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**TEST REPORT**

**DRAINAGE SEWAGE DEPARTMENT**

**NGONG PING SEWAGE TREATMENT PLANT,  
TRUNK SEWERS AND EFFLUENT EXPORT  
PIPELINE**

**OPERATION PHASE**

**MONTHLY EM&A REPORT**

**FOR**

**GROUND WATER MONITORING**

**(MARCH 2007)**

Prepared by:

Linda Law  
Senior Environmental Officer

Checked and  
Approved by:

C. L. Lau  
Environmental Team Leader

Issued Date: 02 April 2007

Report No.: ENA70171

**CH2MHILL**

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CH2M HILL Hong Kong Limited  
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Tel (852) 2507-2203  
Fax (852) 2507-2293

Our Ref.: DSDSTPOPEM0\_0\_0061

Date: 03 April 2007

Consultants Management Division  
Drainage Services Department  
42/F., Revenue Tower,  
5 Gloucester Road, Wan Chai,  
Hong Kong

By mail and by Fax (2827 8526)

Attention : Mr. Mok Wing Cheong, Ringo

Dear Mr. Mok,

**Re: Environmental Permit 157/2003/A**  
**Contract No: DC/2003/01 Ngong Ping Sewage Treatment Plant, Truck Sewers and**  
**Effluent Export Pipeline**  
**Monthly EM&A Report of Ground Water Monitoring for Mar 2007**

Reference is made to the monthly EM&A Report prepared by ETS for the captioned project (report no. ENA70171). We are pleased to verify that the captioned report complied with the conditions 5.4 and 6.1 of the Environmental Permit.

Thank you very much for your attention and please feel free to contact the undersigned or our Eva Ho if you have any queries.

Yours sincerely,

David Yeung  
Independent Environmental Checker

c.c. Mr. Edwin Lam CE/HKI, DSD  
Mr. C L Lau ETS

By Fax: 2827 6657  
By Fax: 2695 3944



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### **EXECUTIVE SUMMARY**

This monthly EM&A report (No.12) has been prepared by the Environmental Team (ET) of ETS-Testconsult Ltd for groundwater monitoring under the operation phase of "Ngong Ping Sewage Treatment Plant, Trunk Sewers and Effluent Export Pipeline" (the Project) during the reporting period from 01 to 31 March 2007.

Under the requirements of Section 5 of "the Environmental Permit (No. EP-157/2003/A)" (the EP), EM&A programme as set out in the EM&A Manual and the EIA Report (Register No.: AEIAR-065/2002) is required to be implemented. In accordance with the EM&A manual and the EIA Report, groundwater monitoring is required for the Project.

#### **Environmental Monitoring Progress**

The summary of the monitoring activities in this monitoring month is listed below:

- *Groundwater Monitoring: 1 Occasion at 9 designated boreholes.*

#### **Groundwater Monitoring**

Groundwater monitoring was carried out on 08 March 2007. During this monitoring, ground water was found in Borehole WM3 and the other boreholes were dry. According to the results of all testing parameters, it was found that no contamination of groundwater due to the leakage from the NPSTP and Effluent Export Pipeline was detected.

#### **Environmental Complaints**

No complaints were received in this reporting month.

#### **Notification of summons and successful prosecutions**

There were no notification of summons and prosecutions with respect to environmental issues in this month.

#### **Future Key Issues**

Future Key issues to be considered for the prevention of contamination of the water gathering ground are as follows:

- The provision of leakage containment system for the section of pipeline in the close proximity of the reservoir;
- Removing waste in a timely manner and disposing of outside the water gathering ground;
- Locating the chemical storage area at a safe environment with adequate space; and
- Reminding the workers not to discharge any sewage or wastewater into the nearby environment.



## 1.0 INTRODUCTION

The construction works of Ngong Ping Sewage Treatment Works (NPSTW) was certificated completed on 09 March 2006 and the NPSTW was handed over to "Drainage Sewage Department" (DSD) for operation and maintenance from 10 March 2006. "ETS-Testconsult Limited" (ETL) has been commissioned as Environmental Team (ET) to carry out groundwater monitoring at Ngong Ping according to the EM&A Manual.

This monthly EM&A report presents the results of groundwater monitoring during the reporting period from 01 to 31 March 2007.

## 2.0 PROJECT INFORMATION

### 2.1 Background

Master Plan (OI SMP) Study in December 1994 and drew up a SMP for Lantau Island, Cheung Chau, Lamma Island, Peng Chau and other smaller and less populated islands. The SMP comprises provisions for upgrading and expanding the sewerage systems to cover unsewered areas.

This sewerage project is the Stage 1 works under the OI SMP and can be divided into 3 packages as follows:

*Package 1 – Ngong Ping STW with tertiary treatment*

*Package 2 – Ngong Ping main trunk sewer and effluent export pipeline*

*Package 3 – Ngong Ping village sewerage system*

This Project only covers the operation phase of Package 1 and Package 2. The general layout plan of the project is shown in Appendix D (Drawing No. 23400/EN/098).

The existing treatment facilities at Ngong Ping include grease traps and septic tanks, with discharge locally to soakaways. Following the opening of the Statue of Buddha in December 1993, the number of visitors to Ngong Ping increased significantly. Besides, the Cable Car system linking Tung Chung and Ngong Ping was being planned for commissioning in June 2006. It will certainly further increase the number of visitors in Ngong Ping. The existing treatment and disposal facilities were found to be inadequate, with significant quantities of sewage being directly discharged into the local stream. It was under this setting that the recommendation to provide a local sewerage system and a centralised treatment system for Ngong Ping was put forward in the OI SMP in 1994.

The Project was planned, designed, operated and maintained by the DSD. During the operation phase of NPSTW, DSD will follow the environmental monitoring recommendation stated at the M&A Manual that was prepared with reference to the EIA Report (Register No.: AEIAR-065/2002) to avoid the contamination of the water gathering ground.

### 2.2 Site Description

The general layout plan of the project is shown in Appendix D. The groundwater monitoring locations are also shown in the Drawing No. 23400/T/202, 23400/T/074, 23400/T/075 and 23400/T/076.

### 2.3 Project Organization and Management Structure

The line of communication of project organization with respect to the on-site environmental management and monitoring program are shown in Appendix A.

### 2.4 Contact Details of Key Personnel

The key personnel contact names and telephone numbers, and construction programme are shown in table 2.1.



Table 2.1 Contact Details of Key Personnel

Organization	Project Role	Name of Key Staff	Tel. No.	Fax No.
Hong Kong & Islands Division, DSD	Contractor (responsible for Groundwater Monitoring)	Mr. Edwin Lam	2594 7208	2827 6657
Sewage Treatment Division 2, DSD	Contractor (responsible for Odour Control and Water Quality Control except Groundwater Monitoring)	Mr. Zenith Chan	2195 3458	2991 4233
CH2M HILL	Independent Environmental Checker	Mr. David B K Yeung	2507 2203	2507 2293
ETL	Contractor's Environmental Team	Mr. C L Lau (ET Leader)	2946 7791	2695 3944

### 3.0 GROUNDWATER QUALITY MONITORING

#### 3.1 Monitoring Locations

Groundwater quality monitoring was undertaken at nine designated boreholes shown in Table 3.1.

Table 3.1 Locations of Groundwater Quality Monitoring

Borehole No.	Depth from Ground Level to end of standpipe (m)	Location
WM1	3.58	Keung Shan Road (L/P FA0463)
WM2	4.24	Keung Shan Road (L/P FA0458)
WM3	3.57	Keung Shan Road (L/P FA0445)
WM4	2.77	Keung Shan Road (L/P FA0437)
WM5	4.63	Keung Shan Road (L/P FA0428)
WM6	10.46	STP (Ngong Ping)
WM7	96.8	STP (Ngong Ping)
WM8	9.99	STP (Ngong Ping)
WM9	10.69	STP (Ngong Ping)

#### 3.2 Monitoring Parameters

Monitoring of the groundwater monitoring parameters are listed below:

- Biochemical Oxygen Demand (BOD<sub>5</sub>), mg/L;
- Ammonia Nitrogen (NH<sub>4</sub><sup>+</sup>-N), mg/L;
- Nitrate + Nitrite Nitrogen (NO<sub>2</sub><sup>-</sup>+NO<sub>3</sub><sup>-</sup>), mg/L;
- pH value;
- Turbidity, NTU;
- Oil & Grease (O&G), mg/L;
- Total Phosphates (TP), mg/L;
- Synthetic detergents, mg/L;
- E-coli, cfu/100ml.



### 3.3 Monitoring Frequency

The monitoring frequency of the groundwater monitoring is summarized in Table 3.3.

Table 3.3 The frequency of the Groundwater Monitoring

Parameter	Frequency	No. of Boreholes
Biochemical Oxygen Demand	Once per month	9
Ammonia Nitrogen		
Nitrate + Nitrite		
pH value		
Turbidity		
Oil & Grease		
Total Phosphates		
Synthetic detergents		
E-coli		

### 3.4 Monitoring Methodology and Equipment Used

A water sampler comprising a transparent PVC cylinder, with a capacity of not less than 2 liters, was lowered into the water body at the predetermined depth. The opening ends of the sampler were then closed accordingly and water samples were collected.

The sample container, made by high-density polythene / glass, was rinsed with a portion of the water sample. The groundwater sample was then transferred to the container, labeled with a unique sample ID and sealed with a screw cap. The water samples were stored in a cool box maintained at 4°C. The groundwater samples were then delivered to a local HOKLAS-accredited laboratory (Environmental Laboratory, ETS-Testconsult Ltd, HOKLAS Registration No. 022) on the same day for analysis.

In accordance with the requirement of HOKLAS, the laboratory testing of the monitoring parameters were carried out with QA/QC results shown in Appendix E. The summary of testing methods of testing parameters as recommended by EIA or required by EPD were shown in Table 3.4.

Table 3.4 Summary of testing procedures

Laboratory Analysis	Testing Procedure	Detection Limit
Biochemical Oxygen Demand	In house method TPE/001/W or BS 6068 : Section 2.14 : 1990	2.0 mg/L
Ammoniacal Nitrogen	In house method TPE/016/W, refer to APHA 19ed 4500-NH <sub>3</sub> F & G	0.13 mg/L
Nitrate + Nitrite	In house method TPE/023/W, refer to APHA 19ed 4500-NO <sub>3</sub> B	0.004 mg/L
pH (at 25°C)	In house method TPE/003/W, refer to APHA 19ed APHA 4500-H <sup>+</sup> B	Detection range: 4.0-10.0
Turbidity	In house method TPE/005/W, refer to APHA 19ed 2130B	0.5 NTU
Oil & Grease	APHA 19ed 5520 B	5.0 mL
Total Phosphate	In house method base on ASTM D 515-88	0.05 mg/L
Synthetic detergents	In house method based on APHA 19ed 5540 C & D	0.1 mg/L
E-coli	DoE Section 7.8 & 7.9 plus in-site urease test	<1 cfu/100ml



### 3.5 Groundwater Monitoring Results

In this reporting month, groundwater monitoring was carried out on 08 March 2007. During this monitoring, groundwater was found in Borehole No WM3 and the other boreholes were dry. The groundwater quality measurement results are detailed in Appendix B. Graphical presentation of the monitoring parameters for this reporting month is shown in Appendix C.

According to the results of all testing parameters, it was found that no contamination of groundwater due to the leakage from the NPSTP and Effluent Export Pipeline was detected.

### 4.0 ENVIRONMENTAL NON-CONFORMANCE

#### 4.1 Summary of Groundwater Quality Monitoring

According to the results of all testing parameters, it was found that no contamination of groundwater due to the leakage from the NPSTP and Effluent Export Pipeline was detected.

#### 4.2 Summary of Environmental Complaints

No complaints were received in this reporting month.

#### 4.3 Summary of Notification of Summons and Prosecution

There was no notification of summons respect to environmental issues registered in this month.

### 5.0 IMPLEMENTATION STATUS

#### 5.1 Implementation Status of Environmental Mitigation Measures

DSD has been implementing the required environmental mitigation measures indicating in Clause 4.5.20 of the EM&A manual.

#### 5.2 Implementation Status of Environmental Complaint Handling

No complaints were received in this reporting month. The details of the complaint-log are presented in Table 5.1.

Table 5.1 Statistical Summary of Environmental Complaints

Reporting Month	Complaint Statistics			
	Frequency	Cumulative	Aspect	Investigation Results and Follow up Actions
April 06	0	0	---	---
May 06	0	0	---	---
June 06	0	0	---	---
July 06	0	0	---	---
Aug 06	0	0	---	---
Sept 06	0	0	---	---
Oct 06	0	0	---	---
Nov 06	0	0	---	---
Dec 06	0	0	---	---
Jan 07	0	0	---	---
Feb 07	0	0	---	---
Mar 07	0	0	---	---





### **5.3 Implementation Status of Notification of Summons and Prosecution**

There were no notifications of summons respect to environmental issues registered in this reporting month.

### **6.0 CONCLUSION**

In this reporting month, groundwater monitoring was carried out on 08 March 2007. During this monitoring, ground water was found in Borehole WM3 and the other boreholes were dry.

According to the results of all testing parameters, it was found that no contamination of groundwater due to the leakage from the NPSTP and Effluent Export Pipeline was detected.

### **7.0 FUTURE KEY ISSUES**

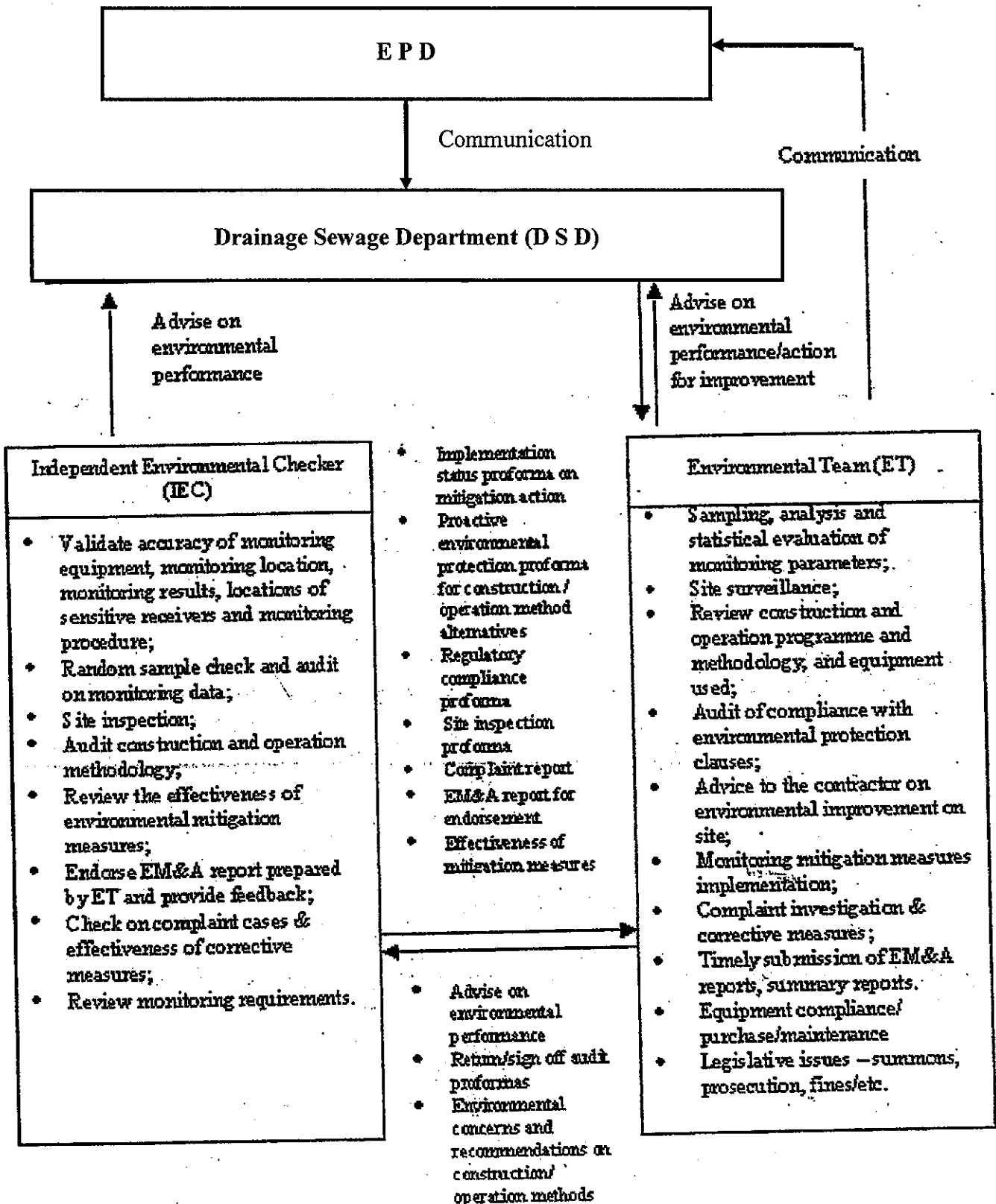
DSD will continue to carry out operation and maintenance works of NPSTW in the coming month. Future Key issues to be considered for the prevention of contamination of the water gathering ground are as follows:

- The provision of leakage containment system for the section of pipeline in the close proximity of the reservoir;
- Removing waste in a timely manner and disposing of outside the water gathering ground;
- Locating the chemical storage area at a safe environment with adequate space; and
- Reminding the workers not to discharge any sewage or wastewater into the nearby environment.



## **Appendix A**

### **Lines of Communication**





## **Appendix B**

### **Groundwater Monitoring Results**

**and**

### **Photos of Groundwater Monitoring at Boleholes**



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**TEST REPORT**

Form : E/EN/R/01/Issue 4 (1/1) [08/02]

**Environmental Testing of Water & Wastewater**

Report No. : ENA70170  
Date of issue : 16 March 2007  
Page No. : 1 of 1

**Information provided by client**

Client name : Paul Y Construction Co. Ltd  
Client address : 31/F Paul Y Centre 51 Hung To Road Kwun Tong Kowloon HK  
Sample Source : DC/2004/09 - Building and Civil Maintenance and Minor Works to DSD Plants and Facilities (2005-2007)  
Sample Type : Groundwater  
Date of sampling : 08 March 2007  
Sample Description : The sample was collected in 100ml glass bottle (for Total Phosphates only), 500ml glass bottle (for Oil & Grease only), 100ml sterilized glass bottle (for E-coli only), 500ml and 1L plastic bottles (for other testing parameters). Sample for Ammonia and Nitrate + Nitrite Nitrogen was preserved by adding conc. H<sub>2</sub>SO<sub>4</sub> to pH<2. Sample for Oil & Grease was preserved by adding conc. HCl to pH<2. All samples were chilled immediately after collection.

**Laboratory information**

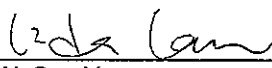
Date Received : 08 March 2007

**Result**

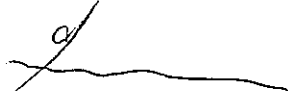
Client Sample ID	Lab Ref No	Test	Method Used	Result	Date Tested
WM3	W21429 (01)	Biochemical Oxygen Demand (5-day)	In house method based on APHA 19ed 4500-O G	7.2 mg/L	08 March 2007 (18:00) to 13 March 2007 (18:00)
		pH Value	In house method TPE/003/W	6.4 (at 25°C)	08 March 2007
		Turbidity	In house method TPE/005/W	9.6 NTU	08 March 2007
	W21429 (05)	Synthetic Detergents	In house method TPE/005/W	0.2 mg/L	08 March 2007
	W21429 (02)	Nitrate & Nitrite Nitrogen	In house method TPE/023/W	<0.1 mg/L	09 March 2007
		Ammonia	In house method TPE/016/W	<0.025 mg/L	09 March 2007
	W21429 (03)	Total Phosphates	In house method TPE/019/W	< 0.1 mg/L	09 March 2007
	W21429 (04)	Oil & Grease	APHA 19ed 5520B	<5.0 mg/L	09 March 2007
	W21429 (06)	E-coli *	DoE (1983), section 7.8 & 7.9 plus in-situ urease test	<1 cfu/100ml	08 to 10 March 2007

Remark (if any) : The tests marked with "\*" indicated the tests were sub-contract to ALS Technichem (HK) Pty Ltd and HOKLAS accredited. Water monitoring was only carried out at Borehole WM3 only since other boreholes were observed to be dry during water monitoring.

Checked by :

  
LAW, Sau Yee  
Senior Chemist

Approved by :

  
LAU, Chi Leung  
Chief Chemist

Project : DC/2004/09 - Building and Civil Maintenance and Minor Works to DSD Plants  
and Facilities (2005-2007)

Date of sampling : 08 March 2007

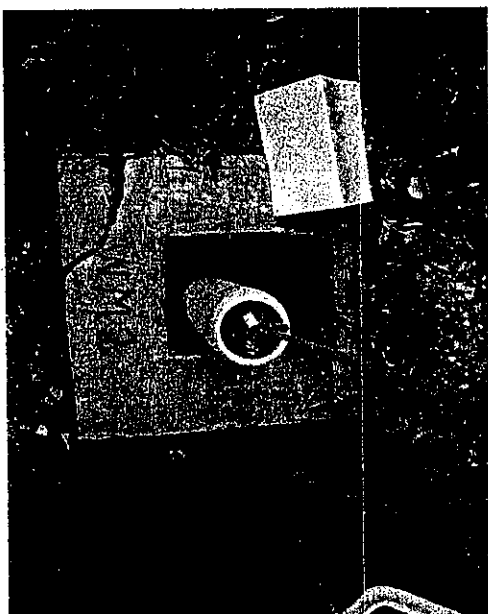
Report No. : ENA70170

Date of issue : 16 March 2007

WM1



WM2



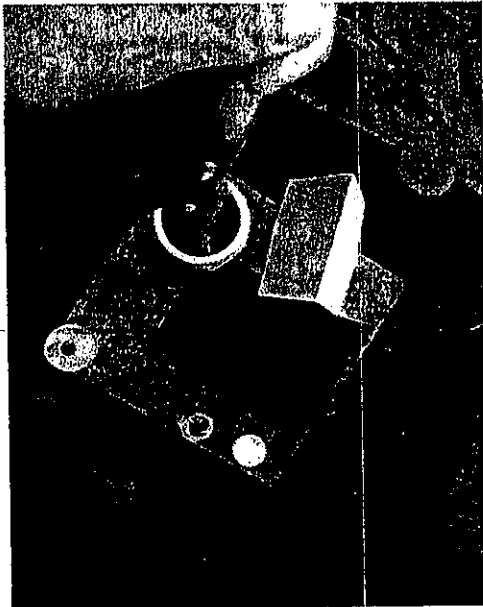
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and Facilities (2005-2007)

Date of sampling : 08 March 2007

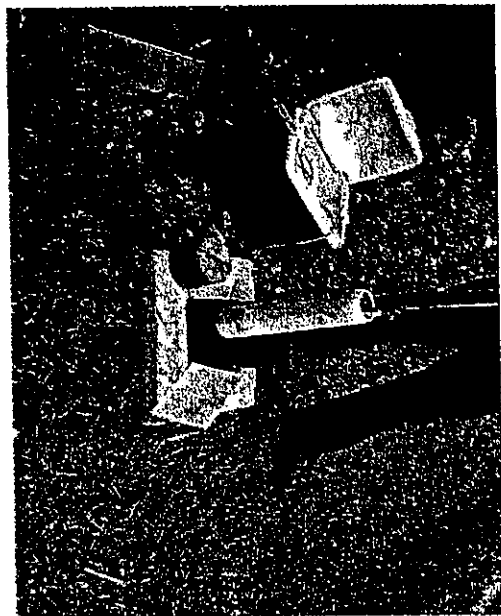
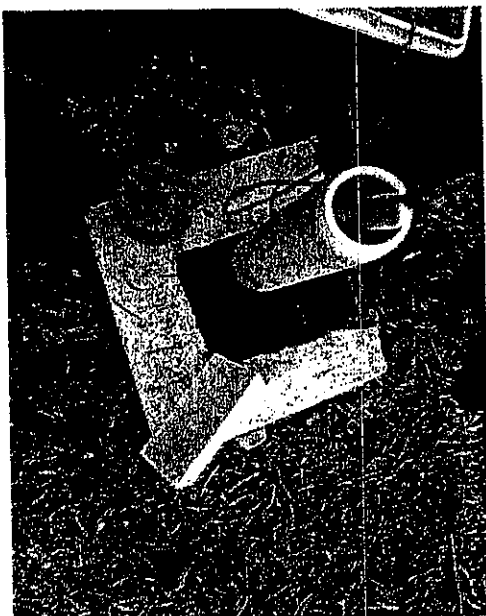
Report No. : ENA70170

Date of issue : 16 March 2007

WM3



WM4



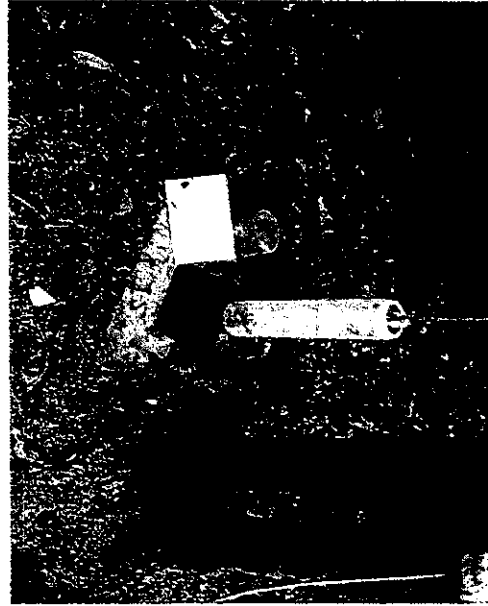
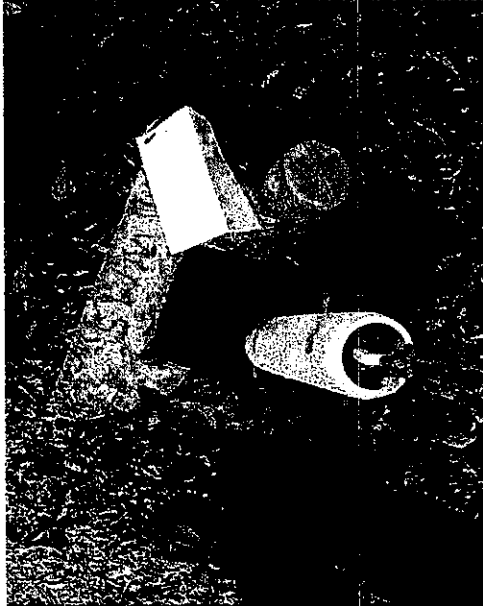
Project : DC/2004/09 - Building and Civil Maintenance and Minor Works to DSD Plants  
and Facilities (2005-2007)

Date of sampling : 08 March 2007

Report No. : ENA70170

Date of issue : 16 March 2007

WM5



WM6





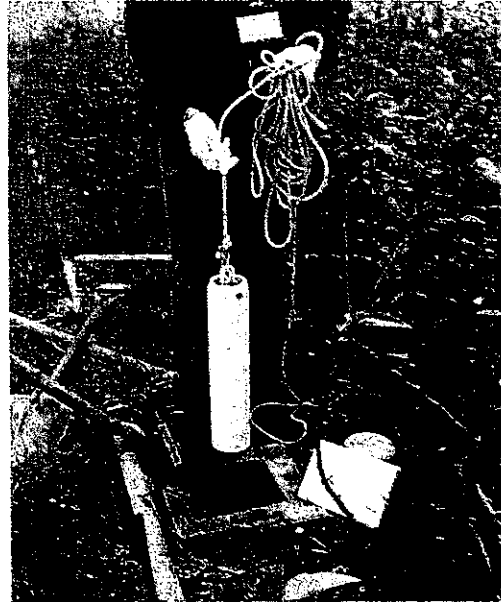
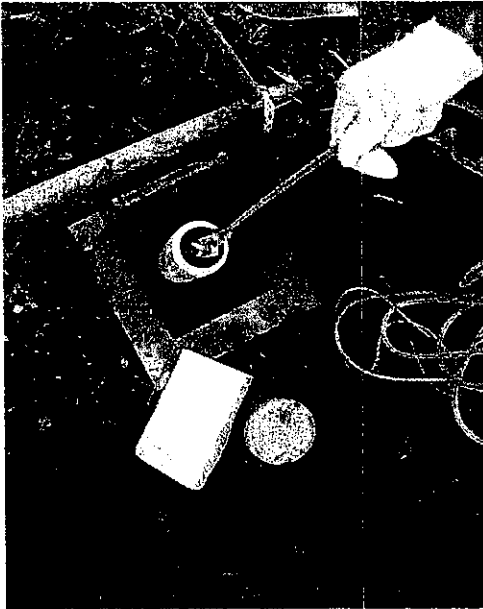
Project : DC/2004/09 - Building and Civil Maintenance and Minor Works to DSD Plants  
and Facilities (2005-2007)

Date of sampling : 08 March 2007

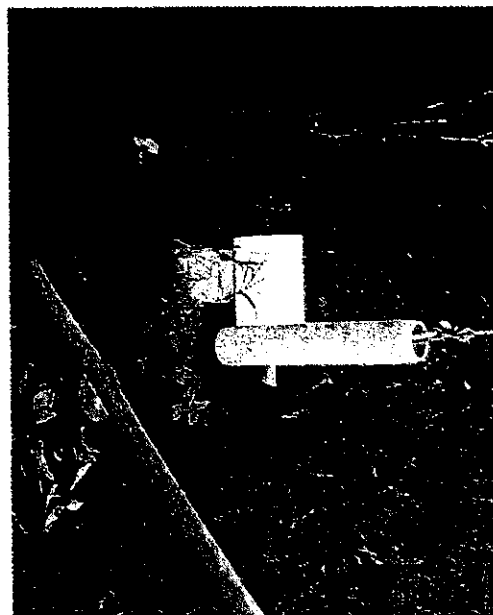
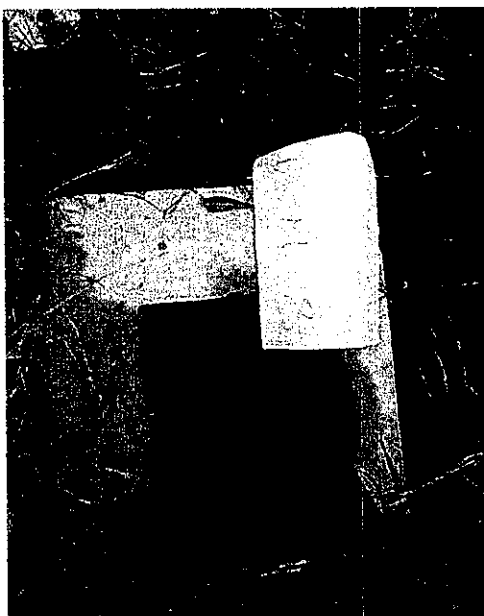
Report No. : ENA70170

Date of issue : 16 March 2007

WM7



WM8



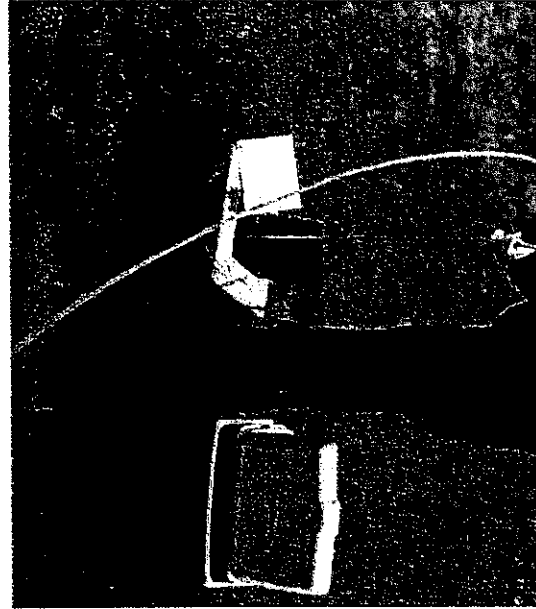
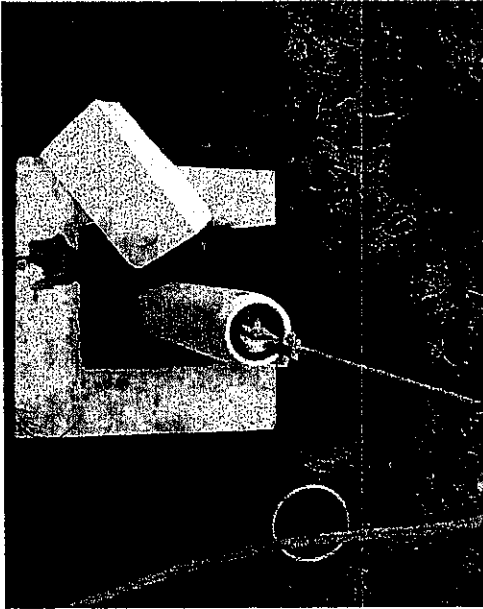
Project : DC/2004/09 - Building and Civil Maintenance and Minor Works to DSD Plants  
and Facilities (2005-2007)

Date of sampling : 08 March 2007

Report No. : ENA70170

Date of issue : 16 March 2007

**WM9**



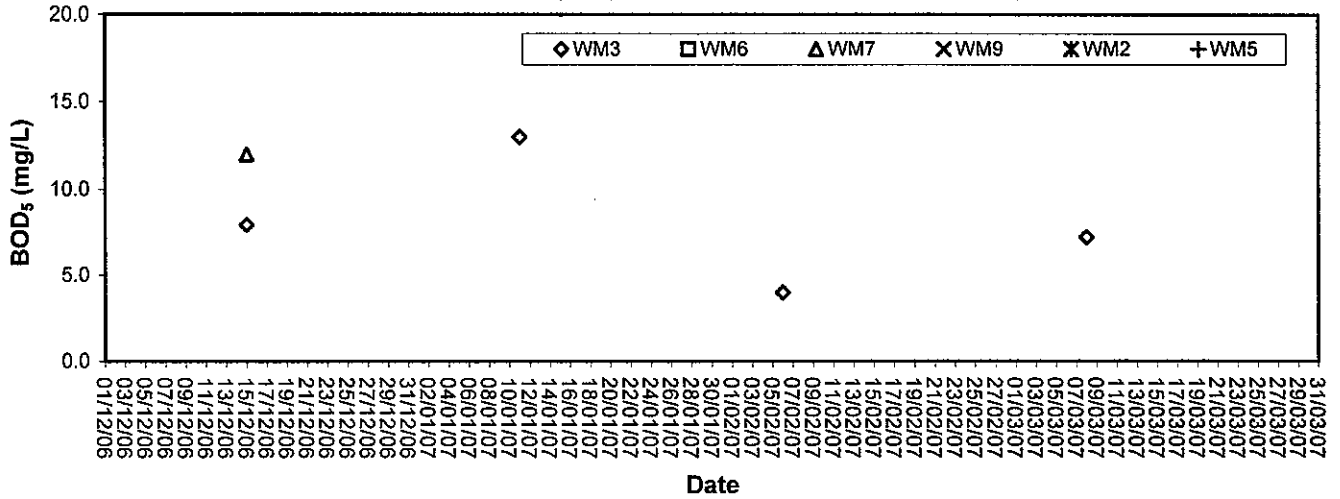


## Appendix C

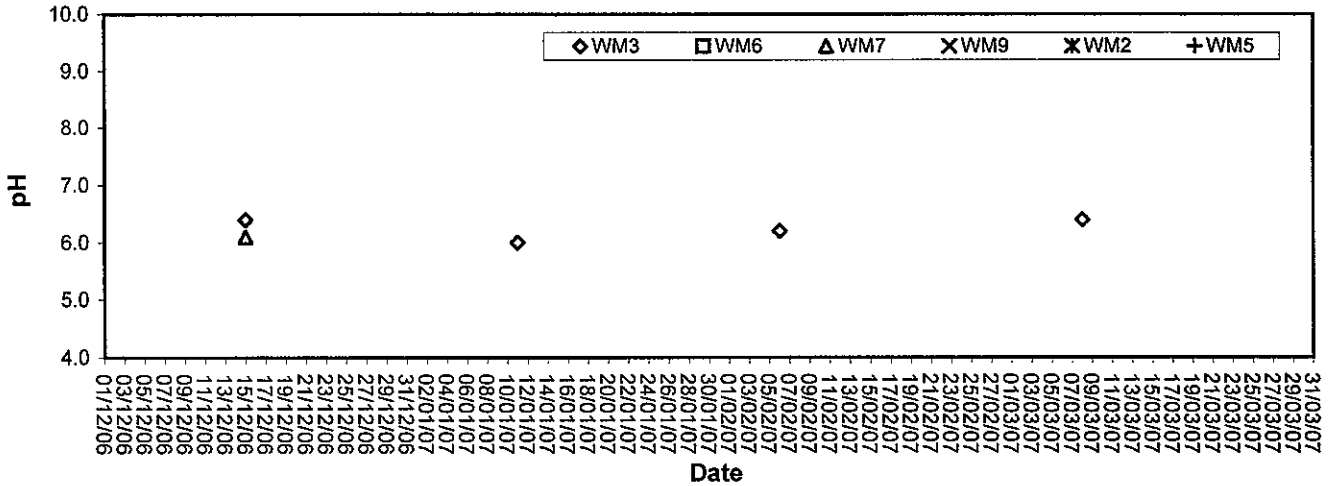
### Graphical Plots of Groundwater Monitoring Data



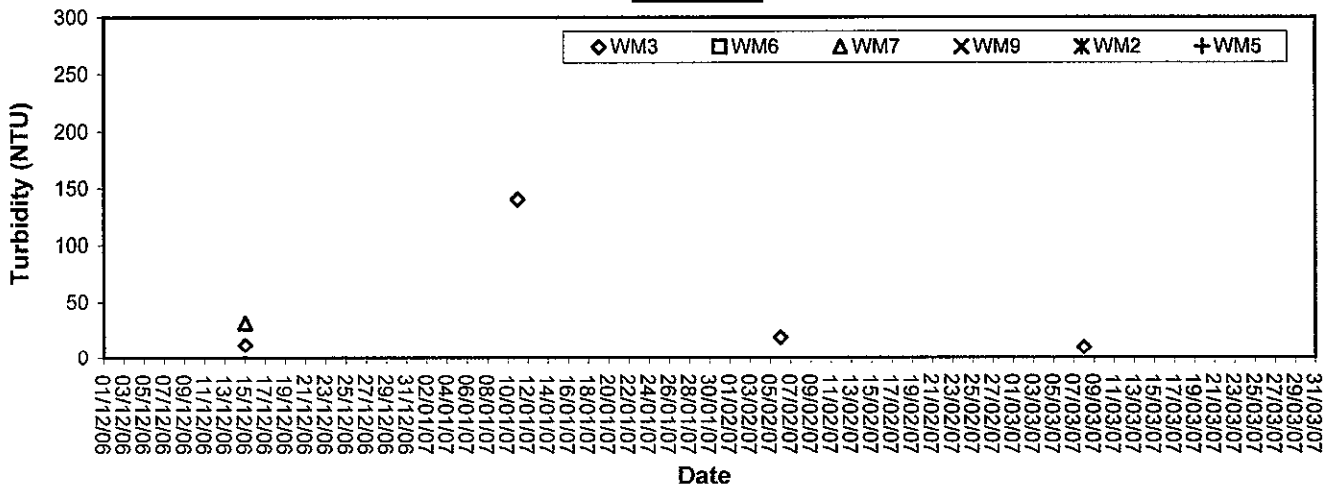
### 5-day Biochemical Oxygen Demand (BOD<sub>5</sub>)



### pH Value

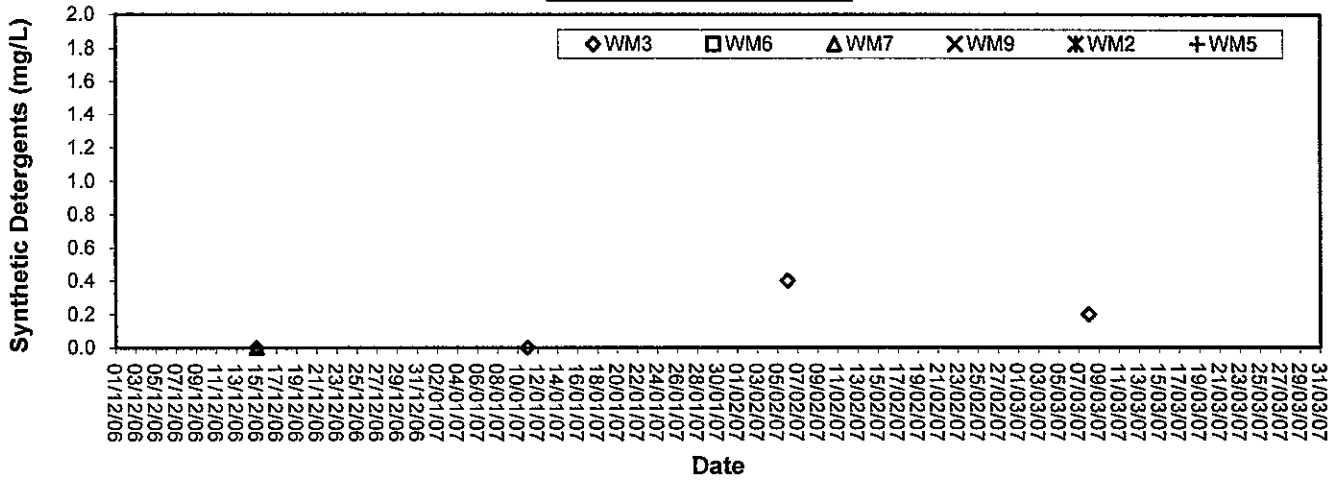


### Turbidity

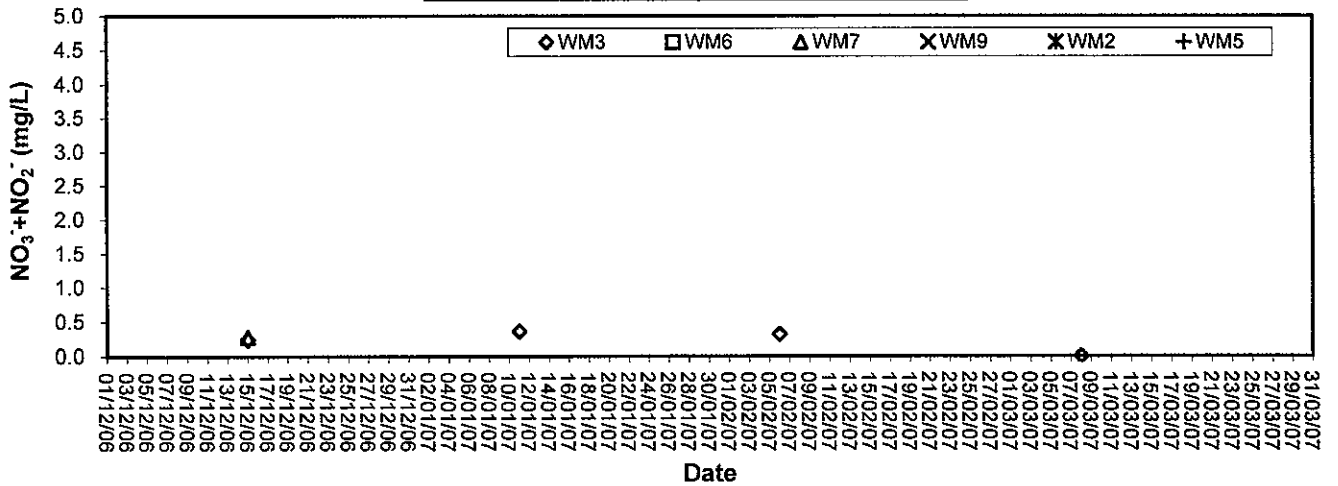




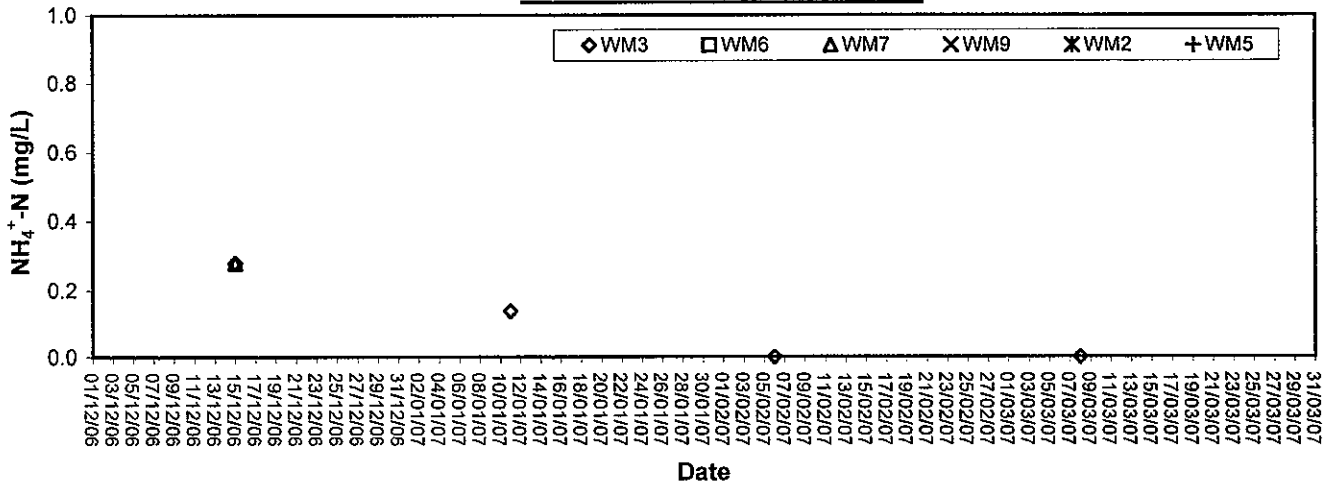
### Synthetic Detergents



### Nitrate & Nitrite Nitrogen (NO<sub>3</sub><sup>-</sup>+NO<sub>2</sub><sup>-</sup>)



### Ammonia Nitrogen (NH<sub>4</sub><sup>+</sup>-N)







## Appendix D

### General Layout Plan

**Legend:**

- Proposed Effluent Export Pipeline
- Proposed Trunk Sewer of Ngong Ping Sewerage
- Ngong Ping Sewerage Catchment Area

**ARUP**

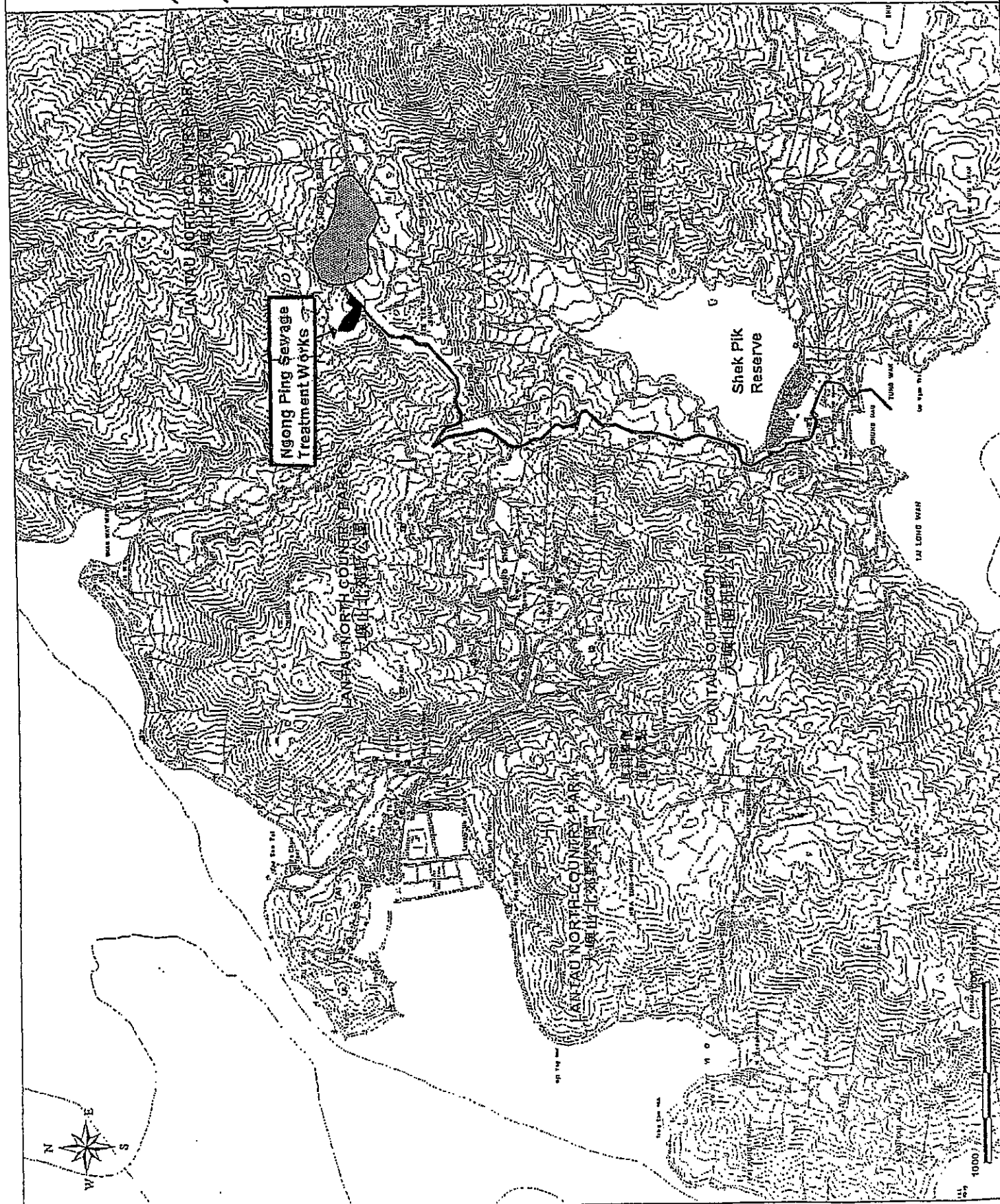
AGREEMENT NO. CE 2801  
OUTLYING ISLANDS STAGE 1 PHASE 1  
NGONG PING SEWERAGE TREATMENT WORKS AND SEWERAGE

Ngong Ping Sewerage Project  
Scheme - General Layout

23400/EN/098

KC Feb 03 AC AC  
1:20000@A3 Preliminary

香港特別行政區環境保護署  
DEPARTMENT OF ENVIRONMENT  
PROTECTION OF THE  
HONG KONG SAR  
SPECIAL ADMINISTRATIVE REGION







## **Appendix E**

### **QA/QC Results**



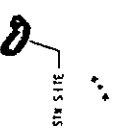
## QA/QC Results of Laboratory Analysis of Testing Parameters

Testing Parameter	QC Sample Analysis	Sample Duplicate		Sample Spike	
	% Recovery *	Sample ID	% Error #	Sample ID	% Recovery @
Turbidity	99	WM3	2.1	---	---
Nitrate + Nitrite	103	---	---	---	---
Oil & Grease	99	---	---	---	---
Ammoniacal Nitrogen	104	---	---	---	---
Synthetic detergents	---	---	---	---	---
Biochemical Oxygen Demand (5-day)	98	WM3	1.4	---	---
Total Phosphates	102	---	---	---	---
Testing Parameter	QC Sample Analysis	Sample Duplicate		Sample Spike	
	% Recovery *	Sample ID	Difference between Duplicates +	Sample ID	% Recovery @
pH Value(at 25°C)	---	WM3	0.02 unit	---	---

Note: (\* ) % Recovery of QC sample should be between 80% to 120%.  
(# ) % Error of Sample Duplicate should be between -10% to 10%.  
(@ ) % Recovery of Sample Spike should be between 80% to 120%.  
(+ ) Difference between Duplicates should be less than 0.1 unit for pH value.



## Figures



KEY PLAN

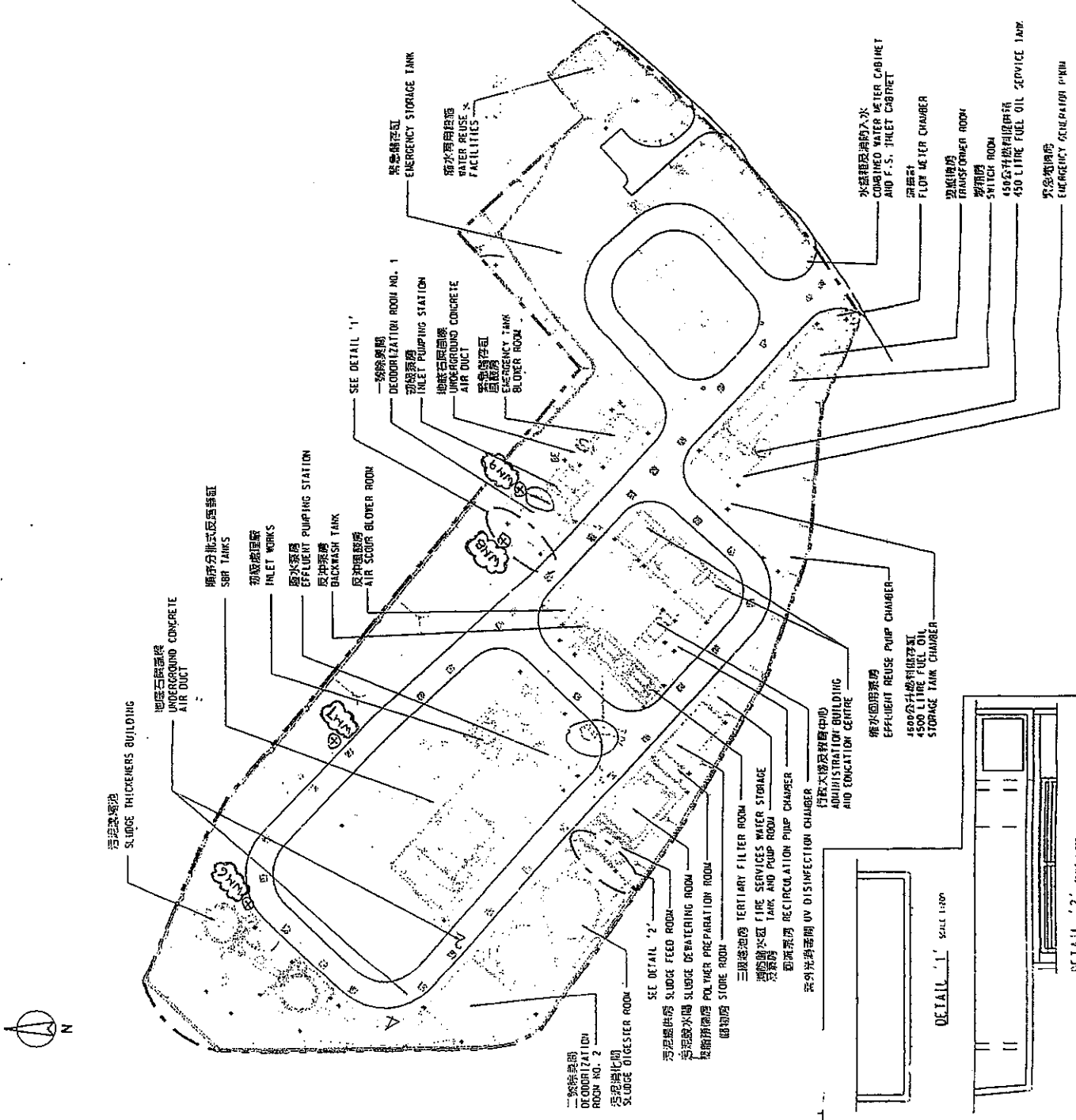
NOTE: 1. COORDINATES SHOWN ON THE TABLE ARE MEASURED AT THE OUTSIDE WALL AT 0.00. 2. PLANS OF STRUCTURES ARE SHOWN AT 4441.00 MFD.

LEGEND: SITE BOUNDARY, CUT SLOPE, FILL SLOPE WITH FILTER, PERIMETER U-CHANNELS / CATCH PITS

Project information including ARUP logo, project name, location, and drawing details.

SETTING OUT TABLE

Table with columns for LOCATION, NORTHING, EASTING, and COORDINATES. It lists grid points from 1 to 62.



DETAIL '1' SCALE 1:500

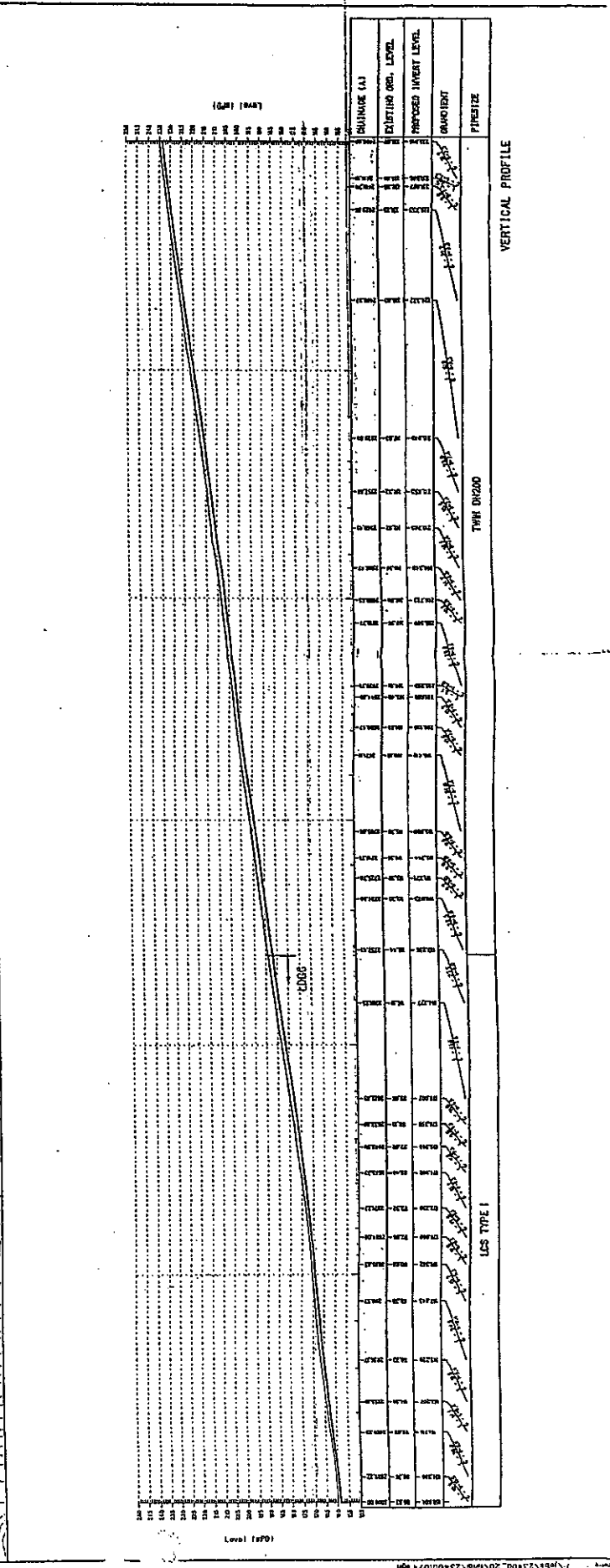
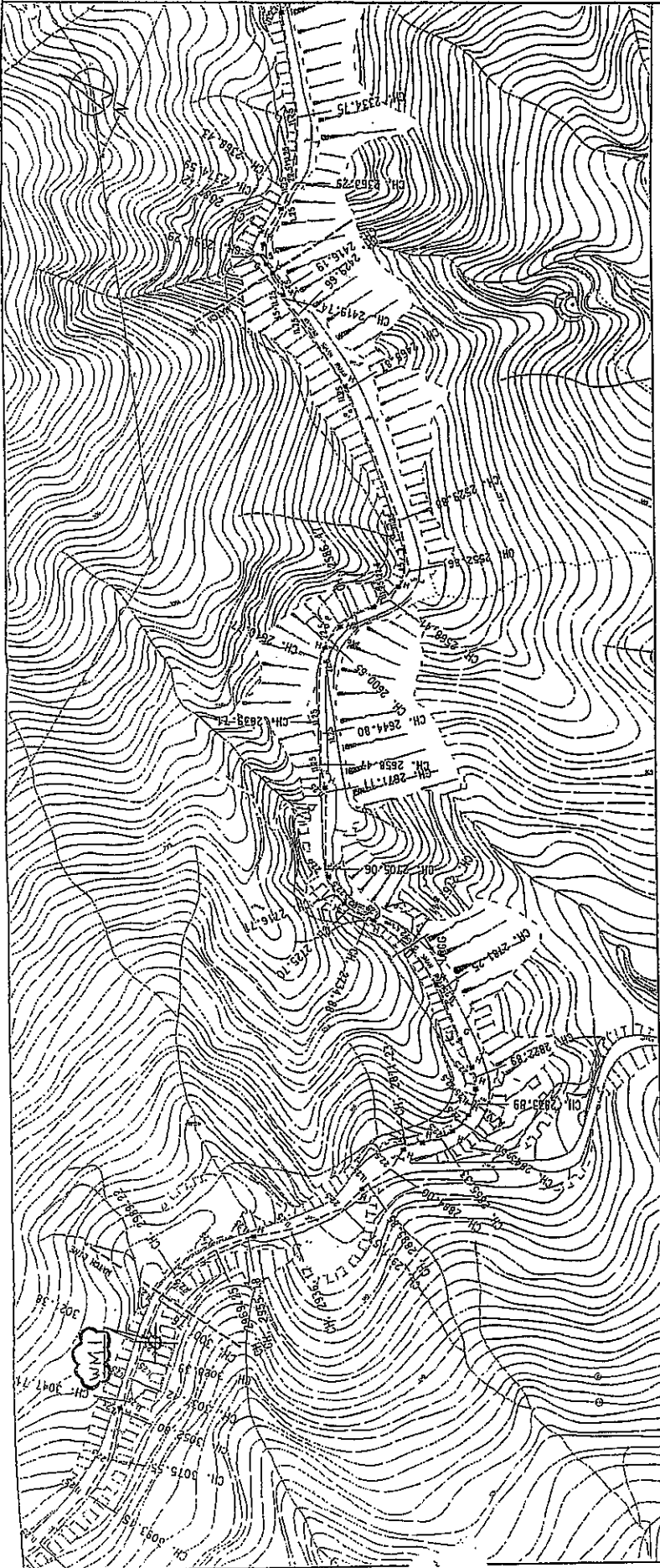
DETAIL '2' SCALE 1:500

LEGENDS :

- EFFLUENT PIPELINE ALIGNMENT
- EXISTING GROUND LEVEL
- EFFLUENT PIPELINE PROFILE
- HATCHBOX CHAMBER
- GATE VALVES CHAMBER
- VENTILATION PIPE CHAMBER
- 1:25 BENDS

NOTE:

1. CHECK TO REFERENCE AN APPROPRIATE CONTROL POINT.
2. USE A GRADE CHECK TABLE - CHECK THAT CORRECT GRADE IS MAINTAINED THROUGHOUT THE LENGTH OF THE PIPE.
3. CHECK THAT THE PROPOSED GRADE IS ABOVE THE MINIMUM REQUIRED GRADE.
4. CHECK THE PROPOSED GRADE IS ABOVE THE MINIMUM REQUIRED GRADE.
5. CHECK THE PROPOSED GRADE IS ABOVE THE MINIMUM REQUIRED GRADE.
6. CHECK THE PROPOSED GRADE IS ABOVE THE MINIMUM REQUIRED GRADE.
7. CHECK THE PROPOSED GRADE IS ABOVE THE MINIMUM REQUIRED GRADE.



ISSUE FOR CONSTRUCTION		DATE
Rev	Description	By / Date
<p><b>ARUP</b> On Amp &amp; Pinnao Hong Kong Island</p>		
<p>CONTRACT NO. DC/2003/01                  NGONG PING SEWAGE TREATMENT PLANT, TRUNK SEWERS AND EFFLUENT EXPORT PIPELINE</p>		
<p>REPLACEMENT OF EXISTING GROUND LEVEL                  ALIGNMENT AND PROFILE                  (SHEET 5 OF 10)</p>		
Scale	Drawing No.	Revision
Scale	Sheet No.	Revised By
Scale	Sheet No.	Revised By

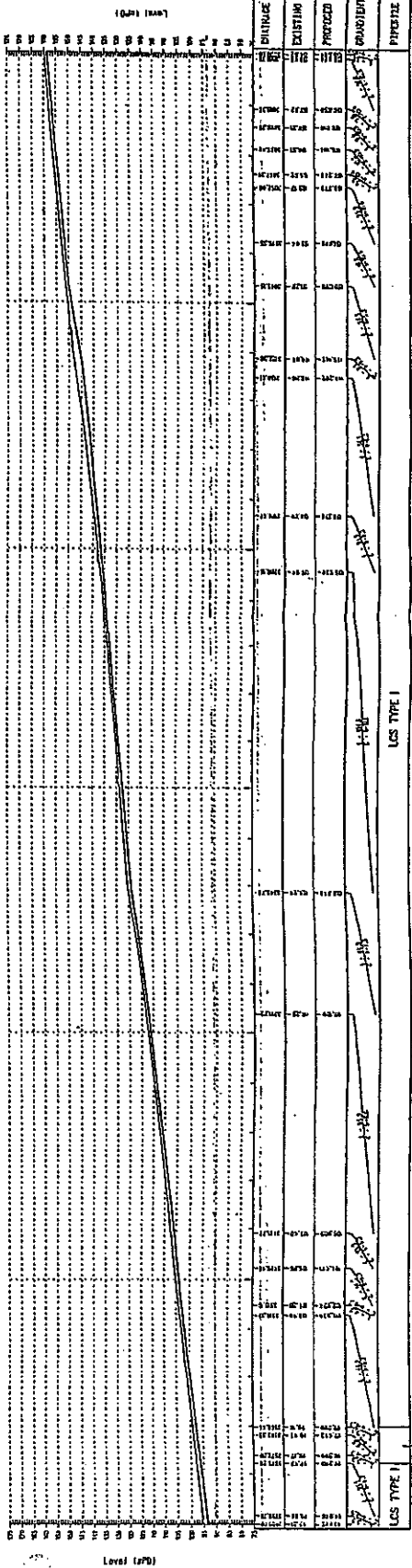
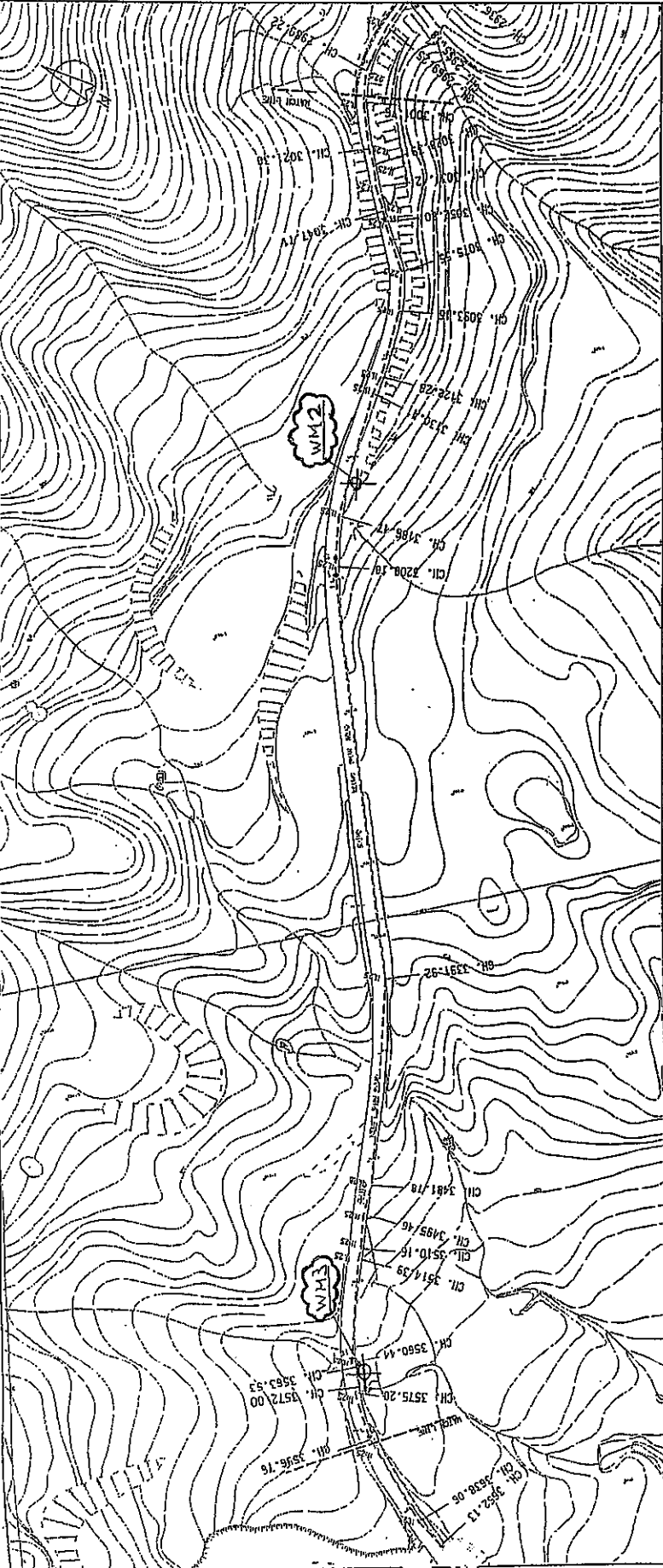
香港特別行政區政府地政處  
 工務工程署  
 政府工程處  
 HONG KONG SPECIAL ADMINISTRATIVE REGION

LEGENDS :

- EFFLUENT PIPELINE ALIGNMENT
- EXISTING GROUND LEVEL
- EFFLUENT PIPELINE PROFILE
- ⊠ HATCHBOX CHAMBER
- ⊙ GATE VALVES CHAMBER
- ⊠ VENTILATION PPE CHAMBER
- TLS SENS

NOTE:

1. REFER TO DRAWING NO. DC2020301 FOR DETAILS.
2. USE 1:50 SCALE FOR ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED.
3. ALL DIMENSIONS ARE TO THE CENTERLINE OF THE PIPE UNLESS OTHERWISE SPECIFIED.
4. REFER DRAWING NO. DC2020301 FOR DETAILS OF GATE VALVE CHAMBER.
5. REFER DRAWING NO. DC2020301 FOR DETAILS OF VENTILATION PPE CHAMBER.
6. REFER DRAWING NO. DC2020301 FOR DETAILS OF HATCHBOX CHAMBER.
7. ALL DIMENSIONS ARE TO THE CENTERLINE OF THE PIPE UNLESS OTHERWISE SPECIFIED.
8. REFER DRAWING NO. DC2020301 FOR DETAILS OF SENS.
9. REFER DRAWING NO. DC2020301 FOR DETAILS OF SENS.
10. REFER DRAWING NO. DC2020301 FOR DETAILS OF SENS.



ISSUE FOR CONSTRUCTION	DATE	BY	DATE
Rev. Description	By	By	Date

Drawn by: \_\_\_\_\_

**ARUP**  
On Amp I Embank (Bang Zeng Lashed)

Project No: \_\_\_\_\_

**CONTRACT NO. DC2020301**  
**NGONG PING SEWAGE TREATMENT PLANT, TRUNK SEWERS AND EFFLUENT EXPORT PIPELINE**

Project Title: \_\_\_\_\_

Drawn by: \_\_\_\_\_

**EFFLUENT EXPORT PIPELINE ALIGNMENT AND PROFILE (SHEET 6 OF 10)**

Drawing No: 23407076


Scale: \_\_\_\_\_

Approved by: \_\_\_\_\_

Checked by: \_\_\_\_\_

Drawn by: \_\_\_\_\_

Project Manager: \_\_\_\_\_

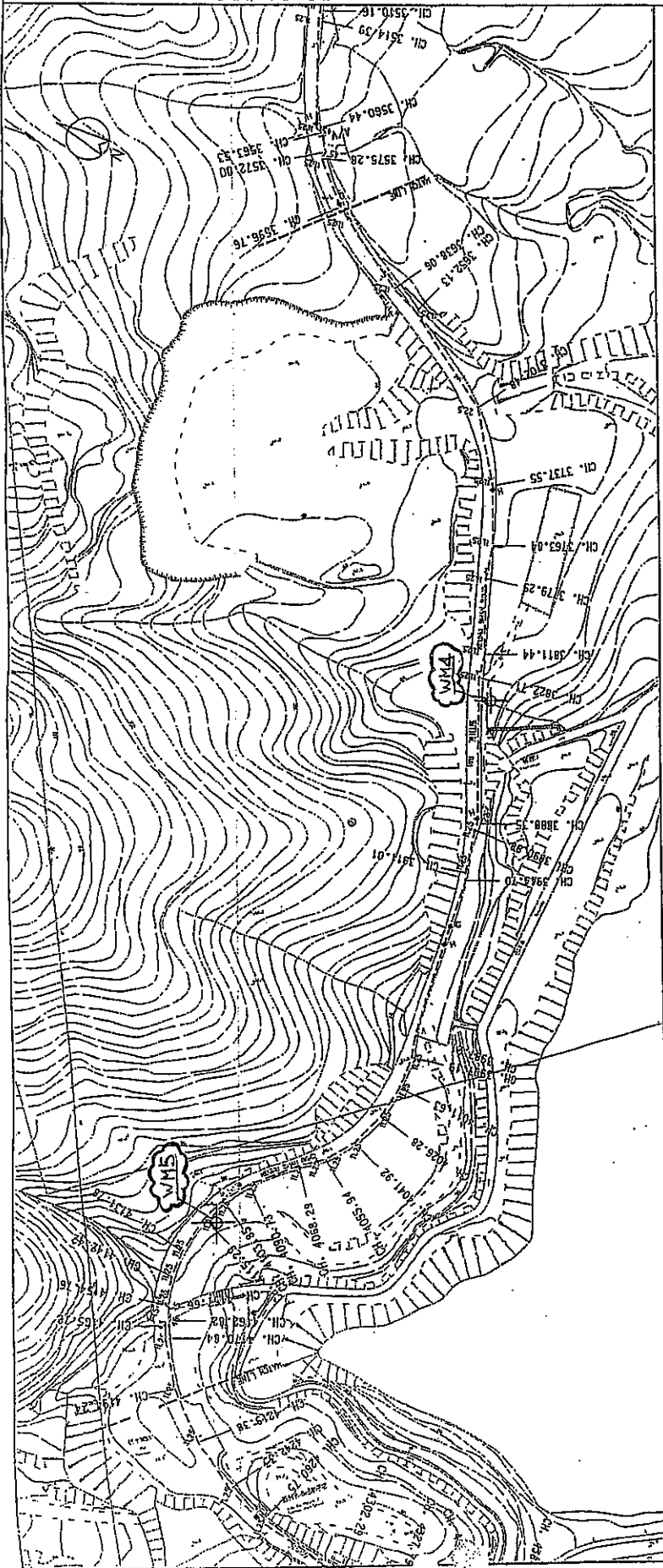

  
 香港特別行政區政府  
 渠務署  
 GOVERNMENT OF THE CITY OF HONG KONG  
 DEPARTMENT OF DRAINAGE

LEGENDS :

- EFFLUENT PIPELINE ALIGNMENT
- - - - - EXISTING GROUND LEVEL
- EFFLUENT PIPELINE PROFILE
- HATCHBOX CHAMBER
- GATE VALVES CHAMBER
- △ VENTILATION PIPE CHAMBER
- ILIS BENDS

NOTE:

1. REFER TO DRAWING NO. DCP030001 FOR GENERAL NOTES.
2. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS AND STANDARDS OF THE DEPARTMENT OF WATER SUPPLY AND SEWERAGE.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE RELEVANT AUTHORITIES.
4. THE CONTRACTOR SHALL MAINTAIN ACCESS TO ALL ADJACENT PROPERTIES AND UTILITIES AT ALL TIMES.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING UTILITIES AND STRUCTURES.
6. THE CONTRACTOR SHALL MAINTAIN THE PROPOSED PIPELINE AT ALL TIMES.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL ADJACENT PROPERTIES AND UTILITIES.



ISSUE FOR CONSTRUCTION	DATE	BY
Revised Description		

ARUP  
One Ping Street, Hong Kong, China

CONTRACT NO. DCP030001  
PING PING SEWAGE TREATMENT PLANT, TRUNK SEWERS AND EFFLUENT EXPORT PIPELINE

EFFLUENT EXPORT PIPELINE: ALIGNMENT AND PROFILE (SHEET 7 OF 10)

234001076

DATE: 23/08/2017

SCALE: 1:1000

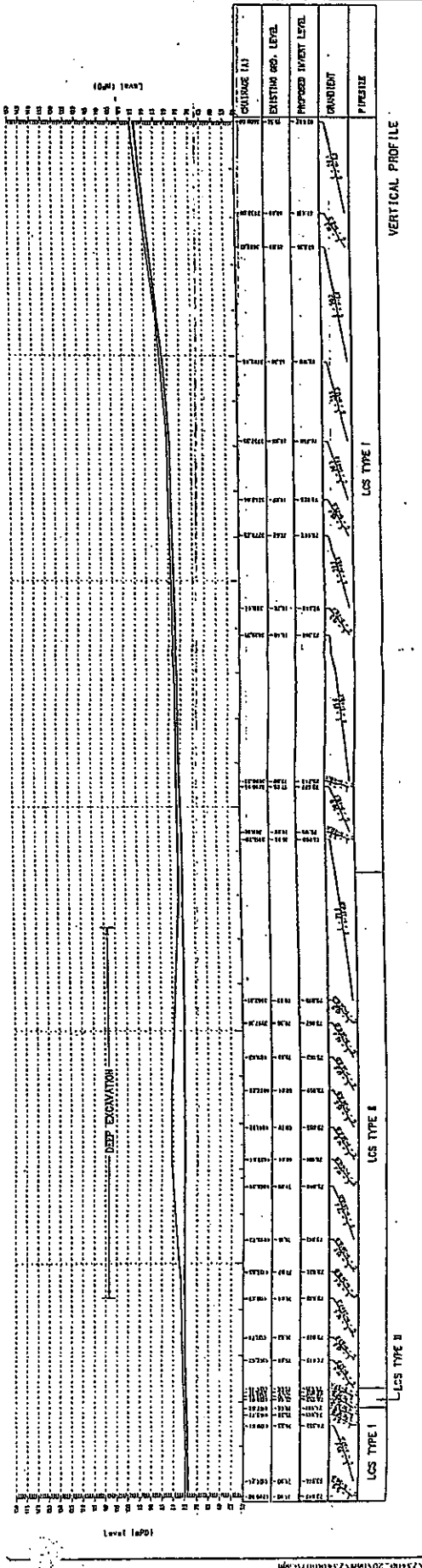
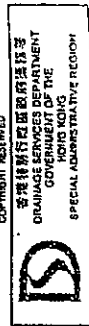
PROJECT NO.: DCP030001

PROJECT NAME: PING PING SEWAGE TREATMENT PLANT, TRUNK SEWERS AND EFFLUENT EXPORT PIPELINE

DESIGNED BY: [Name]

CHECKED BY: [Name]

APPROVED BY: [Name]



Stationing	CHOUAGE (I)	EXISTING GROUND LEVEL	PROPOSED INVERT LEVEL	DEEP EXCAVATION
0+00	100	100	100	0
0+01	100	100	100	0
0+02	100	100	100	0
0+03	100	100	100	0
0+04	100	100	100	0
0+05	100	100	100	0
0+06	100	100	100	0
0+07	100	100	100	0
0+08	100	100	100	0
0+09	100	100	100	0
0+10	100	100	100	0
0+11	100	100	100	0
0+12	100	100	100	0
0+13	100	100	100	0
0+14	100	100	100	0
0+15	100	100	100	0
0+16	100	100	100	0
0+17	100	100	100	0
0+18	100	100	100	0
0+19	100	100	100	0
0+20	100	100	100	0
0+21	100	100	100	0
0+22	100	100	100	0
0+23	100	100	100	0
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0+73	100	100	100	0
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0+95	100	100	100	0
0+96	100	100	100	0
0+97	100	100	100	0
0+98	100	100	100	0
0+99	100	100	100	0