

# 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.: 0041/17/ED/0691

## Quarterly EM&A Report August 2022 - October 2022

Client : Drainage Services Department

Project : Contract No. CM 14/2016  
Environmental Team for Operational  
Environmental Monitoring and Audit for Siu  
Ho Wan Sewage Treatment Works

Report No.: : 0041/17/ED/0691

Prepared by: Andy K. H. Choi

Reviewed by: Cyrus C. Y. Lai

Certified by:

A handwritten signature in black ink, appearing to be "Colin K. L. Yung", written over a horizontal line.

Colin K. L. Yung  
Environmental Team Leader  
Fugro Technical Services Limited

Our Ref. 1458/22-0046



**Drainage Services Department**  
Projects and Development Branch  
Consultants Management Division  
42/F, Revenue Tower,  
5 Gloucester Road  
Wan Chai, Hong Kong

27/F, Overseas Trust Bank Building  
160 Gloucester Road  
Wan Chai  
Hong Kong  
T: +852 2815 7028  
F: +852 2815 5399

[www.asecg.com](http://www.asecg.com)

**Attn: Mr. LAU Ka Kin, Marcus (E/CM16)**

20 December 2022

**By Post and E-mail**

Dear Sir,

**RE: CONTRACT NO. CM 13/2016**  
**INDEPENDENT ENVIRONMENTAL CHECKER FOR OPERATIONAL ENVIRONMENTAL MONITORING**  
**AND AUDIT FOR SIU HO WAN SEWAGE TREATMENT WORKS (SHWSTW)**  
**QUARTERLY ENVIRONMENTAL MONITORING AND AUDIT (EM&A) REPORT (AUGUST 2022**  
**TO OCTOBER 2022)**

Reference is made to the submission of the Quarterly Environmental Monitoring and Audit (EM&A) Report (August 2022 to October 2022) (Report No.: 0041/17/ED/0691A) from the Environmental Team (ET), Fugro Technical Services Ltd., received on 16 November 2022 via email.

We would like to inform you that we have no adverse comment on the captioned submission and hereby verify the same in accordance with Condition 4.3 of the Environmental Permit (EP) for the captioned Project (Permit No.: EP-076/2000).

Notwithstanding, please be reminded that the ET shall strictly follow Condition 4.3 of the EP to submit EM&A report within two weeks after the completion of each reporting period and the report shall be certified by the Independent Environmental Checker (IEC) before depositing with the Environmental Protection Department.

Should you have any queries, please feel free to contact the undersigned, or our Mr. Timmy WONG at 2815 7028.

Yours faithfully,

For and on behalf of  
**Allied Environmental Consultants Ltd.**

A handwritten signature in black ink, appearing to be 'Grace M. H. Kwok', written in a cursive style.

Grace M. H. KWOK  
Independent Environmental Checker

GK/jn/hp

c.c. Fugro Technical Service (ET Leader)  
AECOM

Attn: Mr. Colin YUNG  
Attn: Ms. Joanne TSOI

(By E-mail)  
(By E-mail)

# 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.: 0041/17/ED/0691

## TABLE OF CONTENTS

EXECUTIVE SUMMARY .....	1
1. INTRODUCTION.....	2
2. SUMMARY OF EM&A REQUIREMENTS AND MONITORING RESULTS .....	4
3. ADVICE ON IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES .....	15
4. ADVICE ON THE SOLID AND LIQUID WASTE MANAGEMENT STATUS .....	16
5. SUMMARY OF EXCEEDANCE OF THE ENVIRONMENTAL QUALITY PERFORMANCE LIMITS .....	17
6. SUMMARY OF ENVIRONMENTAL COMPLAINTS .....	18
7. CONCLUSION.....	19

## FIGURE

Figure 1	Monitoring Location of Air Sensitive Receivers
Figure 2	Odour Patrol Points of Modified Odour Patrol
Figure 3	Monitoring Location of Water Quality Monitoring, Sediment Quality Monitoring and Benthic Survey
Figure 4	Location of the Tide Gauge
Figure 5	Location of Survey Areas of Chinese White Dolphins

# 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.: 0041/17/ED/0691

## APPENDICES

- Appendix A Project Organization Chart**
- Appendix B Action and Limit Levels for Air Quality Monitoring**
- Appendix C Graphical Presentation of Air Quality Monitoring**
- Appendix D Graphical Presentation of Water Quality Monitoring**
- Appendix E Tidal Data obtained from Ma Wan Marine Traffic Station**
- Appendix F Graphical Presentation of Sediment Quality Monitoring and Benthic Survey**
- Appendix G Environmental Complaints Log**
- Appendix H Environmental Mitigation Implementation Schedule (EMIS)**

## 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.: 0041/17/ED/0691

### EXECUTIVE SUMMARY

The Drainage Services Department (DSD) of Hong Kong Special Administrative Region has appointed Fugro Technical Services Limited (FTS) to undertake the Environmental Team services for the Project and implement the EM&A works.

This is the twenty-first Quarterly EM&A Report presents the environmental monitoring and audit works for the period between 1 August 2022 and 31 October 2022. As informed by the Contractor, major activities in the reporting period included:

#### August 2022 – October 2022

- Perform comprehensive operation and maintenance services for the electrical, mechanical and electronic systems/equipment at Siu Ho Wan Sewage Treatment Works (SHWSTW).
- Alleviate as far as practicable the impact that the facilities and sewage systems imposed on the environment of Hong Kong.

### Breaches of Action and Limit Levels

Odour patrol monitoring was resumed and carried out on January 2020. The modified odour patrol monitoring plan including updated Event and Action Plan was approved on March 2020, and modified odour patrol monitoring was commenced from 20 March 2020. No exceedances of Action/Limit levels at Air Sensitive Receivers (ASR) and odour patrol points were recorded and no non-compliance of odour monitoring at ASR were recorded in the reporting period.

Water quality monitoring, sediment quality monitoring and benthic survey were carried out on August and October 2022. No specific Action/Limit level has to be followed since the purpose of the monitoring is to collect data for future purpose.

### Complaint Log

There were no complaints received in relation to environmental impact during the reporting period.

### Notifications of Summons and Successful Prosecutions

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

### Summary of the Environmental Mitigations Measures

Mitigation measures specified in the EP and EIA Report such as aeration, chemical dosing system, covering or enclosing the pressing and sludge thickening facilities and ventilating air to a biological treatment unit prior to stack exhaust was implemented during the reporting period.

# 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.: 0041/17/ED/0691

## 1. INTRODUCTION

### 1.1 Background

- 1.1.1 The Project “Upgrading of Siu Ho Wan Sewage Treatment Works” is to upgrade Siu Ho Wan Sewage Treatment Works (SHWSTW) from the preliminary treatment level to Chemically Enhanced Primary Treatment (CEPT) level with Ultraviolet (UV) disinfection facilities. The Project is required to comply with the Environmental Permit (EP) in respect of the construction and operation phases of the Plant.
- 1.1.2 Under the Environmental Impact Assessment Ordinance (EIAO), the Project was classified as “Designated Project”. The Environmental Impact Assessment (EIA) study was completed in September 1997 with the EIA Report of Register No. EIAR-124BC, Operational EM&A Plan and the EP of No. EP-076/2000 was issued in August 2000 to Drainage Services Department (DSD).
- 1.1.3 The CEPT part has been completed and was put into operation in March 2005. The UV disinfection works were substantially completed in December 2006. It is considered that the operation of the Project shall be deemed to start when the UV disinfection facilities have been completely installed and tested.
- 1.1.4 This Quarterly EM&A report is required under Section 8.5 of the OEM&A Plan. It is to report the results and findings of the EM&A programme required in the OEM&A Plan.
- 1.1.5 This is the twenty-first quarterly OEM&A Report which summaries the impact monitoring results and audit findings for the Project within the period between 1 August 2022 and 31 October 2022.

### 1.2 Project Description

- 1.2.1 The project proponent was DSD. AECOM was commissioned by DSD as the Engineer for the Project. Allied Environmental Consultants Limited (AEC) was commissioned by DSD as the Independent Environmental Checker (IEC) in the operation phase of the Project. FTS was appointed as the ET by DSD to implement the EM&A programme for the operation phase of the Project including air quality monitoring, water quality monitoring, sediment quality and benthic survey and Chinese white dolphin (CWD) monitoring.

### 1.3 Project Organization

- 1.3.1 The project organization for environmental works is shown in **Appendix A**. The contact person and telephone numbers of key personnel for the captioned project are shown in **Table 1.1**.

**Table 1.1 Contact Persons and Telephone Numbers of Key Personnel**

Organization	Role	Contact Person	Telephone No.	Fax No.
DSD	Project Proponent Representative	Mr. Marcus Lau	2594 7218	3104 6426
AECOM	Engineer Representative (ER)	Ms. Joanne Tsoi	3922 9423	3922 9797
AEC	Independent Environmental Checker (IEC)	Ms. Grace Kwok	2815 7028	2815 5399

# 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.: 0041/17/ED/0691

FTS	ET Leader (ETL)	Mr. Colin Yung	3565 4114	2450 8032
-----	--------------------	----------------	-----------	-----------

## 1.4 Work Undertaken during the Report Period

1.4.1 During this reporting period, the principal work activities included:

<b>August 2022 - October 2022</b>
<ul style="list-style-type: none"><li>▪ Perform comprehensive operation and maintenance services for the electrical, mechanical and electronic systems/equipment at SHWSTW.</li><li>▪ Alleviate as far as practicable the impact that the facilities and sewage systems imposed on the environment of Hong Kong.</li></ul>

# 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.: 0041/17/ED/0691

## 2. SUMMARY OF EM&A REQUIREMENTS AND MONITORING RESULTS

### 2.1 Monitoring Requirement

2.1.1 In accordance with the approved OEM&A Plan, air quality monitoring (odour patrol monitoring, H<sub>2</sub>S measurement and olfactometry analysis), water quality monitoring (onsite measurement and laboratory analysis), sediment quality & benthic survey at the designated monitoring stations are required. Data interpretation for the distribution and abundance of Chinese white dolphin (CWD) from the survey undertaken by the Agriculture, Fisheries and Conservation Department (AFCD) is also required for CWD monitoring.

2.1.2 Air quality monitoring (H<sub>2</sub>S concentration monitoring and Odour patrol) should be conducted on a weekly basis for six months during initial operation stage while the odour sampling for olfactometry analysis should be conducted on the first week of the odour patrol monitoring. As advice by EPD on the odour complaint received in November 2019, odour patrol monitoring was resumed on weekly basis since January 2020 and a modified version of odour patrol monitoring is proposed and approved on 13 March 2020. According to the approved proposal for odour patrol monitoring plan (0041/17/ED/0524G), a modified version of odour patrol monitoring was commenced from 20 March 2020. The Action and Limit Levels of the air quality monitoring are given in **Appendix B**.

2.1.3 For water quality monitoring, sediment quality & benthic survey and CWD monitoring should be carried out once per two months for a period of five years.

### 2.2 Monitoring Locations

2.2.1 H<sub>2</sub>S concentration monitoring and odour sampling were temporarily suspended from 14 May 2018. According to the OEM&A Plan, odour patrol monitoring was carried out at ASR, Cheung Tung Road near the Bus Depot at the west of the Siu Ho Wan Treatment Plant. The location of ASR is shown in **Figure 1**.

2.2.2 According to the approved proposal for odour patrol monitoring plan (0041/17/ED/0524G), 9 odour patrol points is chosen to conduct the modified odour patrol from 20 March 2020 for collecting more representative data and identify the particular source of odour in the site. The nine odour patrol points are shown in **Table 2.1** and **Figure 2**.

**Table 2.1 Odour Patrol Point**

Odour Patrol Point	Description
OD1	Eastern Site Boundary
OD2	Southern Site Boundary
OD3	Western Site Boundary
OD4	Northern Site Boundary
OD5	Spur Road near Discovery Bay Tunnel Outlet
OD6	Cheung Tung Road near the Bus Depot
OD7	Cheung Tung Road near O-PARK1
OD8	Sham Shui Kok Dr near MTR Depot
OD9	Discovery Bay Tunnel Toll Plaza





Report No.: 0041/17/ED/0691

2.2.3 In accordance with Section 5 of the EM&A Plan, water quality monitoring should be carried out at 8 designated monitoring locations (2 impact stations and 6 control stations). The monitoring locations shall be the same monitoring locations that were used for the baseline monitoring programme and have been approved by EPD. The coordinates of the monitoring location is shown in **Table 2.2**. The monitoring locations of water quality monitoring, Sediment Quality Monitoring and Benthic Survey are also shown in **Figure 3**.

**Table 2.2 Location of Water Quality Monitoring, Sediment Quality Monitoring and Benthic Survey**

Sampling Location		Easting	Northing
A	The Brothers, Control Station	816 100	822 500
B	The Brothers, Control Station	816 680	822 440
C	Siu Ho Wan Outfall, Impact Station	816 800	820 180
D	Siu Ho Wan Outfall, Impact Station	817 160	820 360
E	Cheung Sok, Control Station	819 817	821 655
F	Cheung Sok, Control Station	820 158	821 922
G	Tai Ching Chau, Control Station	822 214	822 692
H	Tai Ching Chau, Control Station	822 494	822 939

**2.3 Monitoring Parameter**

2.3.1 The durations and frequencies of H<sub>2</sub>S concentration measurement, odour patrolling and odour sampling are summarized in **Table 2.3** below.

**Table 2.3 Durations and Frequencies of Air Quality Monitoring Programme**

	Duration	Frequency
H <sub>2</sub> S concentration monitoring	15 minutes	<sup>1</sup> Weekly basis for 6 months during the initial operation stage
Odour patrol		<sup>4,5</sup> Weekly basis
Odour sampling for olfactometry analysis	<sup>3</sup> 15 minutes	<sup>2</sup> First week of the odour patrol monitoring

Remark:

- 1) In case excessive odour nuisance was detected during the odour patrol monitoring or the standard of the 5 odour units cannot be complied with during the odour panel monitoring, the odour patrol monitoring and H<sub>2</sub>S concentration monitoring shall be extended for a period of three months to cater for the warm-up period of the functioning of the additional mitigation measures.
- 2) In case the relationship between H<sub>2</sub>S concentration (ppb) with the odour unit (OU/m<sup>3</sup>) cannot conclude from the correlation study carried out at the first week of the odour patrol monitoring due to invalid data, additional odour sampling for olfactometry analysis shall be carried out for the correlation study.
- 3) Sufficient air samples (approximate 60L) may be collected in less than 15 minutes during odour sampling.
- 4) As advice by EPD on the odour complaint received in November 2019, odour patrol monitoring was resumed on weekly basis from 15 January 2020.
- 5) As instruction from the company of Discovery Bay Tunnel, odour patrol monitoring at OD5 (Spur Road near Discovery Bay Tunnel Outlet) was conducted on monthly basis.

2.3.2 The monitoring parameters for water quality monitoring are summarized in **Table 2.4**.



Report No.: 0041/17/ED/0691

**Table 2.4 Parameters for Water Quality Monitoring**

Monitoring Parameters	
In-situ Measurement	Laboratory Analysis
Dissolved oxygen (mg/L)	<i>E. coli</i> (cfu/100ml)
Temperature (degree Celsius)	5-day BOD (mg/l)
pH value	Suspended Solids (mg/l)
Water depth (m)	Ammonia as N (mg/l)
Salinity (ppt)	Nitrate as N (mg/l)
Turbidity (NTU)	Nitrite as N (mg/l)
Current Speed (m/s)	Total inorganic nitrogen (mg/l)
Current Direction (degree magnetic)	Total phosphorus (soluble and particulate) (mg/l)

2.3.3 The monitoring parameters for sediment quality monitoring and benthic survey are summarized in **Table 2.5**.

**Table 2.5 Parameters for Sediment Quality Monitoring and Benthic Survey**

Monitoring Parameters	
Sediment Quality Monitoring	Rinsate Blank for Benthic Survey
Grain size profile* (i.e. Particle Size Distribution) (%)	Cadmium (µg/L)
Total organic carbon* (%)	Chromium (µg/L)
pH value	Copper (µg/L)
Ammonia as N (mg-N/kg)	Lead (µg/L)
Total nitrogen (mg-N/kg)	Mercury ((µg/L)
Total phosphorus (mg-N/kg)	Nickel (µg/L)
Cadmium (mg/kg)	Zinc (µg/L)
Chromium (mg/kg)	Arsenic (µg/L)
Copper (mg/kg)	Silver (µg/L)
Lead (mg/kg)	
Mercury (mg/kg)	
Nickel (mg/kg)	
Zinc (mg/kg)	
Arsenic (mg/kg)	
Silver (mg/kg)	

\*Grain size profile and total organic carbon is determined from the sediment sampled collected for benthic survey.



Report No.: 0041/17/ED/0691

2.3.4 Apart from the parameters listed in the **Table 2.4** and **Table 2.5**, other relevant supplementary information such as monitoring location, time, weather conditions and any special phenomena shall be also recorded.

2.3.5 The tidal data will be obtained from the tide gauge installed in Ma Wan Marine Traffic Station, managed by the Hydrographic Office of Marine Department. Location of the tide gauge is shown in **Figure 4**. Tidal data obtained from Ma Wan Marine Traffic Station is present in **Appendix E**.

**2.4 Results and Observations**

2.4.1 As advice by EPD on the odour complaint received in November 2019, odour patrol monitoring was resumed on weekly basis. The monitoring data was summarized in **Table 2.6**. The graphical presentation of air quality monitoring results is given in **Appendix C**.

**Table 2.6 Summary of Air Quality Monitoring Data in Reporting Period**

Monitoring Location	Monitoring Parameter
	Odour Patrol^ (Odour Level)
	Range
OD1	0 - 1
OD2	0 - 1
OD3	0 - 1
OD4	0 - 0
OD5	0 - 1
OD6	0 - 0
OD7	0 - 0
OD8	0 - 0
OD9	0 - 0

Remark:

^Odour Level: 0 – Not detected, 1 – Slight, 2 – Noticeable/Moderate, 3 – Strong, 4 – Extreme

2.4.2 According to the approved EM&A plan, a correlation study has to be carried out to establish the relationship of H<sub>2</sub>S concentration (ppb) with the odour unit (OU/m<sup>3</sup>). H<sub>2</sub>S measurement and olfactometry analysis conducted between August 2017 and May 2018 was considered as unlikely way to establish the relationship of H<sub>2</sub>S concentration (ppb) with the odour unit (OU/m<sup>3</sup>). Since six months air quality monitoring and additional three months air quality monitoring had been conducted according to Section 2.2 of OEM&A Plan without any complaint or non-compliance recorded, air quality monitoring was temporarily suspension on air quality monitoring was approved by EPD’s memo dated 14 May 2018. In order to recommence the monitoring, a review on air quality monitoring had been carried out to determine reasonable odour-related criteria and was submitted to EPD for approval on 24 March 2020. Comments from EPD was received on 1 April 2020 and the review is currently under revision for further submission to the EPD. Updated alternative method on air quality monitoring was submitted to IEC and the comments from IEC were received on 8 March 2021. Response to comment for updated alternative method on air quality monitoring was submitted to IEC on 30 April 2021.

2.4.3 Water quality monitoring, sediment quality monitoring and benthic survey were conducted on 17 August 2022 and 10 October 2022 to collect data for future reference in accordance with Section 5.5 and 6.5 of the Operational EM&A Plan. Heavy marine traffic and construction works from expansion of Hong Kong International Airport were observed nearby the Project site and its vicinity and may affect the water and sediment quality. The above conditions may affect monitoring results. The summaries of results collected of the monitoring were presented in the

# 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.: 0041/17/ED/0691

below tables. The graphical presentation of water quality monitoring results, sediment quality monitoring and benthic survey results are given in **Appendix D** and **Appendix F** respectively.

Table 2.7 Summary of In-situ Monitoring Results on 17 August 2022 (Depth – Average)

Monitoring Station		pH	Salinity (ppt)	Temperature (degree Celsius)	Dissolved oxygen (mg/L)	Turbidity (NTU)	Current speed (m/s)	Current velocity (degree magnetic)
A	E	8.06	22.74	28.94	5.96	6.4	0.14	62.7
	F	7.98	18.72	28.82	5.71	3.9	0.16	67.8
B	E	8.05	22.96	27.78	5.53	5.5	0.25	256.4
	F	8.00	16.87	28.78	5.68	4.2	0.16	108.2
C	E	8.06	22.69	28.58	5.54	6.8	0.16	86.4
	F	8.02	16.28	28.66	5.29	2.8	0.22	81.7
D	E	8.06	22.26	29.29	6.02	5.0	0.23	237.0
	F	8.01	14.75	28.55	5.42	3.3	0.16	296.7
E	E	7.94	22.65	28.83	5.77	3.6	0.15	125.9
	F	8.06	21.96	27.61	6.07	4.9	0.15	102.9
F	E	8.19	22.61	28.87	5.74	3.9	0.19	105.0
	F	8.07	21.97	29.12	5.94	5.5	0.26	223.3
G	E	8.09	22.75	28.88	5.74	4.2	0.18	106.8
	F	8.13	22.56	29.19	6.07	5.7	0.16	29.5
H	E	8.04	23.31	28.65	5.33	3.4	0.34	251.7
	F	8.04	23.17	28.80	5.74	1.6	0.11	85.3

Table 2.8 Summary of In-situ Monitoring Results on 10 October 2022 (Depth – Average)

Monitoring Station		pH	Salinity (ppt)	Temperature (degree Celsius)	Dissolved oxygen (mg/L)	Turbidity (NTU)	Current speed (m/s)	Current velocity (degree magnetic)
A	E	8.36	30.57	28.30	5.02	5.4	0.18	82.3
	F	8.69	31.12	28.55	5.19	4.3	0.15	77.0
B	E	8.21	31.92	27.28	4.36	4.5	0.14	195.4
	F	8.52	31.58	28.41	5.09	4.4	0.13	242.4
C	E	8.66	30.92	28.25	5.11	3.6	0.23	82.9
	F	8.49	31.15	28.44	4.75	4.6	0.20	38.6
D	E	8.71	32.89	28.52	4.69	3.0	0.16	48.6
	F	8.45	32.87	28.97	4.93	3.1	0.12	227.4
E	E	8.64	32.75	28.57	5.06	4.5	0.33	87.9
	F	8.15	31.14	28.25	4.85	3.8	0.15	251.2
F	E	8.64	31.26	31.24	5.31	4.6	0.25	69.4
	F	8.19	30.64	28.13	5.94	2.8	0.14	123.5
G	E	8.26	32.20	28.67	5.14	4.7	0.14	286.8
	F	8.65	30.82	28.26	5.26	4.2	0.23	90.1
H	E	8.19	31.40	27.56	5.52	3.6	0.26	124.8
	F	8.29	30.67	28.78	4.76	4.4	0.17	211.2

# 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.: 0041/17/ED/0691

Table 2.9 Summary of Laboratory Analysis Results on 17 August 2022 (Depth – Average)

Monitoring Station		TSS (mg/L)	NH <sub>3</sub> as N (mg/L)	NO <sub>2</sub> <sup>-</sup> as N (mg/L)	NO <sub>3</sub> <sup>-</sup> as N (mg/L)	TIN (mg/L)	E.coli (cfu/100mL)	Total P (mg/L)	BOD <sub>5</sub> (mg/L)
A	E	6	0.066	0.11	0.76	0.9	13	0.02	<1
	F	6	0.064	0.11	0.87	1.1	15	0.02	1.1
B	E	5	0.067	0.11	0.92	1.1	14	0.03	<1
	F	6	0.060	0.11	0.93	1.1	15	0.02	<1
C	E	7	0.073	0.12	0.95	1.1	1	0.02	<1
	F	5	0.060	0.12	0.79	1.0	1	0.02	<1
D	E	7	0.067	0.12	0.96	1.2	0	0.02	<1
	F	6	0.062	0.12	0.85	1.0	6	0.02	<1
E	E	6	0.083	0.12	0.93	1.1	43	0.02	<1
	F	6	0.068	0.11	0.83	1.0	44	0.02	<1
F	E	6	0.073	0.12	0.97	1.2	35	0.02	<1
	F	5	0.205	0.11	0.80	1.0	48	0.02	1.2
G	E	6	0.108	0.12	0.75	1.0	69	0.02	1.2
	F	7	0.135	0.12	0.60	0.9	52	0.02	1.3
H	E	5	0.105	0.12	0.95	1.2	62	0.02	1.1
	F	6	0.077	0.12	0.94	1.1	59	0.02	1.3

Table 2.10 Summary of Laboratory Analysis Results on 10 October 2022 (Depth – Average)

Monitoring Station		TSS (mg/L)	NH <sub>3</sub> as N (mg/L)	NO <sub>2</sub> <sup>-</sup> as N (mg/L)	NO <sub>3</sub> <sup>-</sup> as N (mg/L)	TIN (mg/L)	E.coli (cfu/100mL)	Total P (mg/L)	BOD <sub>5</sub> (mg/L)
A	E	6	0.137	0.07	0.19	0.4	195	0.03	<1
	F	5	0.160	0.07	0.23	0.5	210	0.05	<1
B	E	6	0.208	0.07	0.23	0.5	167	0.04	<1
	F	6	0.150	0.07	0.23	0.5	203	0.06	<1
C	E	6	0.195	0.07	0.30	0.5	225	0.04	<1
	F	5	0.168	0.07	0.23	0.5	207	0.04	1.1
D	E	5	0.157	0.06	0.24	0.5	215	0.04	<1
	F	5	0.167	0.24	0.18	0.5	332	0.03	<1
E	E	4	0.220	0.06	0.25	0.5	1150	0.03	<1
	F	6	0.177	0.06	0.24	0.5	1050	0.03	<1
F	E	6	0.220	0.06	0.19	0.5	1067	0.03	<1
	F	6	0.170	0.06	0.22	0.5	1550	0.04	1.6
G	E	5	0.220	0.06	0.18	0.5	737	0.04	<1
	F	8	0.147	0.06	0.23	0.5	913	0.03	2.0
H	E	6	0.148	0.06	0.16	0.4	1183	0.04	<1
	F	7	0.120	0.06	0.31	0.5	1150	0.04	1.8

Table 2.11 Summary of laboratory analysis results for sediment monitoring on 17 August 2022

Monitoring Station	pH value	NH <sub>3</sub> as N (mg/L)	Total N (mg-N/kg)	Total P (mg-P/kg)	Cd (mg/kg)	Cr (mg/kg)	Cu (mg/kg)	Pb (mg/kg)	Hg (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	As (mg/kg)	Ag (mg/kg)
A	8.3	6.2	880	1200	<0.1	22	23	29	0.07	12	83	12	0.2
B	7.9	11	1300	940	<0.1	29	30	36	0.15	16	94	10	0.3

# 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.: 0041/17/ED/0691

Monitoring Station	pH value	NH <sub>3</sub> as N (mg/L)	Total N (mg-N/kg)	Total P (mg-P/kg)	Cd (mg/kg)	Cr (mg/kg)	Cu (mg/kg)	Pb (mg/kg)	Hg (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	As (mg/kg)	Ag (mg/kg)
C	7.9	10	1200	950	0.1	29	30	37	0.11	17	94	11	0.3
D	8.1	7.4	1200	920	0.1	29	29	36	0.09	16	100	10.0	0.3
E	7.9	14	1500	1000	<0.1	32	33	40	0.17	18	100	10.0	0.4
F	7.9	18	1500	1200	<0.1	33	34	41	0.15	19	110	11.0	0.4
G	8.1	8.0	1100	1000	<0.1	29	39	36	0.10	17	110	10.0	0.3
H	7.9	12	1400	960	<0.1	21	27	25	<0.05	11	66	5.9	0.2

Table 2.12 Summary of laboratory analysis results for sediment monitoring on 10 October 2022

Monitoring Station	pH value	NH <sub>3</sub> as N (mg/L)	Total N (mg-N/kg)	Total P (mg-P/kg)	Cd (mg/kg)	Cr (mg/kg)	Cu (mg/kg)	Pb (mg/kg)	Hg (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	As (mg/kg)	Ag (mg/kg)
A	8.2	13	1100	380	<0.1	25	24	31	0.14	15	78	12	0.2
B	8.2	10	1200	340	<0.1	27	29	32	0.11	16	84	11	0.3
C	8.0	16	1500	400	<0.1	32	33	37	0.13	19	95	11	0.3
D	8.0	11	1500	410	<0.1	29	29	35	0.13	17	88	11	0.3
E	7.9	20	1500	450	<0.1	30	33	34	0.12	18	94	10	0.3
F	8.0	32	1500	500	<0.1	33	34	37	0.14	19	98	11	0.3
G	8.1	6.2	850	340	<0.1	18	31	25	0.06	11	63	8.3	0.2
H	8.1	10	1100	400	<0.1	22	30	27	0.08	13	76	7.4	0.3

Table 2.13 Summary of laboratory analysis results for benthic survey

Monitoring Date	Monitoring Station	Total organic carbon (%)	Grain size profile (%)				Description
			Gravel	Sand	Silt	Clay	
17 August 2022	A	0.91	0	5	50	45	Moist, dark grey, slightly gravelly, slightly sandy SILT/CLAY with shell fragments
	B	0.73	0	19	37	44	Moist, dark grey, slightly gravelly, slightly sandy SILT/CLAY with shell fragments
	C	0.90	5	43	22	30	Moist, dark grey, slightly gravelly, sandy SILT/CLAY with shell fragments
	D	0.81	1	11	40	48	Moist, dark grey, slightly gravelly, slightly sandy SILT/CLAY with shell fragments
	E	0.95	0	4	42	54	Moist, dark grey, slightly gravelly, slightly sandy SILT/CLAY with shell fragments
	F	0.90	0	1	43	56	Moist, dark grey, slightly sandy SILT/CLAY with shell fragments
	G	0.66	3	13	37	47	Moist, dark grey, slightly gravelly, slightly sandy SILT/CLAY with shell fragments
	H	0.74	0	4	39	57	Moist, dark grey, slightly gravelly, slightly sandy SILT/CLAY with shell fragments

# 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.: 0041/17/ED/0691

Monitoring Date	Monitoring Station	Total organic carbon (%)	Grain size profile (%)				Description
			Gravel	Sand	Silt	Clay	
10 October 2022	A	1.0	0	27	27	46	Moist, grey, slightly gravelly, slightly sandy SILT/CLAY
	B	0.8	2	21	33	44	Moist, grey, slightly gravelly, slightly sandy SILT/CLAY
	C	1.2	1	5	40	54	Moist, grey, slightly gravelly, slightly sandy SILT/CLAY
	D	0.9	1	8	39	52	Moist, grey, slightly gravelly, slightly sandy SILT/CLAY
	E	1.6	0	4	39	57	Moist, grey, slightly gravelly, slightly sandy SILT/CLAY
	F	1.2	0	2	36	62	Moist, grey, slightly gravelly, slightly sandy SILT/CLAY
	G	1.7	4	10	37	49	Moist, grey, slightly gravelly, slightly sandy SILT/CLAY with shell fragments
	H	1.3	1	7	39	53	Moist, grey, slightly gravelly, slightly sandy SILT/CLAY with shell fragments

2.4.4 The benthic survey results are analyzed and presented as below:

I. August 2022

II. Abundance

A total of 437 benthic organisms were recorded from the eight monitoring stations during August 2022 monitoring period. Current monitoring results showed lower total monthly abundance compared to both dry (March 2004) and wet (August 2004) seasons baseline data results. Similar with previous monitoring periods, total monthly abundance of benthic organisms exhibits significant seasonal variation (F-value = 4.56; F-crit = 1.53; p-value = 7.64E-11;  $\alpha = 0.05$ ).

In terms of spatial distribution, the lowest abundance of 26 ind. was recorded in the reference station, Station H, while the highest (84 ind.) was also noted in other reference station, Station B. Total macrobenthic abundances, similar with the previous monitoring periods, showed statistically significant spatial distribution (F-value = 3.55; F-crit = 2.05; P-value = 0.001;  $\alpha = 0.05$ ).

III. Biomass

The total wet biomass recorded in the eight monitoring stations was 42.51 g with the highest biomass recorded in the reference station, Station A (20.01 g) while the lowest biomass (0.15 g) was observed in the reference station, Station H. Relative to the June 2022 period, a general increase in biomass was observed during the current monitoring period. Most of the current increase was attributed to the biomass increase of Trypauchen and Styela in the benthic community.

IV. Taxonomic Composition

A total of five phyla comprising of 18 families and about 22 genera were identified. During the current monitoring period, the annelids (88.56%) dominated the



Report No.: 0041/17/ED/0691

macrobenthic assemblage, followed by the molluscs (8.47%). Relative to June 2022 community assemblage, current results showed that annelids still maintained to dominate the community.

The dominance of annelids in the community assemblage was still noted as it is still wet season during the current survey.

V. Diversity

Benthic diversity index (H') in the impact stations ranged from 1.06 to 1.40. In the reference stations, H' values ranged from 0.92 to 1.35. Currently, reference station, Station D had the highest diversity value among the different monitoring stations, while the lowest was the reference station, Station B. In terms of evenness index (J) values, impact Station D was noted with relatively high value as compared to other monitoring stations. Moreover, current monitoring results indicated an overall increase in both diversity and evenness values from the baseline survey condition.

Table 2.14 Summary of Benthic Survey Data on 17 August 2022

Station	Abundance (ind.)	Total Biomass (g)	Number of Taxa	Diversity (H')	Evenness (J)
A	62	20.01	9	1.09	0.49
B	84	12.20	8	0.92	0.44
C	53	0.39	7	1.06	0.54
D	68	4.46	6	1.40	0.78
E	49	1.41	8	1.33	0.64
F	45	0.62	6	1.35	0.75
G	50	3.28	7	1.11	0.57
H	26	0.15	5	1.10	0.68

VI. October 2022

VII. Abundance

A total of 347 benthic organisms were recorded from the eight monitoring stations during the October 2022 monitoring period. Current monitoring results showed lower total monthly abundance compared to both dry (March 2004) and wet (August 2004) seasons baseline data results. The current decrease in overall abundance may be attributed to the decrease in *Trypauchen* and *Styela* abundance which could have been due to the concurrent increase in ammonia of the sediments relative to August 2022 data. As shown in several studies, higher levels of ammonia may cause lower macrobenthic density (Lai et al., 2020). Similar with previous monitoring periods, total monthly abundance of benthic organisms exhibits significant seasonal variation (F-value = 4.52; F-crit = 1.54; p-value = 2.05E-10;  $\alpha$  = 0.05).

In terms of spatial distribution, the lowest abundance of 20 ind. was recorded in the impact station, Station C, while the highest (68 ind.) was also noted in other impact station, Station D. Total macro-benthic abundances, similar with the previous monitoring periods, showed statistically significant spatial distribution (F-value = 3.62; F-crit = 2.05; P-value = 0.001;  $\alpha$  = 0.05).





Report No.: 0041/17/ED/0691

VIII. Biomass

The total wet biomass recorded in the eight monitoring stations was 7.84 g with the highest biomass recorded in the reference station, Station G (3.13 g) while the lowest biomass (0.19 g) was observed in the reference station, Station F. Relative to the August 2022 period, a decrease in biomass was observed during the current monitoring period. Most of the current decrease was attributed to the biomass decrease of *Trypauchen* and *Styela* in the benthic community.

IX. Taxonomic Composition

A total of six phyla comprising of 20 families and 24 genera were identified. During the current monitoring period, the annelids (76.66%) dominated the macro-benthic assemblage, followed by the molluscs (10.95%). Relative to the August 2022 community assemblage, current results showed that the annelids still maintained their dominance of the community.

The dominance of annelids in the community assemblage was still noted as it is still wet season during the current survey.

X. Diversity

Benthic diversity index ( $H'$ ) in the impact stations ranged from 1.47 to 1.59. In the reference stations,  $H'$  values ranged from 1.62 to 2.18. Currently, reference station, Station G had the highest diversity value among the different monitoring stations, while the lowest was the reference station, Station F. In terms of evenness index ( $J$ ) values, impact Station D was noted with relatively high value as compared to other monitoring stations. Moreover, current monitoring results indicated an overall increase in both diversity and evenness values from the baseline survey condition.

Table 2.15 Summary of Benthic Survey Data on 17 October 2022

Station	Abundance (ind.)	Total Biomass (g)	Number of Taxa	Diversity ( $H'$ )	Evenness ( $J$ )
A	57	0.84	10	1.90	15.57
B	43	0.49	11	1.90	17.13
C	20	0.68	7	1.47	18.19
D	68	0.49	12	1.59	25.98
E	55	1.59	12	2.09	16.26
F	32	0.19	7	1.62	14.58
G	38	3.13	11	2.18	14.08
H	34	0.43	10	2.10	13.46

2.4.5 The latest AFCD's report dated 7 July 2022, "*Monitoring of Marine Mammals in Hong Kong Waters (2021-22)*", in terms of the distribution and abundance of CWDs, was reviewed in the Monthly EM&A report in August 2022. The discharge point of Siu Ho Wan outfall is situated at a location about 1km off Northeast Lantau (NEL), as such our scope shall solely focus on CWDs findings within this area. The increased amount of sewage discharged from Siu Ho Wan Sewage Treatment Works has been identified as a potential issue of concern for CWDs. Referring to the latest AFCD's report, "*Monitoring of Marine Mammals in Hong Kong Waters (2021-22)*", 165 line-transact vessel surveys with a total survey effort of 6.566.1km was conducted amongst 10 survey areas in Hong Kong from April 2021 to March 2022; the survey areas included NEL,

## 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.: 0041/17/ED/0691

Northwest Lantau (NWL), West Lantau (WL), Southwest Lantau (SWL), Southeast Lantau (SEL), Deep Bay (DB), Lamma (LM), Po Toi (PT), Ninepins (NP), and Sai Kung (SK). Additionally, under the Hong Kong-Zhuhai-Macao Bridge related EM&A, supplementary surveys with a survey effort of 3,325.2km were conducted at NEL and NWL, bringing the total survey effort to 4,592.8km in North Lantau waters.

- 2.4.6 During the 12-month monitoring period – from the AFCD monitoring surveys, 158 groups of 554 CWDs were sighted from April 2021 to March 2022. Additionally, the complementary sighting contributed from HZMB-related EM&A surveys, a total of 170 groups of 582 dolphin were sighted altogether during the 12-month monitoring period. Among them, 160 groups of 552 dolphins were sighted during the on-effort line-transect vessel surveys while the remaining numbers were sighted during the off-effort search.
- 2.4.7 During the 2021-2022 monitoring period, dolphin sightings were only made in the WL (124 sightings), SWL (31), and NWL (15) survey areas. Despite a significant amount of effort has been made, no sighting occurred in DB, NEL, SEL, or EL survey areas. As in previous monitoring periods, no dolphin was sighted in LM, PT or NP survey areas where porpoises primarily occur on a regular basis.
- 2.4.8 The associated impact of increased effluent discharged from Siu Ho Wan outfall on the CWDs is not mentioned in this report. Despite the combined effort of the AFCD and HZMB-related surveys, only a handful of dolphin sightings were made at the western end of the NWL area. However, there were no dolphins sighted at the central and eastern portions of North Lantau waters, including most of the peripheral of the Three Runway System (3RS) project work zone and the footprints of the HZMB at the juncture of NWL and NEL survey areas.
- 2.4.9 Regarding the habit use pattern of dolphins in the North Lantau region, an alarming decline has been well documented within the Brothers Marine Park and the Sha Chau and Lung Kwu Chau Marine Park in recent years, with the occurrence has noticeably diminished since 2013. Such a trend continued, and there is a complete absence of dolphins in NEL waters as no dolphin sighting was reported in recent AFCD surveys in consecutive years (2015-2021). Moreover, the continuous absence of dolphins in the central and eastern parts of the region since 2015 is of great concern, as no apparent signs of recovery in habitat use have been observed even after the completion of marine work associated with the HZMB construction in 2016, and the major reclamation works associated with the 3RS expansion in 2020. Continuous acoustic monitoring is critical to detect any signs of dolphin despite the recovery remains at very low levels.
- 2.4.10 According to the advice from AFCD, the data of distribution and abundance of CWDs would only be available in the annual reports for Monitoring of Marine Mammals In Hong Kong Waters which cover monitoring data from 1 April to 31 March (next year). The updated status of the distribution and abundance of CWDs will be provided once the annual report (2022-23) is uploaded to AFCD's webpage.

## 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.: 0041/17/ED/0691

### 3. ADVICE ON IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES

#### 3.1 Implementation Status

- 3.1.1 Although no site inspection was prescribed during the operation of the Plant in accordance with the approved EM&A Plan, SHWSTW is reminded to fully and properly implement mitigation measures specified in the EP and EIA Report. Mitigation measures such as aeration, chemical dosing system, covering or enclosing the pressing and sludge thickening facilities and ventilating air to a biological treatment prior to stack exhaust was implemented in the reporting period. A summary of mitigation measures implementation schedule is provided in **Appendix H**.

## 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.: 0041/17/ED/0691

### 4. ADVICE ON THE SOLID AND LIQUID WASTE MANAGEMENT STATUS

4.1.1 SHWSTW is reminded to fully comply with EP conditions. All measures and recommendations in the EP, EIA Report and approved waste management plan shall be fully and properly implemented. During the reporting period, following measures in related to solid and liquid waste management was implemented:

- The influent of waste water shall be treated by CEPT with UV disinfection;
- Trip-ticket system shall be implemented for sludge and sediment;
- The acceptance criteria for Landfill disposal should be followed;
- Chemical waste should be properly handled and stored temporarily in designated chemical waste storage area on site in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes.

4.1.2 A summary of mitigation measures implementation schedule is provided in **Appendix H**.

## 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.: 0041/17/ED/0691

### **5. SUMMARY OF EXCEEDANCE OF THE ENVIRONMENTAL QUALITY PERFORMANCE LIMITS**

- 5.1.1 Odour patrol monitoring was resumed from January 2020 and carried out in the reporting period. No exceedances of Action/Limit levels at ASRs were recorded.
- 5.1.2 Water quality monitoring, sediment quality monitoring and benthic survey were carried out on 17 August 2022 and 10 October 2022. No specific Action/Limit level has to be followed since the purpose of the monitoring is to collect data for future purpose.

# 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.: 0041/17/ED/0691

## 6. SUMMARY OF ENVIRONMENTAL COMPLAINTS

6.1.1 No complaint (written or verbal), inspection notice, notification of summons or prosecution was received in relation to environmental impact during the report period. Summaries of complaints, notification of summons and successful prosecutions are presented in **Table 6.1** and **Table 6.2**.

**Table 6.1 Cumulative Statistics on Complaints**

Environmental Parameters	Cumulative No. Brought Forward	No. of Complaints This Month	Cumulative Project-to-Date
Air	0	0	1
Noise	0	0	0
Water	0	0	0
Waste	0	0	0
Others	0	0	0
Total	0	0	0

**Table 6.2 Cumulative Statistics on Notification of Summons and Successful Prosecutions**

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

6.1.2 The cumulative complaint log and summaries of complaints are presented in **Appendix G**.

## 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.: 0041/17/ED/0691

### 7. CONCLUSION

- 7.1.1 Odour patrol monitoring was resumed from January 2020 and carried out in the reporting period. The modified odour patrol monitoring plan including updated Event and Action Plan was approved on March 2020, and was commenced from 20 March 2020. No exceedances of Action/Limit levels at Air Sensitive Receivers (ASR) and odour patrol points were recorded and no non-compliance of odour monitoring at odour patrol points were recorded in the reporting period.
- 7.1.2 According to the approved EM&A plan, a correlation study has to be carried out to establish the relationship of H<sub>2</sub>S concentration (ppb) with the odour unit (OU/m<sup>3</sup>). H<sub>2</sub>S measurement and olfactometry analysis conducted between August 2017 and May 2018 was considered as unlikely way to establish the relationship of H<sub>2</sub>S concentration (ppb) with the odour unit (OU/m<sup>3</sup>). Since six months air quality monitoring and additional three months air quality monitoring had been conducted according to Section 2.2 of OEM&A Plan without any complaint or non-compliance recorded, air quality monitoring was temporarily suspension on air quality monitoring was approved by EPD's memo dated 14 May 2018. In order to recommence the monitoring, a review on air quality monitoring had been carried out to determine reasonable odour-related criteria and was submitted to EPD for approval on 24 March 2020. Comments from EPD was received on 1 April 2020 and the review is currently under revision for further submission to the EPD. Updated alternative method on air quality monitoring was submitted to IEC and the comments from IEC were received on 8 March 2021. Response to comment for updated alternative method on air quality monitoring was submitted to IEC on 30 April 2021.
- 7.1.3 Water quality monitoring, sediment quality monitoring and benthic survey were conducted on 17 August 2022 and 10 October 2022 to collect data for future reference in accordance with Section 5.5 and 6.5 of the Operational EM&A Plan. The details of methodology and results collected of the monitoring were presented in Section 2. Heavy marine traffic and construction works from expansion of Hong Kong International Airport were observed nearby the Project site and its vicinity and may affect the water and sediment quality. The above conditions may affect monitoring results.
- 7.1.4 The latest AFCD's report dated 7 July 2022, "*Monitoring of Marine Mammals in Hong Kong Waters (2021-22)*", in terms of the distribution and abundance of CWDs, was reviewed in the Monthly EM&A report in August 2022. According to the advice from AFCD, the data of distribution and abundance of CWDs would only be available in the annual reports for Monitoring of Marine Mammals In Hong Kong Waters which cover monitoring data from 1 April to 31 March (next year). The updated status of the distribution and abundance of CWDs will be provided once the annual report (2022-23) is uploaded to AFCD's webpage.
- 7.1.5 SHWSTW is reminded to fully comply with EP conditions. All environmental mitigation measures and recommendations in the EP, EIA Report and approved waste management plan shall be fully and properly implemented.
- 7.1.6 No complaint (written or verbal), inspection notice, notification of summons or prosecution was received in relation to environmental impact during the report period.
- 7.2 Comment and Recommendations
- 7.2.1 The recommended environmental mitigation measures, as proposed in the EIA reports and OEM&A Plan were effectively and efficiently minimize the potential environmental impacts from

## 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.: 0041/17/ED/0691

the Project. Therefore, no complaint or non-compliance of monitoring were recorded during the reporting period. As inadequacy of representative data was result between August 2017 and May 2018, current H<sub>2</sub>S measurement and olfactometry analysis was considered as unlikely way to establish the relationship of H<sub>2</sub>S concentration (ppb) with the odour unit (OU/m<sup>3</sup>). Alternative methods shall be proposed and submitted for EPD's approval to ensure that EM&A programme could effectively monitor the environmental impacts generated from the site and ensure the proper implementation of mitigation measure.

7.2.2 According to the environmental monitoring performed in the reporting period, the following recommendations were made:

### Air Quality Monitoring

- Since six months air quality monitoring and additional three months air quality monitoring had been conducted according to Section 2.2 of OEM&A Plan without any complaint or non-compliance recorded, air quality monitoring was temporarily suspension on air quality monitoring was approved by EPD's memo dated 14 May 2018. In order to recommence the monitoring, a review on air quality monitoring had been carried out to determine reasonable odour-related criteria and was submitted to EPD for approval on 24 March 2020. Comments from EPD was received on 1 April 2020 and the review is currently under revision for further submission to the EPD. Updated alternative method on air quality monitoring was submitted to IEC and the comments from IEC were received on 8 March 2021. Response to comment for updated alternative method on air quality monitoring was submitted to IEC on 30 April 2021.

### Water Quality Monitoring

- No specific observation was identified in the reporting period.

### Sediment Quality Monitoring and Benthic Survey

- No specific observation was identified in the reporting period.

### Chinese White Dolphin Monitoring

- No specific observation was identified in the reporting period.



# 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




---

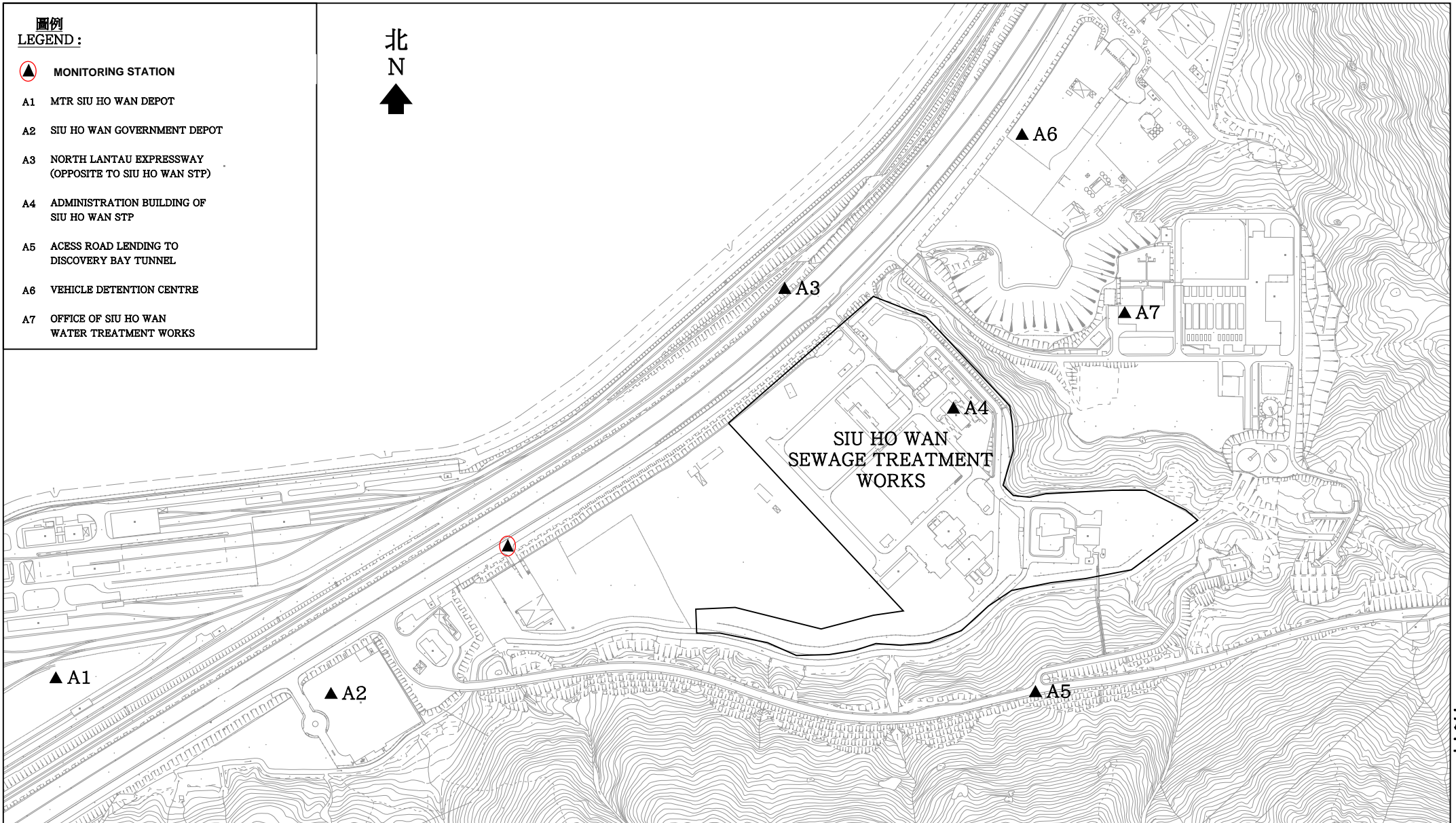
Report No.: 0041/17/ED/0691


## Figure 1

Monitoring Location of Air Sensitive Receiver

**圖例**  
**LEGEND :**

-  **MONITORING STATION**
- A1** MTR SIU HO WAN DEPOT
- A2** SIU HO WAN GOVERNMENT DEPOT
- A3** NORTH LANTAU EXPRESSWAY  
(OPPOSITE TO SIU HO WAN STP)
- A4** ADMINISTRATION BUILDING OF  
SIU HO WAN STP
- A5** ACCESS ROAD LENDING TO  
DISCOVERY BAY TUNNEL
- A6** VEHICLE DETENTION CENTRE
- A7** OFFICE OF SIU HO WAN  
WATER TREATMENT WORKS



<p>圖則名稱 drawing title</p> <p><b>UPGRADING OF SIU HO WAN SEWAGE TREATMENT PLANT OPTIONAL ENVIRONMENTAL MONITORING AND AUDIT PLAN ODOUR PATROL MONITORING STATIONS</b></p>	繪畫 drawn	C.W. CHAN	日期 date 16-08-2006	圖則編號 drawing no.	比例 scale	
	核對 checked	C.K. LAM	日期 date 16-08-2006	<b>DCM/2006/063</b>	N.T.S.	
	批核 approved	S.K. WONG	日期 date 16-08-2006	保留版權 COPYRIGHT RESERVED		
	部門 office	顧問工程管理部 CONSULTANTS MANAGEMENT DIVISION		 <p>香港特別行政區政府渠務署 DRAINAGE SERVICES DEPARTMENT GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION</p>		

# 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



---

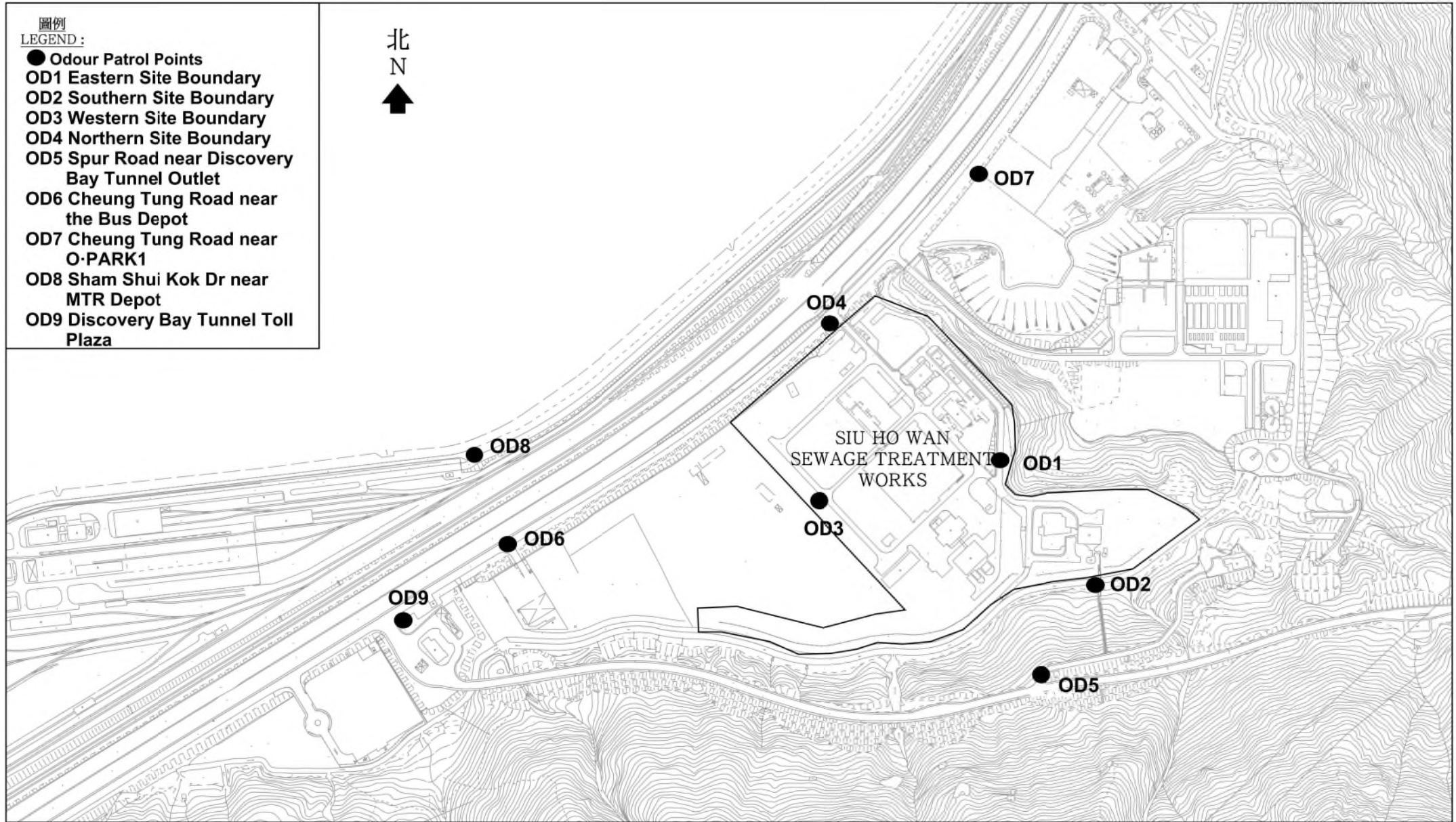
Report No.: 0041/17/ED/0691

## Figure 2

Odour Patrol Points of Modified Odour Patrol

圖例  
LEGEND:

- Odour Patrol Points
- OD1 Eastern Site Boundary
- OD2 Southern Site Boundary
- OD3 Western Site Boundary
- OD4 Northern Site Boundary
- OD5 Spur Road near Discovery Bay Tunnel Outlet
- OD6 Cheung Tung Road near the Bus Depot
- OD7 Cheung Tung Road near O-PARK1
- OD8 Sham Shui Kok Dr near MTR Depot
- OD9 Discovery Bay Tunnel Toll Plaza



# 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.: 0041/17/ED/0691

## Figure 3

Monitoring Location of Water Quality Monitoring, Sediment Quality Monitoring and Benthic Survey



816000E

818000E

820000E

822000E

822000N

大小磨刀  
BROTHERS

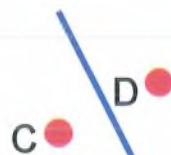
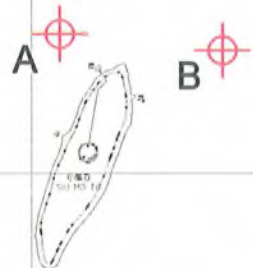
820000N

## CO-ORDINATES OF CONTROL STATIONS :

CONTROL STATION No.	CO-ORDINATES	
	NORTHING	EASTING
A	822500	816100
B	822440	816680
E	821655	819817
F	821922	820158
G	822692	822214
H	822939	822494

## CO-ORDINATES OF IMPACT STATIONS :

IMPACT STATION No.	CO-ORDINATES	
	NORTHING	EASTING
C	820180	816800
D	820360	817160

圖例  
LEGEND :

- IMPACT STATION
- ⊕ CONTROL STATION
- SUBMARINE OUTFALL

圖則名稱 drawing title

UPGRADING OF SIU HO WAN SEWAGE TREATMENT PLANT  
BASELINE MONITORING - LOCATION OF MONITORING STATIONS

繪畫 drawn

H.K. LAI

日期 date

06-02-2004

核對 checked

C.K. LAM

日期 date

04-03-2004

批核 approved

S.K. WONG

日期 date

04-03-2004

部門 office

顧問工程管理部

CONSULTANTS MANAGEMENT DIVISION

圖則編號 drawing no.

DCM/2004/002

比例 scale

N.T.S.

保留版權

COPYRIGHT RESERVED



香港特別行政區政府渠務署  
DRAINAGE SERVICES DEPARTMENT  
GOVERNMENT OF THE  
HONG KONG  
SPECIAL ADMINISTRATIVE REGION

# 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.: 0041/17/ED/0691

## Figure 4 Location of the Tide Gauge

# 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



Location of the Tide Gauge

Source: Google Maps

The copyright of this document is owned by Fugro Technical Services Limited. It may not be reproduced except with prior written approval from the Company.



# 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

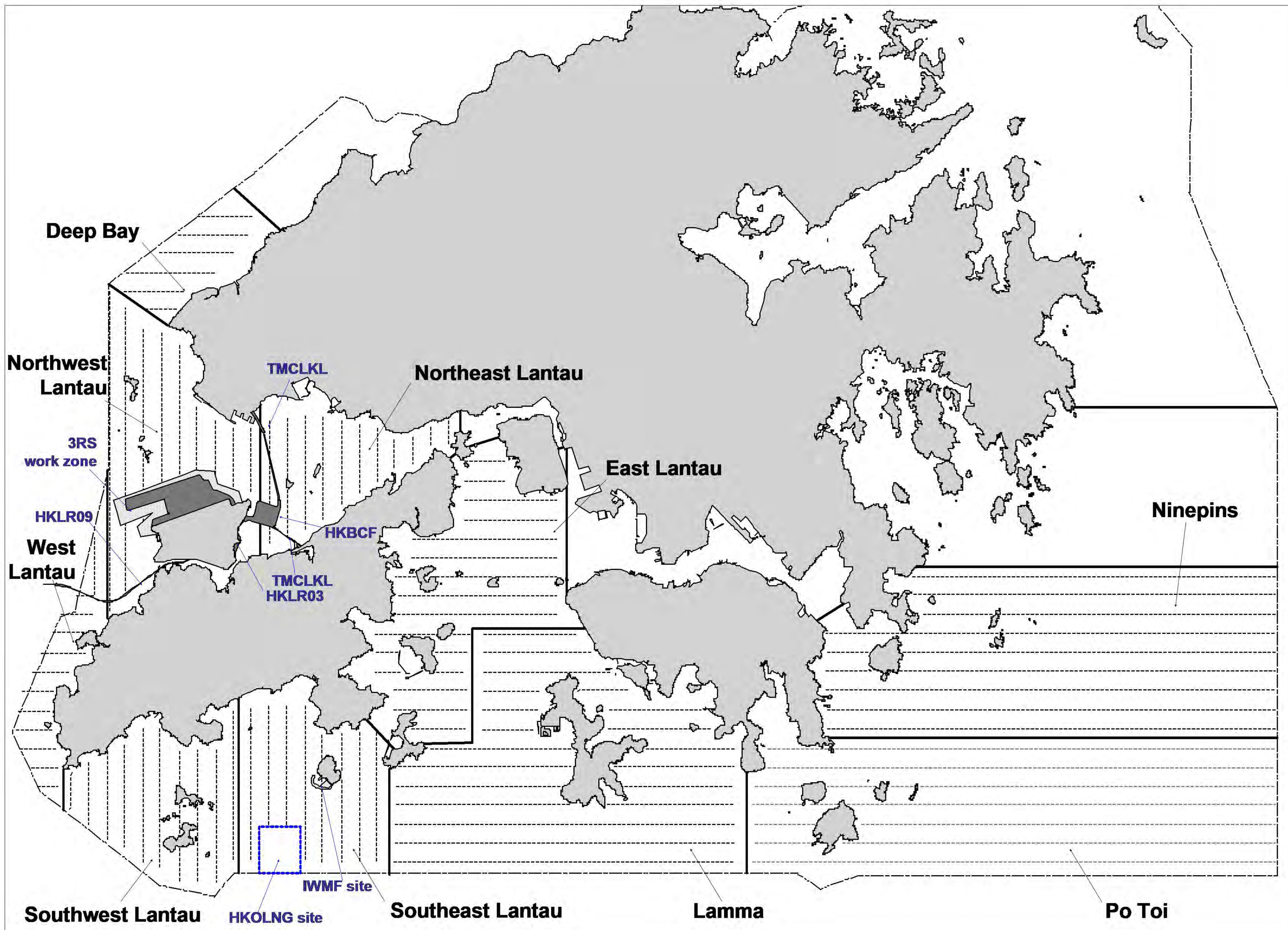


---

Report No.: 0041/17/ED/0691

## Figure 5

Location of Survey Areas of Chinese White Dolphins



Ten Line-Transect Survey Areas within the Study Area chosen for the 2021-22 AFCD Monitoring Study

# 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.: 0041/17/ED/0691

## Appendix A Project Organization Chart

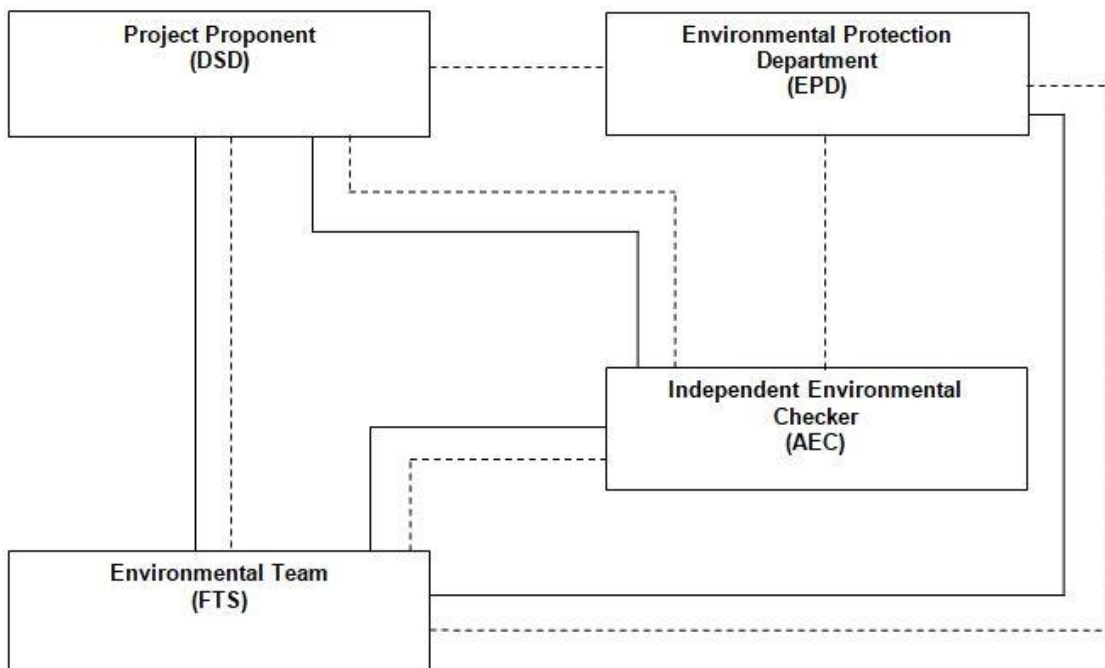
# FUGRO TECHNICAL SERVICES LIMITED

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.: 0041/17/ED/0691



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



---

Report No.: 0041/17/ED/0691

## Appendix B

### Action and Limit Levels for Air 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.: 0041/17/ED/0691

## Action and Limit Levels for Air Quality Monitoring

Parameter	Action	Limit
Odour Nuisance	One complaint received for specific odour event / Odour intensity of 2 or above is measured from odour patrol	Two or more independent complaints received for specific odour event in 3 months / Odour intensity of 3 or above is measured from odour patrol

# 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

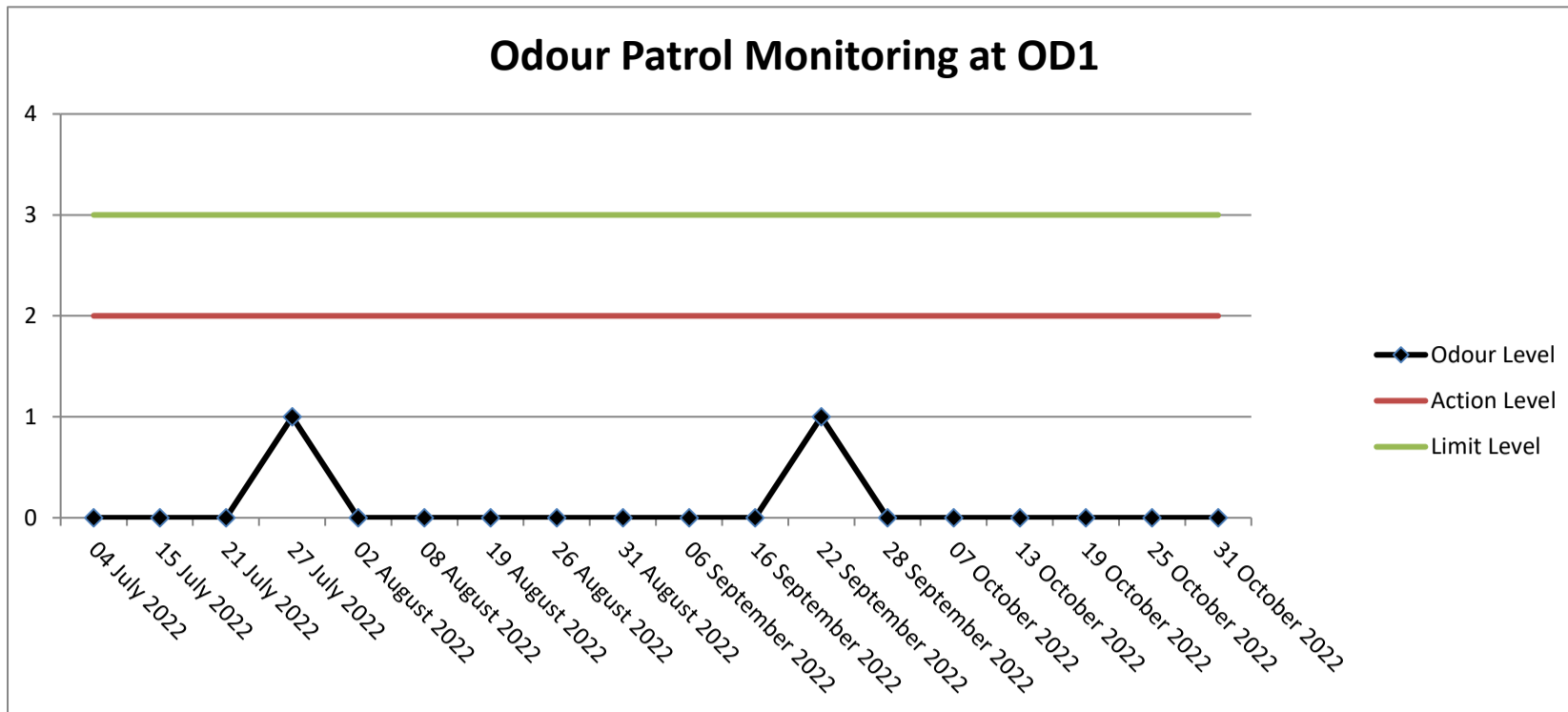


---

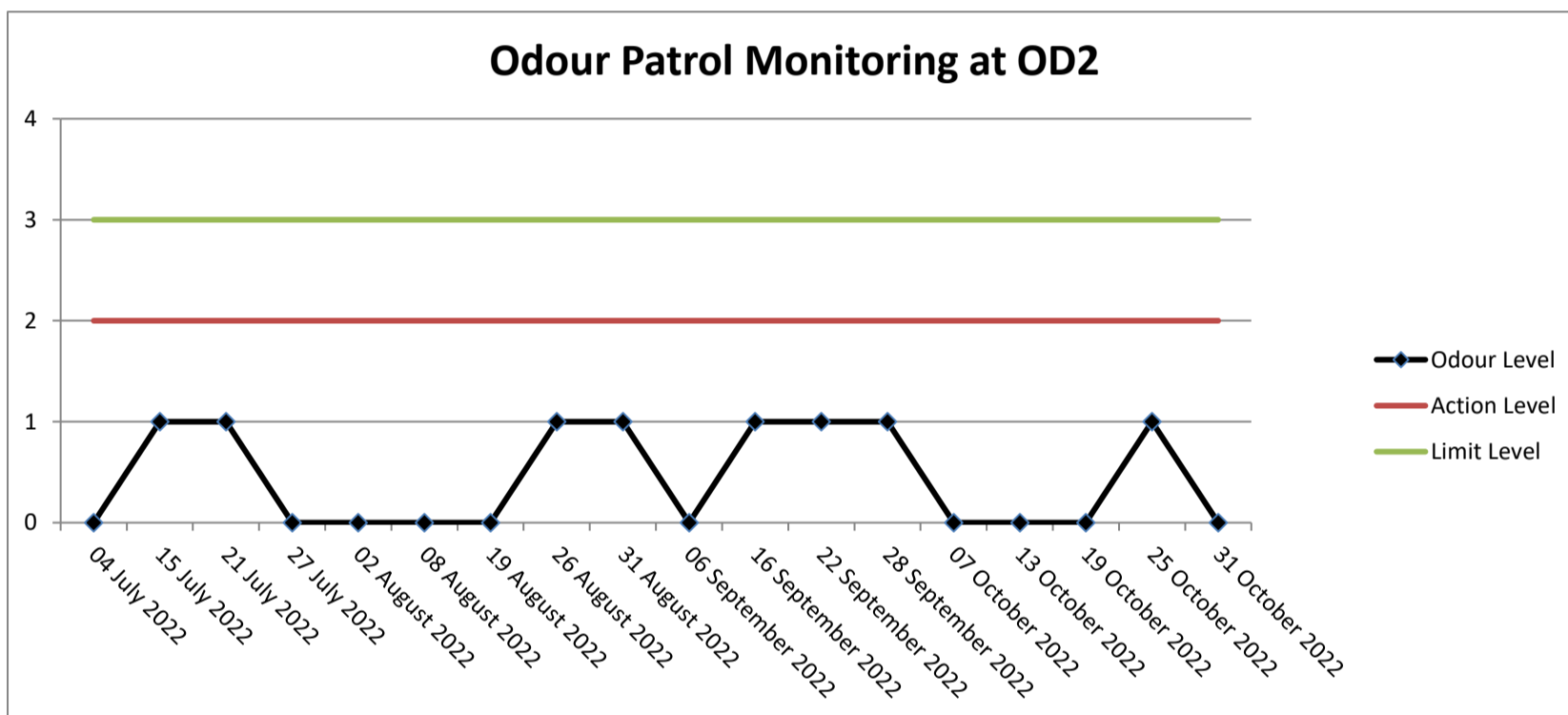
Report No.: 0041/17/ED/0691

## Appendix C

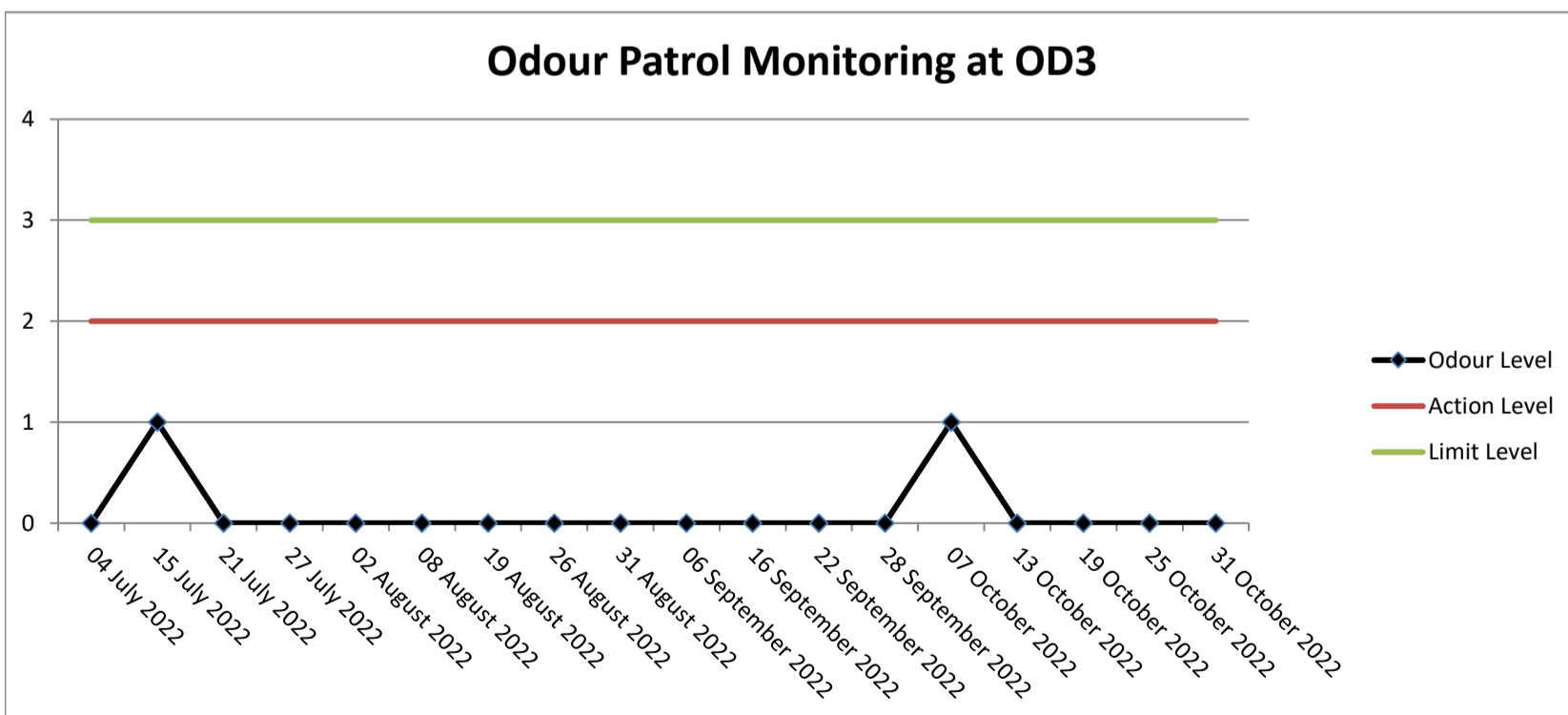
### Graphical Presentation of Air Quality Monitoring



Note:  
Y-axis refers to the Odour Level: 0 - Not Detected; 1- Slight; 2 - Moderate; 3 - Strong; 4 - Extreme

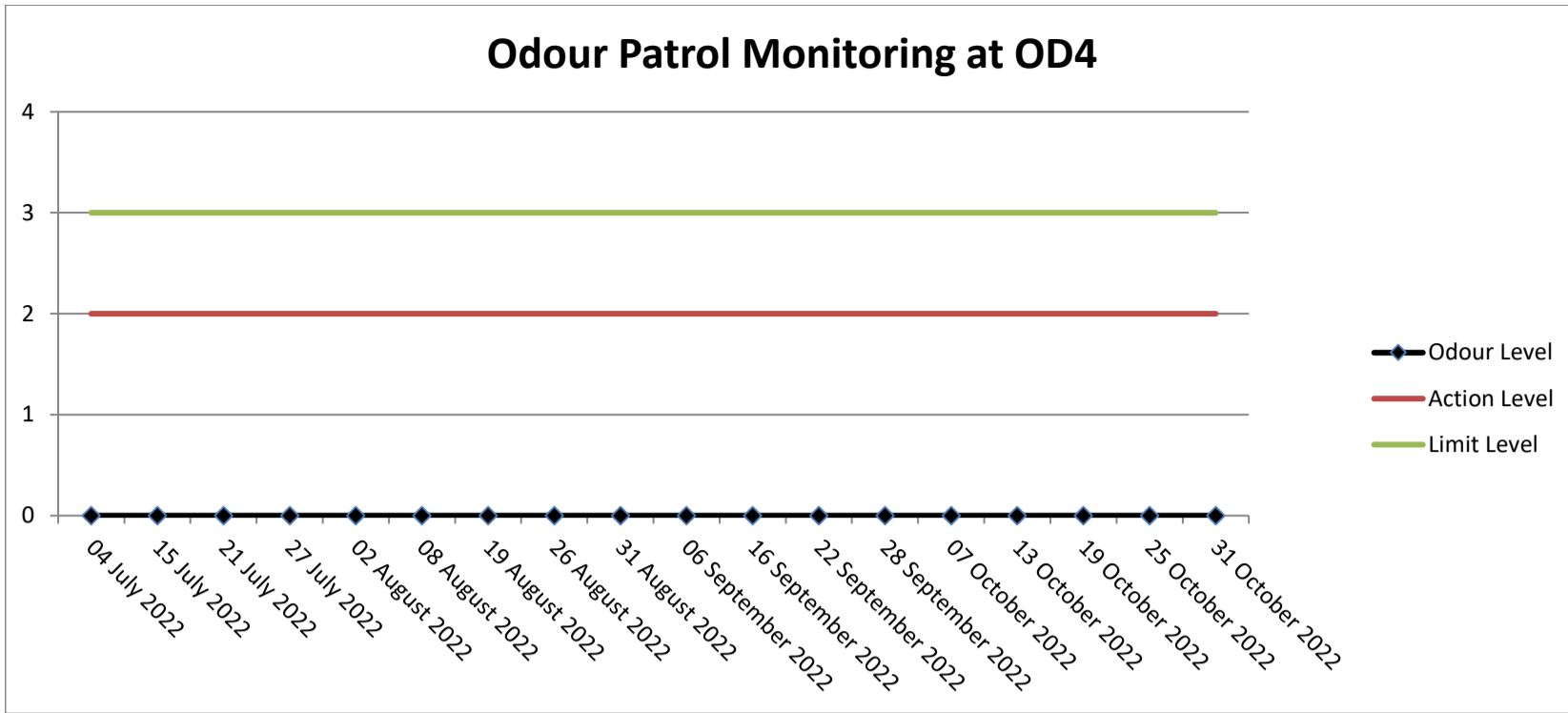


Note:  
Y-axis refers to the Odour Level: 0 - Not Detected; 1- Slight; 2 - Moderate; 3 - Strong; 4 - Extreme

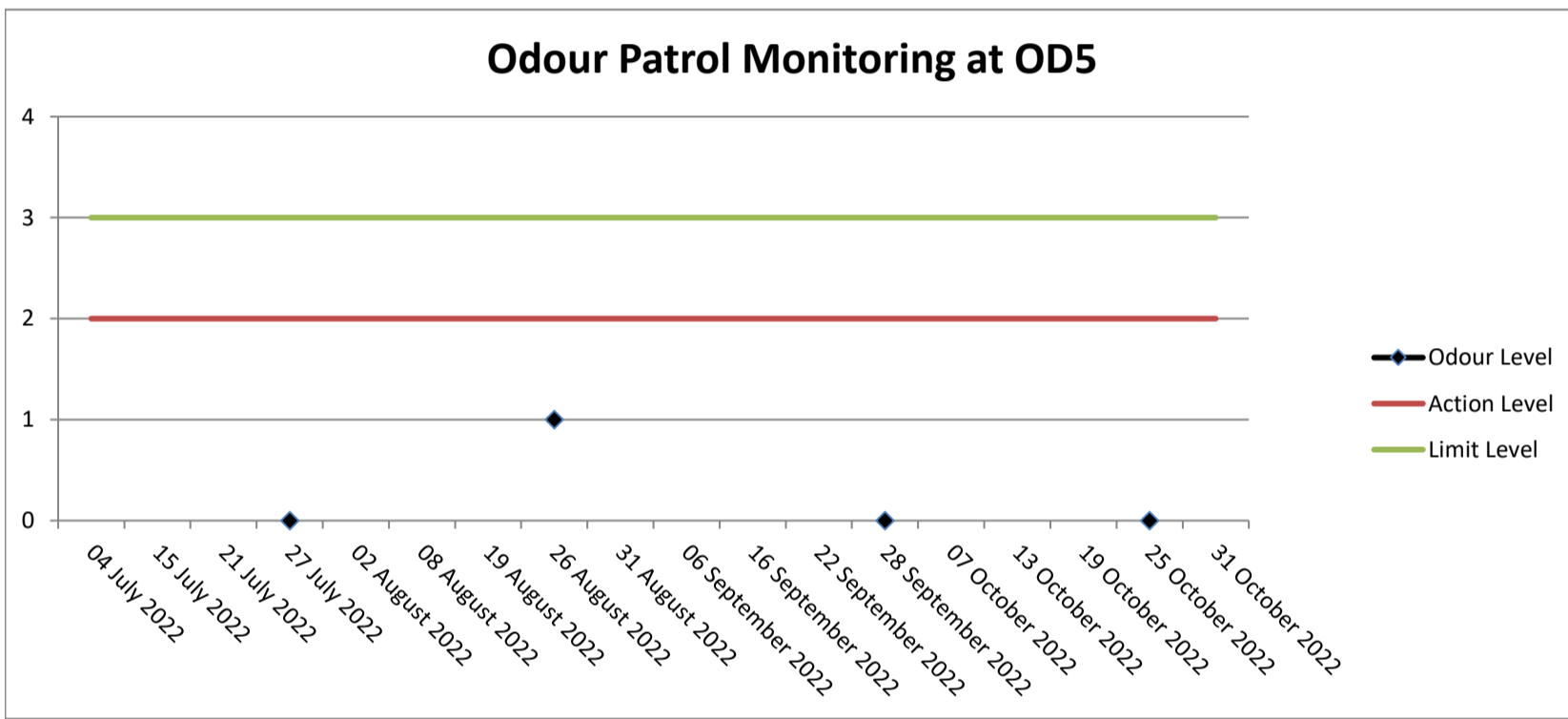


Note:  
Y-axis refers to the Odour Level: 0 - Not Detected; 1- Slight; 2 - Moderate; 3 - Strong; 4 - Extreme

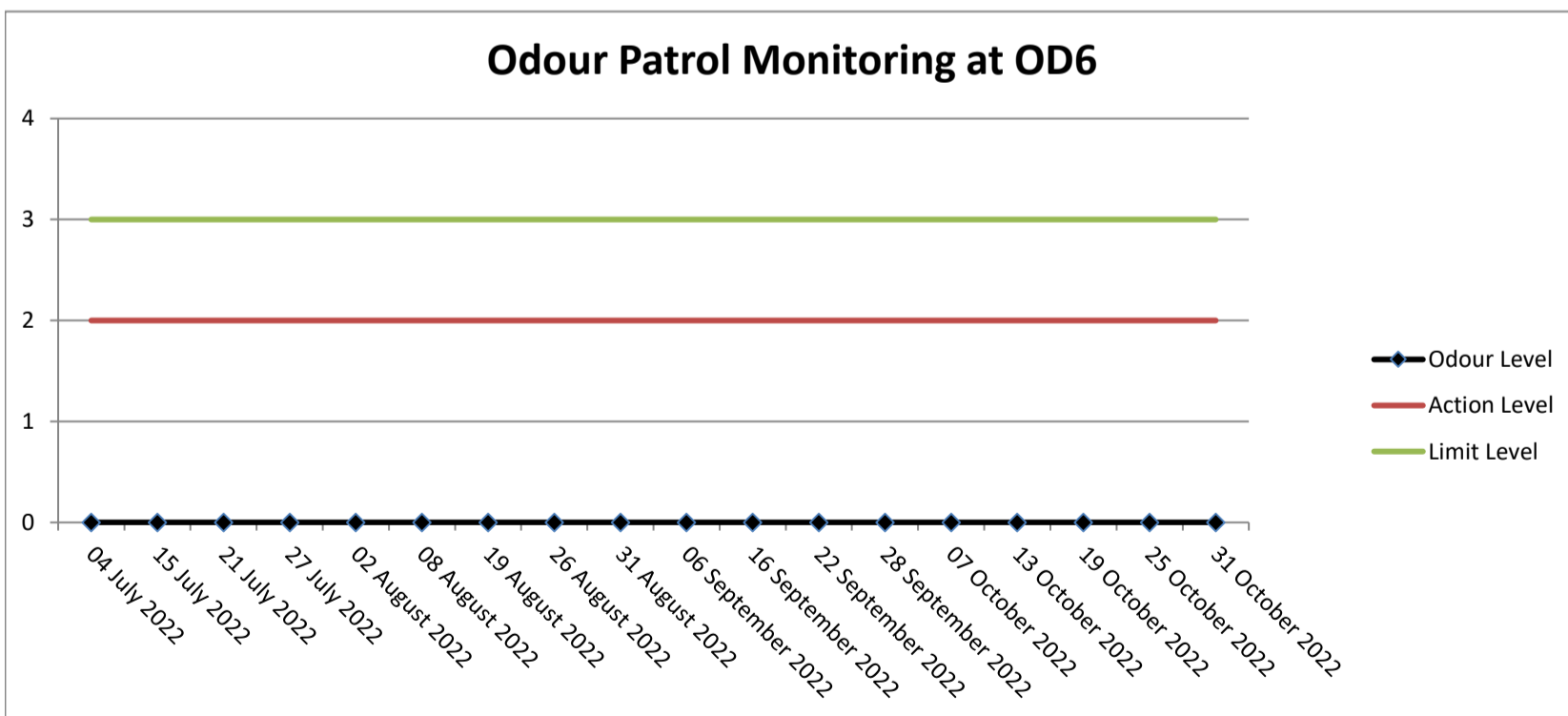




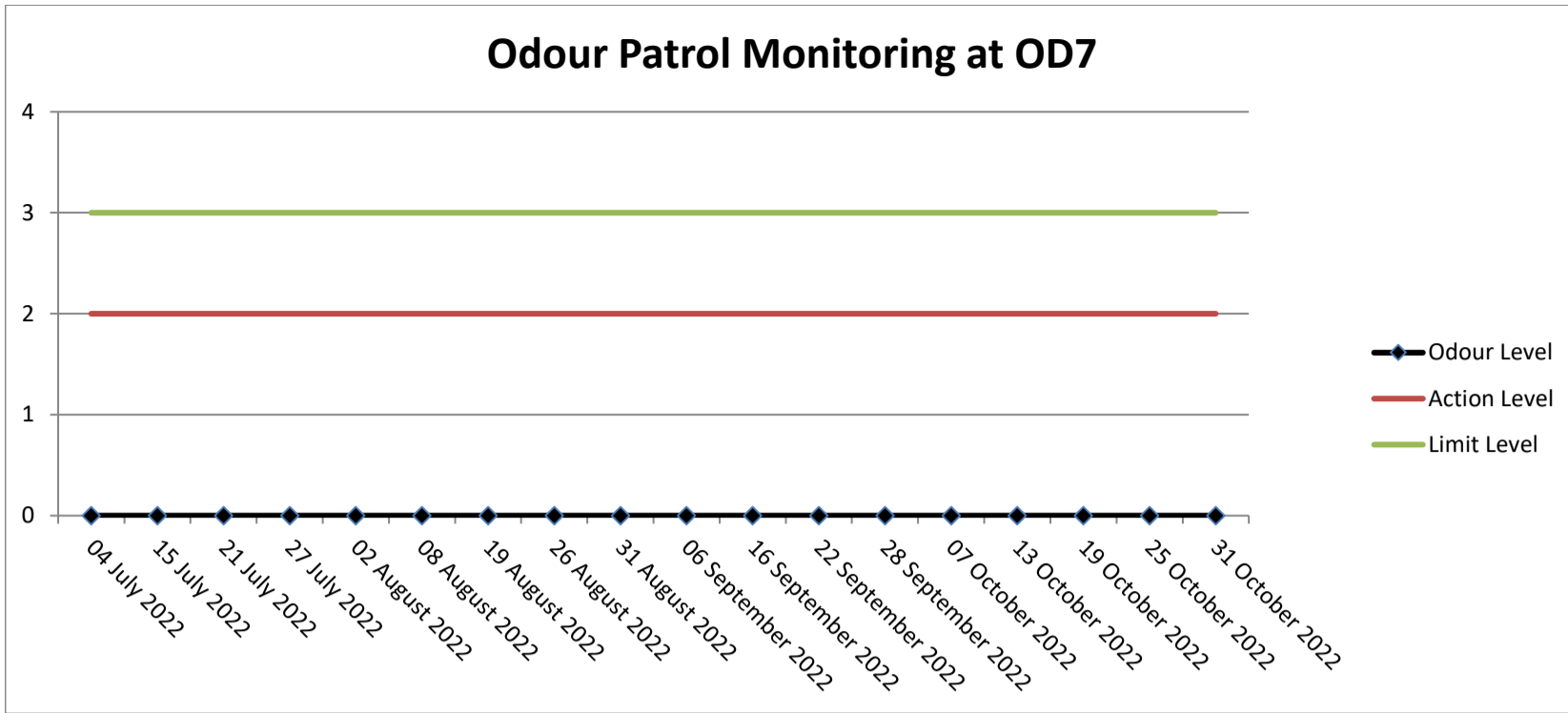
Note:  
Y-axis refers to the Odour Level: 0 - Not Detected; 1- Slight; 2 - Moderate; 3 - Strong; 4 - Extreme



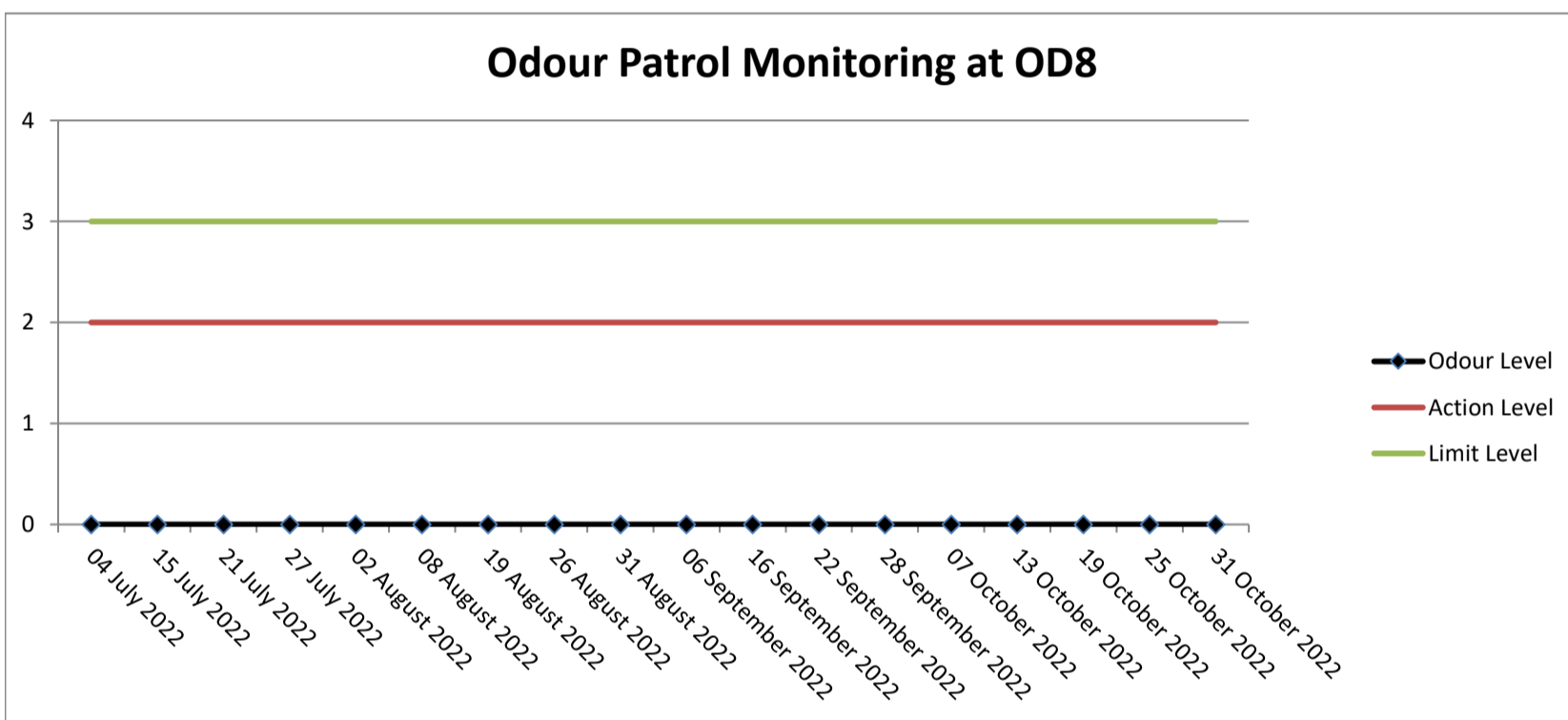
Note:  
Y-axis refers to the Odour Level: 0 - Not Detected; 1- Slight; 2 - Moderate; 3 - Strong; 4 - Extreme



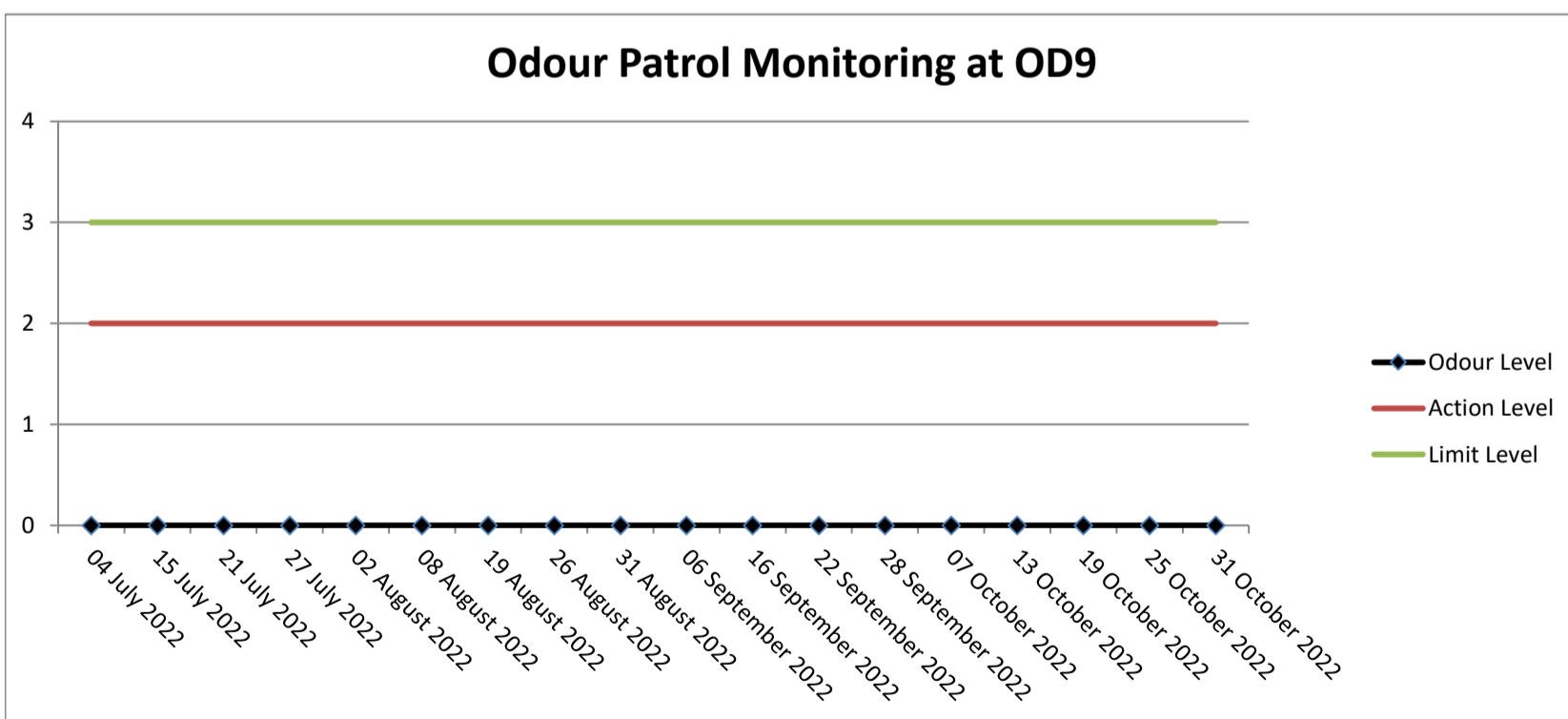
Note:  
Y-axis refers to the Odour Level: 0 - Not Detected; 1- Slight; 2 - Moderate; 3 - Strong; 4 - Extreme



Note:  
Y-axis refers to the Odour Level: 0 - Not Detected; 1- Slight; 2 - Moderate; 3 - Strong; 4 - Extreme



Note:  
Y-axis refers to the Odour Level: 0 - Not Detected; 1- Slight; 2 - Moderate; 3 - Strong; 4 - Extreme



Note:  
Y-axis refers to the Odour Level: 0 - Not Detected; 1- Slight; 2 - Moderate; 3 - Strong; 4 - Extreme

# 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



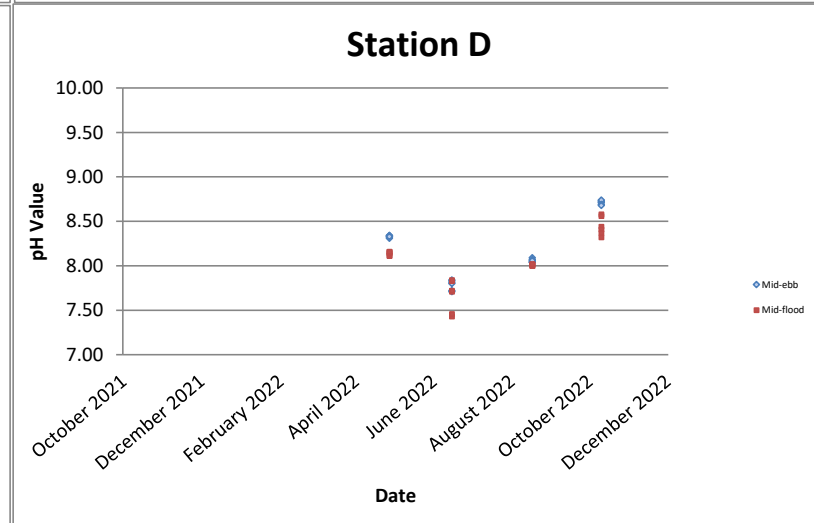
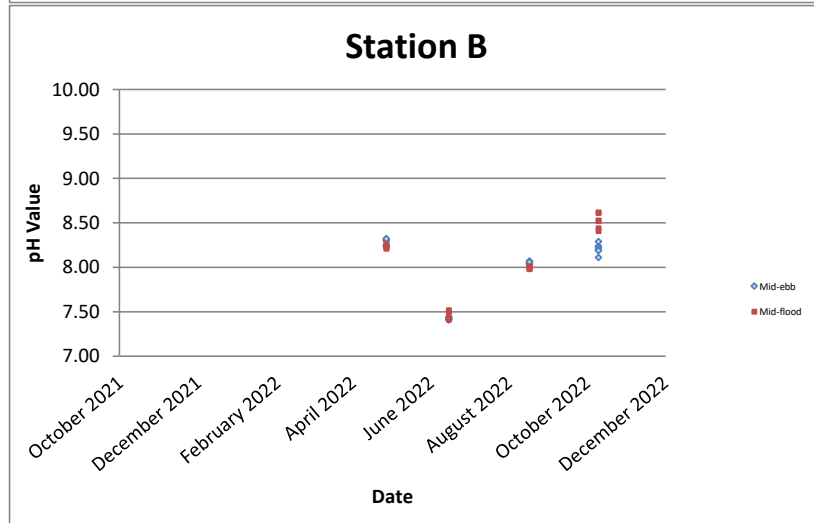
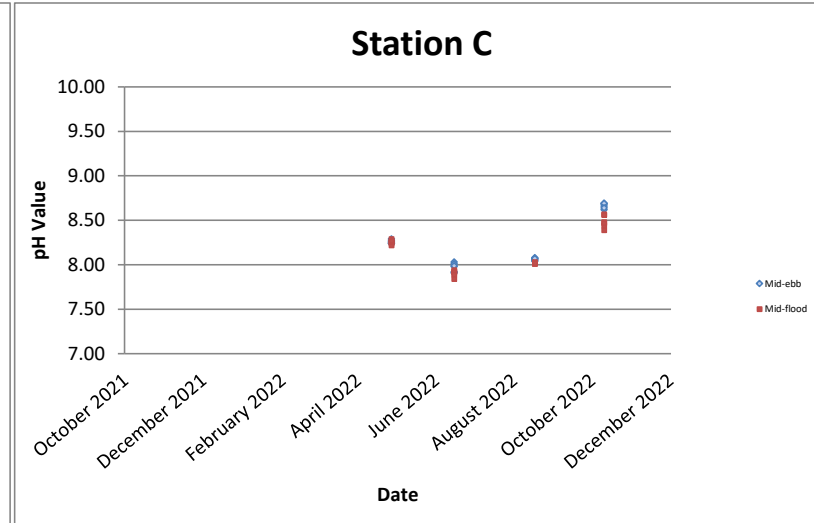
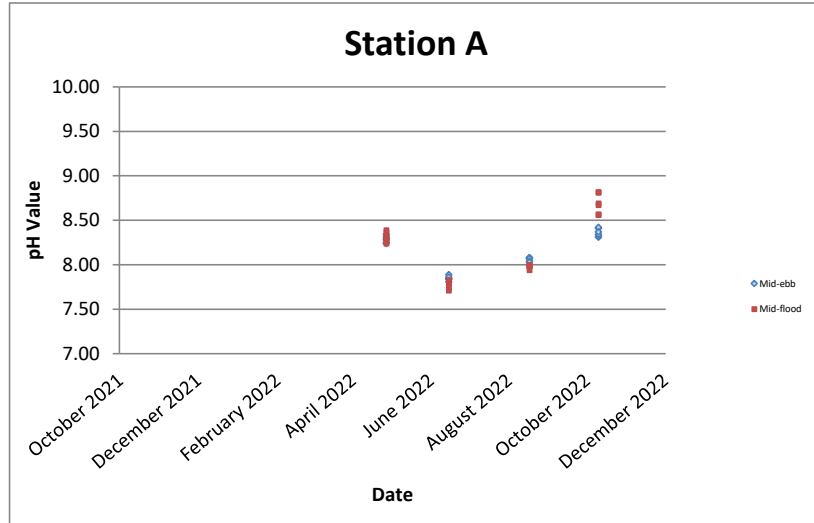
---

Report No.: 0041/17/ED/0691

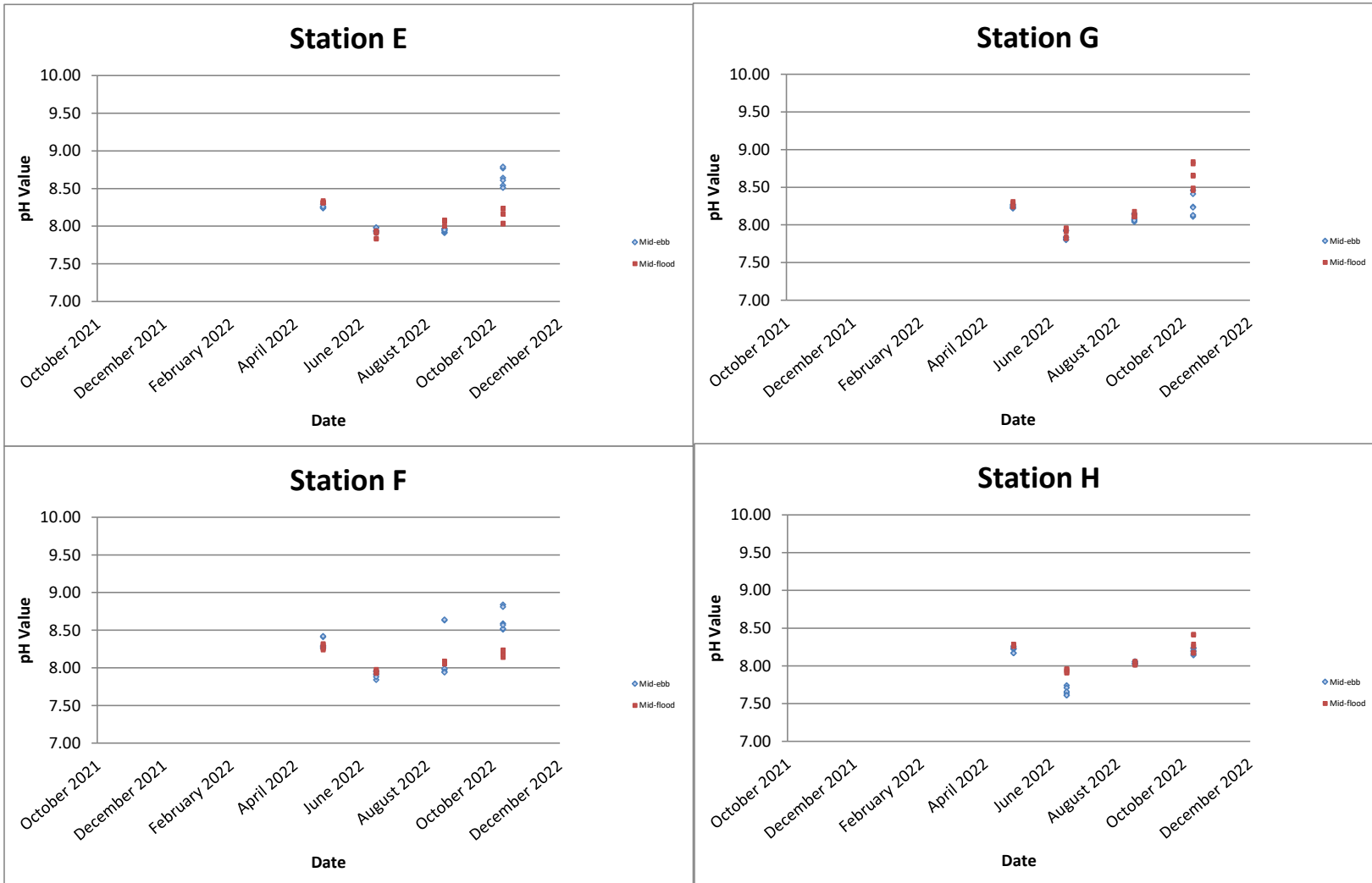
## Appendix D

### Graphical Presentation of Water Quality Monitoring

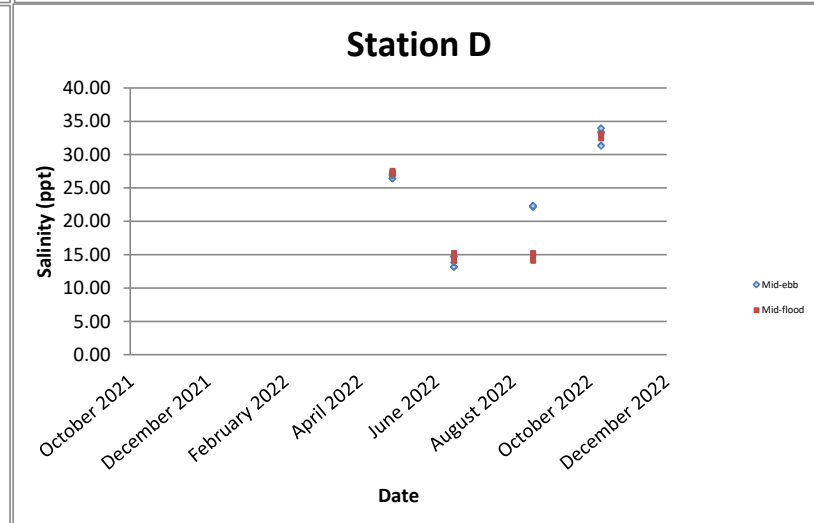
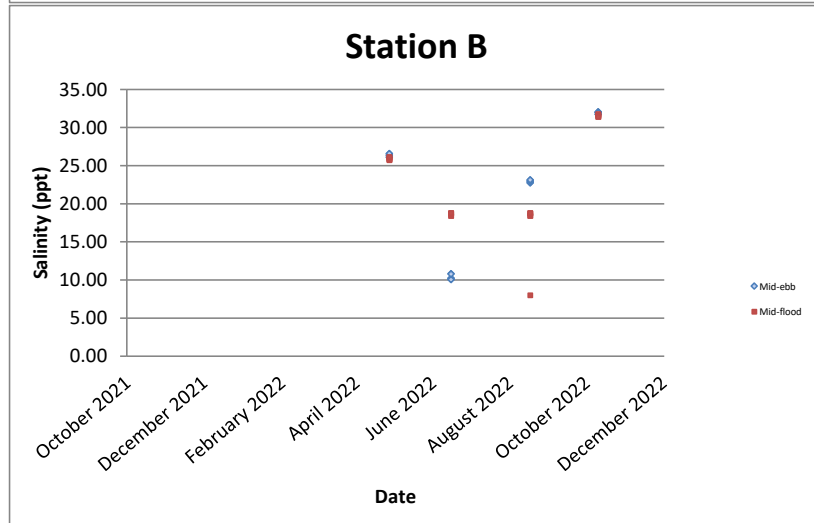
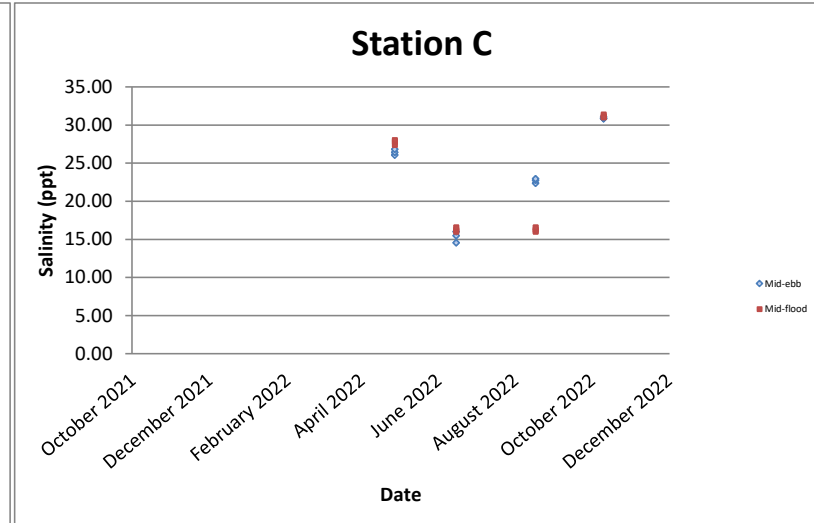
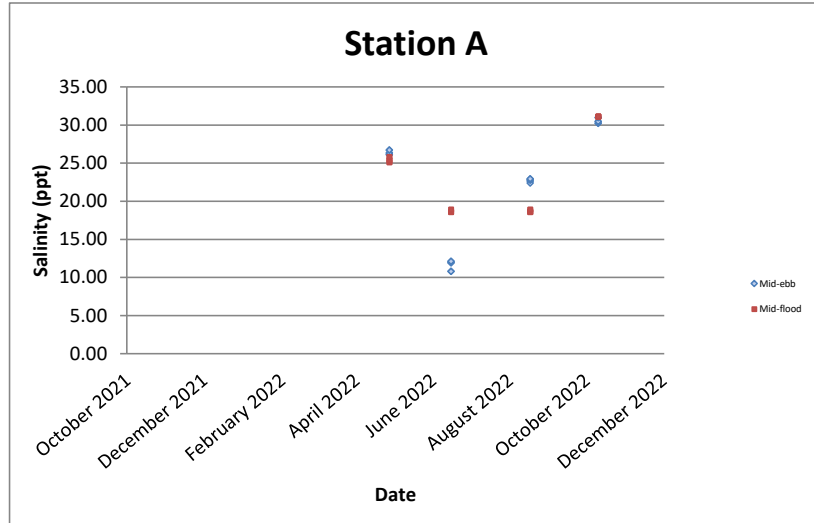
pH value



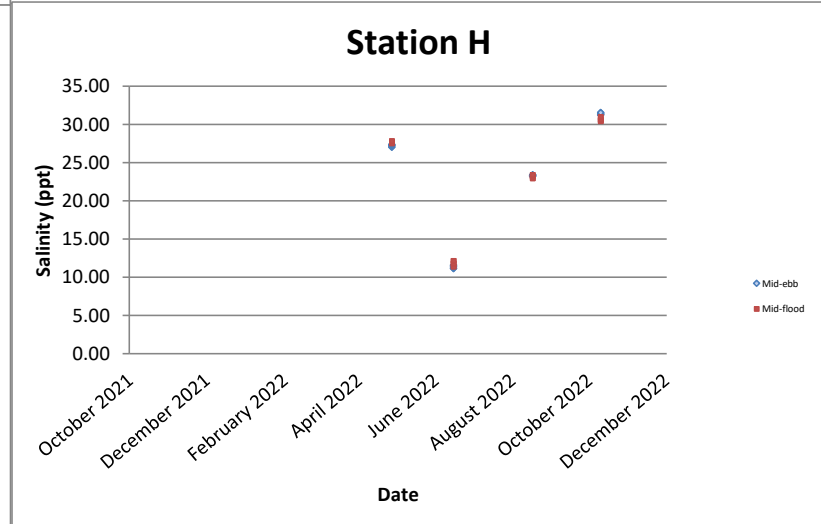
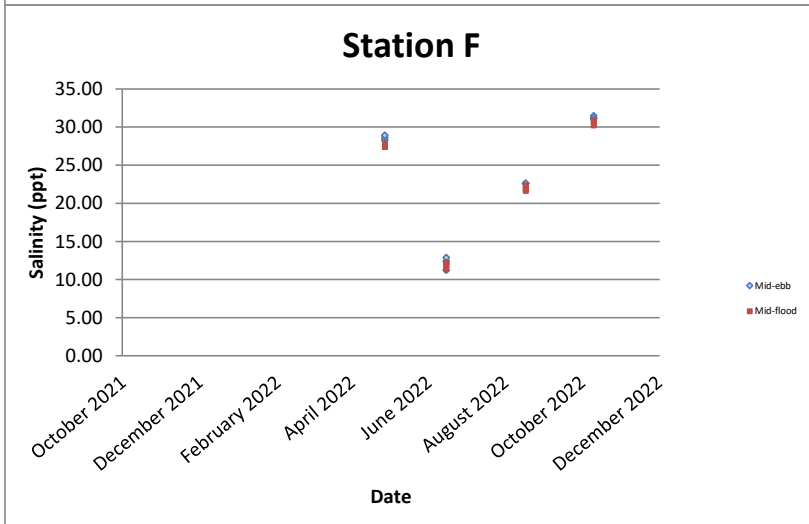
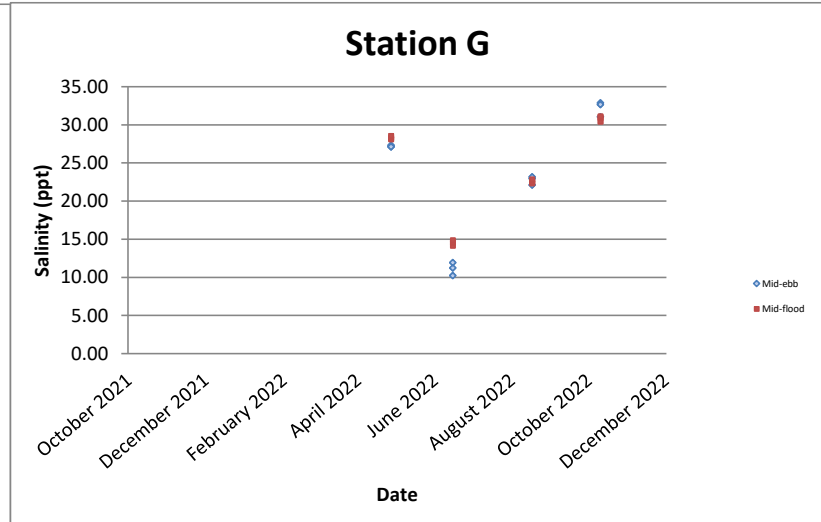
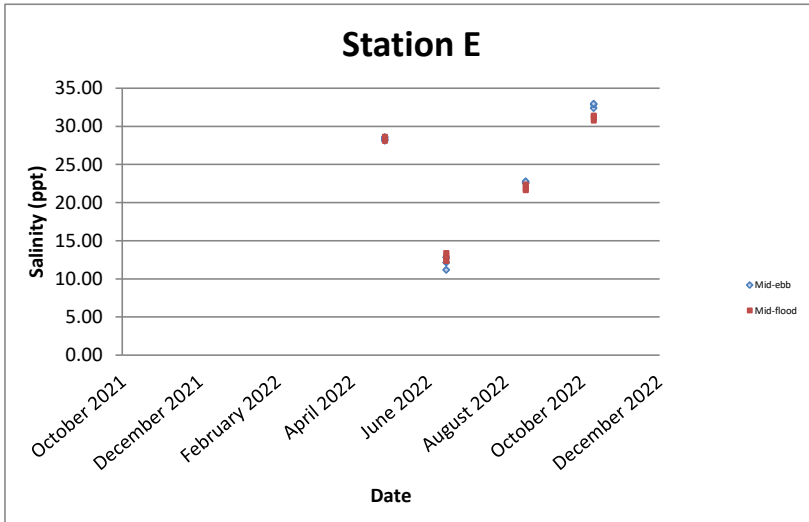
pH value



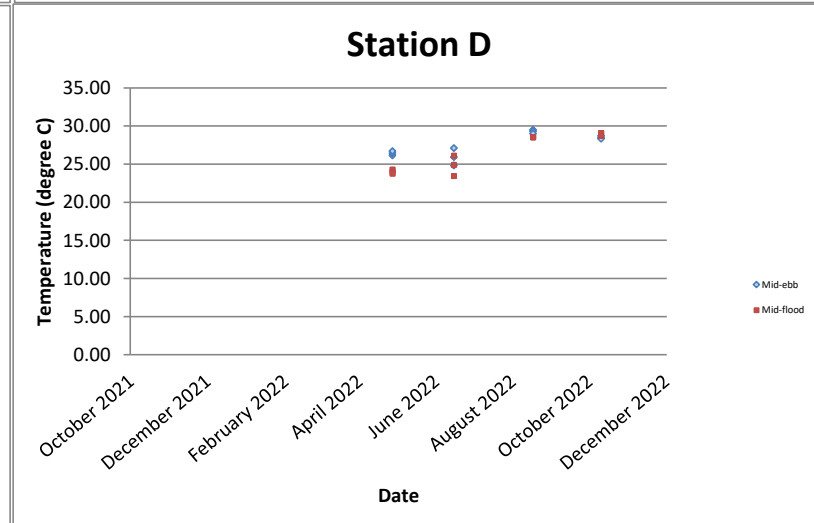
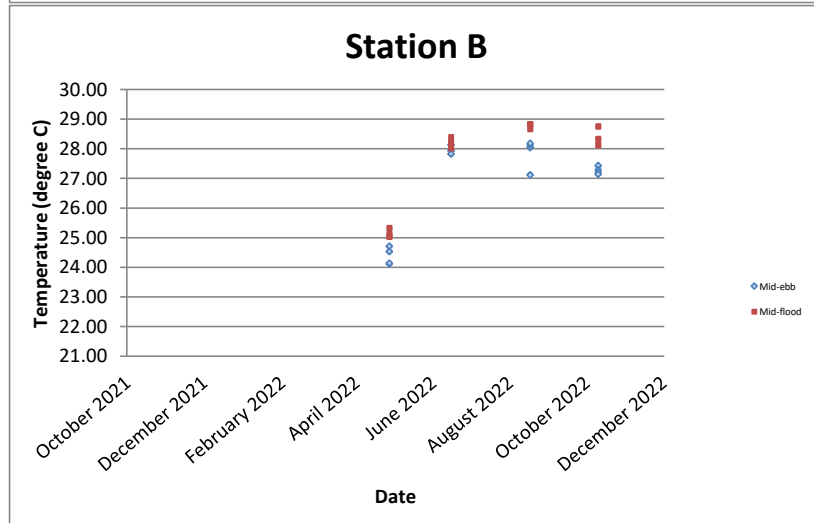
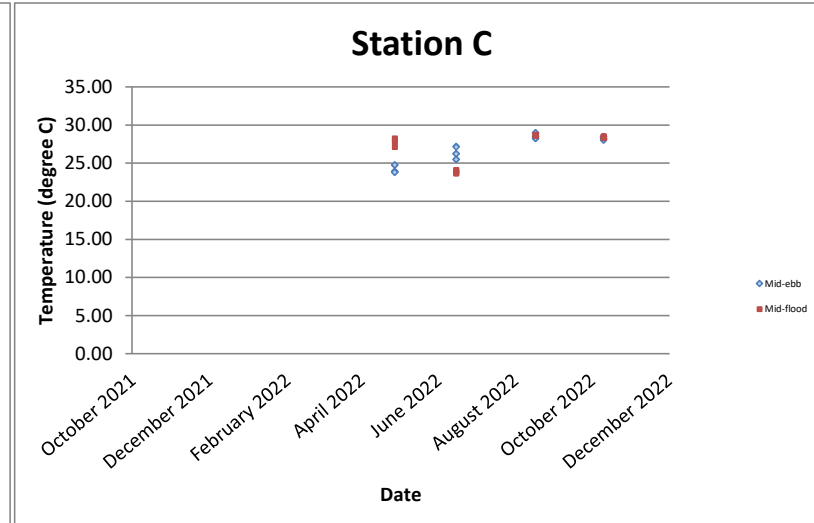
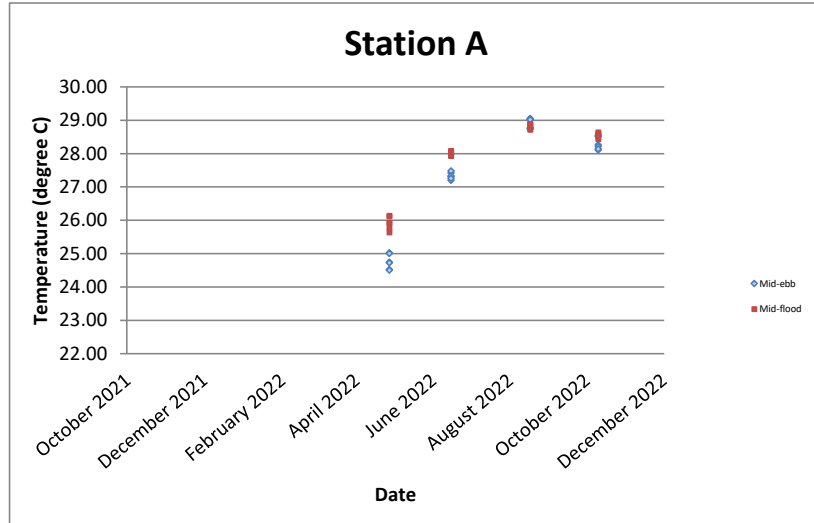
Salinity (ppt)



Salinity (ppt)

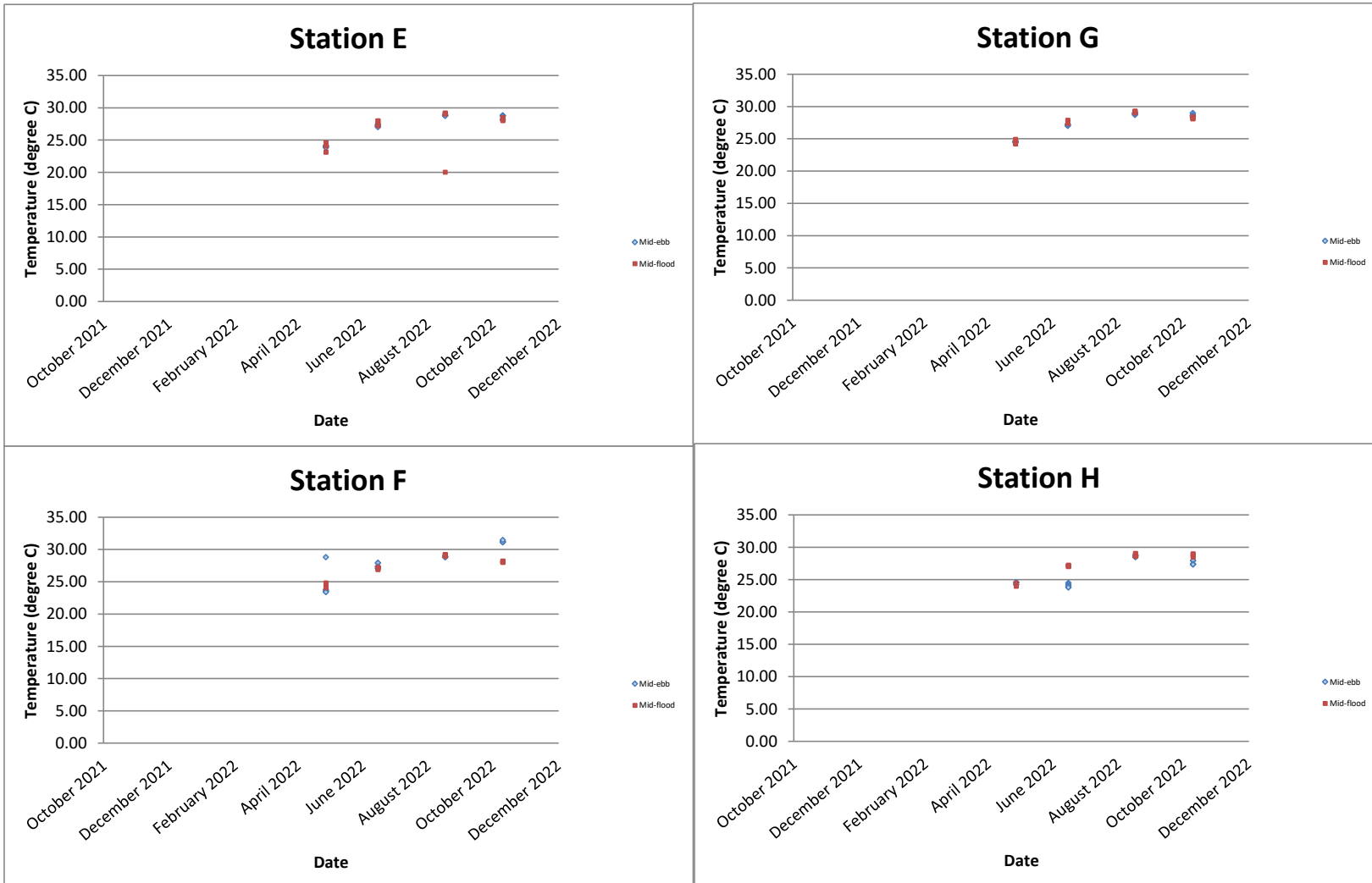


Temperature (degree C)

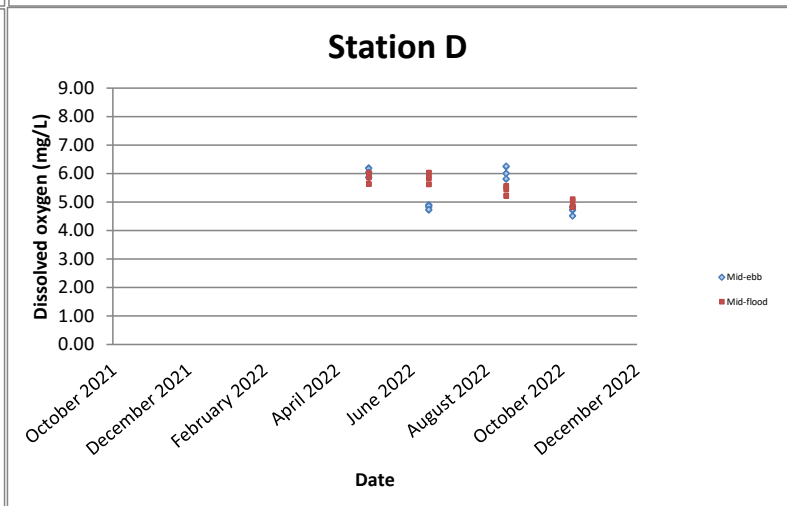
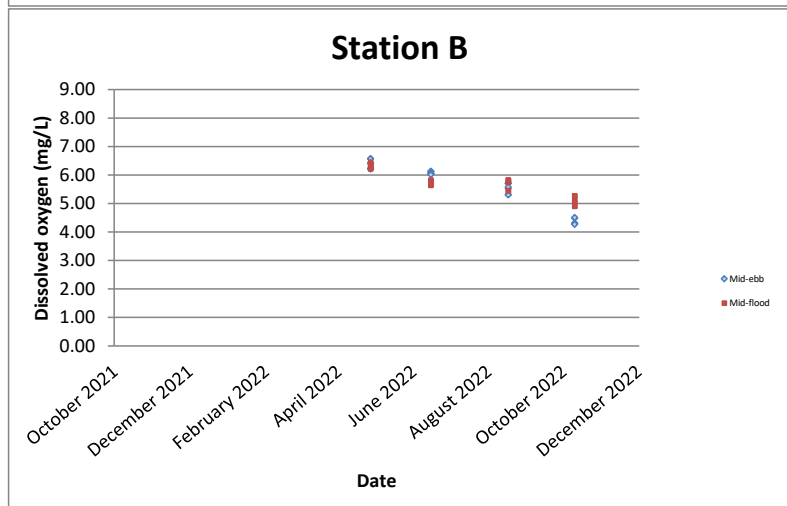
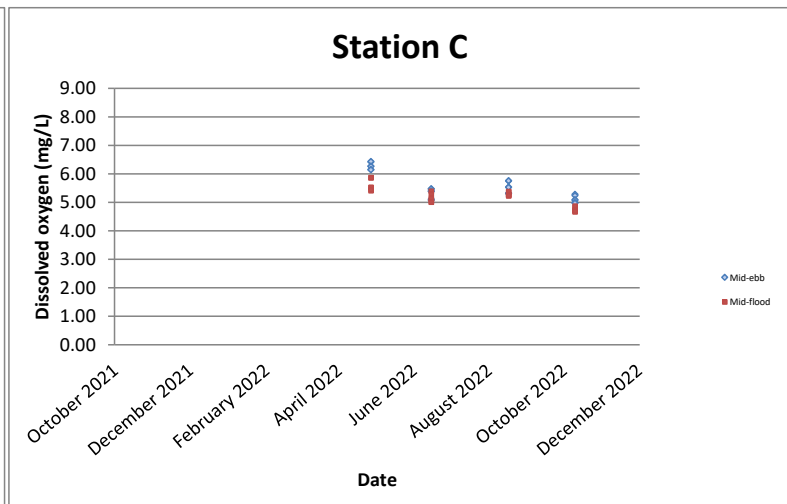
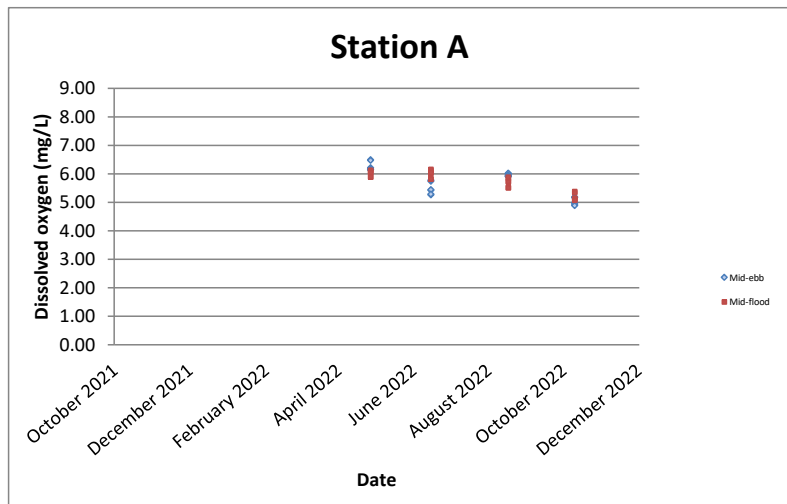




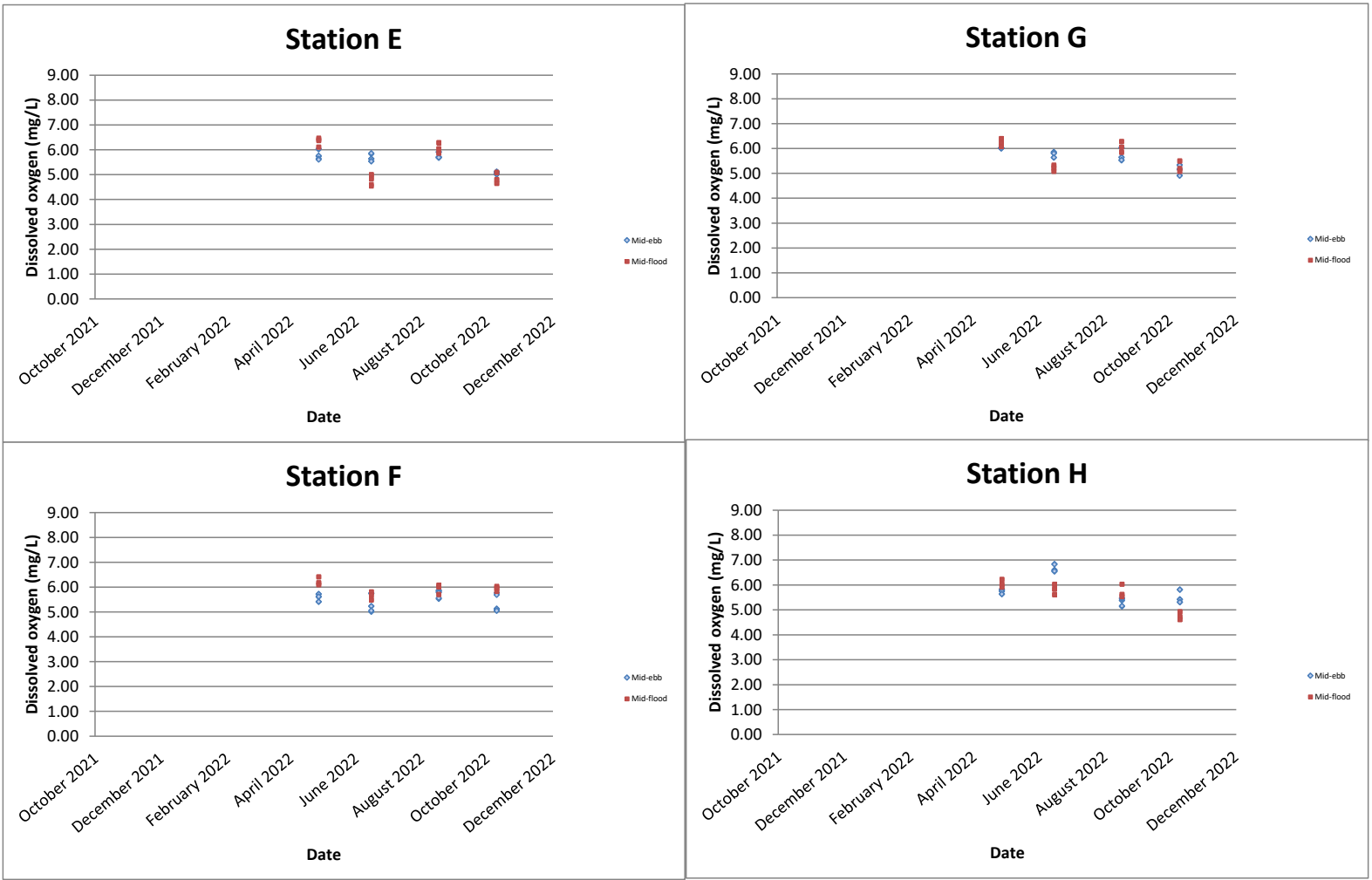
Temperature (degree C)



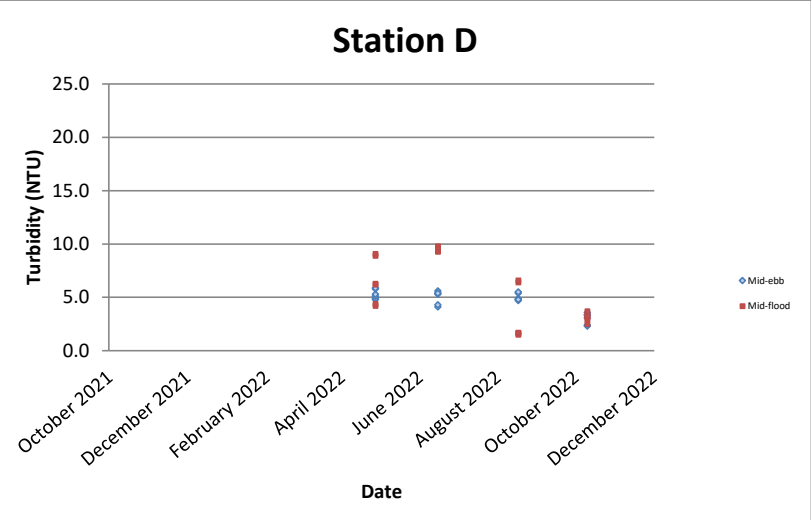
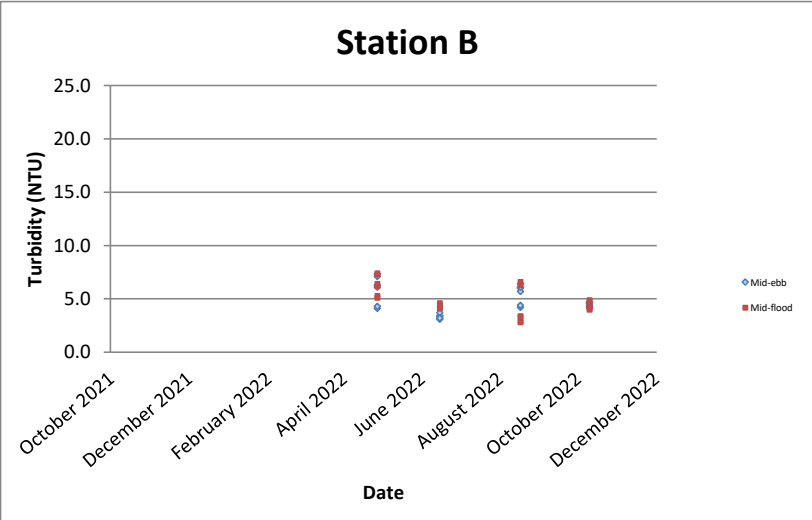
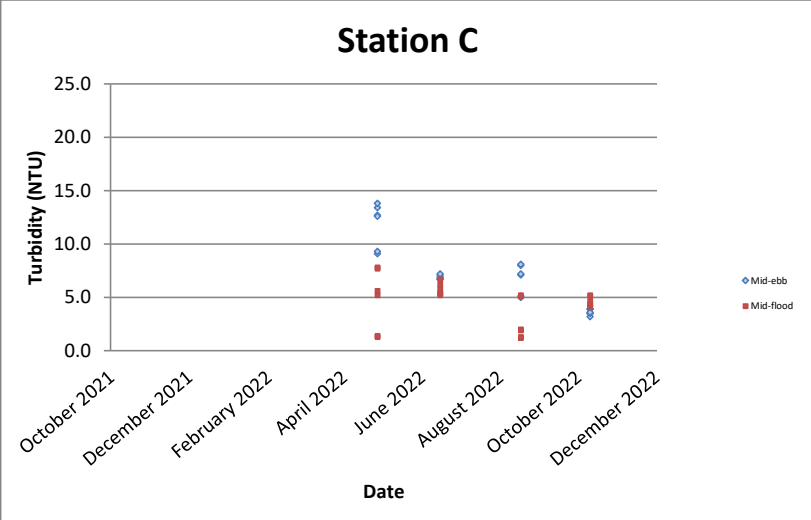
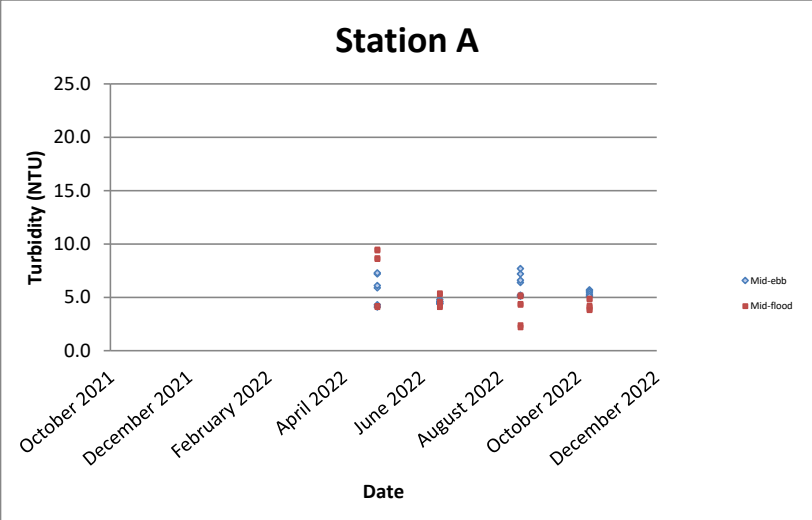
Dissolved oxygen (mg/L)



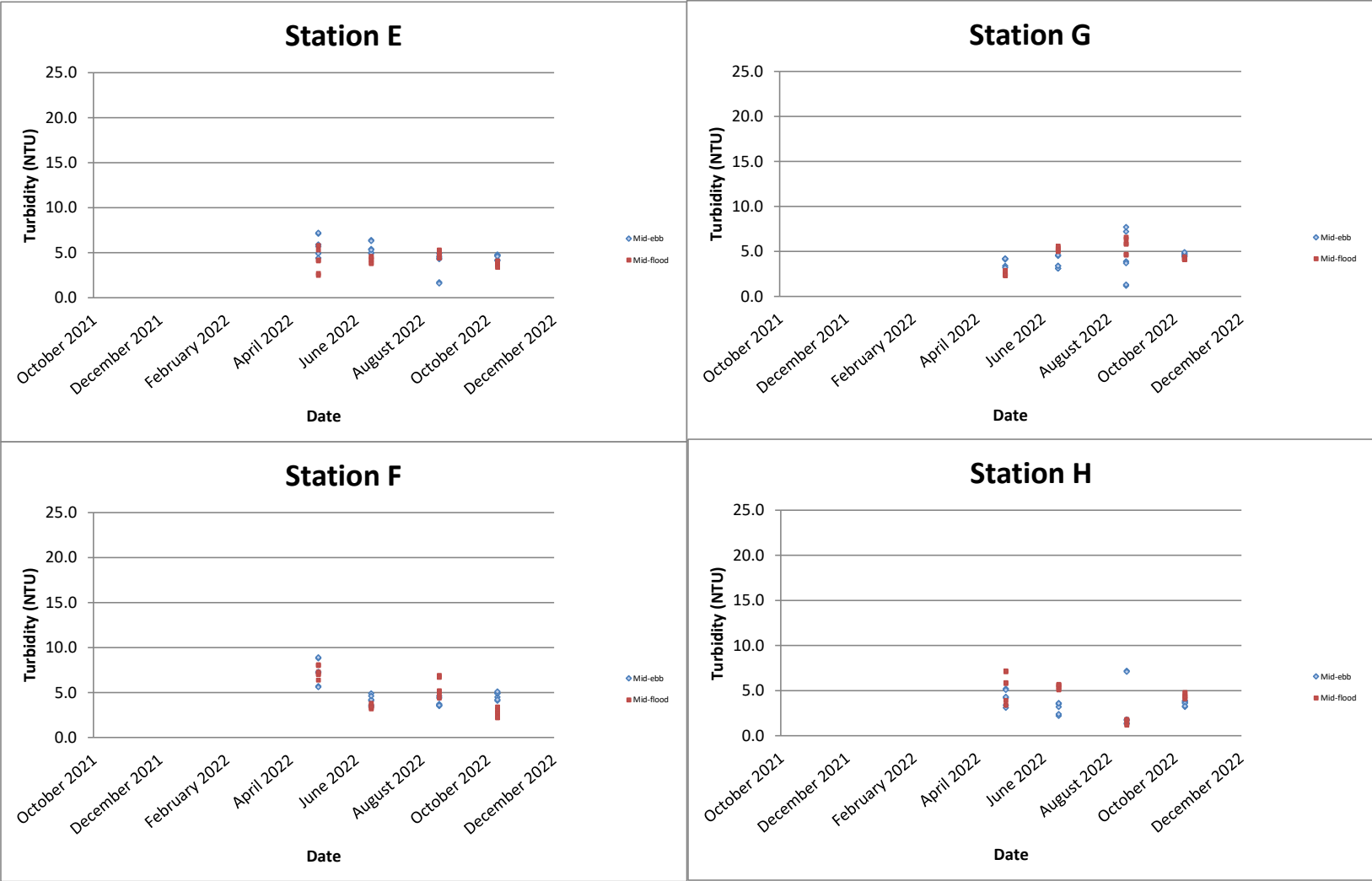
Dissolved oxygen (mg/L)



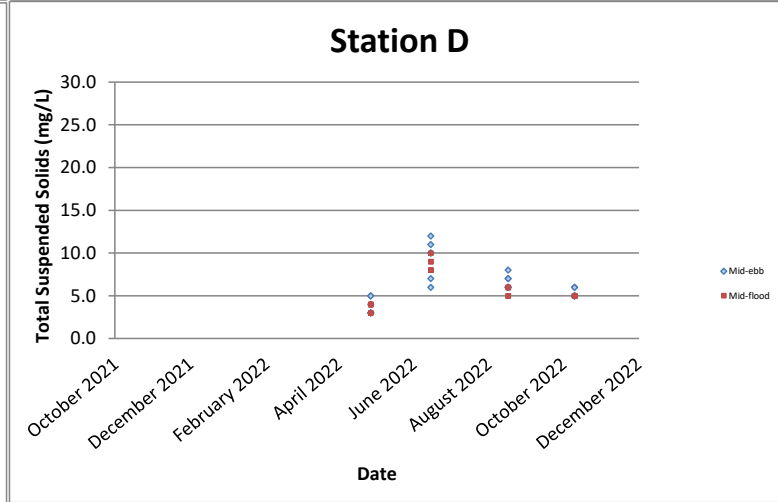
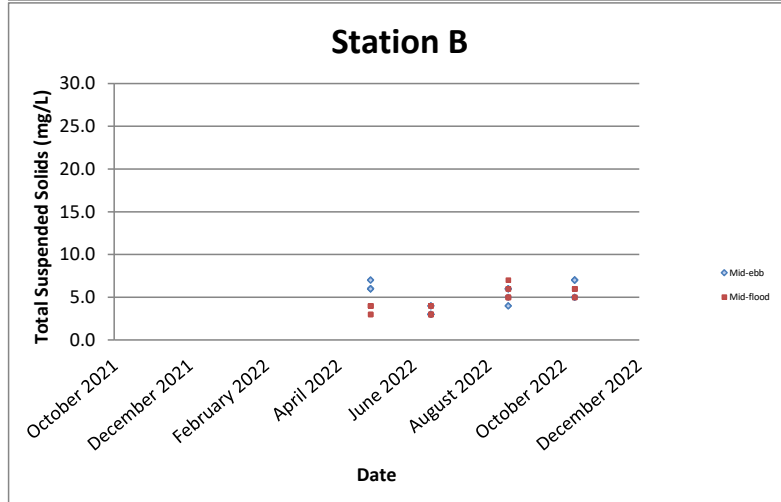
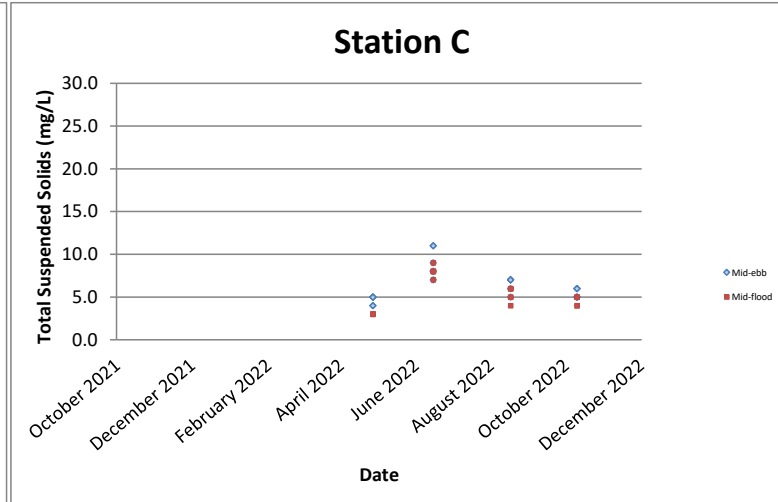
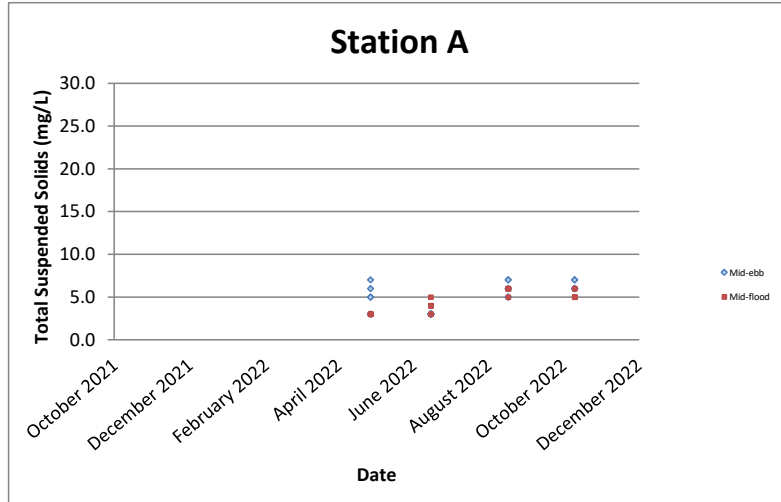
Turbidity (NTU)



Turbidity (NTU)

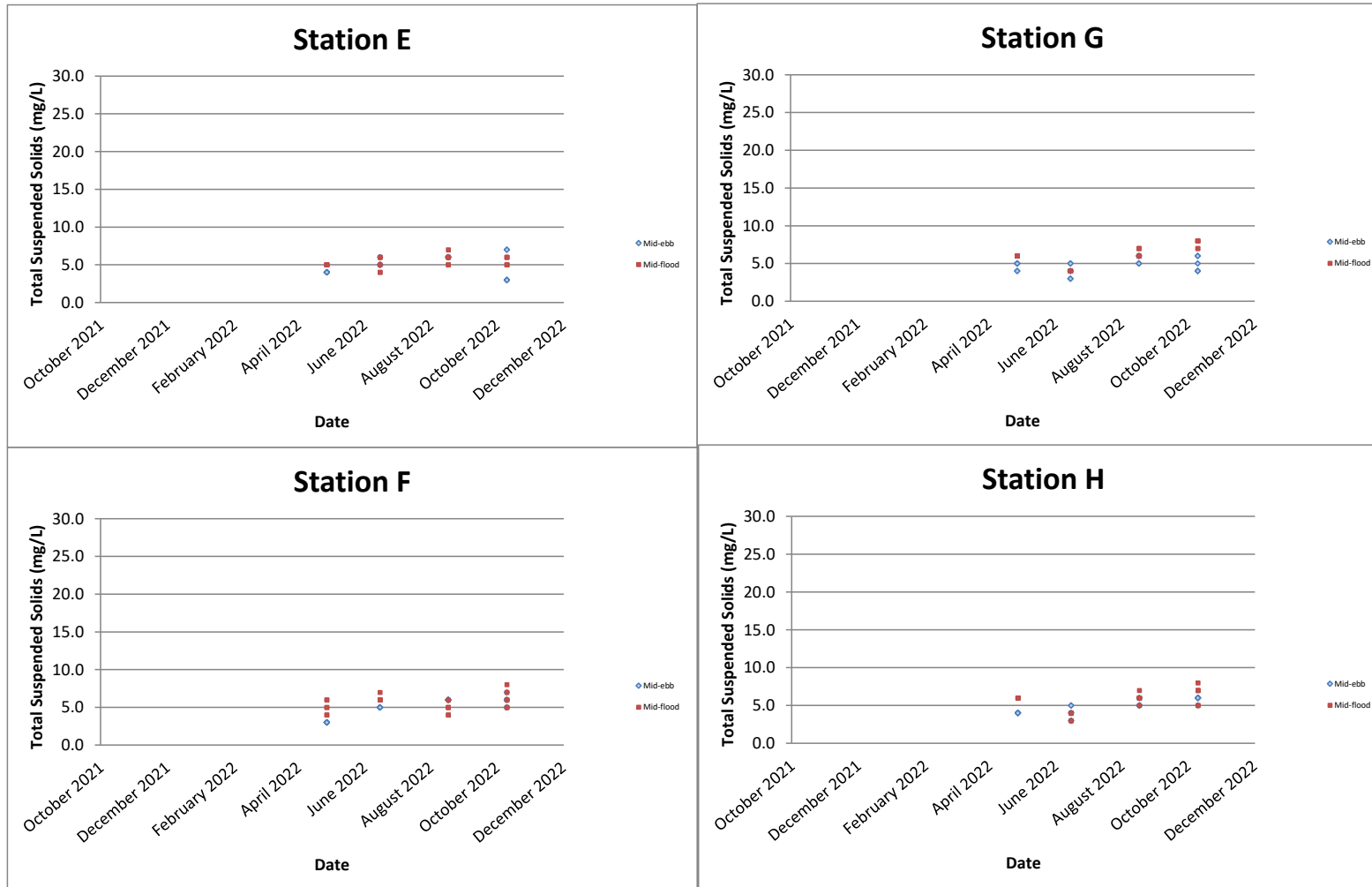


Total Suspended Solids (mg/L)



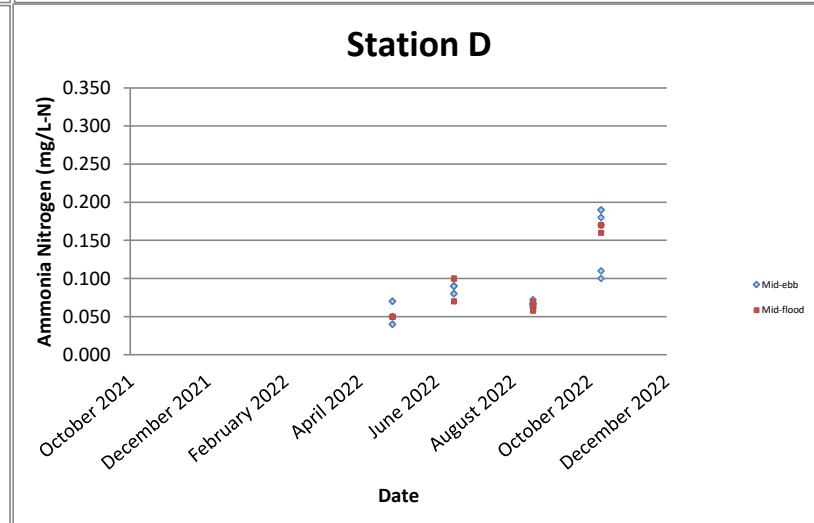
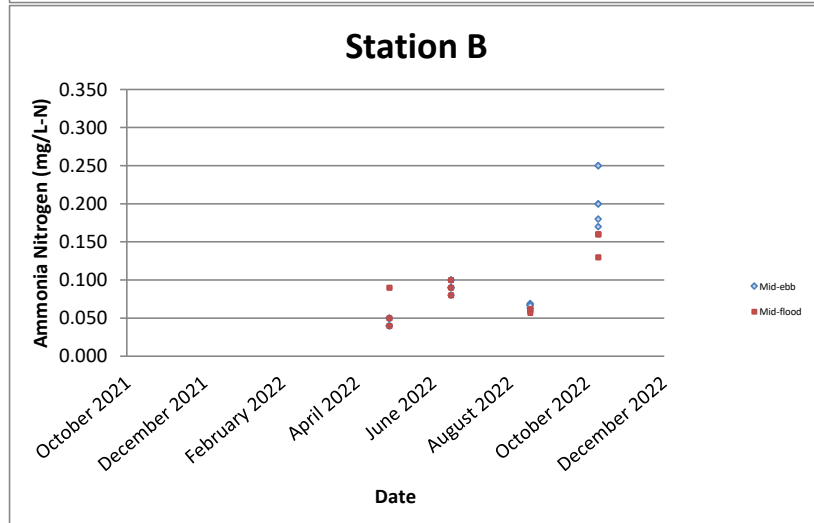
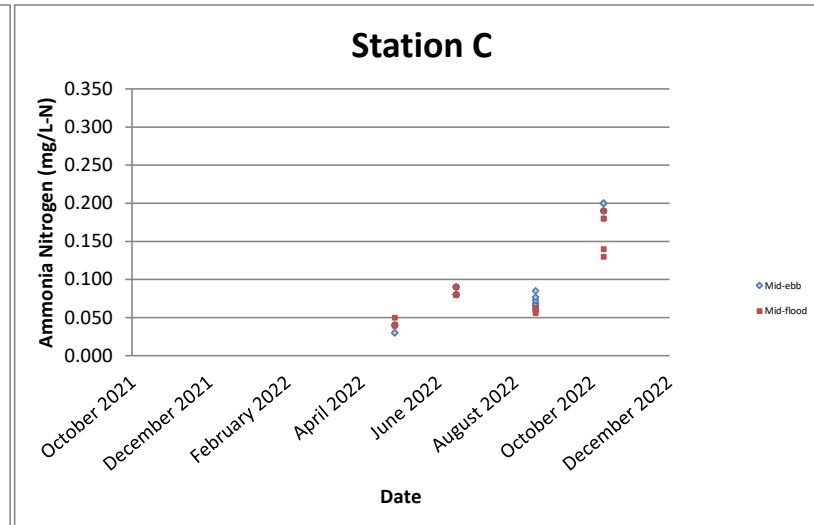
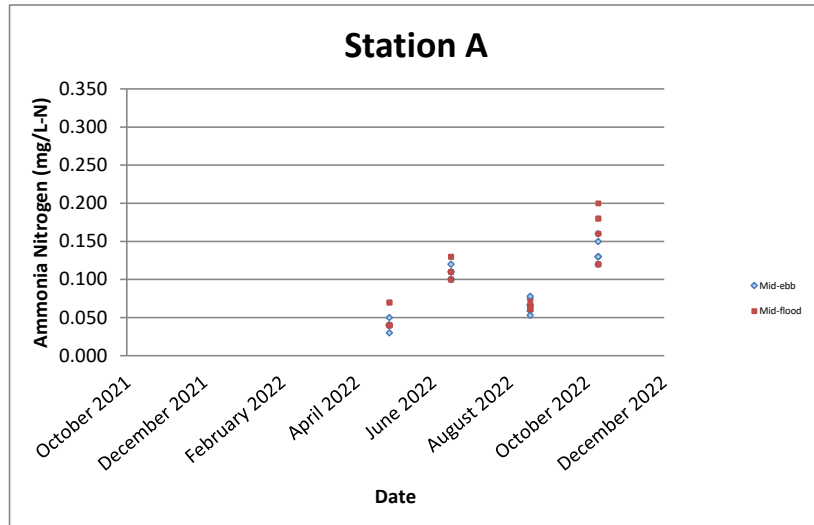
Remark: All below the Limit of Report sample results (<0.5 mg/L) for Total Suspended Solids is regarded as 0.5 mg/L in graphical presentation.

Total Suspended Solids (mg/L)



Remark: All below the Limit of Report sample results (<0.5 mg/L) for Total Suspended Solids is regarded as 0.5 mg/L in graphical presentation.

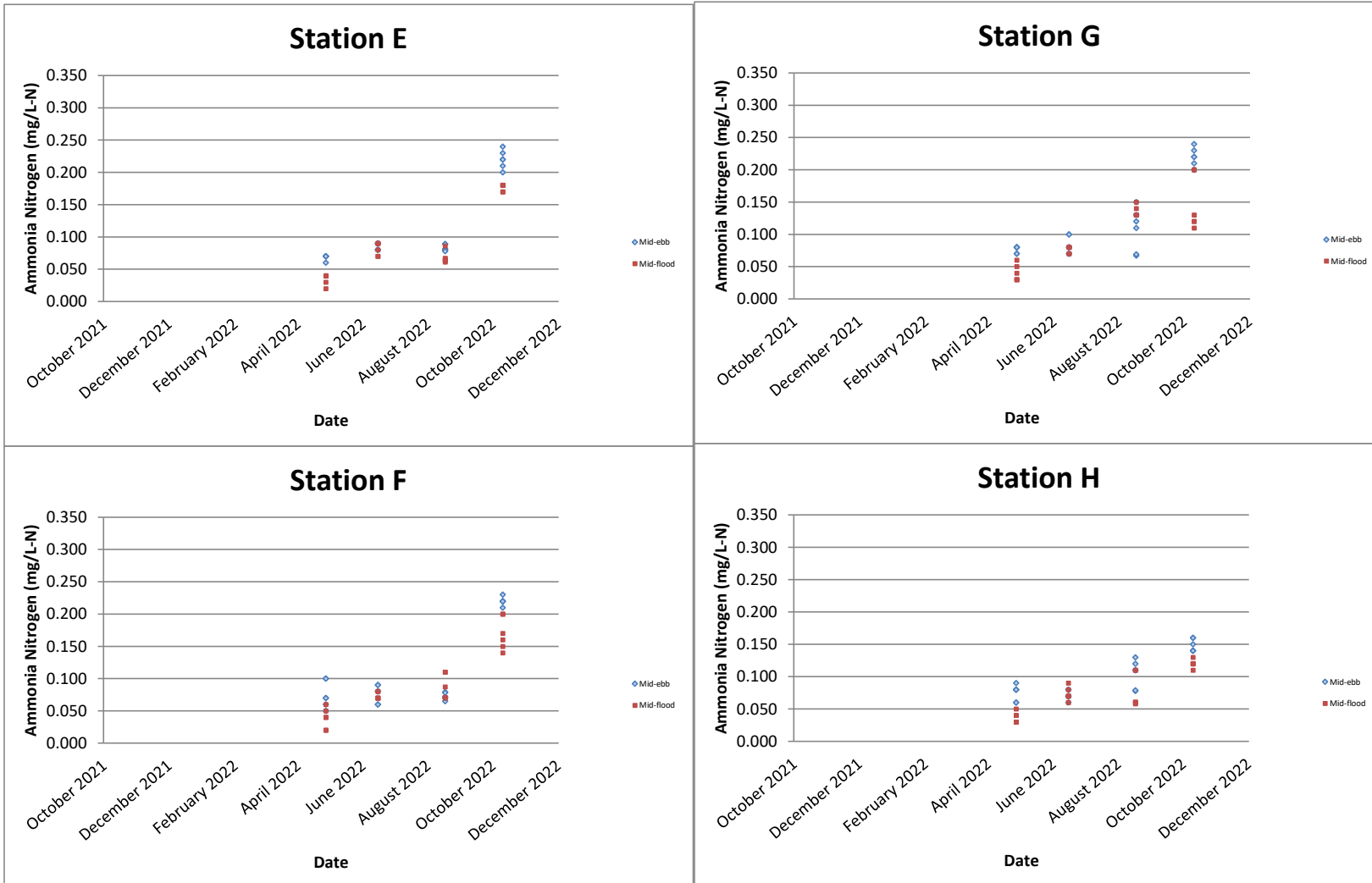
Ammonia Nitrogen (mg/L-N)



Remark: All below the Limit of Report sample results (<0.005 mg/L) for Ammonia Nitrogen is regarded as 0.005 mg/L in graphical presentation.

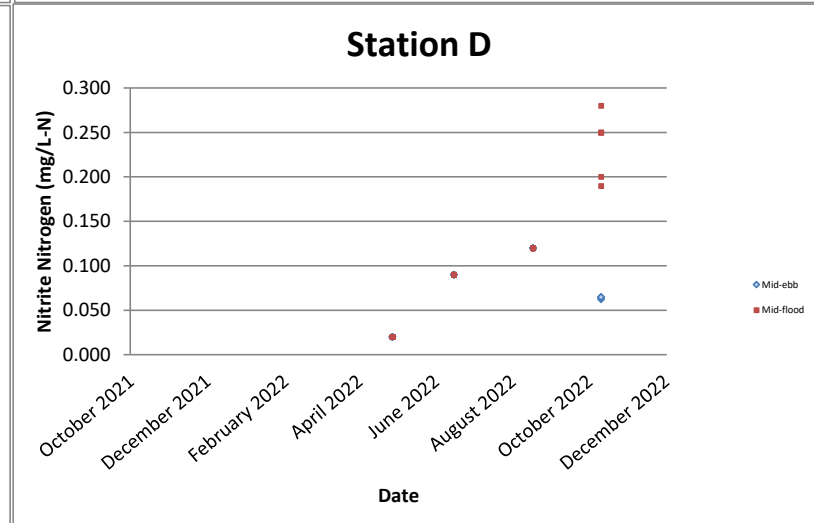
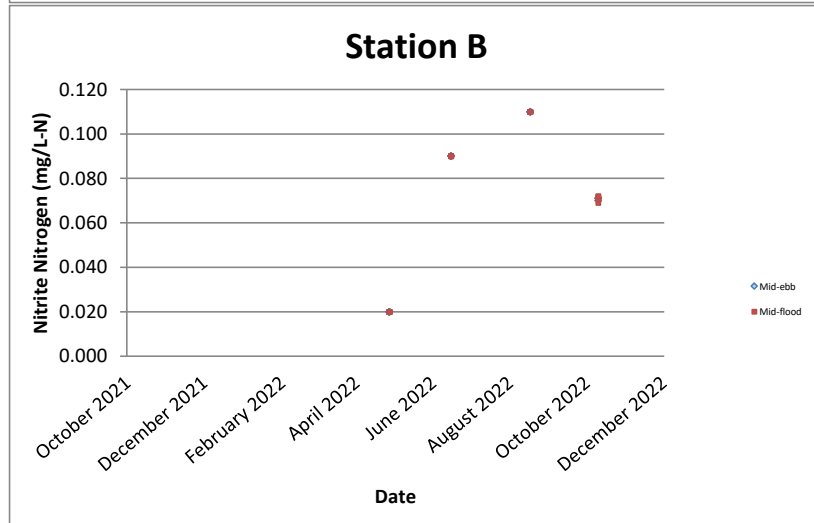
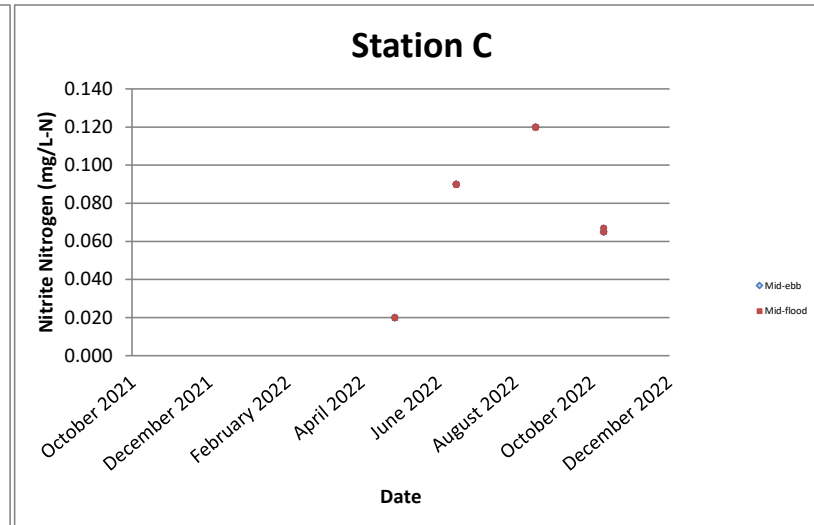
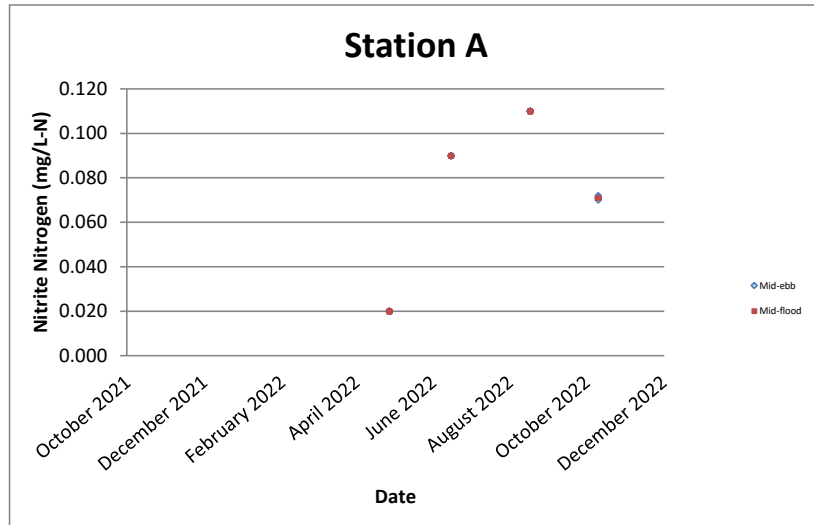


Ammonia Nitrogen (mg/L-N)



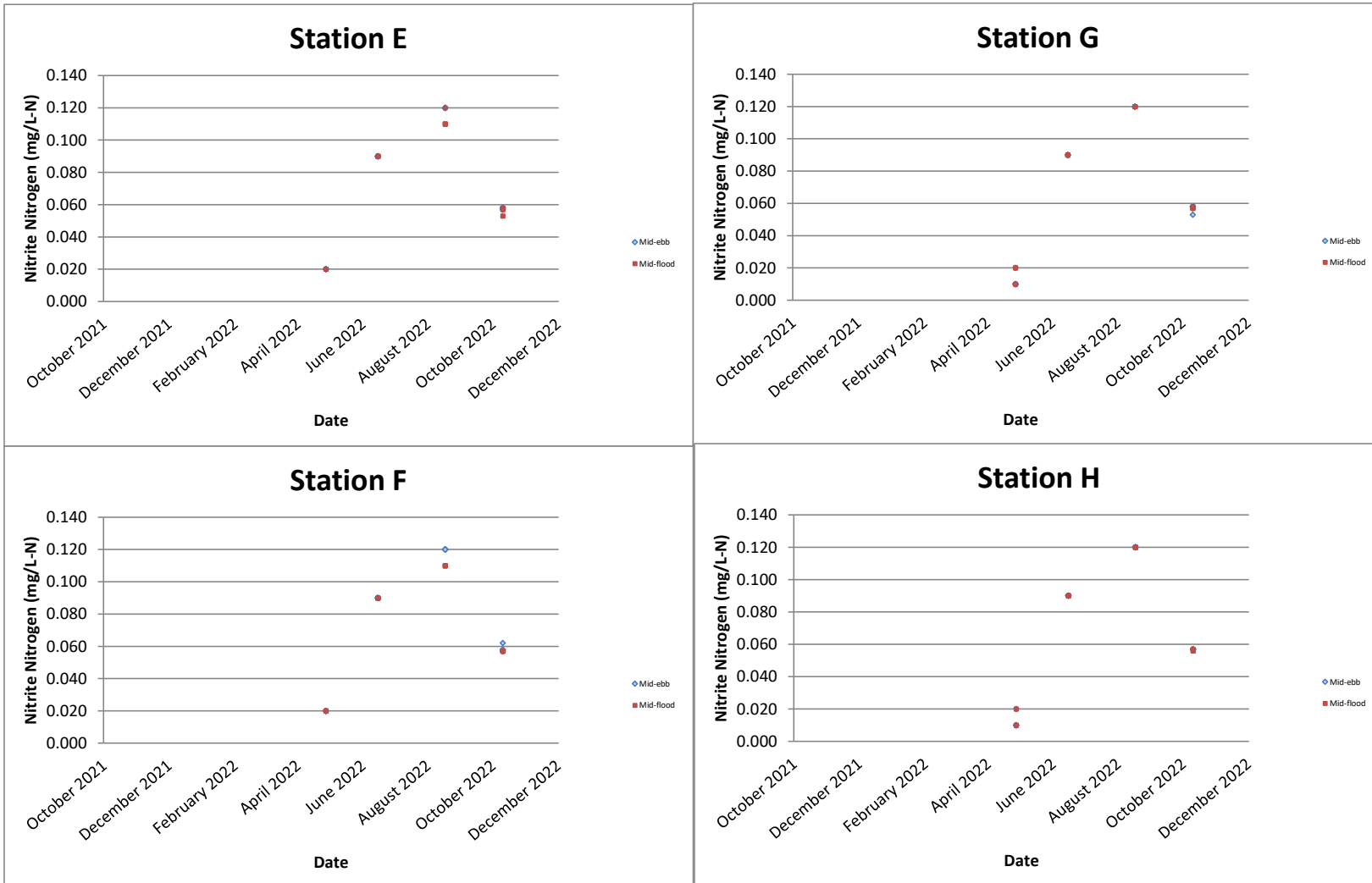
Remark: All below the Limit of Report sample results (<0.005 mg/L) for Ammonia Nitrogen is regarded as 0.005 mg/L in graphical presentation.

Nitrite Nitrogen (mg/L-N)



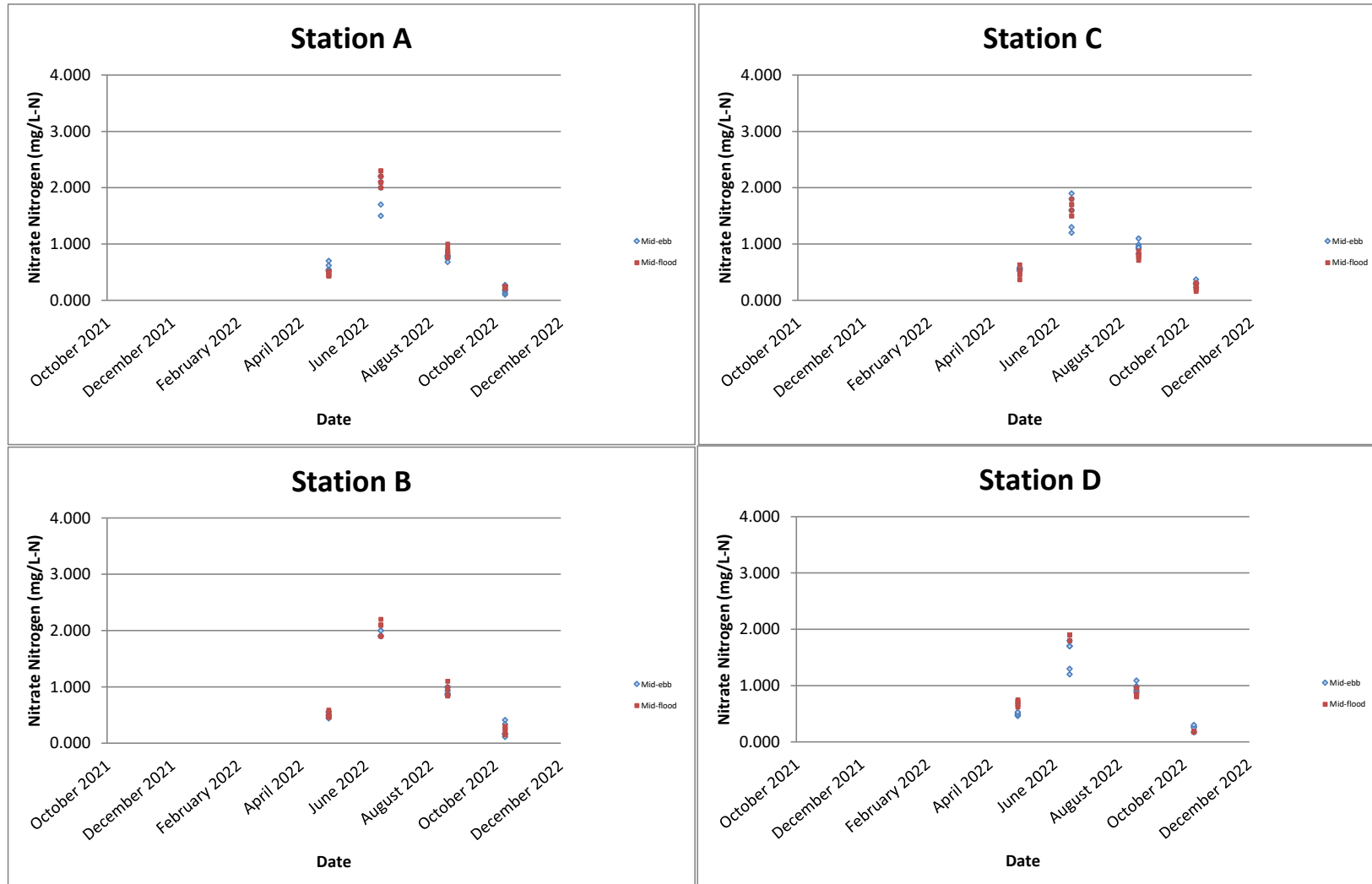
Remark: All below the Limit of Report sample results (<0.005 mg/L) for Nitrite Nitrogen is regarded as 0.005 mg/L in graphical presentation.

Nitrite Nitrogen (mg/L-N)



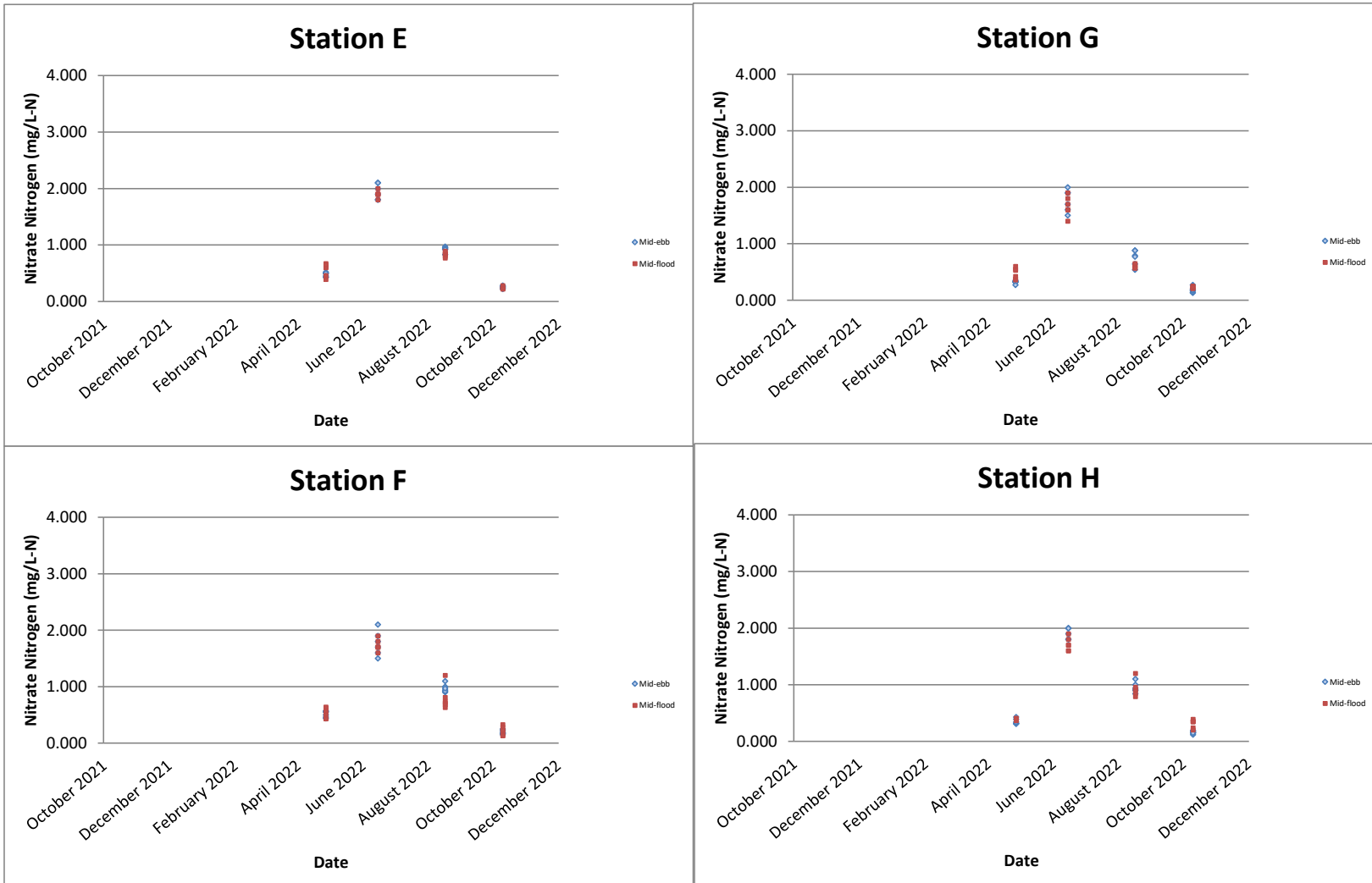
Remark: All below the Limit of Report sample results (<0.005 mg/L) for Nitrite Nitrogen is regarded as 0.005 mg/L in graphical presentation.

Nitrate Nitrogen (mg/L-N)



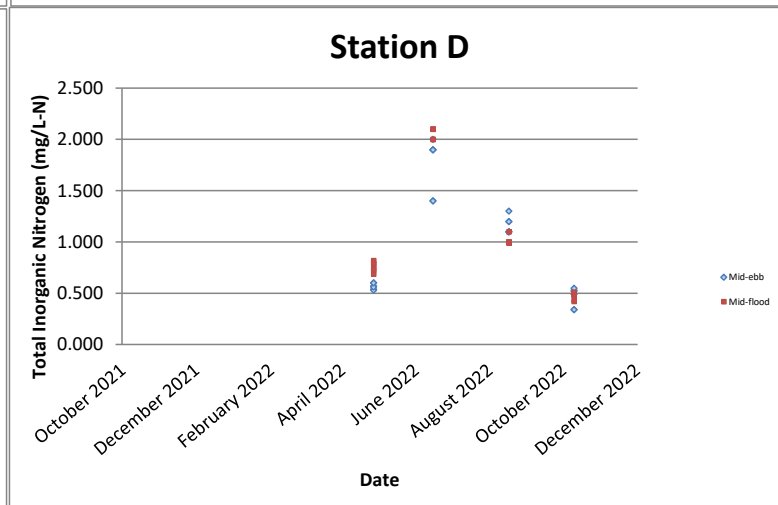
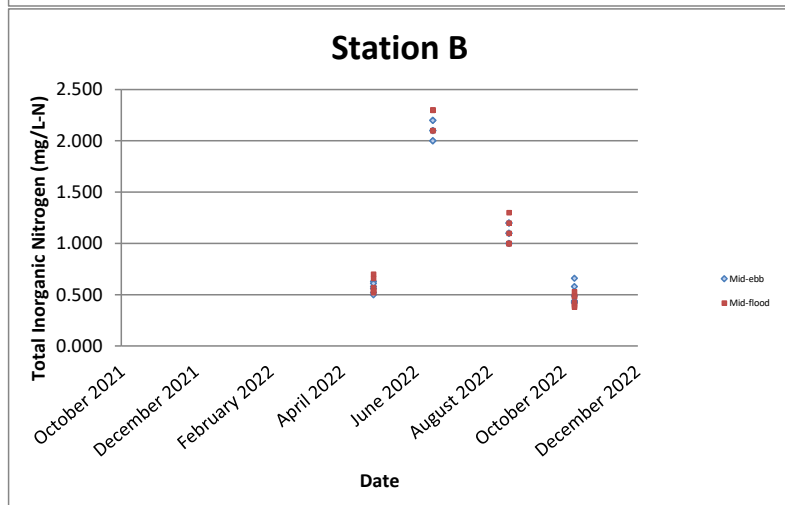
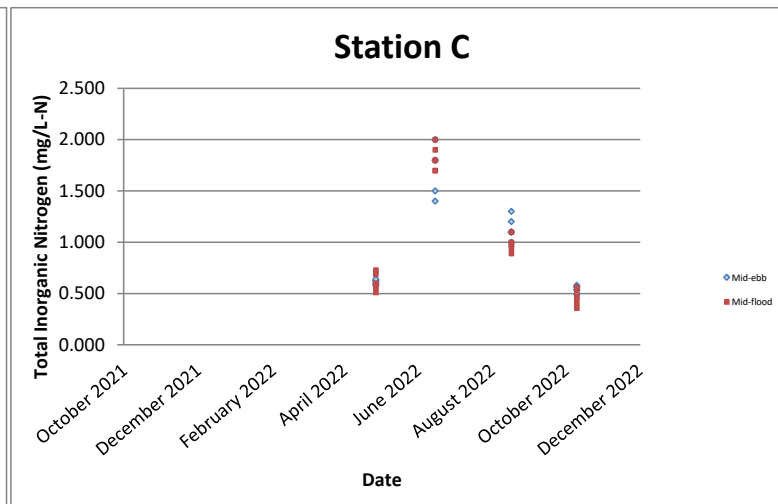
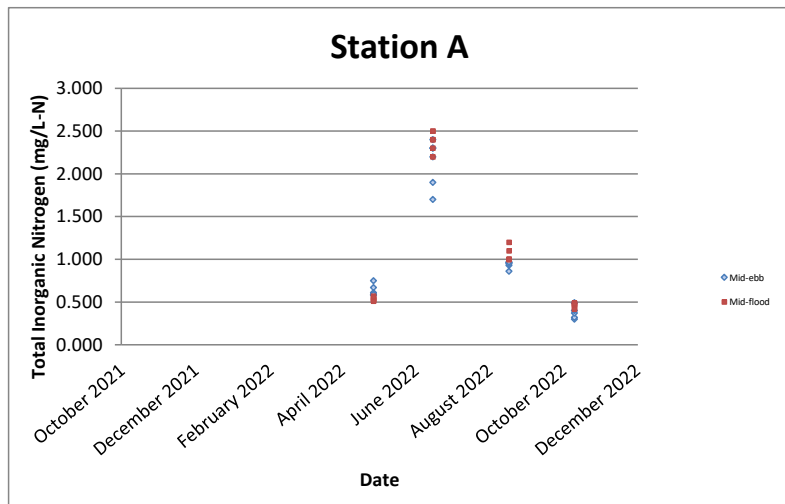
Remark: All below the Limit of Report sample results (<0.005 mg/L) for Nitrate Nitrogen is regarded as 0.005 mg/L in graphical presentation.

Nitrate Nitrogen (mg/L-N)



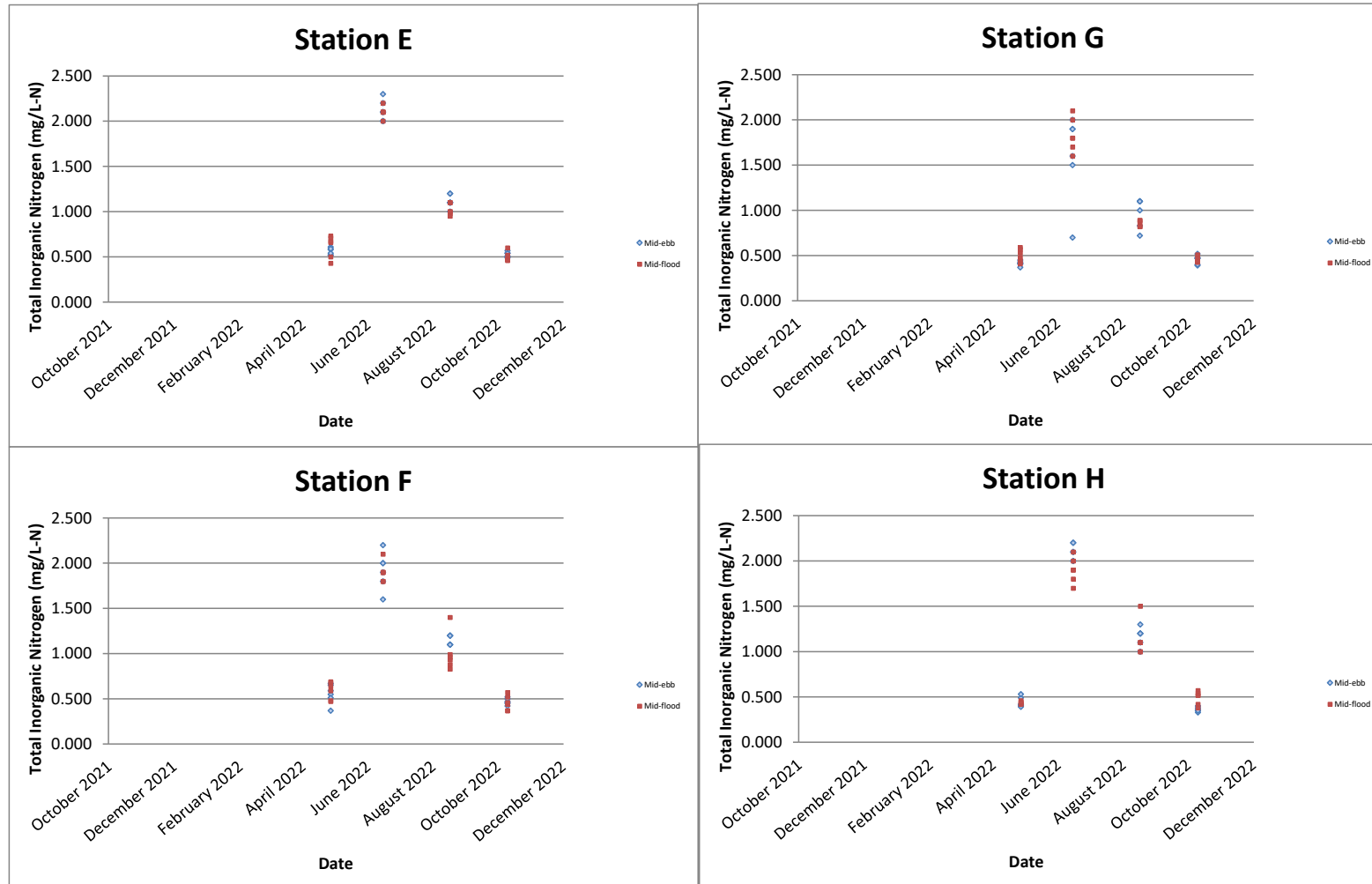
Remark: All below the Limit of Report sample results (<0.005 mg/L) for Nitrate Nitrogen is regarded as 0.005 mg/L in graphical presentation.

Total Inorganic Nitrogen (mg/L-N)



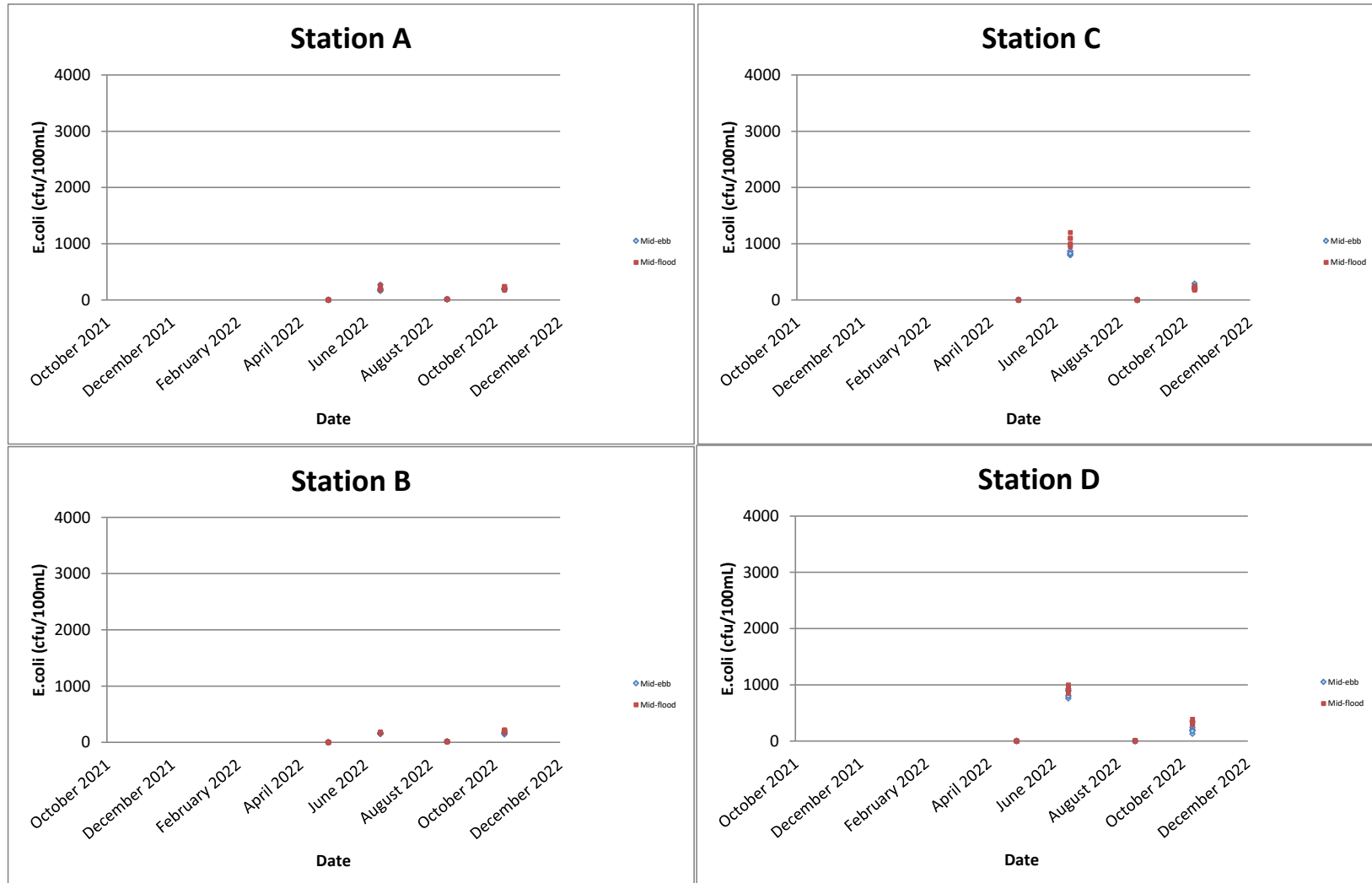
Remark: All below the Limit of Report sample results (<0.010 mg/L) for Total Inorganic Nitrogen is regarded as 0.010 mg/L in graphical presentation.

Total Inorganic Nitrogen (mg/L-N)



Remark: All below the Limit of Report sample results (<0.010 mg/L) for Total Inorganic Nitrogen is regarded as 0.010 mg/L in graphical presentation.

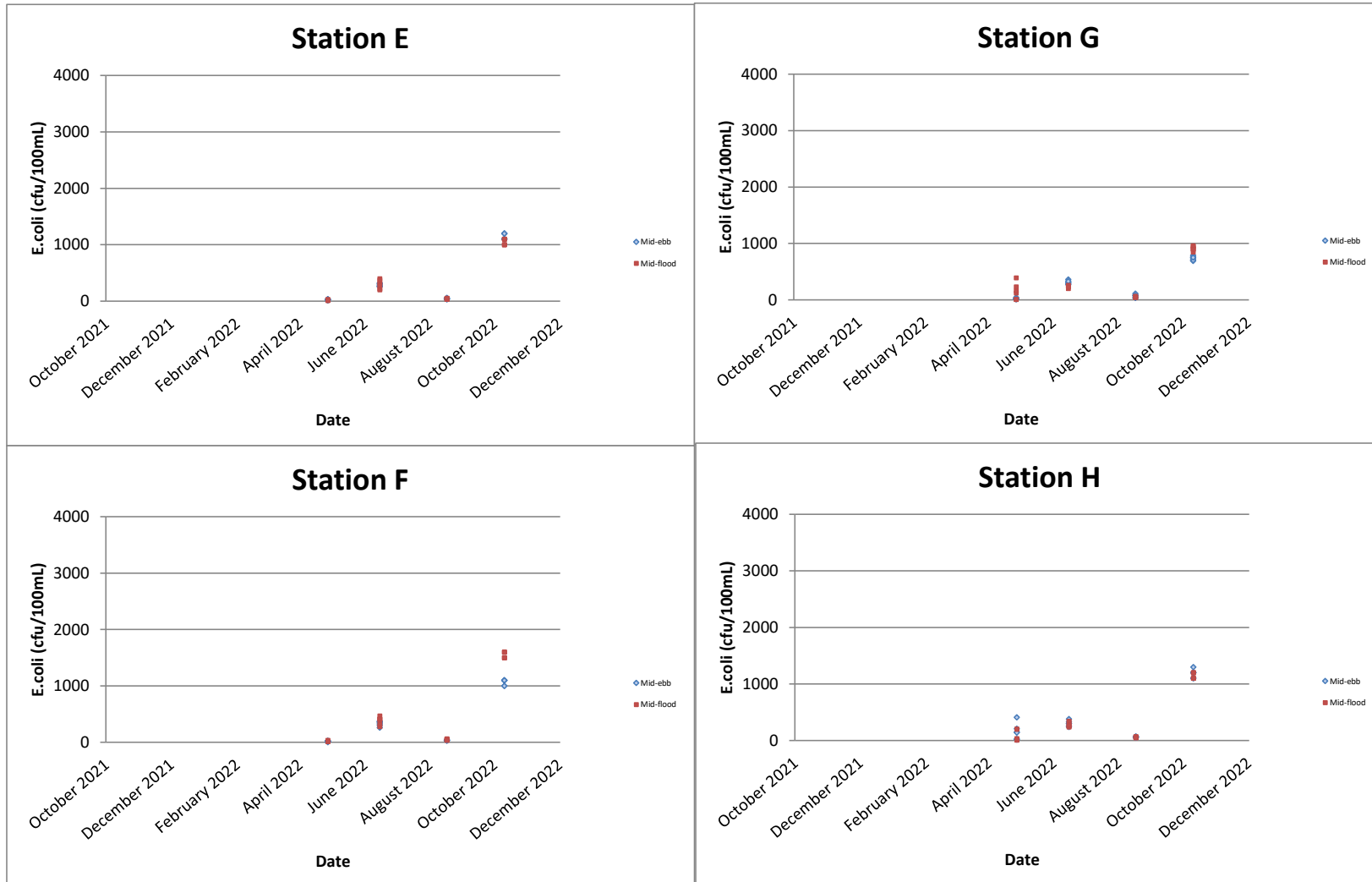
E.coli (cfu/100mL)



Remark: All below the Limit of Report sample results (<1 CFU/100mL) for E.coli is regarded as 1 CFU/100mL in graphical presentation.

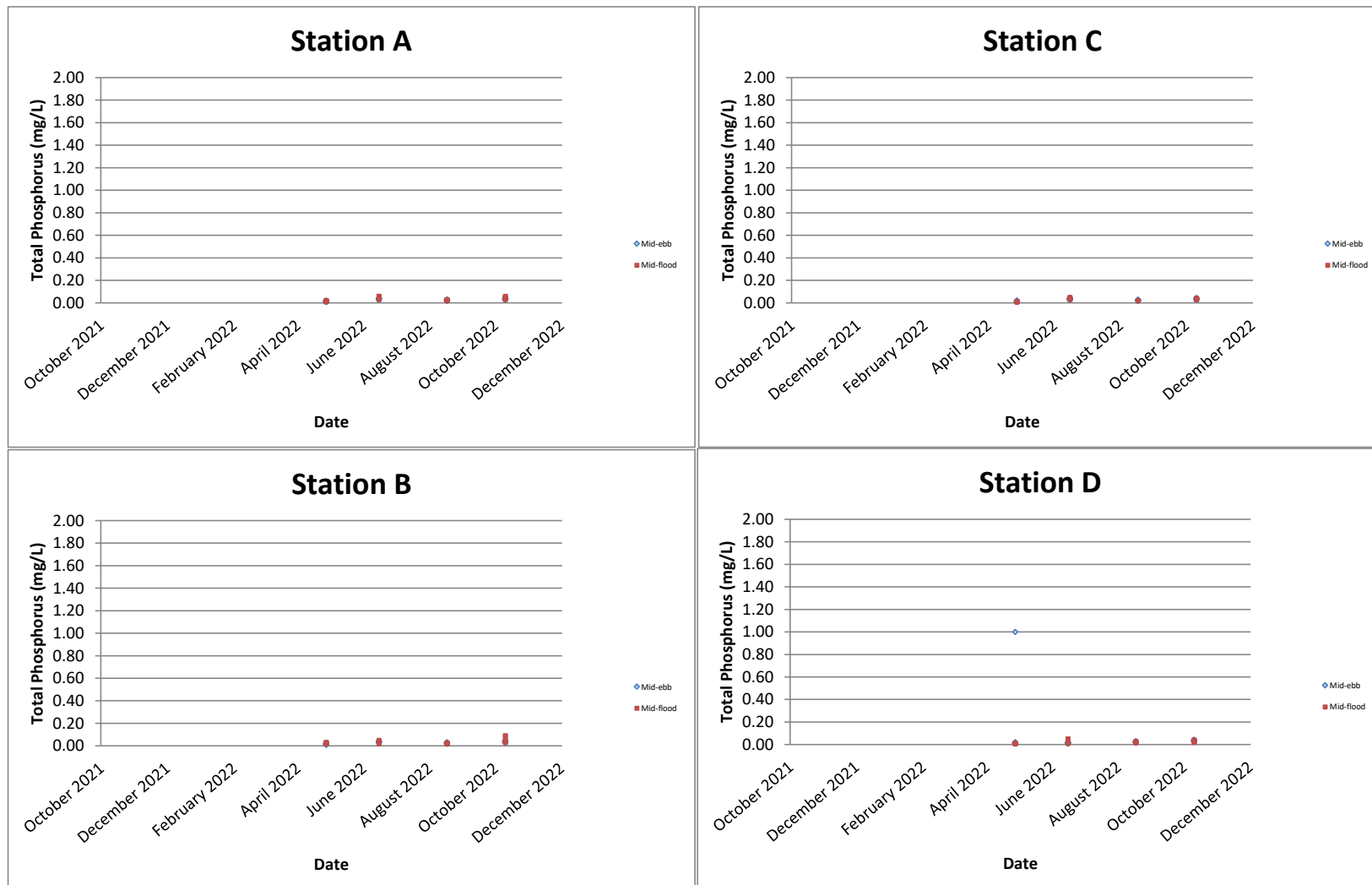


E.coli (cfu/100mL)



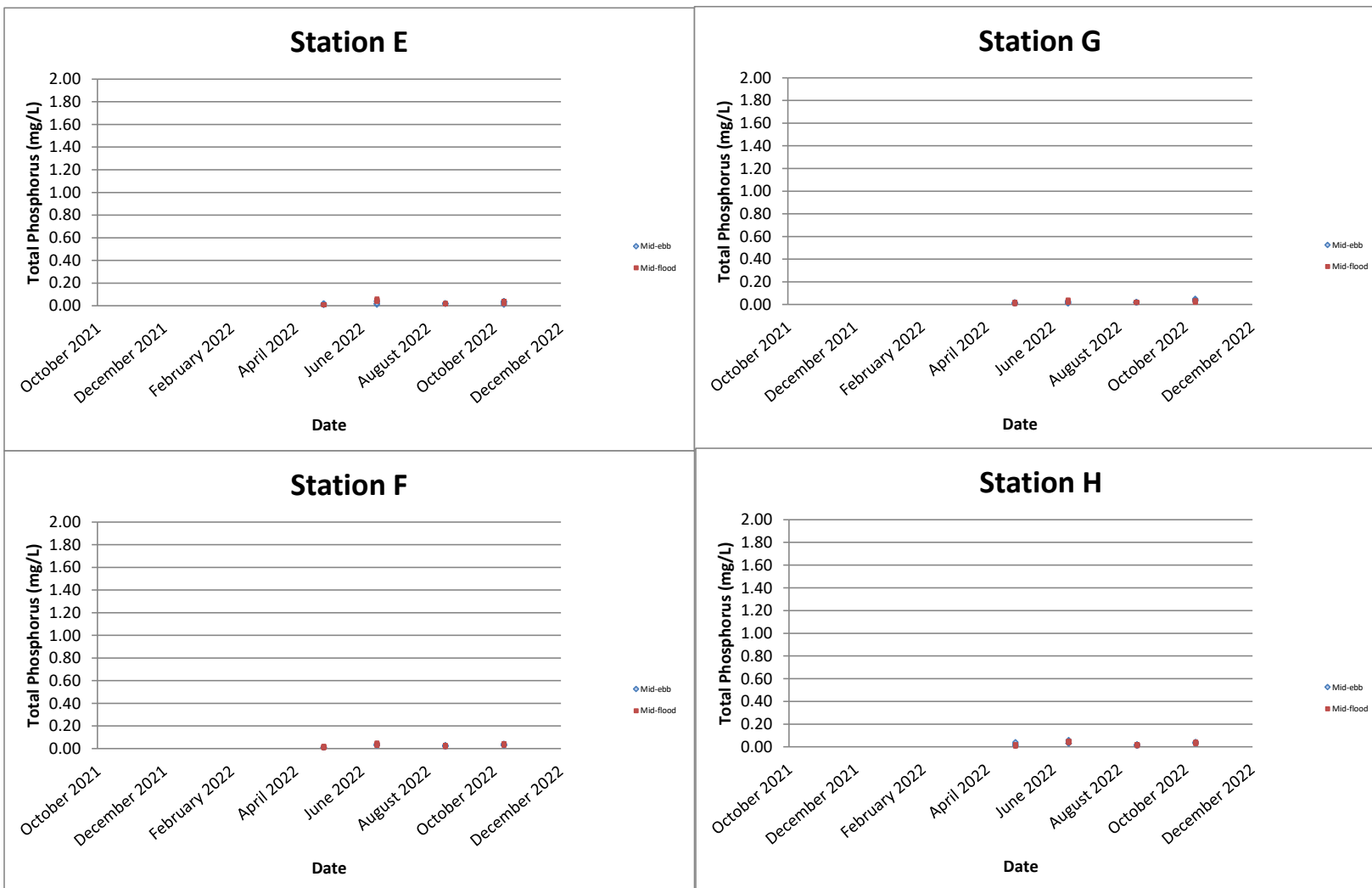
Remark: All below the Limit of Report sample results (<1 CFU/100mL) for E.coli is regarded as 1 CFU/100mL in graphical presentation.

Total Phosphorus (soluble and particulate) (mg/L)



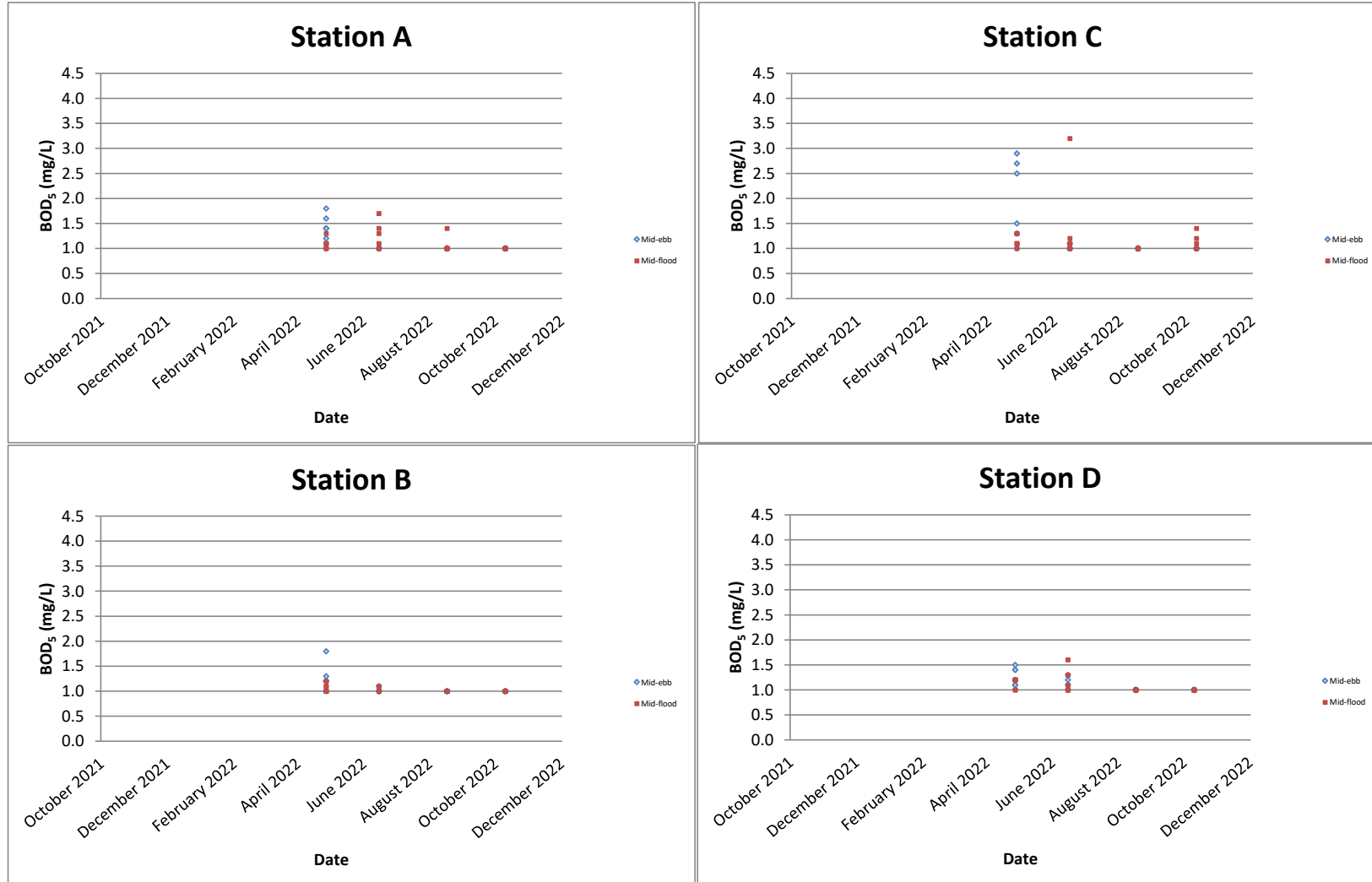
Remark: All below the Limit of Report sample results (<0.01 mg/L) for Total Phosphorus is regarded as 0.01 mg/L in graphical presentation.

Total Phosphorus (soluble and particulate) (mg/L)



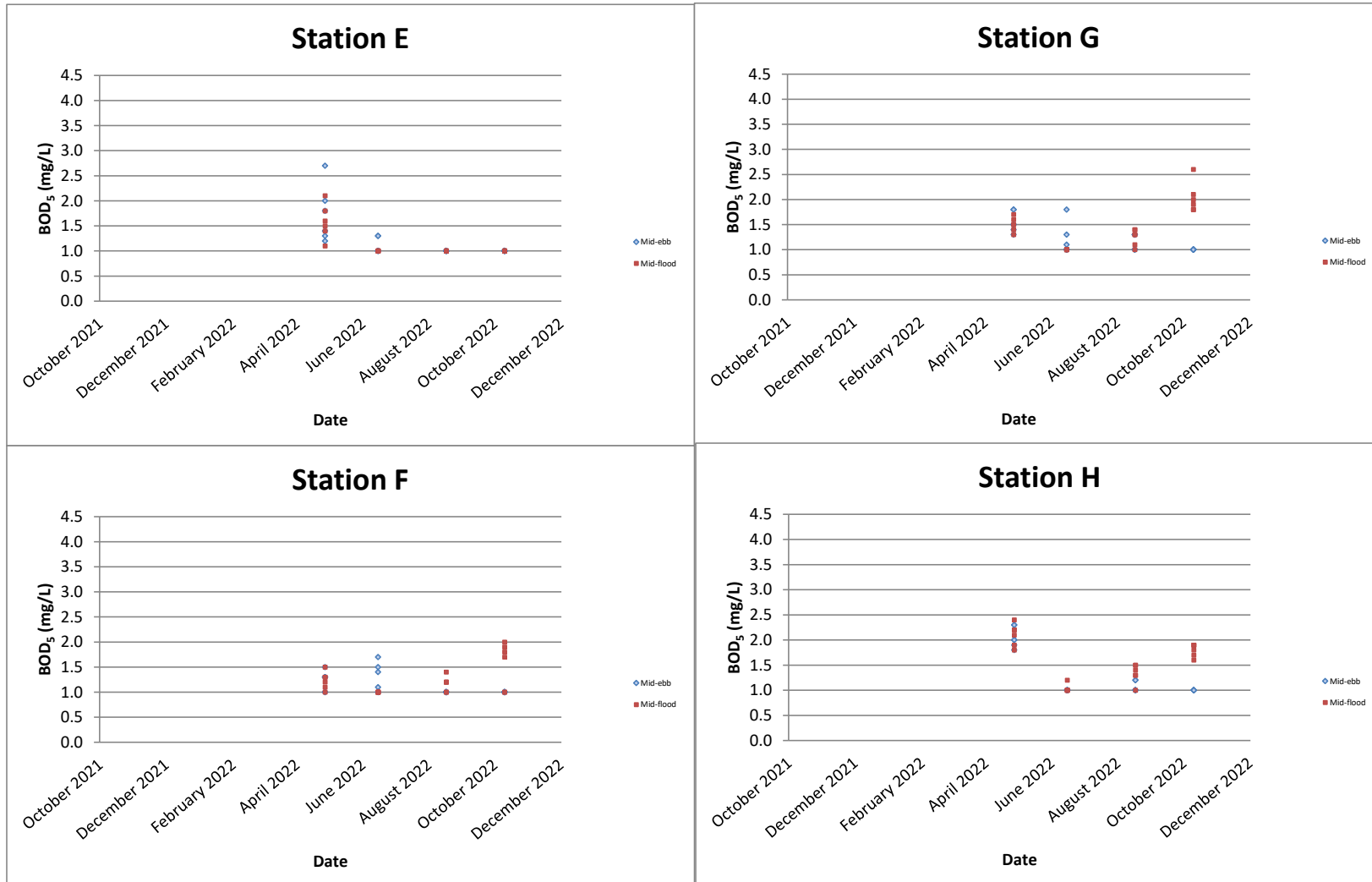
Remark: All below the Limit of Report sample results (<0.01 mg/L) for Total Phosphorus is regarded as 0.01 mg/L in graphical presentation.

BOD<sub>5</sub> (mg/L)



Remark: All below the Limit of Report sample results (<1.0 mg/L) for BOD<sub>5</sub> is regarded as 1.0 mg/L in graphical presentation.

BOD<sub>5</sub> (mg/L)



Remark: All below the Limit of Report sample results (<1.0 mg/L) for BOD<sub>5</sub> is regarded as 1.0 mg/L in graphical presentation.

# 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.: 0041/17/ED/0691

## Appendix E

Tidal Data obtained from Ma Wan Marine Traffic Station

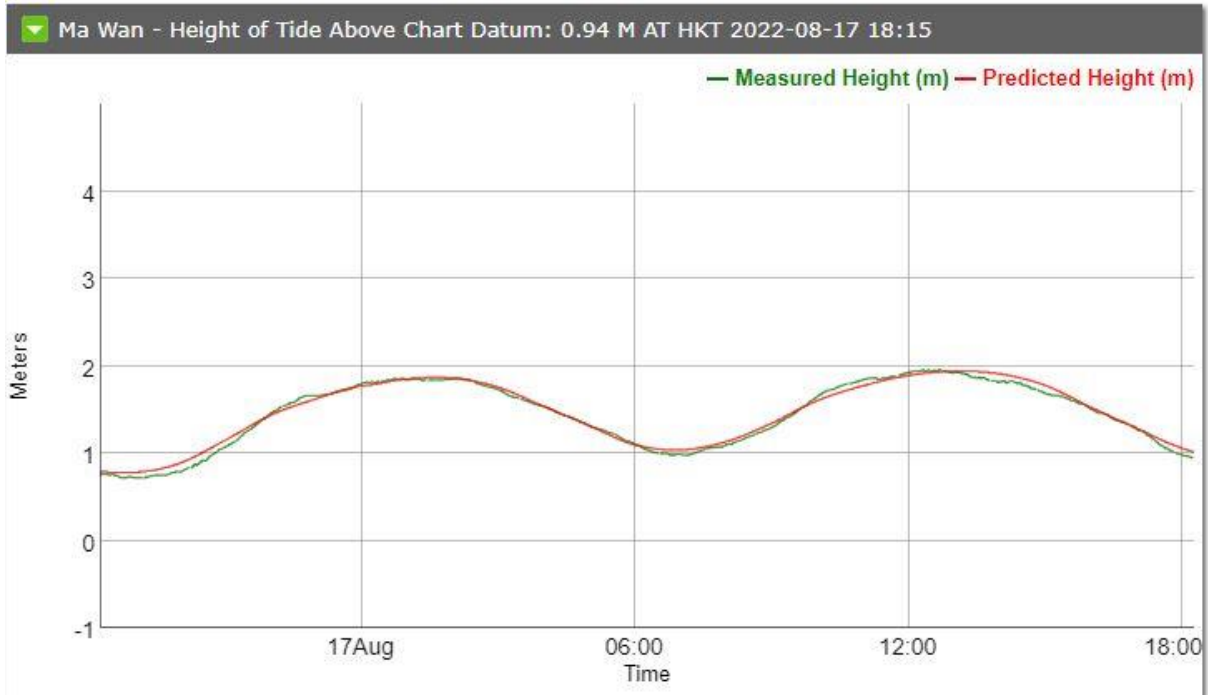
# FUGRO TECHNICAL SERVICES LIMITED

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

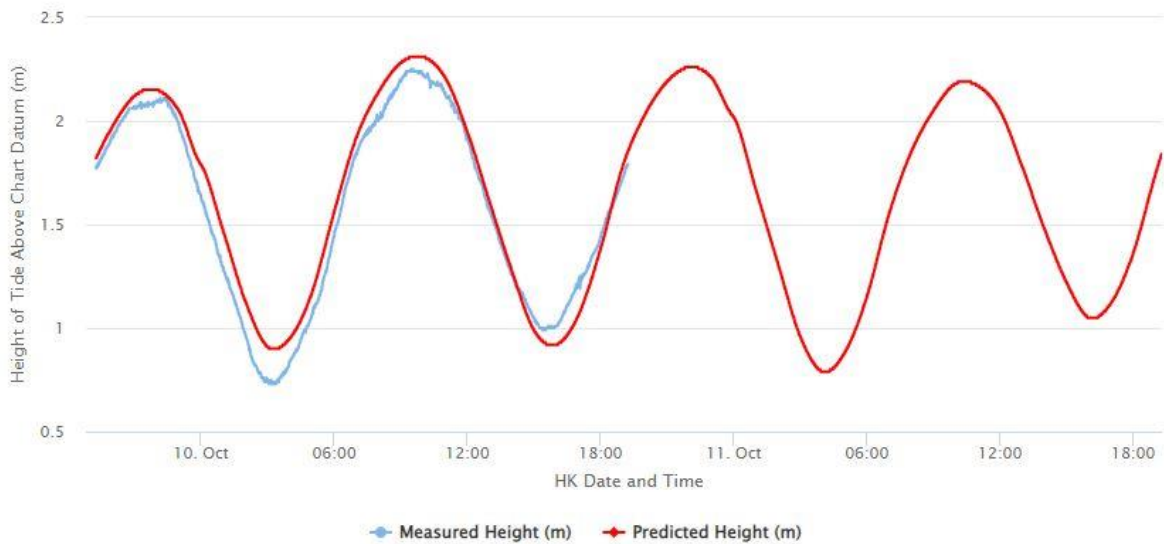
Tel : +852 2450 8233  
Fax : +852 2450 6138  
E-mail : matlab@fugro.com  
Website : www.fugro.com



Report No.: 0041/17/ED/0691



## Ma Wan



# 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



---

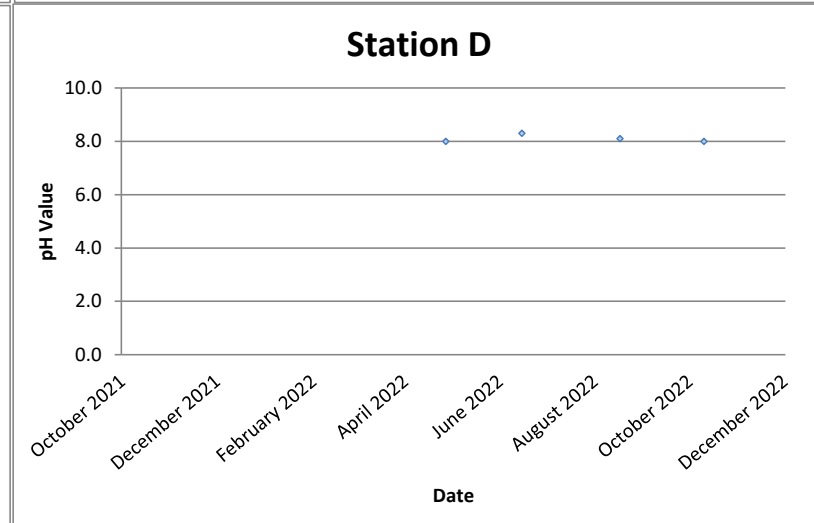
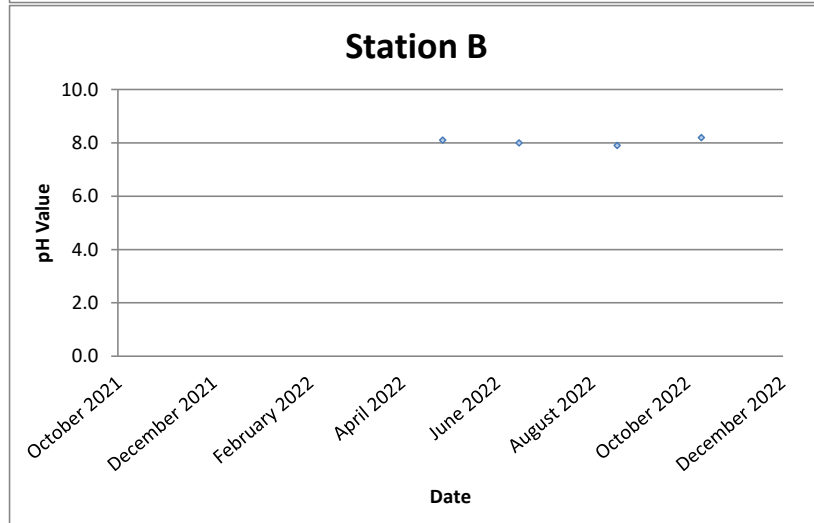
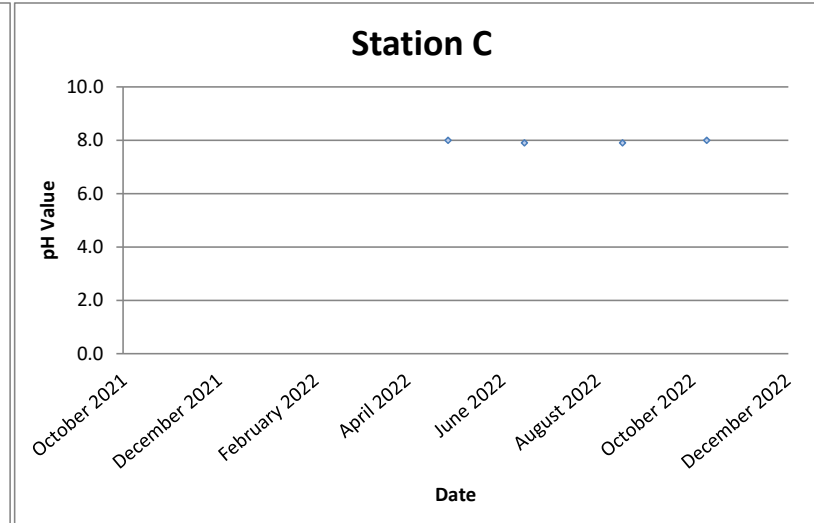
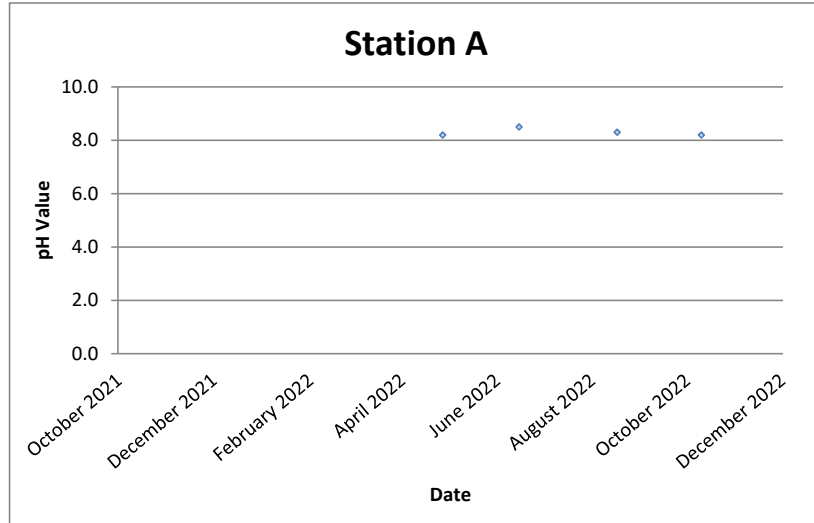
Report No.: 0041/17/ED/0691

## Appendix F

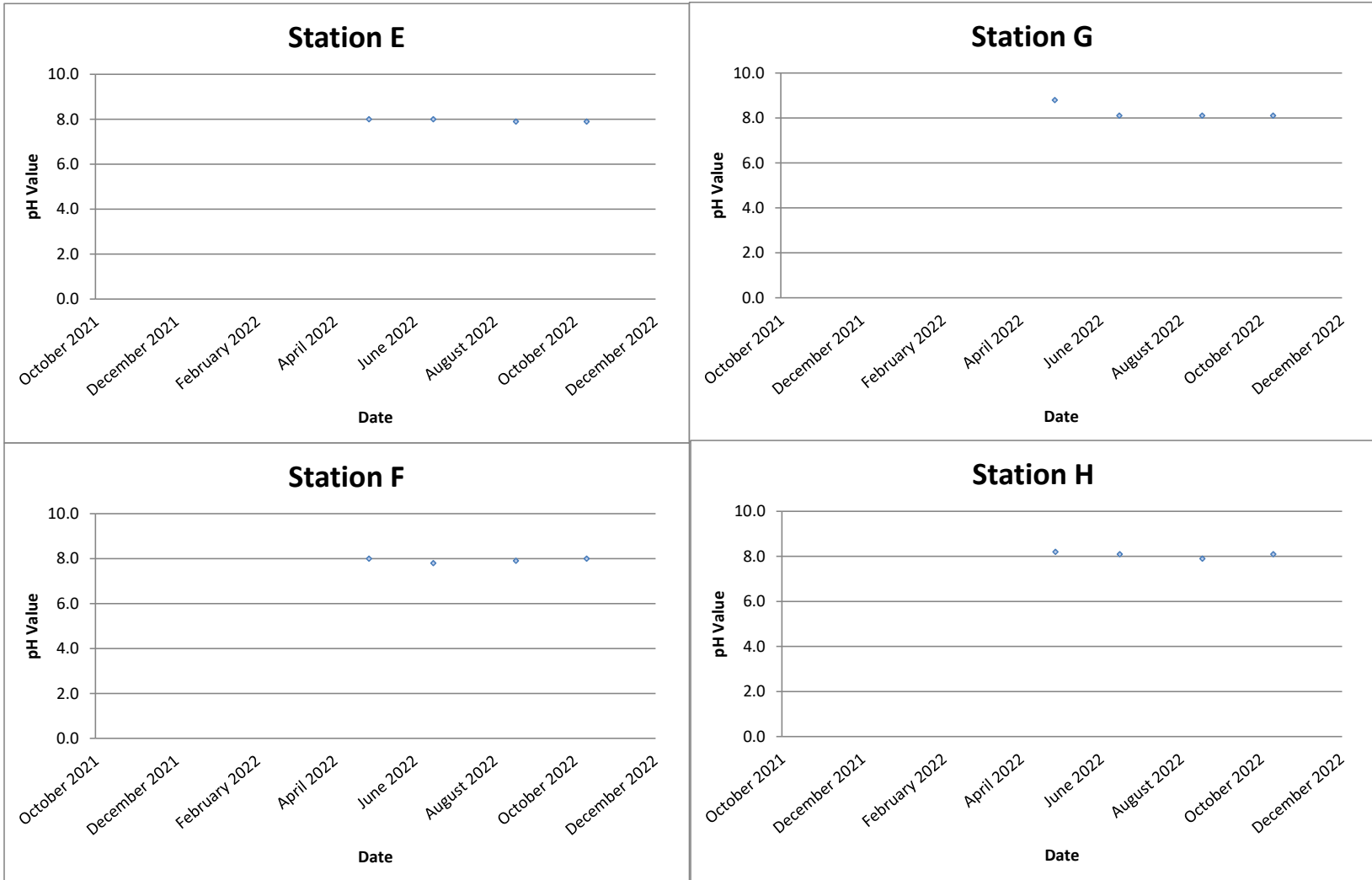
### Graphical Presentation of Sediment Quality Monitoring and Benthic Survey



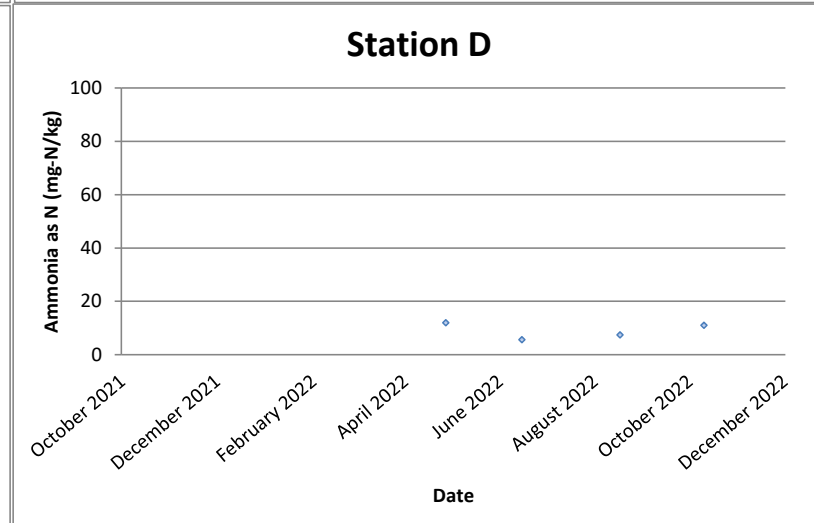
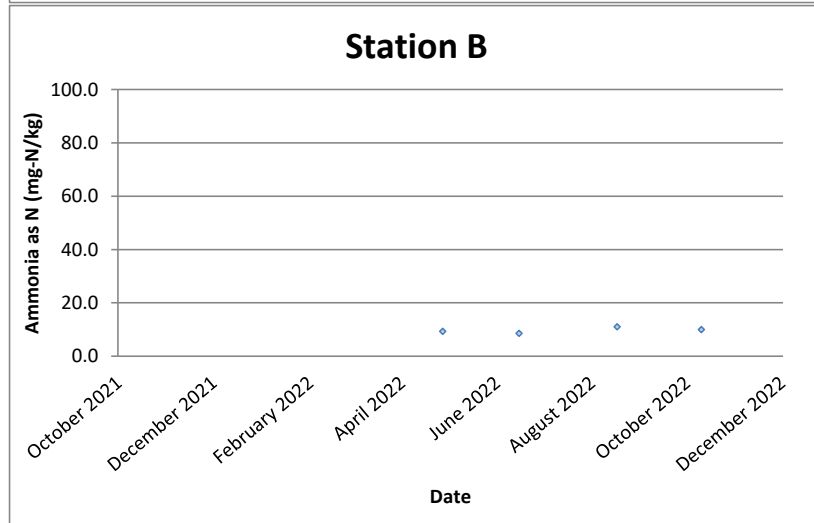
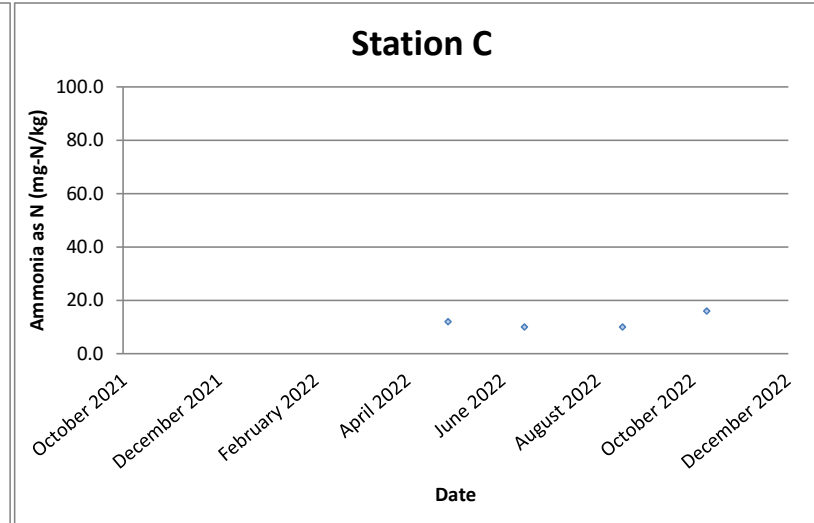
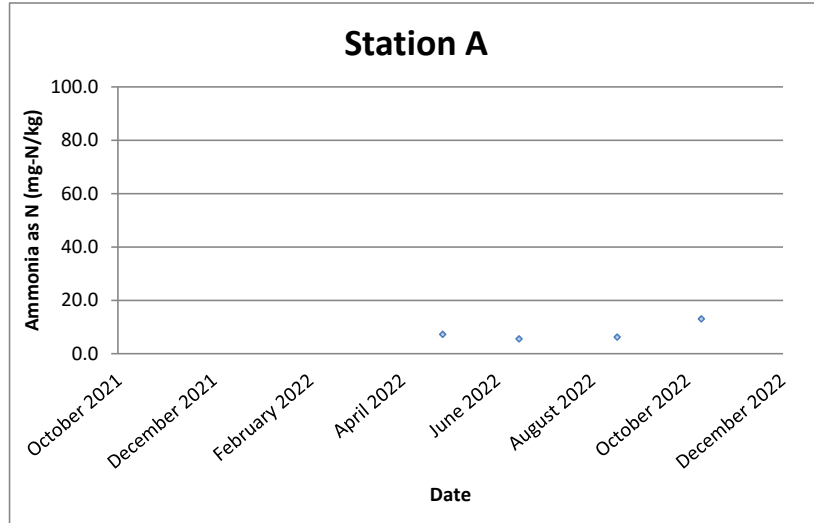
pH value



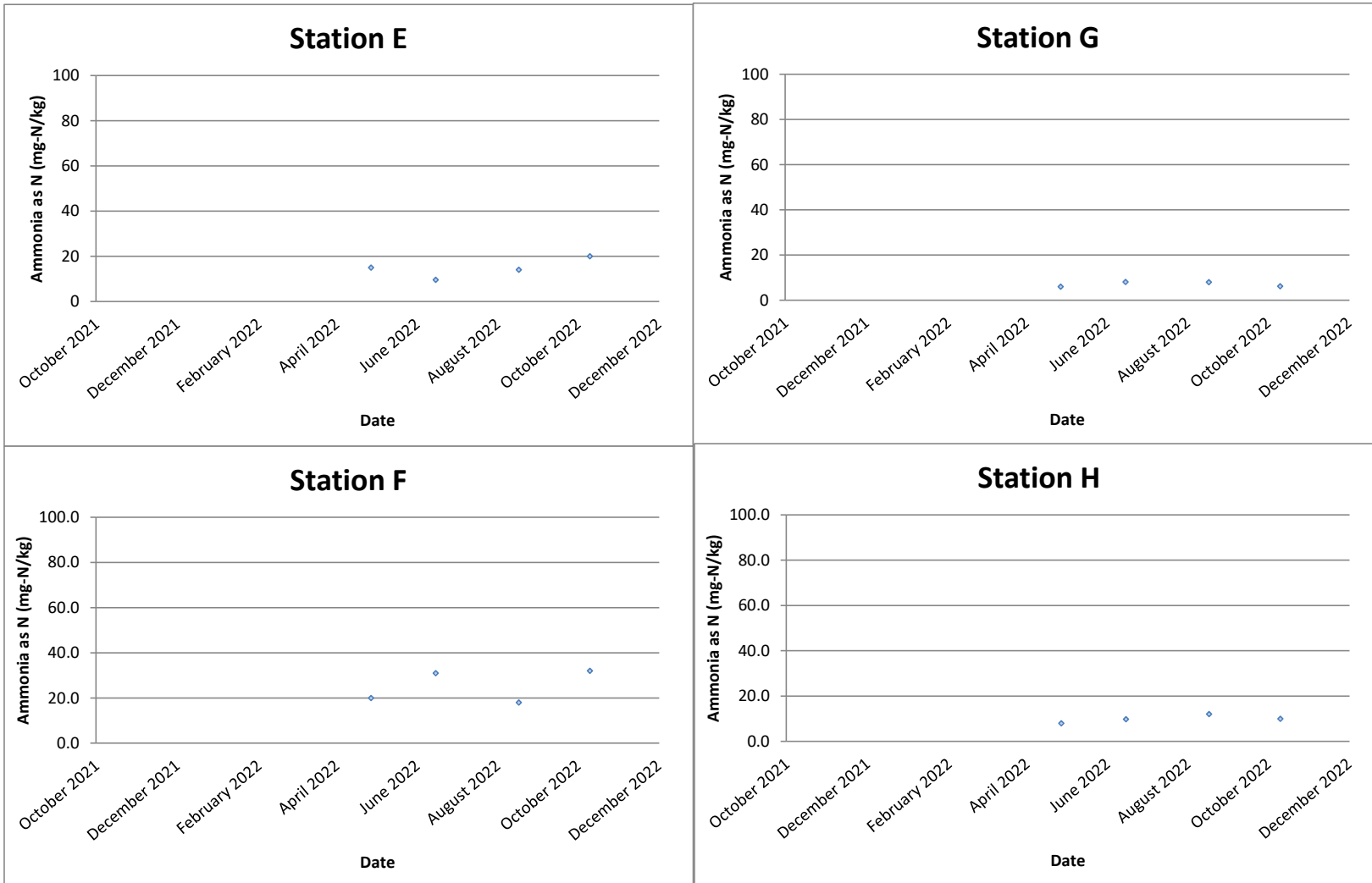
pH value



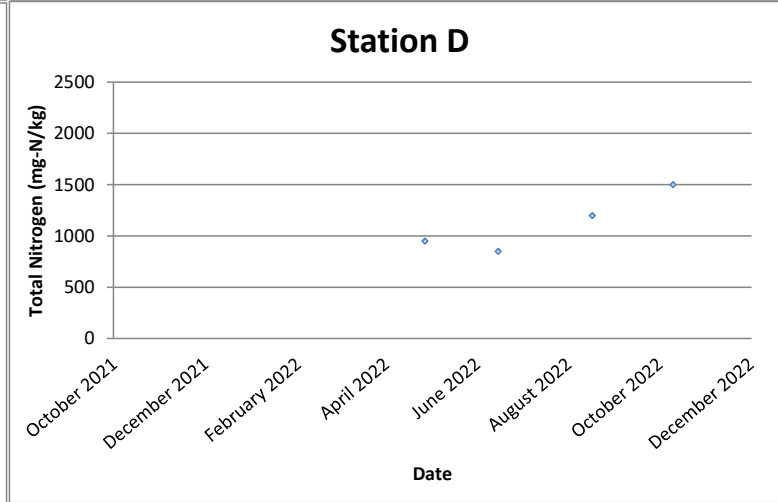
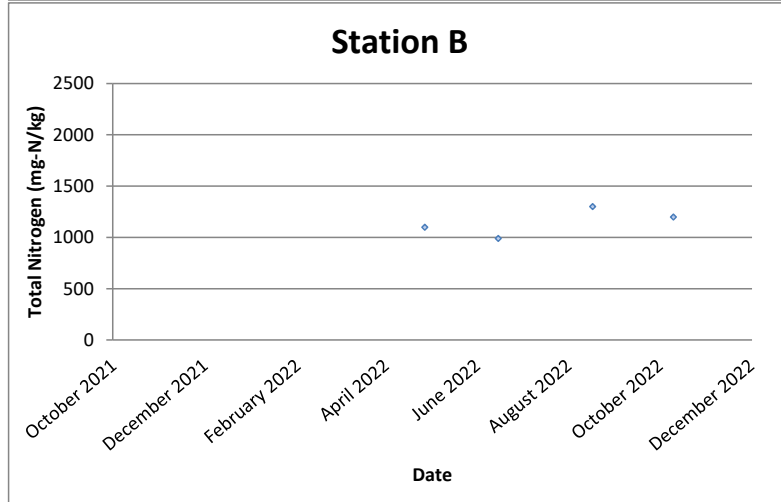
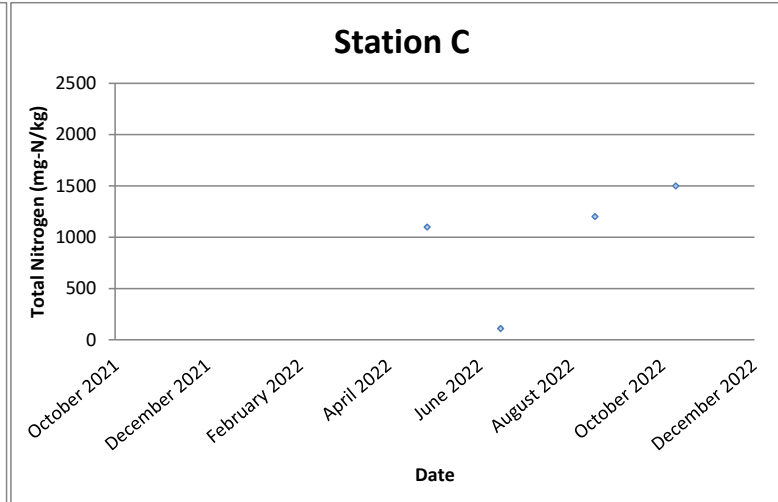
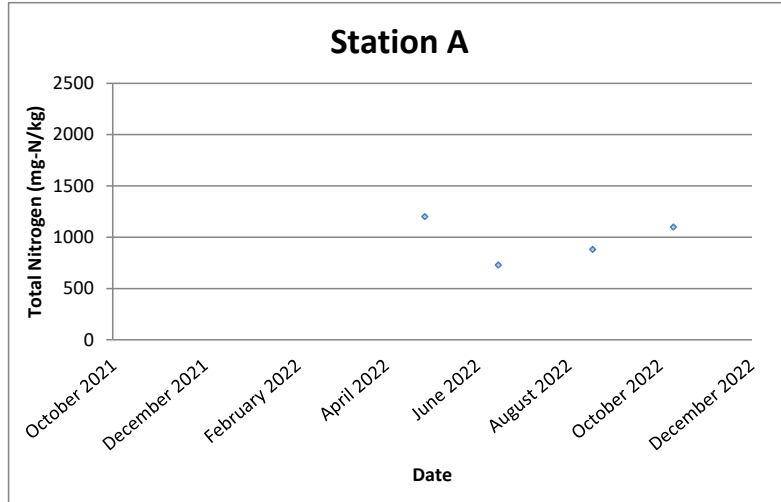
Ammonia Nitrogen (mg-N/kg)



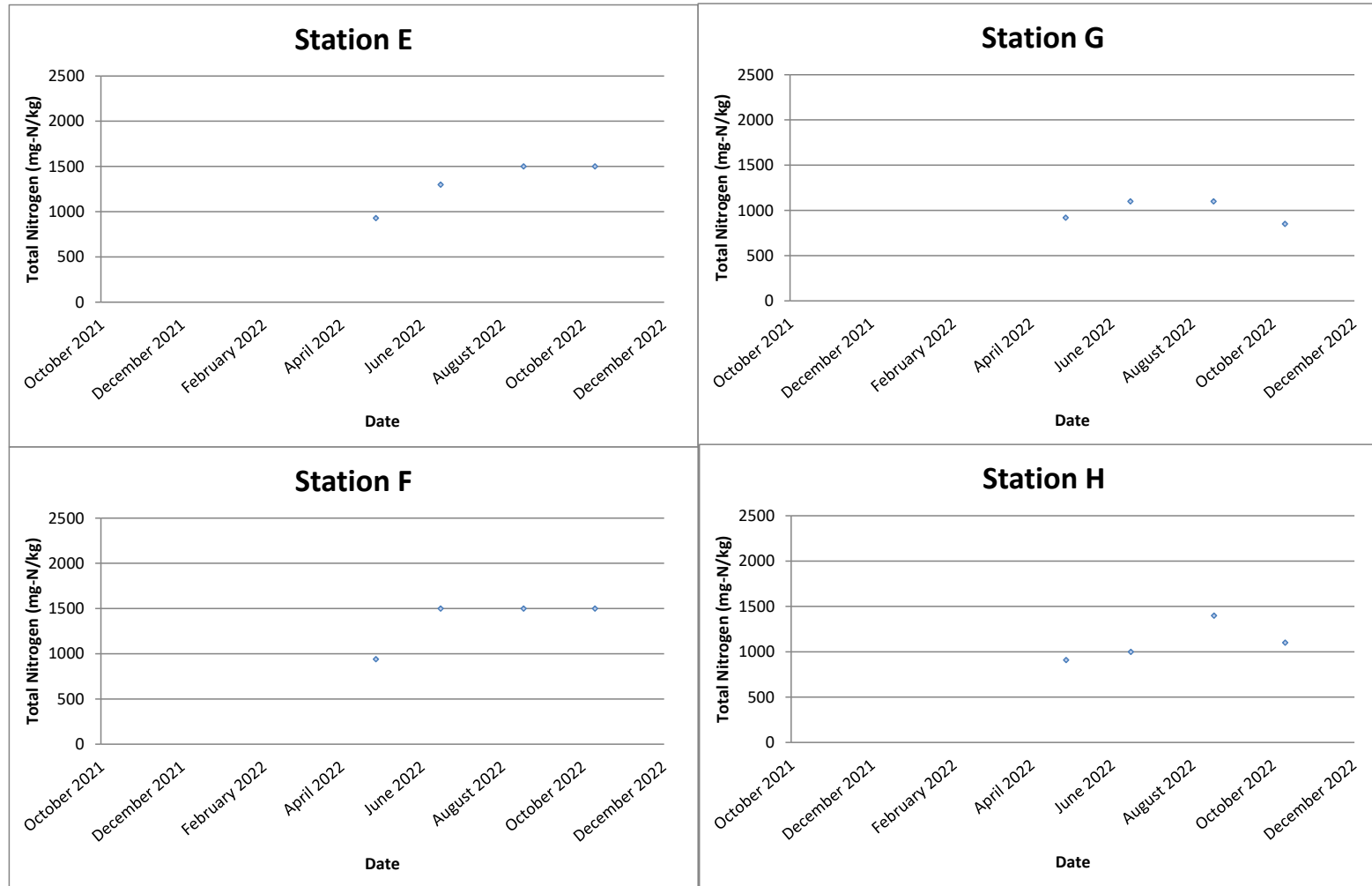
Ammonia Nitrogen (mg-N/kg)



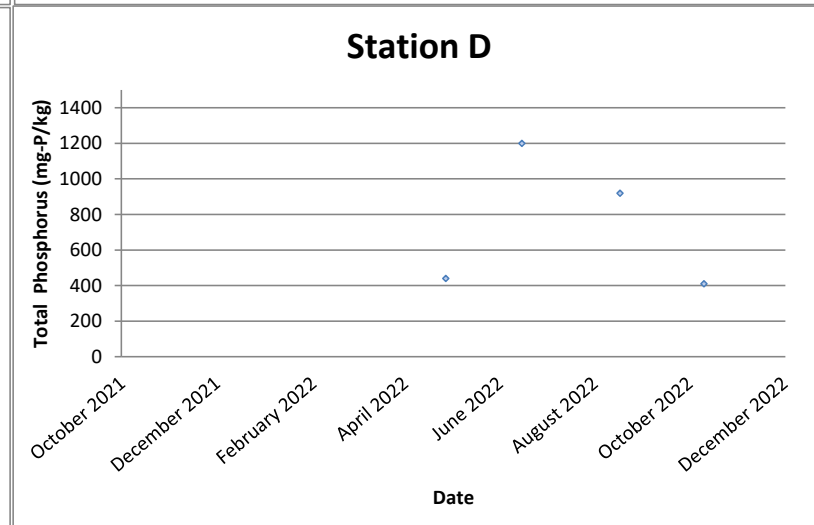
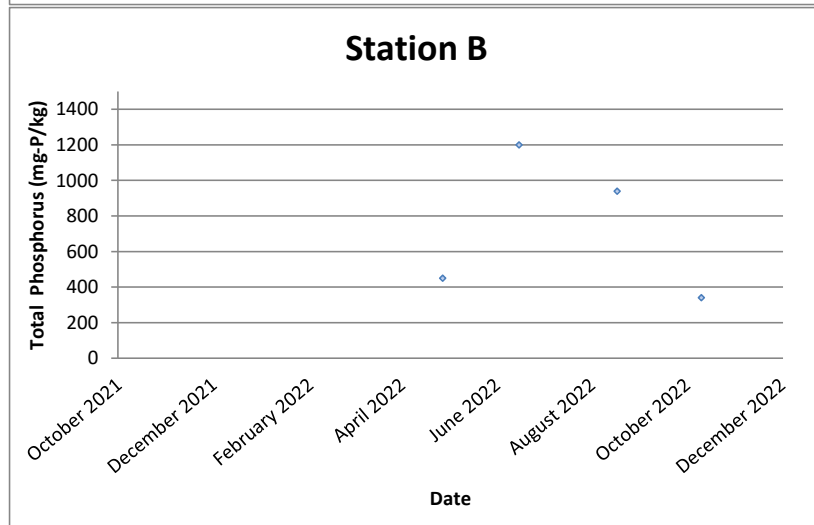
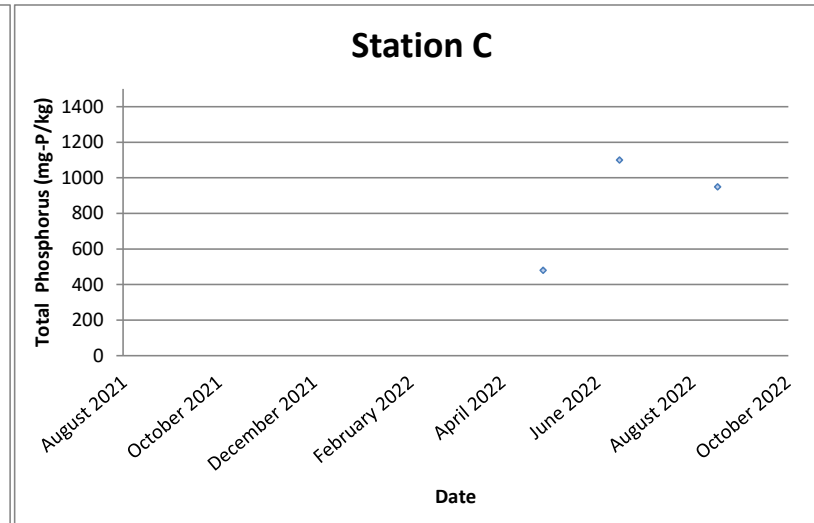
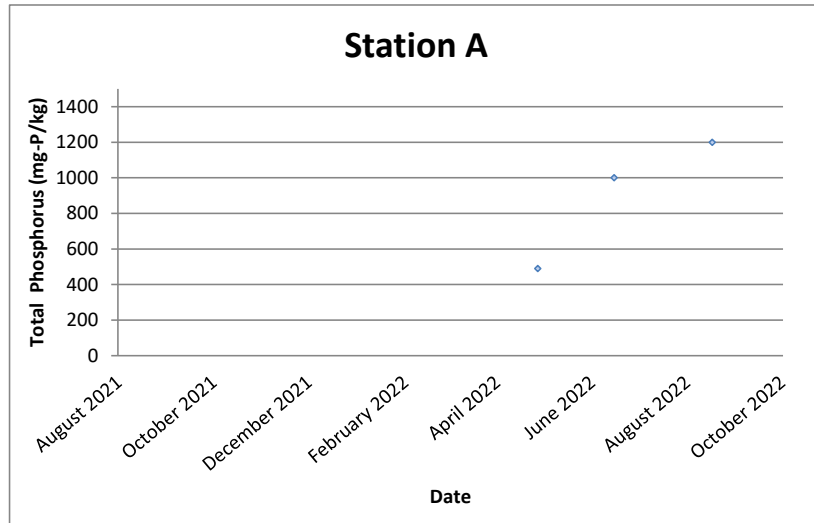
Total Nitrogen (mg-N/kg)



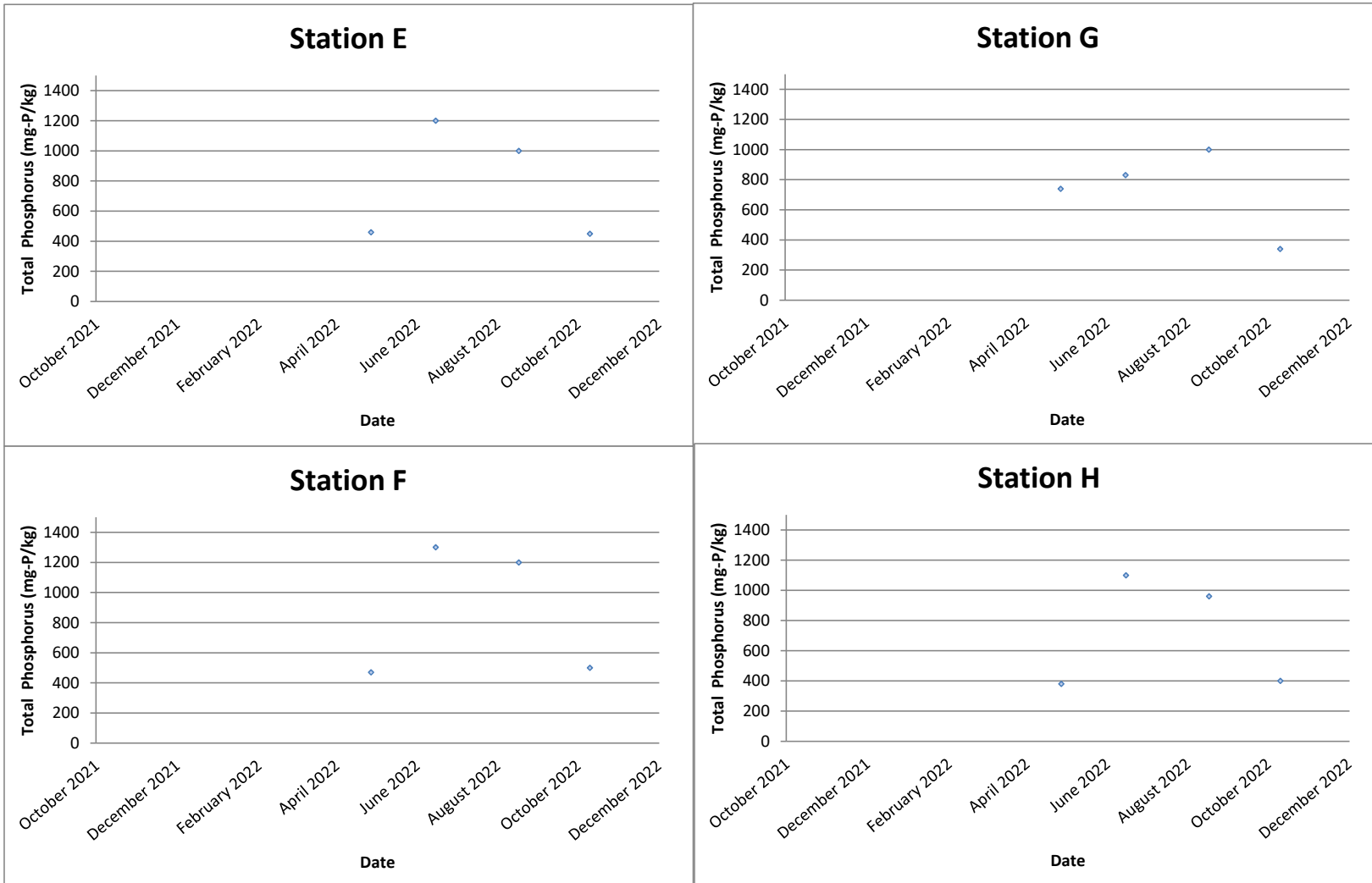
Total Nitrogen (mg-N/kg)



Total Phosphorus (mg-P/kg)

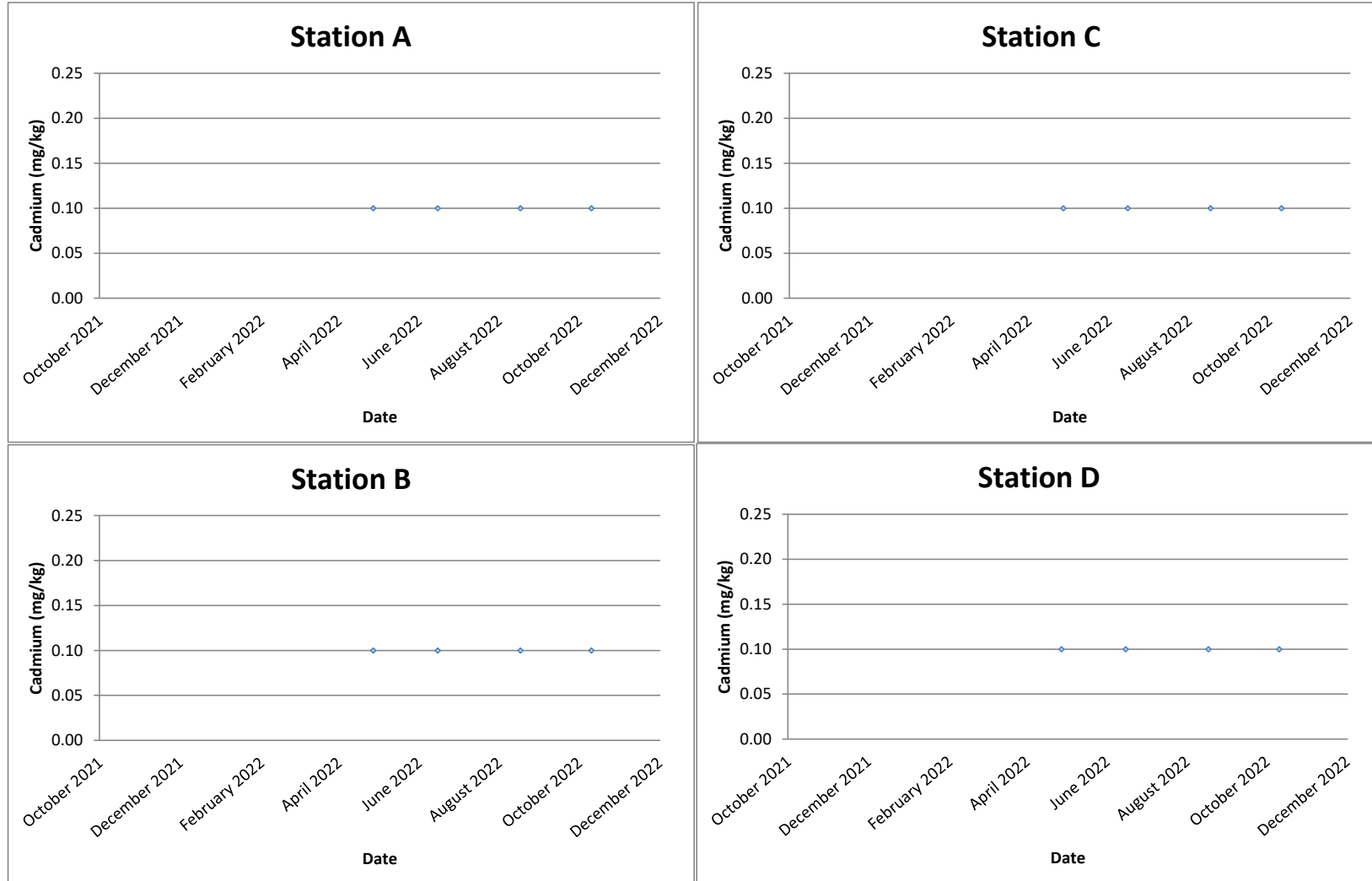


Total Phosphorus (mg-P/kg)



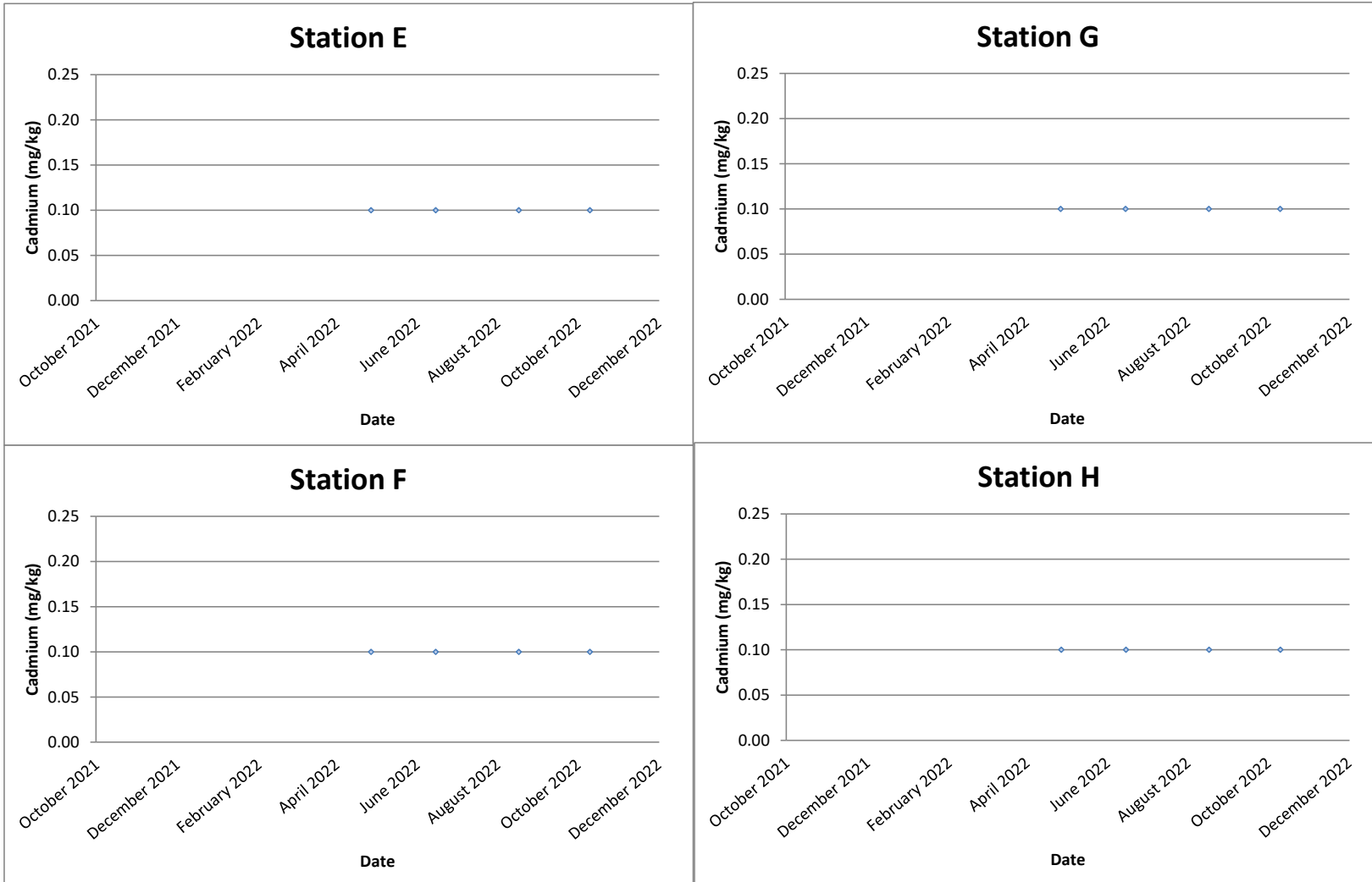


Cadmium (mg/kg)



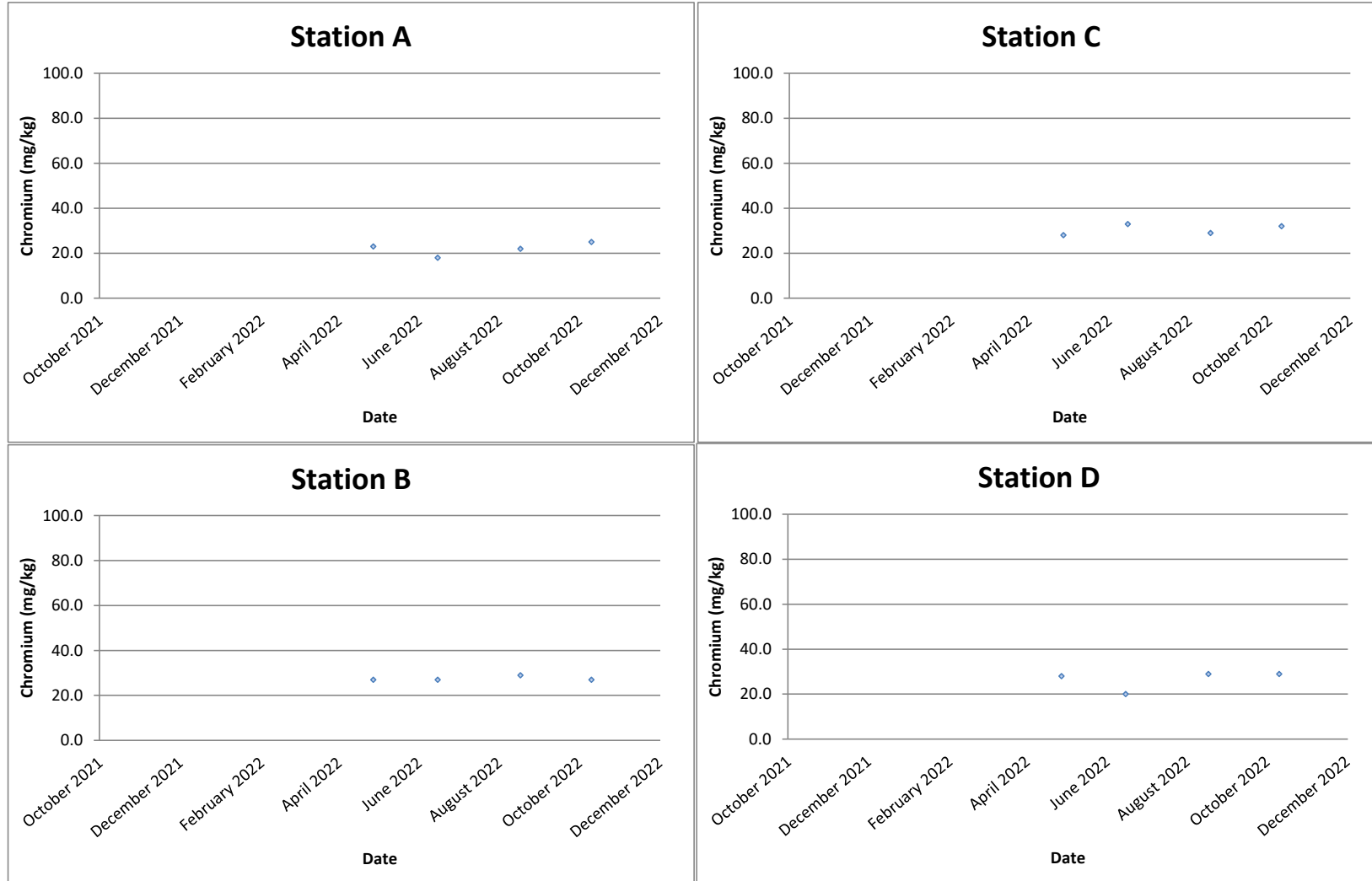
Remark: All below the Limit of Report sample results (<0.1 mg/kg) for Cadmium is regarded as 0.1 mg/kg in graphical presentation.

Cadmium (mg/kg)

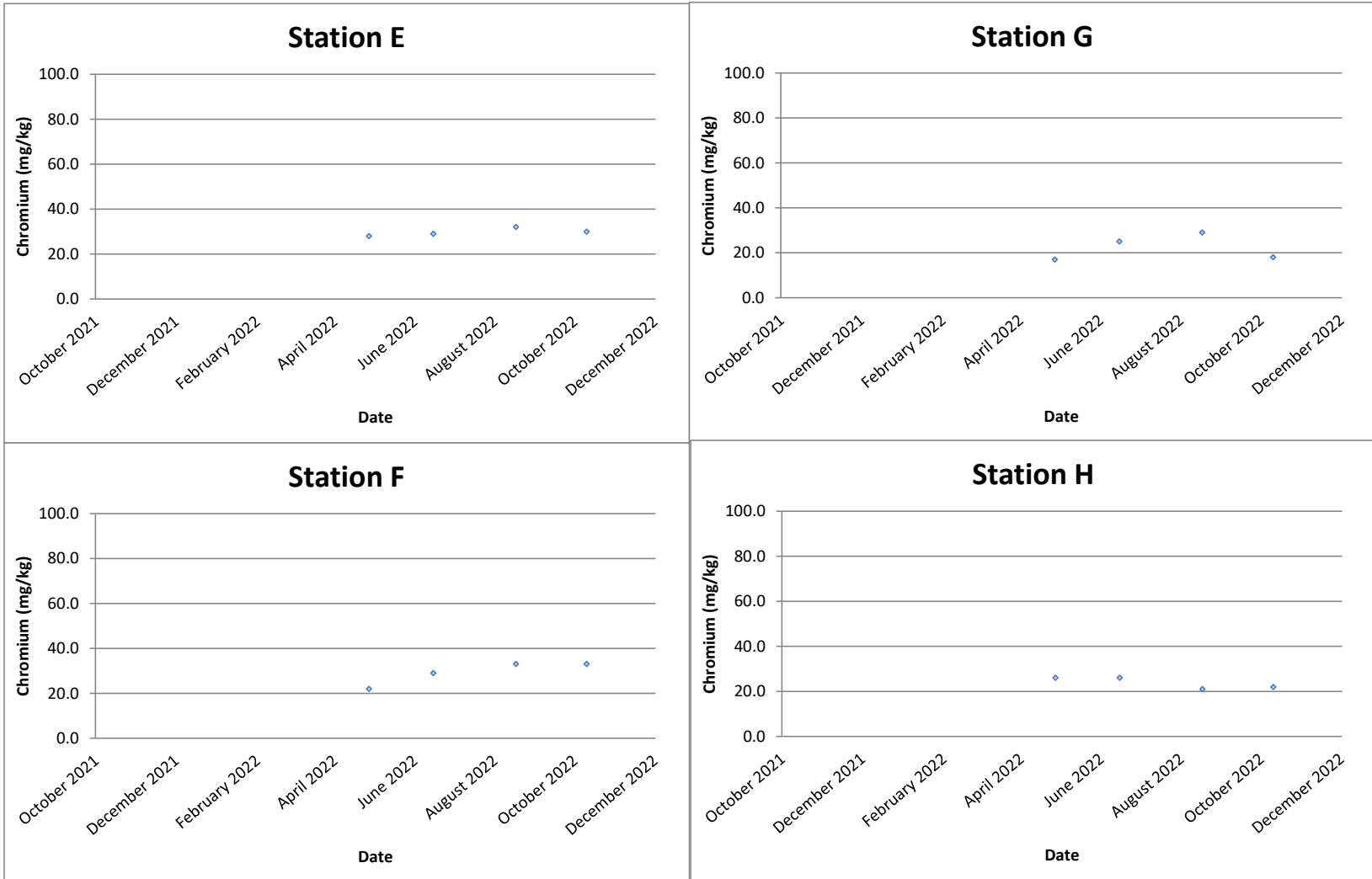


Remark: All below the Limit of Report sample results (<0.1 mg/kg) for Cadmium is regarded as 0.1 mg/kg in graphical presentation.

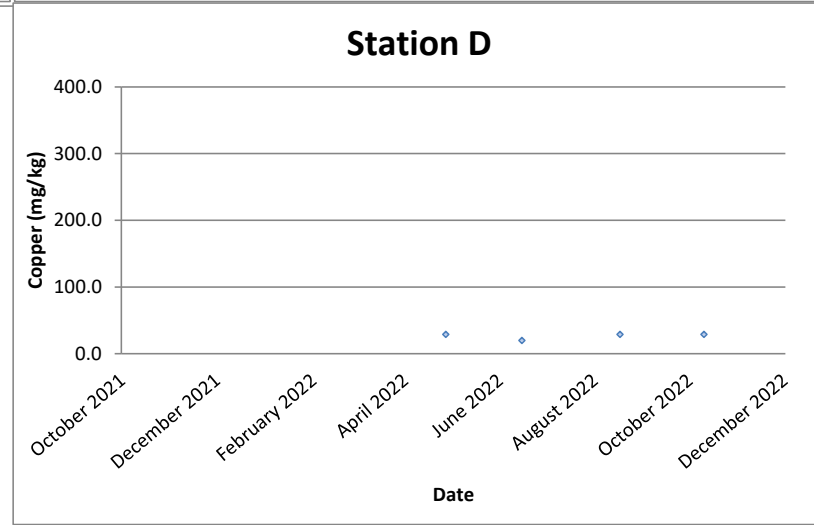
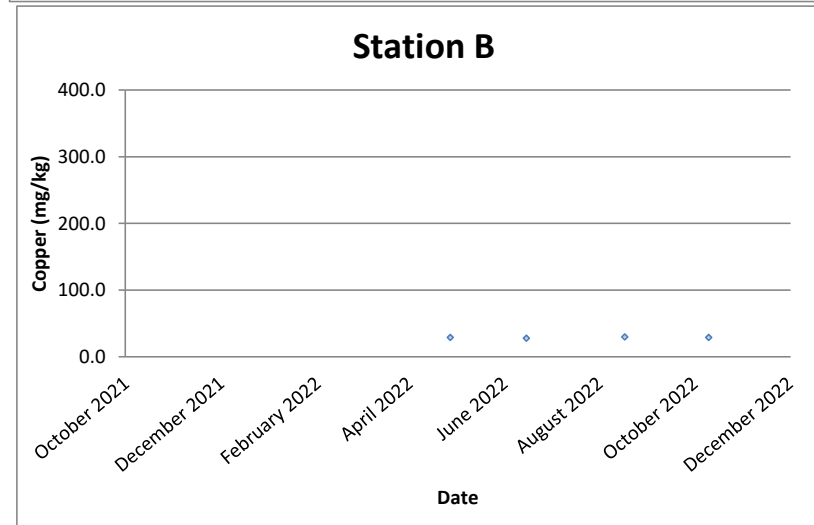
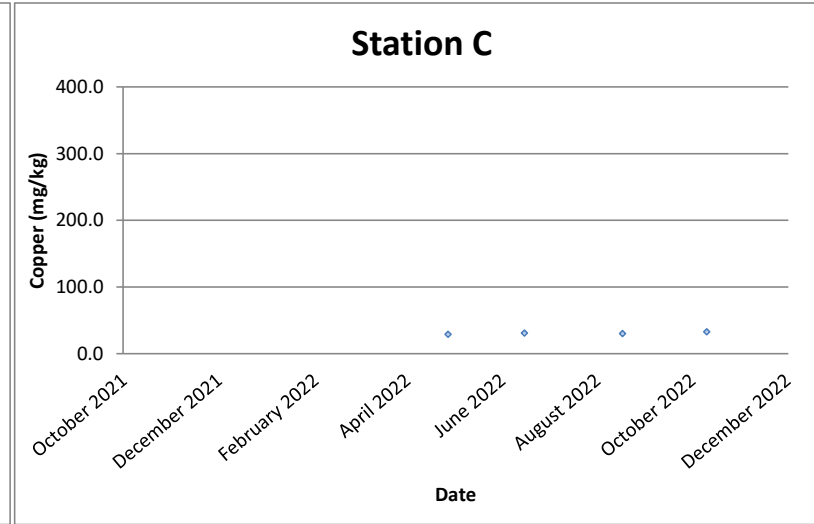
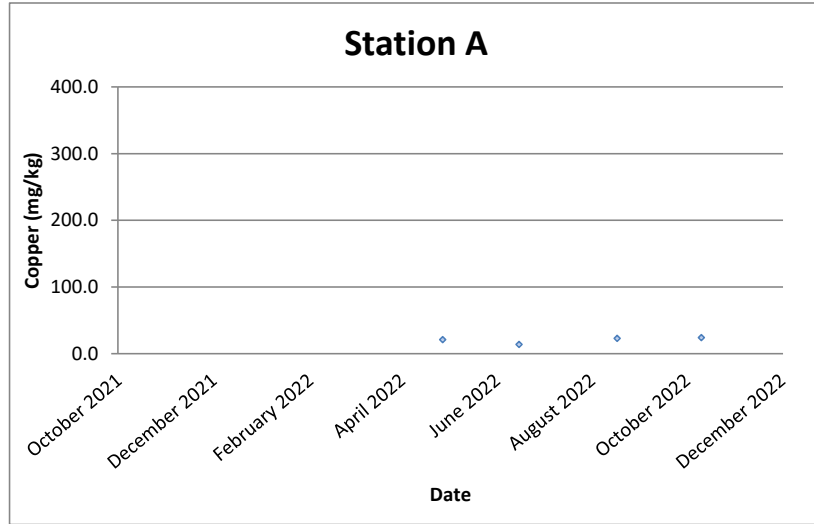
Chromium (mg/kg)



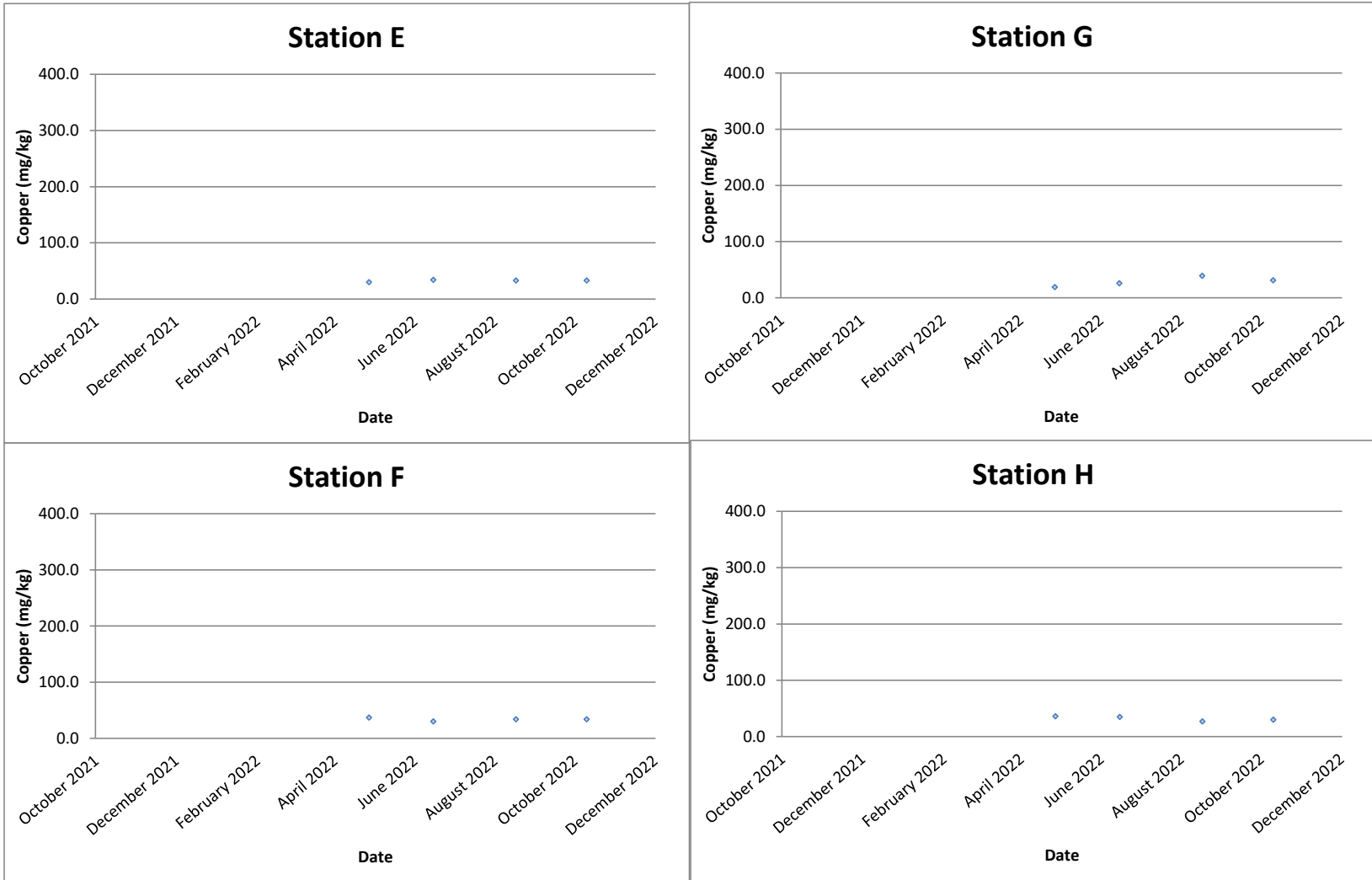
Chromium (mg/kg)



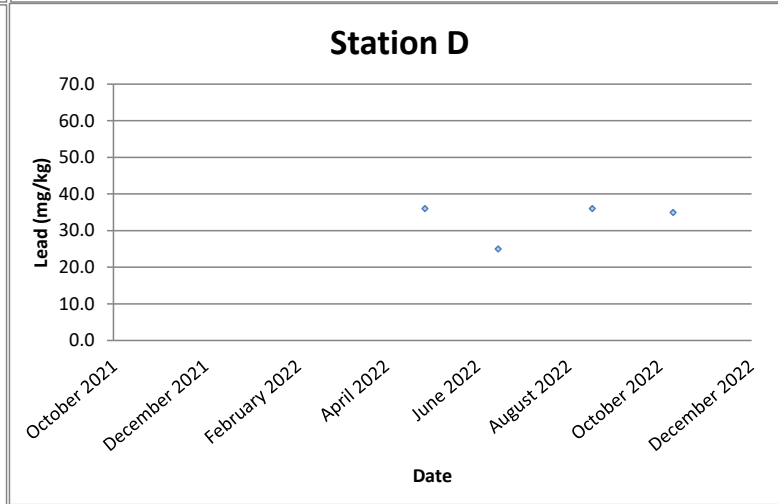
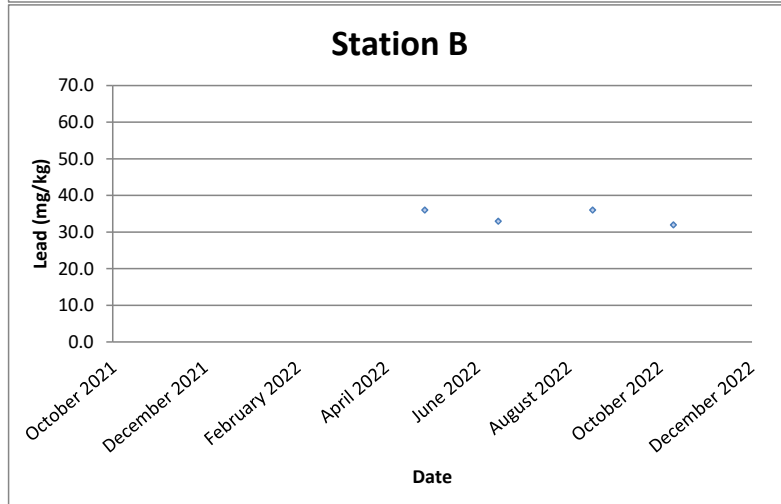
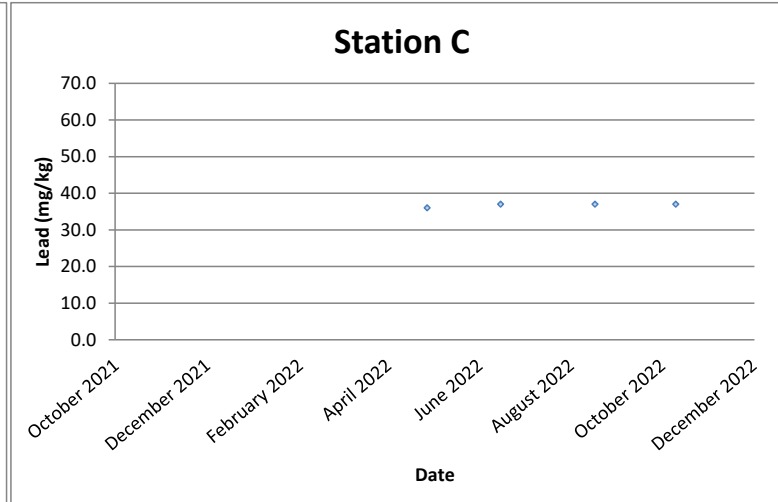
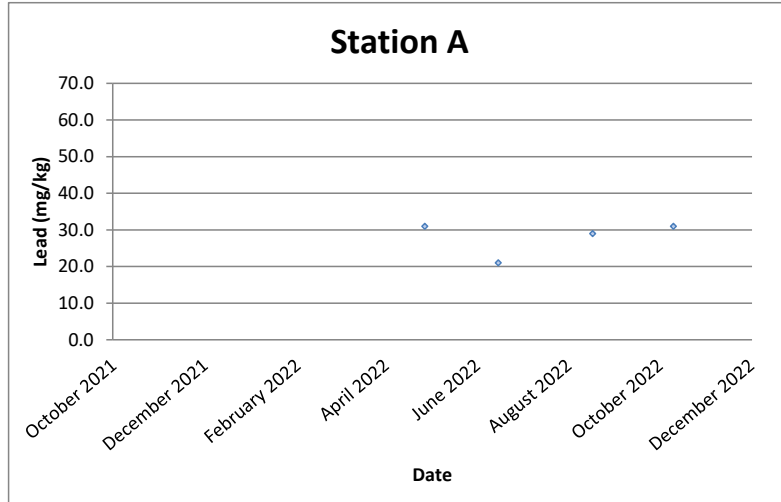
Copper (mg/kg)



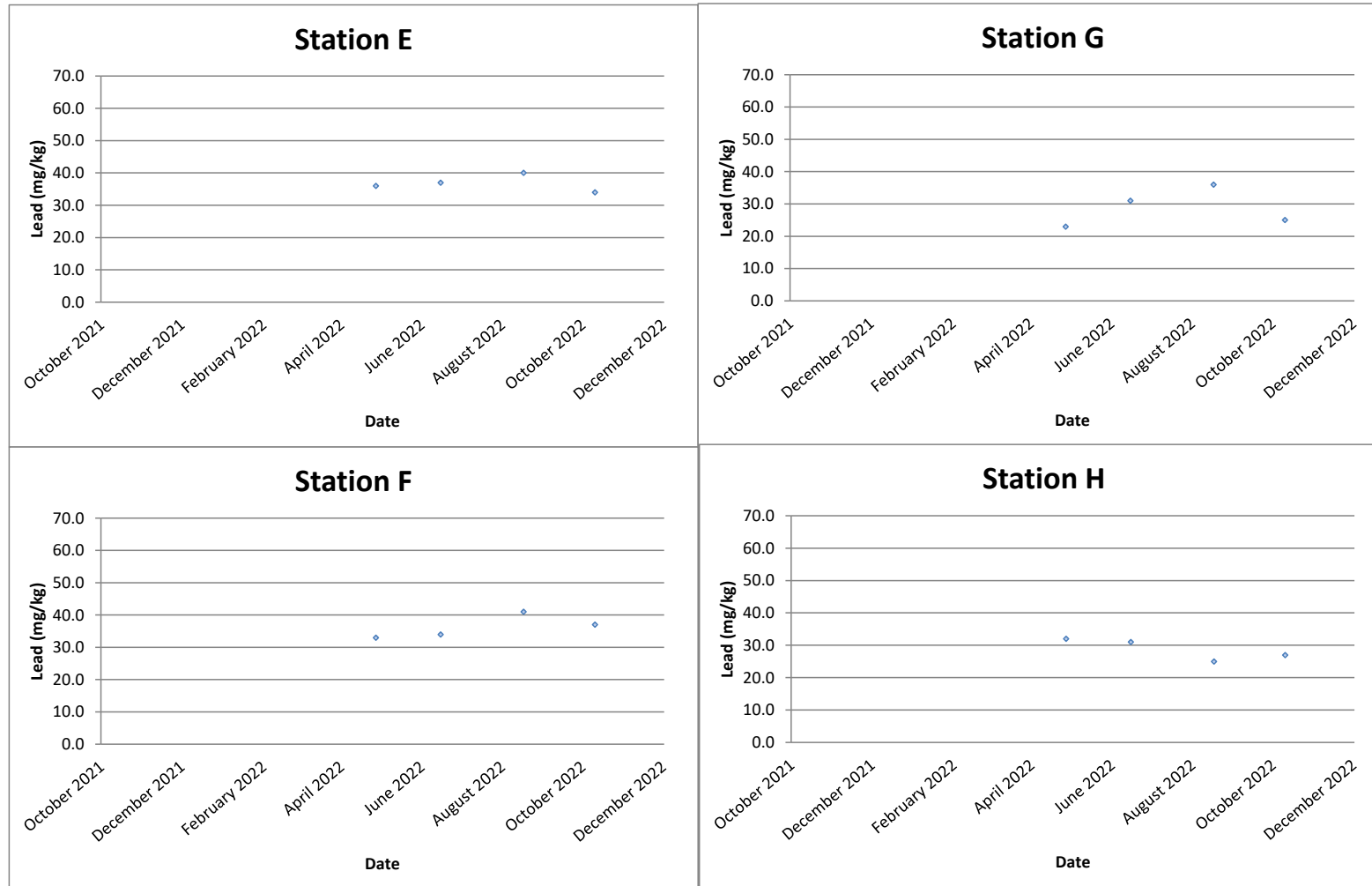
Copper (mg/kg)



Lead (mg/kg)

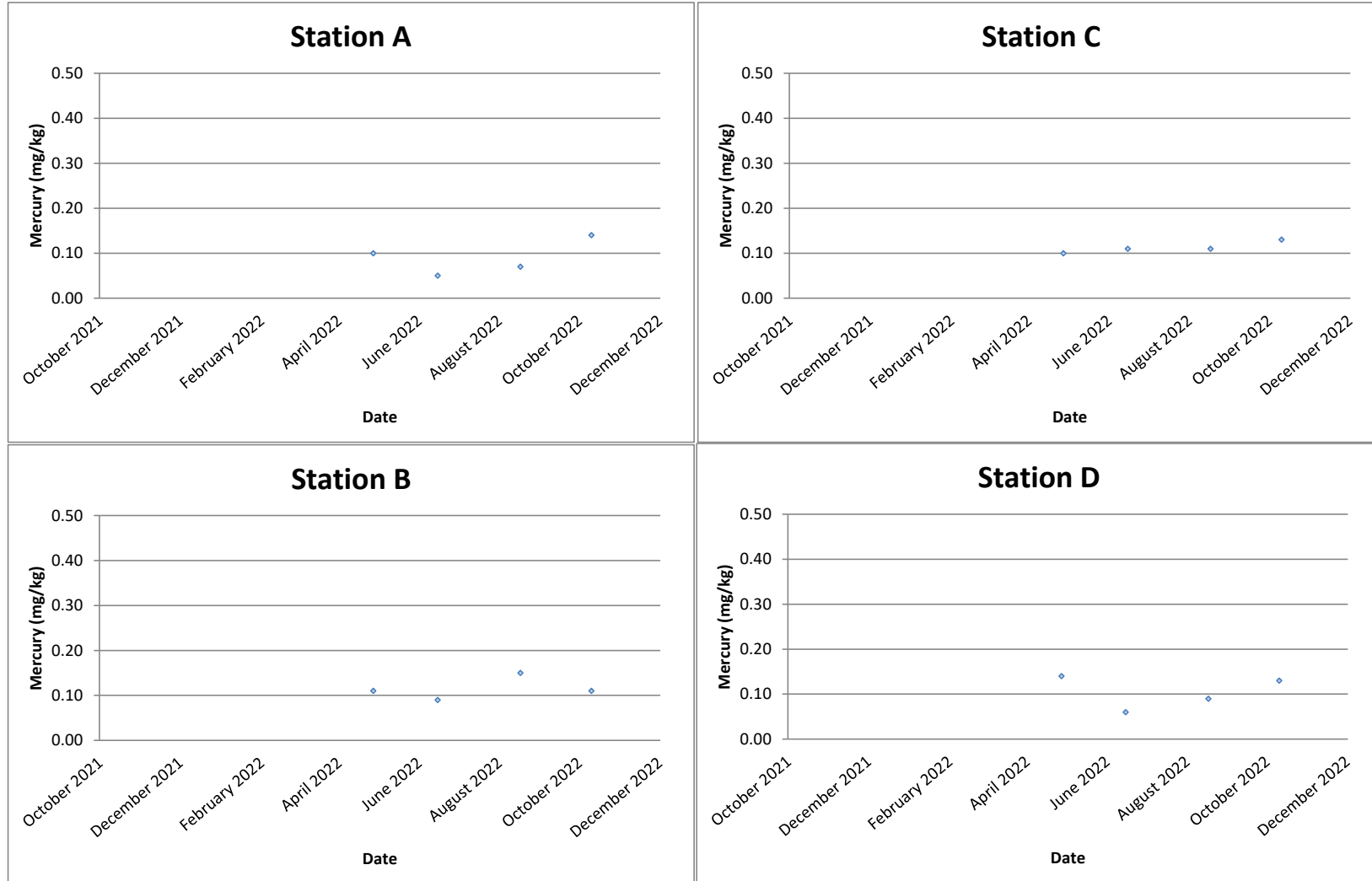


Lead (mg/kg)

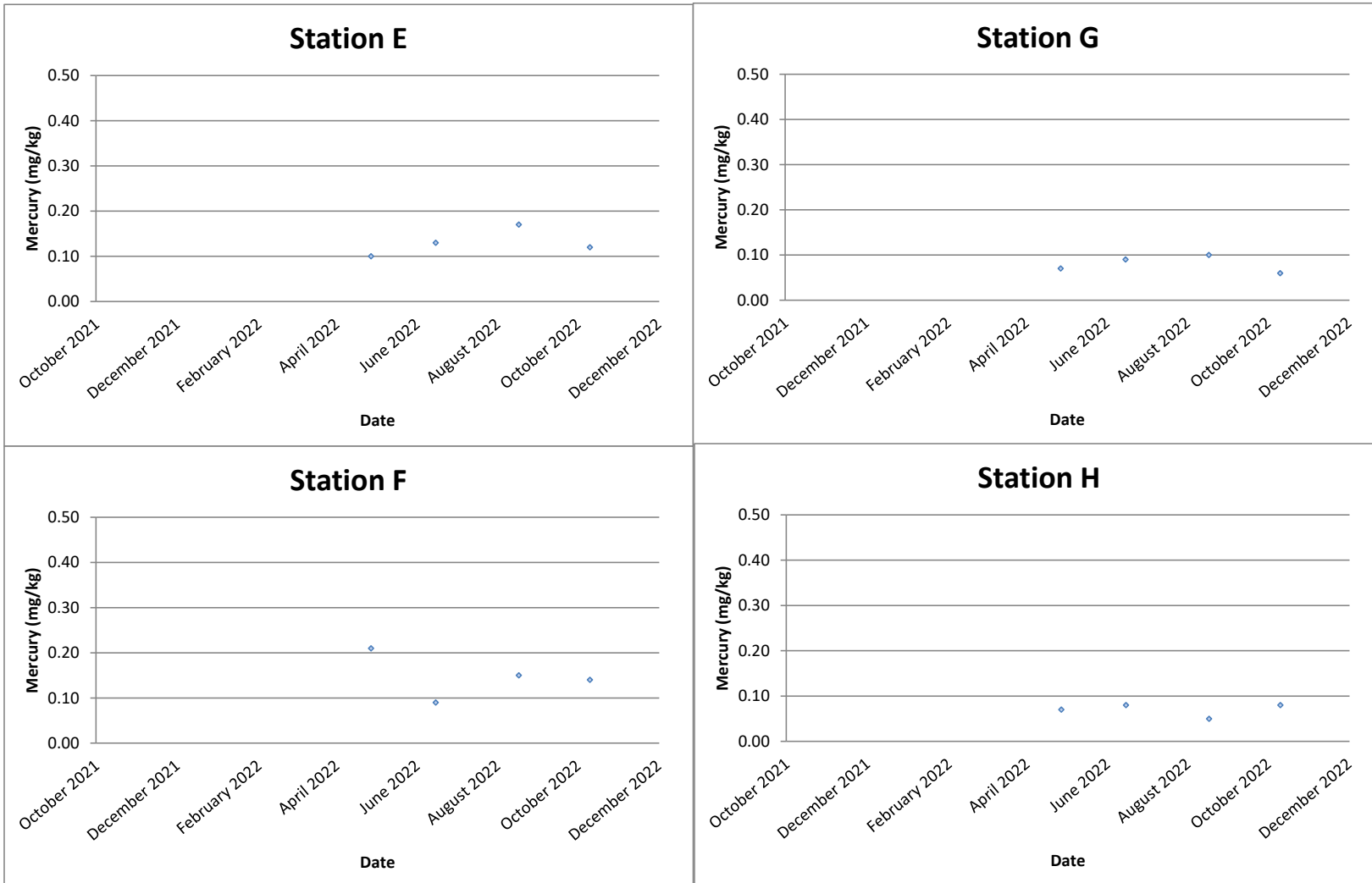




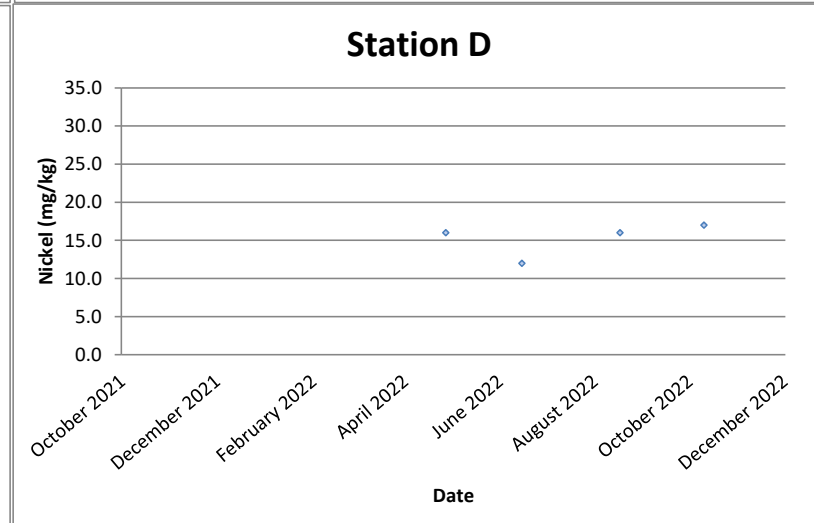
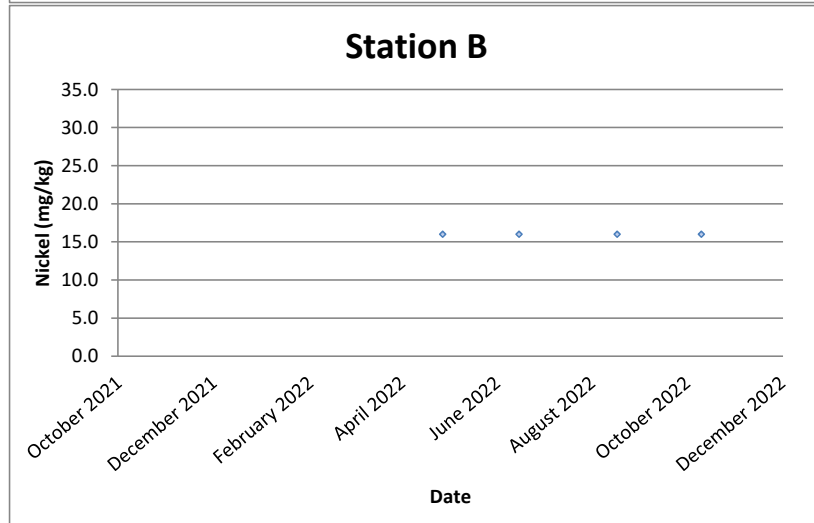
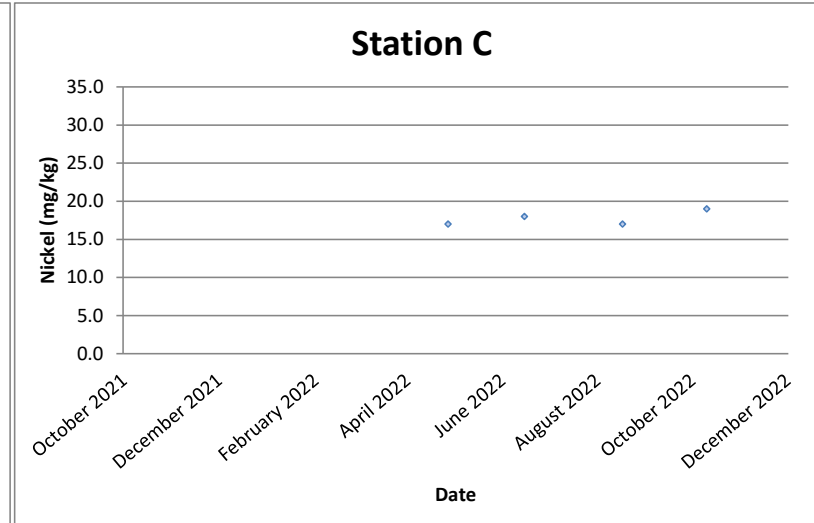
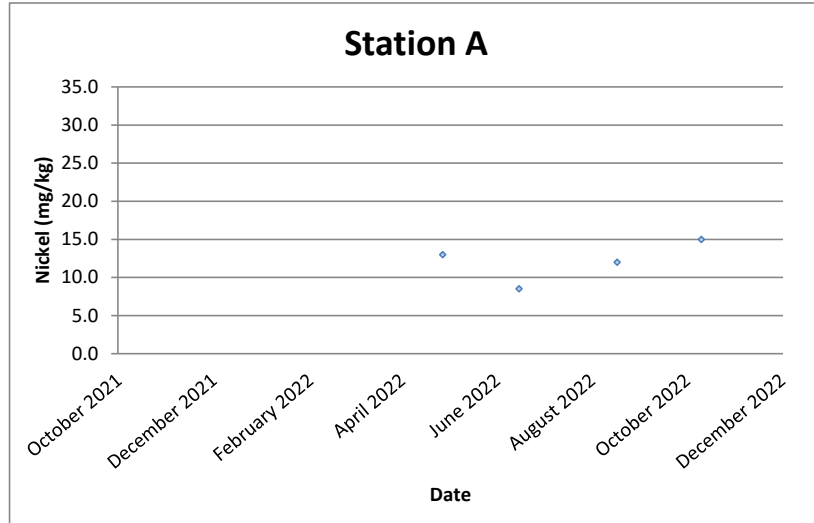
Mercury (mg/kg)



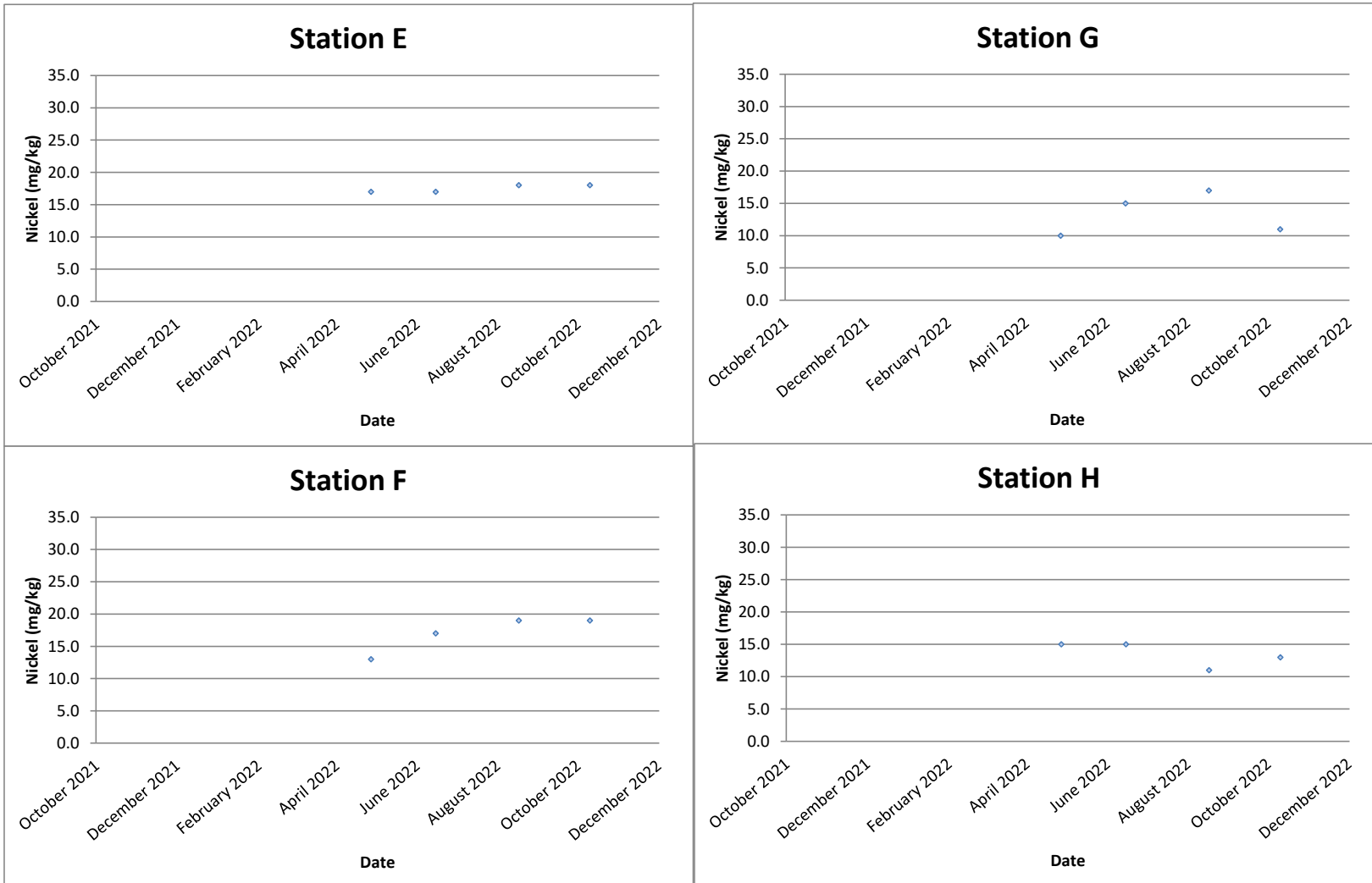
Mercury (mg/kg)



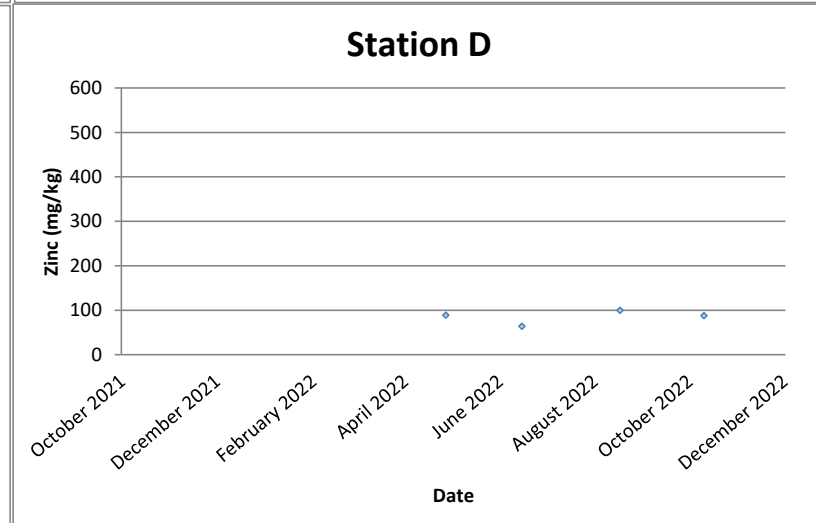
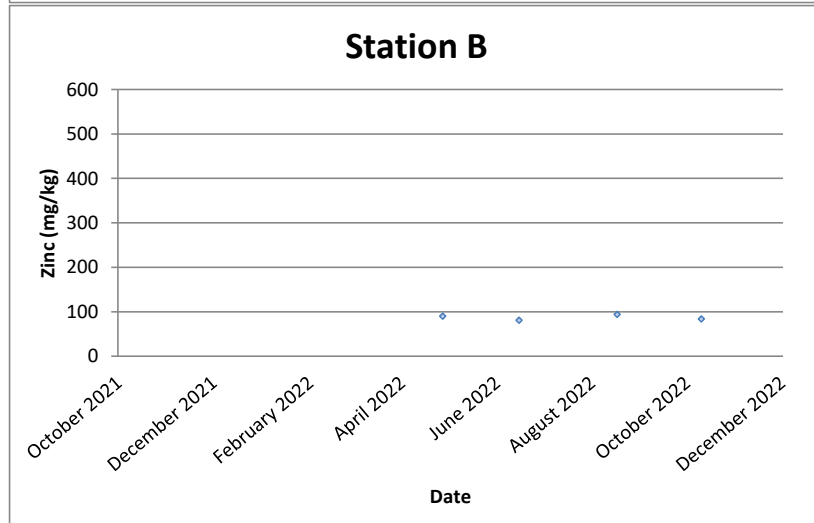
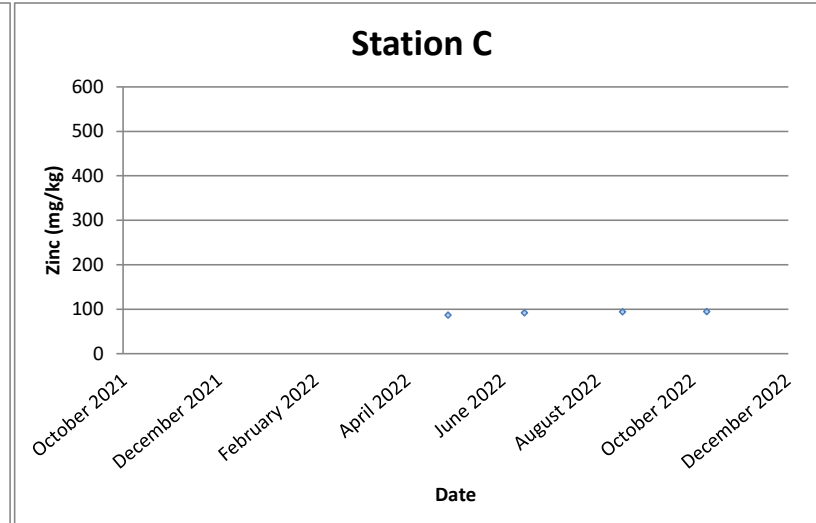
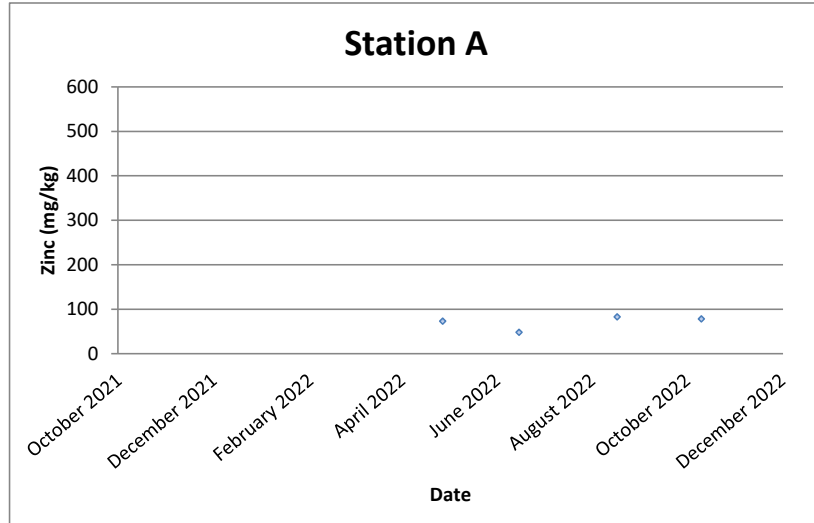
Nickel (mg/kg)



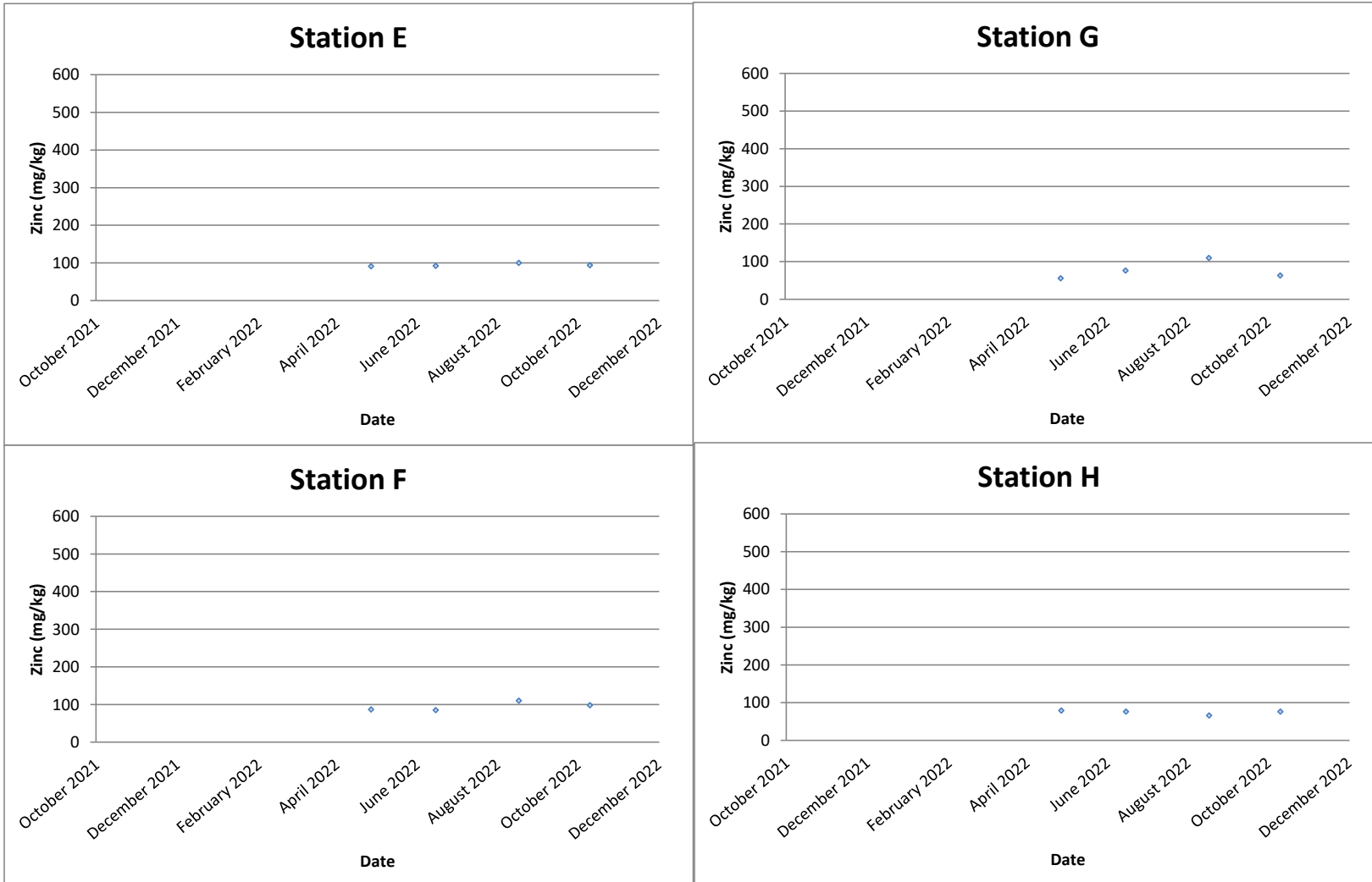
Nickel (mg/kg)



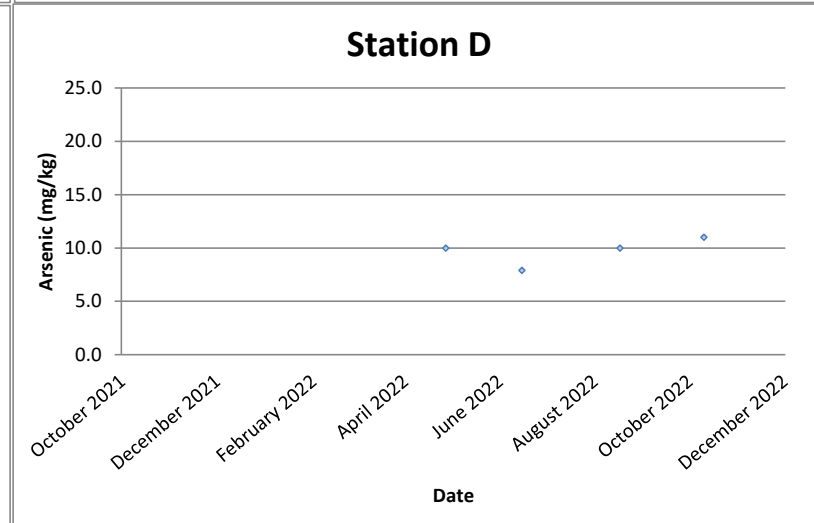
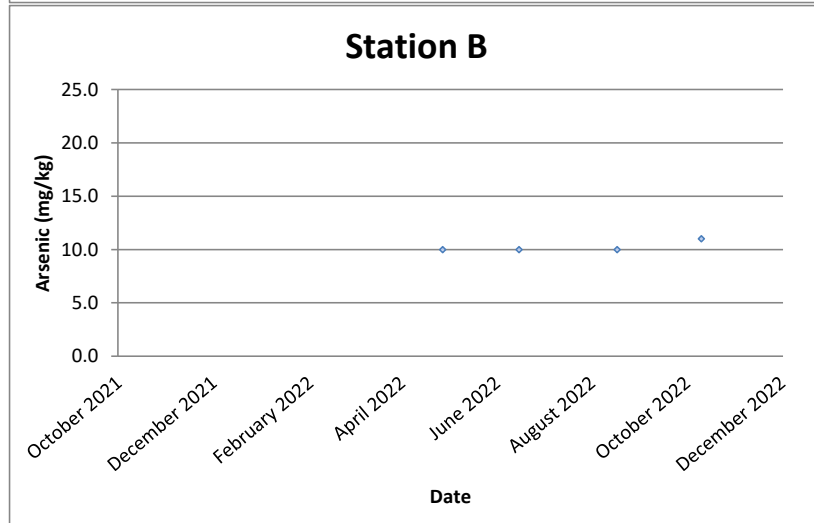
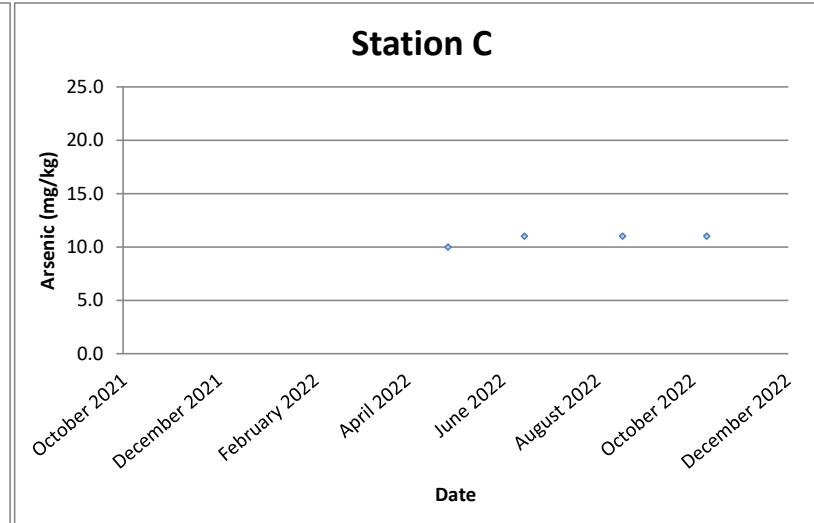
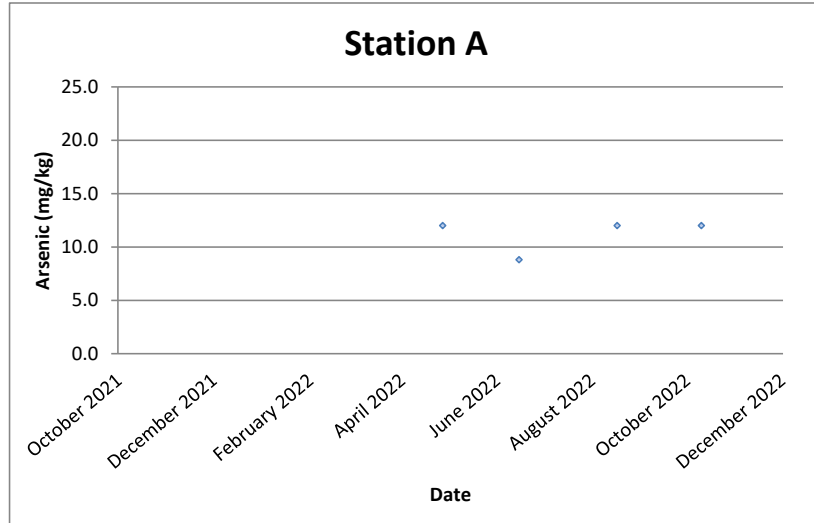
Zinc (mg/kg)



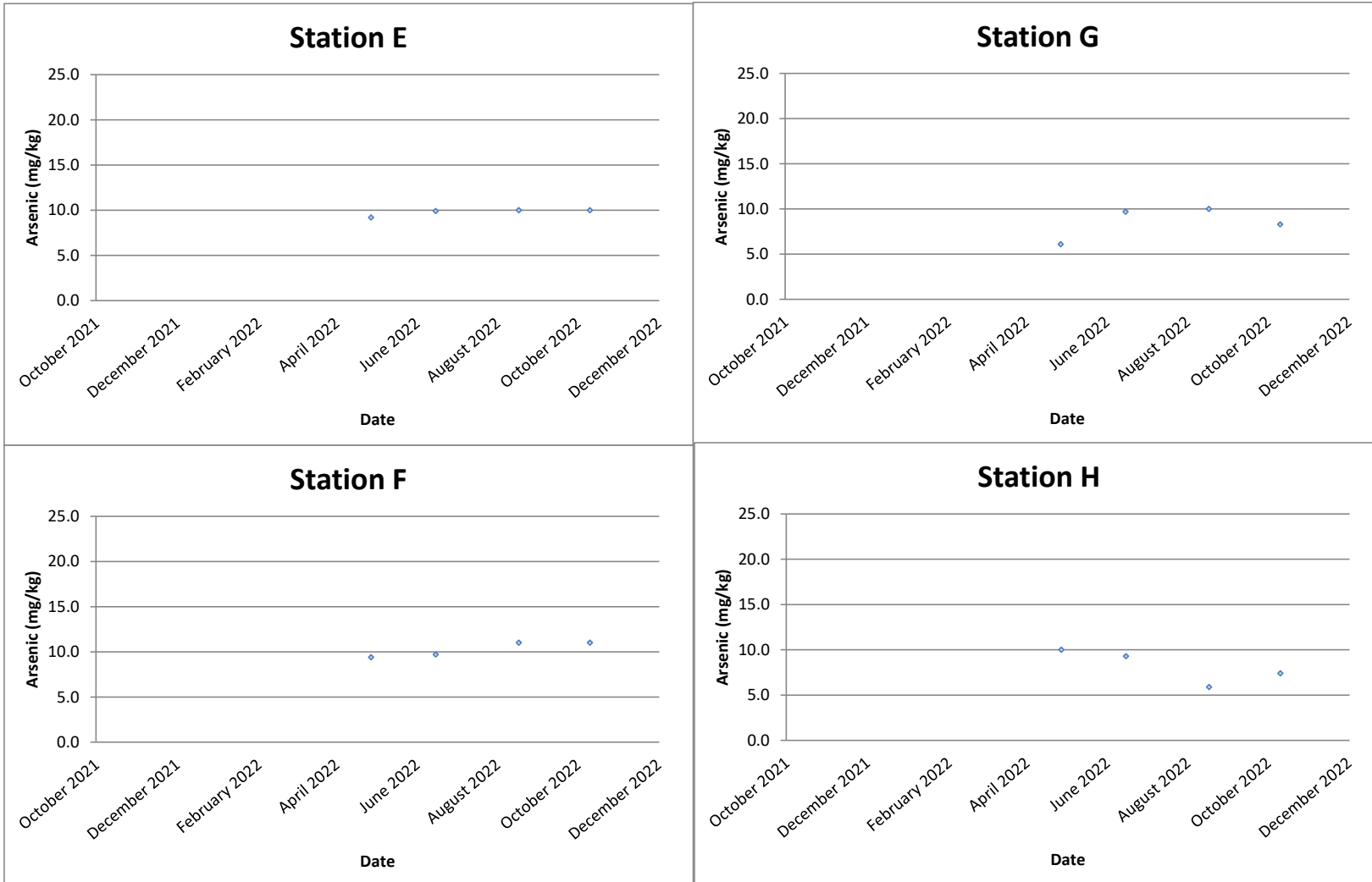
Zinc (mg/kg)



Arsenic (mg/kg)

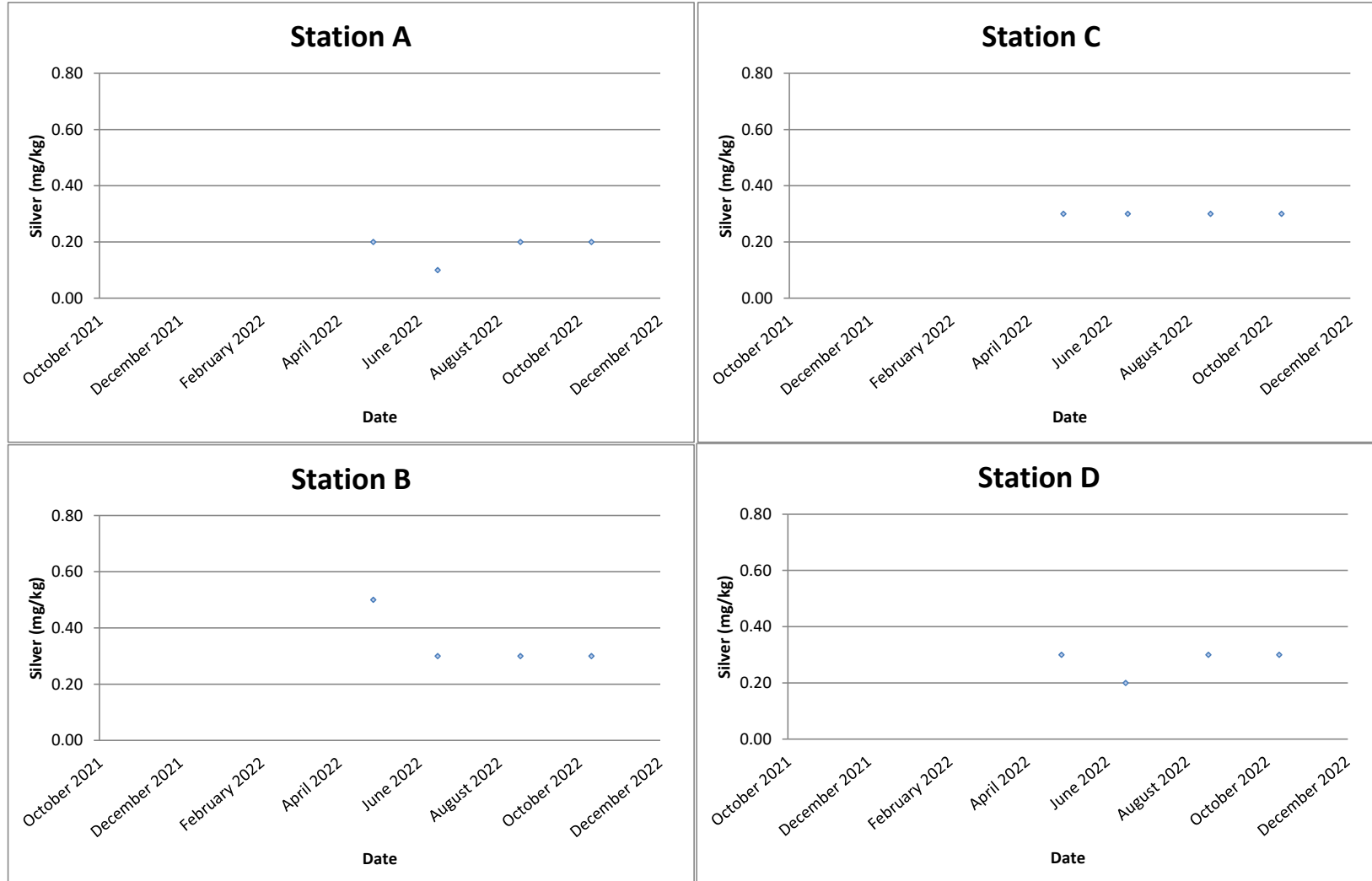


Arsenic (mg/kg)

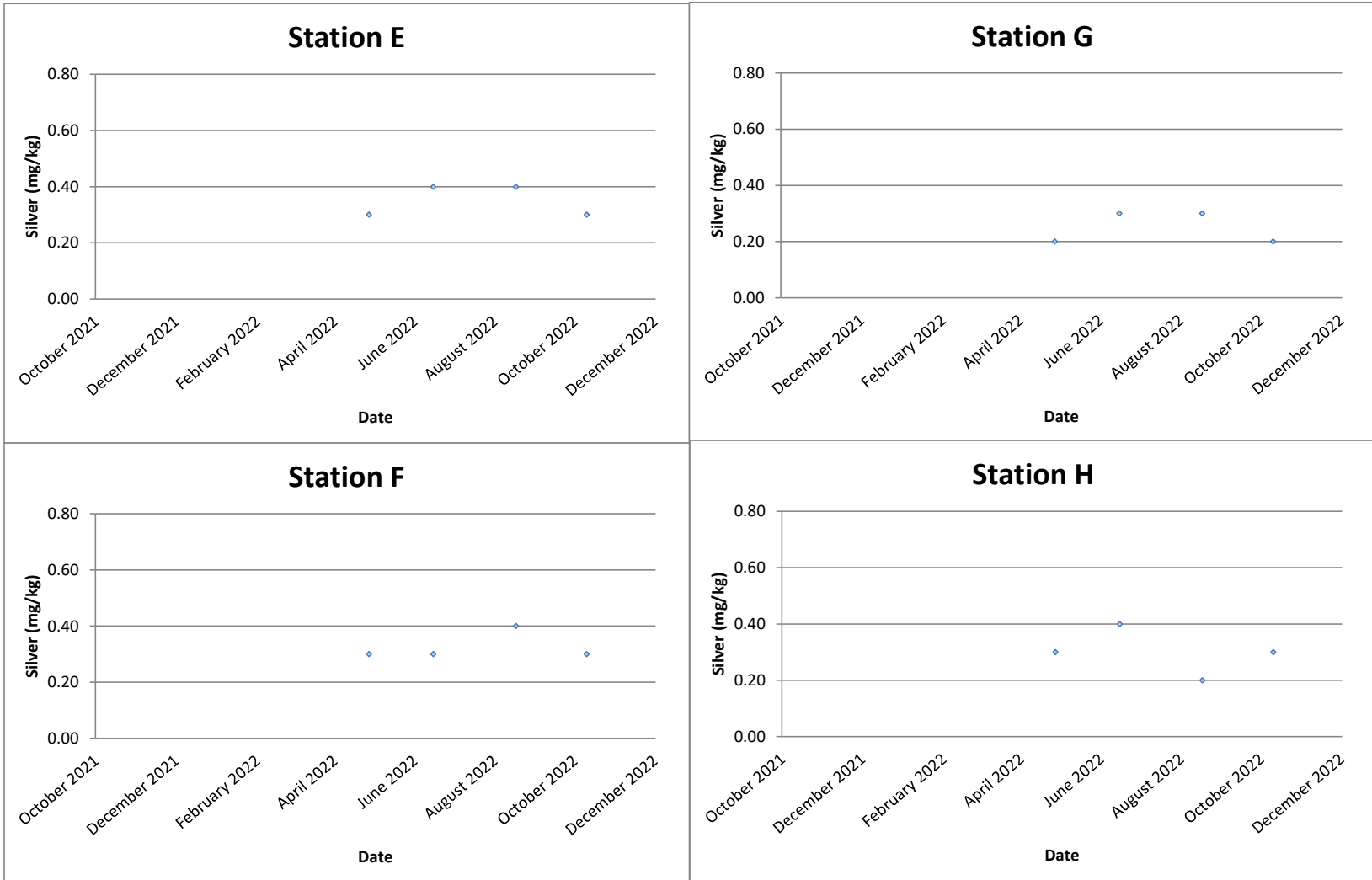




Silver (mg/kg)



Silver (mg/kg)



# 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.: 0041/17/ED/0691

## Appendix G

### Environmental Complaints Log

## 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.: 0041/17/ED/0691

### Environmental Complaints Log

Complaint Log No.	Date of Complaint	Received From and Received By	Nature of Complaint	Investigation
1	28 November 2019	EPD	According to EPD, a member of public complained that SHWSTW cause a malodour and was smelled as far as the Discovery Bay tunnel portal.	As advised by DSD, the operation of Siu Ho Wan Sewage Treatment Works was properly functioned and there was no special activity on 28 <sup>th</sup> November 2019. Due to the possibility of having unpleasant gases or odours emitted from these non-DSD premises cannot be precluded, the complaint is considered as non-project related.

# 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.: 0041/17/ED/0691

## Appendix H

### Environmental Mitigation Implementation Schedule (EMIS)

# 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.: 0041/17/ED/0691

EP Ref.	EIA Ref.	WMP Ref.	Environmental Protection Measures	Location of the measures	Implementation Status
<b>Air Quality</b>					
NA	4.5	NA	Odour reduction measures like aeration, chemical dosing system shall be implemented to reduce any odour impacts to an acceptable level.	SHWSTW	Implemented
3.4	4.5	NA	Sewage treatment works including sludge thickening tanks, the sludge pump house and sludge press house shall be completely enclosed.	SHWSTW	Implemented
3.4	4.5	NA	Exhaust air shall be ventilated to an odour scrubber prior to discharge. Ventilating air to a biological treatment unit with 95% odour removal efficiency prior to stack exhaust shall be implemented	SHWSTW	Implemented
<b>Water Quality</b>					
3.3	NA	4.01	To avoid impacts on the marine ecology due to effluent discharge, the disinfection facility as in Part B of the EP shall be equipped with an UV disinfection system capable of removing at least 99.9% of E.coli from the sewage	SHWSTW	Implemented
<b>Waste Management</b>					
3.6	NA	NA	Transportation of sludge shall be carried out in fully enclosed containers, or be placed in sludge skips with tarpaulin covers	SHWSTW	Implemented
NA	NA	5.02	Trip-ticket system mentioned shall be implemented. Trip-ticket is required for each truckload delivered to the landfills facilities according to WBTC No. 31/2004.	SHWSTW	Implemented
NA	NA	5.02	The acceptance criteria for Landfill disposal should be followed, i.e. solid content of sludge waste should be more than 30%.	SHWSTW	Implemented
NA	NA	5.02	The disposal of grit & debris (if any) generated during primary screening works should follow the requirement set in the WMP Section 4.05.	SHWSTW	Implemented
NA	NA	5.03	The wet sludge should be temporarily stored at the sludge buffer tank. It should then be transported to the centrifuge building for dewatering and discharged to the container for disposal. The whole process should be managed by the automatic electronic electronic system and monitored by the operators during operation.	SHWSTW	Implemented
NA	NA	5.04	The other solid waste material such as sediment and grit, refuse containers or collection bags should be temporarily stored in slips at designated area. Operators should ensure sufficient space is identified and provided for temporary storage of waste materials to facilitate collection. Storage of waste material on site will be kept to a minimum to avoid nuisance to local residents.	SHWSTW	Implemented
NA	NA	5.05	Chemical wastes which likely to be generated by activities arise from the maintenance, shall followed the Waste Disposal (Chemical Waste) (General) Regulation, includes Schedule 1 of the Regulation.	SHWSTW	Implemented
NA	NA	5.06	In case of unlikely occurred chemical spillage, procedures should be followed as according to the WMP Section 5.06.	SHWSTW	Implemented
NA	NA	5.07	Temporary storage areas should be identify and provided for the temporary storage of general	SHWSTW	Implemented

The copyright of this document is owned by Fugro Technical Services Limited. It may not be reproduced except with prior written approval from the Company.

# 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.: 0041/17/ED/0691

EP Ref.	EIA Ref.	WMP Ref.	Environmental Protection Measures	Location of the measures	Implementation Status
			refuse to facilitate collection		
NA	NA	5.07	Domestics wastes refuse generated on-site will be stored in enclosed bins or compaction units separately	SHWSTW	Implemented
NA	NA	5.07	Sufficient dustbins should be provided for domestic waste if required.	SHWSTW	Implemented
NA	NA	5.07	Domestics wastes should be cleared daily and will be disposed off to the nearest licensed landfill or refuse transfer station.	SHWSTW	Implemented
NA	NA	5.07	Separate labeled bins should be provided to segregate the waste generated by workforce. Waste recycle collector should be employed to collect the segregated waste	SHWSTW	Implemented
NA	NA	5.07	Cardboard and paper packaging (for plant, equipment and materials) should be recovered on site, properly stockpiled in dry condition and covered to prevent cross contamination by other materials.	SHWSTW	Implemented
NA	NA	5.07	Office waste should be minimized through using papers on both sides. Communication by electronic means should be used as far as possible.	SHWSTW	Implemented
NA	NA	5.07	The burning of refuse on-site is prohibited by law and shall not be undertaken	SHWSTW	Implemented
NA	NA	5.07	Toilet wastewater shall be transported to the STW for treatment	SHWSTW	Implemented
NA	NA	5.07	Arrangement for collection of recyclable materials by recycling contractors should be followed as according to the WMP Section 5.07.	SHWSTW	Implemented
NA	NA	5.08	All recycling materials removed by the recycling contractors should be properly recorded before the removal. The natures and quantities of the recycling materials, the date of removal and the name of the recycling contractor should be recorded.	SHWSTW	Implemented
NA	NA	5.09	To maintain the site in a clean and tidy condition during the operation, general measures specified in the WMP should be implemented on site at all times. Regular site inspections shall be undertaken by the management team to ensure the measures are implemented.	SHWSTW	Implemented
NA	NA	5.10	Daily cleaning should be performed daily after work within the plant and the public areas immediately next to the site.	SHWSTW	Implemented
NA	NA	5.11	The work officer in charge of the corresponding area should perform daily inspection on the items mentioned in the WMP Section 5.10. If observations were discovered, the work officer should record the result of the inspection on an inspection checklist with photos taken and submitted to the inspectors or Chief Technical Officer for review on the following day. Any deficiency should be rectified promptly.	SHWSTW	Implemented
NA	NA	5.12	Weekly tidying should be performed weekly within the site.	SHWSTW	Implemented
NA	NA	5.13	The inspector should perform Weekly Inspection on the items mentioned in the WMP Section 5.12. If observations were discovered, the work officer should record the result on an inspection checklist and submitted to the Chief Technical Officer for review on the following day. Any deficiency should be rectified promptly.	SHWSTW	Implemented

The copyright of this document is owned by Fugro Technical Services Limited. It may not be reproduced except with prior written approval from the Company.

## 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.: 0041/17/ED/0691

EP Ref.	EIA Ref.	WMP Ref.	Environmental Protection Measures	Location of the measures	Implementation Status
NA	NA	5.14	All wastes generated through the operational phase will be managed in accordance with the protocols set out in the WMP Section 5.14.	SHWSTW	Implemented

The copyright of this document is owned by Fugro Technical Services Limited. It may not be reproduced except with prior written approval from the Company.