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MateriaLab

Contract No. EP/SP/58/08

Sludge Treatment Facilities

Quarterly Environmental Monitoring and Audit Report

For

June 2011 to August 2011

Report No.: 100440EN111344

Certified by :

John K. M. Ho
(Environmental Team Leader)

Date : 04 September 2011

BMT Asia Pacific

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4 October 2011
Our Ref: 8764/0208

By Post

VW-VES (HK) Limited
Level 30, Tower 1
Kowloon Commercial Centre,
No. 51 Kwai Cheong Road,
Kwai Chung,
Hong Kong

Attention: Mr. Vincent Deleu, Project Manager

Dear Sir,

CONTRACT NO. EP/SP/58/08 DESIGN, BUILD AND OPERATE OF SLUDGE TREATMENT FACILITIES
- QUARTERLY EM&A SUMMARY REPORT (JUN 2011 – AUG 2011)

I refer to the email from Environmental Team on 3 October 2011 with the revised report. I do not have further comment and have verified the captioned report.

Should you have any questions, please do not hesitate to contact the undersigned.

Yours faithfully
BMT Asia Pacific Limited

Claudine Lee
Independent Environmental Checker

Cc. Environmental Manager – Mr. Chris Chan (By email)
ET Leader – Fugro Technical Services Ltd., Mr. John Ho (By email)

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CONTENTS

1. Executive Summary

The requisite construction works for the Environmental Protection Department Contract No. EP/SP/58/08 Sludge Treatment has commenced construction activity on 22 December 2010. The requisite impact environmental monitoring comprising of water quality, ecology, landscape and visual impact was conducted throughout this reporting quarter.

Air Quality and Noise Level

Accordance to EIA study, there is no sensitive receiver for air and noise located nears the construction area and hence dust and noise monitoring is not required.

Stream Water Quality

74 non-compliance events regarding pH, suspended solids and turbidity were recorded in the past three months.

Marine Water Quality

Piling work was commenced on 21 February 2011. Full compliance was achieved in the reporting quarter.

Landfill Gas Monitoring

There was no excavation in the WENT Landfill Consultation Zone in the reporting period. Monitoring for landfill gas was not carried out in the reporting period.

Ecology

Routine ecology monitoring was carried out throughout the reporting quarter.

Landscape and Visual Monitoring

Monitoring of landscape and visual impact was conducted to ensure compliance with the intended aims of the measures and the effectiveness of the mitigation measures.

Complaints

As far as the complaint on the construction work in respect of environmental protection and pollution control was concerned, there was no complaint received during this reporting quarter.

2. Introduction

This quarterly report reviews the progress of the environmental monitoring and audit work associated with Contract No. EP/SP/58/08 Sludge Treatment Facilities in Nim Wan for the third quarter of construction activity from 25 May 2011 to 24 August 2011.

The graphical plots of the monitoring data are presented in Appendix 2. Results of all heavy metals content were less than detection limit, no graphical presentation for marine water quality results included.

Summary of ecology monitoring, landscape and visual impact monitoring are attached in Appendix 3 and 4 respectively. Comments and conclusions for this reporting quarter are included.

3. General Review

3.1 Background

The Contractor, VW-VES (HK) Limited, has been awarded a contract by the Environmental Protection Department of the Government of the Hong Kong Special Administrative Region for the Sludge Treatment Facilities. The location of the site is shown in Figure 3.1.

The program commenced in November 2010 and is anticipated to complete in 2013.

The construction schedule will be based on the major works associated with the project. The major works under this contract include:

Incineration Plant

a) Sludge receiving, storage and feeding system
b) Fluidized bed incinerators
c) Waste heat recovery and power generation system
d) Flue gas treatment system
e) Ash storage and handling system
f) Residue storage and handling system
g) Fluidized bed sand storage and handing system
h) Reagent reception and storage system
i) Process control and monitoring system

Ancillary and supporting Facilities

a) Weighbridge
b) Site security
c) Administration building
d) Vehicle washing facilities
e) Maintenance workshop and utility yard
f) Drainage system
g) Sewerage system
h) Sewage treatment works
i) Water supply system
j) Deodorization system

The project organisation with respect to environmental protection works is shown in Figure 3.2, which indicates responsibilities and lines of communication of the various parties concerned.

3.2 Summary of Environmental Monitoring and Audit (EM&A) Requirements

The EM&A program requires the monitoring of water quality prior to the commencement of and during the construction. A baseline report was prepared in December 2010 for the contract based on monitoring data acquired before the commencement of construction works.

Impact monitoring of water quality is to be undertaken at the designated monitoring stations. The monitored parameters are summarized in Table 3.1.

Action and Limit (AL) levels are established based on the data from the baseline report. Should the monitoring results indicate any non-compliance of AL levels, actions according to the Event / Action Plan in Appendix 7 are to be followed and appropriate environmental mitigation measures as in Appendix 3 are to be implemented to rectify the situation. The implementation status of mitigation measures is also shown in Appendix 1.

Impact ecology and visual survey monitoring are to be conducted at the construction area on regular basis. Monitoring parameters are tabulated in Table 3.1.

Landfill gas monitoring is required whenever there is excavation deeper than 300 mm or works conducted in confined space within the WENT Landfill Consultation Zone (see Figure 1.1).

The Contractors (VW-VES (HK) Limited) is responsible for waste control within the construction site, removal of the waste material produced from the site and to implement any mitigation measures to minimize waste or redress problems arising from the waste from the site. The waste material may include any sewage, waste water or effluent containing sand, cement, silt or any other suspended or dissolved material to flow from the site onto any adjoining land, storm sewer, sanitary water, or any waste matter or refuse to be deposited anywhere within the site or onto any adjoining land.

The Contractor shall also pay attention to the Waste Disposal Ordinance, the Dumping at Sea Ordinance, the Public Health and Municipal Services Ordinance and the Water Pollution Control Ordinance, and carry out the appropriate waste management work. The relevant licence / permit, such as the effluent discharge licence, the chemical waste producer registration, etc. shall be obtained. The Contractor shall refer to the relevant booklets issued by EPD when applying for the licence / permit.

The environmental mitigation measures and status for waste management are summarized in Appendix 1.

Table 3.1 Summary of Monitored Parameters

Parameters	Monitored Items	Number of Stations	Frequency	Requirement
Marine water	▪ Cadmium ▪ Chromium ▪ Aluminium	2 monitoring stations and 1 control station	Three days per week for mid-ebb and mid-flood tides during foundation piling of the STF	Sampling is taken at three water depths, namely, 1m below water Surface, mid-depth and 1m above sea bed, except where the water depth be less than 6m, in which case the mid-depth station may be omitted. Shall the water depth be less than 3m, only the mid-depth station will be monitored.
Stream water	▪ pH ▪ Turbidity ▪ Suspended solids ▪ Dissolved oxygen	3 monitoring stations and 2 control stations	Three days per week for mid-ebb and mid-flood tides during site formation and foundation piling of the STF and construction of the access road.	▪ Two consecutive measurements of DO concentration, DO saturation, turbidity and pH are taken at mid-depth at each location. ▪ Water samples for SS measurement is collected at the same depth at each location.
Ecology	Site condition and bird monitoring	Whole Middle Lagoon and 20 m from the boundary of the Lagoon	▪ Monthly monitoring for avifauna. ▪ Habitat monitoring at least twice per month. ▪ Monthly vegetation monitoring.	▪ Avifauna and their behavior. ▪ All birds seen and heard should be identified and counted. ▪ Signs of breeding of birds. ▪ Coverage of water and PFA filling activities in Middle Lagoon.
Landscape and Visual Impact	All measures, including compensatory planting, undertaken by both the Contractor and the specialist Landscape Sub-Contractor	East Lagoon	Biweekly	Ensure compliance with the intended aims of the measures and the effectiveness of the mitigation measures.

Table 3.1 (Con't)

Parameters	Monitored Items	Number of Stations	Frequency	Requirement
Landfill gas	▪ Oxygen ▪ Methane ▪ Carbon dioxide	Excavation, operation in chamber and confined space within the WENT Landfill Control Zone. (See Figure 1.1)	During the construction and operation	▪ Excavation between 300mm to 1m deep: - Directly after the excavation has been completed. - Periodically whilst the excavation remains open. ▪ Excavation deeper than 1m: - At ground surface before excavations commences. - Immediately before any worker enters the excavation. - At the beginning of each working day for the entire period the excavation remains open. - Periodically whilst the excavation remains open.

3.3 Action and Limit Levels

Water Quality Limit

Environmental auditing on the monitoring data is to be undertaken based on the Action and Limit (AL) levels for water quality to check against any non-compliances.

The AL levels for monitored parameters are formulated from the baseline monitoring data. The AL levels for marine and stream water quality are tabulated in Table 3.2a.

Table 3.2a Action and Limit Levels for Marine and Stream Water Quality

Parameters	Action Level	Limit Level
DO in mg/L (mid-depth)	≤ 5.16	≤ 4
SS in mg/L (mid-depth)	≥ 41 or 120% of control station's SS on the same day of measurement	≥ 85 or 130% of control station's SS on the same day of measurement
Turbidity in NTU (mid-depth)	≥ 36.4 or 120% of control station's turbidity on the same day of measurement	≥ 78.9 or 130% of control station's turbidity on the same day of measurement
pH	pH ≤7.55 or pH ≥ 8.11	pH ≤ 6 or pH ≥ 9

Table 3.2a (Con't)

Parameters	Action Level	Limit Level
Cadmium in µg/L	≥ 0.5	≥ 0.5
Chromium in µg/L	≥ 1	≥ 1
Aluminium in µg/L	≥ 20	≥ 20

Notes:
1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For SS and turbidity, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.

After commencement of the impact monitoring, there were a lot of incident events recorded. The non-compliance of those incident events were mainly triggered the 120% and 130% of control station readings.

The measured salinity of all monitoring stations, i.e. W1, W2 and W3, from December 2010 indicates the Tsang Kok Stream is retaining the seawater back flushed from Deep Bay all the time. As a result, the water quality at Tsang Kok Stream is significantly subjected to the influence of the Deep Bay marine water. The original criteria stated in Table 3.2a, the "OR" condition, cannot reflect the actual situation of the Stream. With agreement with EIAO (the approval letter was attached in Appendix 10 of the Monthly EM&A Report for June 2011), the criteria is revised to "AND" condition as listed in the following Table 3.2b effective on 03 June 2011 and onwards.

Table 3.2b Action and Limit Levels for Marine and Stream Water Quality used after 03 June 2011

Parameters	Action Level	Limit Level
DO in mg/L (mid-depth)	≤ 5.16	≤ 4
SS in mg/L (mid-depth)	≥ 41 AND 120% of control station's SS on the same day of measurement	≥ 85 AND 130% of control station's SS on the same day of measurement
Turbidity in NTU (mid-depth)	≥ 36.4 AND 120% of control station's turbidity on the same day of measurement	≥ 78.9 AND 130% of control station's turbidity on the same day of measurement
pH	pH ≤7.55 or pH ≥ 8.11	pH ≤ 6 or pH ≥ 9
Cadmium in µg/L	≥ 0.5	≥ 0.5
Chromium in µg/L	≥ 1	≥ 1
Aluminium in µg/L	≥ 20	≥ 20

Notes:
1. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
2. For SS and turbidity, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.

Landfill Gas Limit

Depending on the results of the measurements, actions required will be vary and should be set down by the Safety Officer or other appropriately qualified person. The actions shown in Table 3.3 should be referred as the minimum requirements to be encompassed.

Table 3.3 Action Level for Landfill Gas Measurement

Parameter	Measurement	Action
Oxygen	<19 %	▪ Ventilate to restore oxygen to >19 %
	<18 %	▪ Stop works ▪ Evacuate personnel / prohibit entry ▪ Increase ventilation to restore oxygen to >19 %
Methane	>10 % LEL (i.e. >0.5 % by volume)	▪ Prohibit hot works ▪ Ventilate to restore methane to <10 % LEL
	>20 % LEL (i.e. >1 % by volume)	▪ Stop works ▪ Evacuate personnel / prohibit entry ▪ Increase ventilation to restore methane to <10 % LEL
Carbon dioxide	>0.5 %	▪ Ventilate to restore carbon dioxide to <0.5 %
	>1.5 %	▪ Stop works ▪ Evacuate personnel / prohibit entry ▪ Increase ventilation to restore carbon dioxide to <0.5 %

4. Construction Phase Environmental Monitoring and Audit

4.1 Review of the construction phase environmental monitoring

4.1.1 Impact water quality monitoring was performed at three locations with two control stations at Tsang Kok Stream; and two marine locations with one control station in Deep Bay Zone. Ecology and Visual Impact monitoring were carried out at the East and the Middle Lagoon. The locations of the water monitoring station selected as the nearest water sensitive receivers are shown in Figure 4.1 and 4.2 of Appendix 8.

Table 4.1 Summary of Environmental Monitoring from 25 May 2011 to 24 August 2011

Monitored Parameters		25 May 2011 to 24 June 2011	25 June 2011 to 24 July 2011	25 July 2011 to 24 Aug 2011
Stream water	DO, DOS, pH, SS, Temp and Turbidity	13	13	13
Marine water	Cd, Cr and Al	12*	13	13#
Ecology	Avifauna	1	1	1
	Habitat	4	4	4
	Vegetation	4	4	4
Landscape	Compliance of mitigation measures	2	2	2

* Remark: Marine monitoring on 23 June 2011 was cancelled due to typhoon signal No. 3 was hoisting.
# Remark: Marine monitoring on 28 July 2011 (p.m.) was cancelled due to adverse weather condition and safety concern.

4.1.2 No excavation works was carried out within the WENT Landfill Consultation Zone in the reporting quarter.

4.2 Synopsis of work undertaken during this quarter

During this quarter in review, construction activity undertaken by the Contractor is listed in Table 4.2.

Table 4.2 Construction activity undertaken during 25 May 2011 to 24 August 2011

Month	Construction task item
25 May 2011 to 24 Aug 2011	- Construction of EPC's site office; - Backfilling and compaction; - Excavation of Sludge Bunkers at Plant A & B; - Piling works at EEC Building, Viewing Gallery and Plant B; - Excavation at Plant A; - Substructure works at Plant A & B; - Waterproofing works at Plant A & B; and - Tree Transplant Preparation Works in Portion 6.

4.3 Audit summary of non-compliances of the environmental quality performance limits from 25 May 2011 to 24 August 2011.

Water Quality

The summary of non-compliance is shown in Table 4.3.

Table 4.3 Summary of Monitoring Non-Compliance

Monitored		25 May 2011 to 24 June 2011		25 June 2011 to 24 July 2011		25 July 2011 to 24 Aug 2011	
Parameter		Action	Limit	Action	Limit	Action	Limit
Stream water	Turbidity	2	19	0	0	0	0
	Suspended Solid	2	19	0	0	1	1
	pH	3	0	9	0	18	0
	Dissolved oxygen	0	0	0	0	0	0
Marine water	Cadmium	0	0	0	0	0	0
	Chromium	0	0	0	0	0	0
	Aluminium	0	0	0	0	0	0

Remark: The number of non-compliances is shown

Ecology Monitoring

No non-compliance was recorded in the reporting quarter.

Landscape and Visual Monitoring

No non-compliance was recorded in the reporting quarter.

Landfill Gas Monitoring

No excavation or confined space operation in progress inside the WENT Landfill consultation Zone in the reporting period. Monitoring of landfill gas was not required.

4.4 Review of the events of non-compliance

Stream Water Quality

Table 4.4 Summary of reasons for the exceedances of stream water quality

Month	The reasons for the exceedances of stream water quality
June 2011	▪ Construction works, include setup of EPC's office, cut and fill operation, piling and excavation of sludge bunkers were in progress throughout the reporting period at the North part of the Lagoon and far away from the Tsang Kok Stream. The stream water quality was at the similar level as that before the piling work. The exceedance was not caused by the construction activity and was due to low suspended solids content and turbidity recorded at control station, C2. ▪ One event of exceedance related to turbidity and suspended solids are higher than A/L level derived from baseline data at mid-flood on 11 June 2011. Events were recorded at W1 and W2 that was influent by Deep Bay marine water and not construction activities related. ▪ One event of exceedance of pH were recorded at mid-flood on 28 May 2011 at various location, the exceedance was subjected to influent of high pH from upstream of the Tsang Kok stream.

Table 4.4 (Con't)

Month	Review of the events of non-compliance
July 2011	▪ Construction works, include setup of EPC's office, cut and fill operation, piling and excavation of sludge bunkers were in progress throughout the reporting period at the North part of the Lagoon and far away from the Tsang Kok Stream. The stream water quality was at the similar level as that before the piling work. The exceedances were not caused by the construction activities and were due to heavy rain which could affect the results. ▪ Nine events of exceedance of pH were recorded at mid-flood or mid-ebb during July at various locations, the events were recorded at W2 and W3 due to influence of low pH from upstream of the Tsang Kok stream and not owing to construction activities related.
Aug 2011	▪ Construction works, include setup of EPC's office, cut and fill operation, piling and excavation of sludge bunkers were in progress throughout the reporting period at the North part of the Lagoon and far away from the Tsang Kok Stream. The stream water quality was at the similar level as that before the piling work. The exceedances were not caused by the construction activities and were subject to the influent of the high or low pH from C1 and/or C2. ▪ 18 events of exceedance of pH were recorded at mid-flood or mid-ebb during August at various locations, the events were recorded at W1, W2 and W3 due to influence of low or high pH from upstream of the Tsang Kok stream and not owing to construction activities related. ▪ 2 events of exceedance of SS were recorded at mid-flood or mid-ebb of late July at various locations, the events were recorded at W1 and W3 due to occasional collection of dense solid particles at W3 as the low turbidity was taken at W3 during the same sampling period, and stirring up of seabed materials near W1 when the Deep Bay water surface became rough after Typhoon Signal No.1 was hoisted.

4.5 Action taken in the event of non-compliance

Stream Water Quality

In this reporting quarter, there were 74 events of reported exceedances based on the A/L levels stated in Table 3.2 which are not related to the construction activities, hence, ad-hoc monitoring was not performed.

5. Summary of Complaints, Summons and Successful Prosecutions

No documented correspondence regarding complaints, summons and successful prosecutions in association with the construction activities was received in this reporting quarter.

6. Comments and Conclusions for 25 May 2011 to 24 August 2011

Air Quality

There is no nearby sensitive receiver identified by EIA study hence dust monitoring is not required. The site activities performed in the reporting quarter including vegetation removal, top layer PFA compaction and trial piling works, did not cause significant dust impact. However, the Contractor should deploy necessary dust mitigation measures to reduce potential impacts from construction works to a minimum, which include frequent water spraying at dust generation areas.

Noise Level

Same as air quality, no sensitive receiver is close to the construction site. In the past three months, no deterioration of the environment noise level is noted.

After commencement of piling works, Contractor should deploy necessary noise mitigation measures to minimize the influence to the wildlife in the Middle Lagoon. Close monitoring of any impact to the habitat will be in place.

Water Quality

Stream water

During this reporting quarter, non-compliance of turbidity and suspended solids was recorded according to the A/L levels stated in Table 3.2. The causes were substantially attributable to (1) Influent of the Deep Bay Zone and (2) The low turbidity and suspended solids content at control station, C2. Impact monitoring data indicates the water quality is similar to that of baseline level. The construction activities were located in the North part of the Lagoon and far apart from the Tsang Kok Stream. Hence, the exceedance recorded is not related to the construction activities.

30 events of pH exceedances were reported in the reporting period that was influent by low or high pH from upstream and heavy rain. All the events were not related to the construction activities.

Marine Water

Full compliance of heavy metal content is achieved that indicates the piling work did not cause releasing of PFA leachate into the nearby Deep Bay Zone.

Ecology Monitoring

Contractor has followed the mitigation measures to prevent any disturbance to the wildlife in the Middle Lagoon. After commencement of the piling work on 21 February 2011, no significant impact to the wildlife was observed. However, the impact of the piling work will be monitored closely.

Summary of ecology survey is presented in Appendix 3.

Landscape and Visual Impact Monitoring

In general, the implementation of the proposed measures in construction phase were followed and no non-compliance was observed in the reporting quarter. Summary of observation during the reporting quarter is enclosed in Appendix 4.

Waste Management Status

C&D Waste	Backfill, piling and excavation works were conducted during the reporting period. C&D waste was generated from the current activities and sent to public fill.
General refuse	General refuse including paper / cardboard, metal, plastic and other refuse were collected by registered collector and sent to WENT landfill.
Chemical waste	Liquid and solid chemical waste were generated during the reporting period and collected by licensed contractor.
Wastewater	Rain water was treated by the silt removal facilities before discharged outside the site.

Waste flow summary for the previous months is attached in Appendix 5.

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Appendix 1

Environmental Mitigation Implementation Schedule

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Table 1. Implementation Schedule and Status of Proposed Air Quality Mitigation Measures

EIA Ref #	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	C	O	Dec	
S3.8.1	Implementation of the Air Pollution Control (Construction Dust) Regulation and good site practices: • Use of regular watering, with complete coverage, to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather. • Use of frequent watering for particularly dusty construction areas and areas close to ASRs. • Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines. • Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs. • Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations. • Establishment and use of vehicle wheel and body washing facilities at the exit points of the site. • Provision of wind shield and dust extraction units or similar dust mitigation measures at the loading points, and use of water sprinklers at the loading area where dust generation is likely during the loading process of loose material, particularly in dry seasons/ periods.	Work site / During the construction period	Contractor		√ √ √ √ √ √ √			Air Pollution Control (Construction Dust) Regulation

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EIA Ref #	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	C	O	Dec	
	• Imposition of speed controls for vehicles on unpaved site roads. Ten kilometers per hour is the recommended limit.				√			
	• Where possible, routing of vehicles and positioning of construction plant should be at the maximum possible distance from ASRs.				√			
	• Instigation of an environmental monitoring and auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise.				√			

All recommendations and requirements resulted during the course of EIA/EA Process, including ACE and / or accepted public comment to the proposed project.

- Des - Design, C - Construction, O – Operation, and Dec – Decommissioning
- N/A – The associated activities are not in progress during the monitoring month, √ - The proposed mitigation measures is implemented

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Table 2. Implementation Schedule of Proposed Human Health Risk Mitigation Measures

EIA Ref #	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	C	O	Dec	
	Human Health Risk Associated with Radon							
	Prevention of radon influx from the PFA to the STF buildings • A soil cover can be provided beneath the buildings on top of ash lagoon prior to construction works because it reduces the level of radon influx significantly	STF buildings / During the design, construction and operation of the STF.	Contractor / STF Operator		N/A			EPD's ProPECC Note PN 1/99 Control of Radon Concentration in New Buildings Appendix 2
	• Slab-on-grade can be an option on foundation design				N/A			
	• Soil suction can also prevent radon from entering the building by drawing the radon from below the building and venting it through a pipe, or pipes, to the air above the building.				N/A			
	Provision of Sufficient ventilation of the interior of the STF buildings • Forced and natural ventilation should be introduced properly to enhance air exchange rate in the STF buildings.				N/A			
	• Basement areas should be pressurized by using a fan to blow air into the basement areas from outdoors is suggested. This would create enough pressure at the lowest level indoors to prevent radon from entering into the STF buildings.				N/A			
	Regular maintenance for the floor slabs and walls • Cracks and other openings in the foundation should be properly sealed to reduce radon ingress. Sealing the cracks limits the flow of radon into the building thereby making other radon reduction techniques more effective and cost-efficient. It also reduces the loss of conditioned air.				N/A			

All recommendations and requirements resulted during the course of EIA/EA Process, including ACE and / or accepted public comment to the proposed project.

- Des - Design, C - Construction, O – Operation, and Dec – Decommissioning
- N/A – The associated activities are not in progress during the monitoring month, √ - The proposed mitigation measures is implemented

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Table 3. Implementation Schedule of Proposed Waste Management Measures

EIA Ref #	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	C	O	Dec	
S5.5.1	*Good Site Practices* Recommendations for good site practices during the construction activities include: • Nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site • Training of site personnel in proper waste management and chemical handling procedures • Provision of sufficient waste disposal points and regular collection of waste • Appropriate measures to minimize windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers • Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors.	Work site / During the construction period	Contractor		√ √ √ √ √			Waste Disposal Ordinance (Cap.354) ETWB TCW No. 19/2005
S5.5.1	*Waste Reduction Measures* • Waste reduction is best achieved at the planning and design stage, as well as by ensuring the implementation of good site practices. Recommendations to achieve waste reduction include:	Work site / During planning & design stage, and construction stage	Contractor		√			

EIA Ref #	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	C	O	Dec	
	• The design of the foundation works should minimize the amount of excavated material to be generated.				√			
	• Excavated soil should be reused on site as far as possible, e.g. for landscape works, in order to minimize the amount of public fill to be disposed off-site.				√			
	• Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal.				√			
	• Encourage collection of aluminium cans by individual collectors by providing separate labelled bins to enable this waste to be segregated from other general refuse generated by the work force				√			
	• Proper storage and site practices to minimize the potential for damage or contamination of construction materials.				√			
	• Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste.				√			
S5.5.1	*General Refuse* General refuse should be stored in enclosed bins or compaction units separate from C&D material. A reputable waste collector should be employed by the contractor to remove general refuse from the site, separately from C&D material. Preferably an enclosed and covered area should be provided to reduce the occurrence of 'wind blown' light material.	Work site / During the construction period	Contractor		√			Public Health and Municipal Services Ordinance (Cap. 132)

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EIA Ref #	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	C	O	Dec	
S5.5.1	*Construction and Demolition Material* In order to minimize the impact resulting from collection and transportation of C&D material for off-site disposal, the excavated material arising from site formation and foundation works should be reused on-site as backfilling material and for landscaping works as far as practicable. Other mitigation requirements are listed below: • A Waste Management Plan, which becomes part of the Environmental Management Plan, should be prepared in accordance with ETWB TCW No.19/2005. • A recording system for the amount of wastes generated, recycled and disposed (including the disposal sites) should be proposed. • In order to monitor the disposal of C&D material at public filling facilities and landfills and to control fly-tipping, a trip-ticket system should be included. One may make reference to ETWB TCW No. 31/2004 for details.	Work site / During design stage & construction period	Contractor	√	√ √ √ √			ETWB TCW No. 33/2002 ETWB TCW No. 19/2005 ETWB TCW No. 31/2004
S5.5.1	*Chemical Waste* If chemical wastes are produced at the construction site, the Contractor would be required to register with the EPD as a Chemical Waste Producer and to follow the guidelines stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Good quality containers compatible with the chemical wastes should be used, and incompatible	Work site / During the construction period	Contractor		√			Waste Disposal (Chemical Waste)(General) Regulation)

EIA Ref #	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	C	O	Dec	
	chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosive, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc. The Contractor shall use a licensed collector to transport and dispose of the chemical wastes, to either the Chemical Waste Treatment Centre at Tsing Yi, or another licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.							

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Table 4. Implementation Schedule of Proposed Land Contamination Preventive Measures

EIA Ref #	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	C	O	Dec	
S5.6.3	*Fuel Oil Tank Construction and Test* • The fuel tank to be installed should be of specified durability • Double skin tanks are preferable • Underground fuel storage tank to be installed should be placed within a concrete pit • The concrete pit shall be accessible to allow regular tank integrity tests to be carried out at regular intervals • The tank integrity tests should be conducted by an independentqualified surveyor or structural engineer • Any potential problems identified in the test should be rectified as soon as possible	Fuel Oil Storage Tank /	Contractor/ STF Operator	√	√ √ N/A √ √ √			
S5.6.3	*Fuel Oil Pipeline Construction and Test* • Installation of aboveground fuel oil pipelines is preferable; if underground pipelines are unavoidable, concrete lined trenches should be constructed to contain the pipelines • Double skin pipelines are preferable • Distance between the fuel oil refuelling points and the fuel oil storage tank shall be minimized • The integrity tests for the pipelines should be conducted by an independent qualified surveyor or structural engineer at regular intervals • Any potential problems identified in the test should be rectified as soon as possible	Fuel Oil Pipelines/ Design, Construction and Operation Phase	Contractor/ STF Operator	√	√ √ √ √ √			
S5.6.3	*Fuel Oil Leakage Detection* • Installation of leak detection device at storage tank and pipelines	Fuel Oil Storage Tank	Contractor/ STF Operator	N/A	N/A			

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Table 5. Implementation Schedule of Proposed Water Pollution Control Measures

EIA Ref #	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	C	O	Dec	
S6.7.2	Construction Runoff and Drainage • Site practices outlined in ProPECC PN 1/94 "Construction Site Drainage" shall be followed as far as practicable in order to minimize surface runoff and the chance of erosion: • At the start of site establishment, internal drainage works and erosion and sedimentation control facilities shall be implemented. Channels, earth bunds or sand bag barriers shall be provided on site to direct stormwater to silt removal facilities. The detailed design and installation of the temporary on-site drainage system shall be undertaken by the contractor prior to the commencement of construction. • Before commencing any site formation work, all sewer and drainage connections shall be sealed to prevent debris, soil, sand etc. from entering public sewers/drains. • Boundaries of earthworks shall be surrounded by dykes or embankments for flood protection, as necessary. • Sand/silt removal facilities such as sand traps, silt traps and sediment basins shall be provided to remove sand/silt particles from runoff to meet the standards of the Technical	Work site / During the construction period	Contractor		√ N/A √ √ √			ProPECC PN 1/94; WPCO

EIA Ref #	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	C	O	Dec	
	Memorandum under the Water Pollution Control Ordinance. The design of silt removal facilities shall be based on the guidelines provided in ProPECC PN 1/94. All drainage facilities and erosion and sediment control structures shall be inspected monthly and maintained to ensure proper and efficient operation at all times and particularly during rainstorms.							
	• Water pumped out from foundation piles shall be discharged into silt removal facilities.				N/A			
	• During rainstorms, exposed slope/soil surfaces shall be covered by a tarpaulin or other means, as far as practicable. Other measures that need to be implemented before, during and after rainstorms are summarized in ProPECC PN 1/94.				√			
	• Exposed soil areas shall be minimized to reduce potential for increased siltation and contamination of runoff.				√			
	• Earthwork final surfaces shall be well compacted and subsequent permanent work or surface protection shall be immediately performed. Open stockpiles of construction materials or construction wastes on- site of more than 50m3 shall be covered with tarpaulin or similar fabric during rainstorms.				√			
	• All vehicles shall be cleaned before leaving the works area to ensure no earth, mud and debris is deposited on roads. An adequately designed and				√			

EIA Ref #	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	C	O	Dec	
	sited wheel washing bay shall be provided at every site exit. The wheel washing facility shall be designed to minimize the intake of surface water (rainwater). Wash-water shall have sand and silt settled out and removed at least on a weekly basis to ensure the continued efficiency of the process.							
S6.7.2	*General Construction Activities* • Debris and refuse generated on-site shall be collected, handled and disposed of properly to avoid entering the nearby water bodies and public drainage system. Stockpiles of cement and other construction materials shall be kept covered when not being used. • Oils and fuels shall only be used and stored in designated areas which have pollution prevention facilities. To prevent spillage of fuels and solvents to nearby water bodies and public drains, all fuel tanks and storage areas shall be provided with locks and be sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank. The bund shall be drained of rainwater after a rain event.	Work site / During the construction period	Contractor		√ √			ProPECC PN 1/94;
S6.7.2	*Sewage Effluents* • Temporary sanitary facilities, such as portable chemical toilets, shall be employed on-site where necessary to handle sewage from the workforce. A licensed contractor would be responsible for appropriate disposal and maintenance of these facilities.	Work site / During the construction period	Contractor		√			ProPECC PN 1/94; WPCO

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EIA Ref #	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	C	O	Dec	
S6.7.2	*Release of PFA Leachate from Ash Lagoon into the Aquatic Environment* • Environmental monitoring and audit (EM&A) should be included to ensure that the foundation construction would not cause an unacceptable release of PFA leachate into the Deep Bay waters. The parameters to be measured should include the heavy metals such as cadmium, chromium and aluminium, which have the greatest tendency to leach from the lagooned PFA into the seawater. Details of the measurement requirements are presented in the EM&A manual	Deep Bay Water outside the Ash Lagoon / During the construction period	Contractor		√			WPCO

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Table 6. Implementation Schedule of Proposed Ecological Mitigation Measures

EIA Ref #	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	C	O	Dec	
S7.8.2	Measures to Minimize Disturbance Impact to Wildlife							
	• Hoarding of 3m high shall be set up along the boundary of the works areas and associated site access to shield the fauna and breeding population of Little Grebe in the Middle Lagoon from the disturbance impact of machinery.	Boundary of works areas/ Construction Phase	Contractor		√			
	• The works boundaries shall not go beyond the proposed Project Area. All work crews, equipment and human activities shall be confined within the designated works area only. No personnel should encroach or wilfully disturb any wild animals and their habitats. Traffic and human access from the western side of the Project Area should be avoided.	Boundary of works areas/ Construction Phase	Contractor		√			
	• Fencing with climbers or plantation shall be provided, where appropriate, along the STF site boundary and the two sides of access road to screen the surrounding habitats from the STF works areas.	Boundary of works areas/ Operation Phase	Contractor		√			

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EIA Ref #	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	C	O	Dec	
S7.8.2	Measures to Minimize Impact to natural habitats							
	• Where practicable, all proposed works shall be conducted in existing built up area to minimize impact to natural habitats.	Works areas/ Design and Construction Phase	STF Designer/ Contractor	√	√			
	• The abutment (permanent structure) for the vehicular bridge shall avoid streambed. The number and size of the temporary supporting structures to be installed over the streambed during construction shall be minimized as far as practicable.	Vehicular bridge/ Design and Construction Phase	STF Designer/ Contractor	√	√			ETWB TC (Works)
	• The temporarily affected natural habitats, including streambed, shall be reinstated after the completion of works.	Works Area/ Operation Phase	Contractor		N/A			No. 5/2005 Protection of natural streams/ rivers from adverse impacts arising from construction works
	• For affected natural stream section, placement of substrates of similar size and composition to those of original streambed shall be considered to encourage colonization.	Works Area/ Operation Phase	Contractor		N/A			
S7.8.2	*Minimise sedimentation/water quality impacts to waterbodies* • Measures to control potential sedimentation/ water quality impacts during the construction phase shall be implemented. • To minimize the potential water quality impacts from the construction works located at any river channels, natural streams or seafront, the practices outlined in	Whole Site/ Construction Phase	Contractor		√ √			ETWB TC (Works) No. 5/2005 Protection of natural streams/ rivers from adverse impacts arising from construction works

EIA Ref #	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	C	O	Dec	
	ETWB TC (Works) No. 5/2005 "Protection of natural streams/rivers from adverse impacts arising from construction works" shall be adopted where applicable.							
S7.8.2	*Minimize noise disturbance* • Noise mitigation measures including the use of quieter piling machinery and construction plants shall be implemented to lower the noise level due to construction works. • Only well-maintained plant shall be operated on-site and plant shall be serviced regularly during the construction programme. • Machines and plant which may be in intermittent use shall be shut down to a minimum. • Plant known to emit noise strongly in one direction, shall be oriented so that the noise is directed away from the Middle Lagoon, where possible. • Silencers or mufflers on construction equipment shall be utilized and shall be properly maintained during the construction period. • Mobile plant (such as generator) shall be sited as far away from the Middle Lagoon as possible. • Material stockpiles and other structures shall be effectively utilized, where practicable, to screen noise from on-site construction activities.	Whole Site/ Construction Phase	Contractor		√ √ √ √ N/A √ √			ETWB TC (Works) No. 5/2005 Protection of natural streams/ rivers from adverse impacts arising from construction works

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				Des	C	O	Dec	
S7.8.3	*Measures to Mitigate the Loss of Vegetation* • All vegetation located within the work areas shall be preserved as far as practicable. • To compensate for the loss of the vegetation and habitats, tree planting shall be provided in the site area where possible. Species chosen for planting shall be similar to the species identified in the survey and be native to Hong Kong or the Southern China.	Whole Site / Design, Construction and Operation Phase	Contractor / STF Operator	√	√ √			
S7.8.4	Enhancement Measures to Create Additional Habitat for Little Grebe • An additional habitat for Little Grebe shall be created in a less disturbed area located at the northeastern part of the proposed STF. • The created habitat shall be provided in form of shallow pond(s) incorporating suitable habitat characteristics for Little Grebe. The water level of the created pond shall be kept between 1.5 m to 2 m. • Emergent vegetation shall be planted and fish population shall be controlled to allow development of aquatic invertebrate populations as prey of Little Grebe. • To screen the created habitat from disturbance due to nearby landfill traffic, planting of native plants shall be provided on the boundary of the pond(s) as appropriate. • Prior to construction of the pond(s), detailed Habitat Creation and Management Plan (HCMP) of the created habitat prepared by experienced ecologist(s) with over seven year experience in relevant field shall be circulated to relevant departments including AFCD for comment.	Within Project Area/ Design Phase, Construction and Operation Phase	Contractor / STF Operator	√	N/A N/A N/A N/A N/A			

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Table 7. Implementation Schedule for Landscape and Visual Impact

EIA Ref #	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	C	O	Dec	
T able 9.4 CM-01	*Contaminant/ Sediment Control* – Suitable temporary barriers, covers and drainage provisions shall be provided around construction works to avoid discharge of contaminants (such as bleeding from in-situ concrete works) and sediments into sensitive water-based habitats, especially the tidal streams and the mangrove.	Work site / During the construction period	Contractor		√			
T able 9.4 CM-02	Early Planting of Tall Trees – Tall trees proposed under mitigation measure OM-02 shall be planted early, providing visual effect also during construction.	Work site / During the construction period	Contractor		N/A			
T able 9.4 CM-03	Good Site Practice – Construction activities should be restricted to works areas and should be clearly demarcated onsite. Piling of construction materials onsite shall be carefully considered for possible impacts before carrying out.	Work site / During the construction period	Contractor		√			
T able 9.4 CM-04	Existing Trees within Works Areas – All existing trees within work sites shall be properly maintained and protected for their crowns, trunks and roots.	Work site / During the construction period	Contractor	√	√			
T able 9.4 OM-01	Sensitive Bridge Design – The bridge of the proposed access road shall be sensitively designed to minimize impact to the tidal stream and mangrove. It shall be constructed with minimal use of in-situ concreting and with maximum use of precast or prefabricated elements. No pile or support shall be erected within the stream channel.	Bridge of access road / During the design & construction phases	Contractor	√	N/A			

EIA Ref #	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	C	O	Dec	
T able 9.4 OM-02	Tall trees for Chimney – Fast-growing tall trees shall be planted along the east side of the ash-lagoon to counterbalance possible exotic silhouettes, such as from the chimney, of the proposed sludge treatment facilities for sensitive viewers in Pak Nai. The trees shall be planted during the early stage of the construction to ensure effectiveness during operation. They will also help to lessen the visual impact during construction, as already suggested in mitigation measure CM-02.	East side of ash lagoon / During the design & construction phases	Contractor	√	N/A			
Table 9.4 OM-03	Suitable Reinstatement at Ash-lagoon – Affected perimeter of the proposed works area within the ash-lagoon shall be reinstated with suitable planting materials. Traditional reinstatement planting approach for construction projects may not work well for this project. Certain existing grasses and small shrubs have self-seeded the ash- lagoon, demonstrating their tolerance to salts, alkalinity and possible trace metals in the ash. Therefore the same or similar species of vegetation shall be used.	Perimeter of works area / During the design & construction phases	Contractor	√	N/A			
Table 9.4 OM-04	Existing Tree Transplanting – The proposed access roadworks may affect few existing trees, which shall be transplanted as far as practical. A comprehensive tree survey is recommended to locate these trees.	Access road / During the design & operation phases	Contractor	√	N/A			
Table 9.4 OM-05	Planting at Road Intersection – Suitable planting of woodland trees and shrubs shall be provided for the proposed access roadworks at the junction with Nim Wan Road.	Junction of access road with Nim Wan Road / During the design & operation phases	Contractor	√	N/A			

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Table 8. Implementation Schedule of Proposed Landfill Gas Hazard Protection Measures

EIA Ref #	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	C	O	Dec	
S10.7.2	**Appointment of Safety Officer** Appoint a properly trained safety officer and provide with appropriate equipment to measure and monitor LFG hazard.	Work Site / During the construction phase	Contractor		√			
S10.7.2	**Safety Measures - Excavation** Staff should receive appropriate training on working in areas susceptible to landfill gas, fire and explosion hazards. Excavation procedures and code of practice should be implemented.	Work Site / During the construction phase	Contractor		√			
S10.7.2	*Safety Measures – Welding, Flame-Cutting and Hot works* Hot works should be confined to open areas away from any trench or excavation. Should hot works must be carried out in trenches or confined space, "permit to work" procedures should be followed.	Work Site / During the construction phase	Contractor		√			
S10.7.2	**Safety Measures – Enclosed Spaces** Site offices or buildings located within WENT Landfill Consultation Zone which have the capacity to accumulate landfill gas, then they should either be located in an area which has been proven to be free of landfill gas; or be raised clear of the ground by a minimum of 500mm.	Enclosed Spaces within WENT Consultant Zone / During the construction phase	Contractor		N/A			
S10.7.2	**Safety Measures – Electrical Equipment** Any electrical equipment, such as motors and extension cords, should be intrinsically safe.	Work Site / During the construction phase	Contractor		N/A			

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				Des	C	O	Dec	
S10.7.2	**Safety Measures – Piping** During piping assembly or conduiting construction, all valves/seals should be closed immediately after installation. As construction progresses, all valves/seals should be closed as installed to prevent the migration of gases through the pipeline/conduit. All piping/conduiting should be capped at the end of each working day.	Work Site / During the construction phase	Contractor		N/A			
S10.7.2	**Safety Measures – Fire Safety** Adequate fire safety equipments should be provided on site. Workers and visitors should be notified of the potential fire hazards. Safety notices should be posted around the site warning the anger and potential hazards.	Work Site / During the construction phase	Contractor		√			
S10.7.2	**Safety Measures – Confined Spaces** Precautionary measures should include ensuring that staff members are aware of the potential hazards of working in confined spaces, and that appropriate monitoring procedures are in place to prevent hazards in confined spaces.	Confined Spaces at Work Site / During the construction phase	Contractor		N/A			
S10.7.2	**Monitoring** Periodically during ground-works within the Consultation Zone, the works area should be monitored for methane, carbon dioxide and oxygen using appropriately calibrated portable gas detection equipment. The monitoring frequency and areas to be monitored shall be set down prior to commencement of ground-works. Depending on the results of the measurements, actions required will vary. As a minimum these should encompass those actions specified in Table 10.6 of the EIA Report.	Work Site / During the construction phase	Contractor		N/A			

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Appendix 2

Graphical Presentation of Water Quality Monitoring Data

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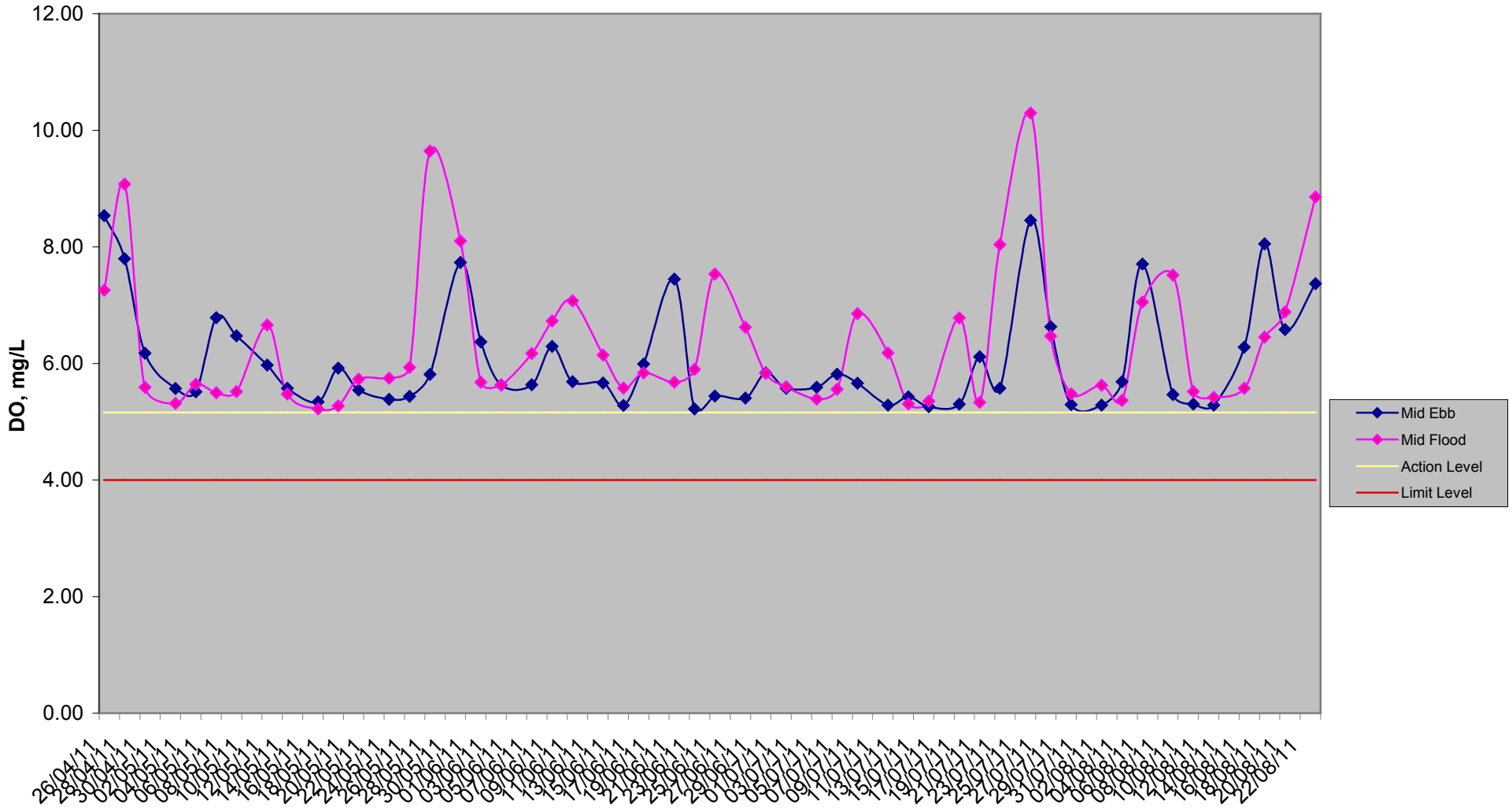
W1 - Dissolved Oxygen Content



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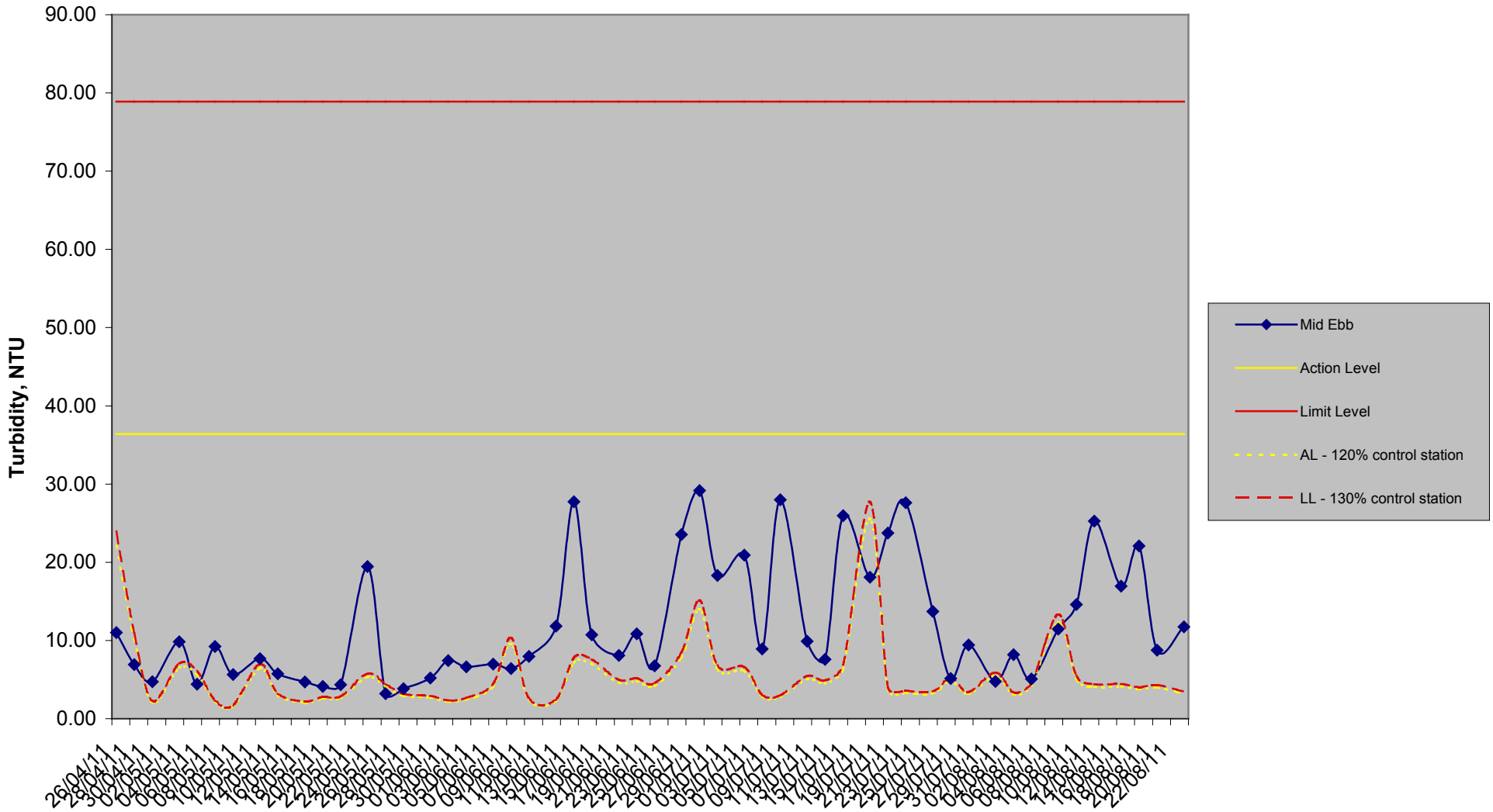
W1 - Turbidity (Mid-Ebb)



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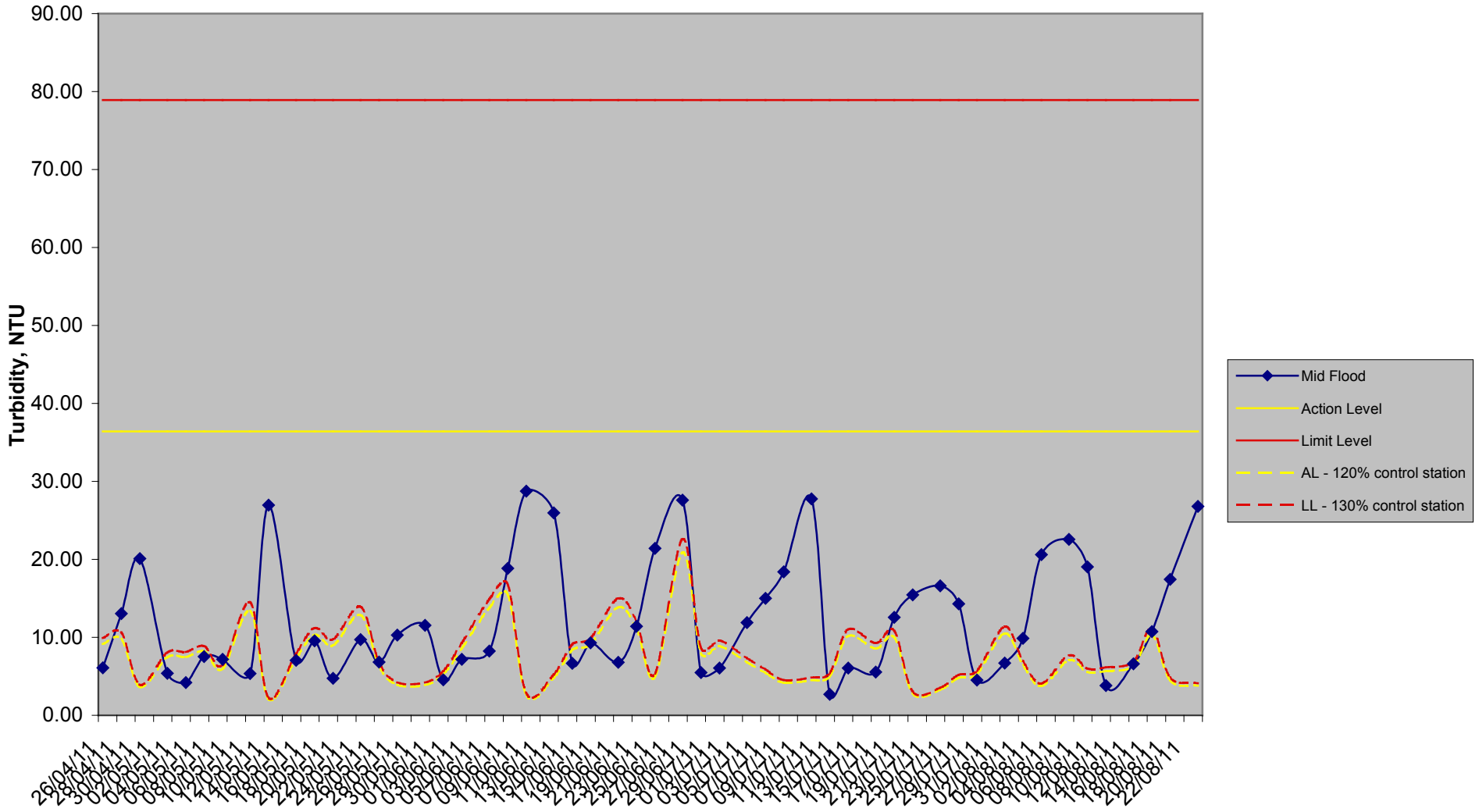
W1 - Turbidity (Mid-Flood)



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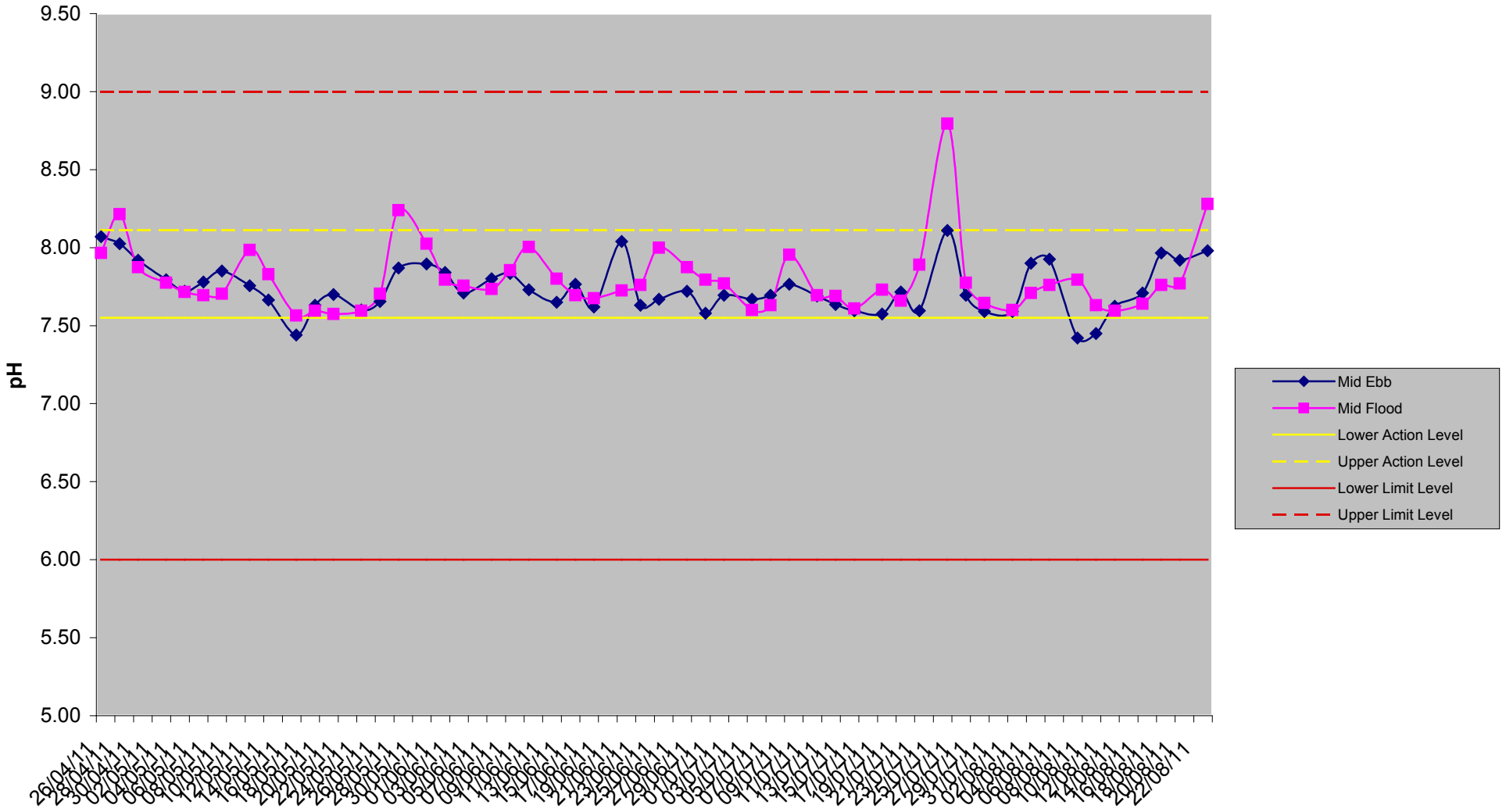
W1 - pH



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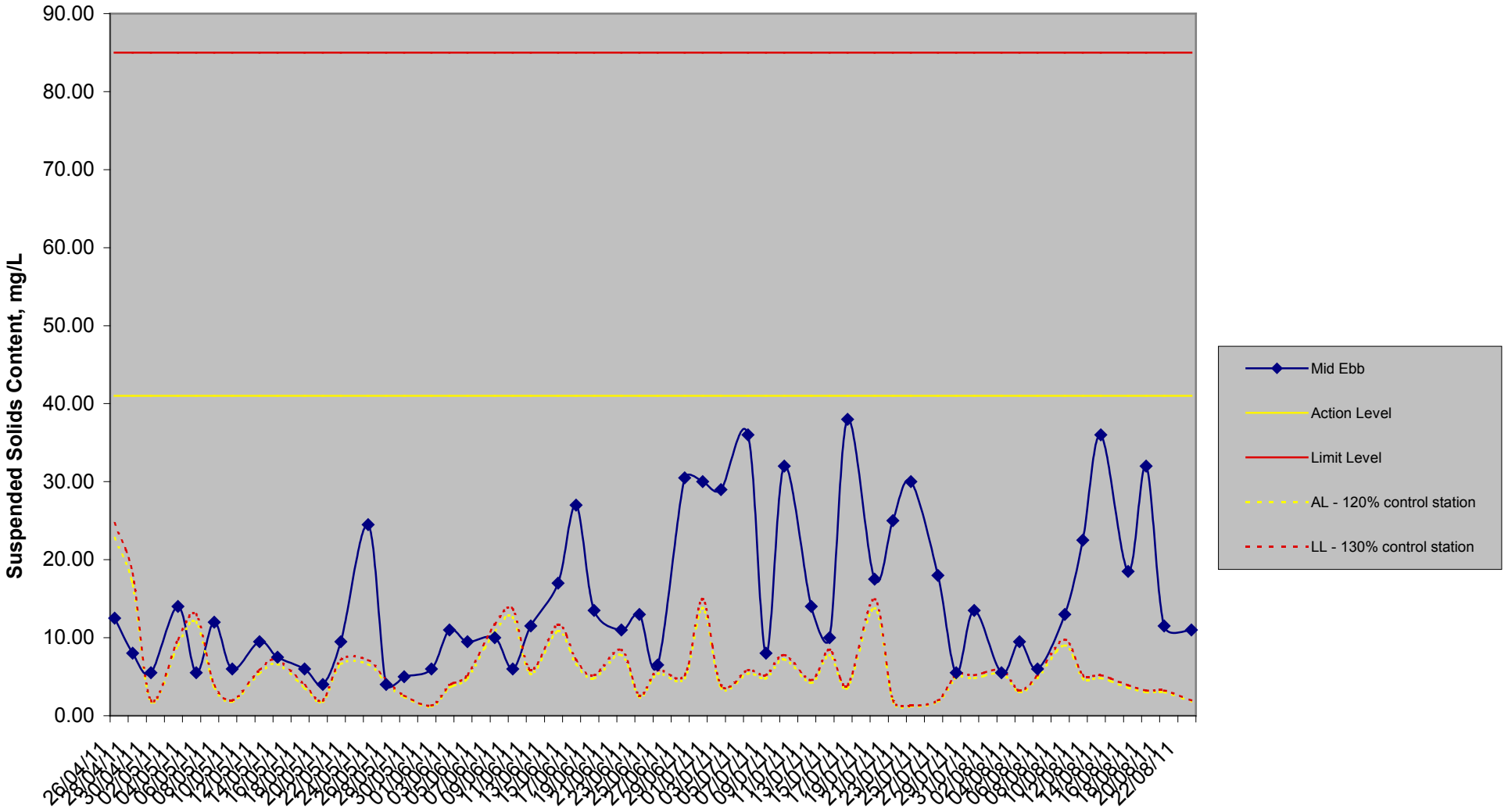
W1 - Suspended Solid Content (Mid-Ebb)



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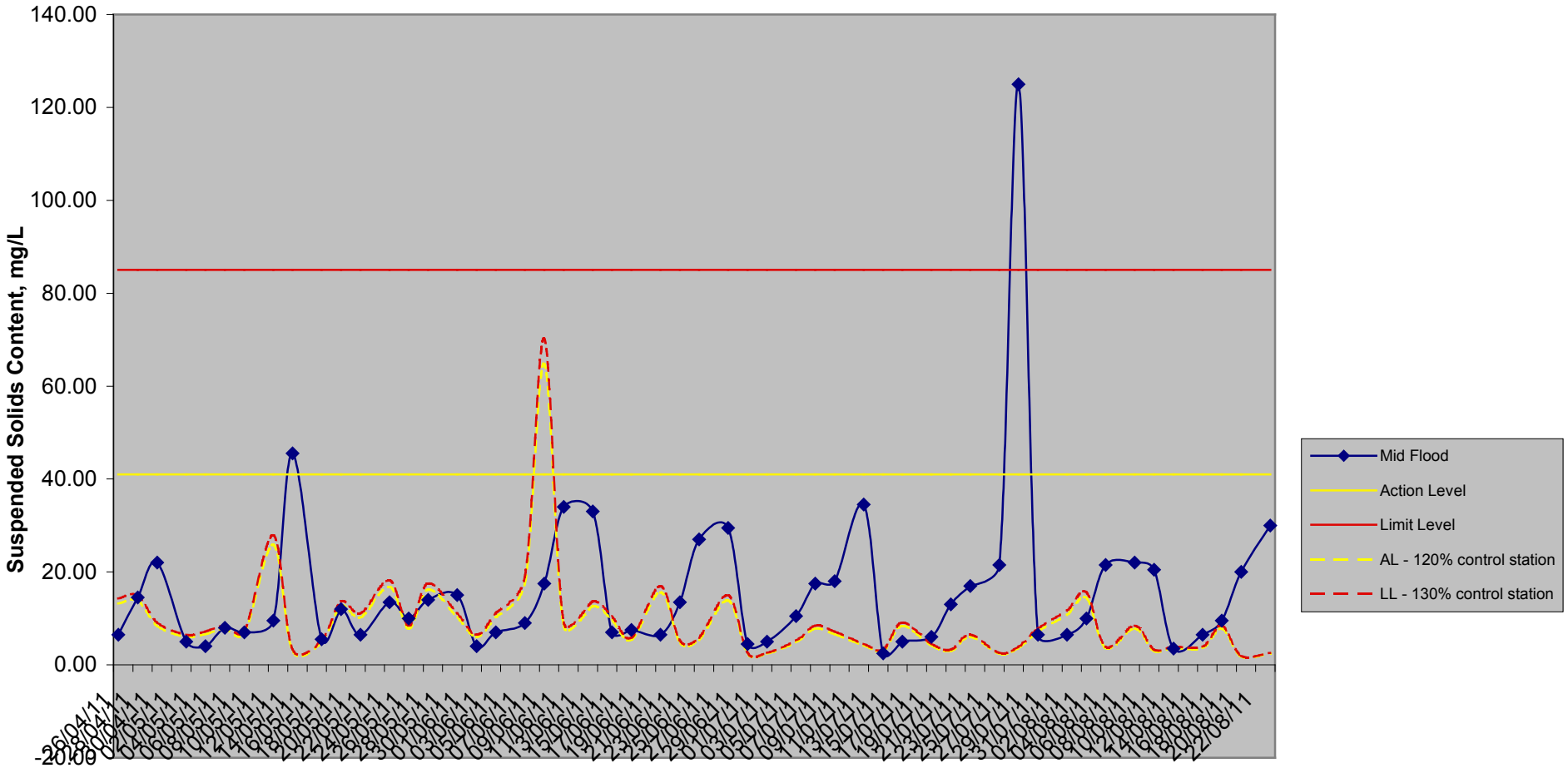
W1 - Suspended Solids Content (Mid-Flood)



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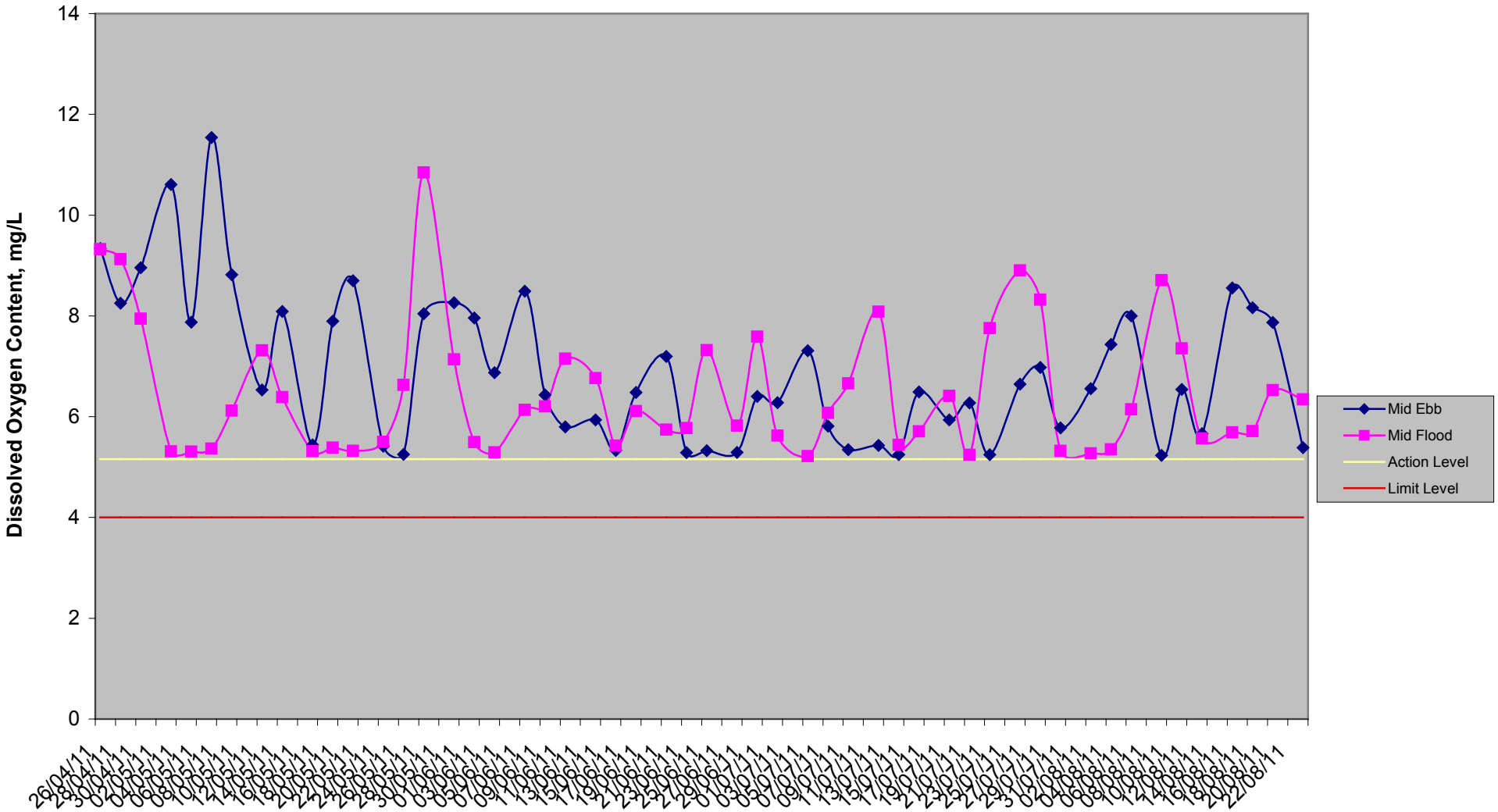
W2 - Dissolved Oxygen Content



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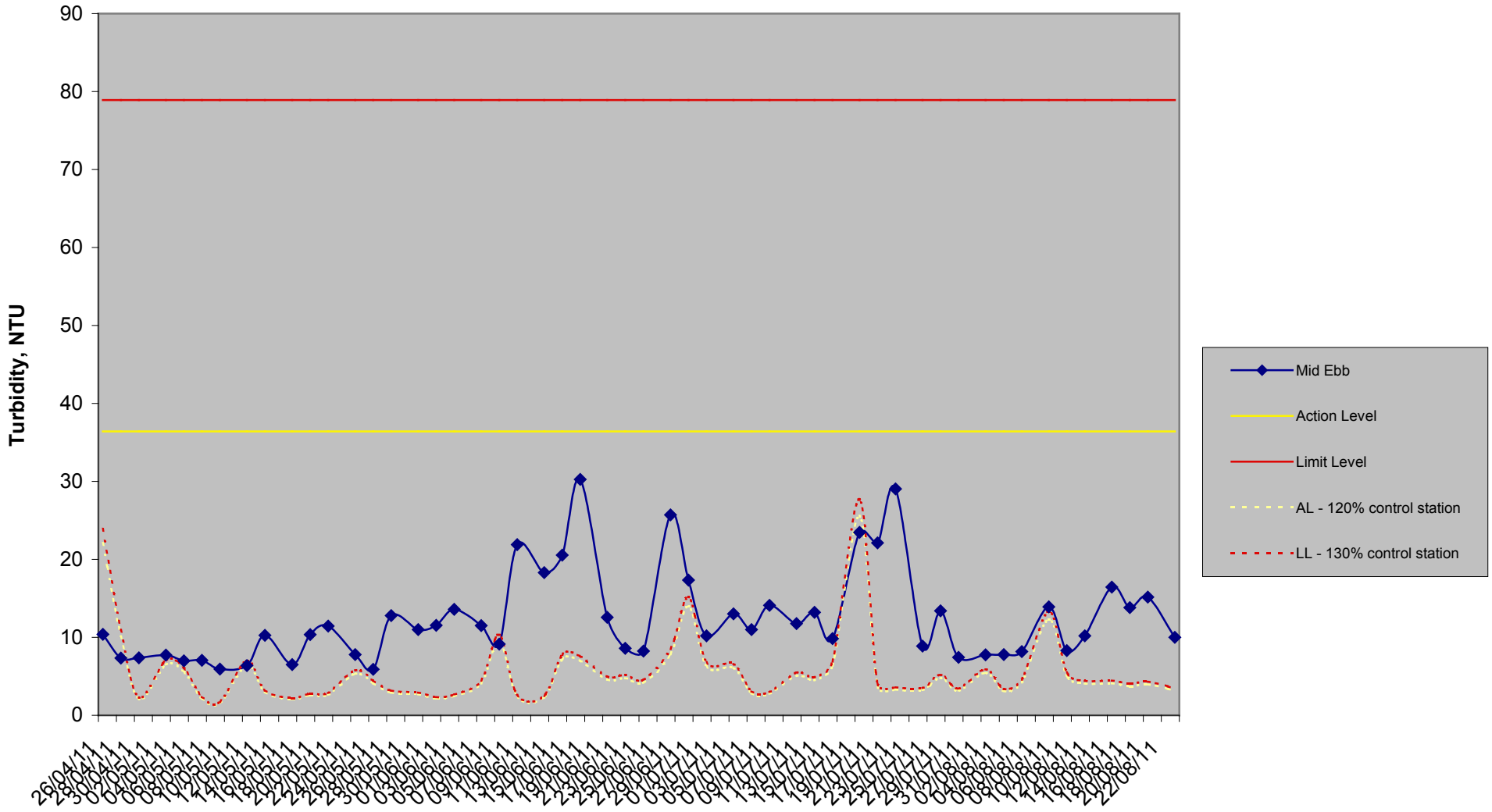
W2 - Turbidity (Mid-Ebb)



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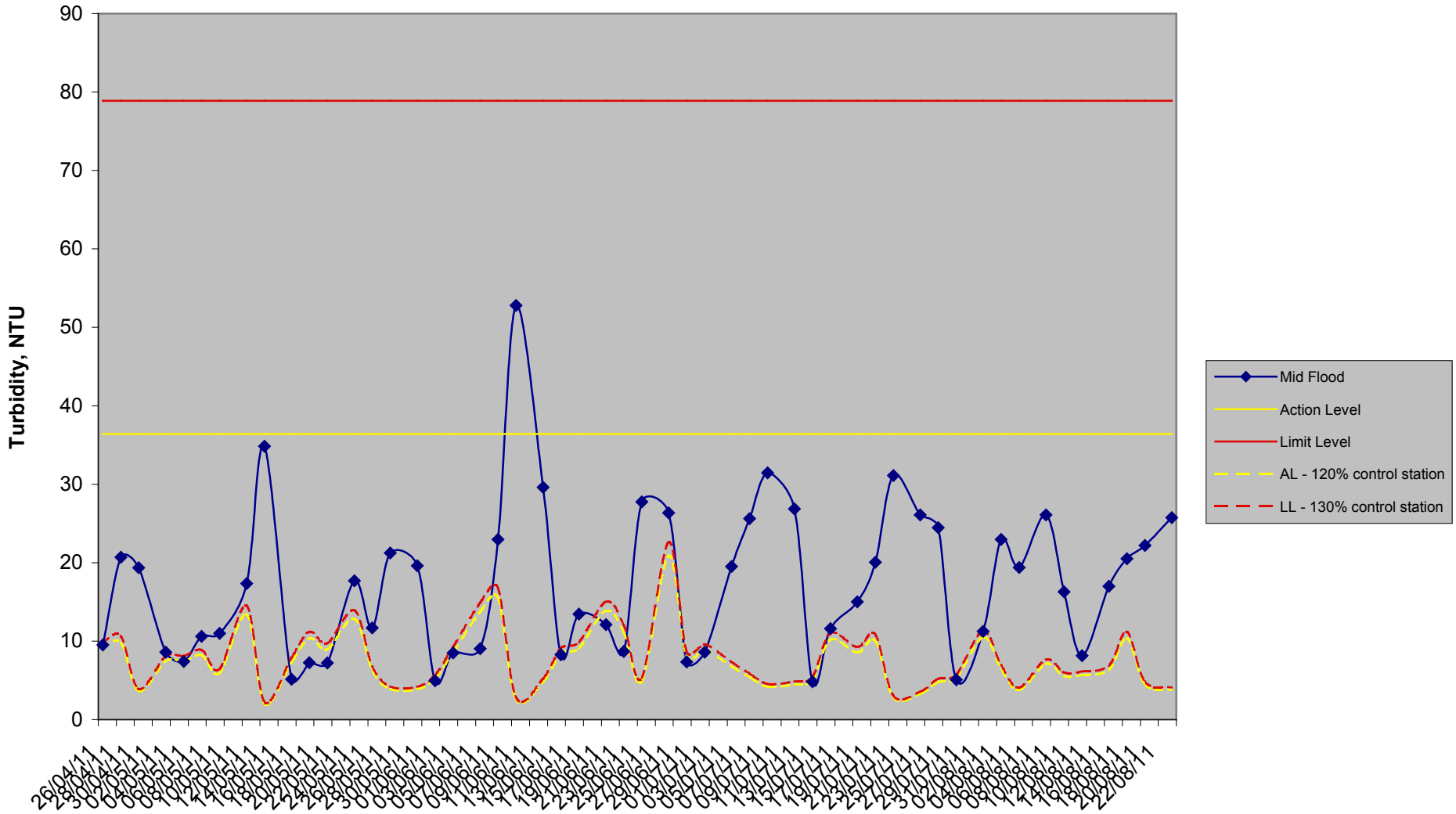
W2 - Turbidity (Mid-Flood)



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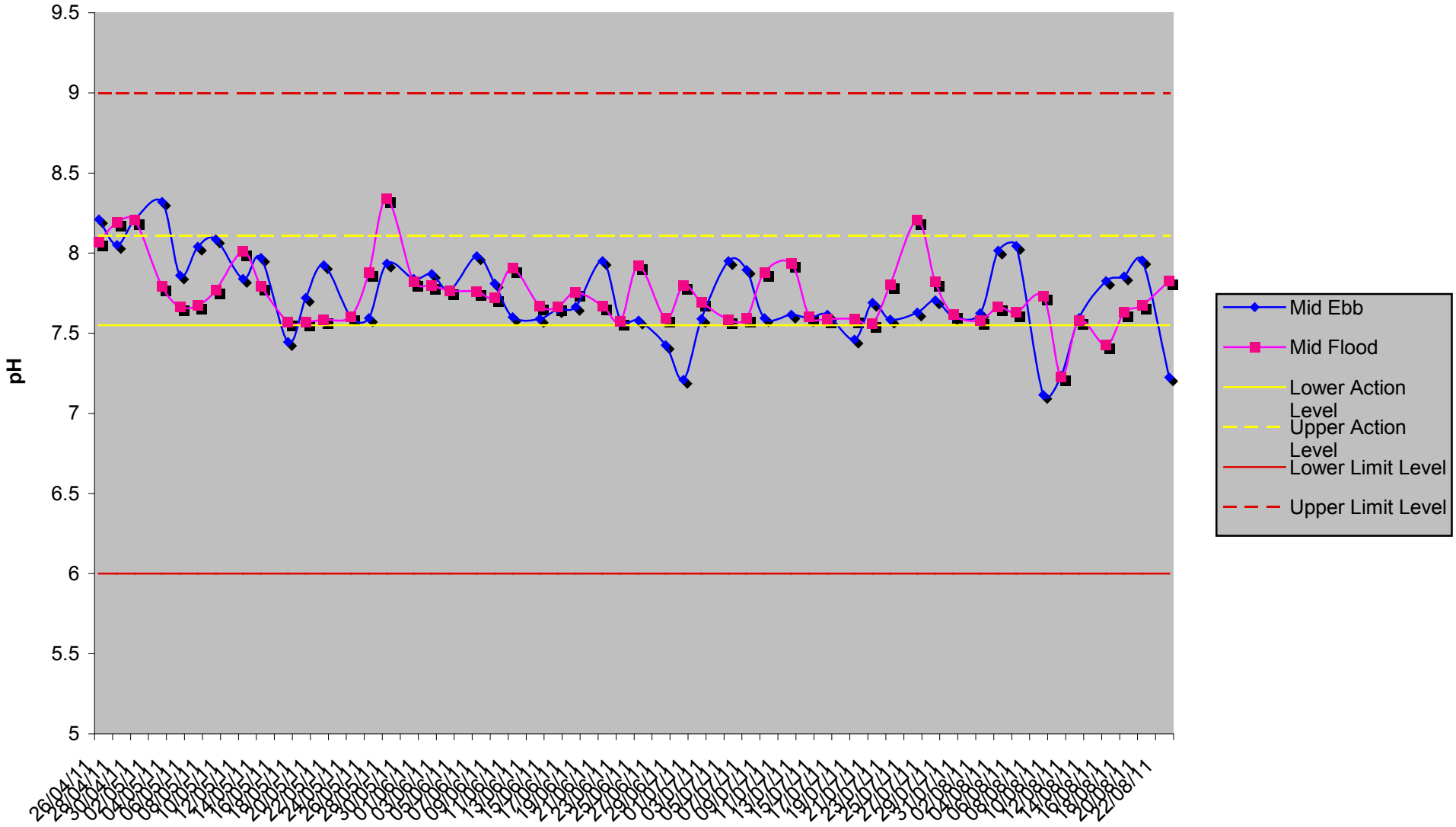
W2 - pH



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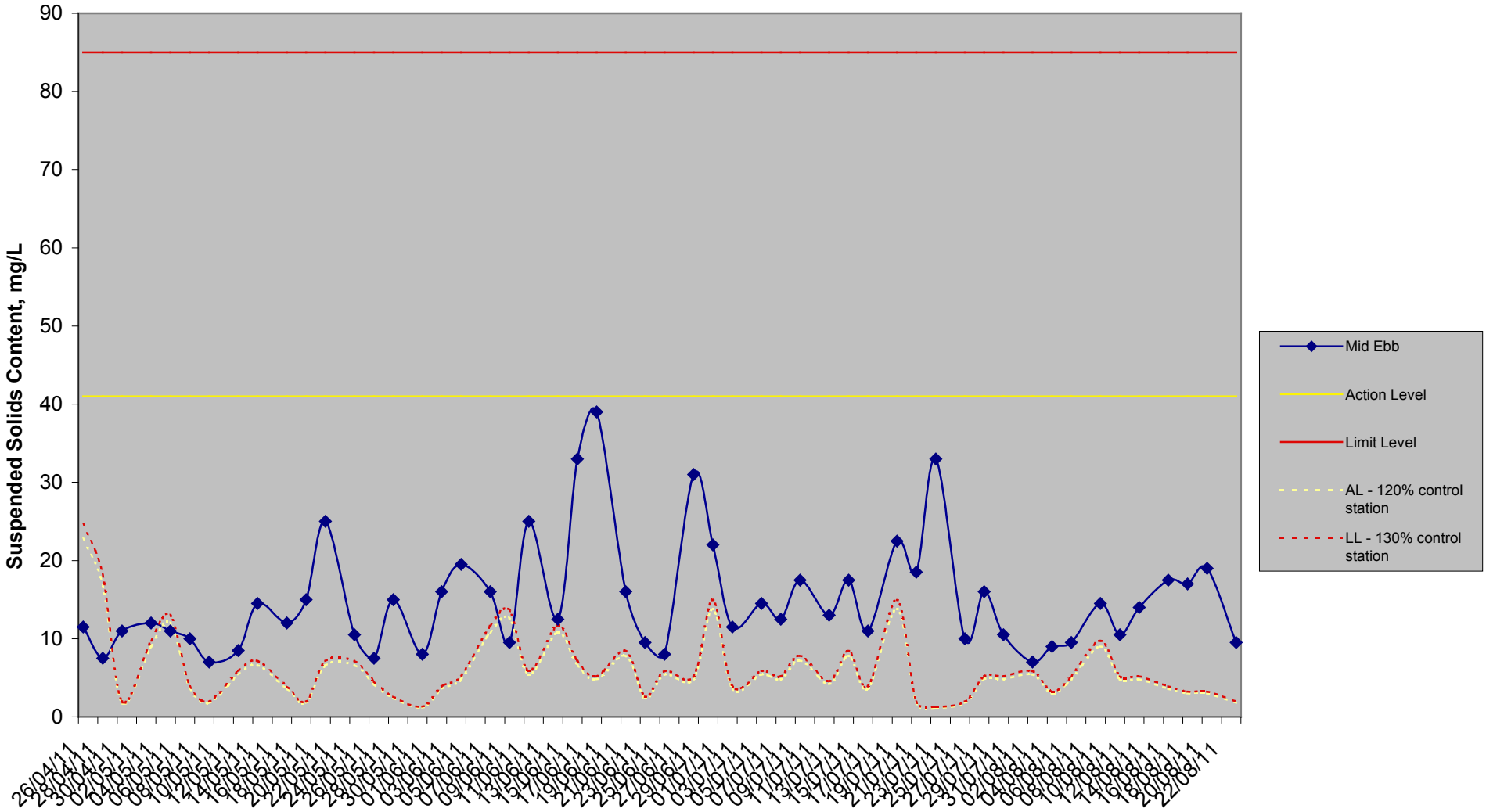
W2 - Suspended Solids Content (Mid-Ebb)



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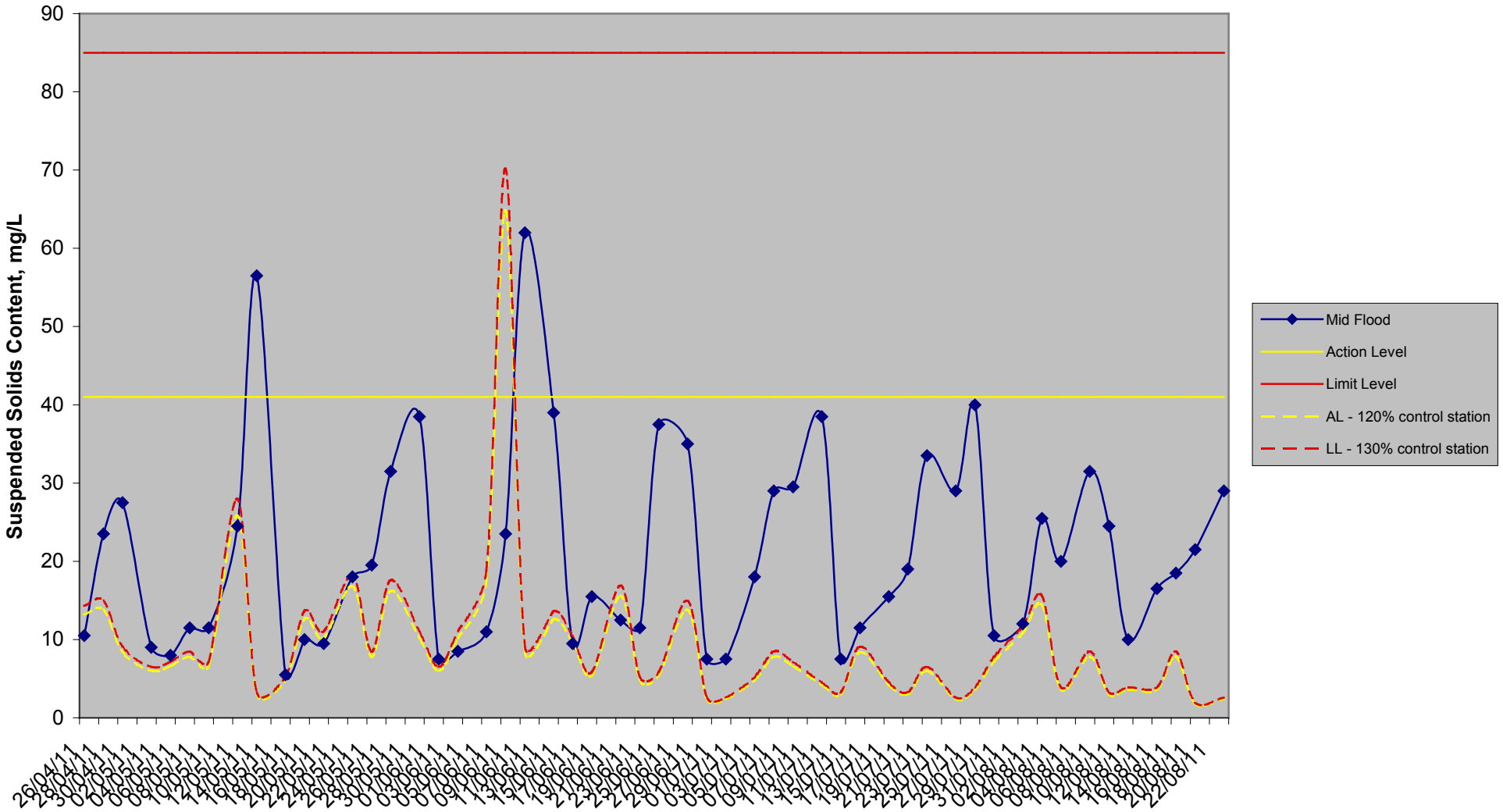

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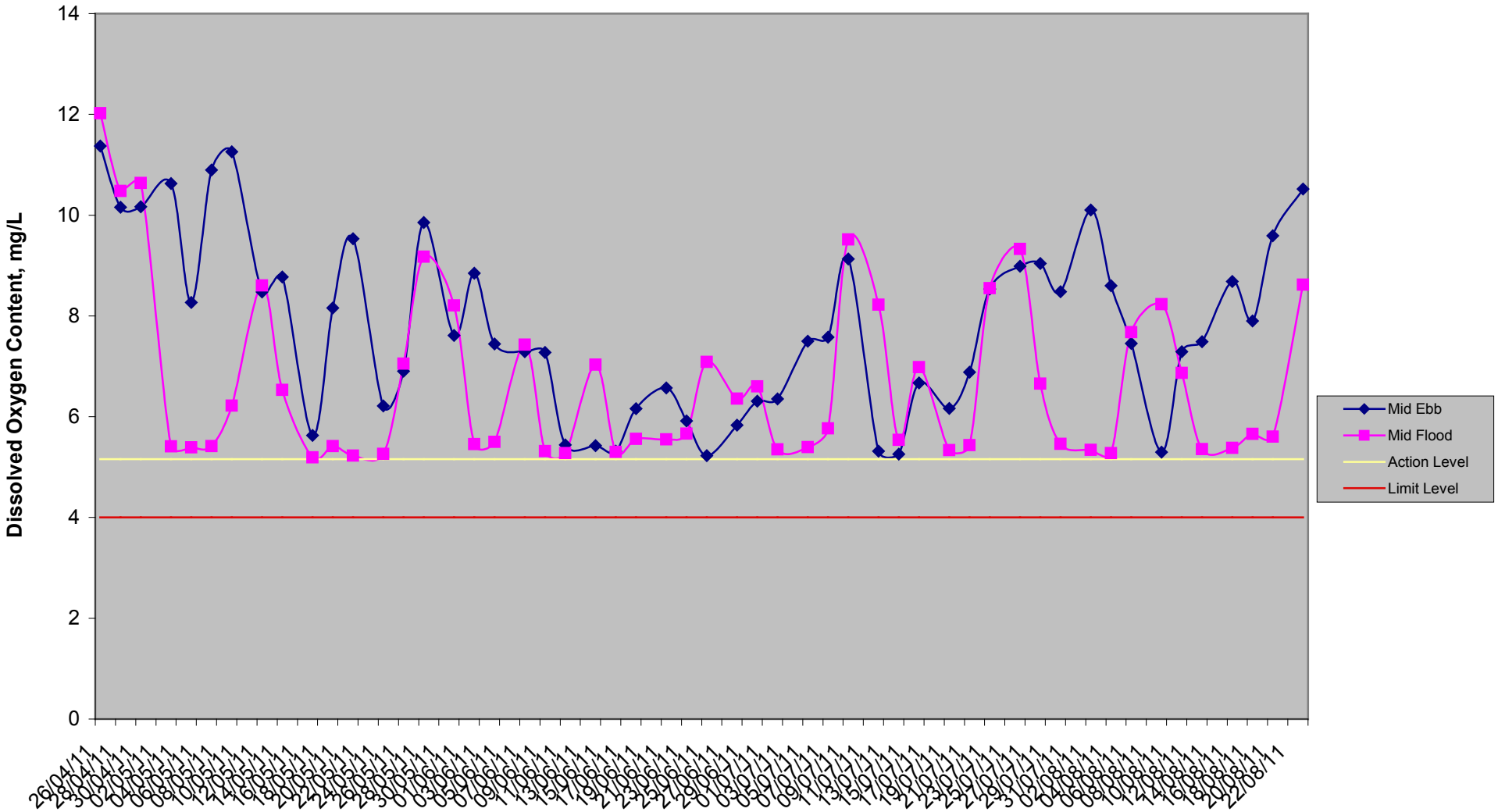
W3 - Dissolved Oxygen Content



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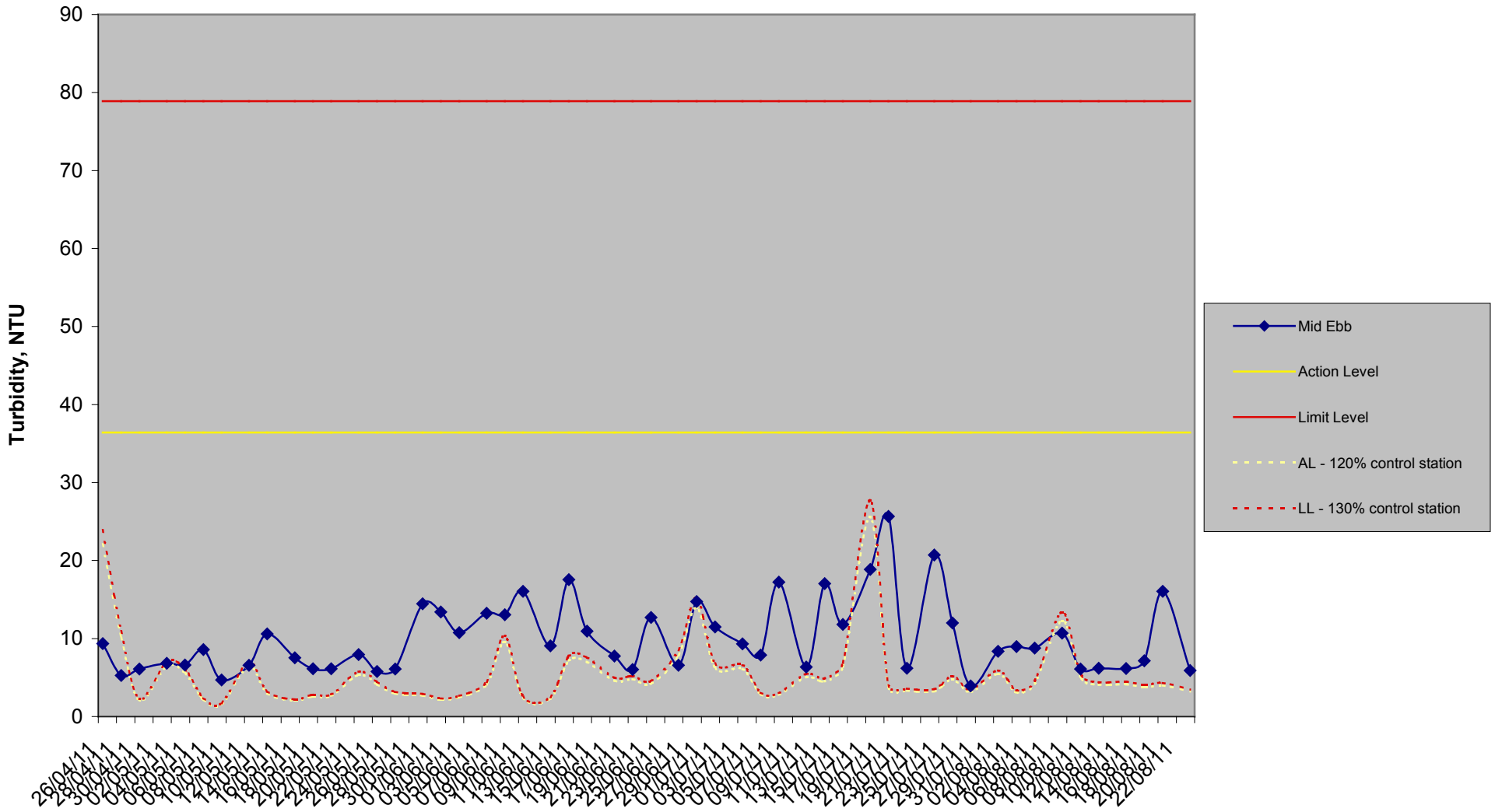
W3 - Turbidity (Mid-Ebb)



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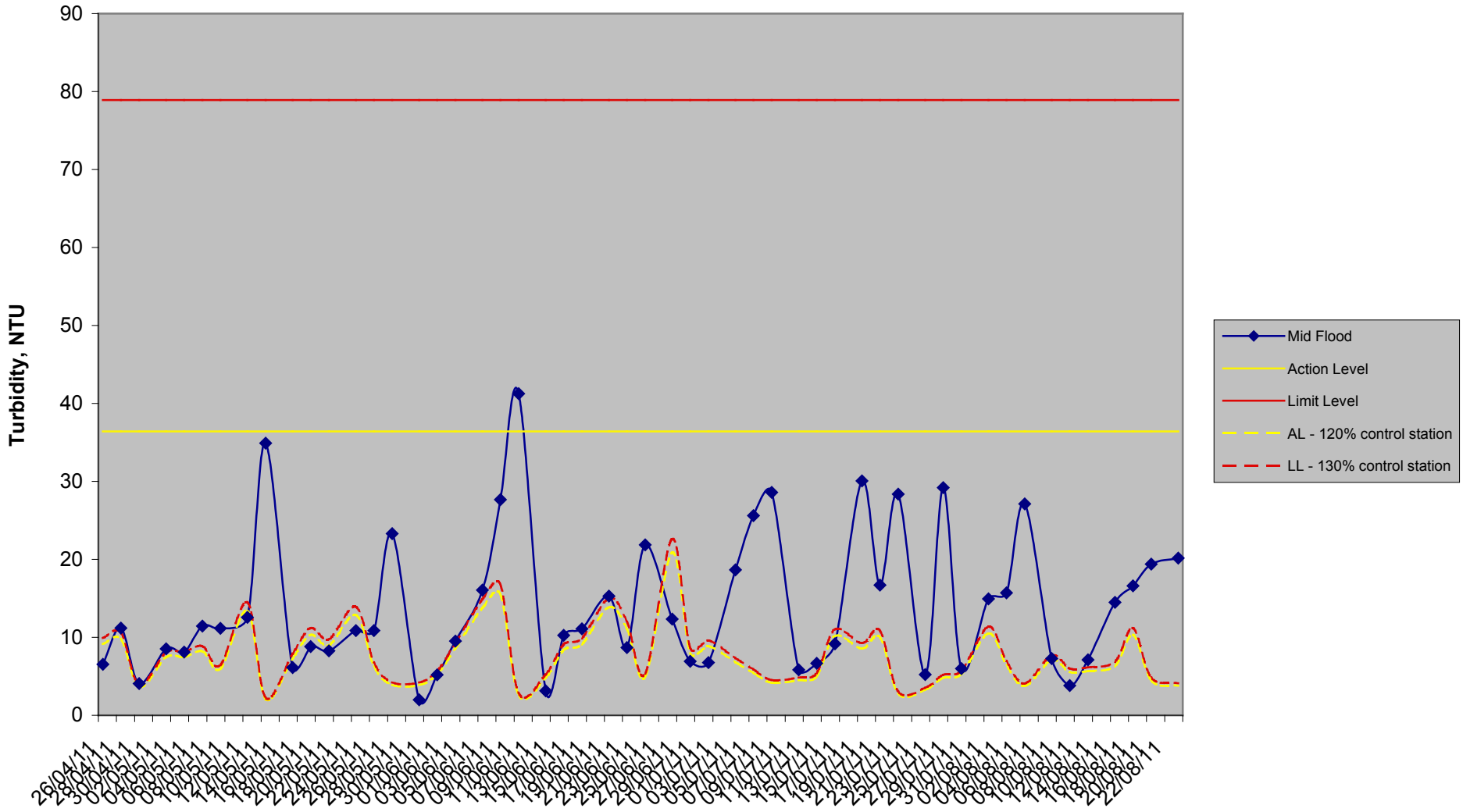
W3 - Turbidity (Mid-Flood)



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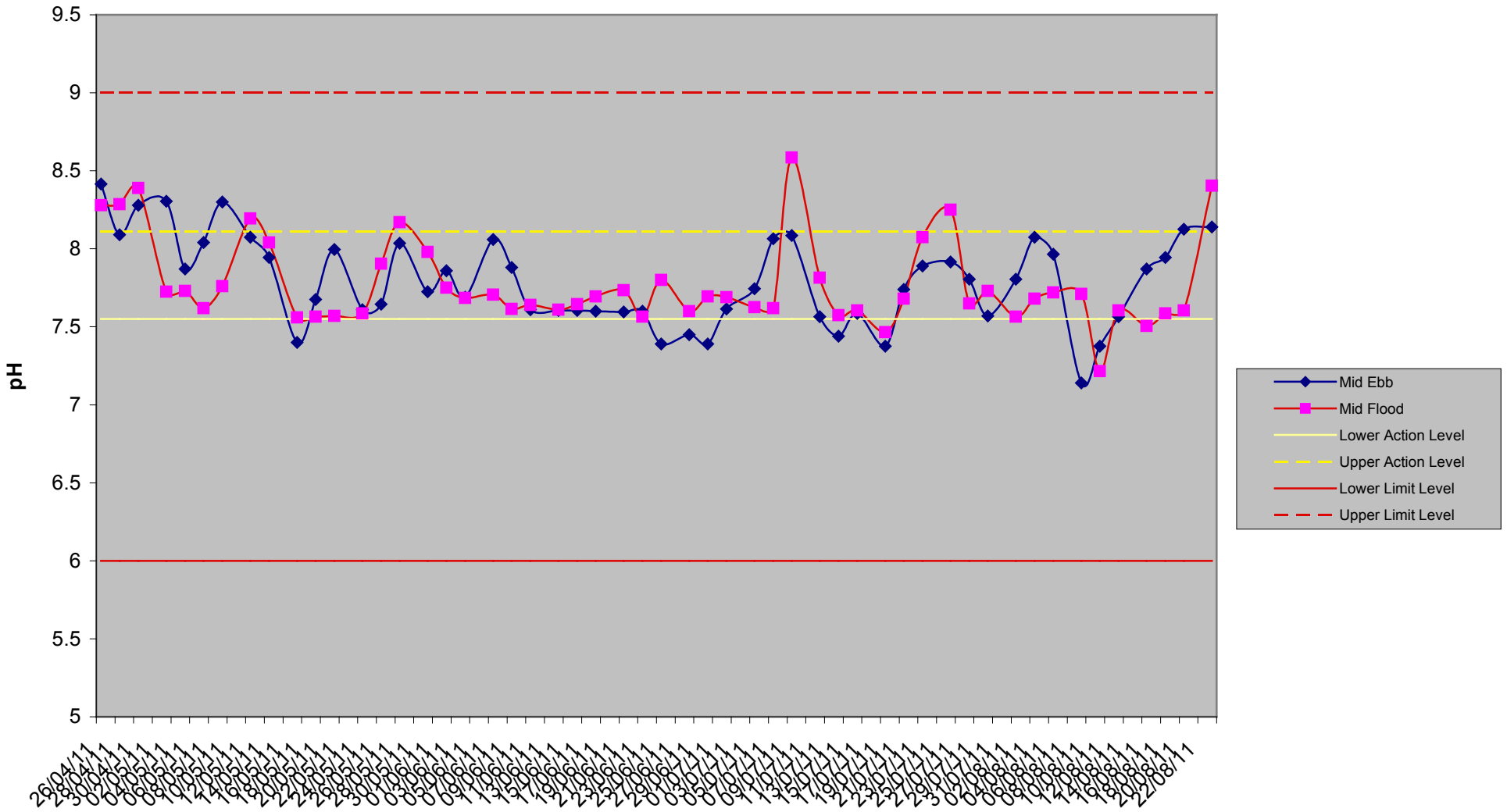
W3 - pH



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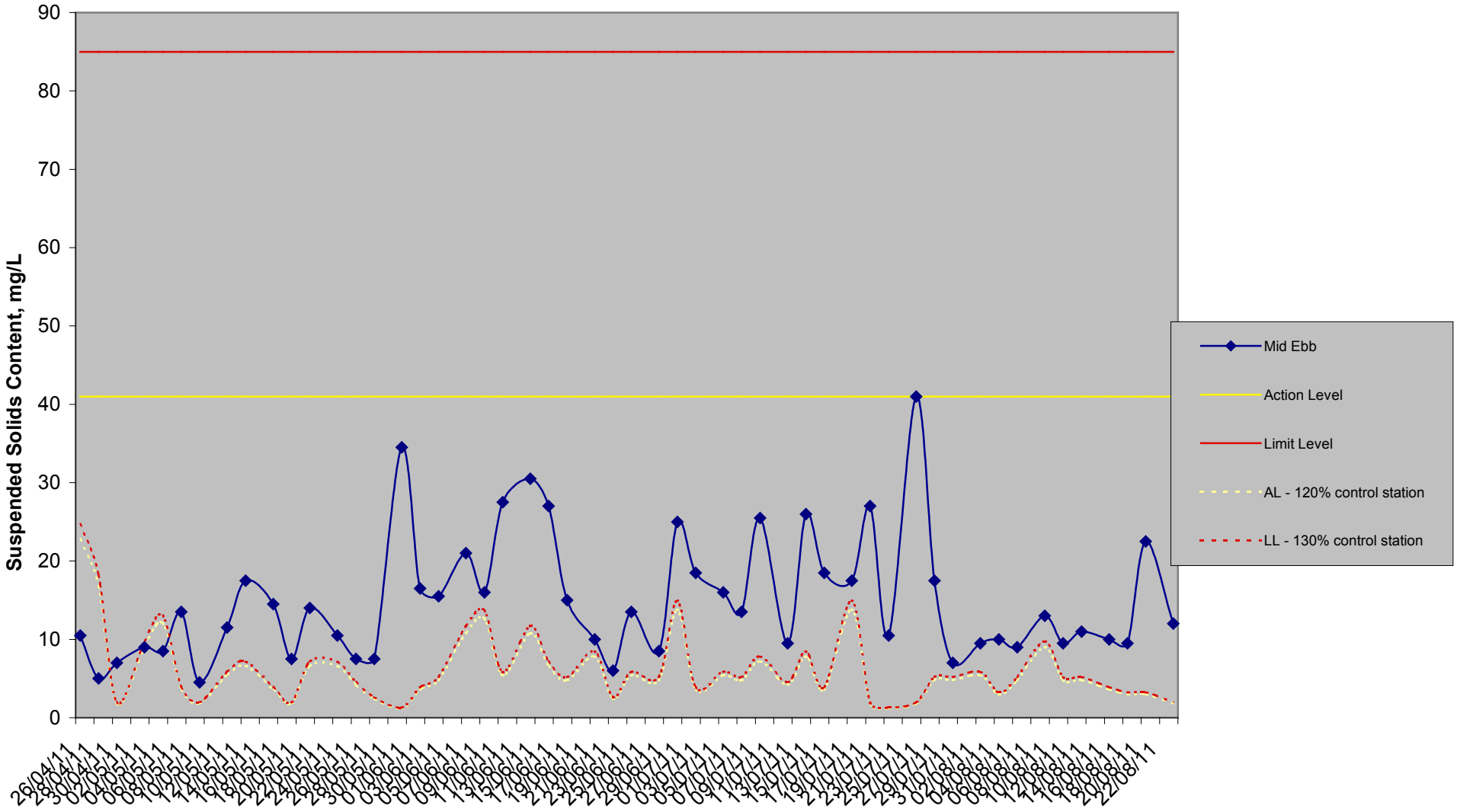
W3 - Suspended Solids Content (Mid-Ebb)



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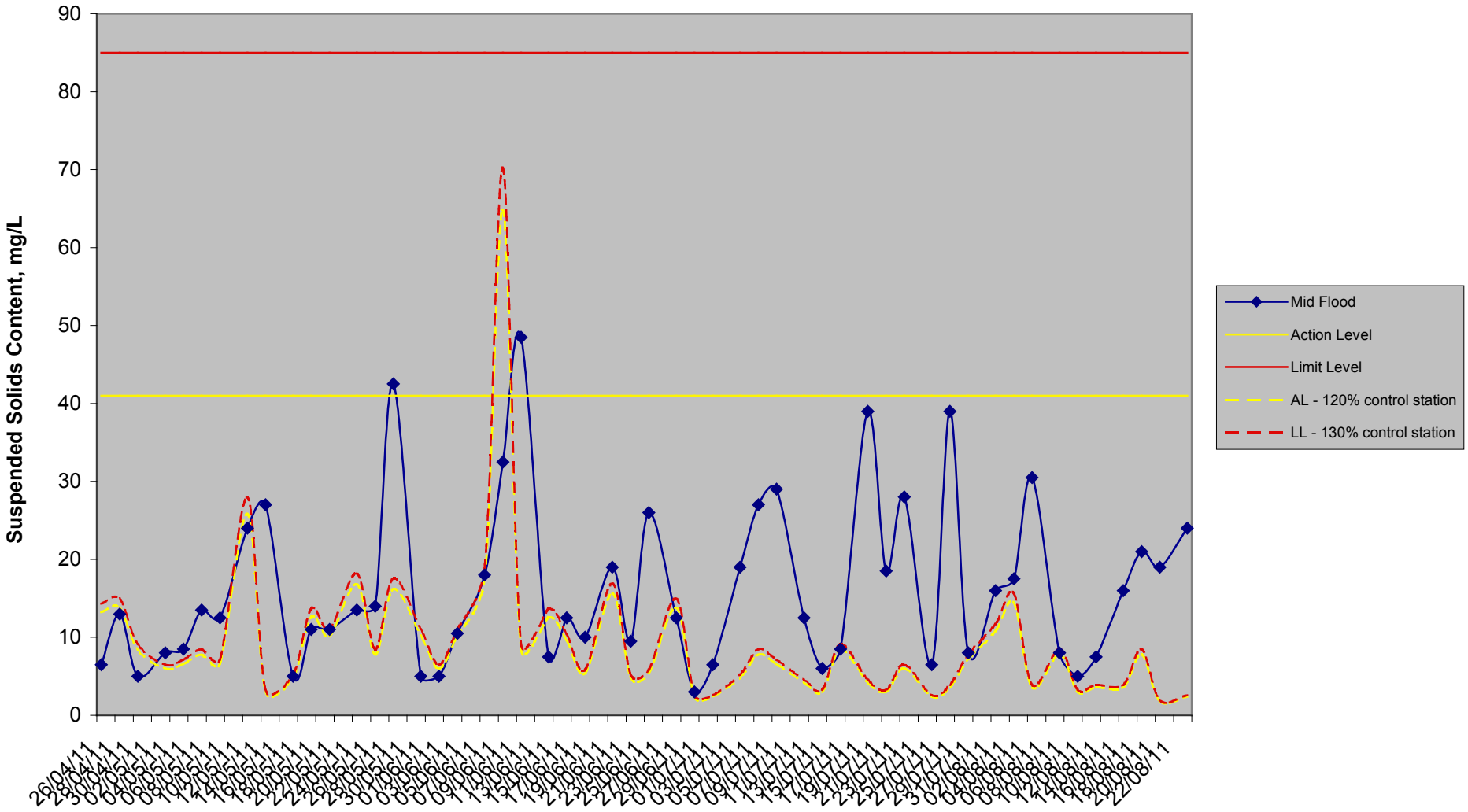

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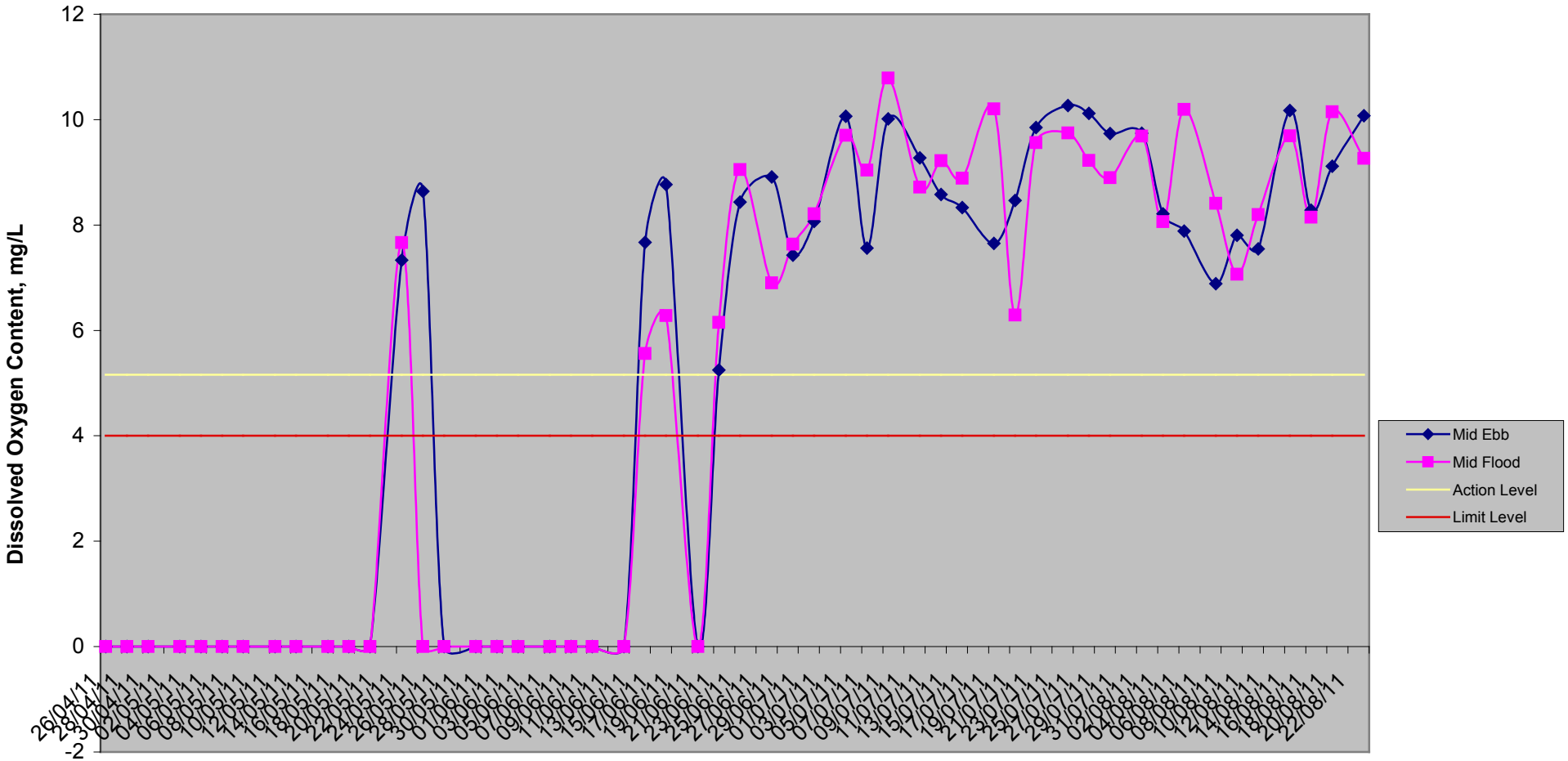
C1 - Dissolved Oxygen Content



Remark: No water at C1 occasionally after 17/02/2011. Zero values are shown in the graph

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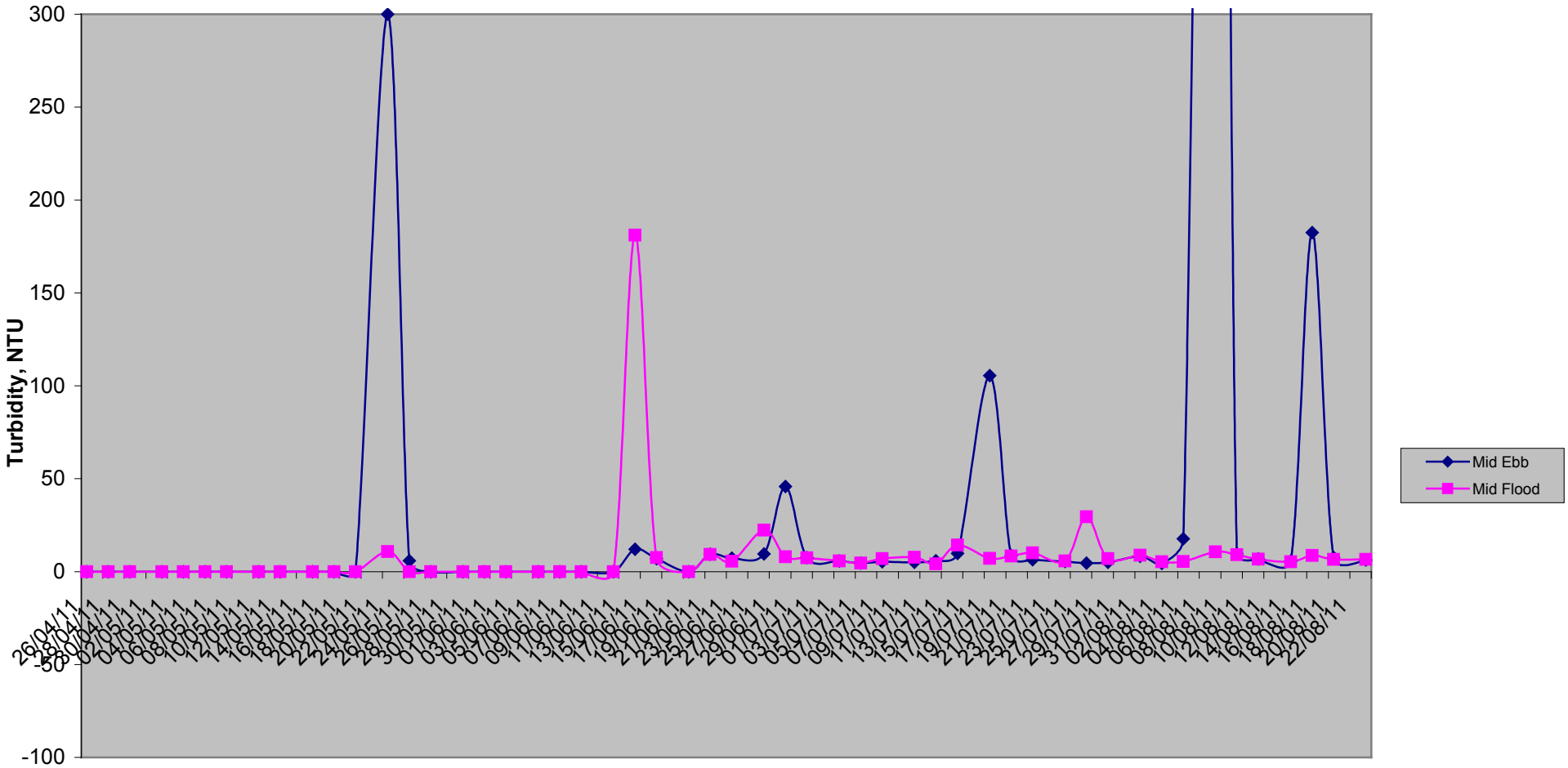
C1 - Turbidity



Remark: No water at C1 occasionally after 17/02/2011. Zero values are shown in the graph

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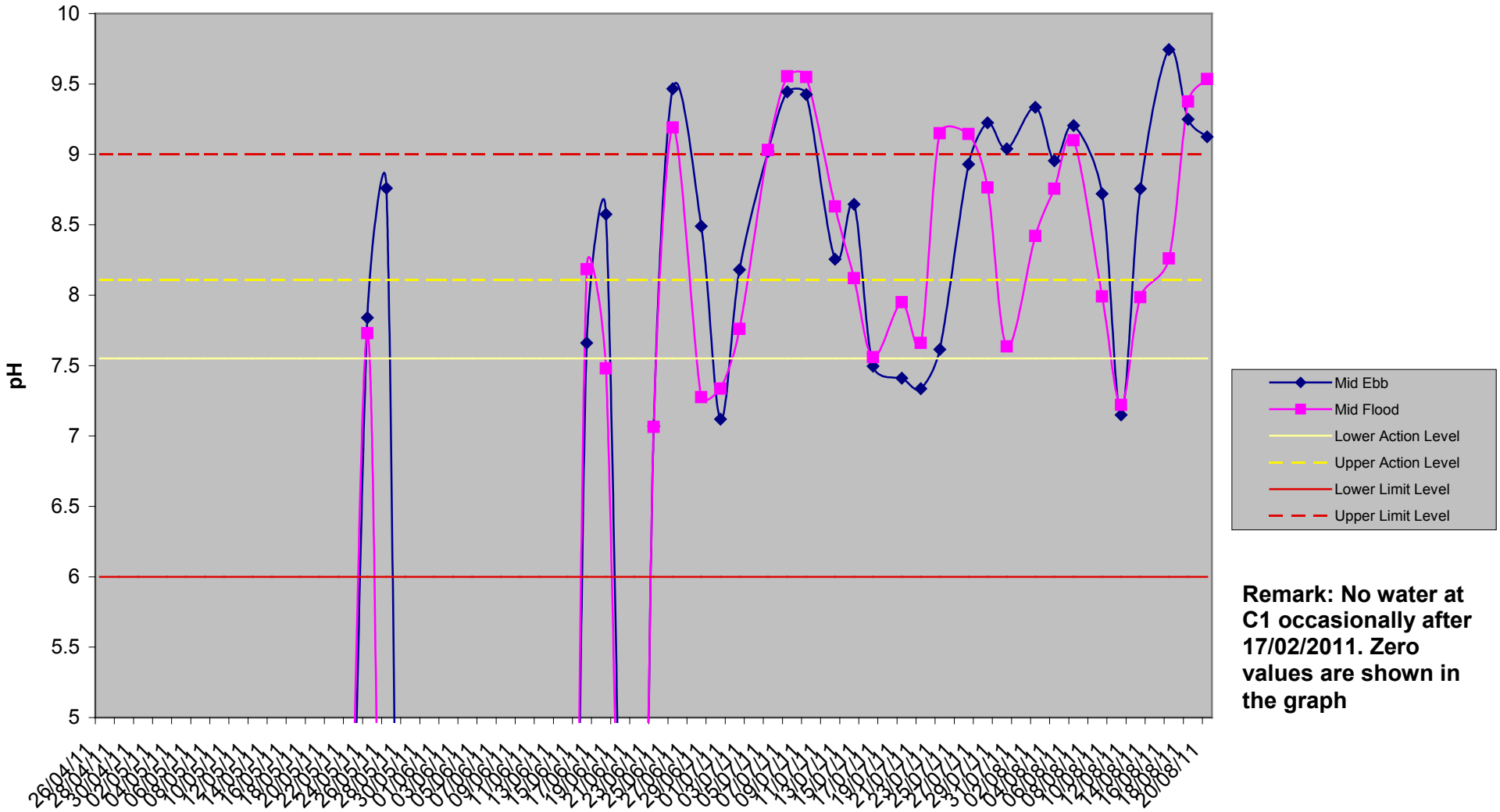
C1 - pH



Remark: No water at C1 occasionally after 17/02/2011. Zero values are shown in the graph

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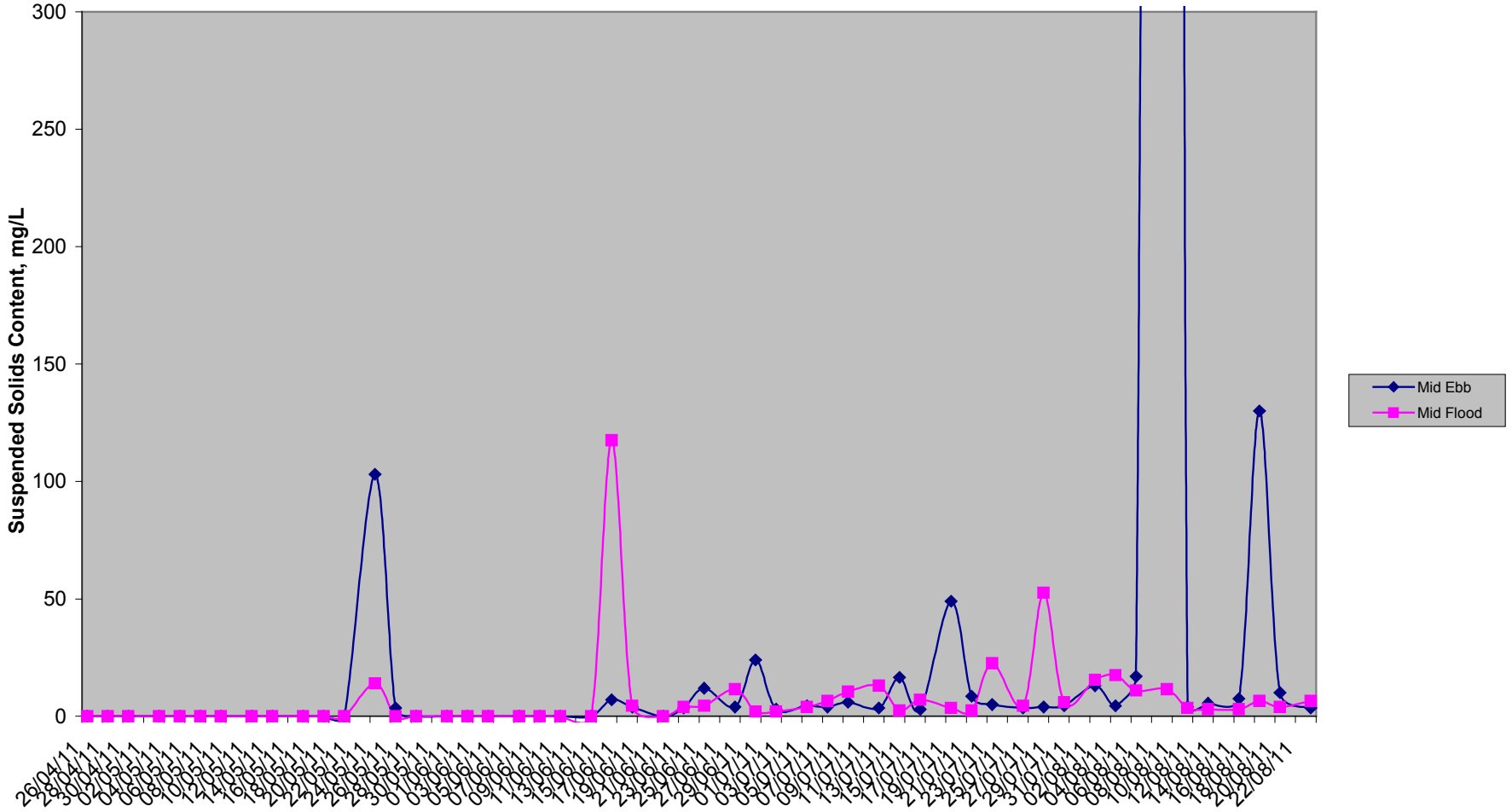
C1 - Suspended Solids Content



Remark: No water at C1 occasionally after 17/02/2011. Zero values are shown in the graph

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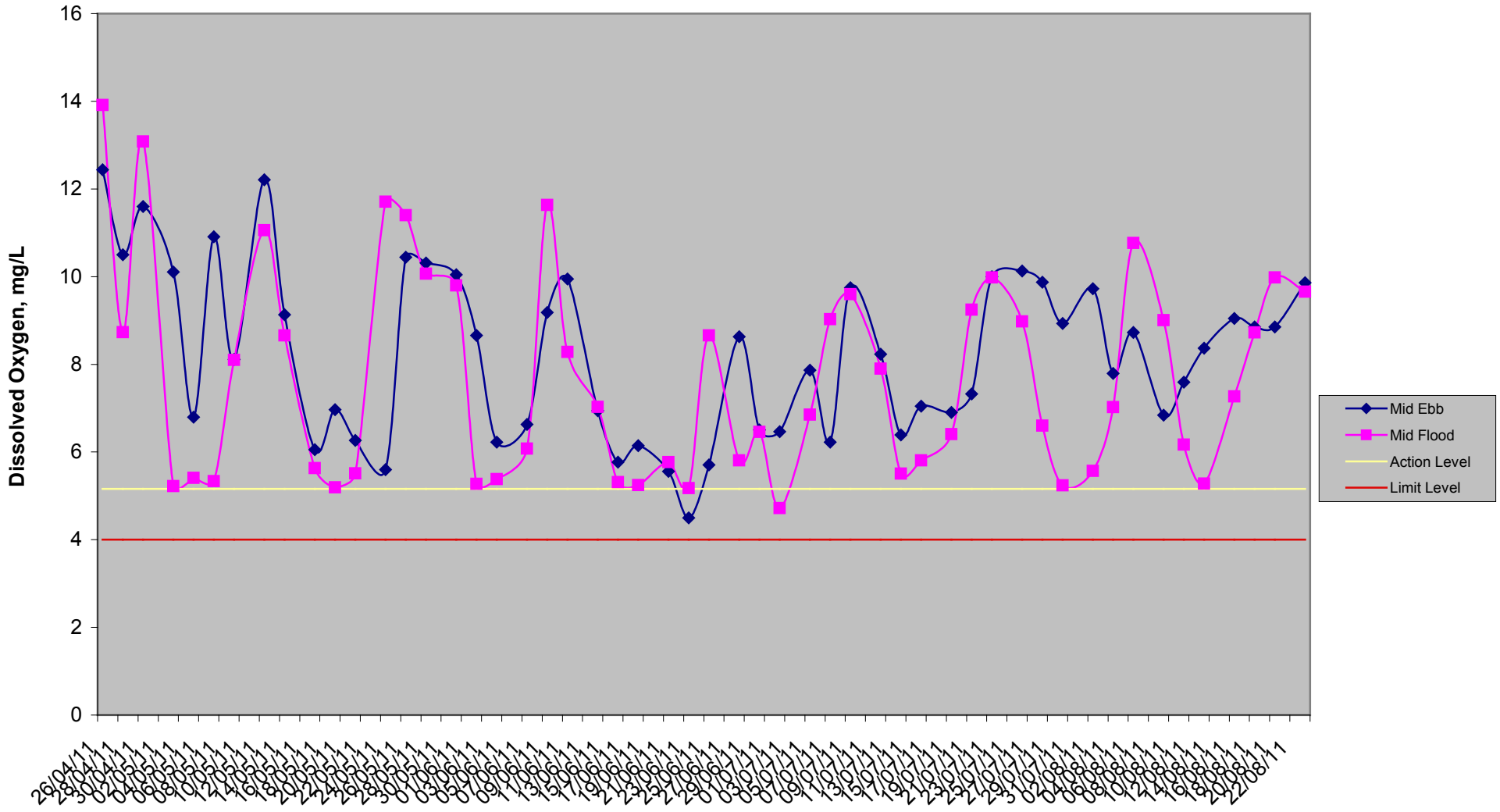
C2 - Dissolved Oxygen Content



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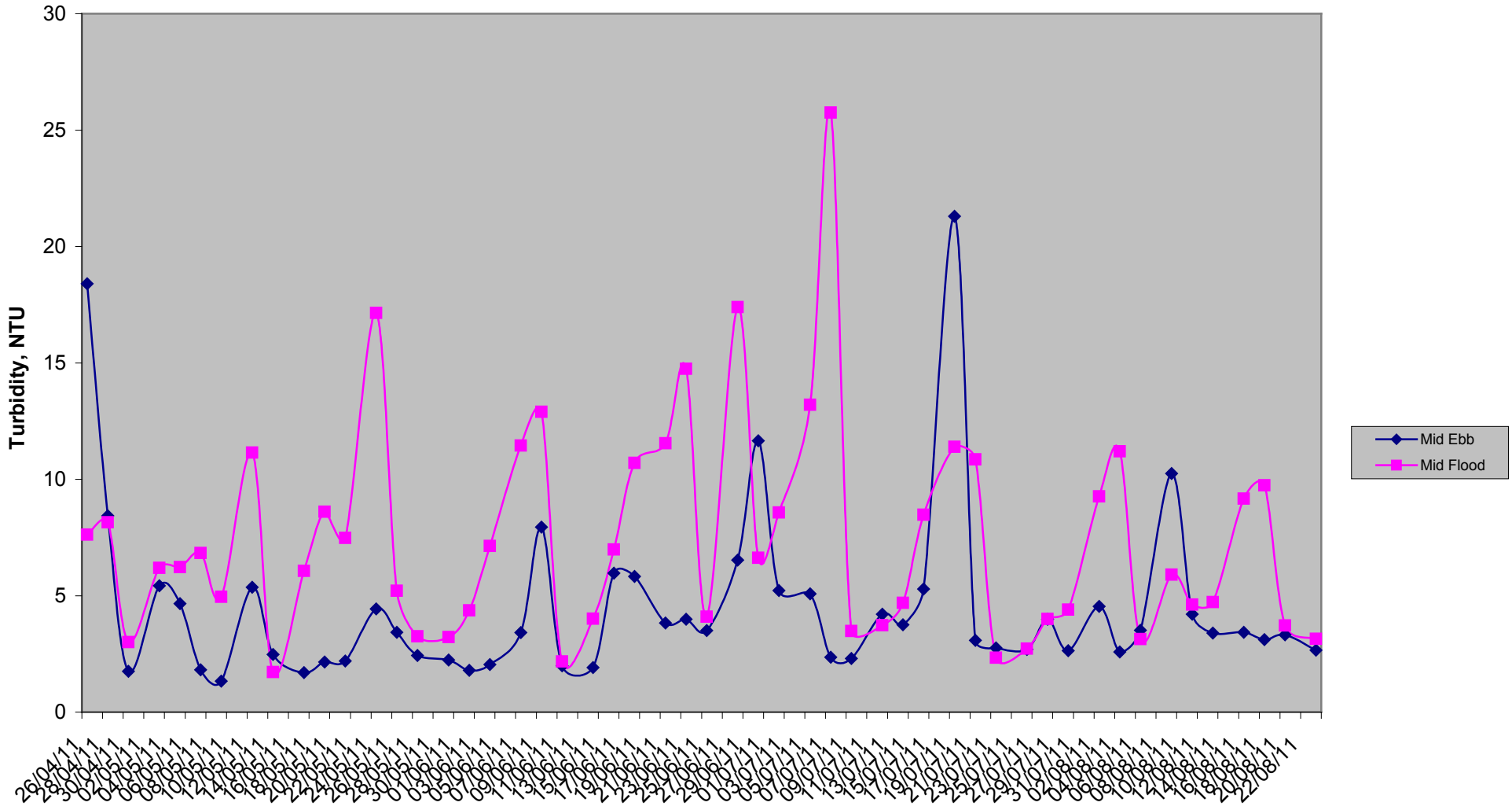
C2 - Turbidity



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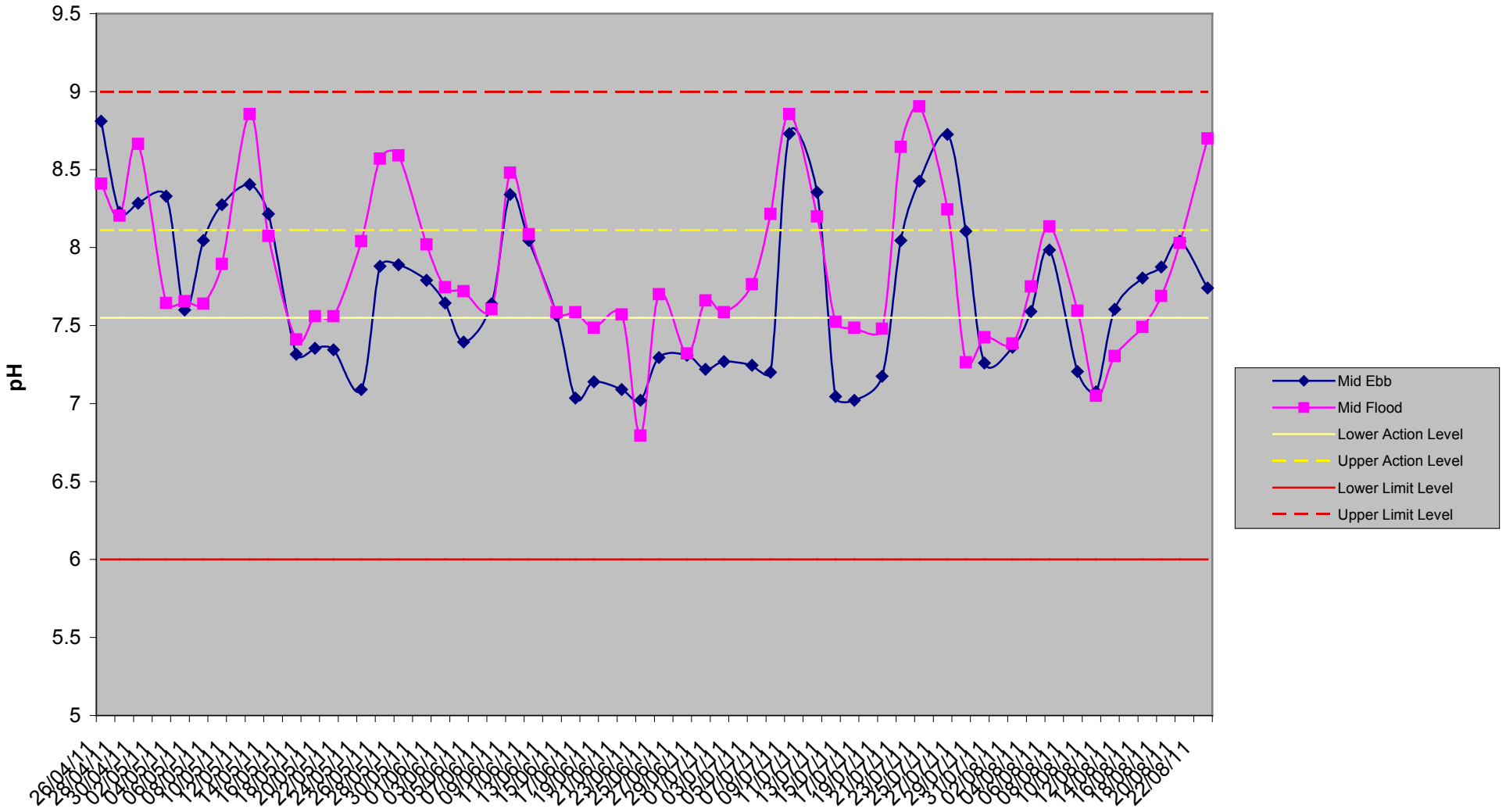
C2 - pH



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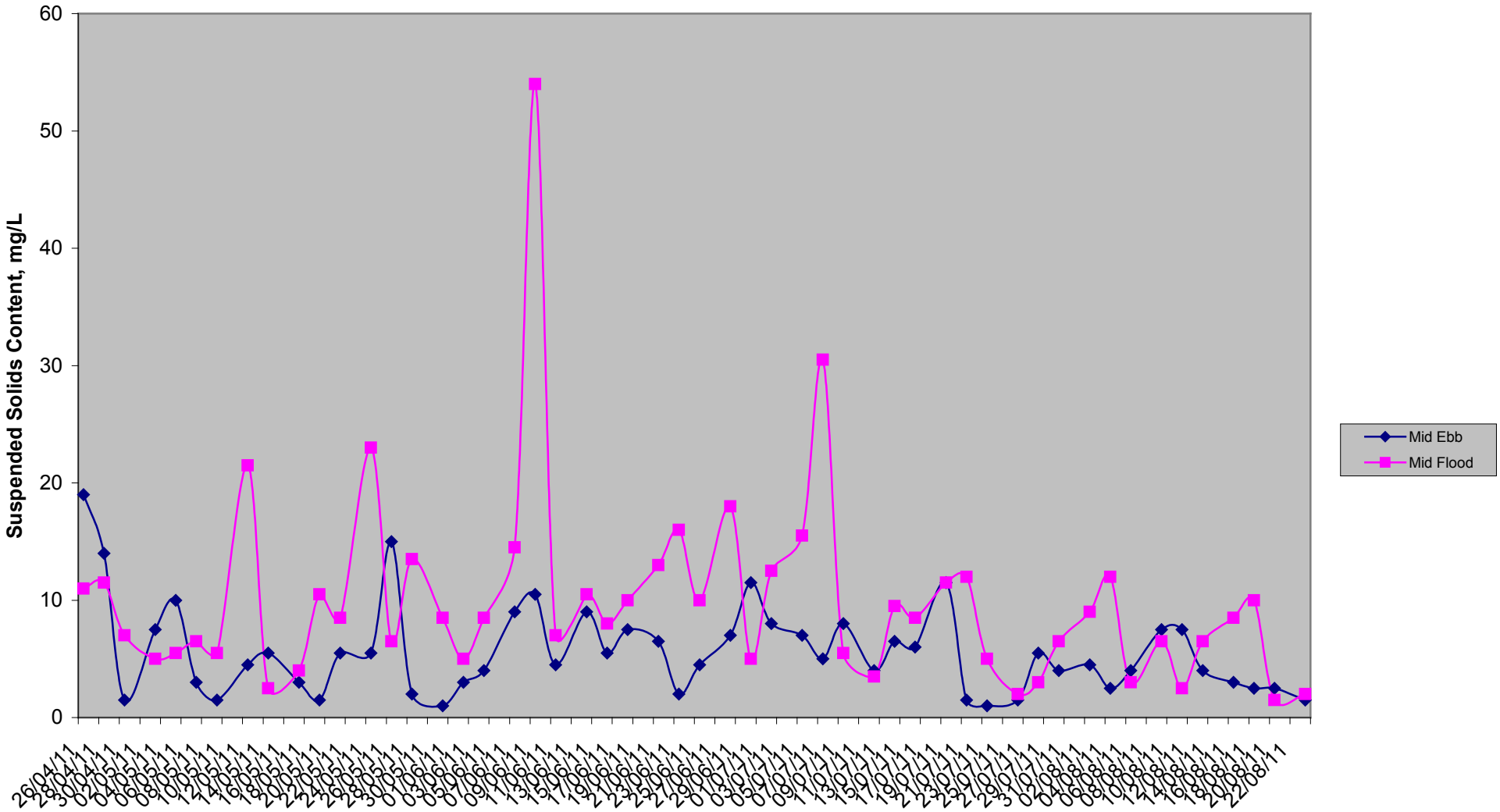
C2 - Suspended Solids Content



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Appendix 3

Summary of Ecology Monitoring

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		25 May 2011 to 24 June 2011		25 June 2011 to 24 July 2011		25 July 2011 to 24 Aug 2011	
Species Name	Scientific Name	Middle Lagoon	Notable / Breeding Activity	Middle Lagoon	Notable / Breeding Activity	Middle Lagoon	Notable / Breeding Activity
Barn Swallow	*Hirundo rustica*	100	NO	0	-	0	-
Black-collared Starling	*Sturnus nigricollis*	0	-	8	NO	0	-
Black Drongo	*Dicrurus macrocercus*	0	-	1	NO	5	NO
Chinese Bulbul	*Pycnonotus sinensis*	4	NO	0	-	0	-
Chinese Francolin	*Francolinus pintadeanus*	1	Calling	0	-	0	-
Common Koel	*Eudynamys scolopacea*	1	Calling	0	-	0	-
Common Magpie	*Pica pica*	1	NO	0	-	2	NO
Common Sandpiper	*Actitis hypoleucos*	0	-	2	NO	2	NO
Crested Myna	*Acridotheres cristatellus*	18	Adult with Juvenile	31	Adults with fledged Juveniles	0	-
Great Egret	*Egretta alba*	0	-	1	NO	0	-
Hair-crested Drongo	*Dicrurus hottentottus*	3	Adult with Juvenile	0	-	0	-
Large Hawk Cuckoo	*Hierococcyx sparveriodes*	1	Calling	0	-	0	-
Little Egret	*Egretta garzetta*	3	NO	7	NO	2	NO
Little Grebe	*Tachybaptus ruficollis*	14	4 nests in the SW corner of Lagoon. Other pairs holding territory	12	Adults with swimming young	32	includes 12 chicks
Little Ringed Plover	*Charadrius dubius*	2	Suspected Breeding	1	NO	0	-
Long-tailed Shrike	*Lanius schach*	1	NO	0	-	3	NO
Masked Laughing-thrush	*Garrulax perspicillatus*	1	NO	0	-	0	-
Purple Heron	*Ardea purpurea*	0	-	1	NO	0	-
Red-billed Starling	*Sturnes sericeus*	21	Adult with Juvenile - unusual HK Record	0	-	0	-
Spotted Dove	*Streptopelia chinensis*	1	NO	0	-	0	-
Watercock	*Gallicrex cinerea*	1	Male in breeding Condition in Habitat suitable for breeding - Unusual HK record	0	-	0	-
White-shouldered Starling	*Sturnus sinensis*	0	-	5	Adults with fledged juveniles	0	-
White-throated Kingfisher	*Halcyon smyrnensis*	1	NO	0	-	1	NO

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(Con't)

		25 May 2011 to 24 June 2011		25 June 2011 to 24 July 2011		25 July 2011 to 24 Aug 2011	
Species Name	Scientific Name	Middle Lagoon	Notable / Breeding Activity	Middle Lagoon	Notable / Breeding Activity	Middle Lagoon	Notable / Breeding Activity
White Wagtail	*Motacilla alba*	2	Adult with Juvenile	0	-	1	NO
Yellow-bellied Prinia	*Prinia flaviventris*	1	NO	0	-	0	-
Yellow Bittern	*Ixobrychus sinensis*	2	Two adults - Potential breeding	0	-	0	-
Total Numbers		179		69		48	
Total Species		20		10		8	

Note: NO - None observed

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Appendix 4

Summary of Landscape and Visual Impact Survey

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			25 May 2011 to 24 June 2011		25 June 2011 to 24 July 2011		25 July 2011 to 24 Aug 2011	
ID No.	Nature / Type	Landscape and Visual Mitigation Measures	Status	Remarks	Status	Remarks	Status	Remarks
CM 1	Design / Construction Planning	Topsoil, where identified, should be stripped and stored for re-use in the construction of the soft landscape works, where practical.	Not applicable.	The topsoil was PFA which is not suitable for re-use in the soft landscape works. Suitable topsoil will be imported for planting during landscape planting phase.	Not applicable.	The topsoil was PFA which is not suitable for re-use in the soft landscape works. Suitable topsoil will be imported for planting during landscape planting phase.	Not applicable.	The topsoil was PFA which is not suitable for re-use in the soft landscape works. Suitable topsoil will be imported for planting during landscape planting phase. As confirmed by Leighton, all the PFA has been buried inside the site confinement. PFA attached to the felled trees is washed and retained inside the site boundary.
CM 2	Site Practice	Existing trees to be retained on site should be carefully protected during construction.	Second part of the Tree Felling Application has been approved by DLO and tree felling work has commenced since the approval. Proper procedures of tree felling have been observed during the process.	Photographic record of the fell tree are shown in Table 4.10, Monthly EM&A Report of June 2011.	Second part of the Tree Felling Application has been approved by DLO and tree felling work has commenced since the approval. Proper procedures of tree felling have been observed during the process. Existing trees should be carefully protected during construction.	Photographic record of the fell tree and existing trees are shown in Table 4.10, Monthly EM&A Report of July 2011.	Tree felling work has commenced since the approval of Phase II tree felling application. Proper procedures of tree felling have been observed during the process. Existing trees to be retained have been carefully protected during construction.	Photographic record of the retained trees are shown in Table 4.10, Monthly EM&A Report of Aug 2011.
CM 3	Design / Construction Planning	Trees unavoidably affected by the works should be transplanted where practical.	In progress.	Trees to be transplanted are proposed in the tree felling application to be submitted to DLO. Transplant work has not commenced yet.	In progress.	Trees to be transplanted are proposed in the tree felling application to be submitted to DLO. Transplant work has not commenced yet.	Tree transplant work has commenced since the approval of Phase II tree felling application. Proper procedures of tree transplant have been observed during the process.	Photographic record of the transplant trees T332 to 359 are shown in Table 4.10, Monthly EM&A Report of Aug 2011.

(Con't)

			25 May 2011 to 24 June 2011		25 June 2011 to 24 July 2011		25 July 2011 to 24 Aug 2011	
ID No.	Nature / Type	Landscape and Visual Mitigation Measures	Status	Remarks	Status	Remarks	Status	Remarks
CM 4	Design / Construction Planning	Compensatory tree planting should be provided to compensate for felled trees.	In progress.	Compensatory tree planting is proposed for any trees to be felled in the tree felling application.	In progress.	Compensatory tree planting is proposed for any trees to be felled in the tree felling application.	In progress.	Compensatory planting plan has been proposed to and approved by DLO.
CM 5	Site Practice	Control of night-time lighting.	Not applicable.	No night time work was implemented in June 2011	In progress.	Night time work was implemented from 7pm to 11pm for certain period in July 2011. The lighting is confined to the construction site without affecting the periphery area.	In progress.	Night time work was implemented from 7pm to 11pm for certain period in Aug 2011. The lighting is confined to the construction site without affecting the periphery area. Photographic record of the night time working is shown in Table 4.10, Monthly EM&A Report of Aug 2011.
CM 6	Design / Construction Planning	Erection of decorative screen hoarding compatible with the surrounding setting.	Completed.	Erection of decorative screen hoarding has been set up along the site boundary.	Completed.	Erection of decorative screen hoarding has been set up along the site boundary.	Completed.	Erection of decorative screen hoarding has been set up along the site boundary.

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Appendix 5

Summary of Waste Flow

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Summary of Waste Flow

Type of Waste	Quantity Generated in June 2011	Quantity Generated in July 2011	Quantity Generated in Aug 2011
Inert C&D Waste	1,551.595m³	3,100.032m³	NIL
Chemical Waste (Liquid)	NIL	NIL	NIL
Chemical Waste (Solid)	105.000kg	NIL	120.000kg
Metal	247,666.000kg	10.000kg	22.000kg
Paper / Cardboard Packaging	982.000kg	789.000kg	1,135.000kg
Plastic	14.000kg	9.000kg	17.000kg
Others, e.g. General Refuse	153.425m³	57.469m³	116.669m³

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Appendix 6

Event Action Plan for Water Quality Monitoring

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Event/Action Plan for Water Quality

Event	ET Leader	IEC	SOR	Contractor
Action level being exceeded by one sampling day	• Repeat *in situ* measurement to confirm findings; • Identify reasons for non-compliance and source(s) of impact; • Inform IEC and Contractor; • Check monitoring data, all plant, equipment and Contractor's working methods; • Discuss mitigation measures with IEC and Contractor; • Repeat measurement on next day of exceedance.	• Discuss with ET and Contractor on the mitigation measures; • Review proposals on mitigation measures submitted by Contractor and advise the SOR accordingly; • Assess the effectiveness of the implemented mitigation measures.	• Discuss with IEC on the proposed mitigation measures; • Make agreement on the mitigation measures to be implemented. • Assess the effectiveness of the implemented mitigation measures.	• Inform the SOR and confirm notification of the non-compliance in writing; • Rectify unacceptable practice; • Check all plant and equipment; • Consider changes of working methods; • Discuss with ET and IEC and propose mitigation measures to IEC and SOR; • Implement the agreed mitigation measures.
Action level being exceeded by more than one consecutive sampling day	• Repeat *in situ* measurement to confirm findings; • Identify reasons for non-compliance and source(s) of impact; • Inform IEC and Contractor; • Check monitoring data, all plant, equipment and Contractor's working methods; • Discuss mitigation measures with IEC and Contractor;	• Discuss with ET and Contractor on the mitigation measures; • Review proposals on mitigation measures submitted by Contractor and advise the SOR accordingly; • Assess the effectiveness of the implemented mitigation measures.	• Discuss with IEC on the Proposed mitigation measures; • Make agreement on the mitigation measures to be implemented; • ♦ Assess the effectiveness of the implemented mitigation measures.	• Inform the SOR and confirm notification of the non-compliance in writing; • Rectify unacceptable practice; • Check all plant and equipment; Consider changes of working methods; • Discuss with ET and IEC and propose mitigation measures to IEC and SOR within three working days;

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Event	ET Leader	IEC	SOR	Contractor
	• Ensure mitigation measures are implemented; • Prepare to increase the monitoring frequency to daily; • Repeat measurement on next day of exceedance.			• Implement the agreed mitigation measures.
Limit level being exceeded by one sampling day	• Repeat *in situ* measurement to confirm findings; • Identify reasons for non-compliance and source(s) of impact; • Inform IEC Contractor and EPD; • Check monitoring data, all plant, equipment and Contractor's working methods; • Discuss mitigation measures with IEC, SOR and Contractor; • Ensure mitigation measures are implemented; • Increase the monitoring frequency to daily until no exceedance of Limit level.	• Discuss with ET and Contractor on the mitigation measures; • Review proposals on mitigation measures submitted by Contractor and advise the SOR accordingly; • Assess the effectiveness of the implemented mitigation measures.	• Discuss with IEC, ET and Contractor on the proposed mitigation measures; • Request Contractor to critically review the working methods; • Make agreement on the mitigation measures to be implemented; • Assess the effectiveness of the implemented mitigation measures.	• Inform the SOR and confirm notification of the non-compliance in writing; • Rectify unacceptable practice; • Check all plant and equipment; • Consider changes of working methods; • Discuss with ET, IEC and SOR and propose mitigation measures to IEC and SOR within three working days; • Implement the agreed mitigation measures.
Limit level being exceeded by more than one consecutive sampling day	• Repeat *in situ* measurement to confirm findings; • Identify reasons for non-compliance	• Discuss with ET and • Contractor on the mitigation measures; • Review proposals on mitigation	• Discuss with IEC, ET and Contractor on the proposed mitigation measures; • Request Contractor to	• Inform the SOR and confirm notification of the non-compliance in writing; • Rectify

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Event	ET Leader	IEC	SOR	Contractor
	and source(s) of impact; Inform IEC Contractor and EPD; • Check monitoring data, all plant, equipment and Contractor's working methods; • Discuss mitigation measures with IEC, SOR and Contractor; • Ensure mitigation measures are implemented; • Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days.	measures submitted by Contractor and advise the SOR accordingly; • Assess the effectiveness of the implemented mitigation measures.	critically review the working methods; • Make agreement on the mitigation measures to be implemented; • Assess the effectiveness of the implemented mitigation measures; • Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the construction activities until no exceedance of Limit level.	unacceptable practice; • Check all plant and equipment; • Consider changes of working methods; • Discuss with ET, IEC and SOR and propose mitigation measures to IEC and SOR within three working days; • Implement the agreed mitigation measures; • As directed by the SOR, to slow down or to stop all or part of the construction activities.

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Appendix 7

Figures

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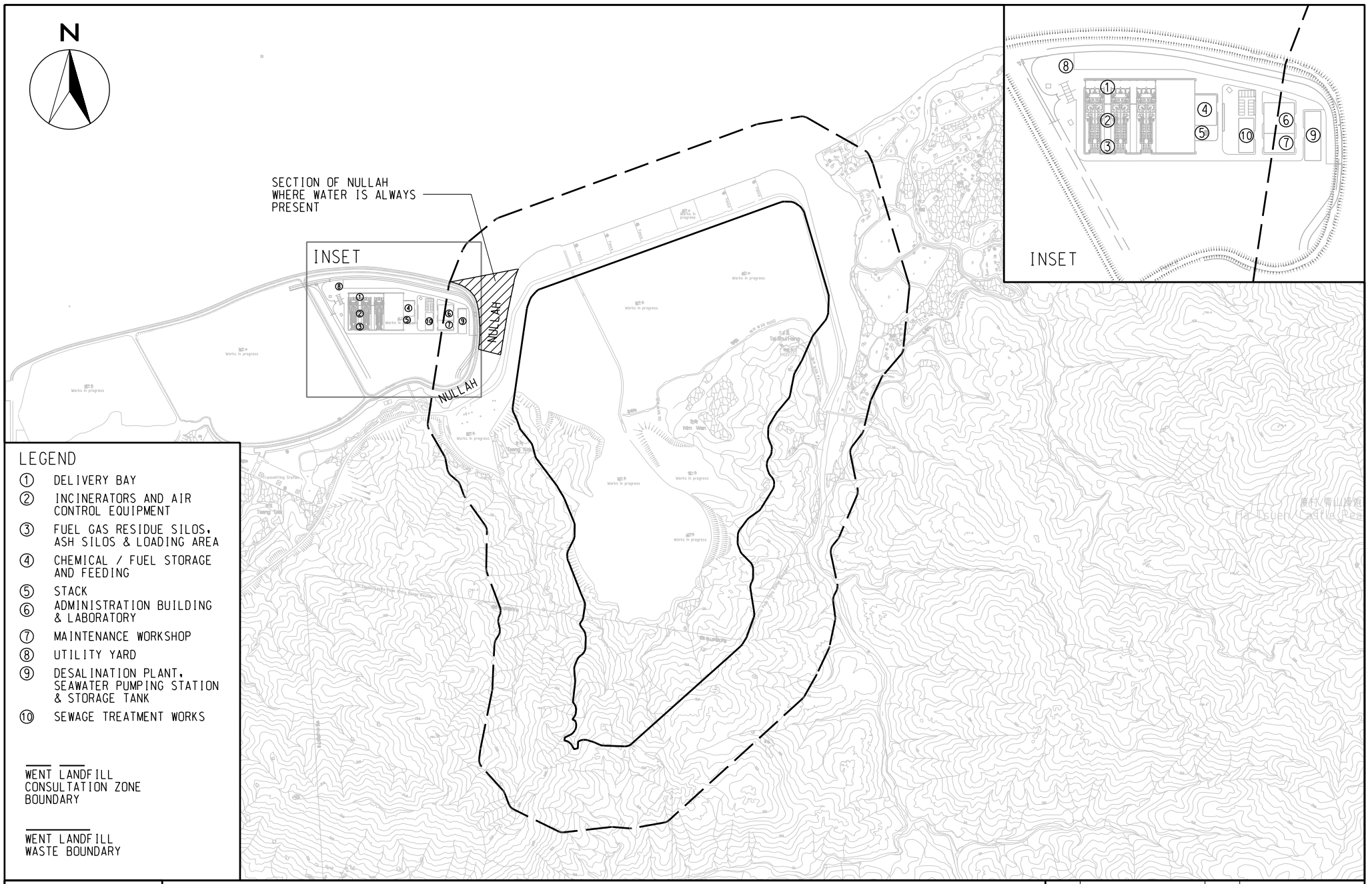
Figure 1.1
WENT Landfill Consultation Zone



MAUNSELL AECOM
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AGREEMENT NO. CE 28/2003 (EP)
SLUDGE TREATMENT FACILITIES - FEASIBILITY STUDY

WENT LANDFILL CONSULTATION ZONE

SCALE	1:11000	DATE	APR. 2008
CHECK	TCYC	DRAWN	ALFA
JOB No.	60039510	DRAWING No.	FIGURE 10.1
		REV	-

DATE: $DATE$

P:/60039510/1.01/CAD/DRAWING/REPORT/FIGURE 10.1.DGN

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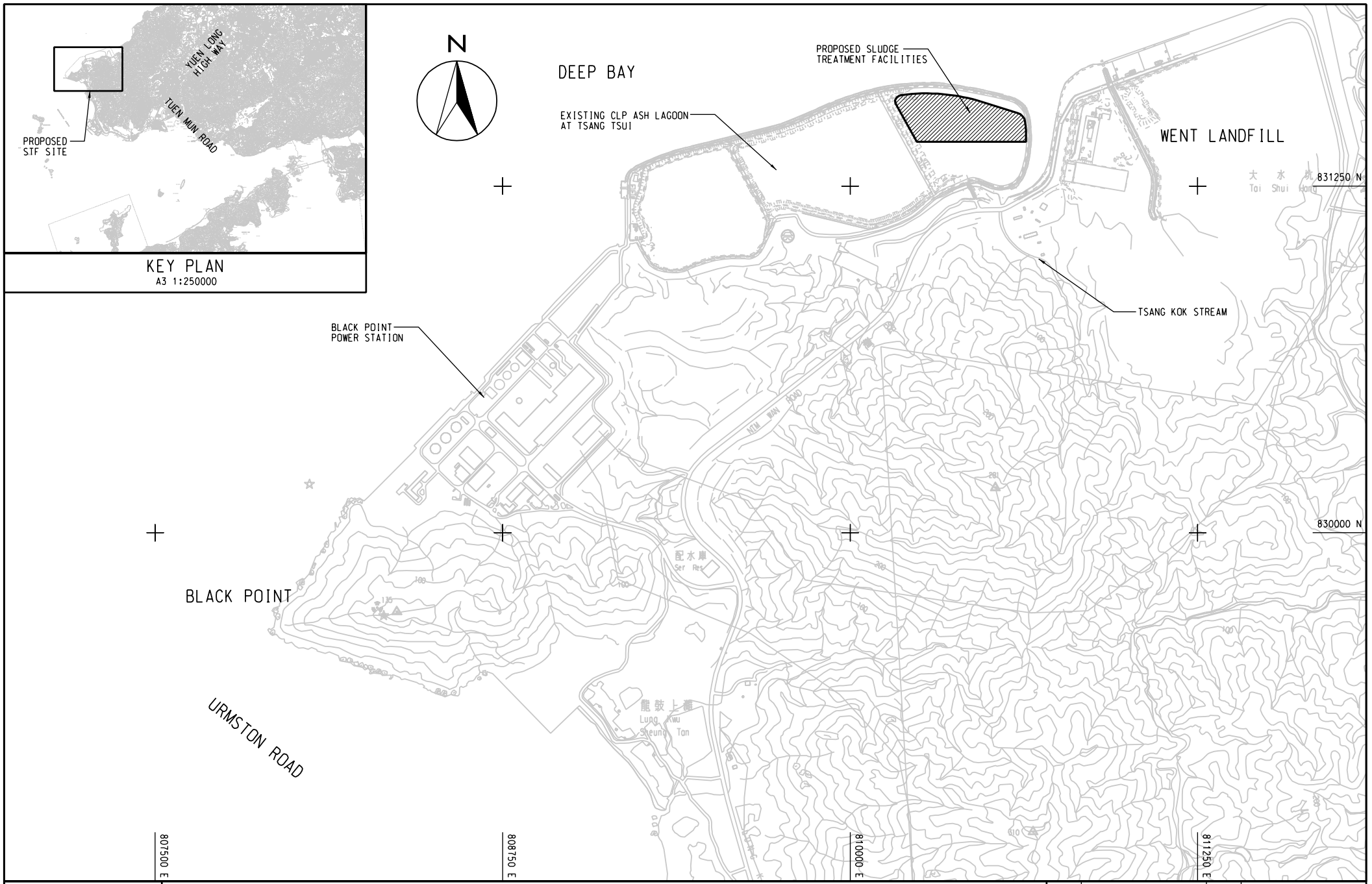
Figure 3.1
Location of Project Site



MAUNSELL | AECOM
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AGREEMENT NO. CE 28/2003 (EP)
SLUDGE TREATMENT FACILITIES - FEASIBILITY STUDY

LOCATION PLAN OF PROPOSED SLUDGE TREATMENT FACILITIES

SCALE	A3 1:12500	DATE	SEP. 2008
CHECK	PPMY	DRAWN	XCF
JOB No.	60015756	DRAWING No.	FIGURE 1.1
		REV	-

DATE: GUOXH 2008-9-30

p:\projects\60015756\DRAWING\REPORT\ES REPORT\FIGURE 1-1.dgn

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Figure 3.2
Project Organisation Structure

Figure 3.2 Project Organisation Structure

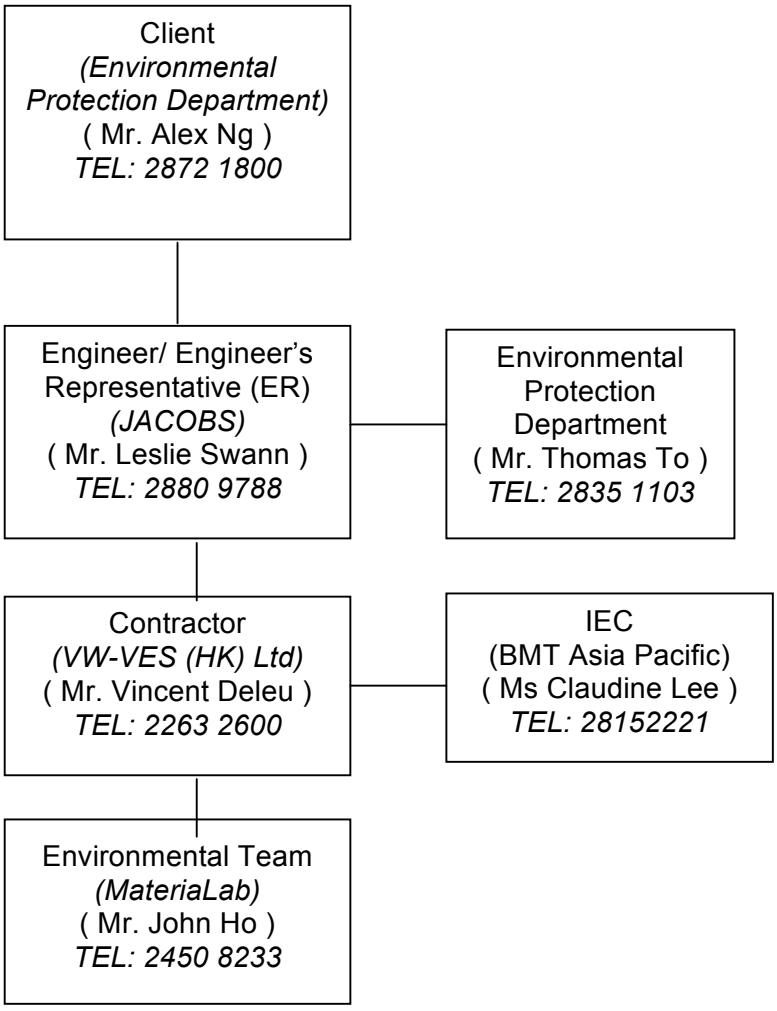

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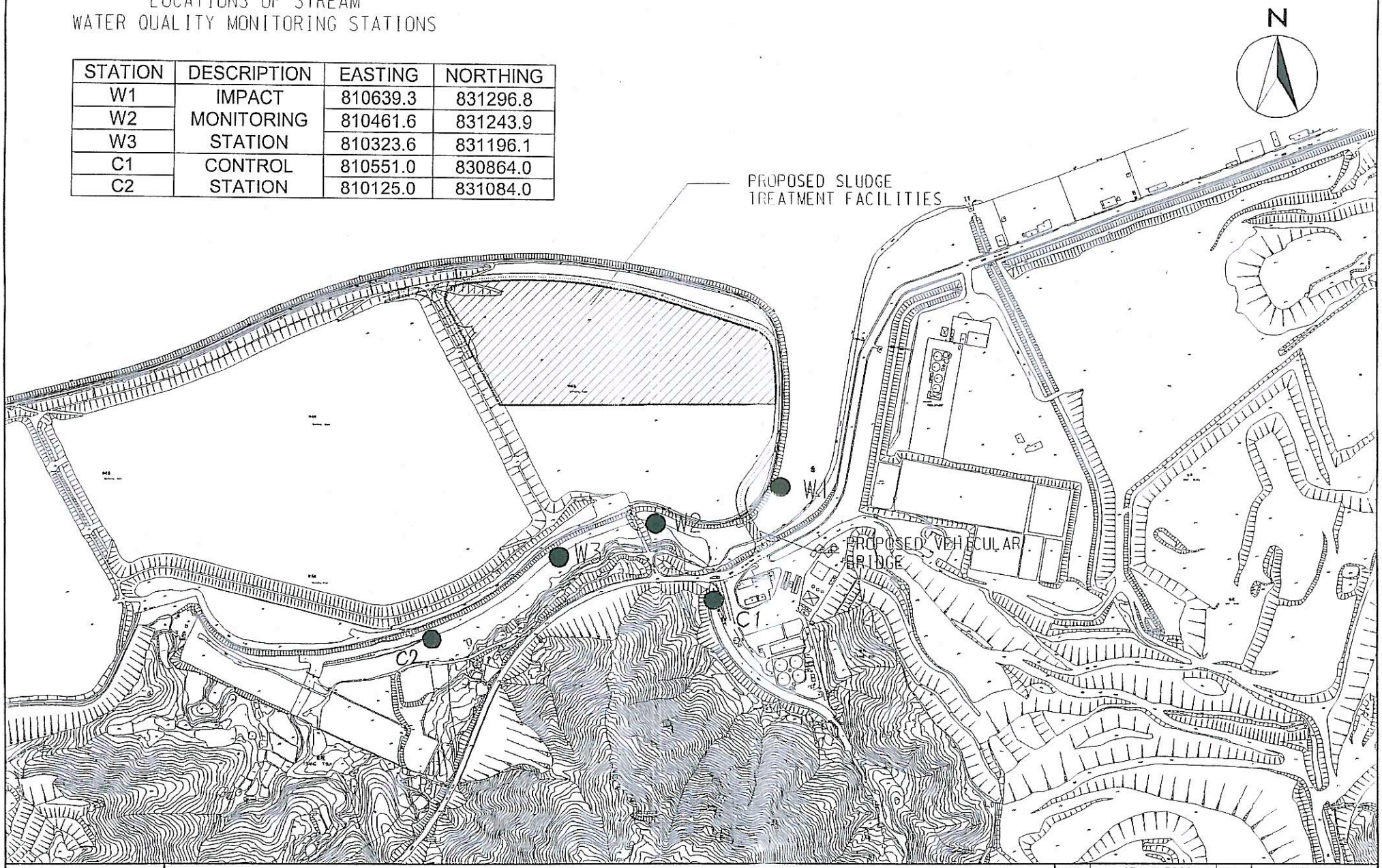
Figure 4.1 - 4.2
Water Quality Monitoring Location

LOCATIONS OF STREAM
WATER QUALITY MONITORING STATIONS

STATION	DESCRIPTION	EASTING	NORTHING
W1	IMPACT MONITORING STATION	810639.3	831296.8
W2		810461.6	831243.9
W3		810323.6	831196.1
C1	CONTROL STATION	810551.0	830864.0
C2		810125.0	831084.0



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AGREEMENT NO. CE 28/2003 (EP)
SLUDGE TREATMENT FACILITIES - FEASIBILITY STUDY

LOCATION OF WATER QUALITY MONITORING STATIONS (Sheet 1 of 2)

SCALE	A3 1:5000	DATE	JUN 2008
CHECK	AKYC	DRAWN	LMWI
JOB No.	60039510	DRAWING No.	FIGURE 5.1
		REV	-

DATE: $DATE$

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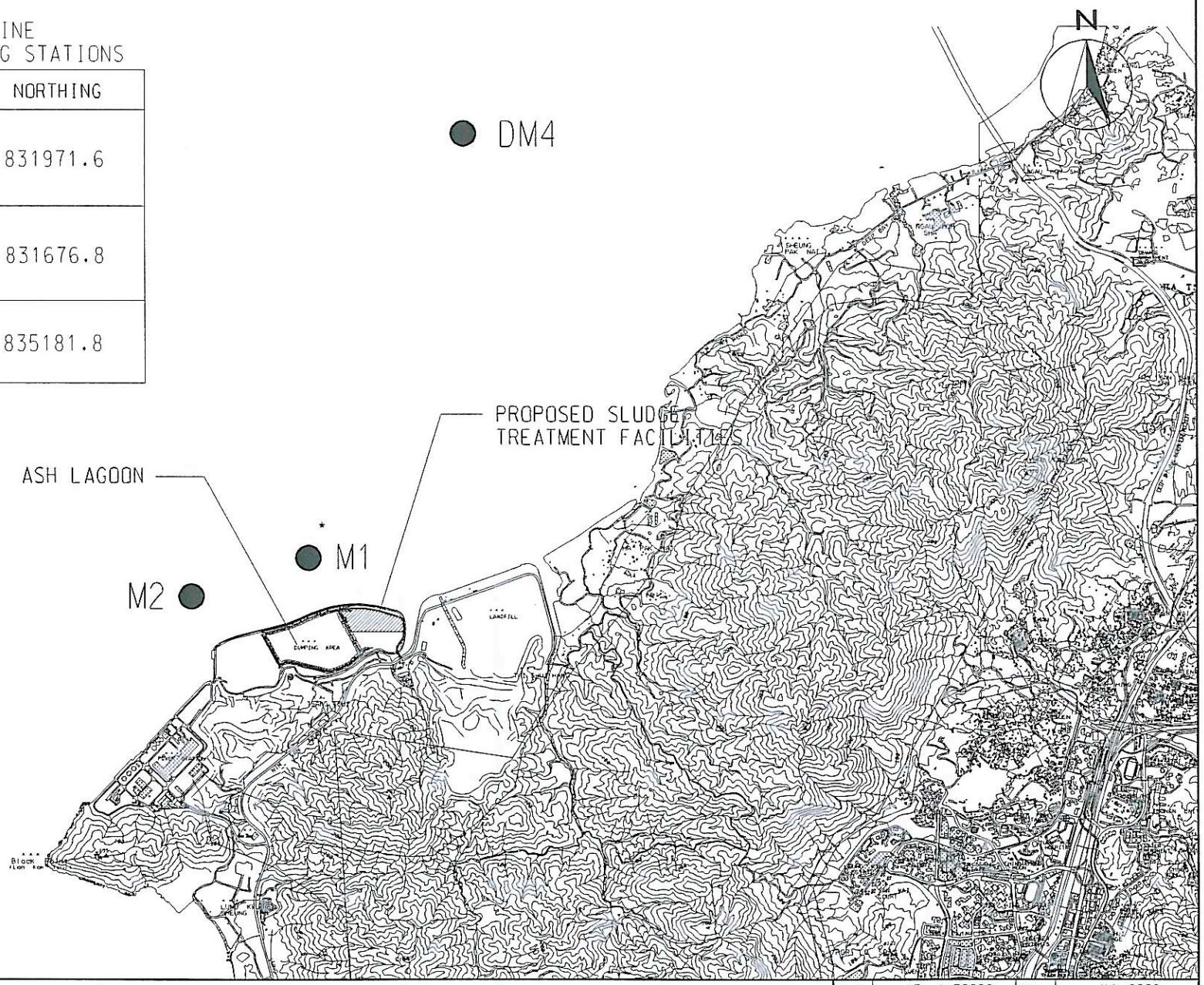
LOCATIONS OF MARINE
WATER QUALITY MONITORING STATIONS

STATION	EASTING	NORTHING
M1 (IMPACT MONITORING STATION)	809915.3	831971.6
M2 (IMPACT MONITORING STATION)	809026.4	831676.8
DM4 (CONTROL STATION)	811092.2	835181.8



AGREEMENT NO. CE 28/2003 (EP)
SLUDGE TREATMENT FACILITIES - FEASIBILITY STUDY

LOCATION OF WATER QUALITY MONITORING STATIONS (Sheet 2 of 2)

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SCALE	A3 1:30000	DATE	JUN 2008
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JOB NO.	60039510	DRAWING NO.	FIGURE 5.1
		REV	-

DATE: $DATE$

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Appendix 8

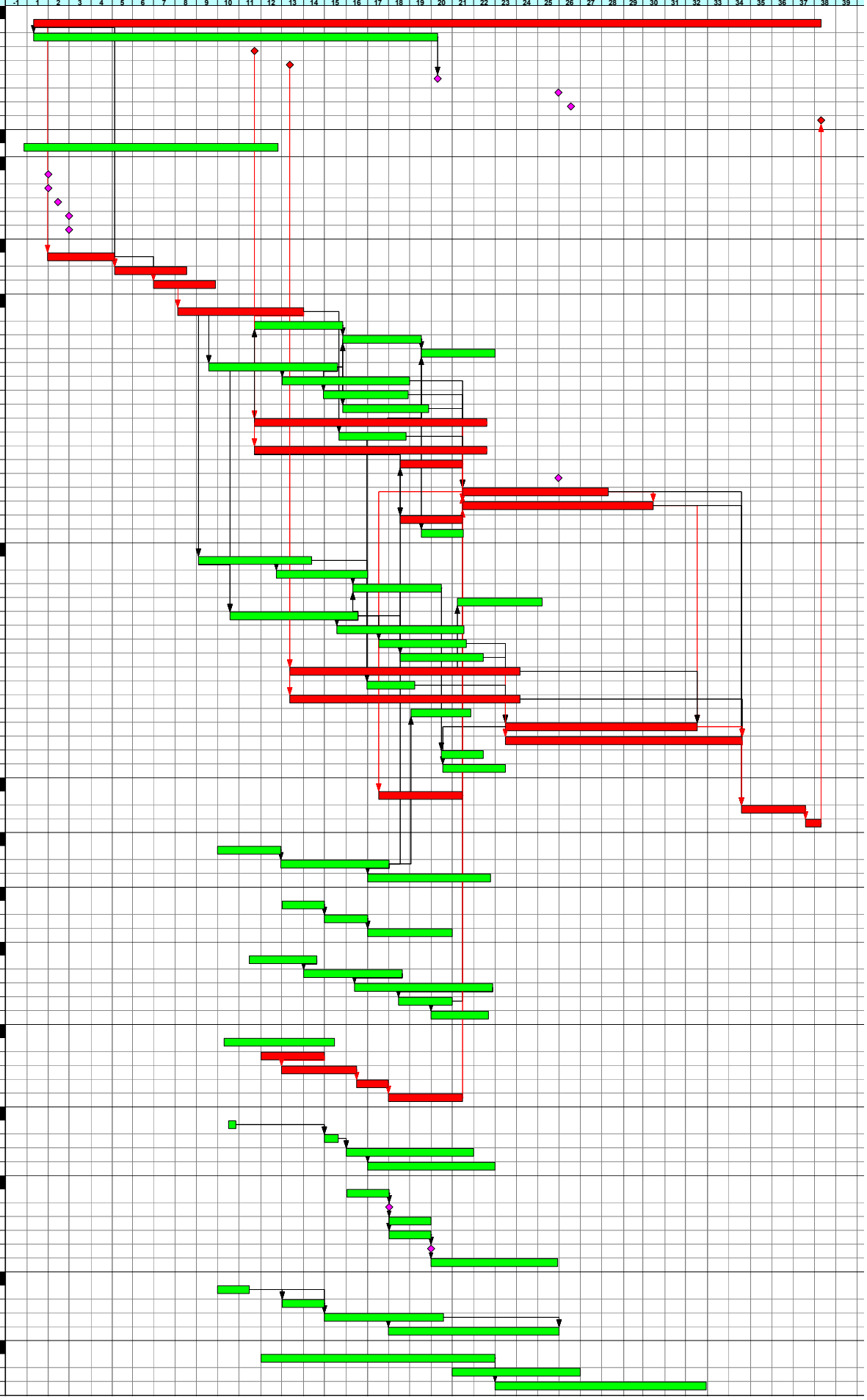
Work Program

Printed On : 02DEC10

HONG KONG SLUDGE TREATMENT FACILITY
Project Overview

Date	Revision	Checked	Approved
02DEC10	VLJH-W-PT-ZZ-0002-D01	RGU	NPR

Activity ID	Activity Description
KEYDATES	
50	SPECIFIED CONTRACT PERIOD 37 MONTHS
60	Ancillary Power from CLP
90	Commence Boiler Install A
140	Commence Boiler Install B
80	Energization
70	First Fire Sludge
150	First Steam
170	Complete Section I & II
DESIGN & APPROVALS	
100	Design Submissions & Approvals
MAJOR PROCUREMENT AWARDS	
190	Main Structural Steelwork
200	Main Building Facade
180	Flue Gas Treatment
110	Incinerator/Boilers
160	Turbine
SITE WORKS	
115	Advanced Works
120	Site Formation
130	Foundations Plant A & B
PLANT A	
2010	Substructure + UG Utilities
2040	Superstr (Roof) inc Glazing/Cladding - Area 1
2080	Superstr (Roof) Inc Glazing/Cladding - Area 3
2070	Superstr (Roof) Inc Glazing /Cladding - Area 2
2015	Sub - Superstructure Common Plant Area 3
2016	Main Plant Elect & Chillers
2017	Sludge Receiving / Storage / Feeder
2018	Deoderisation Plant
2020	Process Train 1 Installation - Incin / Boiler
2025	Process Train 1 - 2 Installation - FGT
2030	Process Train 2 Installation - Incin / Boiler
2035	Ash / Additives Handling / Storage
2038	1st Fire Sludge
2050	Process Train 1 Commissioning
2060	Process Train 2 Commissioning
2090	Steam Loop Complete - Plant A
2100	Superstr (Roof) - Area 4
PLANT B	
3010	Substructure + UG Utilities
3040	Superstr (Roof) inc Glazing/Cladding - Area 1
3070	Superst (Roof) Inc Glazing / Cladding Area 3
3080	Superstr (Roof) Inc Glazing/Cladding - Area 2
3015	Sub - Superstructure Common Plant Area 3
3016	Main Plant Elect & Chillers
3017	Sludge Receiving / Storage / Feeding
3018	Deoderisation Plant
3020	Process Train 3 - Installation - Incin / Boiler
3025	Process Train 3 - 4 - Installation - FGT
3030	Process Train 4 Installation - Incin / Boiler
3035	Ash / Additives Handling / Storage
3050	Process Train 3 Commissioning
3060	Process Train 4 Commssioning
3100	Superstr (Roof) - Area 4
3090	Steam Loop Complete
SYSTEM & PLANT COMMISSIONING	
4030	Training
4010	System & Plant Commissioning, Report & Consent
4020	Request / Issue Cert of Subst Completion
ADMINISTRATION TOWER	
5010	Substructure (Basement)
5020	Superstructure & Facade
5030	Fitout including MEP
ANCILLARY BUILDING - MAINTENANCE BLG	
6010	Foundations / Substructure
6020	Superstructure
6030	BW & MEP Fitout
ANCILLARY BUILDINGS - TURBINE A & B	
7010	Foundations / Substructure
7020	Superstructure
7030	BW & MEP Fitout
7040	Process Equipment Installation Plant A
7050	Process Equipment Installation Plant B
ANCILLARY BUILDING - WATER TREATMENT	
8005	Intake / Outfall
8010	Foundations / Substructure
8020	Superstructure
8030	BW & MEP Fitout
8040	Process Equipment Installation
ANCILLARY BUILDING - CONDENSER A & B	
7500	Foundations - Condenser A & B
7510	Substructure - Plant A & B
7520	Installation Condenser Plant A
7530	Installation Condenser Plant B
VISITOR GALLERY	
8500	Steelwork Erection Plant A
8520	Access Cabling & Pipework Plant A
8510	Ext Facade/CladdingGallery Plant A
8550	Steelwork Erection Plant B
8570	Access Cabling & Pipework Plant B
8560	Ext Facade & Fitout Gallery Plant B
EEC BUILDING	
9010	Foundations
9040	Substructure
9020	Superstructure + Facade
9030	Fitout including MEP
EXTERNAL WORKS	
10010	Roads & U/G Utilities
10030	Habitat
10020	Site Landscaping



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