Final Environmental Monitoring & Audit Report

Contract No.	:	CV/2012/01
Project	:	Sediment Removal at Yim Tin Tsai (East) Fish Culture Zone
Client	:	Civil Engineering and Development Department (CEDD)
Main Contractor	:	Zhen Hua Engineering Company Limited

Certified By _____

Dr. Priscilla Choy (Environmental Team Leader)
Cinotech Consultants Limited
Date: 28th August 2014

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Mr. Thomas Chan
(Independent Environmental Checker)
Ove Arup & Partners Hong Kong Ltd.
Date: 28th August 2014

Zhen Hua Engineering Company Limited

Contract No. CV/2012/01
Sediment Removal at
Yim Tin Tsai (East) Fish Culture Zone

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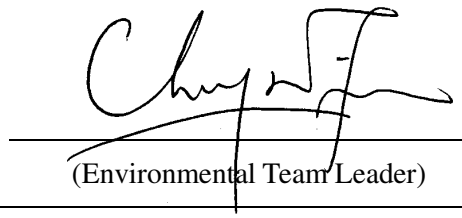
August 2014

(Version 1.0)

Certified By 

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REMARKS:

The information supplied and contained within this report is, to the best of our knowledge, correct at the time of printing.

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TABLE OF CONTENTS

Page

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

EXECUTIVE SUMMARY

Introduction

1. This is the Final Environmental Monitoring and Audit (EM&A) Report prepared by Cinotech Consultants Limited for Contract No. CV/2012/01 "Sediment Removal at Yim Tin Tsai (East) Fish Culture Zone" (the Project). This report documents the findings of EM&A works of the Project.

2. The construction works were commenced in November 2013. The construction works has been completed in July 2014. The completion of Construction Phase EM&A works was subsequently proposed to the Environmental Protection Department (EPD) by the end of July 2014.

3. The construction activities undertaken in the construction period were:
   1. Daily cleaning and weekly tidying;
   2. Relocation of fish rafts to temporary relocation site for fish raft;
   3. Removal of seabed sediments; and
   4. Relocation of fish rafts back to the original position.

Environmental Monitoring Works

4. Environmental monitoring for the Project was performed regularly as stipulated in the Appendix G – Environmental Monitoring and Audit Requirements of the Project Profile and the results were checked and reviewed. Site audits were conducted once per week.

5. The cessation of construction phase EM&A works of the Project was proposed to the Environmental Protection Department (EPD) by the end of July 2014.

6. The implementation of the environmental mitigation measures and environmental complaint handling procedures were also checked.

7. Summary of the non-compliance of the project is tabulated in Table I.

Table I Summary Table for Non-compliance Record Due to the Project

Parameter	Number of Exceedances due to the Project		Action Taken	Results of Action Taken
	Action Level	Limit Level		
Water Quality	0	67*	N.A.	N.A.
Coral Monitoring	0	0	N.A.	N.A.

#Note: According to investigation, the exceedances were not related to the contract works and no further action was taken.

Water Quality

8. Water quality monitoring at 8 monitoring stations were conducted as scheduled in the Project.

9. There are 67 Limit level exceedances for turbidity recorded in this Project. No Action/Limit Level exceedance for dissolved oxygen, suspended solids and metals was recorded.

10. According to the investigation, water quality mitigation measures such as silt curtains were properly implemented. In addition, adverse water quality outside site boundary due to heavy rainfall was observed. Also, some of the exceeded results were recorded in the period without dredging work. Therefore, the exceedances are considered not due to the Project.

11. Water quality monitoring works was ceased in June 2014 as the dredging works was completed in late May 2014.

Coral Monitoring

12. All coral quality monitoring was conducted as scheduled in the Project. Level of sedimentation, bleaching and mortality on corals were monitored in accordance with the approved Proposal for Coral Monitoring.

13. No Action/ Limit Level exceedance was recorded due to the Project throughout the whole Project.

14. Coral monitoring works was ceased in June 2014 as the construction works was completed in late May 2014.

Ardeids & White-bellied Sea Eagles Monitoring

15. Ardeids & White-bellied Sea Eagles monitoring were conducted as scheduled in the Project.

Complaints and Prosecutions

16. No environmental complaints were received since the commencement of the Project.

17. No warnings, summons or successful environmental prosecution were received since the commencement of the Project.

Conclusion

18. The EM&A programme were found to be effective in monitoring impacts arising from the Project. The findings of the environmental monitoring program suggest that no adverse impacts on sensitive receivers were brought about by the Project.

19. In conclusion the Project was environmentally acceptable in terms of water quality, coral quality and ecology.

1. INTRODUCTION

Background

1.1 A priority list for removing sediments at the 26 Fish Culture Zones (FCZs) in Hong Kong (HK) had been prepared by the Agriculture, Fisheries and Conservation Department (AFCD). Civil Engineering and Development Department (CEDD) and AFCD consulted marine culturists' representatives on this list in May 2007. The representatives supported the government to carry out the sediment removal at the top five priority FCZs. Yim Yin Tsai (East) Fish Culture Zone was selected as one of them for improvement to the fish farming environment. The layout plan of the Project is shown in **Figure 1**.

1.2 The works "Sediment Removal at Yim Tin Tsai (East) Fish Culture Zone" under Contract No. CV/2012/01 (hereinafter called the "Project") was awarded to Zhen Hua Engineering Company Limited (hereinafter called the "Contractor") by the Civil Engineering and Development Department (CEDD) of the Hong Kong Special Administrative Region (HKSAR).

1.3 The Environmental Impact Assessment (EIA) Report for the Project was approved on 4 July 2002 under the Environmental Impact Assessment Ordinance (EIAO). An Environmental Permit (EP- 419/2011) for the works was also granted on 26 August 2011. A varied Environmental Permit (EP) (EP-419/2011/B) was issued on 11 February 2014.

1.4 Cinotech Consultants Ltd. (CINOTECH) was employed by the Contractor to serve as the Environmental Team (ET) to undertake the environmental monitoring services for the Project. Dr. Priscilla CHOY of Cinotech Consultants Ltd. was appointed as the ET Leader as per the Condition 2.1 of the EP.

1.5 The Final EM&A report was prepared by Cinotech for the Project to summarize the finding of all EM&A Works associated with baseline monitoring, construction and operation phase conducted between July 2013 and July 2014.

Project Organizations and Contacts of Key Management

1.6 Different parties with different levels of involvement in the project organization include:

- Project Proponent / Engineer's Representative (ER) – Civil Engineering and Development Department (CEDD)
- Environmental Team (ET) – Cinotech Consultants Ltd.
- Independent Environmental Checker (IEC) – Ove Arup & Partners Hong Kong Ltd.
- Contractor – Zhen Hua Engineering Co., Ltd. (Zhen Hua)

1.7 The Project Organization during Construction Phase is listed in **Table 1.1**.

Table 1.1 Key Project Contacts

Party	Role	Name	Position	Phone No.	Fax No.
CEDD	Project Proponent	Mr. Walter Wong	Engineer Representative	2762 5584	2762 4015
Cinotech	Environmental Team	Dr. Priscilla Choy	ET Leader	2151 2089	3107 1388
		Ms. Ivy Tam	Project Coordinator and Audit Team Leader	2151 2090	
		Mr. Tang Wing Kwai	Monitoring Team Leader	2151 2073	
Ove Arup	Independent Environmental Checker	Mr. Thomas Chan	Independent Environmental Checker	2268 3093	2268 3950
Zhen Hua	Contractor	Mr. Y F Cho	Senior Project Manager	2727 0128	2512 0427
		Mr. C K Li	Site Agent		

Summary of EM&A Requirements

1.8 The EM&A programme requires construction phase water quality monitoring, coral monitoring, ardeids & white-bellied sea eagles monitoring as well as environmental site audits. The EM&A requirements are described in the following sections, including:

- All monitoring parameters;
- Action and Limit levels for all environmental parameters;
- Event / Action Plans;
- Environmental mitigation measures, as recommended in the project EIA study final report; and
- Environmental requirements in contract documents.

1.9 Monitoring works/equipments were conducted/calibrated regularly in accordance with the EM&A Manual. Copies of calibration certificates are attached in the appendices of the Monthly Reports.

1.10 The environmental quality performance limits, i.e. Action and Limit Levels were derived from the baseline monitoring results. Should the measured environmental quality parameters exceed the Action/Limit Levels, the respective action plans would be implemented. The Action/Limit Levels for each environmental parameter are given in **Appendix A.**

1.11 Relevant mitigation measures as recommended in the Project Profile have been stipulated in **Appendix F.**

1.12 This Final EM&A Summary Report summarizes the finding of all EM&A Works associated with baseline monitoring, construction and operation phase conducted between July 2013 and July 2014.

2. WATER QUALITY MONITORING

Monitoring Requirements

General

2.1 Baseline water quality monitoring was conducted three times per week for four consecutive weeks at the designated monitoring stations between 15th July 2013 and 9th August 2013.

2.2 Impact Water Quality Monitoring took place two times per monitoring day during mid ebb and mid flood tides at three depths (1 meter from surface, mid depth and 1 meter from the bottom). If the water depth is less than 6m, the mid-depth measurement may be omitted. If the depth is less than 3m, only the mid-depth measurements need to be taken.

2.3 Post-project water quality monitoring was conducted at the designated monitoring stations on 3rd, 6th and 9th June 2014.

2.4 Duplicate *in-situ* measurements (Dissolved oxygen (DO) concentration, DO saturation, turbidity, pH, temperature and salinity) and one water sample at each depth (suspended solids (SS) and metals) shall be monitored in accordance with the requirements set out in the Project Profile.

2.5 For selection of tides for *in-situ* measurement and water sampling, tidal range of individual flood and ebb tides shall not be less than 0.5m.

2.6 Other relevant data shall also be recorded, such as monitoring location / position, time, water depth, sampling depth, tidal stages, weather conditions and any special phenomena or work underway nearby.

2.7 Action/Limit Levels for the environmental monitoring works are shown in **Appendix A**.

Monitoring Locations

2.8 The monitoring stations for water quality monitoring are shown in **Figure 2**. **Table 2.1** summarizes the water quality monitoring stations for the Project.

Table 2.1 Locations for Water Quality Monitoring

Stations	Marine Water Quality Stations	Coordinates	
		Easting	Northing
F4	Relocation site for Yim Tin Tsai FCZ	840174	833468
F5	Temporary Fish Raft Relocation site for Yim Tin Tsai East FCZ	840303	835819
F6		843004	835347
F7	Existing Yim Tin Tsai FCZ	839720	834870
F8	Existing Yim Tin Tsai East FCZ	840871	835101
G2	Gradient Station	839760	834165
G3	Gradient Station	840637	835503
G4	Gradient Station	842184	835872

Monitoring Equipment

2.9 For in-situ monitoring, a multi-parameter meter (Model YSI 6820 C-M / YSI 6920-M) was used to measure DO, DO saturation, pH, turbidity, salinity and temperature. A sampler was used to collect water samples for laboratory analysis of SS and metal levels.

Dissolved Oxygen (DO) and Temperature Measuring Equipment

2.10 The instrument for measuring dissolved oxygen and temperature was portable and weatherproof complete with cable, sensor, comprehensive operation manuals and use DC power source. It was capable of measuring:

- a dissolved oxygen level in the range of 0-20 mg/L and 0-200% saturation; and
- a temperature of 0-45 degree Celsius.

2.11 It has a membrane electrode with automatic temperature compensation complete with a cable.

2.12 Sufficient stocks of spare electrodes and cables were available for replacement where necessary.

2.13 Salinity compensation was built-in in the DO equipment.

Turbidity

2.14 Turbidity was measured *in situ* by the nephelometric method. The instrument was portable and weatherproof using a DC power source complete with cable, sensor and comprehensive operation manuals. The equipment was capable of measuring turbidity between 0-1000 NTU. The probe cable was not less than 25m in length.

Salinity

2.15 A portable salinometer capable of recording salinity within the range of 0-40 ppt was used for salinity measurements.

pH

2.16 The instrument was consisting of a potentiometer, a glass electrode, a reference electrode and a temperature-compensating device. It was readable to 0.1pH in a range of 0 to 14. Standard buffer solutions of at least pH 7 and pH 10 were used for calibration of the instrument before and after use.

Water Depth Detector

2.17 A portable, battery-operated echo sounder was used for the determination of water depth at each designated monitoring station.

Water Sampler

2.18 A water sampler, consisting of a transparent PVC cylinder of a capacity of not less than two litres which can be effectively sealed with cups at both ends was used. The water sampler should have a positive latching system to keep it open and prevent premature closure until released by a messenger when the sampler was at the selected water depth.

Monitoring Position Equipment

2.19 A hand held Global Positioning System (GPS) was used to ensure that the correct location has been selected prior to sample collection.

Sample Container and Storage

2.20 Following collection, water samples for laboratory analysis were stored in high density polythene bottles, packed in ice (cooled to 4°C without being frozen) and delivered to the HOKLAS accredited laboratory and analyzed as soon as possible after collection. Sufficient volume of samples was collected to achieve the detection limit.

Calibration of In Situ Instruments

2.21 All *in situ* monitoring instruments were checked, calibrated and certified by a laboratory accredited under HOKLAS or other international accreditation scheme before use, and subsequently re-calibrated at 3 monthly intervals throughout all stages of the water quality monitoring.

2.22 For the on-site calibration of field equipment, the BS 1427:1993, "Guide to Field and on-site test methods for the analysis of waters" was observed.

2.23 Before each round of monitoring, a zero check in distilled water was performed with the turbidity probe of YSI 6820-C-M / YSI 6920-M. The probe was then be calibrated with a solution of known NTU.

2.24 Sufficient stocks of spare parts were maintained for replacements when necessary. Backup monitoring equipment was also being made available so that monitoring can proceed uninterrupted even when some equipment is under maintenance, calibration, etc.

2.25 **Table 2.2** summarizes the equipment used in the water quality monitoring program. Copies of the calibration certificates of the equipment are shown in the Monthly EM&A Reports.

Table 2.2 Water Quality Monitoring Equipment

Equipment	Model and Make	Qty.
Water Sampler	Kahlsico Water-Bottle Model 135DW 150	1
Multi-parameter Water Quality System	YSI 6820-C-M, YSI 6920-M	2
Monitoring Position Equipment	"Magellan" Handheld GPS Model GPS-320	1
Water Depth Detector	Fishfinder 140	1

Monitoring Parameters, Frequency and Duration

2.26 **Table 2.3** summarizes the monitoring parameters, monitoring period and frequencies of the impact water quality monitoring.

Table 2.3 Impact Water Quality Monitoring Parameters and Frequency

Station	Key Parameters	Frequency Note 1	Depth	No. of samples events
F4 F5 F6 F7 F8 G2 G3 G4	*In-situ*: Dissolved oxygen (DO) concentration, DO saturation, turbidity, pH, temperature and salinity Laboratory Testing: Suspended Solids (SS), Copper (Cu), Lead (Pb), Zinc (Zn) and Arsenic (As)	3 times per week (each series of sampling / measurement should not be less than 36 hours)	• 3 water depths: 1m below water surface, mid-depth and 1m above sea bed. • If the water depth is less than 3m, mid-depth sampling only. • If the water depth is less than 6m, omit mid-depth sampling.	2 per monitoring day (1 for mid-ebb and 1 for mid-flood)

Note:
1. For selection of tides for *in-situ* measurement and water sampling, tidal range of individual flood and ebb tides should be not less than 0.5m.

2.27 Monitoring location/position, time, water depth, sampling depth, pH, salinity, DO saturation, water temperature, tidal stages, weather conditions and any special phenomena or work underway nearby were recorded.

Monitoring Methodology

2.28 The monitoring stations were accessed using survey boat to within 3 m by the guide of a hand-held Global Positioning System (GPS). The depth of the monitoring location was measured using depth meter in order to determine the sampling depths. Afterwards, the probes of the in-situ measurement equipment was lowered to the predetermined depths (1 m below water surface, mid-depth and 1 m above seabed) and the measurements was carried out accordingly. The in-situ measurements at predetermined depths were carried out in duplicate. In case the difference in the duplicate in-situ measurement results was larger than 25%, the third set of in-situ measurement would be carried out for result confirmation purpose.

2.29 Water sampler was lowered into the water to the required depths of sampling. Upon reaching the pre-determined depth, a messenger to activate the sampler was then released to travel down the wire. The water sample was sealed within the sampler before retrieving. At each station, water samples for SS and metals at three depths (1 m below water surface, mid-depth and 1 m above seabed) were collected accordingly. Water samples were stored in a cool box and kept at less than 4°C but without frozen and sent to the laboratory as soon as possible.

Laboratory Analytical Methods

2.30 The testing of all parameters were conducted by Wellab Ltd. (HOKLAS Registration No.083) and comprehensive quality assurance and control procedures in place in order

to ensure quality and consistency in results. The testing method and limit of reporting are provided in **Table 2.4**.

Table 2.4 Methods for Laboratory Analysis for Water Samples

Parameters (Unit)	Proposed Method	Reporting Limit
SS (mg/L)	APHA 17e 2540 D	0.5 (See Note 1)
Copper (μg/L)	In-house method SOP 076 (ICP-MS)	1
Zinc (μg/L)		2
Arsenic (μg/L)		1
Lead (μg/L)		1

Note:
1) Limit of Reporting is reported as Detection Limit for non-HOKLAS report.
2) The testing for the parameters in the table are HOKLAS accredited

QA/QC Requirements

Decontamination Procedures

2.31 Water sampling equipment used during the course of the monitoring programme was decontaminated by manual washing and rinsed clean seawater/distilled water after each sampling event. All disposal equipment was discarded after sampling.

Sampling Management and Supervision

2.32 Water samples were dispatched to the testing laboratory for analysis as soon as possible after the sampling. All samples were stored in a cool box and kept at less than 4°C but without frozen. All water samples were handled under chain of custody protocols and relinquished to the laboratory representatives at locations specified by the laboratory.

Results and Observations

2.33 The monitoring locations shown in **Table 2.1** were agreed by the IEC and Engineer. Water quality monitoring was conducted at all designated locations and the monitoring locations agreed during the construction period.

2.34 Action and Limit Levels for the water quality monitoring were adopted from the baseline monitoring data established for the Project. **Appendix A** shows the water quality criteria, namely Action and Limit levels to be used.

2.35 The graphical presentation for baseline, impact and post-project water quality monitoring over the project period is shown in **Appendix C.**

2.36 There are 67 Limit level exceedances for turbidity recorded in this Project. No Action/Limit Level exceedance for dissolved oxygen, suspended solids and metals was recorded. According to the investigation, the exceedances are considered not due to the Project. Event Action Plans are attached in **Appendix G.**

2.37 The laboratory testing report and QC report are provided in the Baseline Water Quality Monitoring Report and Monthly EM&A Reports.

2.38 No water quality monitoring was required during the operation phase EM&A.

3. CORAL MONITORING

Monitoring Requirements

3.1 According to Section 3.3.3 of Annex G – "Environmental Monitoring and Audit Requirements" of the Project Profile, the coral monitoring programme shall comprise a baseline survey (prior to the dredging work), impact monitoring surveys (during the dredging period) and a post-project monitoring survey (after completion all the dredging works). In addition, the corals were monitored twice a month during the first 2 months of the construction works in accordance with approved Proposal for Coral Monitoring.

3.2 On 4th August 2013, four subtidal sites (Sites T1, T2, T3 and Site C), were surveyed to assess the baseline substrate type and ecological attributes (species compositions). Coral tagging exercise at Sites T2, T3 and C were conducted on 10th August 2013.

3.3 Impact Monitoring Survey was carried out on three subtidal sites (Sites T2, T3 and Site C) to determine whether impacts are occurring on the tagged corals during the construction phase. A particular focus of the Impact Monitoring was the effects of sedimentation, bleaching and mortality on corals. The tagged corals were monitored twice a month during the first 2 months of the construction works. Since there was no exceedance recorded, the monitoring frequency was adjusted to monthly during the rest of the construction phase.

3.4 Post-project Monitoring Survey was carried out on 8th June 2014. Three subtidal sites (Sites T2, T3 and Site C), were surveyed to assess the substrate type and ecological attributes (species compositions).

3.5 All monitoring surveys were conducted by a qualified marine biologist with specialist knowledge of corals and sound experience at identifying corals in the field.

Monitoring Locations

3.6 The locations plan of the impact coral monitoring stations is shown in **Figure 3**. The summary for coral monitoring stations is shown in **Table 3.1**.

Table 3.1 Summary of Coral Monitoring Stations

Monitoring	Nature of Monitoring Station	Monitoring ID and Location
Baseline Monitoring	Impact Coral Monitoring Station	T1 – Area Next to Sam Mun Tsai Road
		T2 – North of Shuen Wan Typhoon Shelter
		T3 - Southeast of Shuen Wan Typhoon Shelter
	Impact Coral Control Station	Site C –Whitehead Peninsula
Impact Monitoring	Impact Coral Monitoring Station	T2 – North of Shuen Wan Typhoon Shelter
		T3 - Southeast of Shuen Wan Typhoon Shelter
	Impact Coral Control Station	Site C –Whitehead Peninsula

Methodology

Dive Survey - Rapid Ecological Assessment

3.7 Assessment of substrate and ecological attributes using a semi-quantitative, Rapid Ecological Assessment (REA) method (DeVantier et al. 1998) was conducted at each site. The field data were collected by marine ecologists using SCUBA dive.

3.8 At each site, the REA survey was performed along a 100m transect parallel to the coastline. Substrate type along the transect was recorded at 1m intervals. The benthic cover, occurrence of both fishes and invertebrates and ecological attributes along the transect were recorded in a swathe of 2m wide, 1m either side of the transect. Locations of the transect are shown in **Figure 3.**

3.9 Locations of any corals and associated substrates size and health status (including percentage cover of bleaching, mortality and sedimentation) were recorded and feasibility of translocation were assessed.

3.10 The condition of each tagged coral colony was recorded by taking a photograph from an angle and distance that best represents the entire colony.

3.11 The locations of the REA transects were recorded on site using handheld GPS unit (Garmin GPS). Pictures of representative taxa along the transects were taken during the surveys.

3.12 Assessment tables following the TM-EIAO guidance was completed in order to assess ecological value for each site. Two major types of information were recorded:

(1) Cover of the major Benthic groups;

(2) Inventory of sessile benthic taxa.

3.13 These were performed according to Tier I and Tier II levels of information.

Tier I: Categorization of ecological (benthic cover) and environmental variables

To describe the benthic cover, six substrate and seven ecological attributes (**Table 3.2, column a**) were assigned. Each attribute was given a rank, from 0 to 6 (**Table 3.2, column b**) based on the overall cover along the survey area.

Tier II: Taxonomic inventories to define types of benthic communities

An inventory of benthic taxa was compiled during each dive. Taxa was identified either in situ or with the aid of photos to confirm identification afterward.

- **Hard corals** (Order Scleractinia) – to genus and species level where possible;
- **Soft corals** (Subclass Octocorallia) – to genus level where possible;

Other benthos (such as sponges zoanthids, bryozoans, macroalgae, etc) – to genus level where possible or phylum with growth form.

3.14 Each taxon in the inventory was given a rank (0 to 5) on the basis of its abundance in the community at the site (**Table 3.2, column c**). These broad categories rank the taxa in terms of the relative abundance of individuals, rather than the contribution to benthic cover, at each site.

Table 3.2 Categories of a) Benthic Attributes, b) Ordinal Ranks of Percentage Cover of Substrate, and c) Ordinal Ranks of Taxa Abundance

a) Benthic attributes		b) Percentage Cover		c) Taxon abundance	
Substrate	**Ecological**	**Rank**	**Percentage Cover**	**Rank**	**Abundance**
Bedrock	Hard Corals	0	Not recorded	0	Absent
Boulders (diameter >50cm)	Dead Coral Skeleton	1	1-5%	1	Sparse
Cobbles (diameter < 50cm)	Soft Corals	2	6-10%	2	Uncommon
Rubble (dead corals)	Sea anemone beds	3	11-30%	3	Common
Sand with gravel	Encrusting Algae	4	31-50%	4	Abundant
Mud & Silt	Coralline Algae	5	51-75%	5	Dominant
	Erect Macroalgae	6	76-100%	--	

Results and Observations

Baseline Monitoring

3.15 The baseline monitoring survey was carried out on 4th August 2013. Coral tagging exercise at Sites T2, T3 and C were conducted on 10th August 2013. Dive surveys conducted at three potential impact sites (T1, T2 and T3) and one proposed control site (Site C) showed that the abundance of hard corals were very low in the Study Area.No soft coral colony was observed in the Study Area. No other sessile taxon of high conservation interest was recorded in the Study Area.

3.16 It was concluded from the baseline monitoring survey that Site T1 was not suitable or useful for the purpose of coral impact monitoring due to the following reasons:

- Only one coral was found at Site T1; and

- Site T1 is located far away from the marine works under the Project than Site T2 and T3. The Site T2 and T3 are more feasible as impact monitoring sites for coral.

3.17 The details of the monitoring results were presented in **Appendix D** and the Baseline Coral Survey Report of this Project.

Impact Monitoring

3.18 Impact monitoring surveys were carried out from October 2013 to May 2014. The details of the monitoring results were presented in **Appendix D** and the Monthly EM&A Report of this Project.

3.19 No Action/Limit Level exceedance was recorded due to the Project in the whole project period.

Post-Project Monitoring

3.20 The Post-Project monitoring survey was carried out on 8 June 2014. No Action/Limit Level exceedance was recorded in the post-project monitoring.

3.21 Overall, a total of thirteen (13) coral impact monitoring surveys were conducted during the construction works since October 2013, and one (1) post-project monitoring survey was conducted after the construction work in June 2014. All tagged corals were in good condition and no adverse impact was observed during the construction phase.

3.22 In all the monitoring surveys conducted from October 2013 to June 2014, at Impact Sites T2 and T3 and the Reference Site C, the change in level of sedimentation on the tagged colonies was less than 15% when compared with the baseline data in August 2013. As the sedimentation occurred at all sites including the Reference Site C, the small change in sedimentation was likely a natural fluctuation as a result of tidal current, prevailing monsoons, disturbance by waves during low tide period, heavy rainfall and associated stream runoffs, etc. No significant increment in level of blenching or partial mortality suggested that adverse effect, if any, was minor.

3.23 The data from all monitoring surveys showed no significant increase in sedimentation, bleaching or mortality in both Sites T2 and T3 and the reference Site C. Hence, no adverse impact by the construction activity on the coral community was demonstrated.

4. ARDEIDS AND WHITE-BELLIES SEA EAGLES MONITORING

Monitoring Requirements

4.1 In accordance with the approved monitoring programme under condition 2.7 of Environmental Permit No. EP-419/2011/A, surveys by counts on ardeids and White-bellied Sea Eagles should be conducted to quantify their existence in vicinity of the proposed dredging area and temporary relocation sites for fish rafts as well as to monitor ardeids and White-bellied Sea Eagles nesting at Yeung Chau. Their nests will be monitored if identified. The survey results enable comparison of their populations before, during and after construction works.

4.2 By comparison and evaluation of the survey results, any impact on the target species could be verified.

Monitoring Routes & Locations

4.2 Transect route with some vantage points is shown in **Figure 4**. There are a total of 9 point count locations. The counting vantage points are selected with at least 500m distance with each other to avoid double-counting. The main focus areas of survey are the location of existing fish rafts before and after dredging works and Yeung Chau, where ardeids were observed in the past records.

Monitoring Frequencies & Durations

4.3 The bird count was conducted at monthly intervals since the relocation of fish rafts begins. The survey would be carried out until completion of subsequent relocation of fish raft to the original Fish Culture Zone after dredging. Counts normally started after sunrise and last for 2-3 hours (normally before 10:00). Bird count should be postponed when it is on inclement weather.

Monitoring Methodology

4.4 The target species were surveyed quantitatively by transect count and point count method covering the survey area. Birds heard or seen within the survey area were identified to species and counted. They were counted directly from vantage points or along the edge of a colony with the use of 10x binoculars or by the naked-eye, depending on the proximity between the surveyor and the colony. It is advisable to travel with a pace of 10 km/hr by small boat for transect method, and point count was last for less than or equal to 10 mins for each station. The quantitatively monitoring results were undertaken by experienced bird watchers. Photographic records were taken when possible.

4.5 Furthermore, during each survey (both transect and point counting), nests of ardeids and White-bellied Sea Eagles were counted by tracking the landing locations of the found species at Yeung Chau. Similar to the method mentioned above, active nests, determined by the presence of incubating adults or chicks, were counted directly from

vantage points or along the edge of the colony. If they were invisible due to dense vegetation, their landing locations were recorded and repeated landings around the same location were considered as one nest.

Results & Observations

4.6 Bird counts were conducted monthly from November 2013 to July 2014. The species and number of birds observed, the nature of construction works within works area conducting during the impact monitoring visit were recorded. Also, weather condition and other noticeable activities occurring within the survey area were recorded.

4.7 The details of the monitoring results were presented in **Appendix E** and the Monthly EM&A Reports of this Project.

5. COMPAISION OF EM&A WITH EIA PREDICTION

Site Audits

5.1 Site audit provided a direct means to trigger and enforce the specified environmental protection and pollution control measures. The ET undertook site audits routinely to ensure that appropriate environmental protection and pollution control mitigation measures are properly implemented. Additionally, the ET was responsible for defining the scope of the inspections, detailing any deficiencies that are identified, and reporting any necessary action or mitigation measures that were implemented as a result of the audit.

5.2 Site audits were carried out on a weekly basis in construction phase. The areas of inspection included the general environmental conditions in the vicinity of site, pollution control and mitigation measure within the site, and also review the environmental conditions outside the site area which are likely to be affected, directly or indirectly, by the site activities.

5.3 The implementation of the environmental mitigation measures and environmental complaint handling procedures were also checked.

Review of Environmental Monitoring Procedures

5.4 The monitoring works conducted by the monitoring team were inspected regularly. The following observations have been recorded for the monitoring works:

Water Quality Monitoring

- The monitoring team recorded all observations around the monitoring stations, which might affect the monitoring result.
- The monitoring team recorded the weather and water surface conditions on the monitoring day.

5.5 No changes had been made to the monitoring methodology during the construction period.

Implementation Status of Environmental Mitigation Measures

5.6 The mitigation measures detailed in the Environmental Permit and the Project Profile were implemented throughout the whole project period.

5.7 The EM&A programme was found effective in monitoring the environmental impacts of the Project. The data collected were useful in determining whether the Project has caused unacceptable impacts on the sensitive receivers. During the construction phase the impact data indicated where exceedances occurred and helped determine whether the exceedances were due to the works. Analysis of all EM&A data collected throughout the construction periods demonstrated the environmental acceptability of the Project.

5.8 No non-compliance related to the Project was recorded throughout the construction period. Observations and recommendations recorded during the site inspections were summarized in each of the Monthly EM&A Reports.

Waste Management

5.9 The amount of wastes generated by the major site activities of this Project is shown in the Dredging Report Summary in A**ppendix H**. The details are presented in the Monthly EM&A Reports.

Summary of Complaint and Prosecution

5.10 There was no environmental complaint, prosecution or notification of summons received since the Project commencement. The Complaint Log is attached in **Appendix I**.

Comparison with EIA predictions

5.11 The environmental impact caused by the Project during the Construction phase and Operation phase were generally in line with the predictions in EIA report.

5.12 With the environmental monitoring and site inspection to directly ensure the timely implementation of mitigation measures during the Project, the environmental performance of the Project was generally acceptable.

6 COMMENTS, CONCLUSIONS AND RECOMMENDATIONS

Comments on Overall EM&A Programme

6.1 The EM&A programme requires construction phase monitoring for water quality, coral, ardeids & white-bellied sea eagles and environmental site audit. The construction phase environmental monitoring for water quality and coral were ceased in June 2014. Ardeids & white-bellied sea eagles of the Project was ceased in July 2014 as the construction activities of this Project were completed.

6.2 The weekly site inspections were effective to ensure the implementation and efficiency of the mitigation measures. In addition, the recommendations made by the auditors of the ET could continuously improve the house keeping of the Contractor and maintain good site cleaning and tidiness. As a result, environmental nuisance to the public could be reduced to a minimal.

6.3 Therefore, the overall performance of the environmental management system in this Project was effective.

Overall EM&A Data

6.4 Impact water quality, coral and ardeids & white-bellied sea eagles were conducted at the designated monitoring stations in accordance with the Project Profile.

Water Quality

6.5 There are 67 Limit level exceedances for turbidity recorded in this Project. No Action/Limit Level exceedance for dissolved oxygen, suspended solids and metals was recorded. All exceedances are considered not due to the Project.

Coral

6.6 No Action/Limit Level exceedance in sedimentation, bleaching and mortality was recorded due to the Project throughout the whole Project.

Ardeids & White-Bellied Sea Eagles

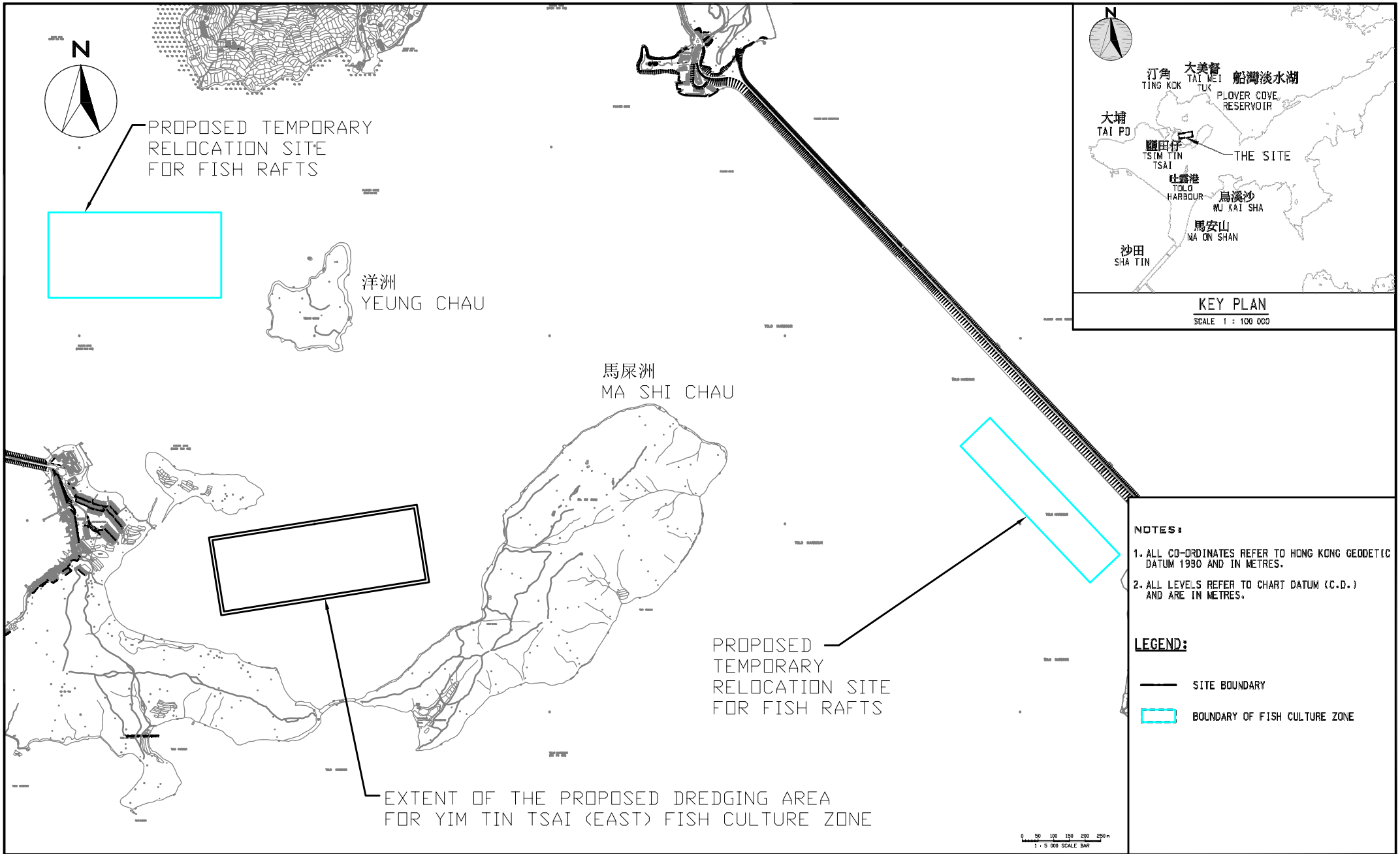
6.7 It is considered no unacceptable environmental impact was brought to ecology based on the EM&A data.

Recommendations and Conclusions

6.8 The EM&A programme was found to be effective in monitoring impacts arising from the Project. The findings of the environmental monitoring program suggest that no adverse impacts on sensitive receivers were brought about by the Project. There was no non-compliance recorded. In conclusion the Project was environmentally acceptable in terms of water quality, coral and ecology.

6.9 With the success of the overall EM&A programme, the deterioration of the Project could be cost-effectively identified and necessary prompt effective mitigation measures were implemented to avoid any unacceptable the impacts.

FIGURE(S)



KEY PLAN

SCALE 1 : 100 000

NOTES:

1. ALL CO-ORDINATES REFER TO HONG KONG GEODETIC DATUM 1980 AND IN METRES.
2. ALL LEVELS REFER TO CHART DATUM (C.D.) AND ARE IN METRES.

LEGEND:

SITE BOUNDARY

BOUNDARY OF FISH CULTURE ZONE

CINOTECH
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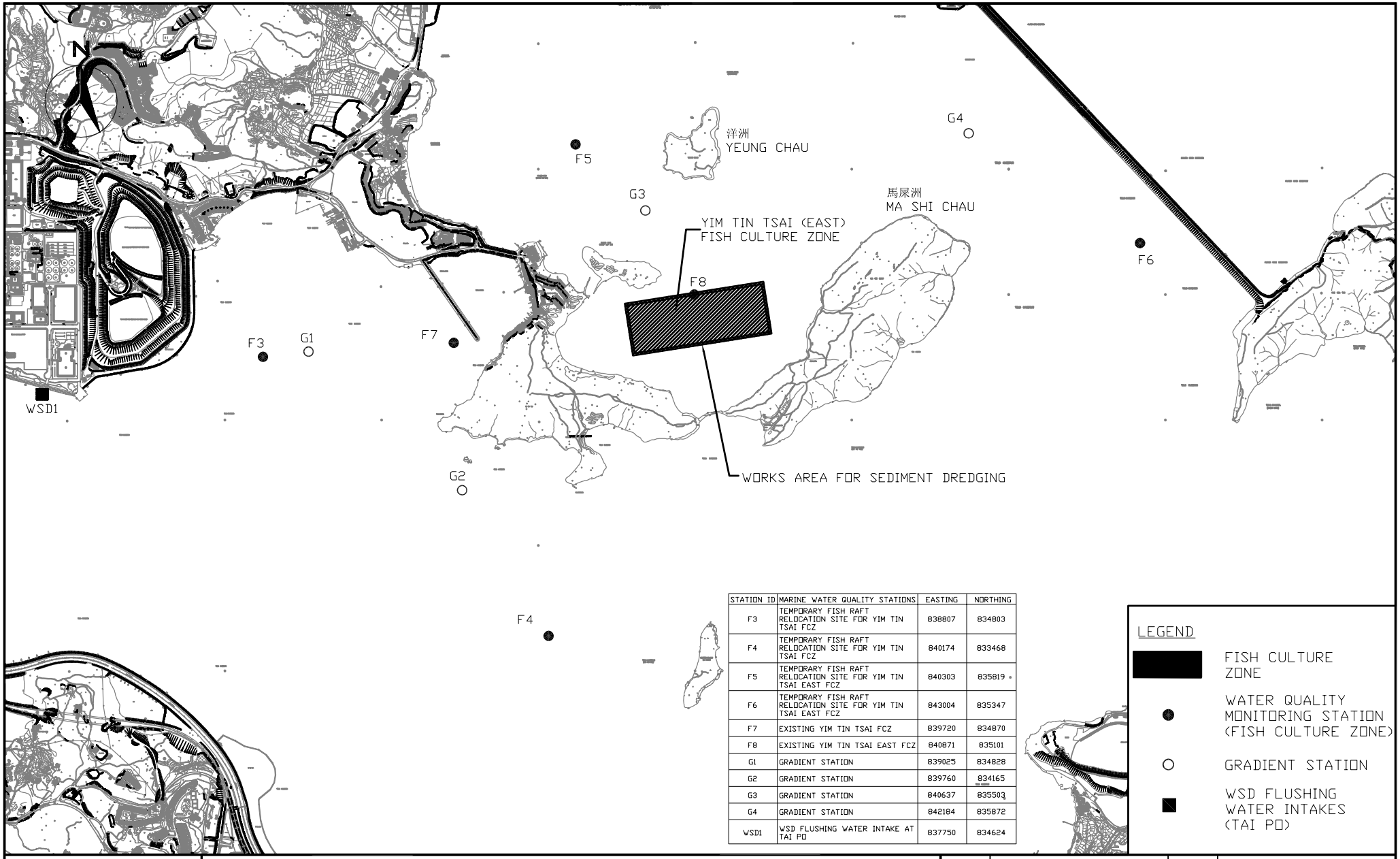
SEDIMENT REMOVAL AT YIM TIN TSAI (EAST) FISH CULTURE ZONE

SITE LAYOUT PLAN

SCALE	1:400 @ A4	DATE	DEC 2013
CHECK	IT	DRAWN	JW
JOB No.	MA13027	FIGURE NO. 1	REV –



STATION ID	MARINE WATER QUALITY STATIONS	EASTING	NORTHING
F3	TEMPORARY FISH RAFT RELOCATION SITE FOR YIM TIN TSAI FCZ	838807	834803
F4	TEMPORARY FISH RAFT RELOCATION SITE FOR YIM TIN TSAI FCZ	840174	833468
F5	TEMPORARY FISH RAFT RELOCATION SITE FOR YIM TIN TSAI EAST FCZ	840303	835819
F6	TEMPORARY FISH RAFT RELOCATION SITE FOR YIM TIN TSAI EAST FCZ	843004	835347
F7	EXISTING YIM TIN TSAI FCZ	839720	834870
F8	EXISTING YIM TIN TSAI EAST FCZ	840871	835101
G1	GRADIENT STATION	839025	834828
G2	GRADIENT STATION	839760	834165
G3	GRADIENT STATION	840637	835503
G4	GRADIENT STATION	842184	835872
WSD1	WSD FLUSHING WATER INTAKE AT TAI PO	837750	834624

LEGEND

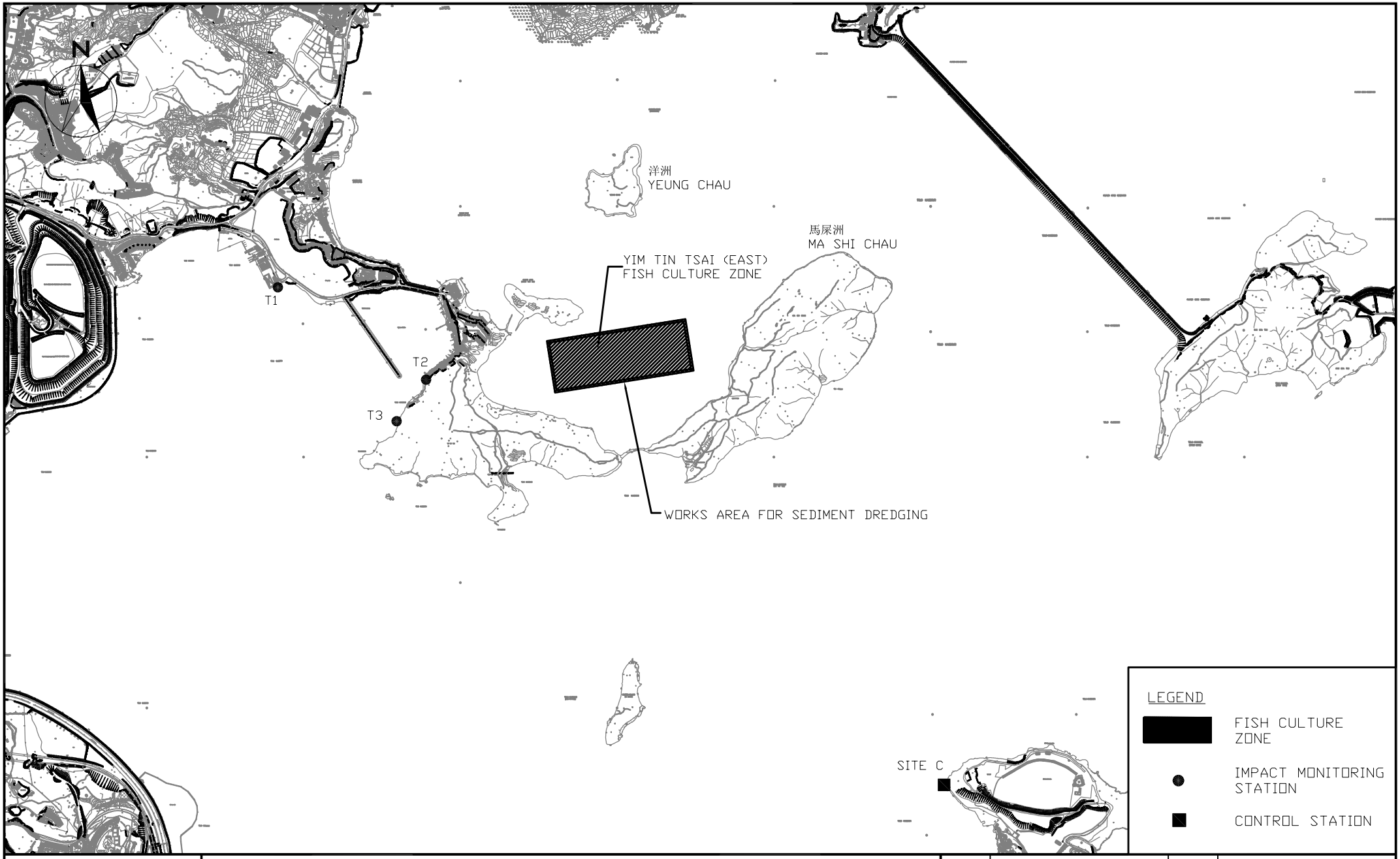
- FISH CULTURE ZONE
- WATER QUALITY MONITORING STATION (FISH CULTURE ZONE)
- GRADIENT STATION
- WSD FLUSHING WATER INTAKES (TAI PO)

CINOTECH
Cinotech Consultants Limited

SEDIMENT REMOVAL AT YIM TIN TSAI (EAST) FISH CULTURE ZONE

LOCATION OF WATER QUALITY MONITORING STATIONS

SCALE	1:600	DATE	JUN 2013
CHECK	IT	DRAWN	JW
JOB No.	MA13027	FIGURE NO. 2	REV –

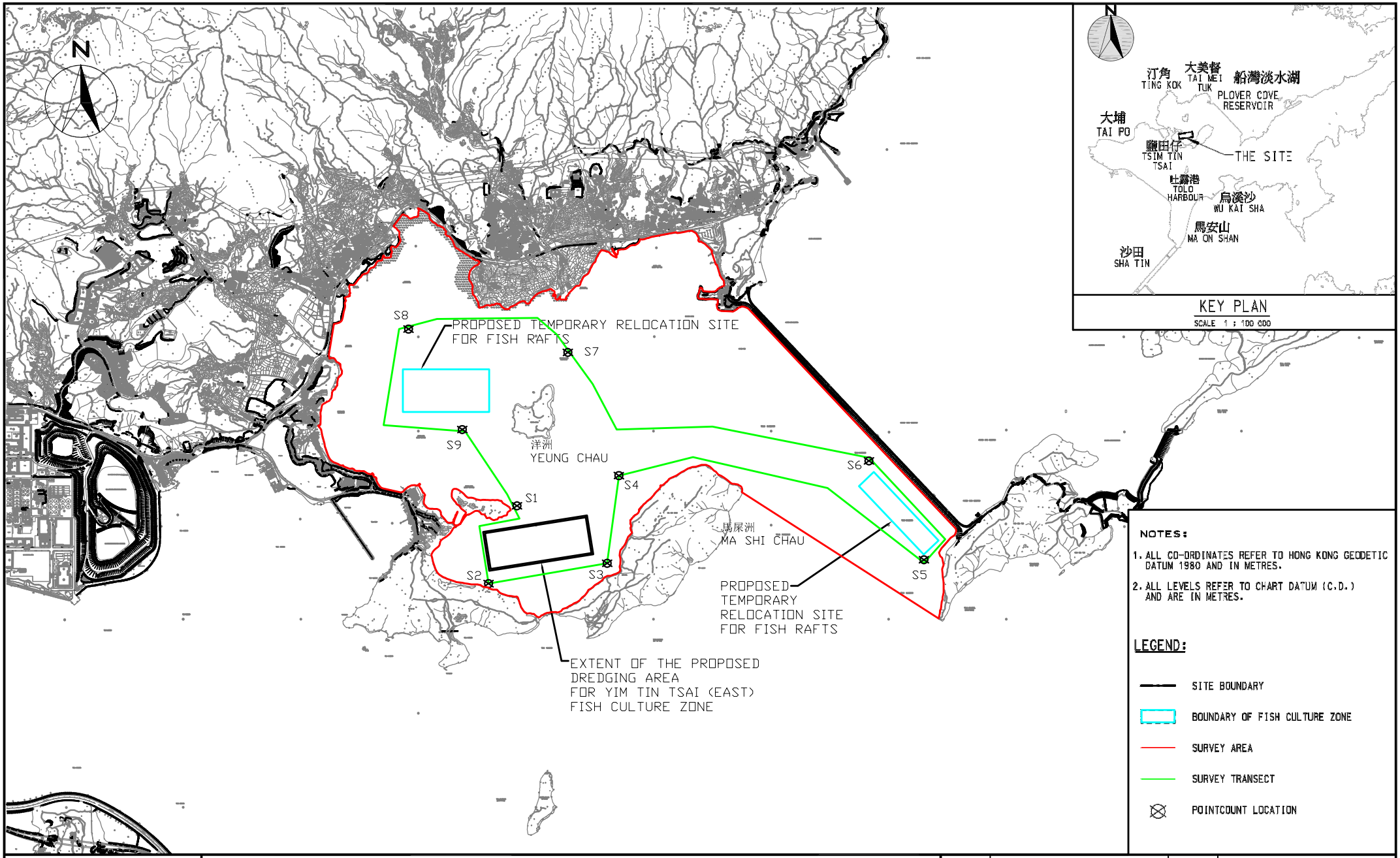


CINOTECH
Cinotech Consultants Limited

SEDIMENT REMOVAL AT YIM TIN TSAI (EAST) FISH CULTURE ZONE

LOCATION OF CORAL MONITORING STATIONS

SCALE	1:600	DATE	JUN 2013
CHECK	GL	DRAWN	JW
JOB No.	MA13027	FIGURE NO. 3	REV –



CINOTECH
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SEDIMENT REMOVAL AT YIM TIN TSAI (EAST) FISH CULTURE ZONE

SURVEY AREA, TRANSECT ROUTE AND POINT COUNT LOCATIONS OF BIRD COUNT

SCALE	1:800 @ A4	DATE	DEC 2013
CHECK	IT	DRAWN	JW
JOB No.	MA13027	FIGURE NO. 4	REV –

APPENDIX A
ACTION AND LIMIT LEVELS

Appendix A

Guidelines for Establishment of Action and Limit Levels

Parameter (unit)	Action Level	Limit Level
DO in mg/L (See Note 1)	**For Stations F4 and F7** Surface or Mid-Depth 5 percentile of baseline surface / mid-depth data or <4mg/L Bottom 5 percentile of baseline bottom data or <2mg/L	**For Stations F4 and F7** Surface or Mid-Depth 1 percentile of baseline surface / mid-depth data or <4mg/L Bottom 1 percentile of baseline bottom data or <2mg/L
	For Stations F5, F6, F8 Surface or Mid-Depth 5 percentile of baseline surface / mid-depth data or <4mg/L Bottom 5 percentile of baseline bottom data or <3mg/L	**For Stations F5, F6, F8** Surface or Mid-Depth 1 percentile of baseline surface / mid-depth data or <4mg/L Bottom 1 percentile of baseline bottom data or <3mg/L
Turbidity in NTU (See Note 2)	95 percentile of baseline data	99 percentile of baseline data
SS in mg/L (See Note 2)	95 percentile of baseline data or 10mg/L	99 percentile of baseline data or 10mg/L
Copper in µg/L (See Note 2 and 4)	95 percentile of baseline data or 4.8µg/L	99 percentile of baseline data or 4.8µg/L
Zinc in µg/L (See Note 2 and 4)	95 percentile of baseline data or 40µg/L	99 percentile of baseline data or 40µg/L
Arsenic in µg/L (See Note 2 and 4)	95 percentile of baseline data or 25µg/L	99 percentile of baseline data or 25µg/L

Lead in mg/L (See Note 2 and 4)	95 percentile of baseline data or 25μg/L	99 percentile of baseline data or 25μg/L

Notes:
1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity, SS and metals, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values of metals are based on the assessment criteria adopted under the water quality impact assessment (refer to Appendix B of Project Profile).

Calculated Action and Limit Levels for Water Quality

Parameter (unit)	Depth	Action Level			Limit Level		
		For Stations F4, F7 and G2	For Stations F5, F6, F8, G3 and G4		For Stations F4, F7 and G2	For Stations F5, F6, F8, G3 and G4	
DO in mg/L (See Note 1 and 4)	Surface	5.4mg/L	4.0mg/L		5.0mg/L	3.8mg/L	
	Middle	4.3mg/L	3.8mg/L		4.0mg/L	3.5mg/L	
	Bottom	2.2mg/L	For Stations F5, G3 2.2mg/L	For Stations F6, F8 and G4 2.8mg/L	1.9mg/L	For Stations F5, G3 1.8mg/L	For Stations F6, F8 and G4 2.4mg/L
Turbidity in NTU (See Note 2 and 4)	Depth-averaged	4.5NTU			4.7NTU		
SS in mg/L (See Note 2 and 4)	Depth-averaged	11.2mg/L			11.9mg/L		
Copper in μg/L (See Note 2 and 4)	Depth-averaged	8.0μg/L			8.4μg/L		
Zinc in μg/L (See Note 2 and 4)	Depth-averaged	22.0μg/L			26.4μg/L		
Arsenic in μg/L (See Note 2 and 4)	Depth-averaged	24.0μg/L			25.5μg/L		
Lead in mg/L (See Note 2 and 4)	Depth-averaged	1.0μg/L			1.0μg/L		

Notes:
1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For turbidity, SS and metals, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
3. All the figures given in the table are used for reference only and EPD may amend the figures whenever it is considered as necessary.
4. Action and limit values are derived based on baseline water quality monitoring results to show the actual baseline water quality condition.

Action and Limit Level for Coral Monitoring

Parameter	Action Level Definition	Limit Level Definition
Sedimentation	If during Impact Monitoring a 20% increase in the percentage of sediment cover on hard corals occurs at more than 20% of the tagged coral at any one Impact Monitoring Site that is not recorded at the Control Site, then the Action Level is exceeded.	If during the Impact Monitoring a 25% increase in the percentage of sediment cover occurs at more than 20% of the tagged coral at any one Impact Monitoring Site that is not recorded at the Control Site, then the Limit Level is exceeded.
Bleaching	If during Impact Monitoring a 15% increase in the percentage of bleaching (bleached white) on hard corals occurs at more than 20% of the tagged coral at any one Impact Monitoring Site that is not recorded at the Control Site, then the Action Level is exceeded.	If during the Impact Monitoring a 25% increase in the percentage of bleaching (bleached white) occurs at more than 20% of the tagged coral at any one Impact Monitoring Site that is not recorded at the Control Site, then the Limit Level is exceeded.
Mortality	If during Impact Monitoring a 15% increase in the percentage of partial mortality on hard corals occurs at more than 20% of the tagged coral at any one Impact Monitoring Site that is not recorded at the Control Site, then the Action Level is exceeded.	If during the Impact Monitoring a 25% increase in the percentage of partial mortality occurs at more than 20% of the tagged coral at any one Impact Monitoring Site that is not recorded at the Control Site, then the Limit Level is exceeded.

APPENDIX B
ENVIRONMENTAL IMPACT MONITORING PARAMETERS

Appendix B - Environmental Impact Monitoring Requirements

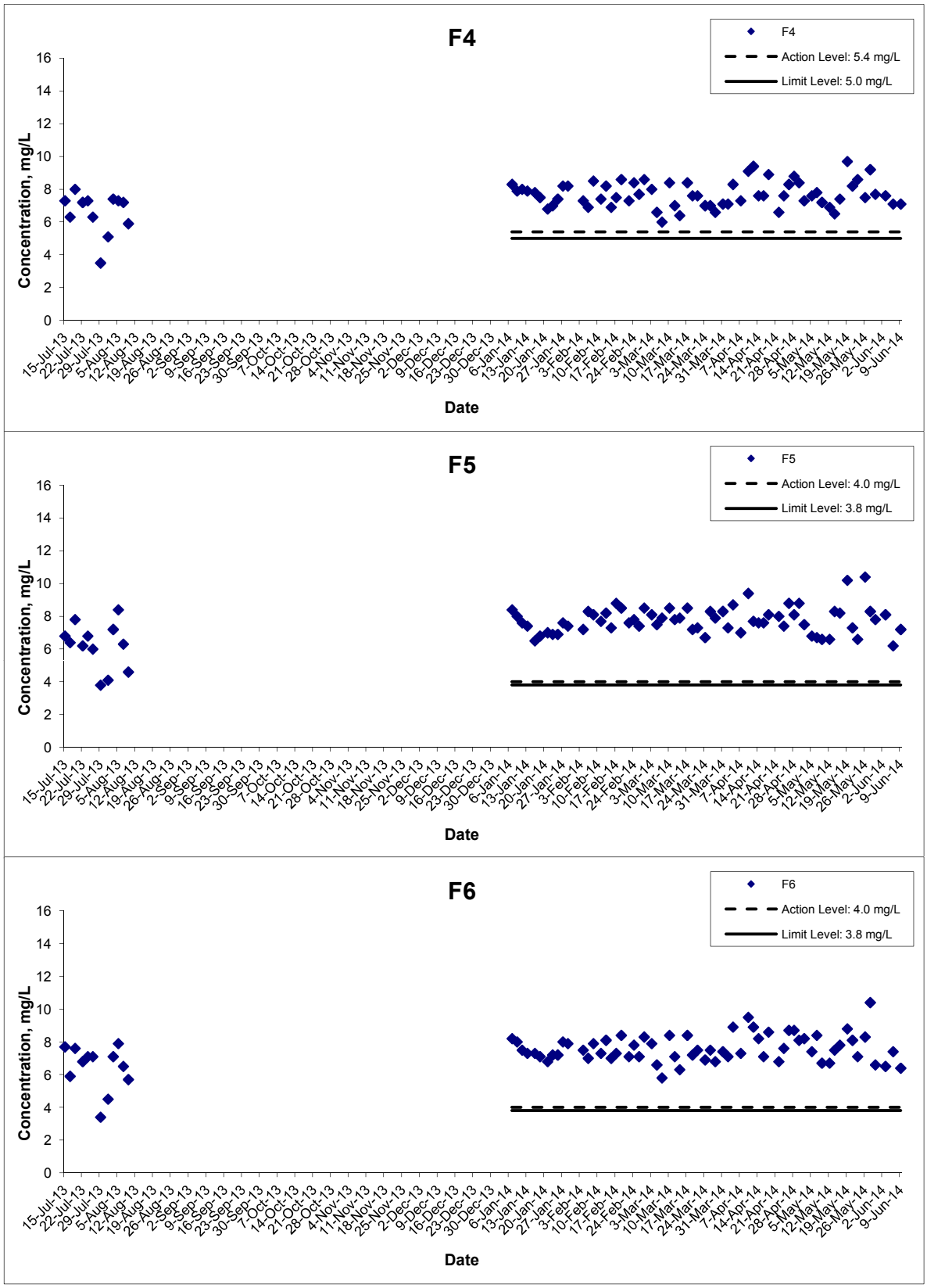
Type of Monitoring	Parameter	Frequency	Location	Measurement Conditions
Water Quality	• Temperature (oC) • pH (pH unit) • Turbidity (NTU) • Water depth (m) • Salinity (mg/L) • Dissolved oxygen (DO) (mg/L and % of saturation) • Suspended solids (SS) (mg/L) • Copper (µg/L) • Zinc (µg/L) • Arsenic (µg/L)) • Lead (µg/L)	Three times per week	<u>Impact Stations</u> • F4 • F5 • F6 • F7 • F8 <u>Gradient Stations</u> • G2 • G3 • G4	Two times per monitoring day during mid ebb and mid flood tides at three depths (1 meter from surface, mid depth and 1 meter from the bottom)

Type of Monitoring	Parameter	Frequency	Location	Measurement Conditions
Coral Quality	• Mortality (%) • Sediment cover (%) • Bleaching (%)	<u>October 2013 – February 2014</u> Twice a month <u>March to June 2014</u> Once a month	<u>Impact Stations</u> • T2 • T3 <u>Control Station</u> • Site C	During each survey, the health status of each tagged coral colony will be recorded, including percentage cover of bleaching, mortality and sedimentation. The condition of each tagged coral colony will be recorded by taking a photograph from an angle and distance that best represents the entire colony.

Type of Monitoring	Parameter	Frequency	Location	Measurement Conditions
Ardeids & White-bellies Sea Eagles Monitoring	• Abundance	Monthly	• Monitoring Stations S1 – S9	• Transect method was carried out with a pace of 10 km/hr by small boat. Point count method was carried out at each monitoring station for not more than 10 mins.

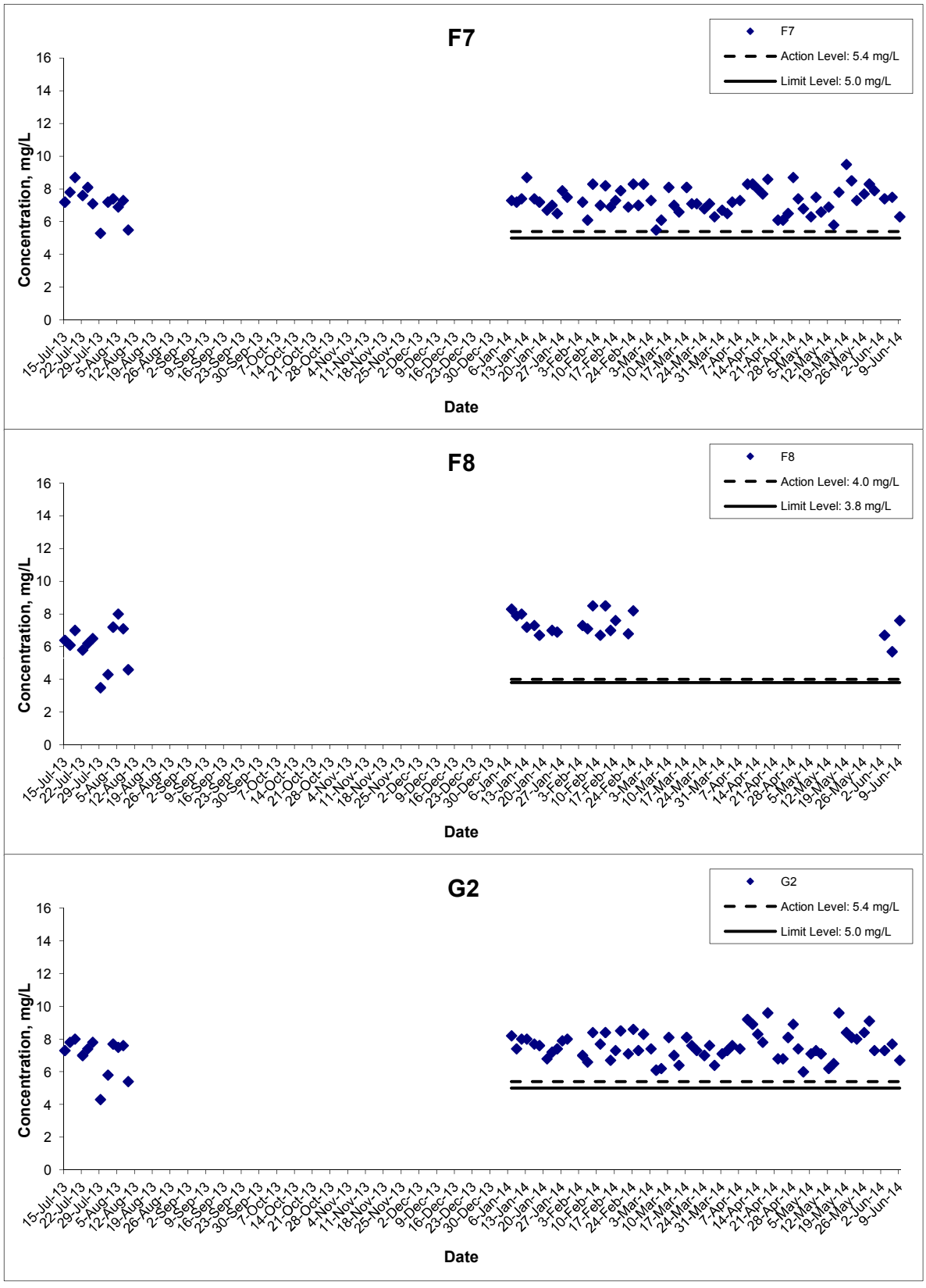
APPENDIX C
GRAPHICAL PRESENTATION FOR BASELINE AND IMPACT WATER QUALITY MONITORING OVER THE PROJECT PERIOD

Dissolved Oxygen (Surface) at Mid-Ebb Tide



Title	Contract No. CV/2012/01 - Sediment Removal at Yim Tin Tsai (East) Fish Culture Zone Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA13027	CINOTECH
		Date Jun 14	Appendix C	

Dissolved Oxygen (Surface) at Mid-Ebb Tide



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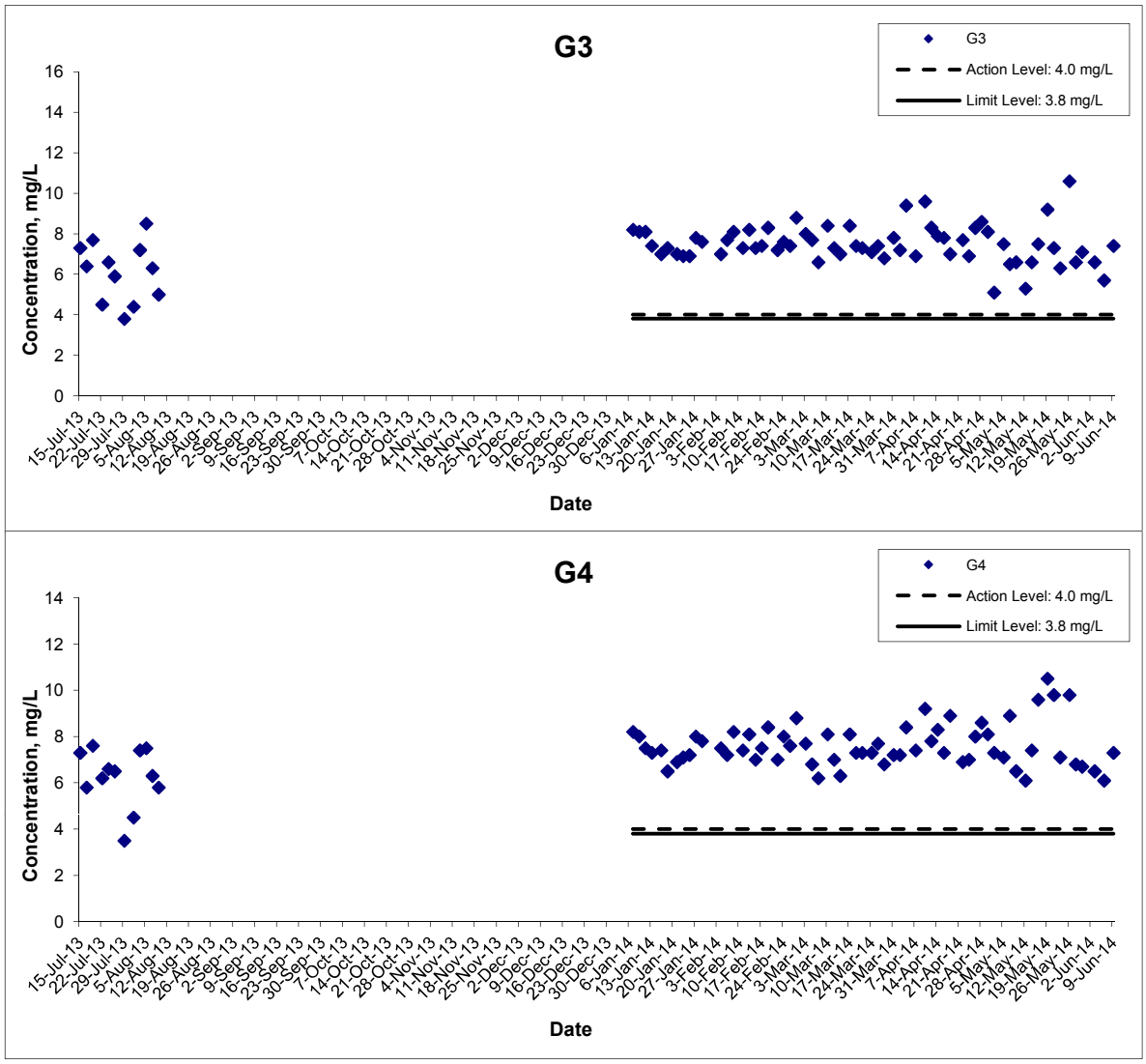
	Date: Jun 14	Appendix: C	

Dissolved Oxygen (Surface) at Mid-Ebb Tide



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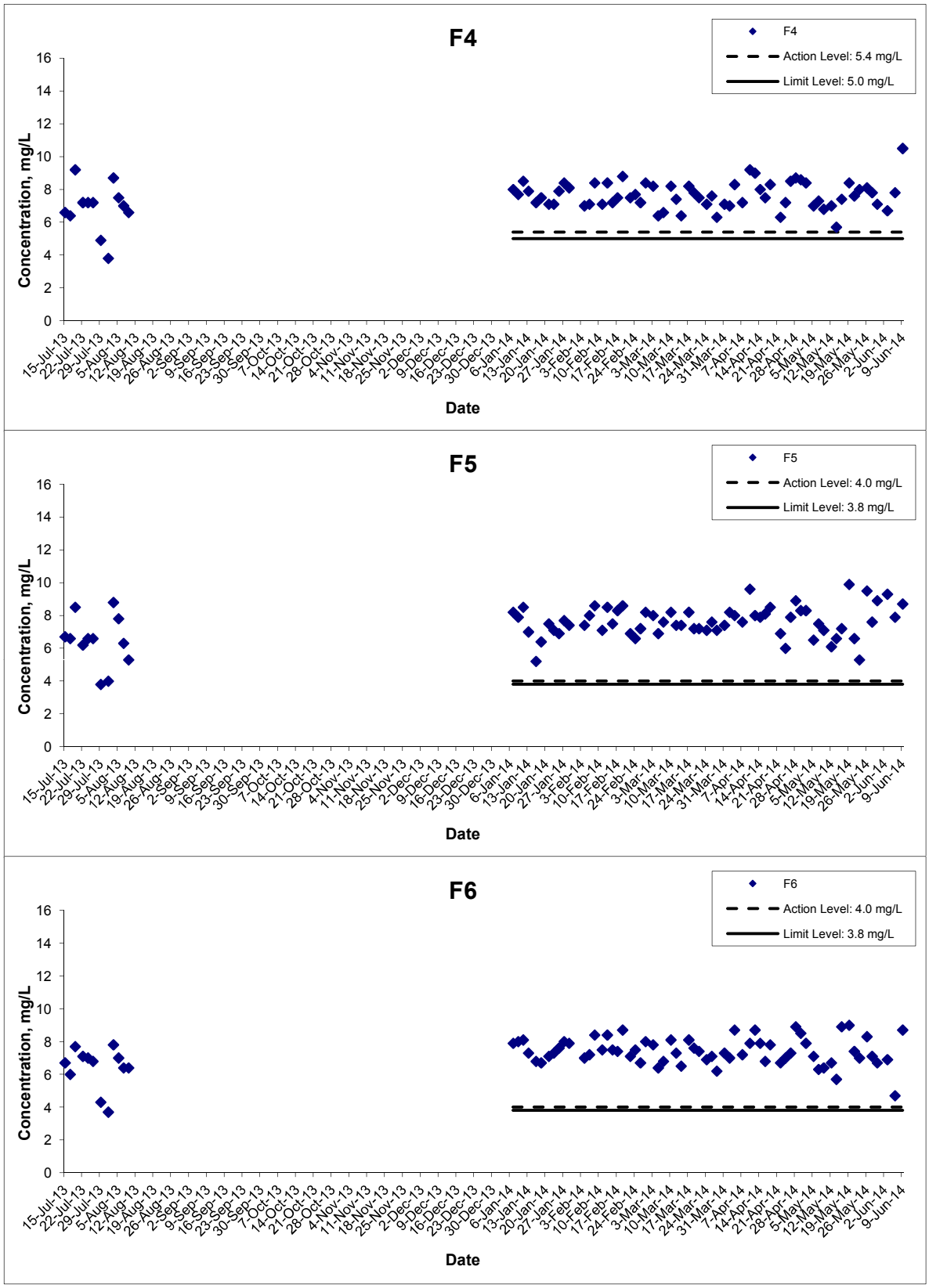
		Date Jun 14	Appendix C	

Dissolved Oxygen (Surface) at Mid-Flood Tide



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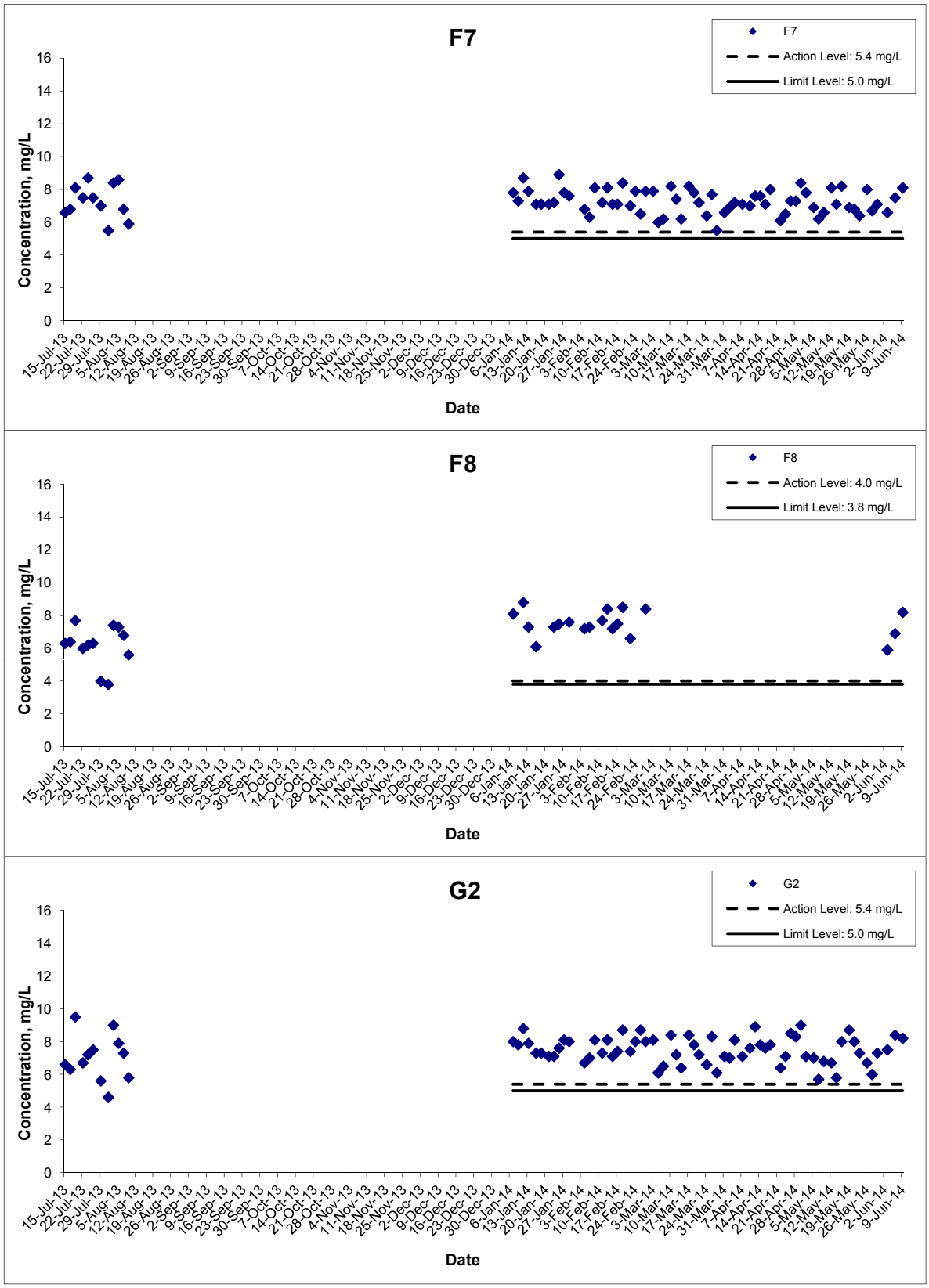
	Date: Jun 14	Appendix: C	

Dissolved Oxygen (Surface) at Mid-Flood Tide



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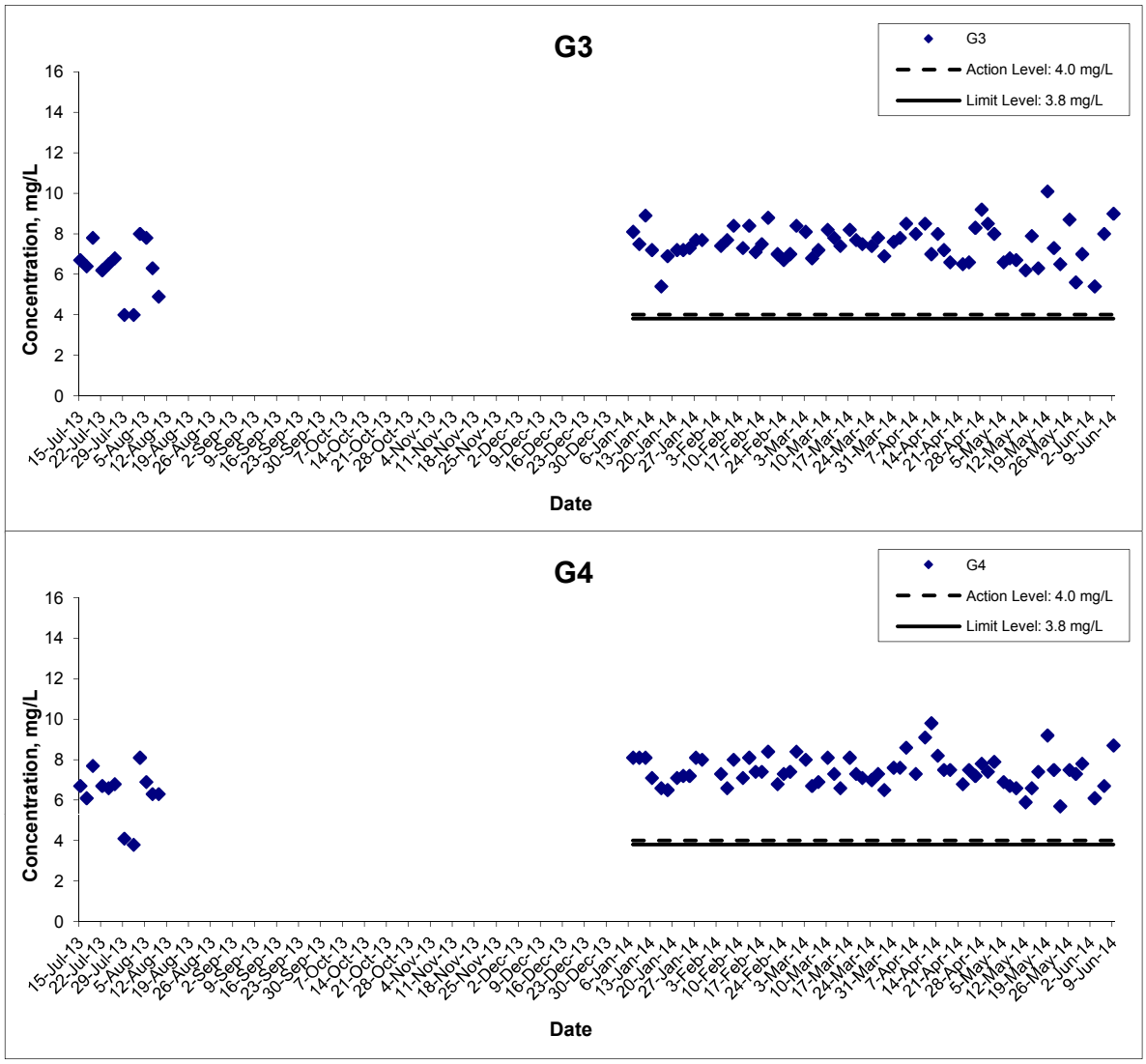
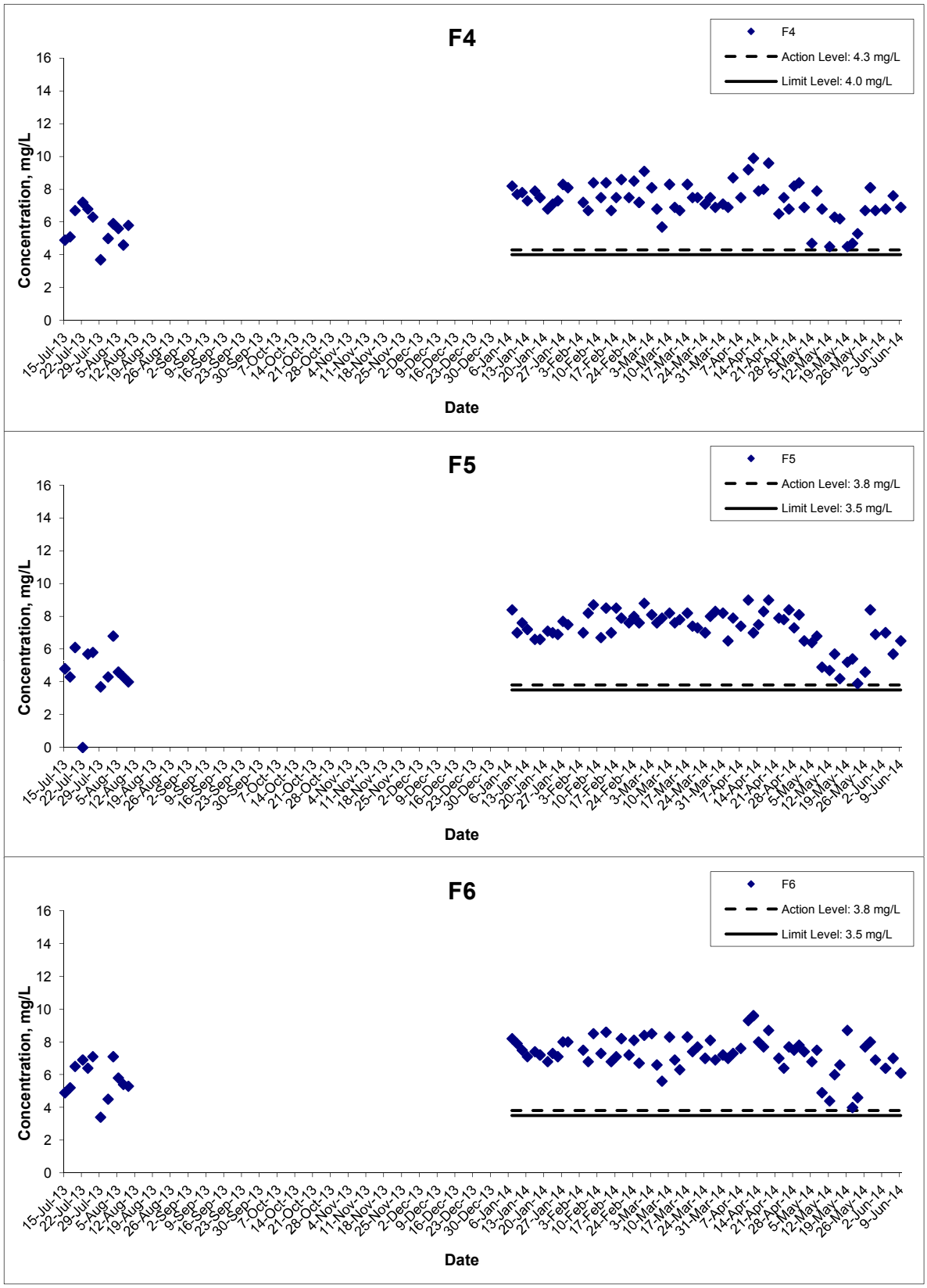
	Date: Jun 14	Appendix: C	

Dissolved Oxygen (Surface) at Mid-Flood Tide



Title	Contract No. CV/2012/01 - Sediment Removal at Yim Tin Tsai (East) Fish Culture Zone Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA13027	CINOTECH
		Date Jun 14	Appendix C	

Dissolved Oxygen (Middle) at Mid-Ebb Tide



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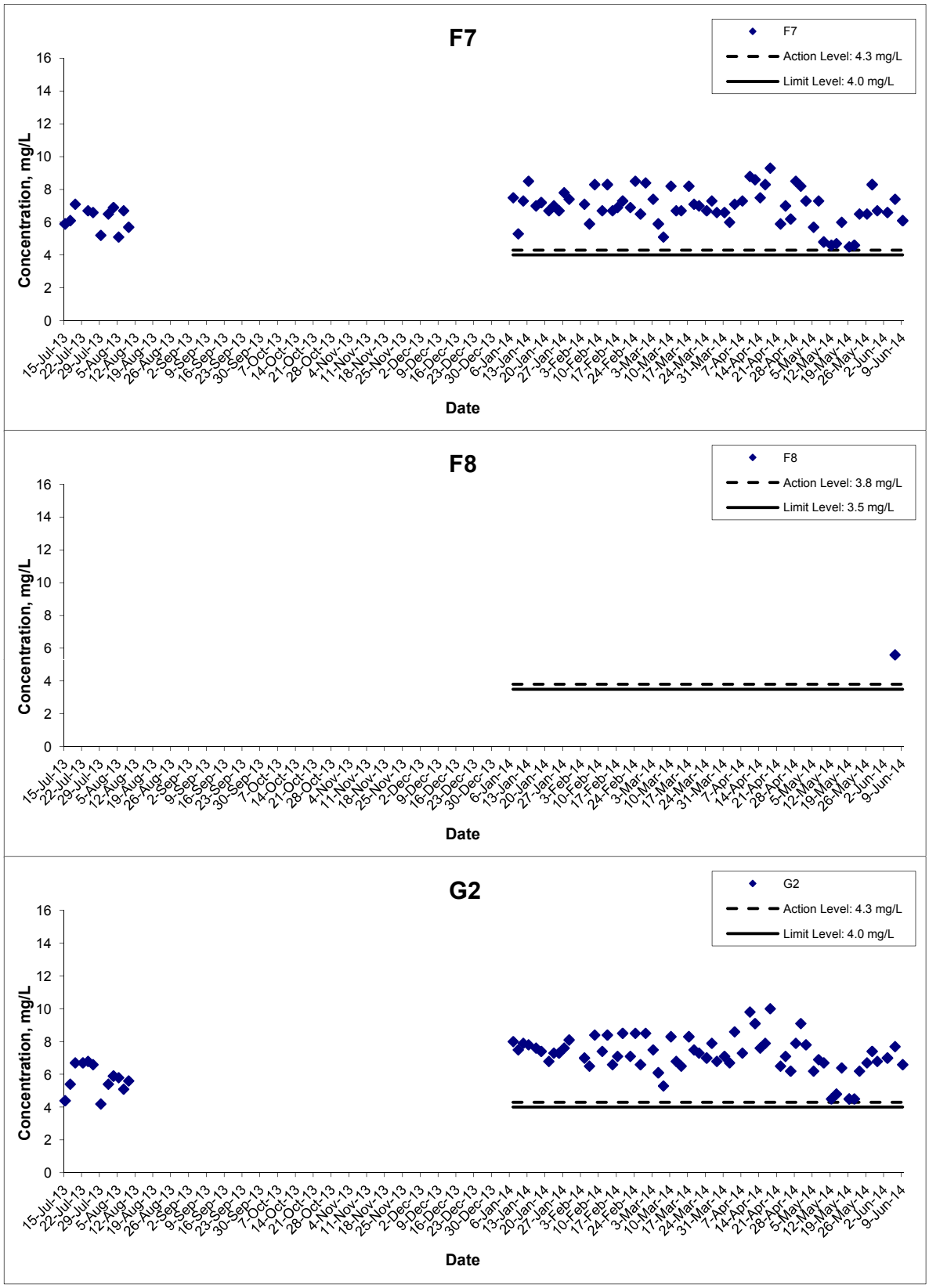
	Date: Jun 14	Appendix: C	

Dissolved Oxygen (Middle) at Mid-Ebb Tide



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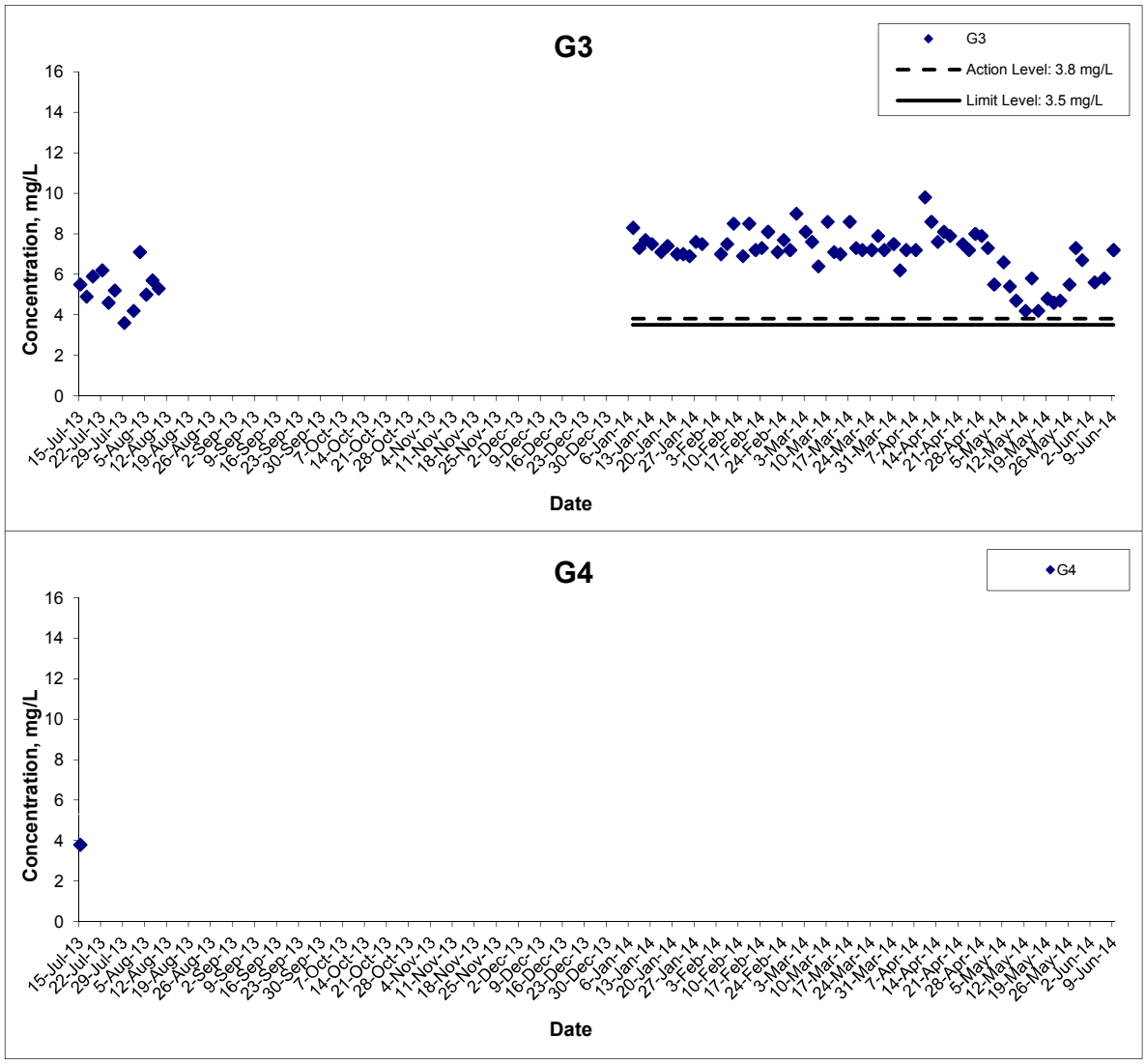
		Date Jun 14	Appendix C	

Dissolved Oxygen (Middle) at Mid-Ebb Tide



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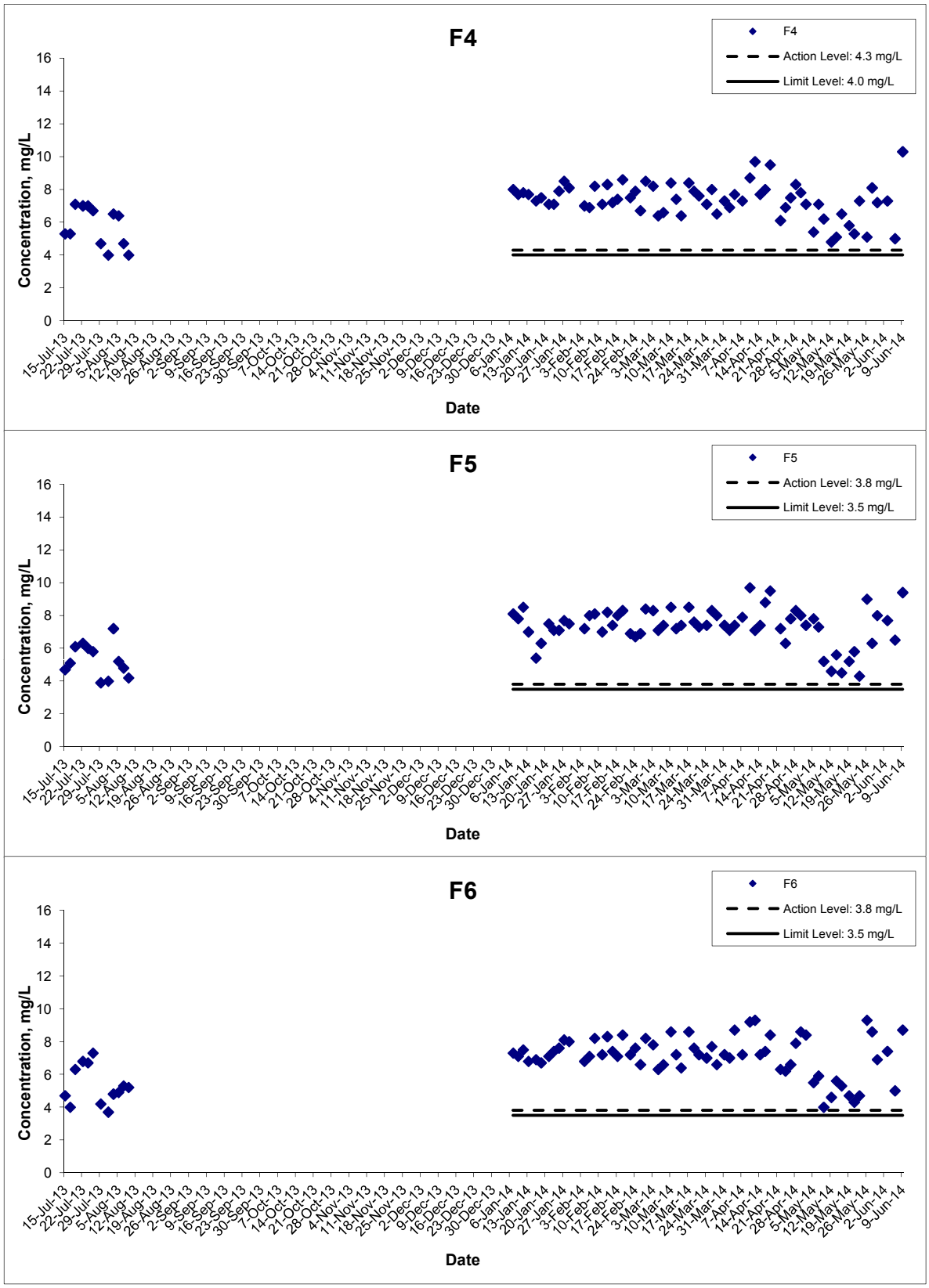
		Date Jun 14	Appendix C	

Dissolved Oxygen (Middle) at Mid-Flood Tide



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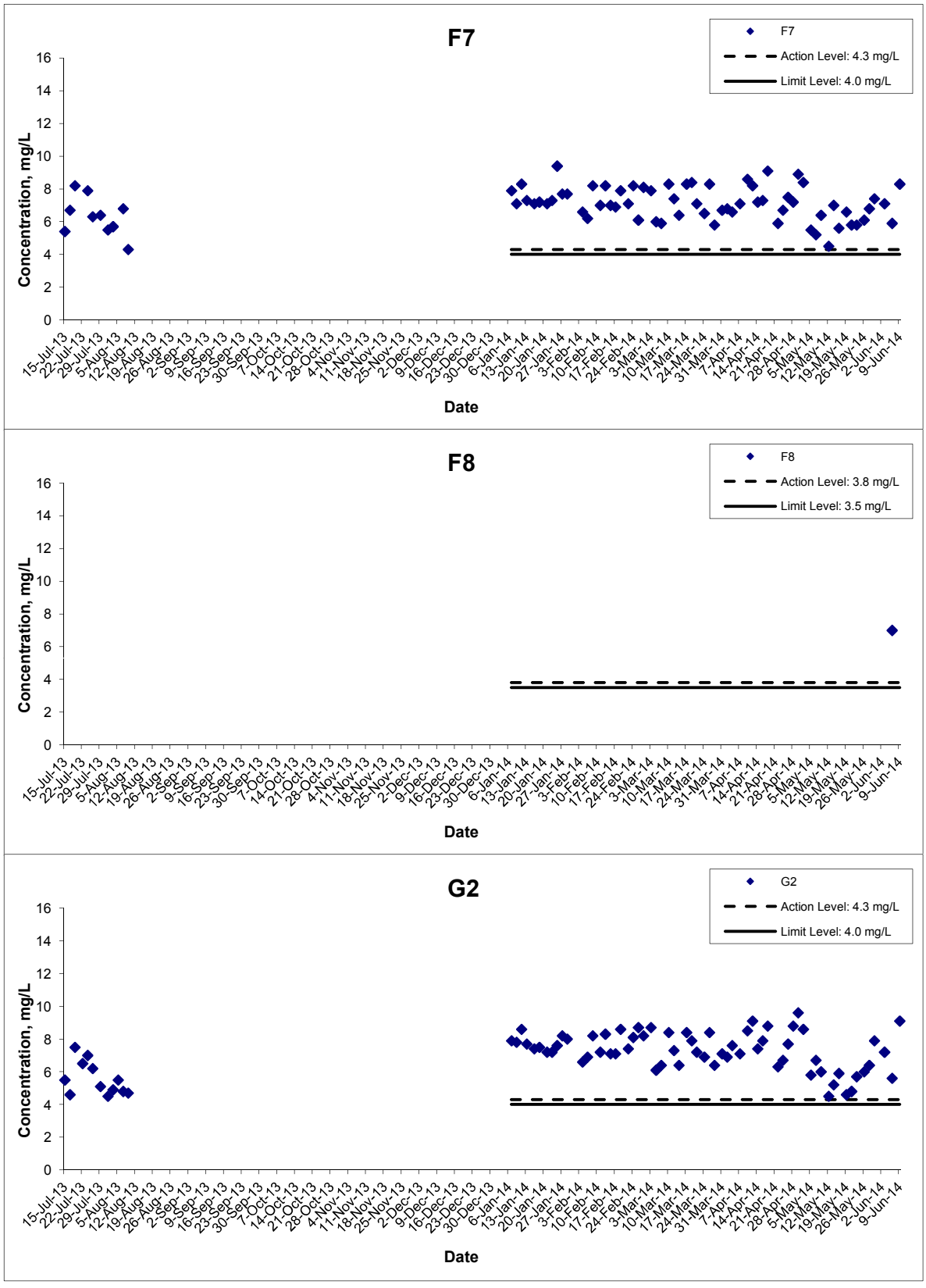
	Date: Jun 14	Appendix: C	

Dissolved Oxygen (Middle) at Mid-Flood Tide



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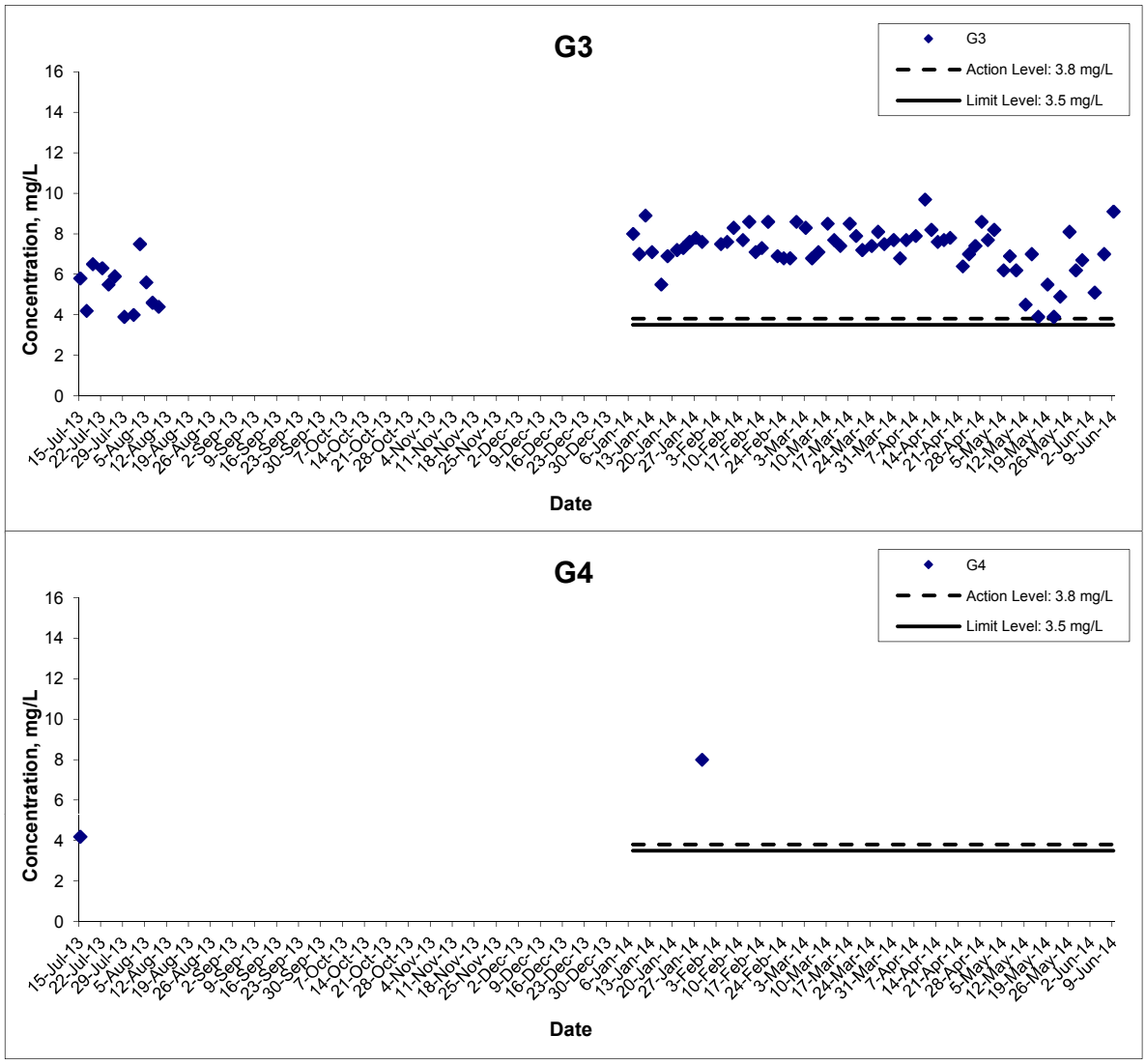
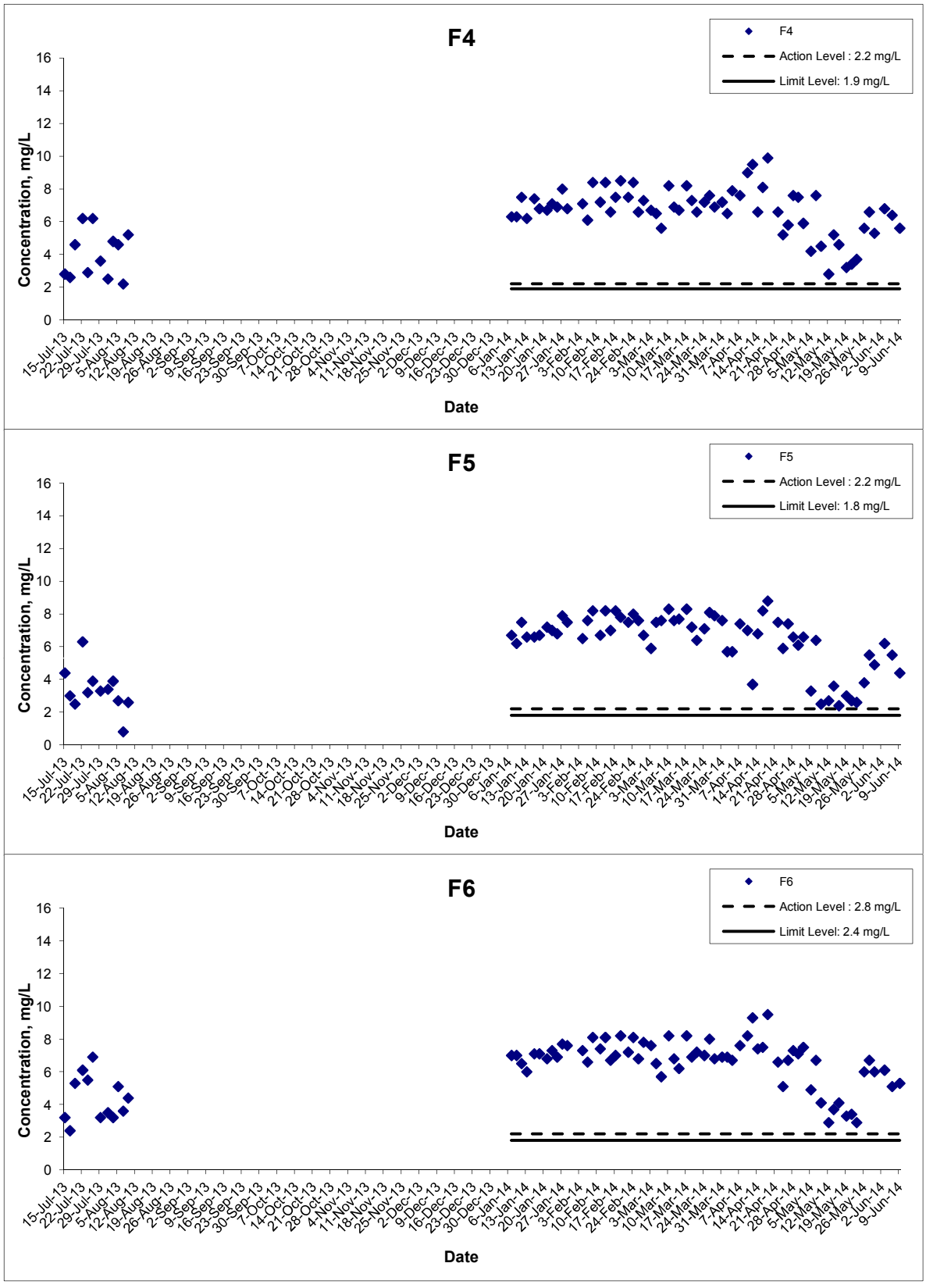
		Date Jun 14	Appendix C	

Dissolved Oxygen (Middle) at Mid-Flood Tide



Title	Contract No. CV/2012/01 - Sediment Removal at Yim Tin Tsai (East) Fish Culture Zone Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA13027	CINOTECH
		Date Jun 14	Appendix C	

Dissolved Oxygen (Bottom) at Mid-Ebb Tide



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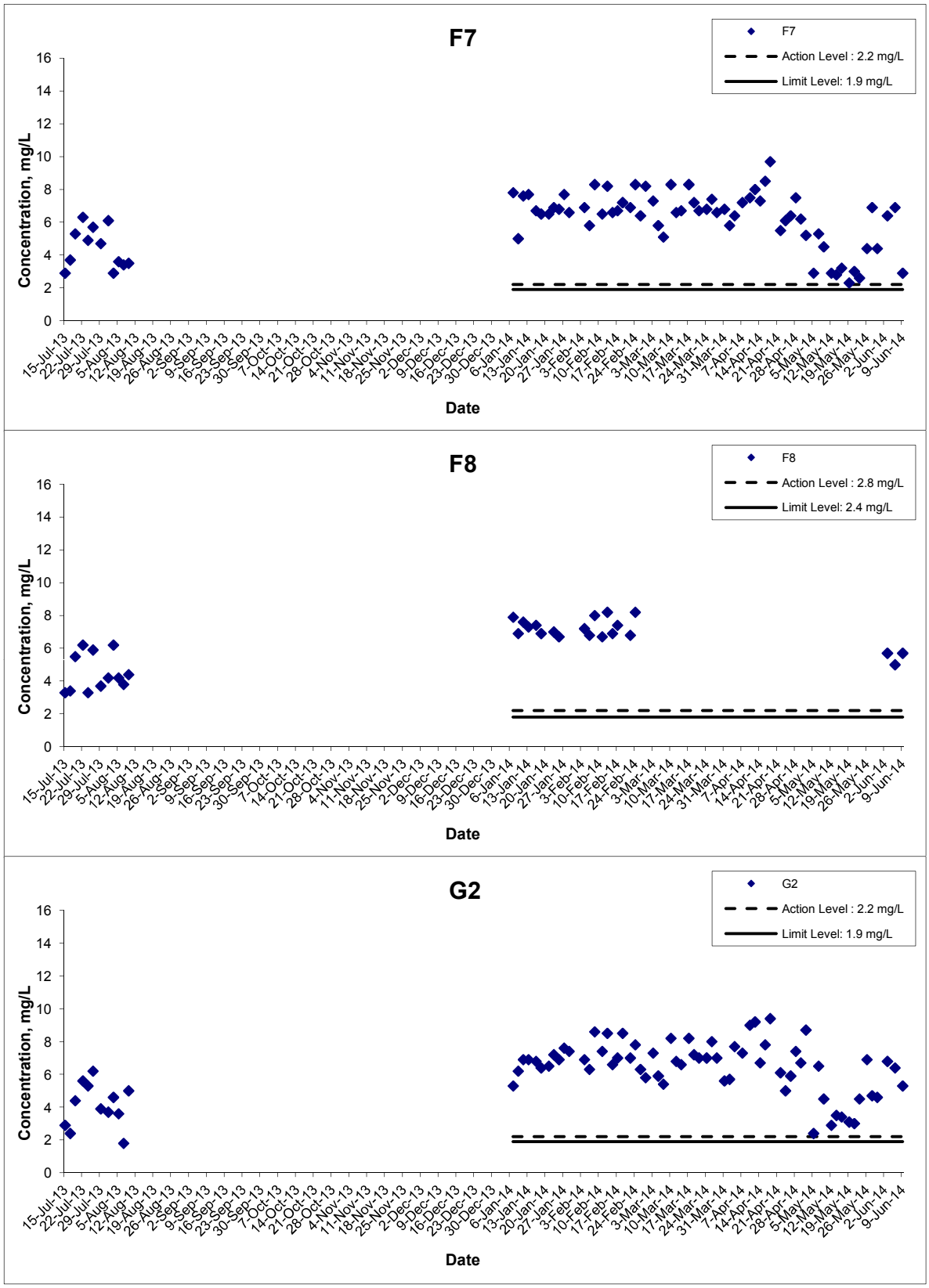
	Date: Jun 14	Appendix: C	

Dissolved Oxygen (Bottom) at Mid-Ebb Tide



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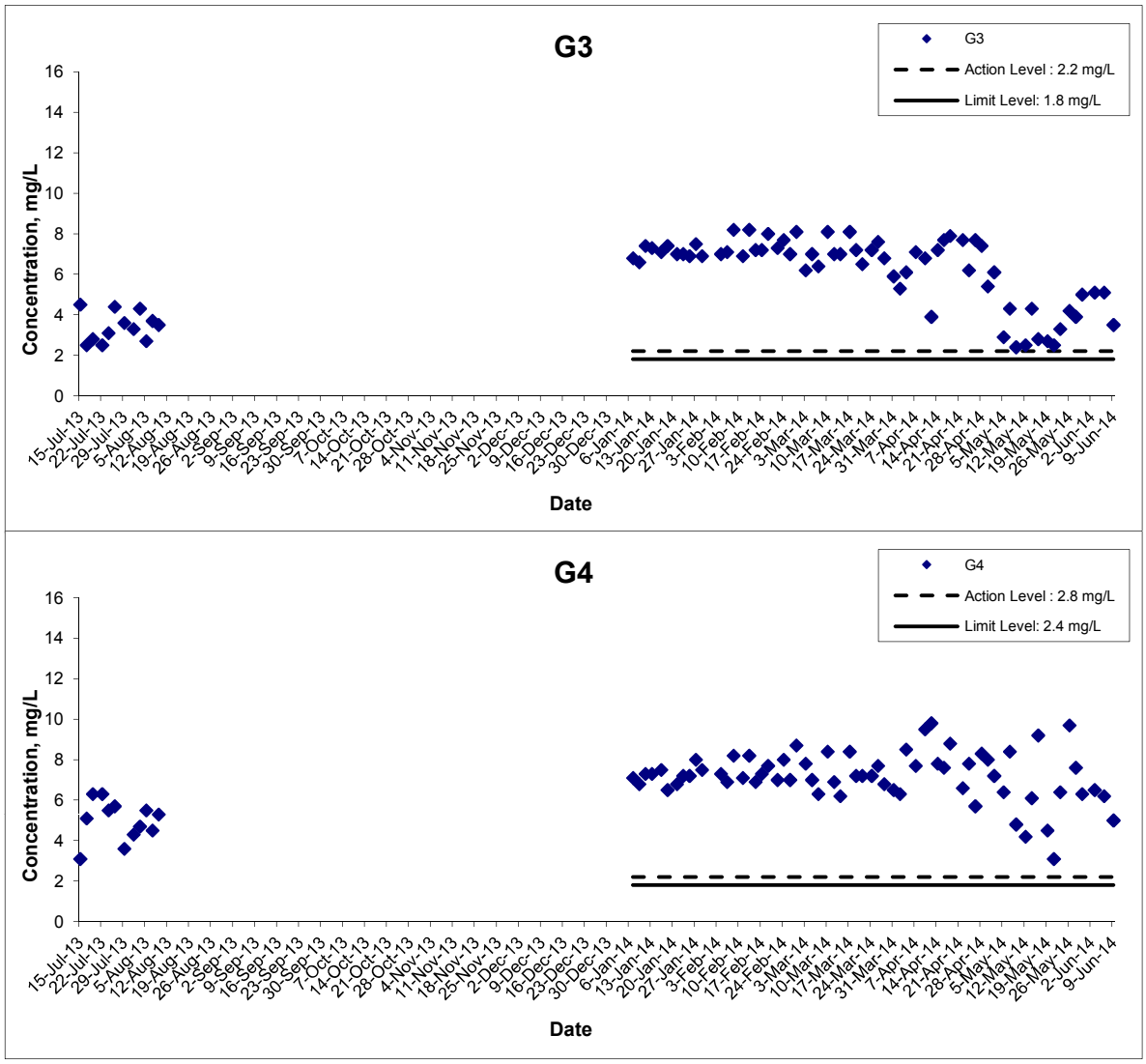
	Date: Jun 14	Appendix: C	

Dissolved Oxygen (Bottom) at Mid-Ebb Tide



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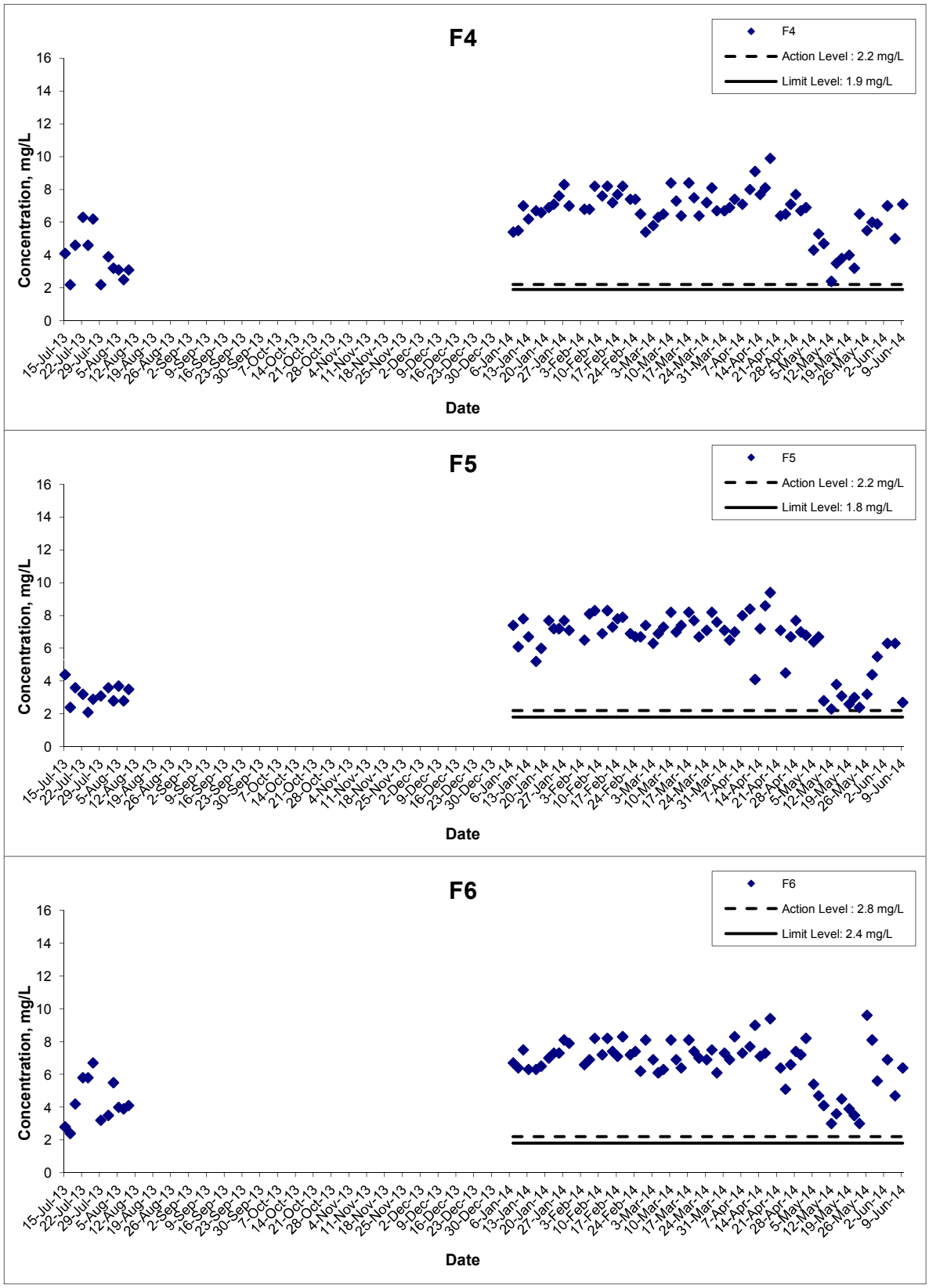
		Date Jun 14	Appendix C	

Dissolved Oxygen (Bottom) at Mid-Flood Tide



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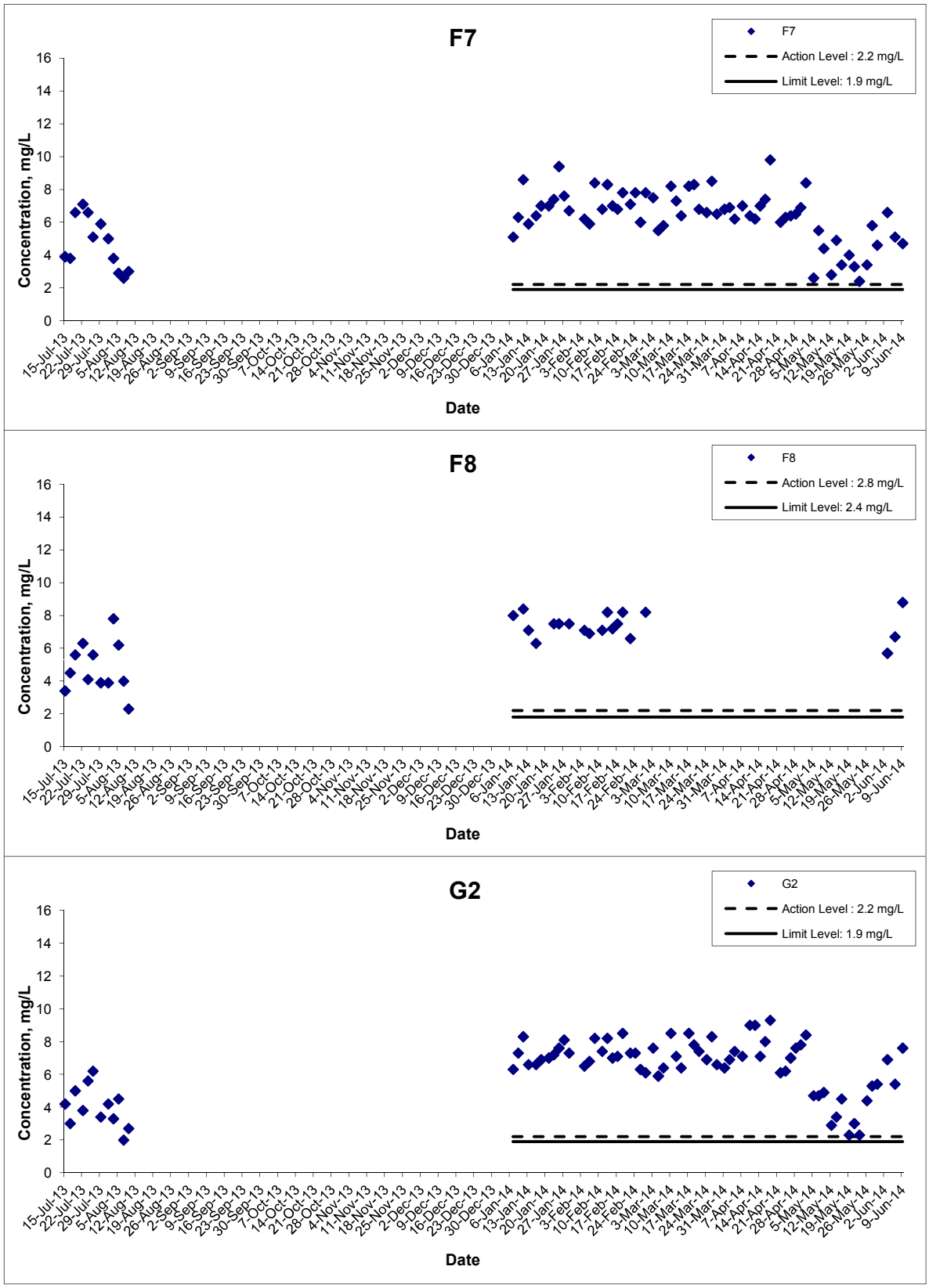
		Date Jun 14	Appendix C	

Dissolved Oxygen (Bottom) at Mid-Flood Tide



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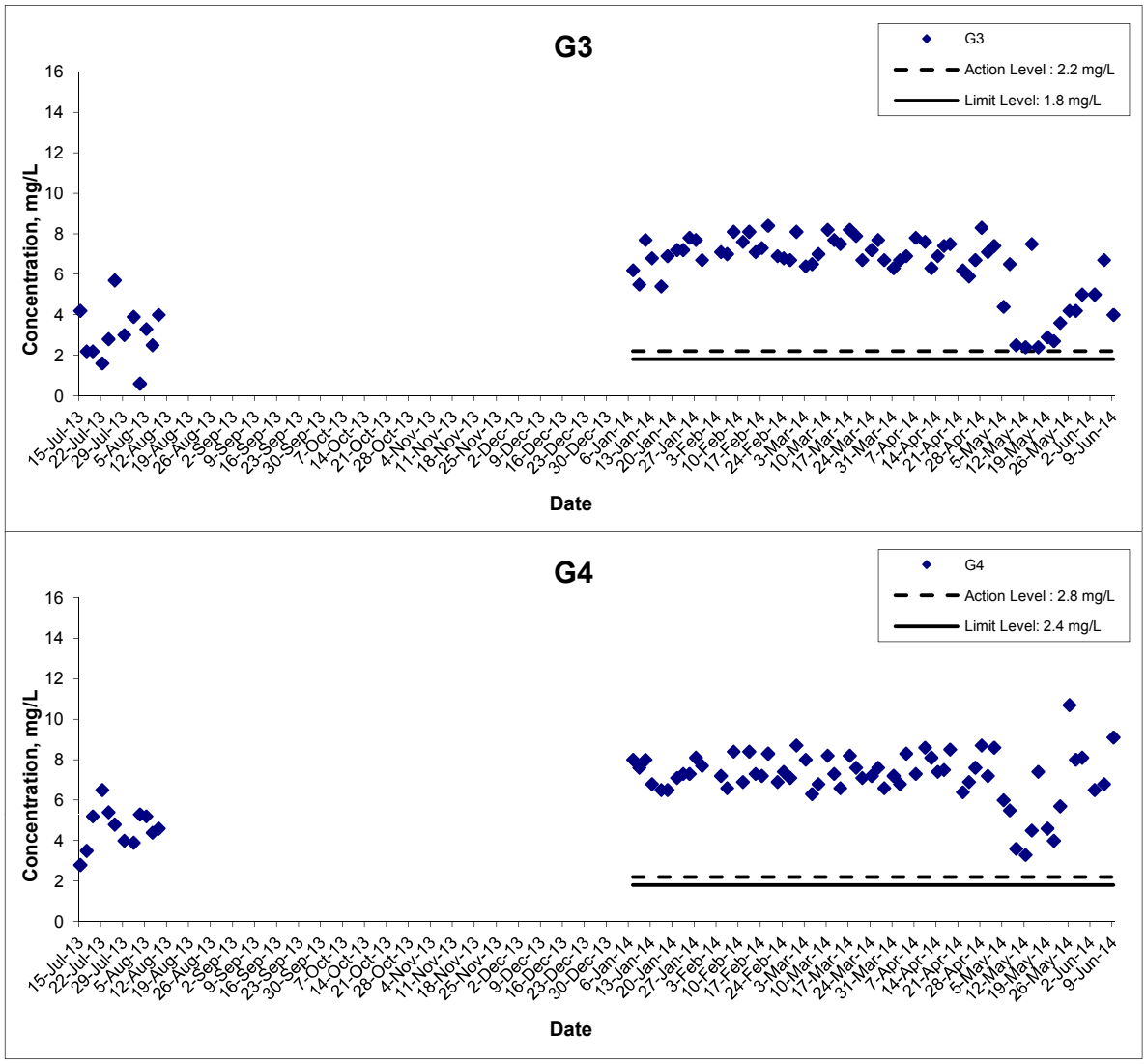
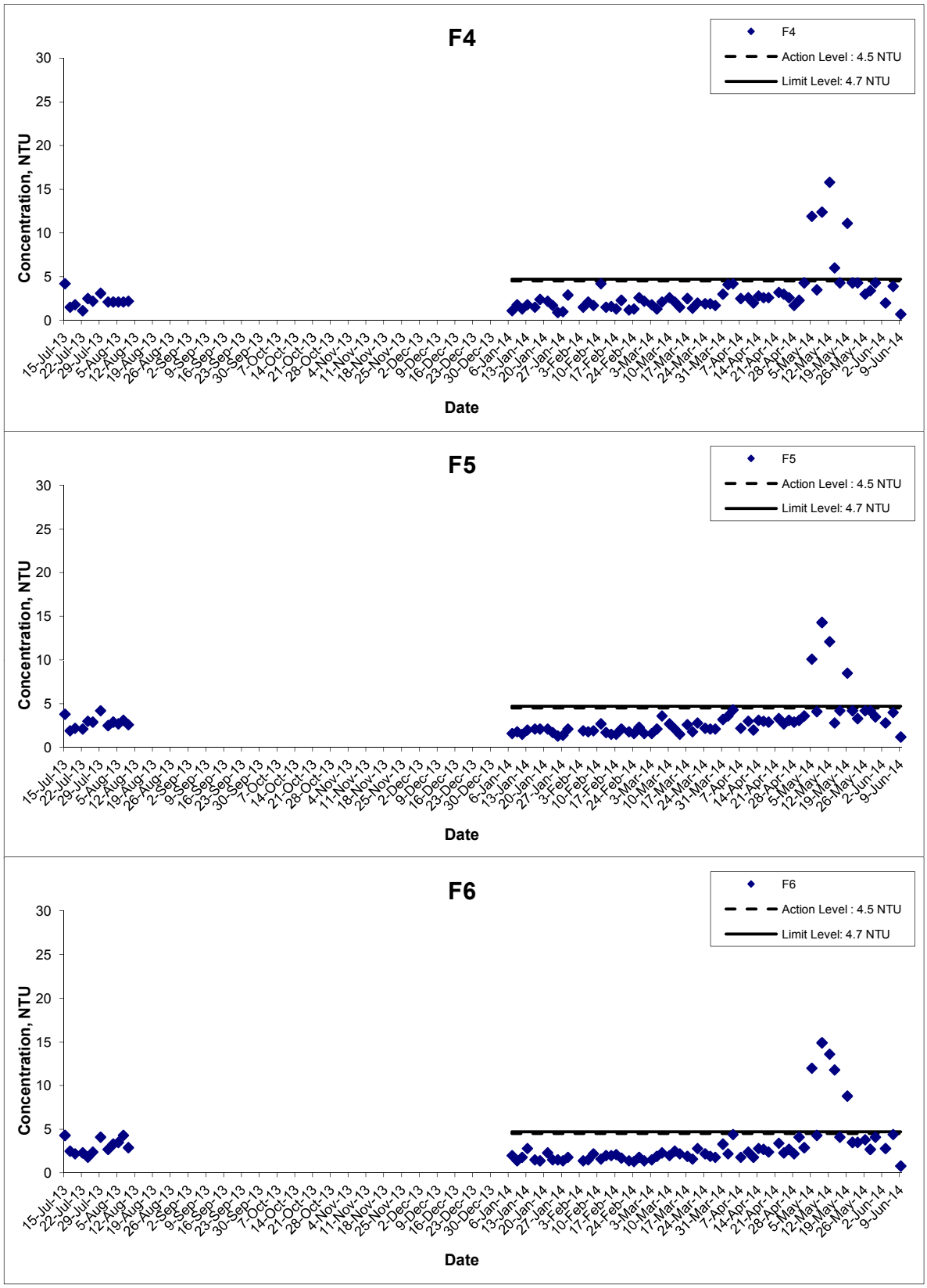
	Date: Jun 14	Appendix: C	

Dissolved Oxygen (Bottom) at Mid-Flood Tide



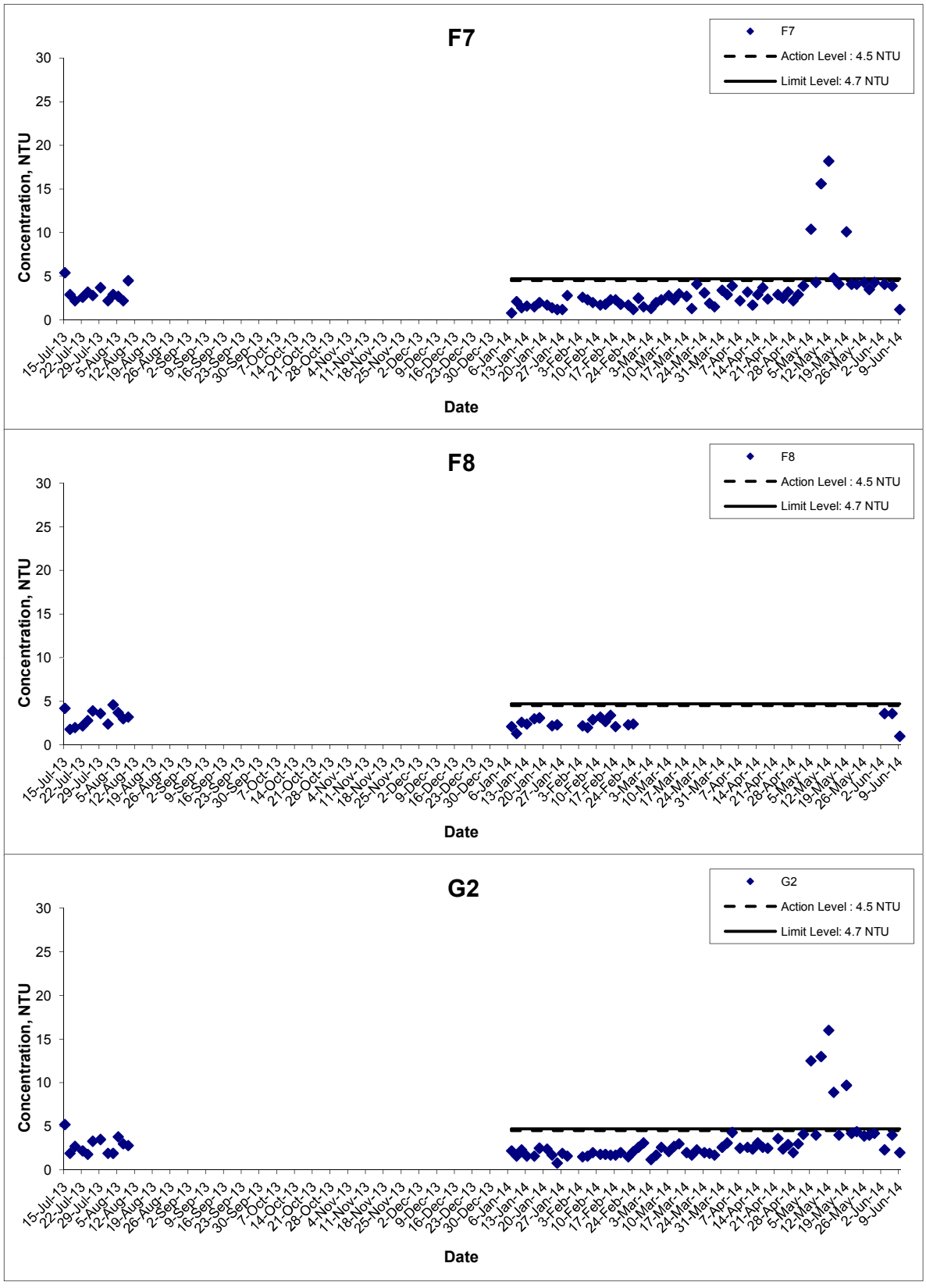
Title	Contract No. CV/2012/01 - Sediment Removal at Yim Tin Tsai (East) Fish Culture Zone Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA13027	CINOTECH
		Date Jun 14	Appendix C	

Turbidity (Depth-averaged) at Mid-Ebb Tide



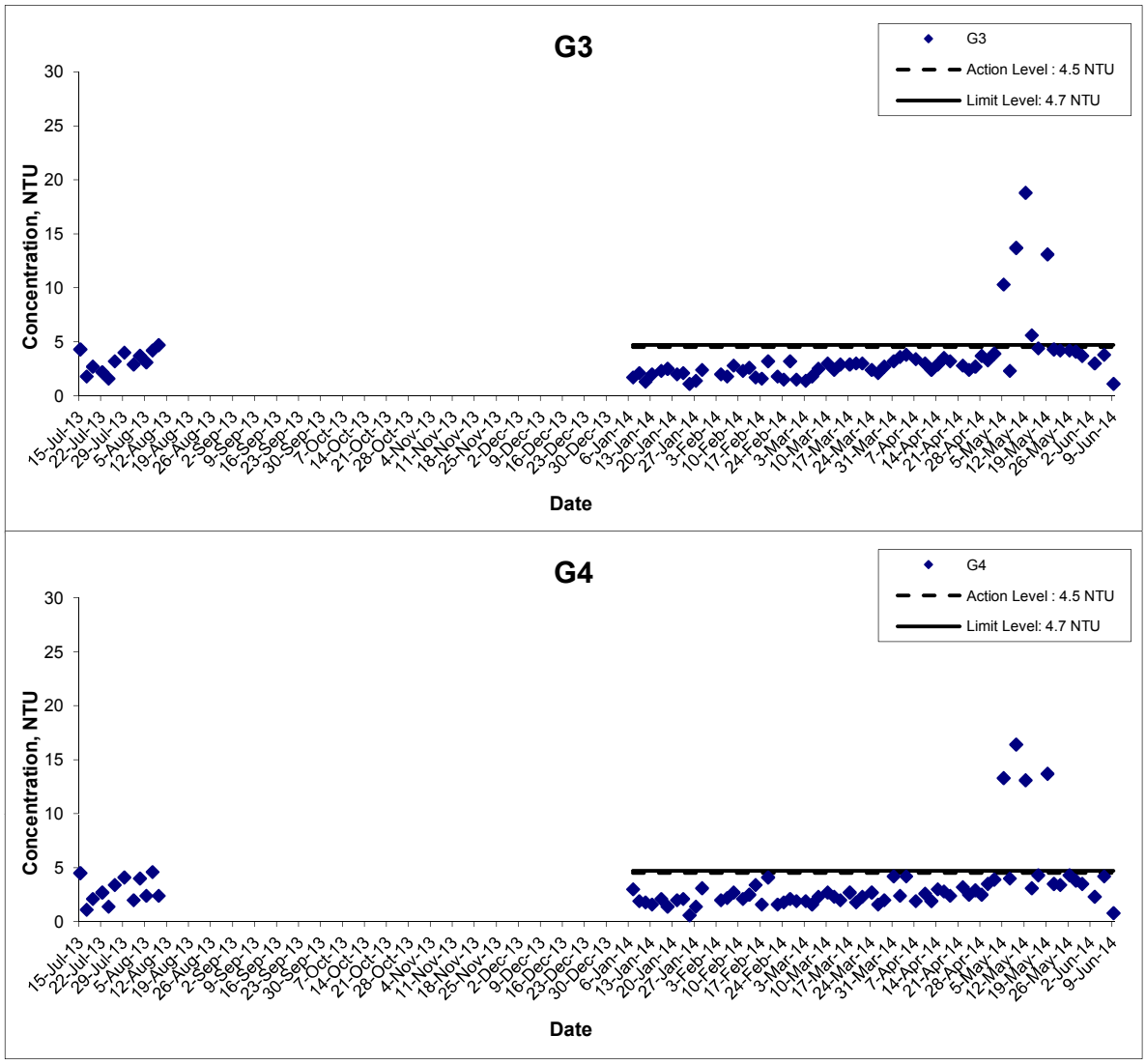
Title	Contract No. CV/2012/01 - Sediment Removal at Yim Tin Tsai (East) Fish Culture Zone Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA13027	CINOTECH
		Date Jun 14	Appendix C	

Turbidity (Depth-averaged) at Mid-Ebb Tide



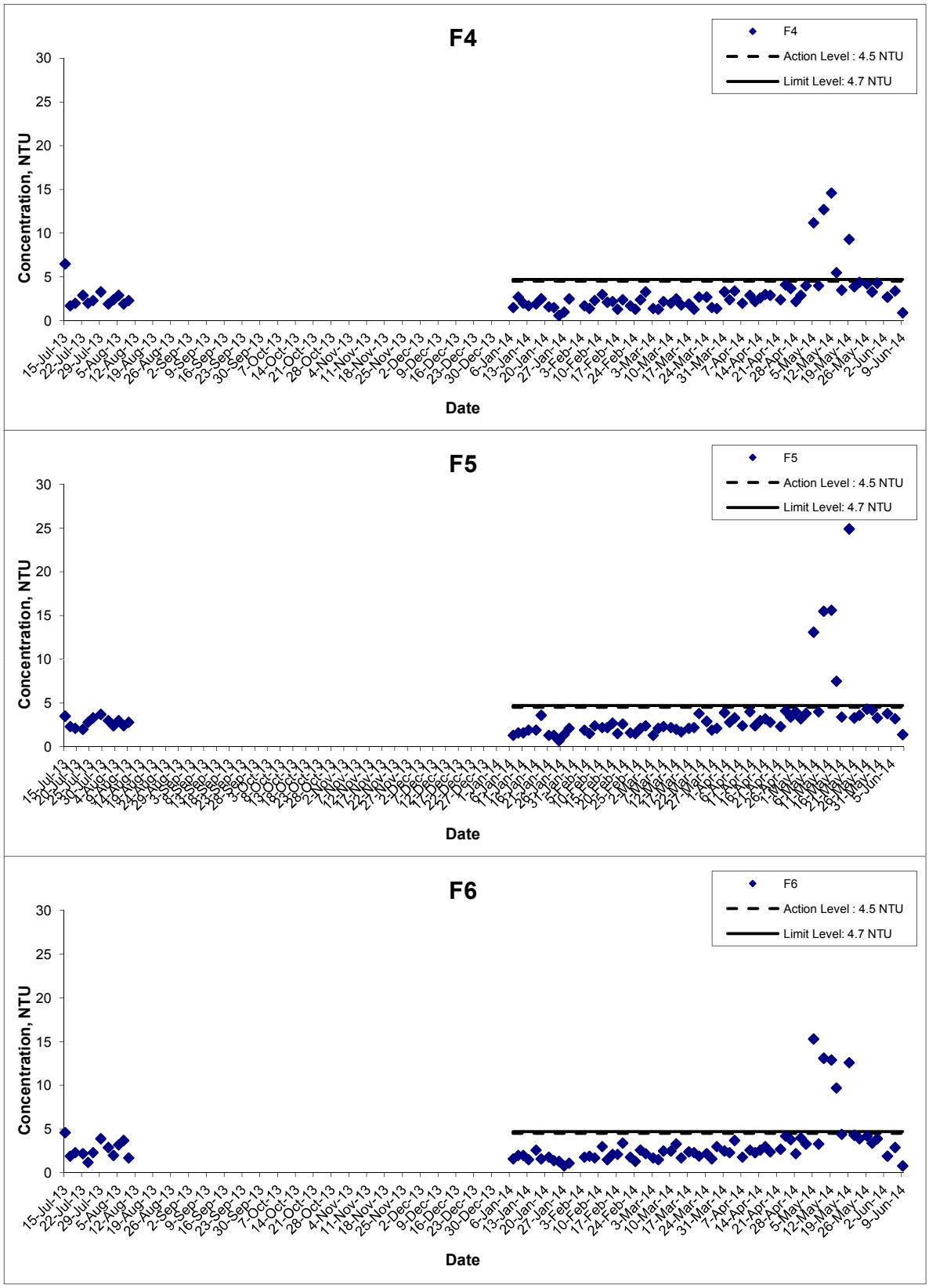
Title	Contract No. CV/2012/01 - Sediment Removal at Yim Tin Tsai (East) Fish Culture Zone Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA13027	CINOTECH
		Date Jun 14	Appendix C	

Turbidity (Depth-averaged) at Mid-Ebb Tide



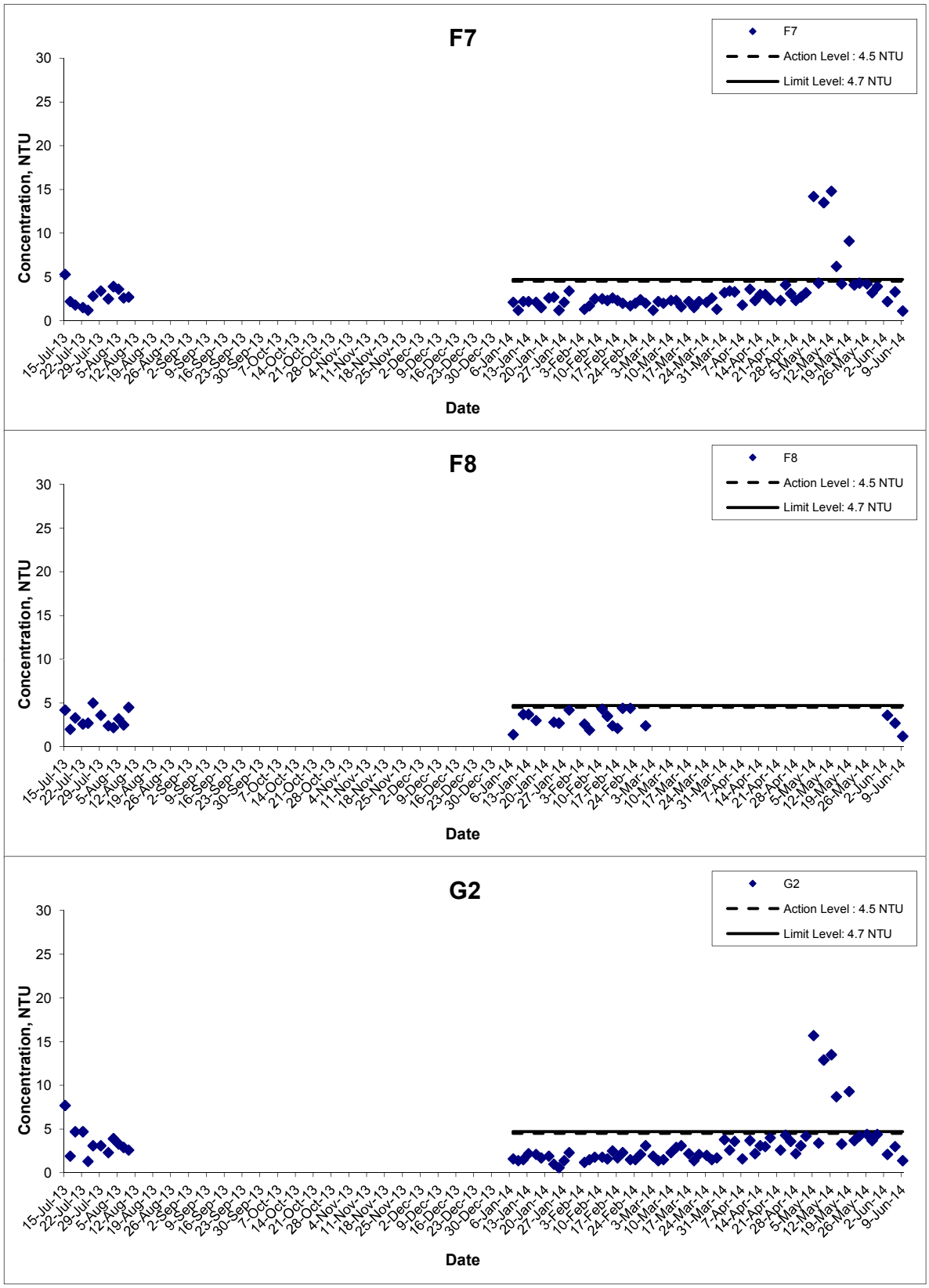
Title		Scale	Project No.	
	Contract No. CV/2012/01 - Sediment Removal at Yim Tin Tsai (East) Fish Culture Zone	N.T.S	MA13027	CINOTECH
	Graphical Presentation of Water Quality Monitoring Results	Date: Jun 14	Appendix: C	

Turbidity (Depth-averaged) at Mid-Flood Tide



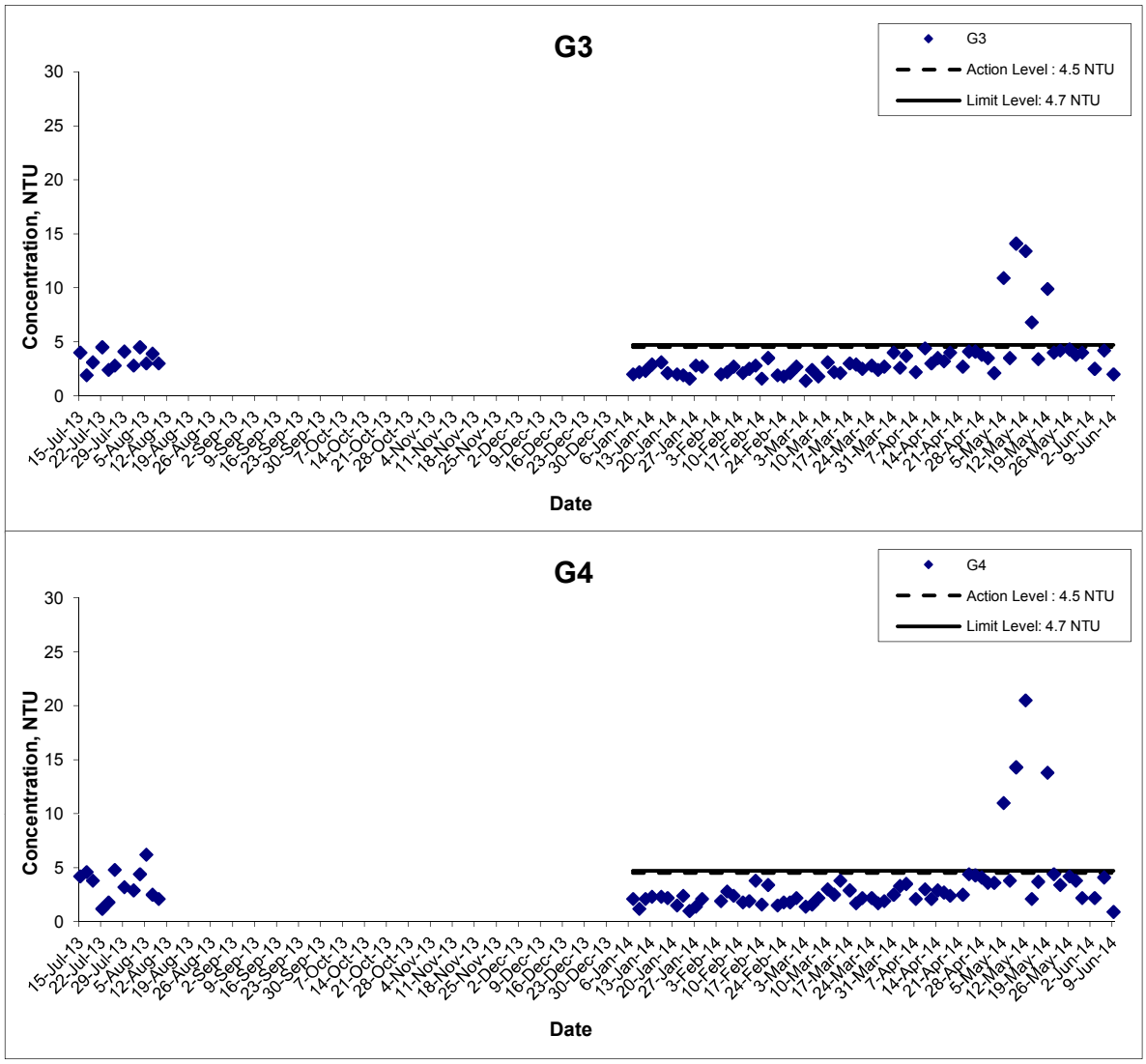
Title	Contract No. CV/2012/01 - Sediment Removal at Yim Tin Tsai (East) Fish Culture Zone Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA13027	CINOTECH
		Date Jun 14	Appendix C	

Turbidity (Depth-averaged) at Mid-Flood Tide



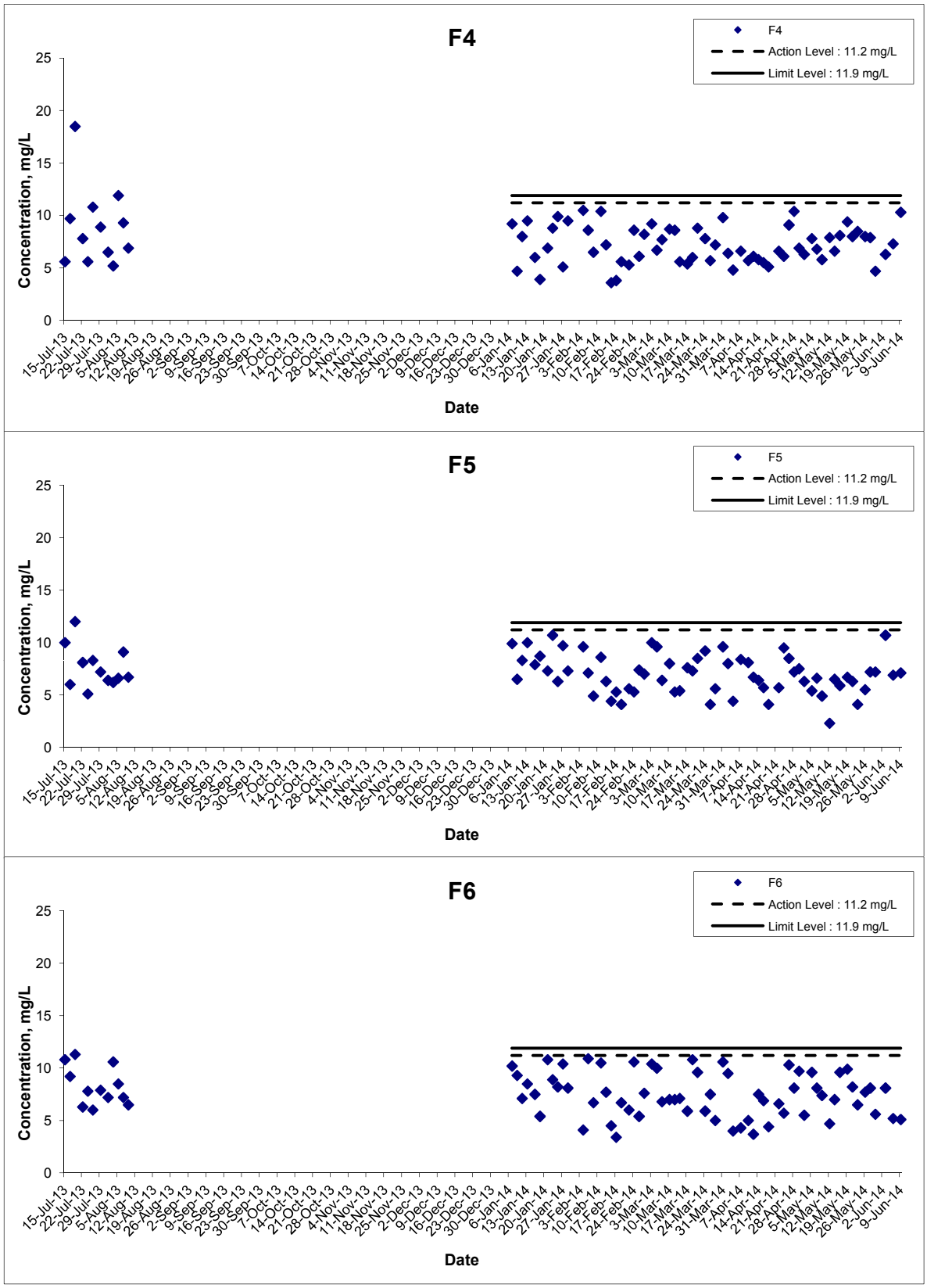
Title	Contract No. CV/2012/01 - Sediment Removal at Yim Tin Tsai (East) Fish Culture Zone Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA13027	CINOTECH
		Date Jun 14	Appendix C	

Turbidity (Depth-averaged) at Mid-Flood Tide



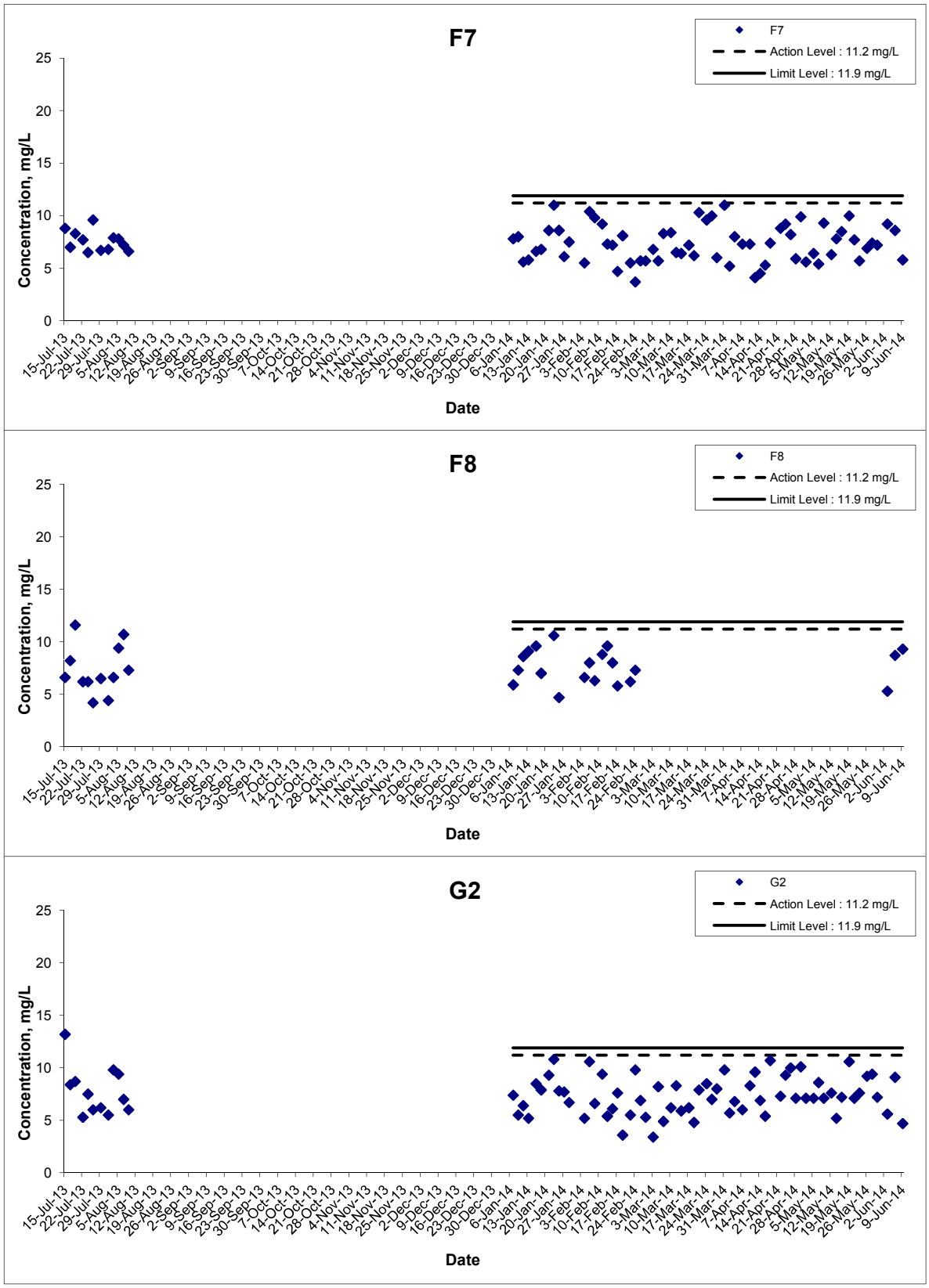
Title	Contract No. CV/2012/01 - Sediment Removal at Yim Tin Tsai (East) Fish Culture Zone Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA13027	CINOTECH
		Date Jun 14	Appendix C	

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



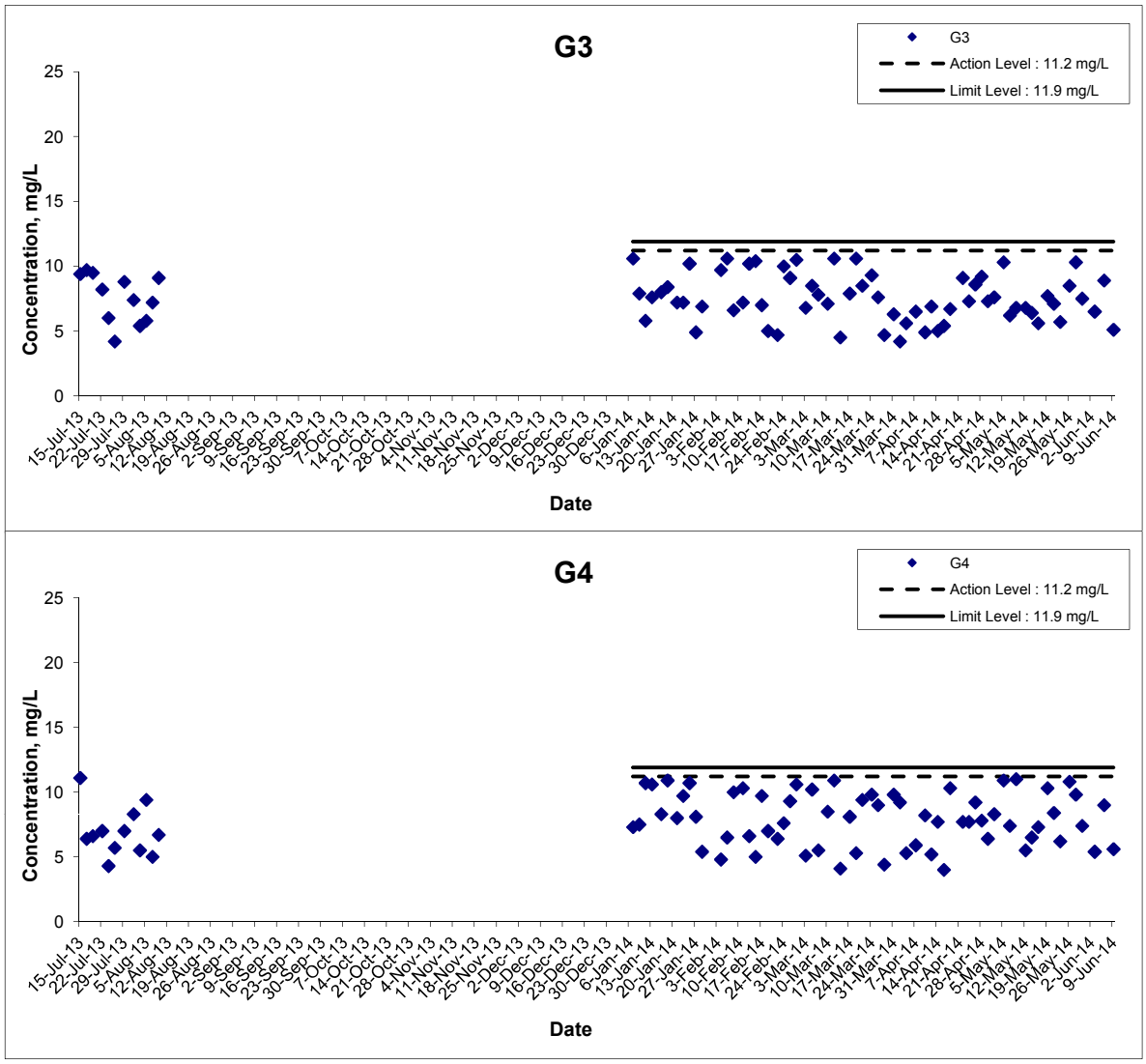
Title: Contract No. CV/2012/01 - Sediment Removal at Yim Tin Tsai (East) Fish Culture Zone Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA13027	CINOTECH
	Date: Jun 14	Appendix: C	

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



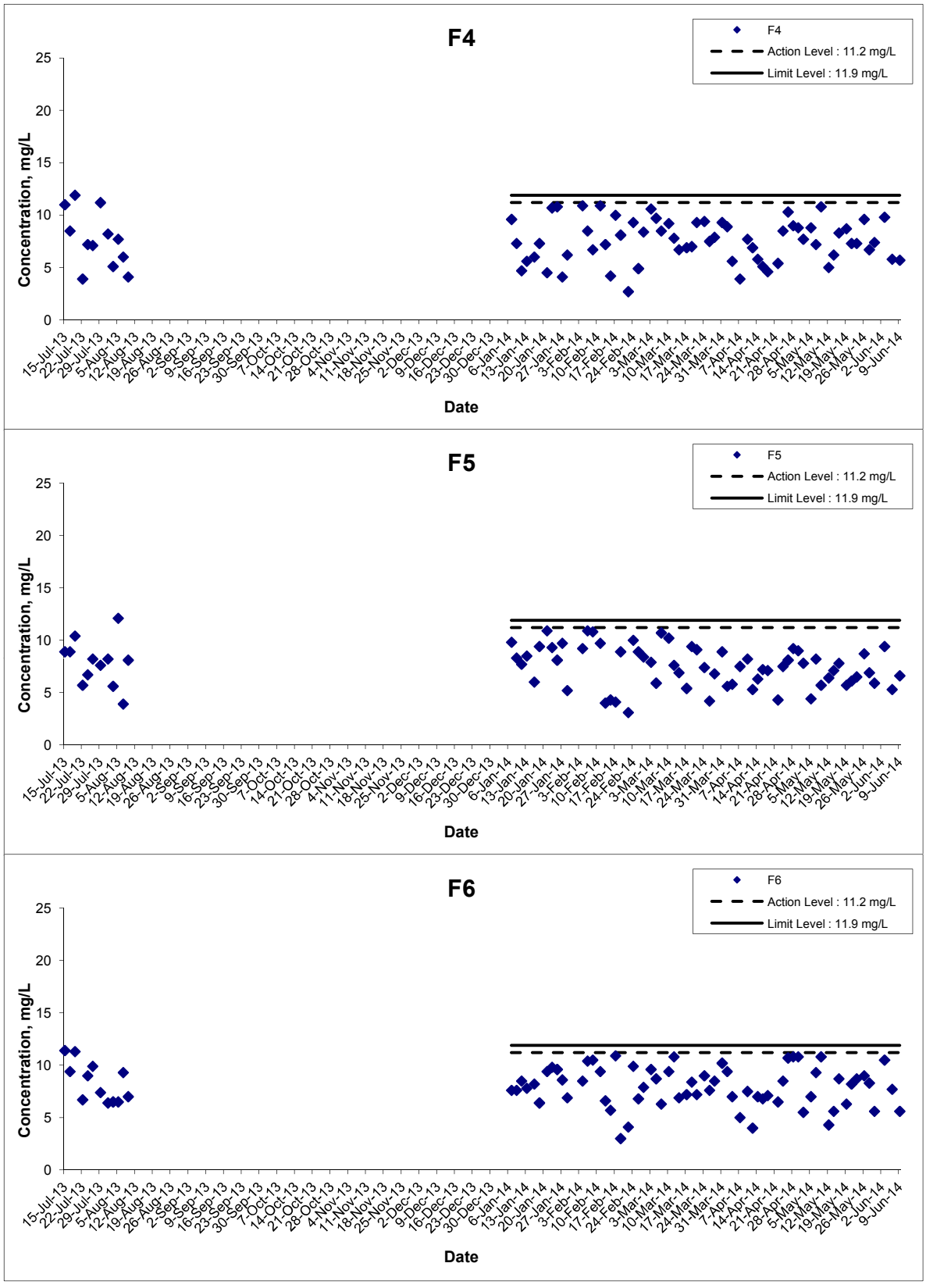
Title: Contract No. CV/2012/01 - Sediment Removal at Yim Tin Tsai (East) Fish Culture Zone Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA13027	CINOTECH
	Date: Jun 14	Appendix: C	

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



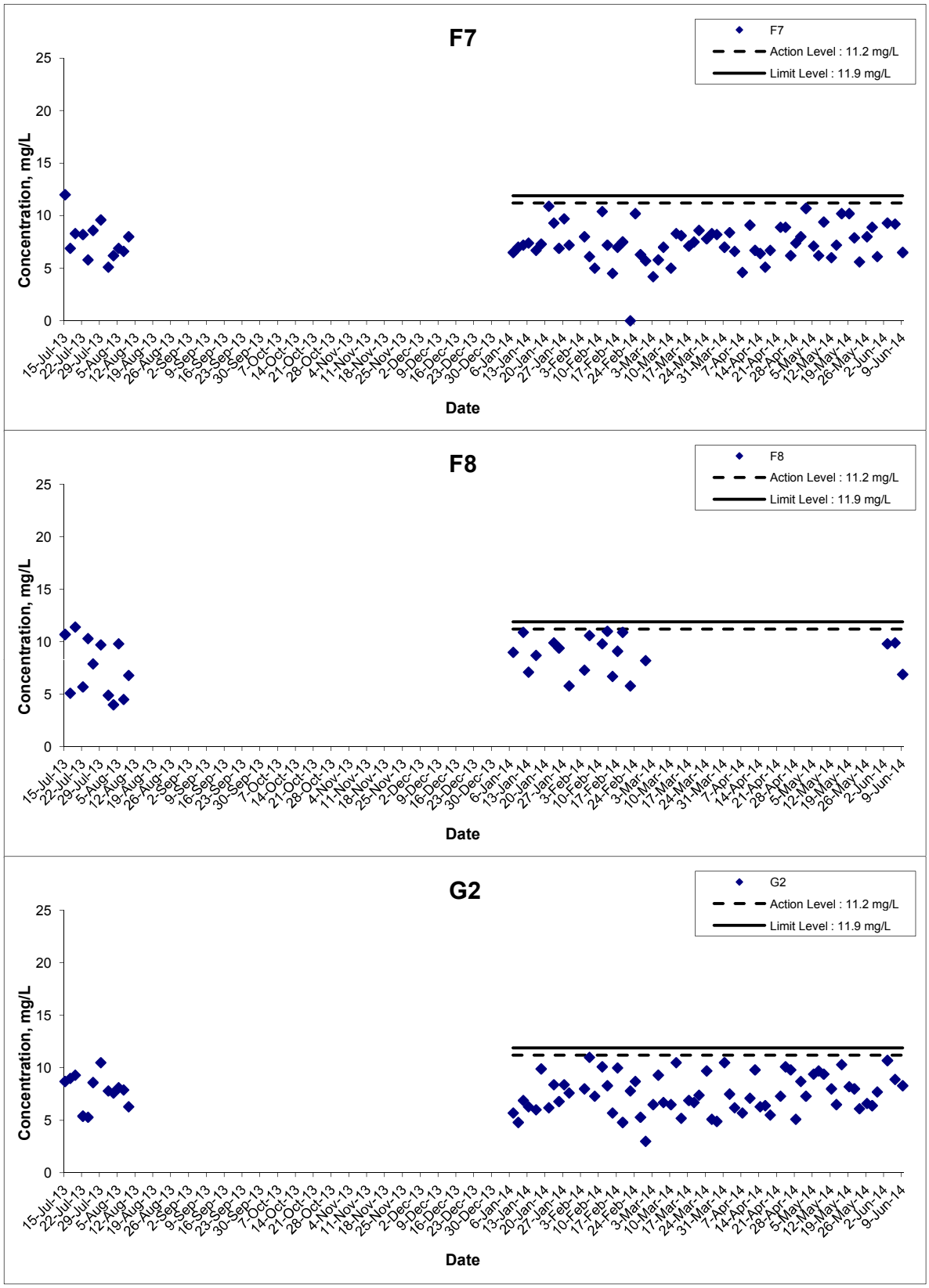
Title	Contract No. CV/2012/01 - Sediment Removal at Yim Tin Tsai (East) Fish Culture Zone Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA13027	CINOTECH
		Date Jun 14	Appendix C	

Suspended Solids (Depth-averaged) at Mid-Flood Tide



Title: Contract No. CV/2012/01 - Sediment Removal at Yim Tin Tsai (East) Fish Culture Zone Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA13027	CINOTECH
	Date: Jun 14	Appendix: C	

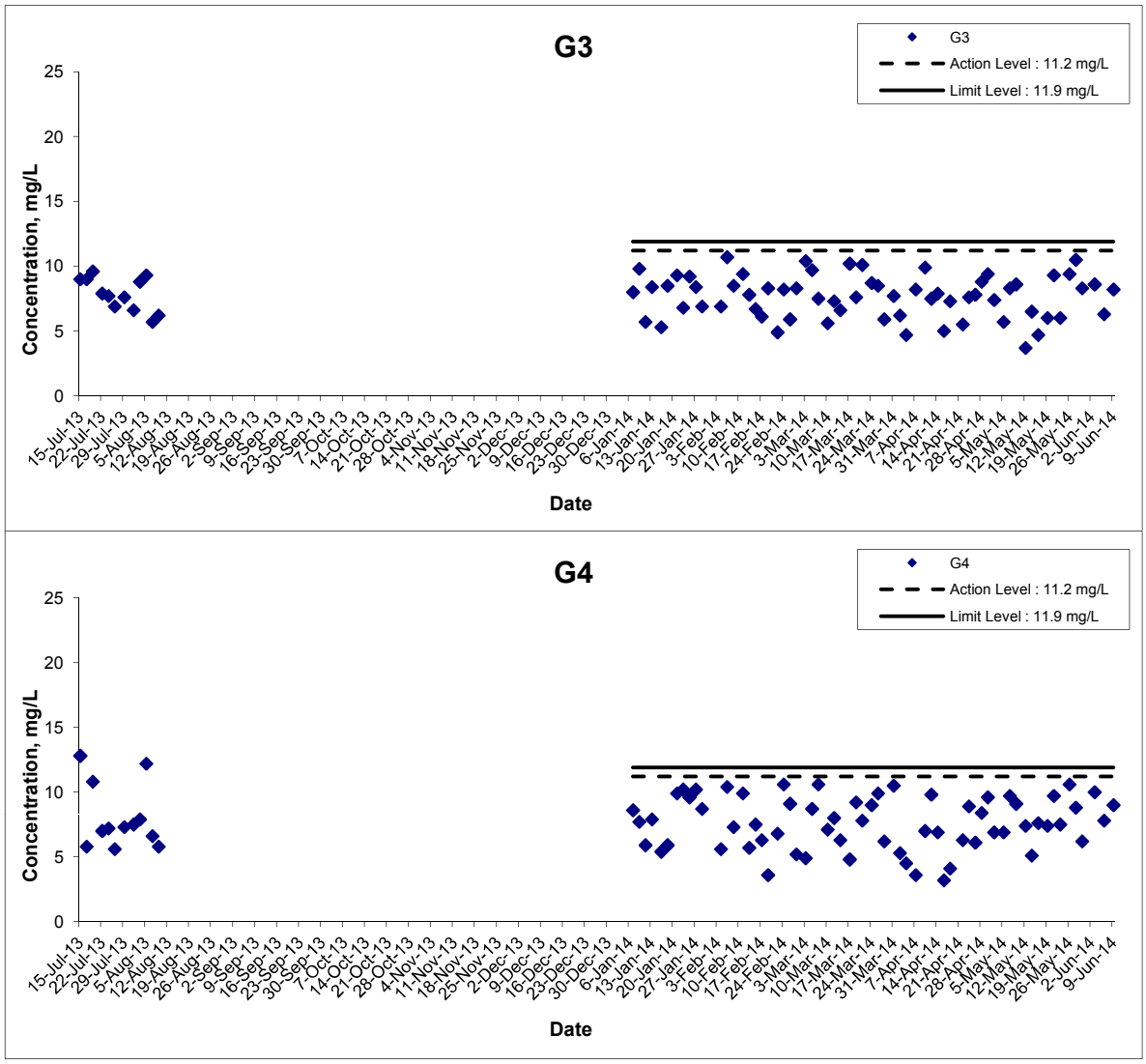
Suspended Solids (Depth-averaged) at Mid-Flood Tide



Remarks: The graphical point at zero concentration is presented as <2.5 μg/L

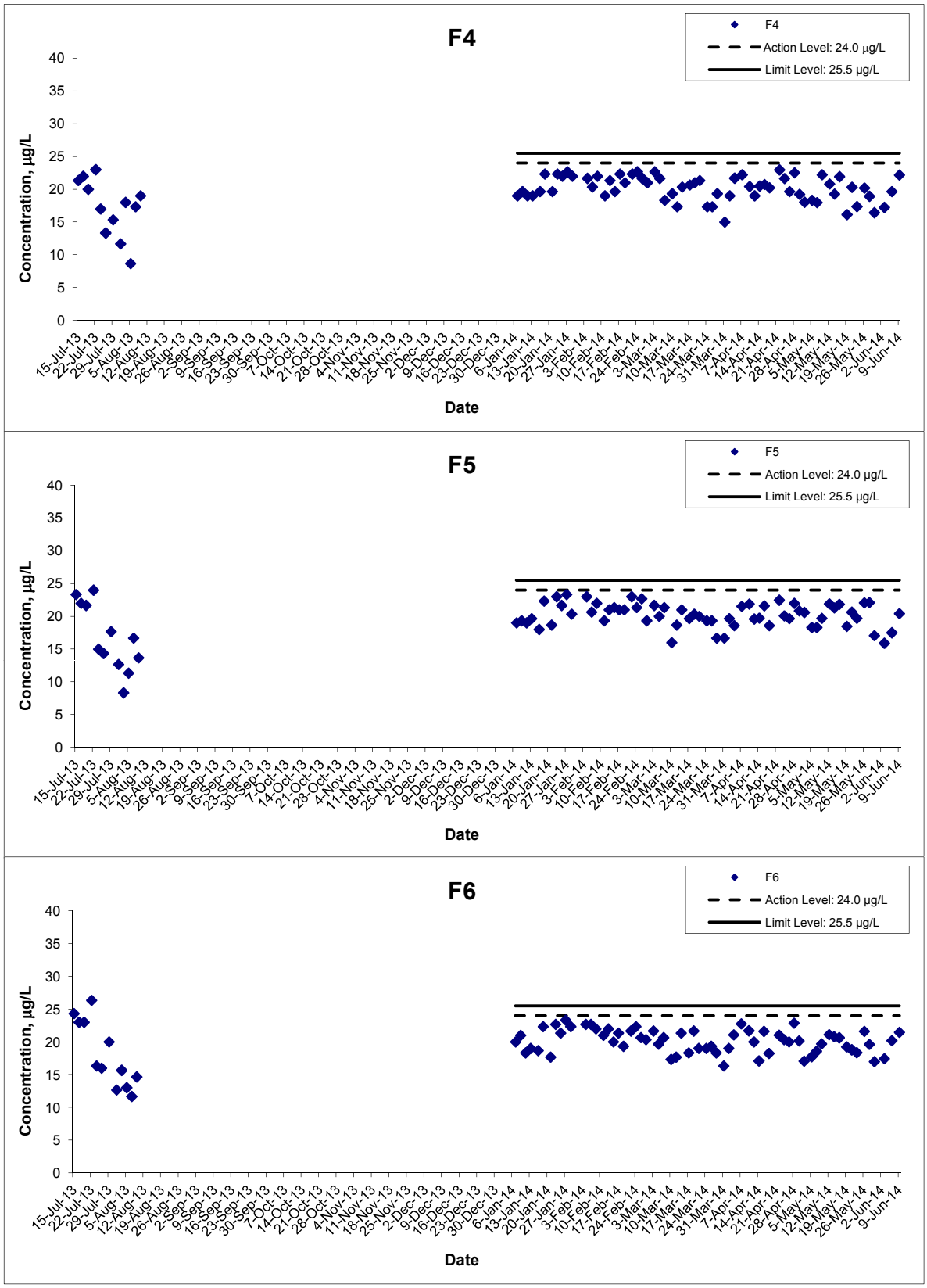
Title: Contract No. CV/2012/01 - Sediment Removal at Yim Tin Tsai (East) Fish Culture Zone Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA13027	CINOTECH
	Date: Jun 14	Appendix: C	

Suspended Solids (Depth-averaged) at Mid-Flood Tide



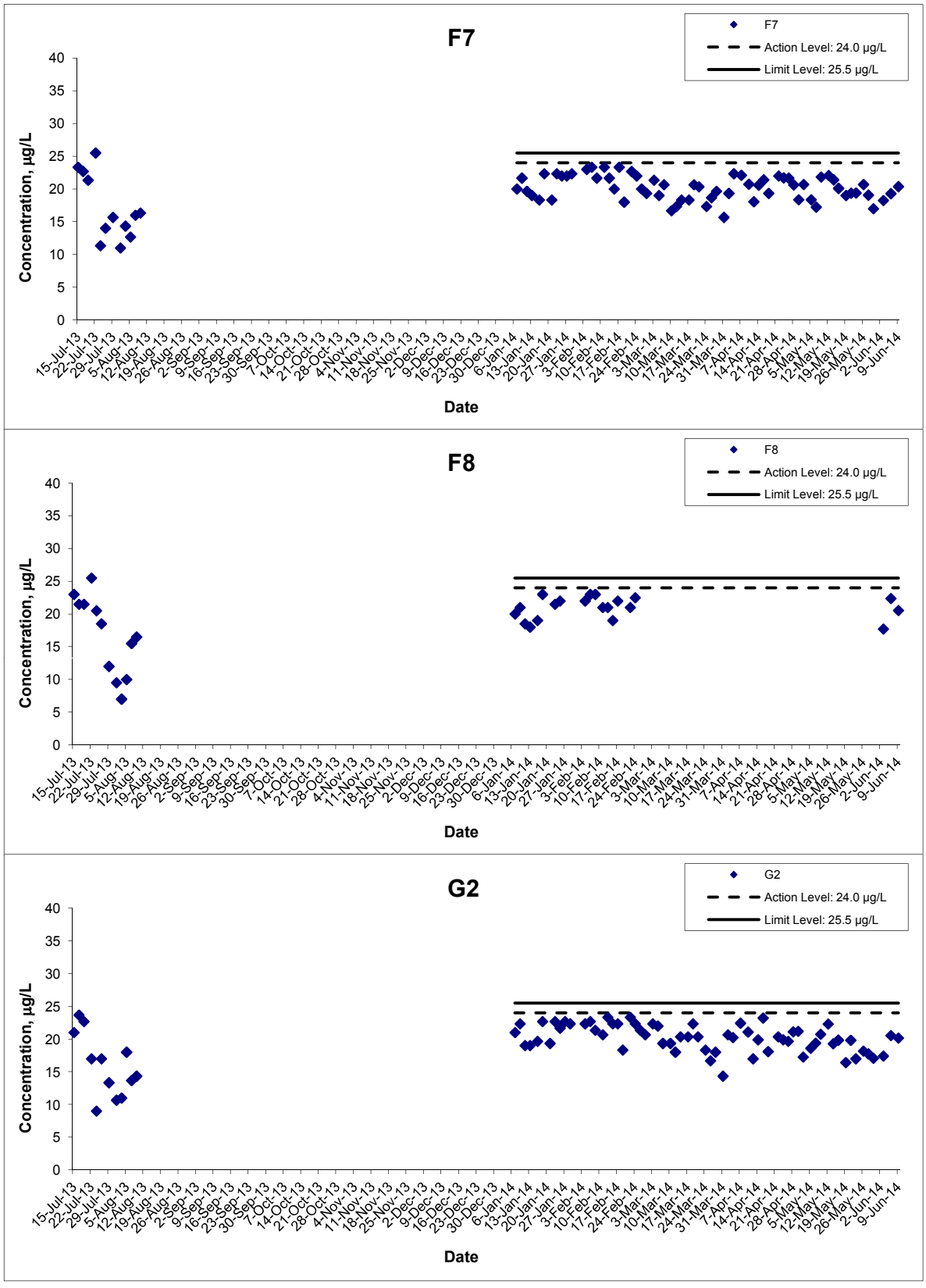
Title	Contract No. CV/2012/01 - Sediment Removal at Yim Tin Tsai (East) Fish Culture Zone Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA13027	CINOTECH
		Date Jun 14	Appendix C	

Arsenic (Depth-averaged) at Mid-Ebb Tide



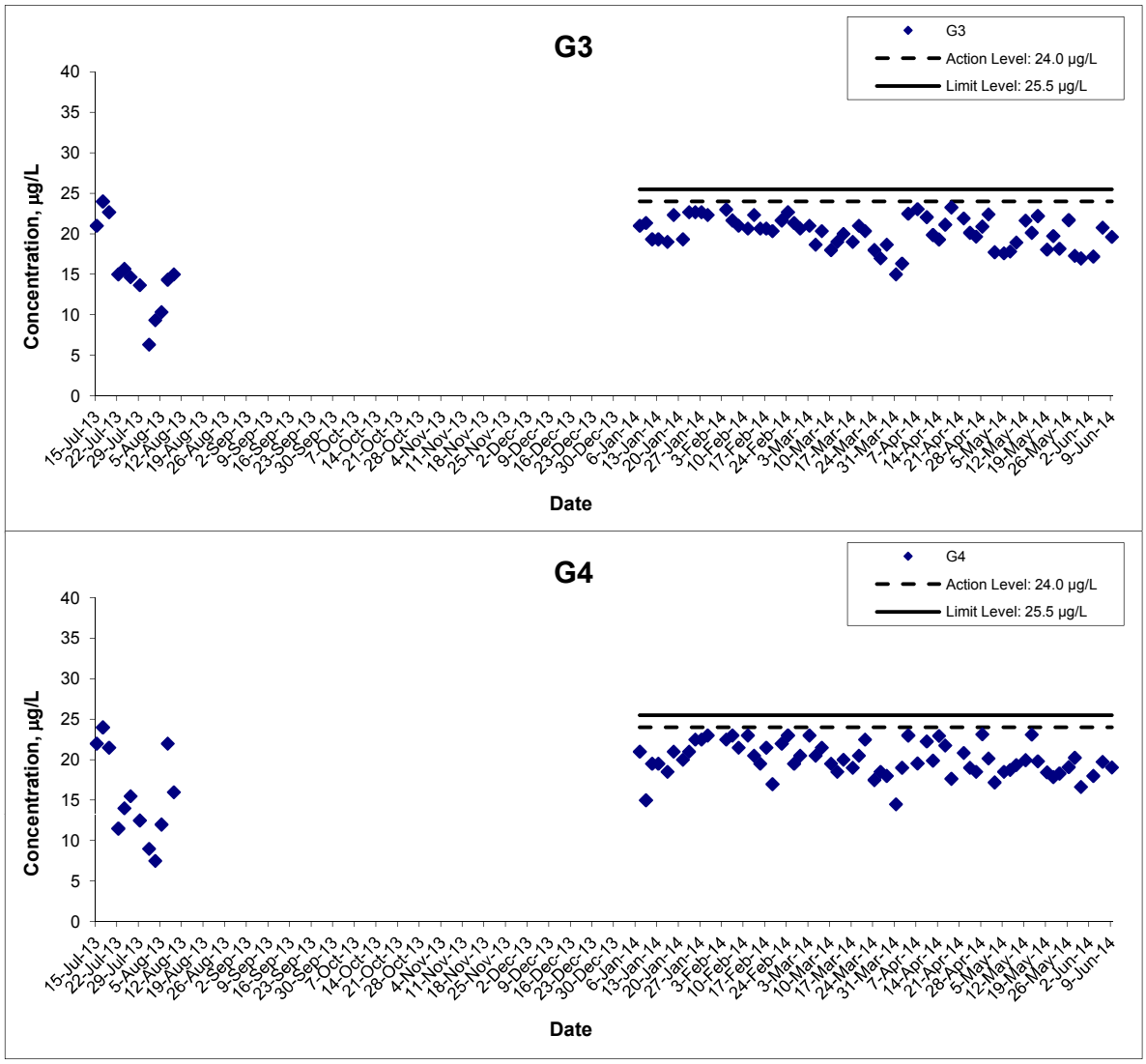
Title: Contract No. CV/2012/01 - Sediment Removal at Yim Tin Tsai (East) Fish Culture Zone Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA13027	CINOTECH
	Date: Jun 14	Appendix: C	

Arsenic (Depth-averaged) at Mid-Ebb Tide



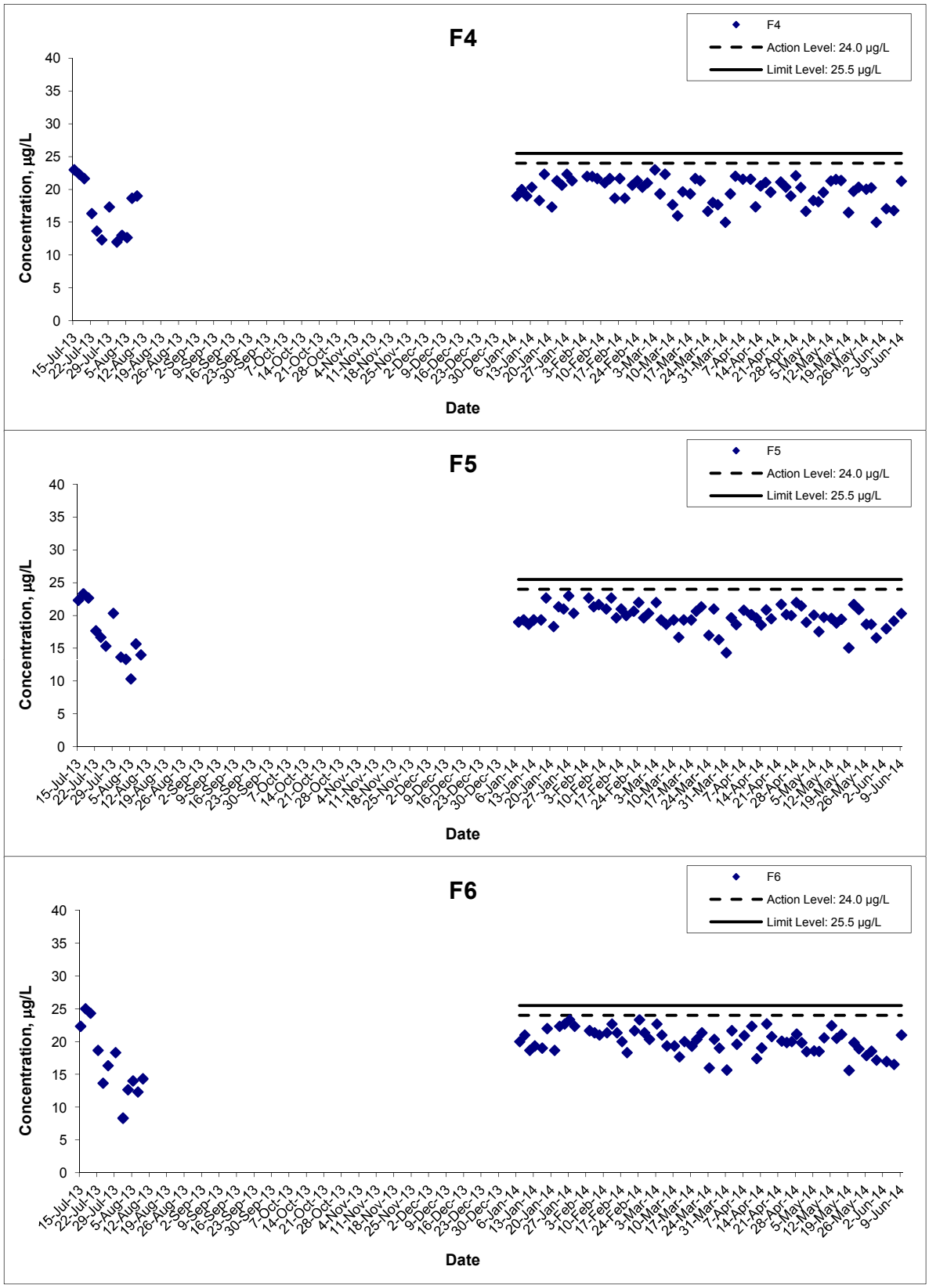
Title: Contract No. CV/2012/01 - Sediment Removal at Yim Tin Tsai (East) Fish Culture Zone Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA13027	CINOTECH
	Date: Jun 14	Appendix: C	

Arsenic (Depth-averaged) at Mid-Ebb Tide



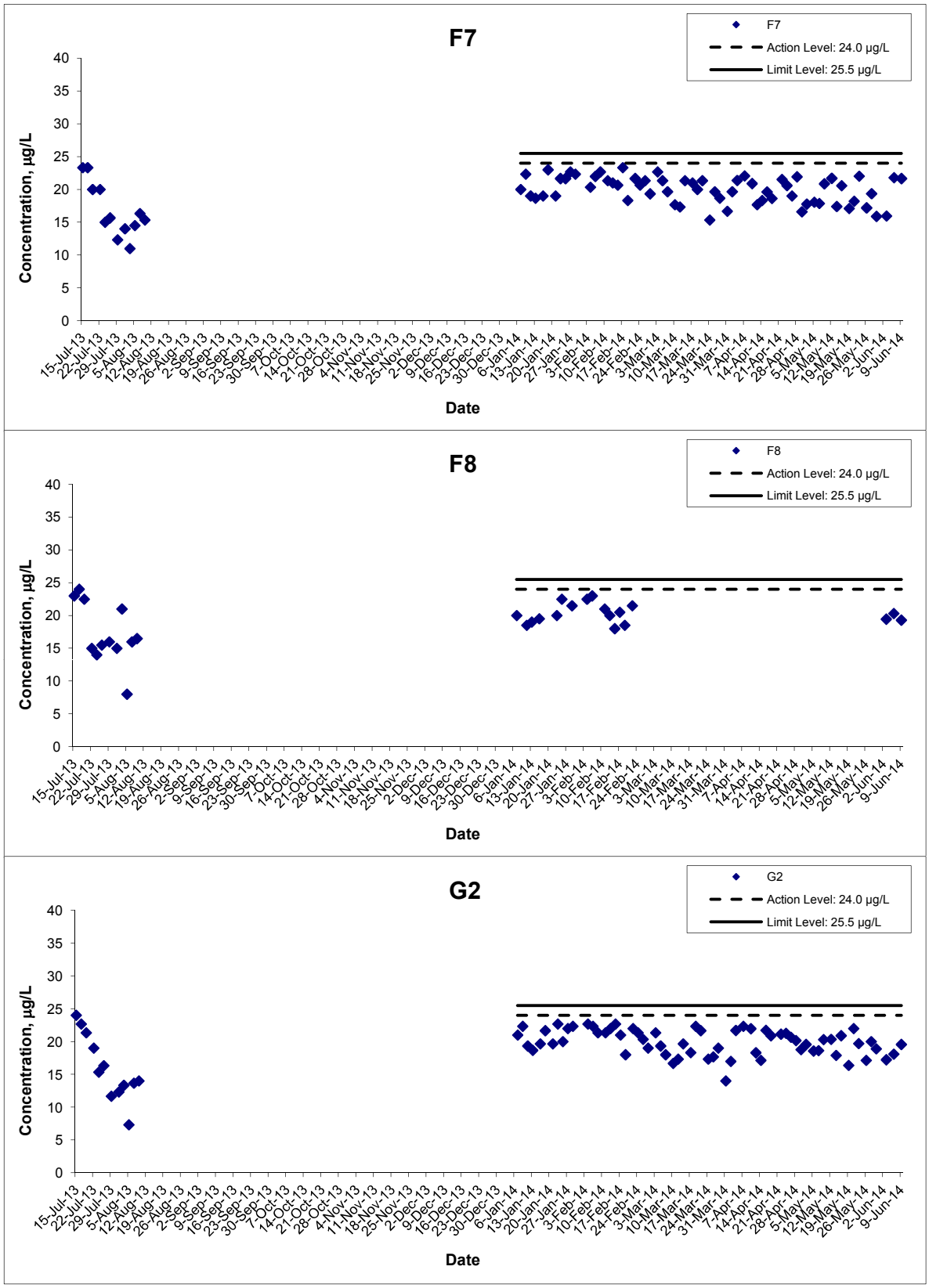
Title	Contract No. CV/2012/01 - Sediment Removal at Yim Tin Tsai (East) Fish Culture Zone Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA13027	CINOTECH
		Date Jun 14	Appendix C	

Arsenic (Depth-averaged) at Mid-Flood Tide



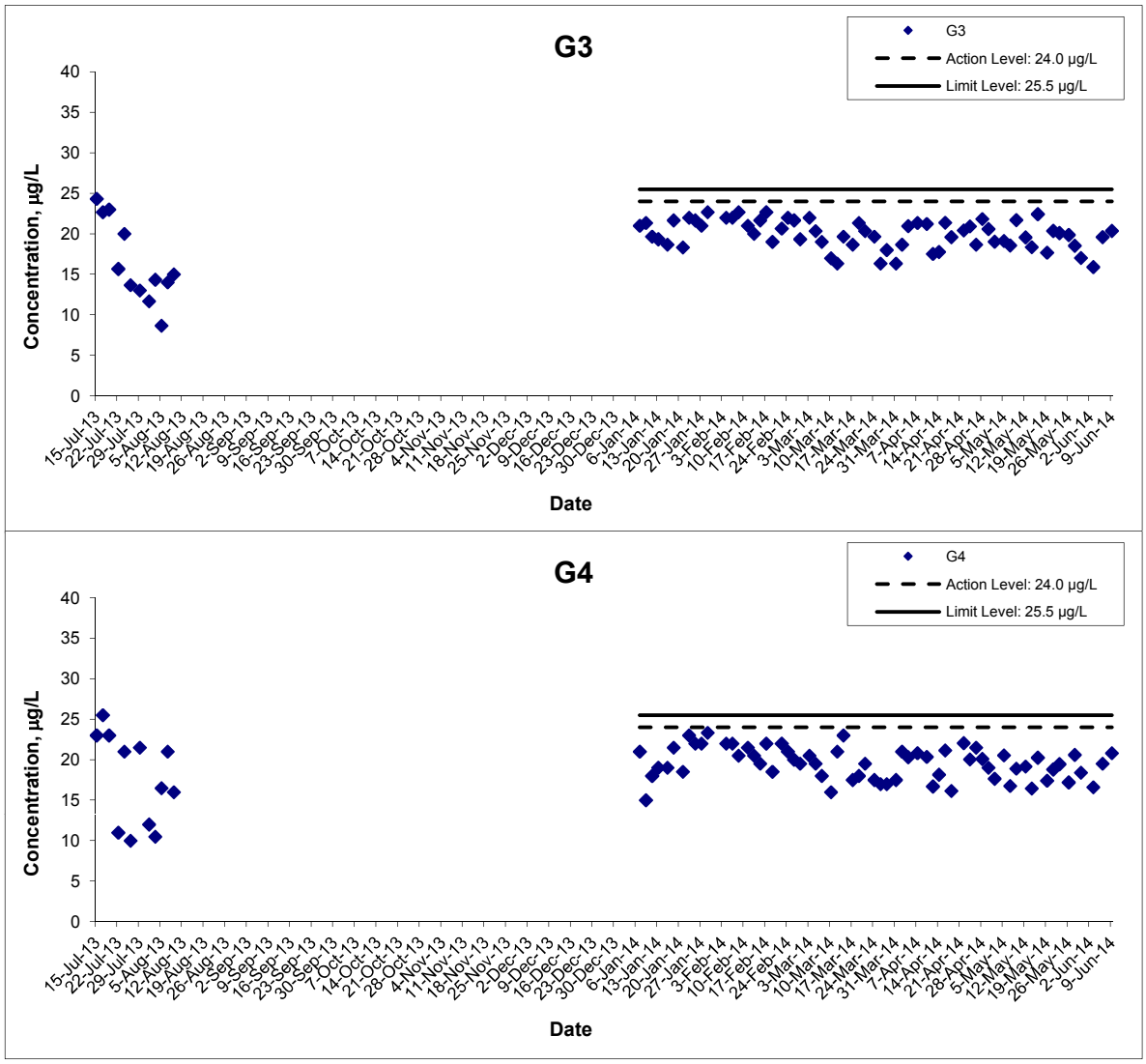
Title: Contract No. CV/2012/01 - Sediment Removal at Yim Tin Tsai (East) Fish Culture Zone Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA13027	CINOTECH
	Date: Jun 14	Appendix: C	

Arsenic (Depth-averaged) at Mid-Flood Tide



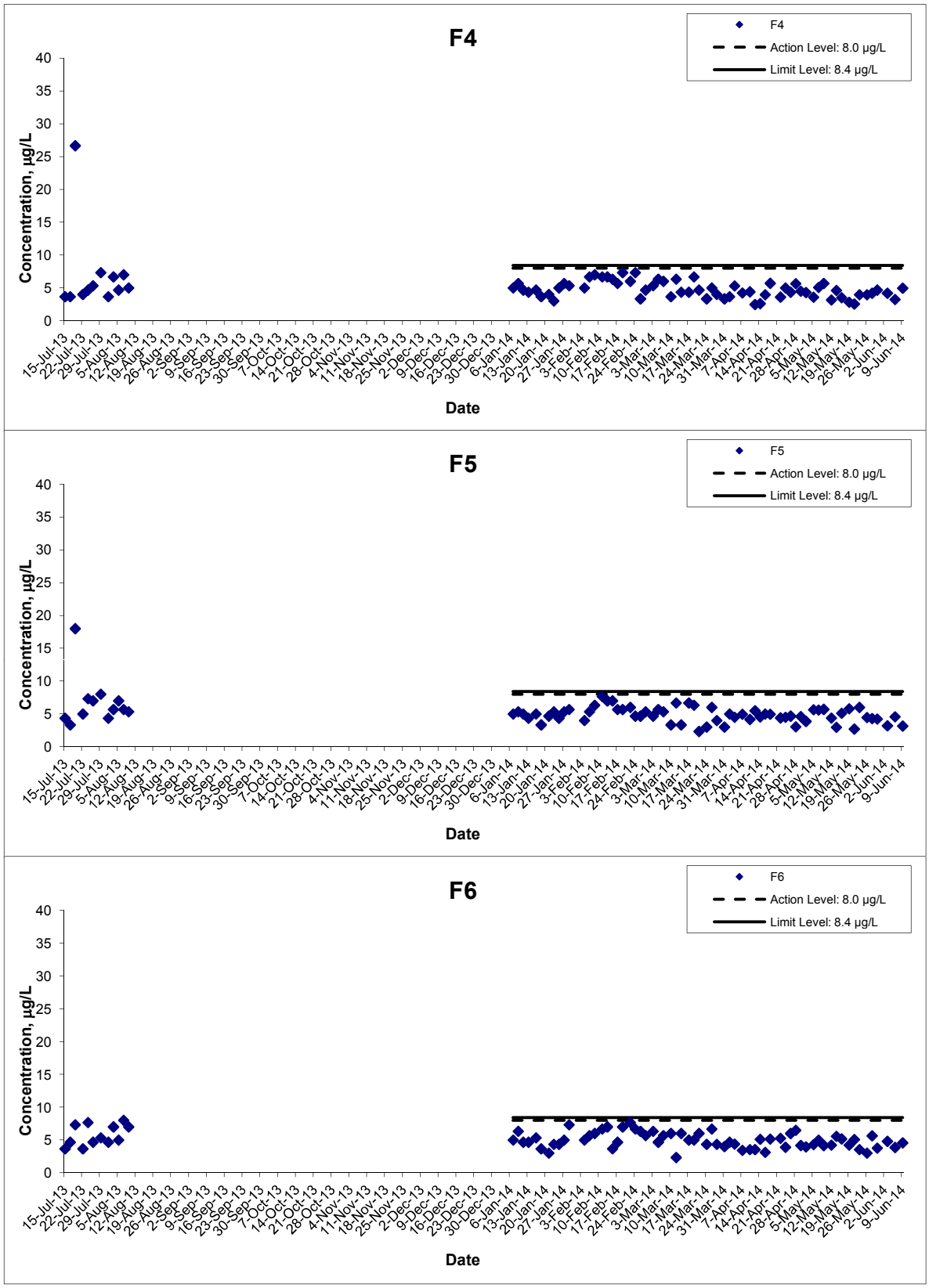
Title: Contract No. CV/2012/01 - Sediment Removal at Yim Tin Tsai (East) Fish Culture Zone Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA13027	CINOTECH
	Date: Jun 14	Appendix: C	

Arsenic (Depth-averaged) at Mid-Flood Tide



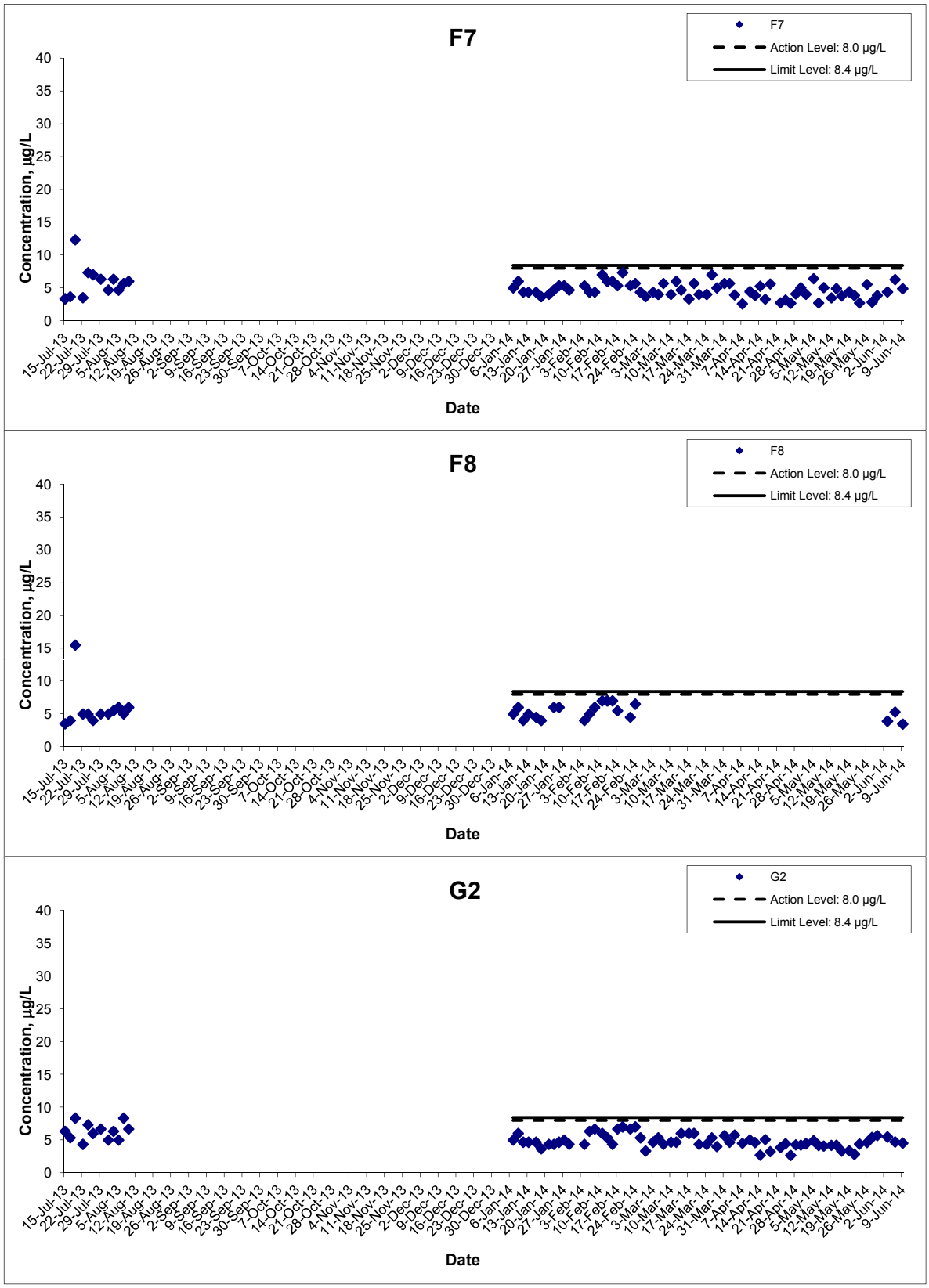
Title	Contract No. CV/2012/01 - Sediment Removal at Yim Tin Tsai (East) Fish Culture Zone Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA13027	CINOTECH
		Date Jun 14	Appendix C	

Copper (Depth-averaged) at Mid-Ebb Tide



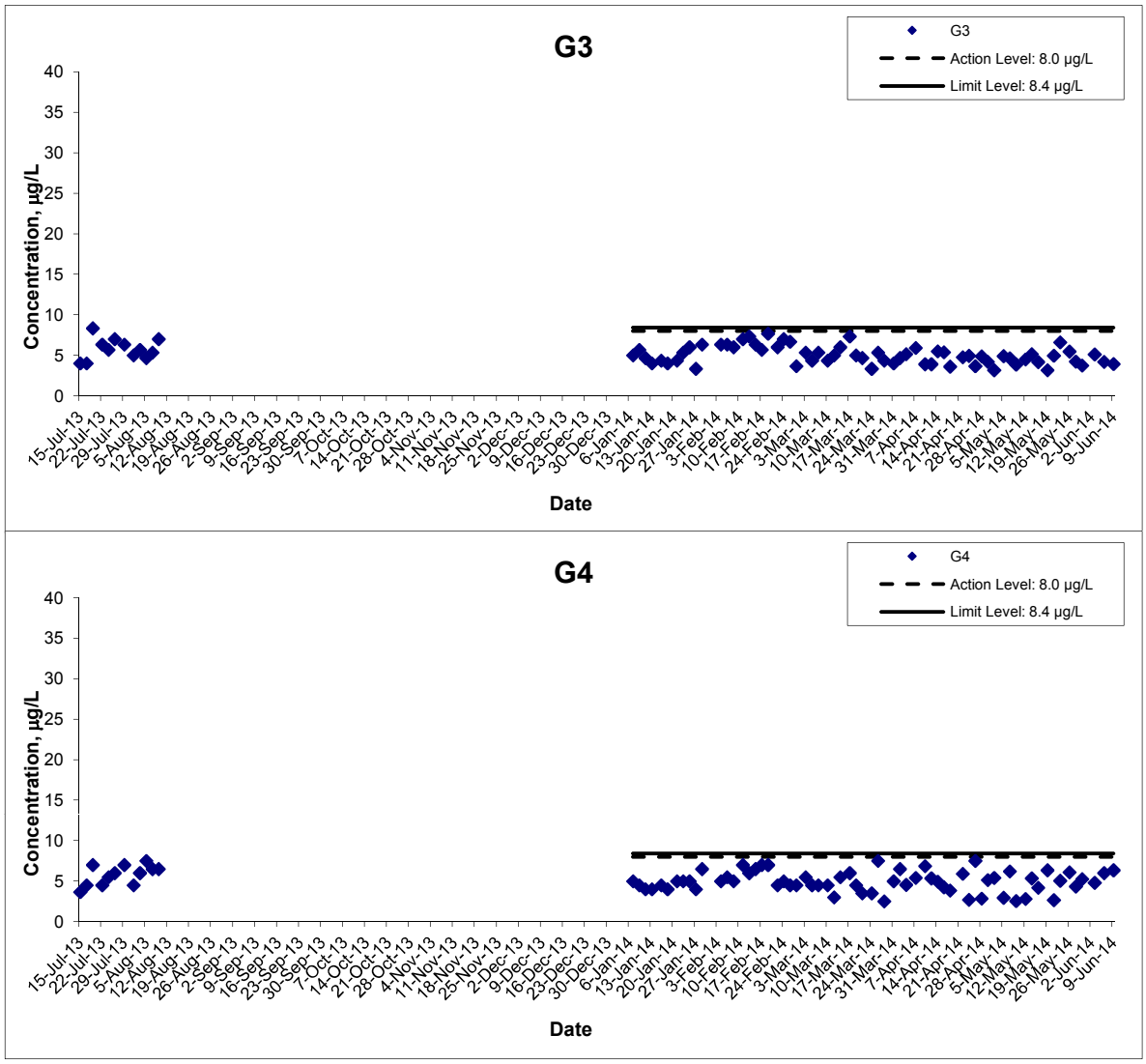
Title	Contract No. CV/2012/01 - Sediment Removal at Yim Tin Tsai (East) Fish Culture Zone Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA13027	CINOTECH
		Date Jun 14	Appendix C	

Copper (Depth-averaged) at Mid-Ebb Tide



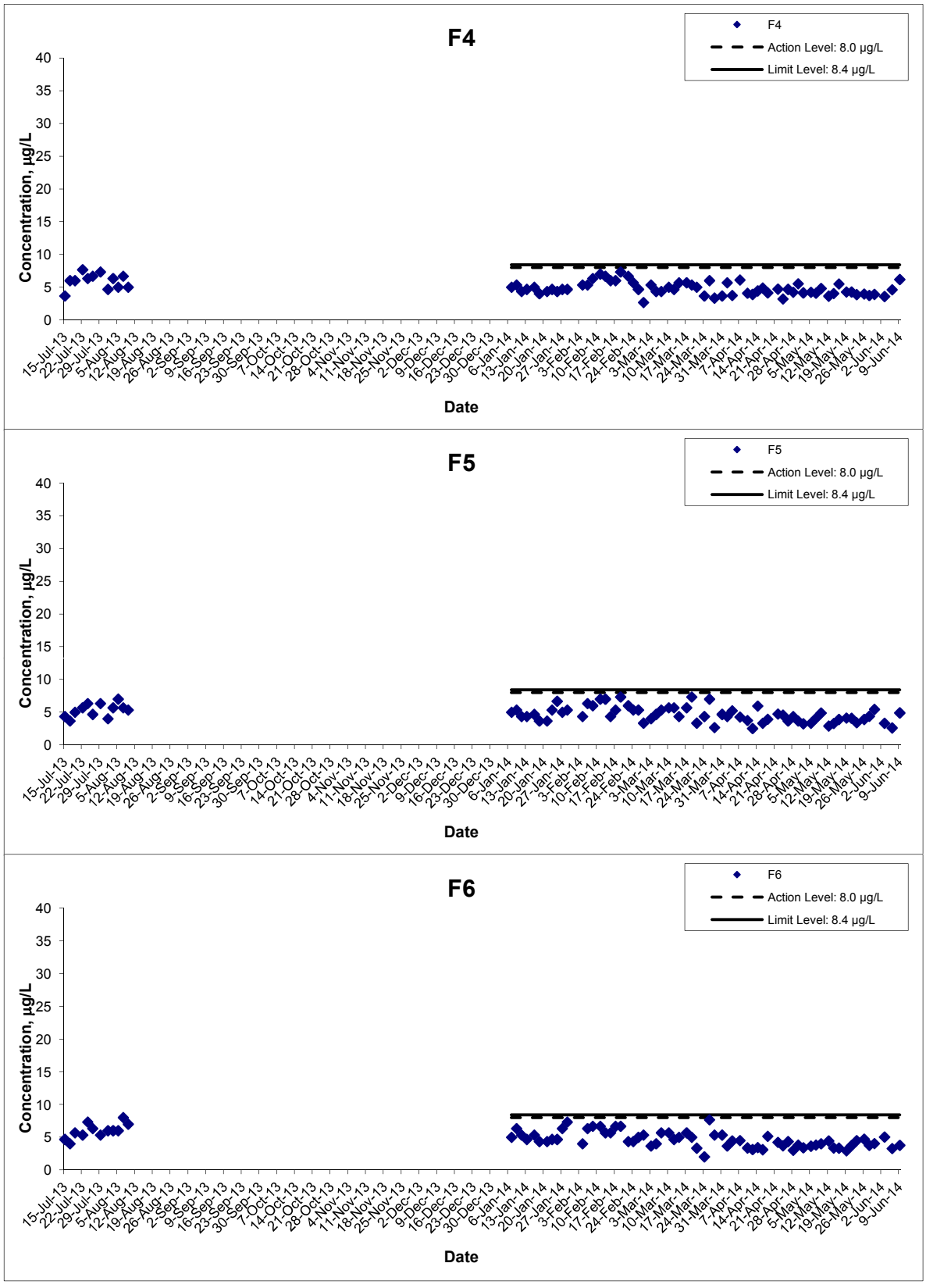
Title	Contract No. CV/2012/01 - Sediment Removal at Yim Tin Tsai (East) Fish Culture Zone Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA13027	CINOTECH
		Date Jun 14	Appendix C	

Copper (Depth-averaged) at Mid-Ebb Tide



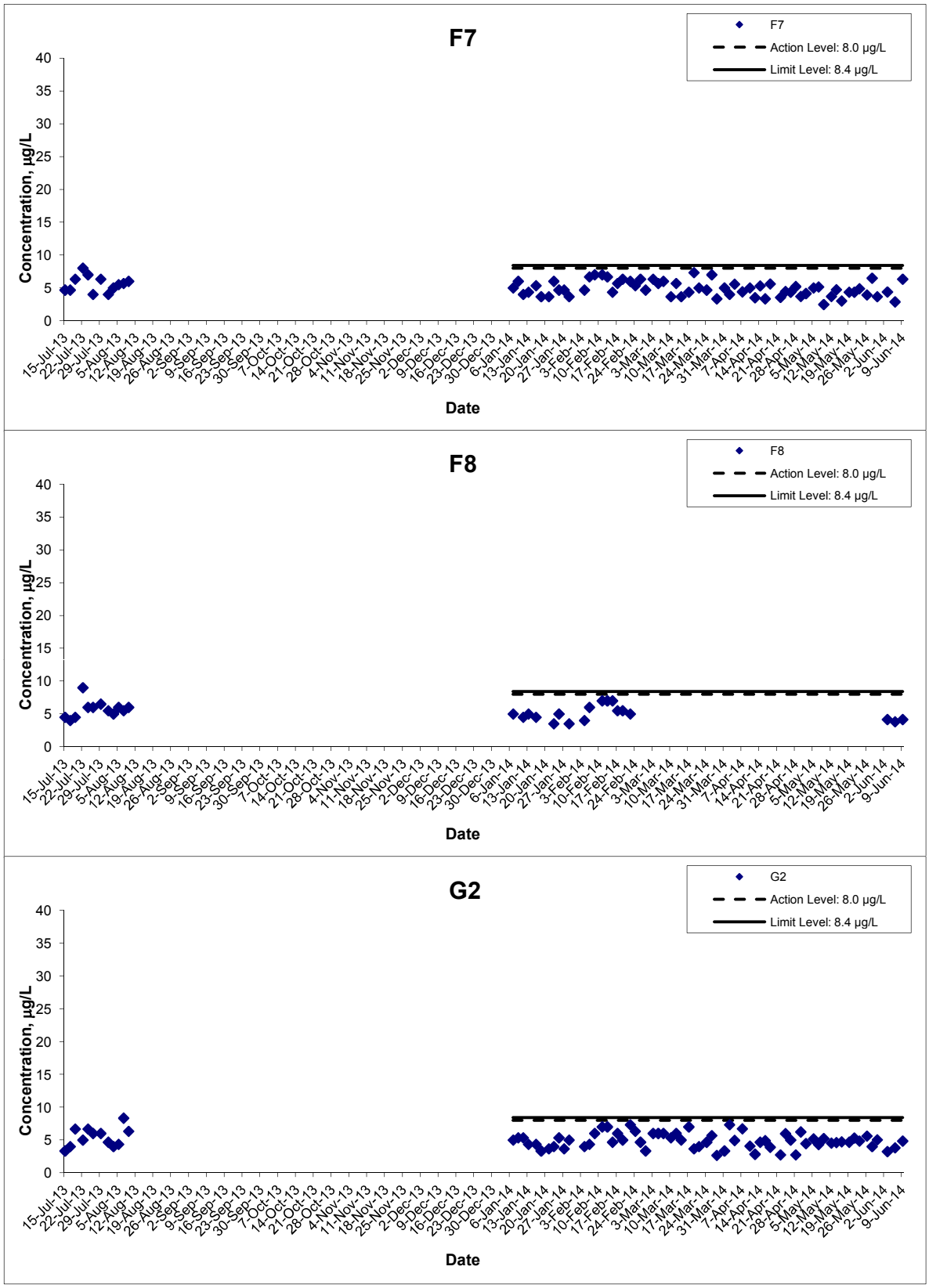
Title	Contract No. CV/2012/01 - Sediment Removal at Yim Tin Tsai (East) Fish Culture Zone Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA13027	CINOTECH
		Date Jun 14	Appendix C	

Copper (Depth-averaged) at Mid-Flood Tide



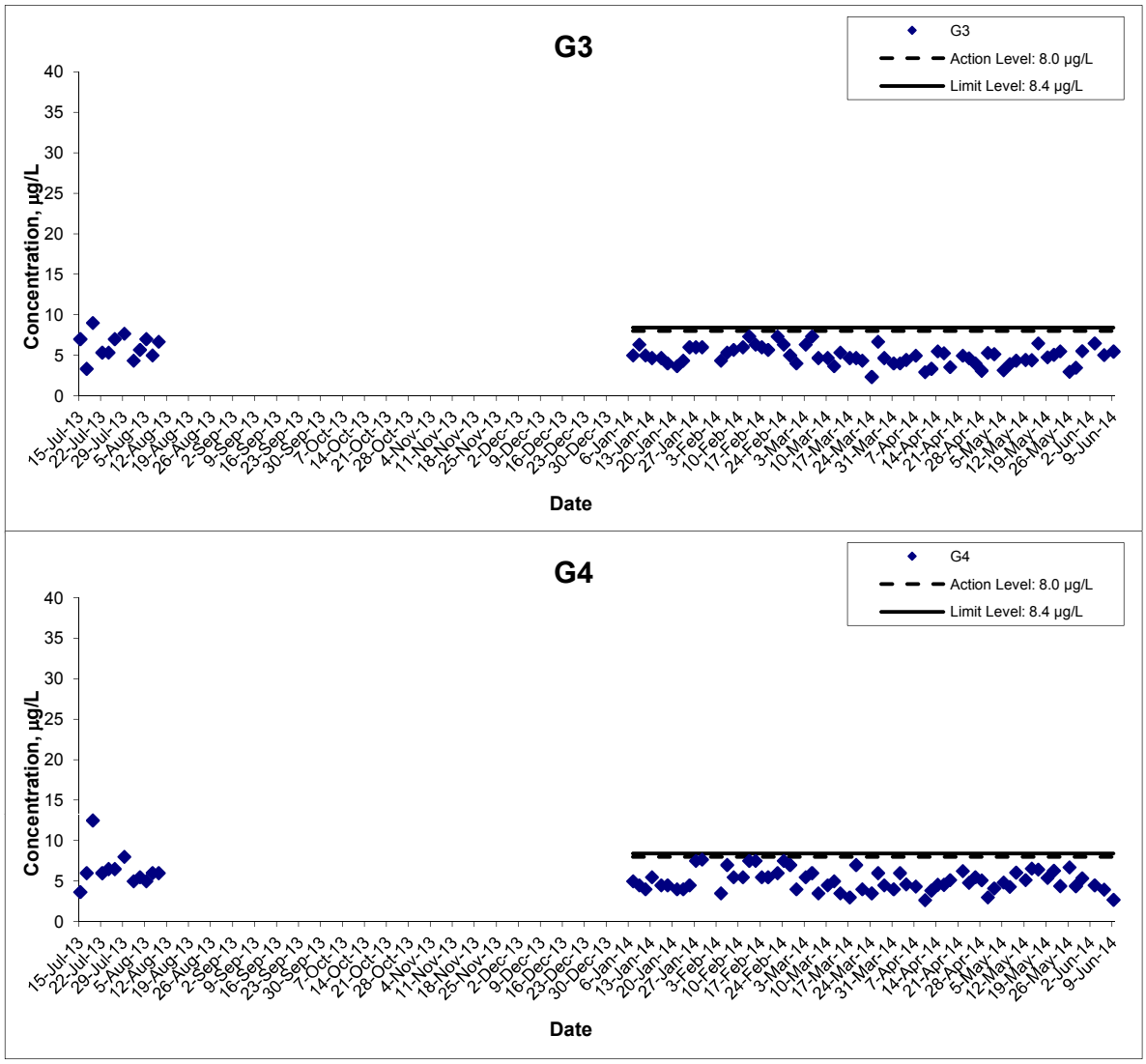
Title	Contract No. CV/2012/01 - Sediment Removal at Yim Tin Tsai (East) Fish Culture Zone Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA13027	CINOTECH
		Date Jun 14	Appendix C	

Copper (Depth-averaged) at Mid-Flood Tide



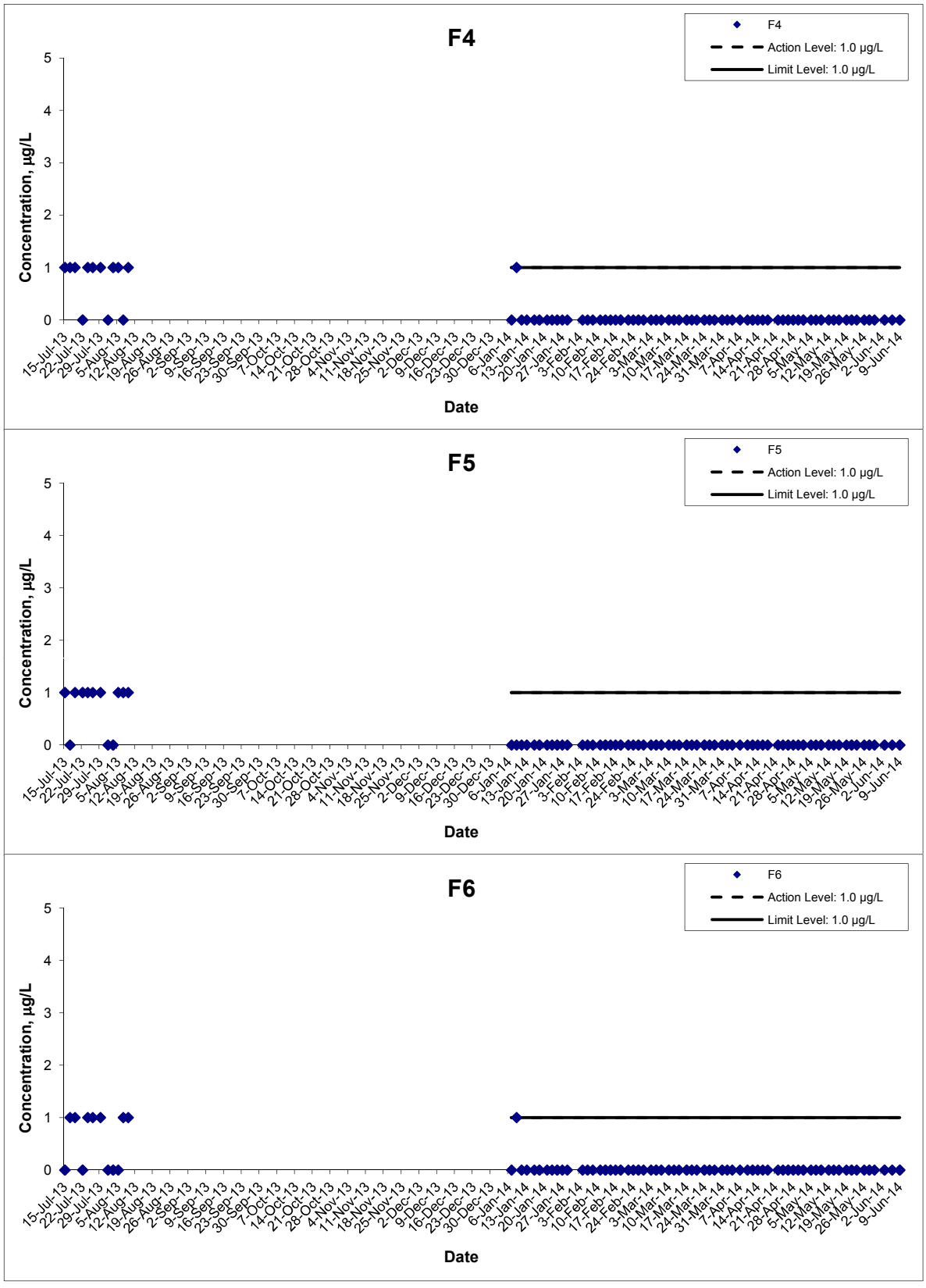
Title	Contract No. CV/2012/01 - Sediment Removal at Yim Tin Tsai (East) Fish Culture Zone Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA13027	CINOTECH
		Date Jun 14	Appendix C	

Copper (Depth-averaged) at Mid-Flood Tide



Title	Contract No. CV/2012/01 - Sediment Removal at Yim Tin Tsai (East) Fish Culture Zone Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA13027	CINOTECH
		Date Jun 14	Appendix C	

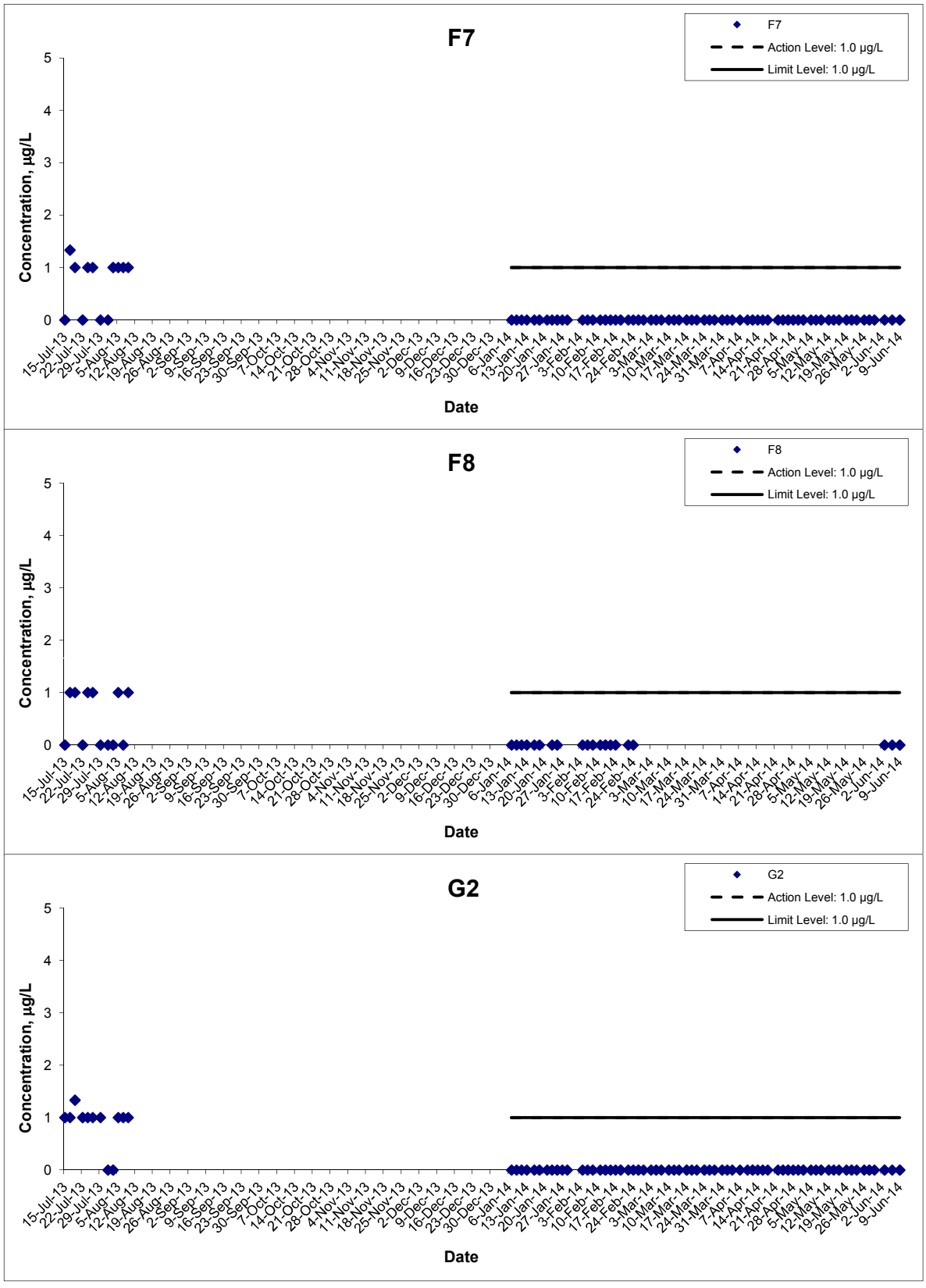
Lead (Depth-averaged) at Mid-Ebb Tide



Remarks: The graphical point at zero concentration is presented as <1µg/L

Title: Contract No. CV/2012/01 - Sediment Removal at Yim Tin Tsai (East) Fish Culture Zone Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA13027	CINOTECH
	Date: Jun 14	Appendix: C	

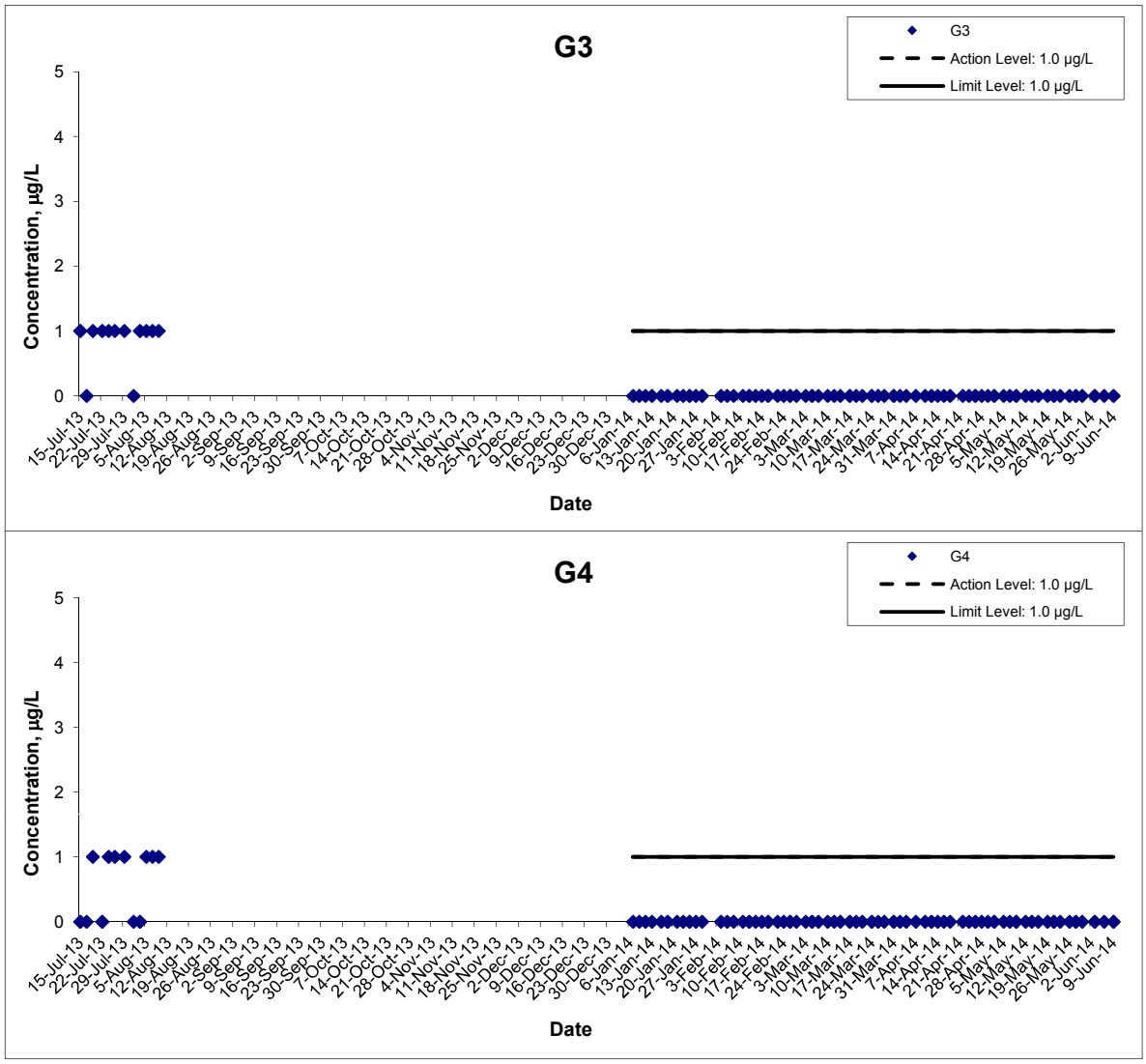
Lead (Depth-averaged) at Mid-Ebb Tide



Remarks: The graphical point at zero concentration is presented as <1µg/L

Title: Contract No. CV/2012/01 - Sediment Removal at Yim Tin Tsai (East) Fish Culture Zone Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA13027	CINOTECH
	Date: Jun 14	Appendix: C	

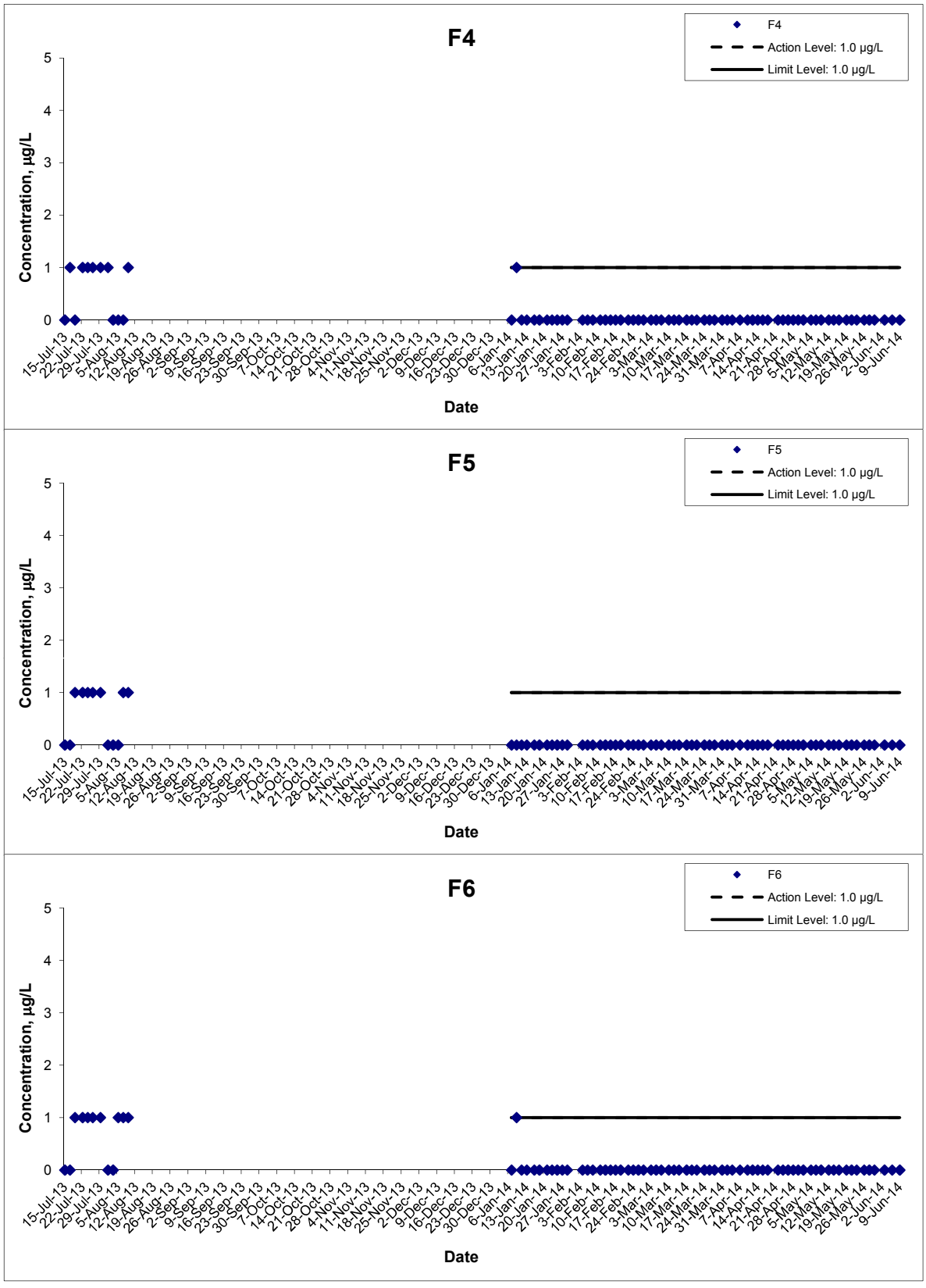
Lead (Depth-averaged) at Mid-Ebb Tide



Remarks: The graphical point at zero concentration is presented as <1µg/L

Title: Contract No. CV/2012/01 - Sediment Removal at Yim Tin Tsai (East) Fish Culture Zone Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA13027	CINOTECH
	Date: Jun 14	Appendix: C	

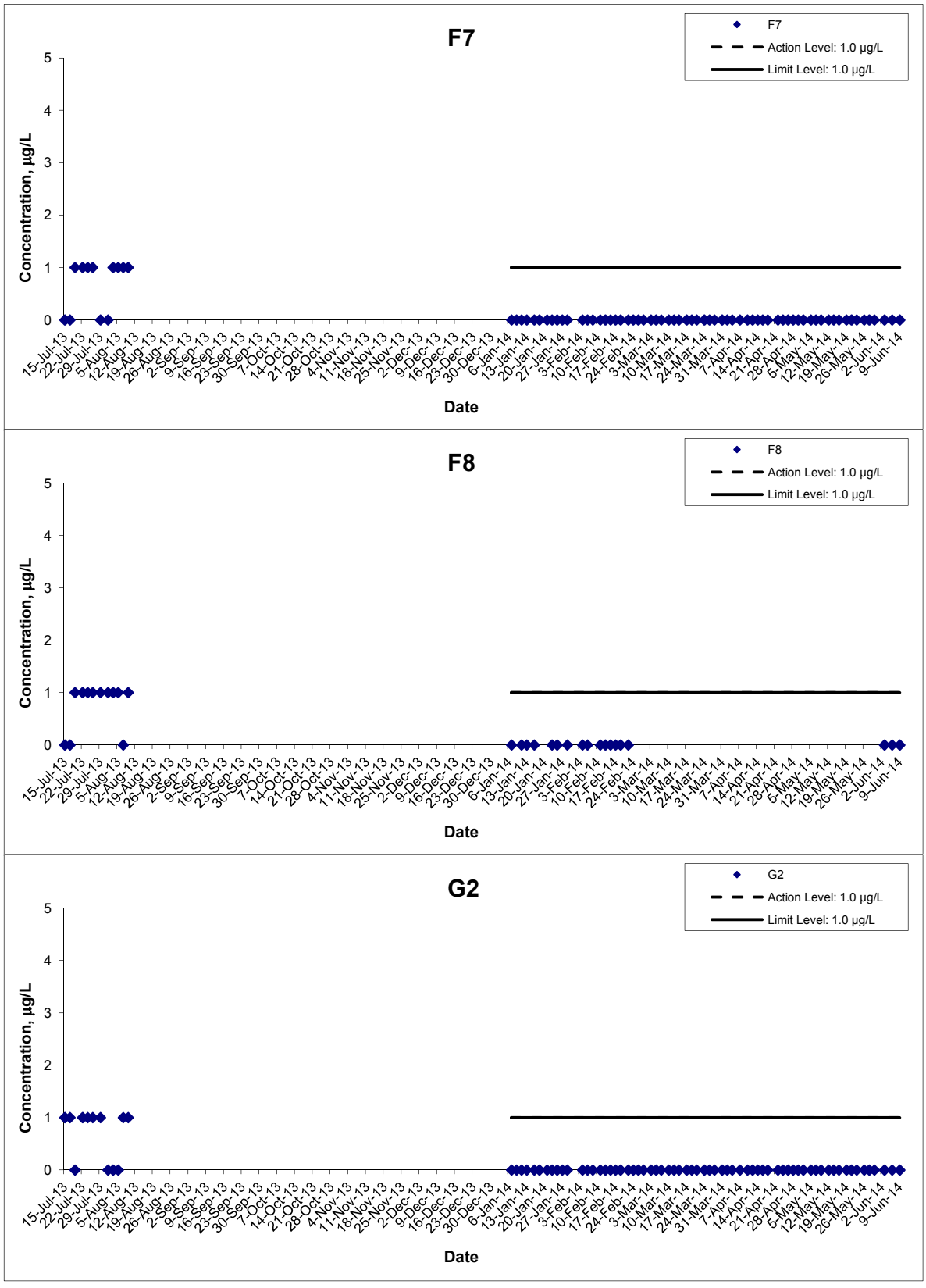
Lead (Depth-averaged) at Mid-Flood Tide



Remarks: The graphical point at zero concentration is presented as <1µg/L

Title: Contract No. CV/2012/01 - Sediment Removal at Yim Tin Tsai (East) Fish Culture Zone Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA13027	CINOTECH
	Date: Jun 14	Appendix: C	

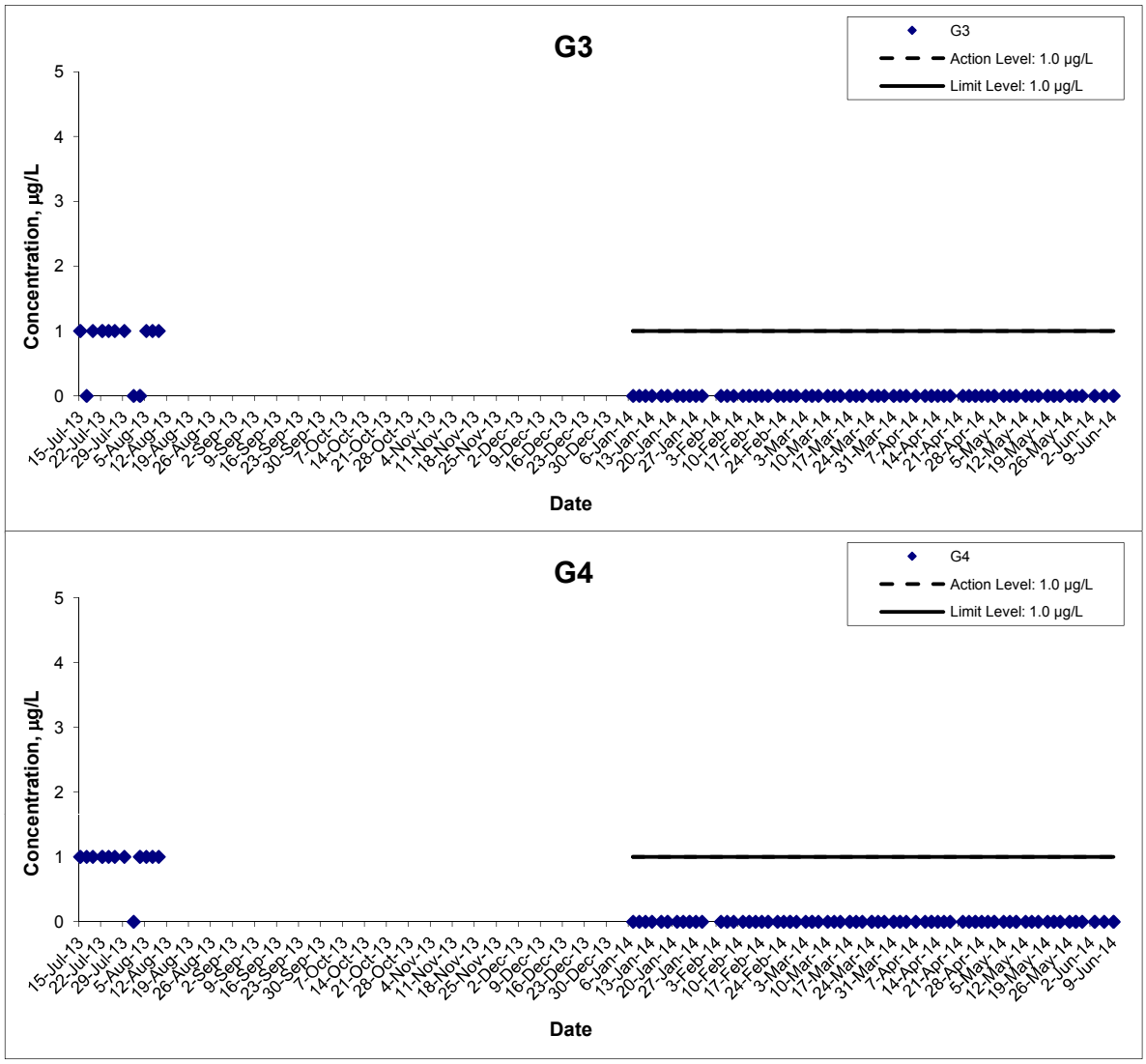
Lead (Depth-averaged) at Mid-Flood Tide



Remarks: The graphical point at zero concentration is presented as <1µg/L

Title: Contract No. CV/2012/01 - Sediment Removal at Yim Tin Tsai (East) Fish Culture Zone Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA13027	CINOTECH
	Date: Jun 14	Appendix: C	

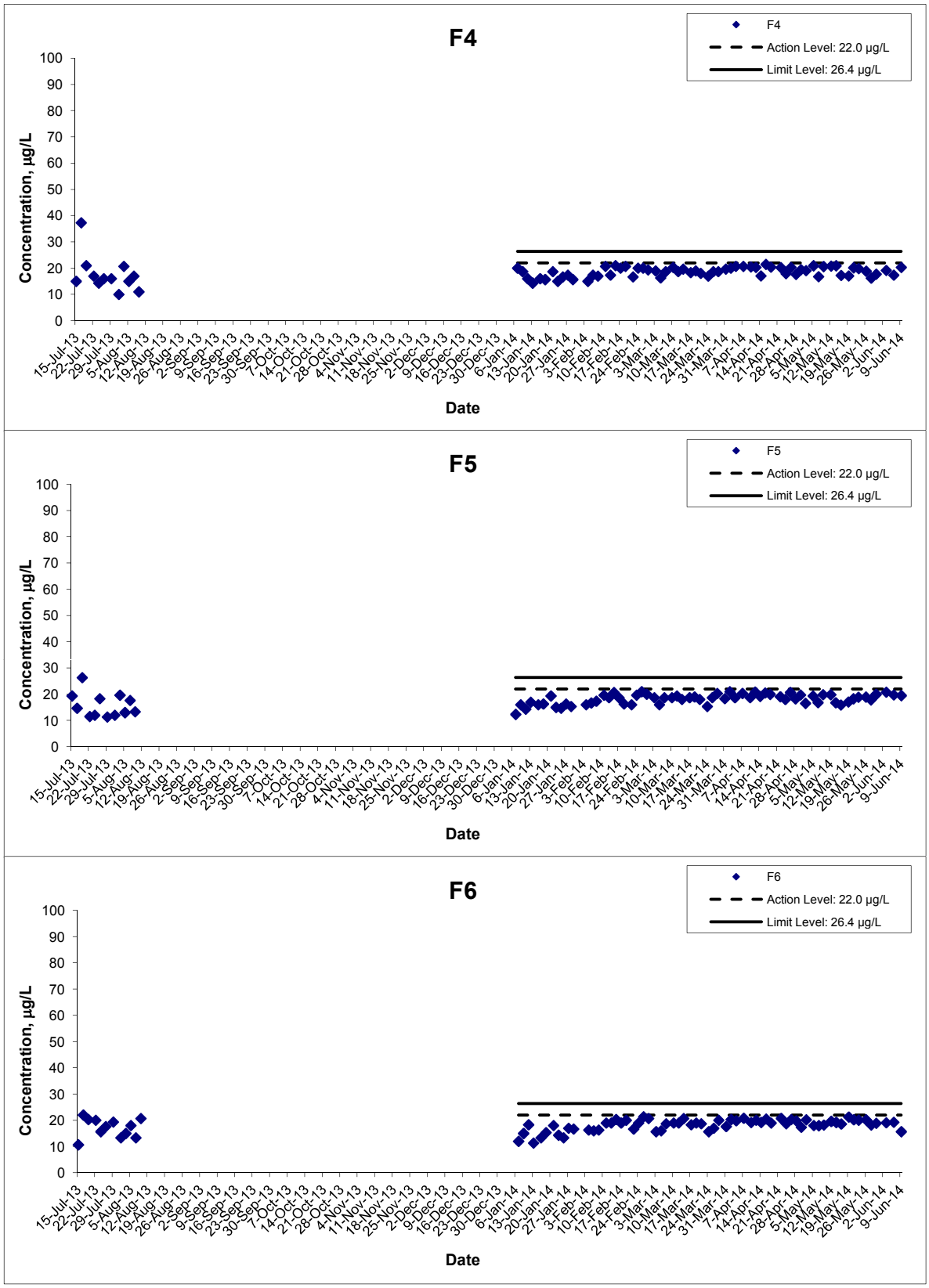
Lead (Depth-averaged) at Mid-Flood Tide



Remarks: The graphical point at zero concentration is presented as <1µg/L

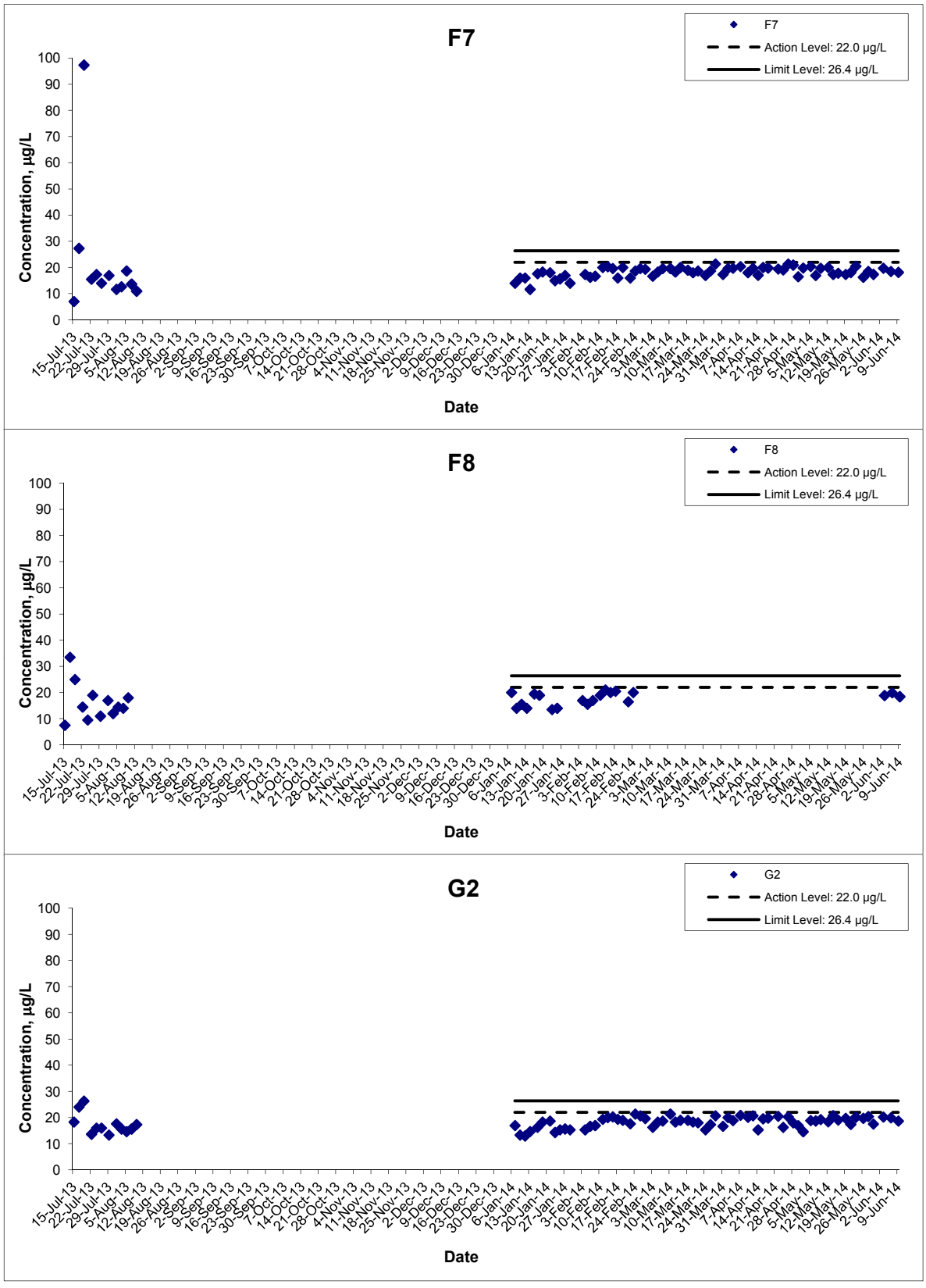
Title	Contract No. CV/2012/01 - Sediment Removal at Yim Tin Tsai (East) Fish Culture Zone Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA13027	CINOTECH
		Date Jun 14	Appendix C	

Zinc (Depth-averaged) at Mid-Ebb Tide



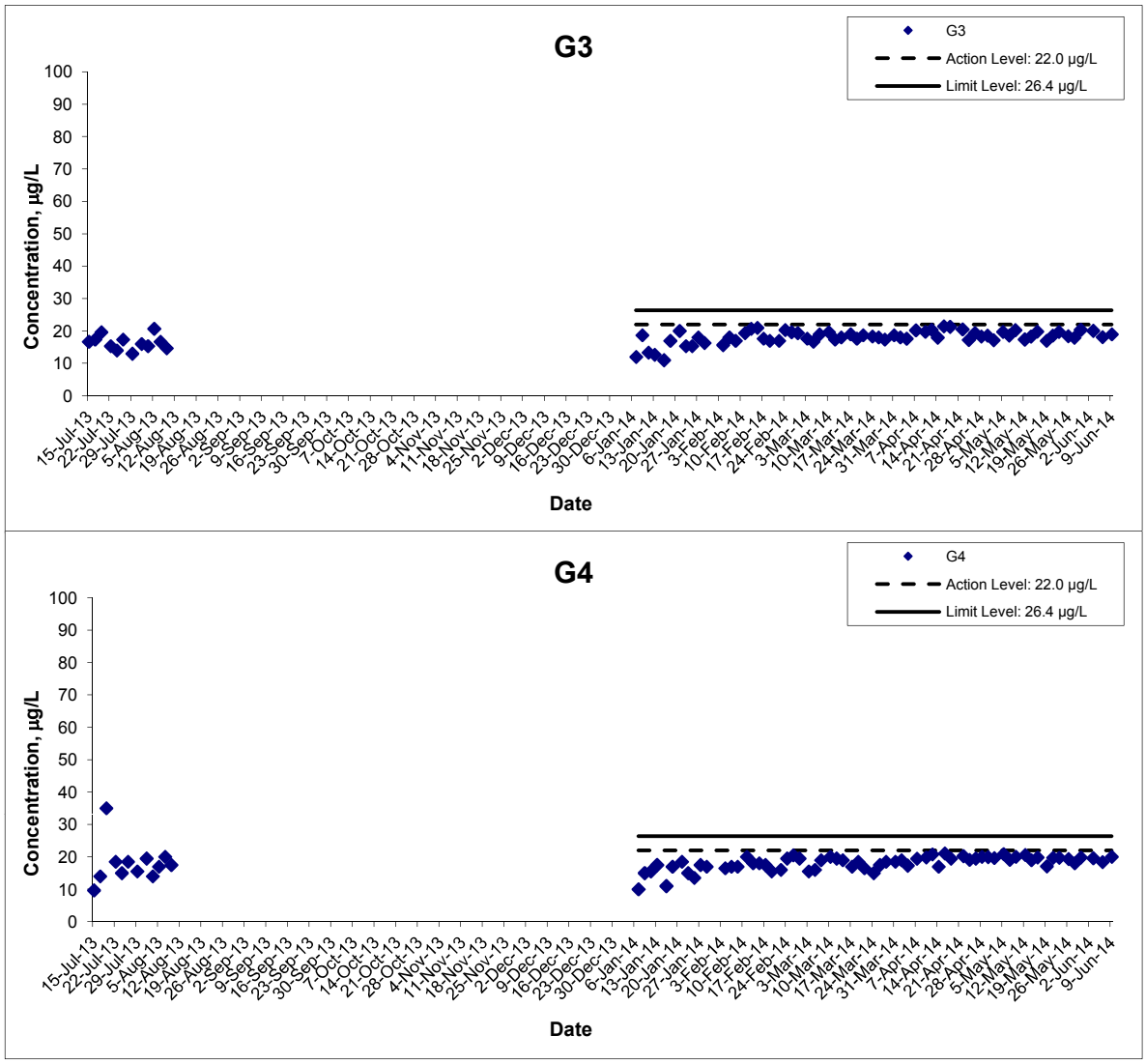
Title	Contract No. CV/2012/01 - Sediment Removal at Yim Tin Tsai (East) Fish Culture Zone Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA13027	CINOTECH
		Date Jun 14	Appendix C	

Zinc (Depth-averaged) at Mid-Ebb Tide



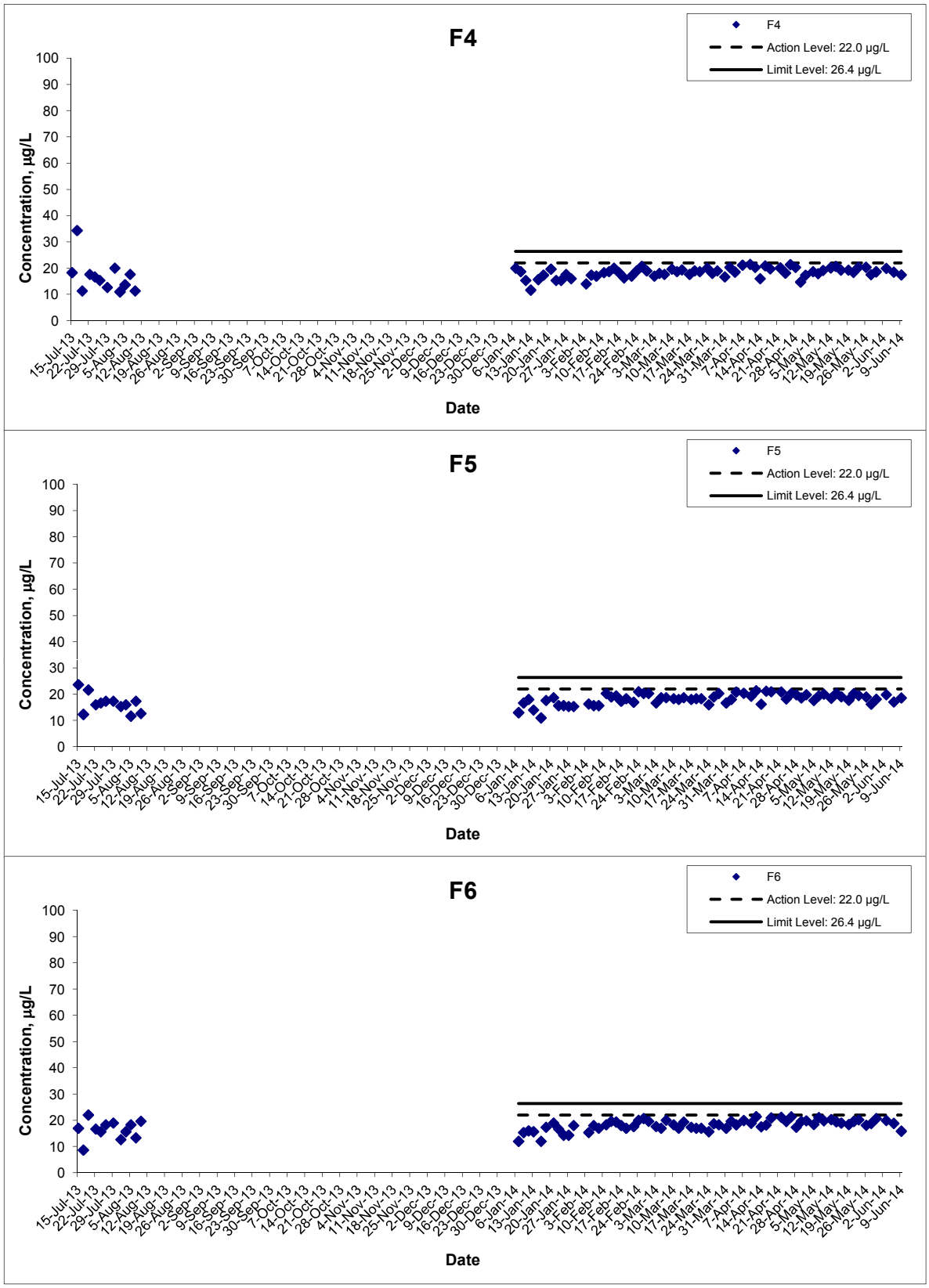
Title: Contract No. CV/2012/01 - Sediment Removal at Yim Tin Tsai (East) Fish Culture Zone Graphical Presentation of Water Quality Monitoring Results	Scale: N.T.S	Project No.: MA13027	CINOTECH
	Date: Jun 14	Appendix: C	

Zinc (Depth-averaged) at Mid-Ebb Tide



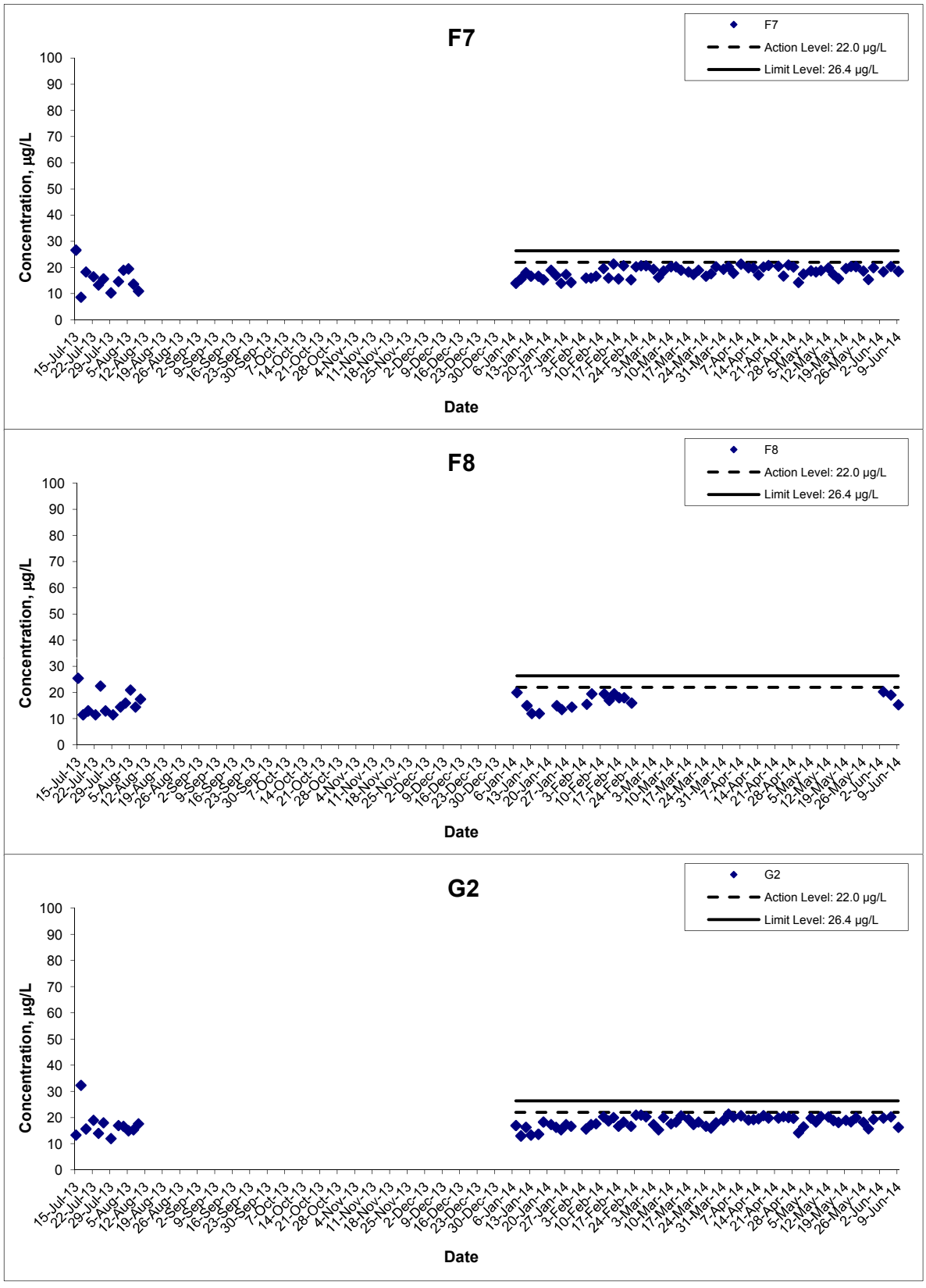
Title	Contract No. CV/2012/01 - Sediment Removal at Yim Tin Tsai (East) Fish Culture Zone Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA13027	CINOTECH
		Date Jun 14	Appendix C	

Zinc (Depth-averaged) at Mid-Flood Tide



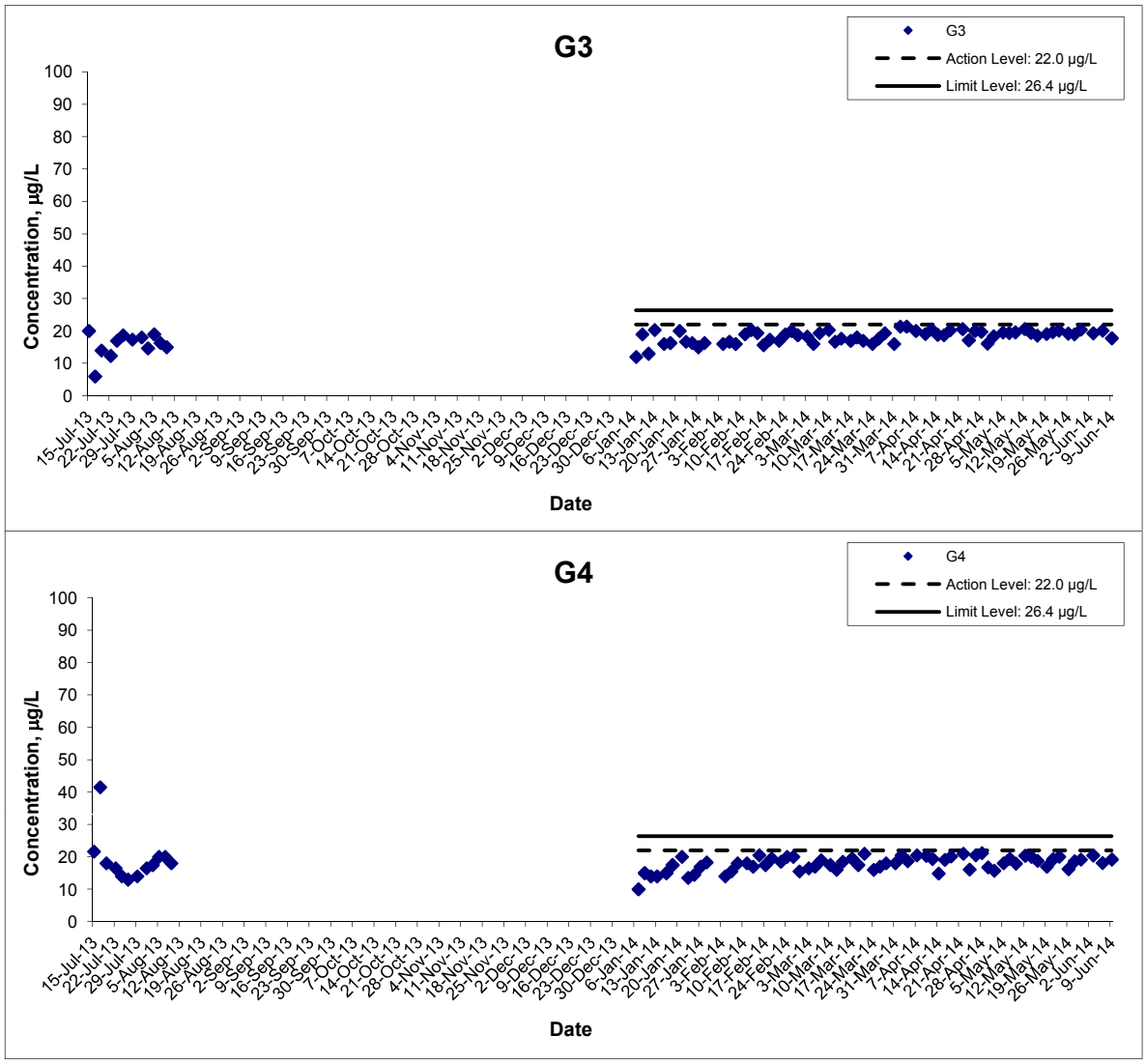
Title	Contract No. CV/2012/01 - Sediment Removal at Yim Tin Tsai (East) Fish Culture Zone Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA13027	CINOTECH
		Date Jun 14	Appendix C	

Zinc (Depth-averaged) at Mid-Flood Tide



Title	Contract No. CV/2012/01 - Sediment Removal at Yim Tin Tsai (East) Fish Culture Zone Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA13027	CINOTECH
		Date Jun 14	Appendix C	

Zinc (Depth-averaged) at Mid-Flood Tide



Title	Contract No. CV/2012/01 - Sediment Removal at Yim Tin Tsai (East) Fish Culture Zone Graphical Presentation of Water Quality Monitoring Results	Scale N.T.S	Project No. MA13027	CINOTECH
		Date Jun 14	Appendix C	

APPENDIX D
CORAL MONITORING RESULTS

Appendix D Coral Monitoring Results

Table 1 Site C (Reference Site) - Percentage of Sedimentation of the Tagged Coral Colonies

Code	Coral Species	Size (length x width, cm)	Sedimentation, % (thickness, mm)														
			Baseline (10Aug)	1st (19Oct)	2nd (27Oct)	3rd (17Nov)	4th (30Nov)	5th (14Dec)	6th (28Dec)	7th (04Jan)	8th (11Jan)	9th (08Feb)	10th (23Feb)	11th (16Mar)	12th (26Apr)	13th (17May)	Post-Project (08Jun)
C1	*Oulastrea crispata*	5 x 2	5 (2)	5 (2)	5 (2)	5 (2)	10 (2) ▲	5 (2)	5 (2)	10 (2) ▲	10 (2) ▲	5 (2)	5(2)	10 (4) ▲	5 (2)	5(2)	5 (2)
C2	*Oulastrea crispata*	5 x 4	0	5 (2) ▲	5 (2) ▲	0	10 (2) ▲	10 (2) ▲	10 (2) ▲	10 (2) ▲	10 (4) ▲	10 (2) ▲	10 (4) ▲	10 (4) ▲	10 (2) ▲	10 (2) ▲	10 (2) ▲
C3	*Oulastrea crispata*	3 x 3	0	5 (2) ▲	0	0	5 (2) ▲	5 (2) ▲	0	0	0	5 (2) ▲	0	5 (2) ▲	0	0	0
C4	*Oulastrea crispata*	3 x 3	0	5 (2) ▲	0	5 (2) ▲	0	0	5 (2) ▲	5 (2) ▲	5 (2) ▲	10 (2) ▲	10 (2) ▲	10 (2) ▲	10 (2) ▲	10 (2) ▲	10 (2) ▲
C5	*Oulastrea crispata*	3 x 4	5 (2)	5 (2)	5 (2)	5 (2)	5 (2)	5 (2)	5 (2)	10 (2) ▲	10 (2) ▲	10 (2) ▲	15(2) ▲	15(2) ▲	5 (2)	10(2) ▲	5 (2)
C6	*Oulastrea crispata*	6 x 2	0	5 (2) ▲	5 (2) ▲	0	0	5 (2) ▲	5 (2) ▲	5 (2) ▲	5 (2) ▲	5 (2) ▲	5 (2) ▲	5 (2) ▲	10 (2) ▲	5 (2) ▲	10 (2) ▲
C7	*Oulastrea crispata*	5 x 4	0	5 (2) ▲	0	0	0	5 (2) ▲	5 (2) ▲	5 (2) ▲	5 (2) ▲	0	5 (2) ▲	5 (2) ▲	5 (2) ▲	5 (2) ▲	5 (2) ▲
C8	*Oulastrea crispata*	4 x 3	0	5 (2) ▲	0	5 (2) ▲	5 (2) ▲	5 (2) ▲	5 (2) ▲	5 (2) ▲	5 (2) ▲	5 (2) ▲	10 (2) ▲	5 (2) ▲	5 (2) ▲	5 (2) ▲	5 (2) ▲
C9	*Oulastrea crispata*	6 x 4	0	5 (2) ▲	5 (2) ▲	5 (2) ▲	5 (2) ▲	5 (2) ▲	5 (2) ▲	5 (2) ▲	5 (2) ▲	5 (2) ▲	5 (2) ▲	5 (2) ▲	10 (2) ▲	5 (2) ▲	5 (2) ▲
C10	*Oulastrea crispata*	15 x 7	5 (2)	10 (2) ▲	5 (2)	5 (2)	10 (2) ▲	10 (2) ▲	10 (2) ▲	10 (2) ▲	10 (2) ▲	10 (2) ▲	10 (4) ▲	10 (4) ▲	10 (2) ▲	10 (2) ▲	5 (2)

Note: "▲" and "▼" indicate increased and decreased in percentage, respectively, when compared with the baseline data.

Table 2 Site C (Reference Site) - Percentage of Bleaching of the Tagged Coral Colonies

Code	Coral Species	Size (length x width, cm)	Bleaching, %														
			Baseline (10Aug)	1st (19Oct)	2nd (27Oct)	3rd (17Nov)	4th (30Nov)	5th (14Dec)	6th (28Dec)	7th (04Jan)	8th (11Jan)	9th (08Feb)	10th (23Feb)	11th (16Mar)	12th (26Apr)	13th (17May)	Post-Project (08Jun)
C1	*Oulastrea crispata*	5 x 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C2	*Oulastrea crispata*	5 x 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C3	*Oulastrea crispata*	3 x 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C4	*Oulastrea crispata*	3 x 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C5	*Oulastrea crispata*	3 x 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C6	*Oulastrea crispata*	6 x 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C7	*Oulastrea crispata*	5 x 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C8	*Oulastrea crispata*	4 x 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C9	*Oulastrea crispata*	6 x 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C10	*Oulastrea crispata*	15 x 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 3 Site C (Reference Site) - Percentage of Mortality of the Tagged Coral Colonies

Code	Coral Species	Size (length x width, cm)	Mortality, %														
			Baseline (10Aug)	1st (19Oct)	2nd (27Oct)	3rd (17Nov)	4th (30Nov)	5th (14Dec)	6th (28Dec)	7th (04Jan)	8th (11Jan)	9th (08Feb)	10th (23Feb)	11th (16Mar)	12th (26Apr)	13th (17May)	Post-Project (08Jun)
C1	*Oulastrea crispata*	5 x 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C2	*Oulastrea crispata*	5 x 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C3	*Oulastrea crispata*	3 x 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C4	*Oulastrea crispata*	3 x 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C5	*Oulastrea crispata*	3 x 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C6	*Oulastrea crispata*	6 x 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C7	*Oulastrea crispata*	5 x 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C8	*Oulastrea crispata*	4 x 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C9	*Oulastrea crispata*	6 x 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C10	*Oulastrea crispata*	15 x 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 4 Site T2 - Percentage of Sedimentation of the Tagged Coral Colonies

Code	Coral Species	Size (length x width, cm)	Sedimentation, % (thickness, mm)														
			Baseline (10Aug)	1st (19Oct)	2nd (27Oct)	3rd (17Nov)	4th (30Nov)	5th (14Dec)	6th (28Dec)	7th (04Jan)	8th (11Jan)	9th (08Feb)	10th (23Feb)	11th (16Mar)	12th (26Apr)	13th (17May)	Post-Project (08Jun)
A1	*Oulastrea crispata*	15 x 8	0	0	0	5 (2) ▲	0	0	0	0	5 (2) ▲	0	0	0	0	0	0
A2	*Oulastrea crispata*	8 x 4	5 (2)	5 (2)	5 (2)	5 (2)	5 (2)	5 (2)	5 (2)	5 (2)	10 (2) ▲	5 (2)	5 (2)	5 (2)	5 (2)	5 (2)	5 (2)
A3	*Oulastrea crispata*	4 x 4	0	0	0	0	0	0	0	0	5 (2) ▲	0	5 (2) ▲	5 (2) ▲	0	5 (2) ▲	5 (2) ▲
A4	*Oulastrea crispata*	15 x 4	0	0	0	0	0	0	0	5 (2) ▲	0	0	0	5 (2) ▲	0	0	0
A5	*Oulastrea crispata*	5 x 3	0	0	0	0	5 (2) ▲	0	0	0	5 (2) ▲	5 (2) ▲	5 (2) ▲	5 (2) ▲	0	0	0
A6	*Oulastrea crispata*	8 x 4	0	0	5 (2) ▲	0	0	5 (2) ▲	0	0	0	0	0	5 (2) ▲	0	0	0
A7	*Oulastrea crispata*	8 x 4	5 (2)	5 (2)	5 (2)	5 (2)	5 (2)	5 (2)	5 (2)	10 (2) ▲	5 (2)	5 (2)	10(2) ▲	5 (2)	5 (2)	5(2)	5(2)
A8	*Oulastrea crispata*	5 x 4	0	5 (2) ▲	0	0	0	5 (2) ▲	5 (2) ▲	5 (2) ▲	0	0	5 (2) ▲	5 (2) ▲	5 (2) ▲	5 (2) ▲	5 (2) ▲
A9	*Oulastrea crispata*	3 x 3	0	0	0	0	0	0	0	0	0	5 (2) ▲	0	0	0	0	0
A10	*Oulastrea crispata*	7 x 4	0	0	0	0	0	0	0	0	0	5 (2) ▲	0	0	5 (2) ▲	0	0

Note: "▲" and "▼" indicate increased and decreased in percentage, respectively, when compared with the baseline data.

Table 5 Site T2 - Percentage of Bleaching of the Tagged Coral Colonies

Code	Coral Species	Size (length x width, cm)	Bleaching, %														
			Baseline (10Aug)	1st (19Oct)	2nd (27Oct)	3rd (17Nov)	4th (30Nov)	5th (14Dec)	6th (28Dec)	7th (04Jan)	8th (11Jan)	9th (08Feb)	10th (23Feb)	11th (16Mar)	12th (26Apr)	13th (17May)	Post-Project (08Jun)
A1	*Oulastrea crispata*	15 x 8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
A2	*Oulastrea crispata*	8 x 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
A3	*Oulastrea crispata*	4 x 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
A4	*Oulastrea crispata*	15 x 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
A5	*Oulastrea crispata*	5 x 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
A6	*Oulastrea crispata*	8 x 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
A7	*Oulastrea crispata*	8 x 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
A8	*Oulastrea crispata*	5 x 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
A9	*Oulastrea crispata*	3 x 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
A10	*Oulastrea crispata*	7 x 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 6 Site T2 - Percentage of Mortality of the Tagged Coral Colonies

Code	Coral Species	Size (length x width, cm)	Mortality, %														
			Baseline (10Aug)	1st (19Oct)	2nd (27Oct)	3rd (17Nov)	4th (30Nov)	5th (14Dec)	6th (28Dec)	7th (04Jan)	8th (11Jan)	9th (08Feb)	10th (23Feb)	11th (16Mar)	12th (26Apr)	13th (17May)	Post-Project (08Jun)
A1	*Oulastrea crispata*	15 x 8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
A2	*Oulastrea crispata*	8 x 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
A3	*Oulastrea crispata*	4 x 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
A4	*Oulastrea crispata*	15 x 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
A5	*Oulastrea crispata*	5 x 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
A6	*Oulastrea crispata*	8 x 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
A7	*Oulastrea crispata*	8 x 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
A8	*Oulastrea crispata*	5 x 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
A9	*Oulastrea crispata*	3 x 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
A10	*Oulastrea crispata*	7 x 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 7 Site T3 - Percentage of Sedimentation of the Tagged Coral Colonies

Code	Coral Species	Size (length x width, cm)	Sedimentation, % (thickness, mm)														
			Baseline (10Aug)	1st (19Oct)	2nd (27Oct)	3rd (17Nov)	4th (30Nov)	5th (14Dec)	6th (28Dec)	7th (04Jan)	8th (11Jan)	9th (08Feb)	10th (23Feb)	11th (16Mar)	12th (26Apr)	13th (17May)	Post-Project (08Jun)
B1	*Oulastrea crispata*	5 x 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B2	*Oulastrea crispata*	10 x 8	0	0	0	0	0	0	0	0	0	0	0	0	0	5 (2) ▲	0
B3	*Oulastrea crispata*	5 x 3	0	5 (2) ▲	5 (2) ▲	0	5 (2) ▲	0	0	0	5 (2) ▲	0	5 (2) ▲	0	0	5 (2) ▲	0
B4	*Oulastrea crispata*	5 x 3	0	0	0	5 (2) ▲	5 (2) ▲	5 (2) ▲	5 (2) ▲	5 (2) ▲	5 (2) ▲	0	5 (2) ▲	5 (2) ▲	0	5 (2) ▲	0
B5	*Oulastrea crispata*	3 x 3	0	5 (2) ▲	0	0	0	0	0	5 (2) ▲	5 (2) ▲	5 (2) ▲	5 (2) ▲	5 (2) ▲	0	0	0
B6	*Oulastrea crispata*	4 x 4	0	5 (2) ▲	0	0	0	0	0	0	0	0	0	5 (2) ▲	0	0	0
B7	*Oulastrea crispata*	5 x 4	0	0	0	0	0	0	5 (2) ▲	0	0	0	5 (2) ▲	0	0	0	0
B8	*Oulastrea crispata*	8 x 3	5 (2)	10 (2) ▲	5 (2)	5 (2)	5 (2)	5 (2)	5 (2)	5 (2)	5 (2)	10(2) ▲	5 (2)	10(2) ▲	5 (2)	5 (2)	5 (2)
B9	*Oulastrea crispata*	4 x 4	0	5 (2) ▲	0	0	0	0	0	5 (2) ▲	5 (2) ▲	0	0	5 (2) ▲	5 (2) ▲	0	5 (2) ▲
B10	*Oulastrea crispata*	5 x 4	0	0	0	0	0	0	0	0	5 (2) ▲	5 (2) ▲	5 (2) ▲	5 (2) ▲	0	0	0

Note: "▲" and "▼" indicate increased and decreased in percentage, respectively, when compared with the baseline data.

Table 8 Site T3 - Percentage of Bleaching of the Tagged Coral Colonies

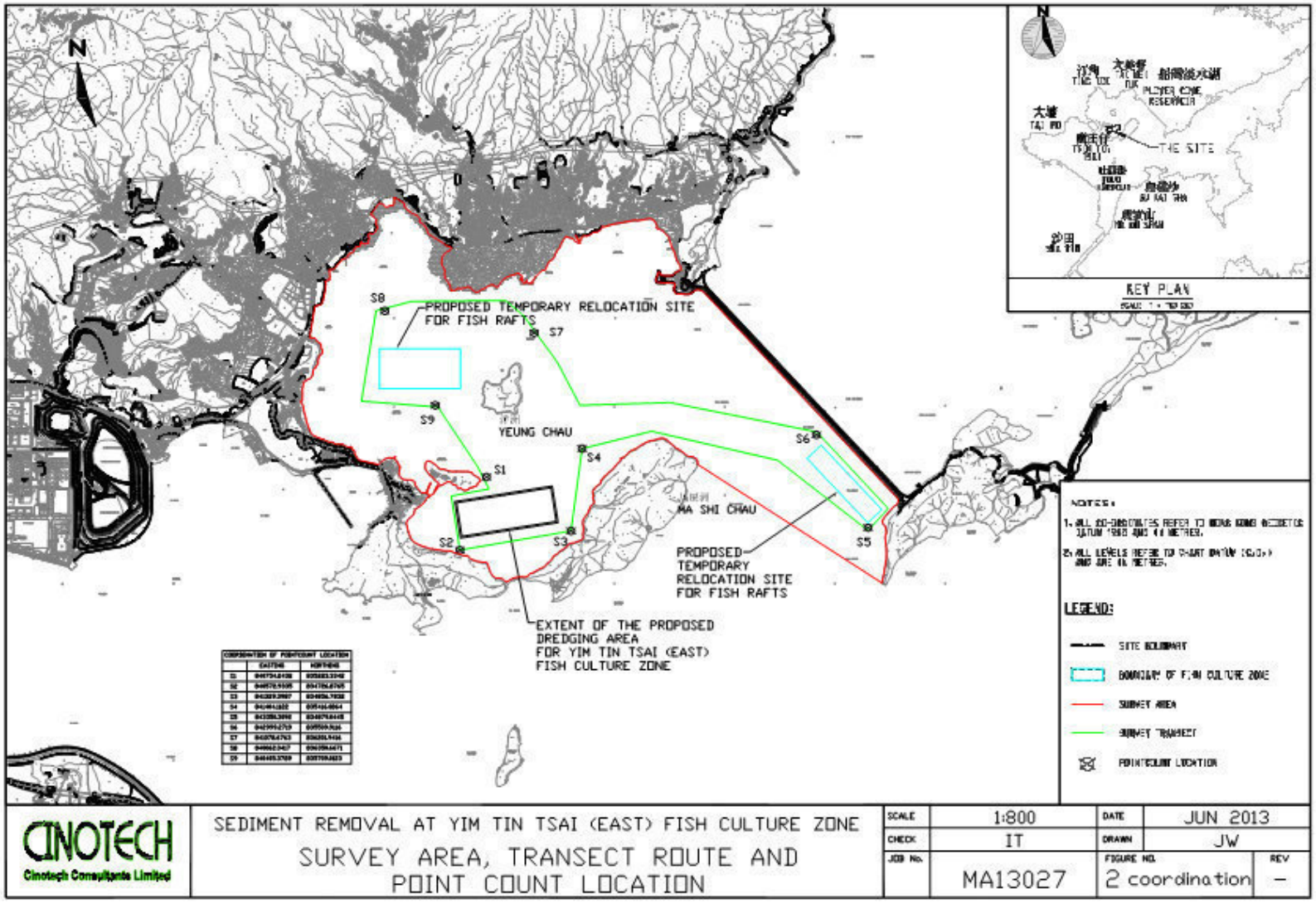
Code	Coral Species	Size (length x width, cm)	Bleaching, %														
			Baseline (10Aug)	1st (19Oct)	2nd (27Oct)	3rd (17Nov)	4th (30Nov)	5th (14Dec)	6th (28Dec)	7th (04Jan)	8th (11Jan)	9th (08Feb)	10th (23Feb)	11th (16Mar)	12th (26Apr)	13th (17May)	Post-Project (08Jun)
B1	*Oulastrea crispata*	5 x 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B2	*Oulastrea crispata*	10 x 8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B3	*Oulastrea crispata*	5 x 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B4	*Oulastrea crispata*	5 x 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B5	*Oulastrea crispata*	3 x 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B6	*Oulastrea crispata*	4 x 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B7	*Oulastrea crispata*	5 x 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B8	*Oulastrea crispata*	8 x 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B9	*Oulastrea crispata*	4 x 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B10	*Oulastrea crispata*	5 x 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 9 Site T3 - Percentage of Mortality of the Tagged Coral Colonies

Code	Coral Species	Size (length x width, cm)	Mortality, %														
			Baseline (10Aug)	1st (19Oct)	2nd (27Oct)	3rd (17Nov)	4th (30Nov)	5th (14Dec)	6th (28Dec)	7th (04Jan)	8th (11Jan)	9th (08Feb)	10th (23Feb)	11th (16Mar)	12th (26Apr)	13th (17May)	Post-Project (08Jun)
B1	*Oulastrea crispata*	5 x 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B2	*Oulastrea crispata*	10 x 8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B3	*Oulastrea crispata*	5 x 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B4	*Oulastrea crispata*	5 x 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B5	*Oulastrea crispata*	3 x 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B6	*Oulastrea crispata*	4 x 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B7	*Oulastrea crispata*	5 x 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B8	*Oulastrea crispata*	8 x 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B9	*Oulastrea crispata*	4 x 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B10	*Oulastrea crispata*	5 x 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

APPENDIX E
ARDEIDS AND WHITE-BELLIES SEA EAGLE MONITORING RESULTS

Appendix E - Ardeids and White-bellied Sea Eagle Monitoring Results



Summaries of total of Ardeids,, White-bellied Sea Eagles and Nests recorded each month

Species		Nov 2013	Dec 2013	Jan 2014	Feb 2014	Mar 2014	April 2014	May 2014	Jun 2014	Jul 2014
Point count	Ardeids	**54**	**45**	**46**	**39**	**34**	**36**	**64**	**28**	**37**
	● Great Egret	**36**	**17**	**17**	**13**	**14**	**11**	**12**	**18**	**18**
	● Little Egret	**14**	**18**	**15**	**21**	**10**	**22**	**50**	**8**	**18**
	● Grey Heron	**4**	**5**	**4**	**1**	**6**	**1**	**2**	**1**	**0**
	● Chinese Pond Heron	**0**	**4**	**10**	**2**	**4**	**1**	**0**	**0**	**0**
	● Little Green Heron	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	● Night Heron	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**
	White-bellied Sea Eagle	**2**	**2**	**1**	**2**	**0**	**2**	**1**	**1**	**1**
	No. of Nests at Yeung Chau	**0**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
Transect Count	Ardeids	**56**	**43**	**40**	**31**	**32**	**14**	**13**	**10**	**25**
	● Great Egret	**25**	**21**	**18**	**19**	**15**	**7**	**8**	**4**	**16**
	● Little Egret	**26**	**18**	**16**	**9**	**11**	**5**	**4**	**3**	**9**
	● Grey Heron	**3**	**4**	**4**	**3**	**4**	**1**	**1**	**0**	**0**
	● Chinese Pond Heron	**2**	**0**	**2**	**0**	**2**	**1**	**0**	**0**	**0**
	● Night Heron	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**
	White-bellied Sea Eagle	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

APPENDIX F
SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE (EMIS)

Appendix F – Environmental Mitigation and Implementation Schedule

Project Stage / Location	Potential Environmental Impact	Mitigation Measure	Implementation Agent
Construction / Construction Site and along the dredged sediment transportation route	Air quality	(1) The dredged sediment placed on barge will be properly covered as far as practicable. (2) Requirements of the Air Pollution Control (Construction Dust) Regulation, where relevant, will be adhered to during the construction period. (3) Ultra low sulphur diesel fuel should be used for all diesel-operated plants and equipment on-site.	Contractor
Construction / Construction Site	Construction Noise	(1) Only well-maintained plantswill be operated on-site and plants should be serviced regularly during the construction program. (2) Plants will be sited as far away from nearby NSRs as possible.	Contractor
Construction / Construction Site	Water quality impact	(1) Closed grab will be used for dredging to minimize release of fines and contaminants. (2) The maximum production rates as indicated in the approved Project Profile will be adopted for the proposed dredging activities. (3) Silt curtains will be deployed around the dredging operation. (4) Good site practices (as outlined in Section 5.7 above) will be adopted during dredging and during transportation and disposal of dredged sediments. (5) Discharge of sewage effluent into drainage and water environment is not allowed. Appropriate numbers of portable chemical toilets will be provided by a licensed contractor as necessary to serve the construction workers. (6) Collection and removal of floating refuse will be performed at regular intervals on a daily basis at or near the dredging sites. (7) Water quality monitoring will be undertaken before, during and after the dredging works	Contractor

Construction / Construction Site	Waste management	(1) Disposal of dredged sediment will follow the requirements and procedures specified under the ETWB TCW No. 34/2002. (2) All chemical wastes from equipment maintenance will be handled, stored and disposed of in accordance with the requirements of the Waste Disposal (Chemical Waste) Regulation. (3) General refuse will be stored and disposed of separately from general construction waste and chemical waste. The storage bins for general refuse will be provided with lids, which will be kept closed to avoid odour nuisance and wind blown litter. The general refuse would be removed regularly and disposed of to licensed landfills.	Contractor
Construction / Construction Site	Ecological impact	(1) Mitigation measures to control water quality, i.e. constriction of dredging rate, use of closed grab for dredging and deployment of silt curtains, proposed in the water quality impact assessment will be adopted. (2) Standard good site practice and management proposed in the water quality impact assessment, such as tight fitting seals to bottom openings of barges/dredgers, effective site drainage, and provision of chemical toilets will be adopted. (3) Good site practices on noise control proposed in the noise impact assessment will be adopted. (4) The health status of the nearby coral colonies will be regularly monitored during the construction phase	Contractor
Construction / Construction Site	Fisheries impact	(1) Mitigation measures to control water quality, i.e. constriction of dredging rate, use of closed grab for dredging and deployment of silt curtains, proposed in the water quality impact assessment will be adopted. (2) Standard good site practice and management proposed in the water quality impact assessment, such as tight fitting seals to bottom openings of barges/dredgers, effective site drainage, and provision of chemical toilets will be adopted.	Contractor
Construction / Construction Site	Visual impact	(1) All construction plants would be sited as far away from nearby shoreline as possible. (2) All the sediment removal works will be carried out in day time (7:00 to 19:00) to minimize the use of night-time lighting. (3) Lighting will be carefully controlled if required	Contractor

Construction / Construction Site	Cultural heritage impact	Antiquities and Monuments Office should be informed of any discovery of antiquities or supposed antiquities in the course of dredging work at all the Project sites in accordance with the Antiquities and Monuments Ordinance.	Contractor
Construction / Construction Site	Air quality, noise, water quality, ecology, fisheries, visual and cultural heritage	An environmental monitoring and audit programme as recommended in the approved Project Profile should be followed.	Contractor

Remarks: No environmental complaint was received in the reporting month.

APPENDIX G
EVENT ACTION PLANS

Appendix G Event and Action Plan for Water Quality

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
Action level being exceeded by one sampling day	1. Repeat in-situ measurement to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC and Contractor; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC and Contractor; 6. (The above actions should be taken within 1 working day after the exceedance is identified) 7. Repeat measurement on next day of exceedance.	1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation measures. 4. (The above actions should be taken within 1 working day after the exceedance is identified)	1. Discuss with IEC on the proposed mitigation measures; 2. Make agreement on the mitigation measures to be implemented. 3. (The above actions should be taken within 1 working day after the exceedance is identified)	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Review the working methods and consider additional measures such as slowing down, or rescheduling of works; 5. Discuss with ET and IEC and propose mitigation measures to IEC and ER; 6. Implement the agreed mitigation measures. 7. (The above actions should be taken within 1 working day after the exceedance is identified)
Action level being exceeded by more than one consecutive sampling days	1. Identify source(s) of impact; 2. Inform IEC and Contractor; 3. Check monitoring data, all plant, equipment and Contractor's working methods; 4. Discuss mitigation measures with IEC and Contractor; 5. Ensure mitigation measures are implemented; 6. Prepare to increase the monitoring	1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation	1. Discuss with IEC on the proposed mitigation measures; 2. Make agreement on the mitigation measures to be implemented; 3. Assess the effectiveness of the implemented mitigation measures. 4. (The above actions should	1. Inform the Engineer and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Review the working methods and consider

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
	frequency to daily; 7. (The above actions should be taken within 1 working day after the exceedance is identified) 8. Repeat measurement on next working day of exceedance.	measures. 4. (The above actions should be taken within 1 working day after the exceedance is identified)	be taken within 1 working day after the exceedance is identified)	additional measures such as slowing down, or rescheduling of works; 5. Discuss with ET and IEC and propose mitigation measures to IEC and ER within 3 working days; 6. Implement the agreed mitigation measures. 7. (The above actions should be taken within 1 working day after the exceedance is identified)

APPENDIX H
DREDGING REPORT SUMMARY

Contract No.: CV/2012/01
Project Title: Sediment Removal at Yim Tin (East) Fish Culture Zone

Dumping Report Summary

Month/Year	Permit No.:	No. of Barge Load	Cumulative Barge Load	Dumping Quantity	Cumulative Dumping Quantity
02-09-2013 ~ 01-10-2013	EP/MD/14-032	0	0	0	0
09-12-2013 ~ 08-01-2014	EP/MD/14-081	4	4	2400	2400
09-01-2014 ~ 08-02-2014	EP/MD/14-115	50	54	30000	32400
09-02-2014 ~ 08-03-2014	EP/MD/14-132	32	86	19200	51600
09-03-2014 ~ 08-04-2014	EP/MD/14-145	65	151	39000	90600
09-04-2014 ~ 08-05-2014	EP/MD/14-159	71	222	42600	133200
09-05-2014 ~ 08-06-2014	EP/MD/15-014	74	296	44400	177600
09-06-2014 ~ 31-07-2014	N/A	0	296	0	177600

APPENDIX I
COMPLAINT LOG

Appendix I – Complaint Log

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
N/A	N/A	N/A	N/A	N/A	N/A

Remarks: No environmental complaint was received under this Project.