, Z2C1-Z2C4

Project Title: Providing Sufficient Water Depth for Kwai Tsing Container Basin and its Approach Channel

Figure 2: Zones and Sub-zone of Dredging Plan Layout (Extracted from Figure 2 of Justification for the Proposed Demarcation of the Dredging Zones)

Environmental Permit No.:

EP-426/2011/A

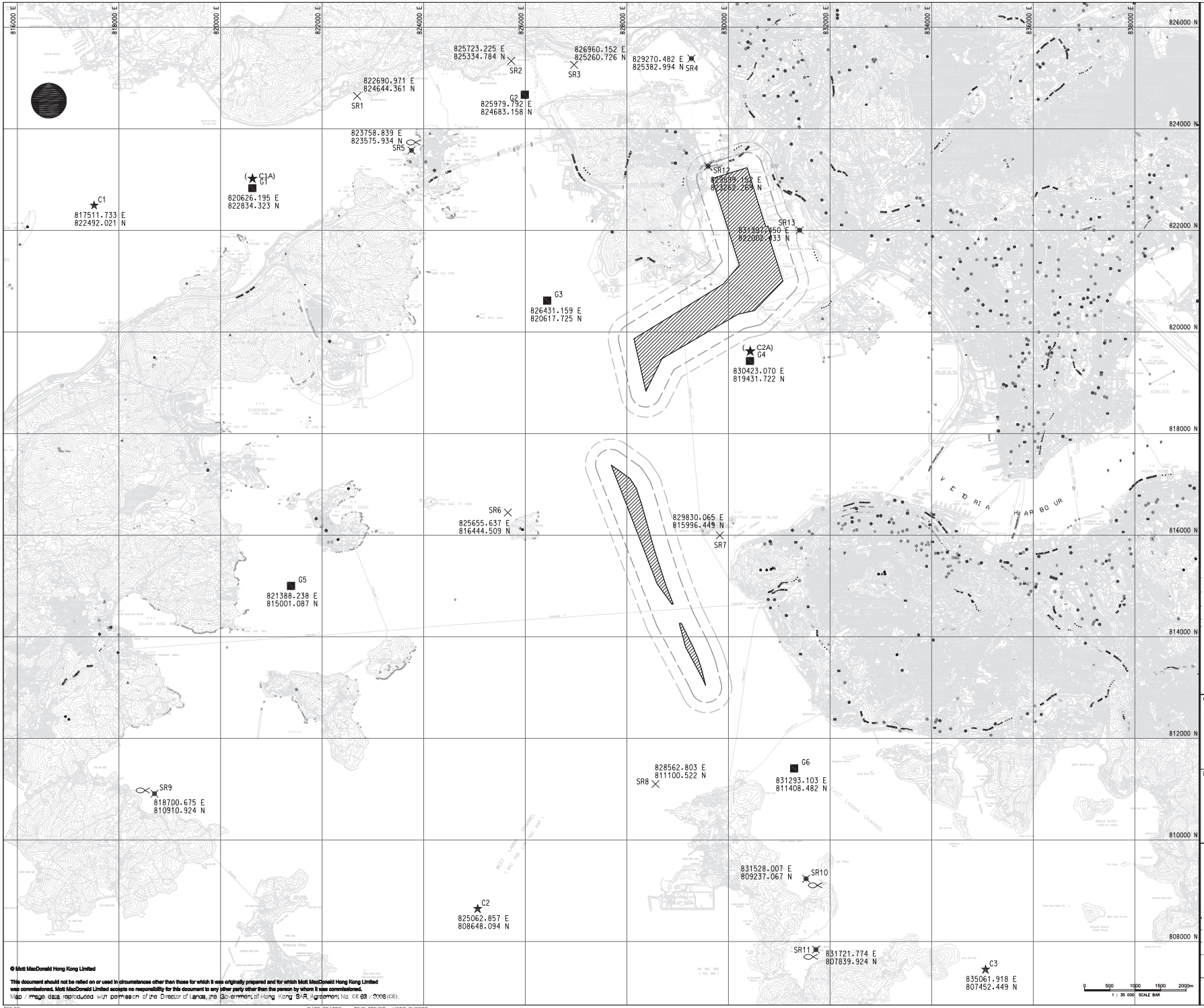
FUGRO TECHNICAL SERVICES LIMITED

Fugro Development Centre,
5 Lok Yi Street, Tai Lam,
Tuen Mun, N.T.,
Hong Kong.

Tel : +852 2450 8233
Fax : +852 2450 6138
E-mail : matlab@fugro.com
Website : www.fugro.com

Figure 2

Locations of Water Quality Monitoring Stations
for Routine Impact Monitoring and Post-construction Monitoring



NOTES:

1. ALL COORDINATES ARE IN HONG KONG METRIC GRID (1980).
2. THE CONTRACTOR SHALL REFER TO RELEVANT SECTION(S) AND APPENDICES OF THE PARTICULAR SPECIFICATION REGARDING THE WATER QUALITY MONITORING.

LEGEND:

- SITE BOUNDARY
- MONITORING STATION
- CONTROL STATION
- GRADIENT STATION
- 24-HRS MONITORING STATION
- FISH CULTURE ZONE

Client

THE GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION
CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

Project

CONTRACT NO. : CV/2013/04
DREDGING WORKS IN KWAI TSING CONTAINER BASIN AND ITS APPROACH CHANNEL

Title

PROVISIONAL LOCATION OF WATER QUALITY MONITORING STATIONS

Scale at A1	Status	Rev
1:35000	TEN	2

$FILES DATE:$DATES TIME:$TIME$ USER:$USER$

FUGRO TECHNICAL SERVICES LIMITED

Fugro Development Centre,
5 Lok Yi Street, Tai Lam,
Tuen Mun, N.T.,
Hong Kong.

Tel : +852 2450 8233
Fax : +852 2450 6138
E-mail : matlab@fugro.com
Website : www.fugro.com

Remark:

1. Referring to the Proposal for Temporary Suspension of Impact Water Quality Monitoring (0394_13_ED_0326F) which was submitted to EPD in August 2016 with no objection was received from EPD; removal of routine water quality monitoring stations at SR1 was effective on 24 December 2016;
2. Referring to the Proposal on Removal of Some Water Quality Monitoring Stations After Resumption of Marine Construction Works (Dredging Works and Marine Works of the Northern Part of Kwai Tsing Container Basin Only) (0394_13_ED_0332I) which has been submitted to EPD and relevant parties in December 2016 with no objection, removal of routine water quality monitoring stations at SR6, SR7, SR8, SR9, SR10 and SR11 was effective from 23 January 2017;
3. Due to removal of some sensitive receivers in routine water quality monitoring, gradient stations G3, G5 and G6 were also be removed and gradient stations G1 and G4 replaced the previous control stations C1, C2 and C3 as C1A and C2A with reference to the approved proposal (0394_13_ED_0332I) which was effective from 23 January 2017;
4. Referring to the Proposal of Scale down for the Water Quality Monitoring Stations during High Spots Removal at Sub-zone Z2B1, Z2B2 and Z2C1 (Ref.: 0394/13/ED/0370G), routine water quality monitoring stations at SR2 (Casam, Gazetted Beach) and SR3 (Approach, Gazetted Beach) were removed. The proposal was justified by ET and verified by IEC, also no objection was received from other parties. The proposal was approved by EPD as per EPD's memo (Ref. (6) in Ax(1) to EP2/N3/C/57 Pt.10) dated 20 August 2019. The removal of the water quality monitoring at SR2 and SR3 was effective from 23 August 2019.

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Fugro Development Centre,
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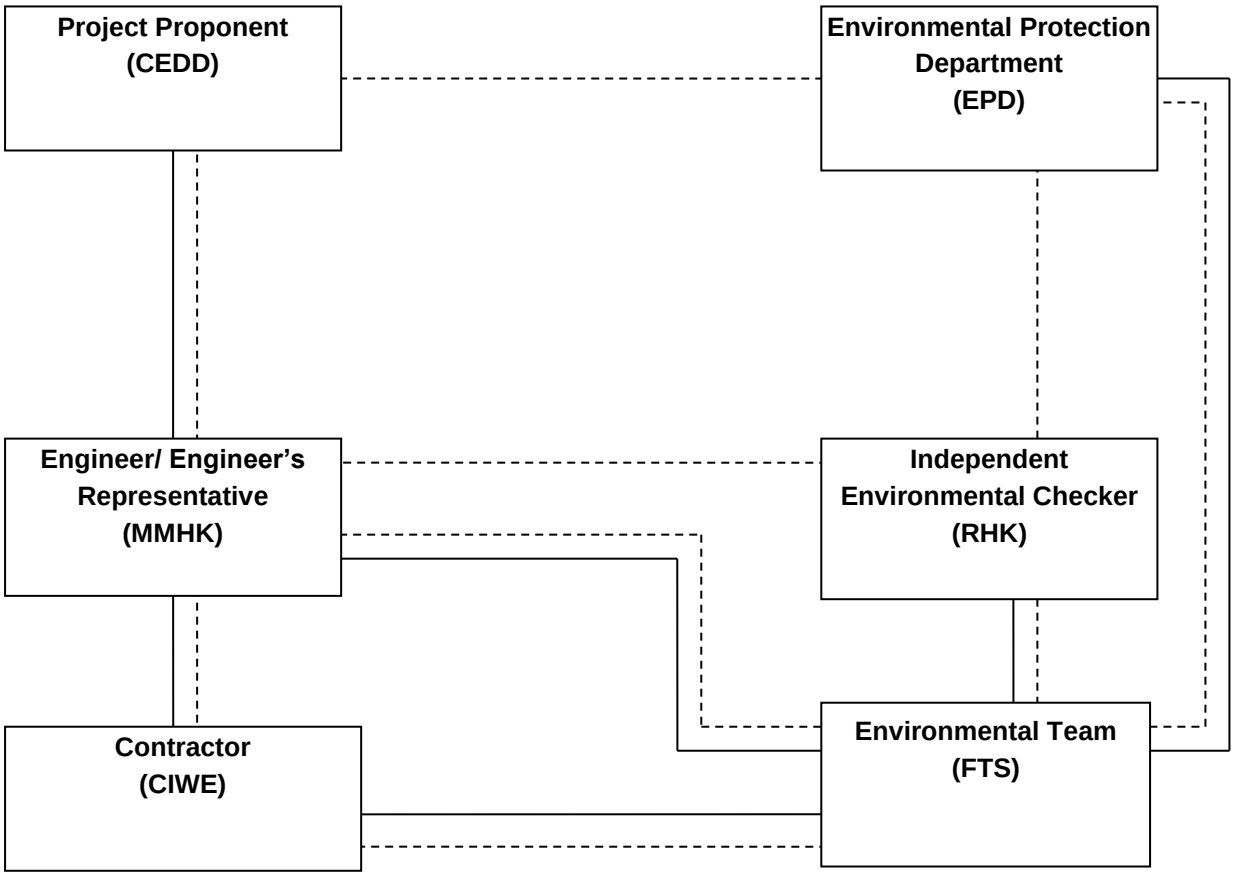
Tuen Mun, N.T.,
Hong Kong.

Tel : +852 2450 8233
Fax : +852 2450 6138
E-mail : matlab@fugro.com
Website : www.fugro.com

Appendix A

Project Organization Chart



Legend:

Line of Reporting

Line of Communication

FUGRO TECHNICAL SERVICES LIMITED

Fugro Development Centre,
5 Lok Yi Street, Tai Lam,
Tuen Mun, N.T.,
Hong Kong.

Tel : +852 2450 8233
Fax : +852 2450 6138
E-mail : matlab@fugro.com
Website : www.fugro.com

Appendix B

Construction Programme

Contract No. CV/2013/04
Dredging Works in Kwai Tsing Container Basin and its Approach Channel
GCC Clause 16 Programme (Version 20)

Date: 11 July 2017

ID	Task Name	Duration	Start	Finish	Predecessors	Successors	Resource Names
1	**Contract Period**	**1470 days**	**Fri 30/8/13**	**Thu 7/9/17**			
2	**Contract Commencement Date**	**0 days**	**Fri 30/8/13**	**Fri 30/8/13**		4SS	
3	**Extended Contract Completion Date**	**0 days**	**Sat 8/7/17**	**Sat 8/7/17**		327FF	
4	**Possession of Site**	0 days			S,31SS,41SS		N
5	**Section 1**	**1470 days**	**Fri 30/8/13**	**Thu 7/9/17**			
6	**Submission**	**1210 days**	**Fri 30/8/13**	**Wed 21/12/16**			
7	**Routine Monitoring / Temporary Marine Traffic Management**	**484 days**	**Fri 30/8/13**	**Fri 26/12/14**			
8	**Environmental Management**	**484 days**	**Fri 30/8/13**	**Fri 26/12/14**			
9	**Baseline monitoring**	**231 days**	**Fri 30/8/13**	**Thu 17/4/14**			
10	ETL and relevant site personal	30 days	Fri 30/8/13	Sat 28/9/13		4SS,13	N
11	Lab Test	30 days	Fri 30/8/13	Sat 28/9/13		4SS,13	N
12	**Monitoring (Location see Drg No. EM/401)**	**201 days**	**Sun 29/9/13**	**Thu 17/4/14**			
13	Plan	93 days	Sun 29/9/13	Mon 30/12/13	10,11	154	N
14	**Sediment Report**	**88 days**	**Mon 20/1/14**	**Thu 17/4/14**			
15	Preliminary report	19 days	Mon 20/1/14	Fri 7/2/14	158	159	N
16	Final report	27 days	Sat 22/3/14	Thu 17/4/14	159	205,207,224	N
17	**Grab sample (Portions A, B & C)**	**321 days**	**Fri 30/8/13**	**Wed 16/7/14**			
18	Grab sample specialist	30 days	Fri 30/8/13	Sat 28/9/13		4SS,19	N
19	Sediment testing and sampling plan	162 days	Sun 29/9/13	Sun 9/3/14	18	162	N
20	**Sediment report**	**105 days**	**Thu 3/4/14**	**Wed 16/7/14**			
21	Preliminary report	26 days	Thu 3/4/14	Mon 28/4/14	166	167	N
22	Final report	37 days	Tue 10/6/14	Wed 16/7/14	167	209	N
23	**Vibro-coring (Portions A, B & C)**	**159 days**	**Mon 21/7/14**	**Fri 26/12/14**			
24	Sediment testing and sampling plan	28 days	Mon 21/7/14	Sun 17/8/14		170	N
25	**Sediment report**	**105 days**	**Sat 13/9/14**	**Fri 26/12/14**			
26	Preliminary report	26 days	Sat 13/9/14	Wed 8/10/14	174	175	N
27	Final report	37 days	Thu 20/11/14	Fri 26/12/14	175	209FS-139 days	N
28	**24 Hours monitoring station and TIN Measuring Device (Location see Drg No. EM/401)**	**79 days**	**Mon 25/11/13**	**Tue 11/2/14**			
29	Instrumentation	79 days	Mon 25/11/13	Tue 11/2/14		177	N
30	**Survey**	**179 days**	**Fri 30/8/13**	**Mon 24/2/14**			
31	Surveyor	35 days	Fri 30/8/13	Thu 3/10/13		4SS,35,38	N
32	Geophysicist	35 days	Sun 3/11/13	Sat 7/12/13		224	N
33	**Land Survey (Container Basin & DSD Tsing Yi Plant)**	**67 days**	**Tue 26/11/13**	**Fri 31/1/14**			
34	**Settlement markers**	**67 days**	**Tue 26/11/13**	**Fri 31/1/14**			
35	Method Statement for Installation and Monitoring	24 days	Tue 26/11/13	Thu 19/12/13	31	185	N
36	Initial report	12 days	Mon 20/1/14	Fri 31/1/14	186	187	N
37	**Hydrographic Survey (Portions A to E)**	**144 days**	**Fri 4/10/13**	**Mon 24/2/14**			
38	Method Statement	36 days	Fri 4/10/13	Fri 8/11/13	31	190	N
39	Initial survey Report	29 days	Mon 27/1/14	Mon 24/2/14	190	191	N
40	**Temporary Marine Traffic Management (Portions A to E)**	**144 days**	**Fri 30/8/13**	**Mon 20/1/14**			
41	Consultant, Risk Manager and Marine Traffic Engineer	28 days	Fri 30/8/13	Thu 26/9/13		4SS,43	N
42	Independent Checking Engineer (ICE)	25 days	Fri 27/12/13	Mon 20/1/14		196FS-60 days	N
43	Webbase software and Trial Run	50 days	Fri 27/9/13	Fri 15/11/13	41	196	N
44	**Dredging Works (Portions A to E)**	**896 days**	**Thu 14/11/13**	**Wed 27/4/16**			
45	Independent Checking Engineer (ICE)	21 days	Thu 14/11/13	Wed 4/12/13		51	N
46	**Silt screen deployment plan and report (Location see Drg No. EM/401)**	**77 days**	**Fri 6/12/13**	**Thu 20/2/14**			
47	Method statement	77 days	Fri 6/12/13	Thu 20/2/14		207,201	N
48	**Dredging method statement and silt curtain deployment plan**	**118 days**	**Thu 28/11/13**	**Tue 25/3/14**			
49	Method statement for dredging works	104 days	Thu 28/11/13	Tue 11/3/14		224	N
50	**Silt curtain deployment plan**	**118 days**	**Thu 28/11/13**	**Tue 25/3/14**			
51	Design	70 days	Tue 17/12/13	Mon 24/2/14	45	52FS-89 days	N
52	Deployment plan	118 days	Thu 28/11/13	Tue 25/3/14	51FS-89 days	224	N
53	**Dredging Works at Portions A and B**	**891 days**	**Tue 19/11/13**	**Wed 27/4/16**			
54	**General seabed**	**891 days**	**Tue 19/11/13**	**Wed 27/4/16**			
55	Marine Notice approval by Marine Departemnt	247 days	Tue 19/11/13	Wed 23/7/14		207	N

China International Water & Electric Corp.

Task | Critical Task | Milestone | Summary

* Subject to availability of working windows
** The removal of broken rock material will be carried out biweekly
*** The frequency of interim survey is once a month

Bar Left: Early Start, Bar Right: Early Finish
Bar Top: Late Start, Bar Bottom: Late Finish

ID	Task Name	Duration	Start	Finish	Predecessors	Successors	Resource Names
56	**Noise Permit**	**739 days**	**Mon 23/12/13**	**Thu 31/12/15**			
57	General	101 days	Mon 23/12/13	Wed 2/4/14		205,207	N
58	**Portion A from 11pm to 7am next day**	**518 days**	**Fri 1/8/14**	**Thu 31/12/15**			
59	Preparation and submission	14 days	Fri 1/8/14	Thu 14/8/14		60	N
60	Rejected by EPD	4 days	Fri 15/8/14	Mon 18/8/14	59	61	N
61	Resubmission	10 days	Tue 9/12/14	Thu 18/12/14	60	62	N
62	Rejected by EPD	13 days	Fri 19/12/14	Wed 31/12/14	61	63	N
63	Resubmission	10 days	Tue 6/1/15	Thu 15/1/15	62	64	N
64	Rejected by EPD	18 days	Fri 16/1/15	Mon 2/2/15	63	65	N
65	Awaiting HIT to release their permit	245 days	Tue 3/2/15	Mon 5/10/15	64	66	N
66	Preparation and submission	1 day	Tue 6/10/15	Tue 6/10/15	65	67	N
67	Rejected by EPD	16 days	Wed 7/10/15	Thu 22/10/15	66	68	N
68	Resubmission	3 days	Thu 17/12/15	Sat 19/12/15	67	69	N
69	Rejected by EPD	12 days	Sun 20/12/15	Thu 31/12/15	68	210	N
70	**Dumping Permit**	**801 days**	**Mon 17/2/14**	**Wed 27/4/16**			
71	**Type 1 and Tpye 2 Sediment**	**88 days**	**Mon 17/2/14**	**Thu 15/5/14**			
72	**Type 1 Sediment**	**57 days**	**Mon 17/2/14**	**Mon 14/4/14**			
73	Preparation and submission	50 days	Mon 17/2/14	Mon 7/4/14		74	N
74	Approval by EPD	7 days	Tue 8/4/14	Mon 14/4/14	73	205,207,224,209	N
75	**Type 2 Sediment**	**42 days**	**Fri 4/4/14**	**Thu 15/5/14**			
76	Preparation and submission	28 days	Fri 4/4/14	Thu 1/5/14		77	N
77	Approval by EPD	14 days	Fri 2/5/14	Thu 15/5/14	76	205,209	N
78	**Type 3 Sediment**	**201 days**	**Sat 10/10/15**	**Wed 27/4/16**			
79	Preparation and submission	14 days	Sat 10/10/15	Fri 23/10/15	104	80	N
80	Comment by EPD	17 days	Sat 24/10/15	Mon 9/11/15	79	81	N
81	Resubmission	21 days	Tue 10/11/15	Mon 30/11/15	80	83	N
82	**Trial dumping operation of Type 2 sediment using geo-containers**	**87 days**	**Tue 1/12/15**	**Thu 25/2/16**			
83	Preparation of method statement	41 days	Tue 1/12/15	Sun 10/1/16	81	84	N
84	Application for Marine Dumping Permit	1 day	Mon 11/1/16	Mon 11/1/16	83	85	N
85	Approval by EPD	45 days	Tue 12/1/16	Thu 25/2/16	84	214	N
86	Preparation and submission	9 days	Thu 31/3/16	Fri 8/4/16	214	87	N
87	Approval by EPD	19 days	Sat 9/4/16	Wed 27/4/16	86	215	N
88	**Type 3 Cat Hf Sediment (Portion A)**	**519 days**	**Fri 31/1/14**	**Fri 3/7/15**			
89	**Method statement for disposal**	**519 days**	**Fri 31/1/14**	**Fri 3/7/15**			
90	**Preparation and submission**	**519 days**	**Fri 31/1/14**	**Fri 3/7/15**			
91	Preparation and submission	60 days	Fri 31/1/14	Mon 31/3/14		92	N
92	Approval by Mott	30 days	Tue 1/4/14	Wed 30/4/14	91	94	N
93	**Resubmission based on Mott's previous submission to EPD**	205 days	Thu 11/12/14	Fri 3/7/15			
94	Preparation and submission	75 days	Thu 11/12/14	Mon 23/2/15	92	95	N
95	Approval by Mott	8 days	Tue 24/2/15	Tue 3/3/15	94	96	N
96	Comment by EPD	40 days	Wed 4/3/15	Sun 12/4/15	95	97	N
97	Mott's instruction to add monitoring stations at disposal ground	1 day	Tue 12/5/15	Tue 12/5/15	96	98	N
98	Resubmission to Mott	4 days	Wed 13/5/15	Sat 16/5/15	97	99	N
99	Approval by Mott	1 day	Sun 17/5/15	Sun 17/5/15	98	100	N
100	Resubmission to EPD	1 day	Mon 18/5/15	Mon 18/5/15	99	101	N
101	Comment by EPD	18 days	Tue 19/5/15	Fri 5/6/15	100	102	N
102	Resubmission to Mott	12 days	Sat 6/6/15	Wed 17/6/15	101	103	N
103	Resubmission to EPD	2 days	Thu 18/6/15	Fri 19/6/15	102	104	N
104	Approved by EPD	14 days	Sat 20/6/15	Fri 3/7/15	103	212,79,215	N
105	**Hot Spot (Portion A)**	**327 days**	**Tue 31/12/13**	**Sat 22/11/14**			
106	**Proposal for field trial at Zone Z2C**	**180 days**	**Tue 31/12/13**	**Sat 28/6/14**			
107	Preparation and submission	115 days	Tue 31/12/13	Thu 24/4/14		108	N
108	Approval by Mott	30 days	Fri 30/5/14	Sat 28/6/14	107	217	N
109	**Method statement for dredging works at Zone Z2B**	**61 days**	**Tue 23/9/14**	**Sat 22/11/14**			
110	Preparation and submission	14 days	Tue 23/9/14	Mon 6/10/14	217	111	N

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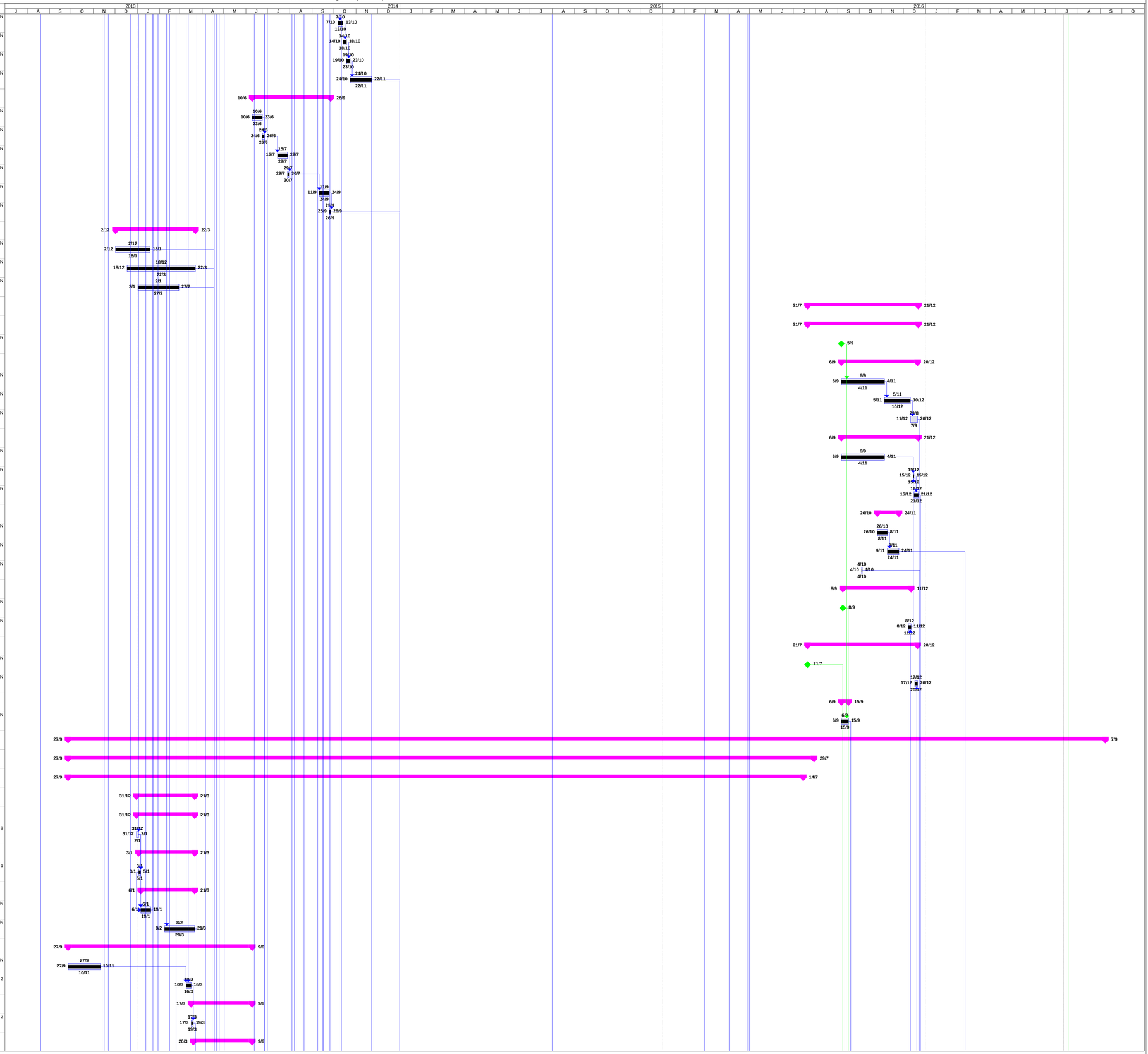
111	Approval by Mott	7 days	Tue 7/10/14	Mon 13/10/14	110	112	N
112	Endorsed by ETL	5 days	Tue 14/10/14	Sat 18/10/14	111	113	N
113	Verified by IEC	5 days	Sun 19/10/14	Thu 23/10/14	112	114	N
114	Approval by EPD	30 days	Fri 24/10/14	Sat 22/11/14	113	218	N
115	**Method staement for dredging hard material**	**109 days**	**Tue 10/6/14**	**Fri 26/9/14**			
116	Preparation and submission	14 days	Tue 10/6/14	Mon 23/6/14		117	N
117	Comment	3 days	Tue 24/6/14	Thu 26/6/14	116	118	N
118	Resubmission	14 days	Tue 15/7/14	Mon 28/7/14	117	119	N
119	Further comment	2 days	Tue 29/7/14	Wed 30/7/14	118	120	N
120	Resubmission	14 days	Thu 11/9/14	Wed 24/9/14	119	121	N
121	Approval by Mott	2 days	Thu 25/9/14	Fri 26/9/14	120	219	N
122	**Dredging Works at Portions C, D and E**	**111 days**	**Mon 2/12/13**	**Sat 22/3/14**			
123	Marine Notice approval by Marine Departemnt	48 days	Mon 2/12/13	Sat 18/1/14		224	N
124	Noise Permit	95 days	Wed 18/12/13	Sat 22/3/14		224	N
125	Dumping Permit	57 days	Thu 2/1/14	Thu 27/2/14		224	N
126	**Remaining Works (Portion A)**	**154 days**	**Thu 21/7/16**	**Wed 21/12/16**			
127	**Rock excavation works outside berth KC5**	**154 days**	**Thu 21/7/16**	**Wed 21/12/16**			
128	Works reviewed and agreed among CEDD and CIWE	0 days	Mon 5/9/16	Mon 5/9/16		130,148	N
129	**Method Statement**	**106 days**	**Tue 6/9/16**	**Tue 20/12/16**			
130	Preparation and submission	60 days	Tue 6/9/16	Fri 4/11/16	128	131	N
131	Resubmission	36 days	Sat 5/11/16	Sat 10/12/16	130	132	N
132	Approval	10 days	Sun 11/12/16	Tue 20/12/16	131	259	N
133	**Marine Department Notice**	**107 days**	**Tue 6/9/16**	**Wed 21/12/16**			
134	Preparation and submission	60 days	Tue 6/9/16	Fri 4/11/16		135	N
135	Resubmission	1 day	Thu 15/12/16	Thu 15/12/16	134,143	136	N
136	Approval	6 days	Fri 16/12/16	Wed 21/12/16	135	259	N
137	**Marine Dumping Permit**	**30 days**	**Wed 26/10/16**	**Thu 24/11/16**			
138	Preparation and submission	14 days	Wed 26/10/16	Tue 8/11/16		139	N
139	Approval	16 days	Wed 9/11/16	Thu 24/11/16	138	261	N
140	Pre-meeting with MTL	1 day	Tue 4/10/16	Tue 4/10/16		259	N
141	**Drilling Barge**	**95 days**	**Thu 8/9/16**	**Sun 11/12/16**			
142	AIP for Drilling Barge	0 days	Thu 8/9/16	Thu 8/9/16		249	N
143	Operating Licence for Drilling Barge	4 days	Thu 8/12/16	Sun 11/12/16	250	135	N
144	**Backhoe Dredger**	**153 days**	**Thu 21/7/16**	**Tue 20/12/16**			
145	AIP for Backhoe Dredger	0 days	Thu 21/7/16	Thu 21/7/16		252	N
146	Operating Licence for Backhoe Dredger	4 days	Sat 17/12/16	Tue 20/12/16	253		N
147	**Hydraulic Breaker**	**10 days**	**Tue 6/9/16**	**Thu 15/9/16**			
148	Purchase Order	10 days	Tue 6/9/16	Thu 15/9/16	128	255	N
149	**Works**	**1442 days**	**Fri 27/9/13**	**Thu 7/9/17**			
150	**Routine Monitoring / Temporary Marine Traffic Management**	**1037 days**	**Fri 27/9/13**	**Fri 29/7/16**			
151	**Environmental Management**	**1022 days**	**Fri 27/9/13**	**Thu 14/7/16**			
152	**Baseline monitoring**	**81 days**	**Tue 31/12/13**	**Fri 21/3/14**			
153	**Monitoring (Location see Drg No. EM/401)**	**81 days**	**Tue 31/12/13**	**Fri 21/3/14**			
154	Mobilization	3 days	Tue 31/12/13	Thu 2/1/14	13	156,158	1
155	**Field works and Lab Test**	**78 days**	**Fri 3/1/14**	**Fri 21/3/14**			
156	Field works	3 days	Fri 3/1/14	Sun 5/1/14	154	158SS+3 days	1
157	**Lab test**	**75 days**	**Mon 6/1/14**	**Fri 21/3/14**			
158	Chemical test	14 days	Mon 6/1/14	Sun 19/1/14	156SS+3 days,154	15	N
159	Biological test	42 days	Sat 8/2/14	Fri 21/3/14	15	16	N
160	**Grab sample (Portions A, B & C)**	**256 days**	**Fri 27/9/13**	**Mon 9/6/14**			
161	Marine Department Notice	45 days	Fri 27/9/13	Sun 10/11/13		162	N
162	Grab sample specialist mobilization	7 days	Mon 10/3/14	Sun 16/3/14	19,161	164	2
163	**Grab sample (field works) and Lab Test**	**85 days**	**Mon 17/3/14**	**Mon 9/6/14**			
164	Field works	3 days	Mon 17/3/14	Wed 19/3/14	162	166	2
165	**Lab test**	**82 days**	**Thu 20/3/14**	**Mon 9/6/14**			



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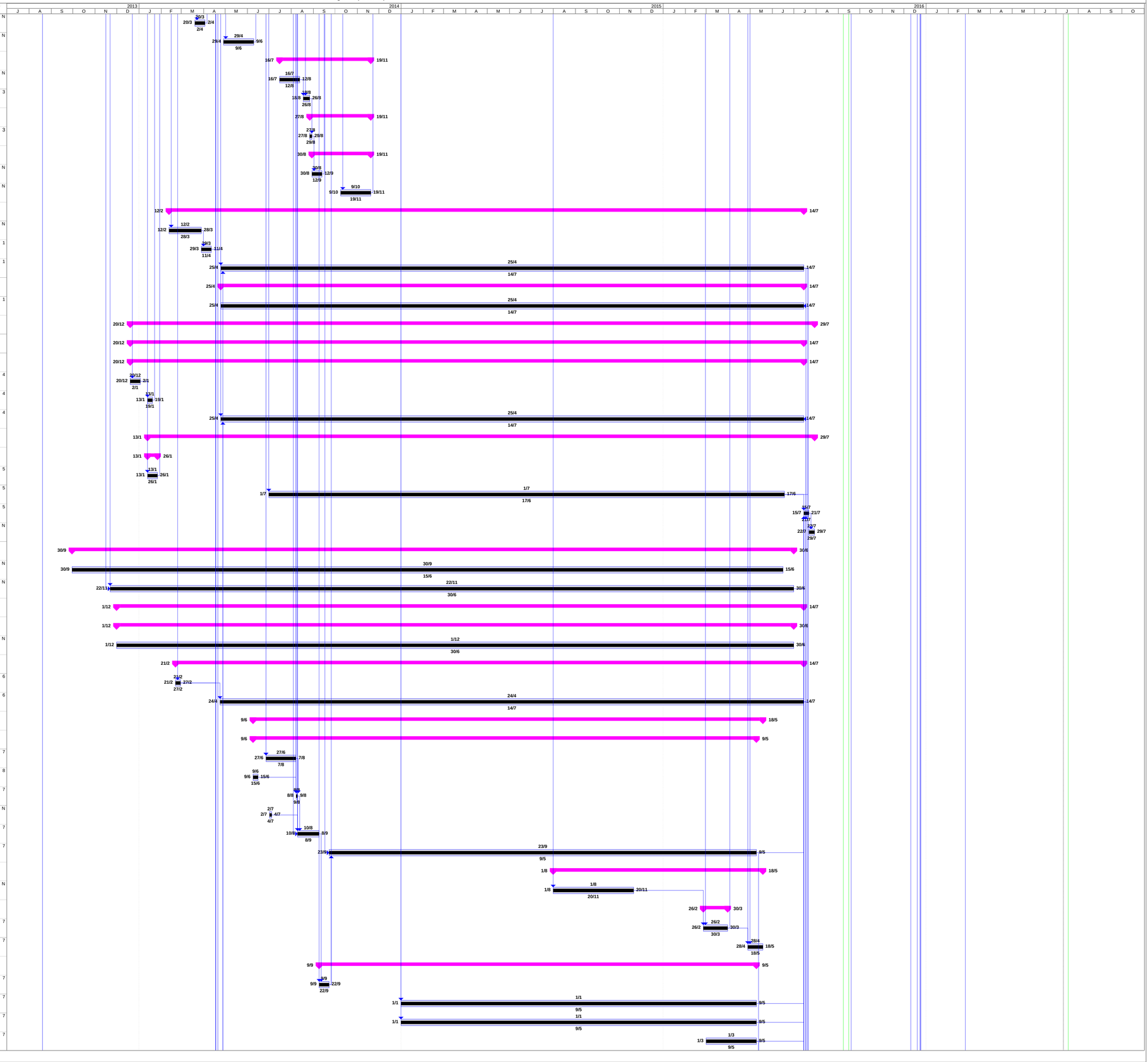
166	Chemical test	14 days	Thu 20/3/14	Wed 2/4/14	164	21	N
167	Biological test	42 days	Tue 29/4/14	Mon 9/6/14	21	22	N
168	**Vibro-coring (Portions A, B & C)**	**127 days**	**Wed 16/7/14**	**Wed 19/11/14**			
169	Marine Department Notice	28 days	Wed 16/7/14	Tue 12/8/14		170	N
170	Vibro-coring specialist mobilization	9 days	Mon 18/8/14	Tue 26/8/14	24,169	172	3
171	**Vibro-coring (field works) and Lab Test**	**85 days**	**Wed 27/8/14**	**Wed 19/11/14**			
172	Field works	3 days	Wed 27/8/14	Fri 29/8/14	170	174	3
173	**Lab test**	**82 days**	**Sat 30/8/14**	**Wed 19/11/14**			
174	Chemical test	14 days	Sat 30/8/14	Fri 12/9/14	172	26	N
175	Biological test	42 days	Thu 9/10/14	Wed 19/11/14	26	27	N
176	**24 Hours monitoring station and TIN Measuring Device (Location see Drg No. EM/401)**	**884 days**	**Wed 12/2/14**	**Thu 14/7/16**			
177	Procurement and delivery	45 days	Wed 12/2/14	Fri 28/3/14	29	178	N
178	Installation	14 days	Sat 29/3/14	Fri 11/4/14	177	179	1
179	Monitoring	812 days	Fri 25/4/14	Thu 14/7/16	178,224	181FF,221FF,243	1
180	**Impact monitoring (Location see Drg No. EM/401)**	**812 days**	**Fri 25/4/14**	**Thu 14/7/16**			
181	Impact monitoring and report submission	812 days	Fri 25/4/14	Thu 14/7/16	179FF	221FF	1
182	**Survey**	**953 days**	**Fri 20/12/13**	**Fri 29/7/16**			
183	**Land Survey (Container Basin & DSD Tsing Yi Plant)**	**938 days**	**Fri 20/12/13**	**Thu 14/7/16**			
184	**Settlement markers**	**938 days**	**Fri 20/12/13**	**Thu 14/7/16**			
185	Installation	14 days	Fri 20/12/13	Thu 2/1/14	35	186	4
186	Initial survey	7 days	Mon 13/1/14	Sun 19/1/14	185	36	4
187	Interim monitoring	812 days	Fri 25/4/14	Thu 14/7/16	191FF,224,36	221FF,247	4
188	**Hydrographic Survey (Portions A to E)**	**929 days**	**Mon 13/1/14**	**Fri 29/7/16**			
189	**Initial survey**	**14 days**	**Mon 13/1/14**	**Sun 26/1/14**			
190	Field works	14 days	Mon 13/1/14	Sun 26/1/14	38	39	5
191	Interim survey	718 days	Tue 1/7/14	Fri 17/6/16	39	192,187FF	5
192	Final survey	7 days	Fri 15/		5,231,228,221	193	5
193	Final survey report	8 days	Fri 22/7/16	Fri 29/7/16	192		N
194	**Temporary Marine Traffic Management (Portions A to E)**	**1005 days**	**Mon 30/9/13**	**Thu 30/6/16**			
195	Organizing meeting for information collection	990 days	Mon 30/9/13	Wed 15/6/16			N
196	Temporary marine traffic management and TMTM meeting	952 days	Fri 22/11/13	Thu 30/6/16	42FS-60 days,43	244	N
197	**Dredging Works (Portions A to E)**	**957 days**	**Sun 1/12/13**	**Thu 14/7/16**			
198	**Interface with other contractors or utility undertakeings**	**943 days**	**Sun 1/12/13**	**Thu 30/6/16**			
199	Organizing coordination meeting	943 days	Sun 1/12/13	Thu 30/6/16			N
200	**Silt screen (Location see Drg No. EM/401)**	**875 days**	**Fri 21/2/14**	**Thu 14/7/16**			
201	Installation of silt screen	7 days	Fri 21/2/14	Thu 27/2/14	47	202,224	6
202	Maintenance of silt screen	813 days	Thu 24/4/14	Thu 14/7/16	201	221FF,245	6
203	**Dredging Works at Portions A and B**	**710 days**	**Mon 9/6/14**	**Wed 18/5/16**			
204	**General seabed**	**701 days**	**Mon 9/6/14**	**Mon 9/5/16**			
205	Mobilization	42 days	Fri 27/6/14	Thu 7/8/14	74,77,16,57	207	7
206	Fabrication of silt curtain	7 days	Mon 9/6/14	Sun 15/6/14		207	8
207	Pilot test for silt curtain	2 days	Fri 8/8/14	Sat	'4,16,47,55,57	209	7
208	Monitoring brief for unidentified sonar contacts & masked areas	3 days	Wed 2/7/14	Fri 4/7/14		209	N
209	Dredging works 1 (subject to availability of working windows)	30 days	Sun 10/8/14	I	',22,27FS-139 days	217	7
210	Dredging works 2 (subject to availability of working windows)	595 days	Tue 23/9/14	Mon 9/5/16	217,69	192,221	7
211	**Type 3 Cat Hf Sediment (Portion A)**	**292 days**	**Sat 1/8/15**	**Wed 18/5/16**			
212	Procurement and delivery of Geo-container	112 days	Sat 1/8/15	Fri 20/11/15	104	214	N
213	**Trial dumping operation of Type 2 sediment using geo-containers**	**34 days**	**Fri 26/2/16**	**Wed 30/3/16**			
214	Trial dumping	34 days	Fri 26/2/16	Wed 30/3/16	85,212	215,86	7
215	Dredging works	21 days	Thu 28/4/16	Wed 18/5/16	104,214,87		7
216	**Hot Spot (Portion A)**	**609 days**	**Tue 9/9/14**	**Mon 9/5/16**			
217	Field trial at Zone Z2C	14 days	Tue 9/9/14	Mon 22/9/14	209,108	210,110	7
218	Dredging works at Z2B *	493 days	Thu 1/1/15	Mon 9/5/16	114	192	7
219	Dredging of hard material *	493 days	Thu 1/1/15	Mon 9/5/16	121	192	7
220	Outfall demolition works*	70 days	Tue 1/3/16	Mon 9/5/16		192,221	7



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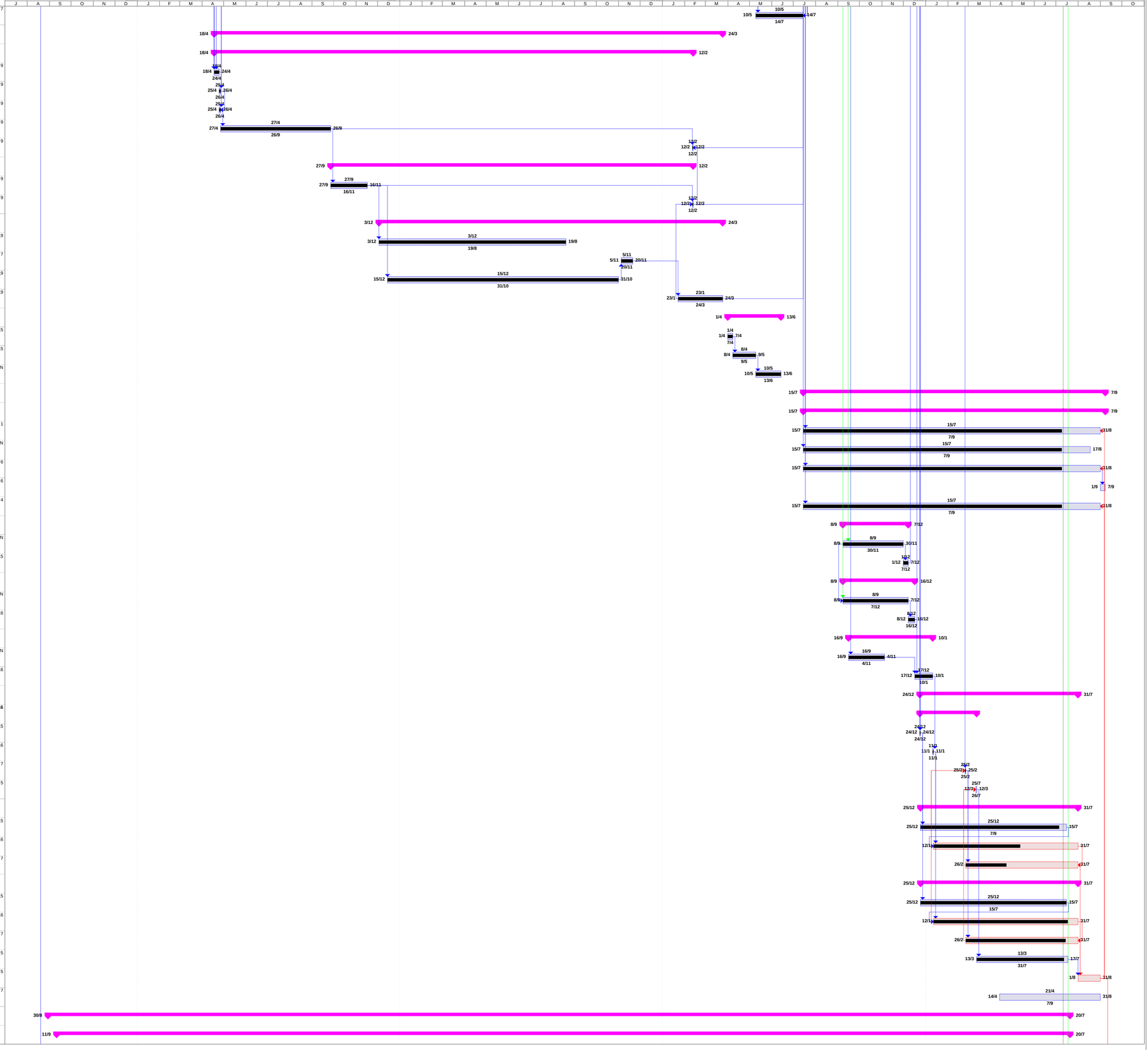
221	Removal of high spots*	66 days	Tue 10/5/.		,187FF,202FF	192	7
222	**Dredging Works for Portions C, D and E**	**707 days**	**Fri 18/4/14**	**Thu 24/3/16**			
223	**Dredging Works for Portion D**	**666 days**	**Fri 18/4/14**	**Fri 12/2/16**			
224	Mobilization	7 days	Fri 18/4/14		2,123,124,125	225,226,179,187	9
225	Pilot test of silt curtain	2 days	Fri 25/4/14	Sat 26/4/14	224	226FF	9
226	Trial dredging	2 days	Fri 25/4/14	Sat 26/4/14	224,225FF	227	9
227	Dredging works	153 days	Sun 27/4/14	Fri 26/9/14	226	230,228	9
228	Removal of high spots	1 day	Fri 12/2/16	Fri 12/2/16	227,231FF	192	9
229	**Dredging Works for Portion E**	**504 days**	**Sat 27/9/14**	**Fri 12/2/16**			
230	Dredging Works	51 days	Sat 27/9/14	Sun 16/11/14	227	231,233,235	9
231	Removal of high spots	1 day	Fri 12/2/16	Fri 12/2/16	230,236SS+20 days	192,228FF	9
232	**Dredging Works for Portion C**	**478 days**	**Wed 3/12/14**	**Thu 24/3/16**			
233	Norhern west section	260 days	Wed 3/12/14	Wed 19/8/15	230		7,9
234	Middle section	16 days	Thu 5/11/15	Fri 20/11/15	235FS+4 days	236	7
235	Southern east section	321 days	Mon 15/12/14	Sat 31/10/15	230	234FS+4 days	7,9
236	Removal of high spots	62 days	Sat 23/1/16	Thu 24/3/16	234	192,231SS+20 days	7,9
237	**Marine Ground Investigation Works near KC5 in Portion A**	**74 days**	**Fri 1/4/16**	**Mon 13/6/16**			
238	Mobilization	7 days	Fri 1/4/16	Thu 7/4/16		239	15
239	Drilling*	32 days	Fri 8/4/16	Mon 9/5/16	238	240	15
240	Report	35 days	Tue 10/5/16	Mon 13/6/16	239		N
241	**Remaining Works (Portion A)**	**420 days**	**Fri 15/7/16**	**Thu 7/9/17**			
242	**Rock excavation works outside berth KC5**	**420 days**	**Fri 15/7/16**	**Thu 7/9/17**			
243	Water Quality Monitoring Works	413 days	Fri 15/7/16	Thu 31/8/17	179,272FF		1
244	Temporary Marine Traffic Management Works	399 days	Fri 15/7/16	Thu 17/8/17	196		N
245	Silt screen and silt curtain maintenance	413 days	Fri 15/7/16	Thu 31/8/17	202,272FF	246	6
246	Removal of silt screen	7 days	Fri 1/9/17	Thu 7/9/17	245		6
247	Monitoring of settlement markers	413 days	Fri 15/7/16	Thu 31/8/17	187,272FF		4
248	**Drilling Barge**	**91 days**	**Thu 8/9/16**	**Wed 7/12/16**			
249	Modification of Drilling Barge to meet HKMD's requirements	84 days	Thu 8/9/16	Wed 30/11/16	142	252SS,250	N
250	Mobilization of Drilling Barge on site	7 days	Thu 1/12/16	Wed 7/12/16	249	143	15
251	**Backhoe Dredger**	**100 days**	**Thu 8/9/16**	**Fri 16/12/16**			
252	Modification of Backhoe Dredger to meet HKMD's requirements	91 days	Thu 8/9/16	Wed 7/12/16	145,249SS	253	N
253	Mobilization of Backhoe Dredger on site	9 days	Thu 8/12/16	Fri 16/12/16	252	146,256	16
254	**Hydraulic Breaker**	**117 days**	**Fri 16/9/16**	**Tue 10/1/17**			
255	Fabrication and delivery	50 days	Fri 16/9/16	Fri 4/11/16	148	256	N
256	Installation	25 days	Sat 17/12/16	Tue 10/1/17	255,253	260	16
257	**Site Works (Subject to working period provided by MTL)**	**220 days**	**Sat 24/12/16**	**Mon 31/7/17**			
258	**Site Trial**	**79 days**	**Sat 24/12/16**	**Sun 12/3/17**			**16**
259	Drilling Works	1 day	Sat 24/12/16	Sat 24/12/16	136,140,132	268,264	15
260	Breaking Works	1 day	Wed 11/1/17	Wed 11/1/17	256	265,269	16
261	Removal of broken rock material	1 day	Sat 25/2/17	Sat 25/2/17	265SS+15 sys,269SS+15 days,139	266,270	7
262	Hydrographic survey	1 day	Sun 12/3/17	Sun 12/3/17	266SS+14 sys,270SS+14 days	271	5
263	**Northern Area (affecting the operation of KC5)**	**219 days**	**Sun 25/12/16**	**Mon 31/7/17**			
264	Drilling (at least 30 working hours/week)	203 days	Sun 25/12/16	Sat 15/7/17	259	265FS-171 days	15
265	Rock breaking (at least 30 working hours/week)	201 days	Thu 12/1/17	Mon 31/7/17	264FS-171 days,260	261SS+15 days,266FF	16
266	Removal of broken rock material**	156 days	Sun 26/2/17	Mon 31/7/17	261,265FF	272,262SS+14 days	7
267	**Southern Area (no implication to the operation of KC5)**	**219 days**	**Sun 25/12/16**	**Mon 31/7/17**			
268	Drilling (at least 30 working hours/week)	203 days	Sun 25/12/16	Sat 15/7/17	259	269FS-171 days	15
269	Rock breaking (35 to 40 working hours/week)	201 days	Thu 12/1/17	Mon 31/7/17	268FS-171 days,260	261SS+15 days,270FF	16
270	Removal of broken rock material**	156 days	Sun 26/2/17	Mon 31/7/17	261,269FF	272,262SS+14 days	7
271	Interiml hydrographic survey***	127 days	Mon 13/3/17	Mon 17/7/17	262	272	5
272	Final hydrographic survey, removal of high spots and handover	31 days	Tue 1/8/17	Thu 31/8/17	266,270,271	5FF,247FF,328FF	5
273	Remaing Dredging works around Tsing Yi Submarine Outfall*	140 days	Fri 14/4/17	Thu 31/8/17			7
274	Section 2	1421 days	Fri 30/8/13	Thu 20/7/17			
275	Submission	1409 days	Wed 11/9/13	Thu 20/7/17			



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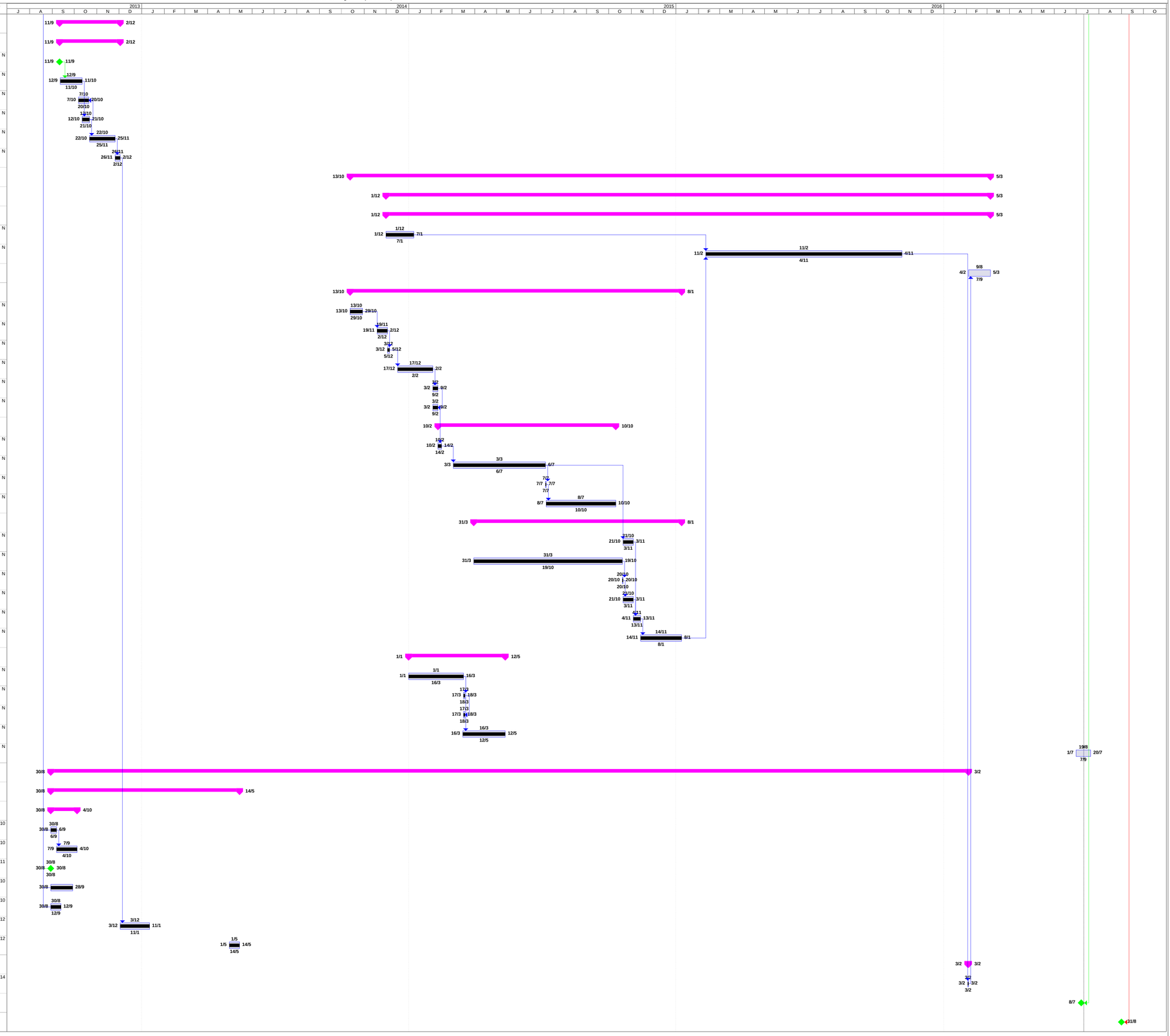
276	**Preliminaries (Portion F)**	**83 days**	**Wed 11/9/13**	**Mon 2/12/13**			
277	**Engineer Principal Accommodation**	**83 days**	**Wed 11/9/13**	**Mon 2/12/13**			
278	Preparation and submisssion of location and layout	0 days	Wed 11/9/13	Wed 11/9/13		279	N
279	Approval of location and layout	30 days	Thu 12/9/13	Fri 11/10/13	278	281	N
280	Independent Checking Engineer (ICE)	14 days	Mon 7/10/13	Sun 20/10/13	281FF-1 day		N
281	Preparation of calculation	10 days	Sat 12/10/13	Mon 21/10/13	279	282,280FF-1 day	N
282	Comment and resubmission of calculation	35 days	Tue 22/10/13	Mon 25/11/13	281	283	N
283	Approval of calculation	7 days	Tue 26/11/13	Mon 2/12/13	282	323	N
284	**Outfall Modification Works (Location see Drg No. S202)**	**875 days**	**Mon 13/10/14**	**Sun 5/3/17**			
285	**Method statement for modification works**	**826 days**	**Mon 1/12/14**	**Sun 5/3/17**			
286	**Preparation and submission**	**826 days**	**Mon 1/12/14**	**Sun 5/3/17**			
287	Preparation and submission	38 days	Mon 1/12/14	Wed 7/1/15		288	N
288	Awaiting resolving TMTA constraints	268 days	Thu 11/2/16	Fri 4/11/16	287,308	326	N
289	Further review diving safety zone with MD and HKPA	30 days	Sat 4/2/17	Sun 5/3/17	326		
290	**Flow Measurement Survey**	**453 days**	**Mon 13/10/14**	**Fri 8/1/16**			
291	Preparation and submission	17 days	Mon 13/10/14	Wed 29/10/14		292	N
292	Resubmission	14 days	Wed 19/11/14	Tue 2/12/14	291	293	N
293	Further comment by Mott	3 days	Wed 3/12/14	Fri 5/12/14	292	294	N
294	Resubmission	48 days	Wed 17/12/14	Mon 2/2/15	293	295	N
295	Approval by Mott	7 days	Tue 3/2/15	Mon 9/2/15	294	296FF	N
296	Approval by DSD	7 days	Tue 3/2/15	Mon 9/2/15	295FF	298	N
297	**Flow Survey Measurement report**	**243 days**	**Tue 10/2/15**	**Sat 10/10/15**			
298	Analyzing survey data	5 days	Tue 10/2/15	Sat 14/2/15	296	299	N
299	Preparation and submission	126 days	Tue 3/3/15	Mon 6/7/15	298	303,300	N
300	Approval by Mott	1 day	Tue 7/7/15	Tue 7/7/15	299	301	N
301	Approval by DSD	95 days	Wed 8/7/15	Sat 10/10/15	300		N
302	**Engineer's Assessment Report on Flow Measurement Survey**	**284 days**	**Tue 31/3/15**	**Fri 8/1/16**			
303	Assessment calculations	14 days	Wed 21/10/15	Tue 3/11/15	299	307	N
304	Preparation and submission	203 days	Tue 31/3/15	Mon 19/10/15		305	N
305	Further comment by Mott	1 day	Tue 20/10/15	Tue 20/10/15	304	306	N
306	Resubmission	14 days	Wed 21/10/15	Tue 3/11/15	305	307	N
307	Approval by Mott	10 days	Wed 4/11/15	Fri 13/11/15	306,303	308	N
308	Approval by DSD	56 days	Sat 14/11/15	Fri 8/1/16	307	288	N
309	**Video Filming and Dye Test**	**132 days**	**Thu 1/1/15**	**Tue 12/5/15**			
310	Preparation and submission	75 days	Thu 1/1/15	Mon 16/3/15		311,313FS-1 day	N
311	Approval by Mott	2 days	Tue 17/3/15	Wed 18/3/15	310	312FF	N
312	Approval by DSD	2 days	Tue 17/3/15	Wed 18/3/15	311FF		N
313	Using digital camera in lieu of CCTV	58 days	Mon 16/3/15	Tue 12/5/15	310FS-1 day		N
314	Deletion of Modification works by the Engineer	20 days	Sat 1/7/17	Thu 20/7/17			N
315	**Works**	**1254 days**	**Fri 30/8/13**	**Fri 3/2/17**			
316	**Preliminaries (Portion F)**	**258 days**	**Fri 30/8/13**	**Wed 14/5/14**			
317	**Contractor's mobilization**	**36 days**	**Fri 30/8/13**	**Fri 4/10/13**			
318	Site clearance	8 days	Fri 30/8/13	Fri 6/9/13		4SS,319	10
319	Contractor's site office	28 days	Sat 7/9/13	Fri 4/10/13	318		10
320	Security Guard	0 days	Fri 30/8/13	Fri 30/8/13		4SS	11
321	Temporary electricity power supply	30 days	Fri 30/8/13	Sat 28/9/13		4SS	10
322	Engineer's Initial Temporary Accommodation	14 days	Fri 30/8/13	Thu 12/9/13		4SS	10
323	Engineer's Principal Accommodation	40 days	Tue 3/12/13	Sat 11/1/14	283		12
324	Engineer's Car Park	14 days	Thu 1/5/14	Wed 14/5/14			12
325	**Outfall Modification Works (Location see Drg No. S202)**	**1 day**	**Fri 3/2/17**	**Fri 3/2/17**			
326	Underwater inspection and underwater filming	1 day	Fri 3/2/17	Fri 3/2/17	288	289	14
327	**Extended Contract Completion Date**	**0 days**	**Sat 8/7/17**	**Sat 8/7/17**	3FF		
328	**Revised Contract Completion Date**	0 days	Thu 31/8/17	Thu 31/8/17	272FF		



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Task | Critical Task | Milestone | Summary

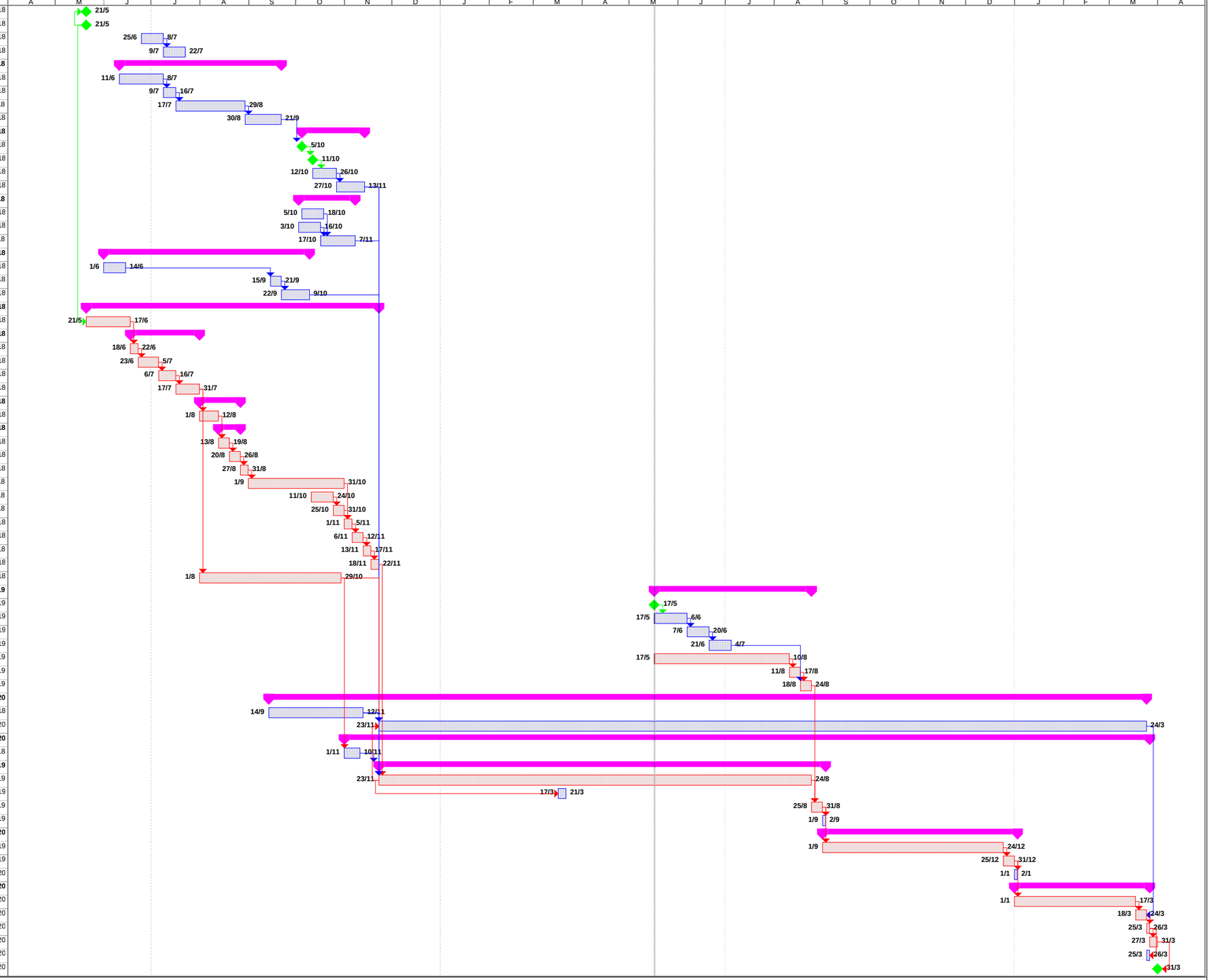
* Subject to availability of working windows
** The removal of broken rock material will be carried out biweekly
*** The frequency of interim survey is once a month

Bar Left: Early Start, Bar Right: Early Finish
Bar Top: Late Start, Bar Bottom: Late Finish

Contract No. CV/2013/04
Dredging Works in Kwai Tsing Container Basin and its Approach Channel
Updated Programme for Rock Excavation Works outside Berth KC5

Date: 17 May 2019

ID	Task Name	Duration	Start	Finish
1	**Commencement Date**	0 days	Mon 21/5/18	Mon 21/5/18
2	Works reviewed and agreed between CEDD and CIWE	0 days	Mon 21/5/18	Mon 21/5/18
3	Notification of works to EPD, MD and relevant stakeholders by CEDD	14 days	Mon 25/6/18	Sun 8/7/18
4	Comments/no objection to works from EPD, MD and relevant stakeholders	14 days	Mon 9/7/18	Sun 22/7/18
5	**Method Statement**	**103 days**	**Mon 11/6/18**	**Fri 21/9/18**
6	Preparation	28 days	Mon 11/6/18	Sun 8/7/18
7	First submission	8 days	Mon 9/7/18	Mon 16/7/18
8	Comments from MMHK	44 days	Tue 17/7/18	Wed 29/8/18
9	Second submission	23 days	Thu 30/8/18	Fri 21/9/18
10	**Marine Department Notice**	**40 days**	**Fri 5/10/18**	**Tue 13/11/18**
11	Notification of MTMLG Meeting	0 days	Fri 5/10/18	Fri 5/10/18
12	MTMLG Meeting	0 days	Thu 11/10/18	Thu 11/10/18
13	Preparation and submission of MDN application	15 days	Fri 12/10/18	Fri 26/10/18
14	Approval	18 days	Sat 27/10/18	Tue 13/11/18
15	**Marine Dumping Permit**	**36 days**	**Wed 3/10/18**	**Wed 7/11/18**
16	Disposal ground allocated by CEDD	14 days	Fri 5/10/18	Thu 18/10/18
17	Preparation and submission	14 days	Wed 3/10/18	Tue 16/10/18
18	Approval	22 days	Wed 17/10/18	Wed 7/11/18
19	**Construction Noise Permit**	**131 days**	**Fri 1/6/18**	**Tue 9/10/18**
20	Noise Assessmet	14 days	Fri 1/6/18	Thu 14/6/18
21	Preparation and submission	7 days	Sat 15/9/18	Fri 21/9/18
22	Approval	18 days	Sat 22/9/18	Tue 9/10/18
23	**Drilling Barge**	**186 days**	**Mon 21/5/18**	**Thu 22/11/18**
24	Design of modification works	28 days	Mon 21/5/18	Sun 17/6/18
25	**Application for MD's approval of modification works**	**44 days**	**Mon 18/6/18**	**Tue 31/7/18**
26	First submission	5 days	Mon 18/6/18	Fri 22/6/18
27	Comments from MD	13 days	Sat 23/6/18	Thu 5/7/18
28	Second submission	11 days	Fri 6/7/18	Mon 16/7/18
29	Approval	15 days	Tue 17/7/18	Tue 31/7/18
30	**Reschedule of modification works due to requiements imposed by MD**	**26 days**	**Wed 1/8/18**	**Sun 26/8/18**
31	Preliminary revised design for modification works	12 days	Wed 1/8/18	Sun 12/8/18
32	**Rearrangement of dockyard for modification works**	**14 days**	**Mon 13/8/18**	**Sun 26/8/18**
33	Liaison with dockyard in Mainland China for modification works	7 days	Mon 13/8/18	Sun 19/8/18
34	Reservation of dockyard for modification works	7 days	Mon 20/8/18	Sun 26/8/18
35	Mobillization of barge to dockyard in Mainland China	5 days	Mon 27/8/18	Fri 31/8/18
36	Modification of flat top barge with 2 nos. drilling rigs added	61 days	Sat 1/9/18	Wed 31/10/18
37	Plan Approval of modification works	14 days	Thu 11/10/18	Wed 24/10/18
38	Survey/Inspection of modification works	7 days	Thu 25/10/18	Wed 31/10/18
39	Brage returnung to Hong Kong	5 days	Thu 1/11/18	Mon 5/11/18
40	Installation of drilling rigs, air compressors and gensets	7 days	Tue 6/11/18	Mon 12/11/18
41	Testing of lifting appliances and gears	5 days	Tue 13/11/18	Sat 17/11/18
42	Operating Licence issued by MD	5 days	Sun 18/11/18	Thu 22/11/18
43	Work Permit approved by Mainland China	90 days	Wed 1/8/18	Mon 29/10/18
44	**Dredger**	**100 days**	**Fri 17/5/19**	**Sat 24/8/19**
45	AIP application	0 days	Fri 17/5/19	Fri 17/5/19
46	AIP approved by MD	21 days	Fri 17/5/19	Thu 6/6/19
47	Modification works	14 days	Fri 7/6/19	Thu 20/6/19
48	Inspection and testing	14 days	Fri 21/6/19	Thu 4/7/19
49	Export Permit	86 days	Fri 17/5/19	Sat 10/8/19
50	Mobilzation to Hong Kong	7 days	Sun 11/8/19	Sat 17/8/19
51	Operating licence issued by MD	7 days	Sun 18/8/19	Sat 24/8/19
52	**Water Quality Monitoring Works**	**558 days**	**Fri 14/9/18**	**Tue 24/3/20**
53	Reinstallation of equipment	60 days	Fri 14/9/18	Mon 12/11/18
54	Monitoring works	488 days	Fri 23/11/18	Tue 24/3/20
55	**Site Works (Subject to working period provided by MTL)**	**512 days**	**Thu 1/11/18**	**Thu 26/3/20**
56	Survey grid plan for drilling works	10 days	Thu 1/11/18	Sat 10/11/18
57	**Drilling works**	**284 days**	**Fri 23/11/18**	**Mon 2/9/19**
58	Drilling works including trial drilling	275 days	Fri 23/11/18	Sat 24/8/19
59	Removal of broken rock material	5 days	Sun 17/3/19	Thu 21/3/19
60	Further removal of broken rock material	7 days	Sun 25/8/19	Sat 31/8/19
61	Interim hydrographic survey	2 days	Sun 1/9/19	Mon 2/9/19
62	**Removal of high spots**	**124 days**	**Sun 1/9/19**	**Thu 2/1/20**
63	Drilling works	115 days	Sun 1/9/19	Tue 24/12/19
64	Removal of broken rock material	7 days	Wed 25/12/19	Tue 31/12/19
65	Interim hydrographic survey	2 days	Wed 1/1/20	Thu 2/1/20
66	**Removal of remaining high spots**	**86 days**	**Wed 1/1/20**	**Thu 26/3/20**
67	Drilling works	77 days	Wed 1/1/20	Tue 17/3/20
68	Removal of broken rock material	7 days	Wed 18/3/20	Tue 24/3/20
69	Final hydrographic survey	2 days	Wed 25/3/20	Thu 26/3/20
70	Handover	5 days	Fri 27/3/20	Tue 31/3/20
71	Hydrographic Survey by CEDD, MD	2 days	Wed 25/3/20	Thu 26/3/20
72	**Completion Date**	0 days	Tue 31/3/20	Tue 31/3/20



China International Water & Electric Corp.

Task | Critical Task | Milestone | Summary

FUGRO TECHNICAL SERVICES LIMITED

Fugro Development Centre,
5 Lok Yi Street, Tai Lam,
Tuen Mun, N.T.,
Hong Kong.

Tel : +852 2450 8233
Fax : +852 2450 6138
E-mail : matlab@fugro.com
Website : www.fugro.com

Appendix C

Action and Limit Levels

Action and Limit Levels for Routine Water Quality Monitoring (for Dry Season since 1 November 2015 and Wet Season before 1 April 2015 only)

Monitoring Station	DO (mg/L) Surface & Middle		DO (mg/L) Bottom		Turbidity (NTU) Depth-Averaged		Suspended Solids (mg/L) Depth-averaged		BOD5(mg/L) Depth- averaged		*E.coli* (CFU /100mL) Depth-averaged		NH_3-N (mg/L) Depth-averaged		UIA (mg/L) Depth-averaged		Synthetic Detergent as MBAS (mg/L) Depth- averaged		TIN (mg/L) Depth Averaged	
	AL	LL	AL	LL	AL	LL	AL	LL	AL	LL	AL	LL	AL	LL	AL	LL	AL	LL	AL	LL
Seawater Intake																				
SR1 SR4 SR12	2	2	2	2	≥10	≥10	≥10	≥10	≥10	≥10	≥20,000	≥20,000	≥1	≥1	0.021	0.021	≥5	≥5	NA	NA
Fish Culture Zone																				
SR5	5.45	5.39#	5.43	5.27+	6.7 or 120%C*	10.1 or 130%C^	12 or 120%C*	19 or 130%C^	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.36	0.39
SR9 SR10 SR11	6.11	6.02#	6.11	6.04+	2.9 or 120%C*	4.8 or 130%C^	9 or 120%C*	18 or 130%C^											0.22	0.29
Gazetted Beach																				
SR2 SR3	5.45	5.39#	5.43	5.27+	6.7 or 120%C*	10.1 or 130%C^	12 or 120%C*	19 or 130%C^	NA	NA	NA	NA	0.21 or 120%C*	0.24 or 130%C^	0.021	0.021	NA	NA	NA	NA
Corals																				
SR6 SR7 SR8	6.11	6.02#	6.11	6.04+	2.9 or 120%C*	4.8 or 130%C^	9 or 120%C*	18 or 130%C^	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
EMSD Cooling Water Intake																				
SR13	5.31	5.22#	5.29	5.12+	13.1 or 120%C*	15.7 or 130%C^	23 or 120%C*	38 or 130%C^	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Note:
* Or 120% of upstream control station at the same tide of the day
^ Or 130% of upstream control station at the same tide of the day
# According to EM&A Manual, LL of DO (surface & middle) is 5 mg/L or 1 percentile of baseline data in FCZ; 4 mg/L or 1 percentile of baseline data in other impact monitoring stations.
+ According to EM&A Manual, LL of DO (bottom) is 2 mg/L or 1 percentile of baseline data
For DO measurement, non-compliance occurs when monitoring result is lower than the limits;
For TIN, UIA, NH_3-N, SS, BOD_5, *E.coli*, synthetic detergent and turbidity, non-compliance of water quality results when monitoring results is higher than the limits;
AL/LL of TIN and NH_3-N are determined from laboratory results for better accuracy and reliability. These AL/LL will be applied to both laboratory and in-situ measurements at impact stage.
Dry Season: November to March
(Referring to the ER Letter ref. (CV/2013/04)/M45/400/1247 dated 19 March 2015, a Revised Baseline Water Quality Monitoring Test Methodology – Review of Action and Limit Levels (0394/13/ED/0175C) has been submitted to EPD by ER in March 2015. The updated Action and Limit Level for the wet season (April – October) was effected and applied to the water quality monitoring data from 1 April 2015)

Action and Limit Levels for Routine Water Quality Monitoring (Wet Season since 1 April 2015)

Monitoring Station	DO (mg/L) Surface & Middle		DO (mg/L) Bottom		Turbidity (NTU) Depth-Averaged		Suspended Solids (mg/L) Depth-averaged		BOD5 (mg/L) Depth- averaged		*E.coli* (CFU /100mL) Depth-averaged		NH_3-N (mg/L) Depth-averaged		UIA (mg/L) Depth-averaged		Synthetic Detergent as MBAS (mg/L) Depth-averaged		TIN (mg/L) Depth Averaged	
	AL	LL	AL	LL	AL	LL	AL	LL	AL	LL	AL	LL	AL	LL	AL	LL	AL	LL	AL	LL
Seawater Intake																				
SR1 SR4 SR12	2	2	2	2	≥10	≥10	≥10	≥10	≥10	≥10	≥20,000	≥20,000	≥1	≥1	0.021	0.021	≥5	≥5	NA	NA
Fish Culture Zone																				
SR5	5.00#	5.00#	4.11	4.04+	10.8 or 120%C*	15.0 or 130%C^	12 or 120%C*	19 or 130%C^	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.45	0.50
SR9 SR10 SR11	5.00	5.00#	4.41	4.25+	4.0 or 120%C*	8.7 or 130%C^	9 or 120%C*	18 or 130%C^											0.37	0.49
Gazetted Beach																				
SR2 SR3	4.68	4.62#	4.11	4.04+	10.8 or 120%C*	15.0 or 130%C^	12 or 120%C*	19 or 130%C^	NA	NA	NA	NA	0.21 or 120%C*	0.24 or 130%C^	0.021	0.021	NA	NA	NA	NA
Corals																				
SR6 SR7 SR8	5.00	4.82#	4.41	4.25+	4.0 or 120%C*	8.7 or 130%C^	9 or 120%C*	18 or 130%C^	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
EMSD Cooling Water Intake																				
SR13	4.24	4.17#	3.70	3.58+	13.1 or 120%C*	15.7 or 130%C^	23 or 120%C*	38 or 130%C^	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Note:

* Or 120% of upstream control station at the same tide of the day

^ Or 130% of upstream control station at the same tide of the day

According to EM&A Manual, LL of DO (surface & middle) is 5 mg/L or 1 percentile of baseline data in FCZ; 4 mg/L or 1 percentile of baseline data in other impact monitoring stations. (5%ile & 1 %ile determined from wet season baseline data for cluster 1 (4.68mg/L & 4.62mg/L) and cluster 2 (5.00mg/L & 4.82mg/L) are 5mg/L or below, thus 5mg/L was adopted as the AL & LL for the SR in FCZ)

+ According to EM&A Manual, LL of DO (bottom) is 2 mg/L or 1 percentile of baseline data

Referring to the ER Letter ref. (CV/2013/04)/M45/400/1247 dated 19 March 2015, a Revised Baseline Water Quality Monitoring Test Methodology – Review of Action and Limit Levels has been submitted to EPD by ER in March 2015. The Action and Limit Level for the wet season (April – October) was effected and applied to the water quality monitoring data from 1 April 2015.

For DO measurement, non-compliance occurs when monitoring result is lower than the limits;

For TIN, UIA, NH_3-N, SS, BOD_5, *E.coli*, synthetic detergent and turbidity, non-compliance of water quality results when monitoring results is higher than the limits;

AL/LL of TIN and NH_3-N are determined from laboratory results for better accuracy and reliability. These AL/LL will be applied to both laboratory and in-situ measurements at impact stage.

Wet season: April to October

(Referring to the ER Letter ref. (CV/2013/04)/M45/400/1247 dated 19 March 2015, a Revised Baseline Water Quality Monitoring Test Methodology – Review of Action and Limit Levels (0394/13/ED/0175C) has been submitted to EPD by ER in March 2015. The updated Action and Limit Level for the wet season (April – October) was effected and applied to the water quality monitoring data from 1 April 2015)

Action and Limit Levels for 24-hr Water Quality Monitoring (for Dry Season since 1 November 2015 and Wet Season before 1 April 2015 only)

Monitoring Station	DO (mg/L) Surface		Turbidity (NTU) Surface		Ammonia-N (mg/L) Surface	
	AL	LL	AL	LL	AL	LL
WSD Seawater Intake						
SR4	2	2	≥10	≥10	≥1	≥1
SR12						
Fish Culture Zone						
SR5	5.46	5.39	6.0	7.9	NA	NA
SR9	6.12	5.97	2.8	4.7		
SR10						
SR11						
EMSD Cooling Water Intake						
SR13	5.28	5.22	11.9	13.3	NA	NA

Note: According to EM&A Manual, LL of DO (surface & middle) is 5 mg/L or 1 percentile of baseline data in FCZ; 4 mg/L or 1 percentile of baseline data in other impact monitoring stations.

Dry Season: November to March.

(Referring to the ER Letter ref. (CV/2013/04)/M45/400/1247 dated 19 March 2015, a Revised Baseline Water Quality Monitoring Test Methodology – Review of Action and Limit Levels (0394/13/ED/0175C) has been submitted to EPD by ER in March 2015. The updated Action and Limit Level for the wet season (April – October) was effected and applied to the water quality monitoring data from 1 April 2015)

Action and Limit Levels for 24-hr Water Quality Monitoring (Wet Season since 1 April 2015)

Monitoring Station	DO (mg/L) Surface		Turbidity (NTU) Surface		Ammonia-N (mg/L) Surface	
	AL	LL	AL	LL	AL	LL
WSD Seawater Intake						
SR4	2	2	≥10	≥10	≥1	≥1
SR12						
Fish Culture Zone						
SR5	5.24	5.13	9.7	14.4	NA	NA
SR9	5.13	5.00#	5.9	7.1		
SR10						
SR11						
EMSD Cooling Water Intake						
SR13	4.23	4.17	11.9	13.3	NA	NA

Note: # According to EM&A Manual, LL of DO (surface & middle) is 5 mg/L or 1 percentile of baseline data in FCZ; 4 mg/L or 1 percentile of baseline data in other impact monitoring stations. (1 %ile determined from wet season baseline data for cluster 2 (4.78mg/L) is below 5mg/L, thus 5mg/L was adopted as the DO (surface) LL for the SR in FCZ in cluster 2 stations)

Referring to the ER Letter ref. (CV/2013/04)/M45/400/1247 dated 19 March 2015, a Revised Baseline Water Quality Monitoring Test Methodology – Review of Action and Limit Levels has been submitted to EPD by ER in March 2015. The Action and Limit Level for the wet season (April – October) was effected and applied to the water quality monitoring data from 1 April 2015.

Wet Season: April to October.

(Referring to the ER Letter ref. (CV/2013/04)/M45/400/1247 dated 19 March 2015, a Revised Baseline Water Quality Monitoring Test Methodology – Review of Action and Limit Levels (0394/13/ED/0175C) has been submitted to EPD by ER in March 2015. The updated Action and Limit Level for the wet season (April – October) was effected and applied to the water quality monitoring data from 1 April 2015)

FUGRO TECHNICAL SERVICES LIMITED

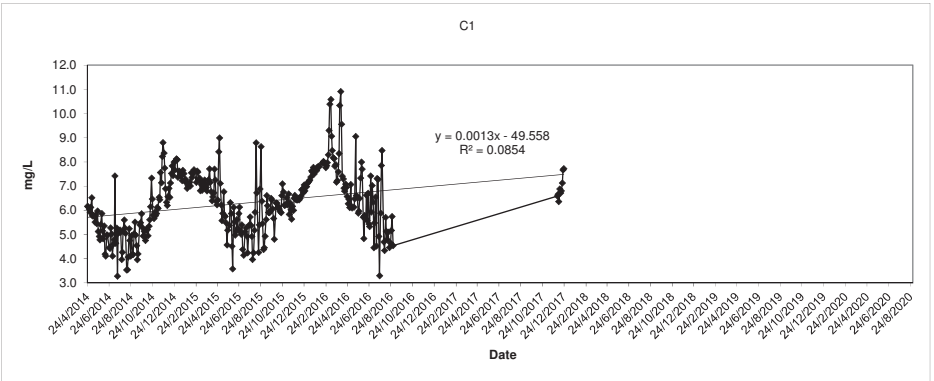
Fugro Development Centre,
5 Lok Yi Street, Tai Lam,
Tuen Mun, N.T.,
Hong Kong.

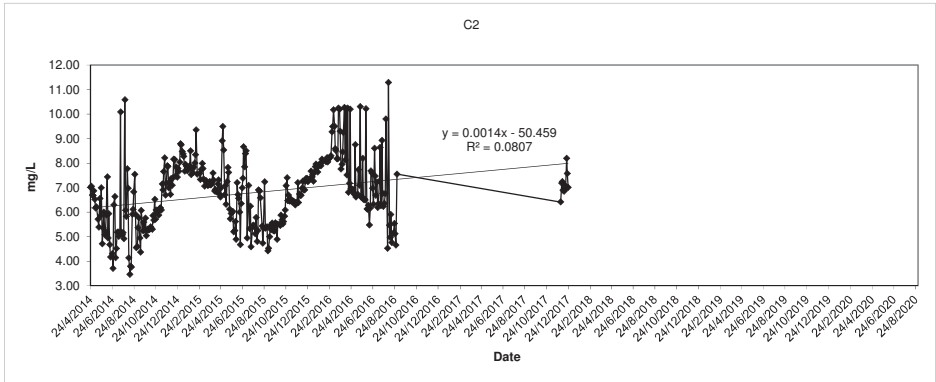
Tel : +852 2450 8233
Fax : +852 2450 6138
E-mail : matlab@fugro.com
Website : www.fugro.com

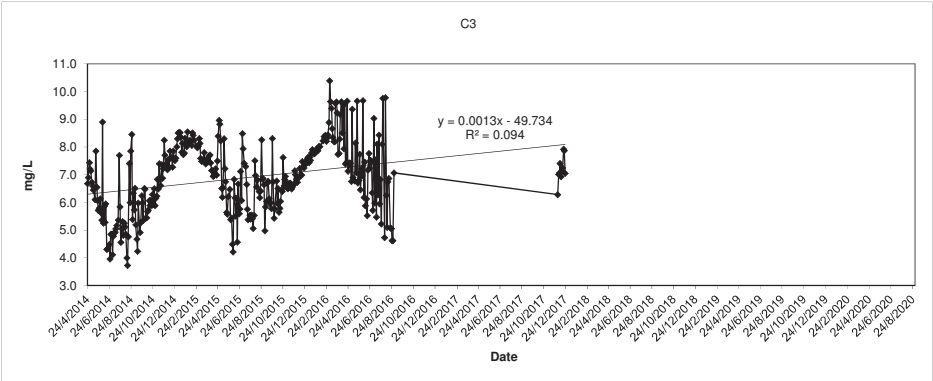
Appendix D

Graphical Presentation – Routine Impact Monitoring and Post Construction Monitoring Results

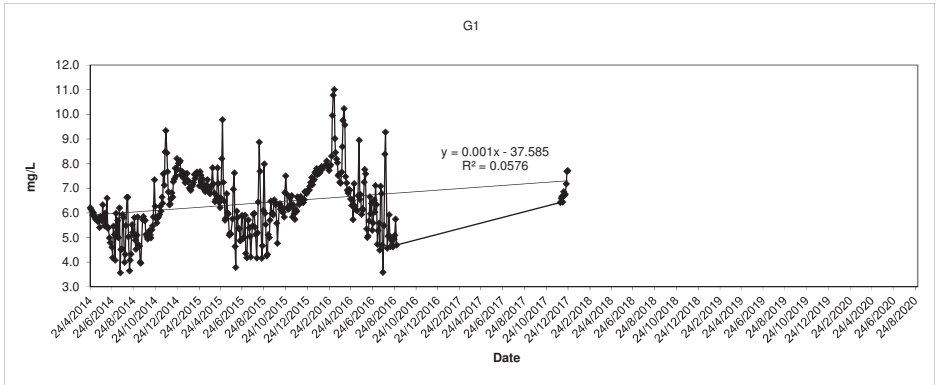
Dissolved Oxygen (Surface and Middle) at Mid-Flood Tide

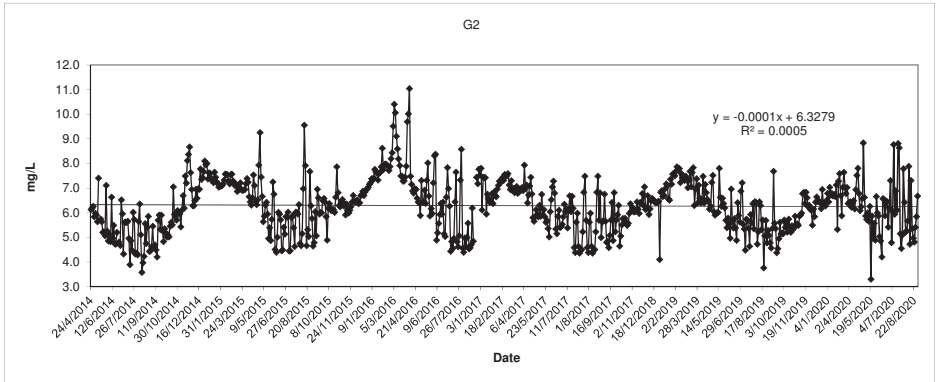


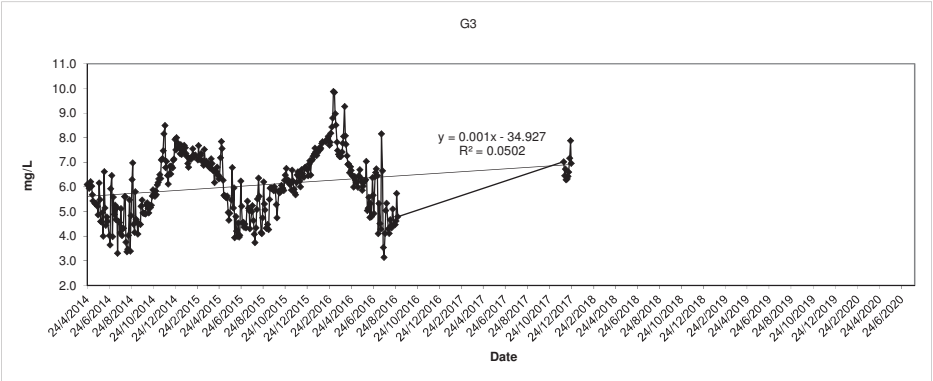




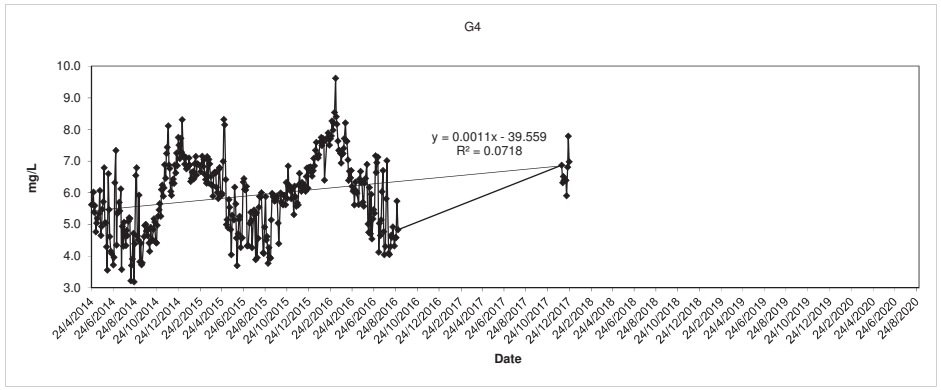
Dissolved Oxygen (Surface and Middle) at Mid-Flood Tide

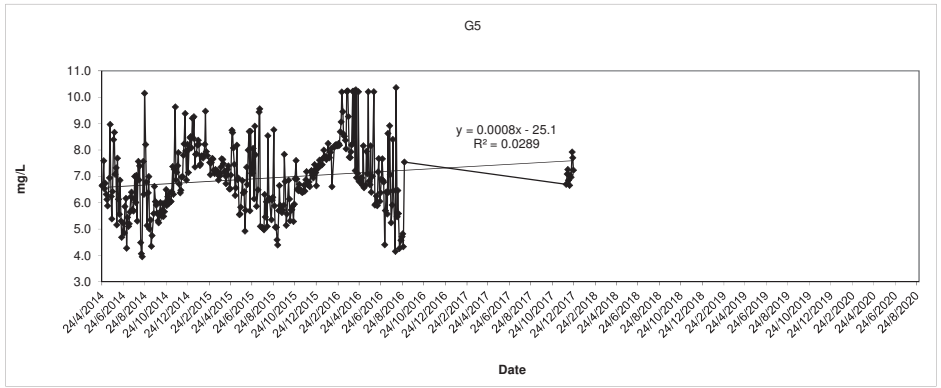


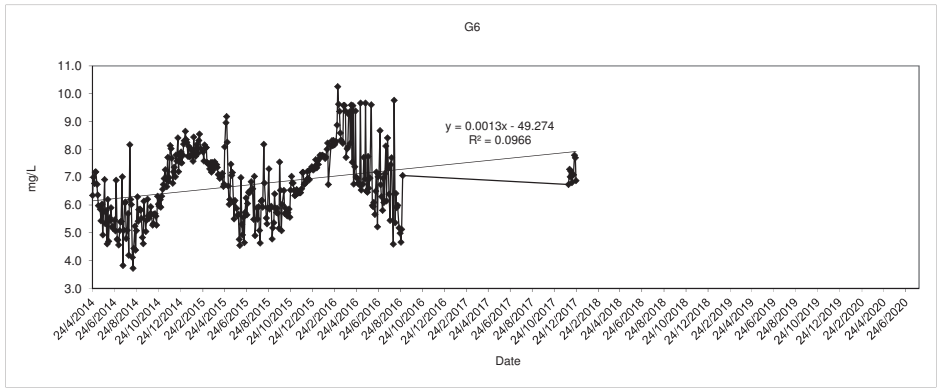




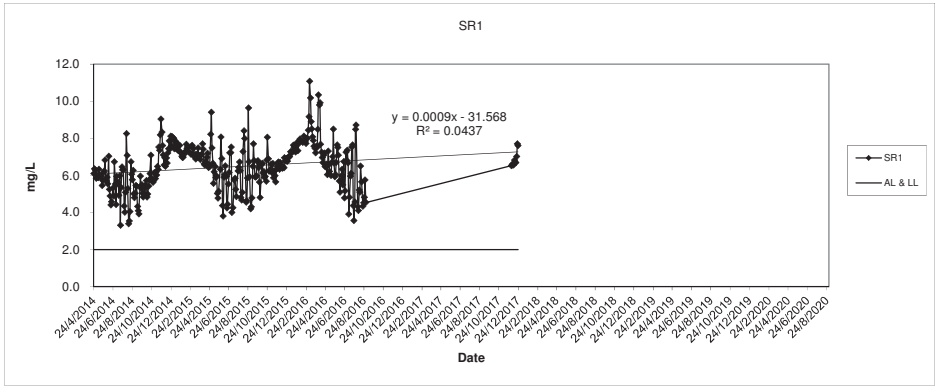
Dissolved Oxygen (Surface and Middle) at Mid-Flood Tide

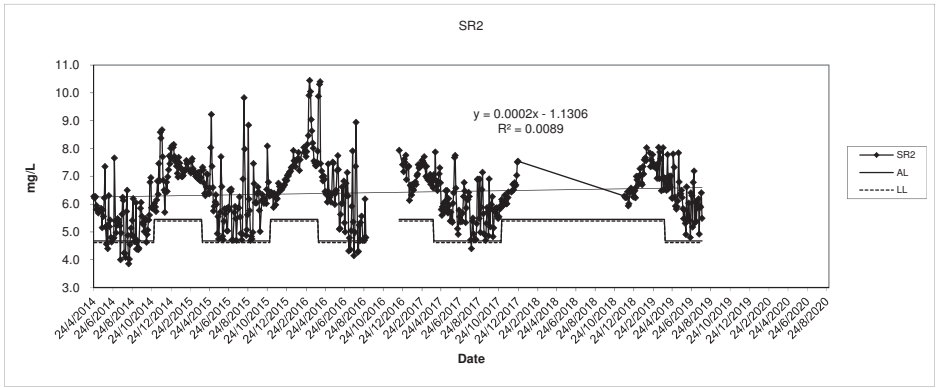


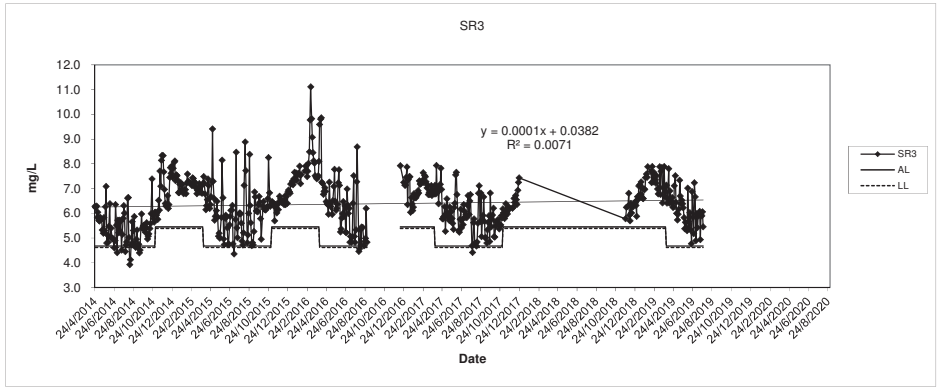




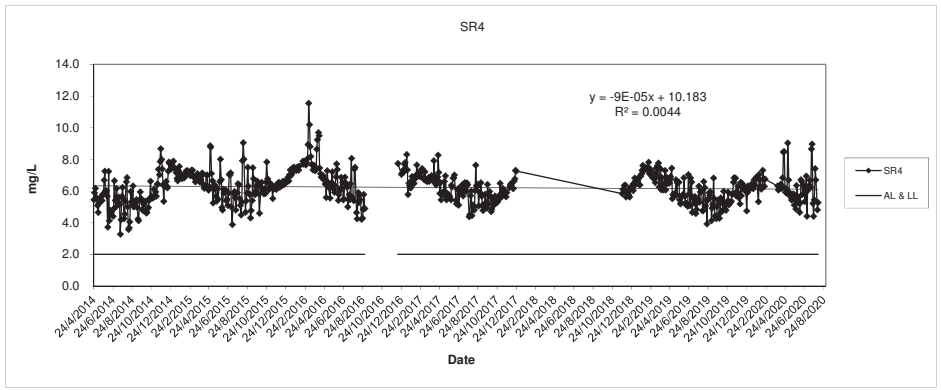
Dissolved Oxygen (Surface and Middle) at Mid-Flood Tide

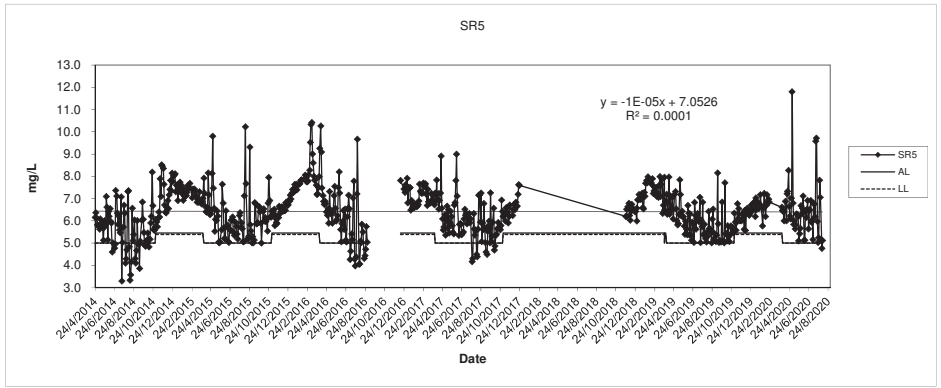


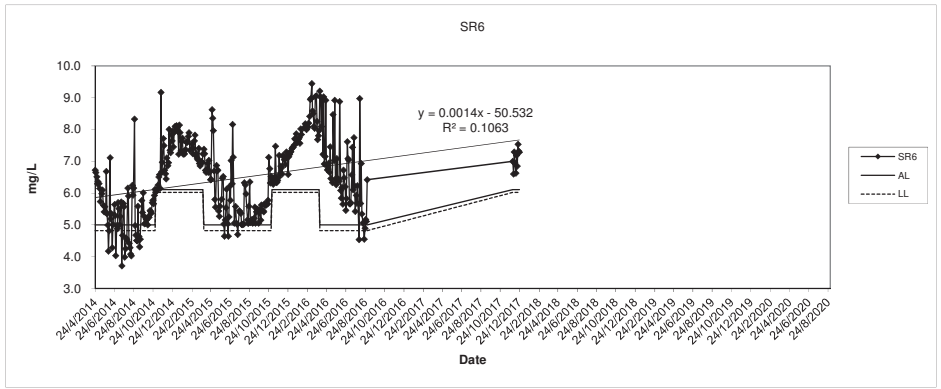




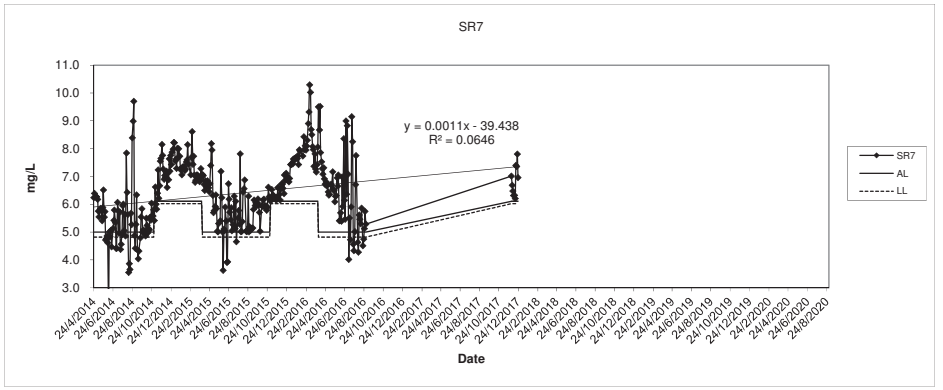
Dissolved Oxygen (Surface and Middle) at Mid-Flood Tide

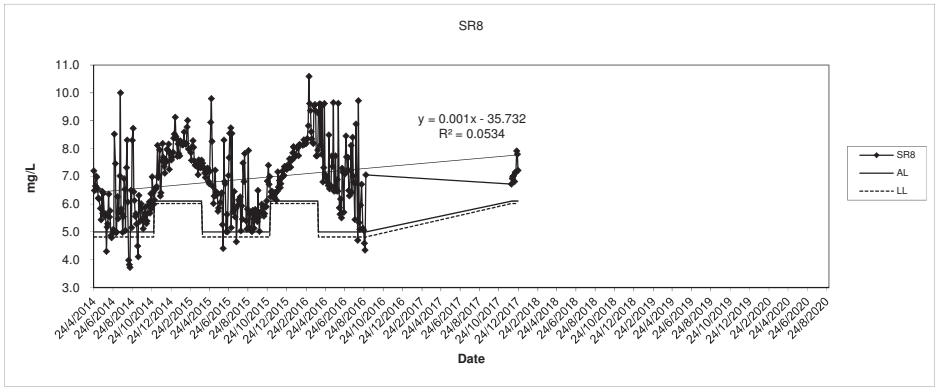


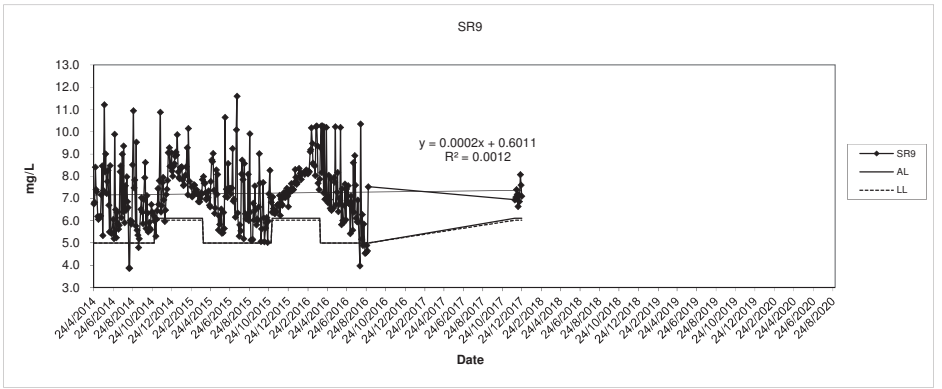




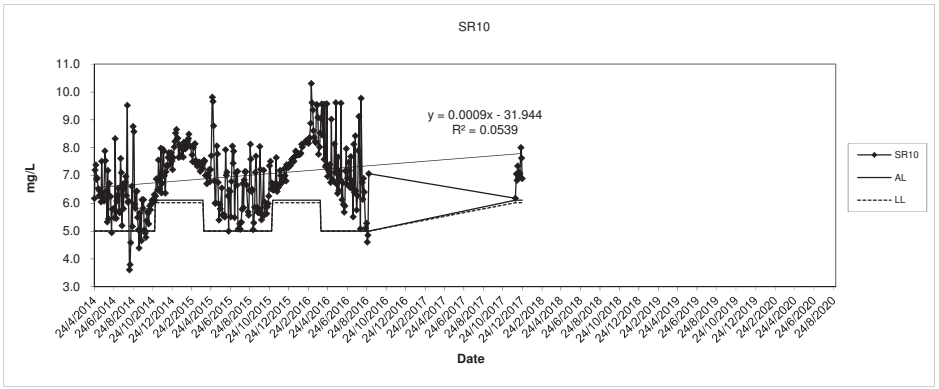
Dissolved Oxygen (Surface and Middle) at Mid-Flood Tide

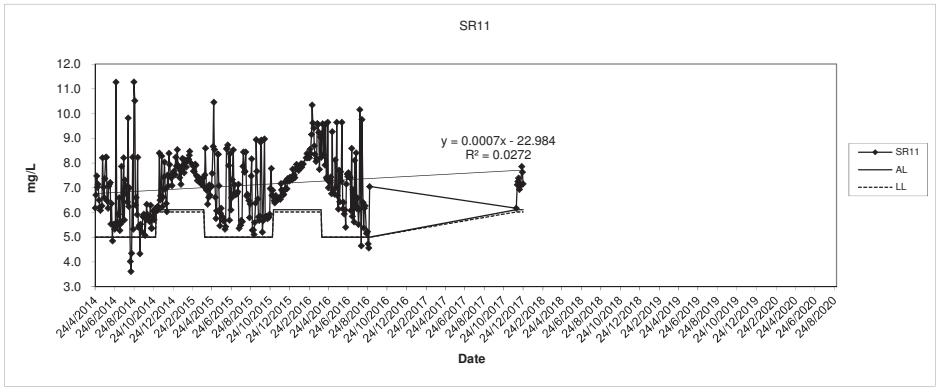


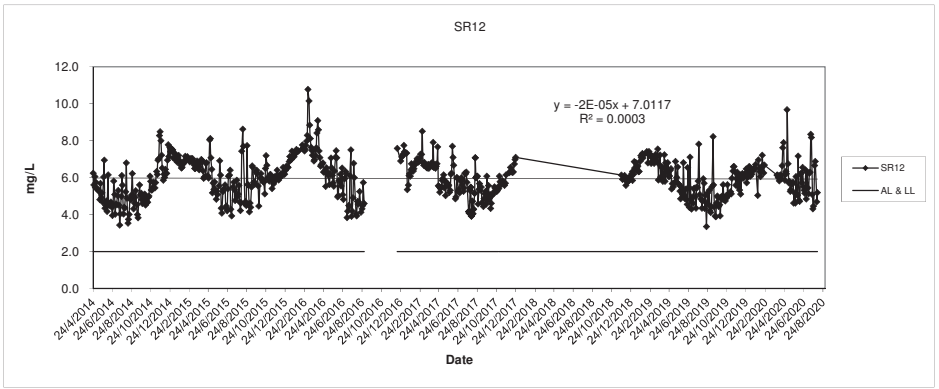




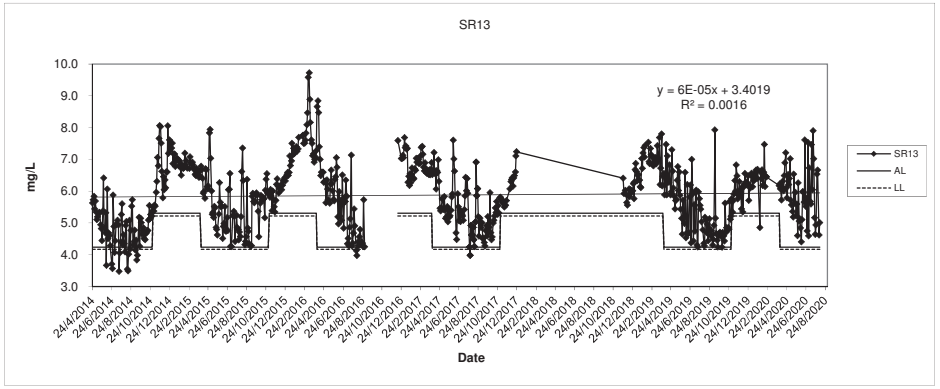
Dissolved Oxygen (Surface and Middle) at Mid-Flood Tide

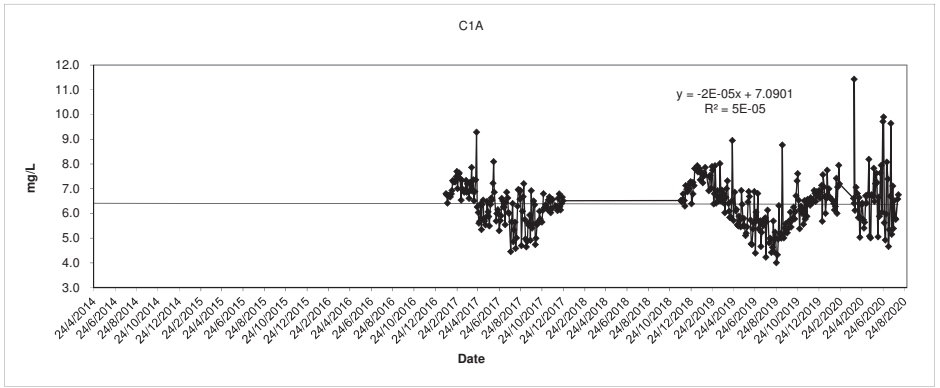


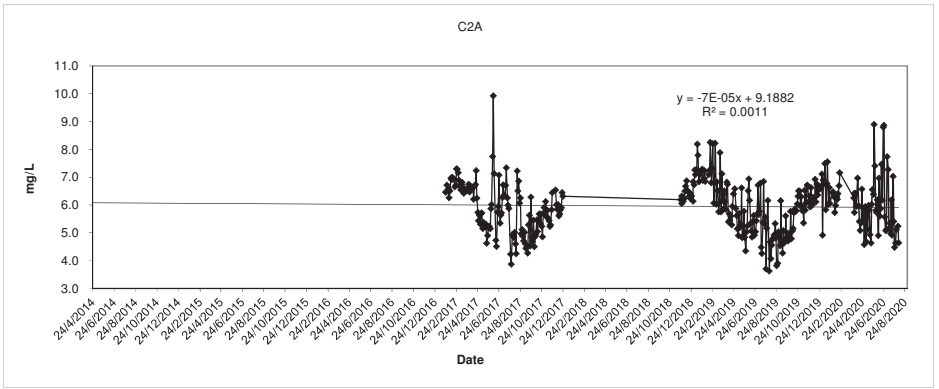




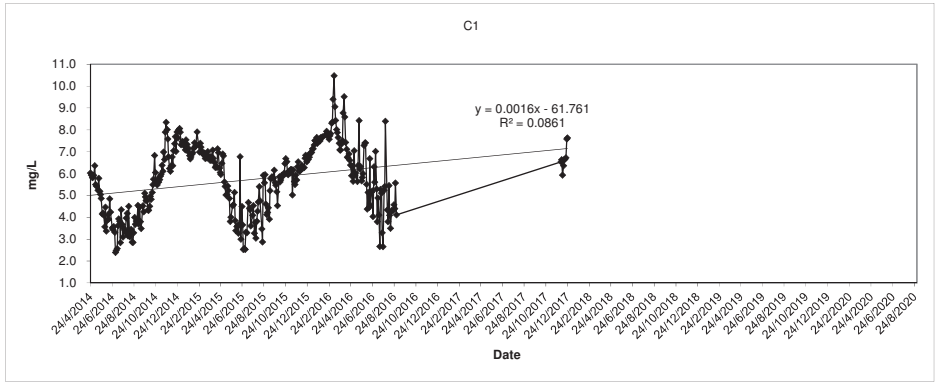
Dissolved Oxygen (Surface and Middle) at Mid-Flood Tide

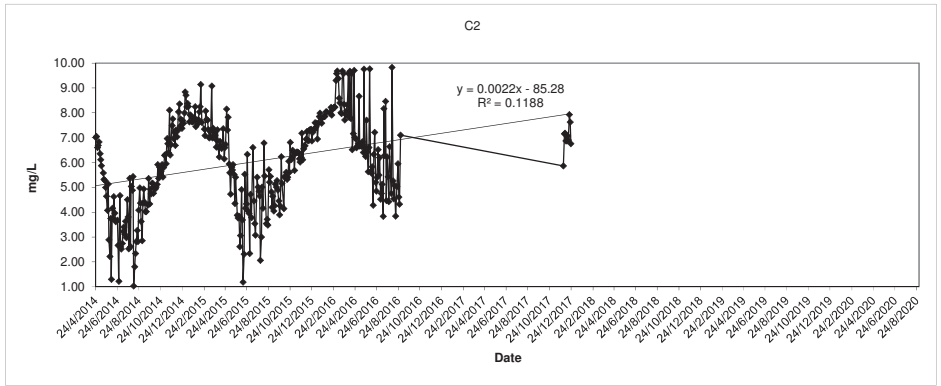


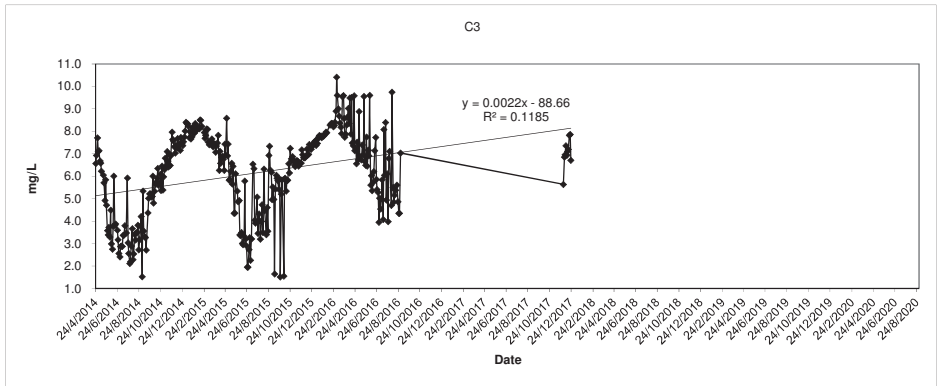




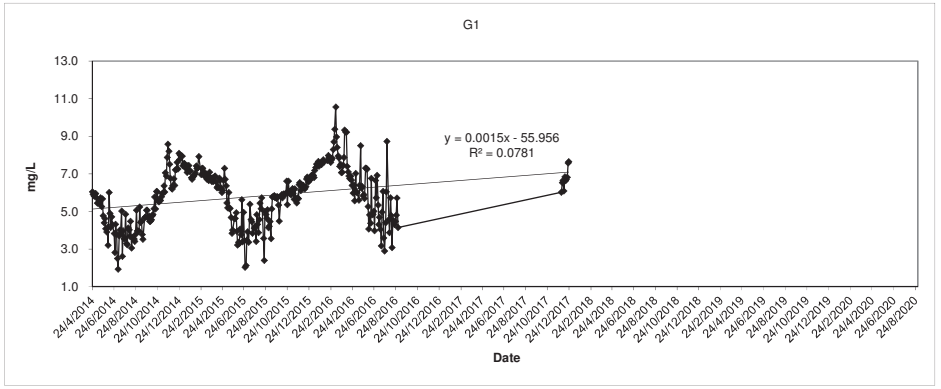
Dissolved Oxygen (Bottom) at Mid-Flood Tide

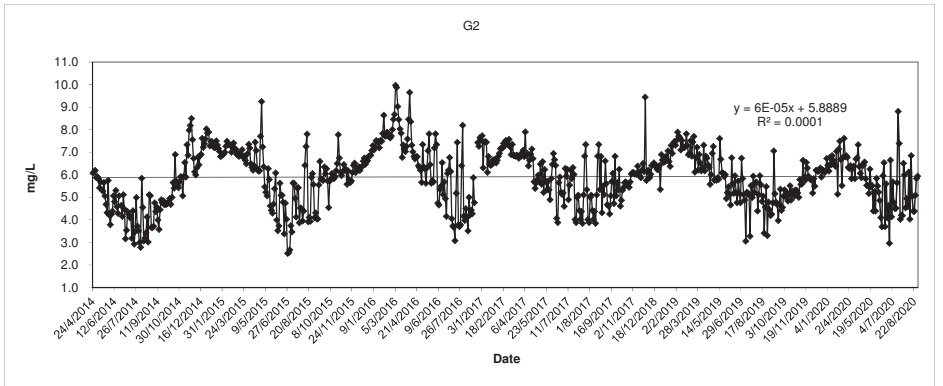


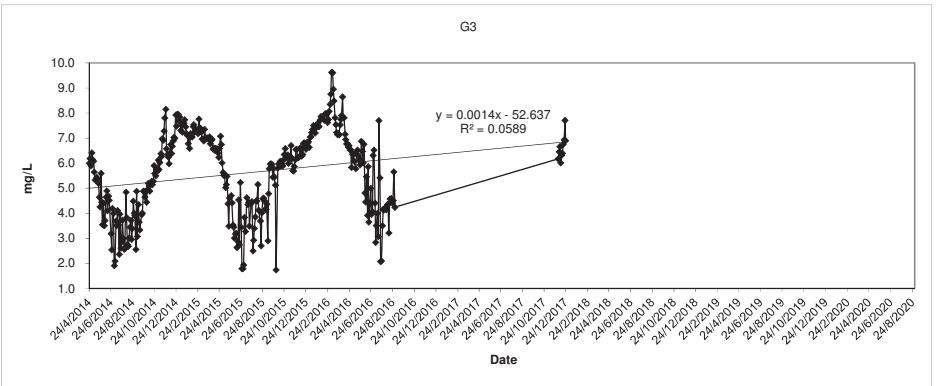




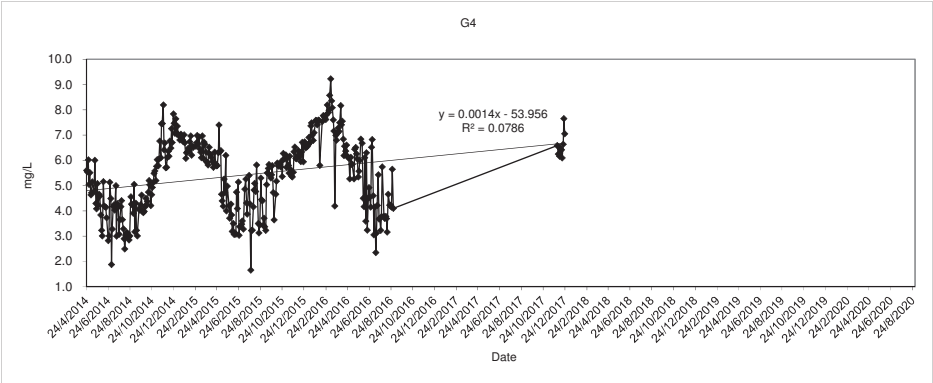
Dissolved Oxygen (Bottom) at Mid-Flood Tide

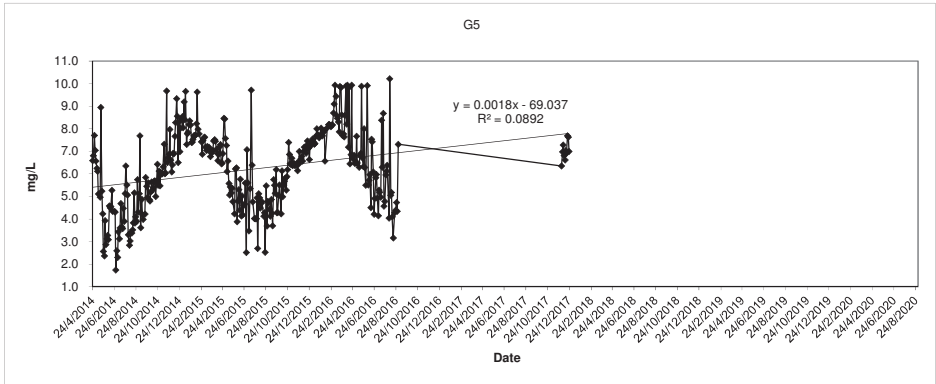


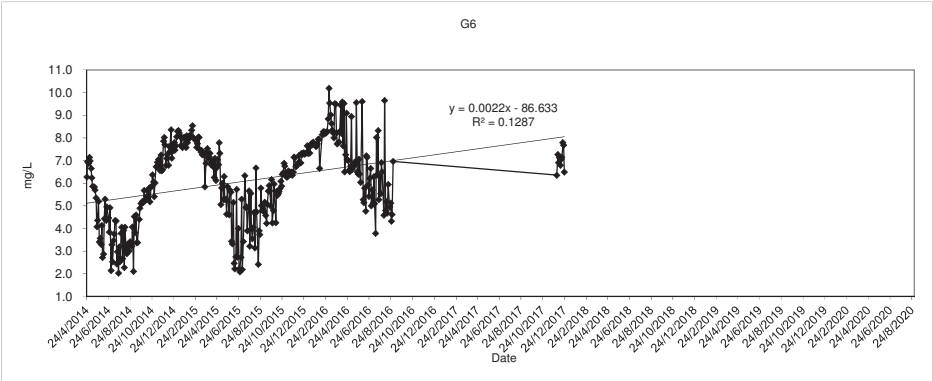




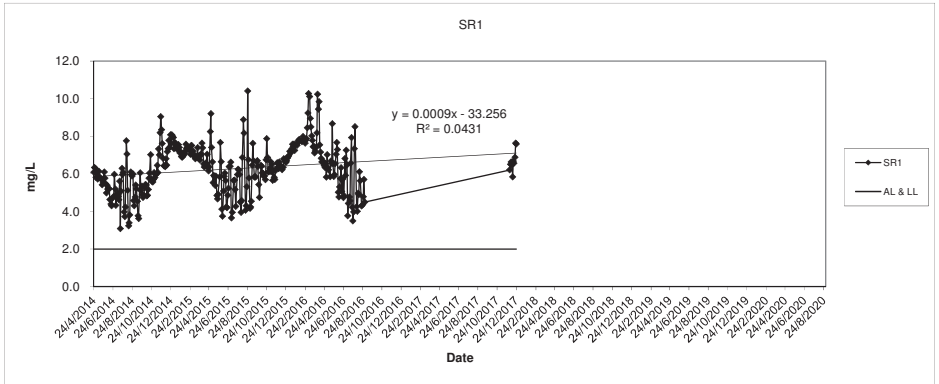
Dissolved Oxygen (Bottom) at Mid-Flood Tide

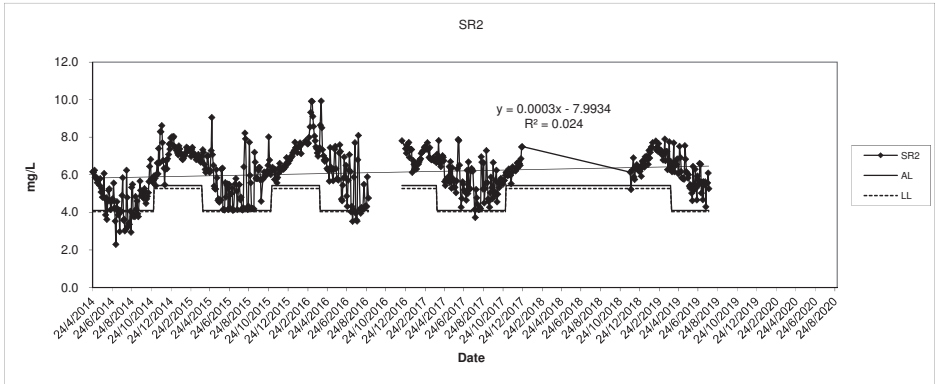


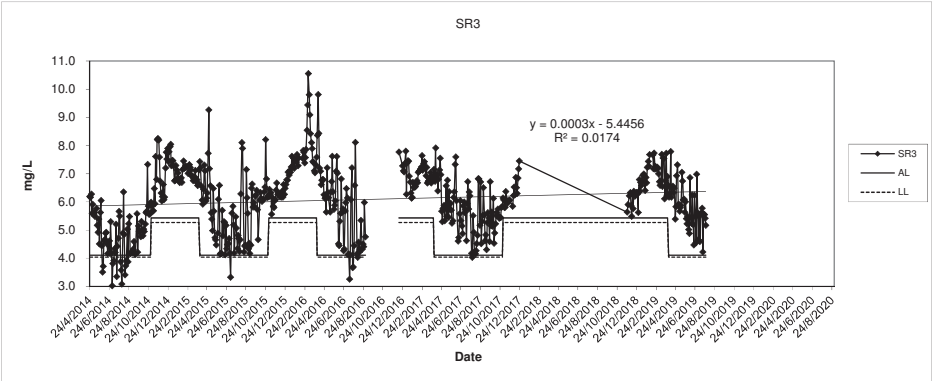




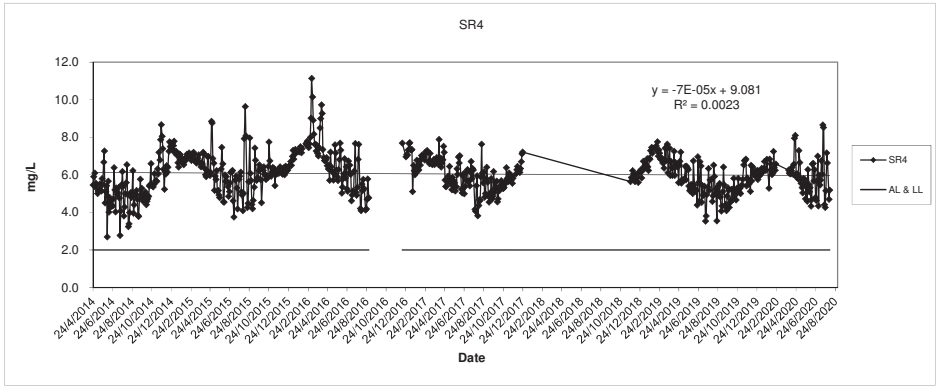
Dissolved Oxygen (Bottom) at Mid-Flood Tide

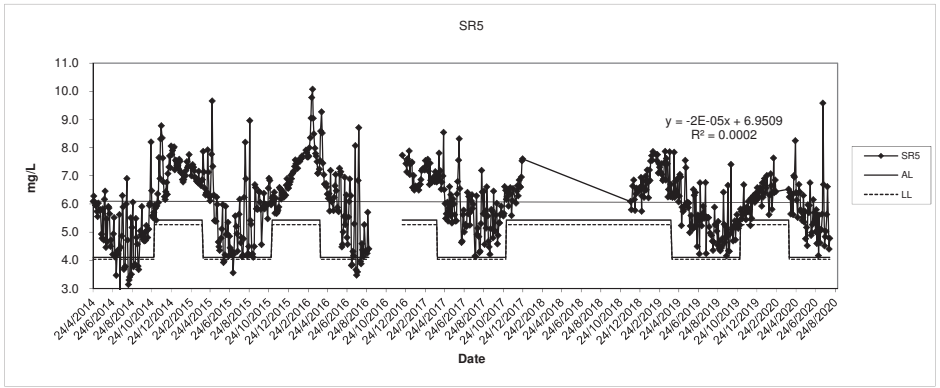


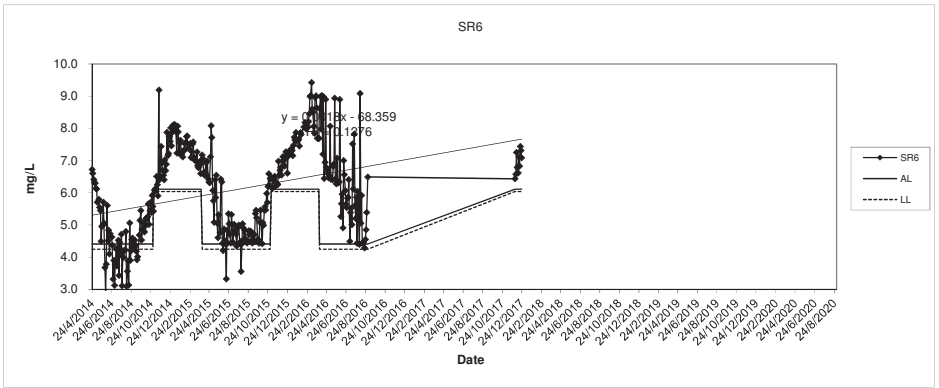




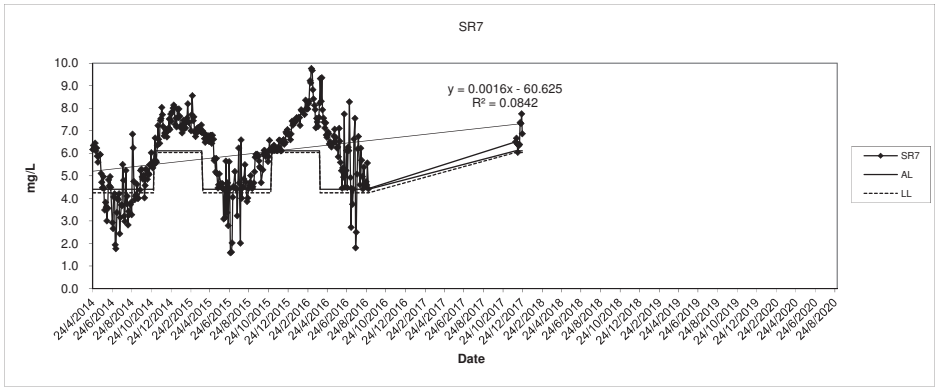
Dissolved Oxygen (Bottom) at Mid-Flood Tide

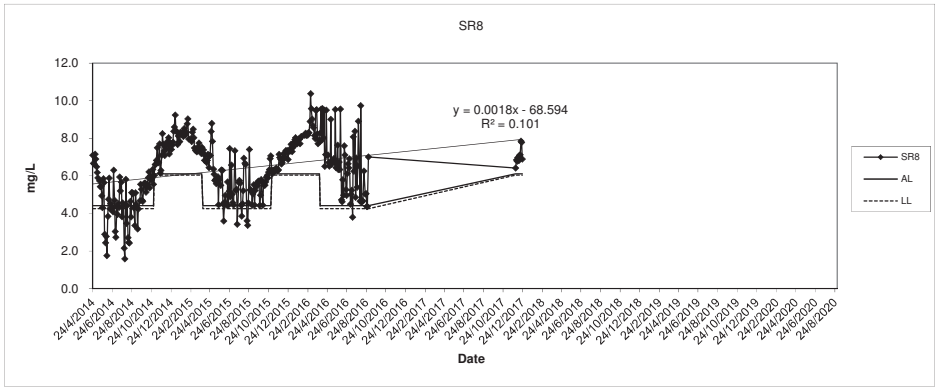


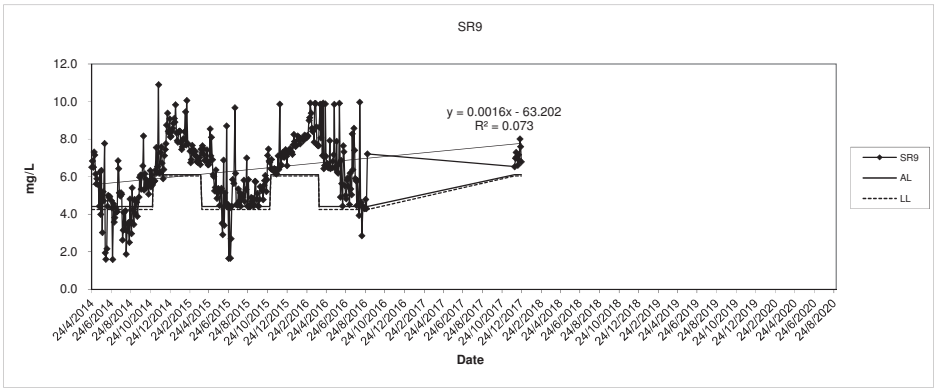




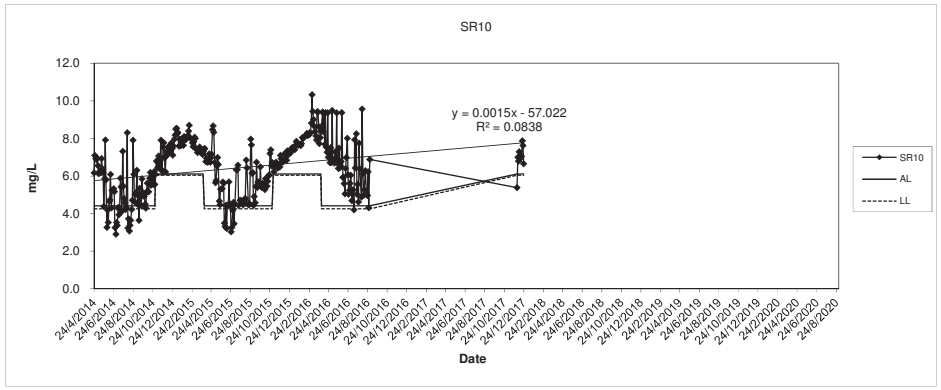
Dissolved Oxygen (Bottom) at Mid-Flood Tide

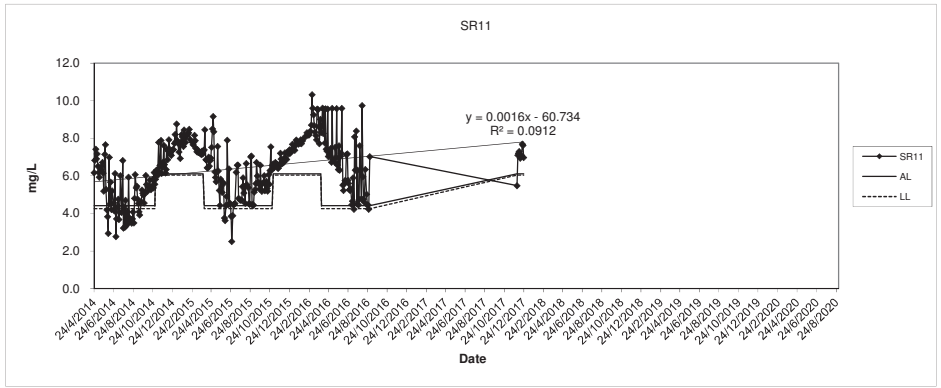


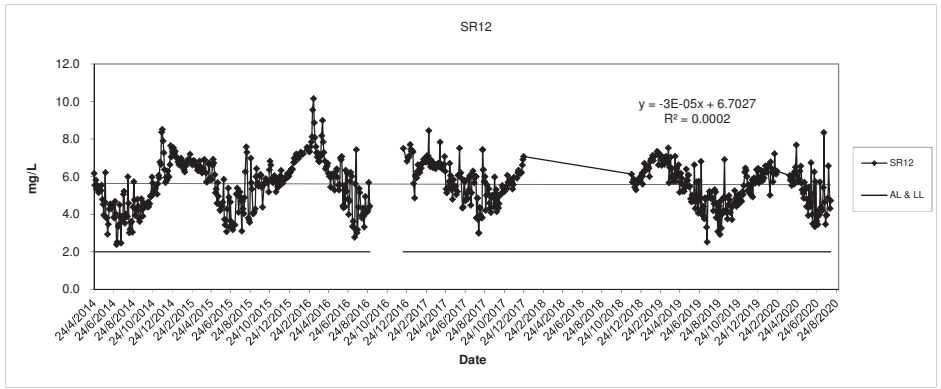




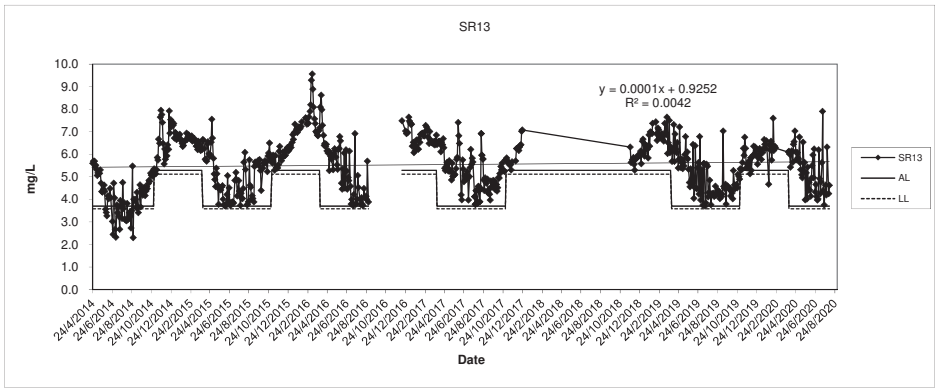
Dissolved Oxygen (Bottom) at Mid-Flood Tide

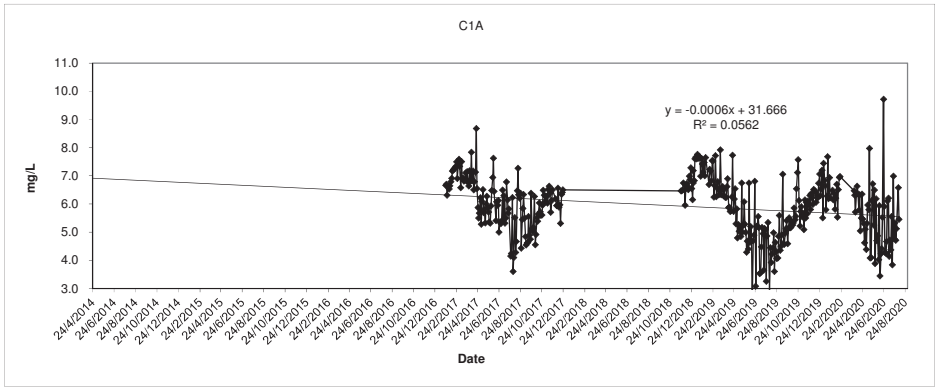


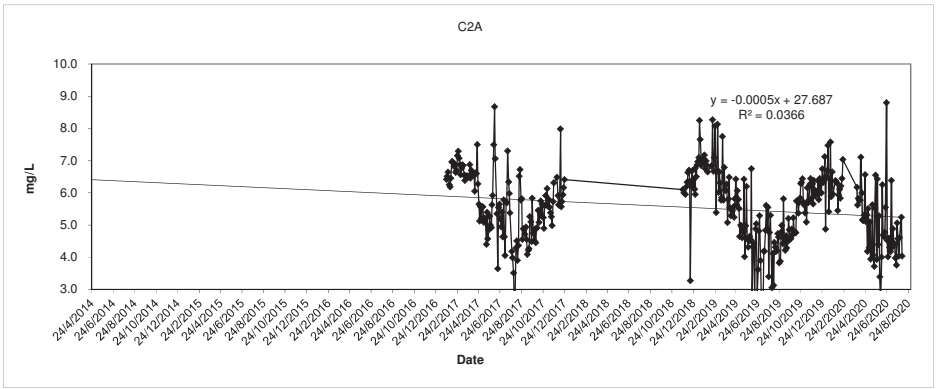




Dissolved Oxygen (Bottom) at Mid-Flood Tide

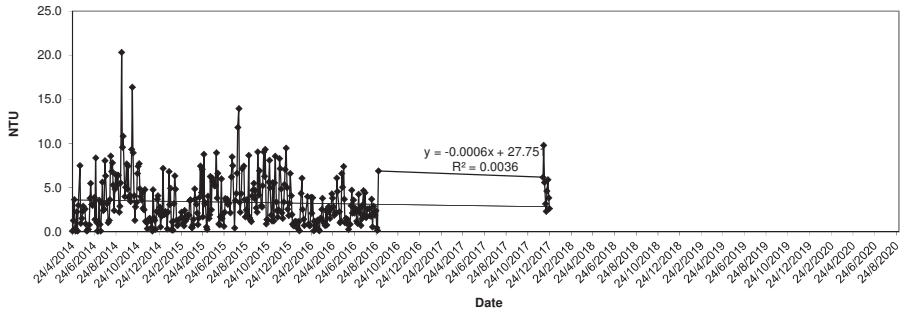




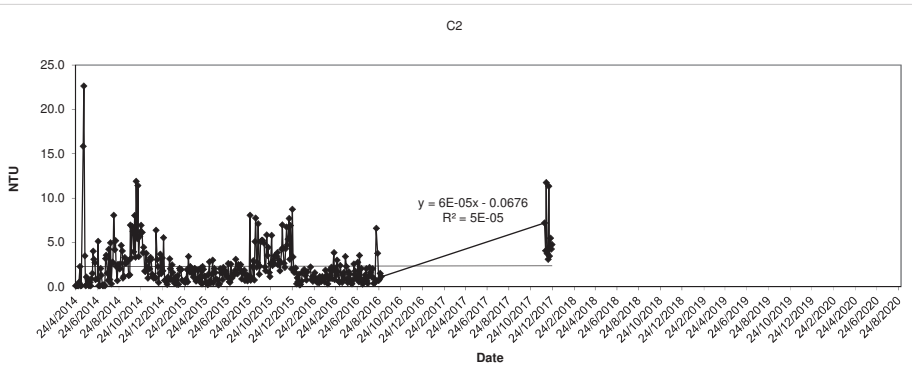


Turbidity (Depth average) at Mid-Flood Tide

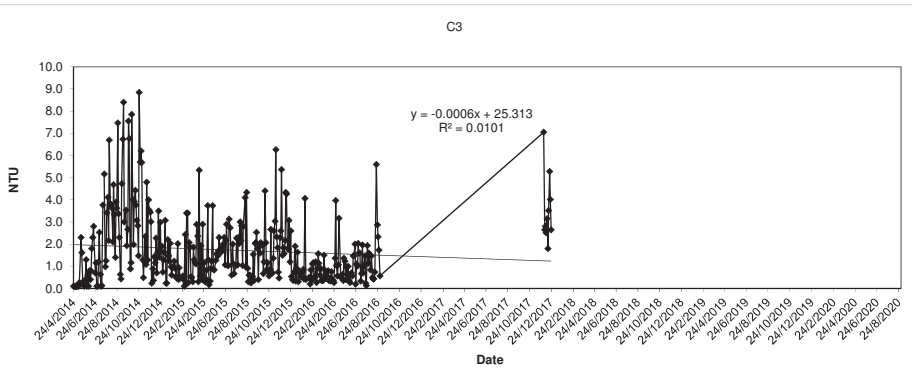
C1



C2

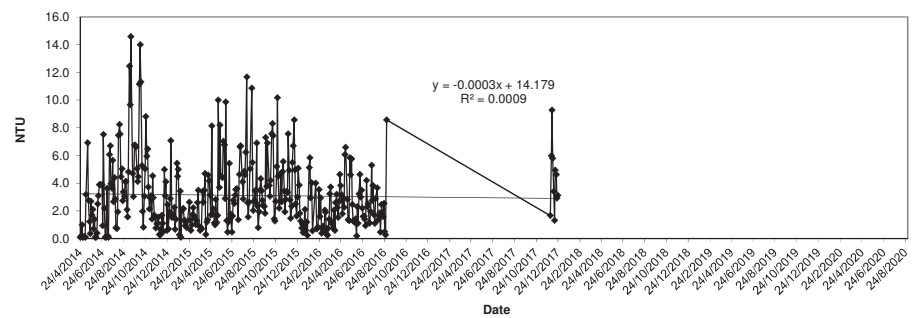


C3

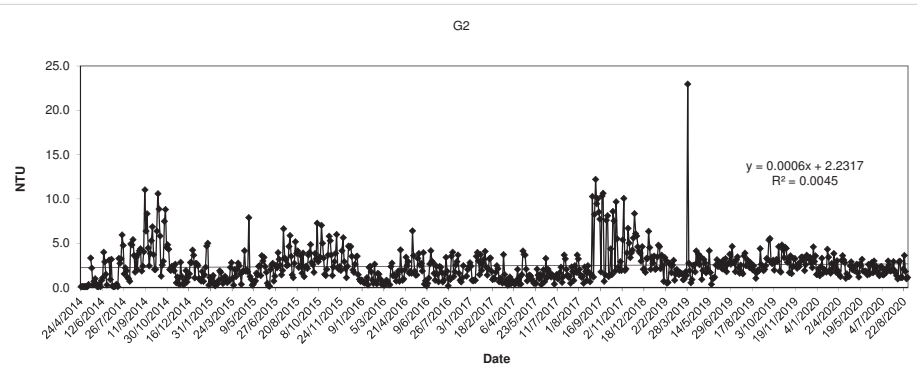


Turbidity (Depth average) at Mid-Flood Tide

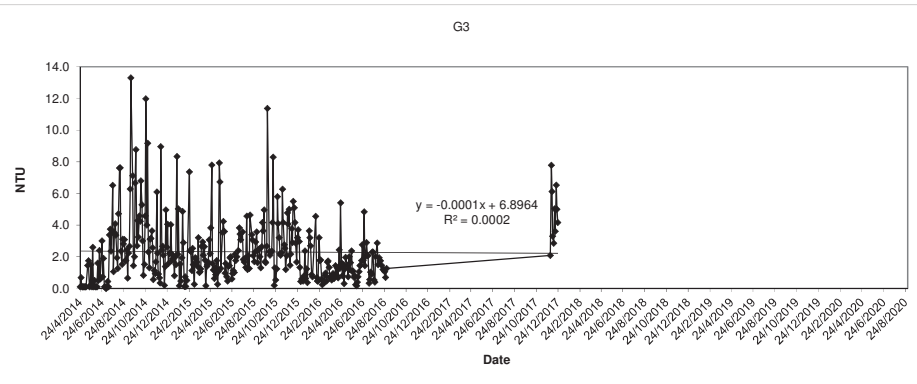
G1



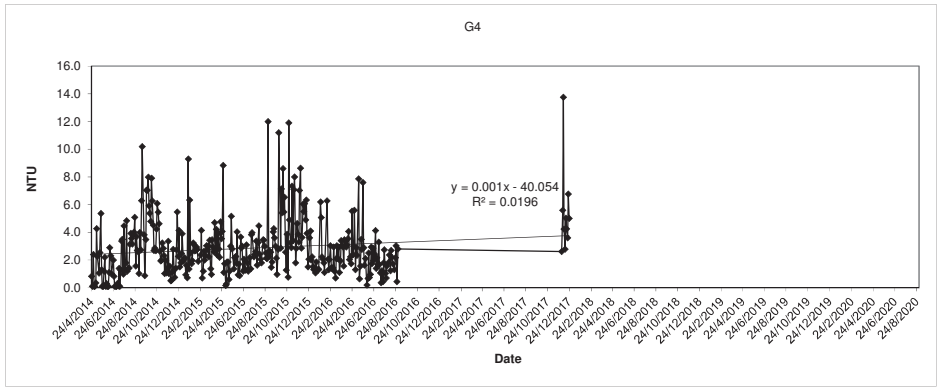
G2

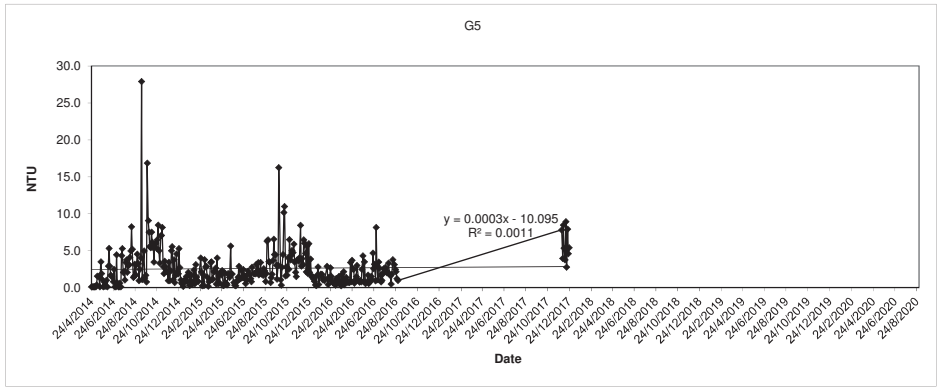


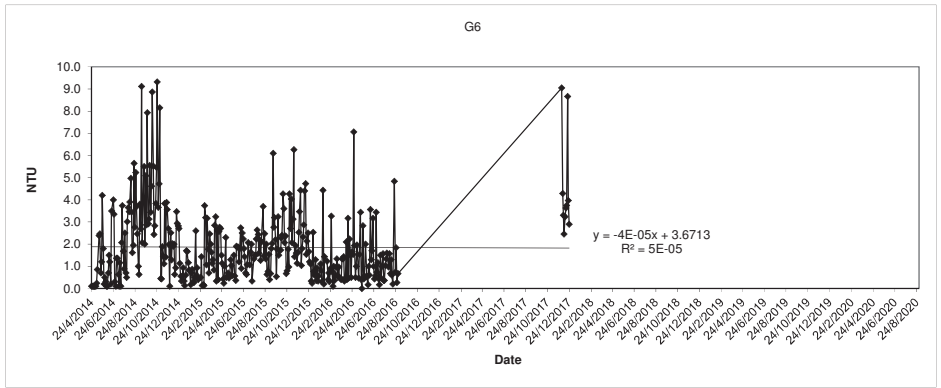
G3



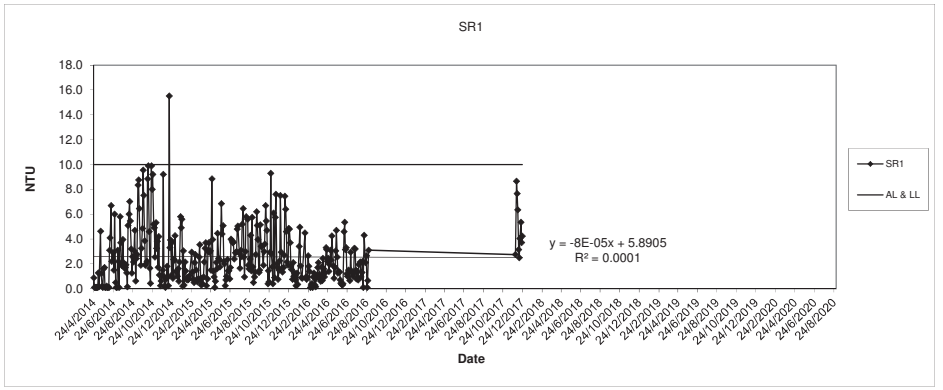
Turbidity (Depth average) at Mid-Flood Tide

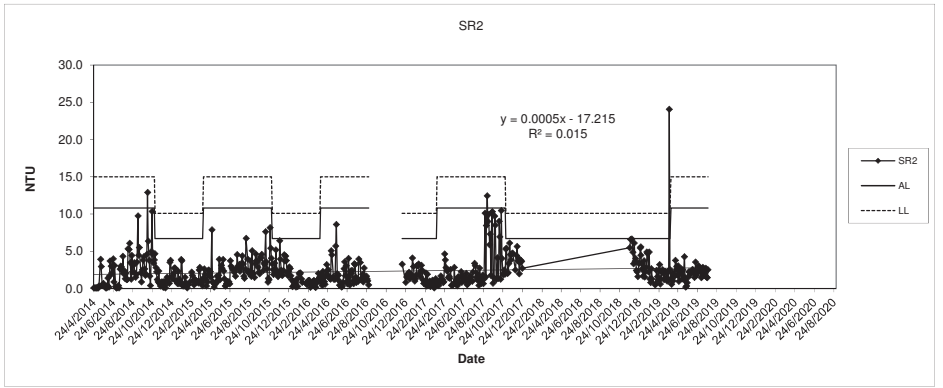


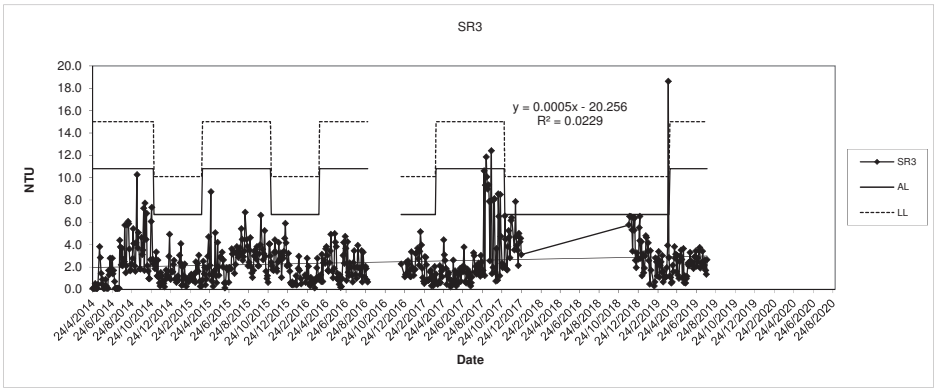




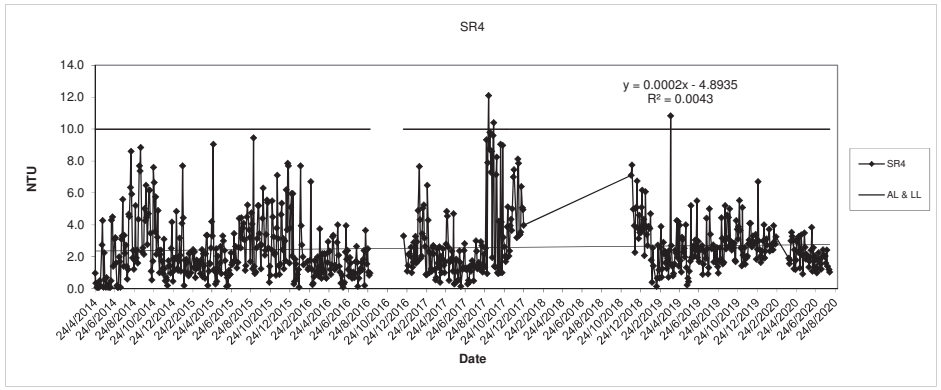
Turbidity (Depth average) at Mid-Flood Tide

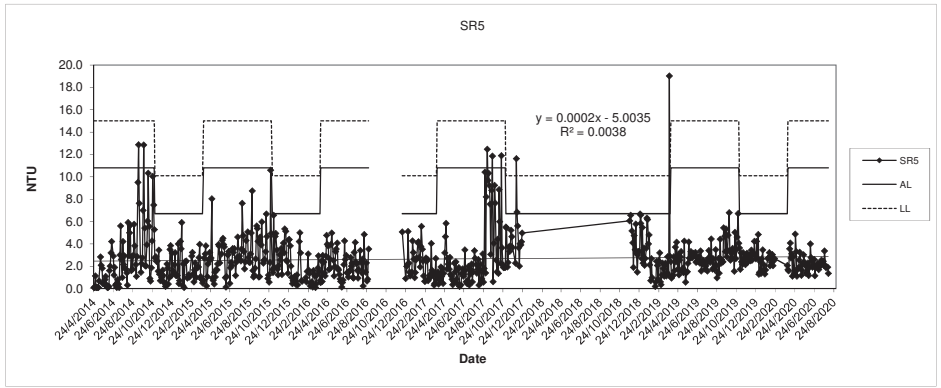


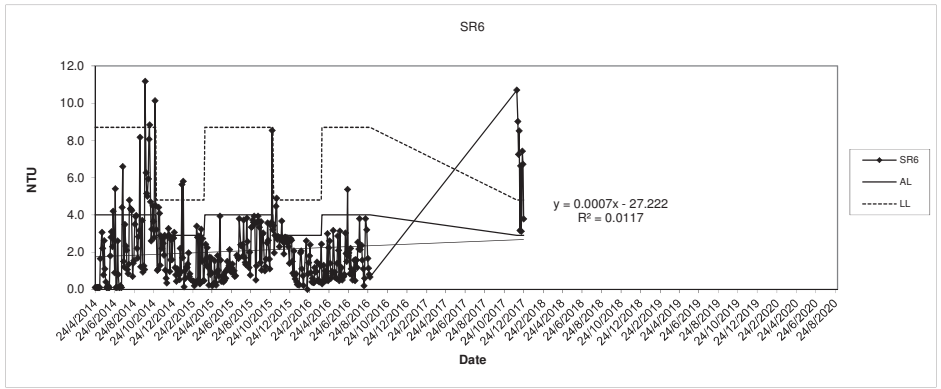




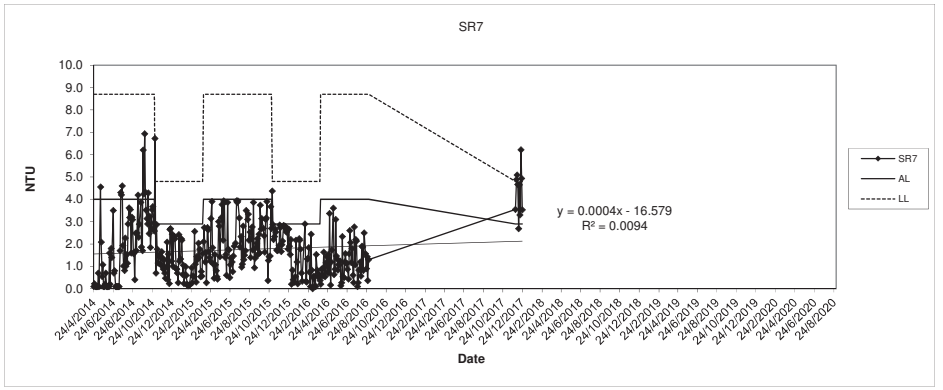
Turbidity (Depth average) at Mid-Flood Tide

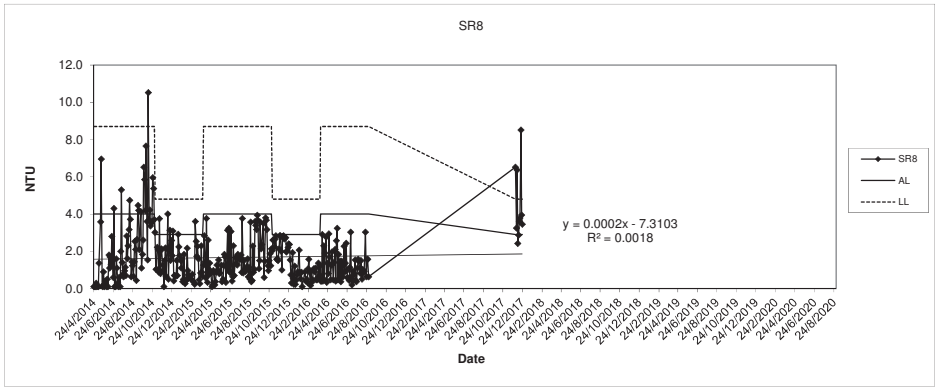


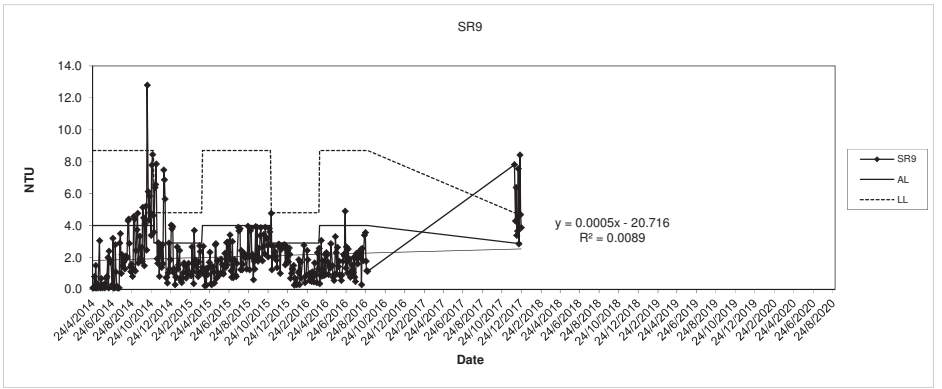




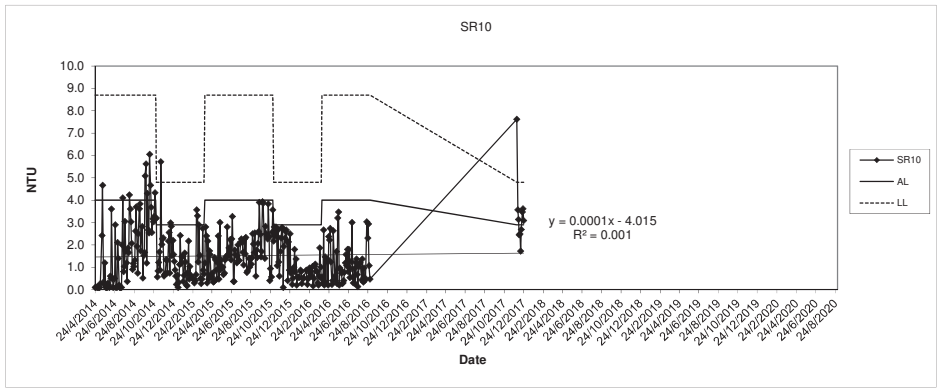
Turbidity (Depth average) at Mid-Flood Tide

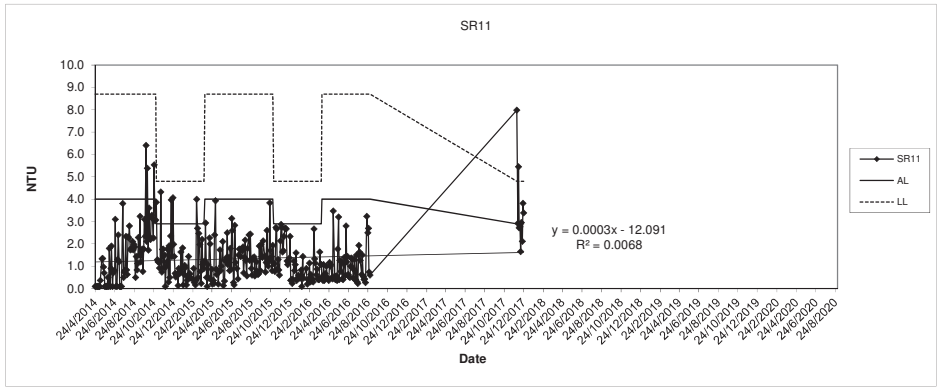


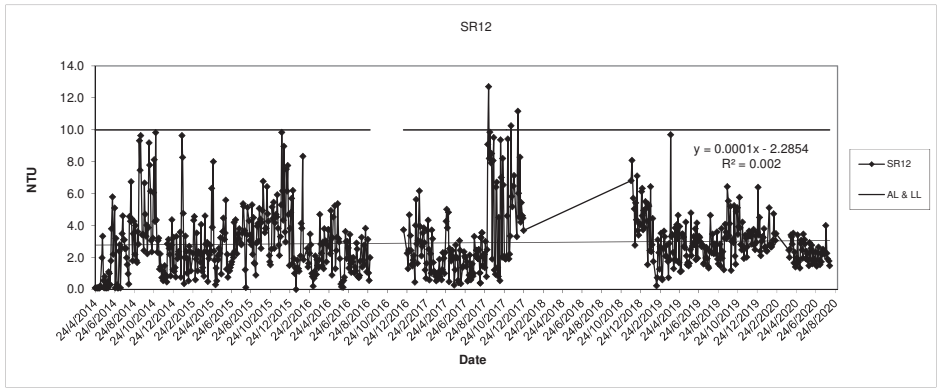




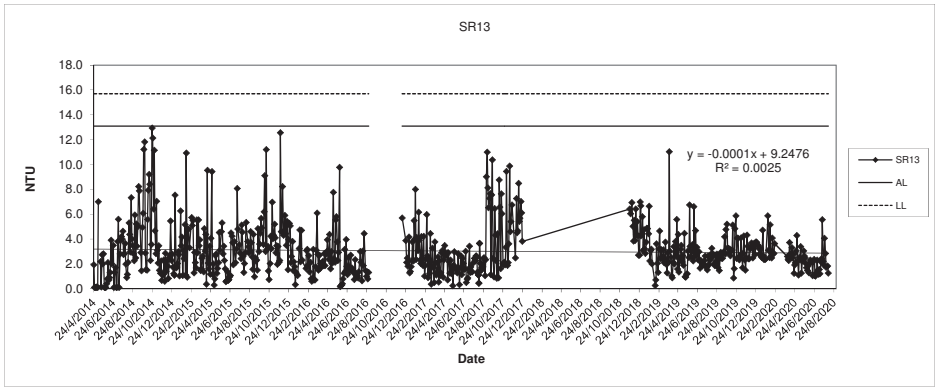
Turbidity (Depth average) at Mid-Flood Tide

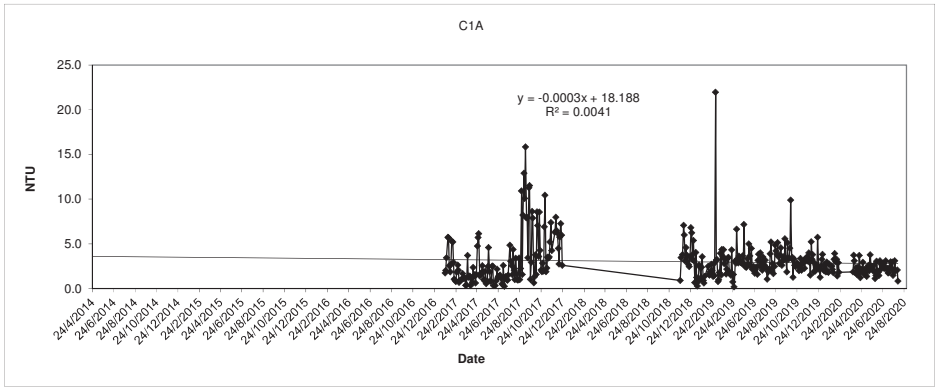


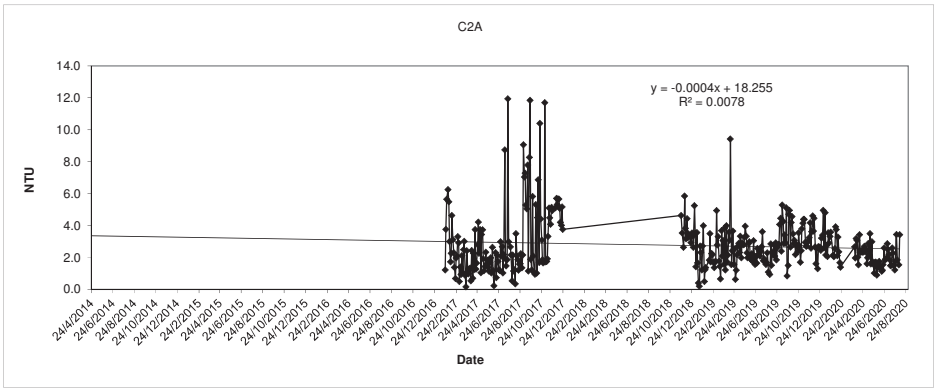




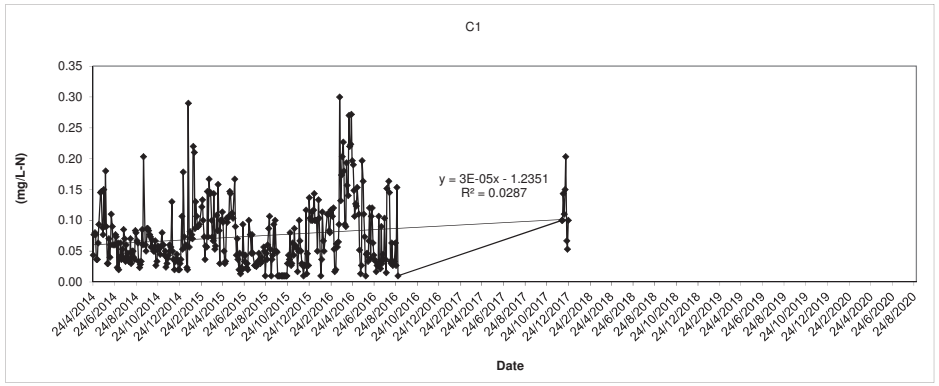
Turbidity (Depth average) at Mid-Flood Tide

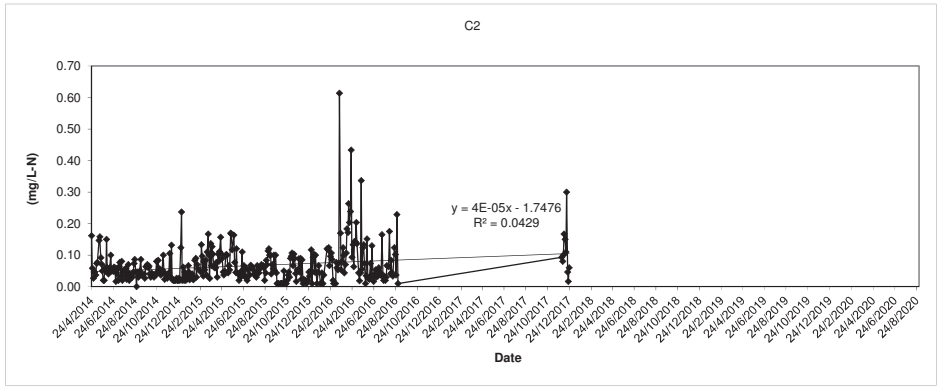


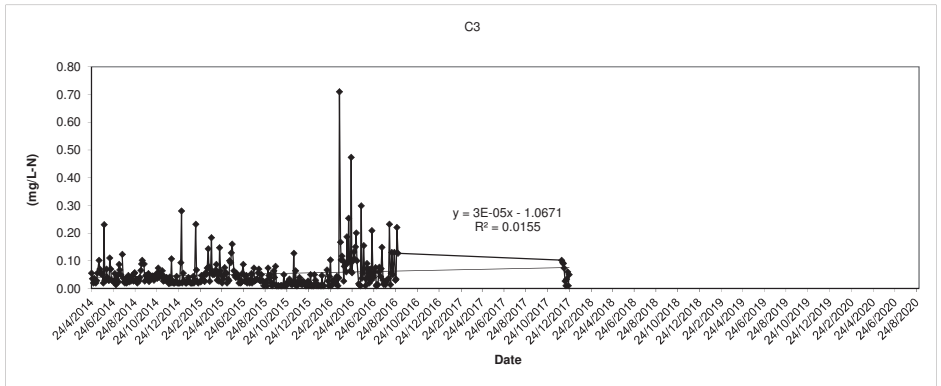




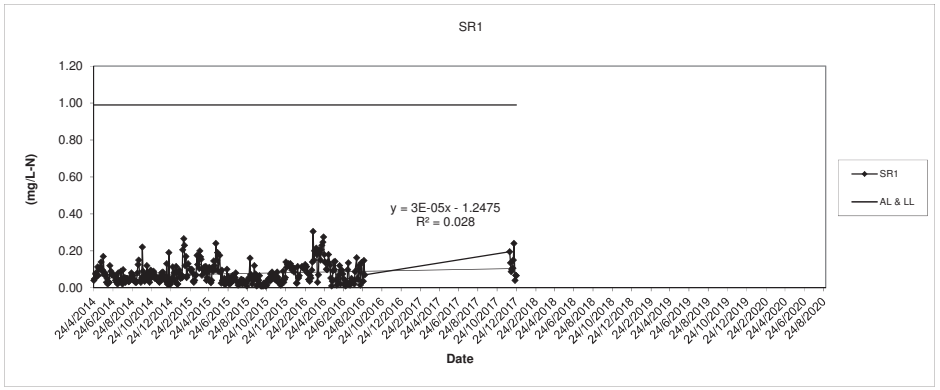
In-situ Ammonia (Depth average) at Mid-Flood Tide

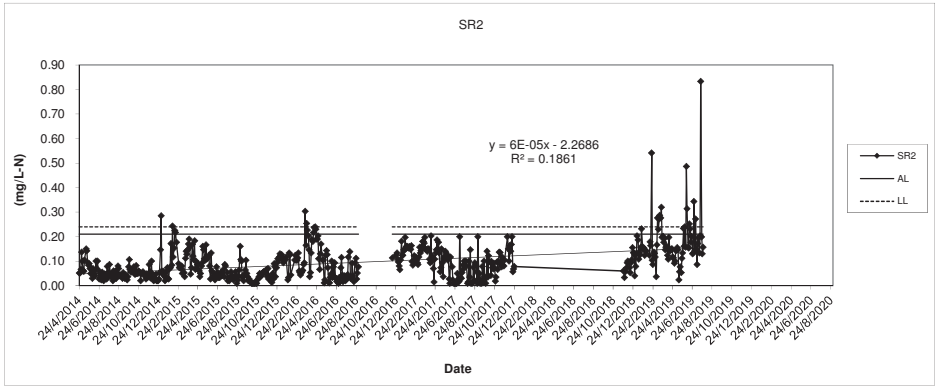


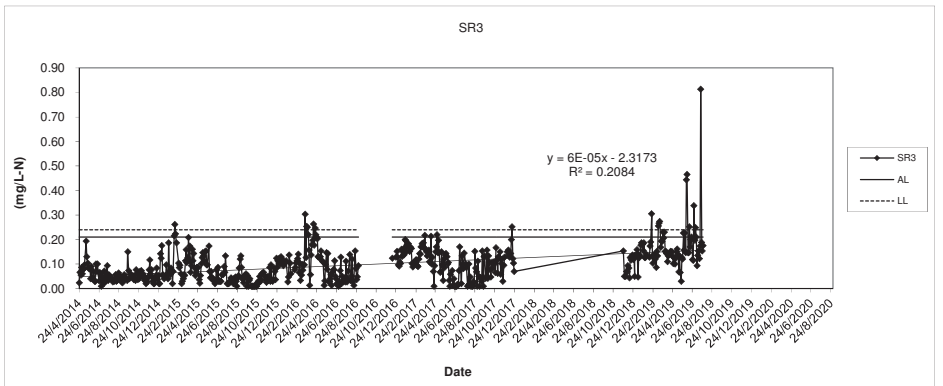




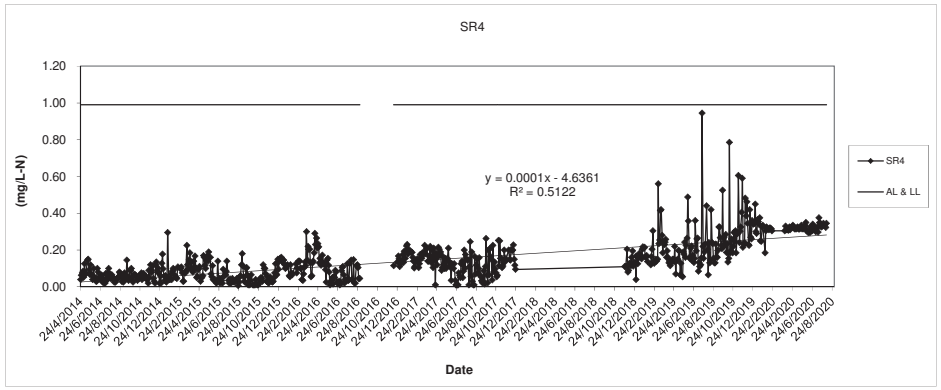
In-situ Ammonia (Depth average) at Mid-Flood Tide

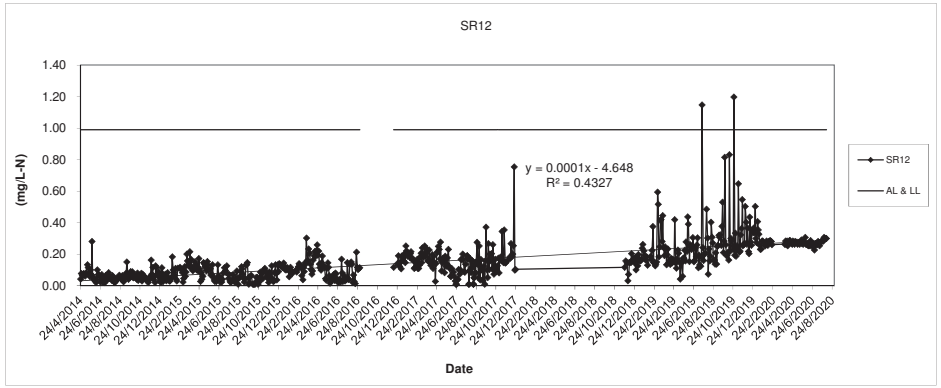


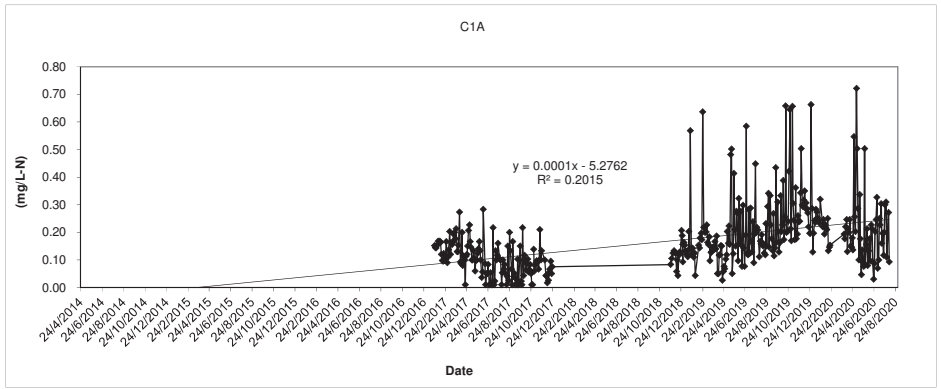




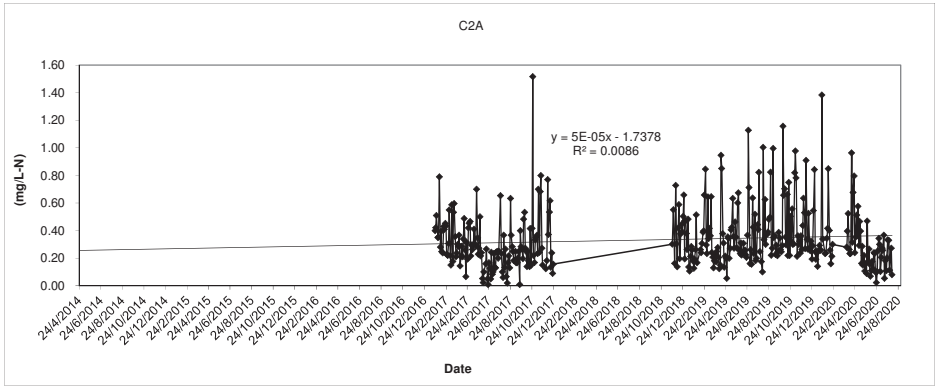
In-situ Ammonia (Depth average) at Mid-Flood Tide





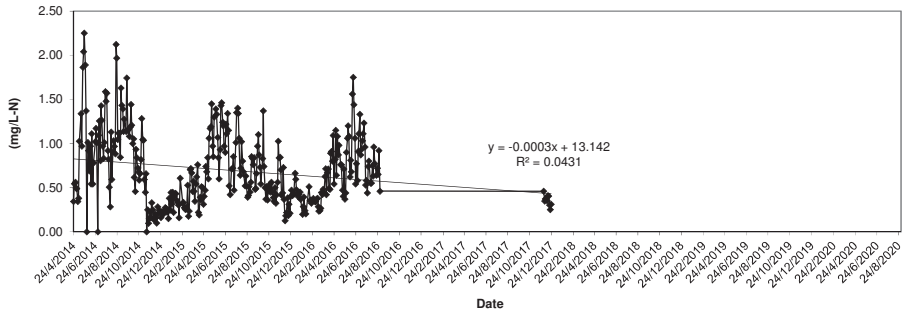


In-situ Ammonia (Depth average) at Mid-Flood Tide

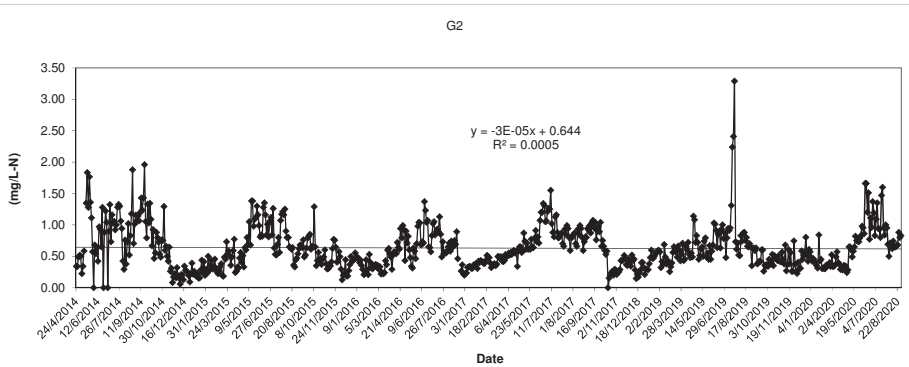


In-situ TIN (Depth average) at Mid-Flood Tide

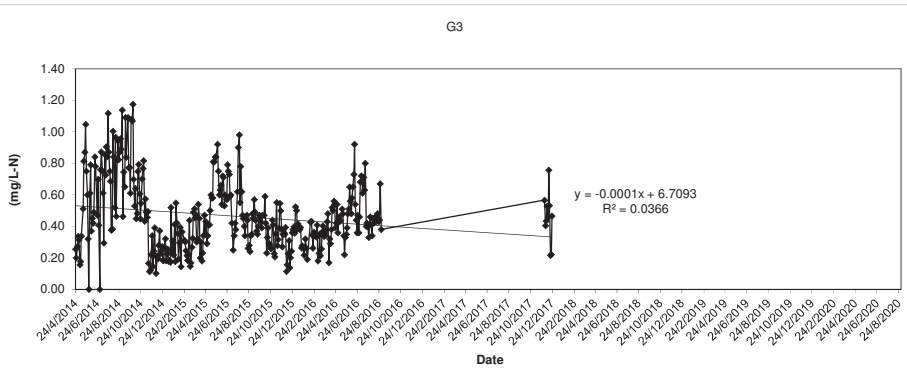
G1



G2

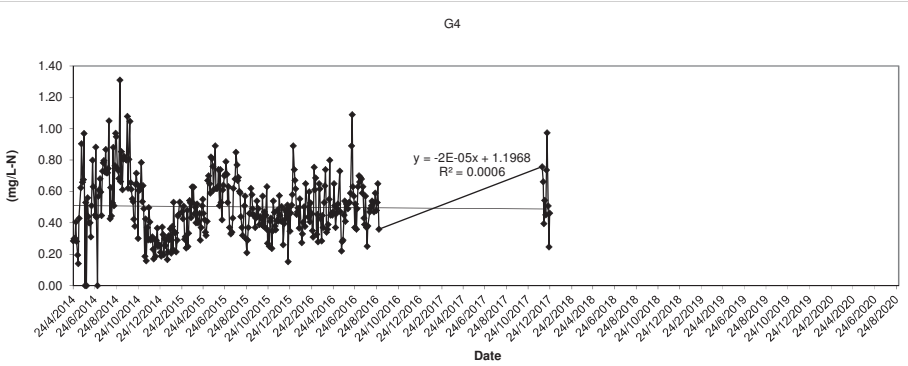


G3

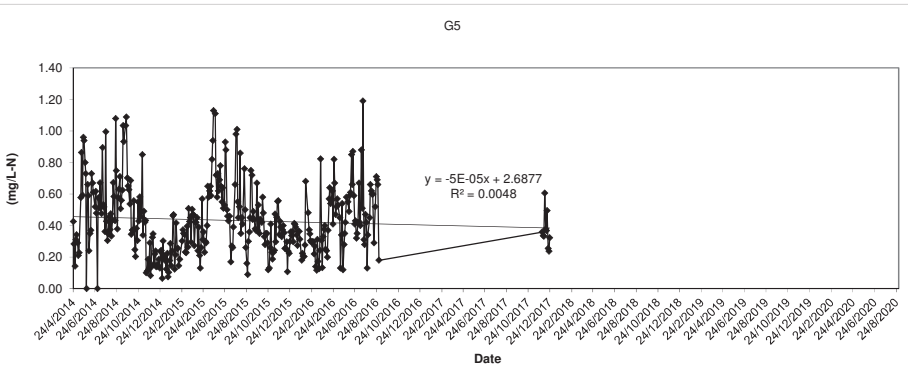


In-situ TIN (Depth average) at Mid-Flood Tide

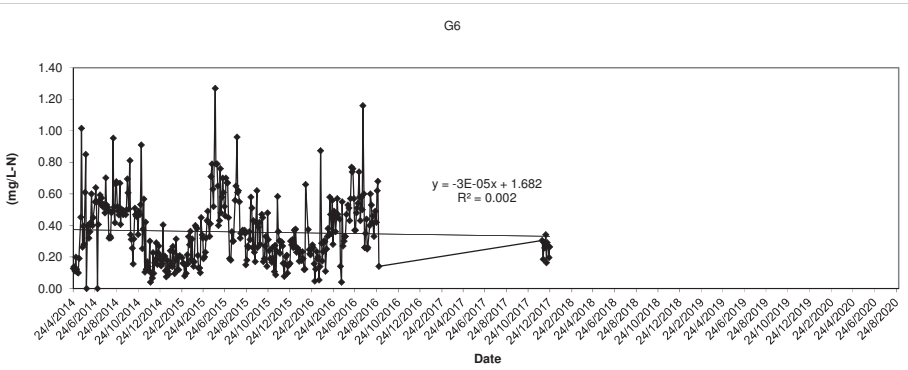
G4



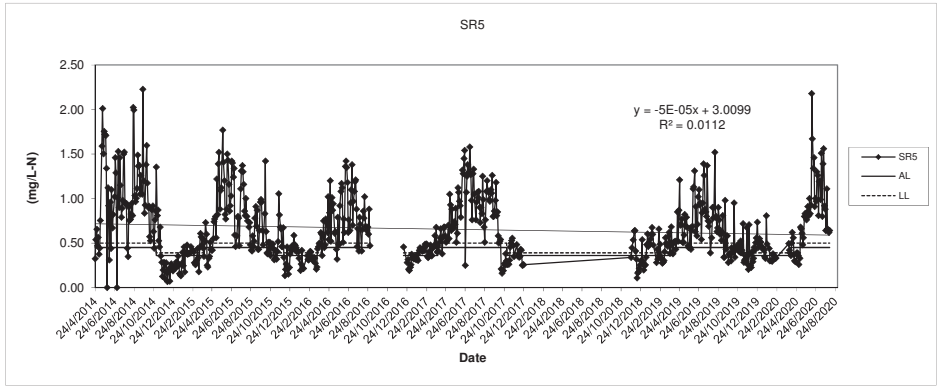
G5

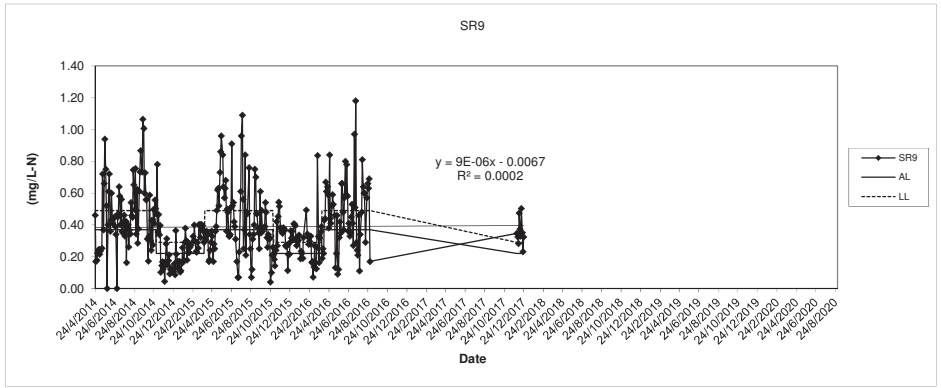


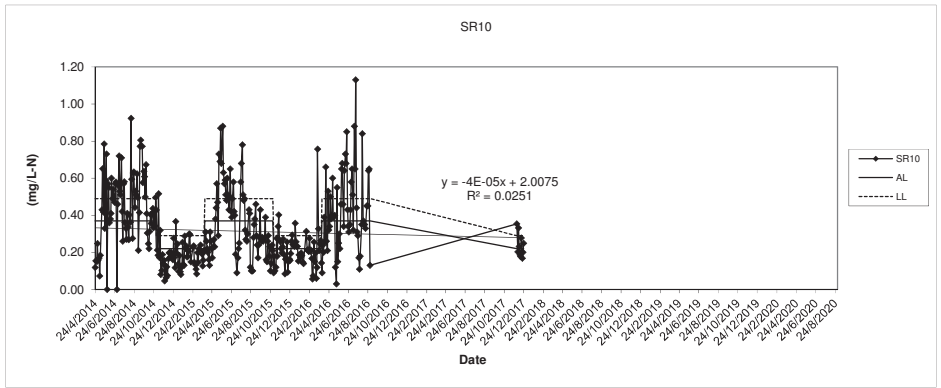
G6



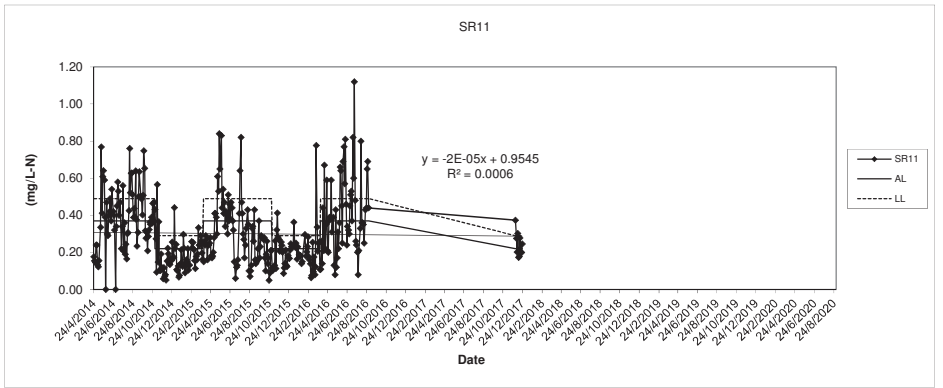
In-situ TIN (Depth average) at Mid-Flood Tide

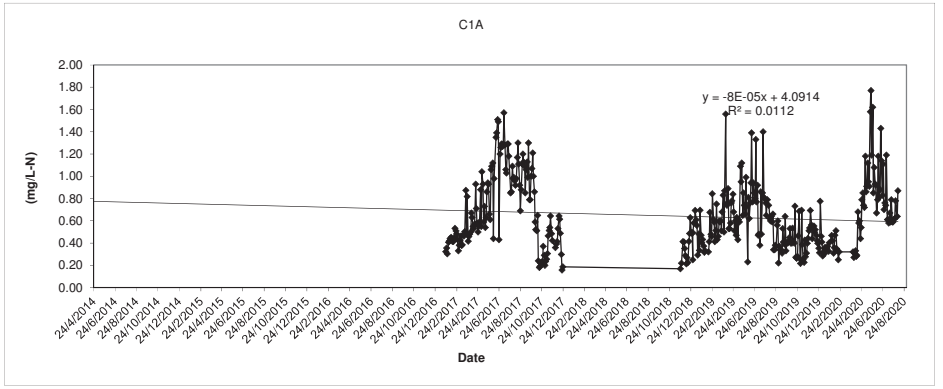


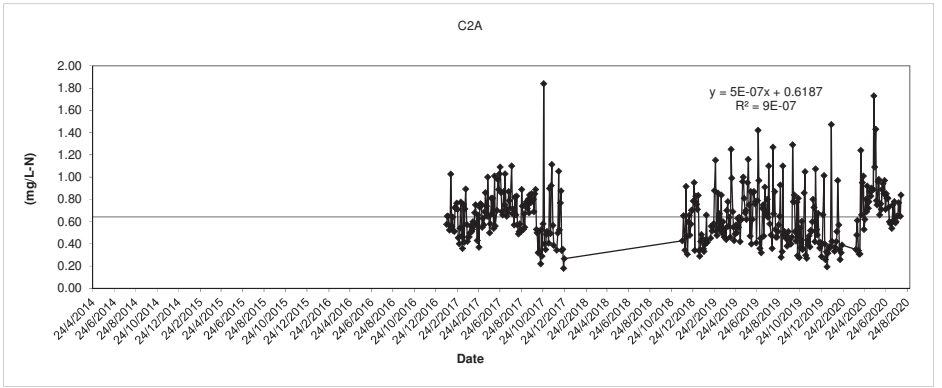




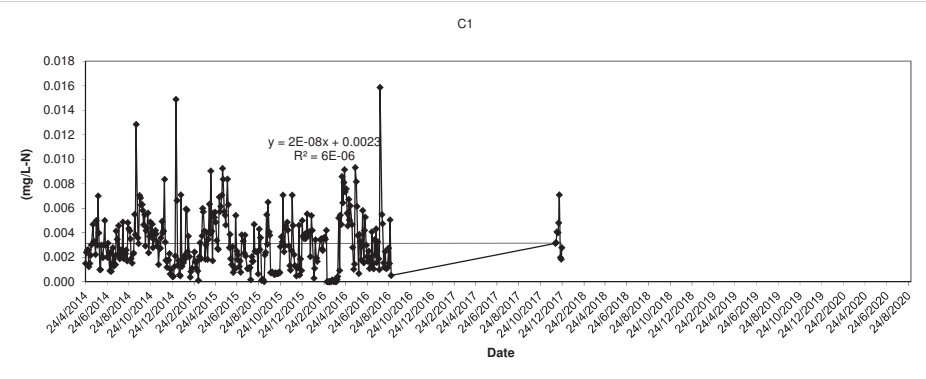
In-situ TIN (Depth average) at Mid-Flood Tide

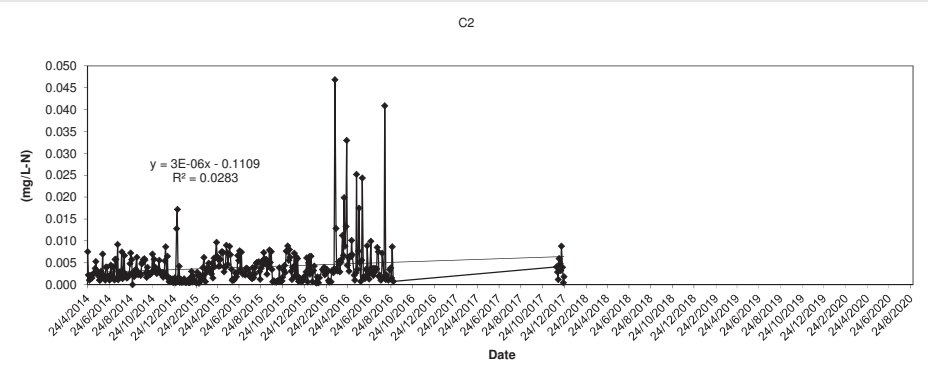


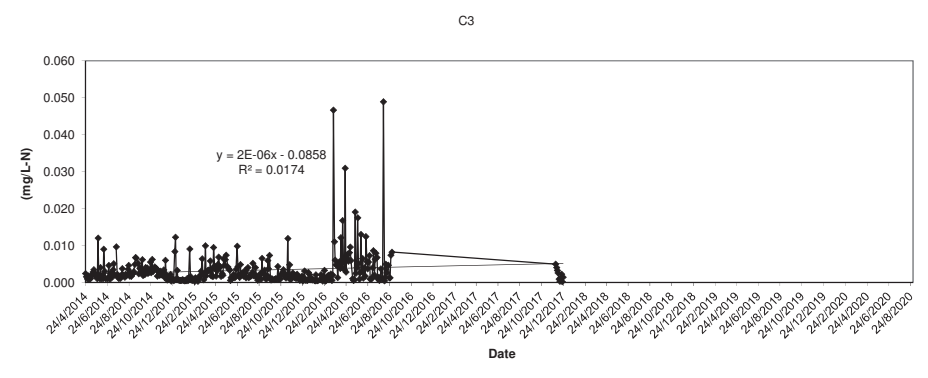




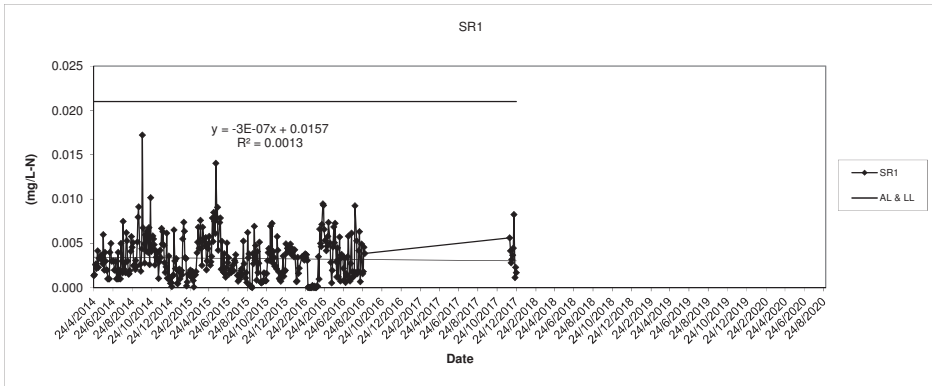
In-situ UIA (Depth average) at Mid-Flood Tide

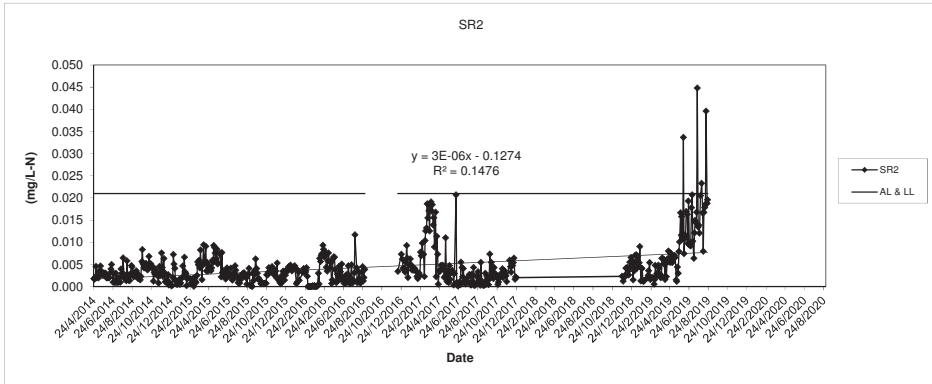


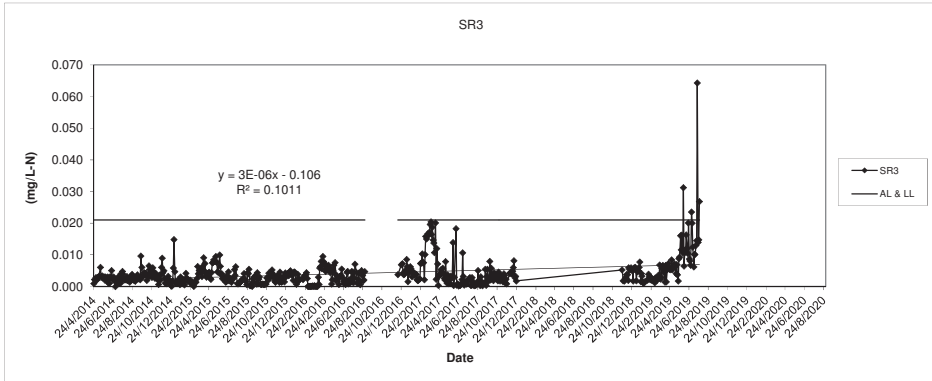




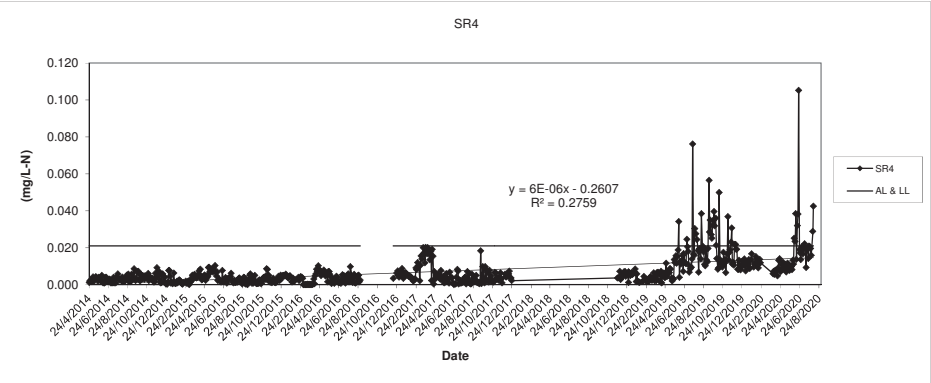
In-situ UIA (Depth average) at Mid-Flood Tide

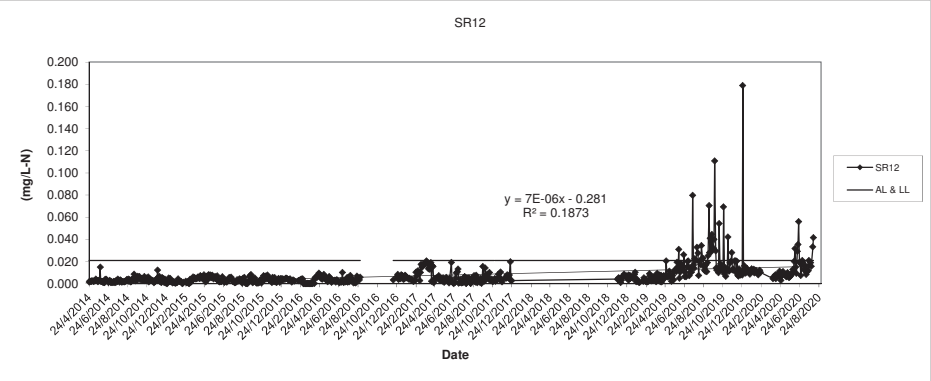


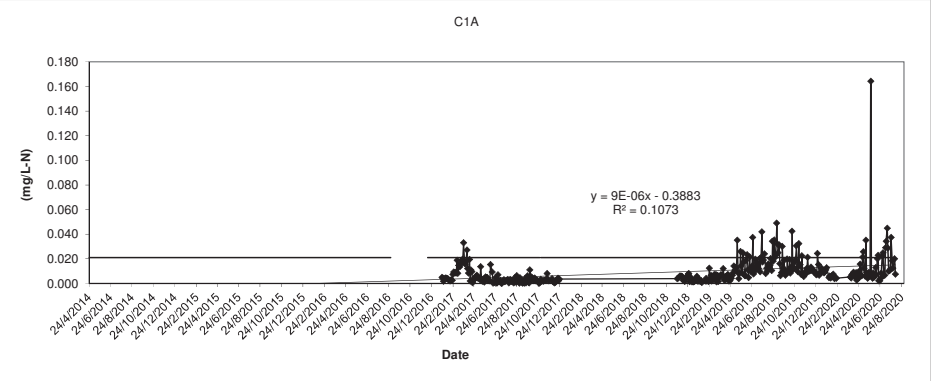




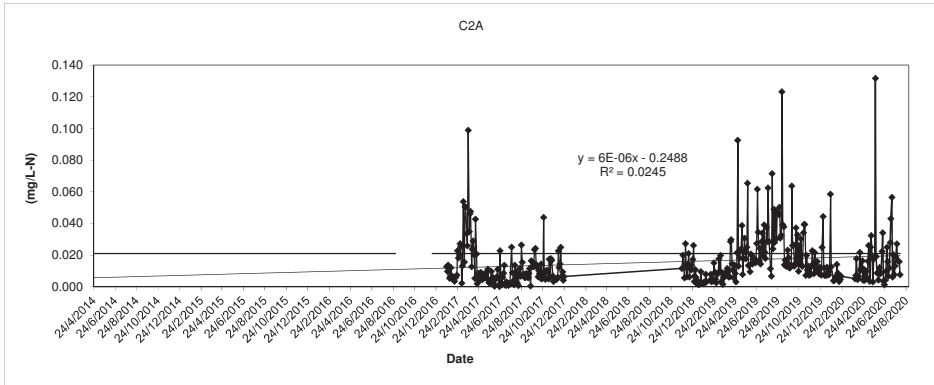
In-situ UIA (Depth average) at Mid-Flood Tide



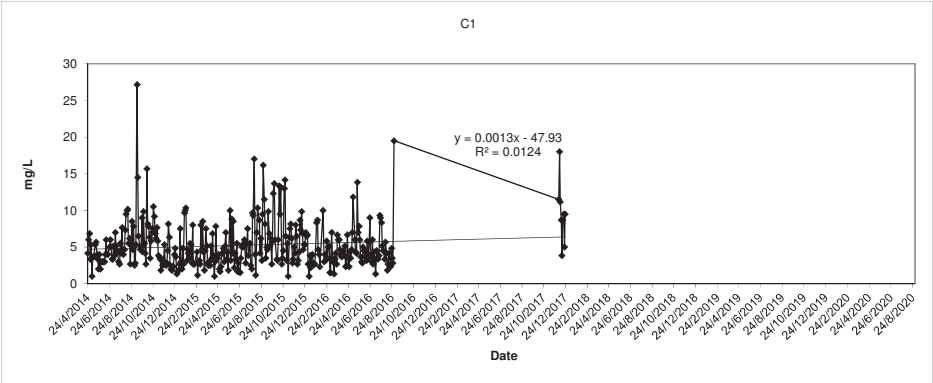


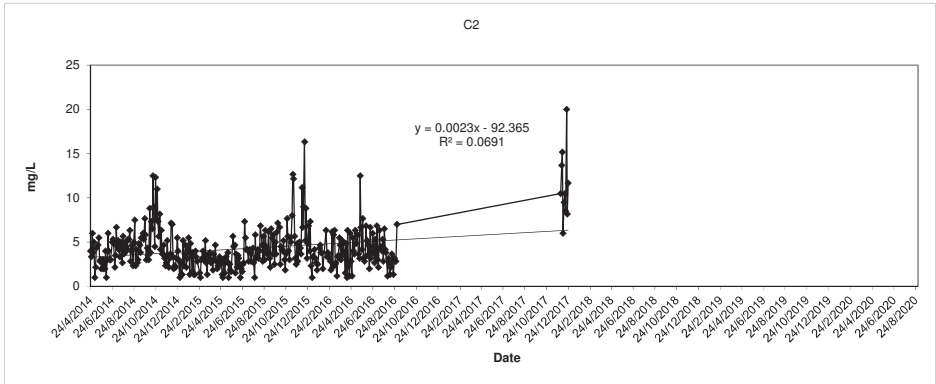


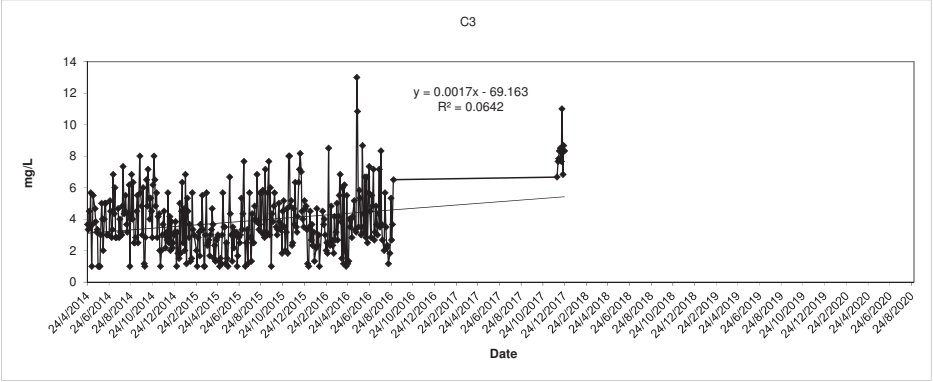
In-situ UIA (Depth average) at Mid-Flood Tide



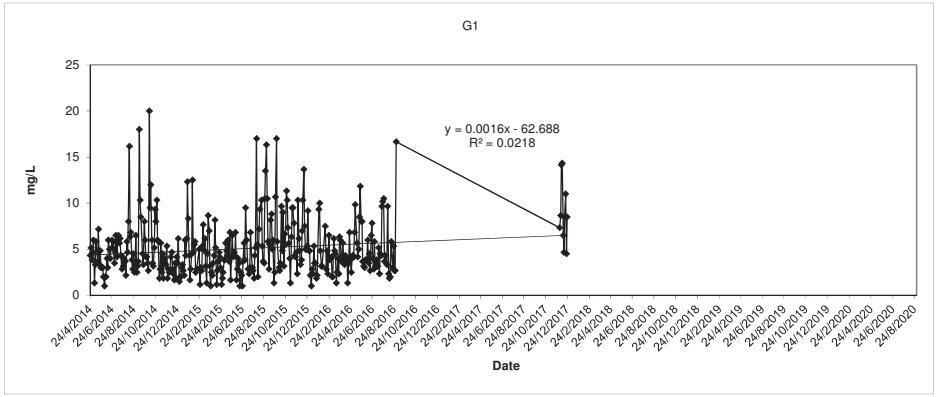
Total Suspended Solids (Depth average) at Mid-Flood Tide

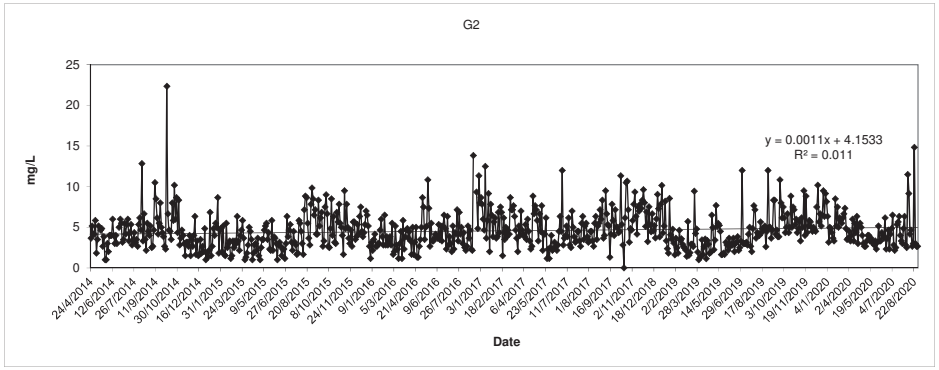


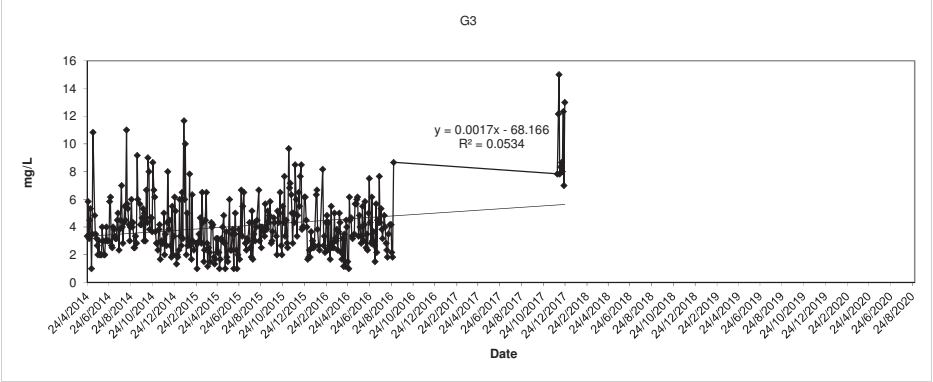




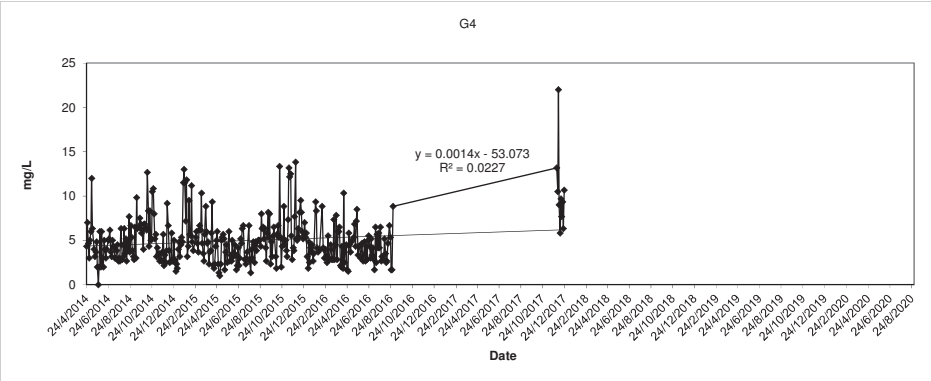
Total Suspended Solids (Depth average) at Mid-Flood Tide

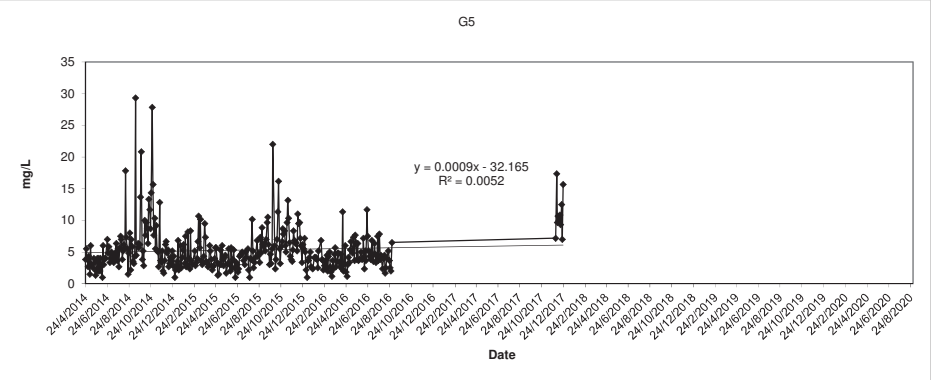


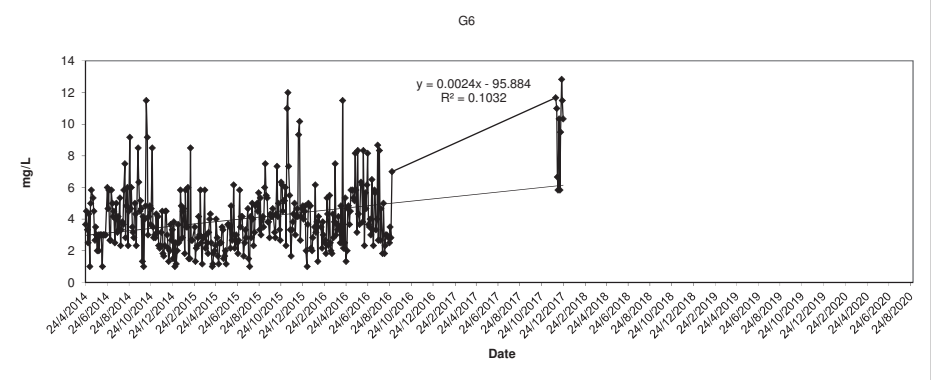




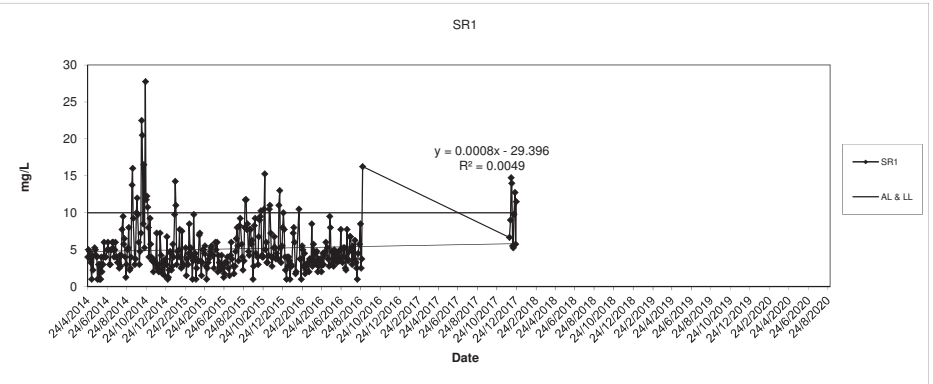
Total Suspended Solids (Depth average) at Mid-Flood Tide

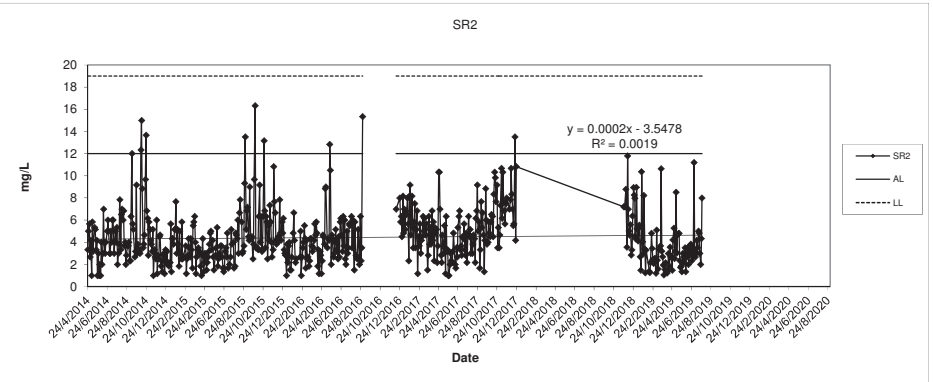


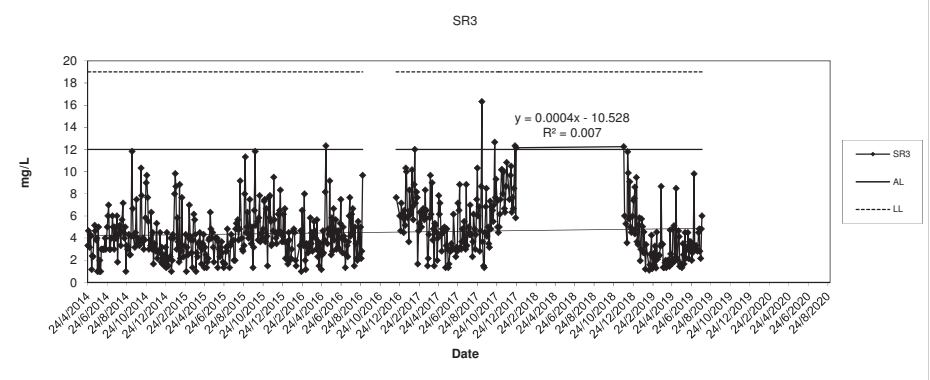




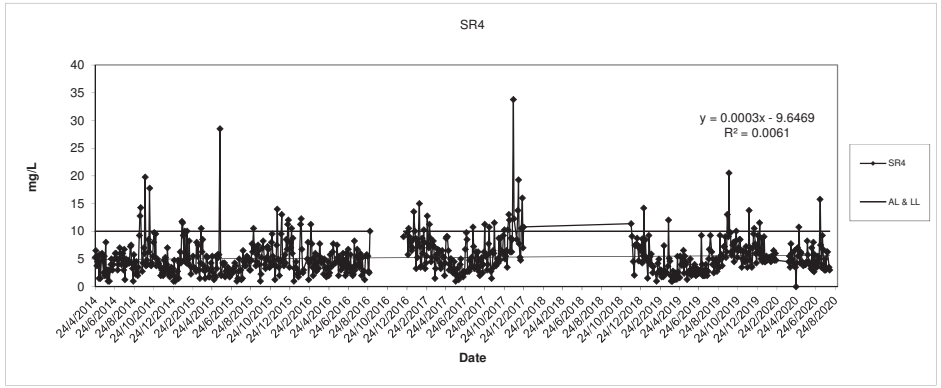
Total Suspended Solids (Depth average) at Mid-Flood Tide

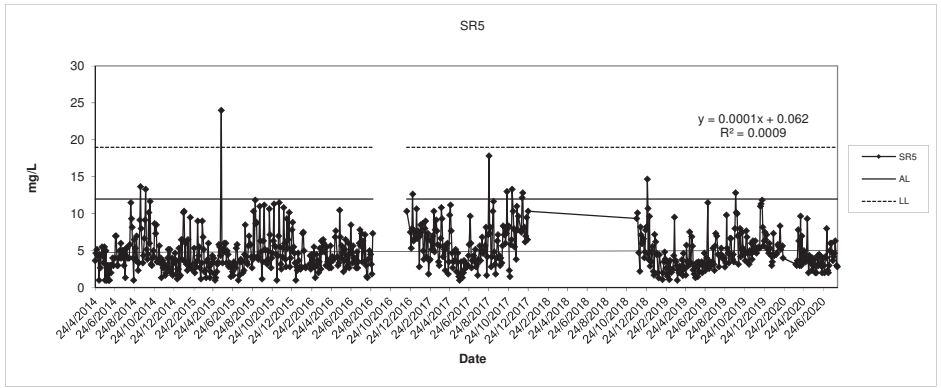


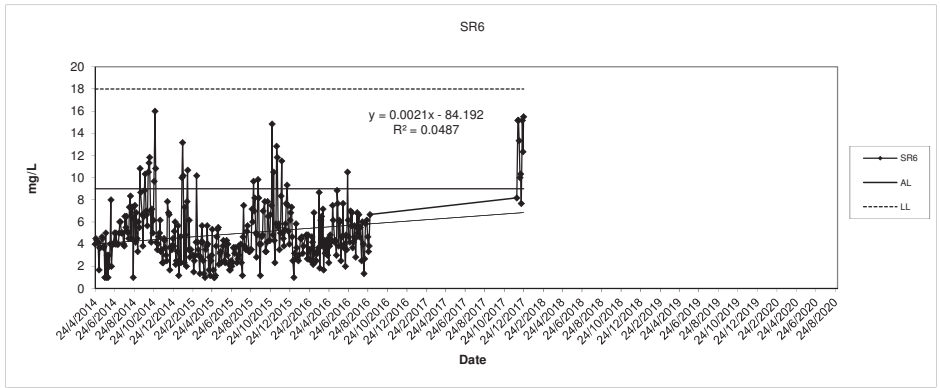




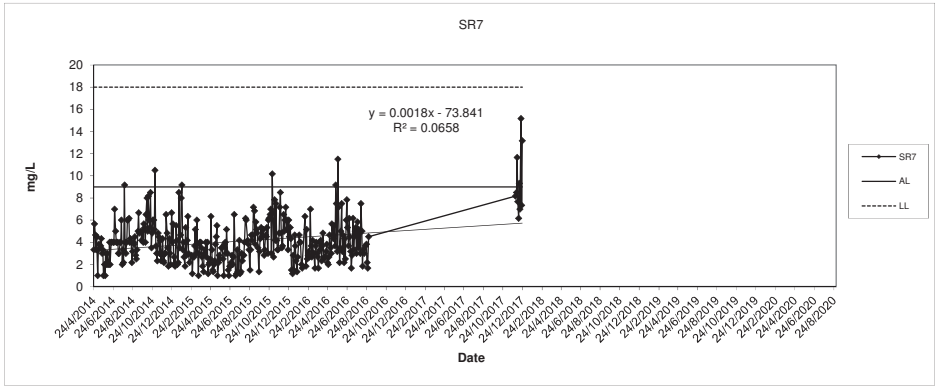
Total Suspended Solids (Depth average) at Mid-Flood Tide

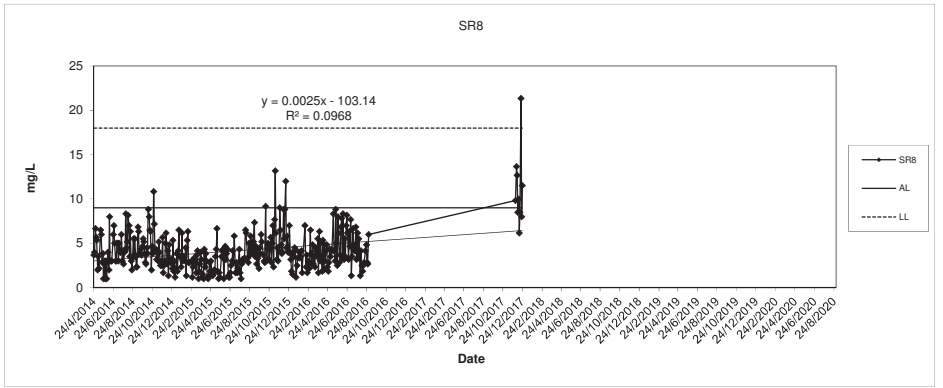


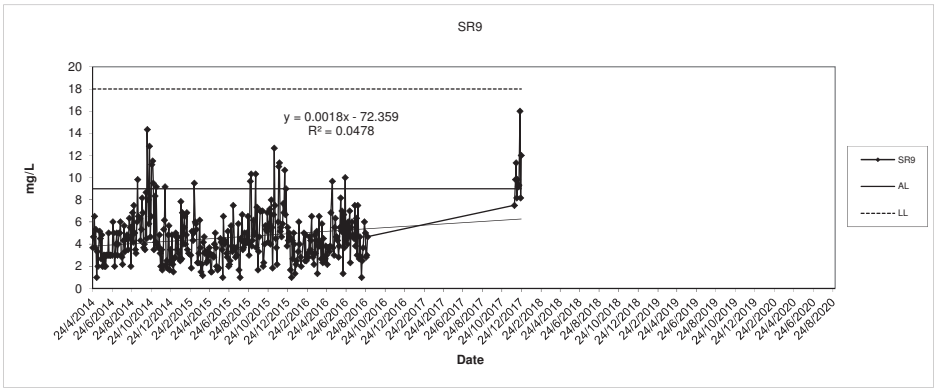




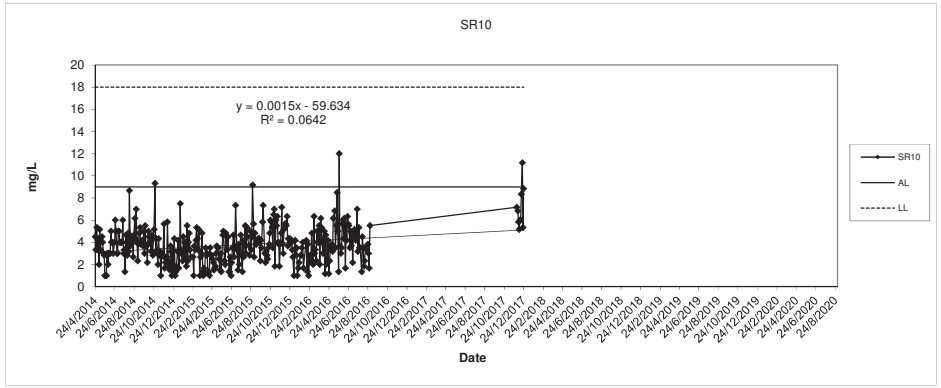
Total Suspended Solids (Depth average) at Mid-Flood Tide

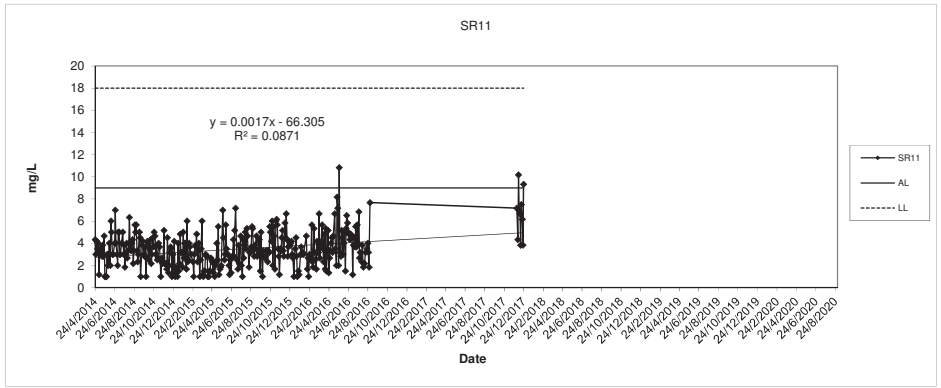


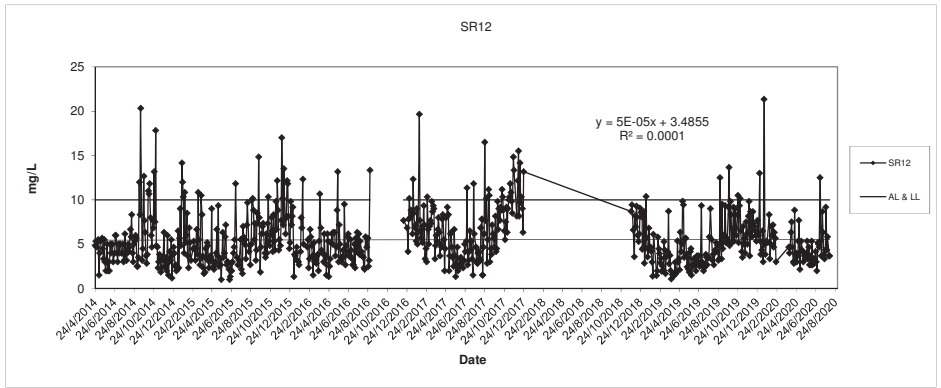




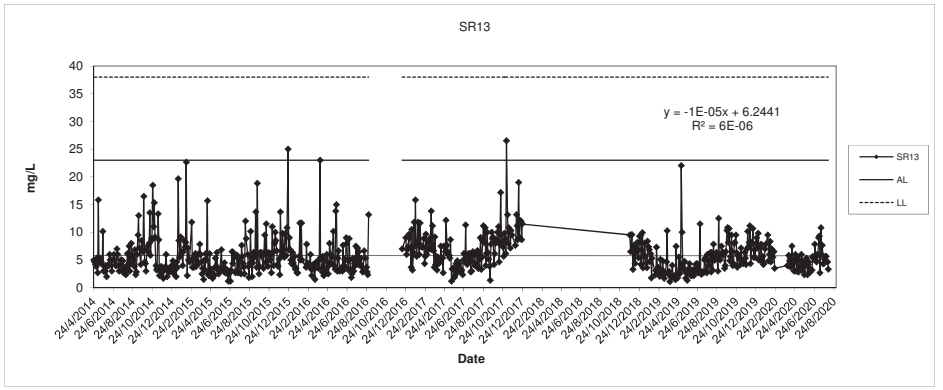
Total Suspended Solids (Depth average) at Mid-Flood Tide

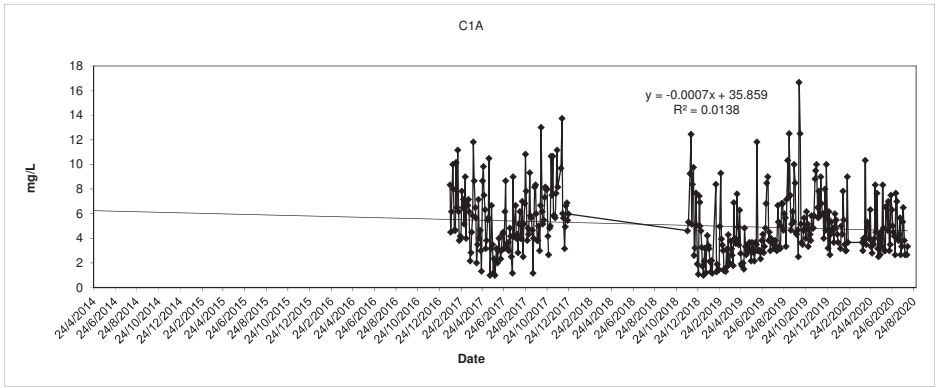


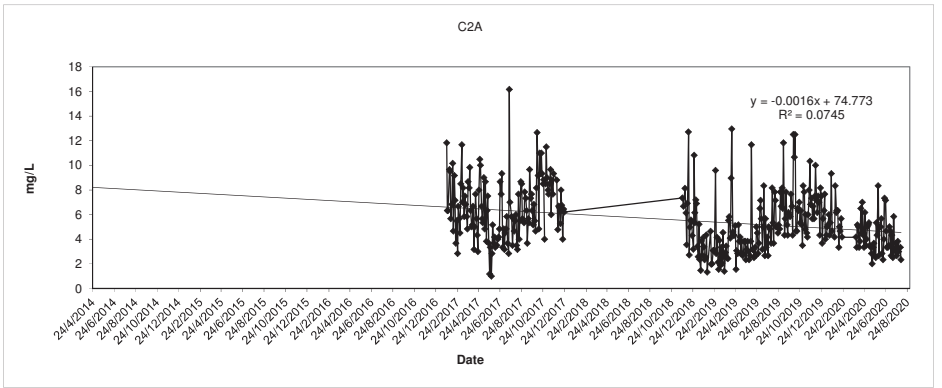




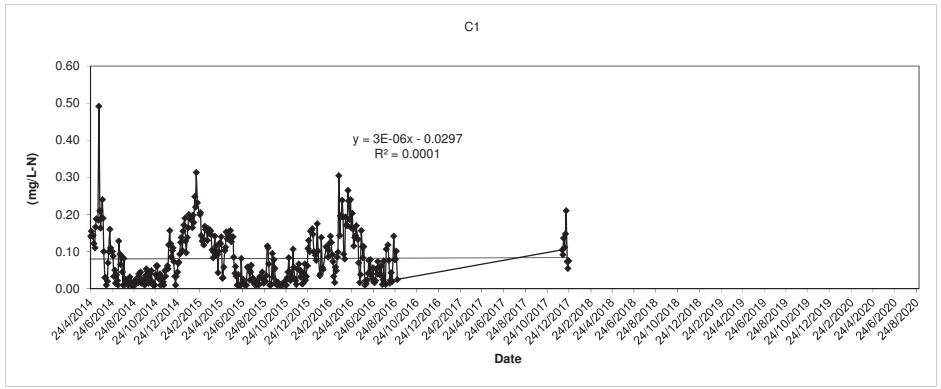
Total Suspended Solids (Depth average) at Mid-Flood Tide

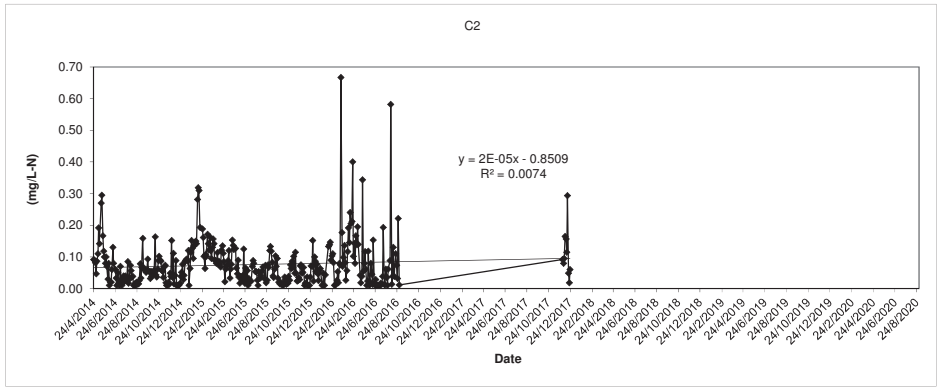


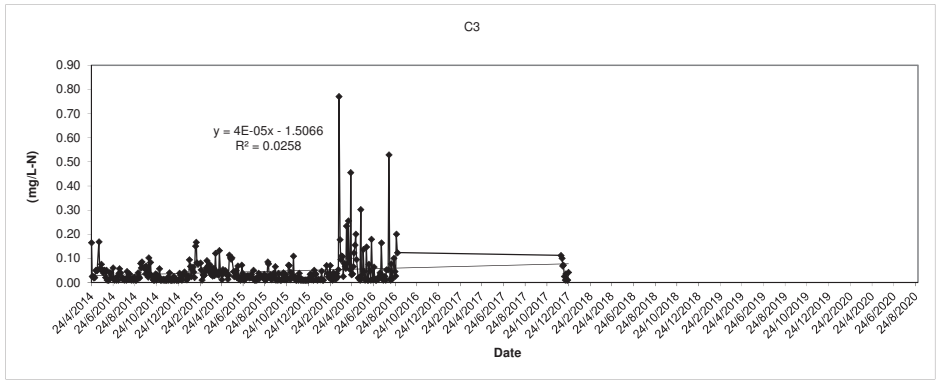




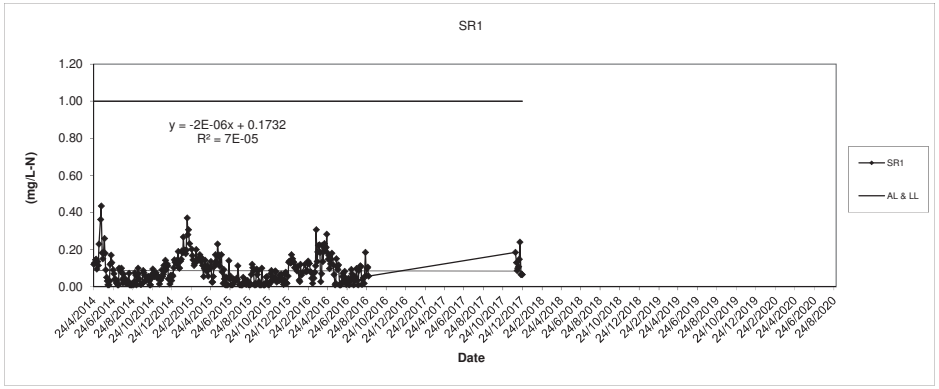
Ammonia Nitrogen (Depth average) at Mid-Flood Tide

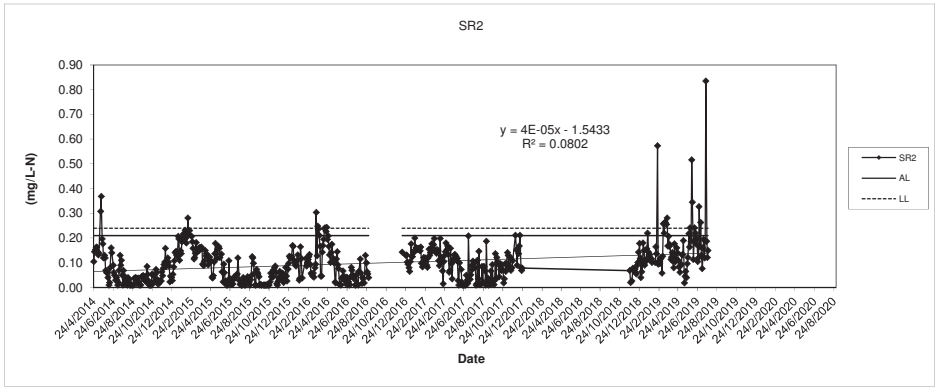


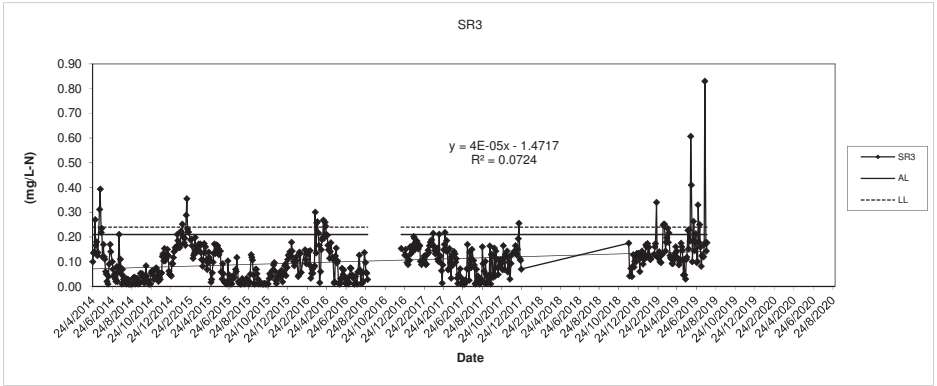




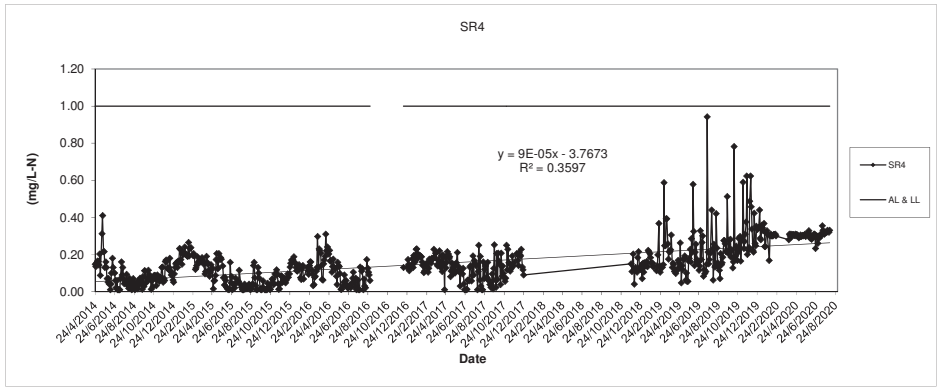
Ammonia Nitrogen (Depth average) at Mid-Flood Tide

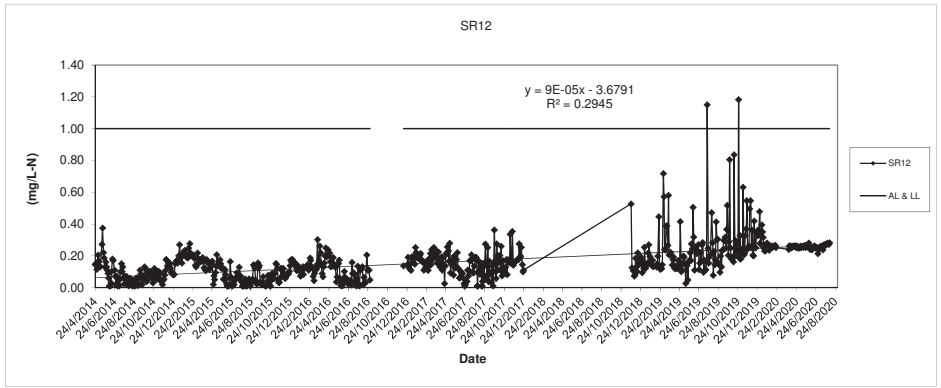


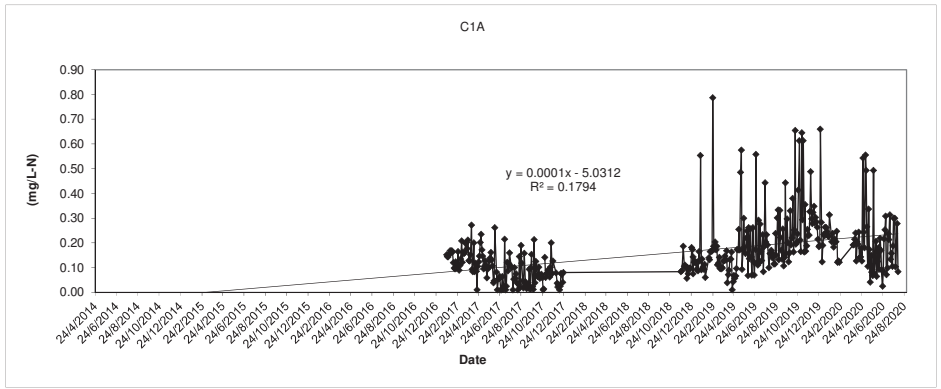




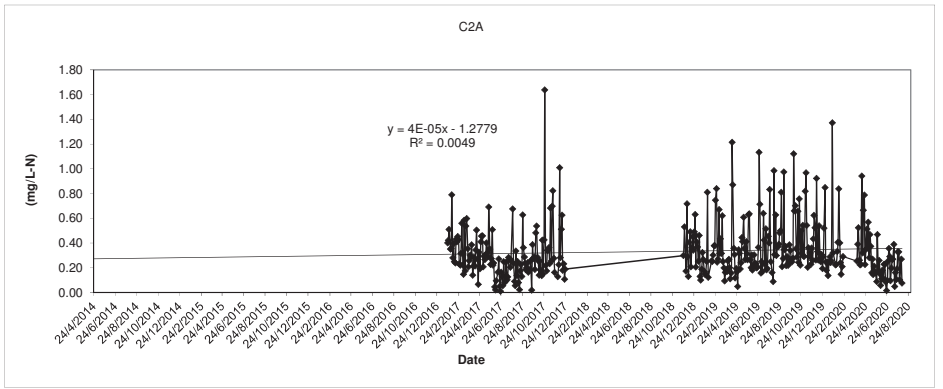
Ammonia Nitrogen (Depth average) at Mid-Flood Tide



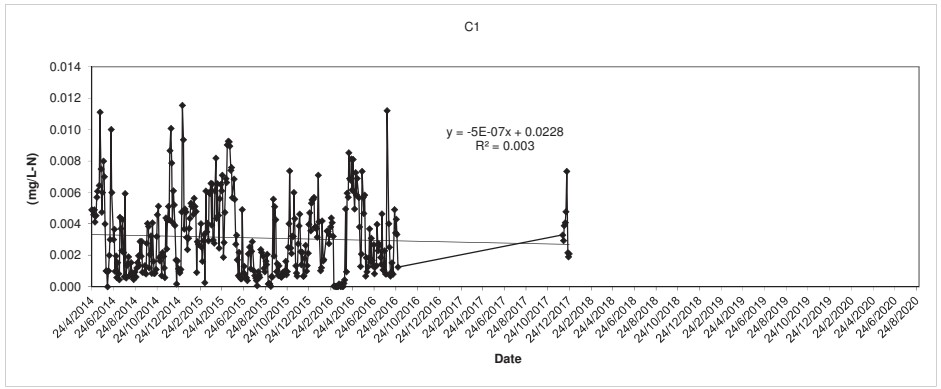


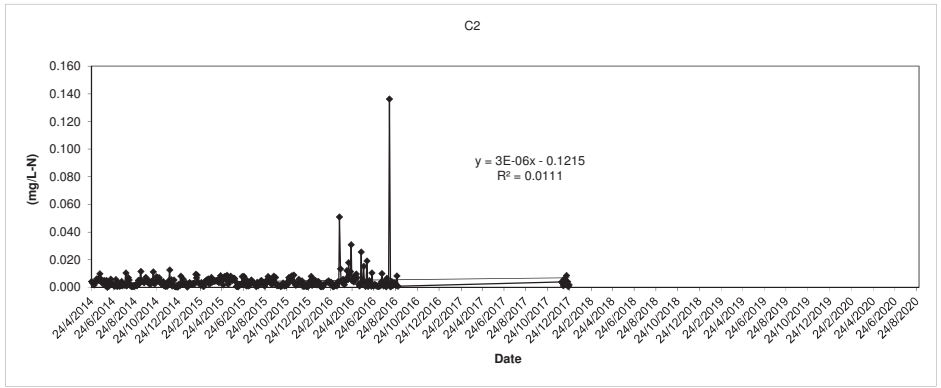


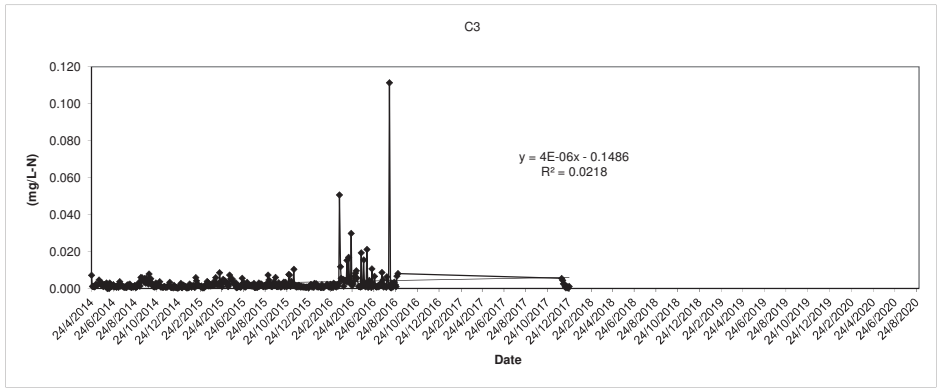
Ammonia Nitrogen (Depth average) at Mid-Flood Tide



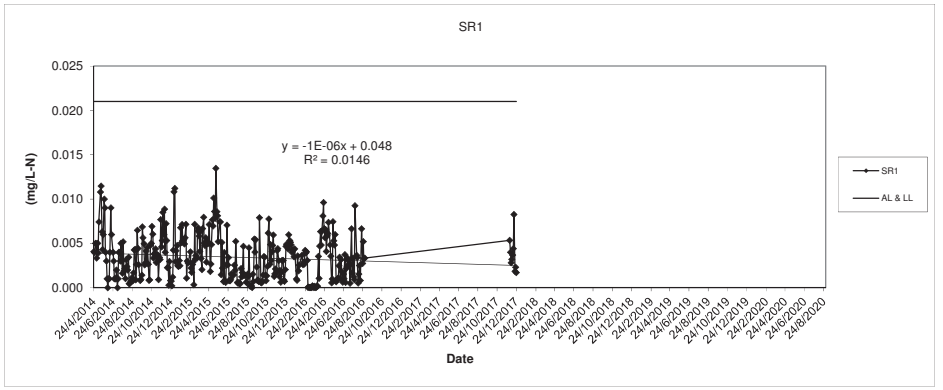
Laboratory Analysis UIA (Depth average) at Mid-Flood Tide

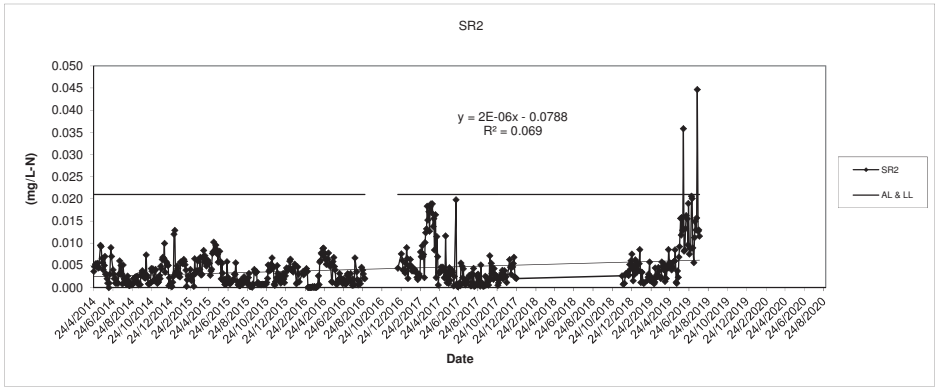


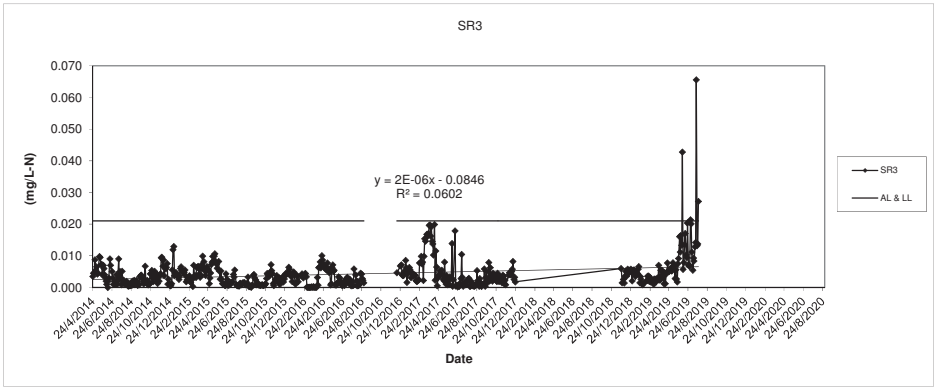




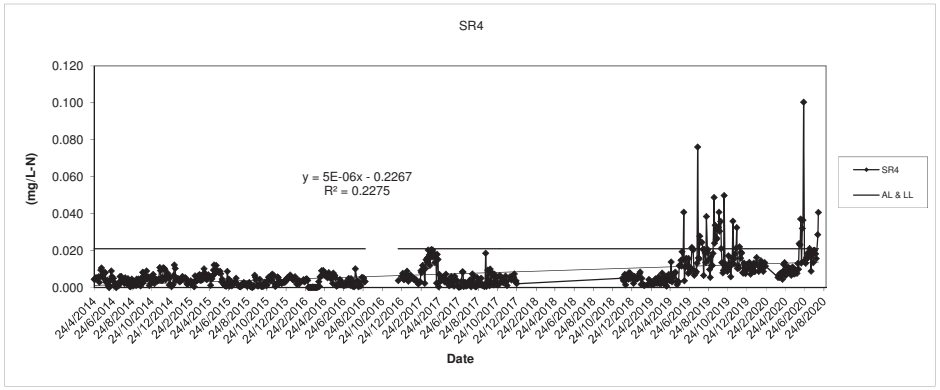
Laboratory Analysis UIA (Depth average) at Mid-Flood Tide

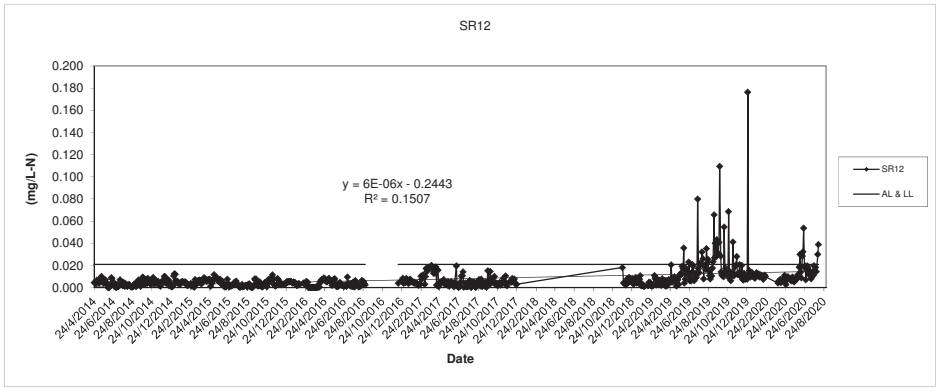


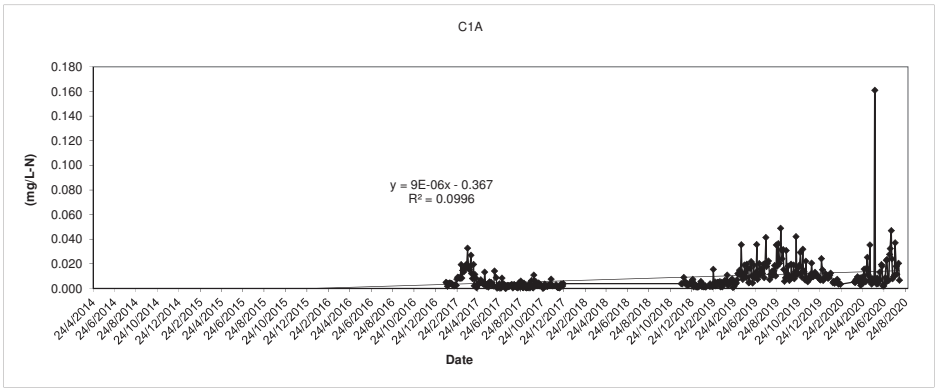




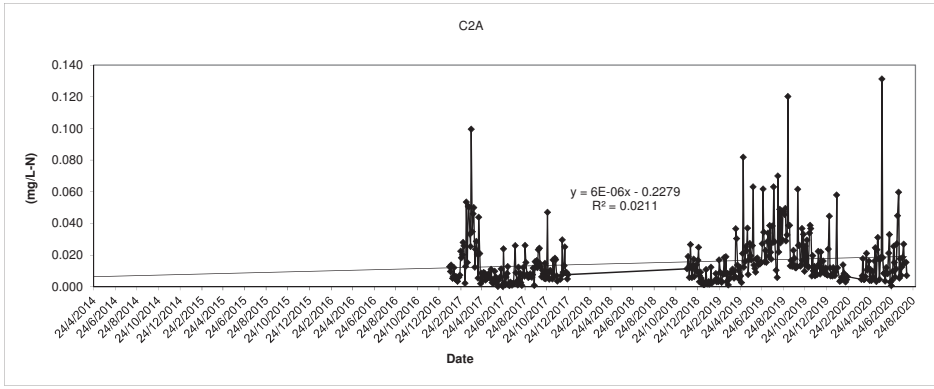
Laboratory Analysis UIA (Depth average) at Mid-Flood Tide



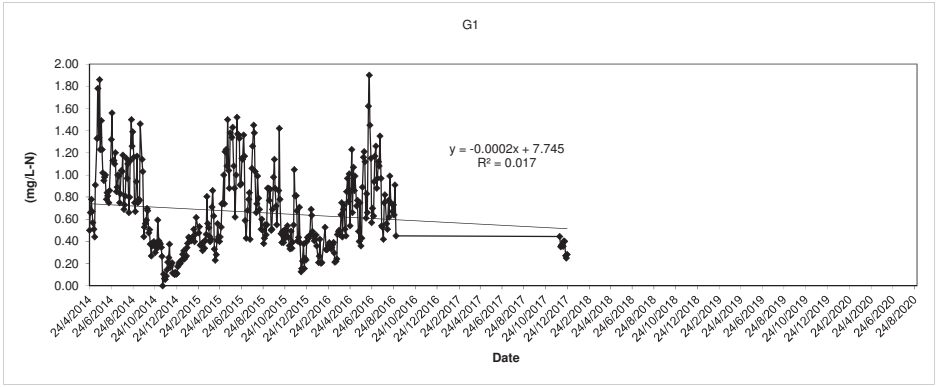


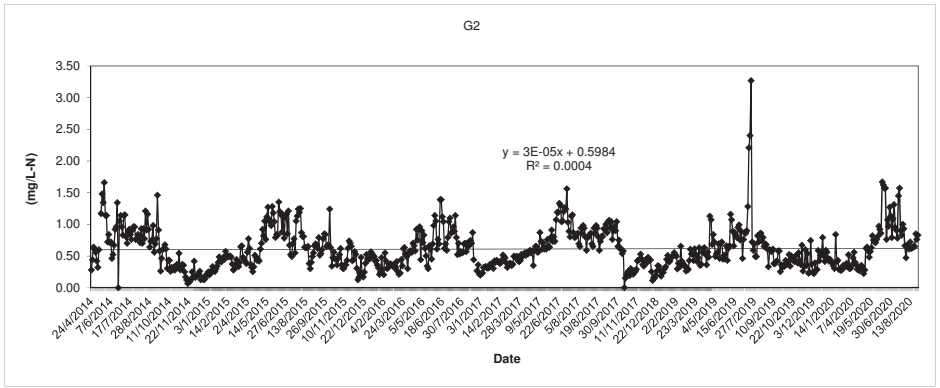


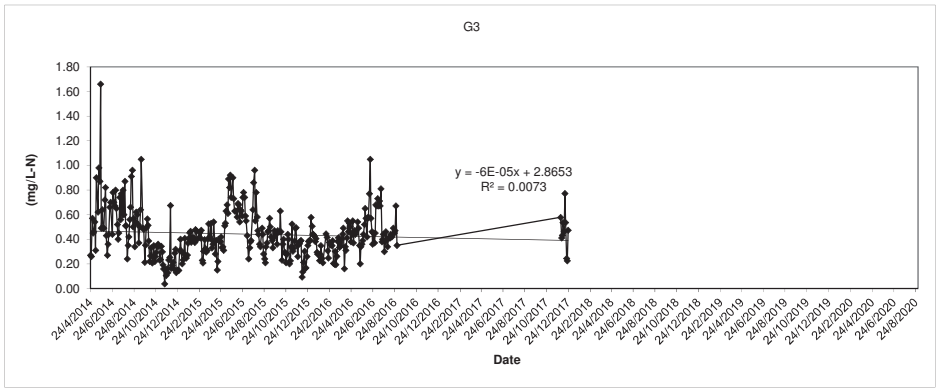
Laboratory Analysis UIA (Depth average) at Mid-Flood Tide



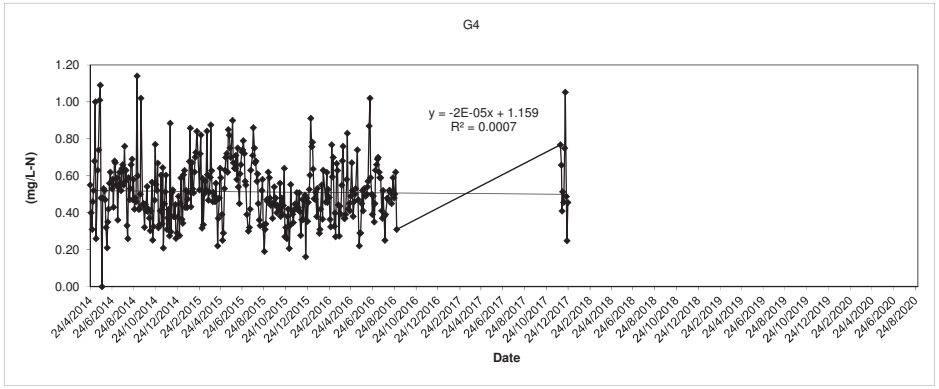
Laboratory Analysis TIN (Depth average) at Mid-Flood Tide

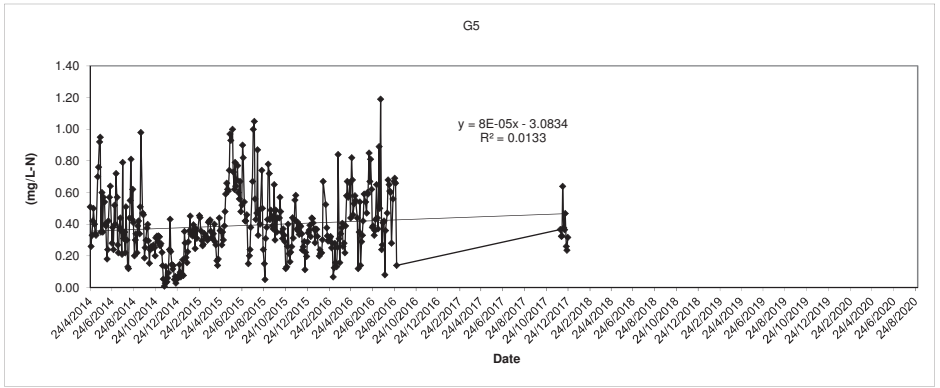


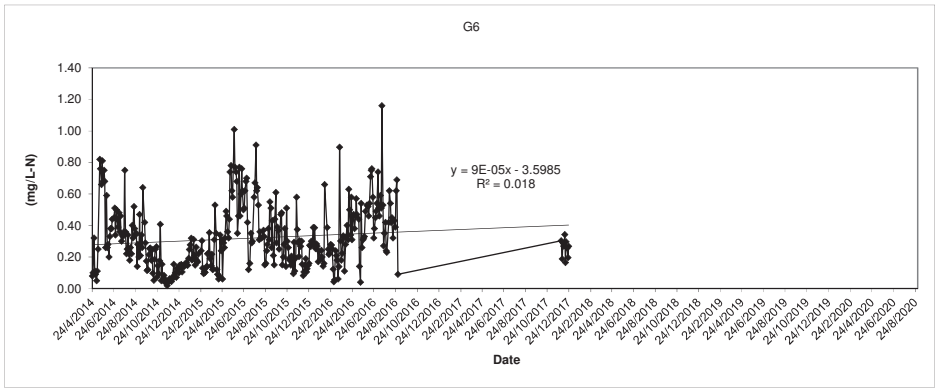




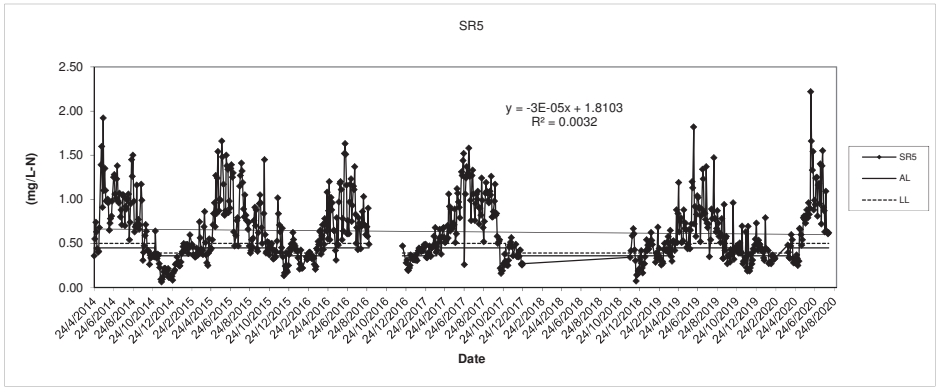
Laboratory Analysis TIN (Depth average) at Mid-Flood Tide

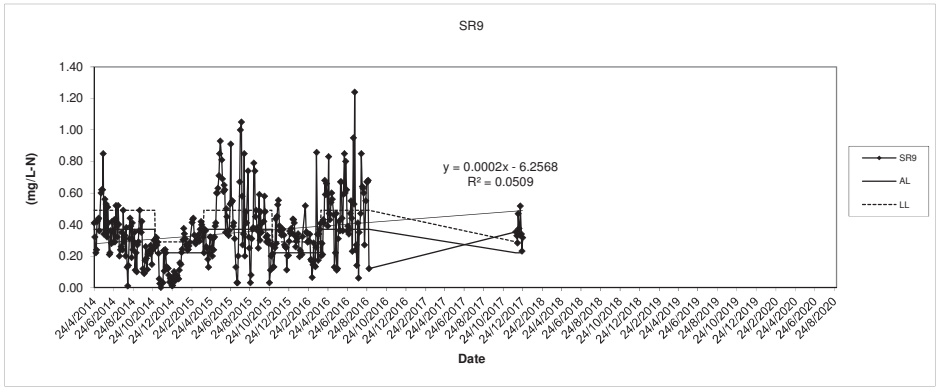


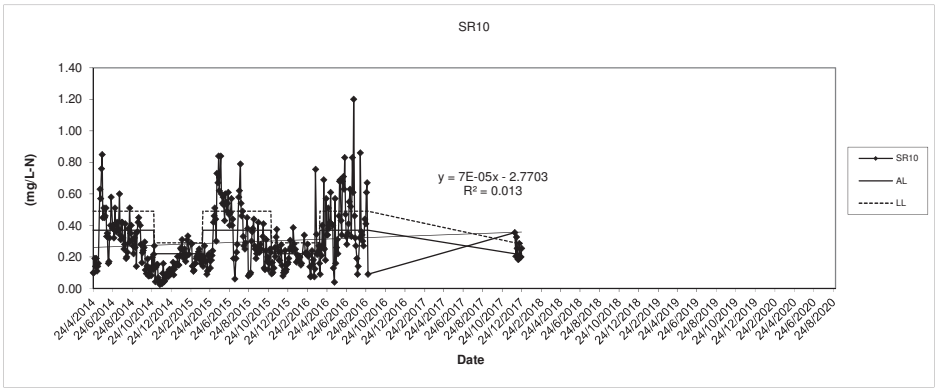




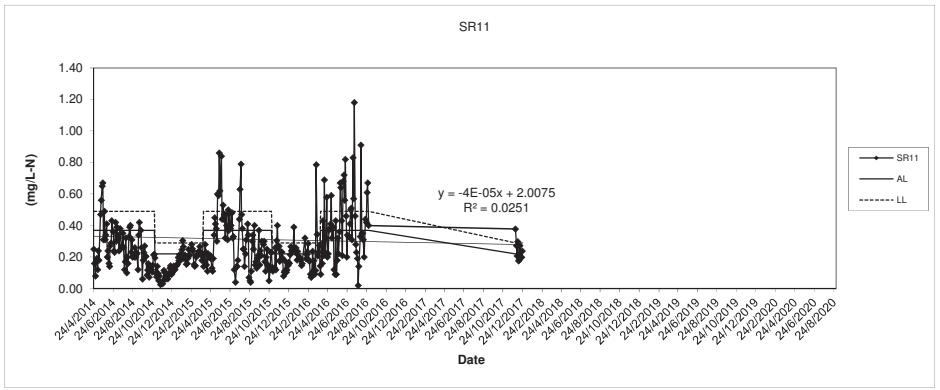
Laboratory Analysis TIN (Depth average) at Mid-Flood Tide

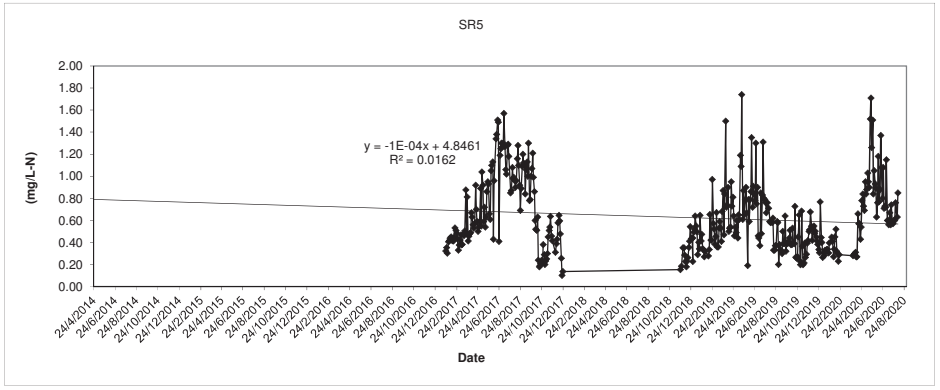


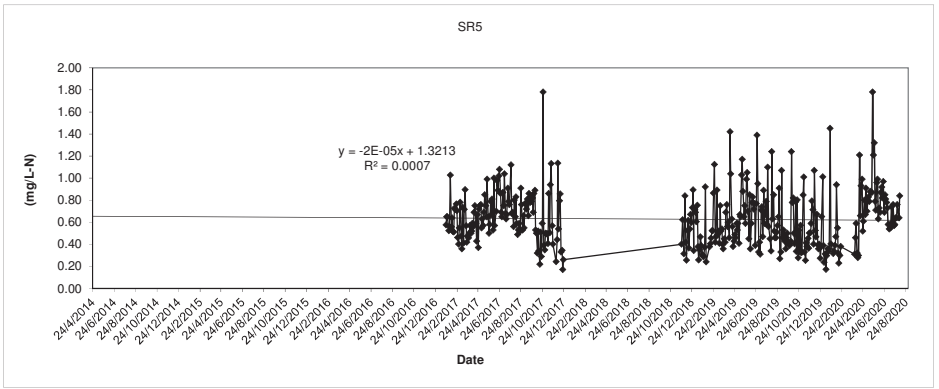




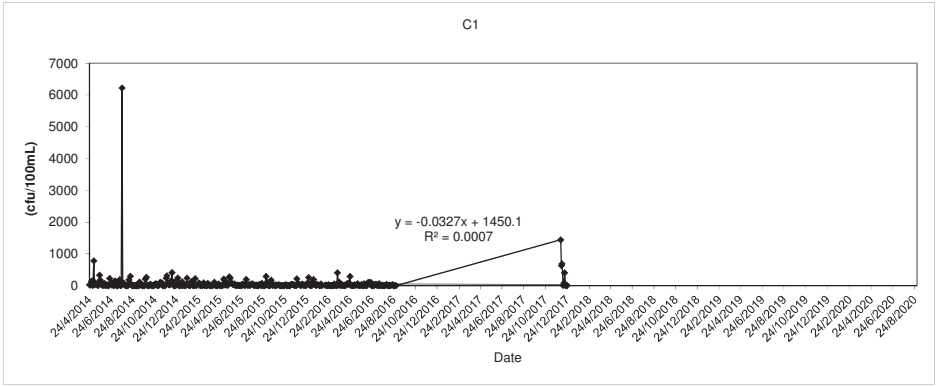
Laboratory Analysis TIN (Depth average) at Mid-Flood Tide

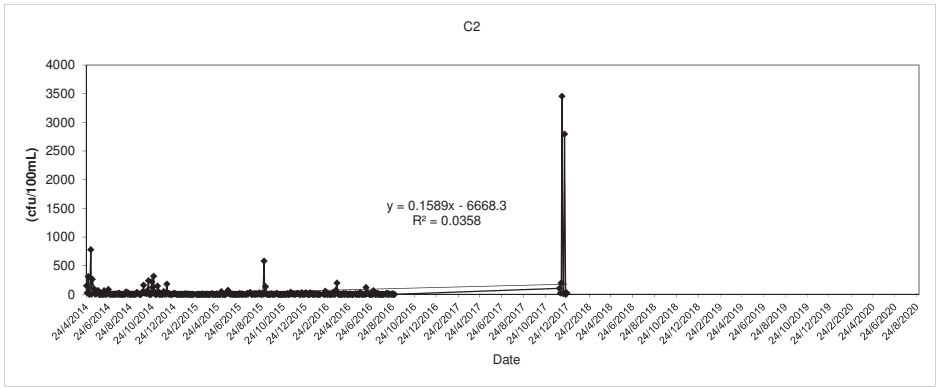


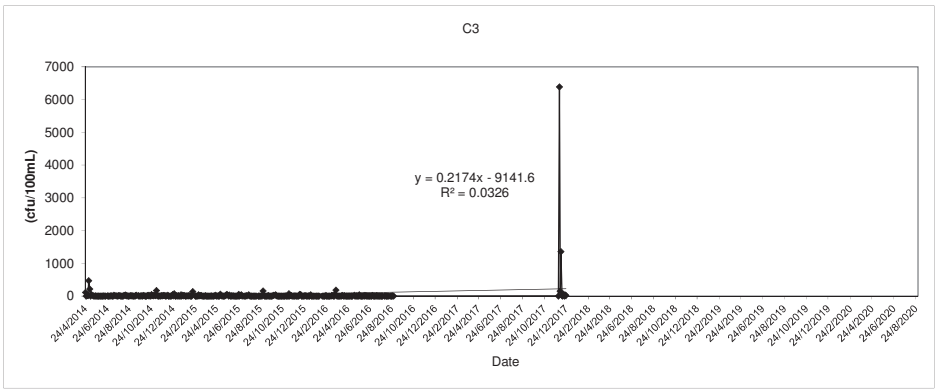




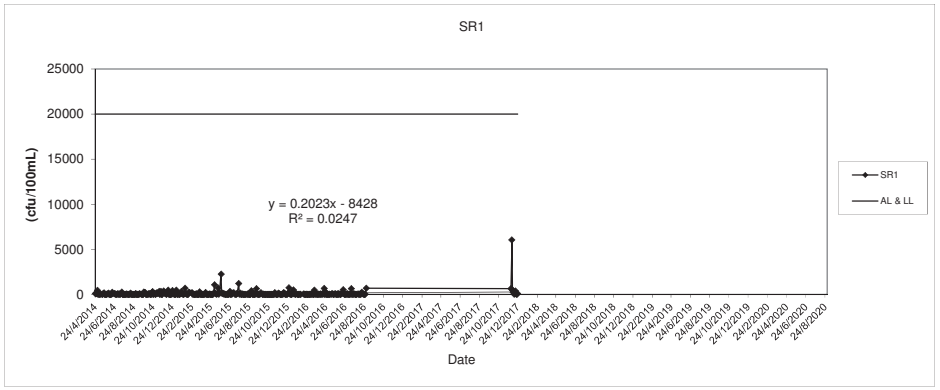
***E.coli* (Depth average) at Mid-Flood Tide**

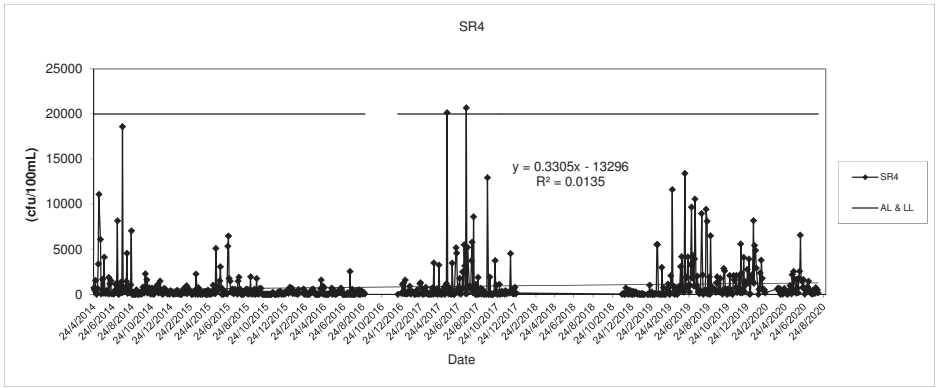


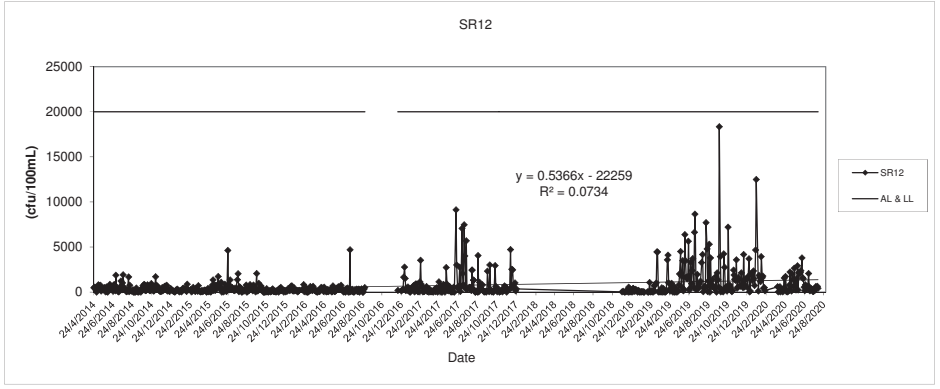




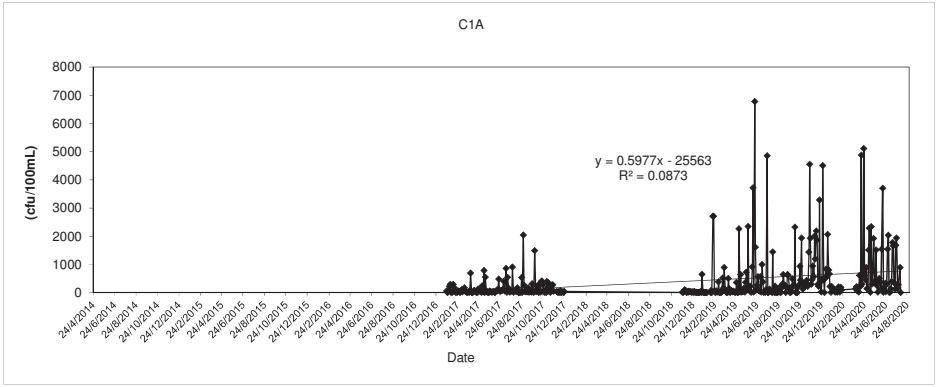
***E.coli* (Depth average) at Mid-Flood Tide**

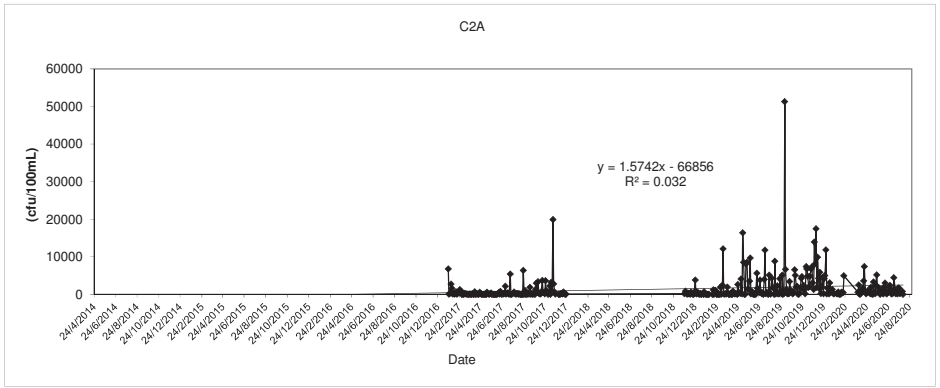




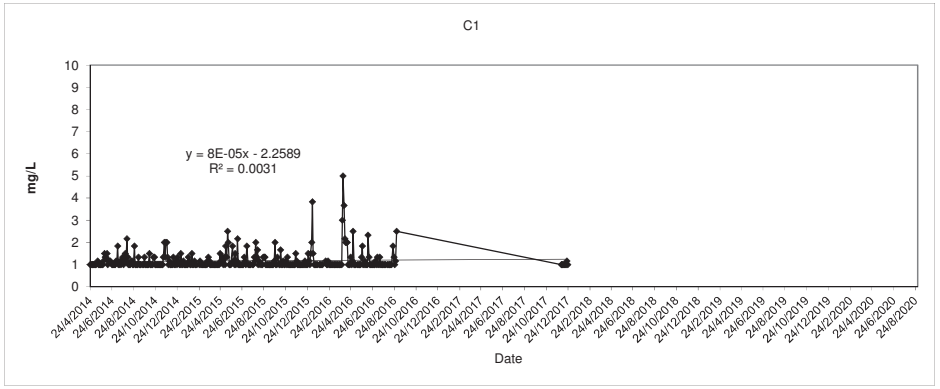


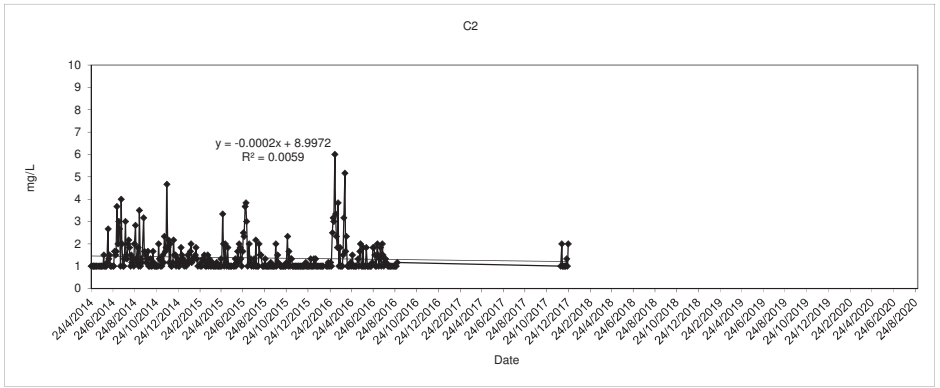
E.coli (Depth average) at Mid-Flood Tide

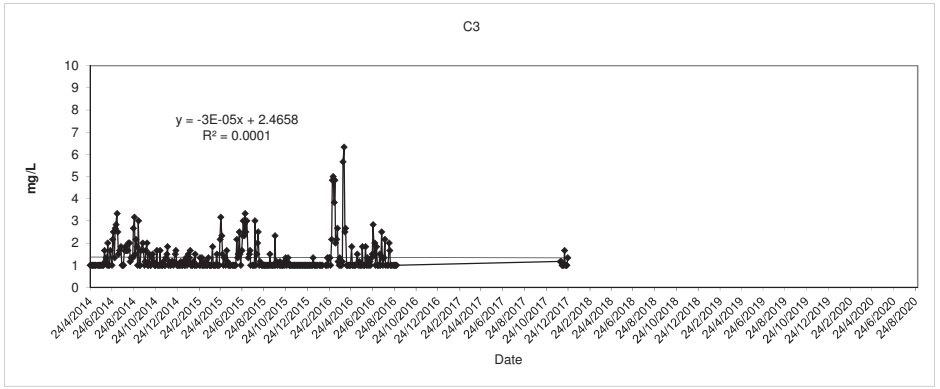




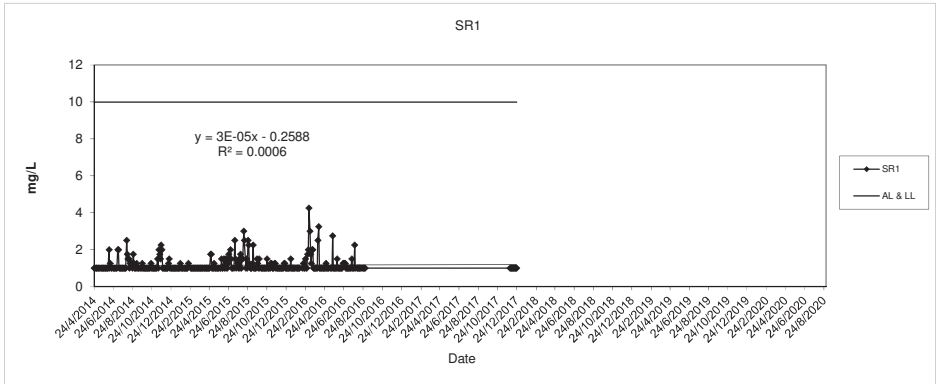
BOD_5 (Depth average) at Mid-Flood Tide

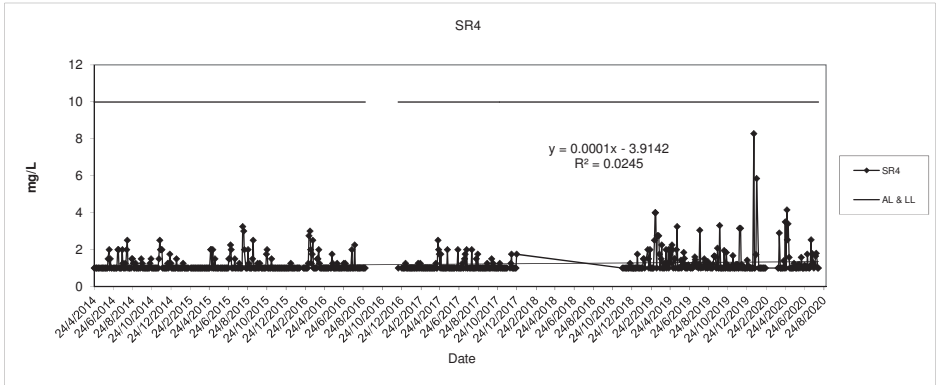


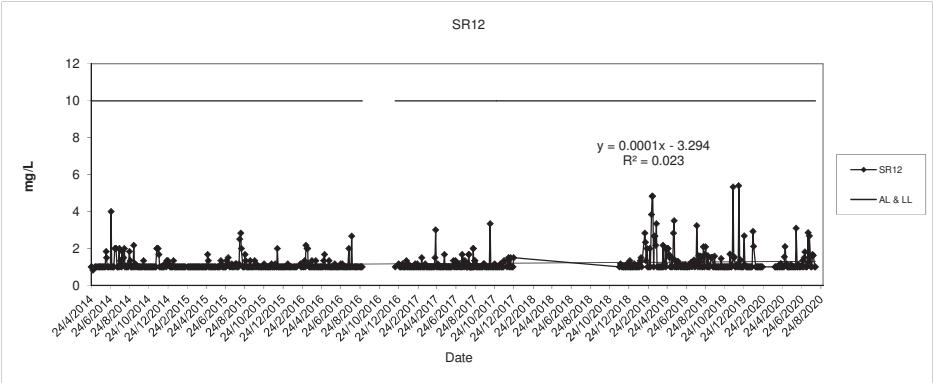




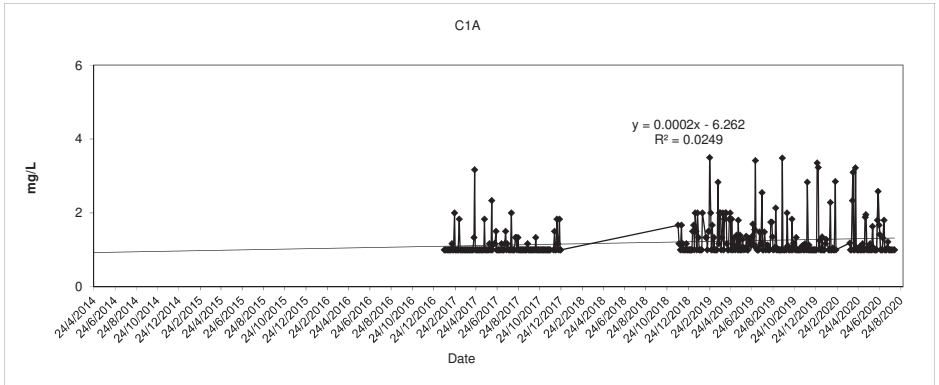
BOD_5 (Depth average) at Mid-Flood Tide

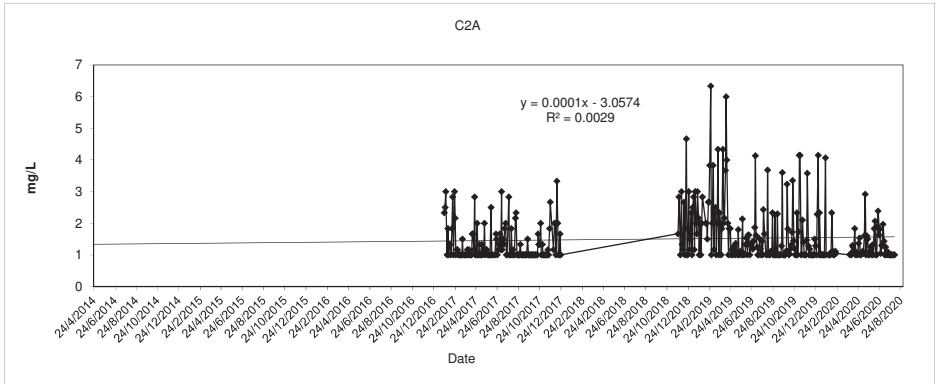




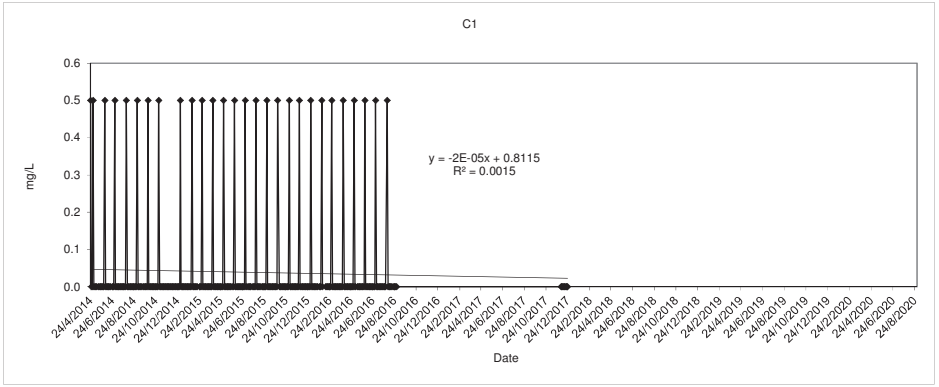


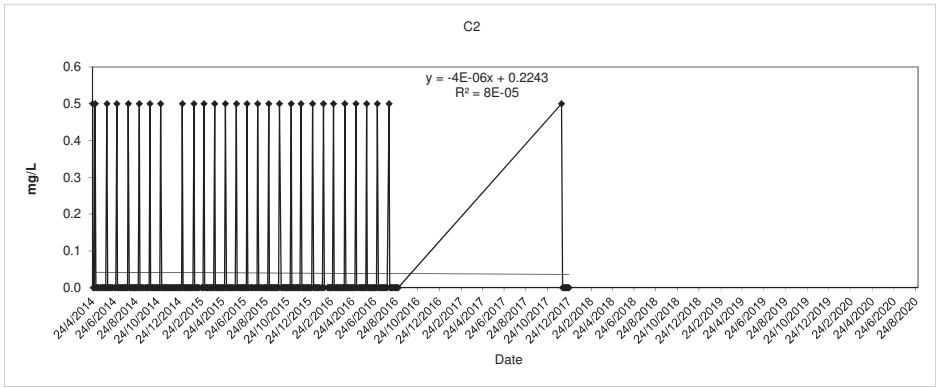
BOD_5 (Depth average) at Mid-Flood Tide

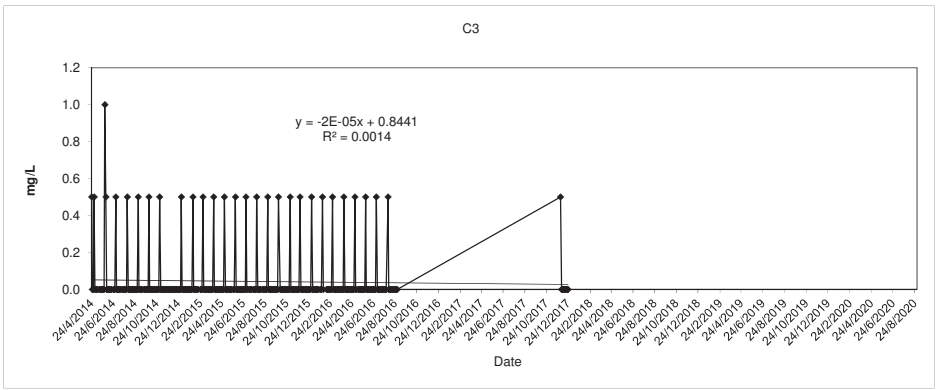




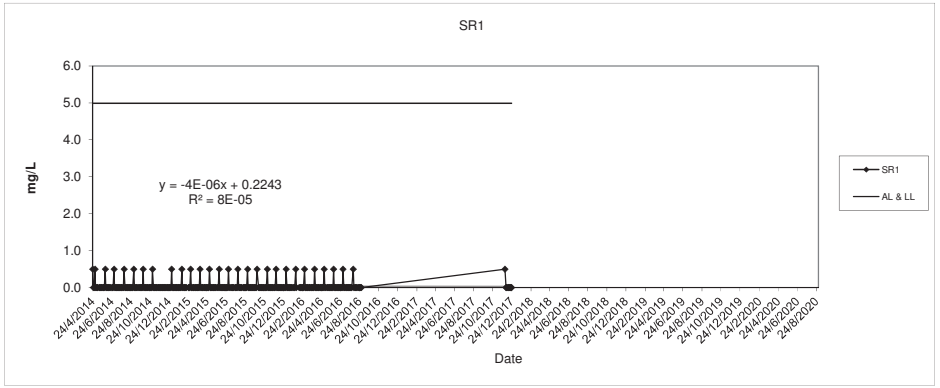
Synthetic Detergent (Depth average) at Mid-Flood Tide

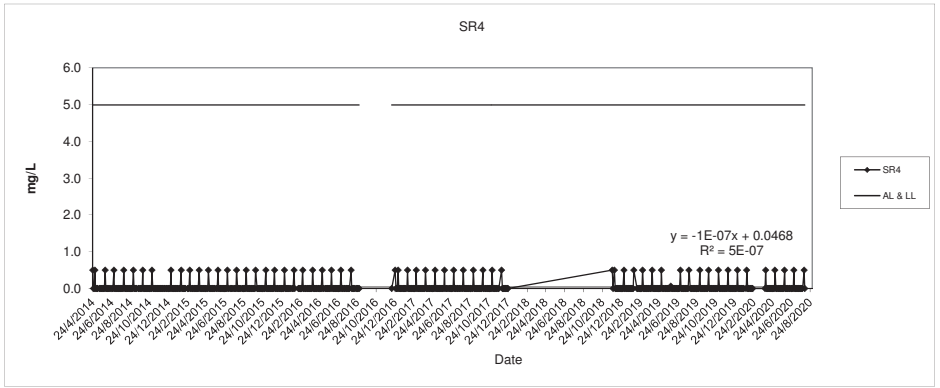


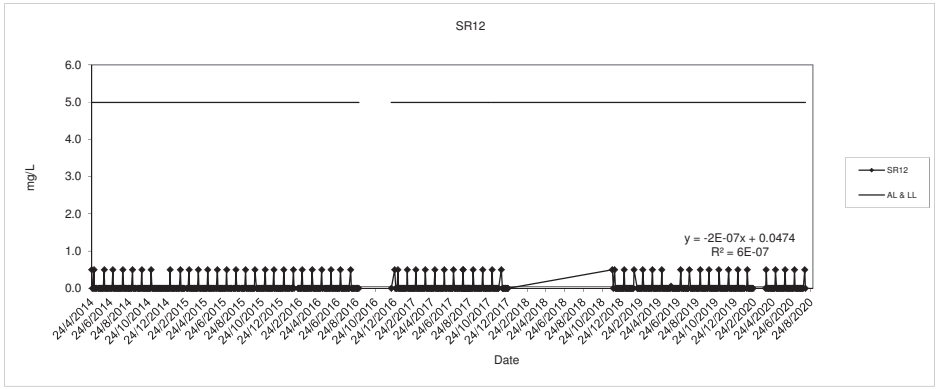




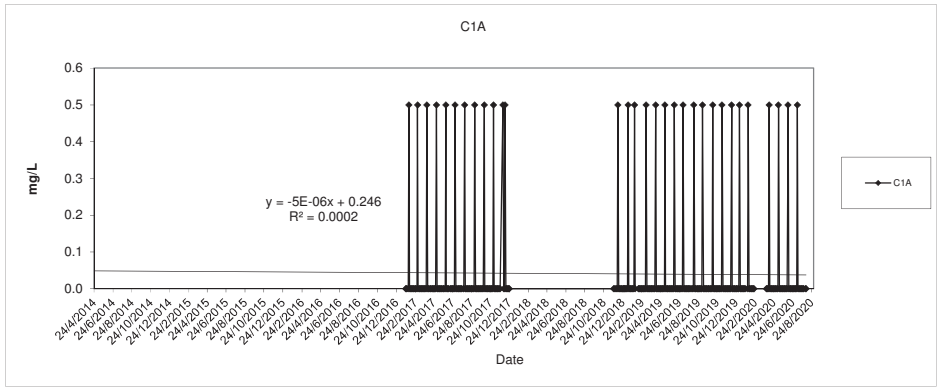
Synthetic Detergent (Depth average) at Mid-Flood Tide

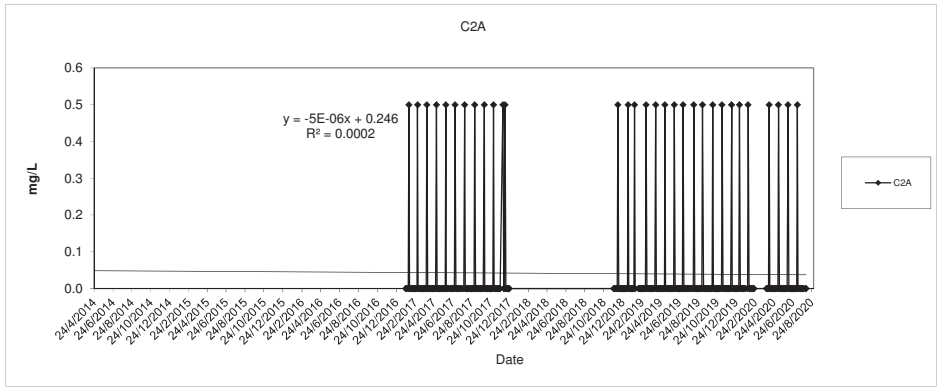




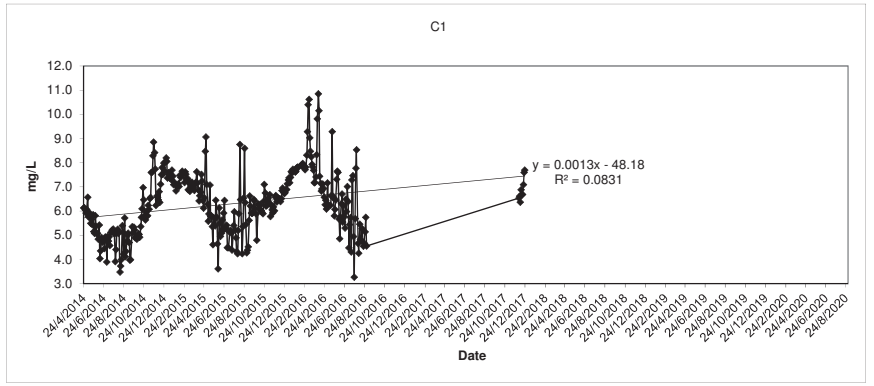


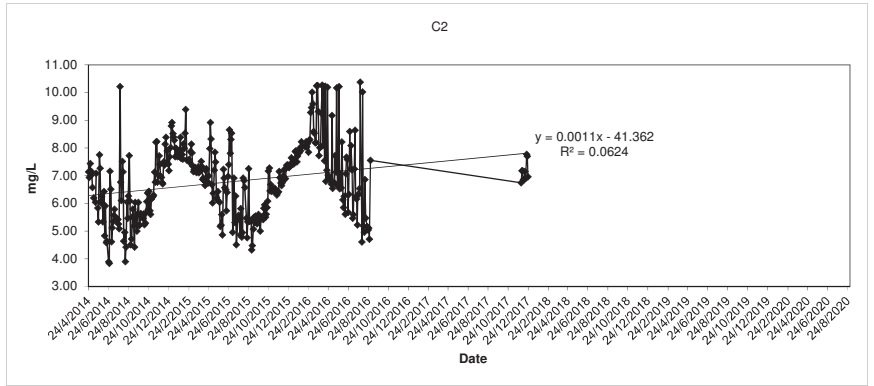
Synthetic Detergent (Depth average) at Mid-Flood Tide

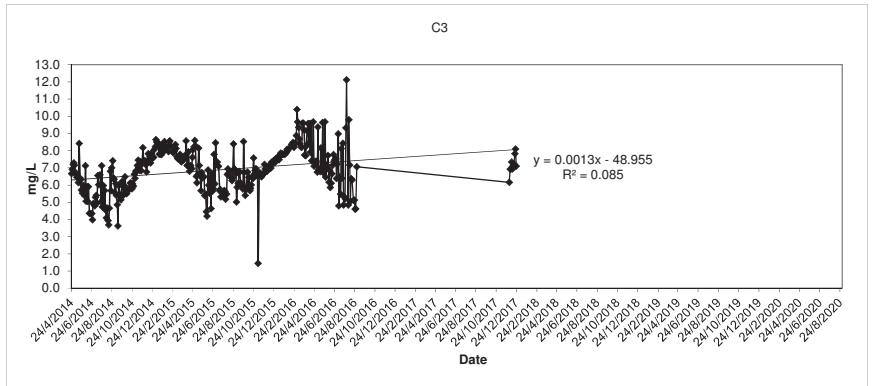




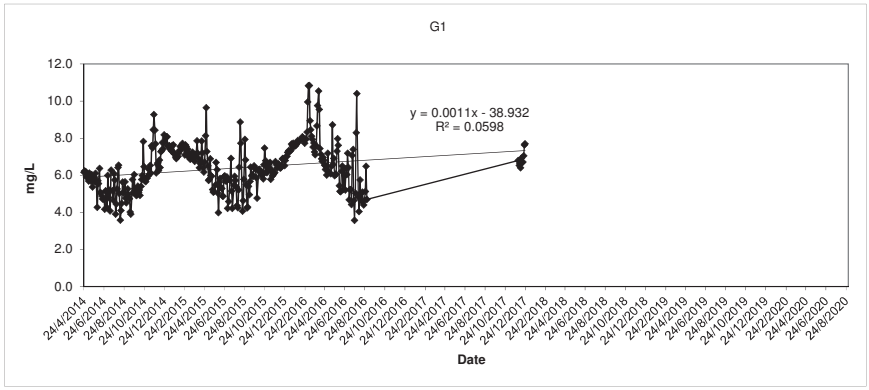
Dissolved Oxygen (Surface and Middle) at Mid-Ebb Tide

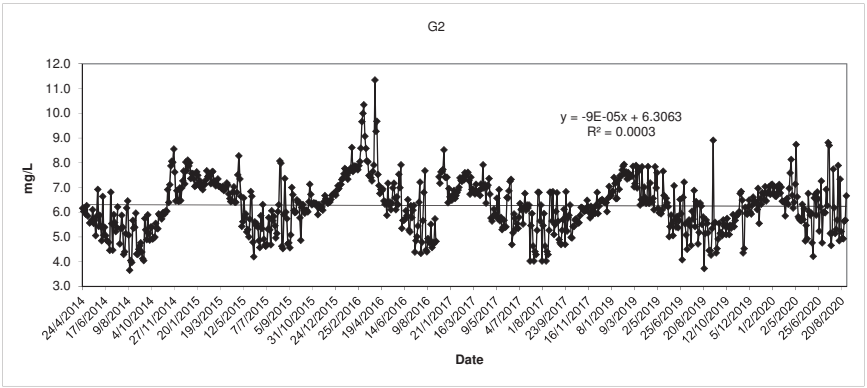


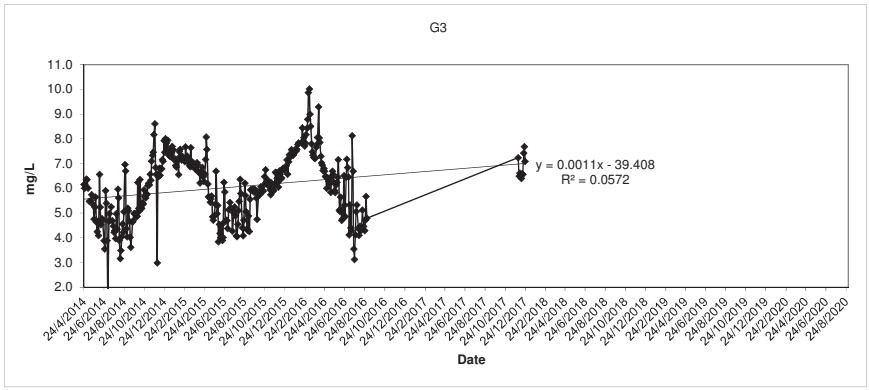




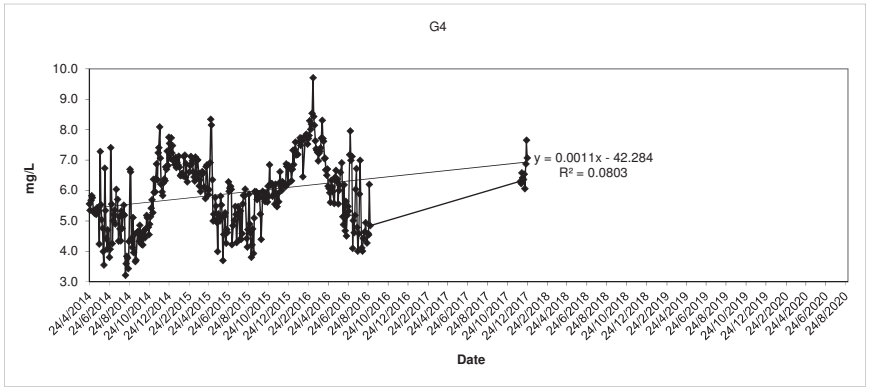
Dissolved Oxygen (Surface and Middle) at Mid-Ebb Tide

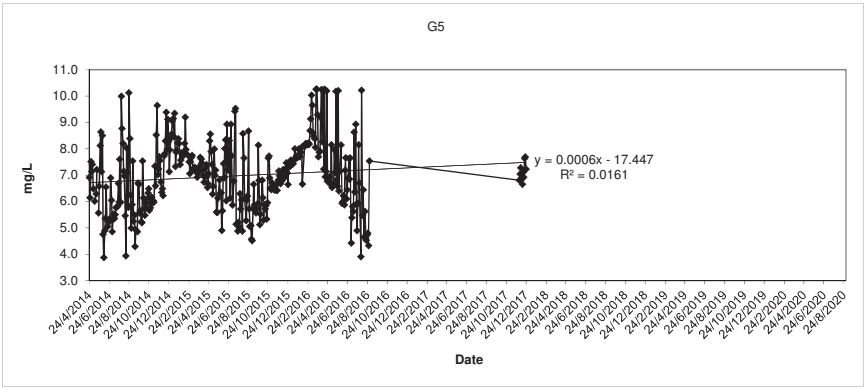


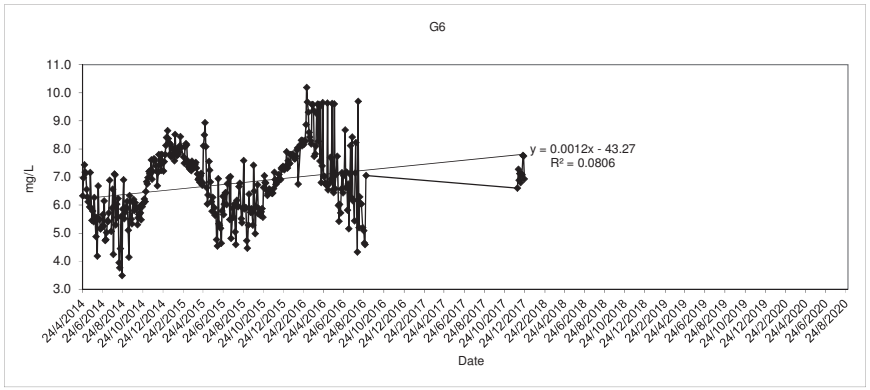




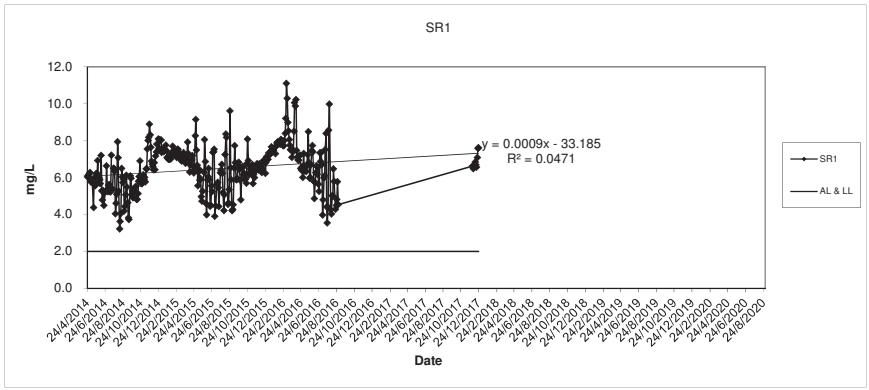
Dissolved Oxygen (Surface and Middle) at Mid-Ebb Tide

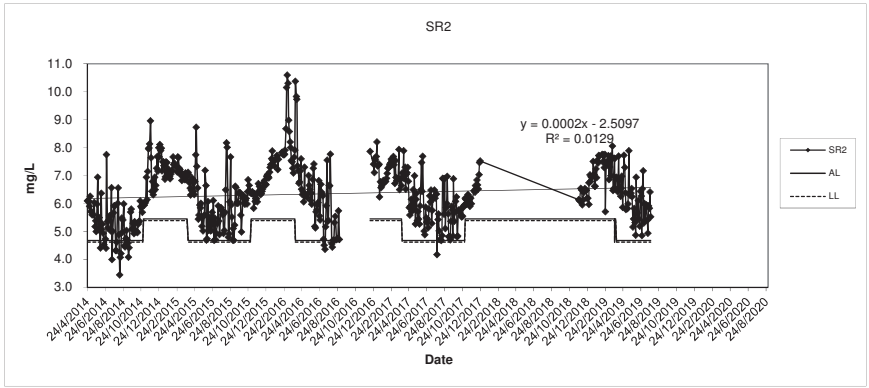


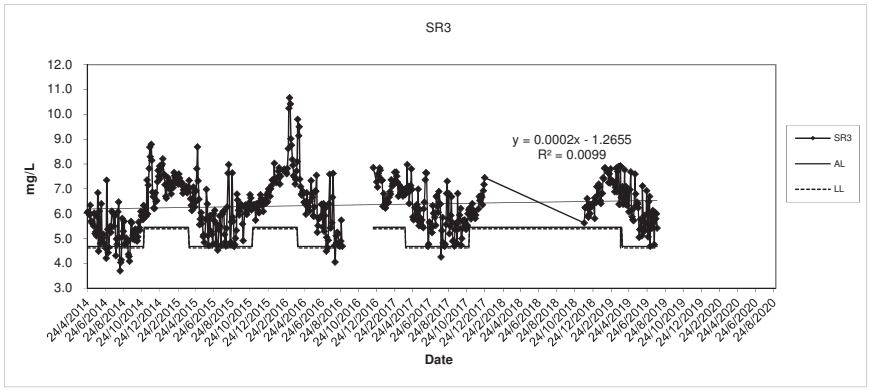




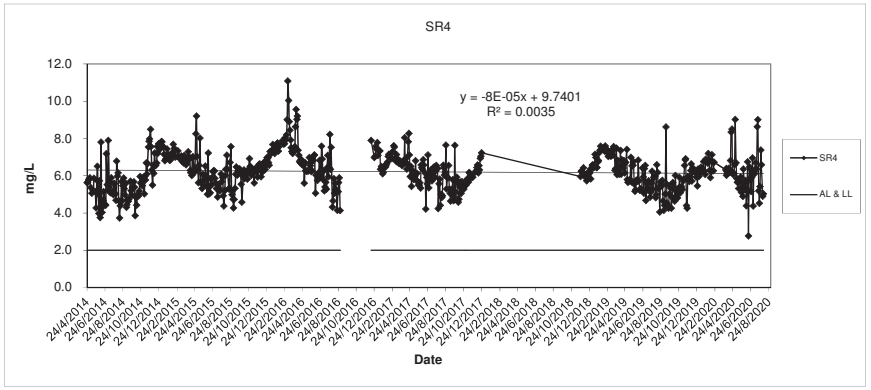
Dissolved Oxygen (Surface and Middle) at Mid-Ebb Tide

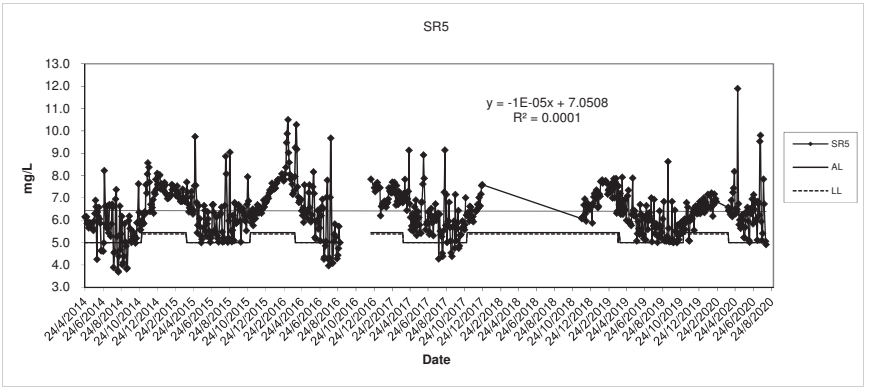


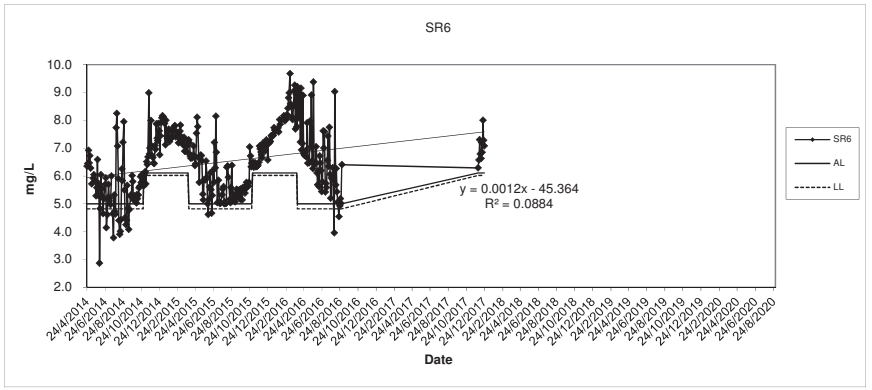




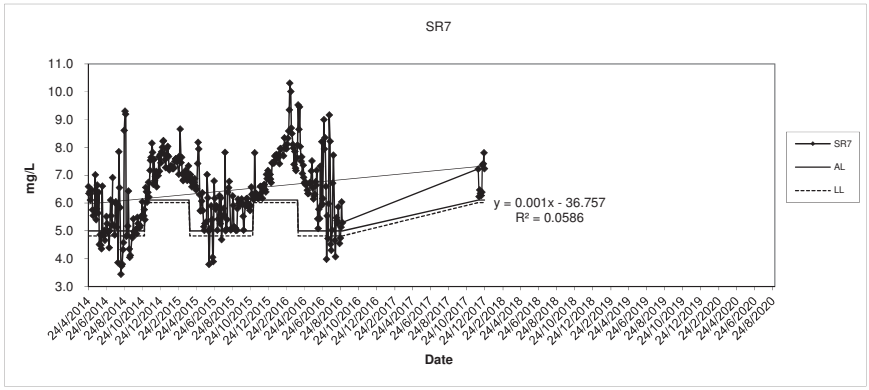
Dissolved Oxygen (Surface and Middle) at Mid-Ebb Tide

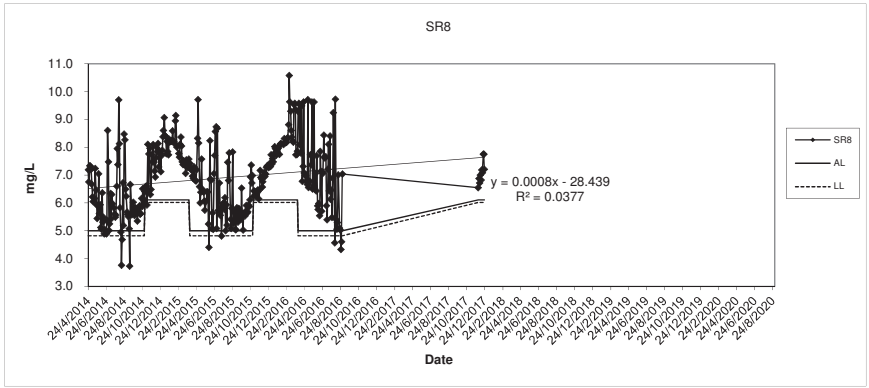


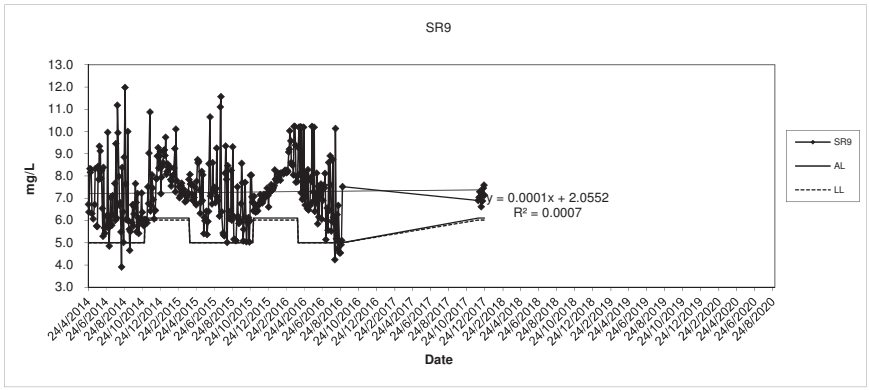




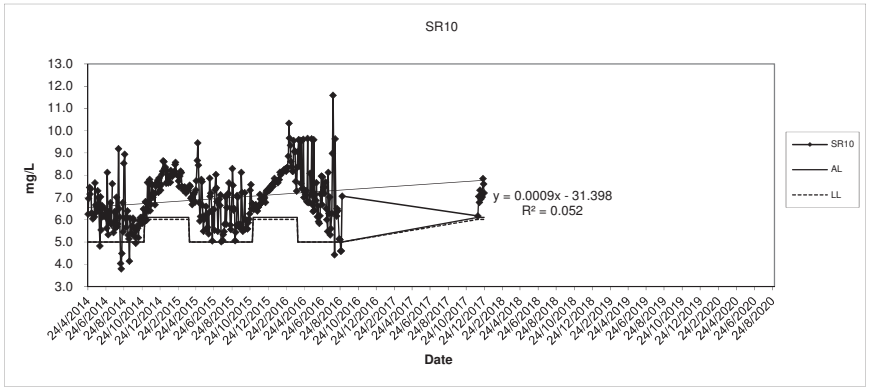
Dissolved Oxygen (Surface and Middle) at Mid-Ebb Tide

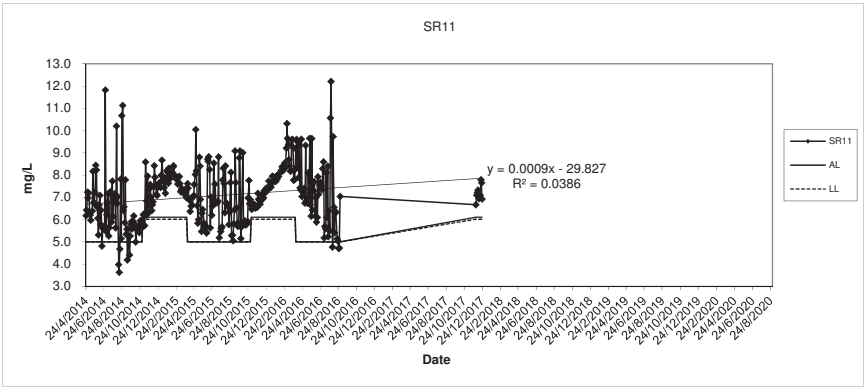


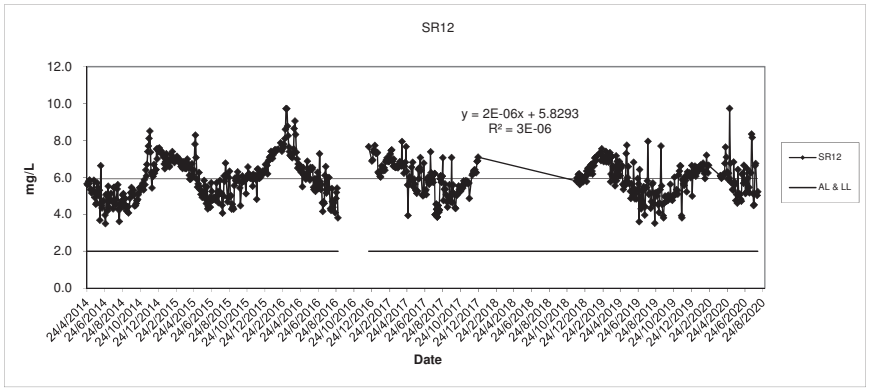




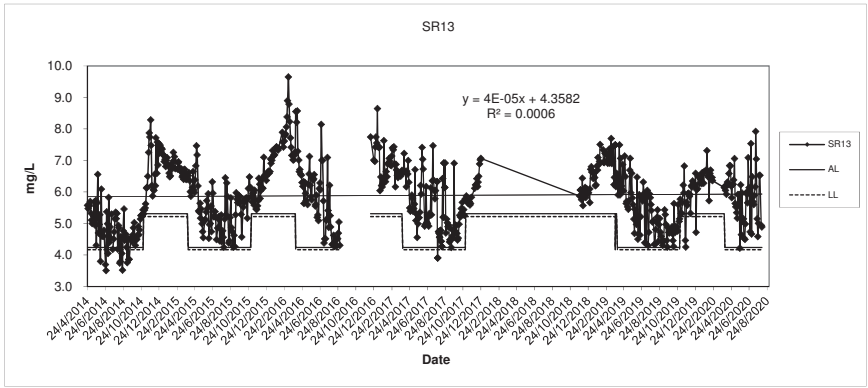
Dissolved Oxygen (Surface and Middle) at Mid-Ebb Tide

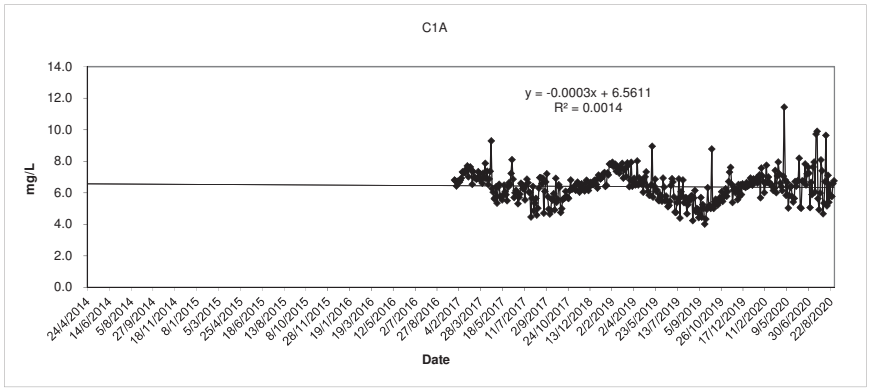


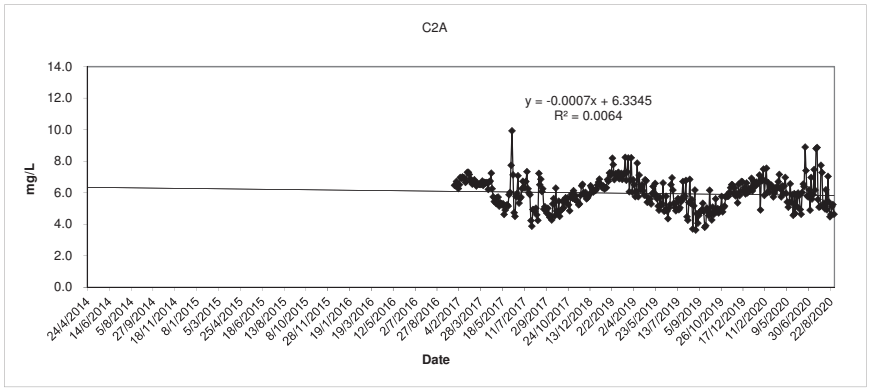




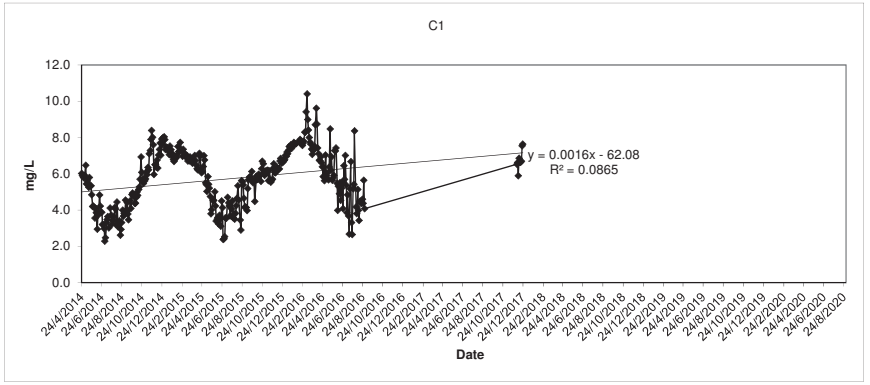
Dissolved Oxygen (Surface and Middle) at Mid-Ebb Tide

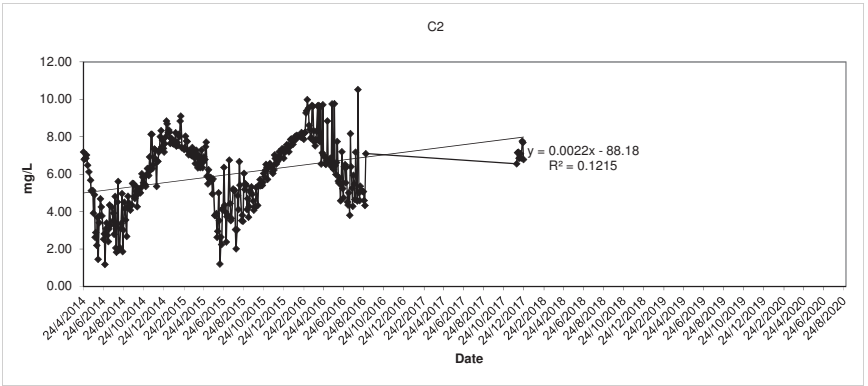


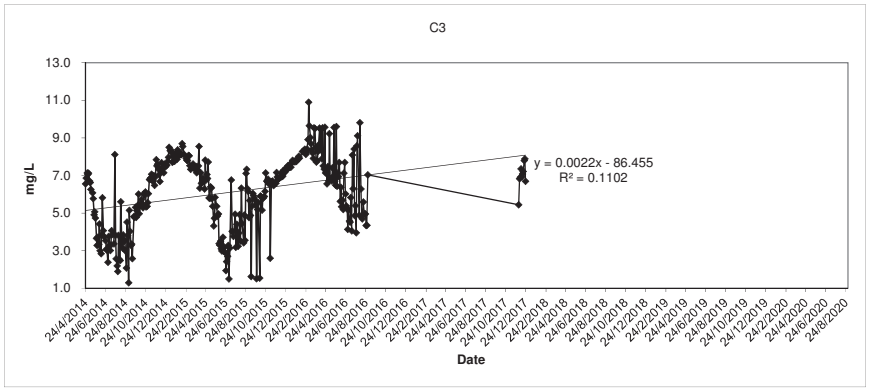




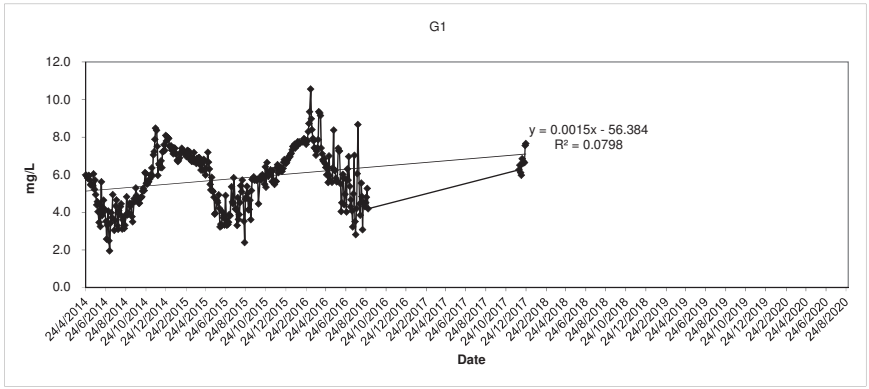
Dissolved Oxygen (Bottom) at Mid-Ebb Tide

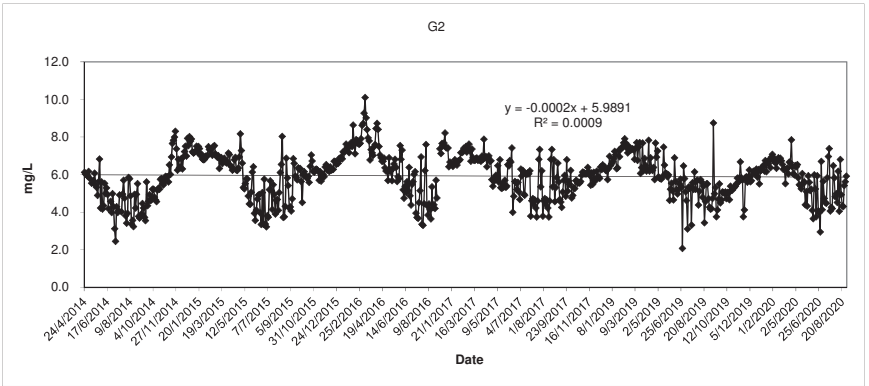


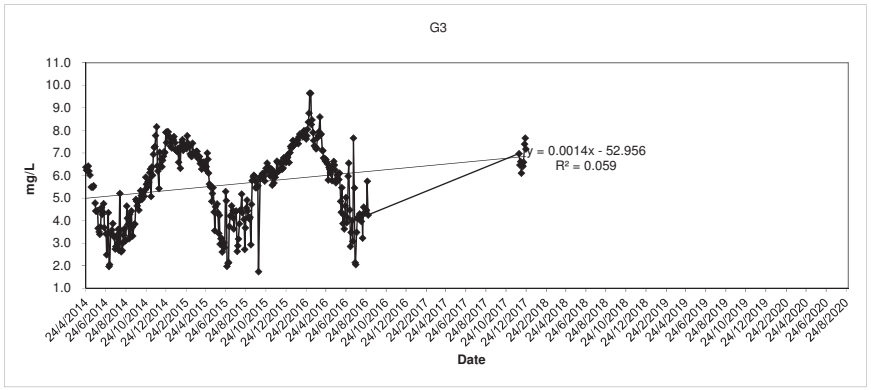




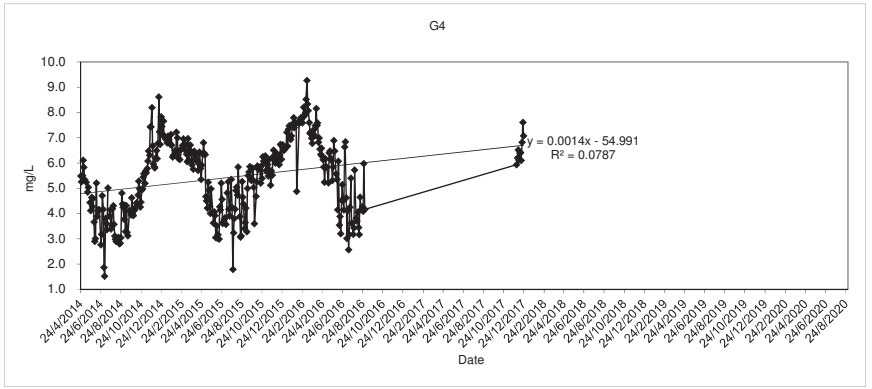
Dissolved Oxygen (Bottom) at Mid-Ebb Tide

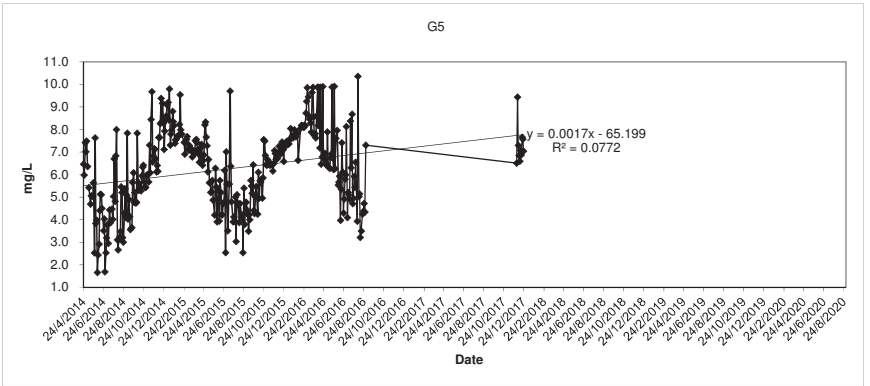


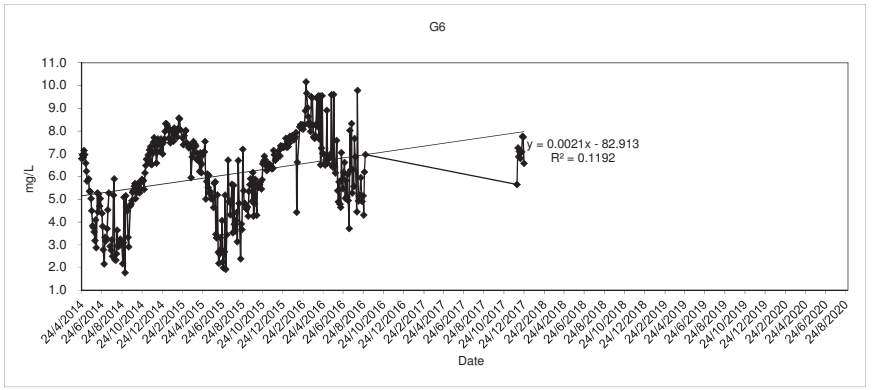




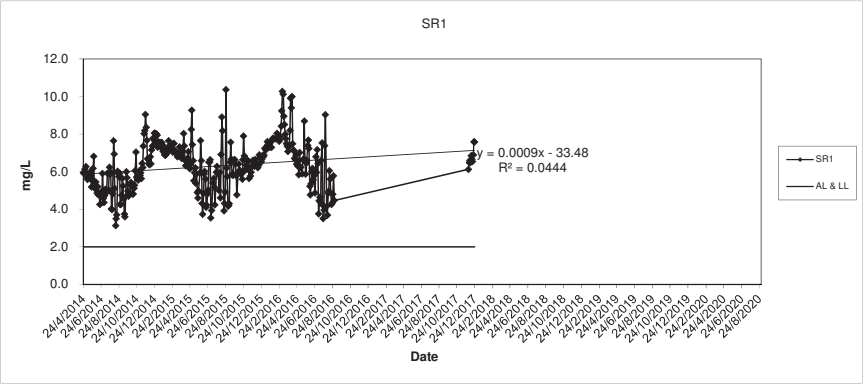
Dissolved Oxygen (Bottom) at Mid-Ebb Tide

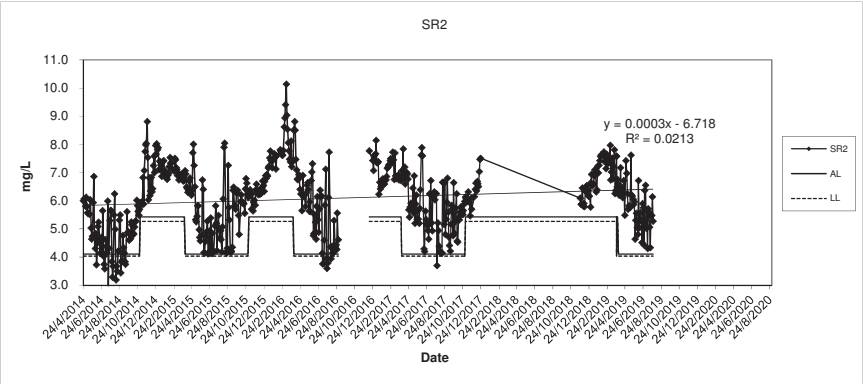


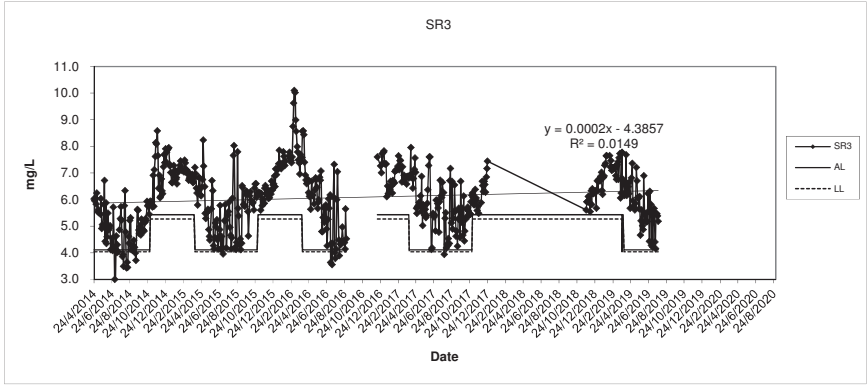




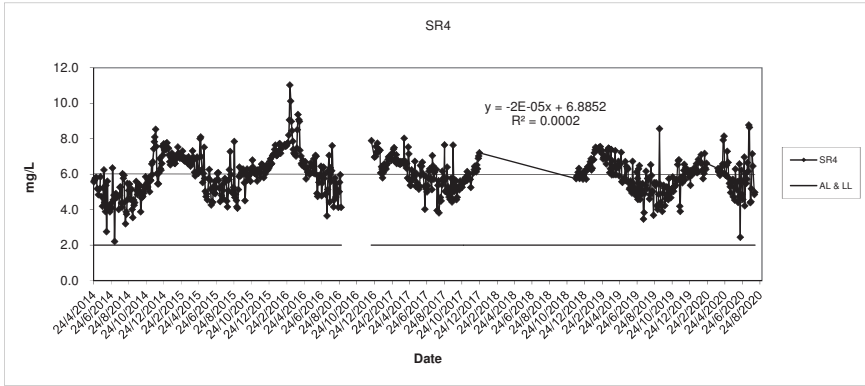
Dissolved Oxygen (Bottom) at Mid-Ebb Tide

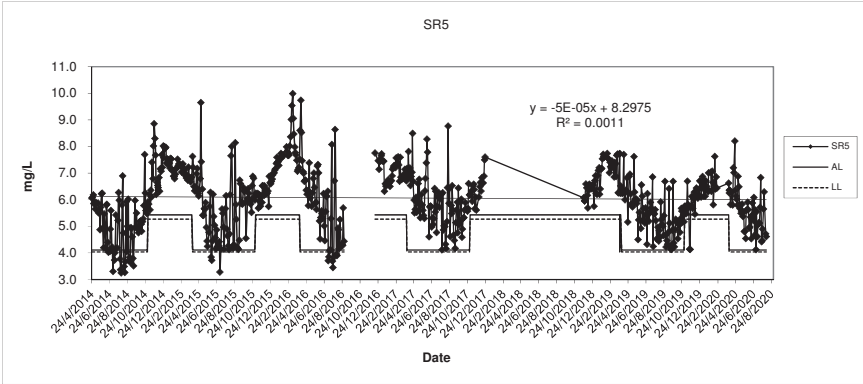


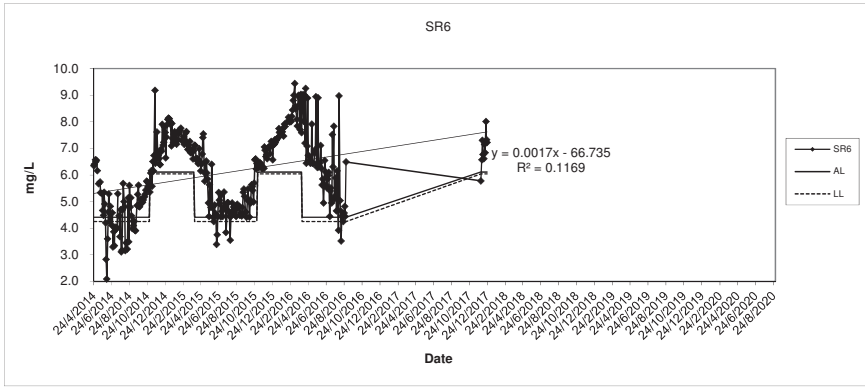




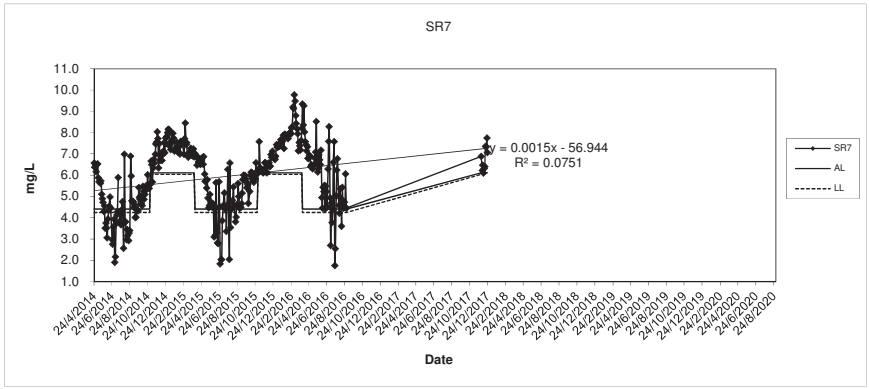
Dissolved Oxygen (Bottom) at Mid-Ebb Tide

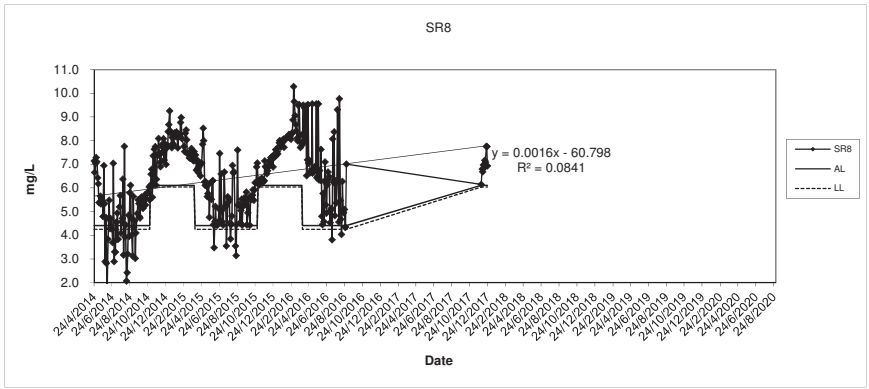


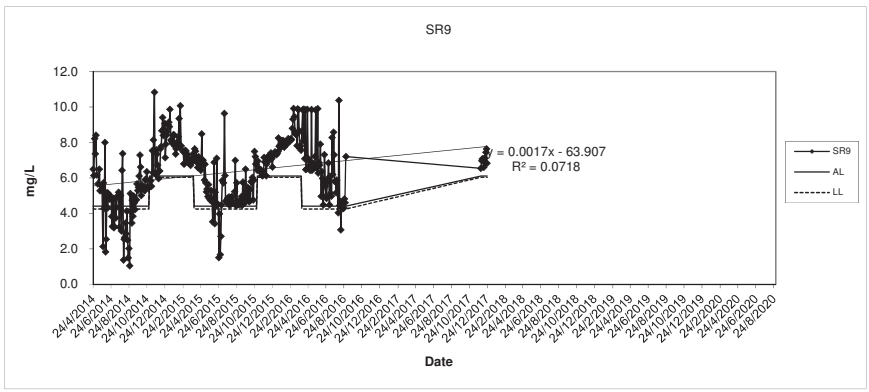




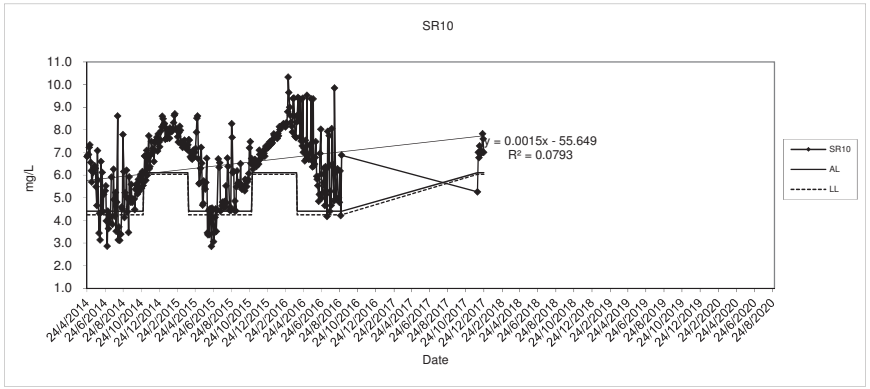
Dissolved Oxygen (Bottom) at Mid-Ebb Tide

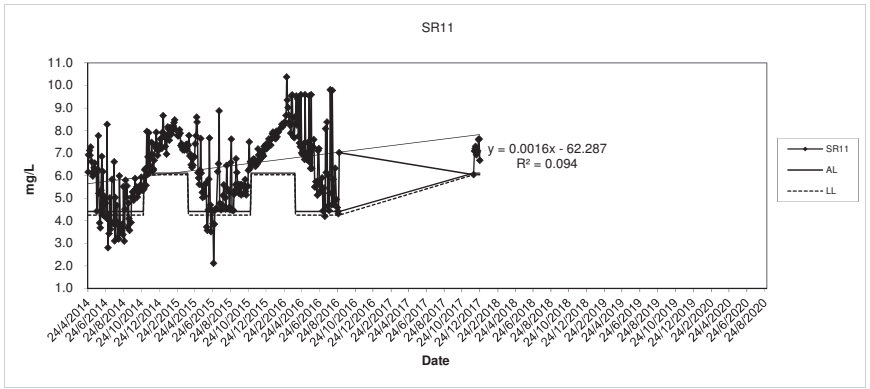


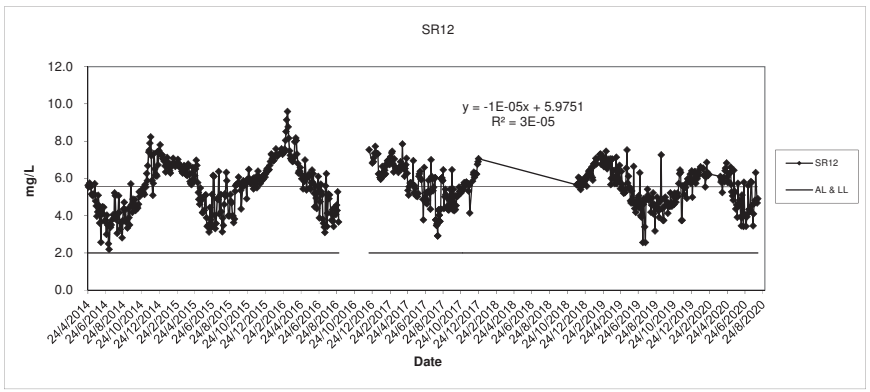




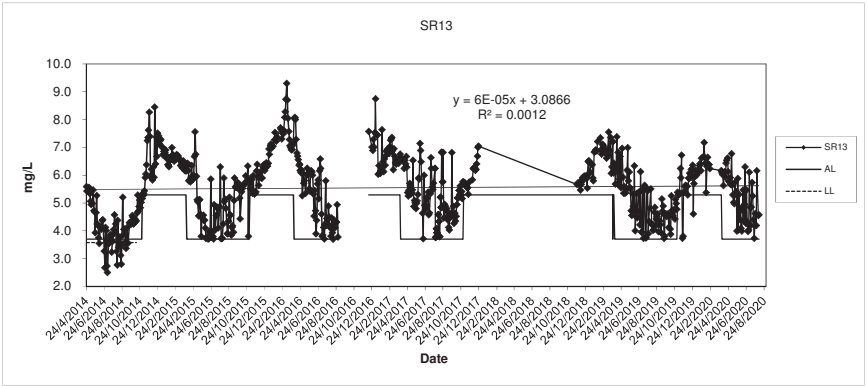
Dissolved Oxygen (Bottom) at Mid-Ebb Tide

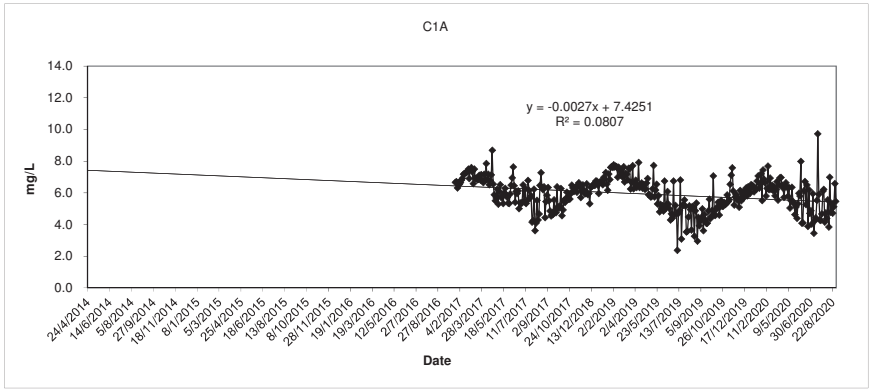


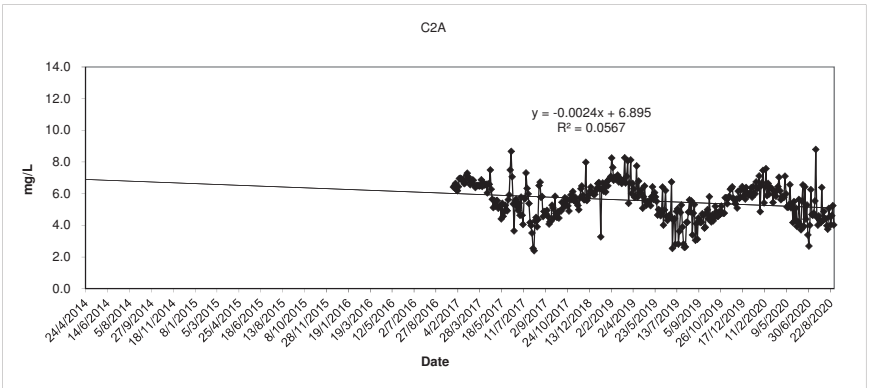




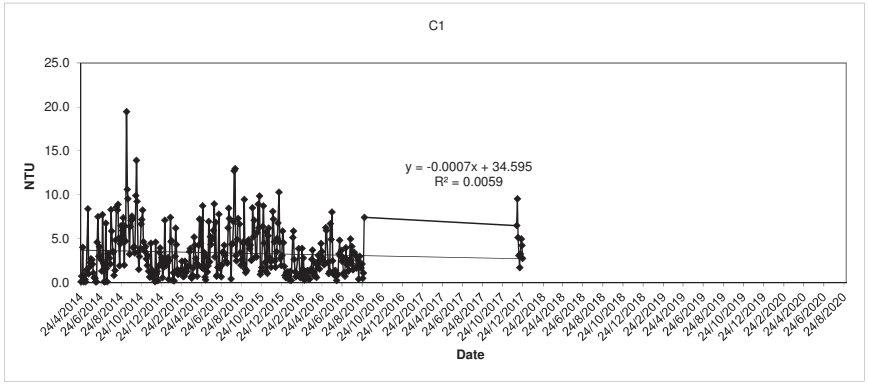
Dissolved Oxygen (Bottom) at Mid-Ebb Tide

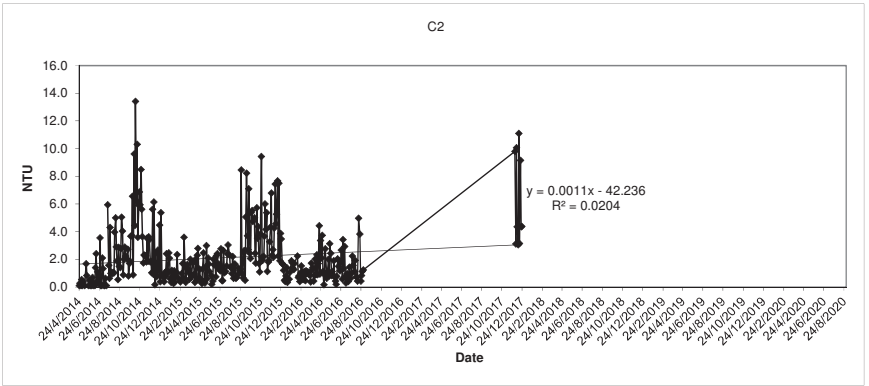


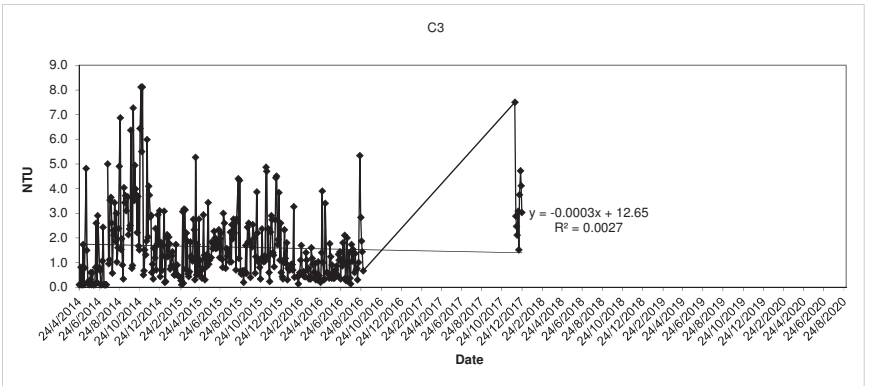




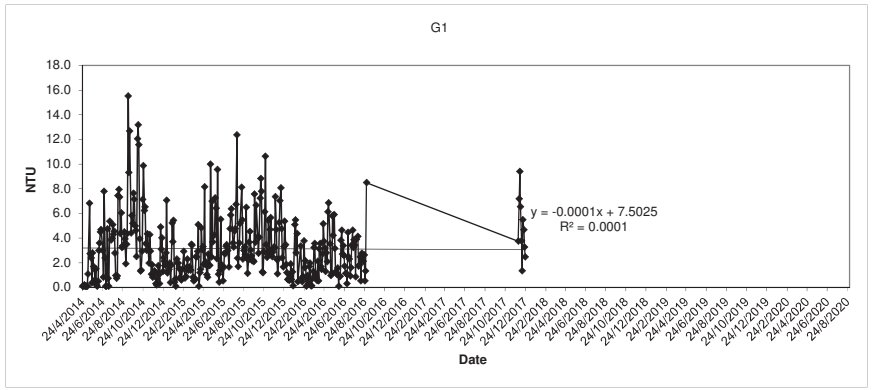
Turbidity (Depth average) at Mid-Ebb Tide

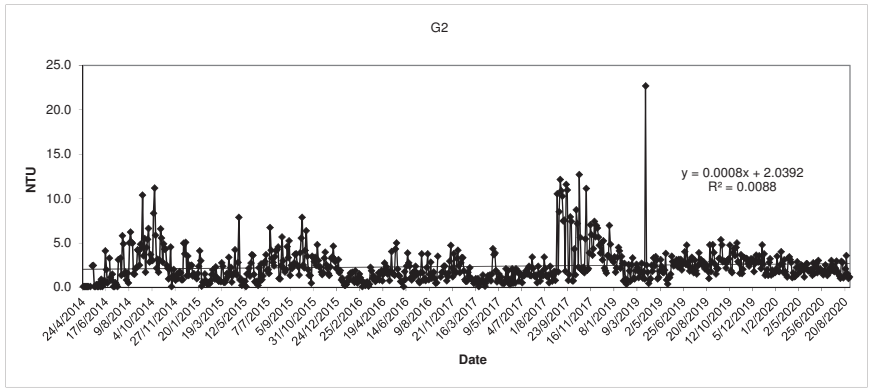


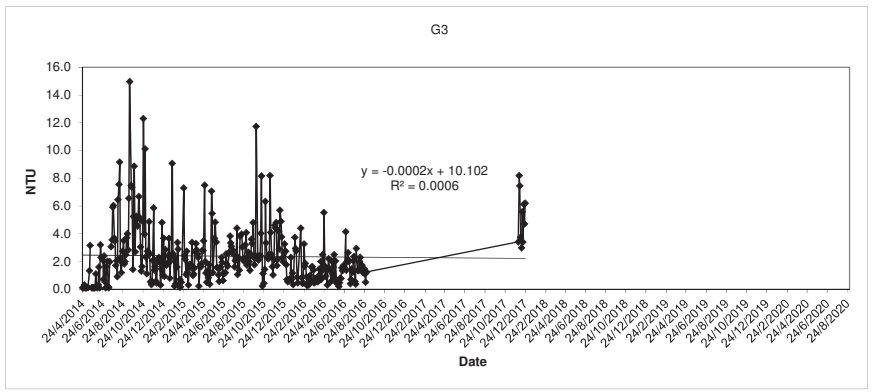




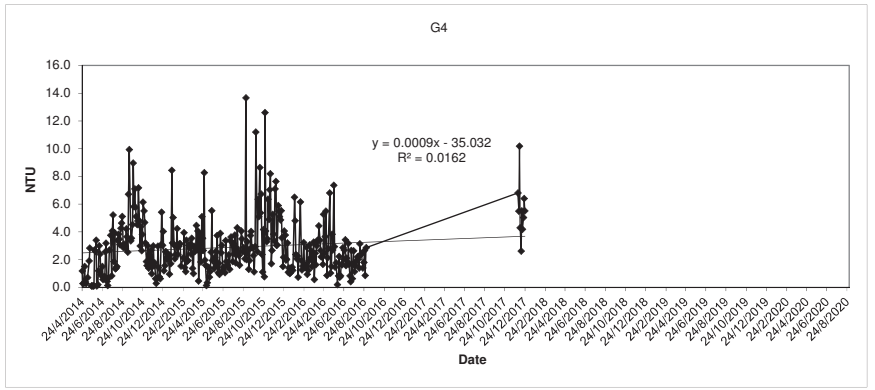
Turbidity (Depth average) at Mid-Ebb Tide

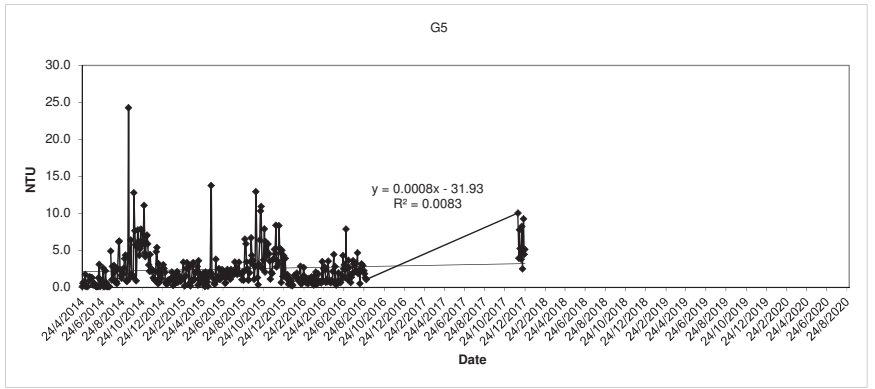


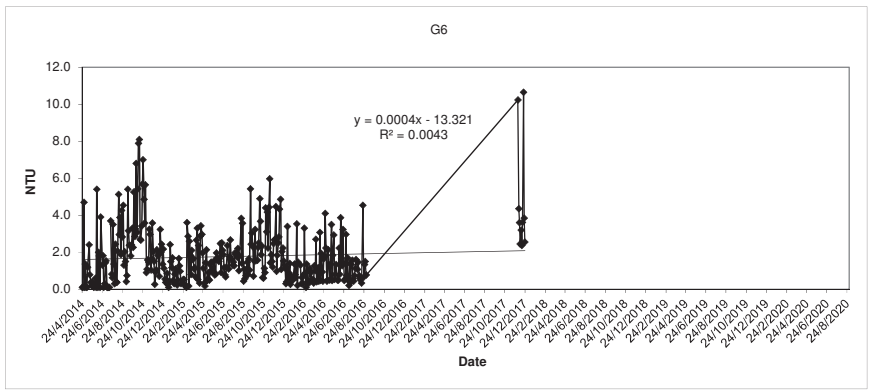




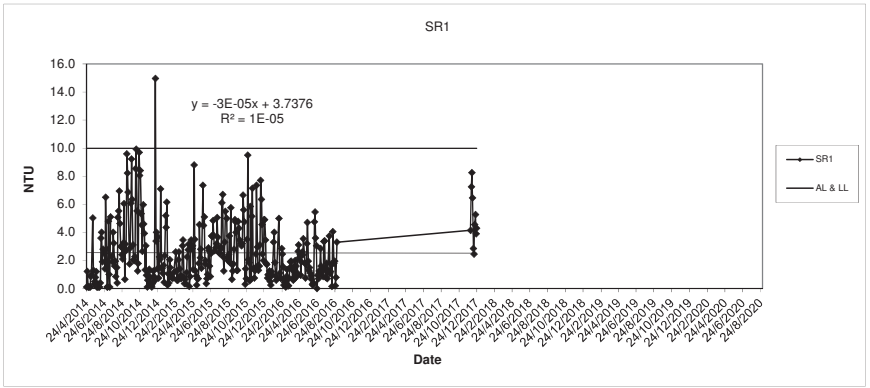
Turbidity (Depth average) at Mid-Ebb Tide

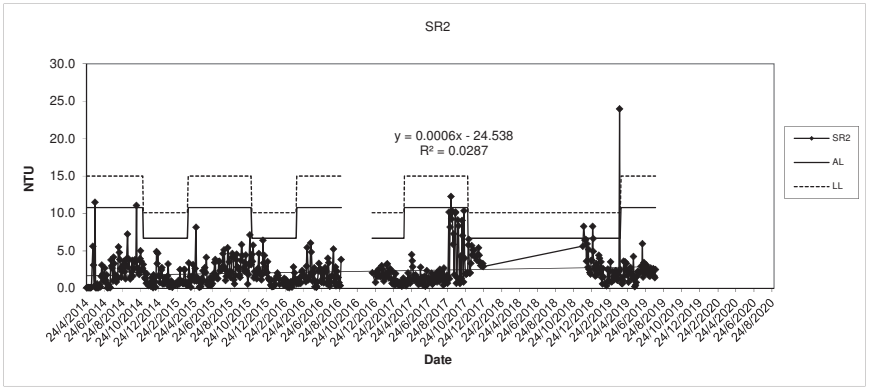


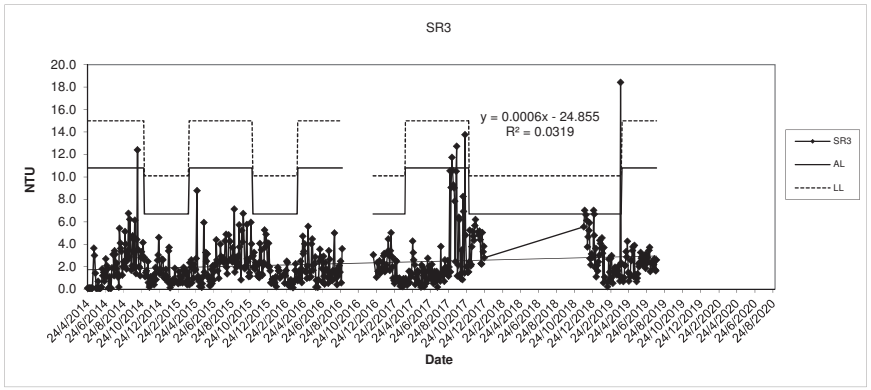




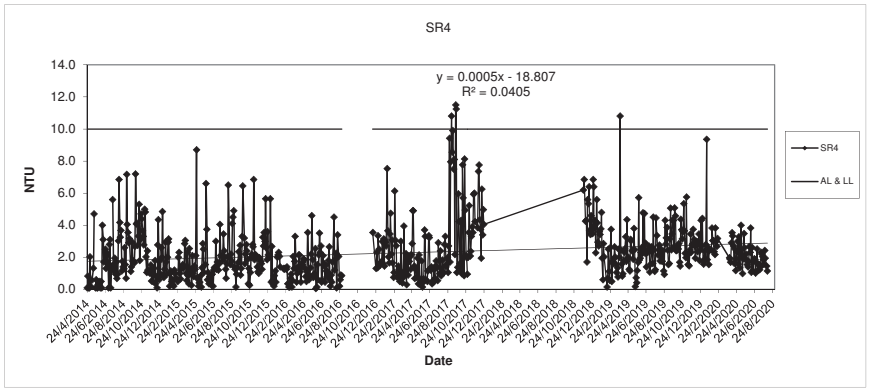
Turbidity (Depth average) at Mid-Ebb Tide

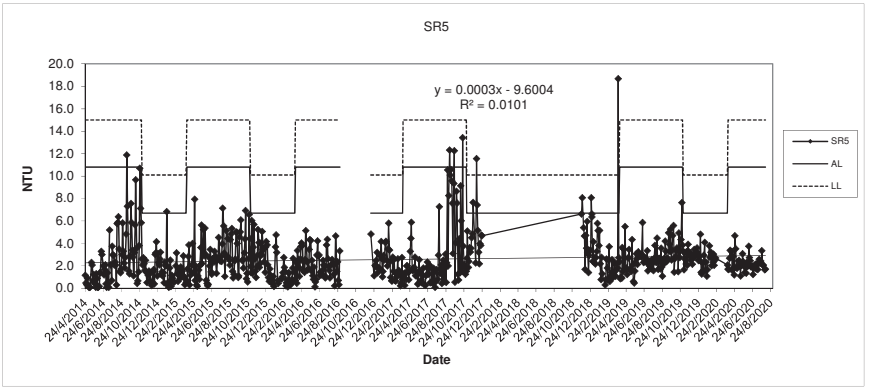


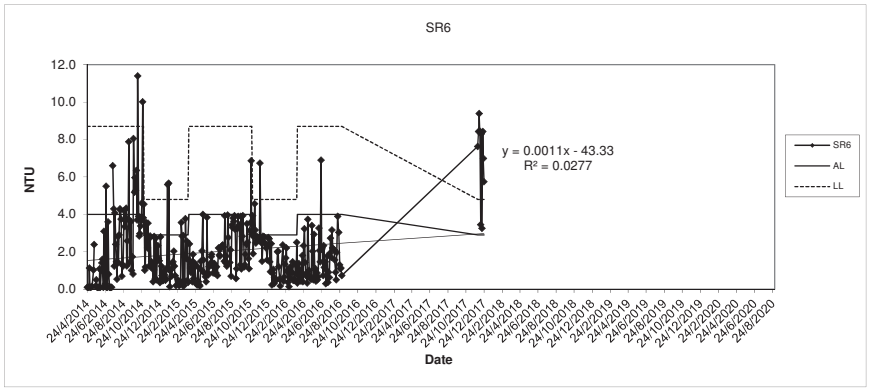




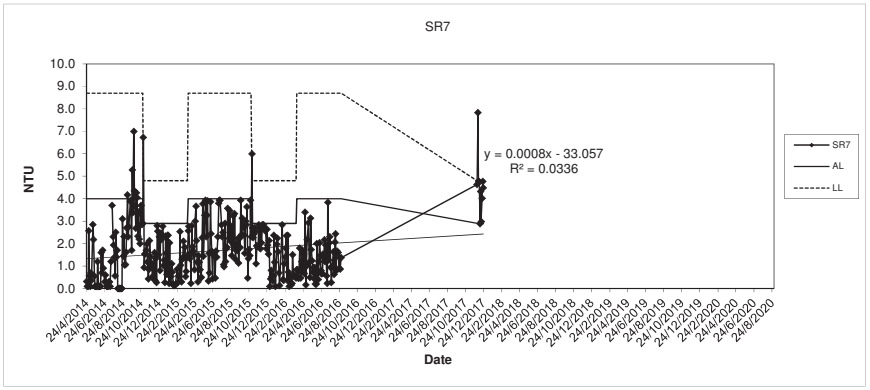
Turbidity (Depth average) at Mid-Ebb Tide

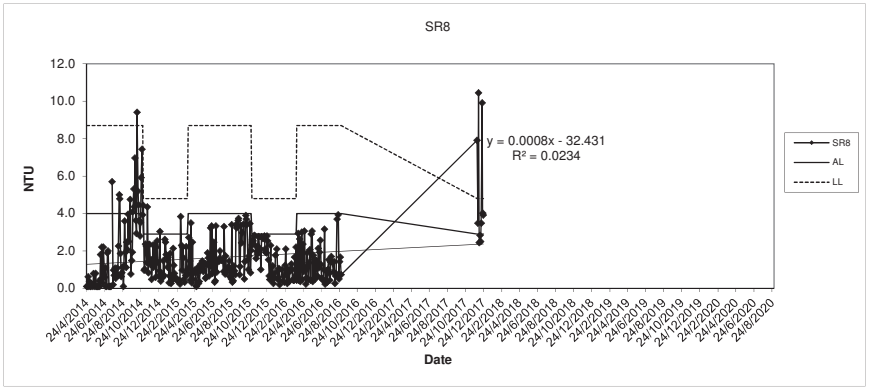


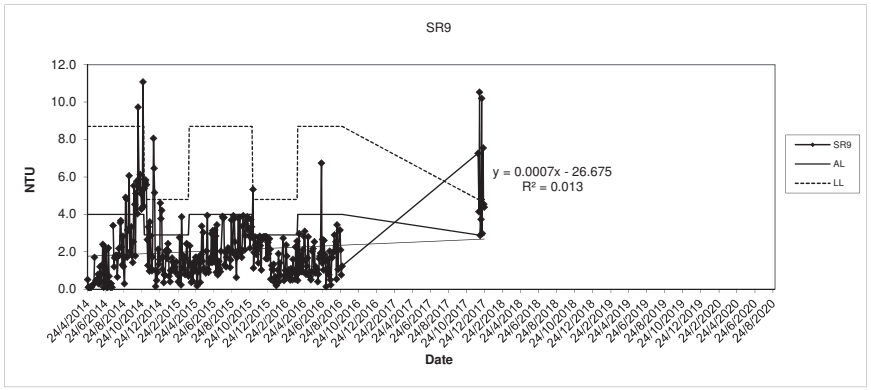




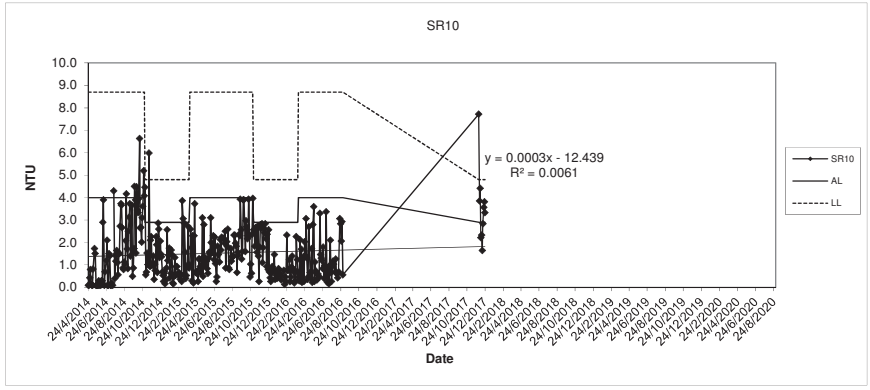
Turbidity (Depth average) at Mid-Ebb Tide

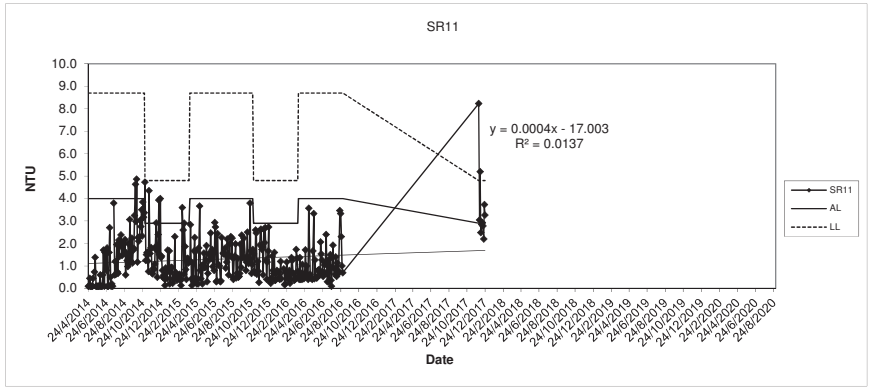


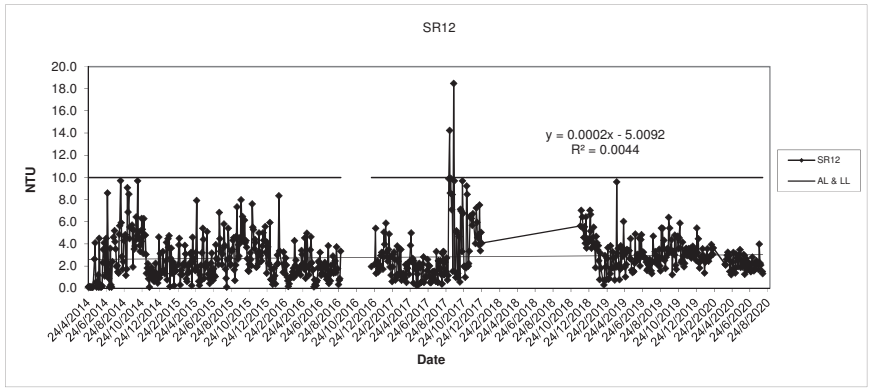




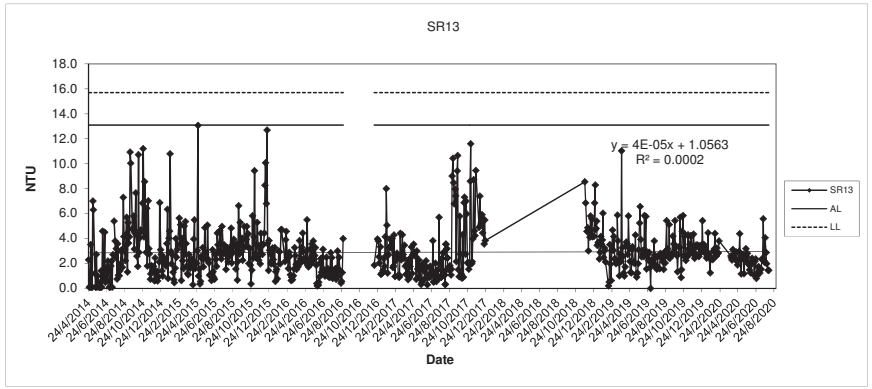
Turbidity (Depth average) at Mid-Ebb Tide

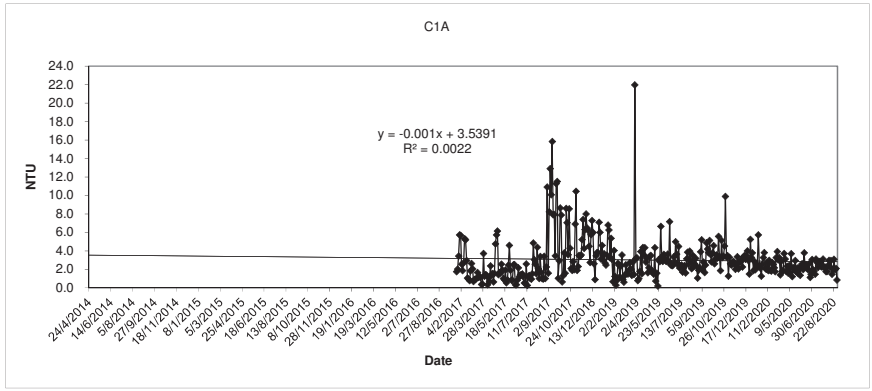


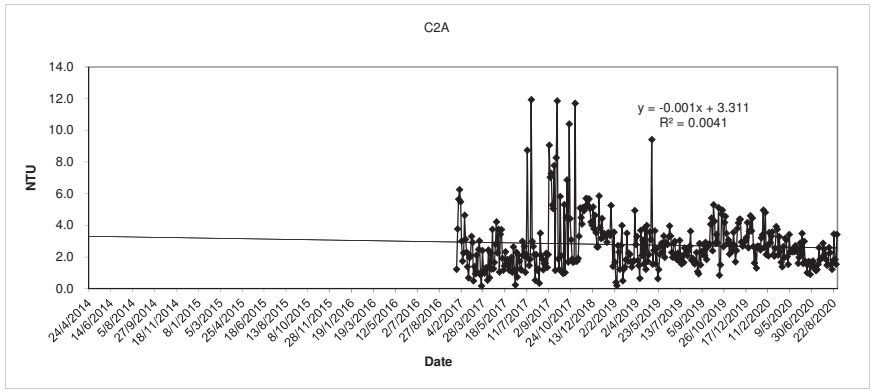




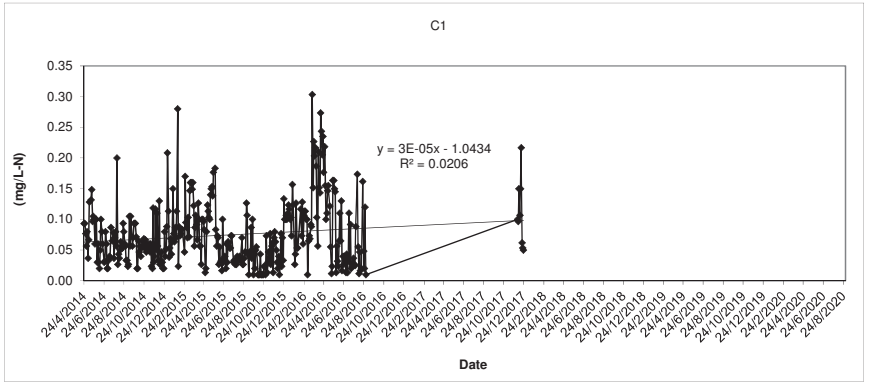
Turbidity (Depth average) at Mid-Ebb Tide

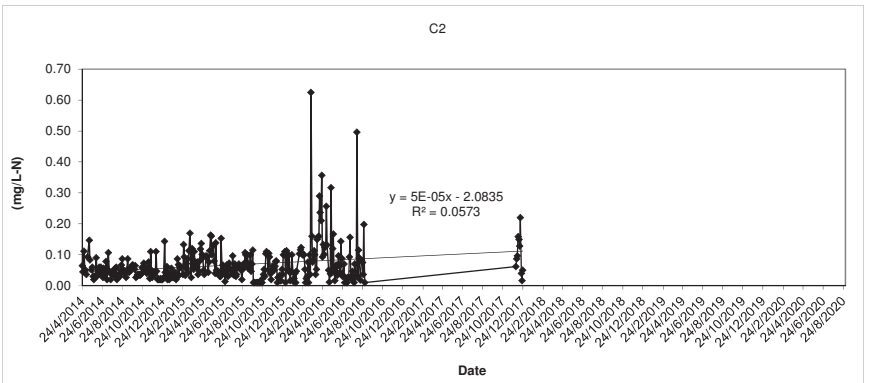


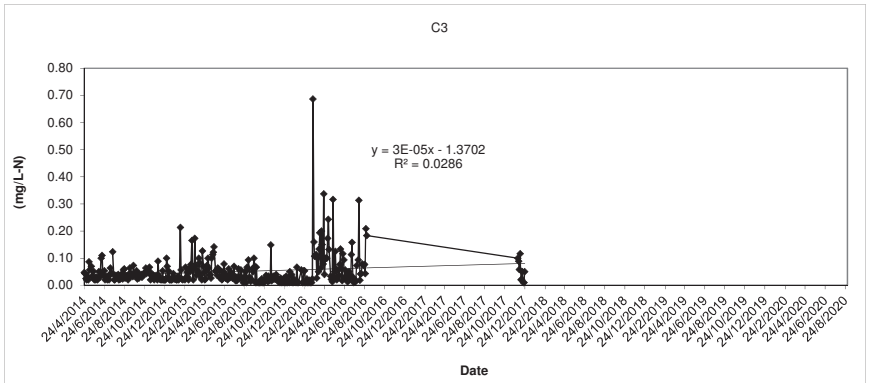




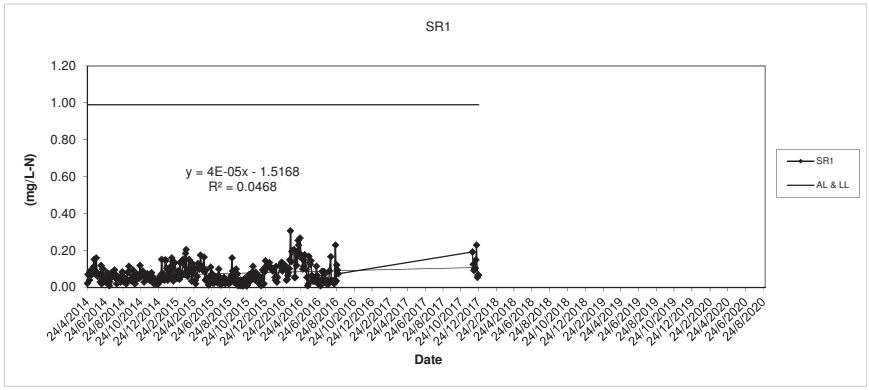
In-situ Ammonia (Depth average) at Mid-Ebb Tide

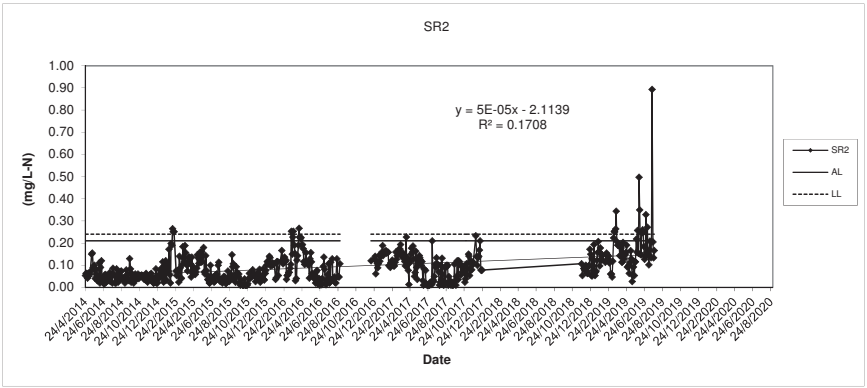


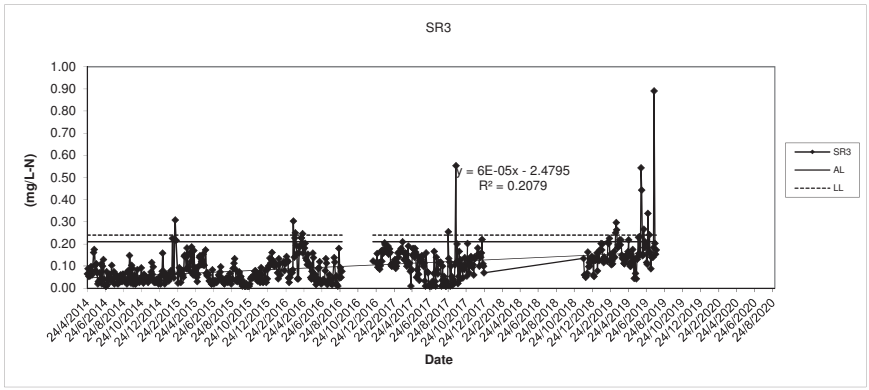




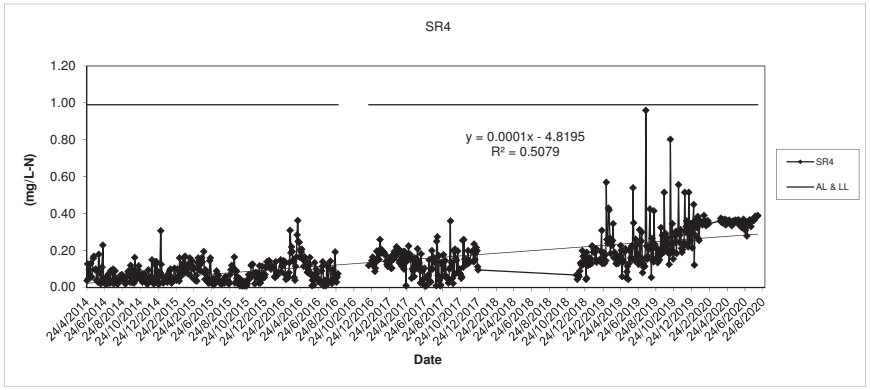
In-situ Ammonia (Depth average) at Mid-Ebb Tide

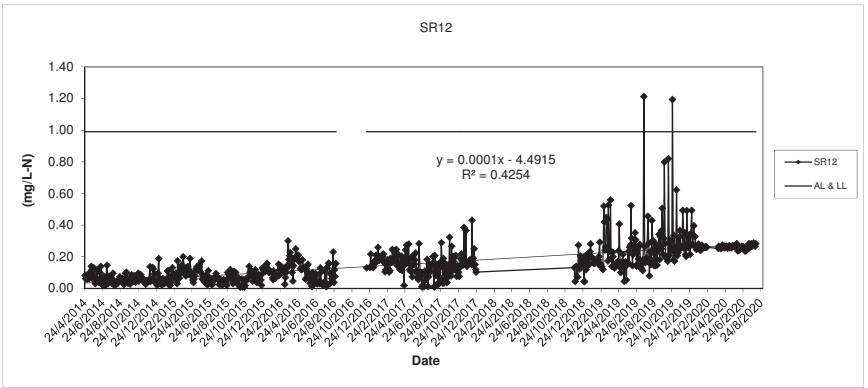


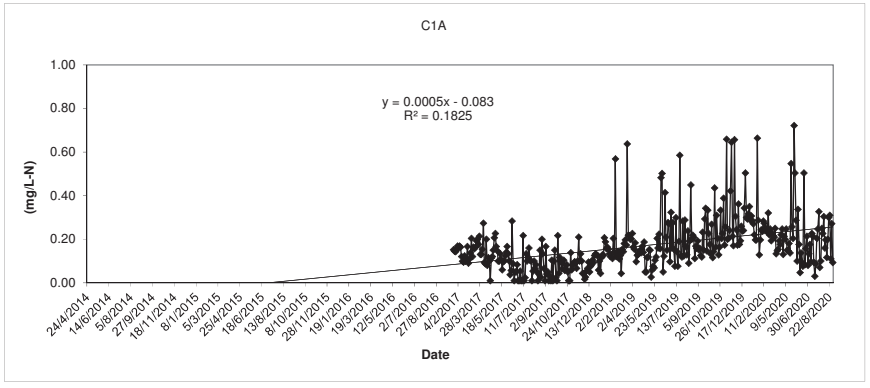




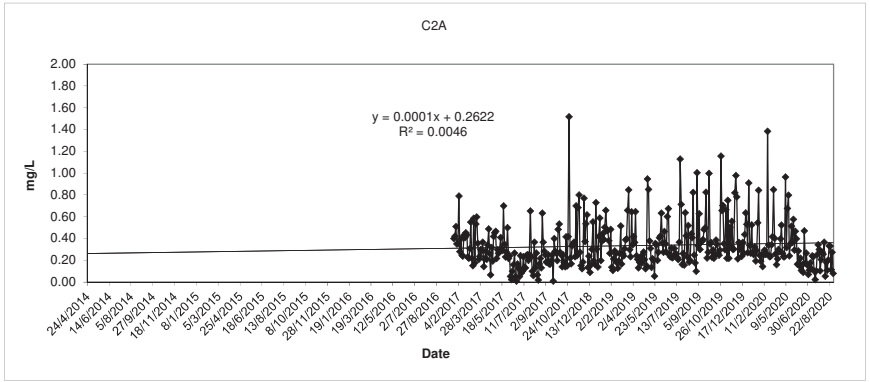
In-situ Ammonia (Depth average) at Mid-Ebb Tide



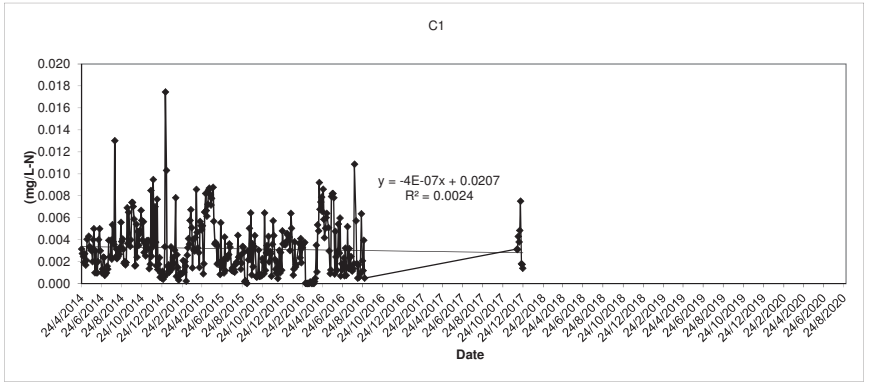


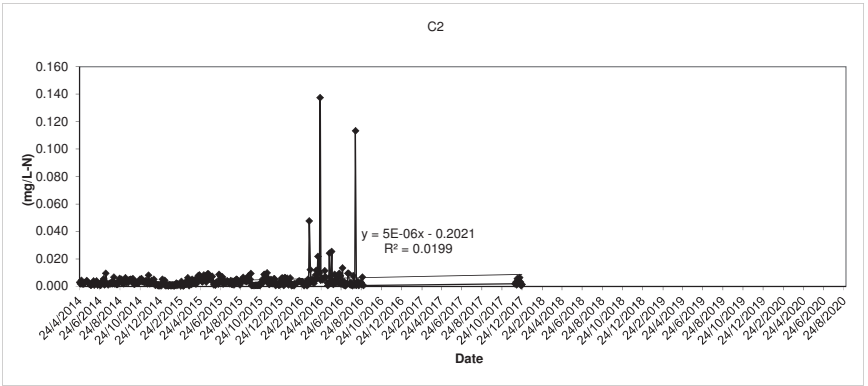


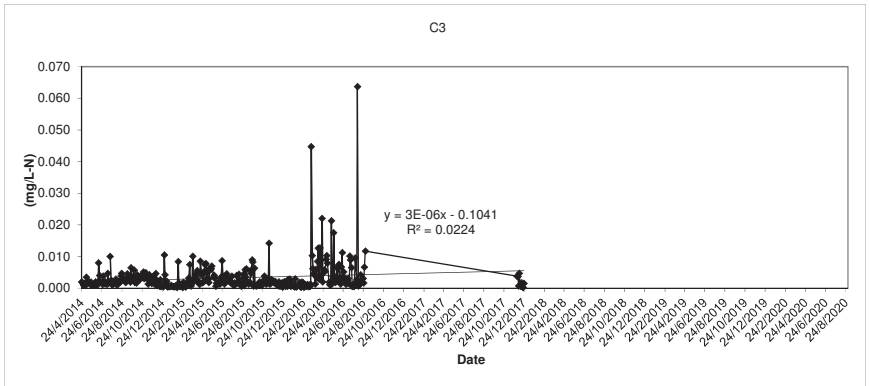
In-situ Ammonia (Depth average) at Mid-Ebb Tide



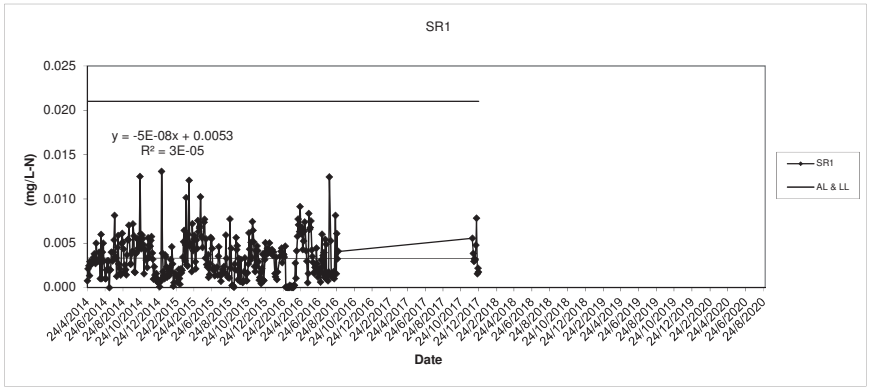
In-situ UIA (Depth average) at Mid-Ebb Tide

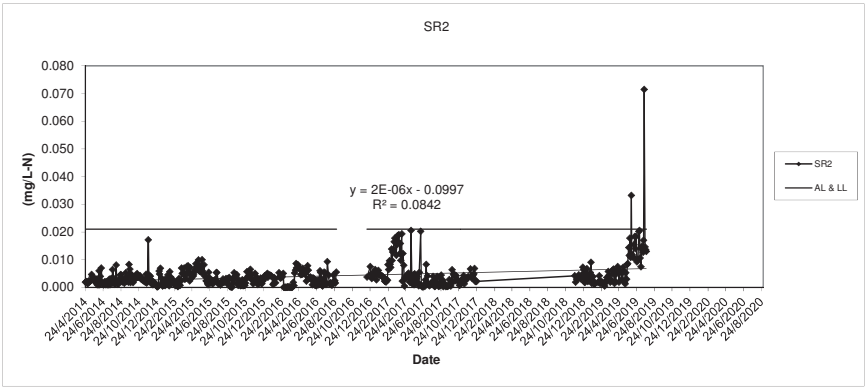


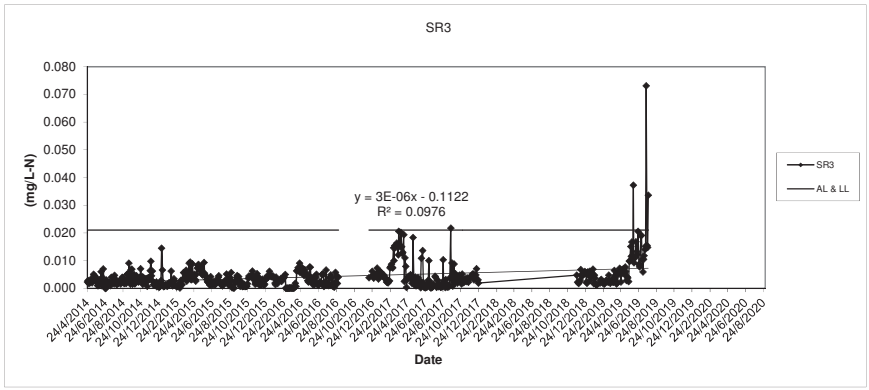




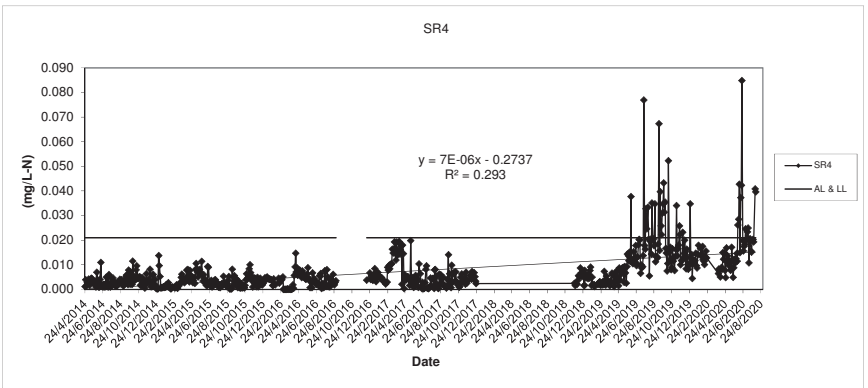
In-situ UIA (Depth average) at Mid-Ebb Tide

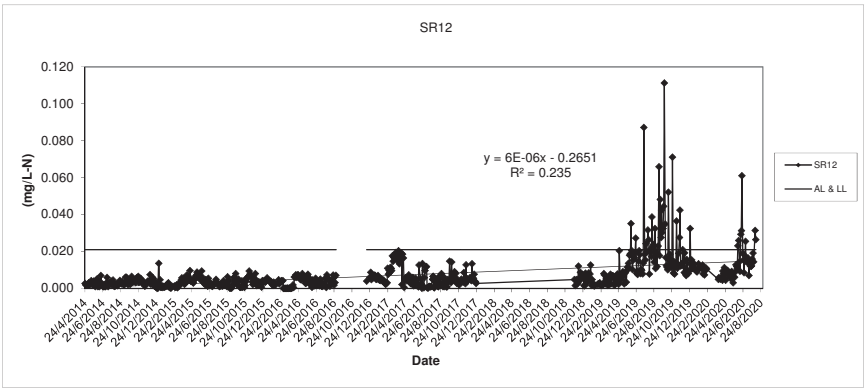


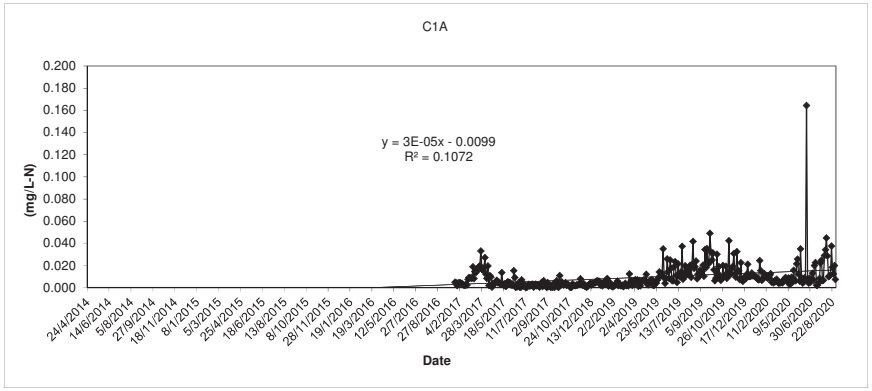




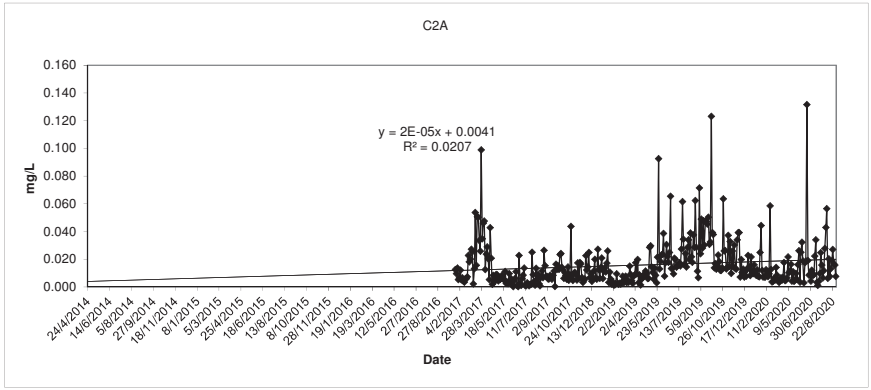
In-situ UIA (Depth average) at Mid-Ebb Tide



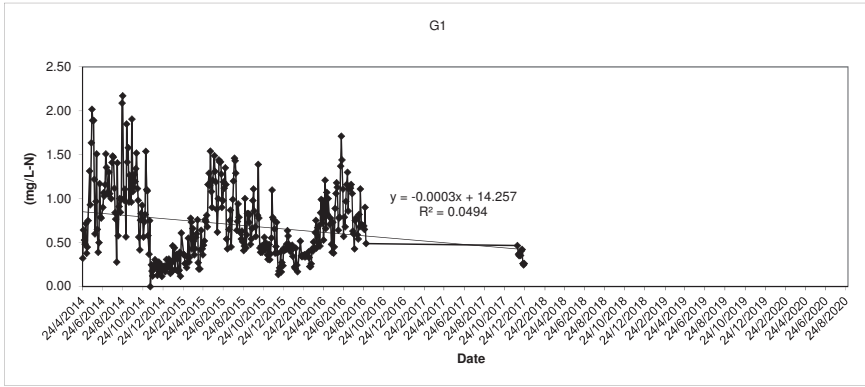


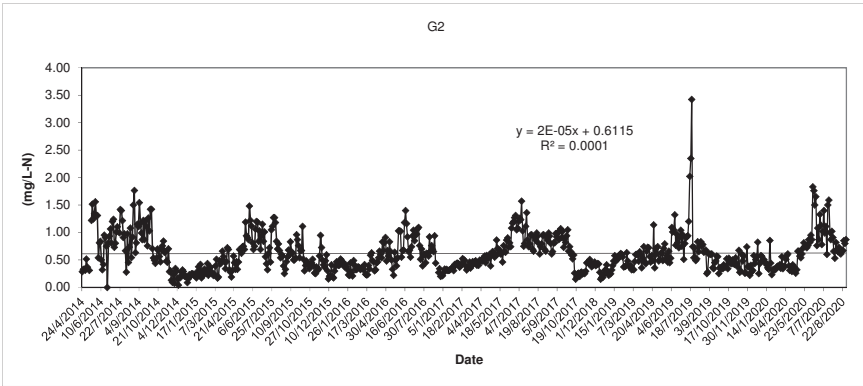


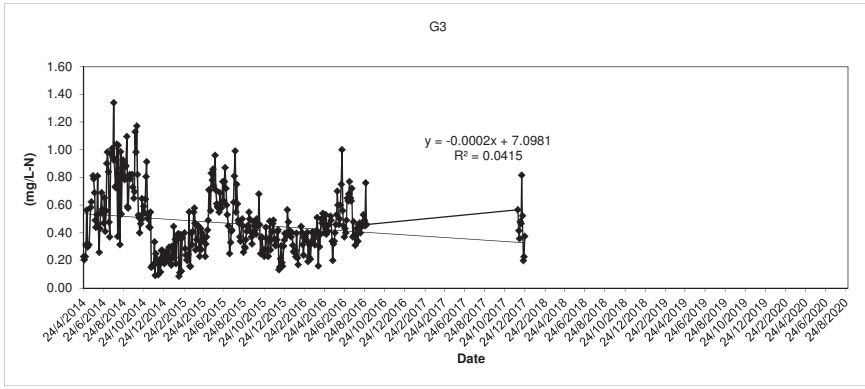
In-situ UIA (Depth average) at Mid-Ebb Tide



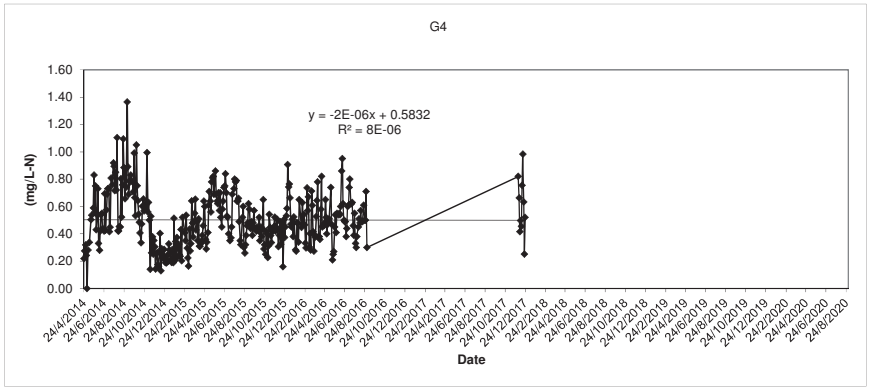
In-situ TIN (Depth average) at Mid-Ebb Tide

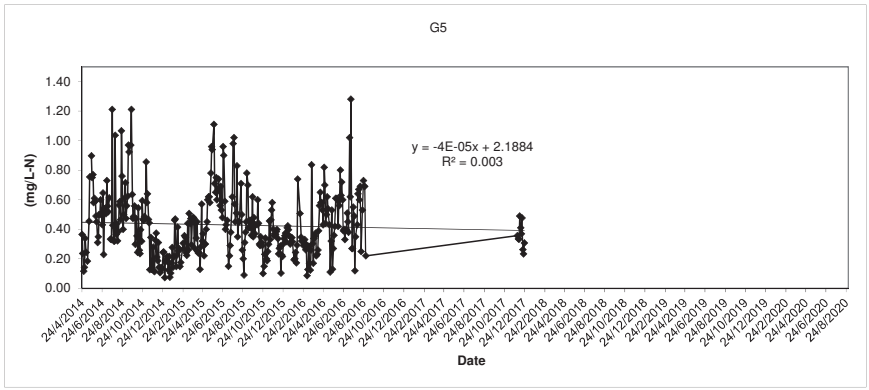


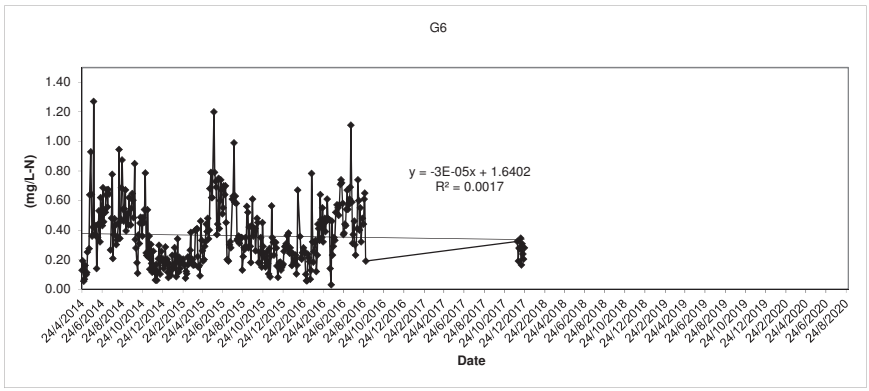




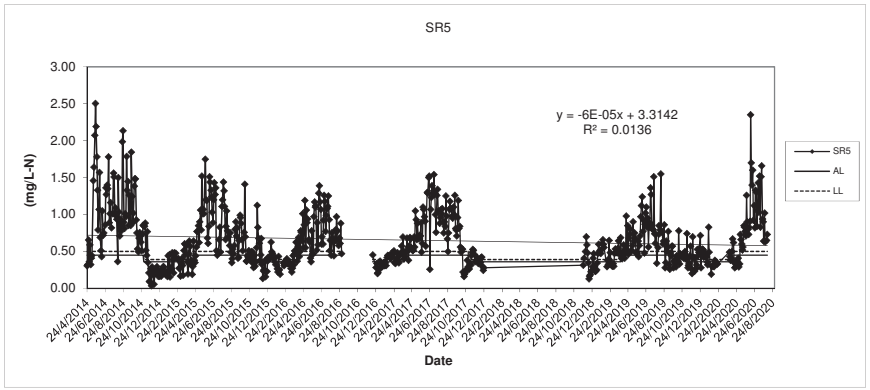
In-situ TIN (Depth average) at Mid-Ebb Tide

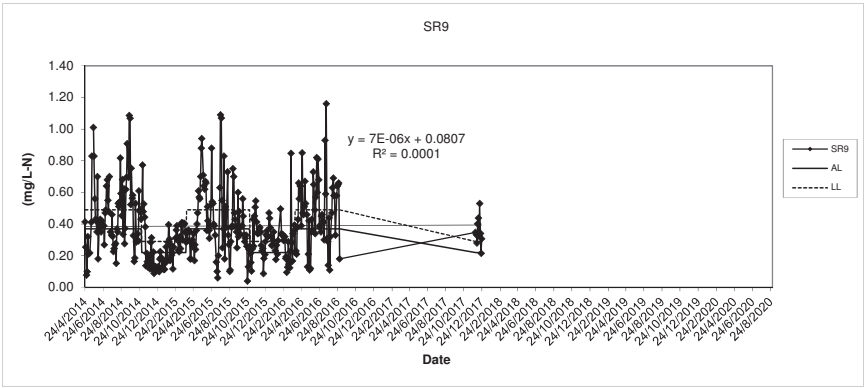


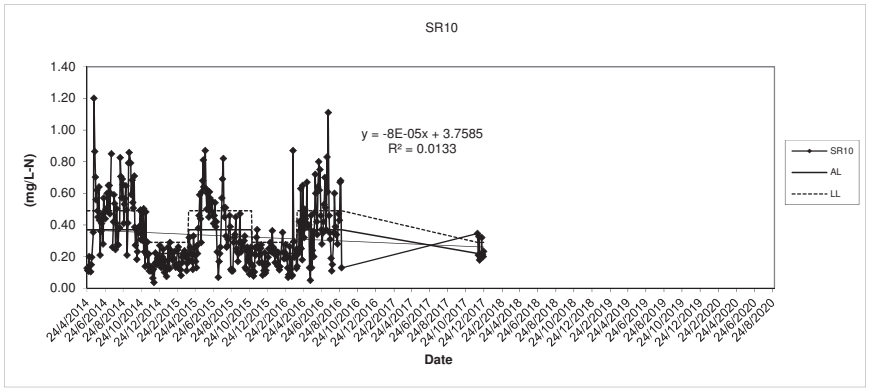




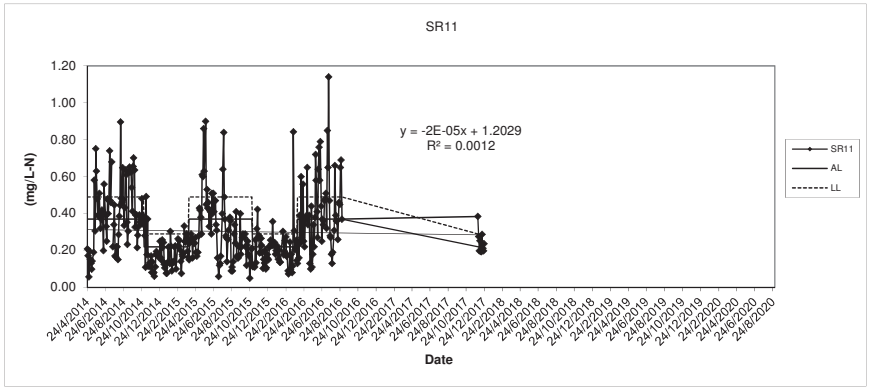
In-situ TIN (Depth average) at Mid-Ebb Tide

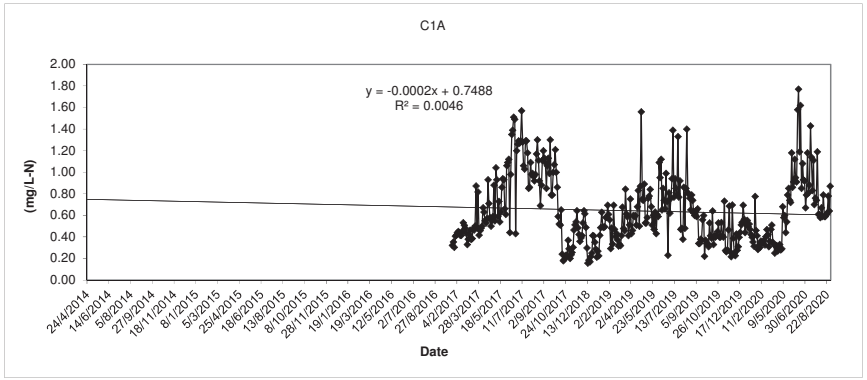


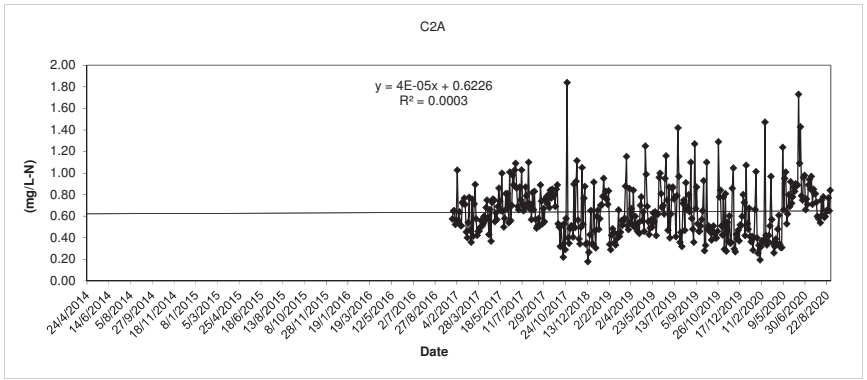




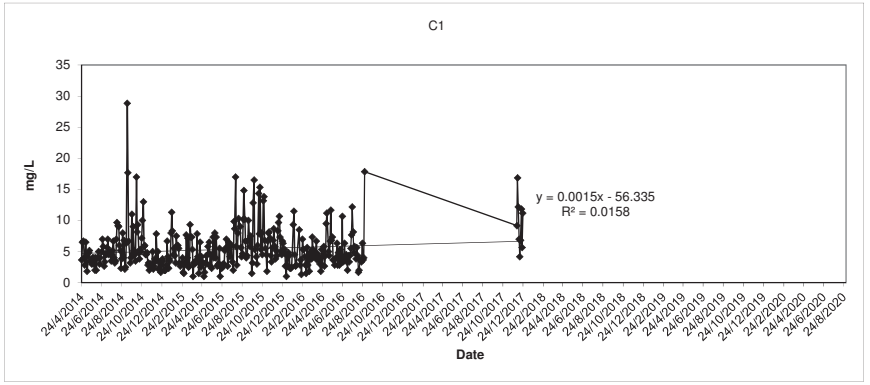
In-situ TIN (Depth average) at Mid-Ebb Tide

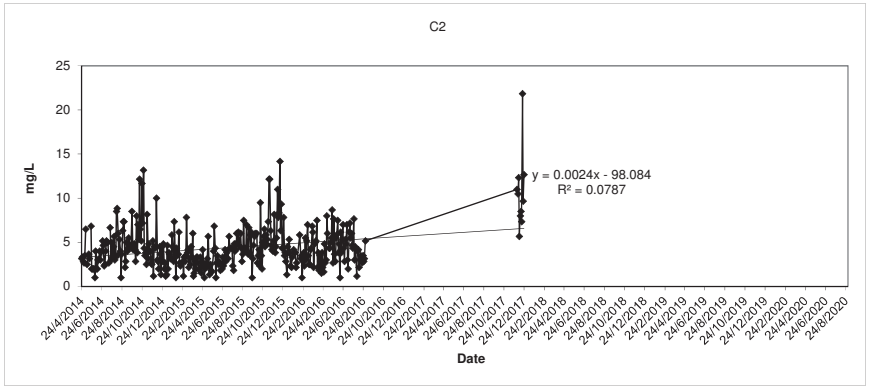


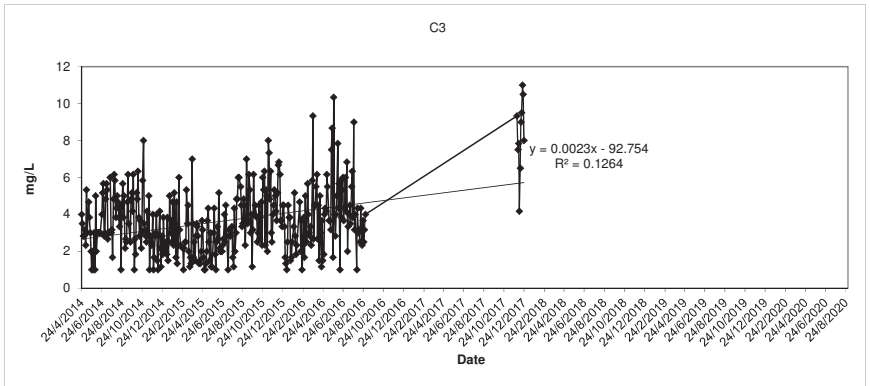




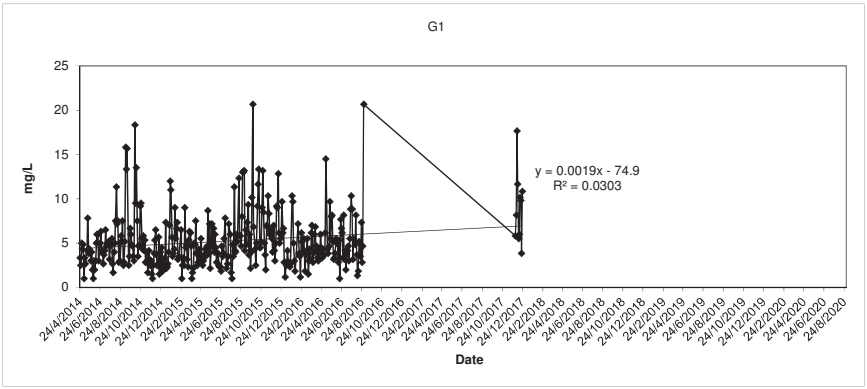
Total Suspended Solids (Depth average) at Mid-Ebb Tide

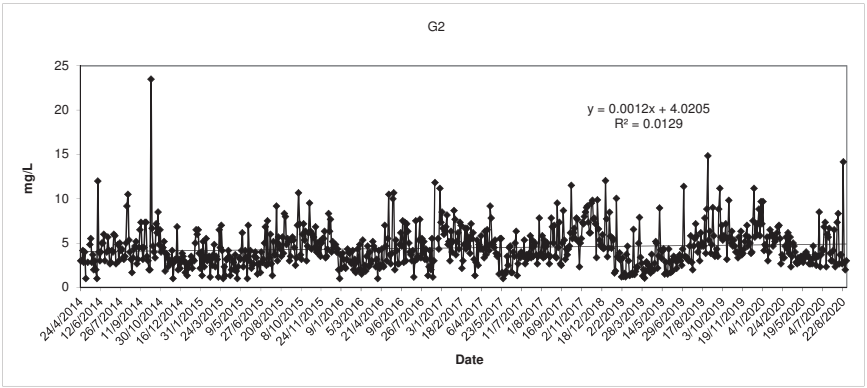


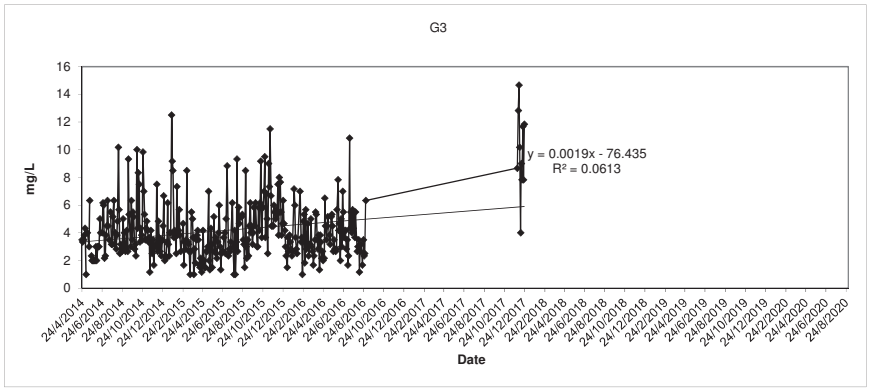




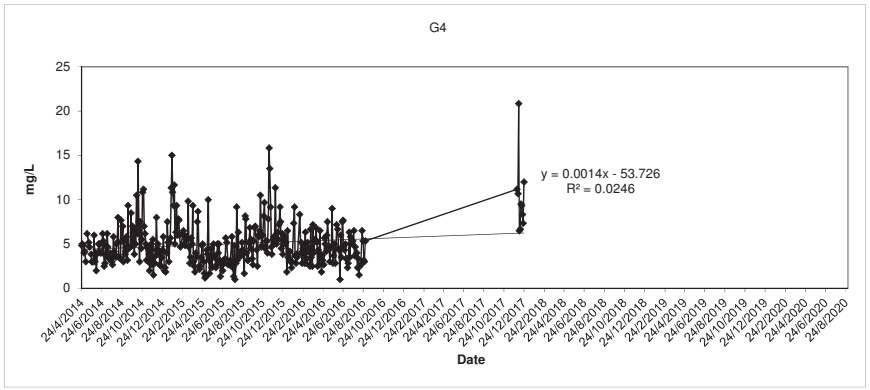
Total Suspended Solids (Depth average) at Mid-Ebb Tide

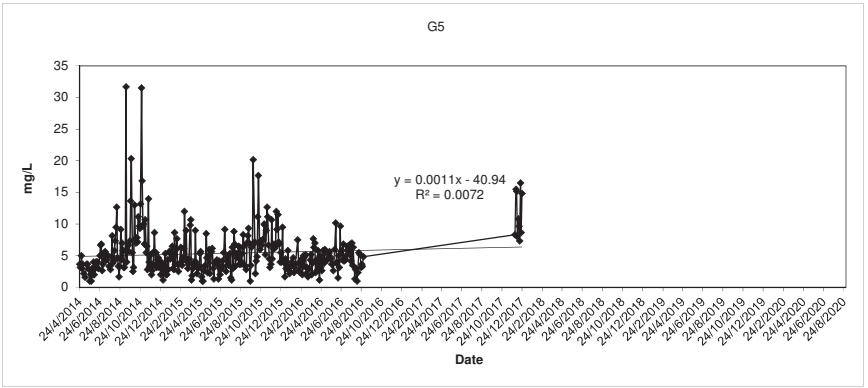


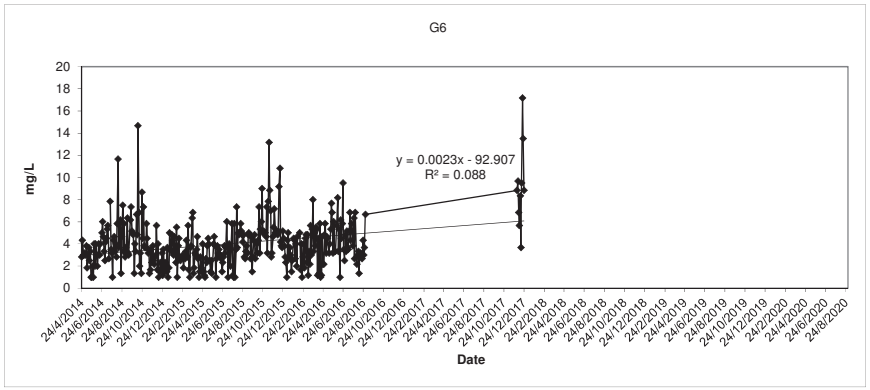




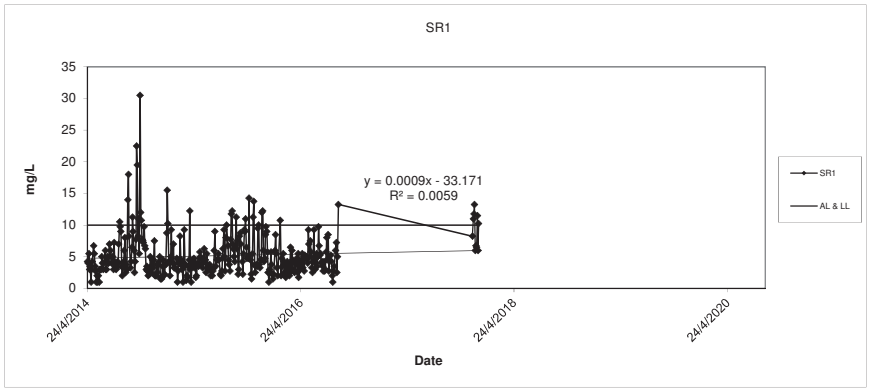
Total Suspended Solids (Depth average) at Mid-Ebb Tide

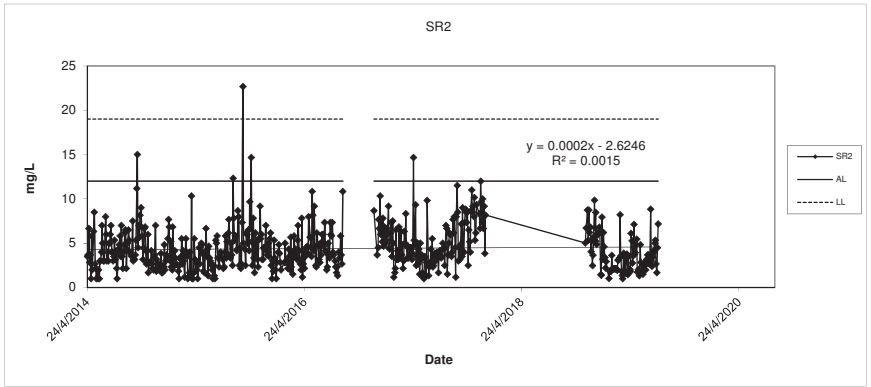


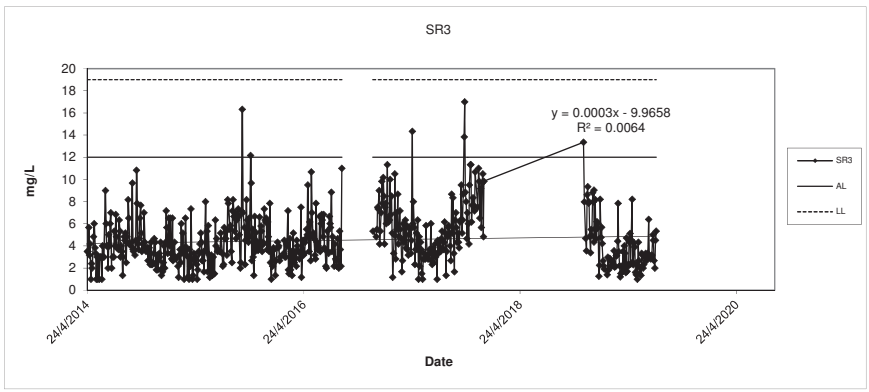




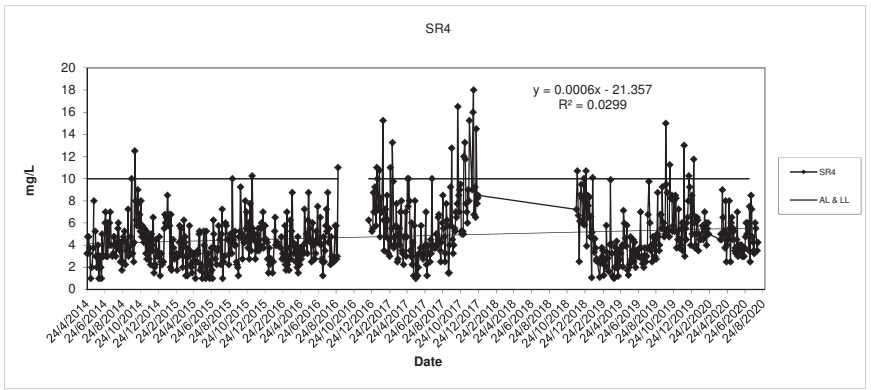
Total Suspended Solids (Depth average) at Mid-Ebb Tide

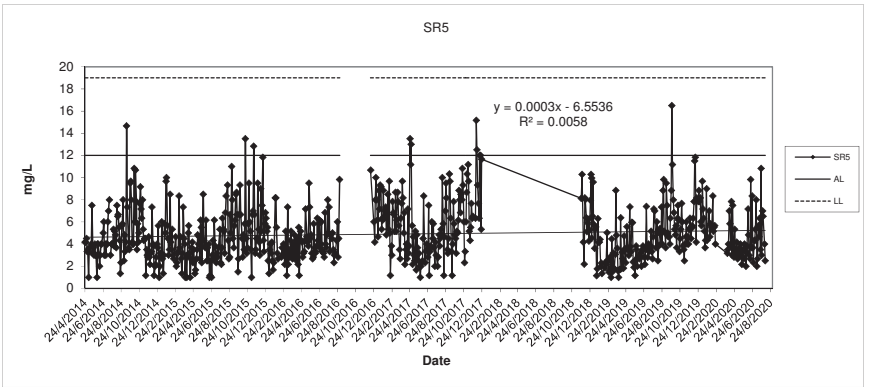


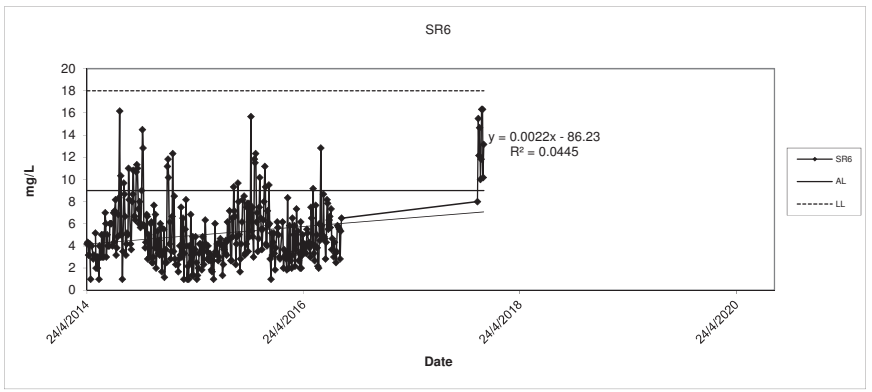




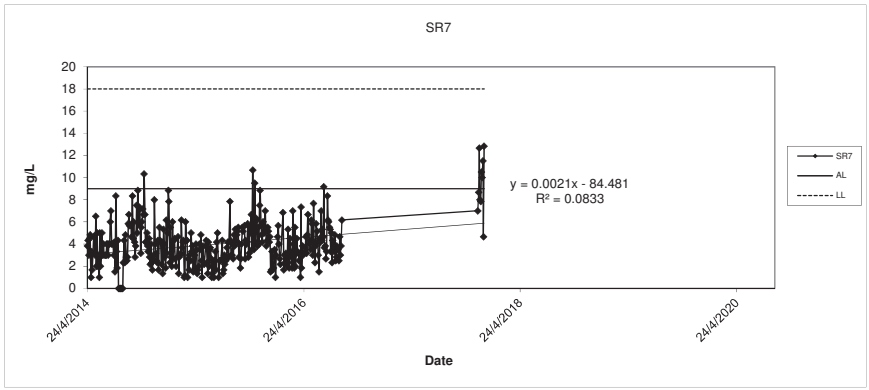
Total Suspended Solids (Depth average) at Mid-Ebb Tide

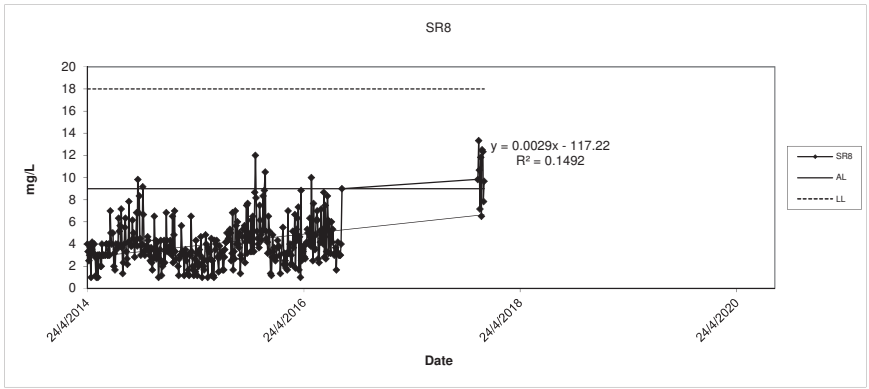


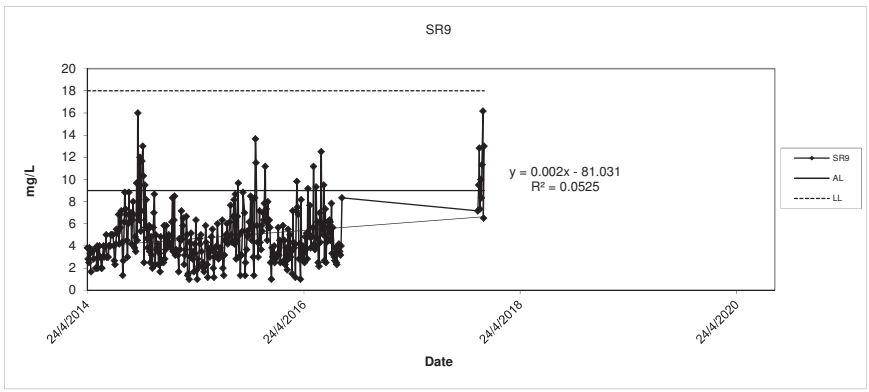




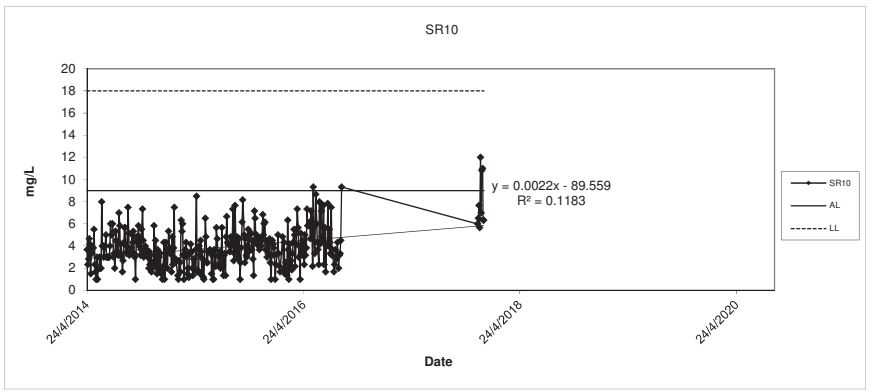
Total Suspended Solids (Depth average) at Mid-Ebb Tide

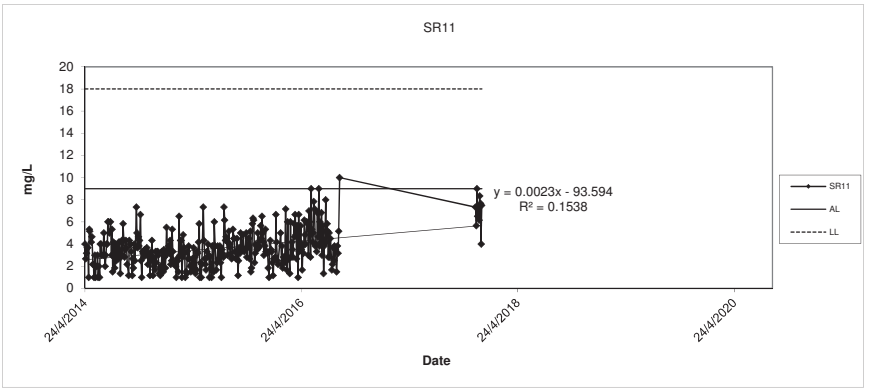


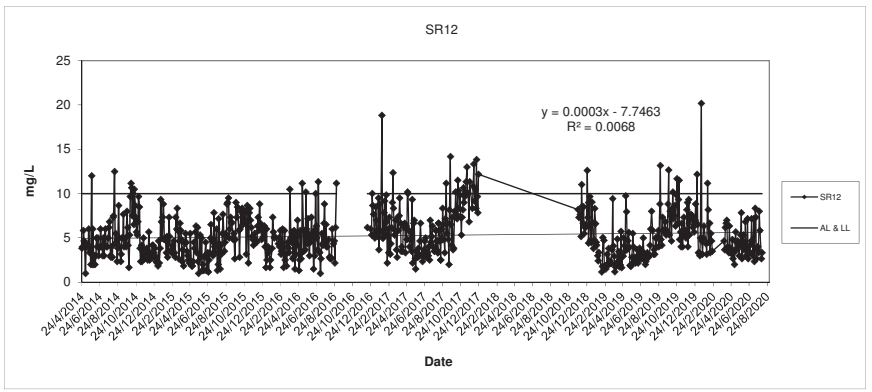




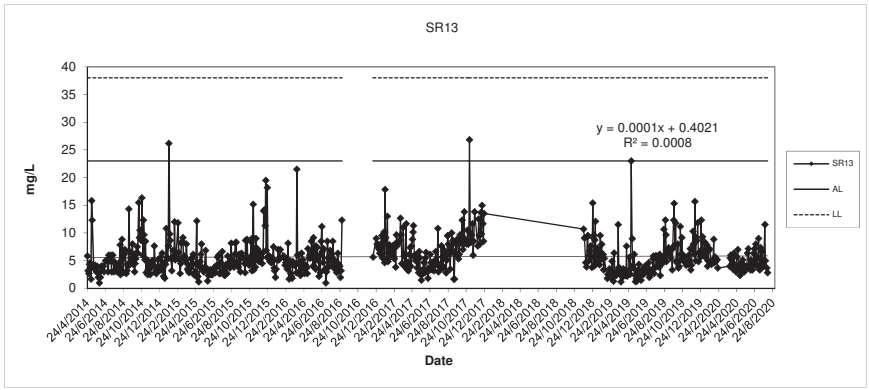
Total Suspended Solids (Depth average) at Mid-Ebb Tide

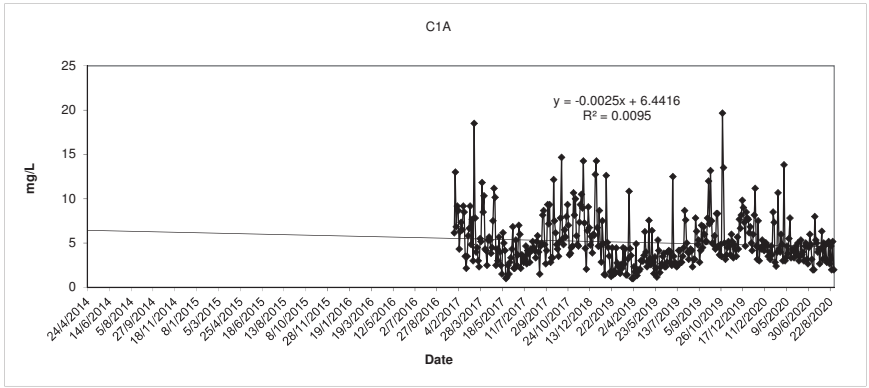


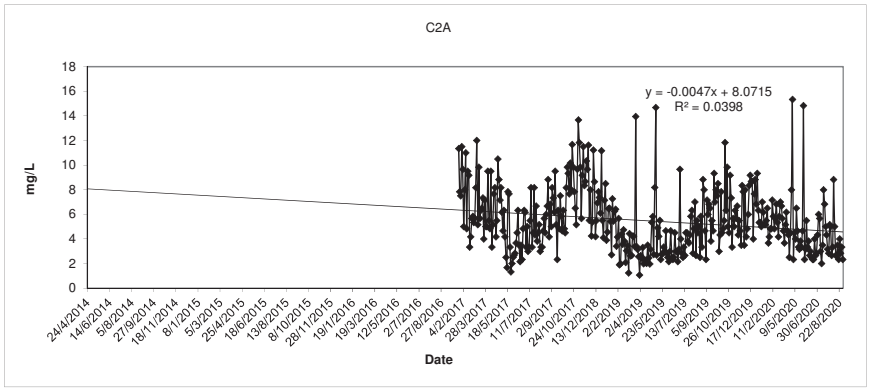




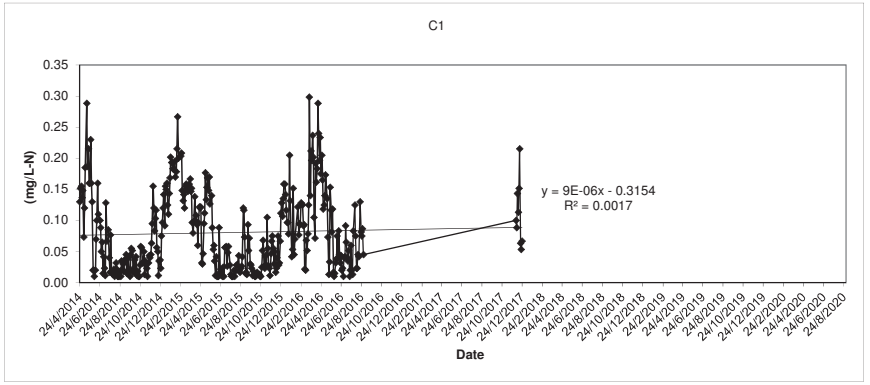
Total Suspended Solids (Depth average) at Mid-Ebb Tide

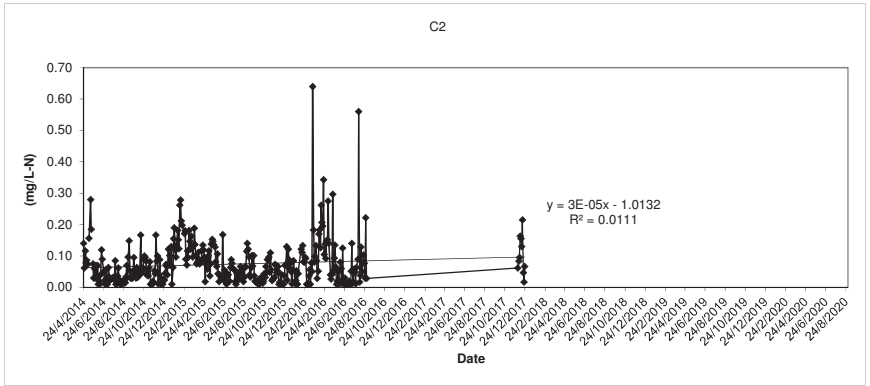


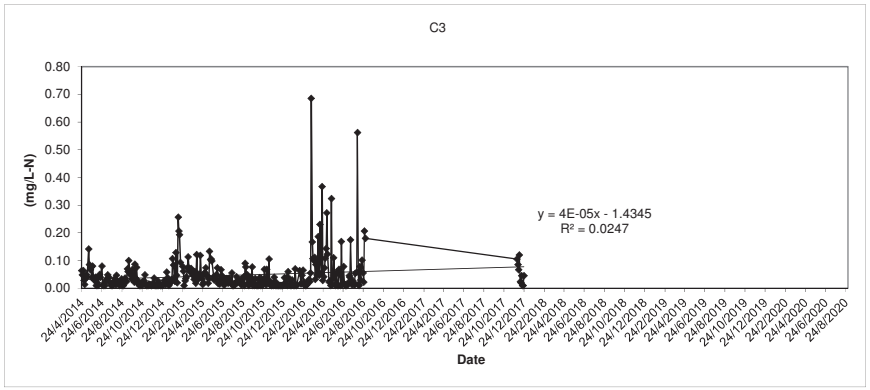




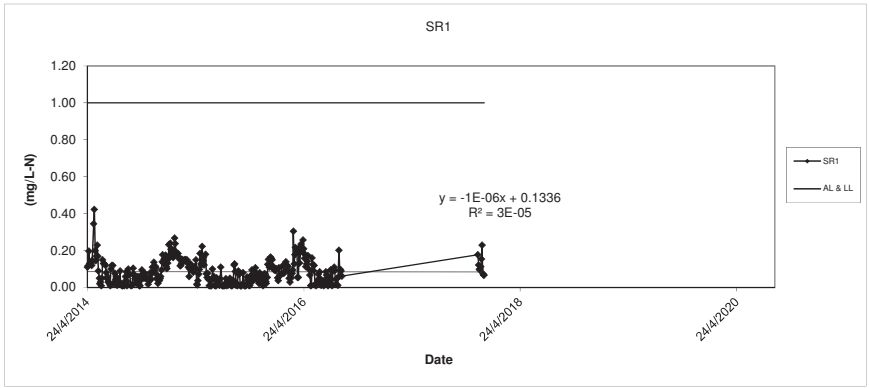
Ammonia Nitrogen (Depth average) at Mid-Ebb Tide

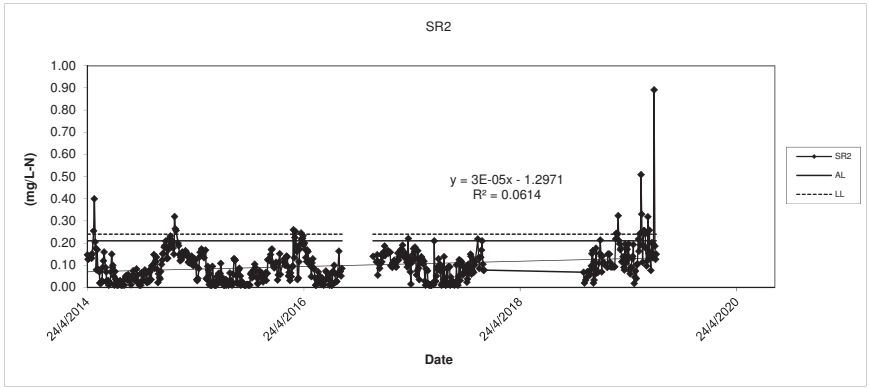


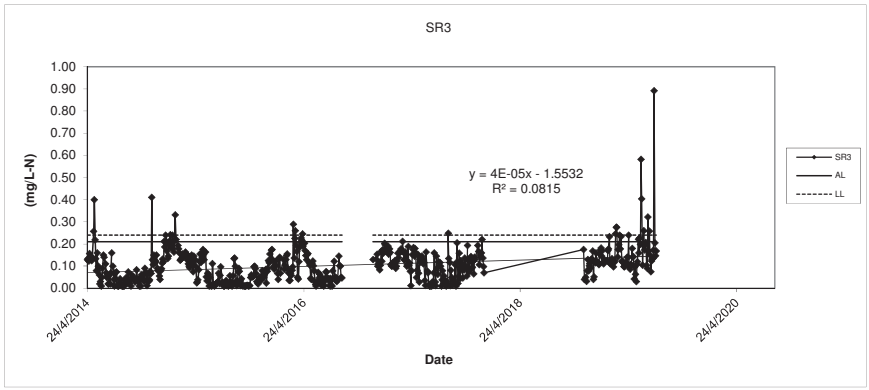




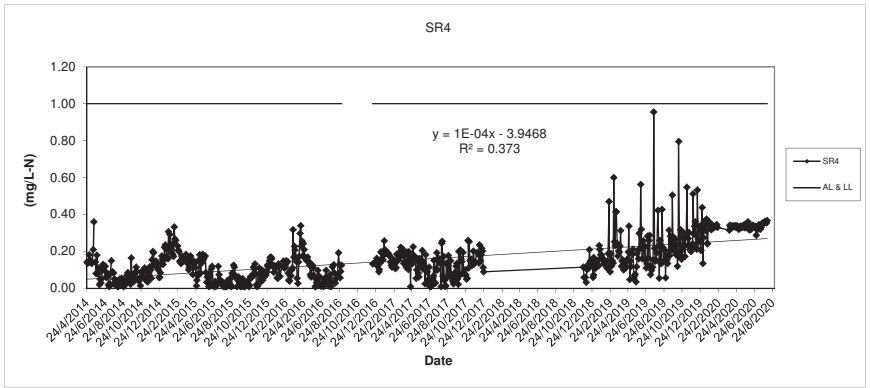
Ammonia Nitrogen (Depth average) at Mid-Ebb Tide

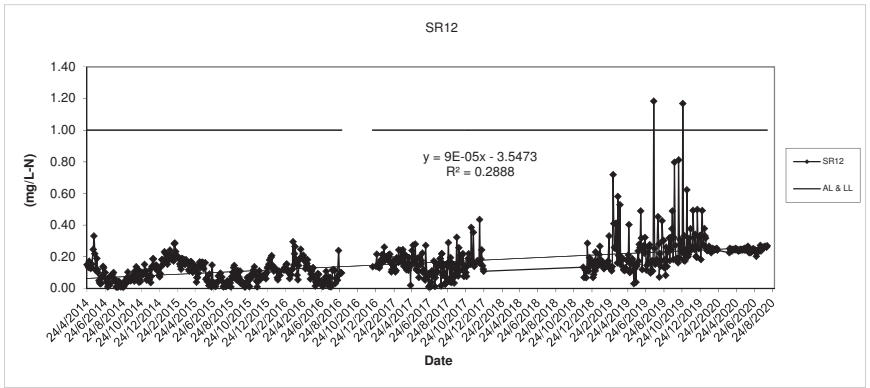


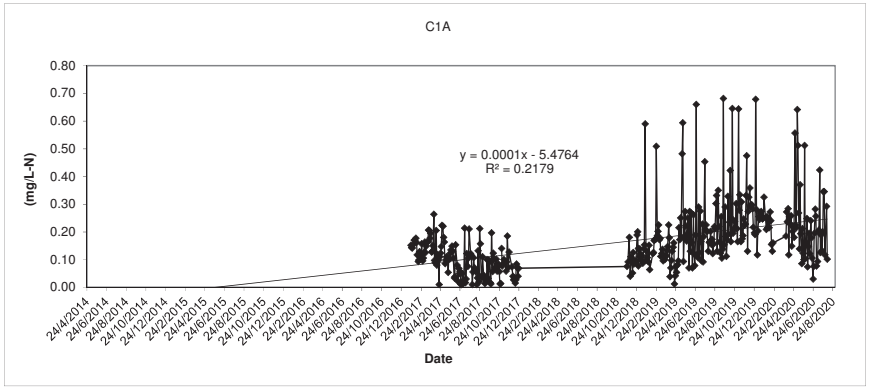




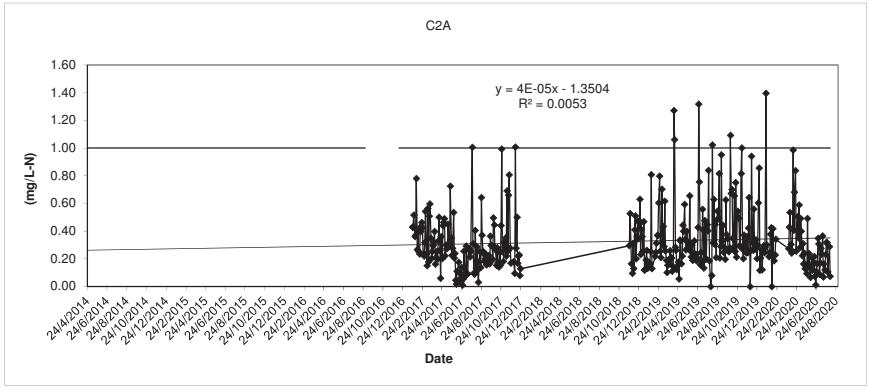
Ammonia Nitrogen (Depth average) at Mid-Ebb Tide



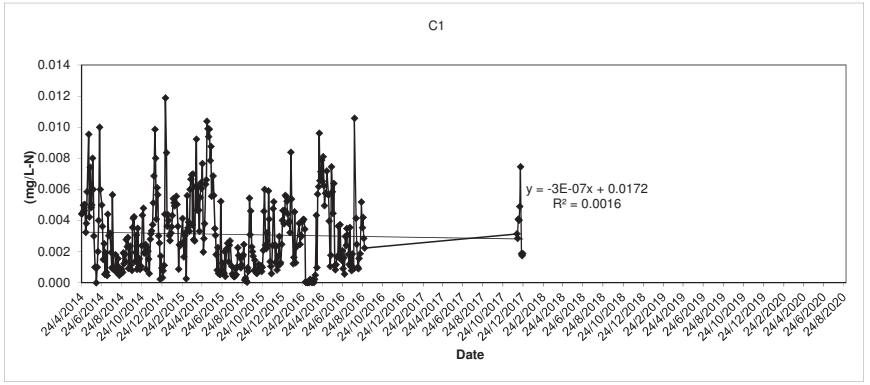


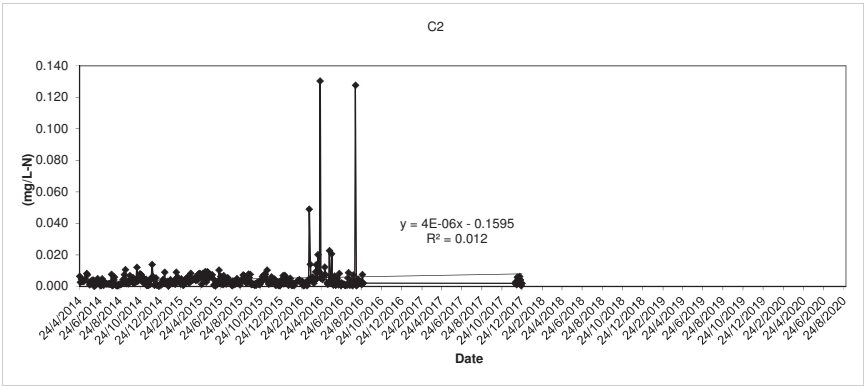


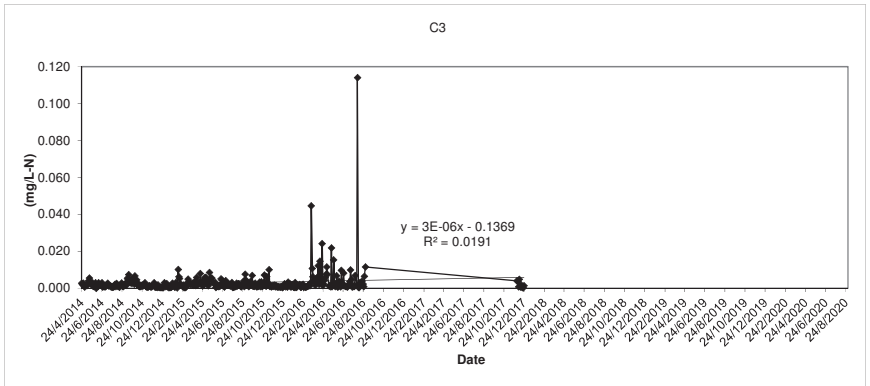
Ammonia Nitrogen (Depth average) at Mid-Ebb Tide



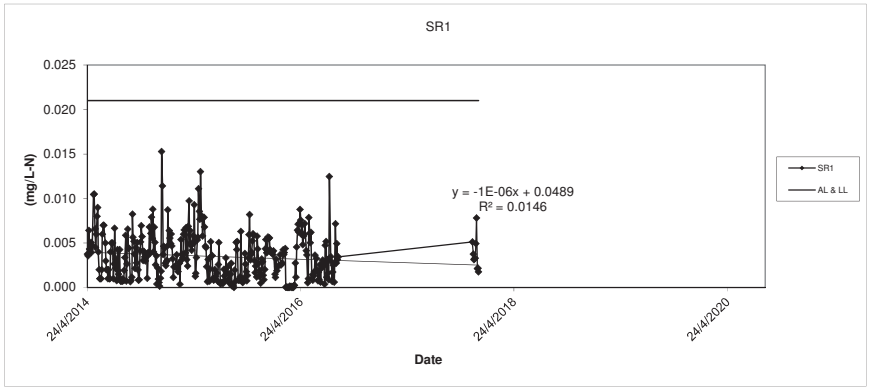
Laboratory Analysis UIA (Depth average) at Mid-Ebb Tide

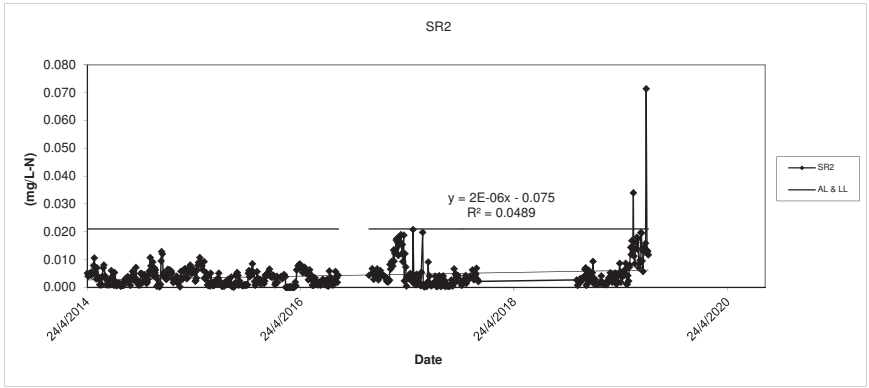


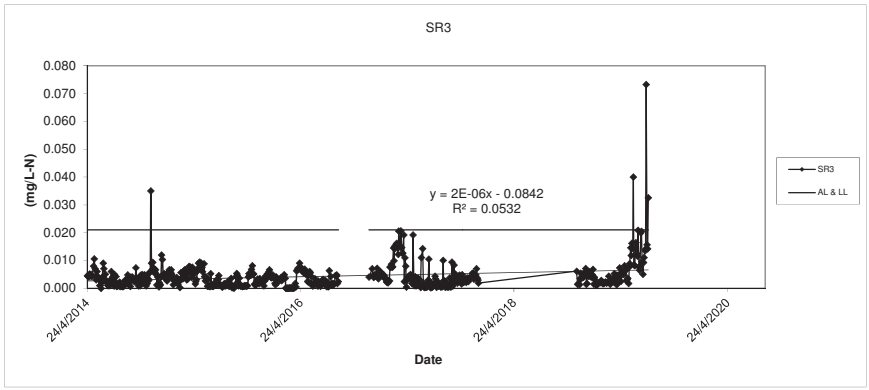




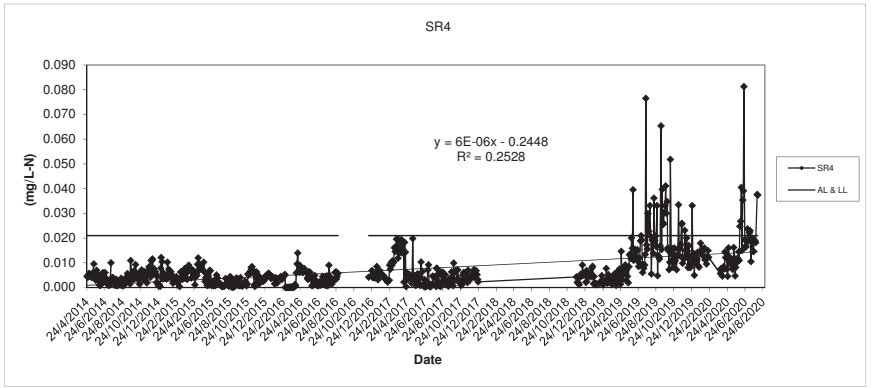
Laboratory Analysis UIA (Depth average) at Mid-Ebb Tide

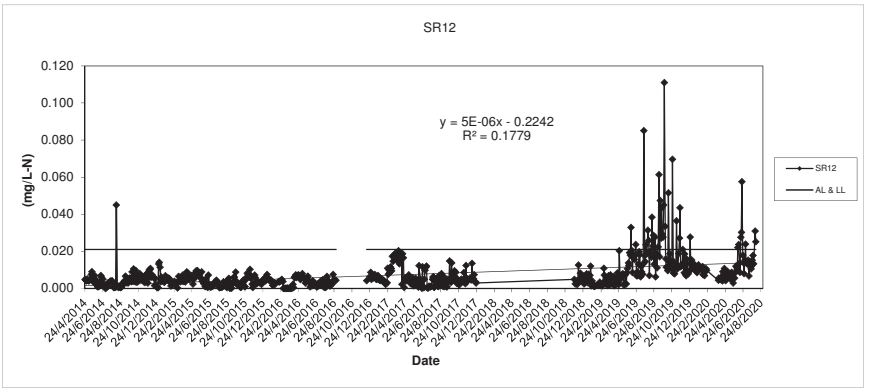


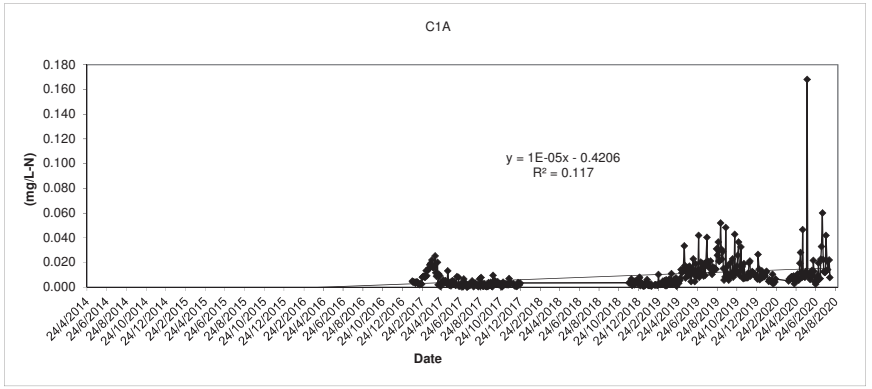




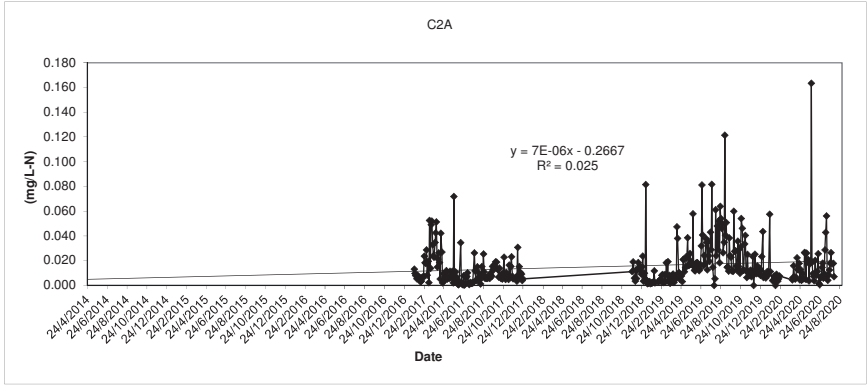
Laboratory Analysis UIA (Depth average) at Mid-Ebb Tide



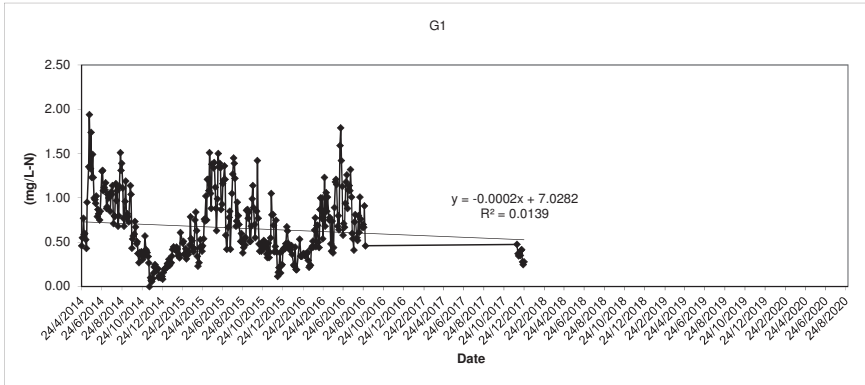


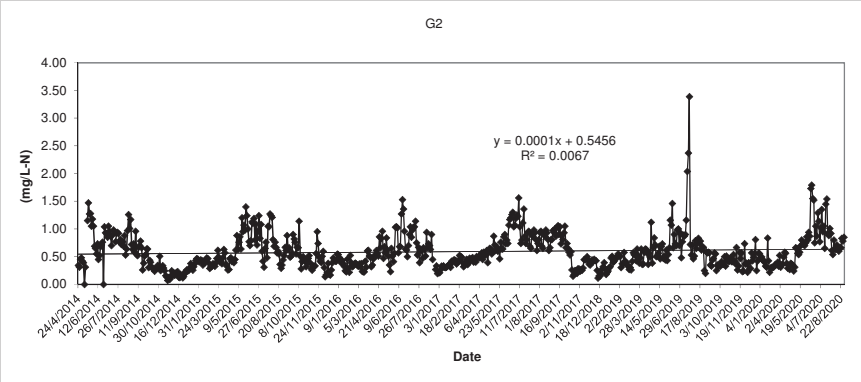


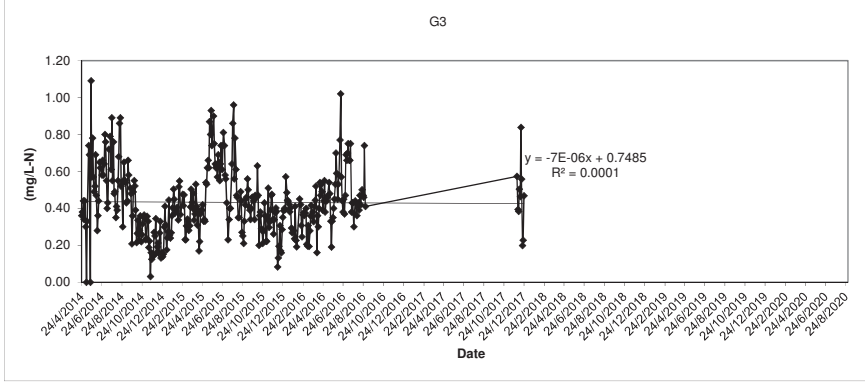
Laboratory Analysis UIA (Depth average) at Mid-Ebb Tide



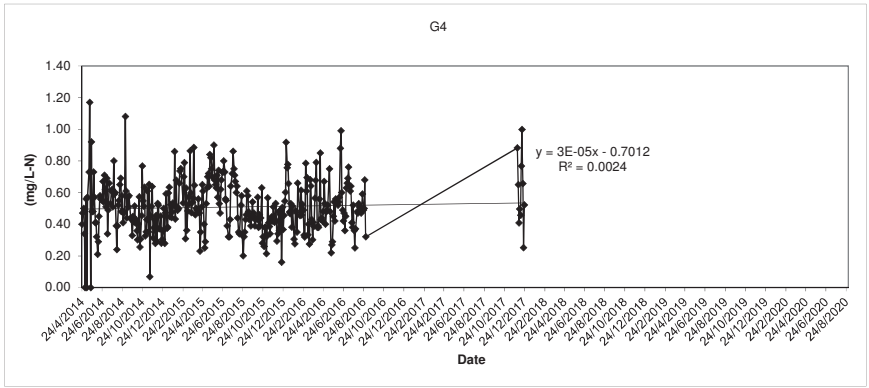
Laboratory Analysis TIN (Depth average) at Mid-Ebb Tide

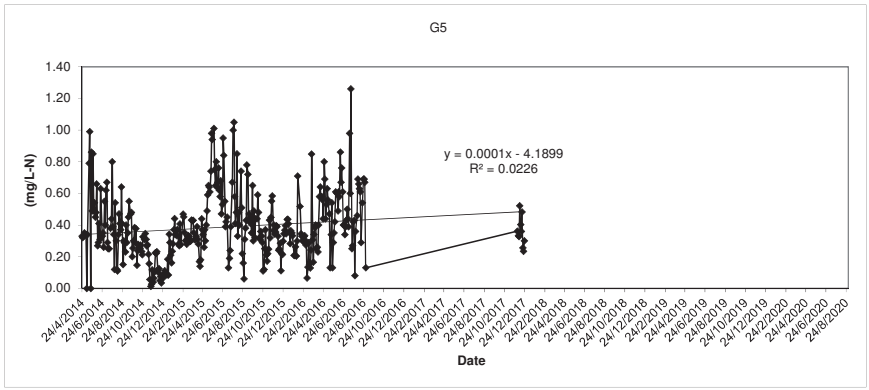


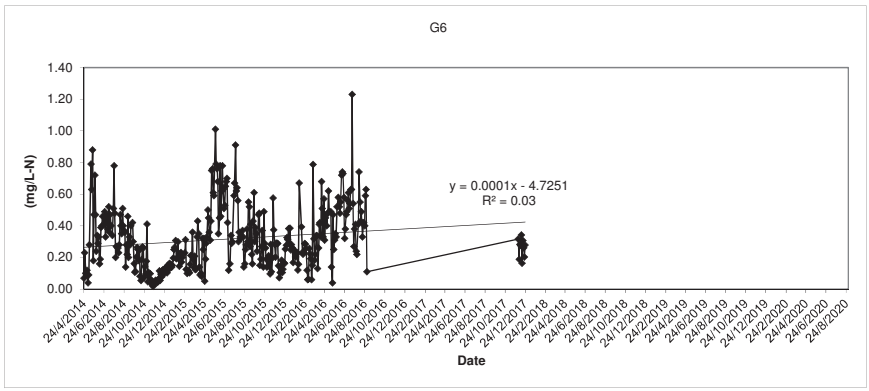




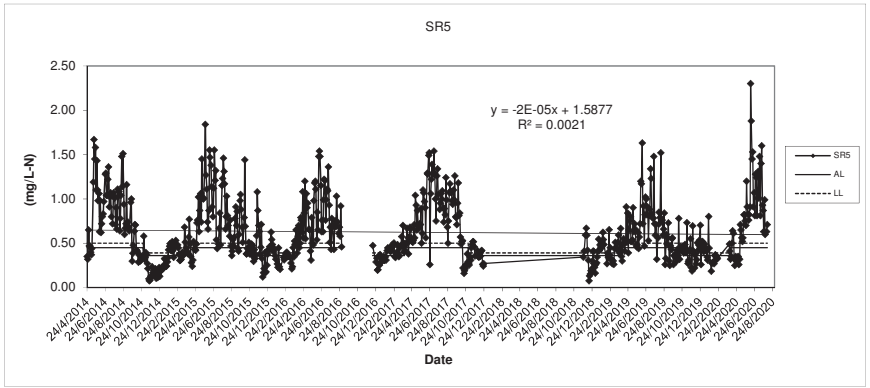
Laboratory Analysis TIN (Depth average) at Mid-Ebb Tide

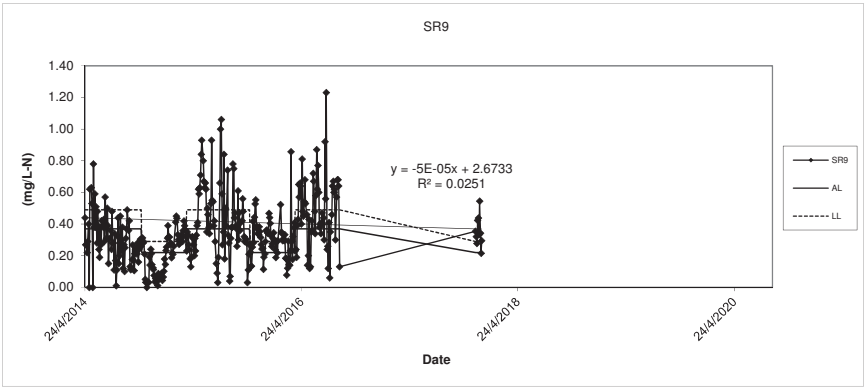


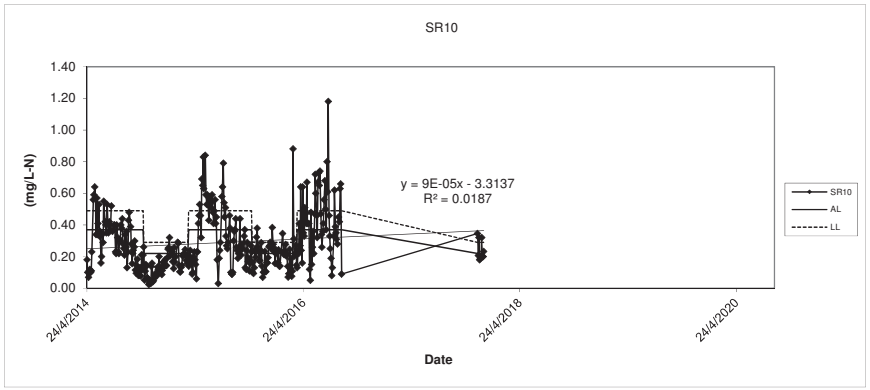




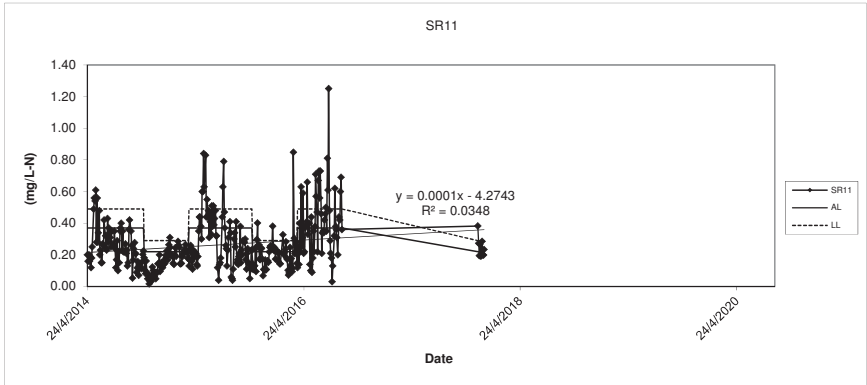
Laboratory Analysis TIN (Depth average) at Mid-Ebb Tide

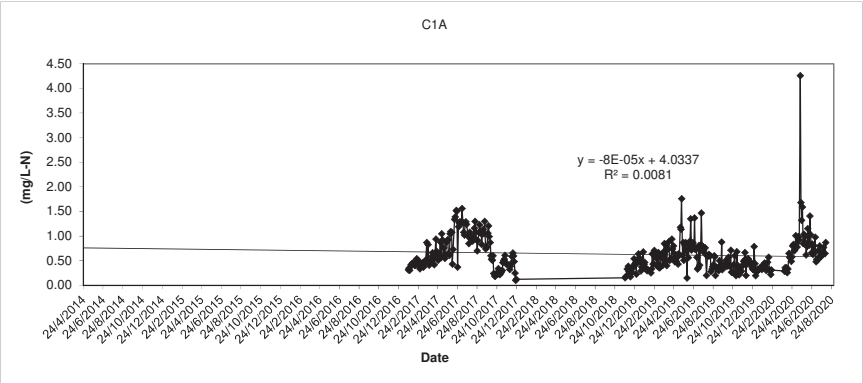


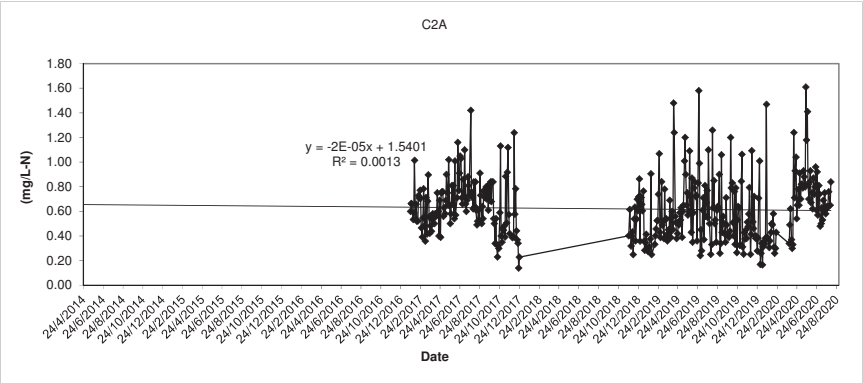




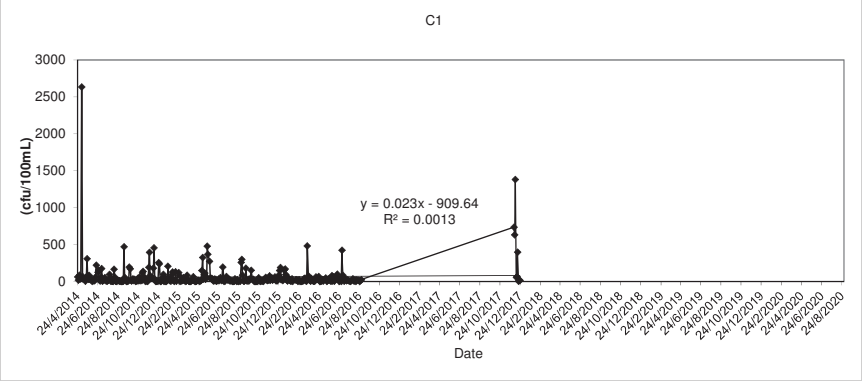
Laboratory Analysis TIN (Depth average) at Mid-Ebb Tide

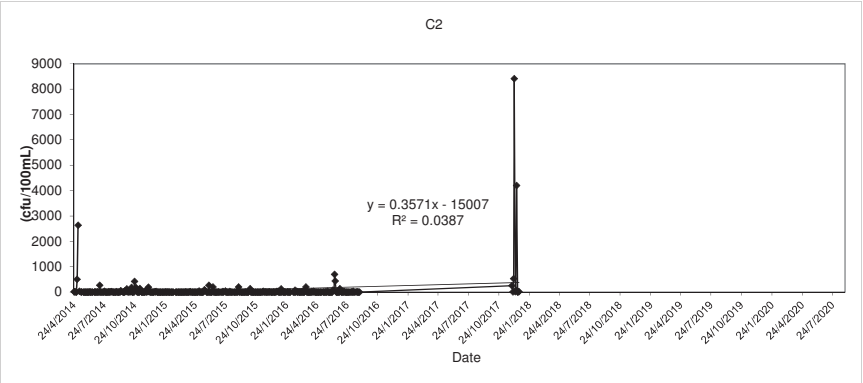


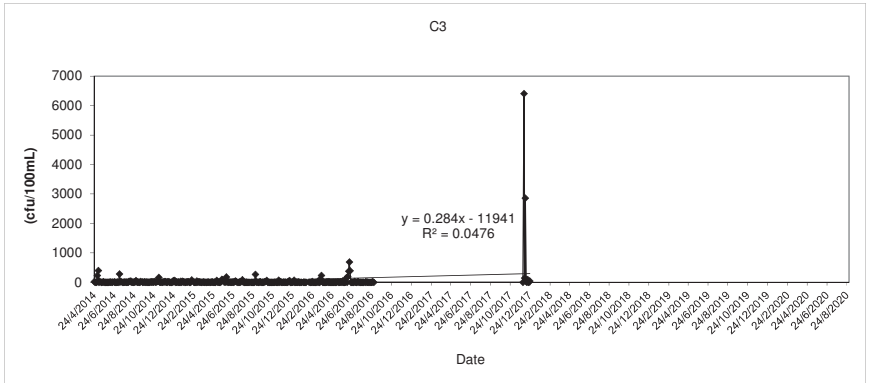




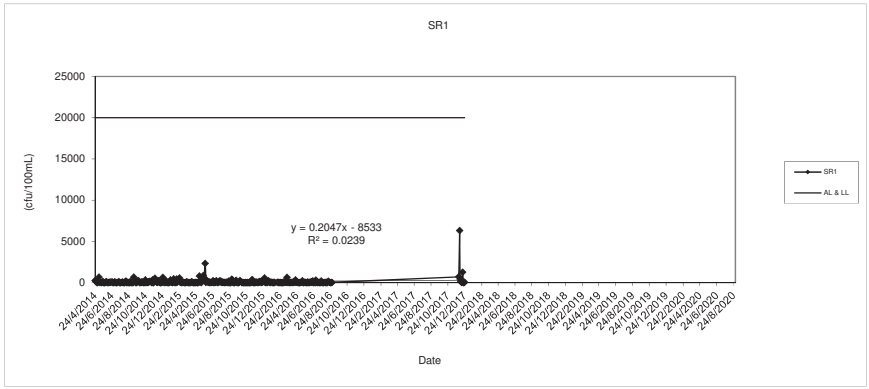
E.coli (Depth average) at Mid-Ebb Tide

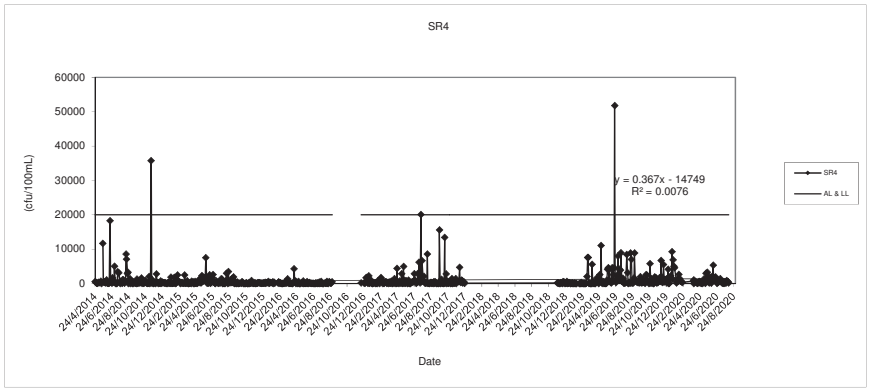


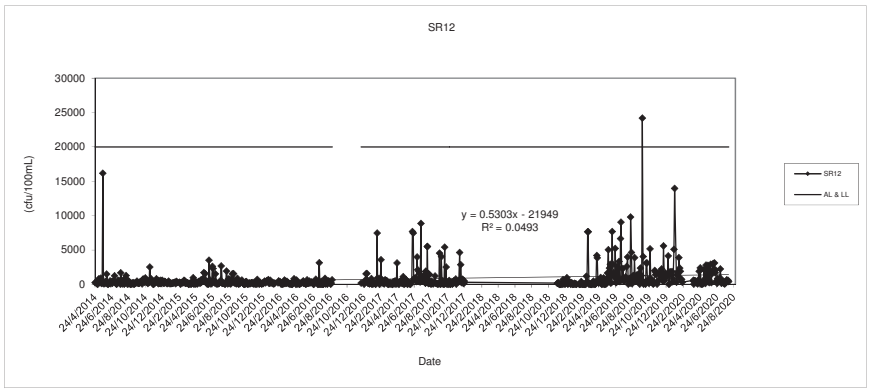




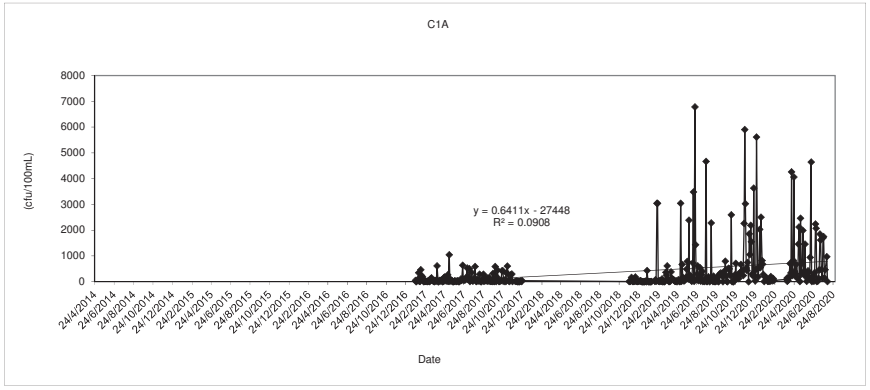
E.coli (Depth average) at Mid-Ebb Tide

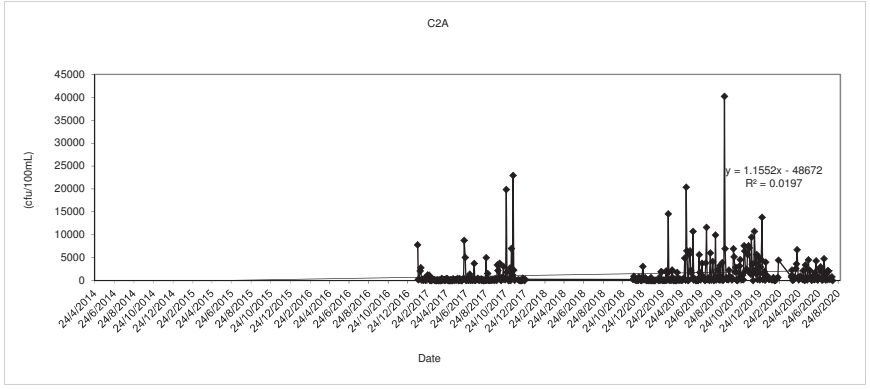




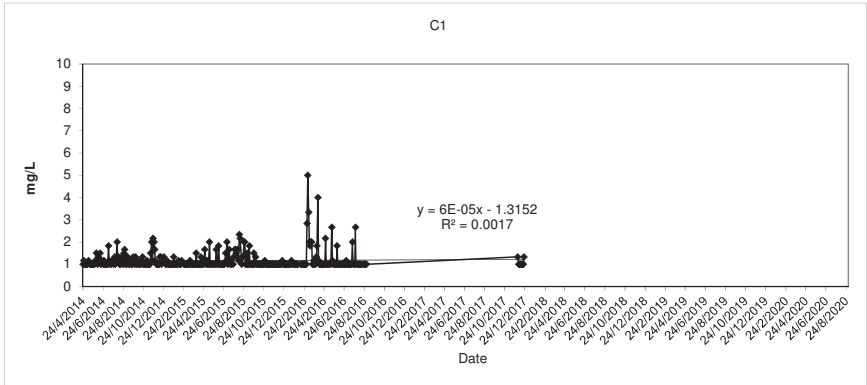


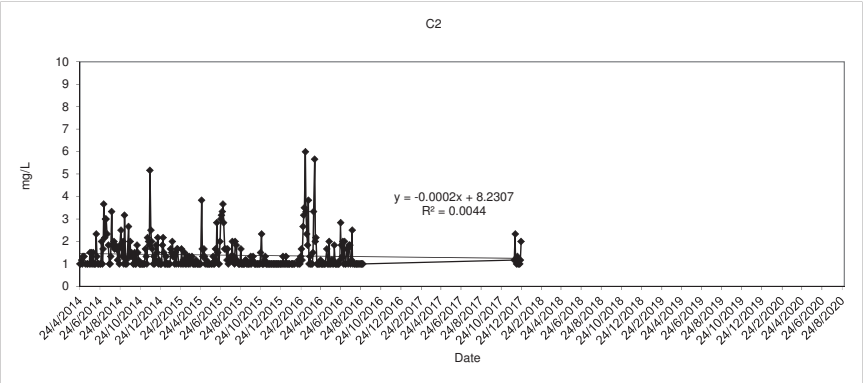
E.coli (Depth average) at Mid-Ebb Tide

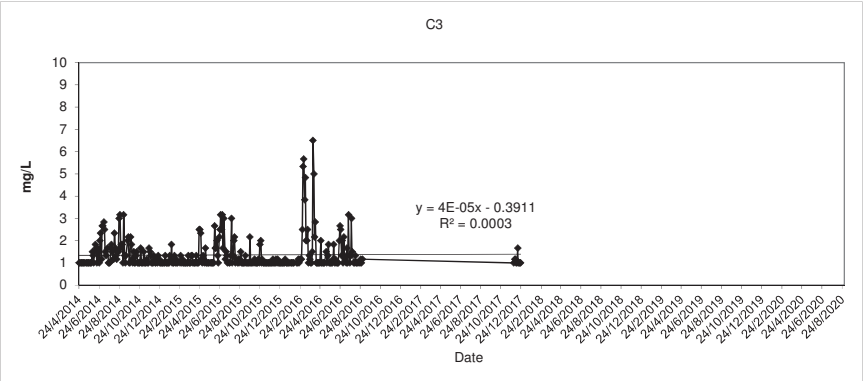




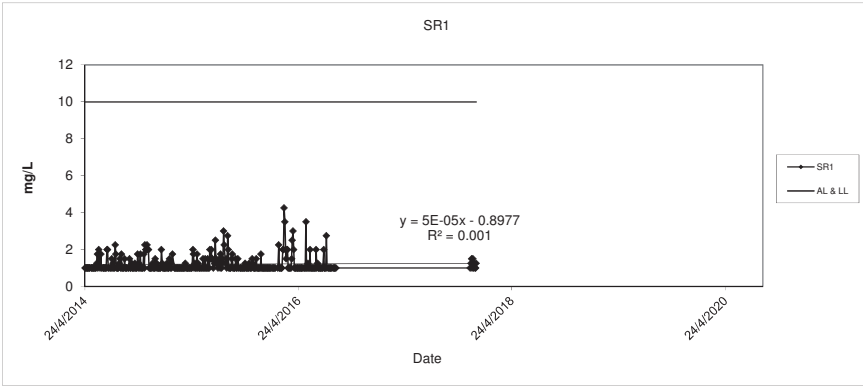
BOD_5 (Depth average) at Mid-Ebb Tide

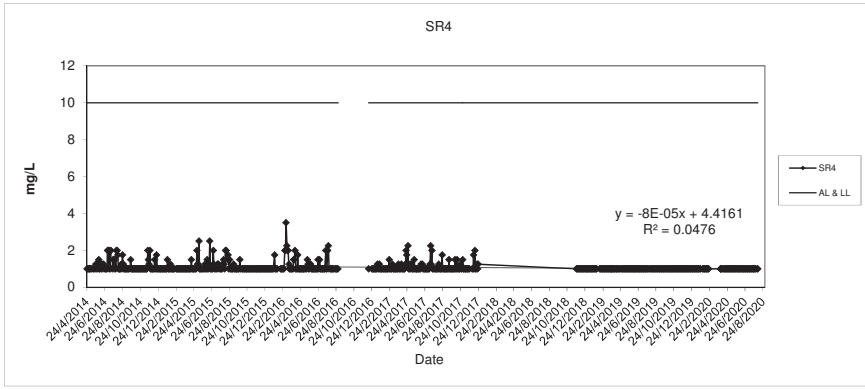


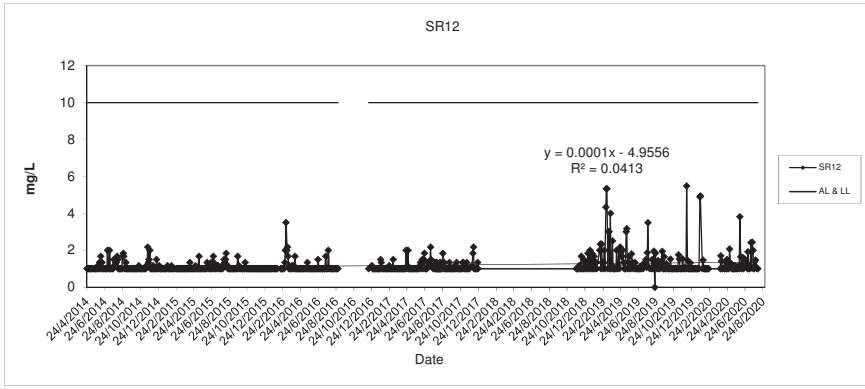




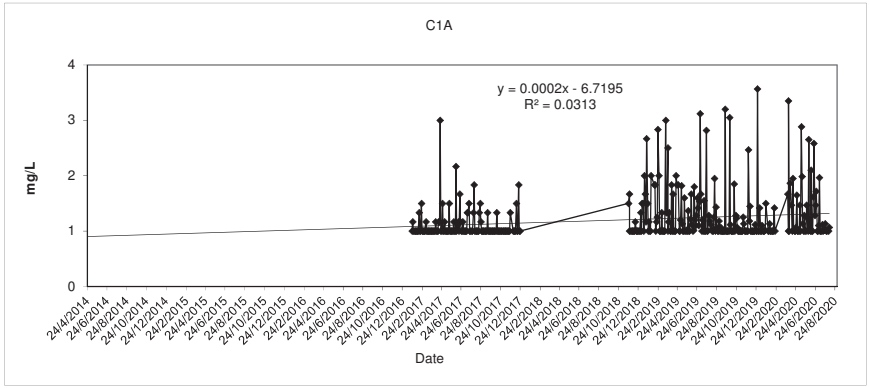
BOD_5 (Depth average) at Mid-Ebb Tide

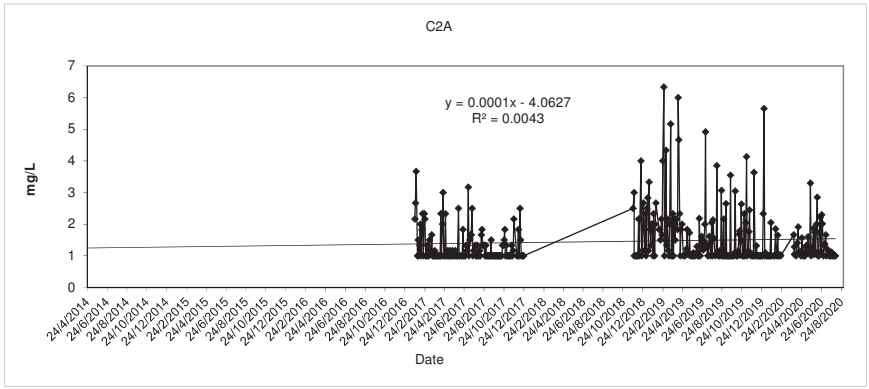




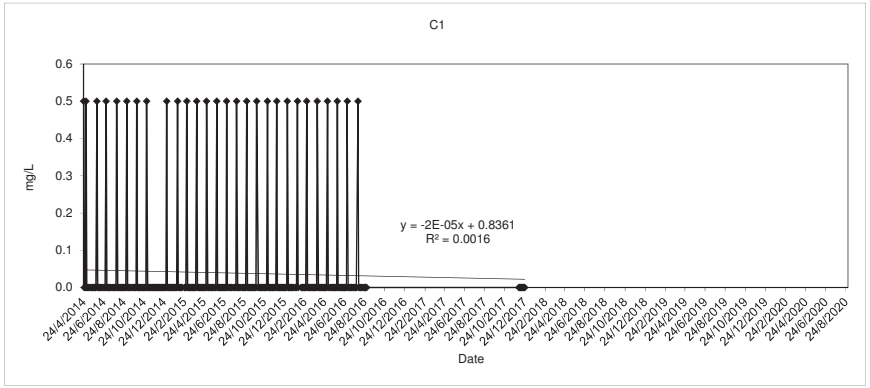


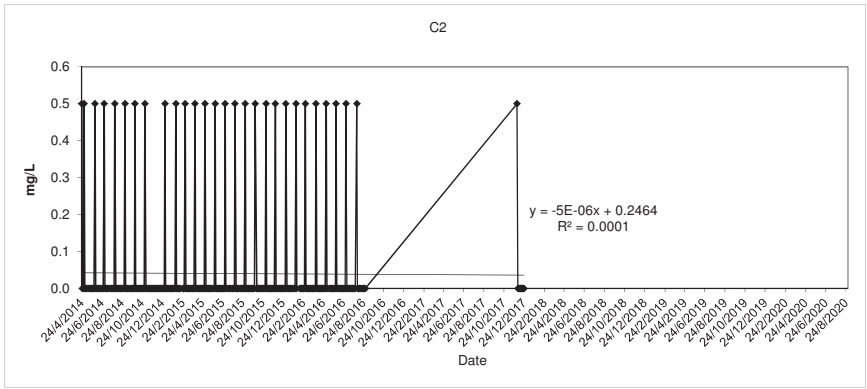
BOD_5 (Depth average) at Mid-Ebb Tide

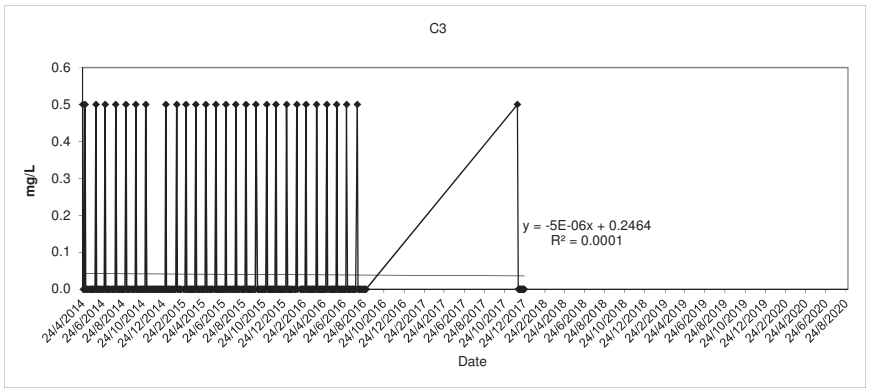




Synthetic Detergent (Depth average) at Mid-Ebb Tide







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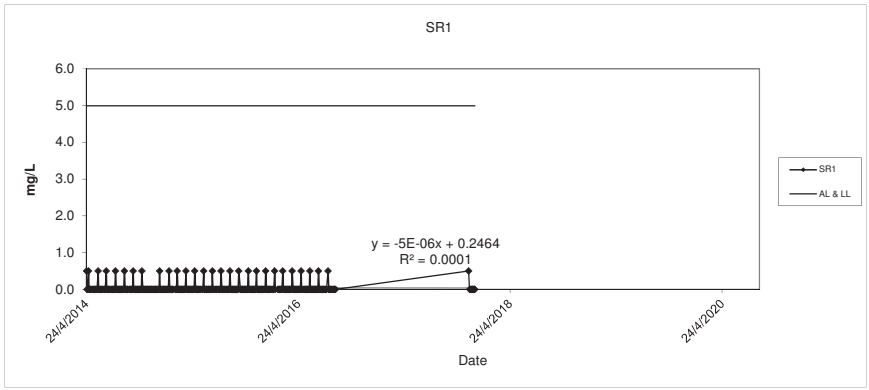
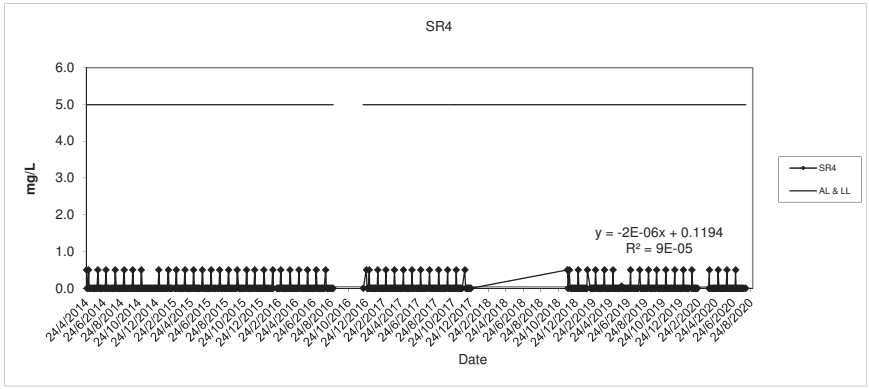
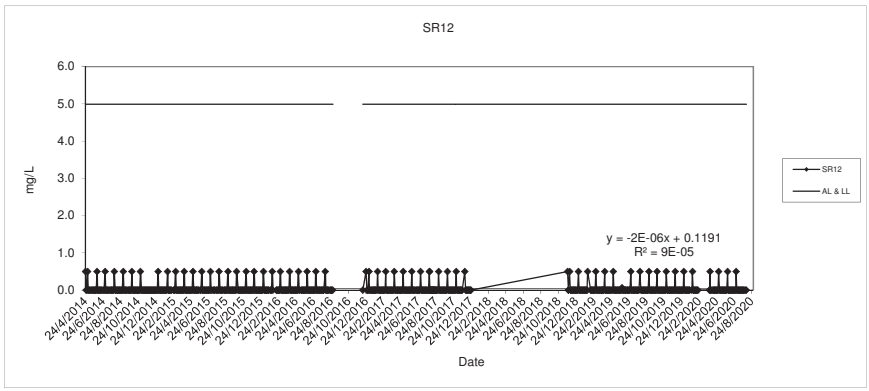
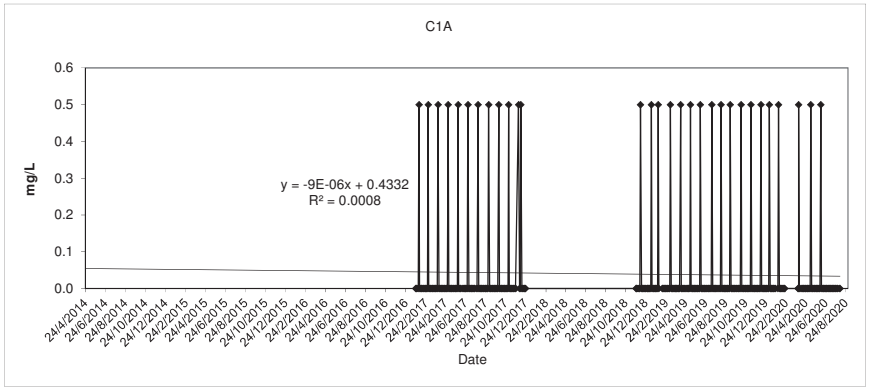
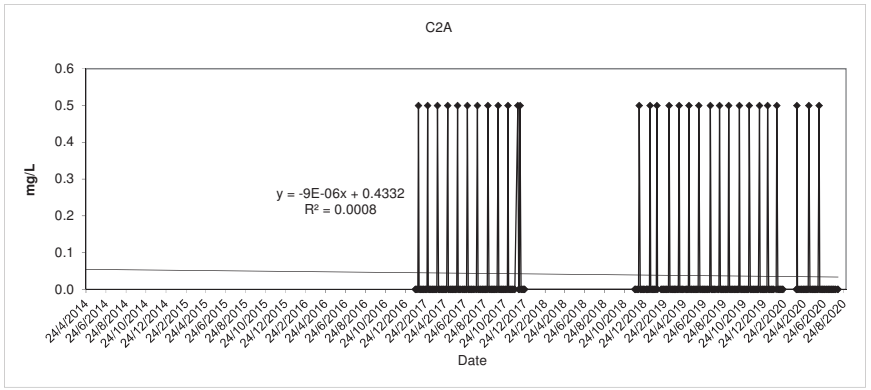






Synthetic Detergent (Depth average) at Mid-Ebb Tide





FUGRO TECHNICAL SERVICES LIMITED

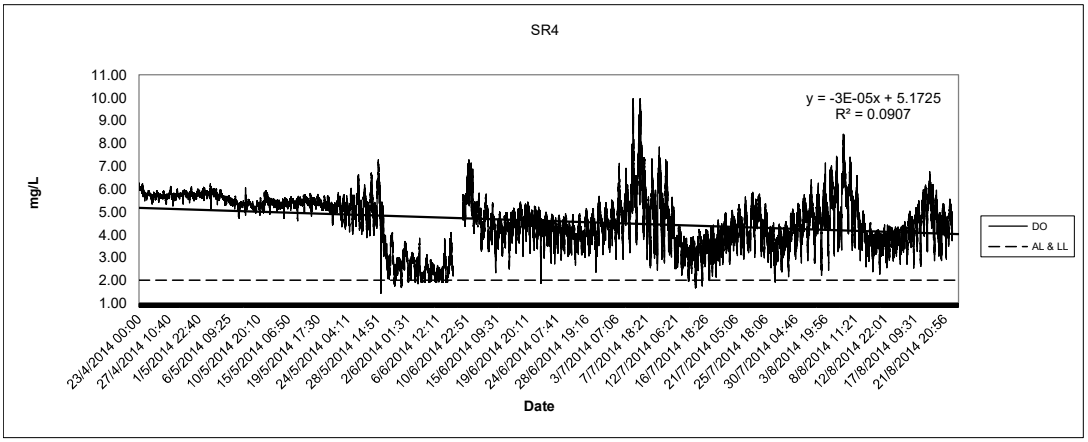
Fugro Development Centre,
5 Lok Yi Street, Tai Lam,
Tuen Mun, N.T.,
Hong Kong.

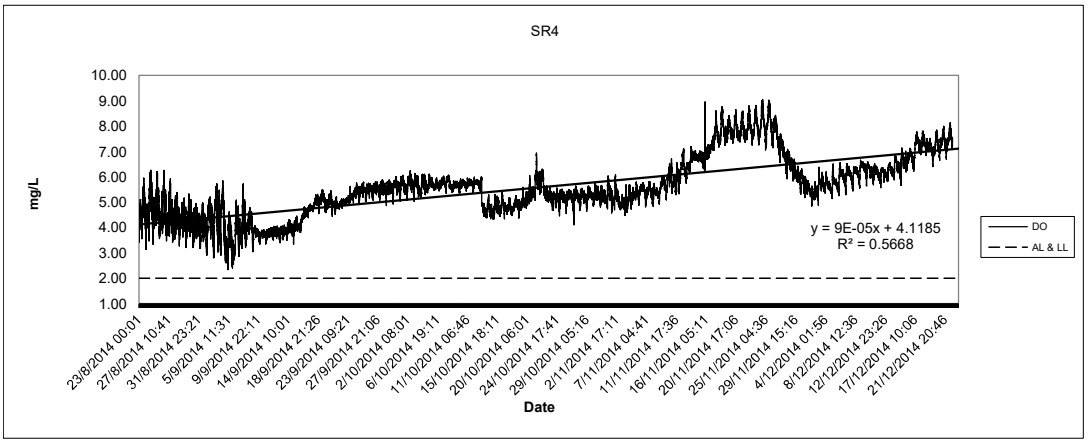
Tel : +852 2450 8233
Fax : +852 2450 6138
E-mail : matlab@fugro.com
Website : www.fugro.com

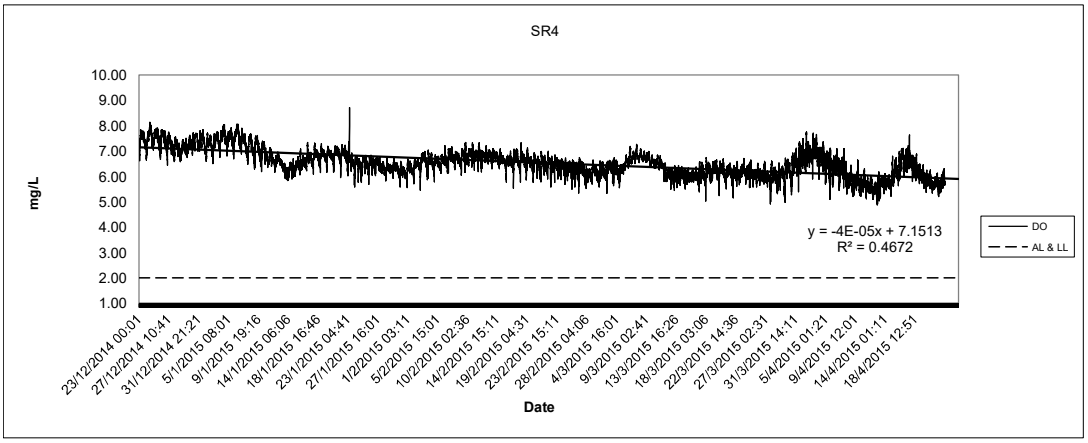
Appendix E

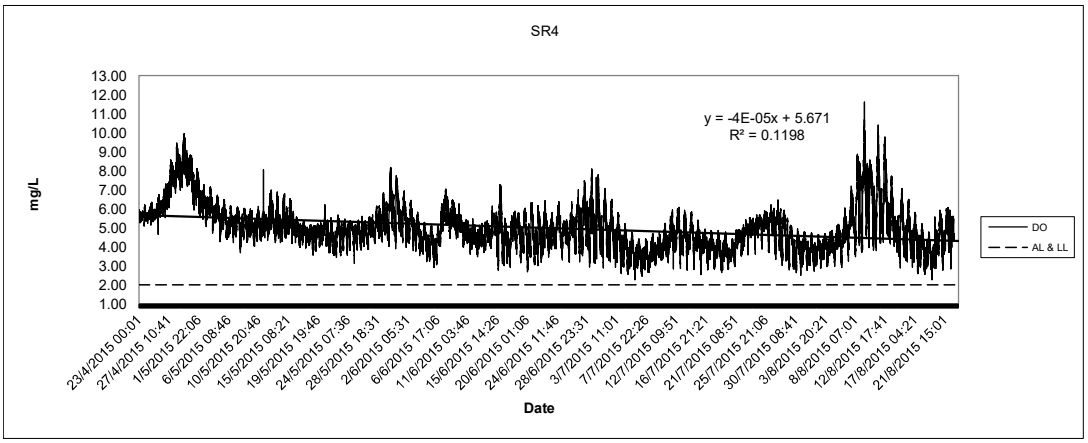
Graphical Presentation – 24-hour Monitoring Results

Dissolved Oxygen
24-hr Water Quality Monitoring

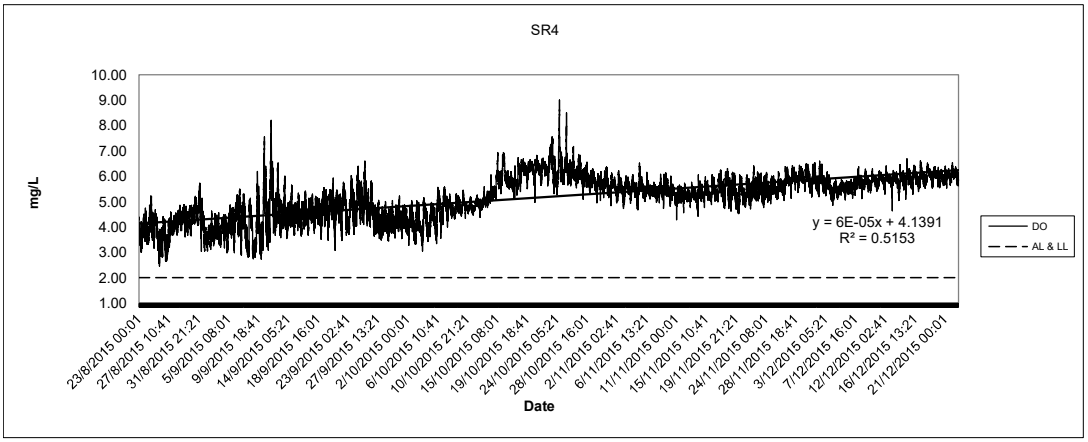


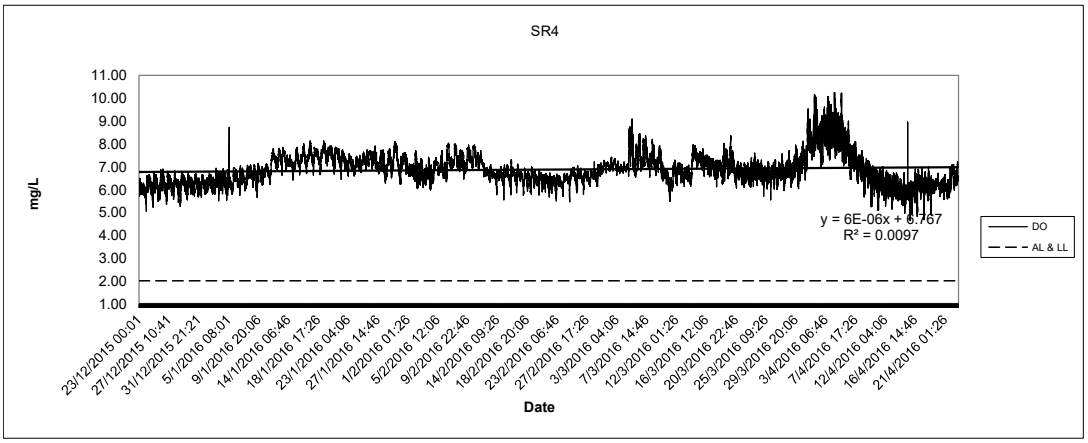


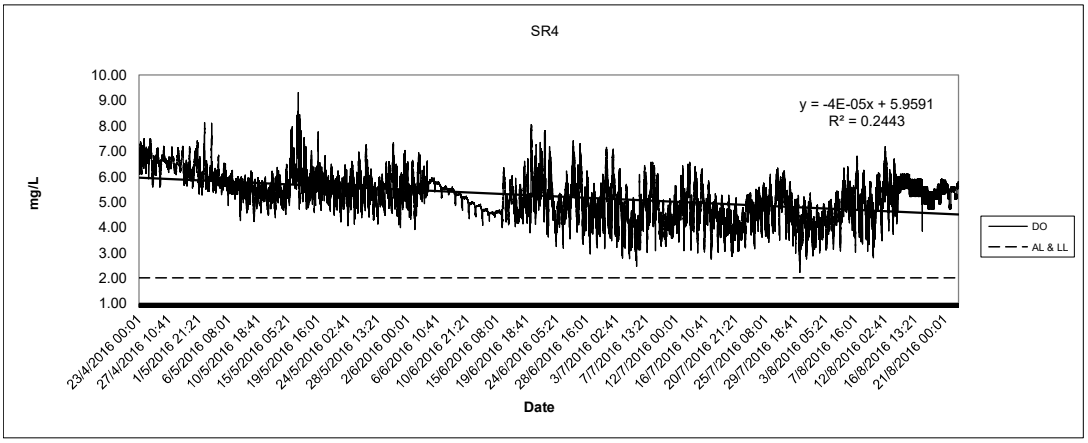


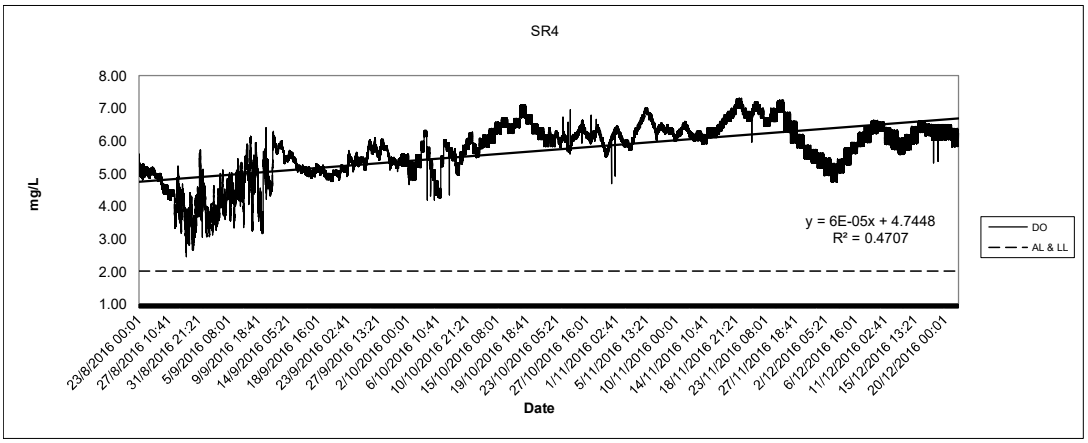


Dissolved Oxygen
24-hr Water Quality Monitoring

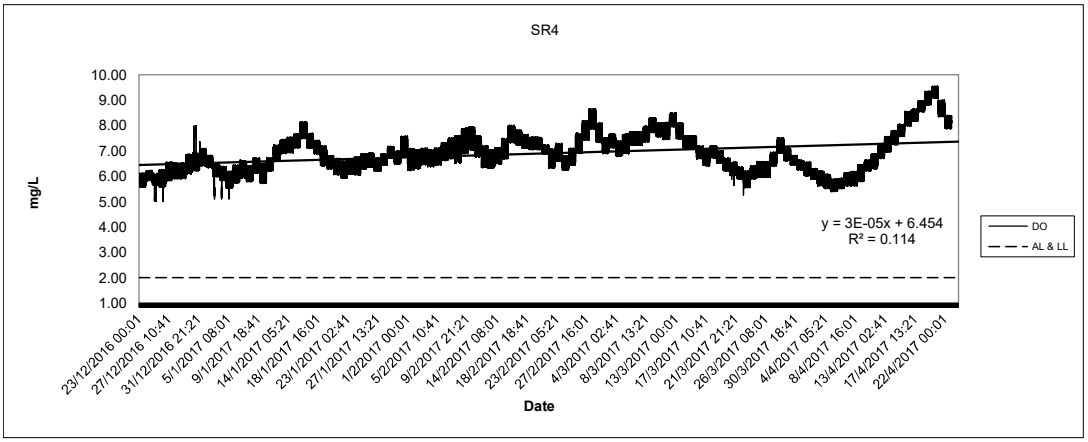


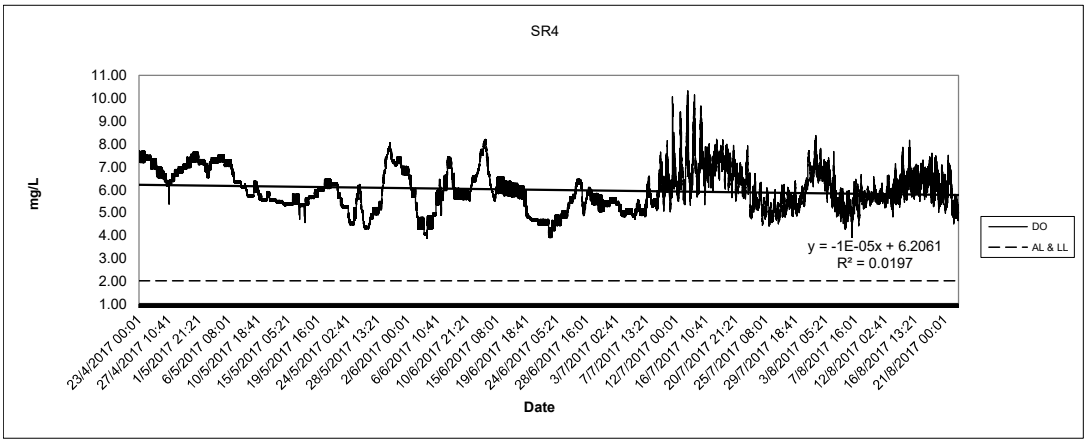


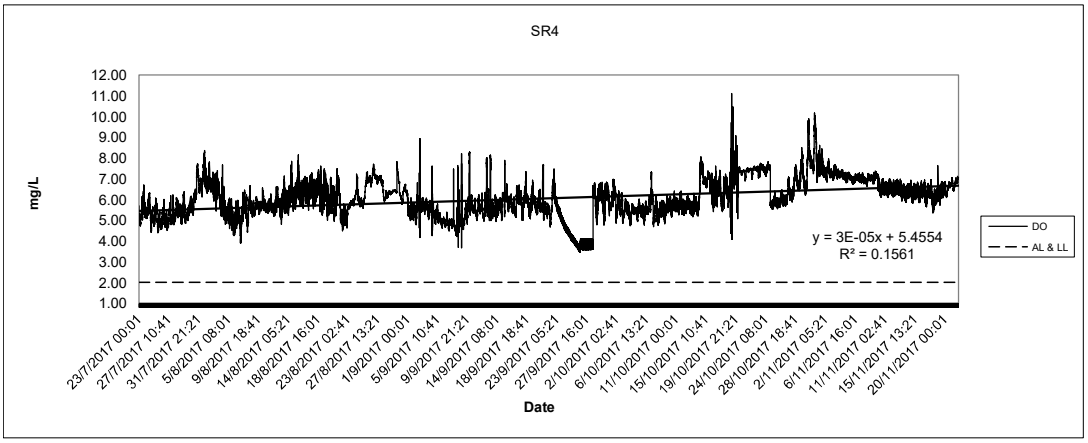


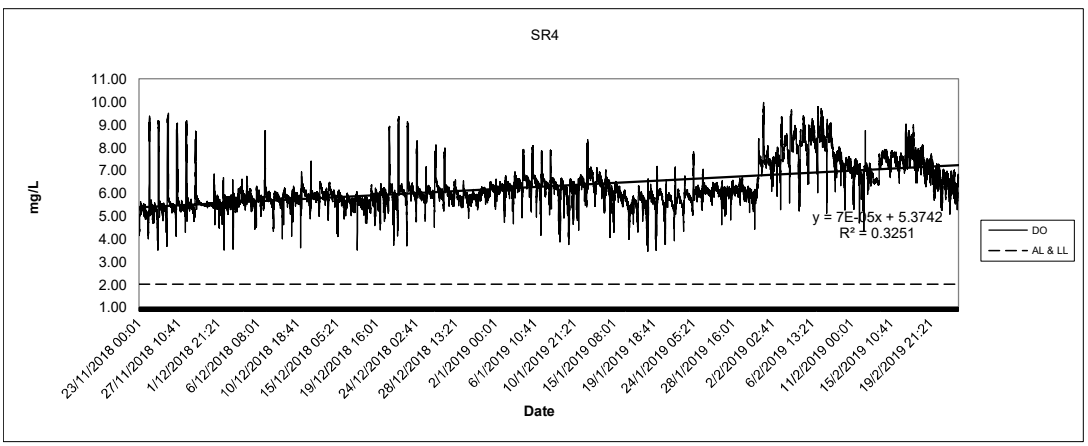


Dissolved Oxygen
24-hr Water Quality Monitoring

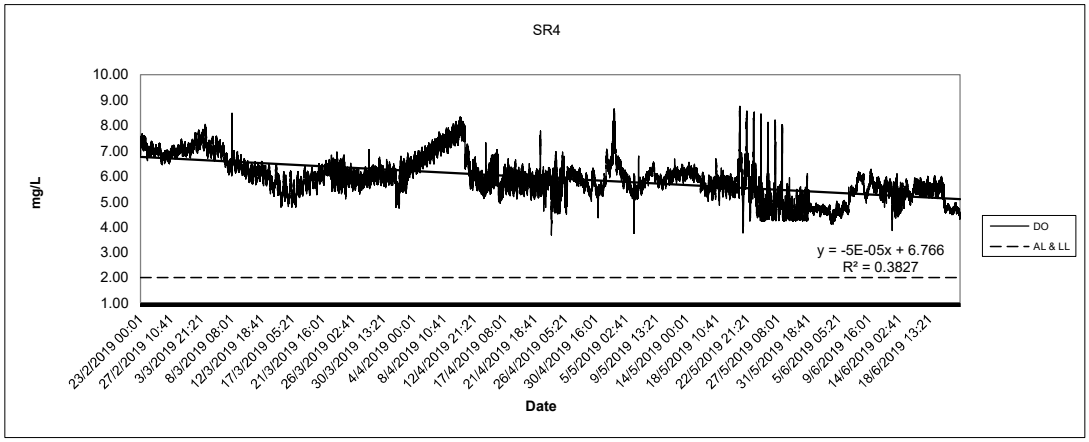


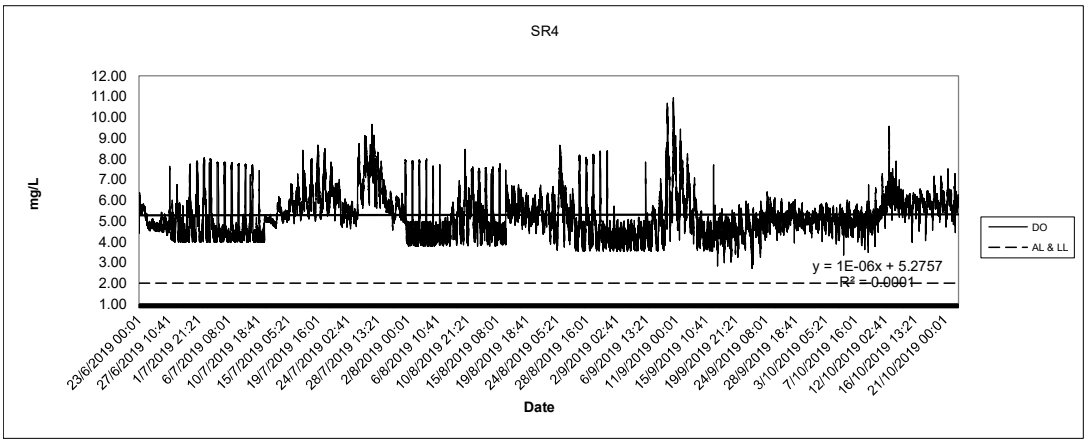


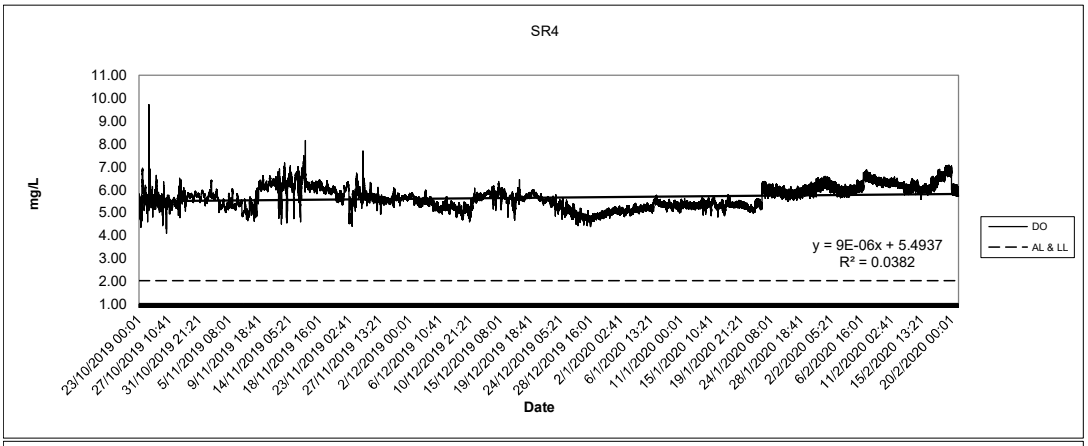


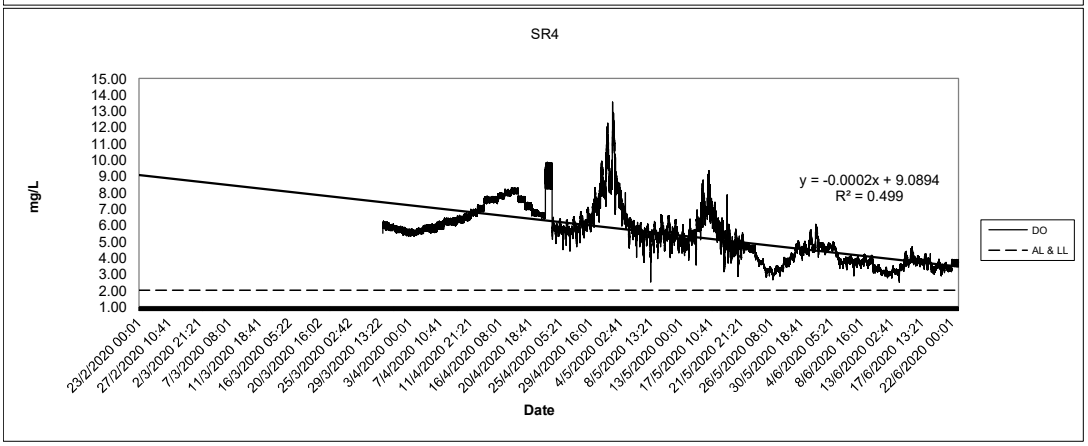


Dissolved Oxygen
24-hr Water Quality Monitoring

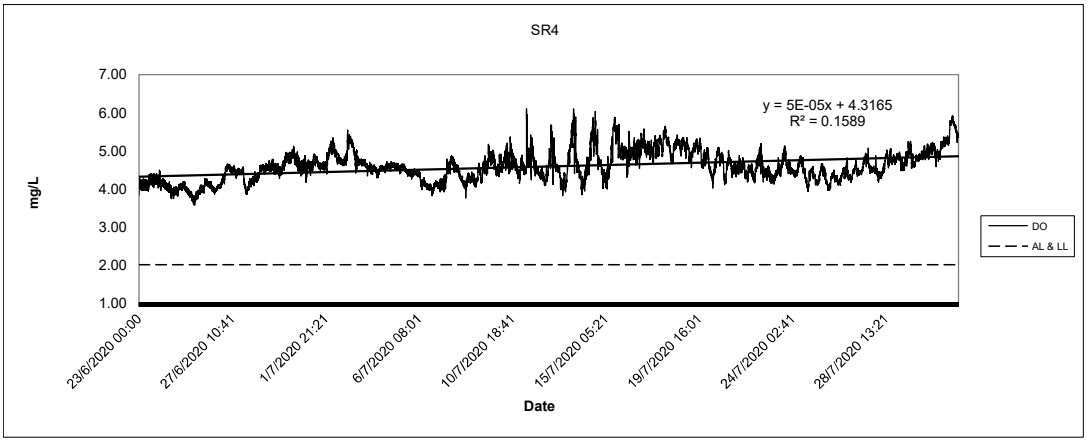




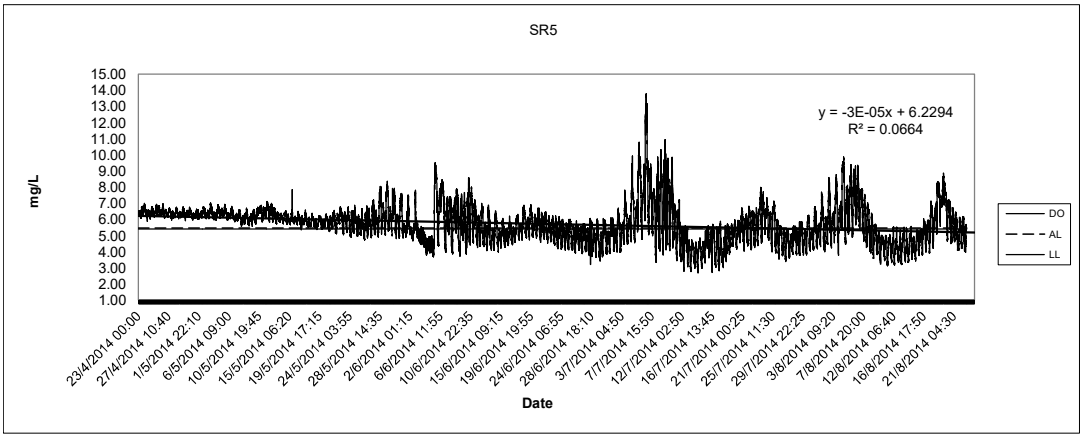


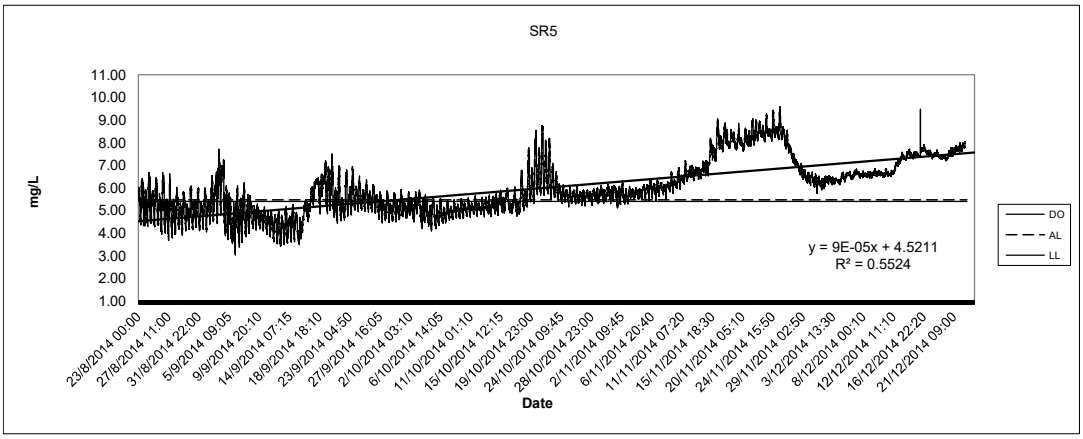


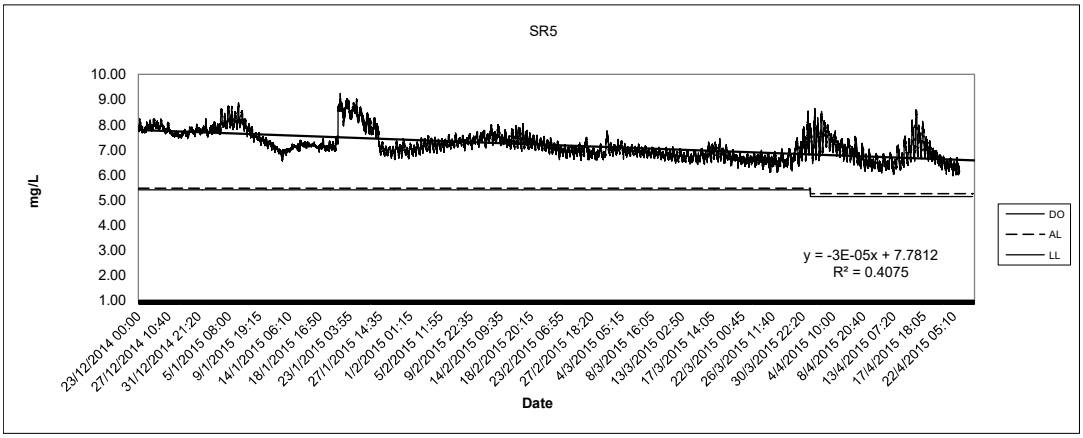
Dissolved Oxygen
24-hr Water Quality Monitoring

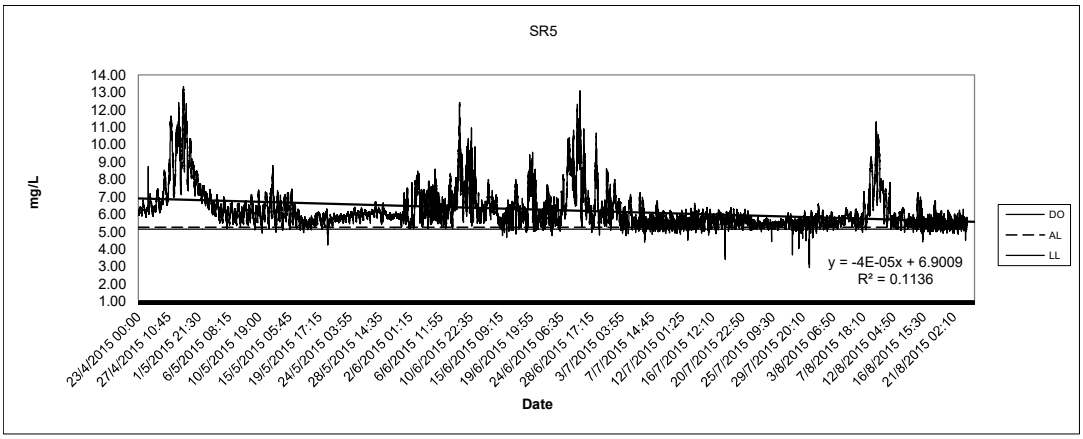


Dissolved Oxygen
24-hr Water Quality Monitoring

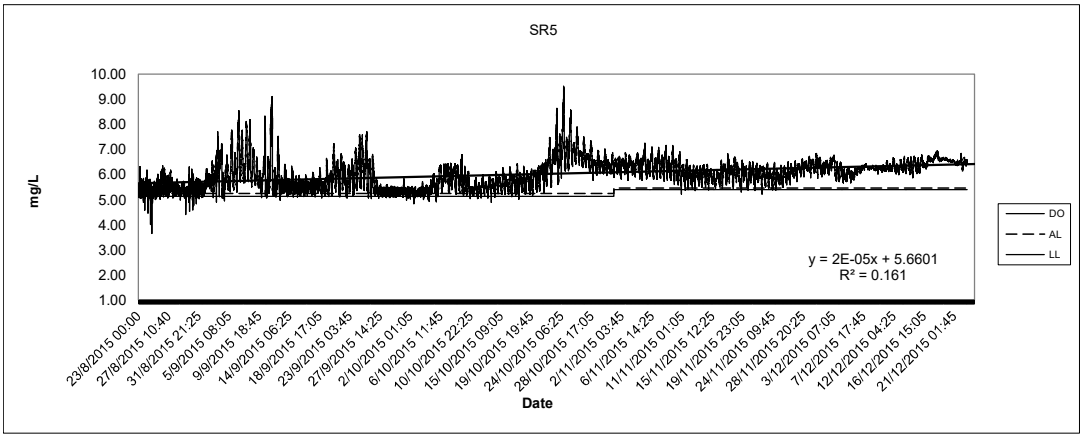


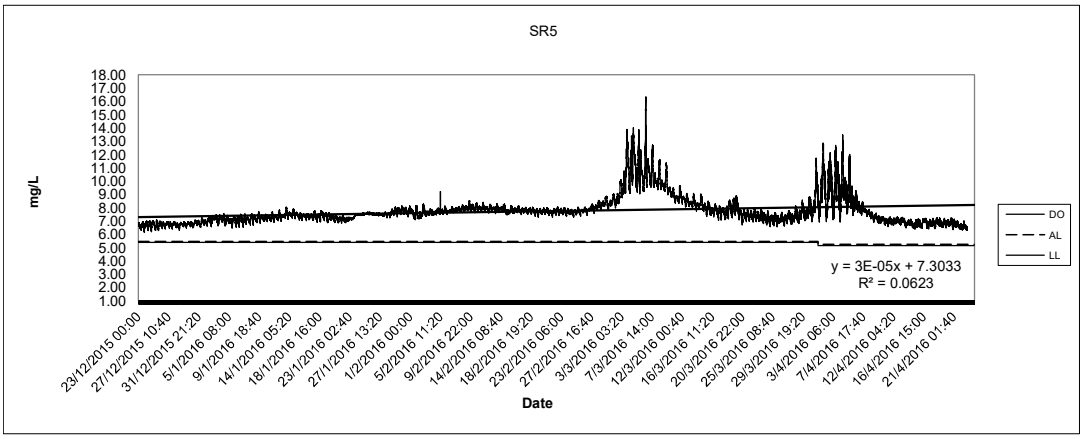


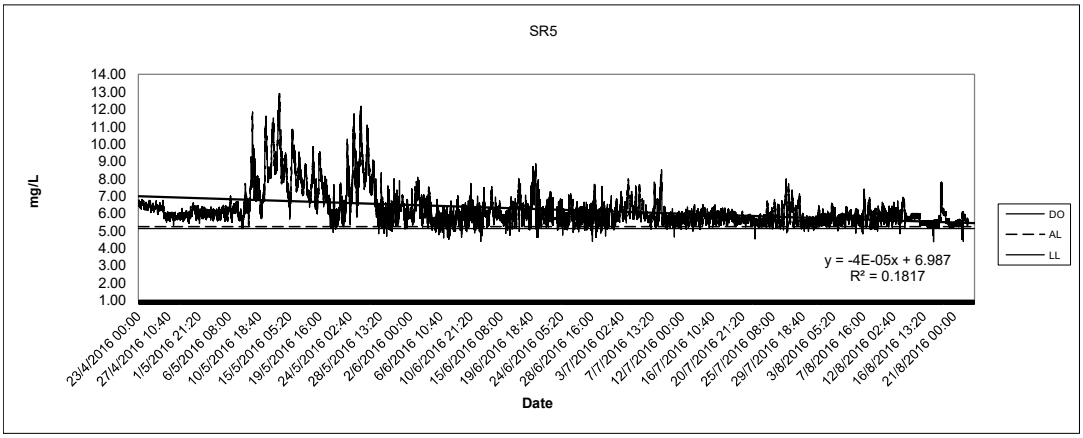


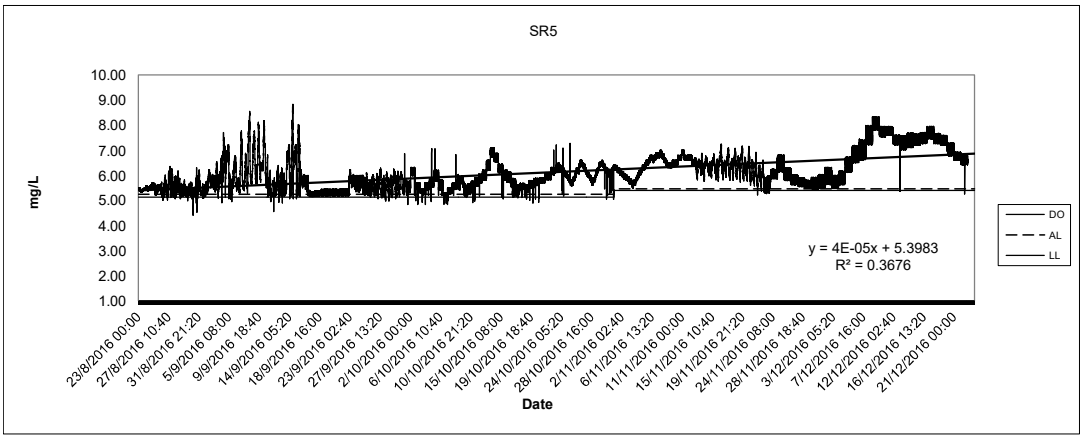


Dissolved Oxygen
24-hr Water Quality Monitoring

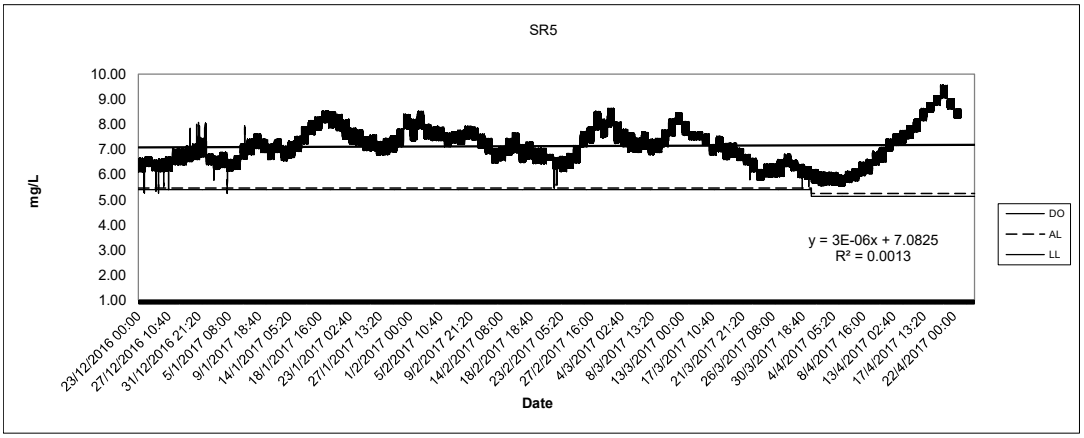


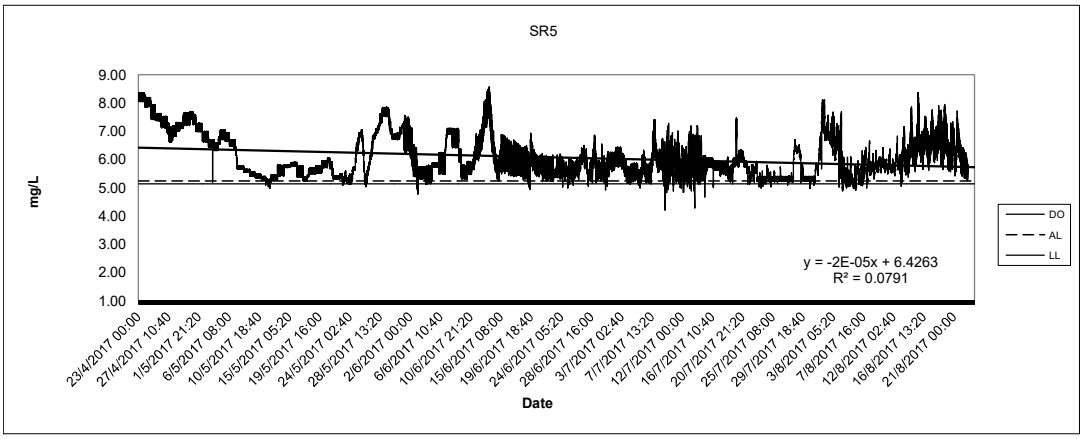


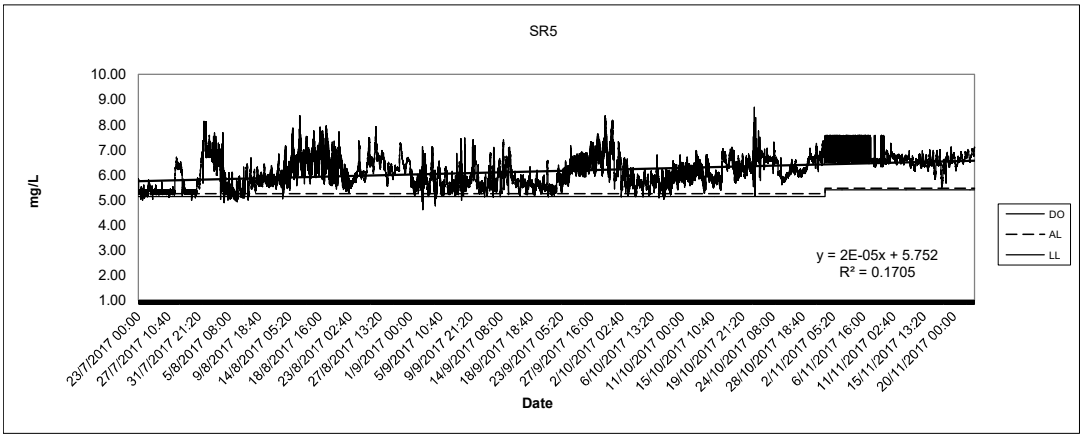


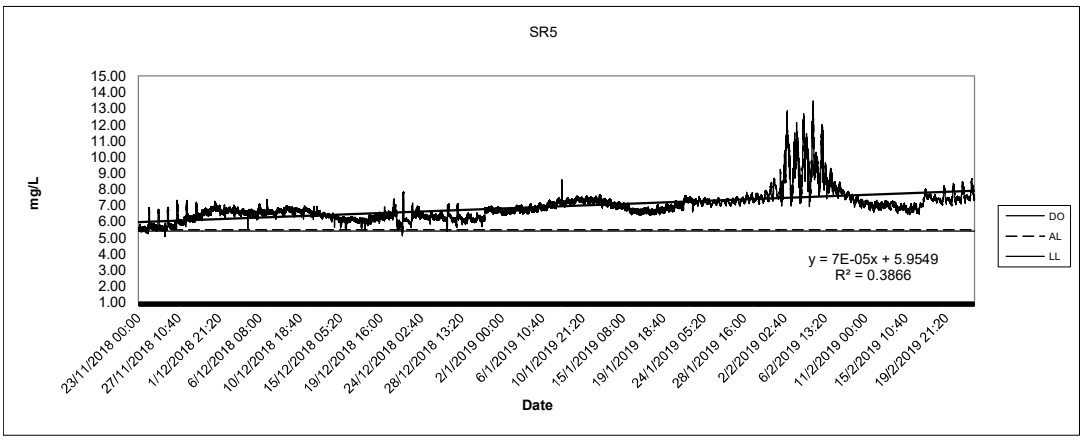


Dissolved Oxygen
24-hr Water Quality Monitoring

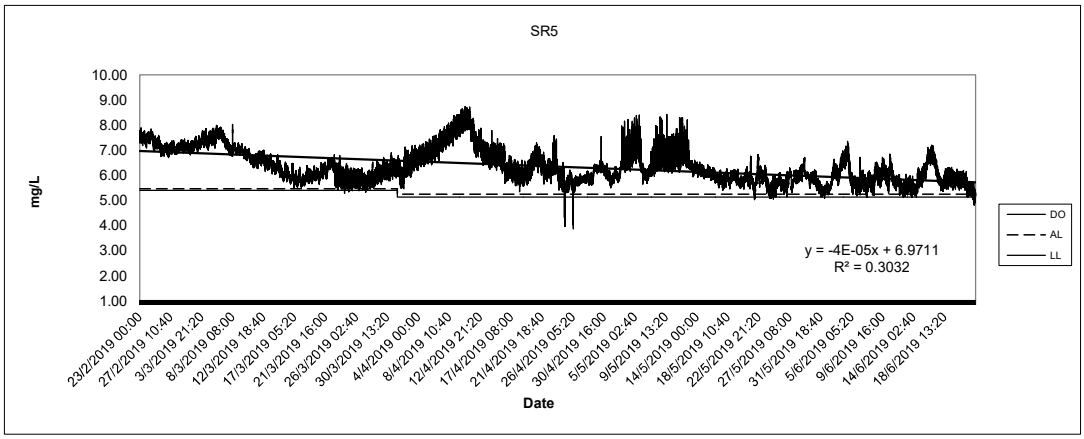


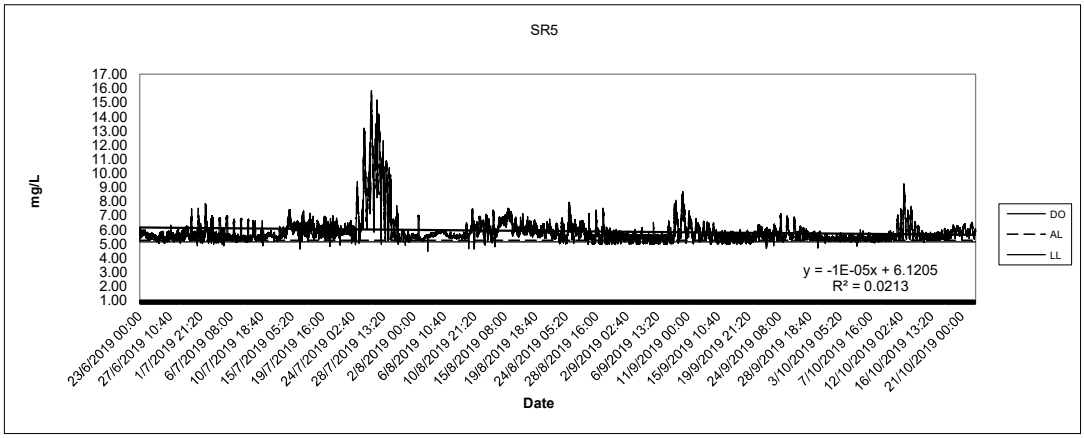


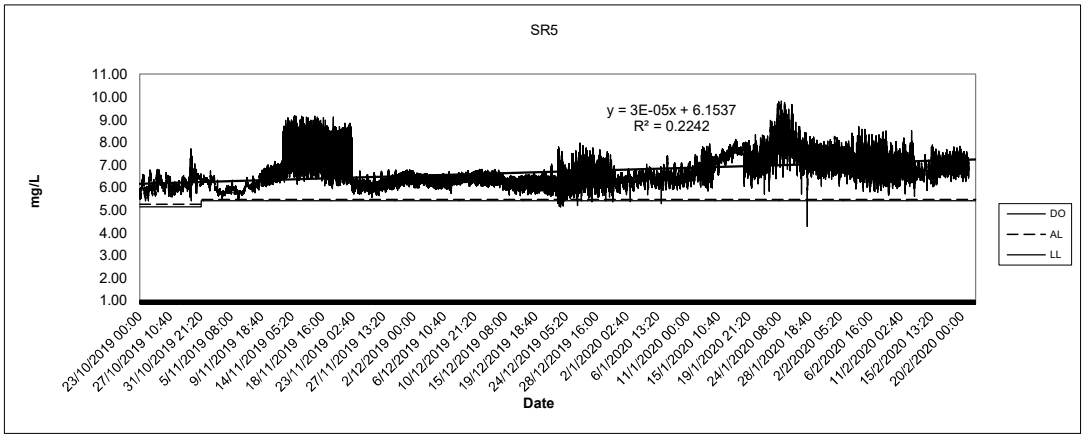


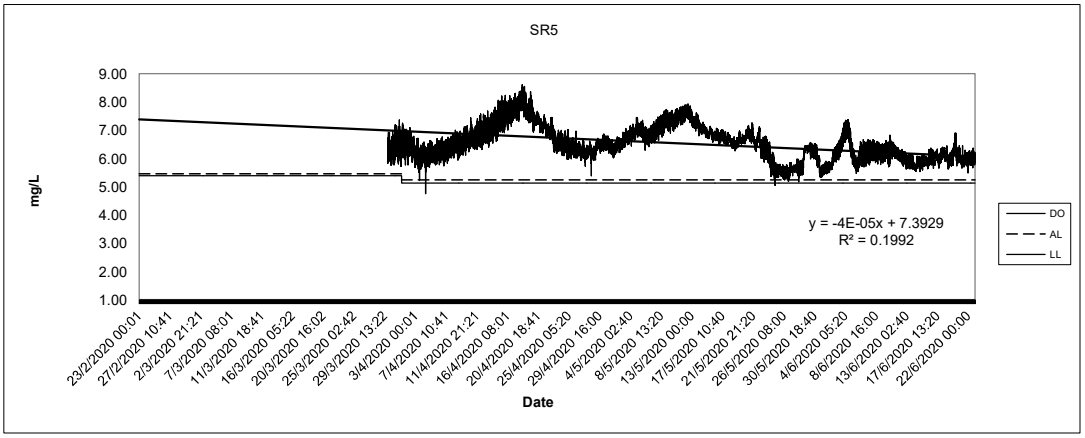


Dissolved Oxygen
24-hr Water Quality Monitoring

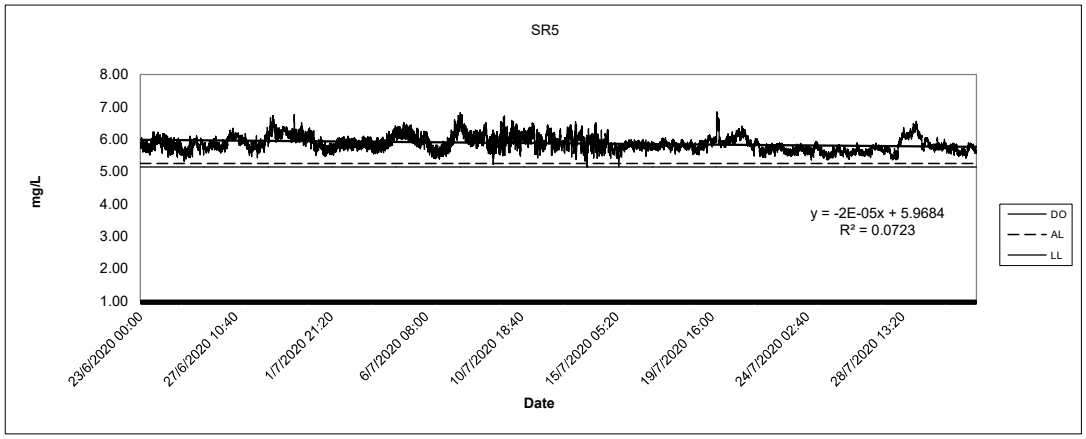




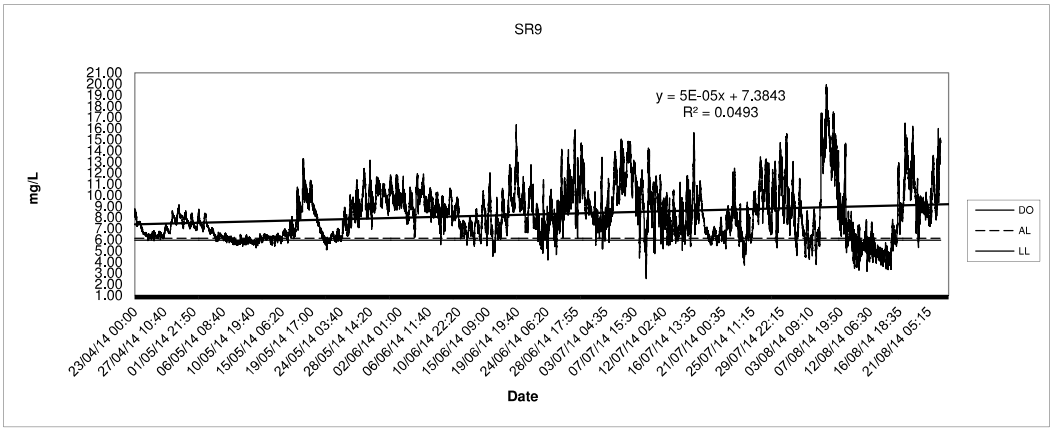


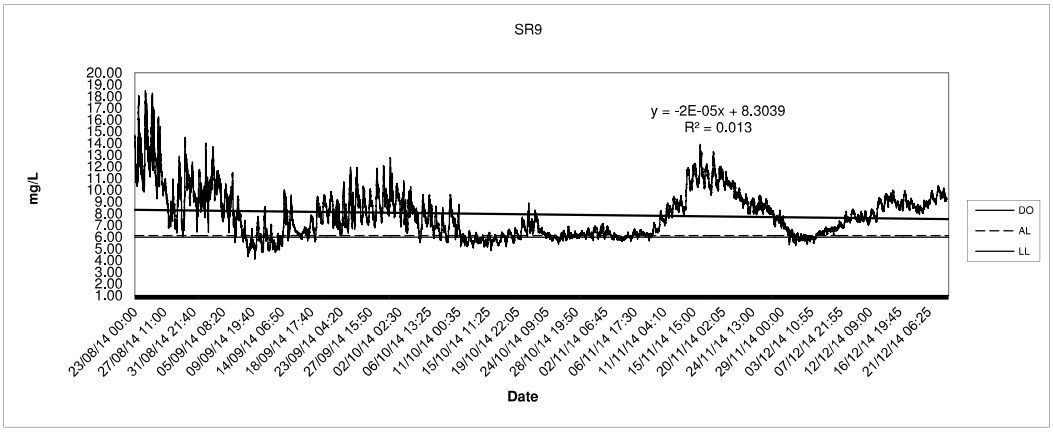


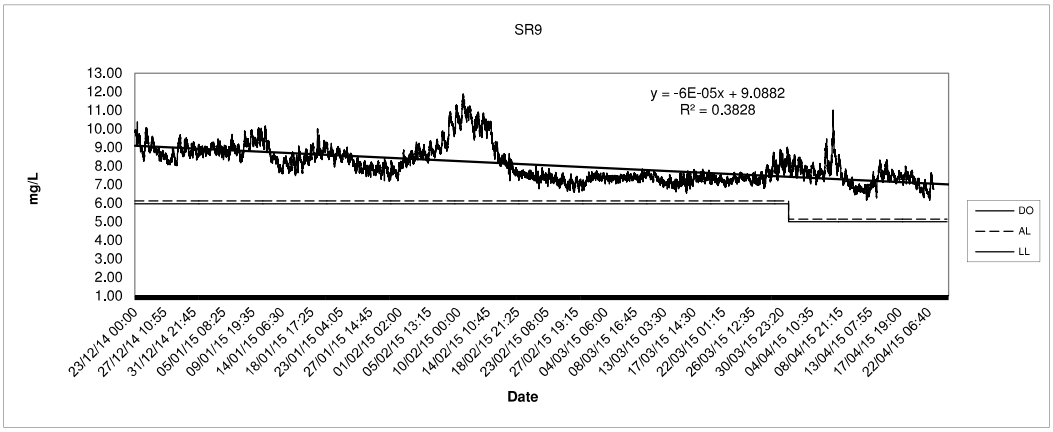
Dissolved Oxygen
24-hr Water Quality Monitoring

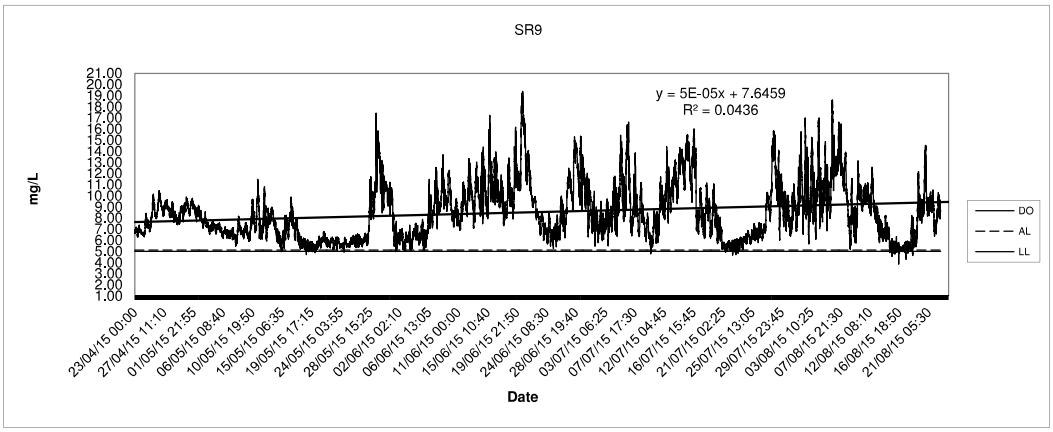


Dissolved Oxygen
24-hr Water Quality Monitoring

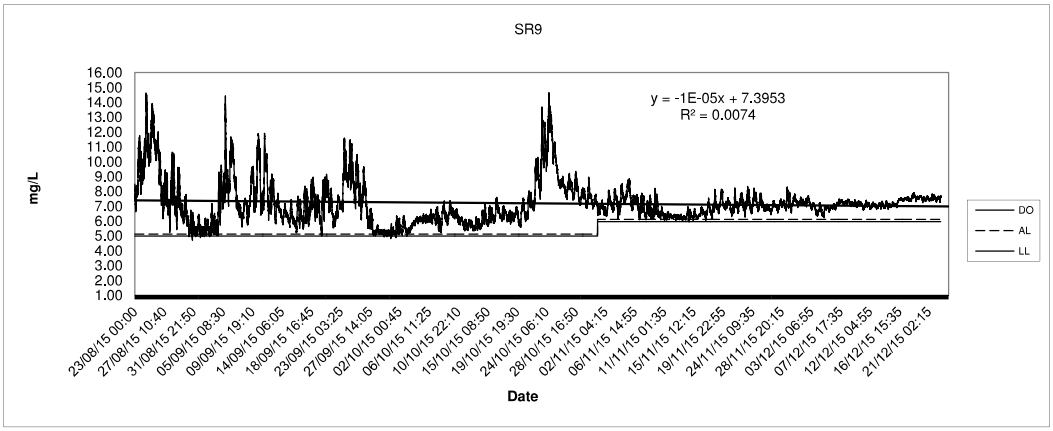


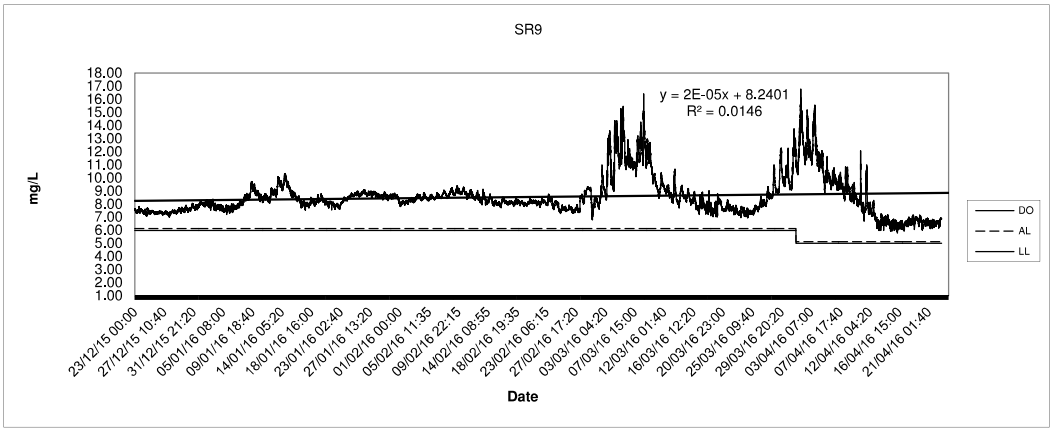


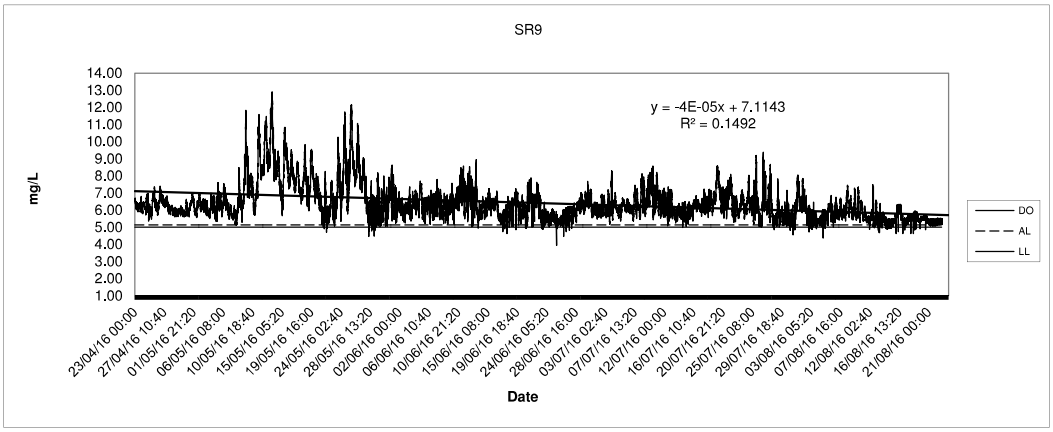


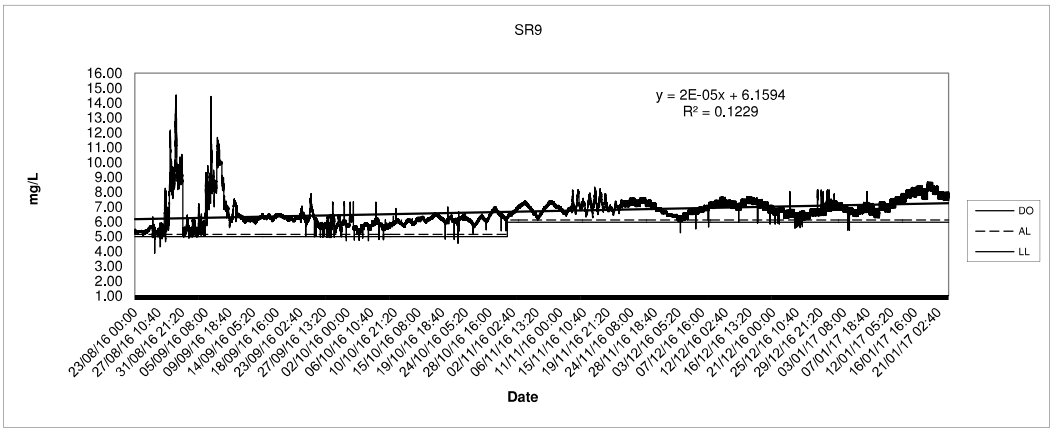


Dissolved Oxygen
24-hr Water Quality Monitoring

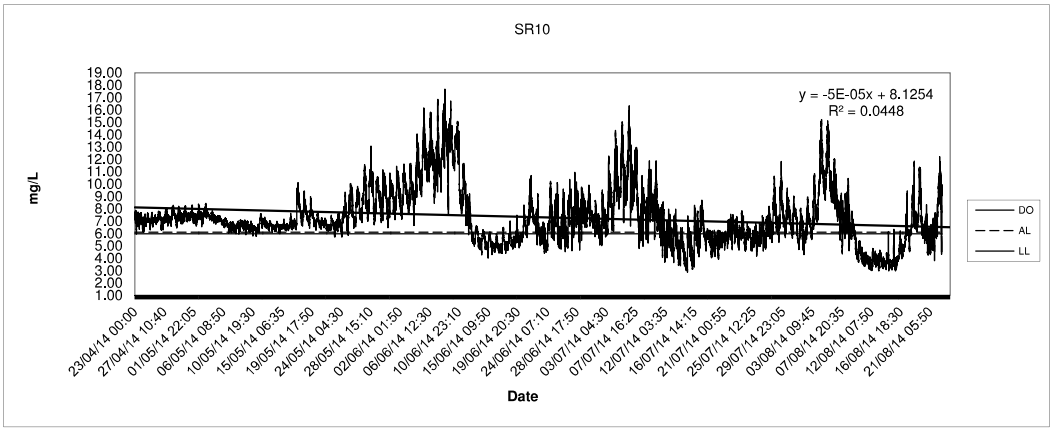


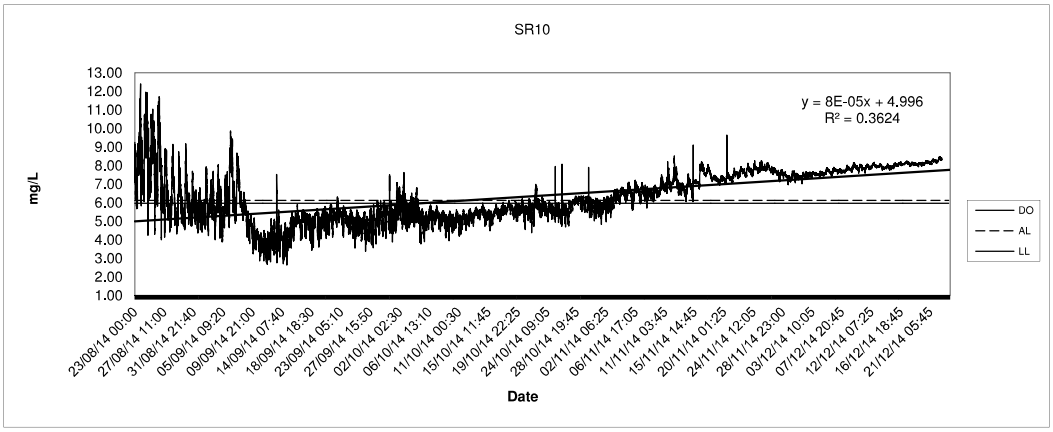


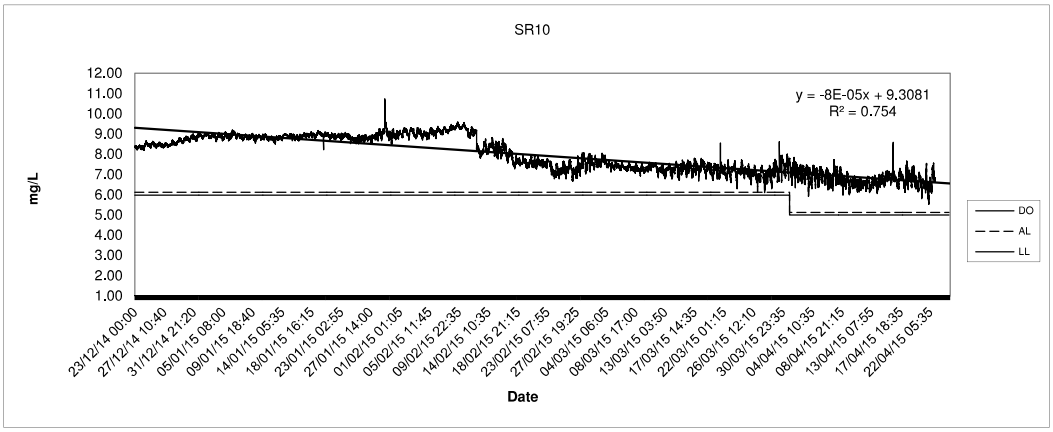


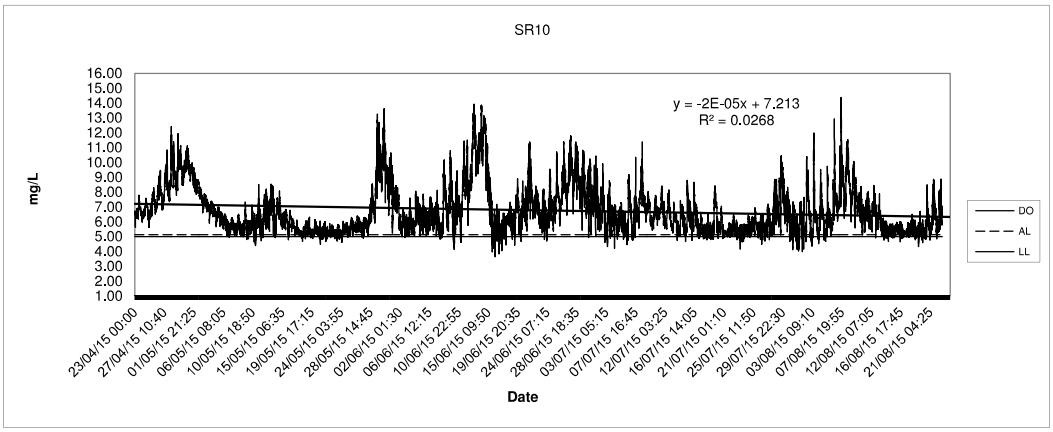


Dissolved Oxygen
24-hr Water Quality Monitoring

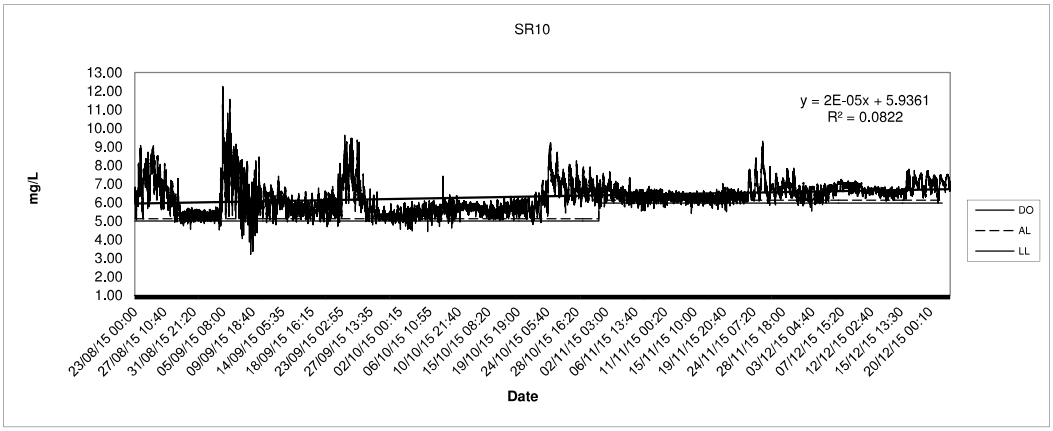


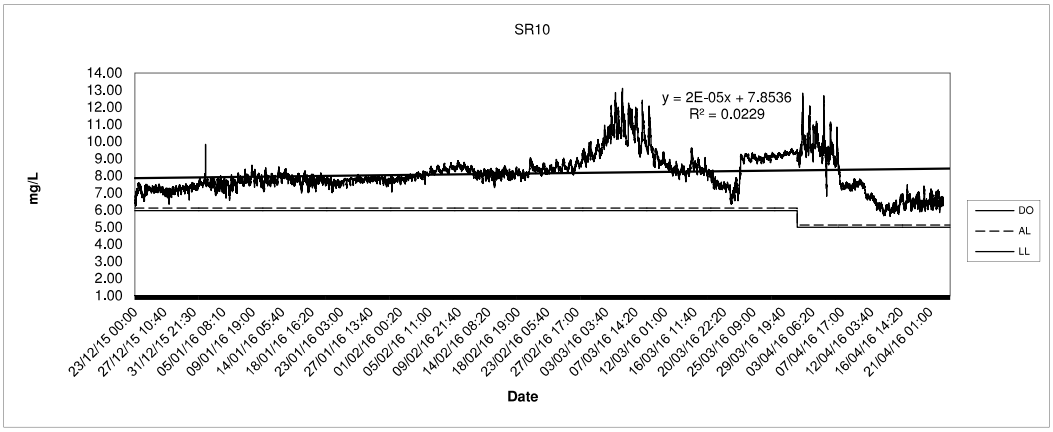


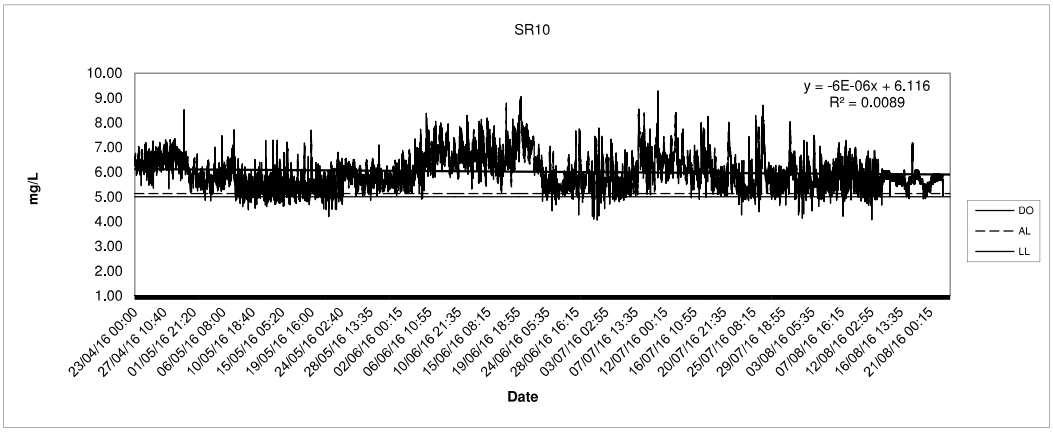


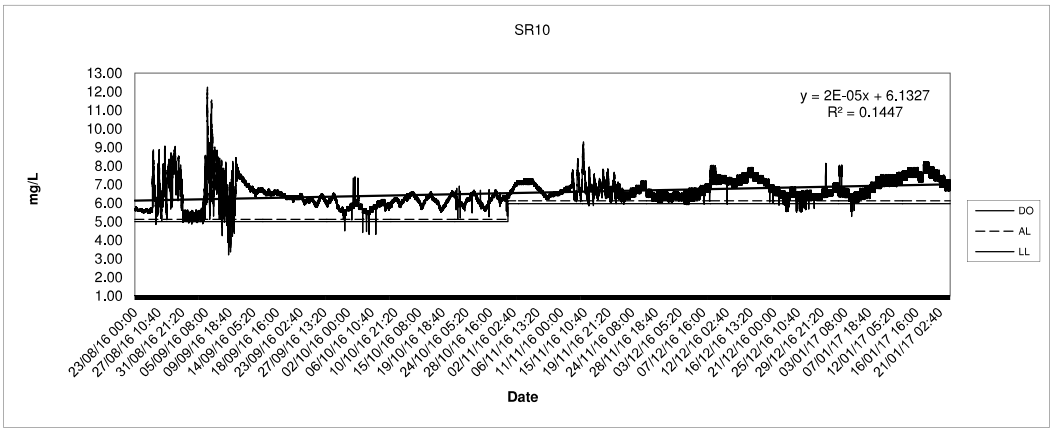


Dissolved Oxygen
24-hr Water Quality Monitoring

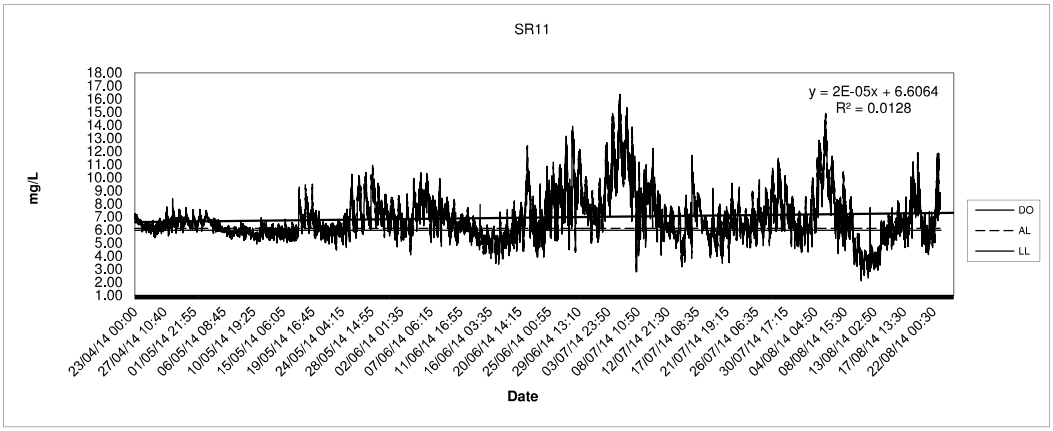


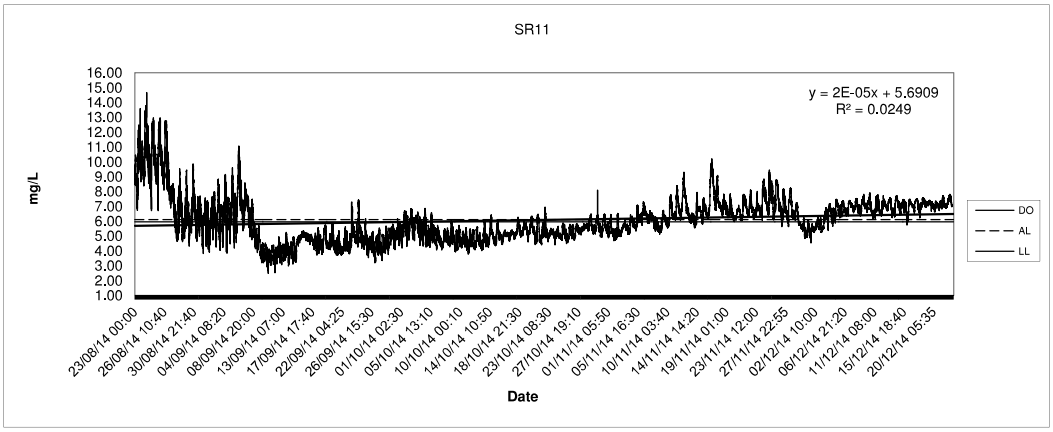


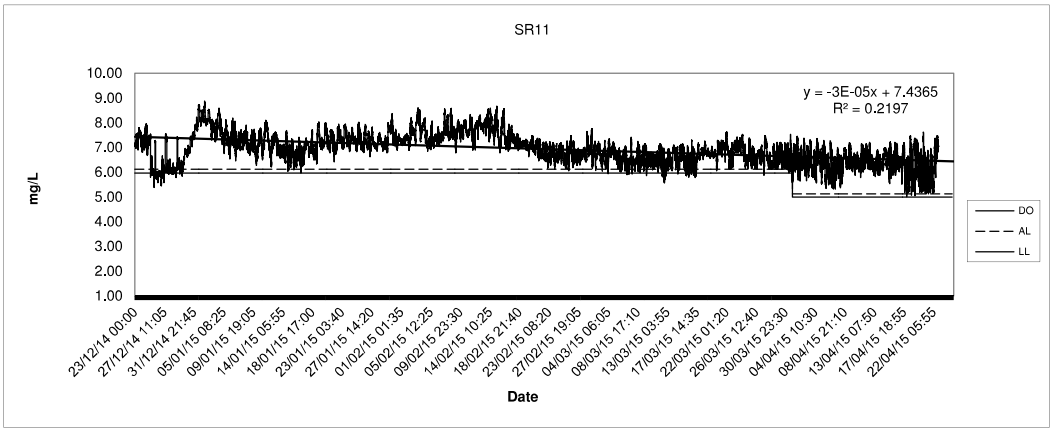


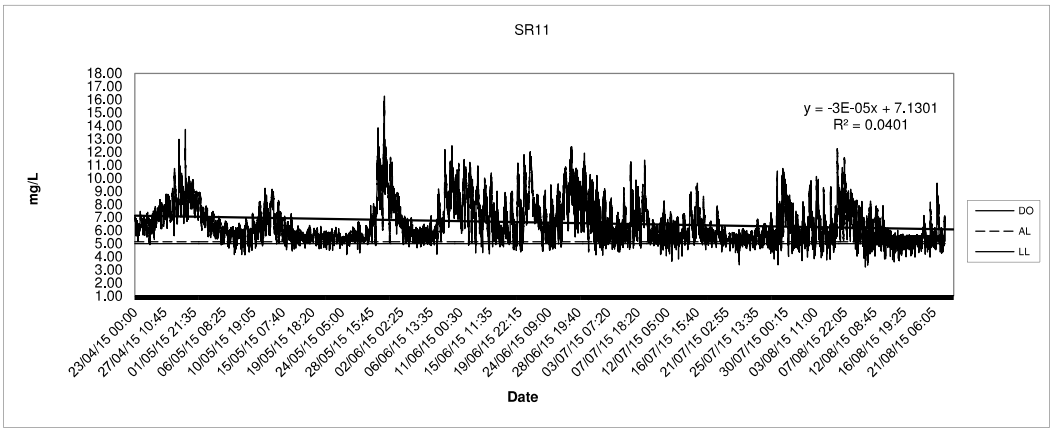


Dissolved Oxygen
24-hr Water Quality Monitoring

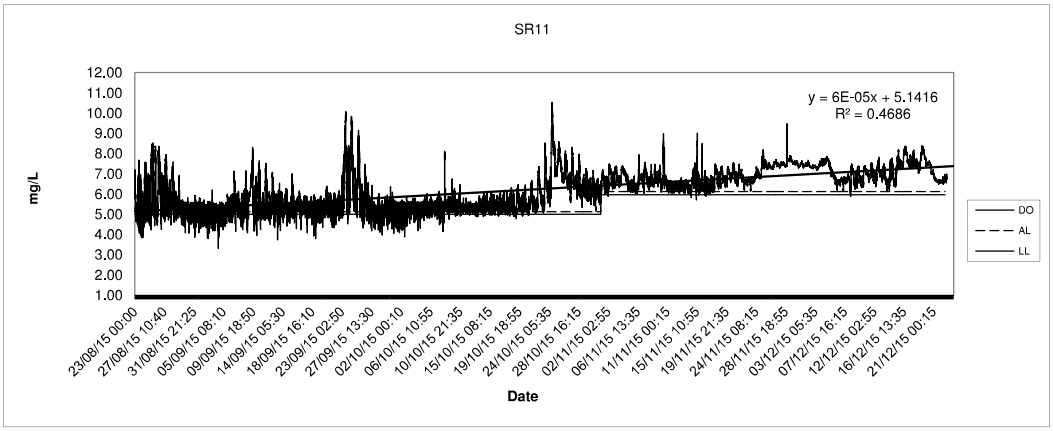


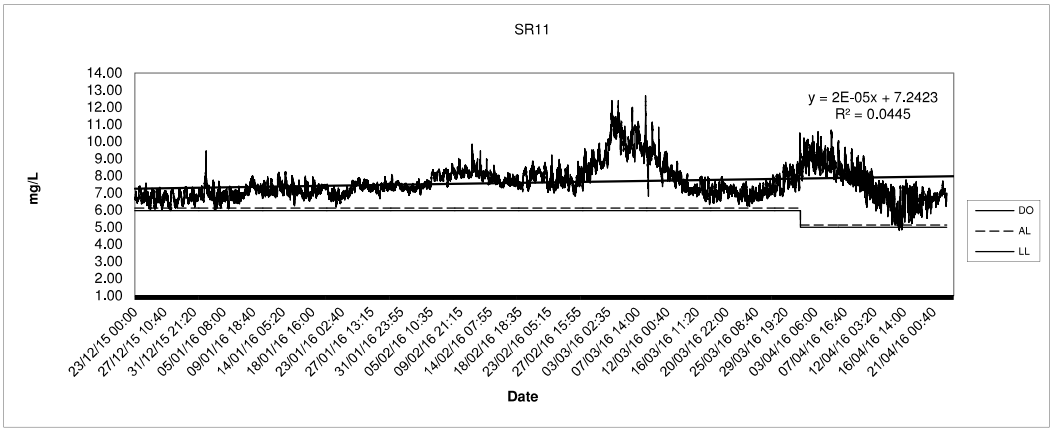


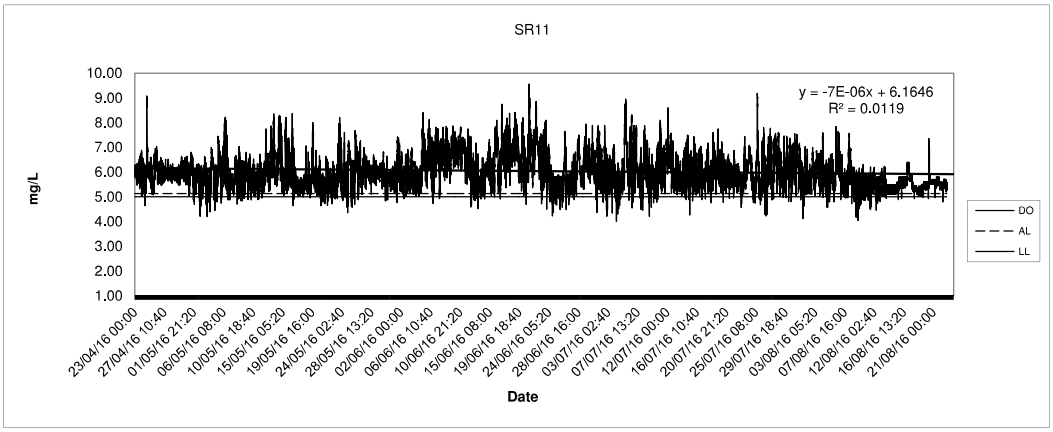


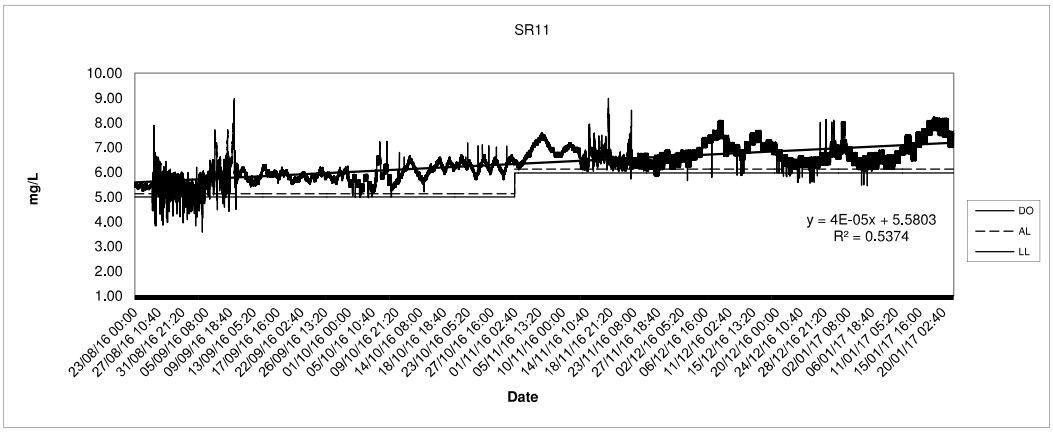


Dissolved Oxygen
24-hr Water Quality Monitoring

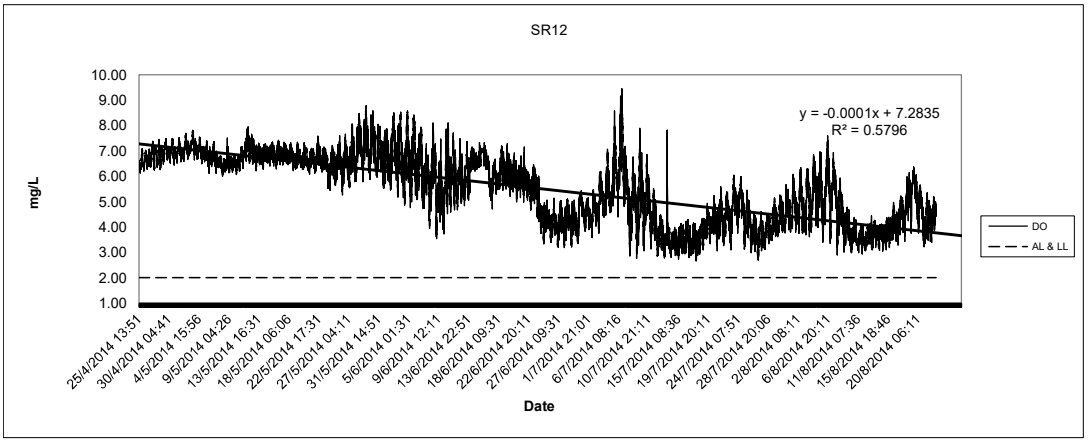


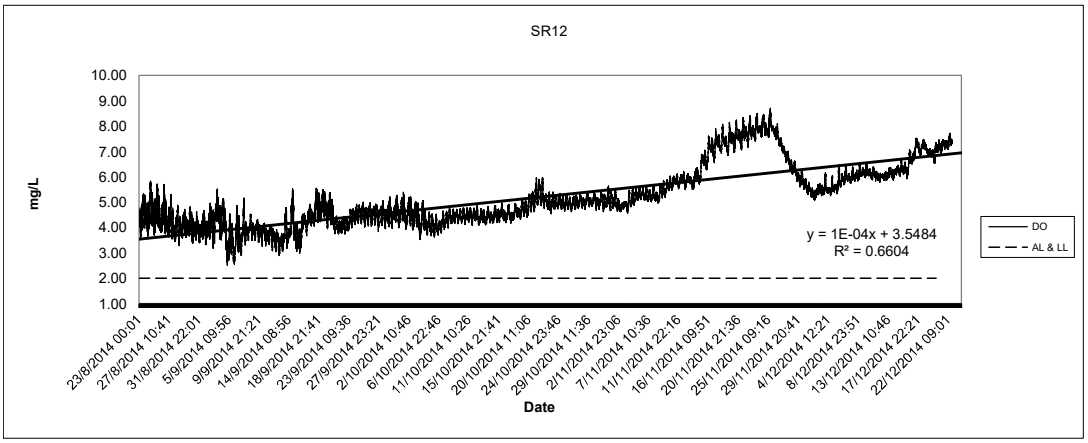


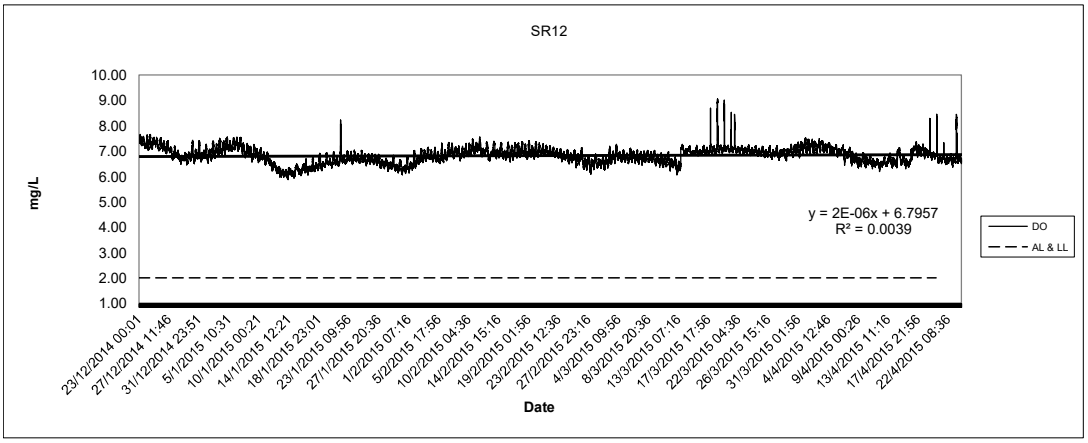


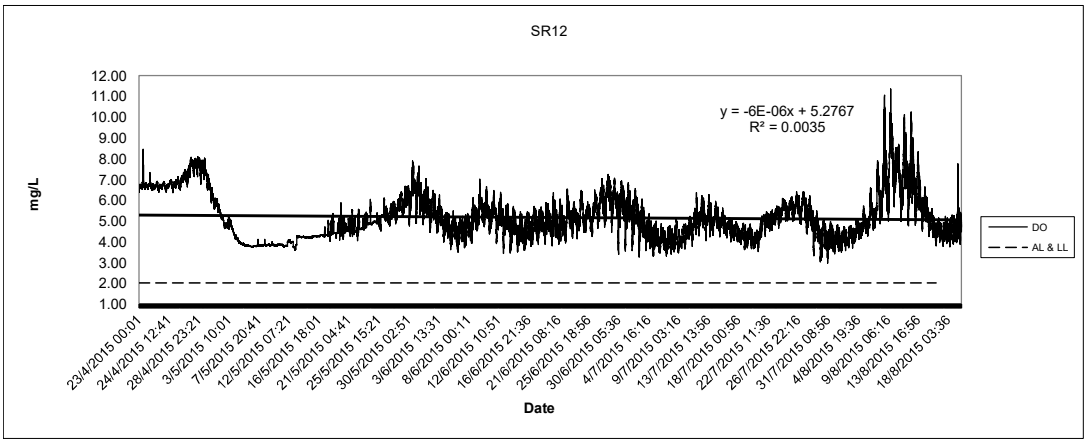


Dissolved Oxygen
24-hr Water Quality Monitoring

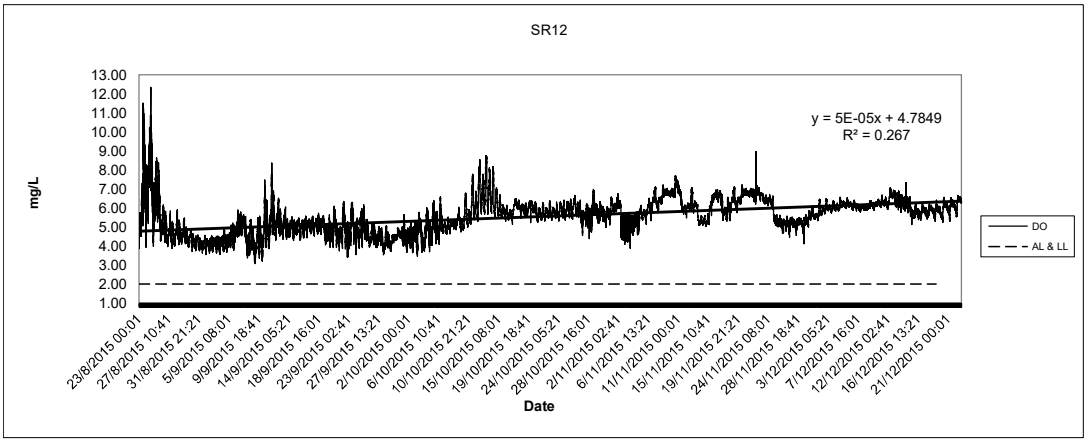


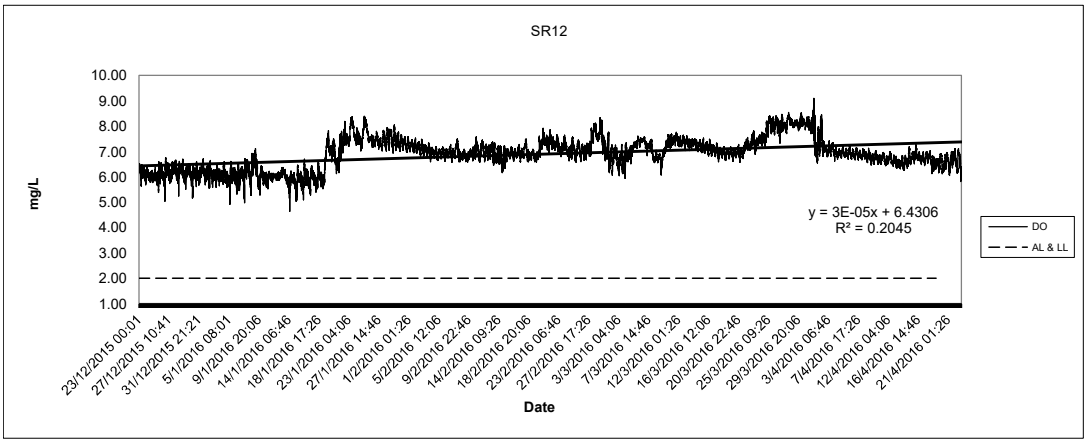


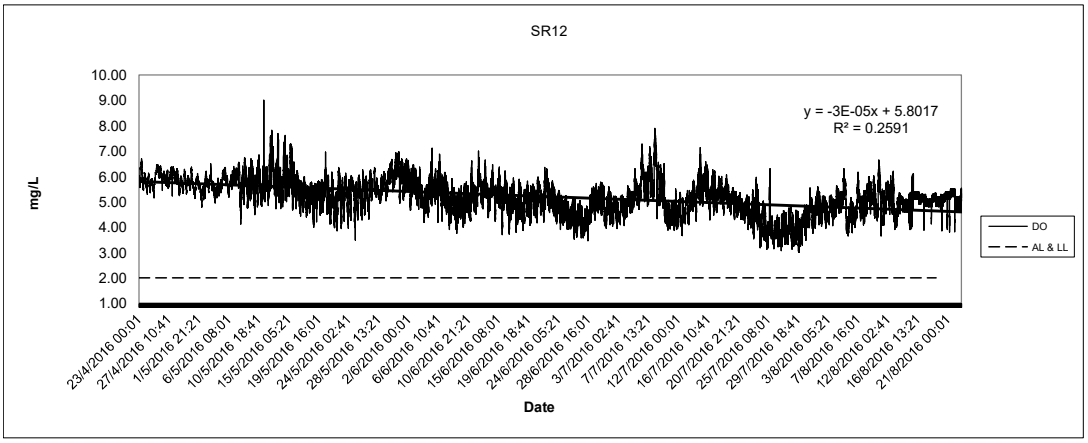


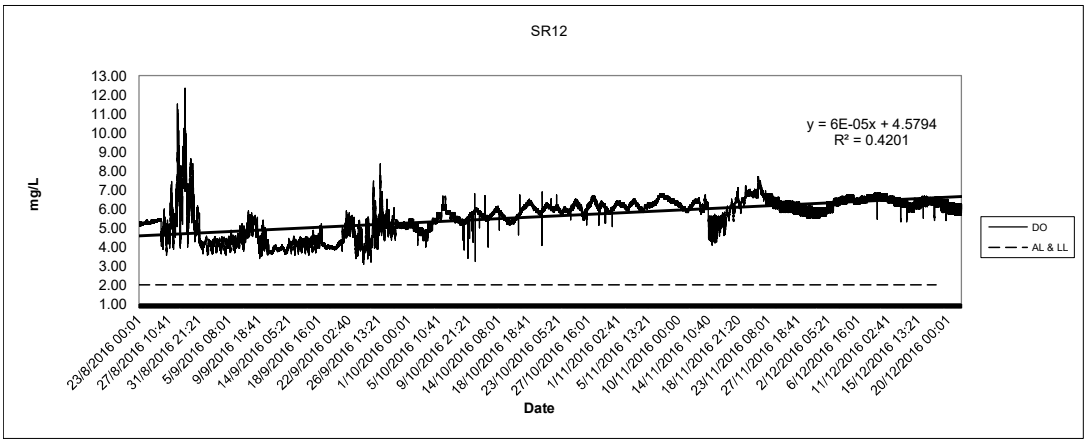


Dissolved Oxygen
24-hr Water Quality Monitoring

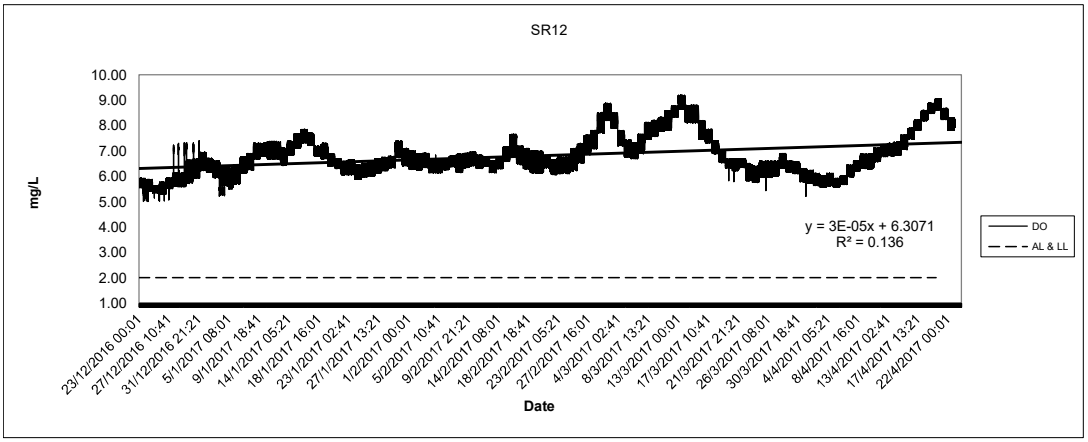


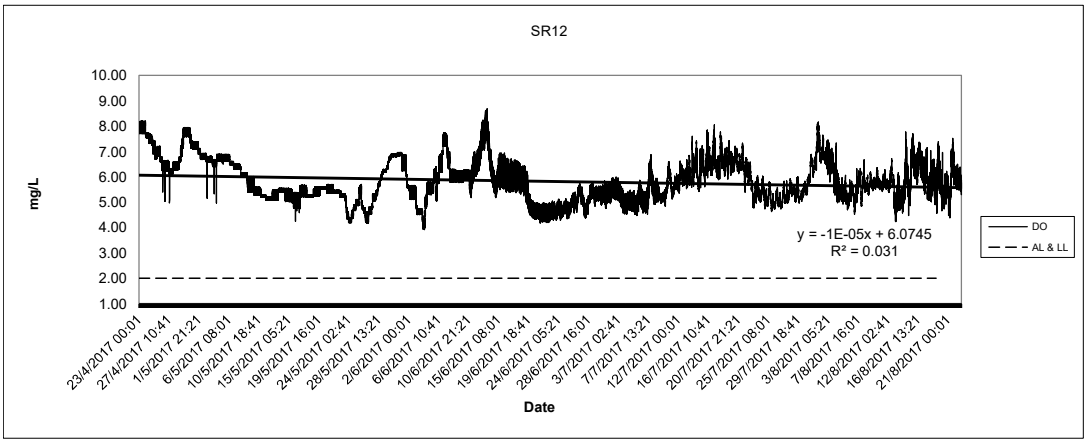


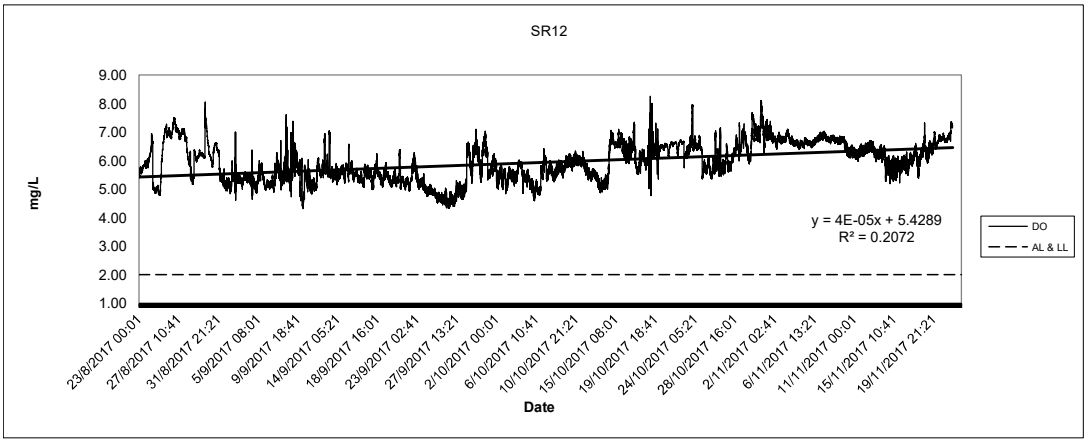


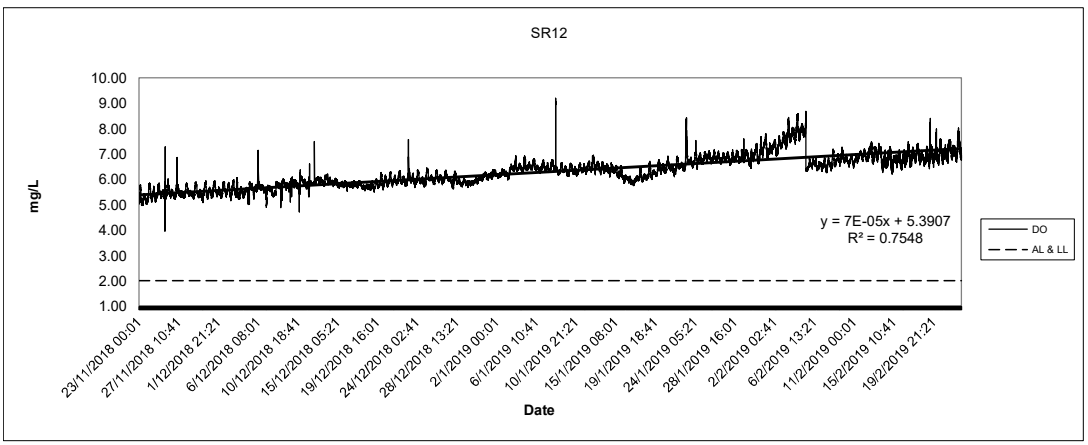


Dissolved Oxygen
24-hr Water Quality Monitoring

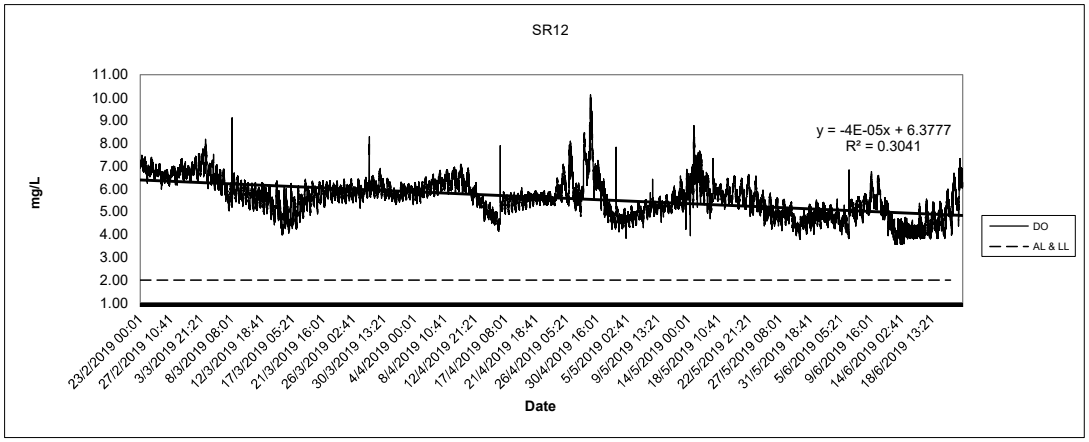


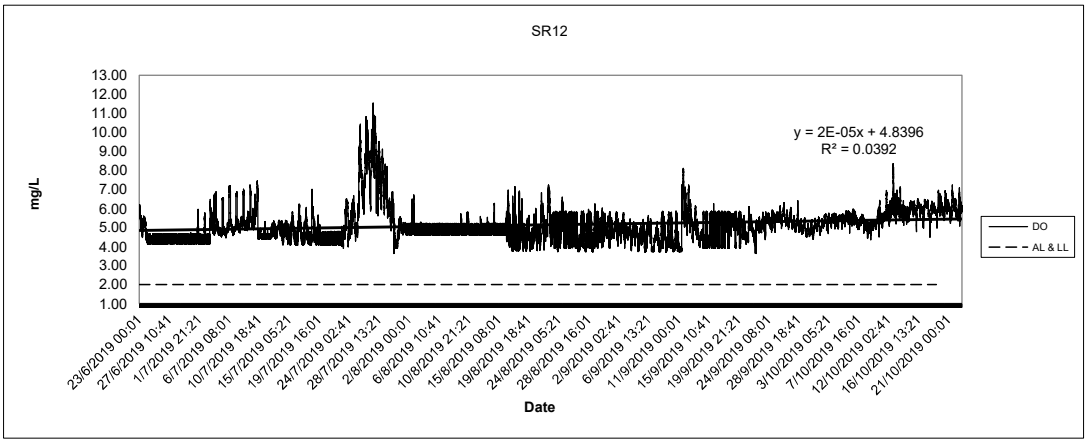


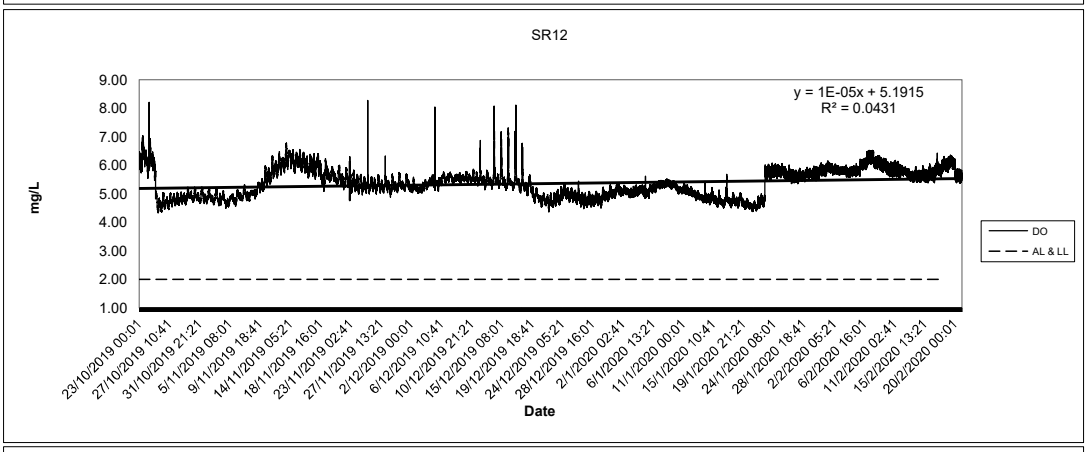


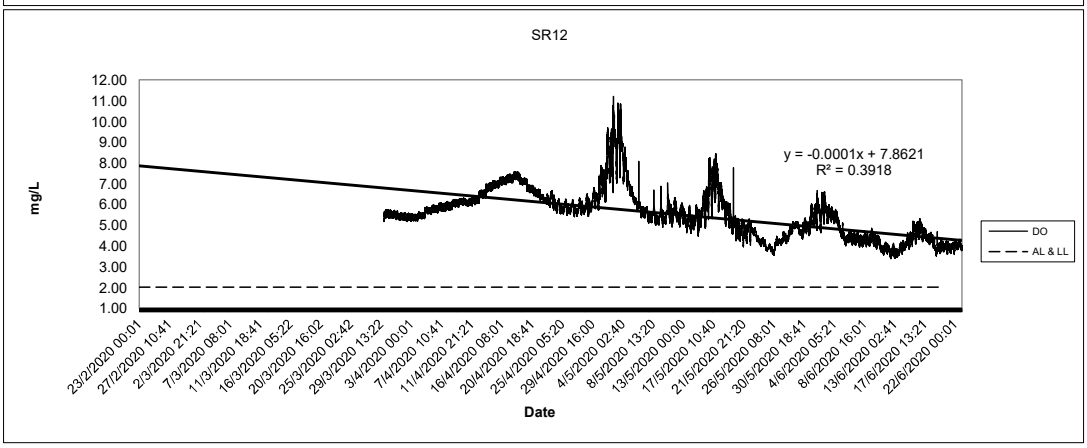


Dissolved Oxygen
24-hr Water Quality Monitoring

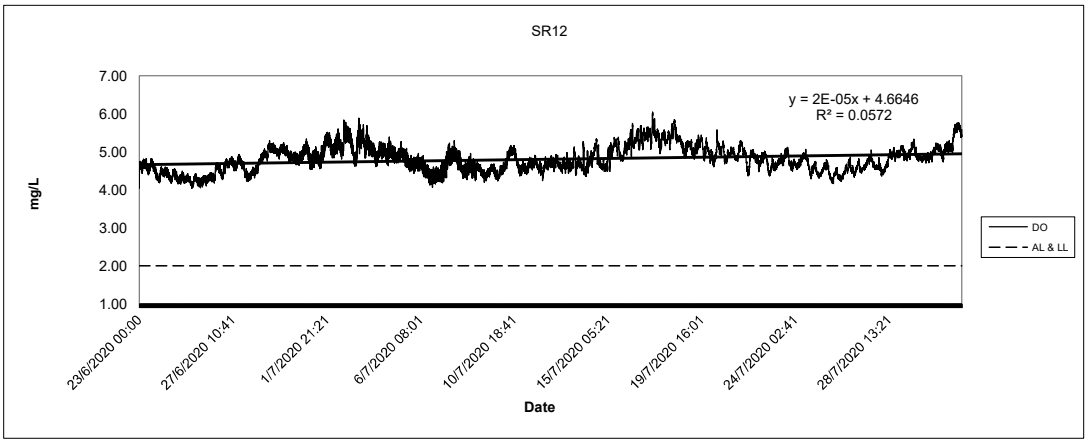




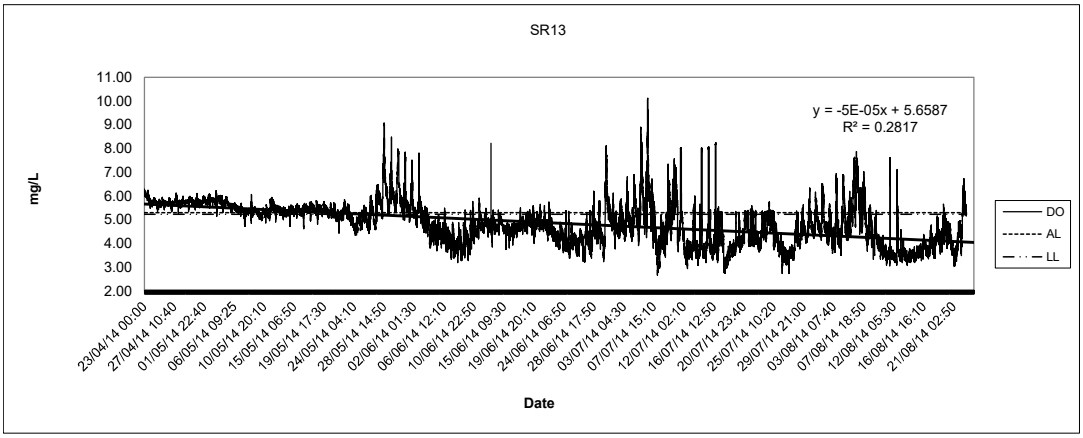


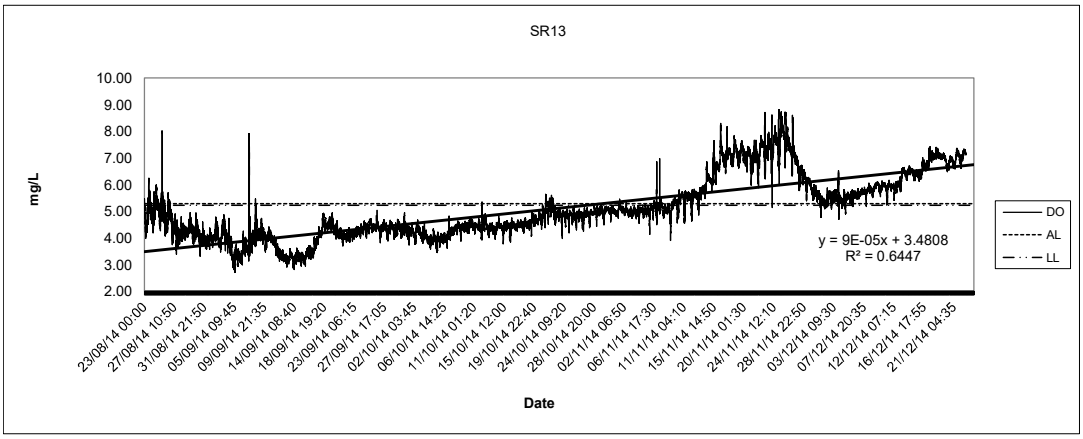


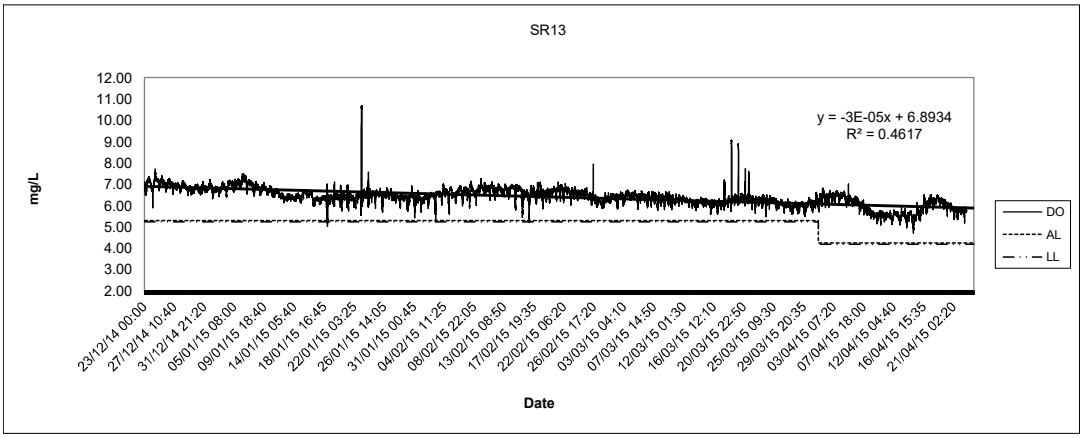
Dissolved Oxygen
24-hr Water Quality Monitoring

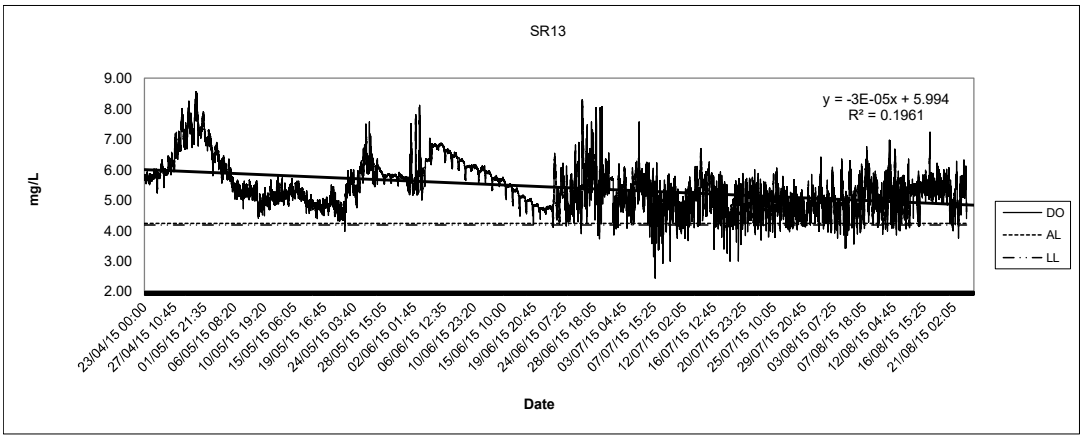


Dissolved Oxygen
24-hr Water Quality Monitoring

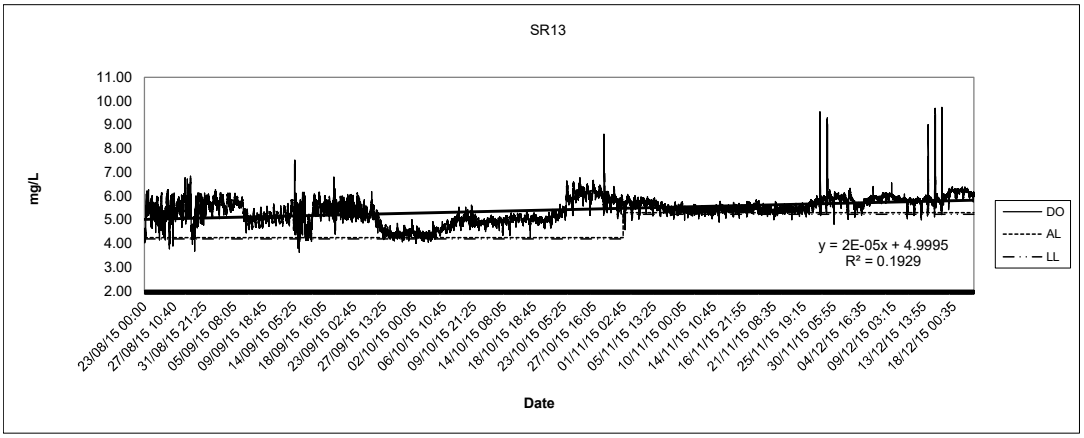


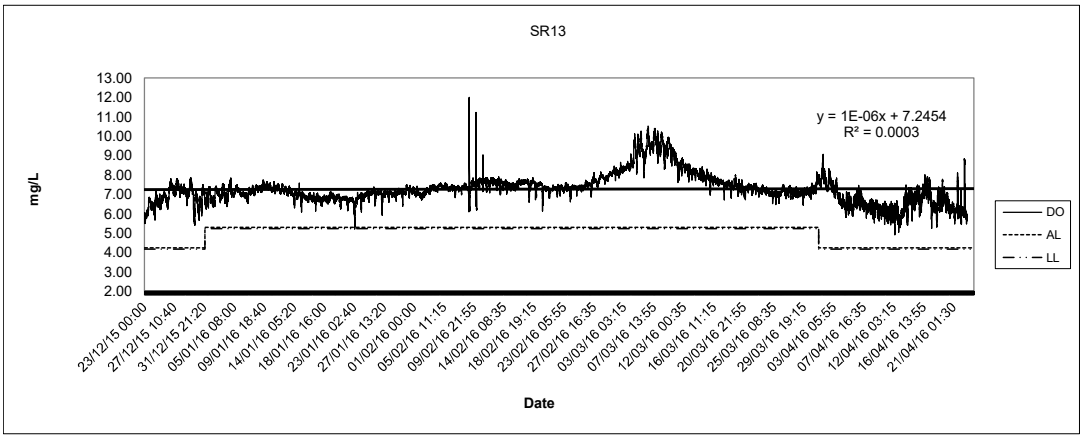


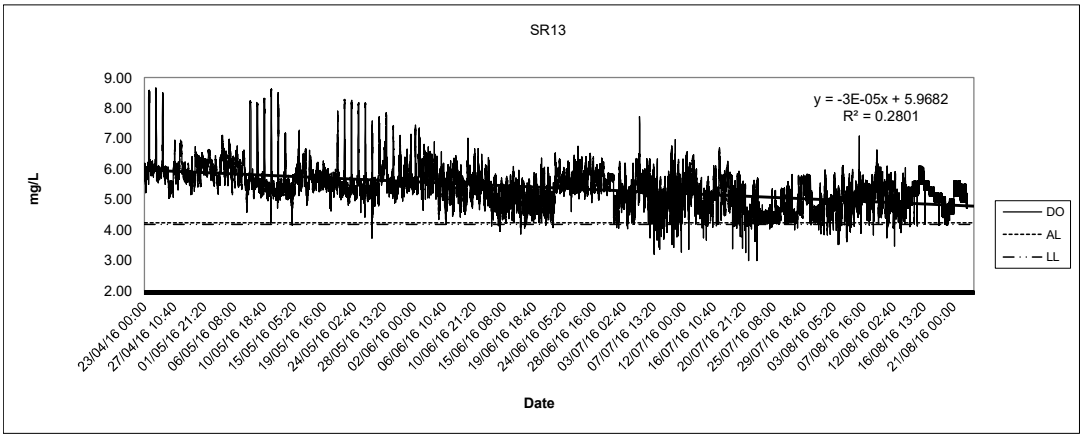


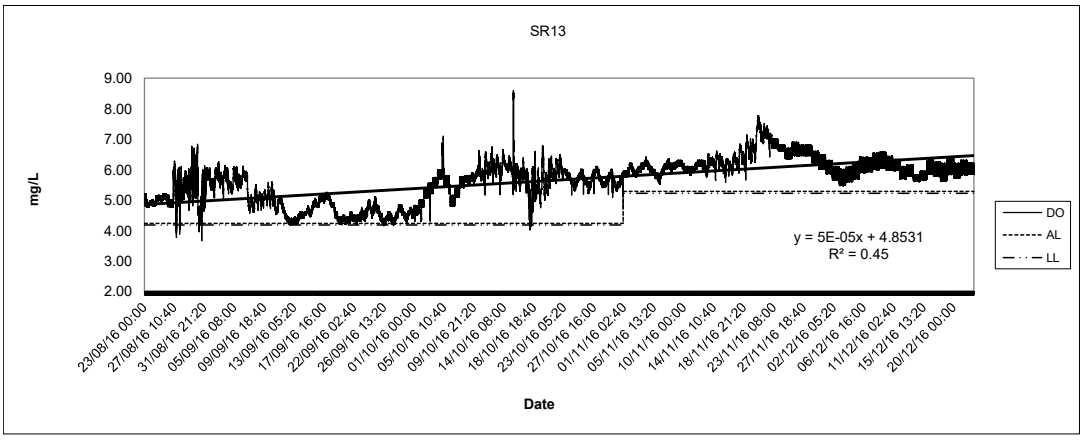


Dissolved Oxygen
24-hr Water Quality Monitoring

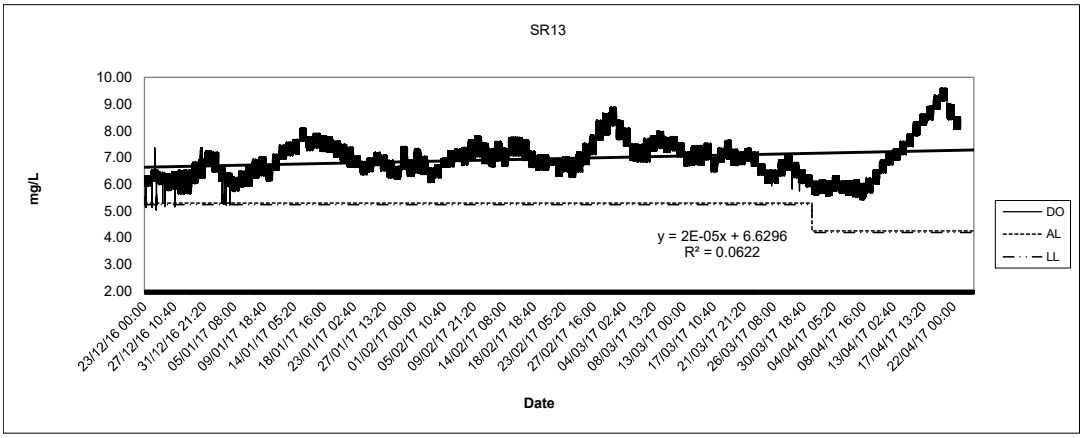


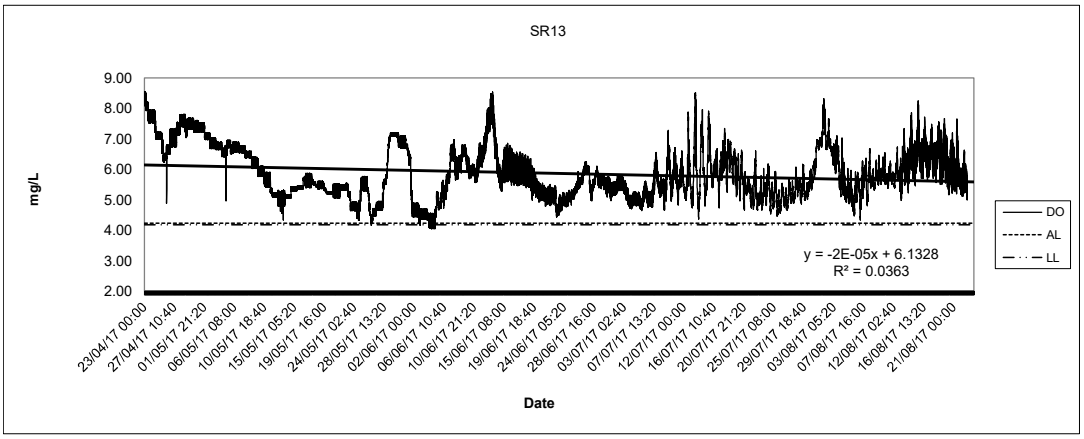


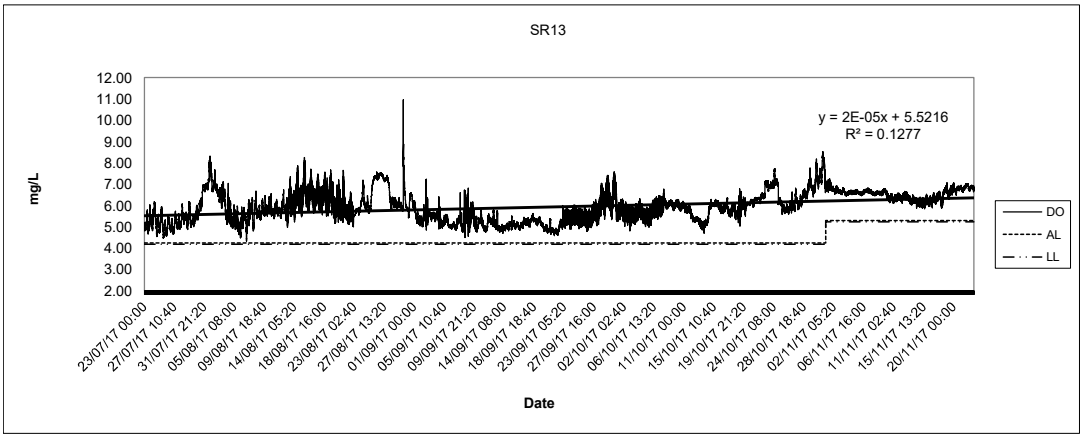


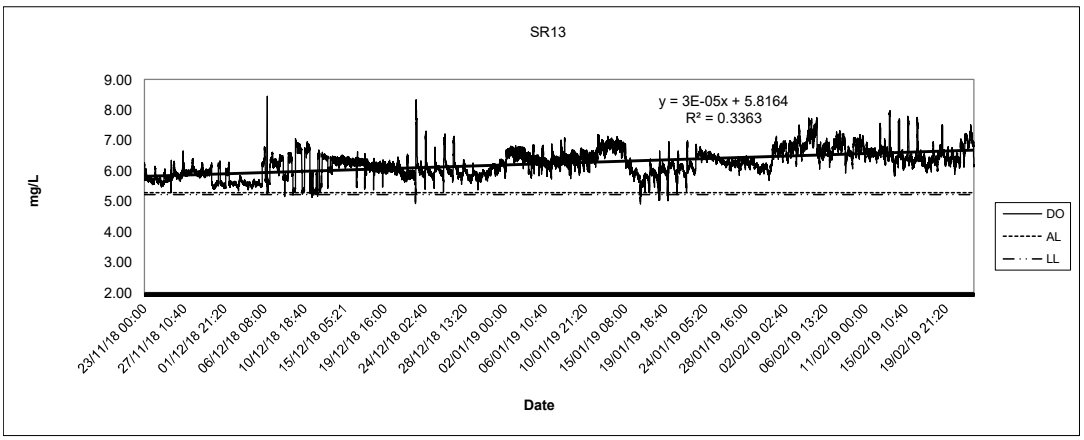


Dissolved Oxygen
24-hr Water Quality Monitoring

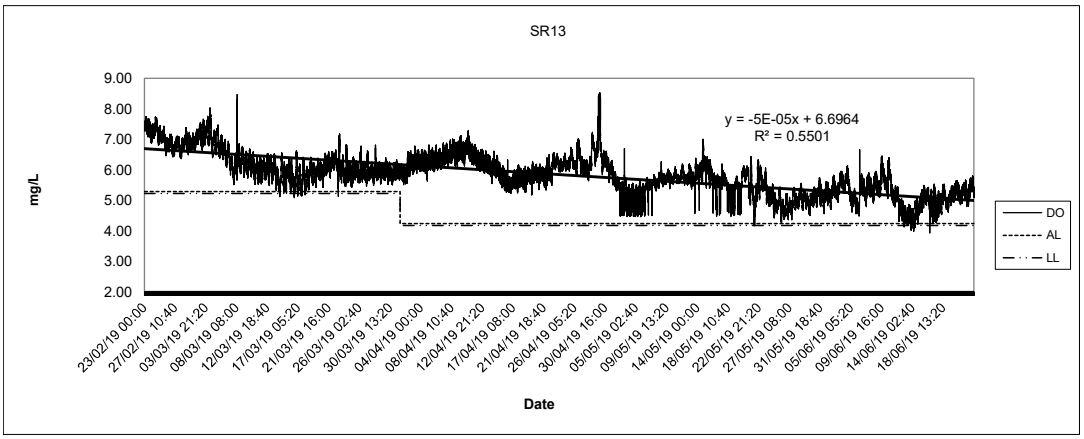


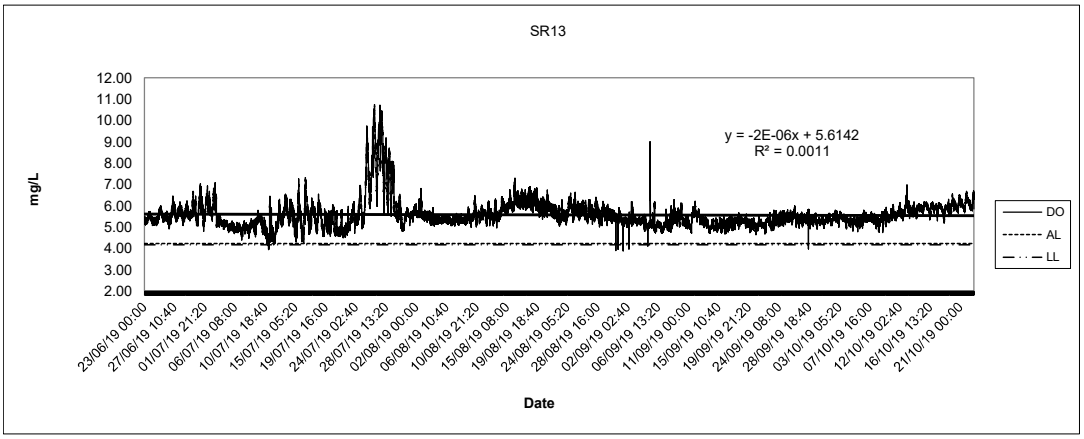


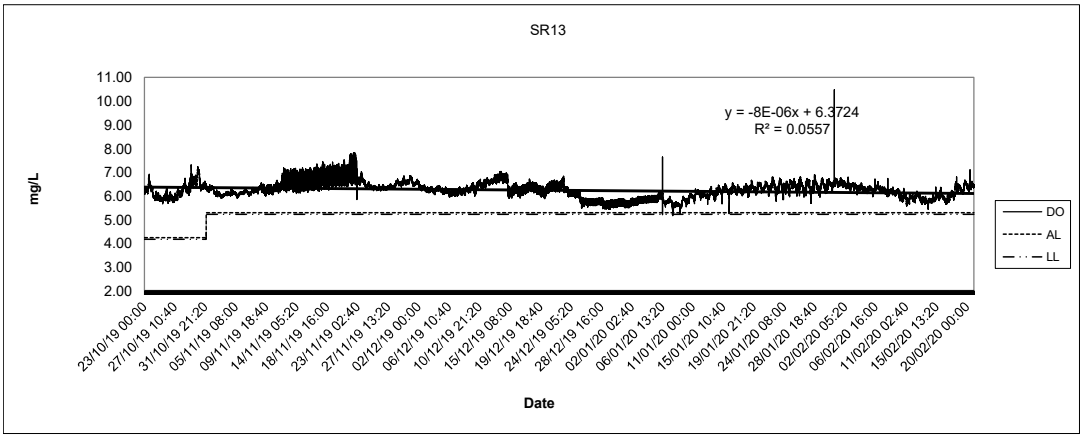


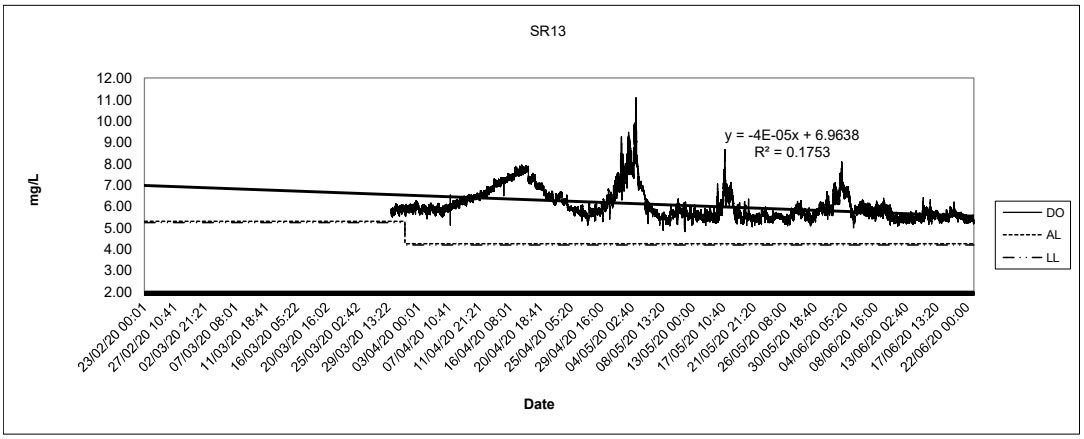


Dissolved Oxygen
24-hr Water Quality Monitoring

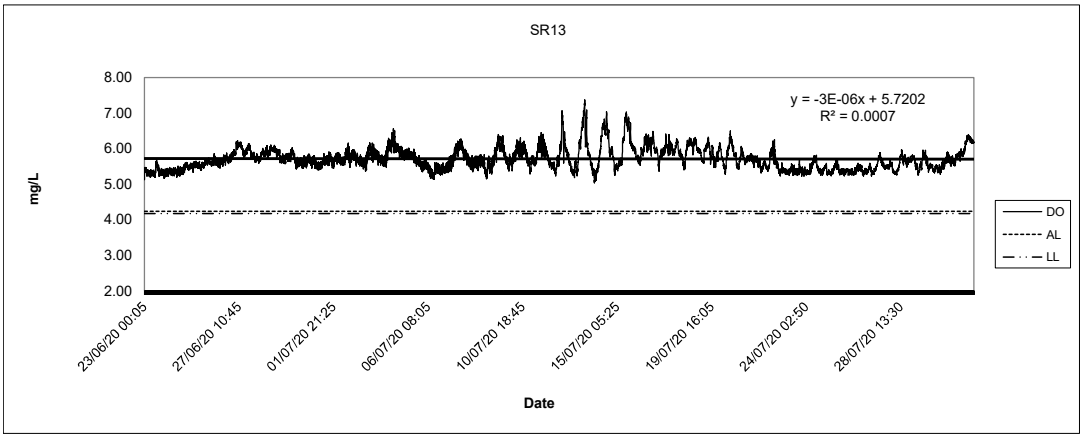




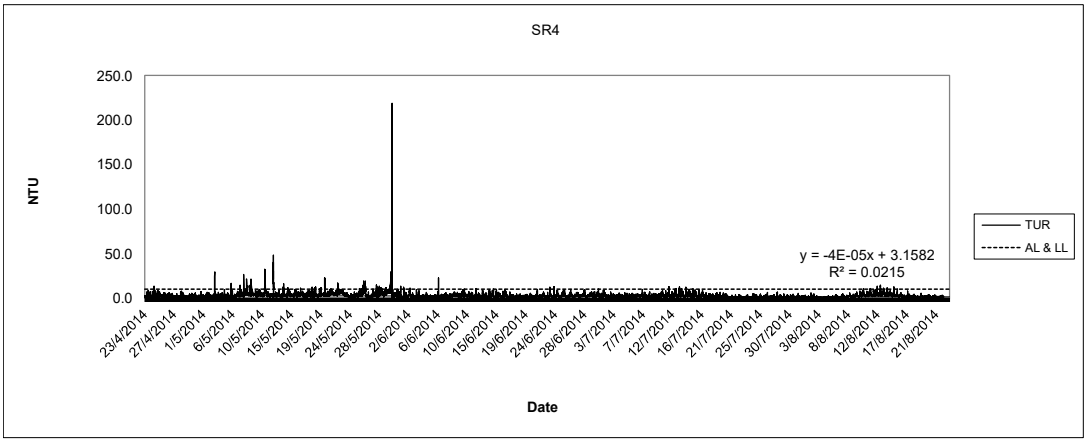


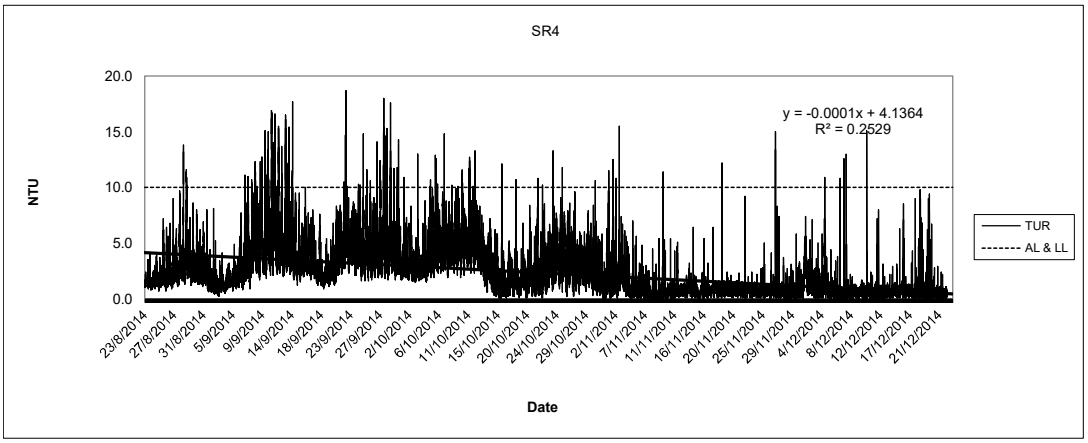


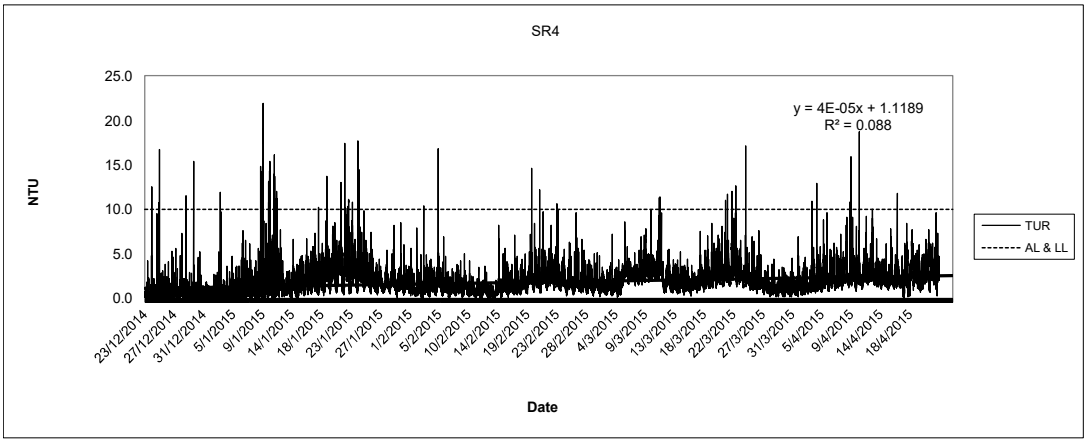
Dissolved Oxygen
24-hr Water Quality Monitoring

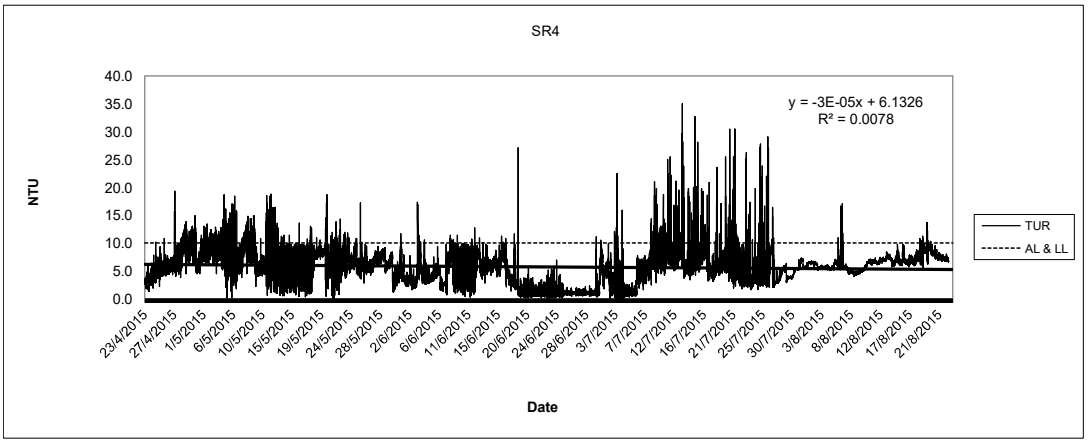


Turbidity
24-hr Water Quality Monitoring

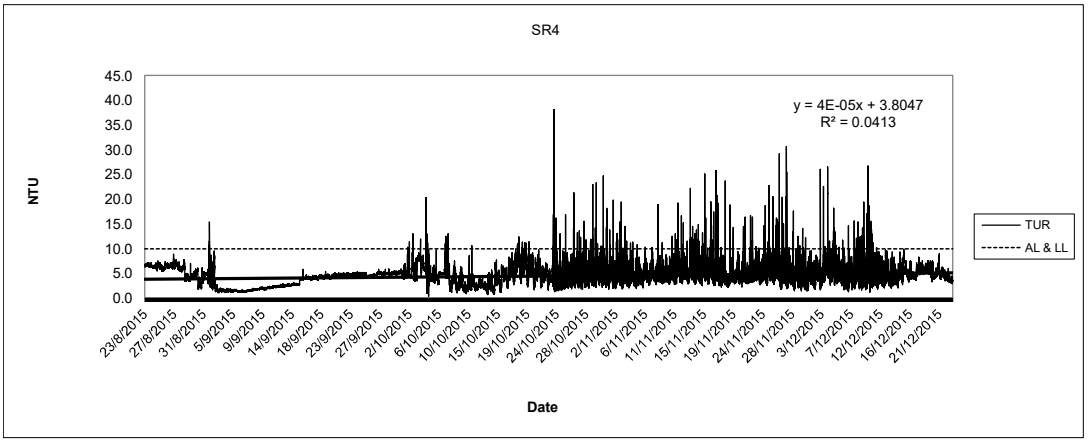


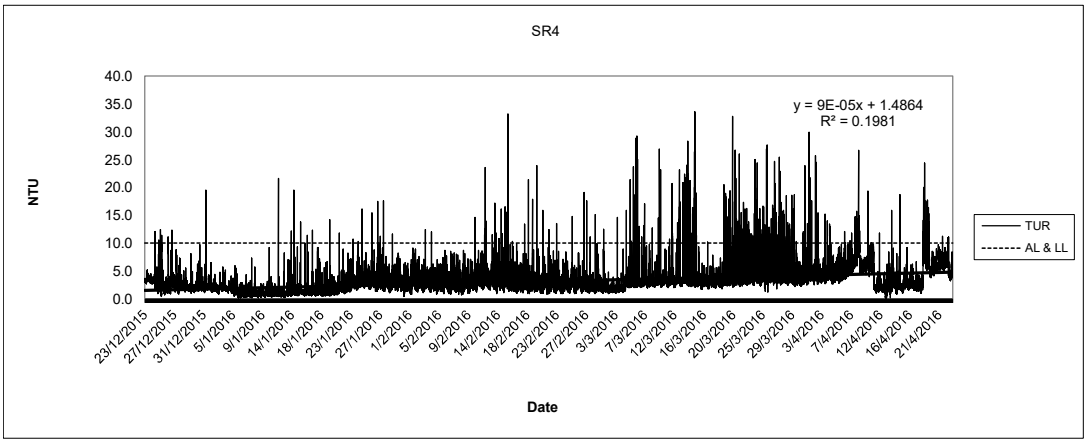


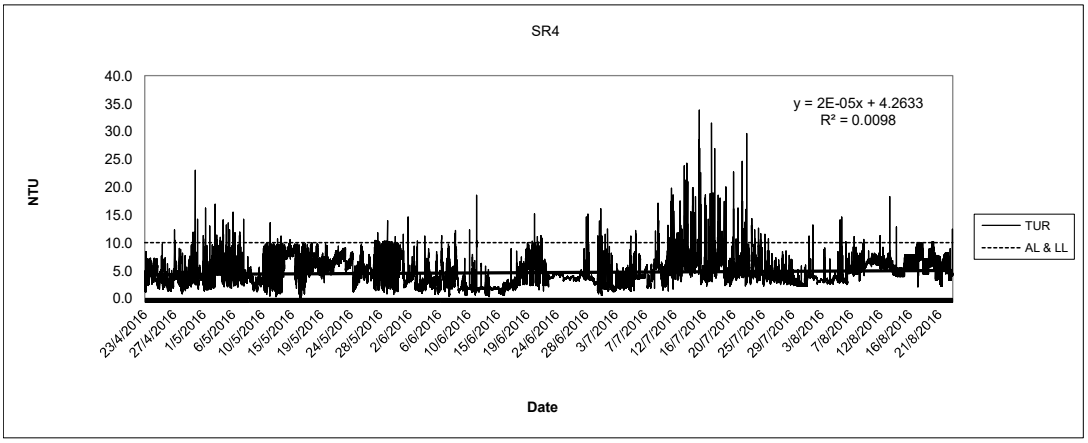


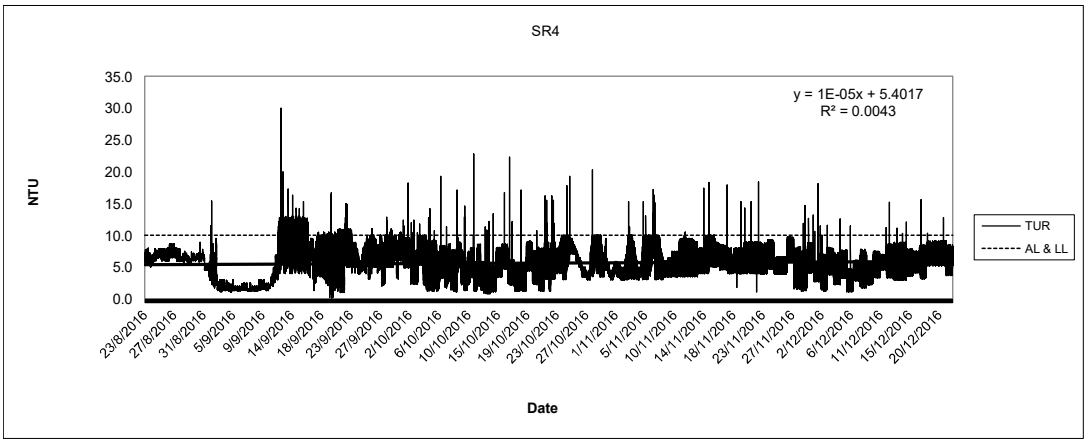


Turbidity
24-hr Water Quality Monitoring

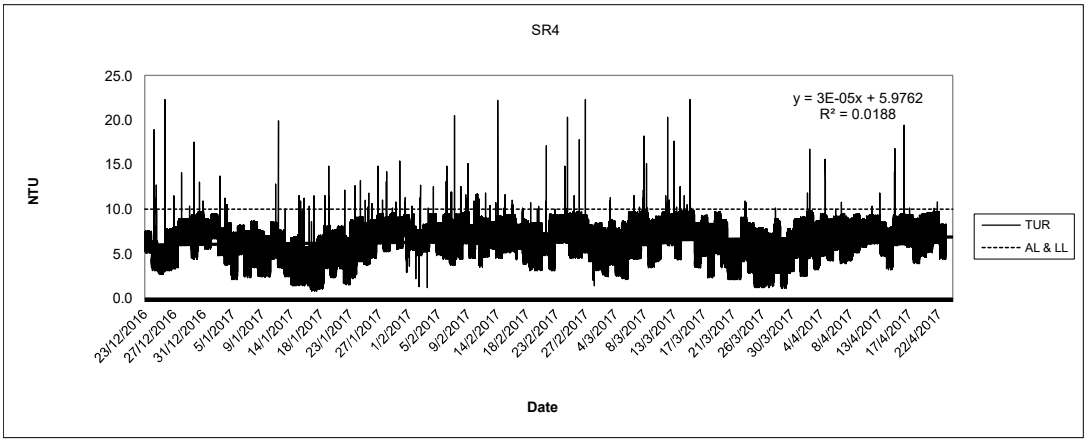


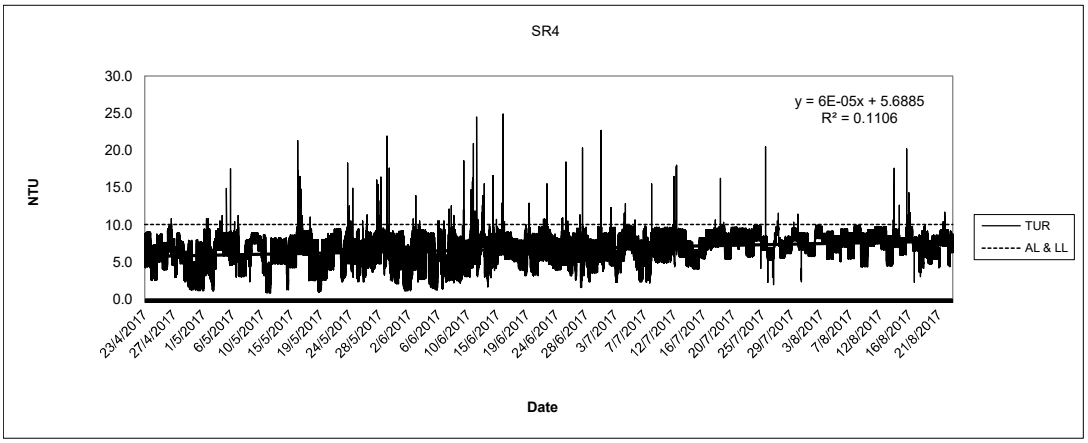


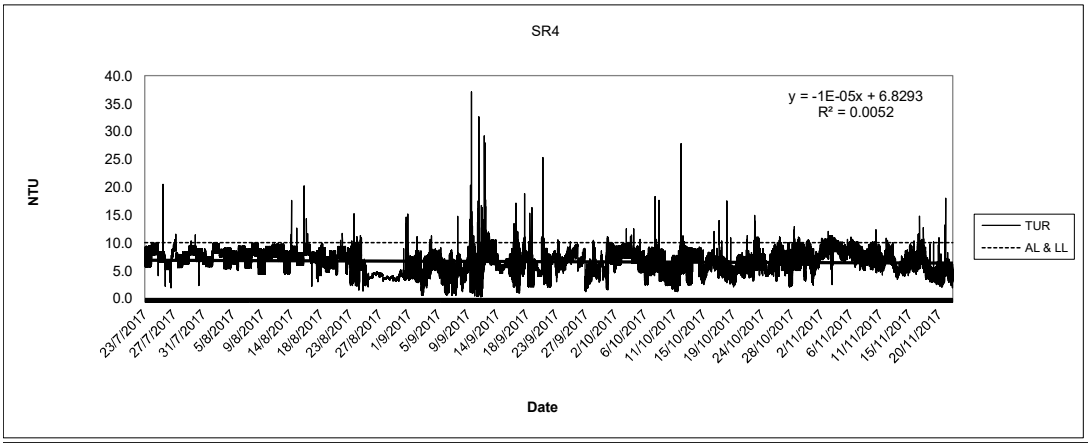


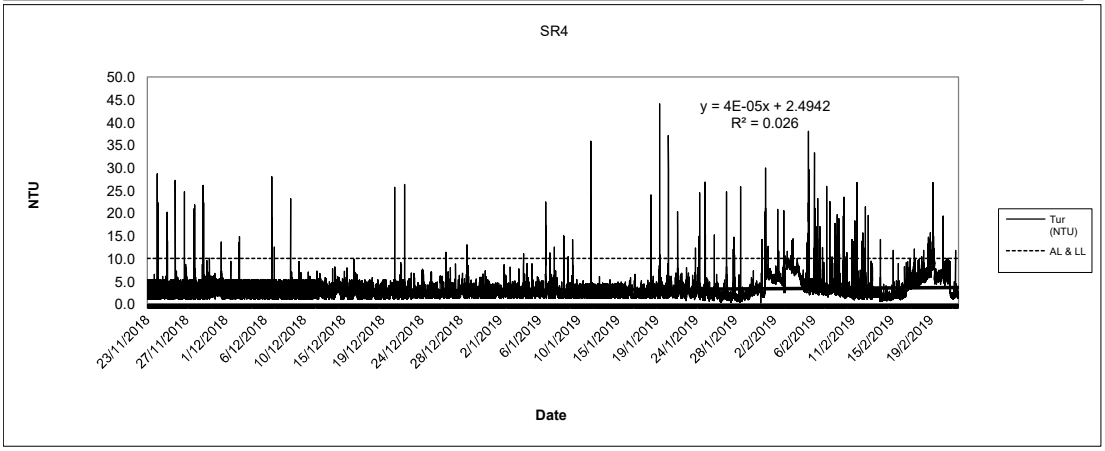


Turbidity
24-hr Water Quality Monitoring

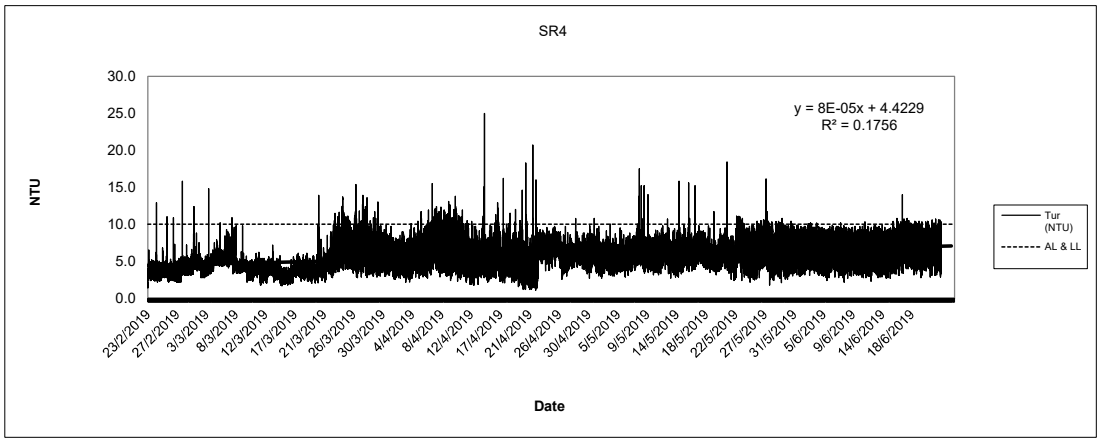


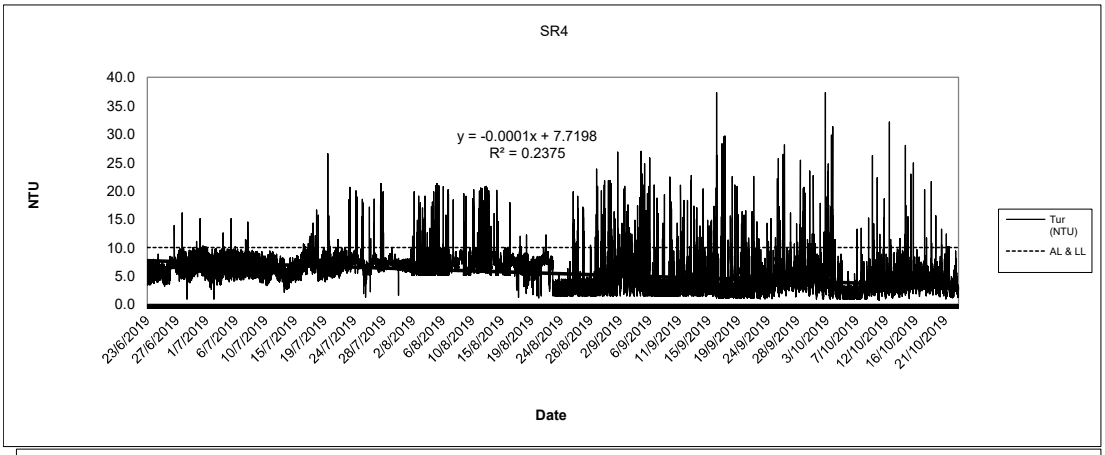


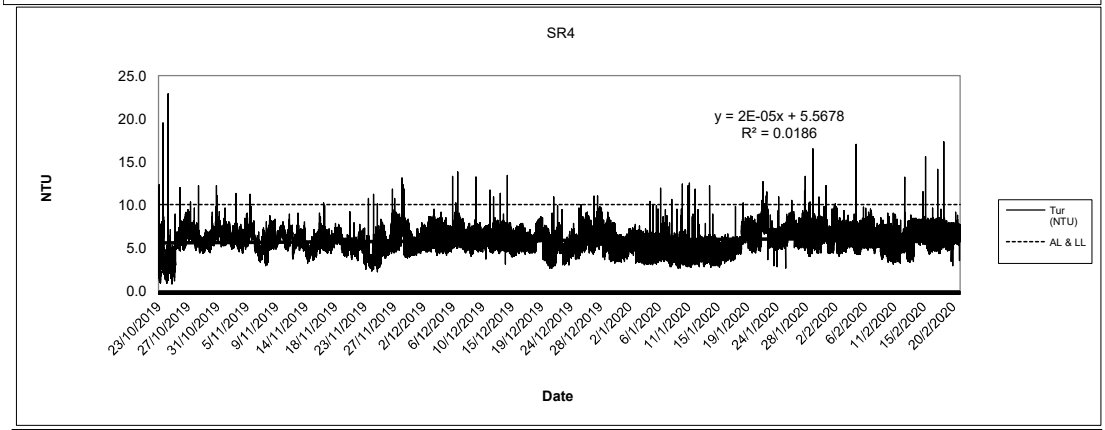


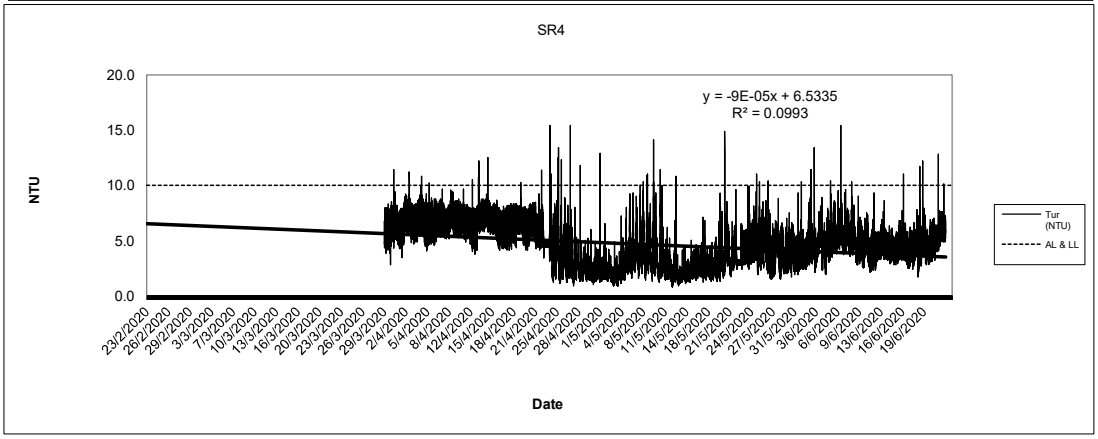


Turbidity
24-hr Water Quality Monitoring

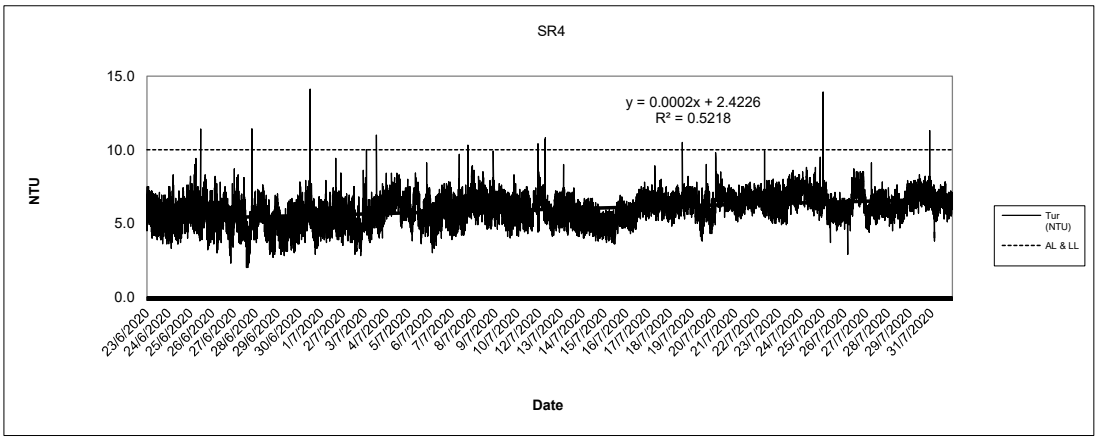




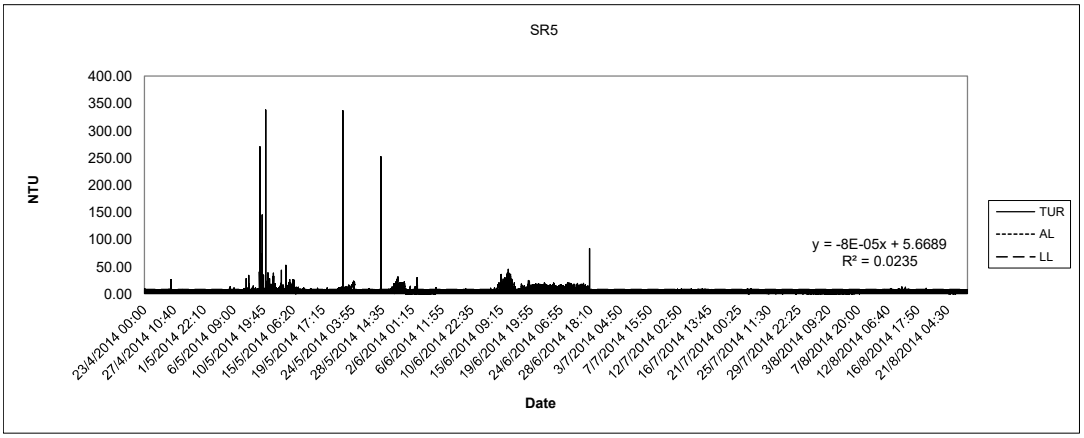


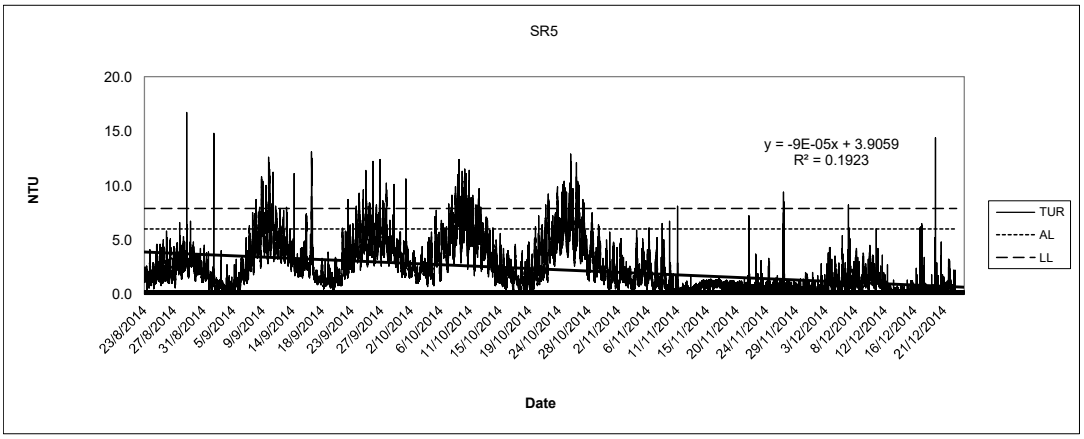


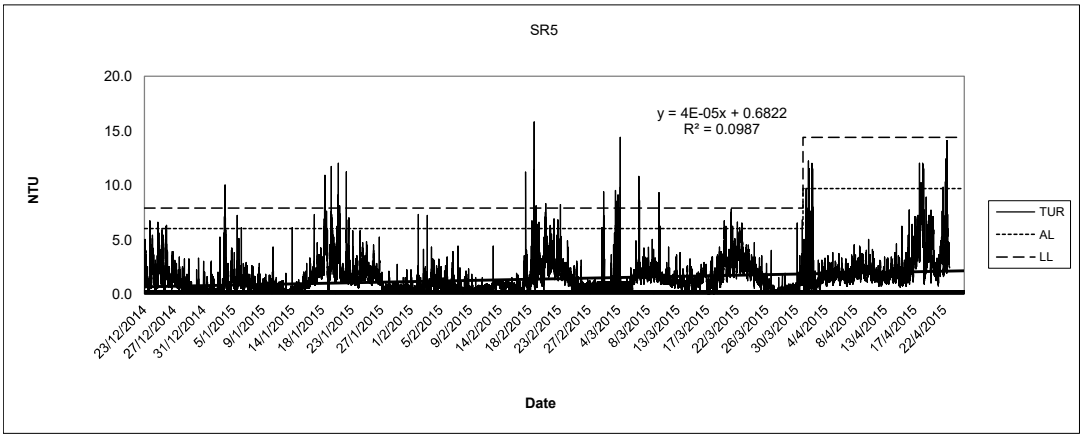
Turbidity
24-hr Water Quality Monitoring

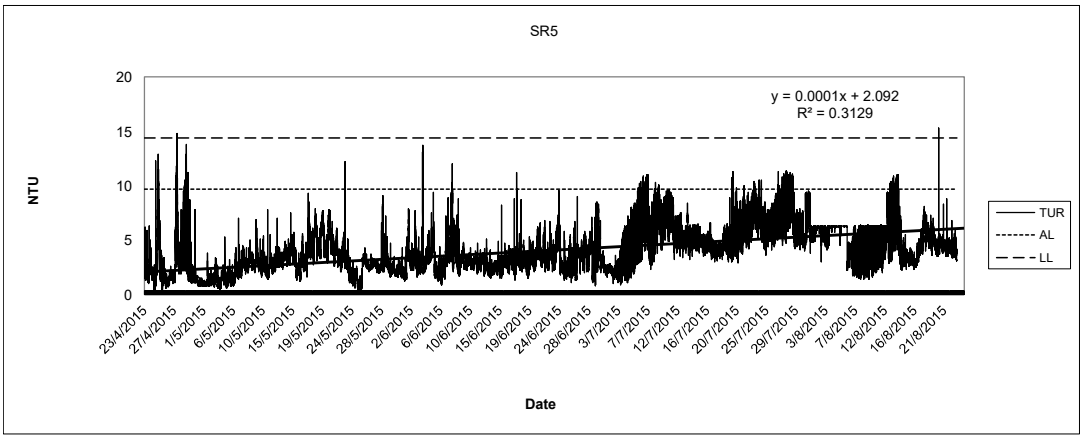


Turbidity
24-hr Water Quality Monitoring

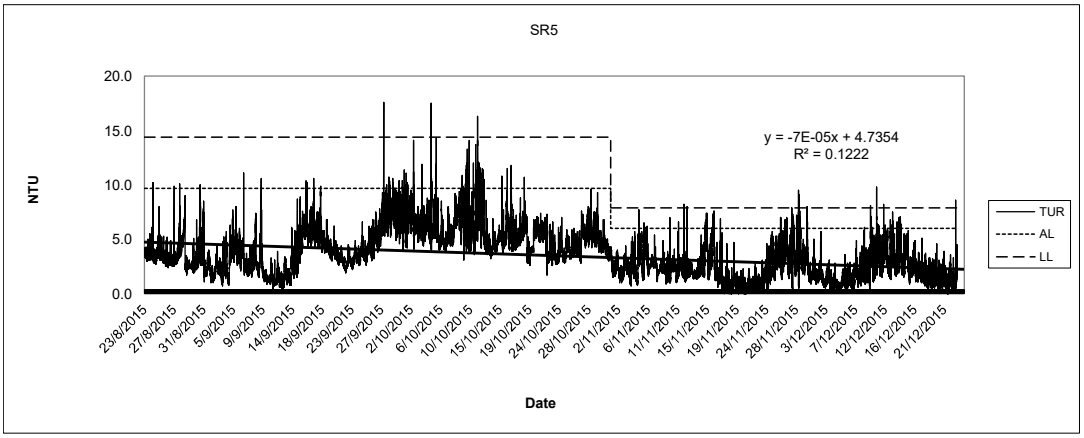


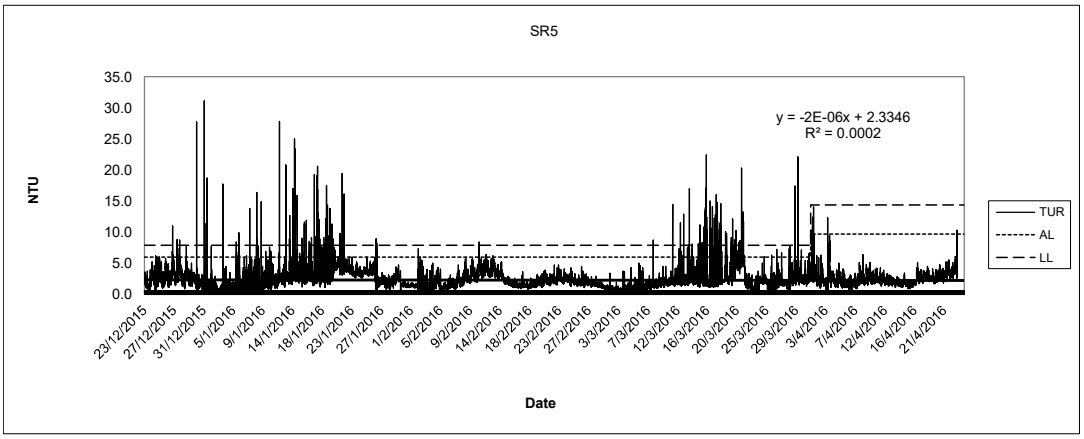


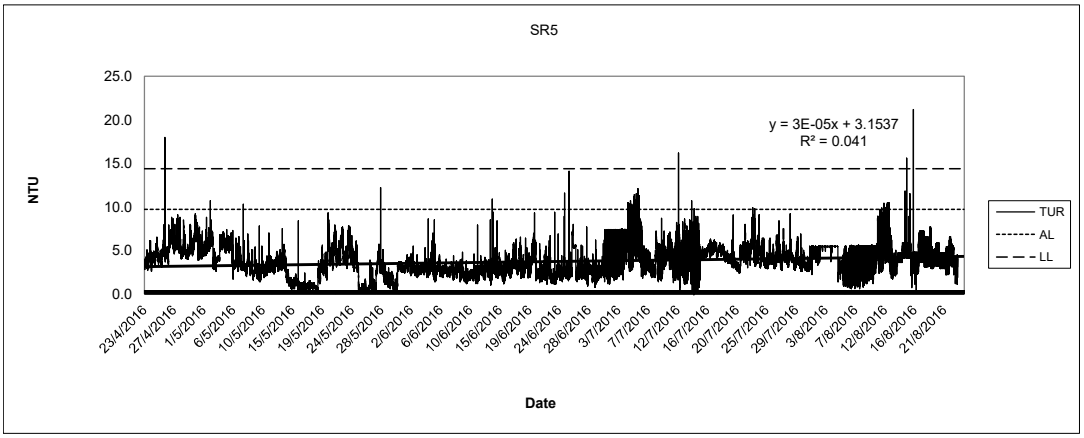


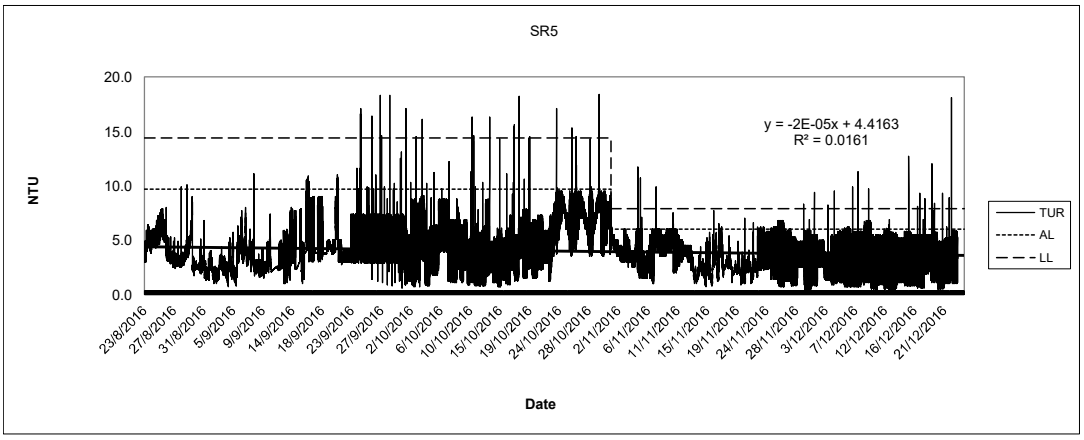


Turbidity
24-hr Water Quality Monitoring

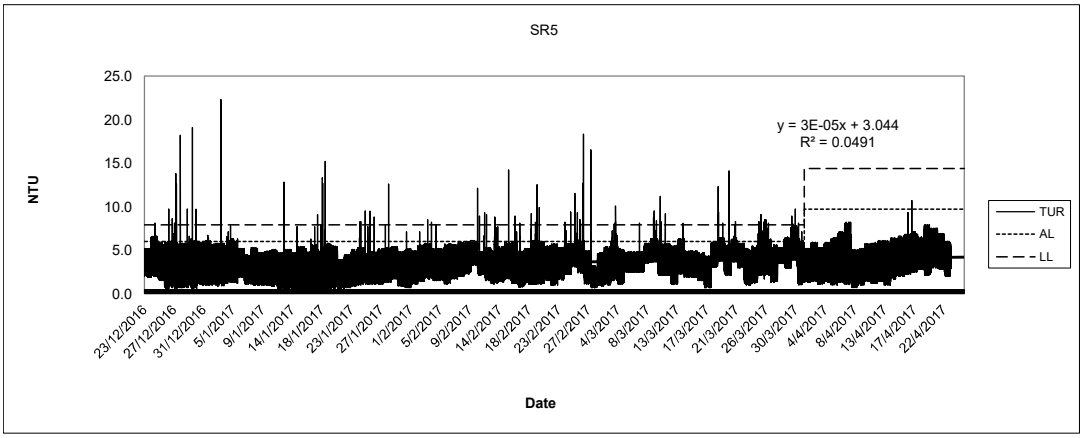


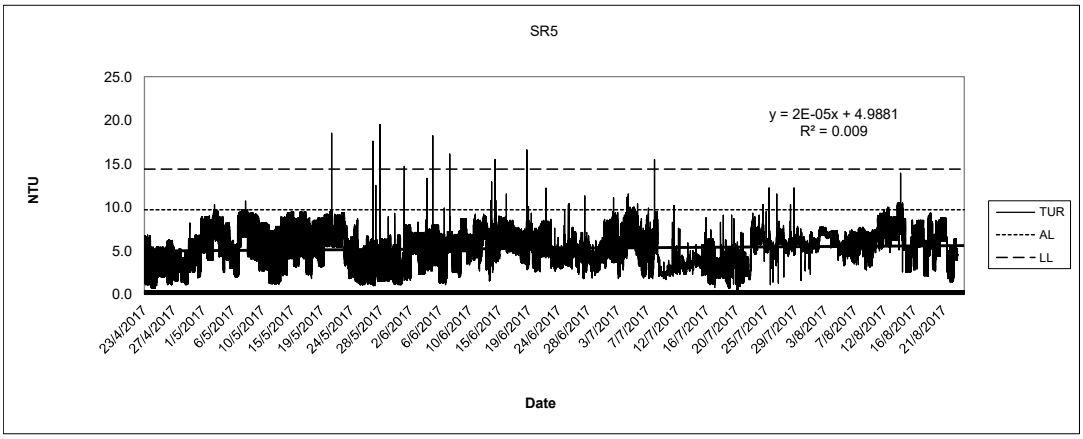


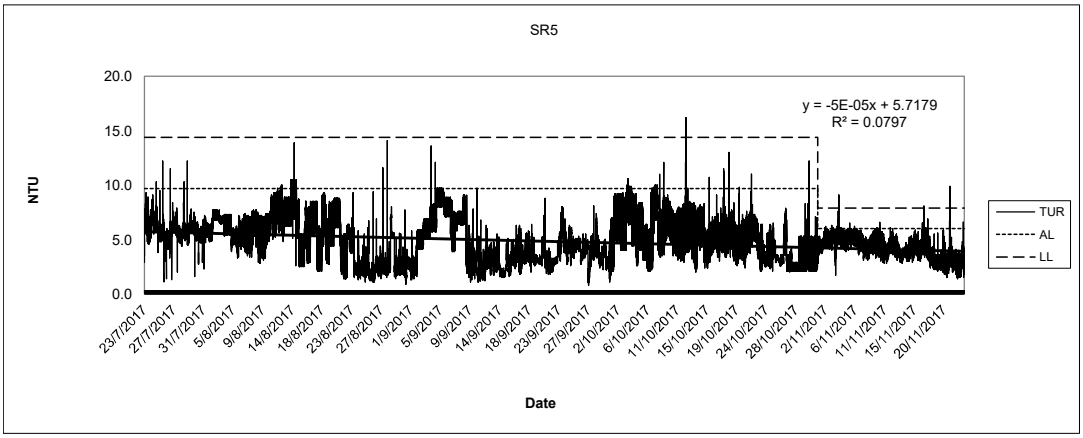


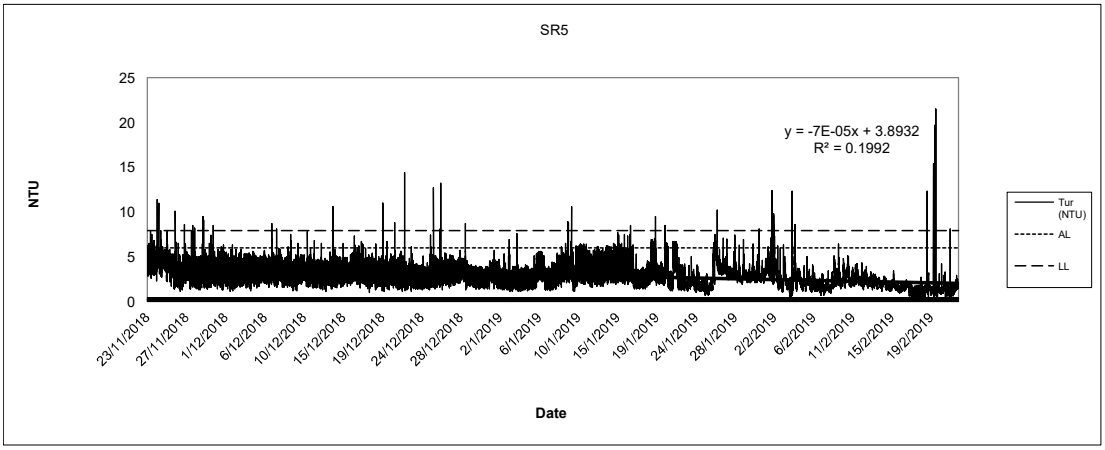


Turbidity
24-hr Water Quality Monitoring

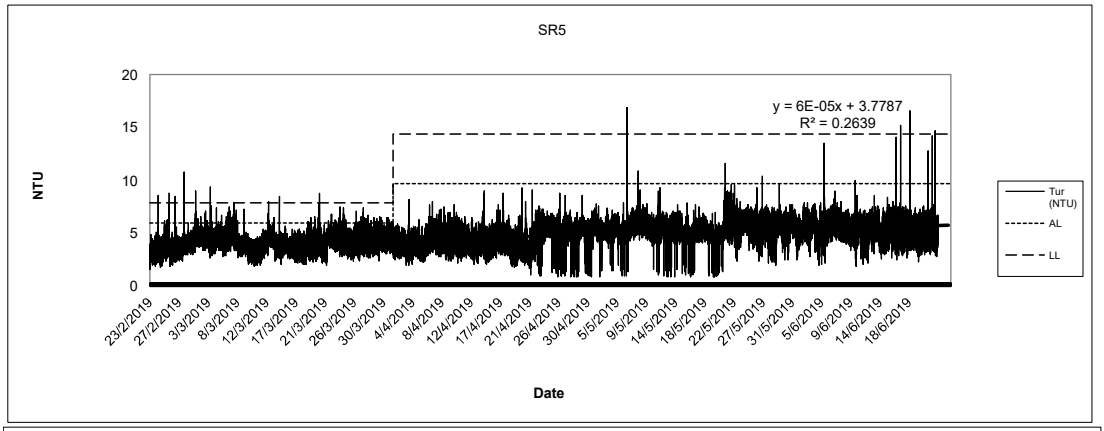


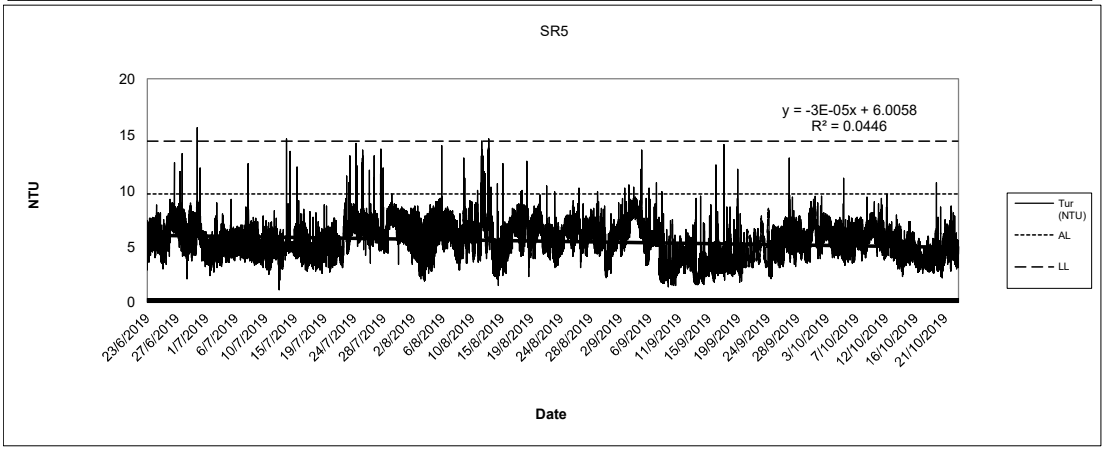


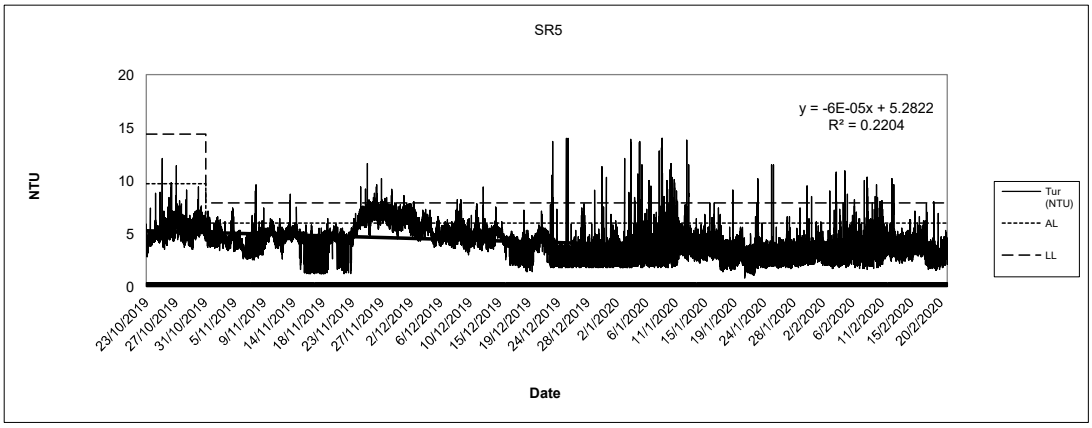


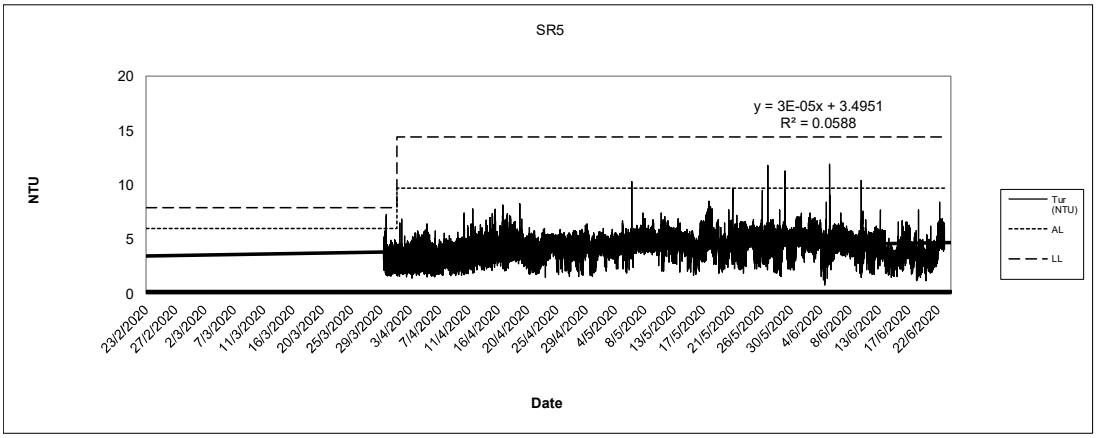


Turbidity
24-hr Water Quality Monitoring

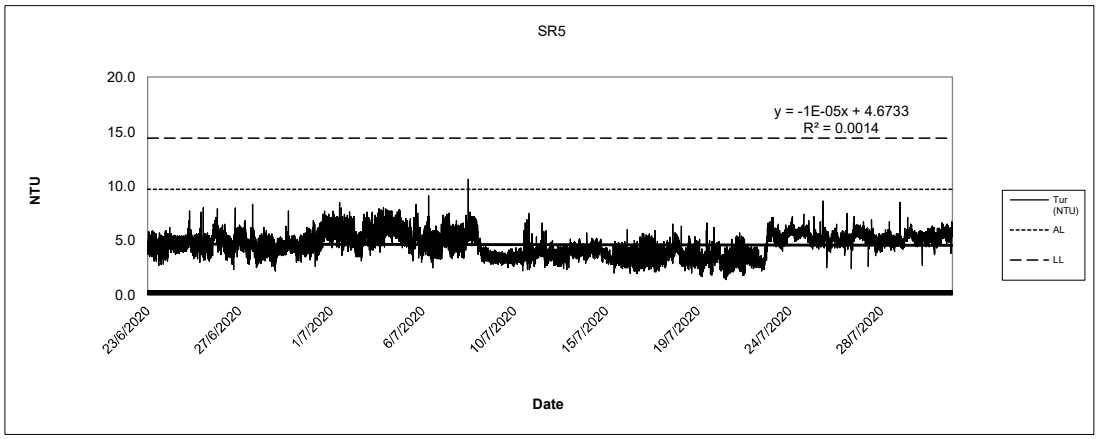




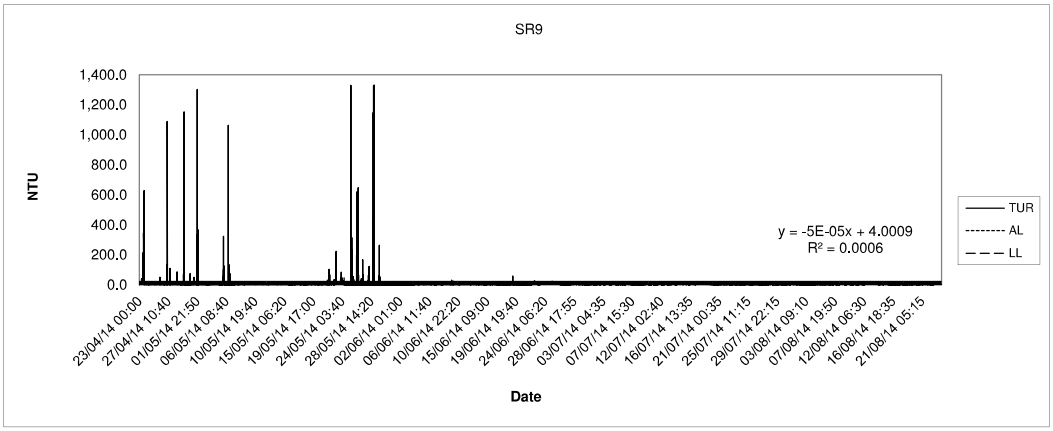


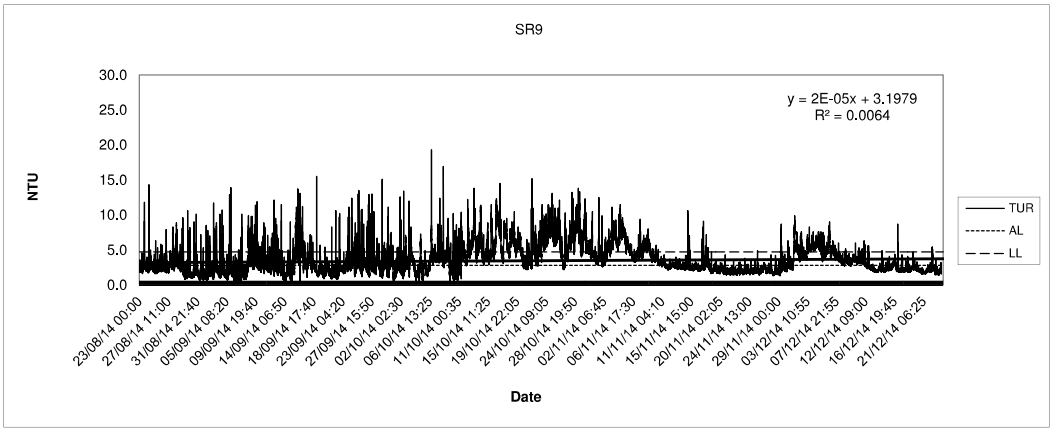


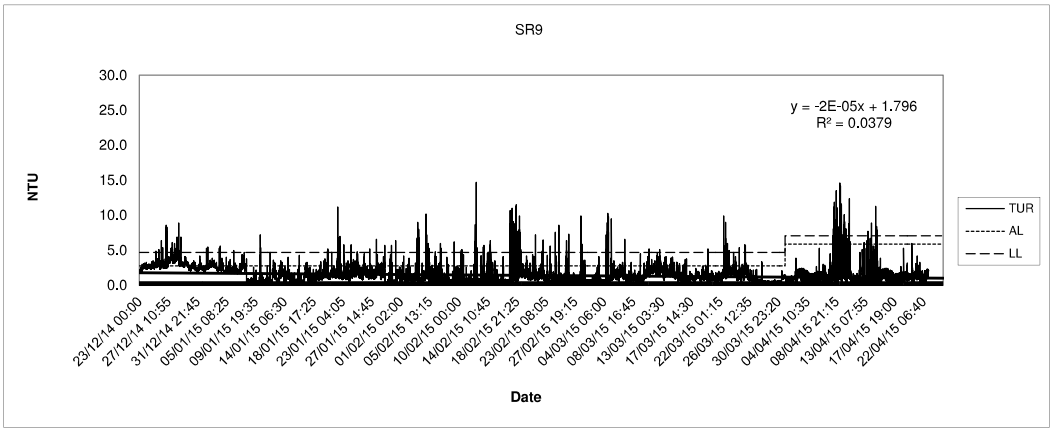
Turbidity
24-hr Water Quality Monitoring

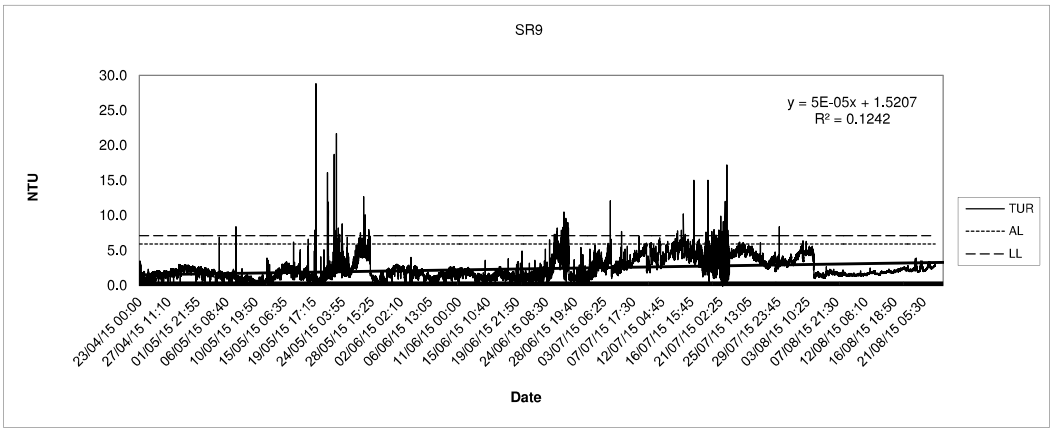


Turbidity
24-hr Water Quality Monitoring









Turbidity
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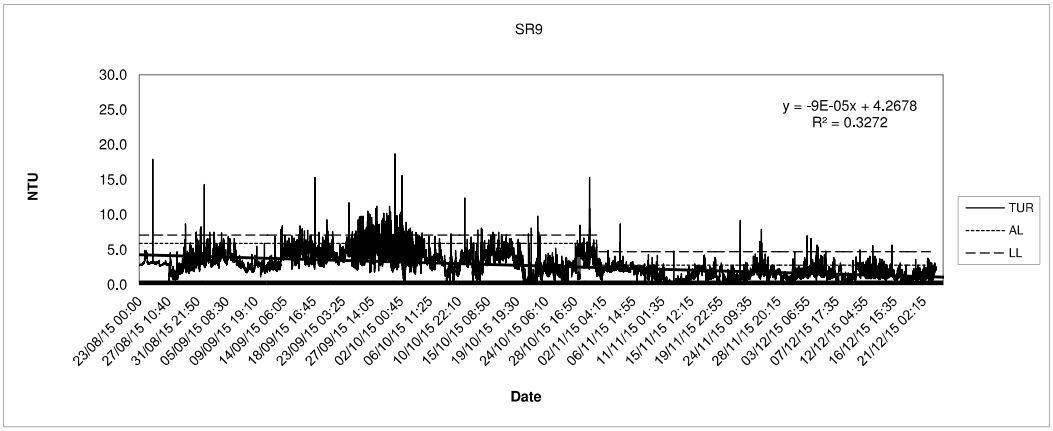

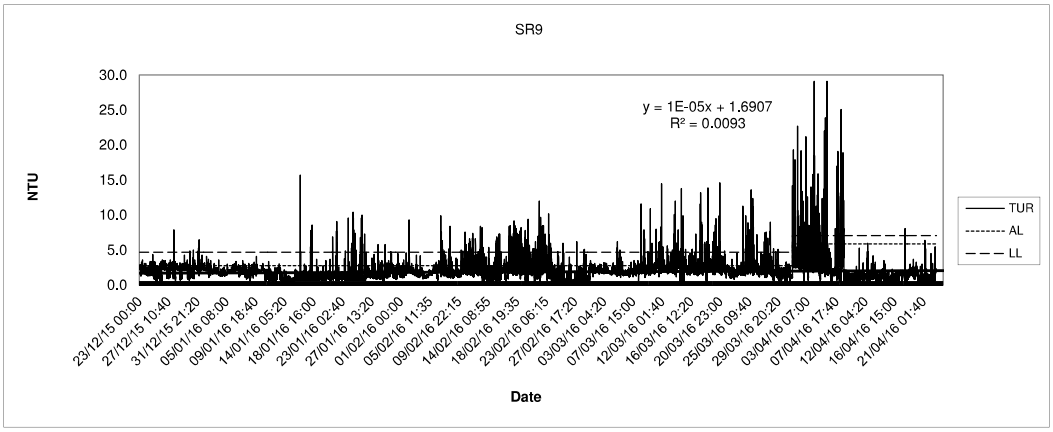

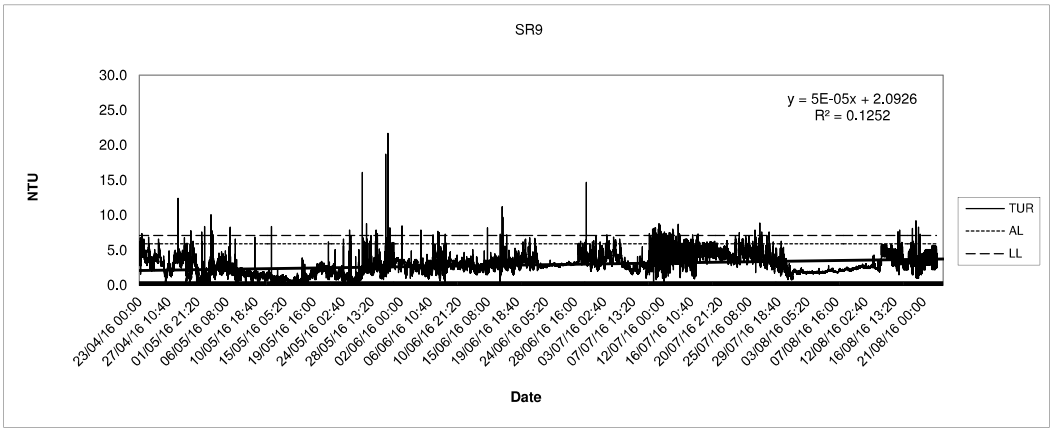

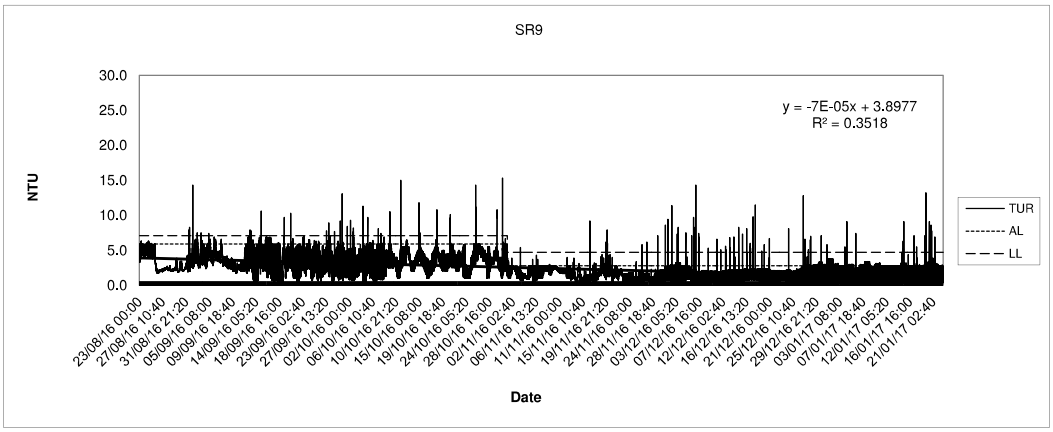

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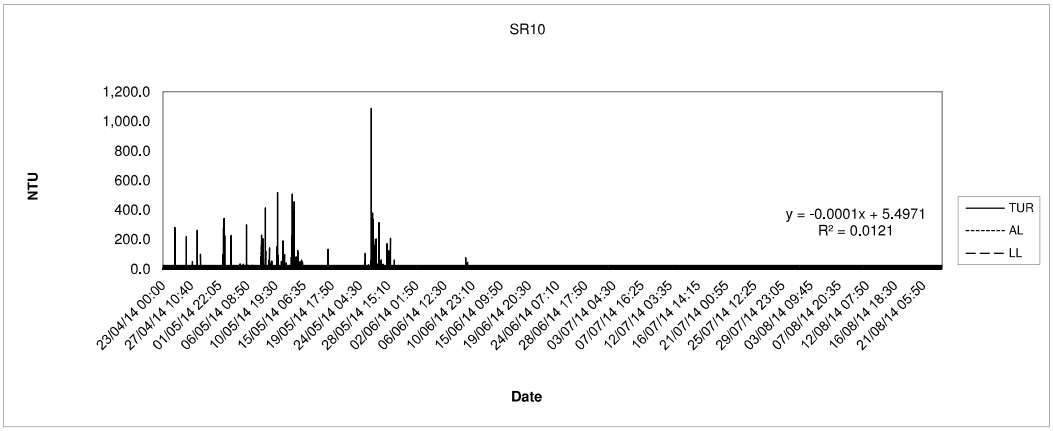

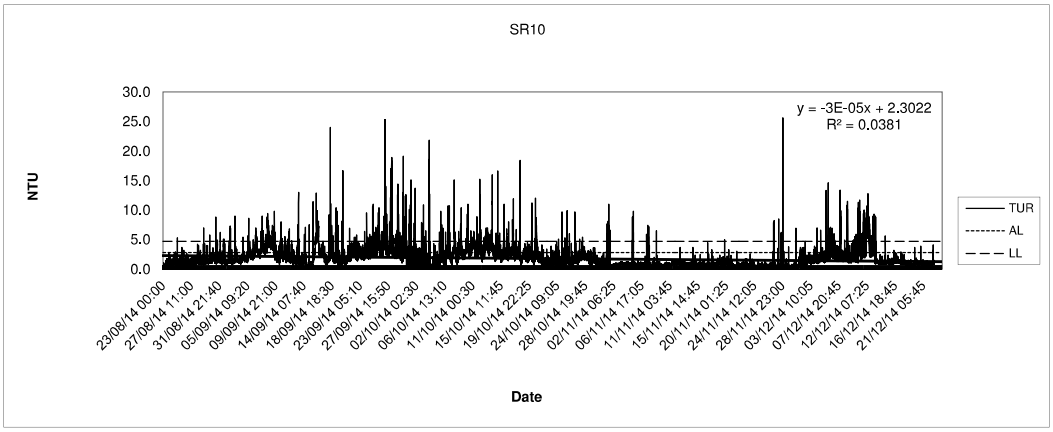

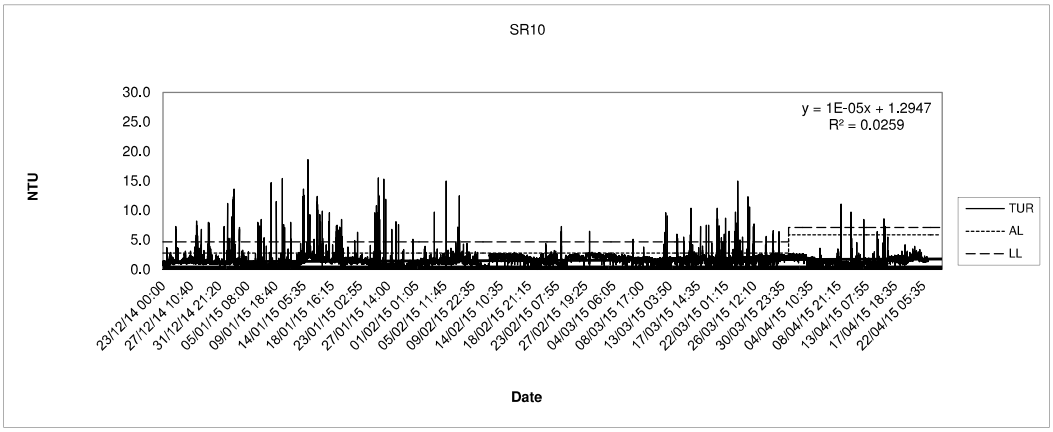

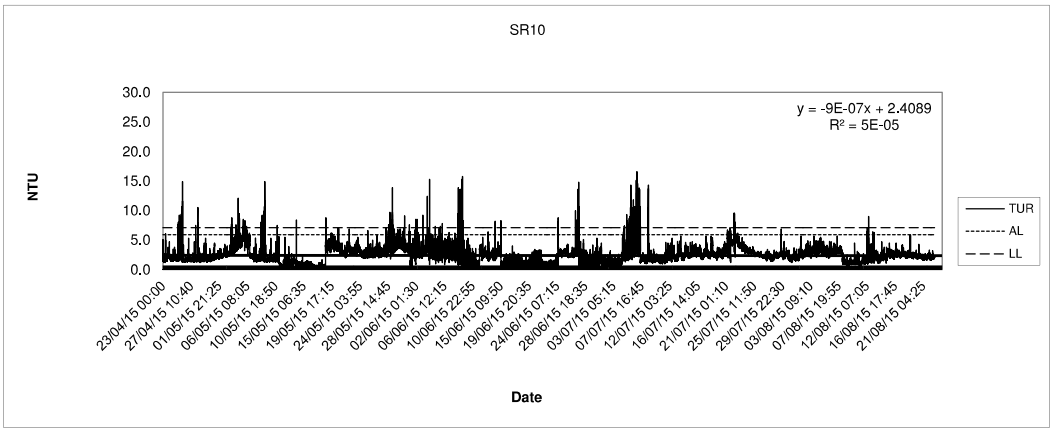

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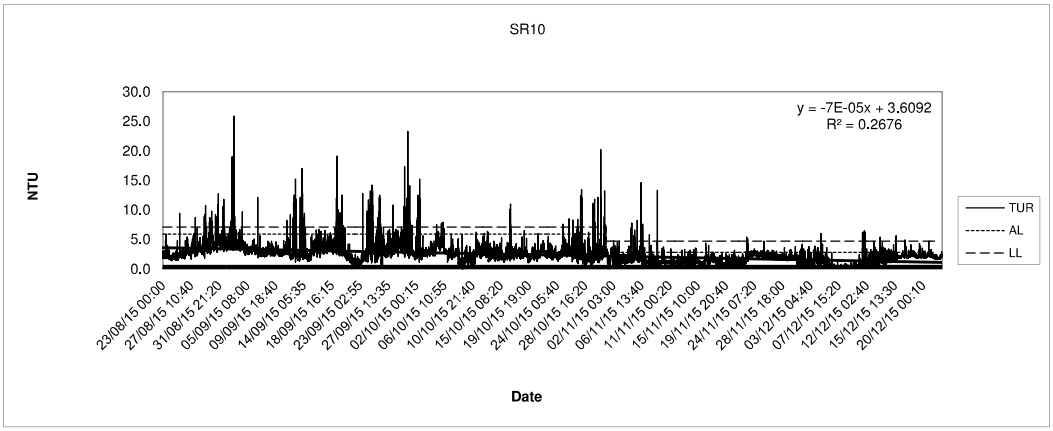

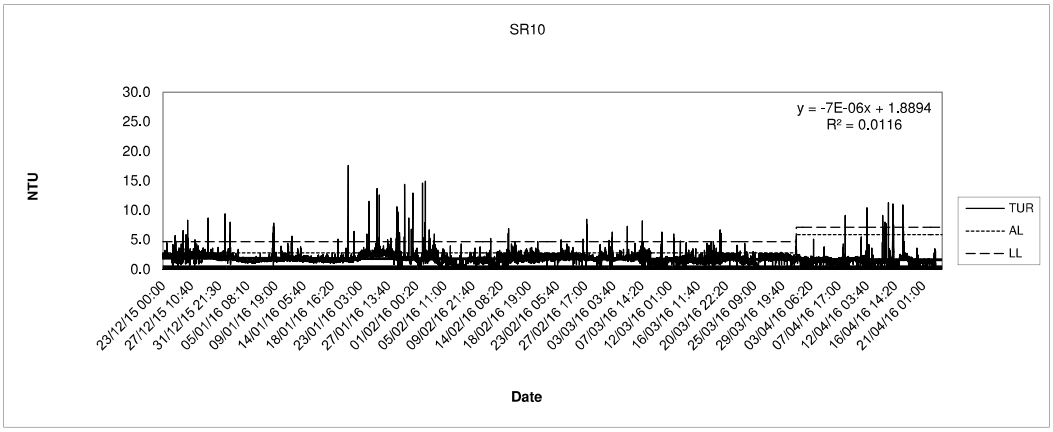

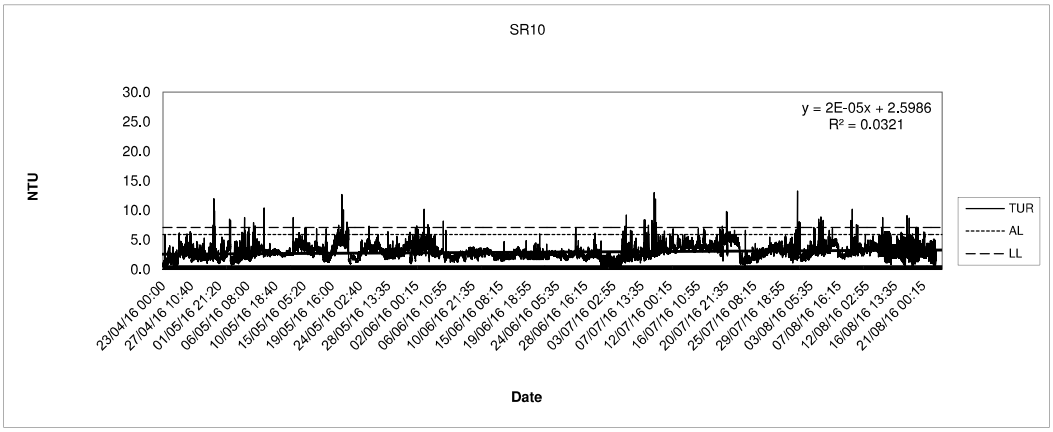

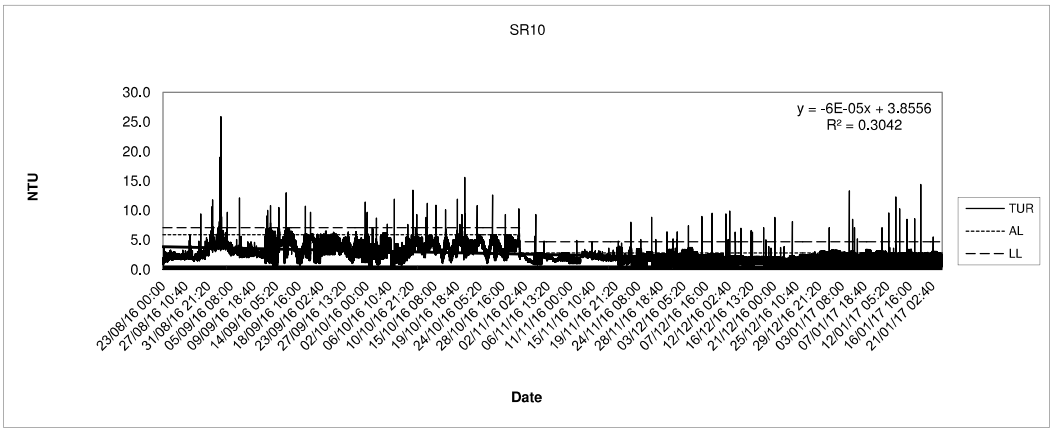

Turbidity
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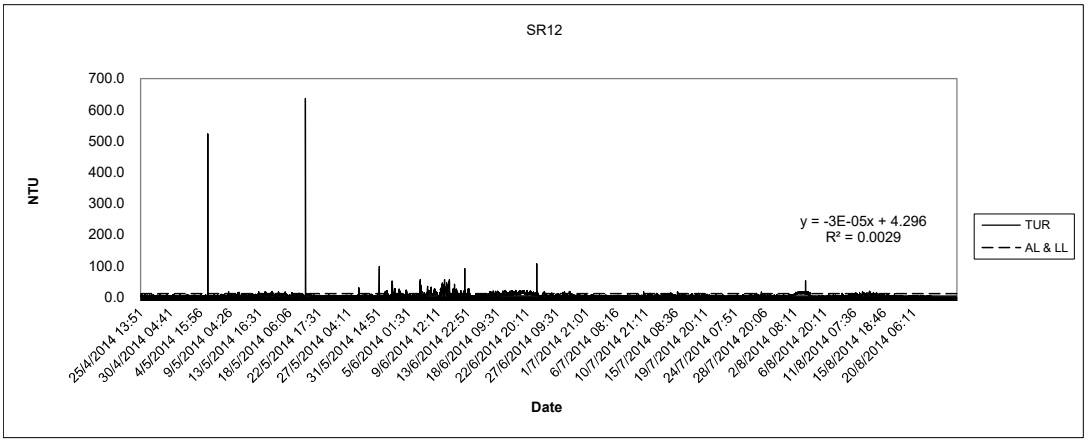

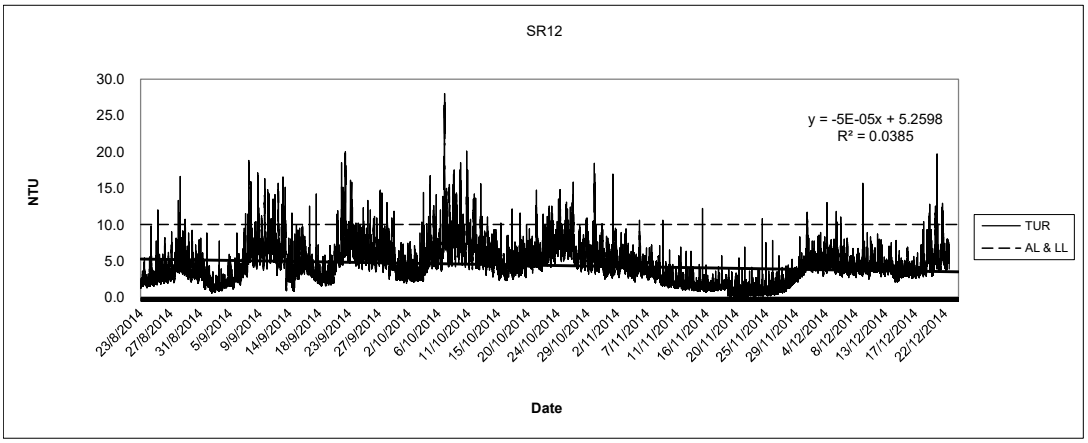

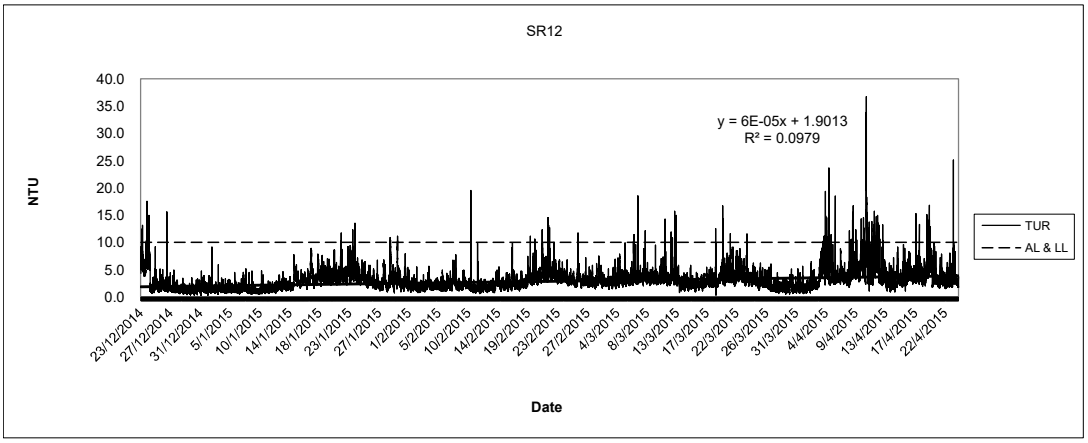

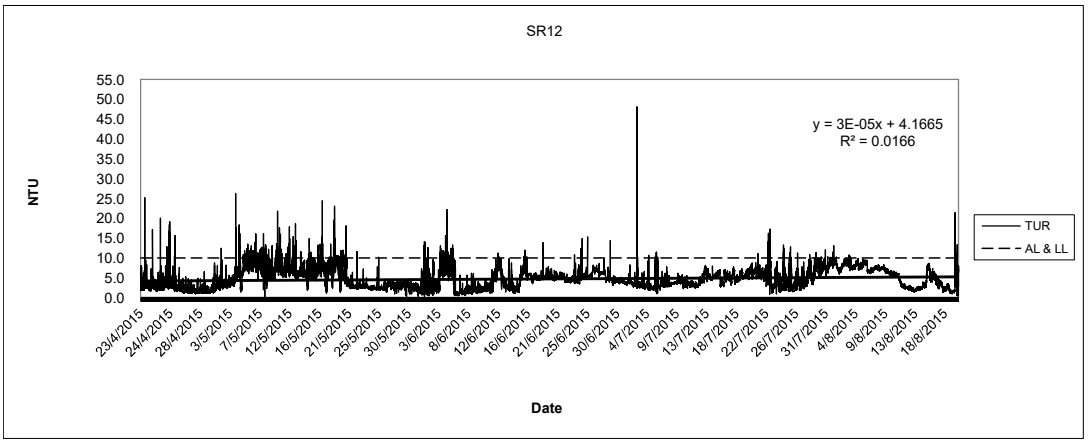

Turbidity
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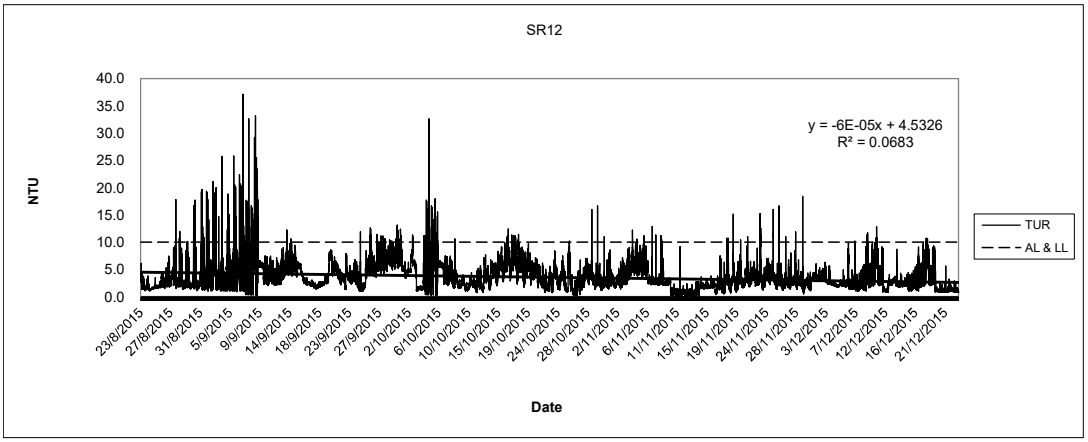

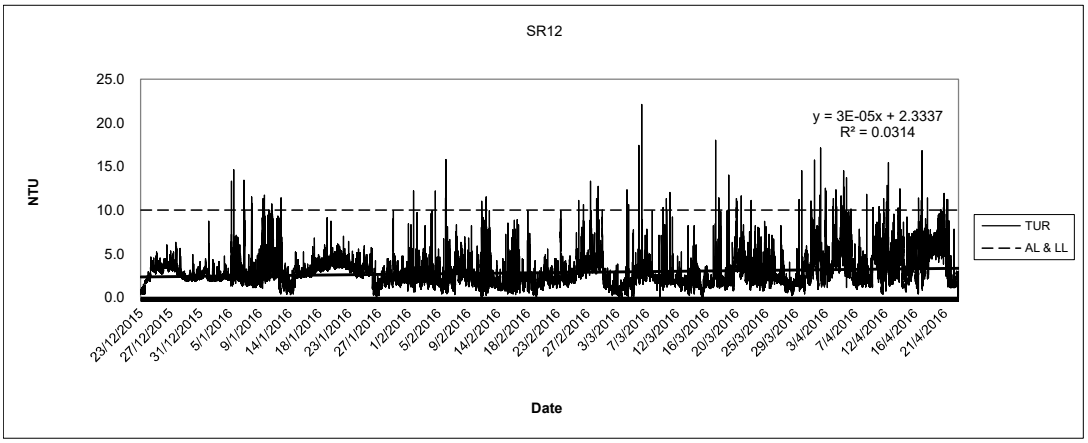

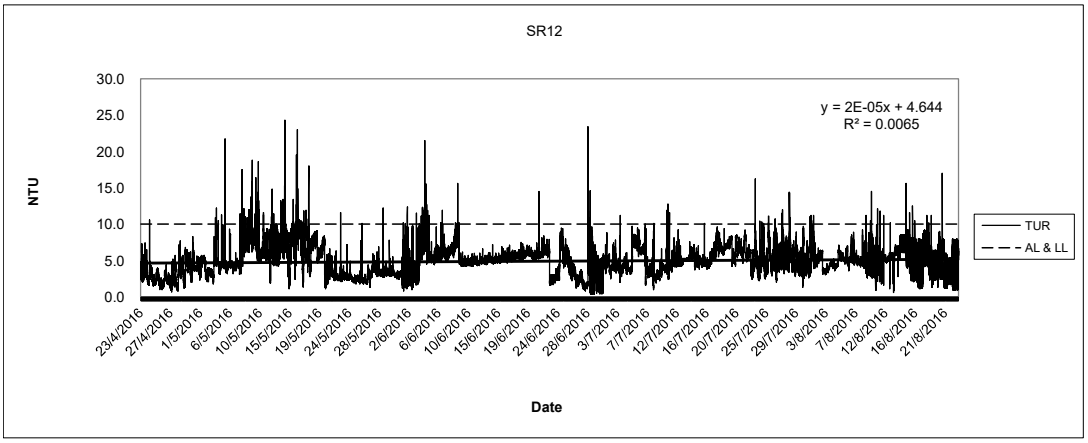

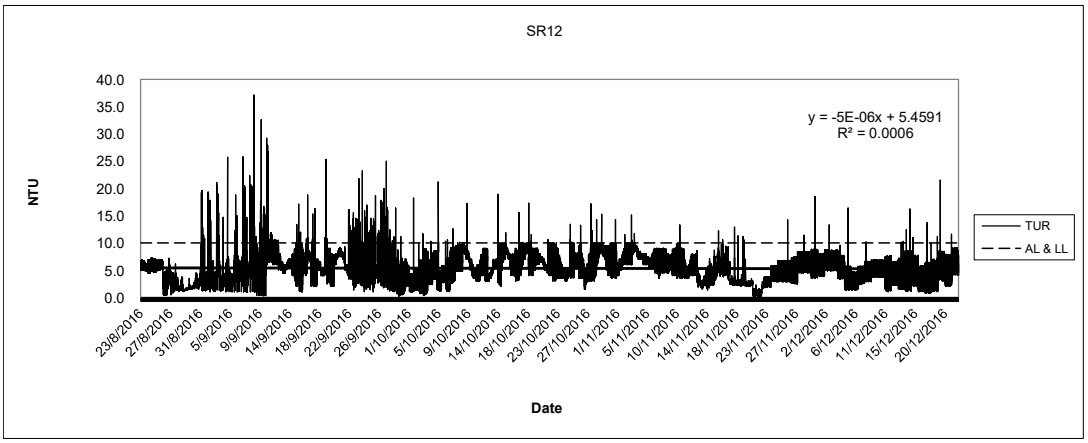

Turbidity
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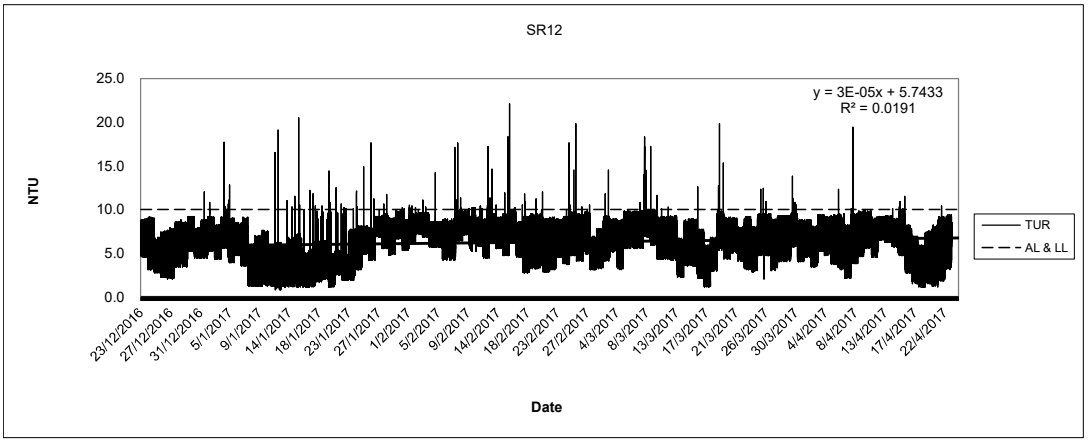

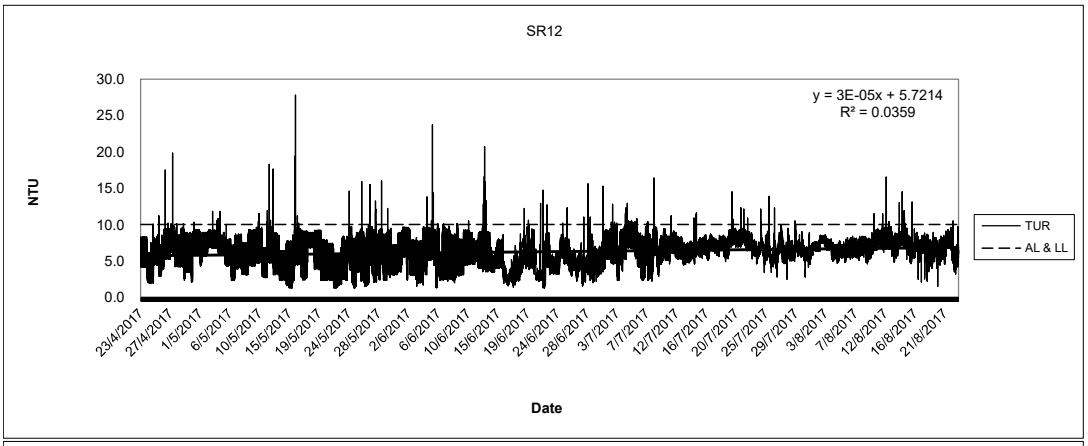

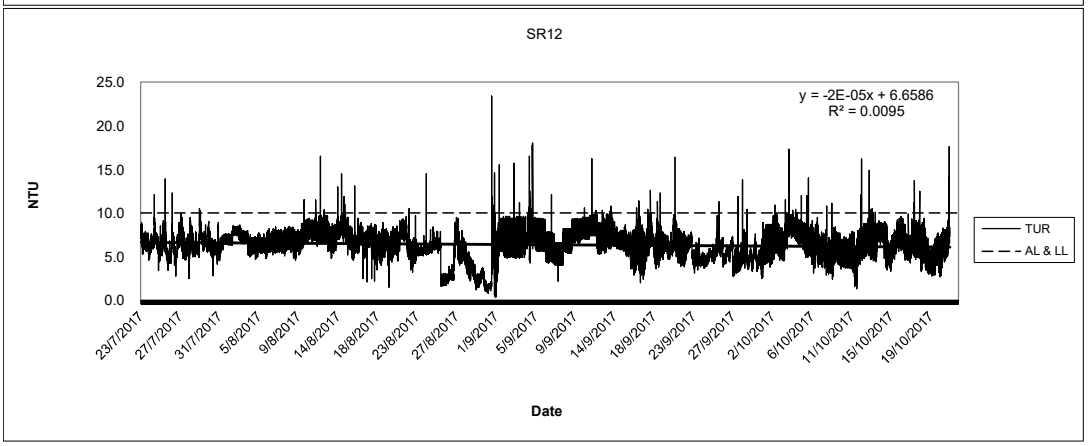

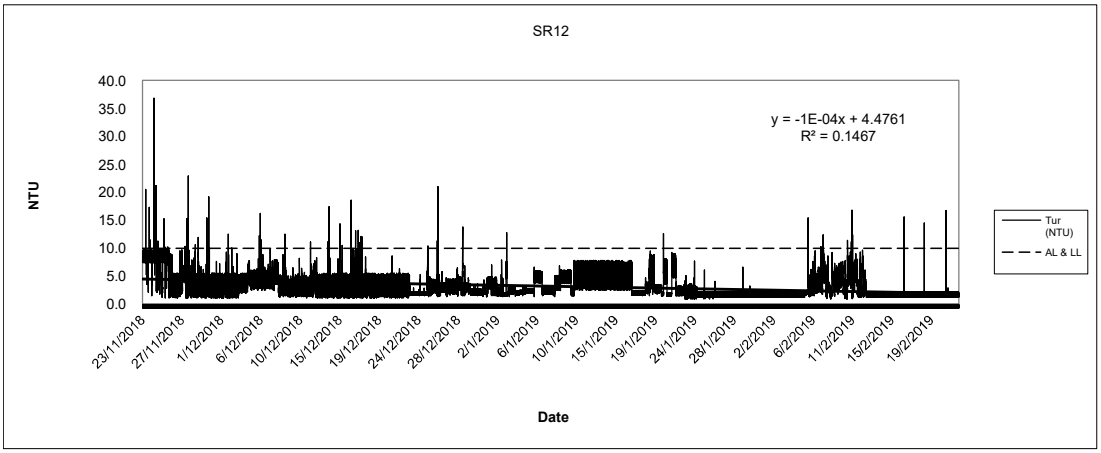

Turbidity
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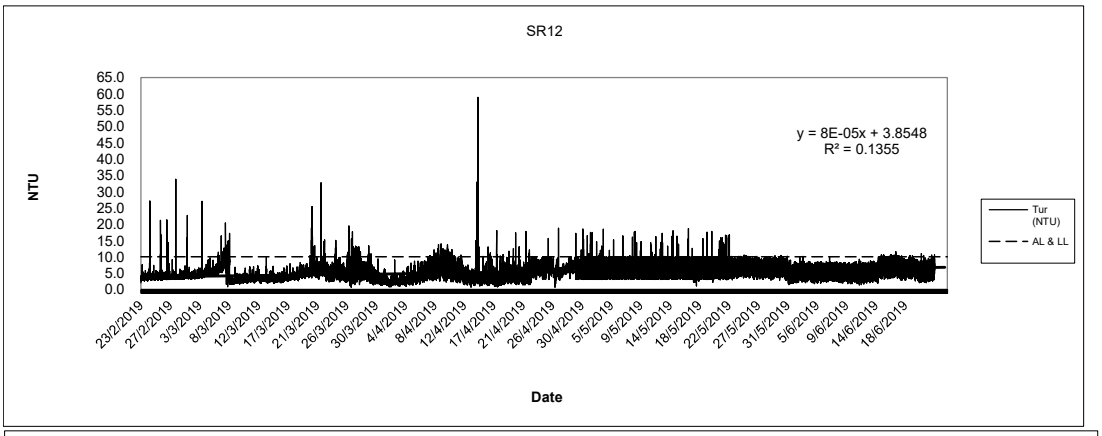
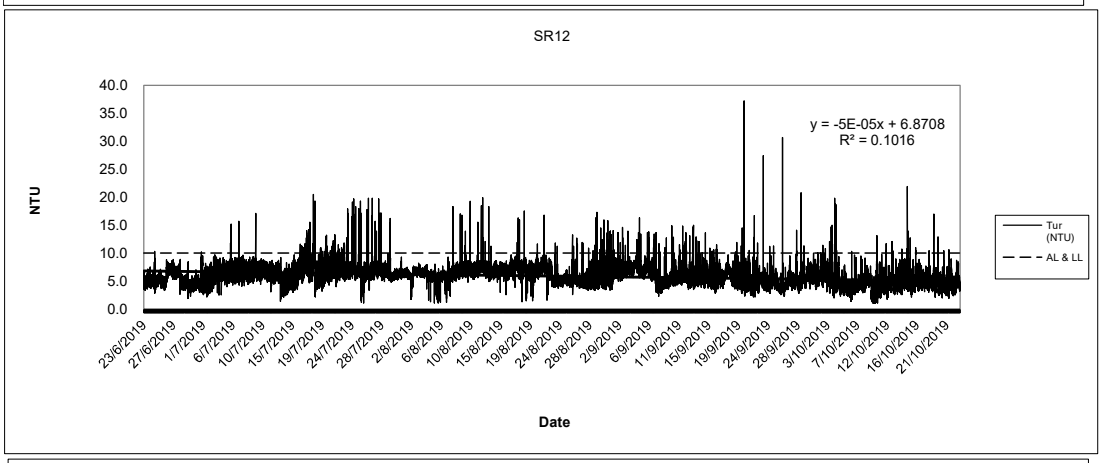
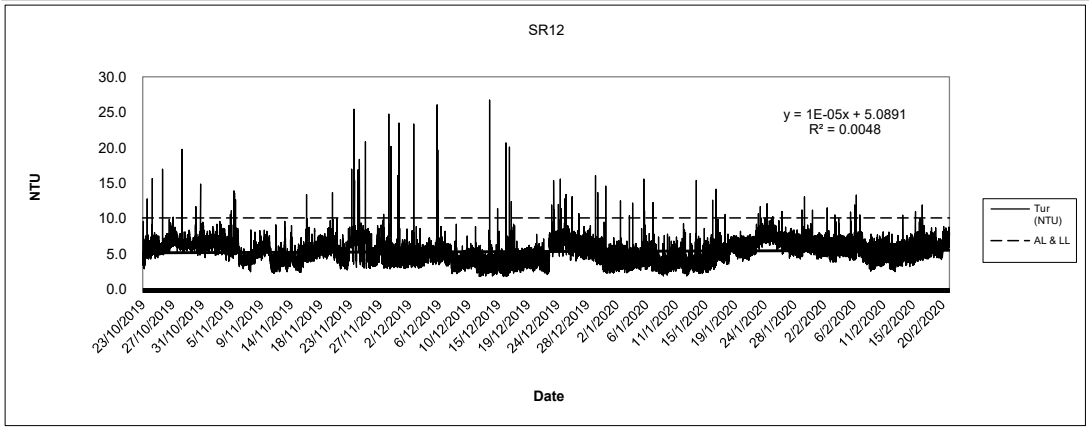
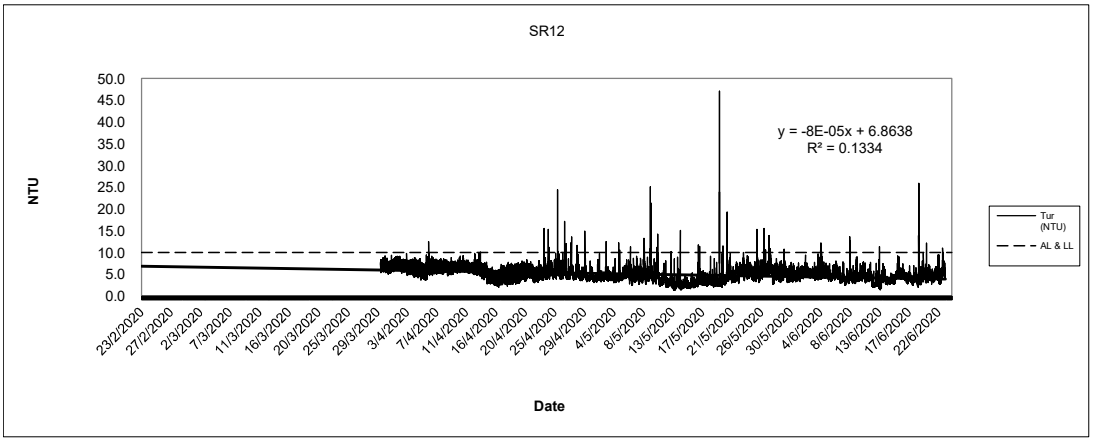
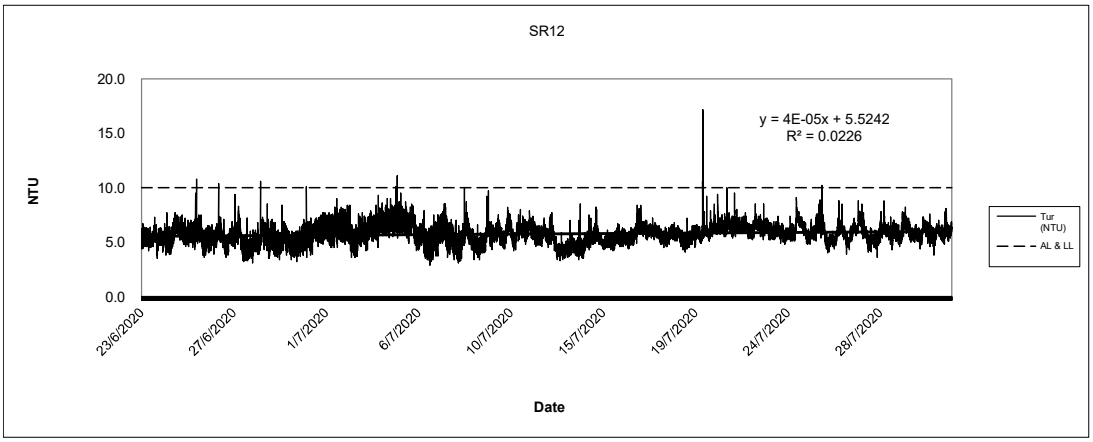








Turbidity
24-hr Water Quality Monitoring



Turbidity
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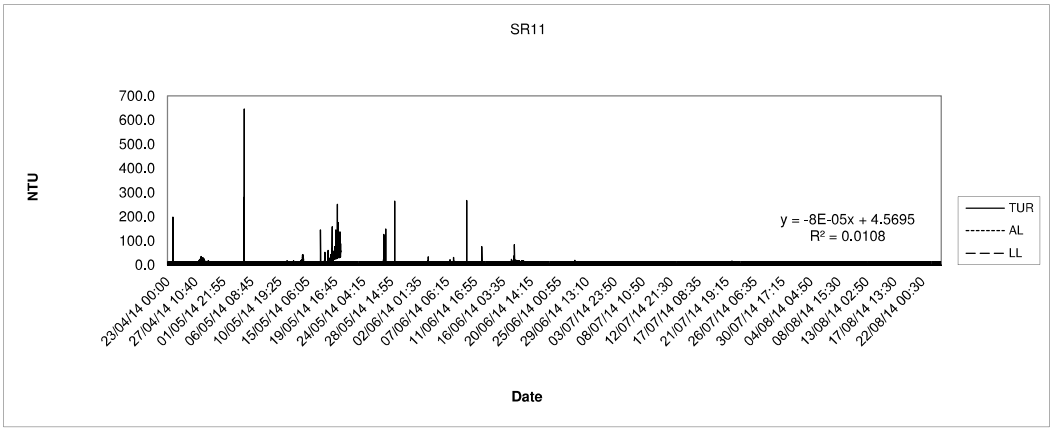
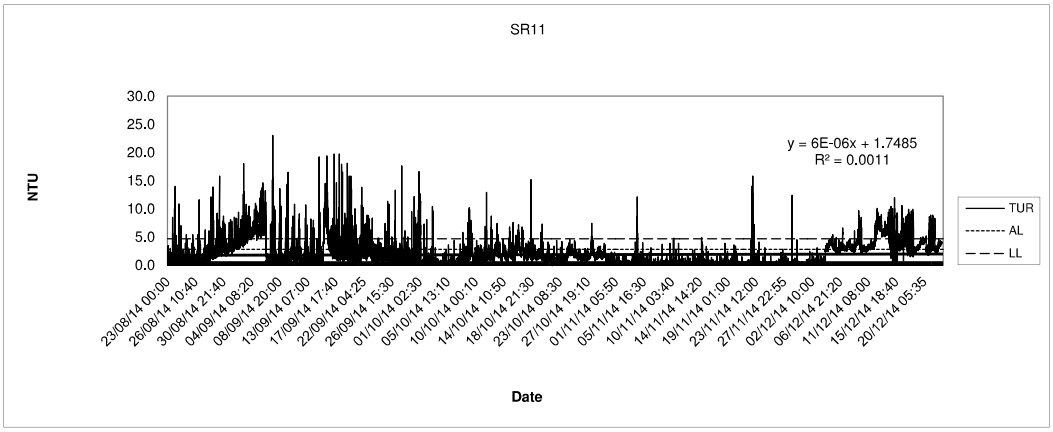
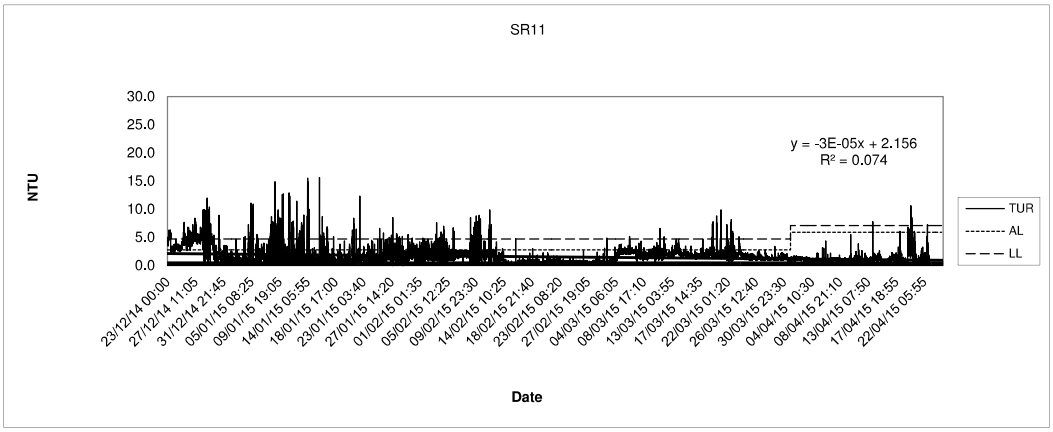
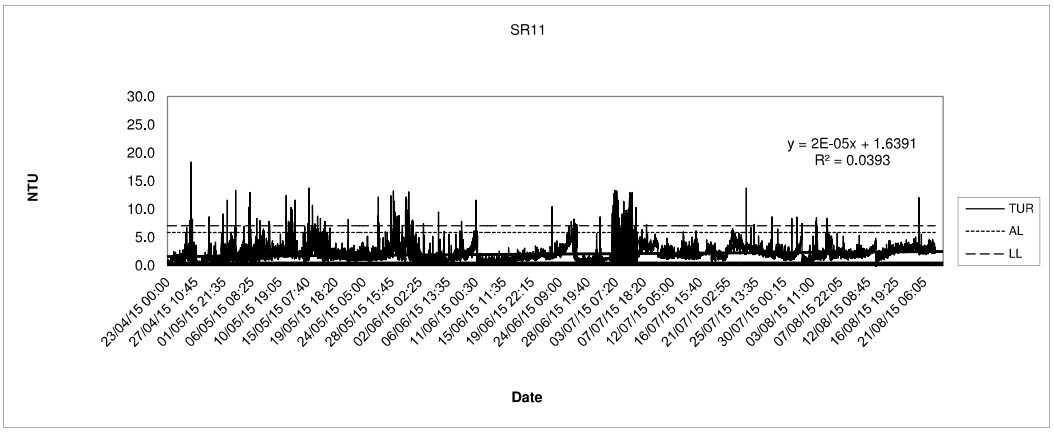
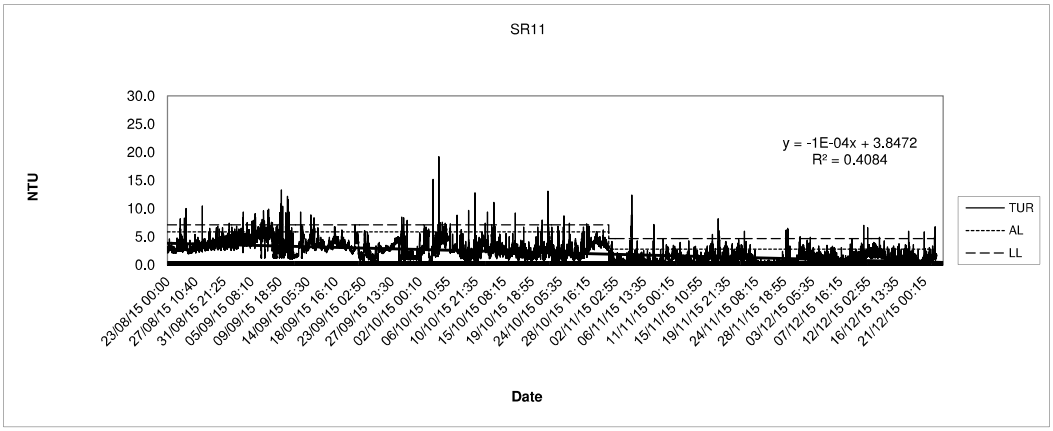


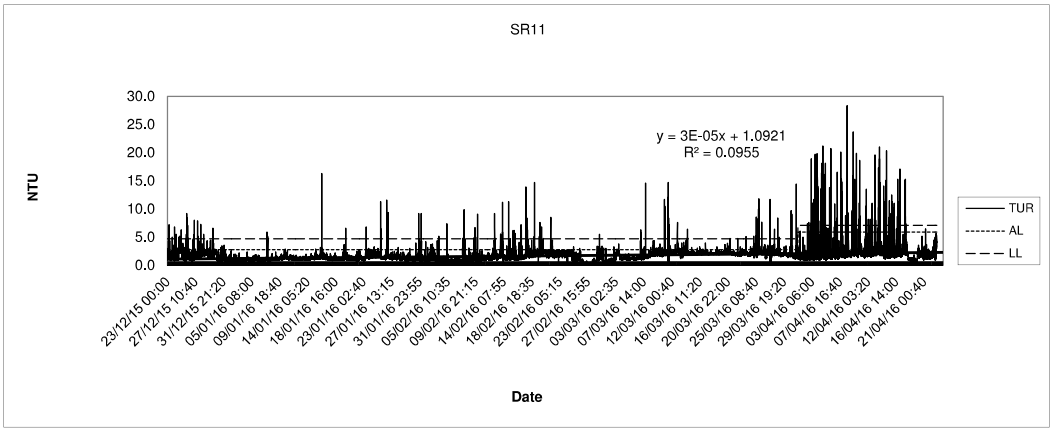


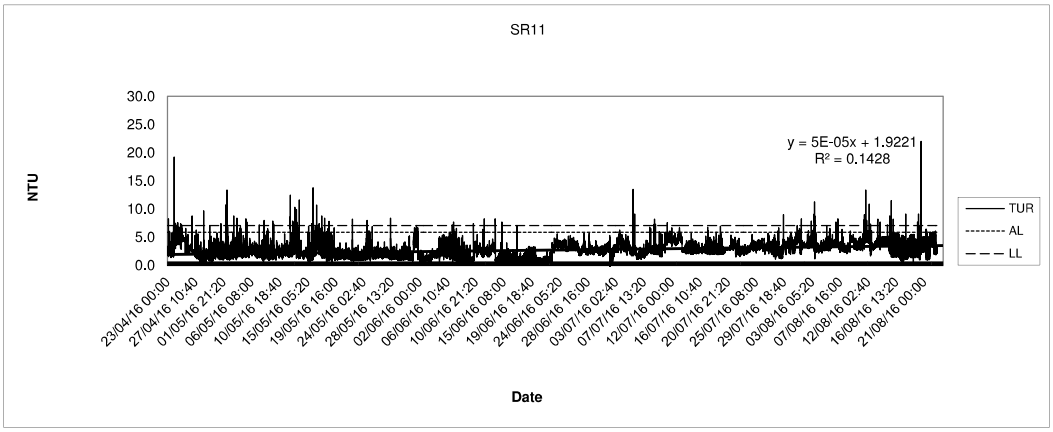


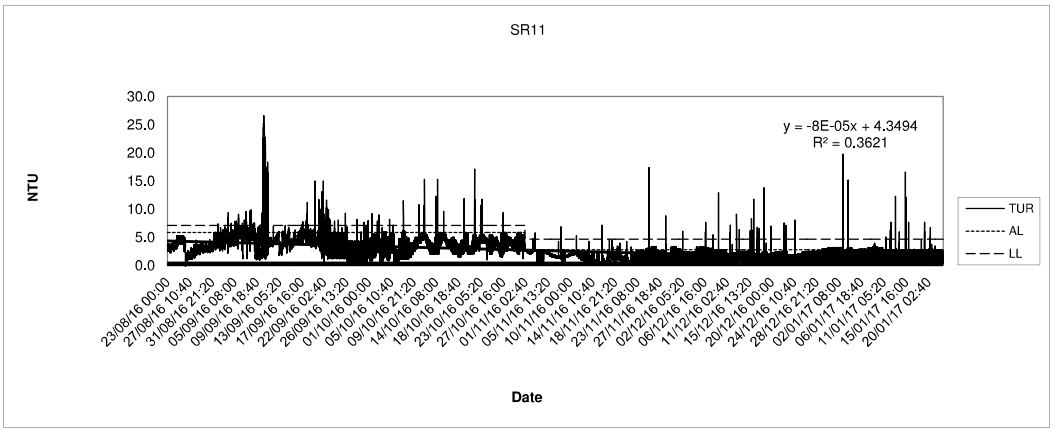


Turbidity
24-hr Water Quality Monitoring









Turbidity
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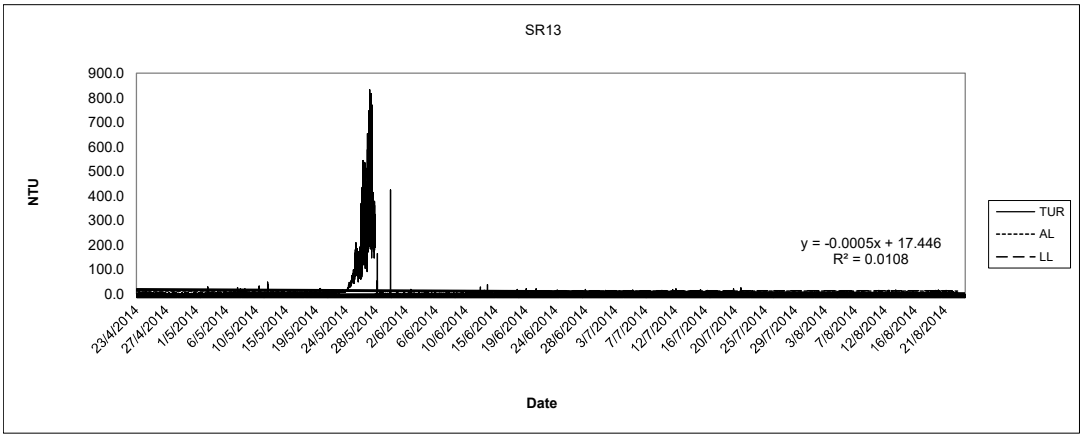
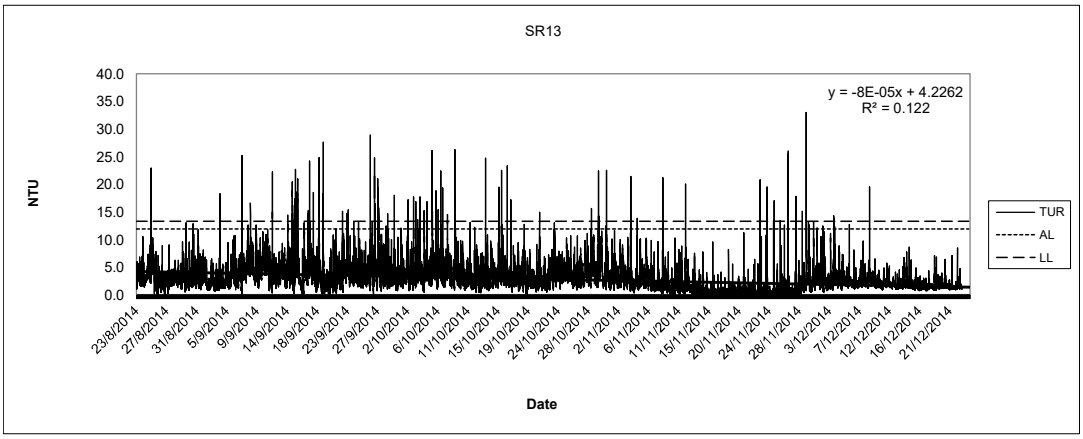
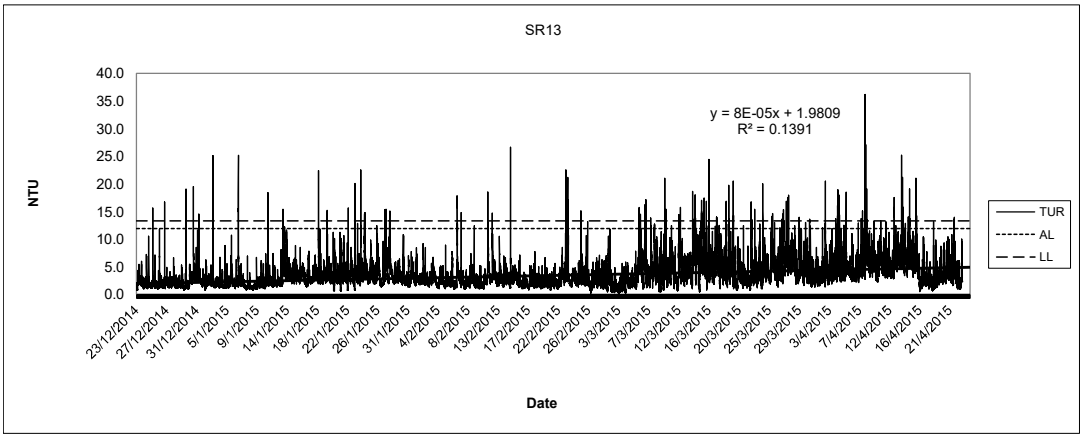
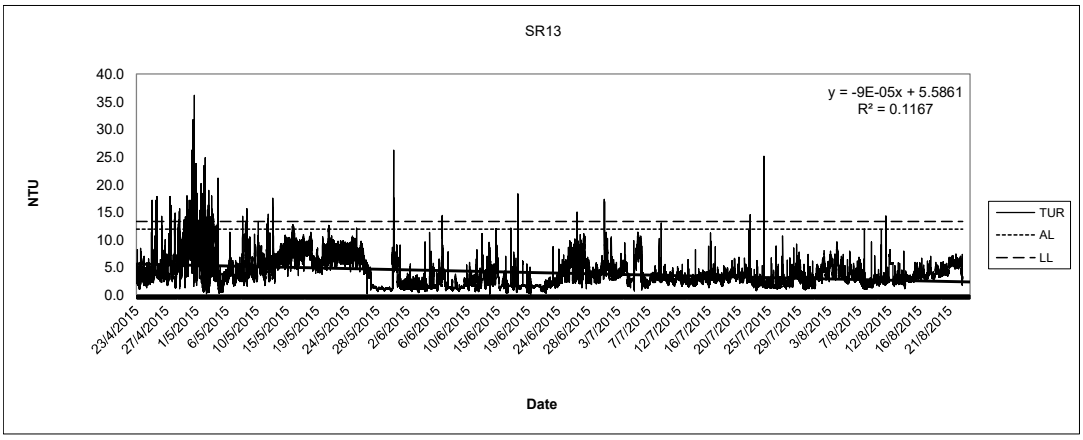
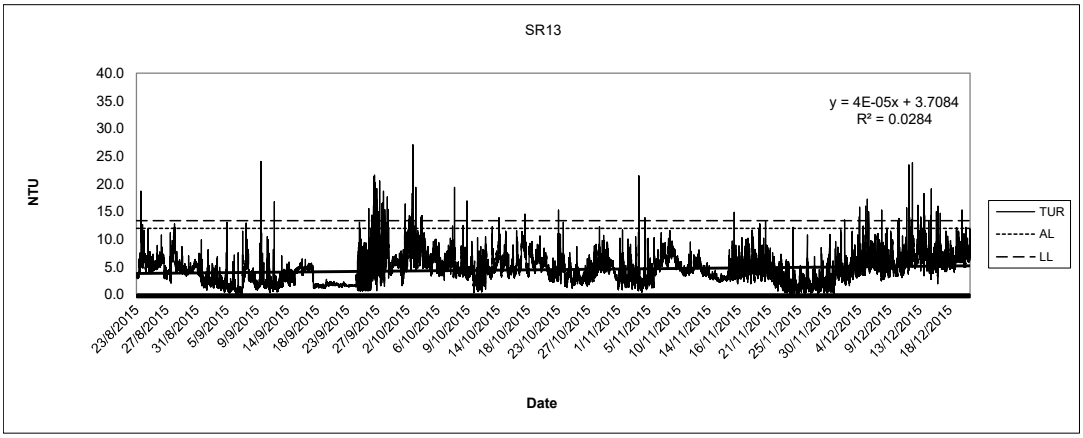


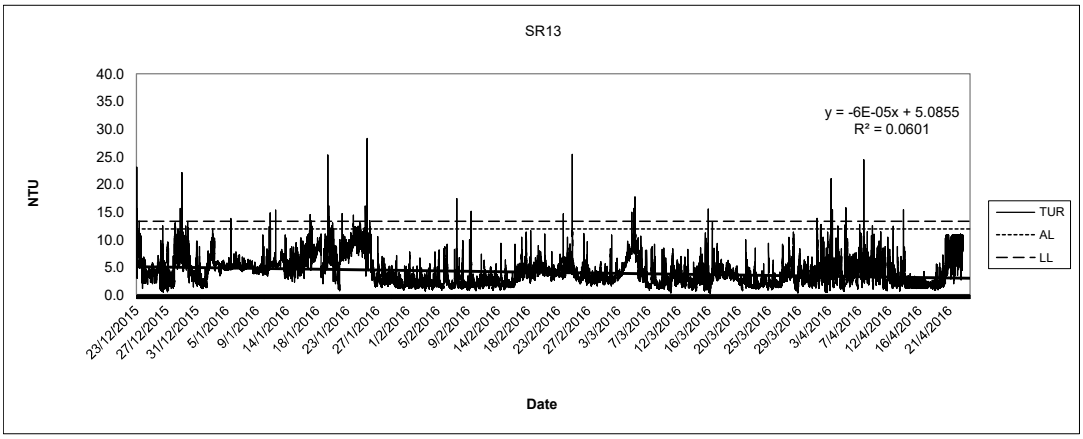


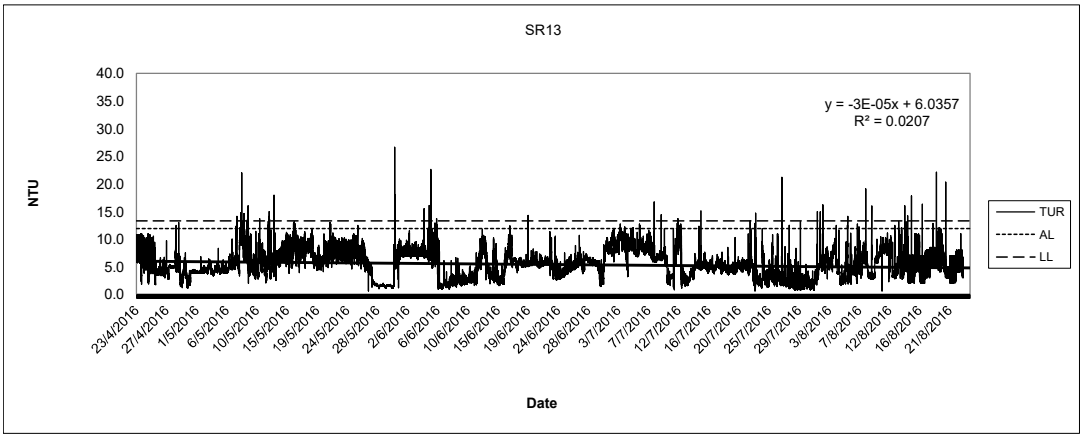


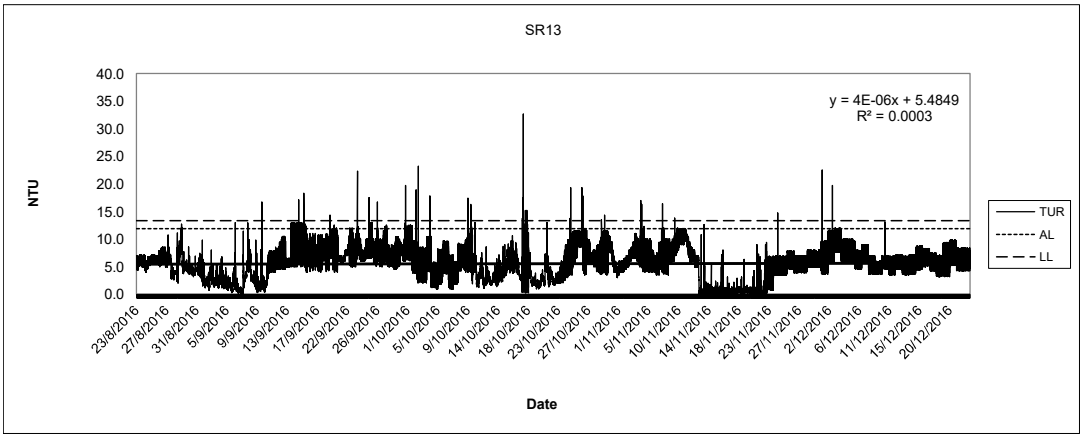


Turbidity
24-hr Water Quality Monitoring

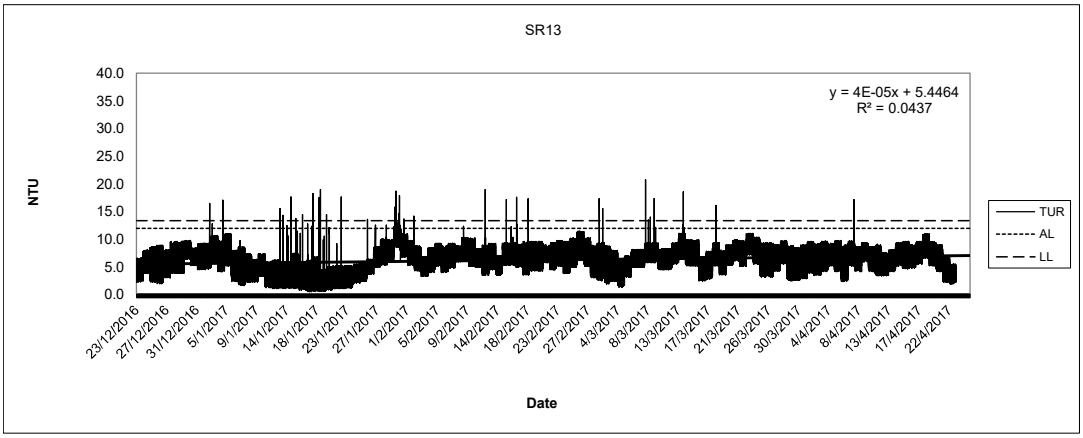


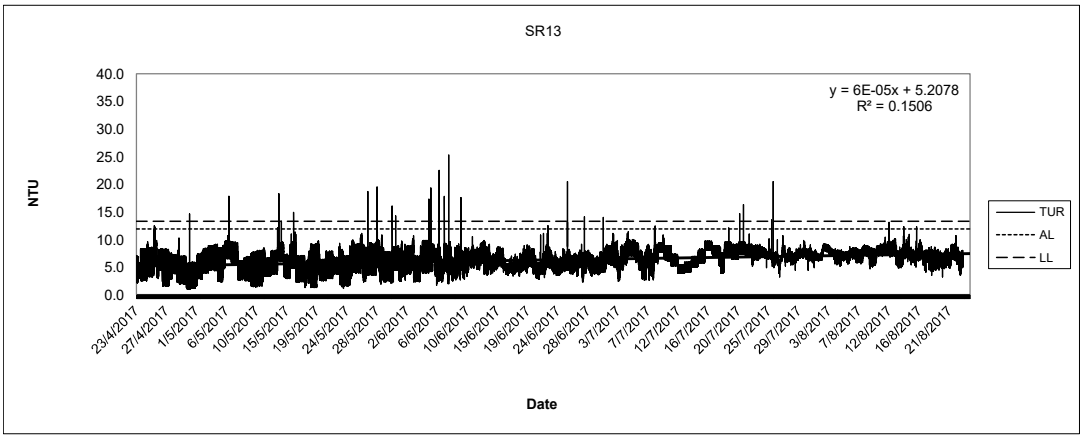


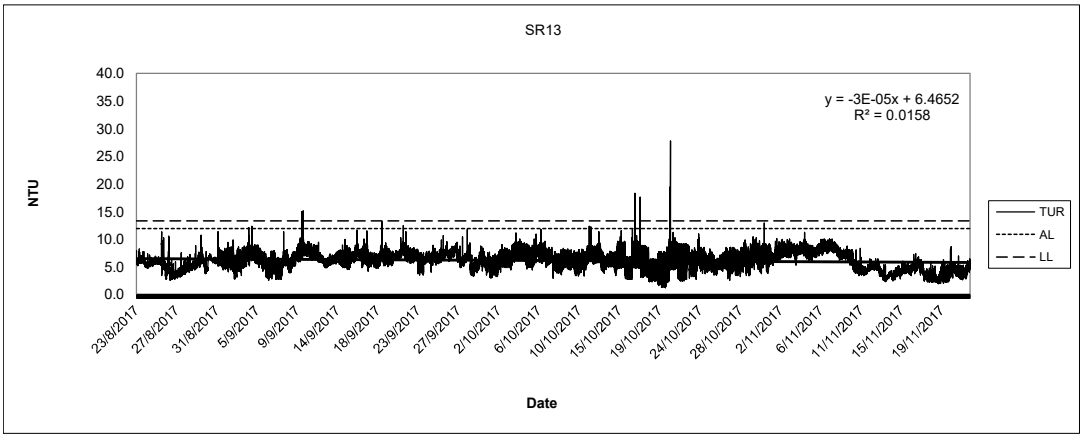


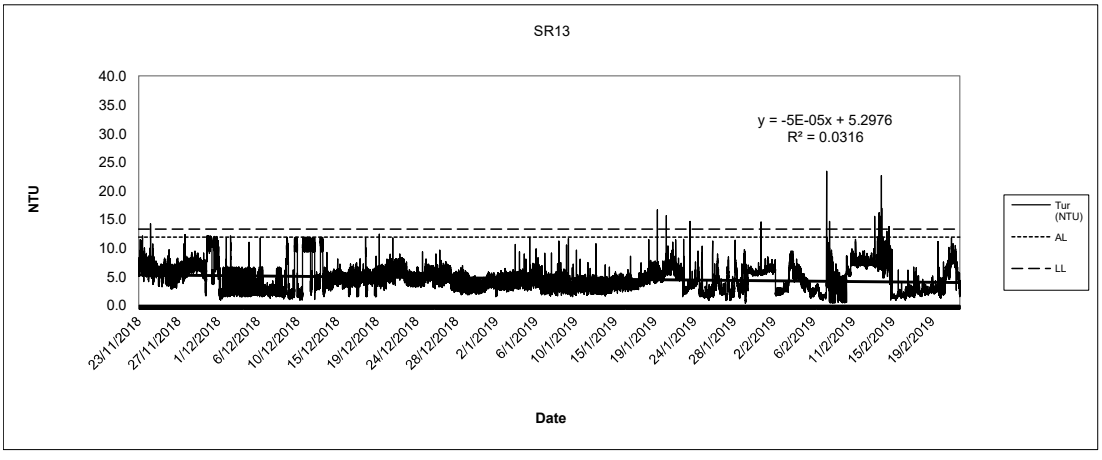


Turbidity
24-hr Water Quality Monitoring

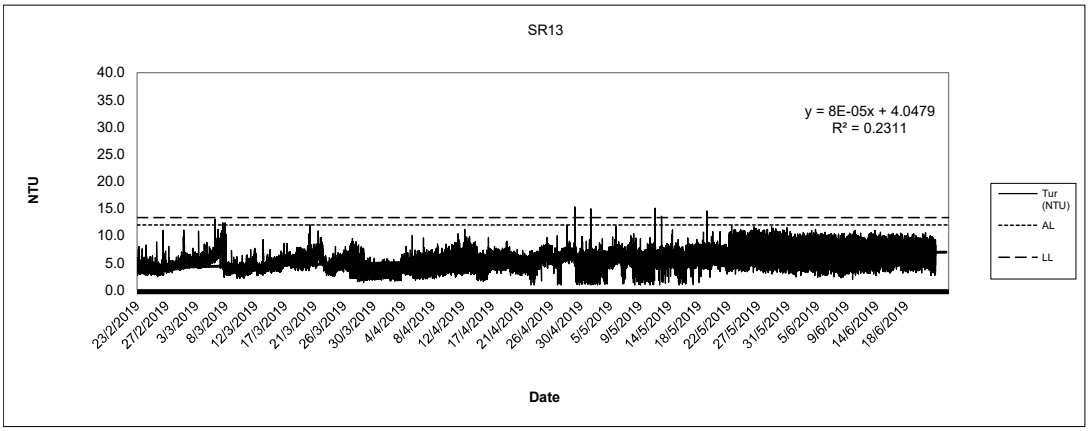


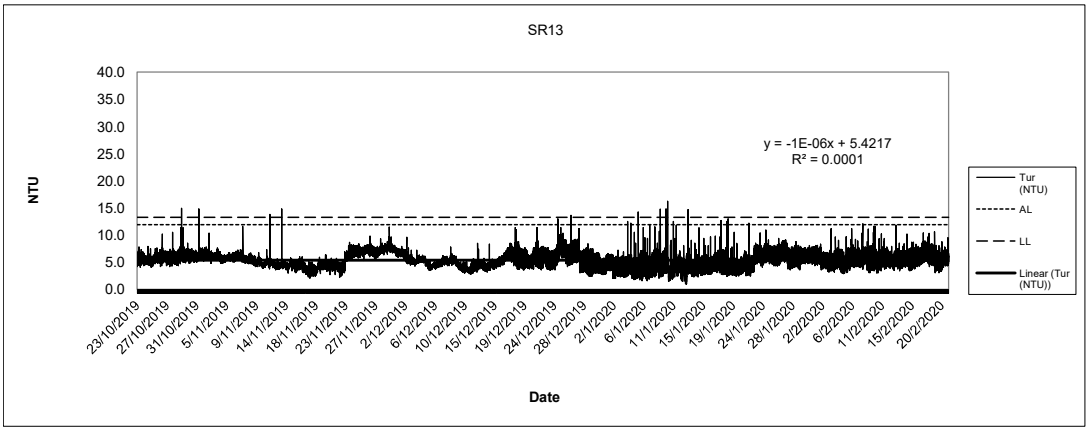


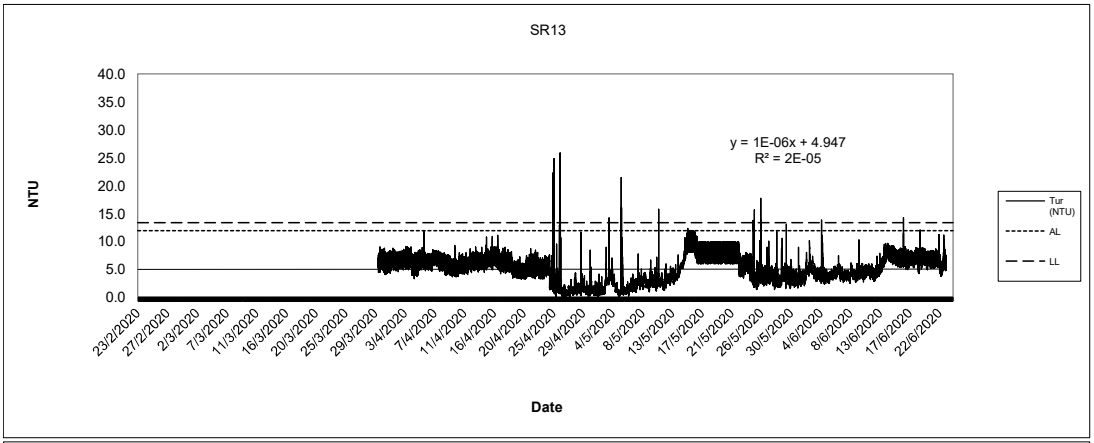


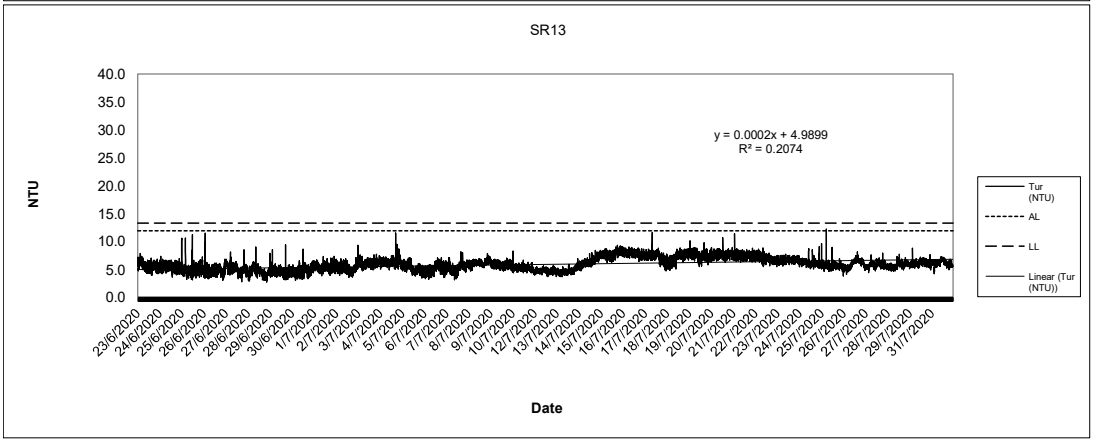


Turbidity
24-hr Water Quality Monitoring









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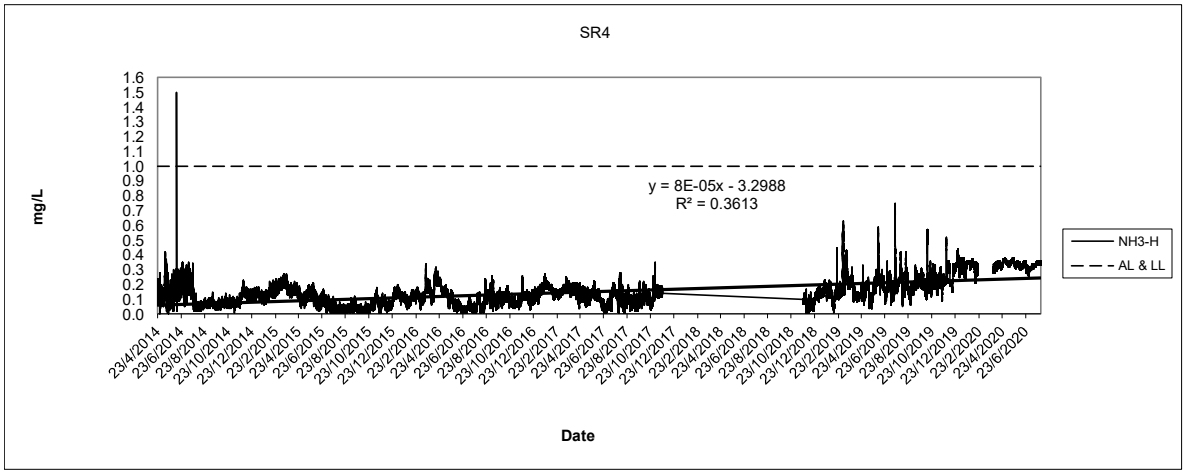
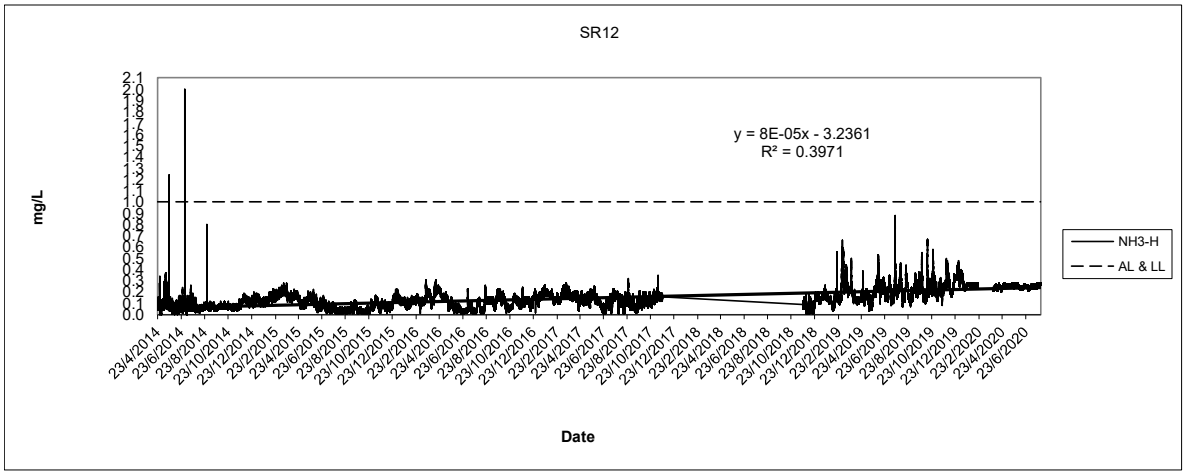
24-hr Water Quality Monitoring





FUGRO TECHNICAL SERVICES LIMITED

Fugro Development Centre,
5 Lok Yi Street, Tai Lam,
Tuen Mun, N.T.,
Hong Kong.

Tel : +852 2450 8233
Fax : +852 2450 6138
E-mail : matlab@fugro.com
Website : www.fugro.com

Report No.: 0394/13/ED/0399C

Appendix F

Event and Action Plans

Typical Event and Action Plan for Water Quality for Construction Phase

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
Action Level				
Exceedance for one sample	1. Repeat in-situ measurement to confirm finding; 2. Identify source(s) of impact; 3. Inform IEC and Contractor; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC and Contractor; and 6. Repeat measurement on next day of exceedance.	1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; and 3. Assess the effectiveness of the implemented mitigation measures.	1. Discuss with IEC on the 2. proposed mitigation measures; and 3. Make agreement on the mitigation measures to be implemented.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET and IEC and propose mitigation measures to IEC and ER; and 6. Implement the agreed mitigation measures.
Exceedance for two or more consecutive samples	1. Repeat in-situ measurement to confirm finding; 2. Identify source(s) of impact; 3. Inform IEC and Contractor; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC and Contractor; 6. Ensure mitigation measures are implemented; 7. Prepare to increase the monitoring frequency to daily; and 8. Repeat measurement on next day of exceedance.	1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; and 3. Assess the effectiveness of the implemented mitigation measures.	1. Discuss with IEC on the proposed mitigation measures; 2. Make agreement on the mitigation measures to be implemented; and 3. Assess the effectiveness of the implemented mitigation measures.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET and IEC and propose mitigation measures to IEC and ER within 3 working days; and 6. Implement the agreed mitigation measures.
Exceedance for two or more consecutive samples	1. Repeat in-situ measurement to confirm finding; 2. Identify source(s) of impact; 3. Inform IEC and Contractor; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC and Contractor; 6. Ensure mitigation measures are implemented; 7. Prepare to increase the monitoring frequency to daily; and 8. Repeat measurement on next day of exceedance.	1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; and 3. Assess the effectiveness of the implemented mitigation measures.	1. Discuss with IEC on the proposed mitigation measures; 2. Make agreement on the mitigation measures to be implemented; and 3. Assess the effectiveness of the implemented mitigation measures.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET and IEC and propose mitigation measures to IEC and ER within 3 working days; and 6. Implement the agreed mitigation measures.
Limit Level				
Exceedance for one sample	1. Repeat in-situ measurement to confirm finding; 2. Identify source(s) of impact; 3. Inform IEC, Contractor and EPD, if the exceedance is recorded at Fish Culture Zone, AFCD should be informed. If the exceedance is recorded at WSD Flushing Water intakes, WSD should be informed; 4. Check monitoring data, all plant, equipment	1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; and 3. Assess the effectiveness of the implemented mitigation measures.	1. Discuss with IEC, ET and Contractor on the proposed mitigation measures; and 2. Request Contractor to critically review the working methods; 3. Make agreement on the mitigation measures to be implemented; and 4. Assess the effectiveness of the implemented mitigation measures.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET and IEC and ER and propose mitigation measures to IEC and ER within 3 working days; and 6. Implement the agreed mitigation measures.

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
	and Contractor's working methods; 5. Discuss mitigation measures with IEC, ER and Contractor; 6. Ensure mitigation measures are implemented; and 7. Increase the monitoring frequency to daily until no exceedance of Limit level.			
Exceedance for two or more consecutive samples	1. Repeat in-situ measurement to confirm finding; 2. Identify source(s) of impact; 3. Inform IEC, Contractor and EPD, if the exceedance is recorded at Fish Culture Zone, AFCD should be informed. If the exceedance is recorded at WSD Flushing Water intakes, WSD should be informed; 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; and 7. Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days.	1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; and 3. Assess the effectiveness of the implemented mitigation measures.	1. Discuss with IEC, ET and Contractor on the proposed mitigation measures; and 2. Request Contractor to critically review the working methods; 3. Make agreement on the mitigation measures to be implemented; 4. Assess the effectiveness of the implemented mitigation measures; and 5. Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the marine work until no exceedance of Limit Level.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET and IEC and ER and propose mitigation measures to IEC and ER within 3 working days; 6. Implement the agreed mitigation measures; and 7. As directed by the ER, to slow down or to stop all or part of the marine work or construction activities.

Event and Action Plan for 24-hour Water Quality Monitoring

Event	Action			
	ET Leader	Contractor	ER	IEC
Action Level				
On Action Level exceedance of turbidity or DO (mg/L) (over a period of 30-minute), or exceedance of ammonia (mg/L) (over a period of 60-minute). Notification is sent to ET, Contractor, ER, EPD, AFCD and WSD automatically via email	1. Check data and determine if the exceedance was due to equipment problem. If so, fix the problem within 1 working day. Continue monitoring 2. Carry out investigation as soon as possible after identification of exceedance. Check monitoring data (including data from regular water quality), all plant, equipment and Contractor's working methods; 3. Report the initial investigation results to the Contractor within 24 hours of identification of exceedance. Advise contractor if exceedance may be due to contractor's construction works. 4. Conduct water quality monitoring at the mariculture/ WSD flushing water intake station with exceedance recorded and gradient stations in vicinity within 18 hours of identification of exceedance if the exceedance may be due to the works. Parameters to monitor include DO (mg/L), turbidity and SS. 5. Report the monitoring data to the Contractor within 48 hours of identification of exceedance. Advise contractor if exceedance is due to contractor's construction works. 6. Discuss mitigation measures with IEC, ER and Contractor within 2 working days of submission of the investigation results. 7. Ensure mitigation measures are implemented; 8. Closely monitor the concerned 24-hr station.	1. Check all plant and equipment; 2. Consider changes of working methods; 3. Rectify unacceptable practice; 4. Submit the monitoring data and results of the investigation to IEC and ER within 48 hours of the identification of an exceedance Inform EPD, AFCD and WSD of the results; 5. Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER within 2 working days of submission of the investigation results; 6. Implement the agreed mitigation measures within reasonable time scale	1. Request Contractor to critically review the working methods; 2. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 3. Ensure remedial measures are properly implemented 4. Assess the effectiveness of the implemented mitigation measures	1. Check monitoring data submitted by ET 2. Confirm ET assessment if exceedance is due /not due to the works 3. Discuss with ET, ER and Contractor on the mitigation measures 4. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly 5. Assess the effectiveness of the implemented mitigation measures
Limit Level				
On Limit Level exceedance of turbidity or DO (mg/L) (over a period of 30-minute or exceedance of ammonia (mg/L) (over a period of 60-minute). Notification is sent to ET, Contractor, ER, EPD, AFCD and	1. Check data and determine if the exceedance was due to equipment problem. If so, fix the problem within 1 working day. Continue monitoring 2. Carry out investigation as soon as possible after identification of exceedance. Check monitoring data (including data from regular water quality), all plant, equipment and Contractor's working methods;	1. Check all plant and equipment; 2. Consider changes of working methods; 3. Rectify unacceptable practice; 4. Submit the monitoring data and results of the investigation to IEC and ER within 48 hours of the identification of an exceedance Inform EPD, AFCD and WSD of the results; 5. Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER within	1. Request Contractor to critically review the working methods; 2. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 3. Ensure remedial measures are properly implemented 4. Assess the effectiveness of the implemented mitigation measures; 5. Consider and instruct, if necessary, the Contractor to slow down or to stop all or	1. Check monitoring data submitted by ET 2. Confirm ET assessment if exceedance is due /not due to the works 3. Discuss with ET, ER and Contractor on the mitigation measures 4. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly 5. Assess the effectiveness of the implemented mitigation measures

Event	Action			
	ET Leader	Contractor	ER	IEC
WSD automatically via email	3. Report the initial investigation results to the Contractor within 24 hours of identification of exceedance. Advise contractor if exceedance may be due to contractor's construction works. 4. Conduct water quality monitoring at the all monitoring stations within 18 hours of identification of exceedance if the exceedance may be due to the works. Parameters to monitor include DO (mg/L), turbidity and SS. 5. Report the monitoring data to the Contractor within 48 hours of identification of exceedance. Advise contractor if exceedance is due to contractor's construction works. 6. Discuss mitigation measures with IEC, ER and Contractor within 2 working days of submission of the investigation results. 7. Ensure mitigation measures are implemented; 8. Closely monitor the concerned 24-hr station.	2 working days of submission of the investigation results; 6. Implement the agreed mitigation measures within reasonable time scale; 7. As directed by ER, to slow down or stop all or part of the marine work or construction activities.	part of the marine work until no exceedance of Limit Level.	

FUGRO TECHNICAL SERVICES LIMITED

Fugro Development Centre,
5 Lok Yi Street, Tai Lam,
Tuen Mun, N.T.,
Hong Kong.

Tel : +852 2450 8233
Fax : +852 2450 6138
E-mail : matlab@fugro.com
Website : www.fugro.com

Report No.: 0394/13/ED/0399C

Appendix G

Environmental Mitigation Implementation Schedule

EIA Ref	EM&A Ref	No.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to Address	Who to implement the measure	Location of the measure	When to implement the measure?	Implementation Status
		A	Water Quality					
3.8	2.9		<u>Use of Silt Screens</u>	Minimize the effect of potential increase in SS levels at the seawater intakes	Contractor	WSD8 and EMSD1	Construction Phase	
		A1	Silt Screens shall be installed at the flushing water intakes WSRs WSD1, WSD8~~, WSD9~~ and EMSD1 to minimise the effect of potential increase in SS levels at the seawater intakes.					Implemented
3.8	2.9		<u>Use of Silt Curtains</u>	Minimize the release of suspended soil from the dredging area	Contractor	Construction Work Sites	Construction Phase	
		A2	To minimize the potential SS impact from dredging, deployment of silt curtains around the grab dredgers is recommended; and Before commencement of dredging works, the holder of the Environmental Permit shall submit detailed proposal of the design and arrangement of the frame type silt curtain to EPD for approval.					Implemented
3.10	2.9	A3	Water Quality Monitoring Program	Perform water quality monitoring at sensitive receivers during construction phase	ET	Monitoring Locations as stated in Table 2.1 of the EM&A Manual	Construction Phase	
			Water quality monitoring shall be carried out in accordance with Section 2 of the Environmental Monitoring and Audit (EM&A) Manual. Event and Action Plan (EAP) for water quality shall be followed in case of any exceedance in action and limit level.					Implemented
3.8 (EP Ref 3)	-		Dredging Operation	Minimize potential adverse effect as a result of dredging activities	Contractor	Construction Work Sites	Construction Phase	
		A4	Only two types of dredgers are allowed for this Project: (a) grab dredger with closed grab, and (b) ~~cutter suction dredger~~ spud pole grab dredger.					Implemented
		A5	The speed of any construction vessels shall not exceed 10 knots when passing through the area of the Project.					Implemented
		A6	No more than ~~three~~ two grab dredgers with closed grab ~~(or one cutter suction dredger with two closed grab dredgers)~~ shall be operated within the Project Area at any one time for the Project.					Implemented
		A7	Only one closed grab dredger ~~or one cutter suction dredger~~ shall be operated in Zone 2B and during which no other closed grab dredger shall be allowed in other zones within the Project Area.					Implemented
		A8	No more than one grab dredger with closed ~~grab (or one cutter suction dredger)~~ shall be operated within each of the five main zones at any one time for the ~~Project in which the cutter suction dredger shall only be operated in Zones 2 and 4 with maximum dredging rate of 700 m³ in 30 minutes in any given hour (max. 8,400 m³/day, based on a 12-hour operation per day)~~.					Implemented
		A9	The maximum dredging rate for closed grab dredger at Rambler Channel – Zones 1 to 2 (subzones Z1A, Z1B, Z2A, Z2B and Z2C) shall follow the Dredging Plan for the Hotspot, as shown in EP-426/2011/A.					Implemented
		A10	The maximum dredging rate for closed grab dredger at Rambler Channel – Zones 3 to 4 (subzones Z3A to Z4B) shall not exceed 1,600 m³ per day during dry season or 3,440 m³ per day during wet season as shown in EP-426/2011/A.					Implemented
		A11	The maximum dredging rate for closed grab dredger at Rambler Channel – Zones 5 to 6 (subzones Z5A, Z5B and Z6A) shall not exceed 4,000 m³ per day during both dry and wet seasons as shown in EP-426/2011/A.					Implemented

EIA Ref	EM& A Ref	No.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to Address	Who to implement the measure	Location of the measure	When to implement the measure?	Implementation Status
		A12	The maximum dredging rate for closed grab dredger at Rambler Channel – Zones 5 to 8 (subzones Z5C, Z6B, Z6C, Z6D, Z7 and Z8) shall not exceed 4,000 m^3 per day during both dry and wet seasons as shown in EP-426/2011/A.					Implemented
		A13	The maximum dredging rate for closed grab dredger at Northern Fairway – Zones 9 to 12 shall not exceed 4,000 m^3 per day during both dry and wet seasons as shown in EP-426/2011/A.					Implemented
		A14	The maximum dredging rate for closed grab dredger at Western Fairway – Zone 13A shall not exceed 4,000 m^3 per day during both dry and wet seasons as shown in EP-426/2011/A.					Implemented
		A15	The maximum dredging rate for closed grab dredger at Western Fairway – Zone 13B shall not exceed 4,000 m^3 per day during both dry and wet seasons as shown in EP-426/2011/A.					Implemented
		A16	~~The dredging pump of cutter suction dredger shall be operated during cutting to reduce the sediment loss to water body.~~					NA-no CSD employed
		A17	Project dredging works within Zone 1 to 6 (including sub-zones) of the Container Basin shall not be carried out at the same time with Terminal Operator's maintenance dredging activities.					Implemented
		A18	~~Cutter suction dredger is only to be deployed for the removal of harder material during daytime only (07:00 to 19:00) in Zone 2 (including subzones) of the Container Basin.~~					NA-no CSD employed
		A19	In case of rainstorm warning in effect during dredging works, the dredged material on barge shall be covered properly before transportation to disposal site.					Implemented
		A20	In case of exceedance of SS and NH_3-N at the Tsing Yi WSD flushing intake due to dredging operation is evidenced, the Contractor shall propose mitigation measures not limited to reducing dredging rate. If exceedance persists, the Contractor shall propose not to undertake dredging operation in close proximity to the Tsing Yi flushing water intake during flood tide. The Contractor shall liaise with the ETL, IEC, ER, EPD and WSD for the proposed mitigation measures.					NA-no exceedance due to dredging operation
		A21	If further mitigation measures are required due to continuous exceedance of SS and NH_3-N, consideration shall then be given to dredge only on the state of the tide which would avoid migration of SS towards the WSD and EMSD intakes.					NA-no exceedance due to dredging operation
		A22	Dredging sub-zone Z2B where high NH_3-N in sediment is found shall be isolated with dredging works to be carried out towards the end of construction programme.					Implemented
		A23	Administrative control in terms of dredging rate adjustment in controlling the release of contaminants shall be employed as mitigation measures.					Implemented
		A24	Field trials shall be carried out to propose the most effective dredging process and rate to control the release of ammoniacal nitrogen and UIA into the water column and achieve compliance at the WSD1 seawater intake (NH_3-N) and at the beaches for UIA. Capital dredging works in dredging sub-zone Z2B (Figure 1.2h refers) should not therefore be carried out until the proposed method and rate are					Implemented

EIA Ref	EM& A Ref	No.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to Address	Who to implement the measure	Location of the measure	When to implement the measure?	Implementation Status
			confirmed.					
		A25	Detailed dredging plan shall be prepared providing details of individual dredging subzones and dredging rate taking into account of the field trial results.					Implemented
3.8	-		Other Good Site Practices for Dredging	Minimize potential adverse effect as a result of dredging activities	Contractor	Construction Work Sites	Construction Phase	
		A26	All vessels should be sized so that adequate clearance is maintained between vessels and the seabed in all tide conditions, to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash.					Implemented
		A27	The speed of all Contractor's vessels should be controlled within the works area to prevent propeller wash from stirring up the seabed sediments.					Implemented
		A28	All barges / dredgers used should be fitted with tight fitting seals to their bottom openings to prevent leakage of material.					Implemented
		A29	Construction activities should not cause foam, oil, grease, scum, litter or other objectionable matter to be present on the water within the site or dumping grounds.					Implemented
		A30	No overflow of dredged mud should be allowed. Barges or hopper should not be filled to a level that will cause the overflow of materials or polluted water during loading or transportation.					Implemented
		B	**Waste Management**					
			Good Site Practices	Minimize potential adverse effect arising from the handling of dredged material	Contractor	Construction Work Sites (General)	Construction Phase	
4.5	3.3	B1	Obtain the profile of different sediment categories and careful planning of sediment removal.					Implemented
		B2	Nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site.					Implemented
		B3	Training of site personnel in proper waste management and chemical handling procedures.					Implemented
		B4	Provision of sufficient waste disposal points and regular collection of waste.					Implemented
		B5	Well planned delivery programme for offsite disposal such that adverse environmental impact from transporting sediment material is not anticipated.					Implemented
		B6	Use well maintained PME on site.					Implemented
			General Refuse	Minimize the adverse effect arising from the handling of site general refuse	Contractor	Construction Work Sites (General)	Construction Phase	
4.5	3.3	B7	General refuse should be stored in enclosed bins. A reputable waste collector should be employed by the contractor to remove general refuse from the site.					Implemented
			Chemical Waste	Minimize the adverse effect arising from the handling of site chemical waste	Contractor	Construction Work Site	Construction Phase	
4.5	3.3	B8	If chemical wastes are produced at the construction site, the Contractor shall be required to register with the EPD as a chemical waste producer and to follow the guidelines stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Good quality containers compatible with the chemical wastes shall be used, and incompatible chemicals should be stored separately. Appropriate labels shall be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosive, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc. The Contractor					Implemented

EIA Ref	EM& A Ref	No.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to Address	Who to implement the measure	Location of the measure	When to implement the measure?	Implementation Status
			shall use a licensed collector to transport and dispose of the chemical wastes, to either the approved Chemical Waste Treatment Centre, or another licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.					
4.5	3.3		Marine Dredged Sediment	Control of transportation and disposal of dredged material in a manner to minimize potential impacts on water quality	Contractor	Construction Work Site	Construction Phase	
		B9	Control of transportation and disposal of dredged material in a manner to minimize potential impacts on water quality.					Implemented
		B10	Bottom opening of barges will be fitted with tight fitting seals to prevent leakage of material. Excess material shall be cleaned from the decks and exposed fittings of barges and dredgers before the vessel is moved.					Implemented
		B11	Monitoring of the barge loading shall be conducted to ensure that loss of material does not take place during transportation. Transport barges or vessels shall be equipped with automatic self-monitoring devices as specified by the EPD.					Implemented
		B12	Barges or hopper barges shall not be filled to a level that would cause the overflow of materials or sediment laden water during loading or transportation.					Implemented
		B13	Sediment Quality Report shall be prepared and submit to EPD under DASO.					Implemented
		B14	If disposal of Type 3 sediment is identified, agreement with EPD shall be reached regarding the treatment of sediment before disposal.					Implemented
		B15	Project works shall not be carried out before obtaining confirmation from MFC on disposal option.					Implemented
		B16	Follow strictly all conditions stipulated in the dumping permit.					Implemented
		C	**Marine Ecology**	Review and assess the potential adverse effect on marine ecology	Contractor	Construction Work Sites	Construction Phase	
5.7	4.1	C1	Water quality monitoring results shall be reviewed from time to time to assess if there were any impact to marine ecology due to dredging operation.					Implemented
		D	**Fisheries**	Review and assess the potential adverse effect on fisheries	Contractor	Construction Work Sites	Construction Phase	
6.7	5.1	D1	Water quality monitoring results shall be reviewed from time to time to assess if there were any impact to fisheries due to dredging operation.					Implemented
		E	**Hazard to Life**		Contractor	Construction Work Sites (General)	Construction Phase	
7.8.2	6.2	E1	Sound communication channel shall be established with the oil companies, Marine Department, and Fire Services Department for effective notification and emergency evacuation in case of accidents.					Implemented
		E2	Proper safety and emergency training shall be given to the relevant operation staff at the dredging site. Emergency plans and procedures should be prepared and drills should be performed periodically.					Implemented
		F	**Landscape Visual and Glare**	Minimize landscape and visual impacts during construction phase	Contractor	Construction activities' area	Throughout design, construction phase	
8.9 Table 8-3 & 8-6	7.2	F1	Visa shields to the lights of dredgers shall be provided.					Implemented
		F2	The light source shall not point directly to any VSRs.					Implemented
		F3	Lights shall be switched off if they are not in use.					Implemented
		G	**Cultural Heritage**	Minimize potential marine archaeological impact during dredging activities	Contractor	Locations of the 20 unidentified sonar	During Construction works	
9.5	8		Monitoring Brief					
		G1	A monitoring brief shall be conducted during the dredging. It shall only be required during dredging at the locations of the 20 unidentified sonar					NA- no archaeological

EIA Ref	EM& A Ref	No.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concerns to Address	Who to implement the measure	Location of the measure	When to implement the measure?	Implementation Status
			contacts and masked areas and does not need to cover all of the dredging activities. Dredging staff should be briefed about the possibility of locating archaeological objects and a marine archaeologist shall be available to monitor the dredged spoil and provide advice. If material indicative of archaeological remains is retrieved, the AMO should be contacted as soon as possible.			contacts and masked areas		deposit was found during reporting period.
		H	**Noise**					
10.8	9		<u>Good Site Practices</u>	Control and minimize the generation of undue noise nuisance	Contractor	Construction Work Sites (Along the alignment of dredging	Construction Phase	
		H1	Only well-maintained plant shall be operated on-site and plant should be serviced regularly during the construction program.					Implemented
		H2	Machines and plant that may be in intermittent use should be shut down between works periods or should be throttled down to a minimum.					Implemented
		H3	Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from nearby NSRs.					Implemented
		H4	If dredging is to be carried out during restricted hours, work locations close to NSRs shall be avoided.					Implemented
		I	**Construction Dust**					
11.7	10		<u>Dust Control</u>	Good site practice to control dust and odour impact to the nearby sensitive receivers	Contractor	Construction Work Sites (General)	Construction Phase	
		I1	Requirements of the Air Pollution Control (Construction Dust) Regulation, where relevant, shall be adhered to during the construction period.					Implemented
			<u>Odour</u>		Contractor	Construction Work Sites (General)	Construction Phase	
		I2	To minimize potential odour emissions, if dredged sediment is anticipated to be placed on barge for more than a day the load shall be properly covered as far as practicable to minimise the exposed area and potential odour.					Implemented
		I3	If dredged sediment is found to be malodorous it shall be removed from site as soon as possible within one hour after the barge being filled up.					Implemented

FUGRO TECHNICAL SERVICES LIMITED

Fugro Development Centre,
5 Lok Yi Street, Tai Lam,
Tuen Mun, N.T.,
Hong Kong.

Tel : +852 2450 8233
Fax : +852 2450 6138
E-mail : matlab@fugro.com
Website : www.fugro.com

Report No.: 0394/13/ED/0399C

Appendix H

Waste Generation in Reporting Period

Name of Department : Civil Engineering and Development Department
Contract No. : CV/2013/04

Summary of Sediment Disposal (2014 - 2020)

Marine Sediment Type	Type 1 – Open Sea Disposal	Type 2 – Confined Marine Disposal	Type 3 – Special Treatment / Disposal
Month*	Quantity (m^3)	Quantity (m^3)	Quantity (m^3)
2014			
Jan-Dec	549,430	99,660	nil
2015			
Jan-Dec	938,560	372,370	nil
2016			
Jan-Dec	195,860	153,250	1,260
2017			
Jan-Dec	1,850	28,550	nil
2018			
Jan-Dec	nil	nil	nil
2019			
Jan-Dec	nil	2,850	nil
2020			
January	nil	250	nil
February	nil	nil	nil
March	nil	nil	nil
April	nil	nil	nil
May	nil	280	nil
June	nil	150	nil
July*	nil	450	nil
Sub-total	nil	1,130	nil
Total	1,685,700	657,810	1,260

Notes:

*The counting cut-off was 22nd of each reporting month except for July 2020 which is from 23 June 2020 – 31 July 2020.

Yearly Summary Waste Flow Table

Year	Estimated Annual Quantities of Inert C&D Materials (in '000m^3)										Estimated Annual of C&D Wastes									
	Total Quantity Generated		Broken Concrete (see Note 3)		Reused in the Contract		Reused in other Projects		Disposed as Public Fill		Metals		Paper/cardboard packaging		Plastics (see Note 2)		Chemical Waste		Others, e.g. general refuse	
	(a)		(b)		(c)		(d)		(a-b-c-d)		(in '000 kg)		(in '000 kg)		(in '000 kg)		(in '000 kg)		(in '000 m^3)	
	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.	Est.	Act.
2013	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.003	0.01
2014	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.2	0.16
2015	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	13	14.4	0.2	0.12
2016	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	17	Nil	0.2	0.12
2017	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	10	Nil	0.15	0.10
2018	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
2019	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
2020	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Grand Total	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	40	14.4	0.753	0.51

Notes:

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

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

(3) Broken concrete for recycling into aggregates.

FUGRO TECHNICAL SERVICES LIMITED
Fugro Development Centre,
5 Lok Yi Street, Tai Lam,
Tuen Mun, N.T.,
Hong Kong.
Tel : +852 2450 8233
Fax : +852 2450 6138
E-mail : matlab@fugro.com
Website : www.fugro.com

Appendix I

Email Consent from Stakeholders for the Review of Operation Phase Silt Curtain and Water Quality Monitoring – Site Trial Report

Lai, Cyrus

Subject: FW: RE: KTCB - Proposed Site Trial for Operation Phase Maintenance Dredging
Attachments: KTCB silt curtain trial report (Final).pdf

From: Ir Felix Chau [mailto:sre@ktcb.com.hk]
Sent: Tuesday, November 29, 2016 9:20 AM
To: derek_wk_lo@wsd.gov.hk
Cc: ping_tong_wong@wsd.gov.hk; Howley, Chris M; RE/KTCB; Zhao, Sunny; Au, Loretta; Garry HUI; billy_kh_cheung@epd.gov.hk; joinchung@epd.gov.hk; ytmok@epd.gov.hk; lokamwah@epd.gov.hk; joanne_oo_lee@afcd.gov.hk; ingridwong@emsd.gov.hk; gordon@epd.gov.hk; vicyeung@epd.gov.hk; wang_yuen@epd.gov.hk; CY Sze; Sam Tam; Chan, Dulcie; Andy Wong; Y H HUI (yhhui@ramboll.com); YUNG Colin (c.yung@fugro.com); Lai, Cyrus [MCL]; W H LAM; CIWE (Site)
Subject: RE: RE: KTCB - Proposed Site Trial for Operation Phase Maintenance Dredging

Thanks Derek.

So far, there is no objection to the captioned Report from EPD, WSD, EMSD and AFCD.
Therefore, it will be reported in the coming EM&A Monthly Report under this CEDD Contract.

Rgds,
Felix

From: derek_wk_lo@wsd.gov.hk [mailto:derek_wk_lo@wsd.gov.hk]
Sent: Tuesday, November 29, 2016 9:12 AM
To: Ir Felix Chau
Cc: ping_tong_wong@wsd.gov.hk
Subject: RE: RE: KTCB - Proposed Site Trial for Operation Phase Maintenance Dredging

Dear Felix,

I have no comment.

Regards,
Derek WK LO
ME/NTW(O)

From: Ir Felix Chau [mailto:sre@ktcb.com.hk]
Sent: Monday, November 28, 2016 1:18 PM
To: ingridwong@emsd.gov.hk
Cc: YIM Daniel; billy_kh_cheung@epd.gov.hk; Howley, Chris M; derek_wk_lo@wsd.gov.hk; Chan, Dulcie; garryhui@epd.gov.hk; gordon@epd.gov.hk; joanne_oo_lee@afcd.gov.hk; joinchung@epd.gov.hk; kityee_chong@afcd.gov.hk; lokamwah@epd.gov.hk; Au, Loretta; re@ktcb.com.hk; Zhao, Sunny; vicyeung@epd.gov.hk; wang_yuen@epd.gov.hk; ytmok@epd.gov.hk
Subject: RE: RE: KTCB - Proposed Site Trial for Operation Phase Maintenance Dredging

Dear Ingrid,

Please find attached Figure 2.1.

For construction phase, our remaining works will be at the Northern part of the Container Basin (i.e. Grids A26 to C26, F26 to G26, A27 to C27 & F27 to G27) only, which is targeted to resume in mid-December 2016. However, this Report is for future Operation Phase which covers the 3 areas under the site boundary as shown in the LHS box of Figure 2.1 (please see the legend "site boundary" – bounded by BLUE dash).

Rgds,
Felix

From: ingridwong@emsd.gov.hk [mailto:ingridwong@emsd.gov.hk]
Sent: Monday, November 28, 2016 10:22 AM
To: Ir Felix Chau
Cc: YIM Daniel; billy_kh_cheung@epd.gov.hk; Howley, Chris M; derek_wk_lo@wsd.gov.hk; Chan, Dulcie; garryhui@epd.gov.hk; gordon@epd.gov.hk; joanne_oo_lee@afcd.gov.hk; joinchung@epd.gov.hk; kityee_chong@afcd.gov.hk; lokamwah@epd.gov.hk; Au, Loretta; re@ktcb.com.hk; Zhao, Sunny; vicyeung@epd.gov.hk; wang_yuen@epd.gov.hk; ytmok@epd.gov.hk
Subject: 回覆: RE: KTCB - Proposed Site Trial for Operation Phase Maintenance Dredging

Dear Felix,

I would like to have figure 2.1 to further review as it is not included in the report. Kindly advise the upcoming dredging location as well. Thanks a lot.

Best regards,

Ingrid WONG
E/H/KW/2
Tel.: 2990 2122
Fax.: 2785 4702

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寄件者: Ir Felix Chau <sre@ktcb.com.hk>
收件者: <joanne_oo_lee@afcd.gov.hk>, <billy_kh_cheung@epd.gov.hk>, <derek_wk_lo@wsd.gov.hk>, <garryhui@epd.gov.hk>, <gordon@epd.gov.hk>, <joinchung@epd.gov.hk>, <vicyeung@epd.gov.hk>, <lokamwah@epd.gov.hk>, <wang_yuen@epd.gov.hk>, <ytmok@epd.gov.hk>, <kityee_chong@afcd.gov.hk>, <ingridwong@emsd.gov.hk>
副本抄送: "Howley, Chris M" <Chris.Howley@mottmac.com>, "Chan, Dulcie" <Dulcie.Chan@mottmac.com>, "Au, Loretta" <Loretta.Au@mottmac.com>, <re@ktcb.com.hk>, "YIM Daniel" <are-1@ktcb.com.hk>, "Zhao, Sunny" <Sunny.Zhao@mottmac.com>
日期: 15/11/2016 15:03
主旨: RE: KTCB - Proposed Site Trial for Operation Phase Maintenance Dredging

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Dear All,

Further to your previous no objection to conduct the proposed site trial plan, the actual field works were executed between July and August 2016 followed by the relevant laboratory works. Accordingly, please find attached Report on the captioned site trial included its recommendations in related to the Operation Phase of this project for your perusal and reference..

I would be grateful if EPD, AFCD, WSD and EMSD could provide your **no objection** to / comments on the attached Report by return email on or before 25 November 2016. Subsequent to confirmation from relevant parties, the attached Report will be included in the coming Monthly EM&A Report.

Your earliest feedback is hereby requested.

Rgds,
Ir CHAU T C, Felix
Engineer's Representative
CEDD Contract No.CV/2013/04